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Smoky Canyon Mine
Remedial Investigation/Feasibility Study

Preliminary Remediation Goal for Soil

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TABLE OF CONTENTS

Page

LIST OF TABLES ii
LIST OF FIGURES ii
LIST OF ATTACHMENTS ii
LIST OF ACRONYMS AND ABBREVIATIONS iii
1.0 INTRODUCTION 1
2.0 ECOLOGICAL RISK ASSESSMENT FINDINGS 3
2.1 Similarity of Conditions at Conda and Smoky Canyon 4
3.0 CONDA SMALL MAMMAL POPULATION STUDY 5
4.0 SMOKY CANYON PRG FOR SELENIUM 7
4.1 Selenium Exposure Corresponding to Proposed PRG 7
4.1.1 Selenium in Exposure Media 8
4.1.1.1 Site-Specific Data 8
4.1.1.2 Relationship between Soil/Overburden and Tissue Selenium 9
4.1.1.3 Relationship between Selenium in Vegetation and Other Prey Tissues 10
4.1.2 Exposure Calculation 10
4.2 Hazard Quotient Calculation 11
4.3 Evaluating the Protectiveness of No-Effect Concentrations on Non-Mammalian Species 12
4.3.1 Toxicity Reference Values 13
5.0 SUMMARY AND CONCLUSIONS 16
6.0 REFERENCES 17

LIST OF TABLES

Table	Title
1	Comparison of Conda and Smoky Canyon Soil/Overburden Selenium Concentrations
2	Conda Small Mammal Population Study No Effect Soil Concentrations
3	Selenium Data from Smoky Canyon Upland Sampling Location Exposure Media
4	Linear Regression Summary for Smoky Canyon Exposure Data
5	Receptor Exposure Parameters from the Smoky Canyon SSERA
6	Exposure and Hazard Quotients Calculated at Smoky Canyon Using the Range of Conda No Effect Soil Concentrations
7	Hazard Quotients Adjusted for Area Use for Large Home Range Receptors

LIST OF FIGURES

Figure	Title
1	Comparison of EcoSSL Bird Versus Mammal NOAEL and LOAEL TRVs for Growth and Reproduction

LIST OF ATTACHMENTS

1	Data Used in the Assessment
2	Linear Regression Plots
3	Detailed Statistical Analysis Output (CD only)

LIST OF ACRONYMS AND ABBREVIATIONS

95UCL	95% Upper Confidence Limit
ANOVA	Analysis of Variance
ARAR	Application or Relevant and Appropriate Requirement
BW	Body Weight
C	Concentration
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COPC	Chemical of Potential Concern
DQO	Data Quality Objectives
DSR	Data Summary Report
ECOC	Ecological Chemical of Concern
EcoSSL	Ecological Soil Screening Level
ERA	Ecological Risk Assessment
FS	Feasibility Study
FSTM-1	Feasibility Study Technical Memorandum #1
HQ	Hazard Quotient
IR	Ingestion Rate
kg	Kilogram
kg/day	Kilogram per day
LOAEL	Lowest Observed Adverse Effect Levels
mg	milligram
mg/kg	milligram per kilogram
mg/L	milligram per liter
NOAEL	No Observed Adverse Effect Level
ODA	Overburden Disposal Area
PRG	Preliminary Remediation Goal
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SSERA	Site-Specific Ecological Risk Assessment
SUF	Site Use Factor
TRV	Toxicity Reference Value
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This document provides the rationale and technical analyses supporting the identification of a Preliminary Remediation Goal (PRG) for use in the Feasibility Study (FS) and to inform risk management decisions at the Smoky Canyon Mine (Smoky Canyon or Site). As part of the Agency review of the Draft Feasibility Study Technical Memorandum #1 (FSTM#1), Simplot was directed to develop a PRG for soil/overburden that is protective of wildlife identified in the Final Site-Specific Ecological Risk Assessment as having unacceptable risk (SSERA; Formation 2015). Because there are no Applicable or Relevant and Appropriate Requirements (ARARs) for soil, a risk-based PRG was developed using Site-specific and area data.

Overburden Disposeal Areas (ODAs) are the most prevelant areas that have soil/overburden and vegetation with elevated selenium concentrations; therefore, ODAs and areas affected by transport from the ODAs are the primary focus of risk management decisions, including PRG identification, and remediation.

Most of the ODAs at Smoky Canyon have been reclaimed using a range of materials and methods including direct revegetation, relatively thin layers of topsoil as a growth medium, or engineered covers that are thicker and consist of multiple layers of topsoil, Dinwoody Formation material, and/or chert. Selenium concentrations can remain elevated in surface soil/overburden and vegetation on reclaimed ODAs that have either no cover (i.e., direct revegetation of overburden material) or a relatively thin layer of topsoil placed as a growth medium. Exposures and risks are considerably lower for northern Sage Valley, where no mining activities have occurred, as well as Panel A and Panel E, where reclamation has been conducted using revegetated multi-layer engineered covers (e.g., Panel A Area 1 and Panel E ODAs). The SSERA characterized risks for surface soil/overburden at the Pole Canyon ODA as elevated, but the Pole Canyon ODA has since been covered with an engineered Dinwoody over chert cover under a Non-Time-Critical Removal Action (Formation 2017).

Simplot proposes that the risk-based soil/overburden PRG be based on risks from selenium exposure for small mammal populations. This approach is primarily founded on three factors. First, selenium is the primary ecological chemical of concern (ECOC) driving risk estimates (SSERA; Formation 2015). Second, selenium has the widest spatial distribution of elevated concentrations in exposure media (i.e. soil/overburden and tissues) relative to risk thresholds. Third, small mammals have similar sensitivity to selenium and higher exposure compared to other terrestrial (upland and riparian) wildlife receptors, but may have entire sub-populations/communities present in areas roughly the size of the ODAs. As a result, small mammals are protective surrogates on which to base a PRG for wildlife populations.

The primary goal of the SSERA for wildlife, including small mammals, was to assess risks that local populations would be adversely affected by exposure to chemicals associated with overburden materials in ODAs. Risks for small mammals and other wildlife populations were assessed using standard exposure-based ecological risk assessment (ERA) methodology directed by state and federal guidance. This approach focuses on evaluating risk for individual organisms; assessment of risk to populations is done only by extrapolation from individual-level risk estimates. This is generally a very conservative approach, and the extrapolation to population-level effects is associated with high uncertainty. Direct evaluation of populations in exposed areas is much less uncertain, but often requires time and resources not available for Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) risk assessments.

No site-specific small mammal population studies have been performed at the Smoky Canyon Mine. However, a three-year study of small mammal populations (Formation 2018a) was completed at the nearby Conda Mine, which has similar types of overburden material and ODAs being evaluated for remediation. The results of this study are being considered in setting soil/overburden PRGs at Conda. Because of the proximity and similarities of the Conda Mine and Smoky Canyon Mine sites, small mammal population study results from Conda are considered in this document for use in setting a soil/overburden PRG for Smoky Canyon.

The data and analyses provided in this document are intended to demonstrate that the proposed soil/overburden PRG is protective of the range of wildlife receptors evaluated in the SSERA and is appropriate for guiding risk management decisions.

This document is organized as follows:

- Section 2 provides a summary of the SSERA conclusions and discusses the risks predicted for selenium and the other ECOCs at the Site. The similarity of conditions at the Conda Mine and the Smoky Canyon Mine is also discussed.

- Section 3 discusses the results of the Conda Mine small mammal population study and its applicability at Smoky Canyon.

- Section 4 presents the collocated soil/overburden and tissue data collected at Smoky Canyon and evaluates the relationship of selenium concentrations in soil/overburden, vegetation, and prey tissue. In addition this section describes exposure estimations that are used to evaluate the protectiveness of the PRG to wildlife receptor populations.

- Section 5 summarizes the approach and provides conclusions for the PRG selection.

2.0 ECOLOGICAL RISK ASSESSMENT FINDINGS

The SSERA for the Smoky Canyon Mine was submitted in December 2015 (Formation 2015). The SSERA assessed potential risks to populations for a range of ecological receptors associated with upland and riparian areas within the Site as well as in northern Sage Valley. For the terrestrial receptors, the SSERA concluded that selenium is the primary ECOC driving risk estimates and the potential need for risk management decisions at the Site.

In the upland portions of the Site, elevated concentrations of selenium were observed primarily on ODAs with either no cover (i.e., direct revegetation) or relatively thin topsoil-only covers. Elevated concentrations of ECOCs in soil/overburden corresponded with higher exposures and risks. Exposures and risks were considerably lower for soils in northern Sage Valley and soil/overburden at Panel A Area 1 and Panel E. Risks were lowest within the areas with Dinwoody or topsoil soil over chert cover reclamation and highest on the ODAs with no cover. For areas of northern Sage Valley that are outside of the Pole Canyon Creek corridor, concentrations of ECOCs were relatively low and may reflect background concentrations.

Copper was the only other ECOC extensively discussed in the conclusions of the SSERA. Elevated concentrations of copper detected in several small mammal samples were observed and resulted in exposure estimates that exceeded the toxicity reference values (TRVs) for both the coyote and northern harrier receptors. The concentrations observed showed no spatial relationship and no relationship with copper concentrations in soil/overburden on the reclaimed and riparian areas of the Site. Site-wide risks to both the coyote and northern harrier could not be ruled out, due to these copper concentrations in small mammal tissue. However, elevated copper concentrations in small mammal tissue samples are thought to be anomalous considering the relatively low copper concentrations in soil/overburden and other tissue samples from the same areas, from other southeast Idaho phosphate mine sites, and concentrations reported in the literature for copper-contaminated sites (Formation 2018b). Copper contamination is not associated with phosphate mining and copper was not identified in the Smoky Canyon Mine Remedial Investigation (RI) at elevated concentrations in soil/overburden (Formation 2014).

The SSERA also concluded that concentrations of cadmium, chromium, lead, manganese, molybdenum, vanadium, and zinc corresponded to exposures that exceeded TRVs at some locations concurrent with elevated selenium concentrations. However, elevated exposures for these ECOCs are restricted to small portions of the Site and do not present unacceptable risk to wildlife populations. Therefore, while individual receptors may experience exposures exceeding lowest observed adverse effect levels (LOAELs), overall effects to receptor populations from these chemicals was concluded to be low.

The SSERA concluded that risk management actions that protect wildlife populations from unacceptable selenium exposure would also protect receptors from other ECOCs.

Small mammals were selected as the surrogate receptor for wildlife exposure and risk, because their small home ranges and sensitivity to selenium results in a PRG that is protective of other terrestrial wildlife receptors[1].

2.1 Similarity of Conditions at Conda and Smoky Canyon

The Conda Mine and Smoky Canyon Mine sites are part of the same mining district and share many physical and ecological similarities, which is expected given their proximity and the fact that at both the phosphate ore is mined from the Meade Peak Member of the Phosphoria Formation. The overburden lithologies that occur in association with the phosphate ore are the same among the mines and include chert, cherty shale, mudstone, black shale, and limestone (McKelvey et al. 1959, Montgomery and Cheney 1967). Oxidation of minerals in the shale occurs during weathering and releases metals or metalloids such as selenium, cadmium, copper, nickel, vanadium, and zinc to the environment (Maxim 2000). The native vegetation communities of both sites are mixed, containing predominately Conifer-Aspen and Sagebrush-Grass communities, with inclusions of Riparian community (Montgomery-Watson 1999). For both sites, ODAs have been reclaimed using a range of techniques from direct revegetation, to installation of vegetated soil covers. The resulting vegetation communities on the reclaimed areas are largely composed of grasses and weedy broadleaf plants, with very little woody shrub cover. At Conda and Smoky Canyon, the ODAs are largely upland and relatively dry.

The habitats at the study locations at Conda are similar to those found at Smoky Canyon. The dry upland habitat vegetation is dominated by reclamation grasses and to a lesser extent by forbs such as alfalfa. The substrate is compact and rocky which limits burrowing and provides only marginal habitat for voles in most areas as evidenced by the dominant presence of deer mice at both sites.

Conda is an older mine site and has not been reclaimed using the more modern reclamation techniques that have been used at Smoky Canyon. Selenium concentrations in ODAs at Smoky Canyon are similar to, but generally lower than at Conda indicating that exposures at Smoky Canyon would be lower than observed at Conda. Table 1 provides a comparison of the surface soil selenium concentrations in each of the Smoky Canyon mined areas with selenium concentrations from the Conda small mammal population study locations. In all cases, the upper-bound estimate on the 95% upper confidence limit (95UCL) concentrations at Smoky Canyon were lower than the geometric mean selenium concentrations discussed in the population study.

Given the similarities of the two sites, and the lower potential exposures at Smoky Canyon, an overburden PRG that is protective for Conda would be protective of the same receptor groups at Smoky Canyon.

[1] The Site-Specific Ecological Risk Assessments at both Smoky Canyon and Conda showed potentially unacceptable risks to terrestrial wildlife receptors from selenium; however, both assessments also concluded that risks were likely to be overstated using existing TRVs and calculated Hazard Quotients.

3.0 CONDA SMALL MAMMAL POPULATION STUDY

Ecological risk assessments for both the Smoky Canyon and Conda mine sites indicated potentially unacceptable risk to wildlife populations with relatively small home ranges (i.e., small mammals and small birds) from exposure to selenium. To test this conclusion, and to complement the ERA, a population effects study was designed to evaluate the impacts of elevated selenium exposure on small mammal populations at Conda (as surrogates for gauging ecological function and population-level effects).[2] The study locations were selected to represent the range of risks calculated for small mammals in the Conda ERA and included areas with the highest calculated risk (non-remediated overburden areas) and areas with low or background risks (i.e., previously remediated areas, and non-mined reference areas). Endpoints measured in the study included selenium tissue concentrations, population densities of individuals (i.e., per unit area), body weight, and sex ratio information.

The data collected during the study are presented in the Conda Final Year 3 Data Summary Report (DSR; Formation 2018a). Data suggested that robust populations exist on the ODAs at Conda. Small mammal populations were dominated by deer mice; with some voles (*Microtus sp.*) collected from areas where forb density was highest. This is similar to what has been observed in the small mammal tissue sampling events at Smoky Canyon in both the 2010 RI sampling event and in the 2016 small mammal sampling event.[3] At Smoky Canyon, deer mice were the dominant species captured on the grassy reclaimed ODAs with voles captured primarily in areas with greater presence of forb species such as in Sage Valley and in several areas of Panel D.

The relative dominance of deer mice within the dry grassy habitats, and greater density of voles within more mesic habitats that are dominated by forbs is consistent with what has been observed at other mines within the southeast Idaho phosphate district. At the more mesic Champ Mountain Mine, alfalfa cover was higher, and voles were the dominant species captured from the highest selenium exposure areas. Deer mice at Champ Mountain sagebrush-dominant reference areas were collected at similar numbers to Conda (Arcadis 2017). These data suggest that the presence of mice and voles is more dependent on habitat than on selenium exposure. Deer mice are more likely to be found in dry habitats dominated by grasses and voles are more likely to be found in more mesic areas with higher forb densities. Similar observations were also noted at the North Maybe and South Maybe Canyon mines (Arcadis 2018).

Selenium-tissue concentrations in the small mammals, while not a direct measure of risk, reflected significantly higher selenium exposure at the Conda study locations (Formation 2018a).

[2] Collection of population- and community-level data, as additional lines-of-evidence for the characterization of risk, is consistent with United States Environmental Protection Agency (USEPA) Guidance for ERA (1998), and USEPA Risk Management Principles (USEPA 1999). The resulting understanding of ecological effects can then help to support risk-management decisions related to site remediation.

[3] The small mammal sampling events at Smoky Canyon were not designed to address questions about the population demographics of the small mammal community at Smoky Canyon. Rather, the samples were collected for the SSERA as measures of exposure for upper trophic level receptors that prey on small mammals.

Selenium-tissue concentrations in 2017 were between 12 and 55 milligrams/kilogram (mg/kg) at sampling locations on overburden areas and from 1.2 to 2.4 mg/kg in non-mined reference areas. The clear difference in selenium tissue concentrations shows that animals living on overburden are exposed to selenium at significantly higher rates than those living in the reference areas.

Despite the differences in selenium exposure, the average population density of the deer mice was not significantly different between the locations on overburden areas and in the reference area ($p < 0.05$) (Formation 2018a). Deer mouse density estimates over three years averaged 108.5 animals/acre on the soil/overburden sampling areas and 107.8 animals/acre on the undisturbed reference area. Both male and female mice, from the range of expected age classes, were present each year at all sampling locations with both juvenile and reproductive animals consistently present. At several locations, both in areas with high selenium exposure and in the reference area, several animals were re-captured in consecutive years during the study indicating year-to-year survival of at least a portion of the population.

The results of the Conda population study show that exposure to selenium in the mined areas at Conda is not resulting in a significant adverse effect on deer mouse populations. Because no effects were observed, the data cannot be used to identify a threshold selenium concentration for effects on populations. However, the data represent a range of environmental selenium concentrations that are clearly below the population effects threshold for selenium. Therefore, the soil/overburden concentrations at the study locations can be considered "no-effects" concentrations for effects on small mammal populations. Similarly, at the Champ Mountain, North Maybe, and South Maybe Canyon mines (Arcadis 2017 and 2018), the small mammal studies concluded that the results indicated no evidence of adverse effects to small mammal populations due to site related chemical exposure and that differences in small mammal populations were due to differences in habitat between the study sites.

Selenium concentrations from the Conda small mammal study locations on soil/overburden are shown in Table 2. These data represent depth-weighted concentrations[4] in the 0 to 12-inch depth interval and ranged from 14 to 248 mg/kg in the 11 soil/overburden samples available from three population sampling locations with similar small mammal densities as the undisturbed reference area. The geometric mean concentration was equal to 64 mg/kg while the arithmetic mean was equal to 98.2 mg/kg and the median was equal to 70.6 mg/kg. The 95UCL was equal to 144 mg/kg. Overall, these concentrations in overburden appear to be protective of small mammal populations and so are also protective of other terrestrial receptors. As a result, the concentrations can be used as a basis for identifying risk management goals, including PRGs, for selenium affected mine sites.

[4] Depth weighted soil concentrations were calculated by combining concentrations in 0 to 2-inch and 2 to 12-inch depth interval samples. The depth weighted concentration was estimate by multiplying the concentration in the 0 to 2-inch interval by 0.167 and the 2 to 12-inch interval by 0.833 and adding the results.

4.0 SMOKY CANYON PRG FOR SELENIUM

Per the USEPA (1997) Risk Assessment guidance, risks should be managed based on potential risks to populations of receptors. As discussed in Section 2, The SSERA concluded that risks, as calculated using HQs, were highest to small home range receptors including omnivorous small mammals represented by the deer mouse, omnivorous small birds represented by the American robin, herbivorous small mammals represented by the eastern cottontail and herbivorous birds represented by the northern bobwhite. The potential for risks to receptors with larger home ranges such as the mule deer, coyote, and northern harrier were determined to be lower, but still had HQs greater than 1. The SSERA further concluded that although HQs greater than 1 were calculated for all receptors, it was likely that the risk models over-predicted risk.

The Conda small mammal study was designed to address the potential for over-estimation of risk using the HQ approach by providing a direct measurement of the populations of the receptor with the highest HQs in both areas with high and low selenium concentrations and potential exposures. Given the similarities in geology, habitat and general ecology between the two mine sites, the geometric mean of the no effect soil/overburden concentrations from the Conda small mammal population study, 64 mg/kg, is proposed as the soil/overburden PRG for Smoky Canyon. The proposal is based, in part, on the similarities in exposure conditions and ecology of the two sites. The relative similarities in uptake of selenium into food chain elements, and exposures to wildlife receptors are discussed further in the following sections as rationale and support for application of the PRG at Smoky Canyon.

It is recognized that there is some uncertainty in utilizing the Conda small mammal population study results at Smoky Canyon as well as uncertainties in applying those results as a protective risk-based PRG for the other wildlife receptors at the Site. Those uncertainties are further considered in this section by estimating the predicted exposure and HQs to all receptors at soil/overburden concentrations equivalent to the PRG and by discussing the potential degree of exposure and potential toxicity between the different receptor populations that may be exposed to soil/overburden selenium at Smoky Canyon.

4.1 Selenium Exposure Corresponding to Proposed PRG

Quantification of exposure requires not only data on selenium concentrations in Site environmental media but also estimates of predicted ingestion rates and contact information for each receptor and pathway. The selenium data collected for the SSERA are discussed in this section as well as all exposure factors such as body weights, ingestion rates of food, proportions of prey ingested, and home range used for each receptor.

The selenium exposures of ecological receptors at Smoky Canyon are estimated assuming a soil/overburden concentration equal to the PRG. Exposures equal to or lower than Conda would indicate that the PRG is at least as protective for Smoky Canyon. Regression analysis of Site-

specific soil/overburden and biota data are used to project concentrations of selenium in biota corresponding to the proposed PRG. These values are then used to estimate exposure via food and soil ingestion and calculate HQs. The selenium data collected for the SSERA are discussed in this section as well as all exposure factors such as body weights, ingestion rates of food, proportions of prey ingested, and home range used for each receptor.

4.1.1 Selenium in Exposure Media

This section provides an analysis of Site-specific data to support the derivation of a PRG for selenium. The available data are described in Section 4.1.1.1 and the relationship between selenium concentrations in collocated soil/overburden samples and in tissue samples are described in Section 4.1.1.2. Section 4.1.1.3 discusses the relationship between selenium concentrations in collocated vegetation samples and concentrations in prey tissue samples.

4.1.1.1 Site-Specific Data

Data were collected under the RI/FS Sampling and Analysis Plan (SAP) (Formation 2010), and the investigation was guided by the Data Quality Objectives (DQOs), background information, and the SSERA Work Plan presented in the RI/FS Work Plan (Formation 2011). The data collected for the RI/FS were used to refine the preliminary characterization of the nature and extent, and fate and transport, of RI chemicals of potential concern (COPCs) in the environment and were used to support the SSERA. A detailed description of the investigations conducted under the RI, as well as data collected, and an evaluation of data quality, is provided in Section 2 of the Final RI Report (Formation 2014).

Surface soil/overburden, terrestrial vegetation, terrestrial invertebrate tissue, and small mammal (whole body) tissues were collected from a total of 58 locations at Smoky Canyon. These locations included ODAs, undisturbed soils in northern Sage Valley, seep areas at the foot of ODAs, riparian areas, and the Hoopes Spring discharge area. Together these data provided collocated soil/overburden (source) and biological tissue selenium concentration data from across the Site and from both upland and riparian areas. The collocated data collected for all four media types at all locations are provided in Attachment 1.

For the purposes of this analysis, only those data collected from sampling locations from the reclaimed and un-reclaimed mining areas were used. Data collected from locations outside of the actual mined areas, including samples from seeps and riparian areas, were not included, because, while they are valuable for assessing risk from exposure in non-mined areas, they are not directly applicable for determining the effects from selenium exposure on ODAs and for assessing the need for, and effectiveness of remedial actions. Because the SSERA concluded that population-level risks to all receptors in all locations outside of the mined area were low, using the data from the mined areas (42 of 58 locations) provides the most applicable dataset. The

collocated data from upland sampling locations from the mined areas for surface soil/overburden, vegetation, terrestrial invertebrates, and small mammals are provided in Table 3.

4.1.1.2 Relationship between Soil/Overburden and Tissue Selenium

In order to estimate exposure to terrestrial receptors at Smoky Canyon following the application of the soil/overburden PRG, it is necessary to define the relationship between selenium concentrations in the source material (i.e. soil/overburden) and the exposure media (i.e. tissues ingested by terrestrial receptors).

The data collected from the 42 collocated upland sampling locations were first evaluated to determine if statistically significant relationships exist between soil/overburden concentrations and tissue concentrations. The data were evaluated using a series of linear regression analyses (NCSS 12 Statistical Software 2018). The results of the linear regression analyses include the calculation of the coefficient of determination (R^2) and a determination regarding the statistical significance of the relationship between the two variables (p). The R^2 value is a measure of the amount of variability in selenium concentrations measured in the tissue media (dependent variable) due to the variability in concentrations measured in the surface soil/overburden (independent variable). A perfect correlation between the two variables would be represented by an R^2 value equal to 1 and the closer the R^2 value is to 1, the more highly correlated the tissue media concentration is to the surface soil/overburden concentration.

As a first step, regressions between surface soil/overburden selenium concentrations and selenium concentrations in vegetation, invertebrates, and small mammals were calculated (Table 4). Using untransformed data, only the relationship between soil/overburden selenium concentrations and vegetation selenium concentrations showed a significant correlation ($p < 0.1$) between the two variables. Terrestrial invertebrate and small mammal selenium concentrations were not correlated with the surface soil/overburden selenium concentration. When the data were transformed using a standard natural logarithm transformation, all three variables were significantly correlated, and the R^2 ranged from 0.47 for small mammals to 0.65 for vegetation indicating a reasonable relationship between soil/overburden selenium concentrations and selenium concentrations in collocated tissue samples. The regression plots for the statistical analyses discussed in this section are provided in Attachment 2. The full results and outputs from the statistical analysis are provided in Attachment 3.

Based solely on the results of the regression analyses between soil/overburden concentrations and tissue concentrations, the use of a soil/overburden PRG results in some uncertainty due to the variability in the uptake of selenium from soil/overburden into tissues; however, the use of Site-specific data for estimating uptake is likely to result in lower levels of uncertainty than would be expected if non-site-specific sources of bioaccumulation data are used (e.g. Ecological Soil Screening Level [EcoSSL] bioaccumulation models in USEPA [2005]).

4.1.1.3 Relationship between Selenium in Vegetation and Other Prey Tissues

Using the same approach as described in the previous section for soil/overburden, the correlation between selenium concentrations in vegetation and prey tissues was also evaluated.

Terrestrial invertebrates are likely to be exposed to selenium via both exposure to surface soil/overburden and exposure to live plant material as well as plant detritus. Small mammals are likely to be exposed to selenium via similar pathways as well as exposure via ingestion of invertebrate tissues. In both cases, exposure to selenium in soil/overburden is most likely much lower than exposure to selenium in the food eaten by animals of both trophic levels. Regression analyses comparing terrestrial invertebrates and small mammals as dependent variables to terrestrial plants was also conducted (Table 4). In both cases, the R^2 values calculated showed stronger correlations between vegetation and invertebrate tissue (R^2 = 0.85) and between vegetation and small mammal tissue (R^2 = 0.76) selenium concentrations than the soil-based regressions. A regression analysis was also run between small mammal and invertebrate tissues which resulted in a very similar R^2 value (R^2 = 0.79) to the vegetation to small mammal regression[5].

Based on these analyses, the relationships between selenium concentrations in terrestrial vegetation and in invertebrate or small mammal tissues provide the best measures for estimating exposure for terrestrial wildlife receptors that correspond to potential soil/overburden PRGs. The details of the estimates of exposure for terrestrial wildlife receptors based on the regression models are provided in the following sections.

4.1.2 Exposure Calculation

Selenium exposures corresponding to the soil/overburden PRG were estimated using the same model provided in the SSERA. The receptors were chosen to provide a range of feeding habits and home range sizes for this analysis. The values from the SSERA were used in this document and are shown in Table 5. The generic exposure equation is:

$$\text{Dose}_{\text{Total}} = (\text{SUF}) \times \frac{\left[\left(\text{C}_{\text{media}} \text{ x } \text{IR}_{\text{media}}\right) + \left(\text{C}_{\text{prey}}\right)\left(\text{IR}_{\text{prey}}\right)\right]}{\text{BW}}$$

Where:

$\text{Dose}_{\text{Total}}$= Daily dose resulting from ingestion of abiotic media and dietary items (milligrams chemical per kilogram body weight per day [mg chemical/kg BW/Day]).

[5] Each regression was evaluated for potential outliers using the NCSS 12 Outlier Detection Routine. Those samples identified as potential outliers were considered on a case-by-case basis. For the vegetation to tissue regressions, one sample (APL-15) was removed as an outlier due to a high vegetation selenium concentration with very low collocated invertebrate and mammal concentrations. For the vegetation to small mammal regression, sample (PCO-06) was also removed due to a very low soil selenium concentration and a very high collocated small mammal tissue concentration. The R^2 presented represent the regressions with the outlier samples removed.

C_{media} = Concentration of chemical in abiotic media (mg/kg or milligrams per liter [mg/L]) during incidental ingestion of that media.

C_{prey} = Measured concentration of chemical in prey or forage types (mg/kg).

IR = Ingestion Rate (the amount of prey items, surface water, sediment, and soil/overburden ingested per day) (kilogram per day [kg/day], kg/kg BW/day).

BW = Body Weight of receptor species (kilogram [kg]).

SUF = Site Use Factor to account for the amount of time that the organism spends using the Site.

The SUF was assumed to be 1.0 for all receptors. Soil/overburden ingestion was assumed to be insignificant, making up less than 5% of the total risk for selenium in the SSERA. Water ingestion was determined to be a minor contributor to exposure and risk in the SSERA and is not discussed further in this analysis.

As shown in Table 6, exposure via the food ingestion pathway was estimated for five receptors representative of a range of exposure types and home range sizes across the range of no-effect soil/overburden concentrations.

4.2 Hazard Quotient Calculation

As defined in the SSERA, HQs are a standard approach identified in USEPA guidance (1997) to make comparisons between the predicted exposure for a receptor and the exposure rate indicative of some level of TRV. Therefore, the HQ is simply a ratio of the estimated exposure concentration to the TRV where:

$$HQ = Intake/TRV$$

Using the exposure parameters provided in Table 6, exposure and HQs were calculated for the SSERA receptors using the geometric mean NOAEL TRVs across the range of no-effect soil/overburden concentrations listed in Table 1.

The soil/overburden ingestion pathway was also considered as part of the exposure calculations as recommended by USEPA in the EcoSSL guidance (USEPA 2005). The soil/overburden ingestion rates used were taken from the SSERA. In general, the addition of the soil/overburden ingestion pathway had very little effect on the HQ calculations.

The data provided in Table 6 also show that area use is an important consideration in PRG development, especially when considering animals with large home ranges. In the case of the small home range receptors such as the deer mouse receptor, home range size is small enough that entire sub-populations of the regional populations may reside entirely within the mined area

assessed at the Site. For the small bird receptor (American robin), small sub-populations may also reside within the mined area.

For the large home range receptors, population-level exposure is low. As shown in Table 7, home ranges for individual coyotes (7,240 acres) and northern harriers (642.5 acres) are very large relative to the size of the mine panels. The home range for a mule deer herd was estimated at 31,424 acres. The largest of the mine panels assessed in the SSERA is 392 acres (Panel E) or approximately half of the home range for an individual northern harrier and approximately 1% of the range for mule deer. This indicates that for large home range receptors, the mine panels represent habitat for only a portion of the activity for one or several individuals of the local populations and are not large enough to support populations or even sub-populations of these receptors for more than periodic feeding.

In northern harrier population studies conducted in sagebrush habitats in Utah and Idaho, nest density was estimated to be less than 0.1 per 10 square kilometers (Smith and Murphy 1973, Howard et al. 1976), or less than 0.0004 nests per acre. These data suggest that while one or several northern harriers may utilize the site for a portion of their feeding activities, population-level effects are highly unlikely due to the low population density of harriers.

HQs calculated for the large home range receptors at the no-effect selenium concentrations, while taking Site use into consideration, are provided in Table 7. Considering these low HQs, the PRG is expected to be protective of large home range receptors.

Since the no-effect concentrations are expected to be protective of small mammal populations, the elevated HQs show that the standard exposure and risk models over-predict risk to a significant extent. While the other small home range receptors also had HQs greater than 1 using the small mammal no-effect concentrations, additional consideration needs to be given to those receptors to assess the protectiveness of the PRG to those populations.

4.3 Evaluating the Protectiveness of No-Effect Concentrations on Non-Mammalian Species

As shown in Table 6, HQs were highest for the deer mouse receptor. HQs for other omnivores with relatively small home ranges, such as the American robin and northern bobwhite were similar, but consistently lower than for the deer mouse. Because of their abundance and high estimated exposure, small mammals provide a robust model for assessing population-level effects at mining disturbed areas such as the Smoky Canyon Mine panels.

Based on the data for the Conda Mine, the average population density of deer mice was equal to approximately 110 animals per acre in both the overburden sampling areas with elevated selenium exposure and in the undisturbed sagebrush non-mineralized reference areas (i.e.,

background levels of selenium exposure). Animals in all age classes and at normal sex ratios were captured in both types of locations.

The size of the overburden areas means that most individual deer mice in the (sub)population may spend their entire life cycles exposed to elevated selenium concentrations. The combination of relatively high density of individuals inhabiting overburden and reference areas, and the life-cycle of exposure makes deer mice abundance a good metric for population effects at this Site. In contrast, the sub-populations of small birds at the Site are mobile in nature and their characteristically low population density makes predicting population-level effects more uncertain than for the small mammals.

For example, the vesper sparrow is a small omnivorous bird species similar in size to the American robin (used as the representative receptor in the SSERA). Studies in Montana grasslands show that the home range of the vesper sparrow ranges from less than 1 to 7.5 acres (Reed et al. 1985, 1986). The vesper sparrow is commonly found in grass dominant habitat and has been observed at both Smoky Canyon and Conda. The sparrows, like the American robin, also eat vegetation and terrestrial invertebrates. Therefore, they provide an excellent real-world example of a small omnivorous bird that would commonly be found foraging within the interior and on the edges of the mine panels at Smoky Canyon.

When considered as part of a risk assessment, it would be assumed that population-level effects can be assessed for such a species in areas the size of the Smoky Canyon ODAs because they are considerably larger than the home range of a single sparrow. However, the population density of the sparrow in sagebrush and reclaimed mined areas in Wyoming is approximately equal to 0.5 birds per acre (Shaid et al. 1983). When the population density of the animals is considered, more than 10,000 deer mice may utilize the available habitat in a 100-acre area for all of their activity, but 50 or fewer sparrows may utilize the same habitat and for many only part of their total activity given the bird's ability to move on and off of the mine panel quickly. Because of their low population density (i.e., small number of individuals using an area) and mobility, small bird populations are expected to be exposed at a much lower rate than small mammal populations within the same exposure area. As a result, observations of population-level effects would be much less likely, especially because the small birds are not more sensitive to selenium exposure than small mammals as discussed in the following section.

4.3.1 Toxicity Reference Values

Comparison of the relative toxicity of selenium to mammal and bird populations is also important in determining whether the PRG is protective of all small-home-range receptors. If the two groups of receptors do not show differential sensitivity to chronic selenium exposure, and potential exposure of birds is equal to or lower than small mammals, PRGs protective of small mammals can also be considered to be protective of small omnivorous bird populations.

The SSERA risk characterization used the geometric mean of the no observed adverse effect level (NOAEL) TRV presented in the EcoSSL document (USEPA 2007) as a less conservative and potentially more representative TRV for consideration in risk management decision making. The traditional NOAEL TRV assessed in the SSERA provides little value in PRG calculation as it is indicative of a no effect level for individuals which is overly conservative in predicted population-level effects. Similarly, the lowest LOAEL TRV was also evaluated in the SSERA but again provides only limited value to the PRG calculation because it is almost identical to the NOAEL TRV.

The geometric mean NOAEL TRVs from the EcoSSL guidance were discussed in the SSERA and provide an estimate of the mean exposure rate across all of the sub-lethal growth and reproduction endpoint species studied. As presented in the SSERA, the geometric mean NOAEL TRVs may provide risk managers with a better estimate of the average exposure rate across species that have been shown to have no effects, but because the TRV is higher than the lowest LOAEL, effects are possible at or below the TRV. However, those effects are not expected to correspond to significant population-level effects. A full discussion of the underlying data used to calculate the geometric mean TRVs was provided in Section 4.3.4 of the SSERA and, as discussed in that document, the geometric mean NOAEL is still conservative. Other factors including habitat and site use are much more important determinants of whether ecologically meaningful adverse impacts on a population are expected.

Since the small mammal no-effect soil/overburden concentrations from the Conda site form the basis of the Smoky Canyon soil/overburden PRG, their protectiveness to avian receptors must be considered. The EcoSSL toxicity database that was used as the basis for calculating the geometric mean NOAEL TRVs in the SSERA was queried to obtain all bird and mammal toxicity studies with growth and reproduction endpoints that had either a paired set of NOAEL and LOAEL TRV or an unbounded NOAEL TRV (i.e. no effects were observed at the highest dose). The EcoSSL toxicity database included 101 mammalian TRVs and 45 avian TRVs, all of which passed USEPAs data quality selection process outlined the EcoSSL guidance (USEPA 2005) and are adequate to derive dose-based TRVs for the given receptors.

The distribution of the NOAEL and LOAEL TRVs for mammals and birds are shown in the box plots in Figure 1. Both NOAEL and LOAEL TRVs were compared statistically using the One-Way Analysis of Variance (ANOVA) routine in Number Cruncher Statistical Systems 12 software package (NCSS 2018) to determine if the means of the mammal and bird TRV datasets are different from one another.

For the NOAEL TRVs, the distribution of the mammal and bird datasets did not meet the assumption of normality required by the parametric ANOVA, so a non-parametric alternative test, the Kruskal-Wallis One-Way ANOVA on ranks was used. The non-parametric test indicated that the NOAEL TRVs for birds and mammals were not significantly different ($p = 0.1$) based on a mean NOAEL for birds equal to 1.22 mg/kg BW/day and a mean NOAEL TRV for mammals equal to 0.93 mg/kg BW/day.

Similarly, for the LOAEL TRVs, no significant difference was observed between birds and mammals (Kruskal-Wallis; p = 0.17). The mean of the bird LOAEL TRVs was equal to 2.73 mg/kg BW/day versus 1.94 mg/kg BW/day for mammals. The detailed statistical output is provided in Attachment 3. Figure 1 also shows that the lowest mammal LOAEL TRVs are lower than the lowest bird LOAELS.

These data indicate that while population level studies for small birds are not available at the Smoky Canyon or Conda mines, the terrestrial-feeding small birds that are most likely to be present on the ODAs at Smoky Canyon are not expected to have significantly different sensitivities to diet-based selenium than small mammals, using either growth or reproduction endpoints. Because birds are not more sensitive to selenium than small mammals, but are generally more mobile resulting in lower exposure, the selenium TRV for small mammals is protective of birds.

5.0 SUMMARY AND CONCLUSIONS

The Smoky Canyon Mine SSERA concluded that selenium is the primary ECOC driving risks in upland areas of the Site. Other ECOCs had minor contributions of overall risk, especially in areas with overburden or other mine disturbance.

Small mammals inhabiting ODAs are the wildlife receptor populations with the highest potential risk from selenium, based on exposure and sensitivity to selenium toxicity. Small-home range omnivorous bird populations are also exposed, but to a lesser degree than small mammals and a comparison of the available dietary toxicity data do not suggest that bird populations would be affected at lower selenium concentrations than small mammals. Therefore, a PRG established for small mammals is protective of other wildlife populations utilizing the sites.

The Assessment Endpoints for all wildlife receptors were risks to populations (or sub-populations) on the sites. However, standard exposure-based ERA methodology directed by state and federal guidance accounts for risk to populations only by extrapolating estimates of risk to individuals. At Conda, a 3-year study was conducted to provide a direct measure of the population effects on small mammals. Results showed that populations on ODAs were not different from those in reference areas, leading to the conclusion that exposures to selenium on the ODAs were not enough to result in impacts to small mammal populations. Since individual-based HQs for small mammals in these areas exceeded the EPA threshold value of 1.0, exposure and risk characterization methods for these sites appear to be very conservative with respect to population-level impacts.

Based on the results of the population studies at Conda, Simplot proposed that the concentrations of selenium in soils/overburden at the study locations represent no-effect concentrations for small mammal populations and would be appropriate to use as a selenium PRG for Conda.

Based on the similarities of ecology, geology, disturbance history, and environmental selenium concentrations, Simplot proposes that the soil/overburden PRG developed for the Conda Mine small mammal population (64 mg/kg) is also appropriate for application at the Smoky Canyon Mine.

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TABLES

TABLE 1
Comparison of Conda and Smoky Canyon Soil/Overbuden Selenium Concentrations

Exposure Area	Number of Samples	Mean (mg/kg)	*Geometric Mean (mg/kg)*	Median (mg/kg)	90th Percentile (mg/kg)	95 UCL (mg/kg)
Conda Sites	11	98.2	***64***	70.6	238	144
Smoky Canyon Sites						
A Panel Area 1	10	2.276	1.58	2.2	5.07	3.3
A Panel Area 2	10	40.66	15.49	17.1	225.19	121
D Panel (north)	10	9.26	6.02	5.15	41.96	27.1
D Panel (south)	10	11.807	7.11	10.25	40.42	18.95
E Panel Area 1	10	1.726	1.3	1.3	6.3	3.08
E Panel Area 2	10	0.325	0.22	0.195	0.914	0.5
Pole Canyon ODA[1]	10	16.46	10.24	12.6	38.75	24.28

Notes:

mg/kg - milligrams per kilogram

RMM - Residual Mining Materials

[1] The data represent selenium concentrations prior to the 2015 installation of a Dinwoody/Chery cover on the Pole Canyon ODA.

TABLE 2
Conda Small Mammal Population Study
No Effect Soil Concentrations

Selenium Concentrations in Soil/Overburden Samples in the Vicinity of Small Mammal PET Locations (mg/kg)			
	0 - 2 inch	**2 - 12 inch**	**Root Zone Depth Weighted**
PET-1			
NT2-01	78.4	69	70.6
NT2-02	91.8	88.3	88.9
NT2-03	39.4	45.9	44.8
NQ-01	19	16.5	16.9
NQ-02	81.1	171	156
PET-2			
NT1-03	35	45.1	43.4
NT1-04	14.9	13.8	14
NQ-06	16.9	18.6	18.3
NT3-01	137	210	197.8
NT3-02	193	259	248
PET-5			
ST4-06	134	191	181.5

Summary Statistics	
Geometric Mean	64.0
Median	70.6
Mean	98.2
75th Percentile	182
90th Percentile	238
95th UCL	144

Note: ST4-06 was sampled twice. In 2003, Se at 0 - 2 inch and 2 - 12 inch = 165 and 191 mg/kg. In 2008, Se at 0 - 2 inch and 2 - 12 inch = 134 and 2,800 mg/kg.

Notes:

mg/kg - milligrams per kilogram

TABLE 3
Selenium Data from Smoky Canyon Upland Sampling Location
Exposure Media

	Exposure Media (mg/kg)			
Sampling Location	**Surface Soil/Overburden**	**Terrestrial Vegetation**	**Terrestrial Invertebrate**	**Small Mammal[1]**
APL-10	245.00	31.60	30.20	28.30
APL-13	6.00	17.50	20.20	23.07
APL-15	46.90	50.10	12.00	10.90
APL-16	1.20	4.08	9.07	14.89
APL-18	39.60	14.10	16.30	16.60
APL-19	4.10	0.37	11.10	2.60
APL-20	0.71	0.08	1.61	11.70
APL-21	5.10	0.43	2.36	2.08
APL-25	0.35	0.11	1.52	2.78
APL-26	3.60	0.62	1.97	2.11
APL-27	2.60	1.50	4.50	1.99
APL-29	0.66	0.03	1.32	0.89
DPL-16	45.60	13.60	34.60	31.10
DPL-18	4.50	2.02	8.77	7.80
DPL-20	5.80	12.20	24.50	36.80
DPL-21	6.80	14.90	26.00	30.40
DPL-23	9.20	29.50	53.80	36.80
DPL-25	7.40	24.80	62.30	53.42
DPL-26	10.80	7.74	32.10	33.30
DPL-27	3.60	28.30	50.10	54.40
DPL-29	18.10	8.81	26.60	23.35
DPL-32	42.90	9.15	16.20	19.07
DPL-33	1.90	5.33	8.45	6.08
DPL-34	4.00	11.80	29.20	48.30
EPL-11	0.46	0.09	5.32	4.05
EPL-12	1.50	0.35	2.27	2.99
EPL-14	1.80	0.34	1.68	1.84
EPL-15	6.80	1.11	3.42	2.97
EPL-18	1.40	0.77	4.41	3.21
EPL-19	0.67	0.33	1.31	2.94
EPL-21	0.94	0.33	7.08	1.52
EPL-22	0.18	0.07	1.09	1.39
EPL-25	0.21	0.30	0.97	3.93
EPL-26	0.54	0.23	1.11	1.28
EPL-27	0.07	0.07	1.07	1.31
EPL-28	0.08	0.04	0.45	1.55
PCO-05	8.40	3.71	20.50	30.10
PCO-06	2.00	8.70	29.30	101.9
PCO-07	1.10	7.02	18.60	54.45
PCO-10	39.20	29.00	27.70	23.90
PCO-12	34.70	6.36	13.60	14.60
PCO-14	5.50	16.00	30.00	36.67

Notes:
mg/kg - milligrams per kilogram
[1]- Small mammal concentrations are averages of concentrations in all animals collected from the site.

TABLE 4
Linear Regression Summary for Smoky Canyon Exposure Data

Soil/Overburden vs. Media	Untransformed	ln Transformed	Equation
Terrestrial Vegetation	0.24	**0.65**	**C_{veg} = 0.971 x C_{soil} + -0.4508**
Terrestrial Invertebrate	0.05	0.55	C_{inv} = 1.3957 x C_{soil} + 0.5568
Small Mammal	0.01	0.35	C_{sm} = 1.6555 x C_{soil} + 0.4446
Vegetation vs. Media[1]			
Terrestrial Invertebrate	0.75	**0.85**	**C_{inv} = 0.591 x C_{veg} +1.6782**
Small Mammal	0.36	**0.76**	**C_{sm} = 0.5580 x C_{veg} +1.8329**
Invertebrate vs. Small Mammal[2]	0.78	0.78	C_{sm} = 0.9504 x C_{veg} + 2.2699

Notes:

[1] - The vegetation concentration at sampling location APL-15 was determined to be an outlier using the outlier detection routine from NCSS 2017. R^2 values presented do not include data from APL-15.

[2] - The invertebrate concentration at sampling location PCO-06 was determined to be an outlier using the outlier detection routine from NCSS 2017. R^2 values presented do not include data from PCO-06

Bold indicates equations used in PRG calculations

TABLE 5
Receptor Exposure Parameters from the Smoky Canyon SSERA

Receptor	Percent of Diet			Food Ingestion Rate (mg/kg BW/day)	Home Range (acres)
	Vegetation	Invertebrate	Small Mammal		
Deer Mouse	55%	46%	0%	0.21	0.23
Eastern Cottontail	100%	0%	0%	0.06	5.96
American Robin	50%	50%	0%	0.21	0.395
Northern Bobwhite	85.6%	14.4%	0%	0.19	28.61
Mule Deer	100%	0%	0%	0.04	31424
Coyote	4%	6%	90%	0.03	7240
Northern Harrier	0%	3%	98%	0.10	642.5

Notes:

SSERA - Site-Specific Ecological Risk Assessment

mg/kg BW/day - milligram per kilogram body weight per day

TABLE 6
Exposure and Hazard Quotients Calculated at Smoky Canyon Using the Range of Conda No Effect Soil Concentrations

Receptor	Conda No Effect Concentration (mg/kg)	Estimated Vegetation Concentration (mg/kg)	Estimated Terrestrial Invertebrate Concentration (mg/kg)	Estimated Small Mammal Concentration (mg/kg)	Food Ingestion Rate (kg/kg BW/day)	Proportion Vegetation	Proportion Invertebrate	Proportion Mammal	Soil Ingestion Rate (kg/kg BW/day)	Exposure Via Soil Ingestion (mg/kg BW/day)	Exposure Food (mg/kg BW/day)	Total Exposure (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ With No Soil Ingestion	HQ With Soil Ingestion
Deer Mouse	Mean; 98	54.7	57.0	33.6	0.21	55%	46%	0%	0.0032	0.31	11.70	0.44	0.437	27	27
Eastern Cottontail					0.06	100%	0%	0%	0.0015	0.15	3.28	0.44	0.437	8	8
American Robin					0.21	50%	50%	0%	0.0027	0.26	11.72	0.61	0.61	19	20
Northern Bobwhite					0.19	85.6%	14.4%	0%	0.0019	0.19	10.45	0.44	0.437	24	24
Mule Deer					0.04	100%	0%	0%	0.0003	0.03	2.19	0.44	0.437	5	5
Coyote					0.03	4%	6%	90%	0.0009	0.09	1.18	1.34	0.437	3	3
Northern Harrier					0.10	0%	3%	98%	0.0007	0.07	3.42	1.59	0.61	6	6
Deer Mouse	Median; 70.6	39.8	47.2	28.2	0.21	55%	46%	0%	0.0032	0.23	9.06	0.44	0.437	21	21
Eastern Cottontail					0.06	100%	0%	0%	0.0015	0.11	2.39	0.44	0.437	5	6
American Robin					0.21	50%	50%	0%	0.0027	0.19	9.13	0.61	0.61	15	15
Northern Bobwhite					0.19	85.6%	14.4%	0%	0.0019	0.13	7.76	0.44	0.437	18	18
Mule Deer					0.04	100%	0%	0%	0.0003	0.02	1.59	0.44	0.437	4	4
Coyote					0.03	4%	6%	90%	0.0009	0.06	0.98	1.34	0.437	2	2
Northern Harrier					0.10	0%	3%	98%	0.0007	0.05	2.86	1.59	0.61	5	5
Deer Mouse	Geometric Mean; 64	36.1	44.6	26.7	0.21	55%	46%	0%	0.0032	0.20	8.40	0.44	0.437	19	20
Eastern Cottontail					0.06	100%	0%	0%	0.0015	0.10	2.17	0.44	0.437	5	5
American Robin					0.21	50%	50%	0%	0.0027	0.17	8.48	0.61	0.61	14	14
Northern Bobwhite					0.19	85.6%	14.4%	0%	0.0019	0.12	7.10	0.44	0.437	16	17
Mule Deer					0.04	100%	0%	0%	0.0003	0.02	1.45	0.44	0.437	3	3
Coyote					0.03	4%	6%	90%	0.0009	0.06	0.93	1.34	0.437	2	2
Northern Harrier					0.10	0%	3%	98%	0.0007	0.04	2.72	1.59	0.61	4	5

Notes:

TRV - Toxicity Reference Value

HQ - Hazard Quotient

mg/kg - milligrams per kilogram

kg/kg BW/day - kilogram per kilogra body weight per day

mg/kg BW/day - milligram per kilogram body weight per day

TABLE 7
Hazard Quotients Adjusted for Area Use for Large Home Range Receptors

Receptor	Conda No Effect Concentration (mg/kg)	HQ	Home Range (acres)	Smoky Canyon Mine Panel	A-1	A-2	A-3	A-4	A-ODA	A-Pit	C	D	D-1	D-2	D-3	D-ODA	E-0n	E-0s	E-1	E-1n	E-1s	E-2	E-3	E-ODA	POLE-ODA
				Mine Panel Area (acres)	52	38	57	26	91	25	70	1	53	82	58	57	27	34	45	63	56	17	28	86	113
Mule Deer	Mean; 98	5	31424	Adjusted HQs	0.01	0.01	0.01	0.004	0.01	0.004	0.01	0.0002	0.01	0.01	0.01	0.01	0.004	0.01	0.01	0.01	0.01	0.003	0.004	0.01	0.02
Coyote		3	7240		0.02	0.01	0.02	0.01	0.03	0.01	0.03	0.0004	0.02	0.03	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.03	0.04
Northern Harrier		6	642.5		0.5	0.3	0.5	0.2	0.8	0.2	0.6	0.01	0.5	0.7	0.5	0.5	0.2	0.3	0.4	0.5	0.5	0.1	0.2	0.8	0.99
Mule Deer	Median; 70.6	4	31424		0.01	0.004	0.01	0.003	0.01	0.003	0.01	0.0001	0.01	0.01	0.01	0.01	0.003	0.004	0.01	0.01	0.01	0.002	0.003	0.01	0.01
Coyote		2	7240		0.02	0.01	0.02	0.01	0.03	0.01	0.02	0.00	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.03	0.04
Northern Harrier		5	642.5		0.4	0.3	0.4	0.2	0.7	0.2	0.5	0.01	0.4	0.6	0.4	0.4	0.2	0.2	0.3	0.5	0.4	0.1	0.2	0.6	0.8
Mule Deer	Geometric Mean; 64	3	31424		0.01	0.004	0.01	0.003	0.01	0.003	0.01	0.0001	0.01	0.01	0.01	0.01	0.003	0.004	0.005	0.01	0.01	0.002	0.003	0.01	0.01
Coyote		2	7240		0.02	0.01	0.02	0.01	0.03	0.01	0.02	0.0003	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.005	0.01	0.03	0.03
Northern Harrier		4	642.5		0.4	0.3	0.4	0.2	0.6	0.2	0.5	0.01	0.4	0.6	0.4	0.4	0.2	0.2	0.3	0.4	0.4	0.1	0.2	0.6	0.8

Notes:

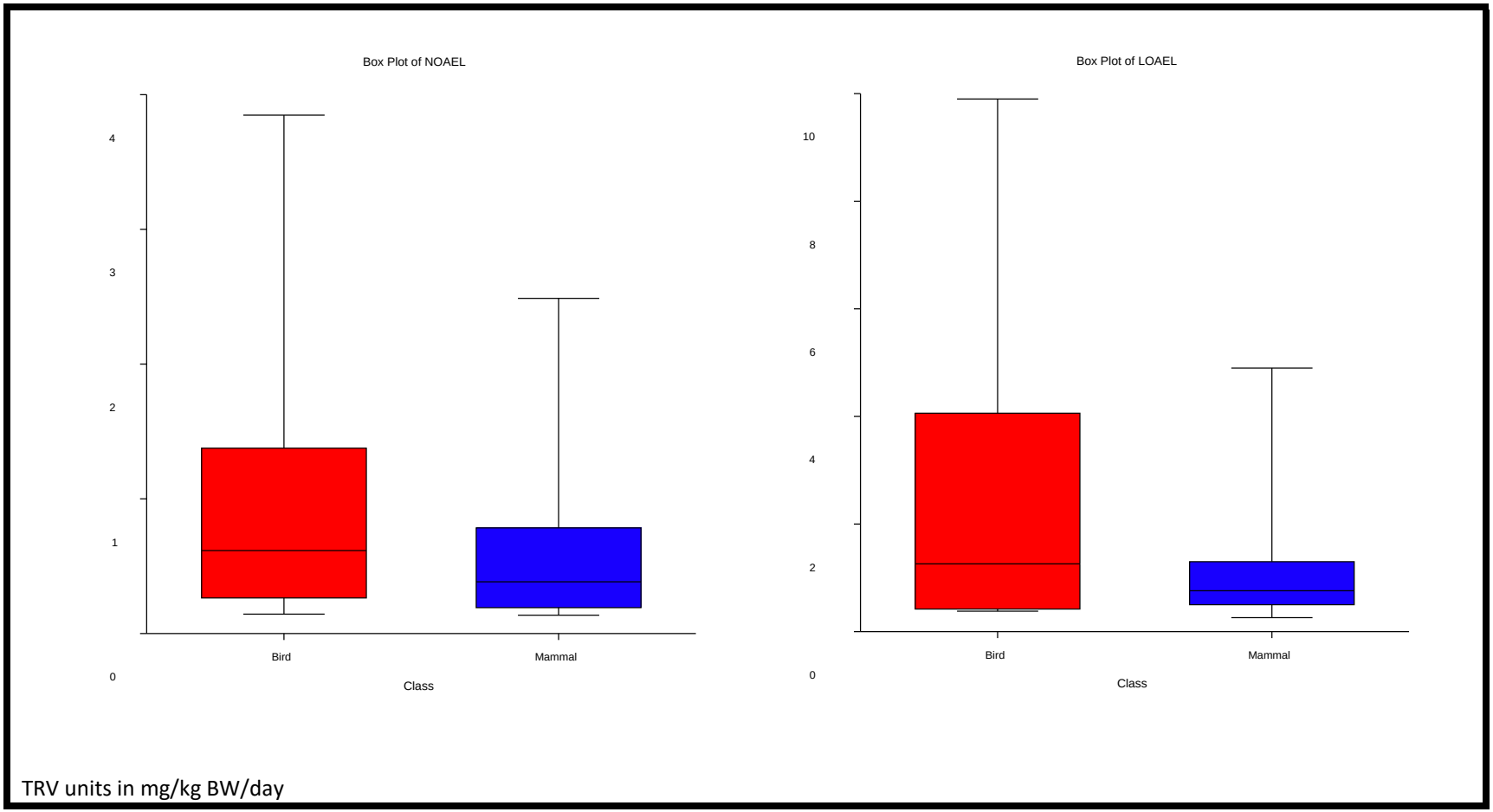
HQ - Hazard Quotient

mg/kg - milligrams per kilogram

ODA - Overburden Disposal Area

FIGURES

FIGURE 1
Comparison of EcoSSL Bird Versus Mammal NOAEL and LOAEL TRVs for Growth and Reproduction



TRV units in mg/kg BW/day

ATTACHMENTS

ATTACHMENT 1

Data Used in the Assessment

Attachment 1
Collocated Soil and Tissue Samples
2010 Smoky Canyon Mine RI Dataset

Type	Location	ECOC	Surface Soil		Terrestrial Vegetation		Terrestrial Invertebrate		Small Mammal	
			As Measured	ln Transformed	As Measured	ln Transformed	As Measured	ln Transformed	As Measured	ln Transformed
Upland	APL-10	Selenium	245	5.50	31.6	3.45	30.2	3.41	28.3	3.34
Upland	APL-13	Selenium	6	1.79	17.5	2.86	20.2	3.01	23.1	3.14
Upland	APL-15	Selenium	46.9	3.85	50.1	3.91	12	2.48	10.9	2.39
Upland	APL-16	Selenium	1.2	0.18	4.08	1.41	9.07	2.20	14.9	2.70
Upland	APL-18	Selenium	39.6	3.68	14.1	2.65	16.3	2.79	16.6	2.81
Upland	APL-19	Selenium	4.1	1.41	0.37	-0.99	11.1	2.41	2.6	0.96
Upland	APL-20	Selenium	0.71	-0.34	0.08	-2.53	1.61	0.48	11.7	2.46
Upland	APL-21	Selenium	5.1	1.63	0.43	-0.84	2.36	0.86	2.1	0.73
Upland	APL-25	Selenium	0.35	-1.05	0.11	-2.21	1.52	0.42	2.8	1.02
Upland	APL-26	Selenium	3.6	1.28	0.62	-0.48	1.97	0.68	2.1	0.75
Upland	APL-27	Selenium	2.6	0.96	1.5	0.41	4.5	1.50	2.0	0.69
Upland	APL-29	Selenium	0.66	-0.42	0.03	-3.51	1.32	0.28	0.9	-0.12
Upland	DPL-16	Selenium	45.6	3.82	13.6	2.61	34.6	3.54	31.1	3.44
Upland	DPL-18	Selenium	4.5	1.50	2.02	0.70	8.77	2.17	7.8	2.05
Upland	DPL-20	Selenium	5.8	1.76	12.2	2.50	24.5	3.20	36.8	3.61
Upland	DPL-21	Selenium	6.8	1.92	14.9	2.70	26	3.26	30.4	3.41
Upland	DPL-23	Selenium	9.2	2.22	29.5	3.38	53.8	3.99	36.8	3.61
Upland	DPL-25	Selenium	7.4	2.00	24.8	3.21	62.3	4.13	53.4	3.98
Upland	DPL-26	Selenium	10.8	2.38	7.74	2.05	32.1	3.47	33.3	3.51
Upland	DPL-27	Selenium	3.6	1.28	28.3	3.34	50.1	3.91	54.4	4.00
Upland	DPL-29	Selenium	18.1	2.90	8.81	2.18	26.6	3.28	23.4	3.15
Upland	DPL-32	Selenium	42.9	3.76	9.15	2.21	16.2	2.79	19.1	2.95
Upland	DPL-33	Selenium	1.9	0.64	5.33	1.67	8.45	2.13	6.1	1.81
Upland	DPL-34	Selenium	4	1.39	11.8	2.47	29.2	3.37	48.3	3.88
Upland	EPL-11	Selenium	0.46	-0.78	0.09	-2.41	5.32	1.67	4.1	1.40
Upland	EPL-12	Selenium	1.5	0.41	0.35	-1.05	2.27	0.82	3.0	1.09
Upland	EPL-14	Selenium	1.8	0.59	0.34	-1.08	1.68	0.52	1.8	0.61
Upland	EPL-15	Selenium	6.8	1.92	1.11	0.10	3.42	1.23	3.0	1.09
Upland	EPL-18	Selenium	1.4	0.34	0.77	-0.26	4.41	1.48	3.2	1.17
Upland	EPL-19	Selenium	0.67	-0.40	0.33	-1.11	1.31	0.27	2.9	1.08
Upland	EPL-21	Selenium	0.94	-0.06	0.33	-1.11	7.08	1.96	1.5	0.42
Upland	EPL-22	Selenium	0.18	-1.71	0.07	-2.66	1.09	0.09	1.4	0.33
Upland	EPL-25	Selenium	0.21	-1.56	0.3	-1.20	0.97	-0.03	3.9	1.37
Upland	EPL-26	Selenium	0.54	-0.62	0.23	-1.47	1.11	0.10	1.3	0.24
Upland	EPL-27	Selenium	0.073	-2.62	0.07	-2.66	1.07	0.07	1.3	0.27
Upland	EPL-28	Selenium	0.077	-2.56	0.04	-3.22	0.45	-0.80	1.6	0.44
Upland	PCO-05	Selenium	8.4	2.13	3.71	1.31	20.5	3.02	30.1	3.40
Upland	PCO-06	Selenium	2	0.69	8.7	2.16	29.3	3.38	101.9	4.62
Upland	PCO-07	Selenium	1.1	0.10	7.02	1.95	18.6	2.92	54.5	4.00
Upland	PCO-10	Selenium	39.2	3.67	29	3.37	27.7	3.32	23.9	3.17
Upland	PCO-12	Selenium	34.7	3.55	6.36	1.85	13.6	2.61	14.6	2.68
Upland	PCO-14	Selenium	5.5	1.70	16	2.77	30	3.40	36.7	3.60
Sage Valley	SV-22	Selenium	0.31	-1.17	0.03	-3.51	0.94	-0.06	1.9	0.65
Sage Valley	SV-23	Selenium	0.36	-1.02	0.2	-1.61	5.58	1.72	1.9	0.65
Sage Valley	SV-25	Selenium	0.28	-1.27	0.03	-3.51	1.22	0.20	0.9	-0.08
Sage Valley	SV-27	Selenium	0.47	-0.76	4.34	1.47	12.1	2.49	3.1	1.13
Sage Valley	SV-28	Selenium	0.27	-1.31	0.41	-0.89	8.57	2.15	1.9	0.66
Sage Valley	SV-29	Selenium	0.24	-1.43	0.03	-3.51	2.37	0.86	2.6	0.97
Riparian	DS-7	Selenium	87.5	4.47	34.6	3.54	86.1	4.46	29.3	3.38
Riparian	ES-3	Selenium	1.2	0.18	0.17	-1.77	1.84	0.61	1.9	0.62
Riparian	ES-4	Selenium	98.7	4.59	149	5.00	193	5.26	95.5	4.56
Riparian	HS-3	Selenium	4.7	1.55	0.28	-1.27	6.75	1.91	10.2	2.32
Riparian	HS-CC1	Selenium	8.4	2.13	0.5	-0.69	3.6	1.28	4.6	1.53
Riparian	HS-CC2	Selenium	1.6	0.47	0.35	-1.05	6.3	1.84	4.6	1.53
Riparian	LP-PD	Selenium	0.56	-0.58	42	3.74	9.85	2.29	12.9	2.56
Riparian	LS	Selenium	0.55	-0.60	0.18	-1.71	1.98	0.68	1.7	0.55
Riparian	LSm	Selenium	0.55	-0.60	0.09	-2.41	1.38	0.32	0.6	-0.48
Riparian	LSS	Selenium	10.4	2.34	0.84	-0.17	5.22	1.65	3.1	1.13

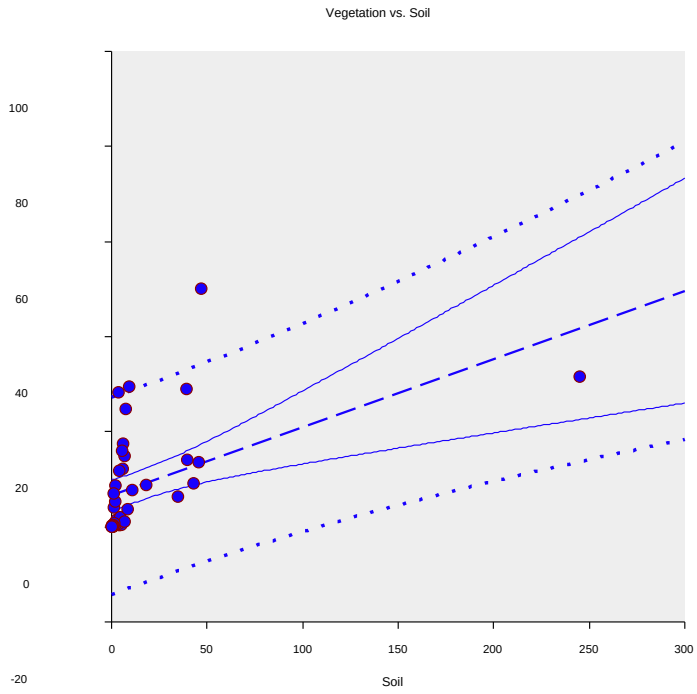
All units presented in mg/kg DW

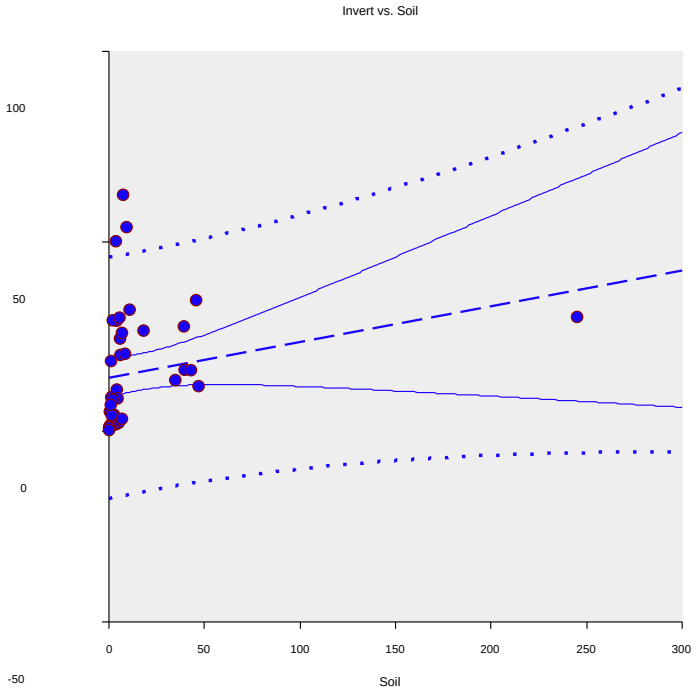
ATTACHMENT 2

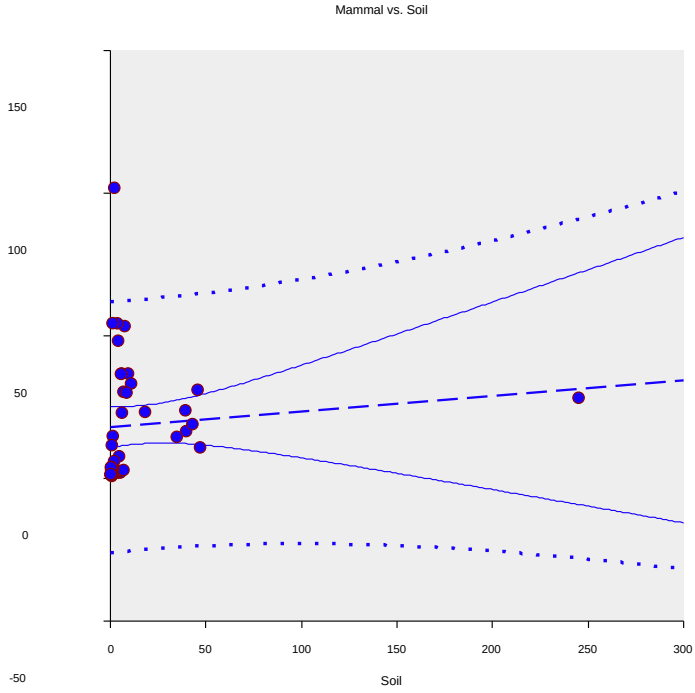
Linear Regression Plots

Attachment 2 – Linear Regression Plots

Figure A2-1 – Soil to media regressions. No transformation. All data.

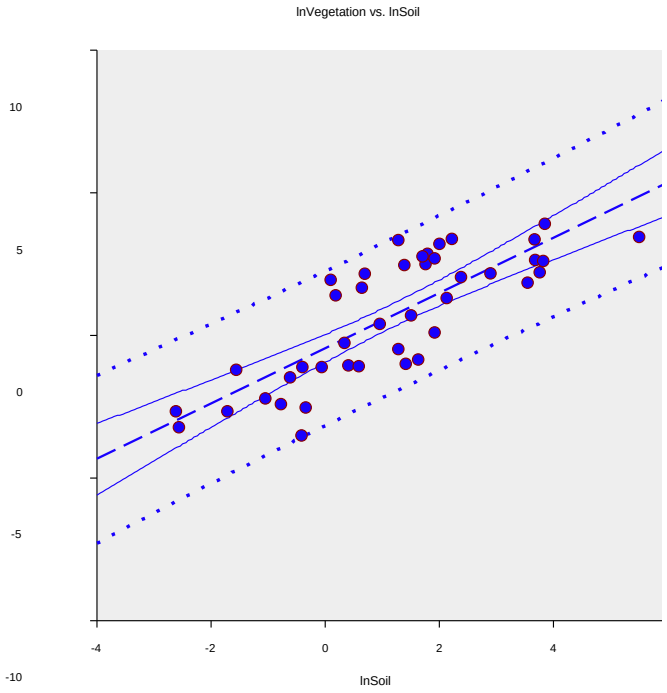


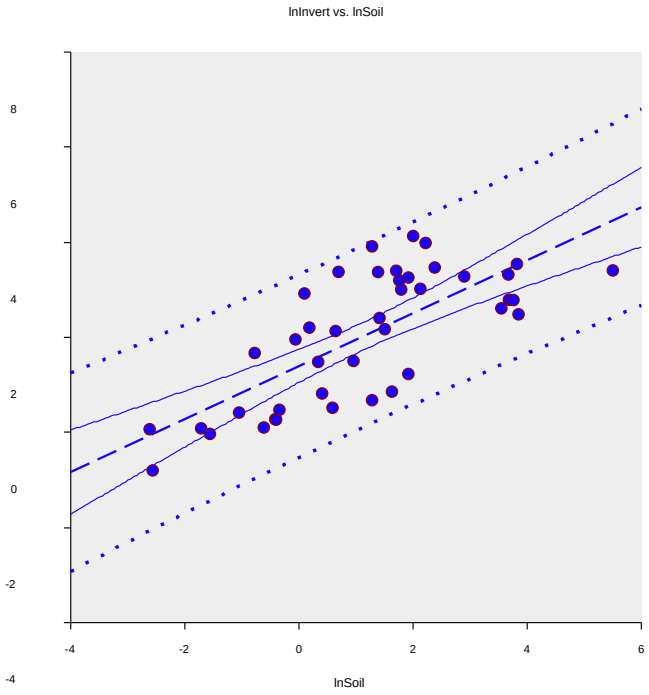


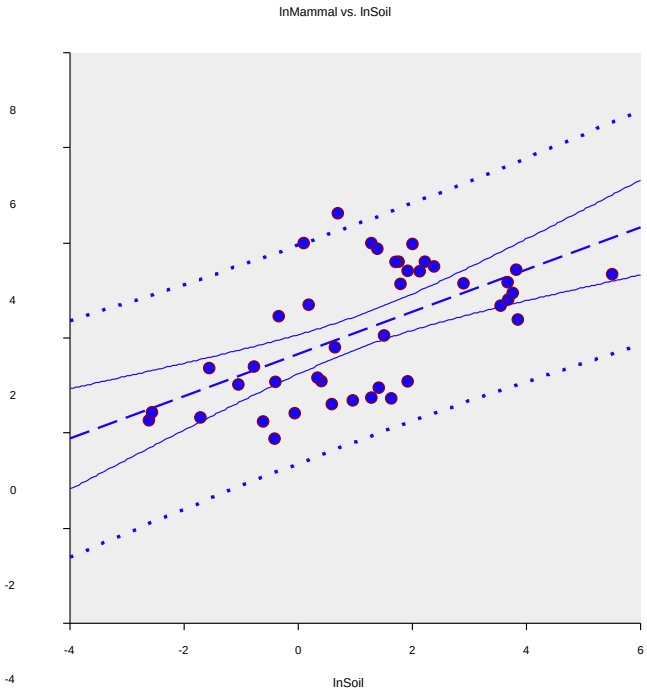


Attachment 2 – Linear Regression Plots

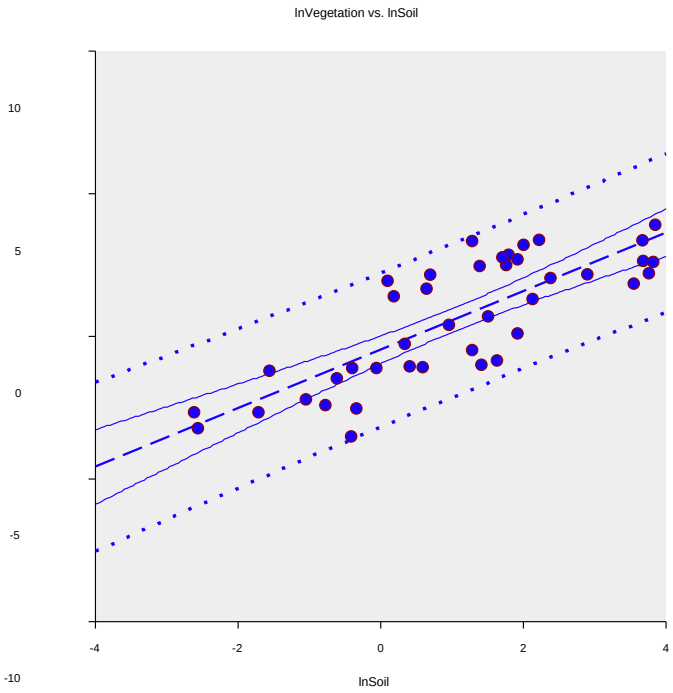
Figure A2-2 – Soil to media regressions. ln transformation. All data.

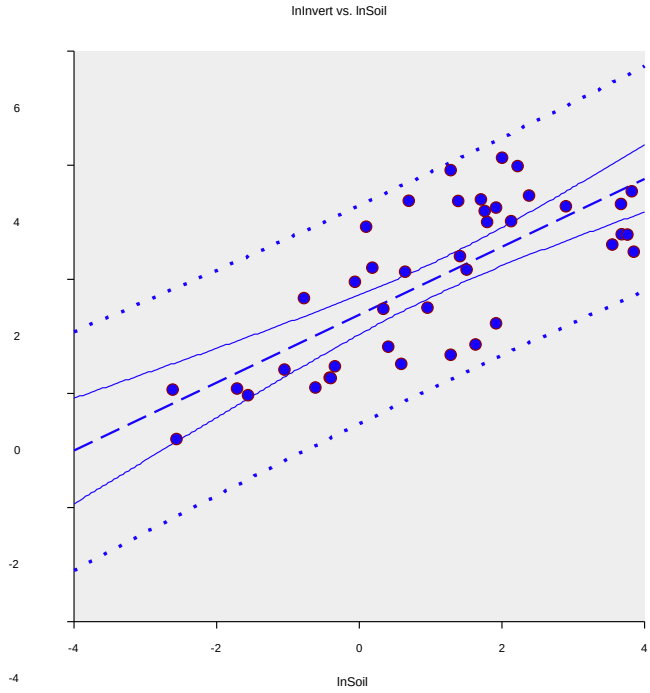






Attachment 2 – Linear Regression Plots
Figure A2-3 – Soil to media regressions. ln transformation. Outlier APL-10 removed





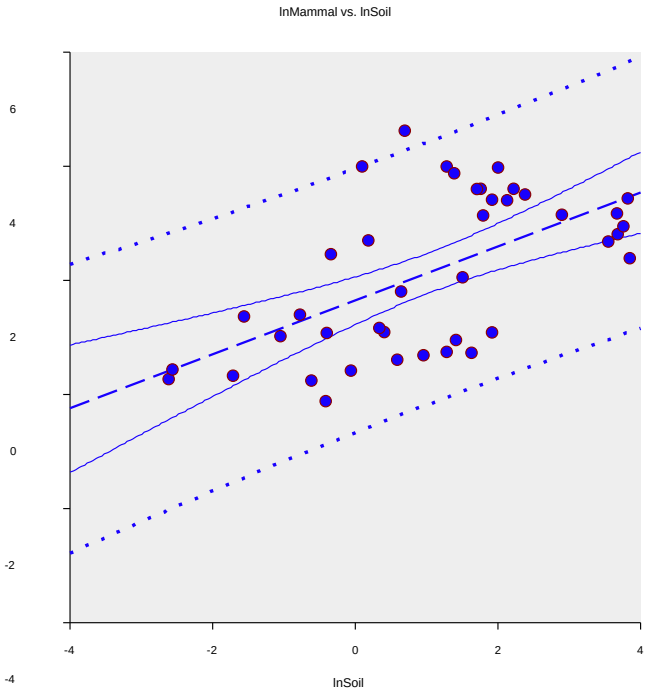
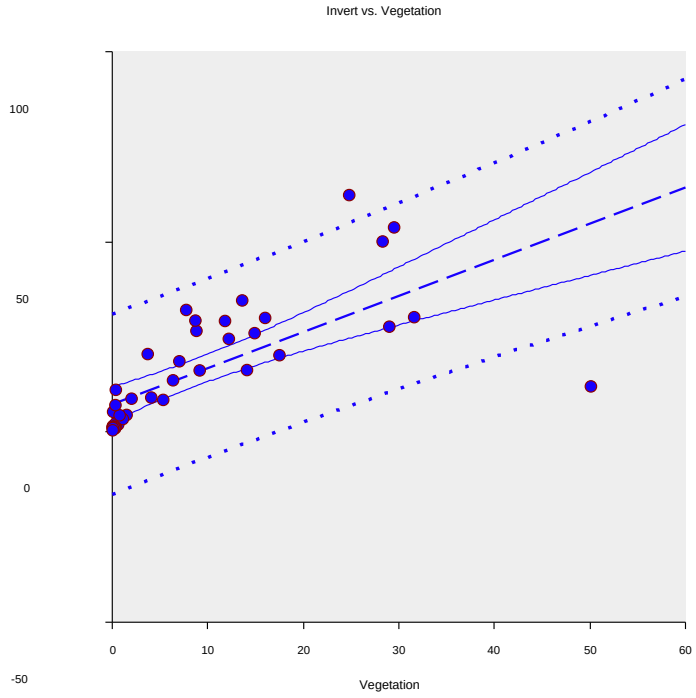
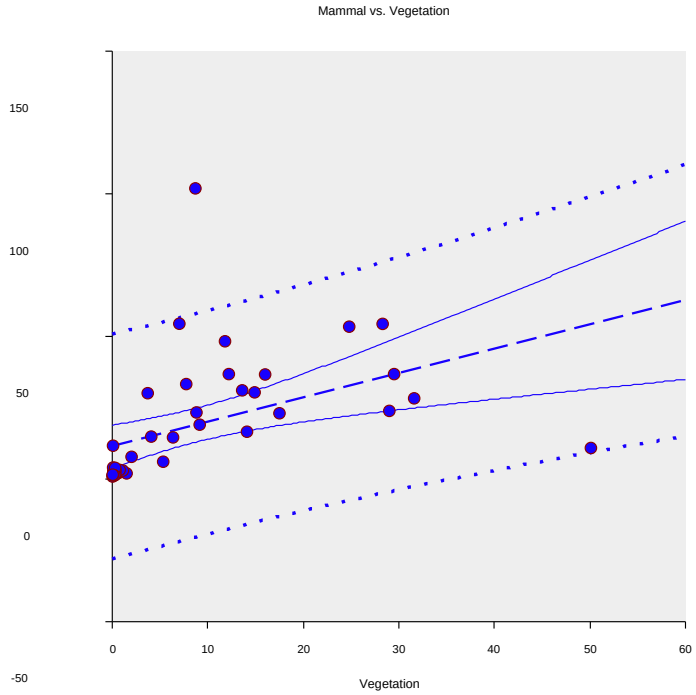
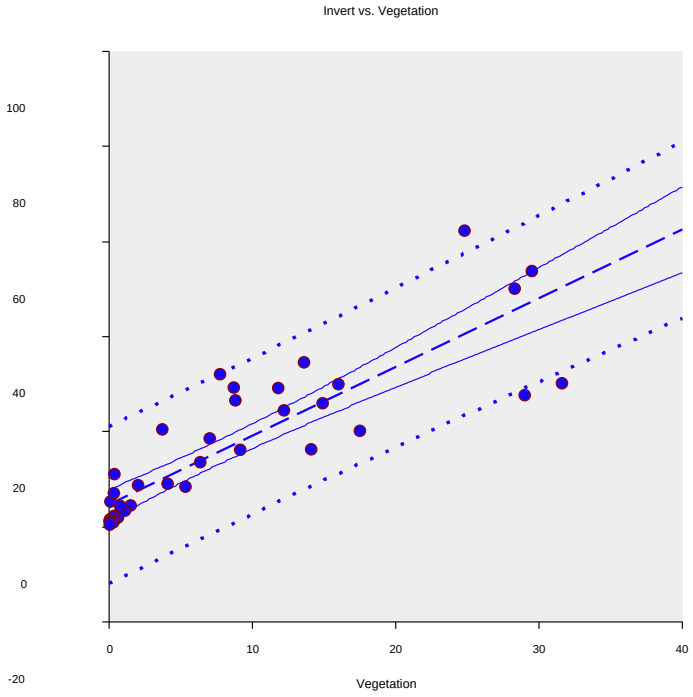


Figure A2-4 – Vegetation to media regressions. No transformation. All data.





Attachment 2 – Linear Regression Plots
Figure A2-5 – Vegetation to media regressions. No transformation. Data from APL-15 removed.



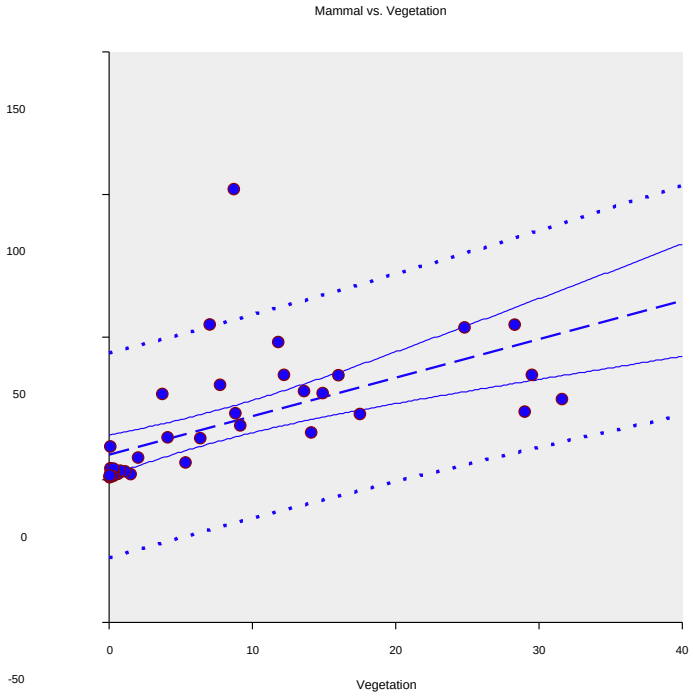
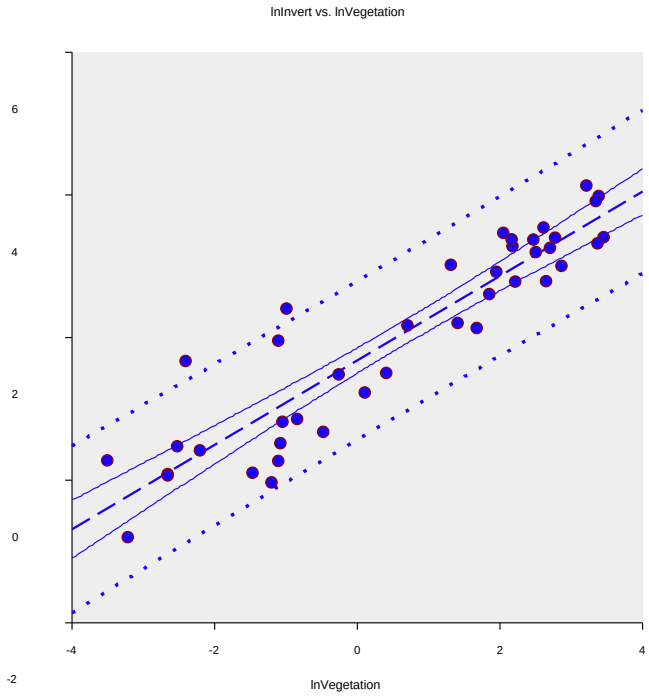
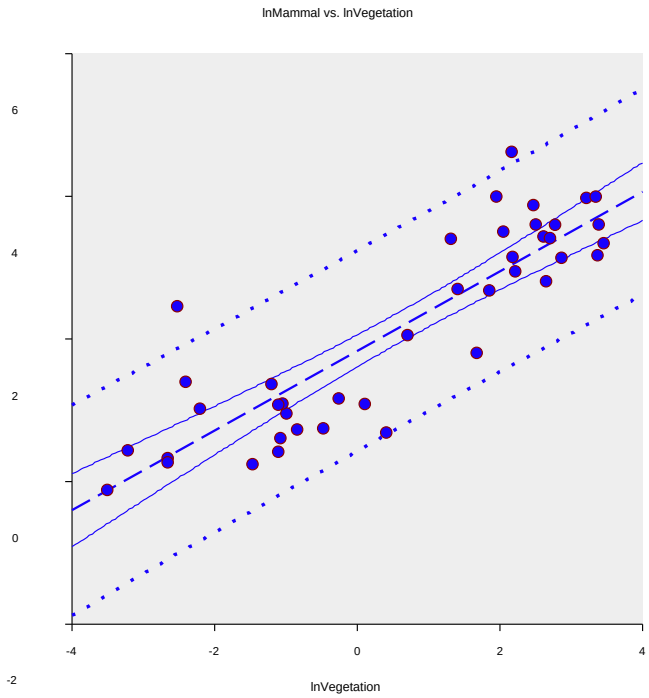
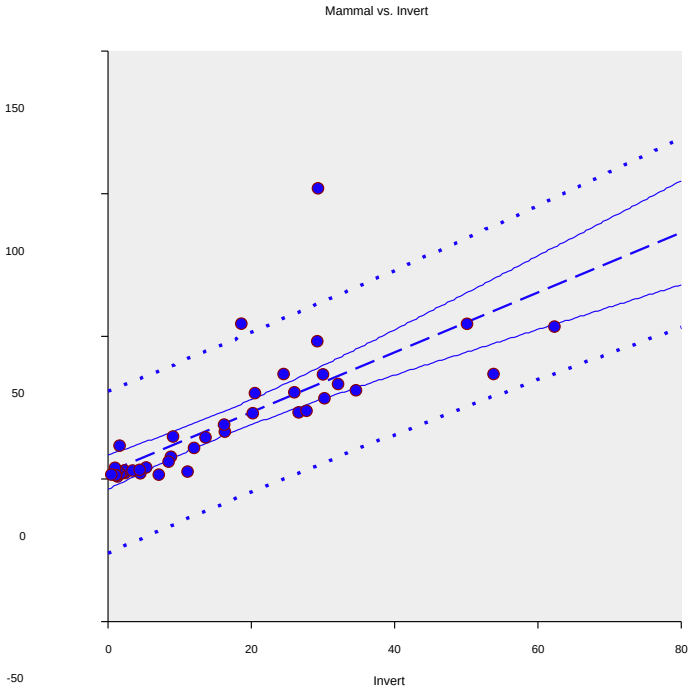


Figure A2-6 – Vegetation to media regressions. ln transformation. Data from APL-15 removed.





All Data



PCO-06 Removed

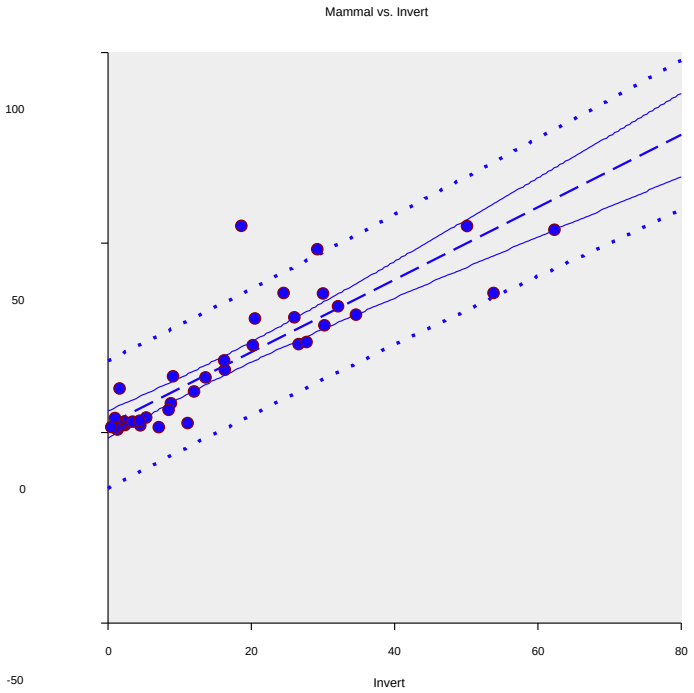
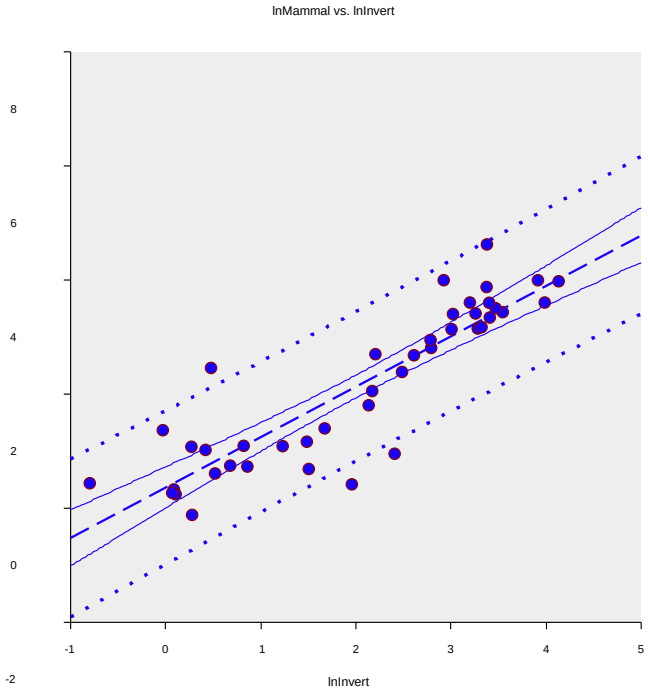
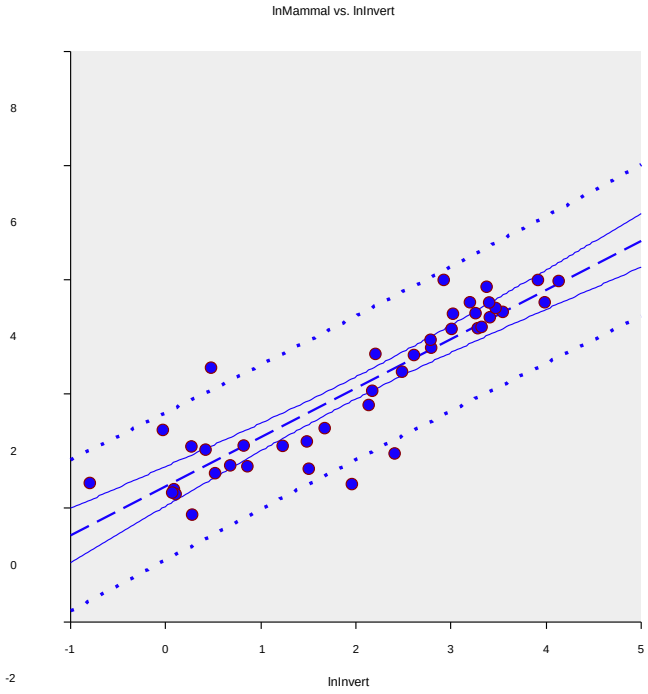


Figure A2-7 – Invertebrate to Small Mammal Regressions. ln transformation.

All Data



PCO-06 Removed



ATTACHMENT 3

Detailed Statistical Analysis Output

(CD only)

Attachment 3

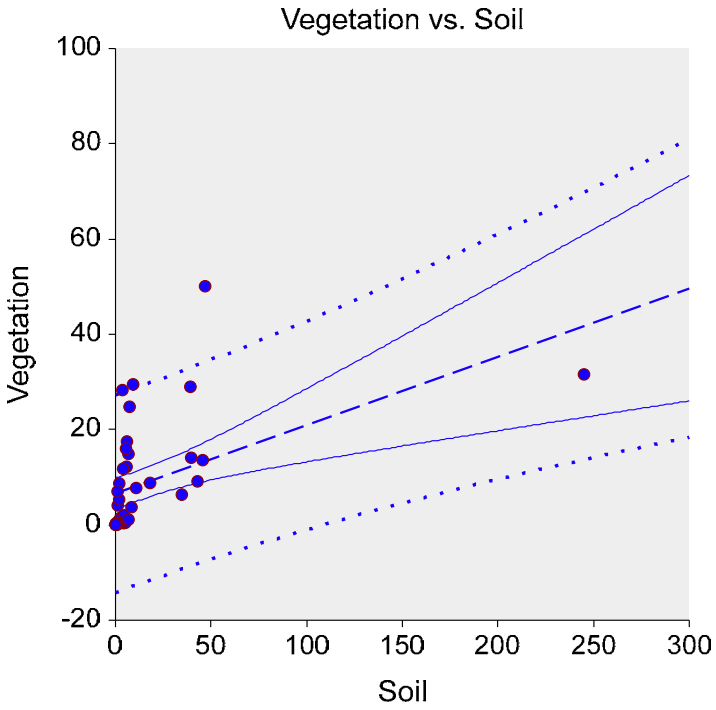
Detailed Statistical Analysis Output

Attachment 3 – Detailed Statistical Results
Soil to Tissue Linear Regressions
No Transformation - All Data

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Vegetation	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	6.5243	Rows Prediction Only	0
Slope	0.1438	Sum of Frequencies	42
R-Squared	0.2384	Sum of Weights	42.0000
Correlation	0.4882	Coefficient of Variation	1.1717
Mean Square Error	102.838	Square Root of MSE	10.14091

Linear Regression Report

Y = Vegetation X = Soil

Summary Statement

The equation of the straight line relating Vegetation and Soil is estimated as: Vegetation = (6.5243) + (0.1438) Soil using the 42 observations in this dataset. The y-intercept, the estimated value of Vegetation when Soil is zero, is 6.5243 with a standard error of 1.6766. The slope, the estimated change in Vegetation per unit change in Soil, is 0.1438 with a standard error of 0.0407. The value of R-Squared, the proportion of the variation in Vegetation that can be accounted for by variation in Soil, is 0.2384. The correlation between Vegetation and Soil is 0.4882.

A significance test that the slope is zero resulted in a t-value of 3.5383. The significance level of this t-test is 0.0010. Since 0.0010 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.1438. The lower limit of the 95% confidence interval for the slope is 0.0617 and the upper limit is 0.2260. The estimated intercept is 6.5243. The lower limit of the 95% confidence interval for the intercept is 3.1358 and the upper limit is 9.9128.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Vegetation	Soil
Count	42	42
Mean	8.6545	14.8088
Standard Deviation	11.4775	38.9564
Minimum	0.0300	0.0730
Maximum	50.1000	245.0000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	6.5243	0.1438
Lower 95% Confidence Limit	3.1358	0.0617
Upper 95% Confidence Limit	9.9128	0.2260
Standard Error	1.6766	0.0407
Standardized Coefficient	0.0000	0.4882
T Value	3.8914	3.5383
Prob Level (T Test)	0.0004	0.0010
Prob Level (Randomization Test N =1000)		0.0230
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.9669	0.9322
Regression of Y on X	6.5243	0.1438
Inverse Regression from X on Y	-0.2817	0.6034
Orthogonal Regression of Y and X	6.3770	0.1538

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(6.52431707491952) + (0.143847264101774) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	6.5243	0.9000	4.2059	10.6549
Bootstrap Mean	5.6838	0.9500	3.7490	11.1089
Bias (BM - OV)	-0.8405	0.9900	2.2603	11.8750
Bias Corrected	7.3648			
Standard Error	1.9467			
Slope				
Original Value	0.1438	0.9000	-0.3289	0.1784
Bootstrap Mean	0.2467	0.9500	-0.4009	0.1816
Bias (BM - OV)	0.1029	0.9900	-0.5492	0.1879
Bias Corrected	0.0410			
Standard Error	0.1770			
Correlation				
Original Value	0.4882	0.9000	0.2523	0.5958
Bootstrap Mean	0.5417	0.9500	0.2140	0.6399
Bias (BM - OV)	0.0535	0.9900	0.1334	0.7317
Bias Corrected	0.4347			
Standard Error	0.1028			
R-Squared				
Original Value	0.2384	0.9000	0.0000	0.3318
Bootstrap Mean	0.3040	0.9500	0.0000	0.3635
Bias (BM - OV)	0.0657	0.9900	0.0000	0.4168
Bias Corrected	0.1727			
Standard Error	0.1143			
Standard Error of Estimate				
Original Value	10.1409	0.9000	7.8812	13.6683
Bootstrap Mean	9.4319	0.9500	7.2856	14.2522
Bias (BM - OV)	-0.7090	0.9900	6.2544	15.3438
Bias Corrected	10.8499			
Standard Error	1.7485			
Orthogonal Intercept				
Original Value	6.3770	0.9000	4.1176	12.1301
Bootstrap Mean	4.9210	0.9500	3.6674	12.5278
Bias (BM - OV)	-1.4560	0.9900	2.2308	13.4133
Bias Corrected	7.8330			
Standard Error	2.5743			
Orthogonal Slope				
Original Value	0.1538	0.9000	-0.6008	0.1949
Bootstrap Mean	0.3314	0.9500	-0.7078	0.1984
Bias (BM - OV)	0.1777	0.9900	-0.9945	0.2049
Bias Corrected	-0.0239			
Standard Error	0.2986			

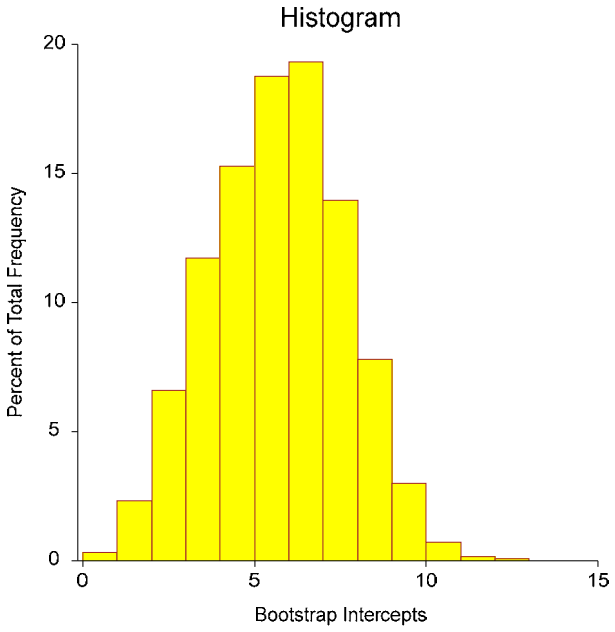
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

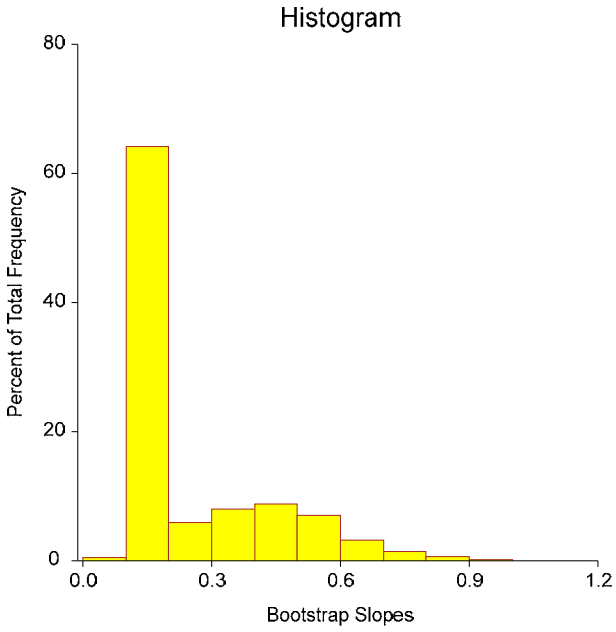
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

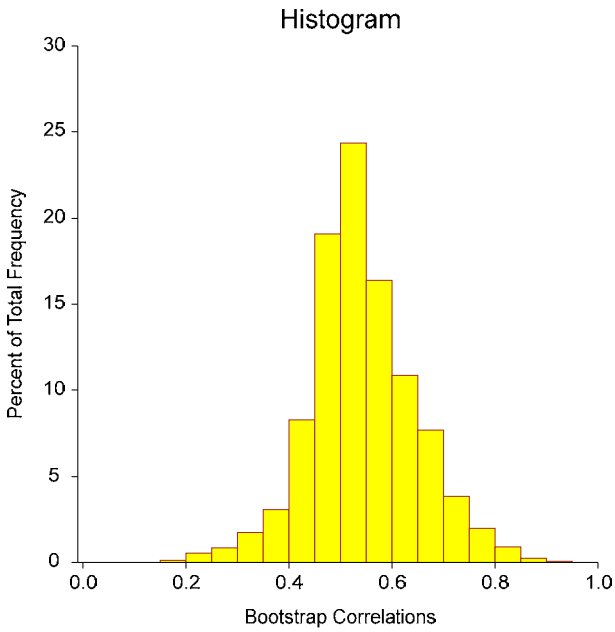
Linear Regression Report

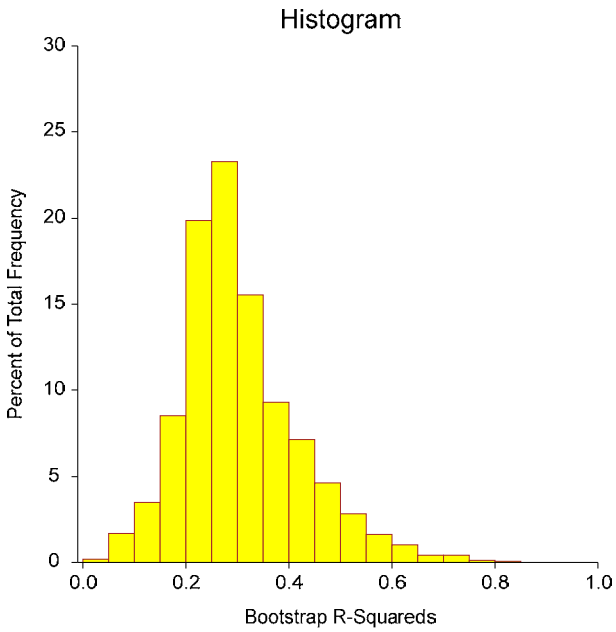
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Bootstrap Histograms Section



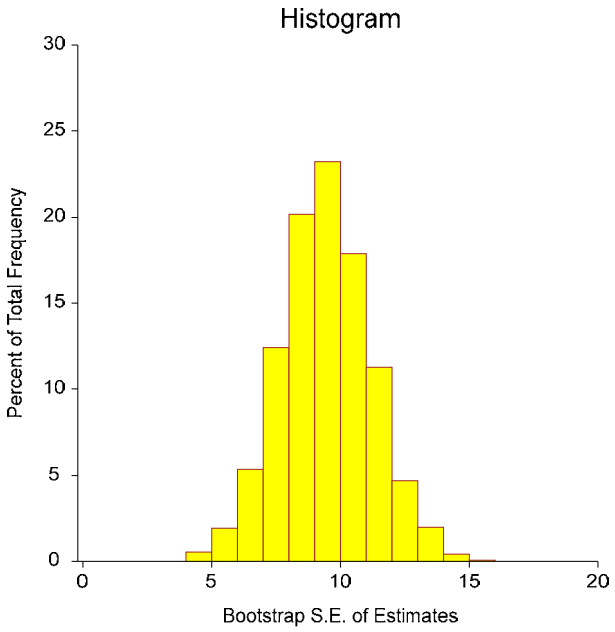


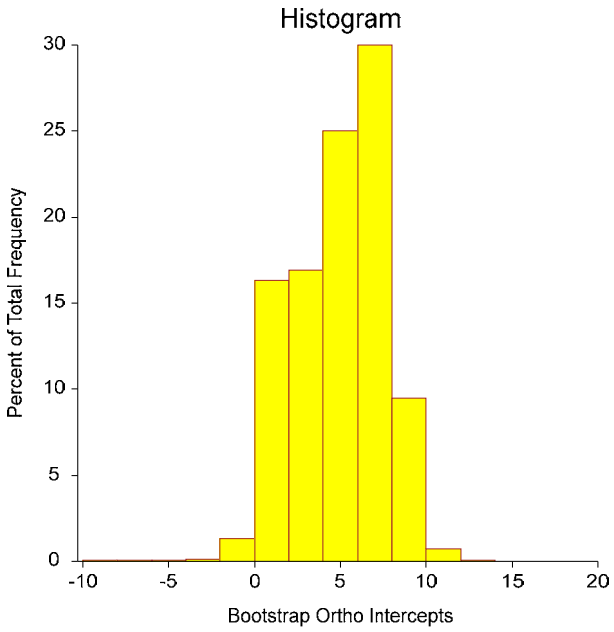


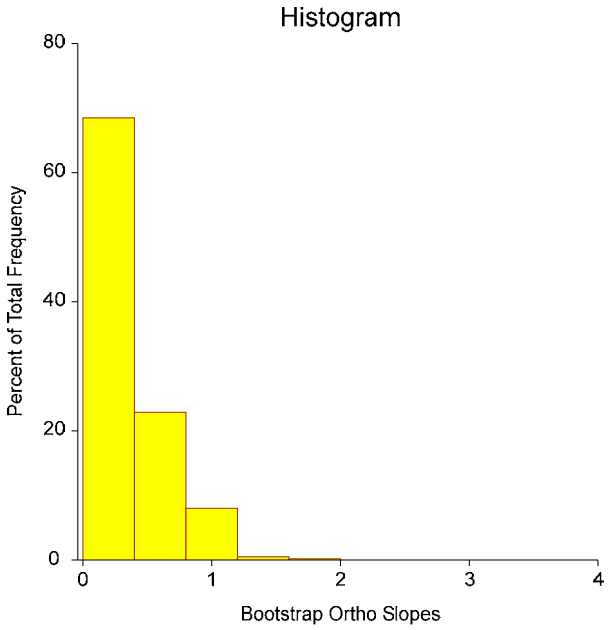


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.4882	0.2384	0.8324
Lower 95% Conf. Limit (r dist'n)	0.2135		
Upper 95% Conf. Limit (r dist'n)	0.6850		
Lower 95% Conf. Limit (Fisher's z)	0.2164		0.7074
Upper 95% Conf. Limit (Fisher's z)	0.6898		0.9069
Adjusted (Rbar)		0.2193	
T-Value for H0: Rho = 0	3.5383	3.5383	9.4999
Prob Level for H0: Rho = 0	0.0010	0.0010	0.0000
Prob Level (Randomization Test N =1000)	0.0230		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	3145.833	3145.833			
Slope	1	1287.493	1287.493	12.5196	0.0010	0.9322
Error	40	4113.519	102.838			
Lack of Fit	38	3635.346	95.667	0.4001	0.9044	
Pure Error	2	478.1732	239.0866			
Adj. Total	41	5401.012	131.732			
Total	42	8546.845				

s = Square Root(102.838) = 10.14091

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	621.97	363.49	0.02733403	-0.0002380009
1	621.97	71432.3	14333.27	-0.0002380009	1.607157E-05
2 (Y'Y)			8546.845		
Determinant		2613310			3.826565E-07

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	2.810977	-0.02447553
1	-0.02447553	0.001652768

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7444	0.000000	No
Anderson Darling	4.0292	0.000000	No
D'Agostino Skewness	4.1670	0.000031	No
D'Agostino Kurtosis	2.9193	0.003509	No
D'Agostino Omnibus	25.8856	0.000002	No
Constant Residual Variance?			
Modified Levene Test	6.8059	0.012716	No
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	0.4001	0.904432	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

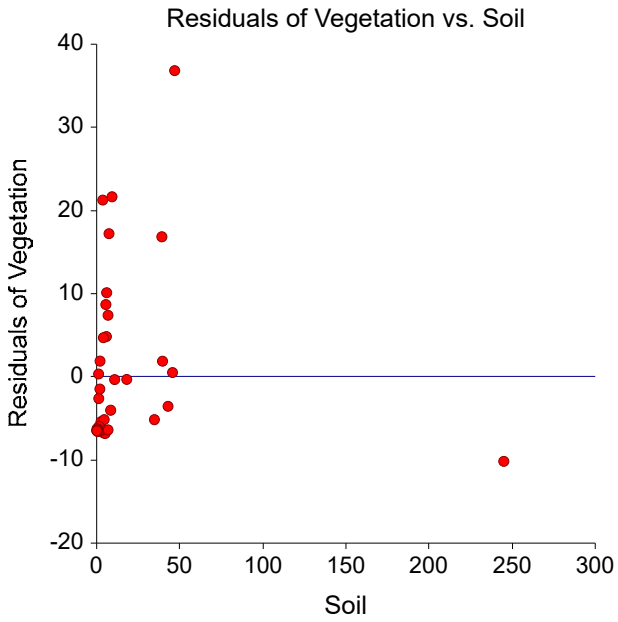
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

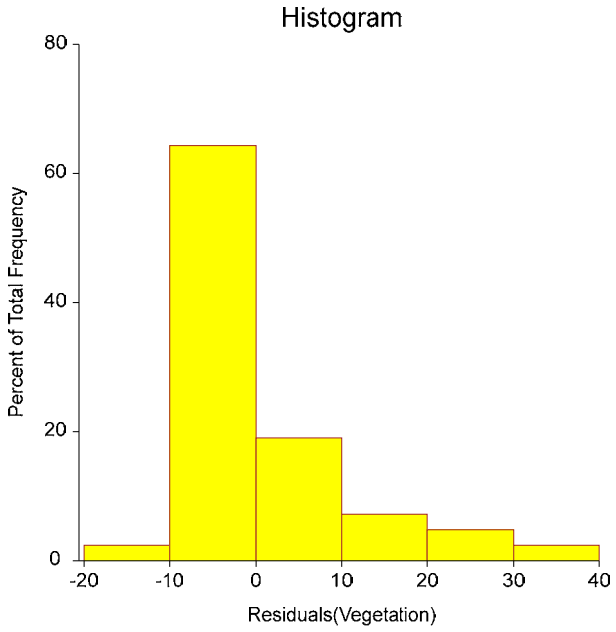
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

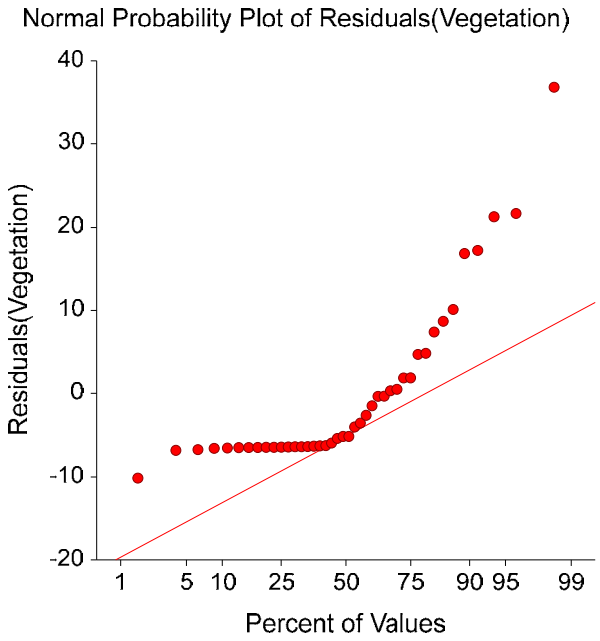
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Original Data Section

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Residual
10	245.0000	31.6000	41.7669	-10.1669
11	6.0000	17.5000	7.3874	10.1126
12	46.9000	50.1000	13.2708	36.8292
13	1.2000	4.0800	6.6969	-2.6169
14	39.6000	14.1000	12.2207	1.8793
15	4.1000	0.3700	7.1141	-6.7441
16	0.7100	0.0800	6.6264	-6.5464
17	5.1000	0.4300	7.2579	-6.8279
18	0.3500	0.1100	6.5747	-6.4647
19	3.6000	0.6200	7.0422	-6.4222
20	2.6000	1.5000	6.8983	-5.3983
21	0.6600	0.0300	6.6193	-6.5893
22	45.6000	13.6000	13.0838	0.5162
23	4.5000	2.0200	7.1716	-5.1516
24	5.8000	12.2000	7.3586	4.8414
25	6.8000	14.9000	7.5025	7.3975
26	9.2000	29.5000	7.8477	21.6523
27	7.4000	24.8000	7.5888	17.2112
28	10.8000	7.7400	8.0779	-0.3379
29	3.6000	28.3000	7.0422	21.2578
30	18.1000	8.8100	9.1280	-0.3180
31	42.9000	9.1500	12.6954	-3.5454
32	1.9000	5.3300	6.7976	-1.4676
33	4.0000	11.8000	7.0997	4.7003
34	0.4600	0.0900	6.5905	-6.5005
35	1.5000	0.3500	6.7401	-6.3901
36	1.8000	0.3400	6.7832	-6.4432
37	6.8000	1.1100	7.5025	-6.3925
38	1.4000	0.7700	6.7257	-5.9557
39	0.6700	0.3300	6.6207	-6.2907
40	0.9400	0.3300	6.6595	-6.3295
41	0.1800	0.0700	6.5502	-6.4802
42	0.2100	0.3000	6.5545	-6.2545
43	0.5400	0.2300	6.6020	-6.3720
44	0.0730	0.0700	6.5348	-6.4648
45	0.0770	0.0400	6.5354	-6.4954
46	8.4000	3.7100	7.7326	-4.0226
47	2.0000	8.7000	6.8120	1.8880
48	1.1000	7.0200	6.6825	0.3375
49	39.2000	29.0000	12.1631	16.8369
50	34.7000	6.3600	11.5158	-5.1558
51	5.5000	16.0000	7.3155	8.6845

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	245.0000	31.6000	41.7669	9.4882	22.5906	60.9432
11	6.0000	17.5000	7.3874	1.6052	4.1431	10.6317
12	46.9000	50.1000	13.2708	2.0373	9.1532	17.3883
13	1.2000	4.0800	6.6969	1.6597	3.3425	10.0513
14	39.6000	14.1000	12.2207	1.8613	8.4589	15.9824
15	4.1000	0.3700	7.1141	1.6242	3.8314	10.3967
16	0.7100	0.0800	6.6264	1.6664	3.2584	9.9945
17	5.1000	0.4300	7.2579	1.6138	3.9963	10.5195
18	0.3500	0.1100	6.5747	1.6715	3.1964	9.9530
19	3.6000	0.6200	7.0422	1.6298	3.7483	10.3361
20	2.6000	1.5000	6.8983	1.6416	3.5805	10.2161
21	0.6600	0.0300	6.6193	1.6671	3.2498	9.9887
22	45.6000	13.6000	13.0838	2.0039	9.0338	17.1337
23	4.5000	2.0200	7.1716	1.6199	3.8976	10.4456
24	5.8000	12.2000	7.3586	1.6071	4.1106	10.6066
25	6.8000	14.9000	7.5025	1.5983	4.2722	10.7327
26	9.2000	29.5000	7.8477	1.5813	4.6518	11.0436
27	7.4000	24.8000	7.5888	1.5935	4.3682	10.8094
28	10.8000	7.7400	8.0779	1.5732	4.8982	11.2575
29	3.6000	28.3000	7.0422	1.6298	3.7483	10.3361
30	18.1000	8.8100	9.1280	1.5705	5.9539	12.3020
31	42.9000	9.1500	12.6954	1.9372	8.7801	16.6106
32	1.9000	5.3300	6.7976	1.6504	3.4620	10.1333
33	4.0000	11.8000	7.0997	1.6253	3.8148	10.3846
34	0.4600	0.0900	6.5905	1.6700	3.2153	9.9656
35	1.5000	0.3500	6.7401	1.6557	3.3938	10.0863
36	1.8000	0.3400	6.7832	1.6517	3.4450	10.1215
37	6.8000	1.1100	7.5025	1.5983	4.2722	10.7327
38	1.4000	0.7700	6.7257	1.6570	3.3768	10.0746
39	0.6700	0.3300	6.6207	1.6670	3.2515	9.9898
40	0.9400	0.3300	6.6595	1.6633	3.2980	10.0211
41	0.1800	0.0700	6.5502	1.6740	3.1670	9.9335
42	0.2100	0.3000	6.5545	1.6736	3.1722	9.9369
43	0.5400	0.2300	6.6020	1.6688	3.2291	9.9748
44	0.0730	0.0700	6.5348	1.6755	3.1484	9.9212
45	0.0770	0.0400	6.5354	1.6755	3.1491	9.9217
46	8.4000	3.7100	7.7326	1.5863	4.5266	10.9387
47	2.0000	8.7000	6.8120	1.6491	3.4790	10.1451
48	1.1000	7.0200	6.6825	1.6611	3.3254	10.0397
49	39.2000	29.0000	12.1631	1.8525	8.4191	15.9072
50	34.7000	6.3600	11.5158	1.7614	7.9559	15.0757
51	5.5000	16.0000	7.3155	1.6099	4.0618	10.5692

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	245.0000	31.6000	41.7669	13.8875	13.6992	69.8346
11	6.0000	17.5000	7.3874	10.2672	-13.3633	28.1381
12	46.9000	50.1000	13.2708	10.3435	-7.6343	34.1758
13	1.2000	4.0800	6.6969	10.2758	-14.0713	27.4652
14	39.6000	14.1000	12.2207	10.3103	-8.6172	33.0586
15	4.1000	0.3700	7.1141	10.2702	-13.6427	27.8708
16	0.7100	0.0800	6.6264	10.2769	-14.1440	27.3969
17	5.1000	0.4300	7.2579	10.2685	-13.4955	28.0114
18	0.3500	0.1100	6.5747	10.2777	-14.1974	27.3468
19	3.6000	0.6200	7.0422	10.2710	-13.7164	27.8007
20	2.6000	1.5000	6.8983	10.2729	-13.8640	27.6607
21	0.6600	0.0300	6.6193	10.2770	-14.1514	27.3899
22	45.6000	13.6000	13.0838	10.3370	-7.8081	33.9756
23	4.5000	2.0200	7.1716	10.2695	-13.5838	27.9270
24	5.8000	12.2000	7.3586	10.2675	-13.3927	28.1099
25	6.8000	14.9000	7.5025	10.2661	-13.2461	28.2510
26	9.2000	29.5000	7.8477	10.2635	-12.8955	28.5909
27	7.4000	24.8000	7.5888	10.2653	-13.1582	28.3358
28	10.8000	7.7400	8.0779	10.2622	-12.6628	28.8186
29	3.6000	28.3000	7.0422	10.2710	-13.7164	27.8007
30	18.1000	8.8100	9.1280	10.2618	-11.6119	29.8678
31	42.9000	9.1500	12.6954	10.3243	-8.1708	33.5615
32	1.9000	5.3300	6.7976	10.2743	-13.9676	27.5628
33	4.0000	11.8000	7.0997	10.2703	-13.6574	27.8568
34	0.4600	0.0900	6.5905	10.2775	-14.1811	27.3621
35	1.5000	0.3500	6.7401	10.2752	-14.0268	27.5070
36	1.8000	0.3400	6.7832	10.2745	-13.9824	27.5489
37	6.8000	1.1100	7.5025	10.2661	-13.2461	28.2510
38	1.4000	0.7700	6.7257	10.2754	-14.0416	27.4930
39	0.6700	0.3300	6.6207	10.2770	-14.1499	27.3913
40	0.9400	0.3300	6.6595	10.2764	-14.1098	27.4289
41	0.1800	0.0700	6.5502	10.2781	-14.2227	27.3231
42	0.2100	0.3000	6.5545	10.2781	-14.2182	27.3273
43	0.5400	0.2300	6.6020	10.2773	-14.1692	27.3732
44	0.0730	0.0700	6.5348	10.2784	-14.2386	27.3082
45	0.0770	0.0400	6.5354	10.2784	-14.2380	27.3088
46	8.4000	3.7100	7.7326	10.2642	-13.0121	28.4774
47	2.0000	8.7000	6.8120	10.2741	-13.9528	27.5768
48	1.1000	7.0200	6.6825	10.2760	-14.0861	27.4512
49	39.2000	29.0000	12.1631	10.3087	-8.6716	32.9978
50	34.7000	6.3600	11.5158	10.2927	-9.2866	32.3182
51	5.5000	16.0000	7.3155	10.2679	-13.4367	28.0677

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	245.0000	31.6000	41.7669	9.4882	14.7598	68.7740
11	6.0000	17.5000	7.3874	1.6052	2.8183	11.9565
12	46.9000	50.1000	13.2708	2.0373	7.4718	19.0697
13	1.2000	4.0800	6.6969	1.6597	1.9728	11.4211
14	39.6000	14.1000	12.2207	1.8613	6.9228	17.5186
15	4.1000	0.3700	7.1141	1.6242	2.4909	11.7372
16	0.7100	0.0800	6.6264	1.6664	1.8831	11.3698
17	5.1000	0.4300	7.2579	1.6138	2.6645	11.8514
18	0.3500	0.1100	6.5747	1.6715	1.8168	11.3325
19	3.6000	0.6200	7.0422	1.6298	2.4032	11.6812
20	2.6000	1.5000	6.8983	1.6416	2.2256	11.5710
21	0.6600	0.0300	6.6193	1.6671	1.8739	11.3646
22	45.6000	13.6000	13.0838	2.0039	7.3799	18.7876
23	4.5000	2.0200	7.1716	1.6199	2.5607	11.7826
24	5.8000	12.2000	7.3586	1.6071	2.7843	11.9330
25	6.8000	14.9000	7.5025	1.5983	2.9531	12.0519
26	9.2000	29.5000	7.8477	1.5813	3.3467	12.3487
27	7.4000	24.8000	7.5888	1.5935	3.0530	12.1245
28	10.8000	7.7400	8.0779	1.5732	3.5998	12.5559
29	3.6000	28.3000	7.0422	1.6298	2.4032	11.6812
30	18.1000	8.8100	9.1280	1.5705	4.6577	13.5982
31	42.9000	9.1500	12.6954	1.9372	7.1813	18.2094
32	1.9000	5.3300	6.7976	1.6504	2.0998	11.4954
33	4.0000	11.8000	7.0997	1.6253	2.4734	11.7260
34	0.4600	0.0900	6.5905	1.6700	1.8371	11.3439
35	1.5000	0.3500	6.7401	1.6557	2.0274	11.4528
36	1.8000	0.3400	6.7832	1.6517	2.0818	11.4847
37	6.8000	1.1100	7.5025	1.5983	2.9531	12.0519
38	1.4000	0.7700	6.7257	1.6570	2.0092	11.4422
39	0.6700	0.3300	6.6207	1.6670	1.8757	11.3657
40	0.9400	0.3300	6.6595	1.6633	1.9252	11.3938
41	0.1800	0.0700	6.5502	1.6740	1.7854	11.3150
42	0.2100	0.3000	6.5545	1.6736	1.7909	11.3181
43	0.5400	0.2300	6.6020	1.6688	1.8518	11.3522
44	0.0730	0.0700	6.5348	1.6755	1.7656	11.3041
45	0.0770	0.0400	6.5354	1.6755	1.7663	11.3045
46	8.4000	3.7100	7.7326	1.5863	3.2173	12.2479
47	2.0000	8.7000	6.8120	1.6491	2.1179	11.5061
48	1.1000	7.0200	6.6825	1.6611	1.9545	11.4106
49	39.2000	29.0000	12.1631	1.8525	6.8901	17.4361
50	34.7000	6.3600	11.5158	1.7614	6.5022	16.5294
51	5.5000	16.0000	7.3155	1.6099	2.7331	11.8979

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Section

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	245.0000	31.6000	41.7669	-10.1669	-2.8403	32.1737
11	6.0000	17.5000	7.3874	10.1126	1.0099	57.7863
12	46.9000	50.1000	13.2708	36.8292	3.7073	73.5115
13	1.2000	4.0800	6.6969	-2.6169	-0.2616	64.1405
14	39.6000	14.1000	12.2207	1.8793	0.1885	13.3286
15	4.1000	0.3700	7.1141	-6.7441	-0.6737	1822.7273
16	0.7100	0.0800	6.6264	-6.5464	-0.6544	8183.0608
17	5.1000	0.4300	7.2579	-6.8279	-0.6820	1587.8926
18	0.3500	0.1100	6.5747	-6.4647	-0.6463	5876.9669
19	3.6000	0.6200	7.0422	-6.4222	-0.6416	1035.8334
20	2.6000	1.5000	6.8983	-5.3983	-0.5394	359.8880
21	0.6600	0.0300	6.6193	-6.5893	-0.6587	21964.1876
22	45.6000	13.6000	13.0838	0.5162	0.0519	3.7959
23	4.5000	2.0200	7.1716	-5.1516	-0.5146	255.0312
24	5.8000	12.2000	7.3586	4.8414	0.4835	39.6834
25	6.8000	14.9000	7.5025	7.3975	0.7387	49.6478
26	9.2000	29.5000	7.8477	21.6523	2.1616	73.3976
27	7.4000	24.8000	7.5888	17.2112	1.7186	69.4001
28	10.8000	7.7400	8.0779	-0.3379	-0.0337	4.3652
29	3.6000	28.3000	7.0422	21.2578	2.1239	75.1160
30	18.1000	8.8100	9.1280	-0.3180	-0.0317	3.6090
31	42.9000	9.1500	12.6954	-3.5454	-0.3562	38.7472
32	1.9000	5.3300	6.7976	-1.4676	-0.1467	27.5352
33	4.0000	11.8000	7.0997	4.7003	0.4696	39.8330
34	0.4600	0.0900	6.5905	-6.5005	-0.6499	7222.7631
35	1.5000	0.3500	6.7401	-6.3901	-0.6387	1825.7394
36	1.8000	0.3400	6.7832	-6.4432	-0.6440	1895.0712
37	6.8000	1.1100	7.5025	-6.3925	-0.6383	575.8990
38	1.4000	0.7700	6.7257	-5.9557	-0.5953	773.4680
39	0.6700	0.3300	6.6207	-6.2907	-0.6289	1906.2711
40	0.9400	0.3300	6.6595	-6.3295	-0.6327	1918.0405
41	0.1800	0.0700	6.5502	-6.4802	-0.6479	9257.4423
42	0.2100	0.3000	6.5545	-6.2545	-0.6253	2084.8417
43	0.5400	0.2300	6.6020	-6.3720	-0.6370	2770.4324
44	0.0730	0.0700	6.5348	-6.4648	-0.6464	9235.4542
45	0.0770	0.0400	6.5354	-6.4954	-0.6494	16238.4833
46	8.4000	3.7100	7.7326	-4.0226	-0.4016	108.4268
47	2.0000	8.7000	6.8120	1.8880	0.1887	21.7010
48	1.1000	7.0200	6.6825	0.3375	0.0337	4.8070
49	39.2000	29.0000	12.1631	16.8369	1.6887	58.0582
50	34.7000	6.3600	11.5158	-5.1558	-0.5163	81.0663
51	5.5000	16.0000	7.3155	8.6845	0.8674	54.2783

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	245.0000	-10.1669	**-3.1390	0.8754	*28.3424	84.2019
11	6.0000	10.1126	1.0102	0.0251	0.0131	102.7853
12	46.9000	36.8292	*4.5184	0.0404	0.2890	69.2328
13	1.2000	-2.6169	-0.2585	0.0268	0.0009	105.2944
14	39.6000	1.8793	0.1862	0.0337	0.0006	105.3811
15	4.1000	-6.7441	-0.6691	0.0257	0.0060	104.2779
16	0.7100	-6.5464	-0.6497	0.0270	0.0059	104.3455
17	5.1000	-6.8279	-0.6774	0.0253	0.0060	104.2484
18	0.3500	-6.4647	-0.6416	0.0272	0.0058	104.3733
19	3.6000	-6.4222	-0.6368	0.0258	0.0055	104.3893
20	2.6000	-5.3983	-0.5346	0.0262	0.0039	104.7075
21	0.6600	-6.5893	-0.6540	0.0270	0.0060	104.3306
22	45.6000	0.5162	0.0513	0.0390	0.0001	105.4677
23	4.5000	-5.1516	-0.5098	0.0255	0.0035	104.7765
24	5.8000	4.8414	0.4788	0.0251	0.0030	104.8584
25	6.8000	7.3975	0.7344	0.0248	0.0070	104.0359
26	9.2000	21.6523	*2.2712	0.0243	0.0582	93.1542
27	7.4000	17.2112	1.7633	0.0247	0.0374	97.6870
28	10.8000	-0.3379	-0.0333	0.0241	0.0000	105.4719
29	3.6000	21.2578	*2.2264	0.0258	0.0598	93.5806
30	18.1000	-0.3180	-0.0313	0.0240	0.0000	105.4722
31	42.9000	-3.5454	-0.3522	0.0365	0.0024	105.1403
32	1.9000	-1.4676	-0.1449	0.0265	0.0003	105.4181
33	4.0000	4.7003	0.4649	0.0257	0.0029	104.8934
34	0.4600	-6.5005	-0.6451	0.0271	0.0059	104.3612
35	1.5000	-6.3901	-0.6339	0.0267	0.0056	104.3992
36	1.8000	-6.4432	-0.6392	0.0265	0.0057	104.3813
37	6.8000	-6.3925	-0.6335	0.0248	0.0052	104.4004
38	1.4000	-5.9557	-0.5904	0.0267	0.0049	104.5404
39	0.6700	-6.2907	-0.6241	0.0270	0.0055	104.4320
40	0.9400	-6.3295	-0.6279	0.0269	0.0055	104.4192
41	0.1800	-6.4802	-0.6431	0.0272	0.0059	104.3679
42	0.2100	-6.2545	-0.6205	0.0272	0.0055	104.4437
43	0.5400	-6.3720	-0.6322	0.0271	0.0056	104.4048
44	0.0730	-6.4648	-0.6416	0.0273	0.0059	104.3731
45	0.0770	-6.4954	-0.6447	0.0273	0.0059	104.3627
46	8.4000	-4.0226	-0.3974	0.0245	0.0020	105.0495
47	2.0000	1.8880	0.1864	0.0264	0.0005	105.3810
48	1.1000	0.3375	0.0333	0.0268	0.0000	105.4719
49	39.2000	16.8369	1.7303	0.0334	0.0492	97.9552
50	34.7000	-5.1558	-0.5115	0.0302	0.0041	104.7720
51	5.5000	8.6845	0.8646	0.0252	0.0097	103.4910

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	* -3.1390	-8.3205	** 28.3424	* 5.3809	1.6662	-8.2066
11	1.0102	0.1619	0.0131	1.0246	0.1603	-0.0361
12	* 4.5184	0.9266	0.2890	0.4723	0.4512	0.5934
13	-0.2585	-0.0429	0.0009	1.0772	-0.0429	0.0143
14	0.1862	0.0348	0.0006	1.0867	0.0205	0.0188
15	-0.6691	-0.1086	0.0060	1.0553	-0.1081	0.0291
16	-0.6497	-0.1082	0.0059	1.0581	-0.1082	0.0372
17	-0.6774	-0.1092	0.0060	1.0543	-0.1084	0.0267
18	-0.6416	-0.1072	0.0058	1.0589	-0.1072	0.0377
19	-0.6368	-0.1037	0.0055	1.0577	-0.1033	0.0290
20	-0.5346	-0.0877	0.0039	1.0646	-0.0875	0.0265
21	-0.6540	-0.1090	0.0060	1.0578	-0.1090	0.0376
22	0.0513	0.0103	0.0001	1.0945	0.0052	0.0065
23	-0.5098	-0.0825	0.0035	1.0652	-0.0820	0.0213
24	0.4788	0.0769	0.0030	1.0665	0.0761	-0.0175
25	0.7344	0.1172	0.0070	1.0495	0.1157	-0.0239
26	* 2.2712	0.3585	0.0582	0.8410	0.3497	-0.0517
27	1.7633	0.2806	0.0374	0.9252	0.2762	-0.0530
28	-0.0333	-0.0052	0.0000	1.0778	-0.0050	0.0005
29	* 2.2264	0.3625	0.0598	0.8500	0.3613	-0.1014
30	-0.0313	-0.0049	0.0000	1.0777	-0.0044	-0.0004
31	-0.3522	-0.0686	0.0024	1.0849	-0.0372	-0.0404
32	-0.1449	-0.0239	0.0003	1.0794	-0.0239	0.0076
33	0.4649	0.0755	0.0029	1.0678	0.0752	-0.0204
34	-0.6451	-0.1077	0.0059	1.0585	-0.1077	0.0376
35	-0.6339	-0.1049	0.0056	1.0588	-0.1048	0.0343
36	-0.6392	-0.1055	0.0057	1.0583	-0.1054	0.0338
37	-0.6335	-0.1011	0.0052	1.0569	-0.0998	0.0206
38	-0.5904	-0.0978	0.0049	1.0617	-0.0977	0.0322
39	-0.6241	-0.1040	0.0055	1.0599	-0.1040	0.0359
40	-0.6279	-0.1044	0.0055	1.0595	-0.1044	0.0354
41	-0.6431	-0.1076	0.0059	1.0588	-0.1076	0.0382
42	-0.6205	-0.1038	0.0055	1.0604	-0.1038	0.0368
43	-0.6322	-0.1055	0.0056	1.0594	-0.1055	0.0367
44	-0.6416	-0.1075	0.0059	1.0590	-0.1075	0.0384
45	-0.6447	-0.1080	0.0059	1.0588	-0.1080	0.0386
46	-0.3974	-0.0629	0.0020	1.0696	-0.0617	0.0103
47	0.1864	0.0307	0.0005	1.0786	0.0307	-0.0097
48	0.0333	0.0055	0.0000	1.0809	0.0055	-0.0019
49	1.7303	0.3215	0.0492	0.9386	0.1917	0.1721
50	-0.5115	-0.0902	0.0041	1.0703	-0.0599	-0.0414
51	0.8646	0.1390	0.0097	1.0389	0.1379	-0.0327

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
10	245.0000	-10.1669	||||.....	-2.8403	||||||||||....	* -3.1390	||||||||||.....
11	6.0000	10.1126	||||.....	1.0099	|||.....	1.0102	|||.....
12	46.9000	36.8292	||||||||||||||||	3.7073	||||||||||||||||	* 4.5184	||||||||||||||||
13	1.2000	-2.6169	|.....	-0.2616	|.....	-0.2585	|.....
14	39.6000	1.8793	|.....	0.1885	|.....	0.1862	|.....
15	4.1000	-6.7441	||.....	-0.6737	||.....	-0.6691	||.....
16	0.7100	-6.5464	||.....	-0.6544	||.....	-0.6497	||.....
17	5.1000	-6.8279	||.....	-0.6820	||.....	-0.6774	||.....
18	0.3500	-6.4647	||.....	-0.6463	||.....	-0.6416	||.....
19	3.6000	-6.4222	||.....	-0.6416	||.....	-0.6368	||.....
20	2.6000	-5.3983	||.....	-0.5394	||.....	-0.5346	|.....
21	0.6600	-6.5893	||.....	-0.6587	||.....	-0.6540	||.....
22	45.6000	0.5162	|.....	0.0519	|.....	0.0513	|.....
23	4.5000	-5.1516	|.....	-0.5146	|.....	-0.5098	|.....
24	5.8000	4.8414	|.....	0.4835	|.....	0.4788	|.....
25	6.8000	7.3975	||.....	0.7387	||.....	0.7344	||.....
26	9.2000	21.6523	|||||||.....	2.1616	|||||||.....	* 2.2712	|||||||.....
27	7.4000	17.2112	||||||.....	1.7186	||||||.....	1.7633	|||||.....
28	10.8000	-0.3379	|.....	-0.0337	|.....	-0.0333	|.....
29	3.6000	21.2578	|||||||.....	2.1239	|||||||.....	* 2.2264	|||||||.....
30	18.1000	-0.3180	|.....	-0.0317	|.....	-0.0313	|.....
31	42.9000	-3.5454	|.....	-0.3562	|.....	-0.3522	|.....
32	1.9000	-1.4676	|.....	-0.1467	|.....	-0.1449	|.....
33	4.0000	4.7003	|.....	0.4696	|.....	0.4649	|.....
34	0.4600	-6.5005	||.....	-0.6499	||.....	-0.6451	||.....
35	1.5000	-6.3901	||.....	-0.6387	||.....	-0.6339	||.....
36	1.8000	-6.4432	||.....	-0.6440	||.....	-0.6392	||.....
37	6.8000	-6.3925	||.....	-0.6383	||.....	-0.6335	||.....
38	1.4000	-5.9557	||.....	-0.5953	||.....	-0.5904	|.....
39	0.6700	-6.2907	||.....	-0.6289	||.....	-0.6241	|.....
40	0.9400	-6.3295	||.....	-0.6327	||.....	-0.6279	|.....
41	0.1800	-6.4802	||.....	-0.6479	||.....	-0.6431	||.....
42	0.2100	-6.2545	||.....	-0.6253	||.....	-0.6205	|.....
43	0.5400	-6.3720	||.....	-0.6370	||.....	-0.6322	||.....
44	0.0730	-6.4648	||.....	-0.6464	||.....	-0.6416	||.....
45	0.0770	-6.4954	||.....	-0.6494	||.....	-0.6447	||.....
46	8.4000	-4.0226	|.....	-0.4016	|.....	-0.3974	|.....
47	2.0000	1.8880	|.....	0.1887	|.....	0.1864	|.....
48	1.1000	0.3375	|.....	0.0337	|.....	0.0333	|.....
49	39.2000	16.8369	||||||.....	1.6887	||||||.....	1.7303	|||||.....
50	34.7000	-5.1558	|.....	-0.5163	|.....	-0.5115	|.....
51	5.5000	8.6845	|||.....	0.8674	|||.....	0.8646	||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
10	245.0000	-8.3205	|||||||||||||||	** 28.3424	|||||||||||||||	-8.2066	|||||||||||||||
11	6.0000	0.1619	|.....	0.0131	|.....	-0.0361	|.....
12	46.9000	0.9266	|.....	0.2890	|.....	0.5934	|.....
13	1.2000	-0.0429	|.....	0.0009	|.....	0.0143	|.....
14	39.6000	0.0348	|.....	0.0006	|.....	0.0188	|.....
15	4.1000	-0.1086	|.....	0.0060	|.....	0.0291	|.....
16	0.7100	-0.1082	|.....	0.0059	|.....	0.0372	|.....
17	5.1000	-0.1092	|.....	0.0060	|.....	0.0267	|.....
18	0.3500	-0.1072	|.....	0.0058	|.....	0.0377	|.....
19	3.6000	-0.1037	|.....	0.0055	|.....	0.0290	|.....
20	2.6000	-0.0877	|.....	0.0039	|.....	0.0265	|.....
21	0.6600	-0.1090	|.....	0.0060	|.....	0.0376	|.....
22	45.6000	0.0103	|.....	0.0001	|.....	0.0065	|.....
23	4.5000	-0.0825	|.....	0.0035	|.....	0.0213	|.....
24	5.8000	0.0769	|.....	0.0030	|.....	-0.0175	|.....
25	6.8000	0.1172	|.....	0.0070	|.....	-0.0239	|.....
26	9.2000	0.3585	|.....	0.0582	|.....	-0.0517	|.....
27	7.4000	0.2806	|.....	0.0374	|.....	-0.0530	|.....
28	10.8000	-0.0052	|.....	0.0000	|.....	0.0005	|.....
29	3.6000	0.3625	|.....	0.0598	|.....	-0.1014	|.....
30	18.1000	-0.0049	|.....	0.0000	|.....	-0.0004	|.....
31	42.9000	-0.0686	|.....	0.0024	|.....	-0.0404	|.....
32	1.9000	-0.0239	|.....	0.0003	|.....	0.0076	|.....
33	4.0000	0.0755	|.....	0.0029	|.....	-0.0204	|.....
34	0.4600	-0.1077	|.....	0.0059	|.....	0.0376	|.....
35	1.5000	-0.1049	|.....	0.0056	|.....	0.0343	|.....
36	1.8000	-0.1055	|.....	0.0057	|.....	0.0338	|.....
37	6.8000	-0.1011	|.....	0.0052	|.....	0.0206	|.....
38	1.4000	-0.0978	|.....	0.0049	|.....	0.0322	|.....
39	0.6700	-0.1040	|.....	0.0055	|.....	0.0359	|.....
40	0.9400	-0.1044	|.....	0.0055	|.....	0.0354	|.....
41	0.1800	-0.1076	|.....	0.0059	|.....	0.0382	|.....
42	0.2100	-0.1038	|.....	0.0055	|.....	0.0368	|.....
43	0.5400	-0.1055	|.....	0.0056	|.....	0.0367	|.....
44	0.0730	-0.1075	|.....	0.0059	|.....	0.0384	|.....
45	0.0770	-0.1080	|.....	0.0059	|.....	0.0386	|.....
46	8.4000	-0.0629	|.....	0.0020	|.....	0.0103	|.....
47	2.0000	0.0307	|.....	0.0005	|.....	-0.0097	|.....
48	1.1000	0.0055	|.....	0.0000	|.....	-0.0019	|.....
49	39.2000	0.3215	|.....	0.0492	|.....	0.1721	|.....
50	34.7000	-0.0902	|.....	0.0041	|.....	-0.0414	|.....
51	5.5000	0.1390	|.....	0.0097	|.....	-0.0327	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked. DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	245.0000	* -3.1390	|||||||||.....	** 28.3424	||||||||||||||	0.8754	||||||||||||||
11	6.0000	1.0102	|||.....	0.0131	|.....	0.0251	|.....
12	46.9000	* 4.5184	||||||||||||||	0.2890	|.....	0.0404	|.....
13	1.2000	-0.2585	|.....	0.0009	|.....	0.0268	|.....
14	39.6000	0.1862	|.....	0.0006	|.....	0.0337	|.....
15	4.1000	-0.6691	||.....	0.0060	|.....	0.0257	|.....
16	0.7100	-0.6497	||.....	0.0059	|.....	0.0270	|.....
17	5.1000	-0.6774	||.....	0.0060	|.....	0.0253	|.....
18	0.3500	-0.6416	||.....	0.0058	|.....	0.0272	|.....
19	3.6000	-0.6368	||.....	0.0055	|.....	0.0258	|.....
20	2.6000	-0.5346	|.....	0.0039	|.....	0.0262	|.....
21	0.6600	-0.6540	||.....	0.0060	|.....	0.0270	|.....
22	45.6000	0.0513	|.....	0.0001	|.....	0.0390	|.....
23	4.5000	-0.5098	|.....	0.0035	|.....	0.0255	|.....
24	5.8000	0.4788	|.....	0.0030	|.....	0.0251	|.....
25	6.8000	0.7344	||.....	0.0070	|.....	0.0248	|.....
26	9.2000	* 2.2712	|||||||.....	0.0582	|.....	0.0243	|.....
27	7.4000	1.7633	|||||.....	0.0374	|.....	0.0247	|.....
28	10.8000	-0.0333	|.....	0.0000	|.....	0.0241	|.....
29	3.6000	* 2.2264	|||||||.....	0.0598	|.....	0.0258	|.....
30	18.1000	-0.0313	|.....	0.0000	|.....	0.0240	|.....
31	42.9000	-0.3522	|.....	0.0024	|.....	0.0365	|.....
32	1.9000	-0.1449	|.....	0.0003	|.....	0.0265	|.....
33	4.0000	0.4649	|.....	0.0029	|.....	0.0257	|.....
34	0.4600	-0.6451	||.....	0.0059	|.....	0.0271	|.....
35	1.5000	-0.6339	||.....	0.0056	|.....	0.0267	|.....
36	1.8000	-0.6392	||.....	0.0057	|.....	0.0265	|.....
37	6.8000	-0.6335	||.....	0.0052	|.....	0.0248	|.....
38	1.4000	-0.5904	|.....	0.0049	|.....	0.0267	|.....
39	0.6700	-0.6241	|.....	0.0055	|.....	0.0270	|.....
40	0.9400	-0.6279	|.....	0.0055	|.....	0.0269	|.....
41	0.1800	-0.6431	||.....	0.0059	|.....	0.0272	|.....
42	0.2100	-0.6205	|.....	0.0055	|.....	0.0272	|.....
43	0.5400	-0.6322	||.....	0.0056	|.....	0.0271	|.....
44	0.0730	-0.6416	||.....	0.0059	|.....	0.0273	|.....
45	0.0770	-0.6447	||.....	0.0059	|.....	0.0273	|.....
46	8.4000	-0.3974	|.....	0.0020	|.....	0.0245	|.....
47	2.0000	0.1864	|.....	0.0005	|.....	0.0264	|.....
48	1.1000	0.0333	|.....	0.0000	|.....	0.0268	|.....
49	39.2000	1.7303	|||||.....	0.0492	|.....	0.0334	|.....
50	34.7000	-0.5115	|.....	0.0041	|.....	0.0302	|.....
51	5.5000	0.8646	||.....	0.0097	|.....	0.0252	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Inverse Prediction of X Means

Row	Vegetation (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	31.6000	245.0000	174.3216	70.6784	113.7048	389.4324
11	17.5000	6.0000	76.3010	-70.3010	47.4677	164.6916
12	50.1000	46.9000	302.9302	-256.0302	196.7216	688.1951
13	4.0800	1.2000	-16.9924	18.1924	-70.3974	5.6118
14	14.1000	39.6000	52.6648	-13.0648	29.1941	112.8003
15	0.3700	4.1000	-42.7837	46.8837	-126.3656	-14.9823
16	0.0800	0.7100	-44.7997	45.5097	-130.8624	-16.4701
17	0.4300	5.1000	-42.3666	47.4666	-125.4367	-14.6729
18	0.1100	0.3500	-44.5912	44.9412	-130.3967	-16.3167
19	0.6200	3.6000	-41.0457	44.6457	-122.4988	-13.6899
20	1.5000	2.6000	-34.9281	37.5281	-108.9695	-9.0589
21	0.0300	0.6600	-45.1473	45.8073	-131.6388	-16.7255
22	13.6000	45.6000	49.1889	-3.5889	26.2524	105.4237
23	2.0200	4.5000	-31.3132	35.8132	-101.0454	-6.2518
24	12.2000	5.8000	39.4563	-33.6563	17.4204	85.3642
25	14.9000	6.8000	58.2262	-51.4262	33.7284	124.7754
26	29.5000	9.2000	159.7228	-150.5228	104.1545	355.6456
27	24.8000	7.4000	127.0492	-119.6492	82.5472	280.2602
28	7.7400	10.8000	8.4512	2.3488	-21.9494	32.6942
29	28.3000	3.6000	151.3806	-147.7806	98.6732	336.3628
30	8.8100	18.1000	15.8897	2.2103	-10.3875	43.2136
31	9.1500	42.9000	18.2533	24.6467	-7.0223	46.8649
32	5.3300	1.9000	-8.3027	10.2027	-52.6816	13.6919
33	11.8000	4.0000	36.6756	-32.6756	14.6902	79.8398
34	0.0900	0.4600	-44.7302	45.1902	-130.7071	-16.4190
35	0.3500	1.5000	-42.9227	44.4227	-126.6753	-15.0852
36	0.3400	1.8000	-42.9922	44.7922	-126.8302	-15.1367
37	1.1100	6.8000	-37.6393	44.4393	-114.9485	-11.1282
38	0.7700	1.4000	-40.0030	41.4030	-120.1833	-12.9099
39	0.3300	0.6700	-43.0618	43.7318	-126.9851	-15.1882
40	0.3300	0.9400	-43.0618	44.0018	-126.9851	-15.1882
41	0.0700	0.1800	-44.8692	45.0492	-131.0176	-16.5212
42	0.3000	0.2100	-43.2703	43.4803	-127.4500	-15.3425
43	0.2300	0.5400	-43.7569	44.2969	-128.5350	-15.7020
44	0.0700	0.0730	-44.8692	44.9422	-131.0176	-16.5212
45	0.0400	0.0770	-45.0778	45.1548	-131.4835	-16.6745
46	3.7100	8.4000	-19.5646	27.9646	-75.7921	3.3709
47	8.7000	2.0000	15.1250	-13.1250	-11.5081	42.0642
48	7.0200	1.1000	3.4459	-2.3459	-30.5214	26.4078
49	29.0000	39.2000	156.2469	-117.0469	101.8730	347.6087
50	6.3600	34.7000	-1.1423	35.8423	-38.8722	21.1383
51	16.0000	5.5000	65.8732	-60.3732	39.6932	141.5110

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Inverse Prediction of X Individuals

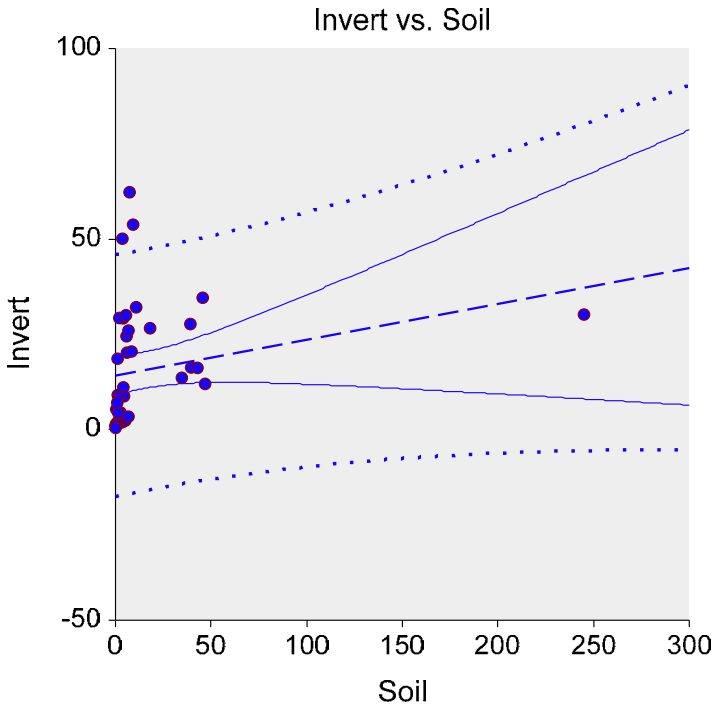
Row	Vegetation (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	31.6000	245.0000	174.3216	70.6784	29.8968	473.2404
11	17.5000	6.0000	76.3010	-70.3010	-77.1343	289.2936
12	50.1000	46.9000	302.9302	-256.0302	141.5953	743.3214
13	4.0800	1.2000	-16.9924	18.1924	-210.0901	145.3045
14	14.1000	39.6000	52.6648	-13.0648	-107.5511	249.5455
15	0.3700	4.1000	-42.7837	46.8837	-252.9746	111.6268
16	0.0800	0.7100	-44.7997	45.5097	-256.4322	109.0997
17	0.4300	5.1000	-42.3666	47.4666	-252.2612	112.1515
18	0.1100	0.3500	-44.5912	44.9412	-256.0738	109.3604
19	0.6200	3.6000	-41.0457	44.6457	-250.0059	113.8173
20	1.5000	2.6000	-34.9281	37.5281	-239.6451	121.6167
21	0.0300	0.6600	-45.1473	45.8073	-257.0298	108.6655
22	13.6000	45.6000	49.1889	-3.5889	-112.2041	243.8802
23	2.0200	4.5000	-31.3132	35.8132	-233.5887	126.2915
24	12.2000	5.8000	39.4563	-33.6563	-125.4864	228.2710
25	14.9000	6.8000	58.2262	-51.4262	-100.2039	258.7077
26	29.5000	9.2000	159.7228	-150.5228	15.5547	444.2454
27	24.8000	7.4000	127.0492	-119.6492	-18.3576	381.1651
28	7.7400	10.8000	8.4512	2.3488	-170.3503	181.0951
29	28.3000	3.6000	151.3806	-147.7806	7.1467	427.8893
30	8.8100	18.1000	15.8897	2.2103	-159.2293	192.0555
31	9.1500	42.9000	18.2533	24.6467	-155.7430	195.5856
32	5.3300	1.9000	-8.3027	10.2027	-196.2244	157.2348
33	11.8000	4.0000	36.6756	-32.6756	-129.3507	223.8807
34	0.0900	0.4600	-44.7302	45.1902	-256.3127	109.1866
35	0.3500	1.5000	-42.9227	44.4227	-253.2126	111.4520
36	0.3400	1.8000	-42.9922	44.7922	-253.3316	111.3647
37	1.1100	6.8000	-37.6393	44.4393	-244.2196	118.1429
38	0.7700	1.4000	-40.0030	41.4030	-248.2301	115.1369
39	0.3300	0.6700	-43.0618	43.7318	-253.4507	111.2773
40	0.3300	0.9400	-43.0618	44.0018	-253.4507	111.2773
41	0.0700	0.1800	-44.8692	45.0492	-256.5517	109.0128
42	0.3000	0.2100	-43.2703	43.4803	-253.8079	111.0154
43	0.2300	0.5400	-43.7569	44.2969	-254.6420	110.4050
44	0.0700	0.0730	-44.8692	44.9422	-256.5517	109.0128
45	0.0400	0.0770	-45.0778	45.1548	-256.9103	108.7523
46	3.7100	8.4000	-19.5646	27.9646	-214.2518	141.8307
47	8.7000	2.0000	15.1250	-13.1250	-160.3622	190.9183
48	7.0200	1.1000	3.4459	-2.3459	-177.9608	173.8472
49	29.0000	39.2000	156.2469	-117.0469	12.0709	437.4108
50	6.3600	34.7000	-1.1423	35.8423	-185.0268	167.2930
51	16.0000	5.5000	65.8732	-60.3732	-90.2948	271.4991

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Invert	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	14.1891	Rows Prediction Only	0
Slope	0.0944	Sum of Frequencies	42
R-Squared	0.0547	Sum of Weights	42.0000
Correlation	0.2339	Coefficient of Variation	0.9926
Mean Square Error	239.3676	Square Root of MSE	15.47151

Linear Regression Report

Y = Invert X = Soil

Summary Statement

The equation of the straight line relating Invert and Soil is estimated as: Invert = (14.1891) + (0.0944) Soil using the 42 observations in this dataset. The y-intercept, the estimated value of Invert when Soil is zero, is 14.1891 with a standard error of 2.5579. The slope, the estimated change in Invert per unit change in Soil, is 0.0944 with a standard error of 0.0620. The value of R-Squared, the proportion of the variation in Invert that can be accounted for by variation in Soil, is 0.0547. The correlation between Invert and Soil is 0.2339.

A significance test that the slope is zero resulted in a t-value of 1.5218. The significance level of this t-test is 0.1359. Since 0.1359 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is 0.0944. The lower limit of the 95% confidence interval for the slope is -0.0310 and the upper limit is 0.2197. The estimated intercept is 14.1891. The lower limit of the 95% confidence interval for the intercept is 9.0194 and the upper limit is 19.3588.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Invert	Soil
Count	42	42
Mean	15.5869	14.8088
Standard Deviation	15.7178	38.9564
Minimum	0.4500	0.0730
Maximum	62.3000	245.0000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	14.1891	0.0944
Lower 95% Confidence Limit	9.0194	-0.0310
Upper 95% Confidence Limit	19.3588	0.2197
Standard Error	2.5579	0.0620
Standardized Coefficient	0.0000	0.2339
T Value	5.5472	1.5218
Prob Level (T Test)	0.0000	0.1359
Prob Level (Randomization Test N =1000)		0.0870
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.9997	0.3178
Regression of Y on X	14.1891	0.0944
Inverse Regression from X on Y	-9.9533	1.7247
Orthogonal Regression of Y and X	13.9380	0.1113

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(14.189108423285) + (0.094389514320674) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Bootstrap Section

Parameter	Estimate	Conf. Level	Lower	Upper
Intercept				
Original Value	14.1891	0.9000	10.2603	19.3685
Bootstrap Mean	13.5020	0.9500	9.2935	20.1572
Bias (BM - OV)	-0.6871	0.9900	7.6668	21.5859
Bias Corrected	14.8762			
Standard Error	2.7484			
Slope				
Original Value	0.0944	0.9000	-0.2901	0.1262
Bootstrap Mean	0.1789	0.9500	-0.3580	0.1328
Bias (BM - OV)	0.0845	0.9900	-0.5696	0.1446
Bias Corrected	0.0098			
Standard Error	0.1676			
Correlation				
Original Value	0.2339	0.9000	0.0246	0.3238
Bootstrap Mean	0.2753	0.9500	-0.0146	0.3463
Bias (BM - OV)	0.0413	0.9900	-0.1116	0.4062
Bias Corrected	0.1926			
Standard Error	0.0919			
R-Squared				
Original Value	0.0547	0.9000	0.0000	0.0887
Bootstrap Mean	0.0842	0.9500	0.0000	0.0947
Bias (BM - OV)	0.0295	0.9900	0.0000	0.1057
Bias Corrected	0.0252			
Standard Error	0.0572			
Standard Error of Estimate				
Original Value	15.4715	0.9000	12.4162	19.8191
Bootstrap Mean	14.9287	0.9500	11.8193	20.7918
Bias (BM - OV)	-0.5428	0.9900	10.7722	22.0233
Bias Corrected	16.0143			
Standard Error	2.2517			
Orthogonal Intercept				
Original Value	13.9380	0.9000	10.2526	38.5495
Bootstrap Mean	8.4207	0.9500	9.3014	45.7171
Bias (BM - OV)	-5.5174	0.9900	7.4926	69.3039
Bias Corrected	19.4554			
Standard Error	12.2169			
Orthogonal Slope				
Original Value	0.1113	0.9000	-3.3587	0.1523
Bootstrap Mean	0.7950	0.9500	-4.6302	0.1585
Bias (BM - OV)	0.6836	0.9900	-7.0595	0.1724
Bias Corrected	-0.5723			
Standard Error	1.4976			

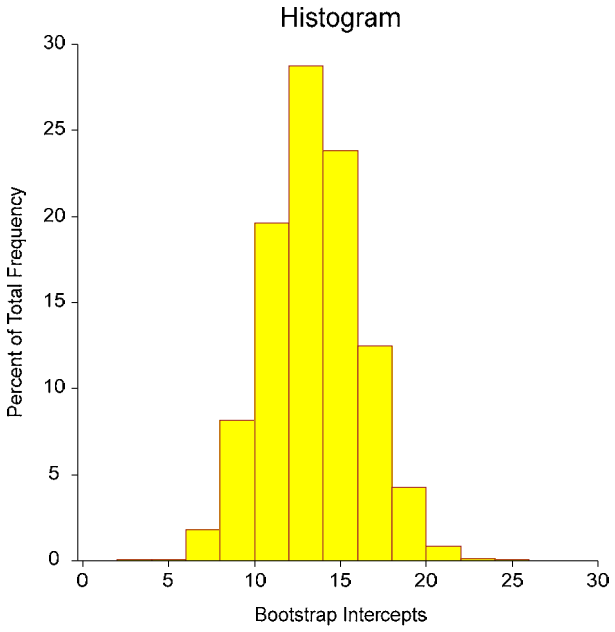
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

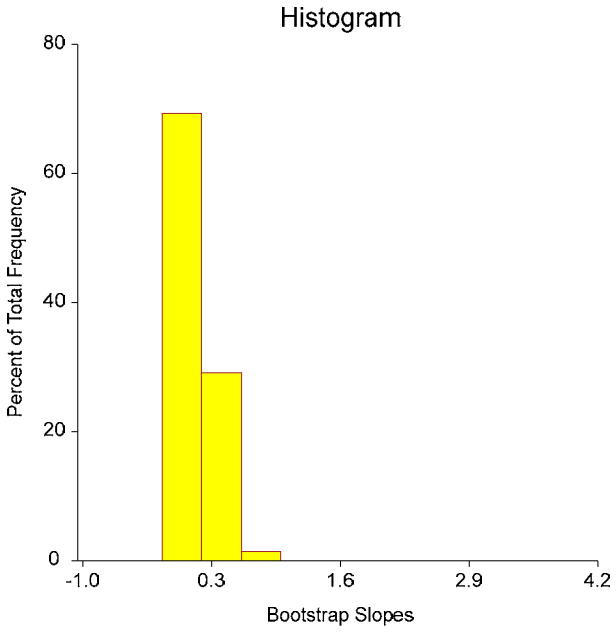
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

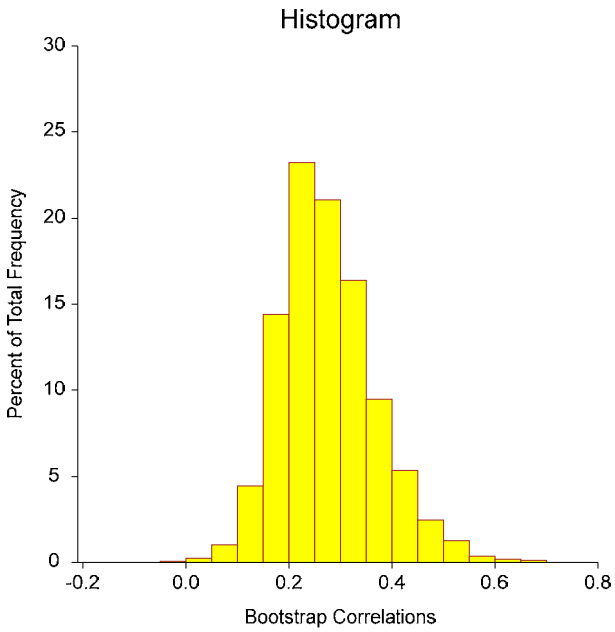
Linear Regression Report

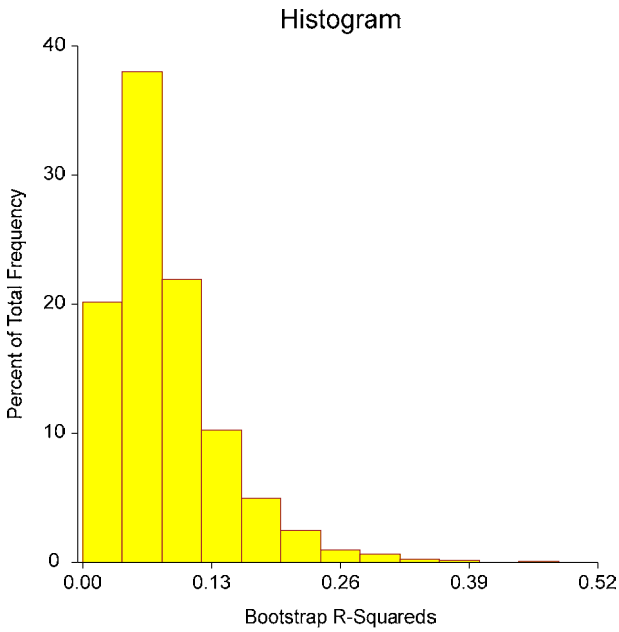
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Bootstrap Histograms Section



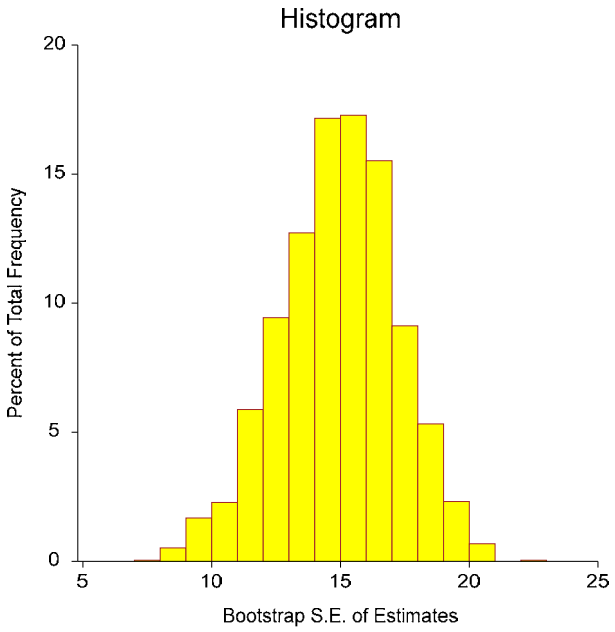


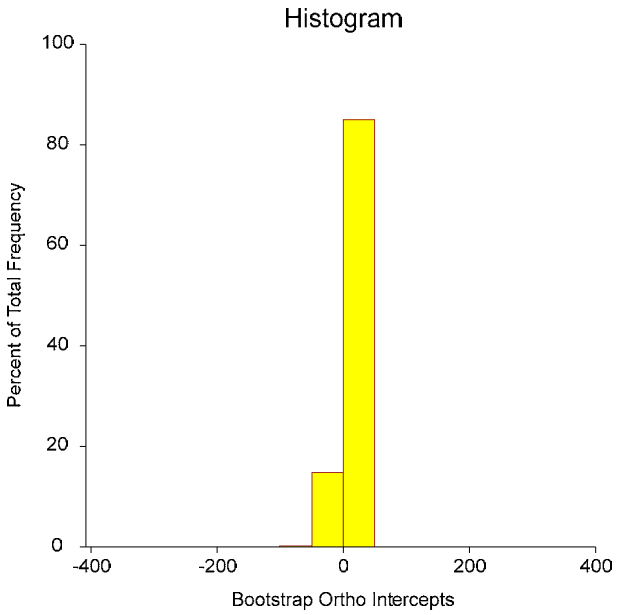


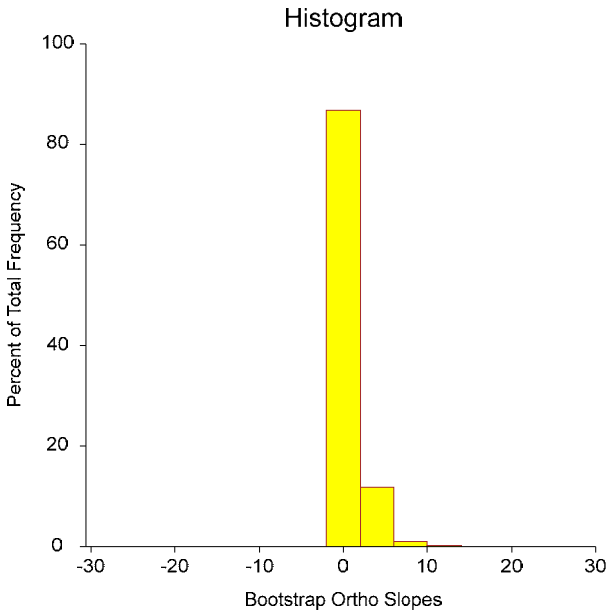


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.2339	0.0547	0.7539
Lower 95% Conf. Limit (r dist'n)	-0.0749		
Upper 95% Conf. Limit (r dist'n)	0.4975		
Lower 95% Conf. Limit (Fisher's z)	-0.0753		0.5837
Upper 95% Conf. Limit (Fisher's z)	0.5022		0.8606
Adjusted (Rbar)		0.0311	
T-Value for H0: Rho = 0	1.5218	1.5218	7.2572
Prob Level for H0: Rho = 0	0.1359	0.1359	0.0000
Prob Level (Randomization Test N =1000)	0.0870		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	10203.97	10203.97			
Slope	1	554.3564	554.3564	2.3159	0.1359	0.3178
Error	40	9574.705	239.3676			
Lack of Fit	38	8161.529	214.7771	0.3040	0.9519	
Pure Error	2	1413.177	706.5883			
Adj. Total	41	10129.06	247.0503			
Total	42	20333.03				

s = Square Root(239.3676) = 15.47151

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	621.97	654.65	0.02733403	-0.0002380009
1	621.97	71432.3	15567.66	-0.0002380009	1.607157E-05
2 (Y'Y)			20333.03		
Determinant		2613310			3.826565E-07

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	6.542883	-0.05696971
1	-0.05696971	0.003847015

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.8181	0.000011	No
Anderson Darling	2.4864	0.000003	No
D'Agostino Skewness	3.4092	0.000651	No
D'Agostino Kurtosis	1.9508	0.051081	No
D'Agostino Omnibus	15.4285	0.000446	No
Constant Residual Variance?			
Modified Levene Test	2.5980	0.114865	No
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	0.3040	0.951886	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

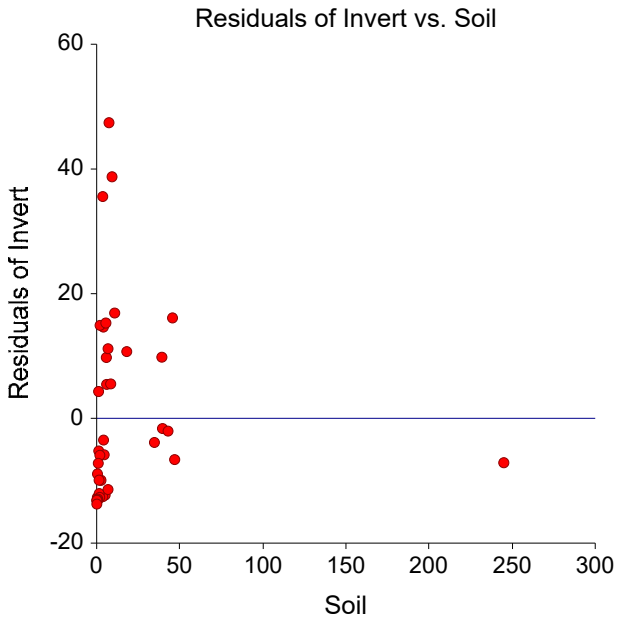
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

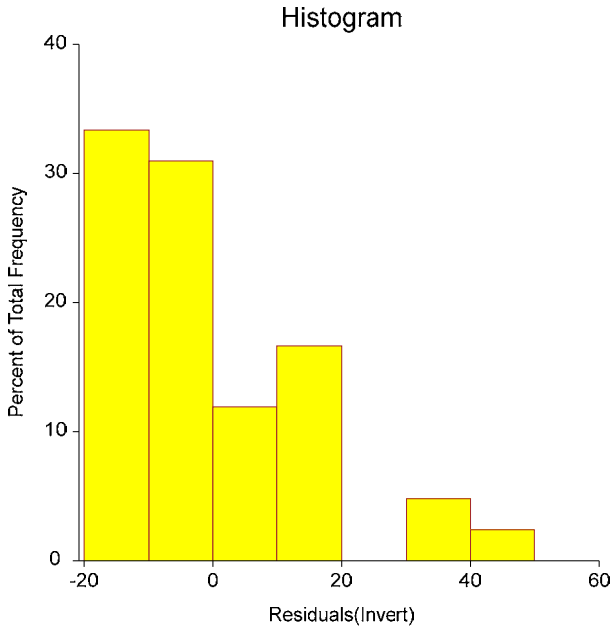
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

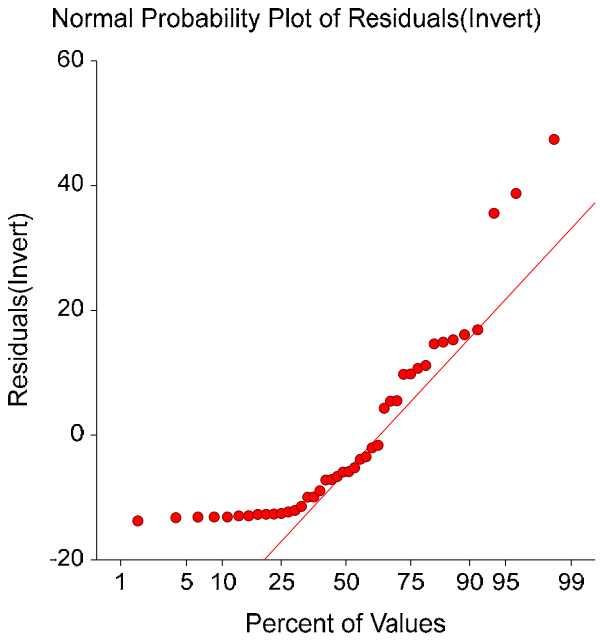
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Original Data Section

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual
10	245.0000	30.2000	37.3145	-7.1145
11	6.0000	20.2000	14.7554	5.4446
12	46.9000	12.0000	18.6160	-6.6160
13	1.2000	9.0700	14.3024	-5.2324
14	39.6000	16.3000	17.9269	-1.6269
15	4.1000	11.1000	14.5761	-3.4761
16	0.7100	1.6100	14.2561	-12.6461
17	5.1000	2.3600	14.6705	-12.3105
18	0.3500	1.5200	14.2221	-12.7021
19	3.6000	1.9700	14.5289	-12.5589
20	2.6000	4.5000	14.4345	-9.9345
21	0.6600	1.3200	14.2514	-12.9314
22	45.6000	34.6000	18.4933	16.1067
23	4.5000	8.7700	14.6139	-5.8439
24	5.8000	24.5000	14.7366	9.7634
25	6.8000	26.0000	14.8310	11.1690
26	9.2000	53.8000	15.0575	38.7425
27	7.4000	62.3000	14.8876	47.4124
28	10.8000	32.1000	15.2085	16.8915
29	3.6000	50.1000	14.5289	35.5711
30	18.1000	26.6000	15.8976	10.7024
31	42.9000	16.2000	18.2384	-2.0384
32	1.9000	8.4500	14.3684	-5.9184
33	4.0000	29.2000	14.5667	14.6333
34	0.4600	5.3200	14.2325	-8.9125
35	1.5000	2.2700	14.3307	-12.0607
36	1.8000	1.6800	14.3590	-12.6790
37	6.8000	3.4200	14.8310	-11.4110
38	1.4000	4.4100	14.3213	-9.9113
39	0.6700	1.3100	14.2523	-12.9423
40	0.9400	7.0800	14.2778	-7.1978
41	0.1800	1.0900	14.2061	-13.1161
42	0.2100	0.9700	14.2089	-13.2389
43	0.5400	1.1100	14.2401	-13.1301
44	0.0730	1.0700	14.1960	-13.1260
45	0.0770	0.4500	14.1964	-13.7464
46	8.4000	20.5000	14.9820	5.5180
47	2.0000	29.3000	14.3779	14.9221
48	1.1000	18.6000	14.2929	4.3071
49	39.2000	27.7000	17.8892	9.8108
50	34.7000	13.6000	17.4644	-3.8644
51	5.5000	30.0000	14.7083	15.2917

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	245.0000	30.2000	37.3145	14.4757	8.0581	66.5709
11	6.0000	20.2000	14.7554	2.4490	9.8058	19.7051
12	46.9000	12.0000	18.6160	3.1082	12.3340	24.8979
13	1.2000	9.0700	14.3024	2.5321	9.1847	19.4200
14	39.6000	16.3000	17.9269	2.8397	12.1878	23.6661
15	4.1000	11.1000	14.5761	2.4780	9.5679	19.5843
16	0.7100	1.6100	14.2561	2.5424	9.1177	19.3946
17	5.1000	2.3600	14.6705	2.4621	9.6944	19.6466
18	0.3500	1.5200	14.2221	2.5502	9.0680	19.3763
19	3.6000	1.9700	14.5289	2.4865	9.5036	19.5543
20	2.6000	4.5000	14.4345	2.5045	9.3727	19.4964
21	0.6600	1.3200	14.2514	2.5435	9.1108	19.3920
22	45.6000	34.6000	18.4933	3.0572	12.3144	24.6721
23	4.5000	8.7700	14.6139	2.4714	9.6189	19.6088
24	5.8000	24.5000	14.7366	2.4518	9.7812	19.6919
25	6.8000	26.0000	14.8310	2.4384	9.9027	19.7592
26	9.2000	53.8000	15.0575	2.4125	10.1816	19.9334
27	7.4000	62.3000	14.8876	2.4311	9.9741	19.8011
28	10.8000	32.1000	15.2085	2.4002	10.3575	20.0595
29	3.6000	50.1000	14.5289	2.4865	9.5036	19.5543
30	18.1000	26.6000	15.8976	2.3960	11.0550	20.7401
31	42.9000	16.2000	18.2384	2.9555	12.2651	24.2117
32	1.9000	8.4500	14.3684	2.5180	9.2794	19.4575
33	4.0000	29.2000	14.5667	2.4797	9.5551	19.5782
34	0.4600	5.3200	14.2325	2.5478	9.0832	19.3818
35	1.5000	2.2700	14.3307	2.5260	9.2255	19.4359
36	1.8000	1.6800	14.3590	2.5200	9.2660	19.4521
37	6.8000	3.4200	14.8310	2.4384	9.9027	19.7592
38	1.4000	4.4100	14.3213	2.5280	9.2119	19.4306
39	0.6700	1.3100	14.2523	2.5433	9.1122	19.3925
40	0.9400	7.0800	14.2778	2.5376	9.1492	19.4064
41	0.1800	1.0900	14.2061	2.5539	9.0444	19.3678
42	0.2100	0.9700	14.2089	2.5533	9.0486	19.3693
43	0.5400	1.1100	14.2401	2.5461	9.0943	19.3859
44	0.0730	1.0700	14.1960	2.5563	9.0296	19.3624
45	0.0770	0.4500	14.1964	2.5562	9.0301	19.3626
46	8.4000	20.5000	14.9820	2.4202	10.0906	19.8733
47	2.0000	29.3000	14.3779	2.5160	9.2928	19.4630
48	1.1000	18.6000	14.2929	2.5342	9.1711	19.4148
49	39.2000	27.7000	17.8892	2.8263	12.1770	23.6013
50	34.7000	13.6000	17.4644	2.6873	12.0333	22.8956
51	5.5000	30.0000	14.7083	2.4561	9.7442	19.6723

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	245.0000	30.2000	37.3145	21.1876	-5.5071	80.1362
11	6.0000	20.2000	14.7554	15.6641	-16.9030	46.4139
12	46.9000	12.0000	18.6160	15.7806	-13.2779	50.5098
13	1.2000	9.0700	14.3024	15.6774	-17.3827	45.9875
14	39.6000	16.3000	17.9269	15.7299	-13.8645	49.7183
15	4.1000	11.1000	14.5761	15.6687	-17.0915	46.2437
16	0.7100	1.6100	14.2561	15.6790	-17.4323	45.9446
17	5.1000	2.3600	14.6705	15.6662	-16.9921	46.3330
18	0.3500	1.5200	14.2221	15.6803	-17.4689	45.9132
19	3.6000	1.9700	14.5289	15.6700	-17.1414	46.1992
20	2.6000	4.5000	14.4345	15.6729	-17.2416	46.1107
21	0.6600	1.3200	14.2514	15.6792	-17.4374	45.9402
22	45.6000	34.6000	18.4933	15.7707	-13.3805	50.3670
23	4.5000	8.7700	14.6139	15.6677	-17.0517	46.2794
24	5.8000	24.5000	14.7366	15.6646	-16.9227	46.3959
25	6.8000	26.0000	14.8310	15.6625	-16.8241	46.4860
26	9.2000	53.8000	15.0575	15.6585	-16.5895	46.7045
27	7.4000	62.3000	14.8876	15.6614	-16.7652	46.5404
28	10.8000	32.1000	15.2085	15.6566	-16.4346	46.8517
29	3.6000	50.1000	14.5289	15.6700	-17.1414	46.1992
30	18.1000	26.6000	15.8976	15.6559	-15.7443	47.5394
31	42.9000	16.2000	18.2384	15.7513	-13.5961	50.0729
32	1.9000	8.4500	14.3684	15.6751	-17.3121	46.0490
33	4.0000	29.2000	14.5667	15.6690	-17.1015	46.2348
34	0.4600	5.3200	14.2325	15.6799	-17.4577	45.9228
35	1.5000	2.2700	14.3307	15.6764	-17.3524	46.0138
36	1.8000	1.6800	14.3590	15.6754	-17.3221	46.0402
37	6.8000	3.4200	14.8310	15.6625	-16.8241	46.4860
38	1.4000	4.4100	14.3213	15.6767	-17.3625	46.0050
39	0.6700	1.3100	14.2523	15.6792	-17.4364	45.9411
40	0.9400	7.0800	14.2778	15.6782	-17.4090	45.9647
41	0.1800	1.0900	14.2061	15.6809	-17.4862	45.8983
42	0.2100	0.9700	14.2089	15.6808	-17.4831	45.9010
43	0.5400	1.1100	14.2401	15.6796	-17.4496	45.9297
44	0.0730	1.0700	14.1960	15.6813	-17.4970	45.8890
45	0.0770	0.4500	14.1964	15.6813	-17.4966	45.8894
46	8.4000	20.5000	14.9820	15.6597	-16.6674	46.6313
47	2.0000	29.3000	14.3779	15.6748	-17.3020	46.0578
48	1.1000	18.6000	14.2929	15.6777	-17.3928	45.9787
49	39.2000	27.7000	17.8892	15.7275	-13.8974	49.6757
50	34.7000	13.6000	17.4644	15.7032	-14.2728	49.2017
51	5.5000	30.0000	14.7083	15.6653	-16.9524	46.3689

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	245.0000	30.2000	37.3145	14.4757	-3.8890	78.5180
11	6.0000	20.2000	14.7554	2.4490	7.7845	21.7264
12	46.9000	12.0000	18.6160	3.1082	9.7687	27.4632
13	1.2000	9.0700	14.3024	2.5321	7.0949	21.5098
14	39.6000	16.3000	17.9269	2.8397	9.8442	26.0097
15	4.1000	11.1000	14.5761	2.4780	7.5228	21.6294
16	0.7100	1.6100	14.2561	2.5424	7.0194	21.4929
17	5.1000	2.3600	14.6705	2.4621	7.6624	21.6786
18	0.3500	1.5200	14.2221	2.5502	6.9633	21.4810
19	3.6000	1.9700	14.5289	2.4865	7.4514	21.6064
20	2.6000	4.5000	14.4345	2.5045	7.3056	21.5634
21	0.6600	1.3200	14.2514	2.5435	7.0116	21.4912
22	45.6000	34.6000	18.4933	3.0572	9.7912	27.1953
23	4.5000	8.7700	14.6139	2.4714	7.5791	21.6486
24	5.8000	24.5000	14.7366	2.4518	7.7577	21.7154
25	6.8000	26.0000	14.8310	2.4384	7.8902	21.7717
26	9.2000	53.8000	15.0575	2.4125	8.1905	21.9245
27	7.4000	62.3000	14.8876	2.4311	7.9676	21.8076
28	10.8000	32.1000	15.2085	2.4002	8.3765	22.0405
29	3.6000	50.1000	14.5289	2.4865	7.4514	21.6064
30	18.1000	26.6000	15.8976	2.3960	9.0775	22.7176
31	42.9000	16.2000	18.2384	2.9555	9.8259	26.6509
32	1.9000	8.4500	14.3684	2.5180	7.2012	21.5357
33	4.0000	29.2000	14.5667	2.4797	7.5086	21.6247
34	0.4600	5.3200	14.2325	2.5478	6.9805	21.4846
35	1.5000	2.2700	14.3307	2.5260	7.1407	21.5207
36	1.8000	1.6800	14.3590	2.5200	7.1862	21.5319
37	6.8000	3.4200	14.8310	2.4384	7.8902	21.7717
38	1.4000	4.4100	14.3213	2.5280	7.1255	21.5170
39	0.6700	1.3100	14.2523	2.5433	7.0132	21.4915
40	0.9400	7.0800	14.2778	2.5376	7.0549	21.5007
41	0.1800	1.0900	14.2061	2.5539	6.9366	21.4756
42	0.2100	0.9700	14.2089	2.5533	6.9413	21.4765
43	0.5400	1.1100	14.2401	2.5461	6.9929	21.4872
44	0.0730	1.0700	14.1960	2.5563	6.9198	21.4722
45	0.0770	0.4500	14.1964	2.5562	6.9204	21.4723
46	8.4000	20.5000	14.9820	2.4202	8.0932	21.8708
47	2.0000	29.3000	14.3779	2.5160	7.2163	21.5395
48	1.1000	18.6000	14.2929	2.5342	7.0796	21.5063
49	39.2000	27.7000	17.8892	2.8263	9.8444	25.9339
50	34.7000	13.6000	17.4644	2.6873	9.8154	25.1134
51	5.5000	30.0000	14.7083	2.4561	7.7171	21.6994

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Section

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	245.0000	30.2000	37.3145	-7.1145	-1.3028	23.5581
11	6.0000	20.2000	14.7554	5.4446	0.3564	26.9532
12	46.9000	12.0000	18.6160	-6.6160	-0.4365	55.1331
13	1.2000	9.0700	14.3024	-5.2324	-0.3428	57.6888
14	39.6000	16.3000	17.9269	-1.6269	-0.1070	9.9812
15	4.1000	11.1000	14.5761	-3.4761	-0.2276	31.3163
16	0.7100	1.6100	14.2561	-12.6461	-0.8286	785.4736
17	5.1000	2.3600	14.6705	-12.3105	-0.8060	521.6311
18	0.3500	1.5200	14.2221	-12.7021	-0.8324	835.6674
19	3.6000	1.9700	14.5289	-12.5589	-0.8224	637.5082
20	2.6000	4.5000	14.4345	-9.9345	-0.6507	220.7671
21	0.6600	1.3200	14.2514	-12.9314	-0.8473	979.6519
22	45.6000	34.6000	18.4933	16.1067	1.0620	46.5512
23	4.5000	8.7700	14.6139	-5.8439	-0.3826	66.6347
24	5.8000	24.5000	14.7366	9.7634	0.6391	39.8507
25	6.8000	26.0000	14.8310	11.1690	0.7310	42.9579
26	9.2000	53.8000	15.0575	38.7425	2.5351	72.0121
27	7.4000	62.3000	14.8876	47.4124	3.1030	76.1034
28	10.8000	32.1000	15.2085	16.8915	1.1052	52.6214
29	3.6000	50.1000	14.5289	35.5711	2.3294	71.0002
30	18.1000	26.6000	15.8976	10.7024	0.7002	40.2347
31	42.9000	16.2000	18.2384	-2.0384	-0.1342	12.5828
32	1.9000	8.4500	14.3684	-5.9184	-0.3877	70.0408
33	4.0000	29.2000	14.5667	14.6333	0.9582	50.1142
34	0.4600	5.3200	14.2325	-8.9125	-0.5840	167.5287
35	1.5000	2.2700	14.3307	-12.0607	-0.7901	531.3080
36	1.8000	1.6800	14.3590	-12.6790	-0.8306	754.7029
37	6.8000	3.4200	14.8310	-11.4110	-0.7469	333.6537
38	1.4000	4.4100	14.3213	-9.9113	-0.6493	224.7450
39	0.6700	1.3100	14.2523	-12.9423	-0.8481	987.9656
40	0.9400	7.0800	14.2778	-7.1978	-0.4716	101.6643
41	0.1800	1.0900	14.2061	-13.1161	-0.8595	1203.3118
42	0.2100	0.9700	14.2089	-13.2389	-0.8676	1364.8382
43	0.5400	1.1100	14.2401	-13.1301	-0.8604	1182.8900
44	0.0730	1.0700	14.1960	-13.1260	-0.8602	1226.7289
45	0.0770	0.4500	14.1964	-13.7464	-0.9009	3054.7503
46	8.4000	20.5000	14.9820	5.5180	0.3611	26.9172
47	2.0000	29.3000	14.3779	14.9221	0.9775	50.9287
48	1.1000	18.6000	14.2929	4.3071	0.2822	23.1563
49	39.2000	27.7000	17.8892	9.8108	0.6450	35.4181
50	34.7000	13.6000	17.4644	-3.8644	-0.2536	28.4149
51	5.5000	30.0000	14.7083	15.2917	1.0011	50.9725

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	245.0000	-7.1145	*-1.3146	0.8754	*5.9627	235.0882
11	6.0000	5.4446	0.3525	0.0251	0.0016	244.7256
12	46.9000	-6.6160	-0.4321	0.0404	0.0040	244.3357
13	1.2000	-5.2324	-0.3390	0.0268	0.0016	244.7839
14	39.6000	-1.6269	-0.1056	0.0337	0.0002	245.4350
15	4.1000	-3.4761	-0.2249	0.0257	0.0007	245.1873
16	0.7100	-12.6461	-0.8253	0.0270	0.0095	241.2908
17	5.1000	-12.3105	-0.8024	0.0253	0.0084	241.5184
18	0.3500	-12.7021	-0.8291	0.0272	0.0097	241.2527
19	3.6000	-12.5589	-0.8190	0.0258	0.0090	241.3538
20	2.6000	-9.9345	-0.6459	0.0262	0.0057	242.9065
21	0.6600	-12.9314	-0.8443	0.0270	0.0100	241.0984
22	45.6000	16.1067	1.0637	0.0390	0.0229	238.5830
23	4.5000	-5.8439	-0.3785	0.0255	0.0019	244.6067
24	5.8000	9.7634	0.6343	0.0251	0.0053	242.9981
25	6.8000	11.1690	0.7267	0.0248	0.0068	242.2251
26	9.2000	38.7425	*2.7324	0.0243	0.0801	206.0594
27	7.4000	47.4124	*3.5163	0.0247	0.1219	186.4066
28	10.8000	16.8915	1.1083	0.0241	0.0151	238.0089
29	3.6000	35.5711	*2.4740	0.0258	0.0719	212.2014
30	18.1000	10.7024	0.6957	0.0240	0.0060	242.4961
31	42.9000	-2.0384	-0.1326	0.0365	0.0003	245.3947
32	1.9000	-5.9184	-0.3836	0.0265	0.0020	244.5827
33	4.0000	14.6333	0.9572	0.0257	0.0121	239.8699
34	0.4600	-8.9125	-0.5792	0.0271	0.0048	243.4117
35	1.5000	-12.0607	-0.7864	0.0267	0.0085	241.6734
36	1.8000	-12.6790	-0.8273	0.0265	0.0094	241.2709
37	6.8000	-11.4110	-0.7427	0.0248	0.0071	242.0815
38	1.4000	-9.9113	-0.6446	0.0267	0.0058	242.9174
39	0.6700	-12.9423	-0.8450	0.0270	0.0100	241.0910
40	0.9400	-7.1978	-0.4670	0.0269	0.0031	244.1401
41	0.1800	-13.1161	-0.8567	0.0272	0.0103	240.9706
42	0.2100	-13.2389	-0.8649	0.0272	0.0105	240.8854
43	0.5400	-13.1301	-0.8575	0.0271	0.0103	240.9617
44	0.0730	-13.1260	-0.8574	0.0273	0.0104	240.9635
45	0.0770	-13.7464	-0.8987	0.0273	0.0114	240.5241
46	8.4000	5.5180	0.3571	0.0245	0.0016	244.7049
47	2.0000	14.9221	0.9769	0.0264	0.0130	239.6407
48	1.1000	4.3071	0.2789	0.0268	0.0011	245.0165
49	39.2000	9.8108	0.6402	0.0334	0.0072	242.9521
50	34.7000	-3.8644	-0.2506	0.0302	0.0010	245.1104
51	5.5000	15.2917	1.0011	0.0252	0.0130	239.3544

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-1.3146	-3.4846	** 5.9627	* 7.7419	0.6978	-3.4369
11	0.3525	0.0565	0.0016	1.0721	0.0559	-0.0126
12	-0.4321	-0.0886	0.0040	1.0858	-0.0431	-0.0567
13	-0.3390	-0.0562	0.0016	1.0746	-0.0562	0.0187
14	-0.1056	-0.0197	0.0002	1.0880	-0.0116	-0.0107
15	-0.2249	-0.0365	0.0007	1.0768	-0.0363	0.0098
16	-0.8253	-0.1375	0.0095	1.0443	-0.1375	0.0473
17	-0.8024	-0.1293	0.0084	1.0445	-0.1284	0.0316
18	-0.8291	-0.1386	0.0097	1.0442	-0.1386	0.0487
19	-0.8190	-0.1334	0.0090	1.0436	-0.1329	0.0373
20	-0.6459	-0.1060	0.0057	1.0575	-0.1058	0.0320
21	-0.8443	-0.1407	0.0100	1.0427	-0.1407	0.0486
22	1.0637	0.2144	0.0229	1.0338	0.1082	0.1339
23	-0.3785	-0.0613	0.0019	1.0716	-0.0609	0.0158
24	0.6343	0.1018	0.0053	1.0571	0.1009	-0.0232
25	0.7267	0.1160	0.0068	1.0501	0.1145	-0.0236
26	* 2.7324	0.4313	0.0801	0.7595	0.4207	-0.0622
27	* 3.5163	0.5595	0.1219	0.6218	0.5507	-0.1058
28	1.1083	0.1740	0.0151	1.0131	0.1680	-0.0180
29	* 2.4740	0.4028	0.0719	0.8067	0.4014	-0.1126
30	0.6957	0.1091	0.0060	1.0515	0.0981	0.0093
31	-0.1326	-0.0258	0.0003	1.0908	-0.0140	-0.0152
32	-0.3836	-0.0633	0.0020	1.0725	-0.0632	0.0201
33	0.9572	0.1554	0.0121	1.0307	0.1547	-0.0420
34	-0.5792	-0.0967	0.0048	1.0629	-0.0967	0.0338
35	-0.7864	-0.1301	0.0085	1.0473	-0.1301	0.0425
36	-0.8273	-0.1366	0.0094	1.0437	-0.1365	0.0437
37	-0.7427	-0.1185	0.0071	1.0489	-0.1170	0.0241
38	-0.6446	-0.1068	0.0058	1.0581	-0.1067	0.0351
39	-0.8450	-0.1408	0.0100	1.0426	-0.1408	0.0486
40	-0.4670	-0.0776	0.0031	1.0690	-0.0776	0.0263
41	-0.8567	-0.1434	0.0103	1.0418	-0.1434	0.0509
42	-0.8649	-0.1447	0.0105	1.0411	-0.1447	0.0513
43	-0.8575	-0.1431	0.0103	1.0416	-0.1431	0.0497
44	-0.8574	-0.1436	0.0104	1.0418	-0.1436	0.0514
45	-0.8987	-0.1506	0.0114	1.0380	-0.1506	0.0538
46	0.3571	0.0566	0.0016	1.0713	0.0554	-0.0093
47	0.9769	0.1610	0.0130	1.0295	0.1608	-0.0508
48	0.2789	0.0463	0.0011	1.0766	0.0463	-0.0155
49	0.6402	0.1190	0.0072	1.0657	0.0709	0.0637
50	-0.2506	-0.0442	0.0010	1.0812	-0.0294	-0.0203
51	1.0011	0.1610	0.0130	1.0257	0.1596	-0.0378

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
10	245.0000	-7.1145	|.....	-1.3028	|||||.....	-1.3146	|||||.....
11	6.0000	5.4446	|.....	0.3564	|.....	0.3525	|.....
12	46.9000	-6.6160	|.....	-0.4365	|.....	-0.4321	|.....
13	1.2000	-5.2324	|.....	-0.3428	|.....	-0.3390	|.....
14	39.6000	-1.6269	|.....	-0.1070	|.....	-0.1056	|.....
15	4.1000	-3.4761	|.....	-0.2276	|.....	-0.2249	|.....
16	0.7100	-12.6461	|||.....	-0.8286	|||.....	-0.8253	|||.....
17	5.1000	-12.3105	|||.....	-0.8060	|||.....	-0.8024	|||.....
18	0.3500	-12.7021	|||.....	-0.8324	|||.....	-0.8291	|||.....
19	3.6000	-12.5589	|||.....	-0.8224	|||.....	-0.8190	|||.....
20	2.6000	-9.9345	||.....	-0.6507	||.....	-0.6459	||.....
21	0.6600	-12.9314	|||.....	-0.8473	|||.....	-0.8443	|||.....
22	45.6000	16.1067	||||.....	1.0620	||||.....	1.0637	||||.....
23	4.5000	-5.8439	|.....	-0.3826	|.....	-0.3785	|.....
24	5.8000	9.7634	||.....	0.6391	||.....	0.6343	||.....
25	6.8000	11.1690	|||.....	0.7310	|||.....	0.7267	||.....
26	9.2000	38.7425	||||||||||...	2.5351	||||||||||...	* 2.7324	||||||||||....
27	7.4000	47.4124	||||||||||||||	3.1030	||||||||||||||	* 3.5163	||||||||||||||
28	10.8000	16.8915	|||||.....	1.1052	||||.....	1.1083	||||.....
29	3.6000	35.5711	||||||||||....	2.3294	||||||||||....	* 2.4740	|||||||||.....
30	18.1000	10.7024	||.....	0.7002	||.....	0.6957	||.....
31	42.9000	-2.0384	|.....	-0.1342	|.....	-0.1326	|.....
32	1.9000	-5.9184	|.....	-0.3877	|.....	-0.3836	|.....
33	4.0000	14.6333	||||.....	0.9582	||||.....	0.9572	|||.....
34	0.4600	-8.9125	||.....	-0.5840	||.....	-0.5792	||.....
35	1.5000	-12.0607	|||.....	-0.7901	|||.....	-0.7864	||.....
36	1.8000	-12.6790	|||.....	-0.8306	|||.....	-0.8273	|||.....
37	6.8000	-11.4110	|||.....	-0.7469	|||.....	-0.7427	||.....
38	1.4000	-9.9113	||.....	-0.6493	||.....	-0.6446	||.....
39	0.6700	-12.9423	|||.....	-0.8481	|||.....	-0.8450	|||.....
40	0.9400	-7.1978	|.....	-0.4716	|.....	-0.4670	|.....
41	0.1800	-13.1161	|||.....	-0.8595	|||.....	-0.8567	|||.....
42	0.2100	-13.2389	|||.....	-0.8676	|||.....	-0.8649	|||.....
43	0.5400	-13.1301	|||.....	-0.8604	|||.....	-0.8575	|||.....
44	0.0730	-13.1260	|||.....	-0.8602	|||.....	-0.8574	|||.....
45	0.0770	-13.7464	|||.....	-0.9009	|||.....	-0.8987	|||.....
46	8.4000	5.5180	|.....	0.3611	|.....	0.3571	|.....
47	2.0000	14.9221	||||.....	0.9775	||||.....	0.9769	|||.....
48	1.1000	4.3071	|.....	0.2822	|.....	0.2789	|.....
49	39.2000	9.8108	||.....	0.6450	||.....	0.6402	||.....
50	34.7000	-3.8644	|.....	-0.2536	|.....	-0.2506	|.....
51	5.5000	15.2917	||||.....	1.0011	||||.....	1.0011	|||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
10	245.0000	-3.4846	|||||||||||||||	** 5.9627	|||||||||||||||	-3.4369	|||||||||||||||
11	6.0000	0.0565	|.....	0.0016	|.....	-0.0126	|.....
12	46.9000	-0.0886	|.....	0.0040	|.....	-0.0567	|.....
13	1.2000	-0.0562	|.....	0.0016	|.....	0.0187	|.....
14	39.6000	-0.0197	|.....	0.0002	|.....	-0.0107	|.....
15	4.1000	-0.0365	|.....	0.0007	|.....	0.0098	|.....
16	0.7100	-0.1375	|.....	0.0095	|.....	0.0473	|.....
17	5.1000	-0.1293	|.....	0.0084	|.....	0.0316	|.....
18	0.3500	-0.1386	|.....	0.0097	|.....	0.0487	|.....
19	3.6000	-0.1334	|.....	0.0090	|.....	0.0373	|.....
20	2.6000	-0.1060	|.....	0.0057	|.....	0.0320	|.....
21	0.6600	-0.1407	|.....	0.0100	|.....	0.0486	|.....
22	45.6000	0.2144	|.....	0.0229	|.....	0.1339	|.....
23	4.5000	-0.0613	|.....	0.0019	|.....	0.0158	|.....
24	5.8000	0.1018	|.....	0.0053	|.....	-0.0232	|.....
25	6.8000	0.1160	|.....	0.0068	|.....	-0.0236	|.....
26	9.2000	0.4313	|.....	0.0801	|.....	-0.0622	|.....
27	7.4000	0.5595	||.....	0.1219	|.....	-0.1058	|.....
28	10.8000	0.1740	|.....	0.0151	|.....	-0.0180	|.....
29	3.6000	0.4028	|.....	0.0719	|.....	-0.1126	|.....
30	18.1000	0.1091	|.....	0.0060	|.....	0.0093	|.....
31	42.9000	-0.0258	|.....	0.0003	|.....	-0.0152	|.....
32	1.9000	-0.0633	|.....	0.0020	|.....	0.0201	|.....
33	4.0000	0.1554	|.....	0.0121	|.....	-0.0420	|.....
34	0.4600	-0.0967	|.....	0.0048	|.....	0.0338	|.....
35	1.5000	-0.1301	|.....	0.0085	|.....	0.0425	|.....
36	1.8000	-0.1366	|.....	0.0094	|.....	0.0437	|.....
37	6.8000	-0.1185	|.....	0.0071	|.....	0.0241	|.....
38	1.4000	-0.1068	|.....	0.0058	|.....	0.0351	|.....
39	0.6700	-0.1408	|.....	0.0100	|.....	0.0486	|.....
40	0.9400	-0.0776	|.....	0.0031	|.....	0.0263	|.....
41	0.1800	-0.1434	|.....	0.0103	|.....	0.0509	|.....
42	0.2100	-0.1447	|.....	0.0105	|.....	0.0513	|.....
43	0.5400	-0.1431	|.....	0.0103	|.....	0.0497	|.....
44	0.0730	-0.1436	|.....	0.0104	|.....	0.0514	|.....
45	0.0770	-0.1506	|.....	0.0114	|.....	0.0538	|.....
46	8.4000	0.0566	|.....	0.0016	|.....	-0.0093	|.....
47	2.0000	0.1610	|.....	0.0130	|.....	-0.0508	|.....
48	1.1000	0.0463	|.....	0.0011	|.....	-0.0155	|.....
49	39.2000	0.1190	|.....	0.0072	|.....	0.0637	|.....
50	34.7000	-0.0442	|.....	0.0010	|.....	-0.0203	|.....
51	5.5000	0.1610	|.....	0.0130	|.....	-0.0378	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	245.0000	-1.3146	|||||.....	** 5.9627	||||||||||||||	0.8754	||||||||||||||
11	6.0000	0.3525	|.....	0.0016	|.....	0.0251	|.....
12	46.9000	-0.4321	|.....	0.0040	|.....	0.0404	|.....
13	1.2000	-0.3390	|.....	0.0016	|.....	0.0268	|.....
14	39.6000	-0.1056	|.....	0.0002	|.....	0.0337	|.....
15	4.1000	-0.2249	|.....	0.0007	|.....	0.0257	|.....
16	0.7100	-0.8253	|||.....	0.0095	|.....	0.0270	|.....
17	5.1000	-0.8024	|||.....	0.0084	|.....	0.0253	|.....
18	0.3500	-0.8291	|||.....	0.0097	|.....	0.0272	|.....
19	3.6000	-0.8190	|||.....	0.0090	|.....	0.0258	|.....
20	2.6000	-0.6459	||.....	0.0057	|.....	0.0262	|.....
21	0.6600	-0.8443	|||.....	0.0100	|.....	0.0270	|.....
22	45.6000	1.0637	||||.....	0.0229	|.....	0.0390	|.....
23	4.5000	-0.3785	|.....	0.0019	|.....	0.0255	|.....
24	5.8000	0.6343	||.....	0.0053	|.....	0.0251	|.....
25	6.8000	0.7267	||.....	0.0068	|.....	0.0248	|.....
26	9.2000	* 2.7324	||||||||||....	0.0801	|.....	0.0243	|.....
27	7.4000	* 3.5163	||||||||||||||	0.1219	|.....	0.0247	|.....
28	10.8000	1.1083	||||.....	0.0151	|.....	0.0241	|.....
29	3.6000	* 2.4740	|||||||||.....	0.0719	|.....	0.0258	|.....
30	18.1000	0.6957	||.....	0.0060	|.....	0.0240	|.....
31	42.9000	-0.1326	|.....	0.0003	|.....	0.0365	|.....
32	1.9000	-0.3836	|.....	0.0020	|.....	0.0265	|.....
33	4.0000	0.9572	|||.....	0.0121	|.....	0.0257	|.....
34	0.4600	-0.5792	||.....	0.0048	|.....	0.0271	|.....
35	1.5000	-0.7864	||.....	0.0085	|.....	0.0267	|.....
36	1.8000	-0.8273	|||.....	0.0094	|.....	0.0265	|.....
37	6.8000	-0.7427	||.....	0.0071	|.....	0.0248	|.....
38	1.4000	-0.6446	||.....	0.0058	|.....	0.0267	|.....
39	0.6700	-0.8450	|||.....	0.0100	|.....	0.0270	|.....
40	0.9400	-0.4670	|.....	0.0031	|.....	0.0269	|.....
41	0.1800	-0.8567	|||.....	0.0103	|.....	0.0272	|.....
42	0.2100	-0.8649	|||.....	0.0105	|.....	0.0272	|.....
43	0.5400	-0.8575	|||.....	0.0103	|.....	0.0271	|.....
44	0.0730	-0.8574	|||.....	0.0104	|.....	0.0273	|.....
45	0.0770	-0.8987	|||.....	0.0114	|.....	0.0273	|.....
46	8.4000	0.3571	|.....	0.0016	|.....	0.0245	|.....
47	2.0000	0.9769	|||.....	0.0130	|.....	0.0264	|.....
48	1.1000	0.2789	|.....	0.0011	|.....	0.0268	|.....
49	39.2000	0.6402	||.....	0.0072	|.....	0.0334	|.....
50	34.7000	-0.2506	|.....	0.0010	|.....	0.0302	|.....
51	5.5000	1.0011	|||.....	0.0130	|.....	0.0252	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Inverse Prediction of X Means

Row	Invert (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	30.2000	245.0000	169.6257	75.3743	-450.6635	74.8779
11	20.2000	6.0000	63.6818	-57.6818	-110.8314	12.4703
12	12.0000	46.9000	-23.1923	70.0923	33.8207	95.3064
13	9.0700	1.2000	-54.2339	55.4339	0.3643	210.0483
14	16.3000	39.6000	22.3636	17.2364	-52.0790	61.9136
15	11.1000	4.1000	-32.7272	36.8272	18.6429	135.4525
16	1.6100	0.7100	-133.2681	133.9781	-42.0647	459.4361
17	2.3600	5.1000	-125.3223	130.4223	-38.2588	434.8234
18	1.5200	0.3500	-134.2216	134.5716	-42.5185	462.3867
19	1.9700	3.6000	-129.4541	133.0541	-40.2435	447.6276
20	4.5000	2.6000	-102.6503	105.2503	-27.0903	364.2859
21	1.3200	0.6600	-136.3404	137.0004	-43.5248	468.9415
22	34.6000	45.6000	216.2411	-170.6411	-594.2663	96.4138
23	8.7700	4.5000	-57.4122	61.9122	-1.7600	220.4954
24	24.5000	5.8000	109.2377	-103.4377	-262.2523	44.5987
25	26.0000	6.8000	125.1293	-118.3293	-312.3286	53.0613
26	53.8000	9.2000	419.6535	-410.4535	-1216.7797	186.2719
27	62.3000	7.4000	509.7059	-502.3059	-1491.7158	225.3971
28	32.1000	10.8000	189.7551	-178.9551	-512.7756	84.2792
29	50.1000	3.6000	380.4542	-376.8542	-1097.0329	169.1722
30	26.6000	18.1000	131.4859	-113.3859	-332.2249	56.3121
31	16.2000	42.9000	21.3042	21.5958	-51.0854	63.6942
32	8.4500	1.9000	-60.8024	62.7024	-3.9421	231.5550
33	29.2000	4.0000	159.0313	-155.0313	-417.8850	69.8418
34	5.3200	0.4600	-93.9629	94.4229	-22.6417	337.0885
35	2.2700	1.5000	-126.2758	127.7758	-38.7180	437.7794
36	1.6800	1.8000	-132.5265	134.3265	-41.7114	457.1408
37	3.4200	6.8000	-114.0922	120.8922	-32.7931	399.9506
38	4.4100	1.4000	-103.6038	105.0038	-27.5717	367.2642
39	1.3100	0.6700	-136.4464	137.1164	-43.5751	469.2692
40	7.0800	0.9400	-75.3167	76.2567	-12.5793	278.1994
41	1.0900	0.1800	-138.7772	138.9572	-44.6787	476.4762
42	0.9700	0.2100	-140.0485	140.2585	-45.2793	480.4059
43	1.1100	0.5400	-138.5653	139.1053	-44.5785	475.8211
44	1.0700	0.0730	-138.9890	139.0620	-44.7789	477.1312
45	0.4500	0.0770	-145.5576	145.6346	-47.8717	497.4243
46	20.5000	8.4000	66.8601	-58.4601	-122.4121	15.7283
47	29.3000	2.0000	160.0908	-158.0908	-421.1662	70.3488
48	18.6000	1.1000	46.7307	-45.6307	-45.4287	-8.5444
49	27.7000	39.2000	143.1398	-103.9398	-368.5595	62.1301
50	13.6000	34.7000	-6.2412	40.9412	-3.2527	87.9920
51	30.0000	5.5000	167.5069	-162.0069	-444.1134	73.8763

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Inverse Prediction of X Individuals

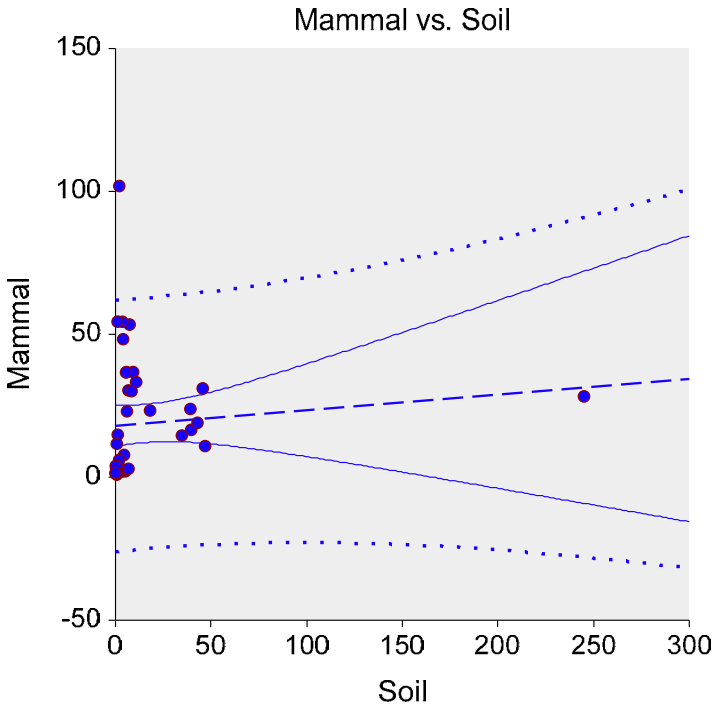
Row	Invert (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	30.2000	245.0000	169.6257	75.3743	-461.0960	85.3103
11	20.2000	6.0000	63.6818	-57.6818	-423.1960	324.8350
12	12.0000	46.9000	-23.1923	70.0923	-313.2502	442.3774
13	9.0700	1.2000	-54.2339	55.4339	-259.0691	469.4817
14	16.3000	39.6000	22.3636	17.2364	-378.4063	388.2409
15	11.1000	4.1000	-32.7272	36.8272	-297.4884	451.5838
16	1.6100	0.7100	-133.2681	133.9781	-75.5899	492.9613
17	2.3600	5.1000	-125.3223	130.4223	-97.9216	494.4861
18	1.5200	0.3500	-134.2216	134.5716	-72.8310	492.6992
19	1.9700	3.6000	-129.4541	133.0541	-86.4525	493.8366
20	4.5000	2.6000	-102.6503	105.2503	-156.0475	493.2432
21	1.3200	0.6600	-136.3404	137.0004	-66.6354	492.0522
22	34.6000	45.6000	216.2411	-170.6411	-405.2228	-92.6296
23	8.7700	4.5000	-57.4122	61.9122	-253.0396	471.7750
24	24.5000	5.8000	109.2377	-103.4377	-455.4520	237.7984
25	26.0000	6.8000	125.1293	-118.3293	-461.7646	202.4973
26	53.8000	9.2000	419.6535	-410.4535	-1105.5504	75.0426
27	62.3000	7.4000	509.7059	-502.3059	-1403.5040	137.1852
28	32.1000	10.8000	189.7551	-178.9551	-447.8500	19.3536
29	50.1000	3.6000	380.4542	-376.8542	-971.0106	43.1499
30	26.6000	18.1000	131.4859	-113.3859	-463.4532	187.5404
31	16.2000	42.9000	21.3042	21.5958	-377.0779	389.6867
32	8.4500	1.9000	-60.8024	62.7024	-246.5041	474.1170
33	29.2000	4.0000	159.0313	-155.0313	-464.2268	116.1836
34	5.3200	0.4600	-93.9629	94.4229	-176.4485	490.8954
35	2.2700	1.5000	-126.2758	127.7758	-95.3014	494.3628
36	1.6800	1.8000	-132.5265	134.3265	-77.7236	493.1530
37	3.4200	6.8000	-114.0922	120.8922	-127.6633	494.8209
38	4.4100	1.4000	-103.6038	105.0038	-153.7501	493.4426
39	1.3100	0.6700	-136.4464	137.1164	-66.3233	492.0174
40	7.0800	0.9400	-75.3167	76.2567	-217.2618	482.8820
41	1.0900	0.1800	-138.7772	138.9572	-59.3971	491.1946
42	0.9700	0.2100	-140.0485	140.2585	-55.5707	490.6973
43	1.1100	0.5400	-138.5653	139.1053	-60.0315	491.2741
44	1.0700	0.0730	-138.9890	139.0620	-58.7618	491.1141
45	0.4500	0.0770	-145.5576	145.6346	-38.5703	488.1230
46	20.5000	8.4000	66.8601	-58.4601	-426.0585	319.3748
47	29.3000	2.0000	160.0908	-158.0908	-464.0117	113.1943
48	18.6000	1.1000	46.7307	-45.6307	-406.4974	352.5244
49	27.7000	39.2000	143.1398	-103.9398	-465.1683	158.7388
50	13.6000	34.7000	-6.2412	40.9412	-339.4285	424.1677
51	30.0000	5.5000	167.5069	-162.0069	-461.9038	91.6667

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Mammal	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	17.9784	Rows Prediction Only	0
Slope	0.0550	Sum of Frequencies	42
R-Squared	0.0101	Sum of Weights	42.0000
Correlation	0.1006	Coefficient of Variation	1.1418
Mean Square Error	460.4685	Square Root of MSE	21.45853

Linear Regression Report

Y = Mammal X = Soil

Summary Statement

The equation of the straight line relating Mammal and Soil is estimated as: Mammal = (17.9784) + (0.0550) Soil using the 42 observations in this dataset. The y-intercept, the estimated value of Mammal when Soil is zero, is 17.9784 with a standard error of 3.5477. The slope, the estimated change in Mammal per unit change in Soil, is 0.0550 with a standard error of 0.0860. The value of R-Squared, the proportion of the variation in Mammal that can be accounted for by variation in Soil, is 0.0101. The correlation between Mammal and Soil is 0.1006.

A significance test that the slope is zero resulted in a t-value of 0.6395. The significance level of this t-test is 0.5261. Since 0.5261 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is 0.0550. The lower limit of the 95% confidence interval for the slope is -0.1188 and the upper limit is 0.2289. The estimated intercept is 17.9784. The lower limit of the 95% confidence interval for the intercept is 10.8082 and the upper limit is 25.1487.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Mammal	Soil
Count	42	42
Mean	18.7931	14.8088
Standard Deviation	21.3033	38.9564
Minimum	0.8900	0.0730
Maximum	101.9000	245.0000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	17.9784	0.0550
Lower 95% Confidence Limit	10.8082	-0.1188
Upper 95% Confidence Limit	25.1487	0.2289
Standard Error	3.5477	0.0860
Standardized Coefficient	0.0000	0.1006
T Value	5.0676	0.6395
Prob Level (T Test)	0.0000	0.5261
Prob Level (Randomization Test N =1000)		0.5310
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.9986	0.0957
Regression of Y on X	17.9784	0.0550
Inverse Regression from X on Y	-61.7021	5.4356
Orthogonal Regression of Y and X	17.6379	0.0780

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(17.9784185725118) + (0.0550156544868287) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	17.9784	0.9000	11.5095	24.2691
Bootstrap Mean	17.7458	0.9500	10.1254	25.3608
Bias (BM - OV)	-0.2326	0.9900	6.4293	27.3327
Bias Corrected	18.2110			
Standard Error	3.8856			
Slope				
Original Value	0.0550	0.9000	-0.2255	0.1203
Bootstrap Mean	0.0961	0.9500	-0.2782	0.1692
Bias (BM - OV)	0.0411	0.9900	-0.4490	0.2887
Bias Corrected	0.0139			
Standard Error	0.1149			
Correlation				
Original Value	0.1006	0.9000	-0.0781	0.2122
Bootstrap Mean	0.1228	0.9500	-0.1171	0.2393
Bias (BM - OV)	0.0222	0.9900	-0.1964	0.3055
Bias Corrected	0.0784			
Standard Error	0.0898			
R-Squared				
Original Value	0.0101	0.9000	0.0000	0.0200
Bootstrap Mean	0.0231	0.9500	0.0000	0.0202
Bias (BM - OV)	0.0130	0.9900	0.0000	0.0202
Bias Corrected	-0.0029			
Standard Error	0.0290			
Standard Error of Estimate				
Original Value	21.4585	0.9000	15.1992	28.3334
Bootstrap Mean	20.7508	0.9500	14.3742	29.1153
Bias (BM - OV)	-0.7077	0.9900	12.3758	30.6936
Bias Corrected	22.1662			
Standard Error	4.0588			
Orthogonal Intercept				
Original Value	17.6379	0.9000	3.9092	210.3003
Bootstrap Mean	60.5336	0.9500	-311.7706	374.1996
Bias (BM - OV)	42.8957	0.9900	-3380.8512	1202.7734
Bias Corrected	-25.2578			
Standard Error	2017.7861			
Orthogonal Slope				
Original Value	0.0780	0.9000	-23.5674	0.2665
Bootstrap Mean	-3.6897	0.9500	-43.7268	32.5145
Bias (BM - OV)	-3.7677	0.9900	-127.5392	325.6535
Bias Corrected	3.8457			
Standard Error	216.5360			

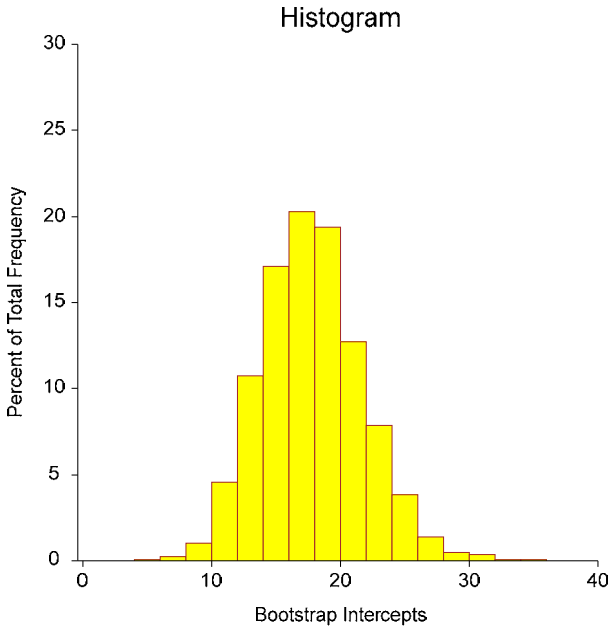
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

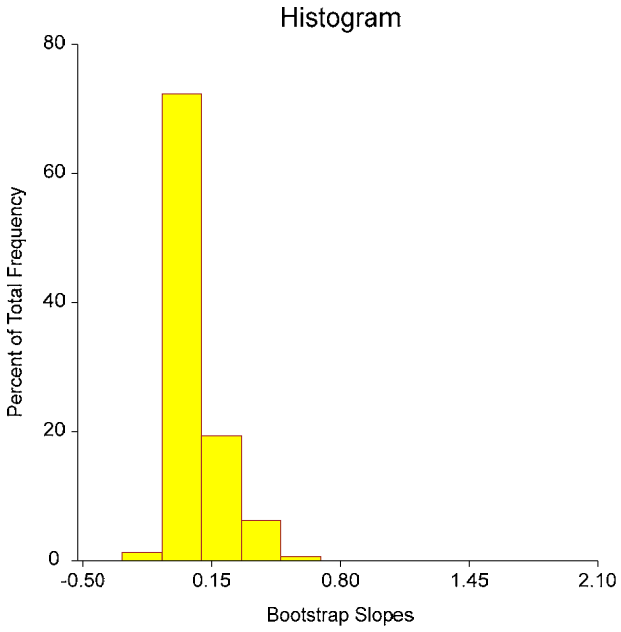
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

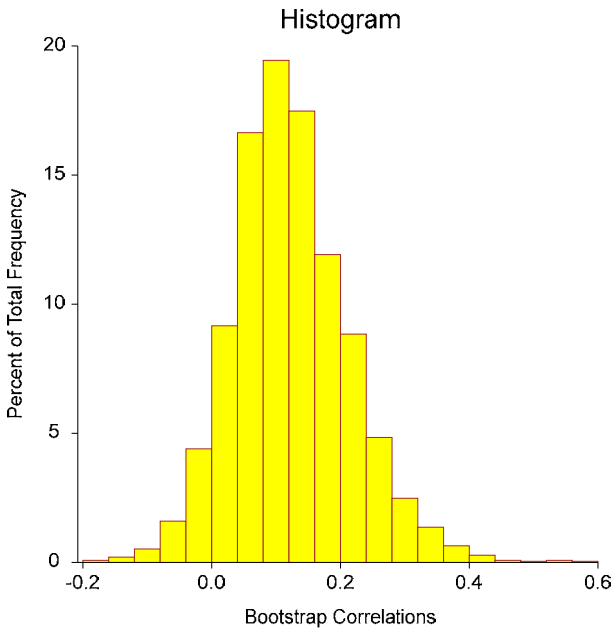
Linear Regression Report

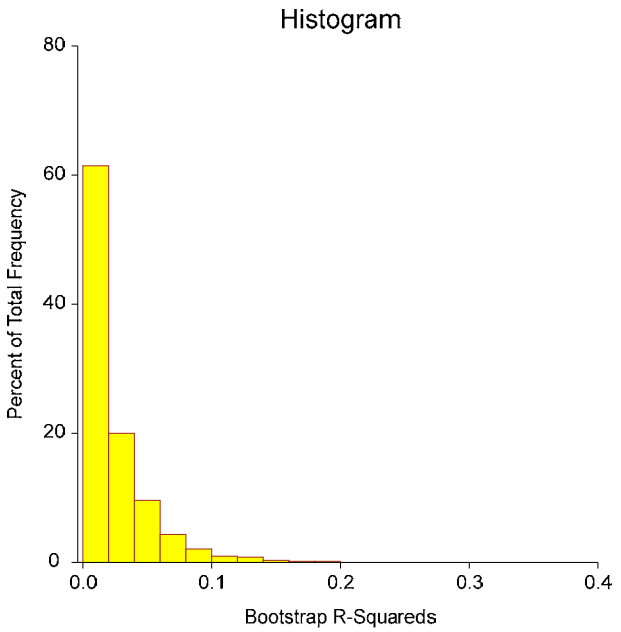
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Bootstrap Histograms Section



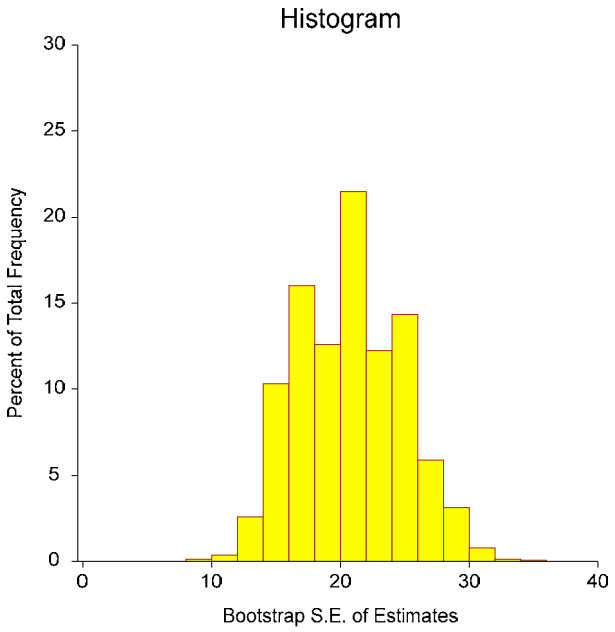


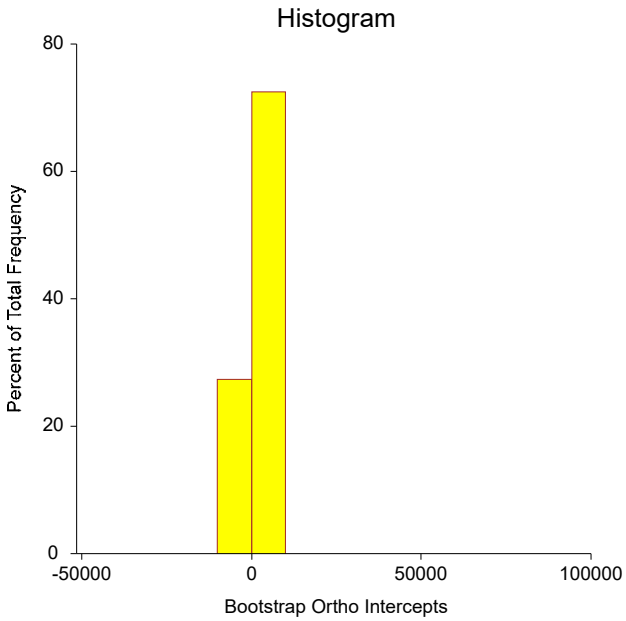


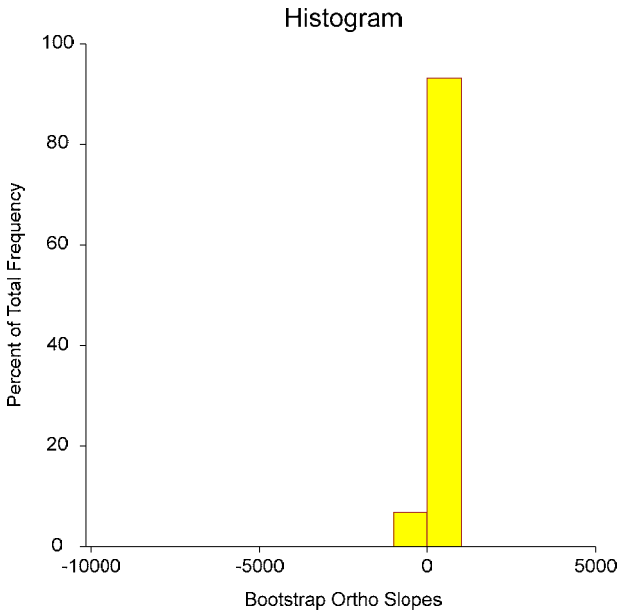


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.1006	0.0101	0.5727
Lower 95% Conf. Limit (r dist'n)	-0.2077		
Upper 95% Conf. Limit (r dist'n)	0.3886		
Lower 95% Conf. Limit (Fisher's z)	-0.2097		0.3254
Upper 95% Conf. Limit (Fisher's z)	0.3925		0.7467
Adjusted (Rbar)		0.0146	
T-Value for H0: Rho = 0	0.6395	0.6395	4.4186
Prob Level for H0: Rho = 0	0.5261	0.5261	0.0001
Prob Level (Randomization Test N =1000)	0.5310		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	14833.64	14833.64			
Slope	1	188.3277	188.3277	0.4090	0.5261	0.0957
Error	40	18418.74	460.4685			
Lack of Fit	38	16675.42	438.8267	0.5034	0.8488	
Pure Error	2	1743.324	871.6622			
Adj. Total	41	18607.07	453.8309			
Total	42	33440.71				

s = Square Root(460.4685) = 21.45853

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	621.97	789.3116	0.02733403	-0.0002380009
1	621.97	71432.3	15111.93	-0.0002380009	1.607157E-05
2 (Y'Y)			33440.71		
Determinant		2613310			3.826565E-07

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	12.58646	-0.1095919
1	-0.1095919	0.007400454

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7770	0.000001	No
Anderson Darling	2.8090	0.000000	No
D'Agostino Skewness	4.1322	0.000036	No
D'Agostino Kurtosis	3.2312	0.001233	No
D'Agostino Omnibus	27.5159	0.000001	No
Constant Residual Variance?			
Modified Levene Test	0.0071	0.933397	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	0.5034	0.848812	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

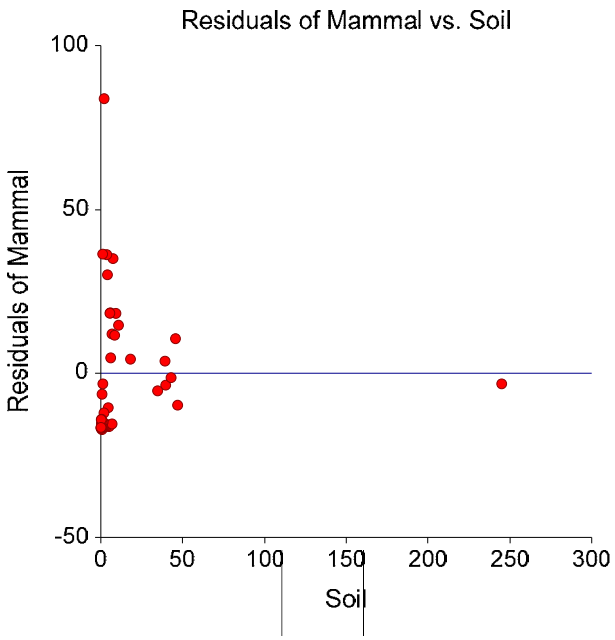
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

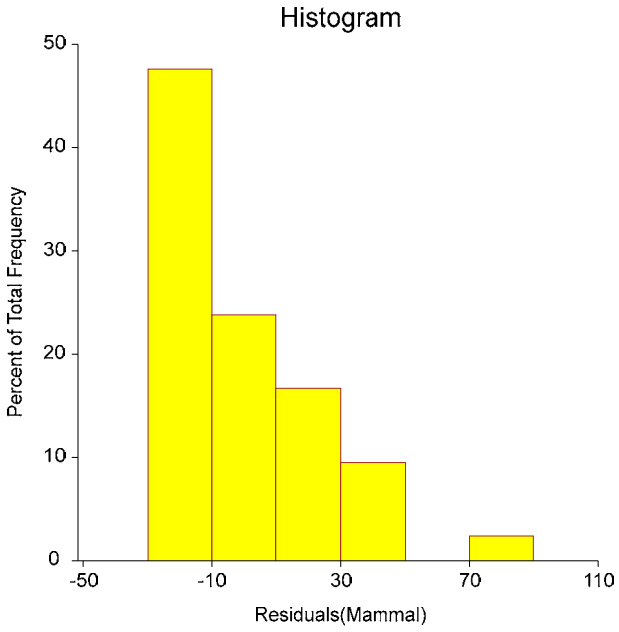
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

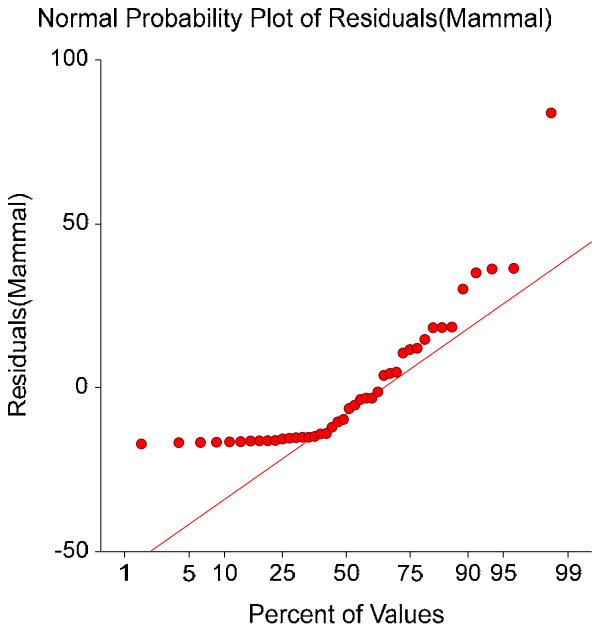
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Original Data Section

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual
10	245.0000	28.3000	31.4573	-3.1573
11	6.0000	23.0667	18.3085	4.7582
12	46.9000	10.9000	20.5587	-9.6587
13	1.2000	14.8900	18.0444	-3.1544
14	39.6000	16.6000	20.1570	-3.5570
15	4.1000	2.6000	18.2040	-15.6040
16	0.7100	11.6950	18.0175	-6.3225
17	5.1000	2.0767	18.2590	-16.1823
18	0.3500	2.7800	17.9977	-15.2177
19	3.6000	2.1100	18.1765	-16.0665
20	2.6000	1.9900	18.1215	-16.1315
21	0.6600	0.8900	18.0147	-17.1247
22	45.6000	31.1000	20.4871	10.6129
23	4.5000	7.8000	18.2260	-10.4260
24	5.8000	36.8000	18.2975	18.5025
25	6.8000	30.4000	18.3525	12.0475
26	9.2000	36.8000	18.4846	18.3154
27	7.4000	53.4233	18.3855	35.0378
28	10.8000	33.3000	18.5726	14.7274
29	3.6000	54.4000	18.1765	36.2235
30	18.1000	23.3500	18.9742	4.3758
31	42.9000	19.0700	20.3386	-1.2686
32	1.9000	6.0800	18.0829	-12.0029
33	4.0000	48.3000	18.1985	30.1015
34	0.4600	4.0533	18.0037	-13.9504
35	1.5000	2.9867	18.0609	-15.0743
36	1.8000	1.8400	18.0774	-16.2374
37	6.8000	2.9700	18.3525	-15.3825
38	1.4000	3.2100	18.0554	-14.8454
39	0.6700	2.9400	18.0153	-15.0753
40	0.9400	1.5200	18.0301	-16.5101
41	0.1800	1.3900	17.9883	-16.5983
42	0.2100	3.9267	17.9900	-14.0633
43	0.5400	1.2767	18.0081	-16.7315
44	0.0730	1.3100	17.9824	-16.6724
45	0.0770	1.5500	17.9827	-16.4327
46	8.4000	30.1000	18.4406	11.6594
47	2.0000	101.9000	18.0884	83.8116
48	1.1000	54.4500	18.0389	36.4111
49	39.2000	23.9000	20.1350	3.7650
50	34.7000	14.6000	19.8875	-5.2875
51	5.5000	36.6667	18.2810	18.3857

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	245.0000	28.3000	31.4573	20.0773	-9.1205	72.0350
11	6.0000	23.0667	18.3085	3.3967	11.4435	25.1736
12	46.9000	10.9000	20.5587	4.3110	11.8458	29.2715
13	1.2000	14.8900	18.0444	3.5120	10.9464	25.1424
14	39.6000	16.6000	20.1570	3.9385	12.1970	28.1171
15	4.1000	2.6000	18.2040	3.4369	11.2578	25.1502
16	0.7100	11.6950	18.0175	3.5263	10.8906	25.1443
17	5.1000	2.0767	18.2590	3.4148	11.3574	25.1606
18	0.3500	2.7800	17.9977	3.5370	10.8490	25.1463
19	3.6000	2.1100	18.1765	3.4487	11.2065	25.1465
20	2.6000	1.9900	18.1215	3.4737	11.1008	25.1421
21	0.6600	0.8900	18.0147	3.5278	10.8849	25.1446
22	45.6000	31.1000	20.4871	4.2403	11.9172	29.0570
23	4.5000	7.8000	18.2260	3.4278	11.2981	25.1539
24	5.8000	36.8000	18.2975	3.4006	11.4246	25.1704
25	6.8000	30.4000	18.3525	3.3820	11.5172	25.1879
26	9.2000	36.8000	18.4846	3.3461	11.7219	25.2473
27	7.4000	53.4233	18.3855	3.3719	11.5707	25.2004
28	10.8000	33.3000	18.5726	3.3290	11.8444	25.3008
29	3.6000	54.4000	18.1765	3.4487	11.2065	25.1465
30	18.1000	23.3500	18.9742	3.3232	12.2578	25.6907
31	42.9000	19.0700	20.3386	4.0992	12.0538	28.6234
32	1.9000	6.0800	18.0829	3.4924	11.0246	25.1413
33	4.0000	48.3000	18.1985	3.4392	11.2476	25.1494
34	0.4600	4.0533	18.0037	3.5337	10.8618	25.1456
35	1.5000	2.9867	18.0609	3.5035	10.9802	25.1417
36	1.8000	1.8400	18.0774	3.4951	11.0135	25.1414
37	6.8000	2.9700	18.3525	3.3820	11.5172	25.1879
38	1.4000	3.2100	18.0554	3.5063	10.9690	25.1419
39	0.6700	2.9400	18.0153	3.5275	10.8860	25.1445
40	0.9400	1.5200	18.0301	3.5195	10.9169	25.1433
41	0.1800	1.3900	17.9883	3.5422	10.8292	25.1474
42	0.2100	3.9267	17.9900	3.5413	10.8328	25.1472
43	0.5400	1.2767	18.0081	3.5313	10.8711	25.1452
44	0.0730	1.3100	17.9824	3.5455	10.8167	25.1481
45	0.0770	1.5500	17.9827	3.5454	10.8172	25.1481
46	8.4000	30.1000	18.4406	3.3567	11.6564	25.2247
47	2.0000	101.9000	18.0884	3.4897	11.0356	25.1413
48	1.1000	54.4500	18.0389	3.5149	10.9351	25.1428
49	39.2000	23.9000	20.1350	3.9200	12.2124	28.0576
50	34.7000	14.6000	19.8875	3.7271	12.3546	27.4203
51	5.5000	36.6667	18.2810	3.4066	11.3960	25.1660

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	245.0000	28.3000	31.4573	29.3865	-27.9351	90.8496
11	6.0000	23.0667	18.3085	21.7257	-25.6008	62.2178
12	46.9000	10.9000	20.5587	21.8873	-23.6772	64.7945
13	1.2000	14.8900	18.0444	21.7440	-25.9019	61.9907
14	39.6000	16.6000	20.1570	21.8170	-23.9367	64.2508
15	4.1000	2.6000	18.2040	21.7320	-25.7181	62.1260
16	0.7100	11.6950	18.0175	21.7463	-25.9335	61.9685
17	5.1000	2.0767	18.2590	21.7285	-25.6560	62.1740
18	0.3500	2.7800	17.9977	21.7481	-25.9568	61.9522
19	3.6000	2.1100	18.1765	21.7339	-25.7493	62.1023
20	2.6000	1.9900	18.1215	21.7379	-25.8124	62.0553
21	0.6600	0.8900	18.0147	21.7466	-25.9367	61.9662
22	45.6000	31.1000	20.4871	21.8735	-23.7208	64.6951
23	4.5000	7.8000	18.2260	21.7306	-25.6932	62.1451
24	5.8000	36.8000	18.2975	21.7263	-25.6130	62.2080
25	6.8000	30.4000	18.3525	21.7234	-25.5521	62.2572
26	9.2000	36.8000	18.4846	21.7178	-25.4088	62.3780
27	7.4000	53.4233	18.3855	21.7218	-25.5159	62.2870
28	10.8000	33.3000	18.5726	21.7152	-25.3155	62.4607
29	3.6000	54.4000	18.1765	21.7339	-25.7493	62.1023
30	18.1000	23.3500	18.9742	21.7143	-24.9121	62.8605
31	42.9000	19.0700	20.3386	21.8466	-23.8149	64.4921
32	1.9000	6.0800	18.0829	21.7409	-25.8570	62.0229
33	4.0000	48.3000	18.1985	21.7324	-25.7243	62.1213
34	0.4600	4.0533	18.0037	21.7475	-25.9497	61.9572
35	1.5000	2.9867	18.0609	21.7427	-25.8826	62.0045
36	1.8000	1.8400	18.0774	21.7413	-25.8634	62.0183
37	6.8000	2.9700	18.3525	21.7234	-25.5521	62.2572
38	1.4000	3.2100	18.0554	21.7431	-25.8890	61.9999
39	0.6700	2.9400	18.0153	21.7465	-25.9361	61.9666
40	0.9400	1.5200	18.0301	21.7452	-25.9186	61.9789
41	0.1800	1.3900	17.9883	21.7489	-25.9679	61.9445
42	0.2100	3.9267	17.9900	21.7488	-25.9659	61.9459
43	0.5400	1.2767	18.0081	21.7472	-25.9445	61.9608
44	0.0730	1.3100	17.9824	21.7495	-25.9749	61.9397
45	0.0770	1.5500	17.9827	21.7494	-25.9746	61.9399
46	8.4000	30.1000	18.4406	21.7195	-25.4562	62.3373
47	2.0000	101.9000	18.0884	21.7404	-25.8506	62.0275
48	1.1000	54.4500	18.0389	21.7445	-25.9083	61.9862
49	39.2000	23.9000	20.1350	21.8136	-23.9520	64.2220
50	34.7000	14.6000	19.8875	21.7798	-24.1312	63.9061
51	5.5000	36.6667	18.2810	21.7272	-25.6314	62.1934

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	245.0000	28.3000	31.4573	20.0773	-25.6908	88.6053
11	6.0000	23.0667	18.3085	3.3967	8.6401	27.9770
12	46.9000	10.9000	20.5587	4.3110	8.2878	32.8295
13	1.2000	14.8900	18.0444	3.5120	8.0479	28.0410
14	39.6000	16.6000	20.1570	3.9385	8.9465	31.3676
15	4.1000	2.6000	18.2040	3.4369	8.4212	27.9867
16	0.7100	11.6950	18.0175	3.5263	7.9803	28.0546
17	5.1000	2.0767	18.2590	3.4148	8.5390	27.9790
18	0.3500	2.7800	17.9977	3.5370	7.9298	28.0655
19	3.6000	2.1100	18.1765	3.4487	8.3602	27.9928
20	2.6000	1.9900	18.1215	3.4737	8.2339	28.0090
21	0.6600	0.8900	18.0147	3.5278	7.9733	28.0561
22	45.6000	31.1000	20.4871	4.2403	8.4176	32.5566
23	4.5000	7.8000	18.2260	3.4278	8.4690	27.9829
24	5.8000	36.8000	18.2975	3.4006	8.6180	27.9770
25	6.8000	30.4000	18.3525	3.3820	8.7259	27.9792
26	9.2000	36.8000	18.4846	3.3461	8.9602	28.0089
27	7.4000	53.4233	18.3855	3.3719	8.7877	27.9833
28	10.8000	33.3000	18.5726	3.3290	9.0968	28.0483
29	3.6000	54.4000	18.1765	3.4487	8.3602	27.9928
30	18.1000	23.3500	18.9742	3.3232	9.5150	28.4334
31	42.9000	19.0700	20.3386	4.0992	8.6707	32.0065
32	1.9000	6.0800	18.0829	3.4924	8.1422	28.0237
33	4.0000	48.3000	18.1985	3.4392	8.4091	27.9878
34	0.4600	4.0533	18.0037	3.5337	7.9453	28.0621
35	1.5000	2.9867	18.0609	3.5035	8.0887	28.0332
36	1.8000	1.8400	18.0774	3.4951	8.1289	28.0260
37	6.8000	2.9700	18.3525	3.3820	8.7259	27.9792
38	1.4000	3.2100	18.0554	3.5063	8.0751	28.0358
39	0.6700	2.9400	18.0153	3.5275	7.9747	28.0558
40	0.9400	1.5200	18.0301	3.5195	8.0122	28.0481
41	0.1800	1.3900	17.9883	3.5422	7.9058	28.0709
42	0.2100	3.9267	17.9900	3.5413	7.9100	28.0699
43	0.5400	1.2767	18.0081	3.5313	7.9566	28.0597
44	0.0730	1.3100	17.9824	3.5455	7.8906	28.0743
45	0.0770	1.5500	17.9827	3.5454	7.8911	28.0742
46	8.4000	30.1000	18.4406	3.3567	8.8860	27.9951
47	2.0000	101.9000	18.0884	3.4897	8.1555	28.0214
48	1.1000	54.4500	18.0389	3.5149	8.0342	28.0437
49	39.2000	23.9000	20.1350	3.9200	8.9772	31.2929
50	34.7000	14.6000	19.8875	3.7271	9.2785	30.4964
51	5.5000	36.6667	18.2810	3.4066	8.5845	27.9775

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Section

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	245.0000	28.3000	31.4573	-3.1573	-0.4168	11.1564
11	6.0000	23.0667	18.3085	4.7582	0.2246	20.6278
12	46.9000	10.9000	20.5587	-9.6587	-0.4595	88.6115
13	1.2000	14.8900	18.0444	-3.1544	-0.1490	21.1849
14	39.6000	16.6000	20.1570	-3.5570	-0.1686	21.4279
15	4.1000	2.6000	18.2040	-15.6040	-0.7367	600.1532
16	0.7100	11.6950	18.0175	-6.3225	-0.2987	54.0614
17	5.1000	2.0767	18.2590	-16.1823	-0.7639	779.2455
18	0.3500	2.7800	17.9977	-15.2177	-0.7190	547.3983
19	3.6000	2.1100	18.1765	-16.0665	-0.7586	761.4443
20	2.6000	1.9900	18.1215	-16.1315	-0.7618	810.6261
21	0.6600	0.8900	18.0147	-17.1247	-0.8090	1924.1268
22	45.6000	31.1000	20.4871	10.6129	0.5045	34.1250
23	4.5000	7.8000	18.2260	-10.4260	-0.4922	133.6665
24	5.8000	36.8000	18.2975	18.5025	0.8733	50.2785
25	6.8000	30.4000	18.3525	12.0475	0.5685	39.6299
26	9.2000	36.8000	18.4846	18.3154	0.8641	49.7702
27	7.4000	53.4233	18.3855	35.0378	1.6534	65.5852
28	10.8000	33.3000	18.5726	14.7274	0.6947	44.2265
29	3.6000	54.4000	18.1765	36.2235	1.7103	66.5874
30	18.1000	23.3500	18.9742	4.3758	0.2064	18.7400
31	42.9000	19.0700	20.3386	-1.2686	-0.0602	6.6523
32	1.9000	6.0800	18.0829	-12.0029	-0.5669	197.4169
33	4.0000	48.3000	18.1985	30.1015	1.4211	62.3220
34	0.4600	4.0533	18.0037	-13.9504	-0.6591	344.1709
35	1.5000	2.9867	18.0609	-15.0743	-0.7120	504.7190
36	1.8000	1.8400	18.0774	-16.2374	-0.7669	882.4699
37	6.8000	2.9700	18.3525	-15.3825	-0.7259	517.9301
38	1.4000	3.2100	18.0554	-14.8454	-0.7012	462.4748
39	0.6700	2.9400	18.0153	-15.0753	-0.7122	512.7646
40	0.9400	1.5200	18.0301	-16.5101	-0.7800	1086.1930
41	0.1800	1.3900	17.9883	-16.5983	-0.7843	1194.1238
42	0.2100	3.9267	17.9900	-14.0633	-0.6645	358.1487
43	0.5400	1.2767	18.0081	-16.7315	-0.7905	1310.5583
44	0.0730	1.3100	17.9824	-16.6724	-0.7878	1272.7049
45	0.0770	1.5500	17.9827	-16.4327	-0.7765	1060.1713
46	8.4000	30.1000	18.4406	11.6594	0.5501	38.7357
47	2.0000	101.9000	18.0884	83.8116	3.9584	82.2488
48	1.1000	54.4500	18.0389	36.4111	1.7200	66.8706
49	39.2000	23.9000	20.1350	3.7650	0.1785	15.7530
50	34.7000	14.6000	19.8875	-5.2875	-0.2502	36.2155
51	5.5000	36.6667	18.2810	18.3857	0.8678	50.1427

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	245.0000	-3.1573	*-0.4125	0.8754	0.6104	470.2239
11	6.0000	4.7582	0.2219	0.0251	0.0006	471.6800
12	46.9000	-9.6587	-0.4549	0.0404	0.0044	469.7827
13	1.2000	-3.1544	-0.1472	0.0268	0.0003	472.0132
14	39.6000	-3.5570	-0.1666	0.0337	0.0005	471.9397
15	4.1000	-15.6040	-0.7324	0.0257	0.0071	465.8678
16	0.7100	-6.3225	-0.2953	0.0270	0.0012	471.2220
17	5.1000	-16.1823	-0.7598	0.0253	0.0076	465.3864
18	0.3500	-15.2177	-0.7146	0.0272	0.0072	466.1717
19	3.6000	-16.0665	-0.7545	0.0258	0.0076	465.4811
20	2.6000	-16.1315	-0.7577	0.0262	0.0078	465.4234
21	0.6600	-17.1247	-0.8055	0.0270	0.0091	464.5471
22	45.6000	10.6129	0.4998	0.0390	0.0052	469.2700
23	4.5000	-10.4260	-0.4875	0.0255	0.0032	469.4152
24	5.8000	18.5025	0.8706	0.0251	0.0098	463.2713
25	6.8000	12.0475	0.5637	0.0248	0.0041	468.4590
26	9.2000	18.3154	0.8613	0.0243	0.0093	463.4596
27	7.4000	35.0378	1.6914	0.0247	0.0346	440.0003
28	10.8000	14.7274	0.6902	0.0241	0.0060	466.5768
29	3.6000	36.2235	1.7541	0.0258	0.0388	437.7386
30	18.1000	4.3758	0.2039	0.0240	0.0005	471.7724
31	42.9000	-1.2686	-0.0595	0.0365	0.0001	472.2326
32	1.9000	-12.0029	-0.5620	0.0265	0.0044	468.4808
33	4.0000	30.1015	1.4401	0.0257	0.0266	448.4295
34	0.4600	-13.9504	-0.6544	0.0271	0.0061	467.1462
35	1.5000	-15.0743	-0.7076	0.0267	0.0069	466.2893
36	1.8000	-16.2374	-0.7629	0.0265	0.0080	465.3308
37	6.8000	-15.3825	-0.7216	0.0248	0.0067	466.0536
38	1.4000	-14.8454	-0.6967	0.0267	0.0067	466.4694
39	0.6700	-15.0753	-0.7078	0.0270	0.0070	466.2863
40	0.9400	-16.5101	-0.7761	0.0269	0.0084	465.0928
41	0.1800	-16.5983	-0.7804	0.0272	0.0086	465.0133
42	0.2100	-14.0633	-0.6598	0.0272	0.0062	467.0622
43	0.5400	-16.7315	-0.7867	0.0271	0.0087	464.8976
44	0.0730	-16.6724	-0.7840	0.0273	0.0087	464.9479
45	0.0770	-16.4327	-0.7725	0.0273	0.0085	465.1572
46	8.4000	11.6594	0.5453	0.0245	0.0038	468.7022
47	2.0000	83.8116	*5.0116	0.0264	0.2128	287.2705
48	1.1000	36.4111	1.7649	0.0268	0.0408	437.3442
49	39.2000	3.7650	0.1763	0.0334	0.0005	471.8994
50	34.7000	-5.2875	-0.2473	0.0302	0.0010	471.5362
51	5.5000	18.3857	0.8651	0.0252	0.0097	463.3838

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.4125	-1.0934	* 0.6104	* 8.3700	0.2190	-1.0784
11	0.2219	0.0356	0.0006	1.0763	0.0352	-0.0079
12	-0.4549	-0.0933	0.0044	1.0846	-0.0454	-0.0597
13	-0.1472	-0.0244	0.0003	1.0797	-0.0244	0.0081
14	-0.1666	-0.0311	0.0005	1.0871	-0.0184	-0.0168
15	-0.7324	-0.1188	0.0071	1.0505	-0.1183	0.0319
16	-0.2953	-0.0492	0.0012	1.0763	-0.0492	0.0169
17	-0.7598	-0.1225	0.0076	1.0480	-0.1216	0.0300
18	-0.7146	-0.1194	0.0072	1.0535	-0.1194	0.0420
19	-0.7545	-0.1229	0.0076	1.0490	-0.1224	0.0343
20	-0.7577	-0.1243	0.0078	1.0491	-0.1241	0.0376
21	-0.8055	-0.1342	0.0091	1.0461	-0.1342	0.0463
22	0.4998	0.1007	0.0052	1.0808	0.0508	0.0629
23	-0.4875	-0.0789	0.0032	1.0664	-0.0784	0.0204
24	0.8706	0.1397	0.0098	1.0383	0.1384	-0.0318
25	0.5637	0.0900	0.0041	1.0614	0.0888	-0.0183
26	0.8613	0.1360	0.0093	1.0383	0.1326	-0.0196
27	1.6914	0.2691	0.0346	0.9362	0.2649	-0.0509
28	0.6902	0.1084	0.0060	1.0520	0.1046	-0.0112
29	1.7541	0.2856	0.0388	0.9277	0.2846	-0.0799
30	0.2039	0.0320	0.0005	1.0755	0.0287	0.0027
31	-0.0595	-0.0116	0.0001	1.0916	-0.0063	-0.0068
32	-0.5620	-0.0927	0.0044	1.0633	-0.0926	0.0295
33	1.4401	0.2338	0.0266	0.9734	0.2328	-0.0632
34	-0.6544	-0.1093	0.0061	1.0579	-0.1092	0.0382
35	-0.7076	-0.1171	0.0069	1.0535	-0.1170	0.0383
36	-0.7629	-0.1259	0.0080	1.0491	-0.1258	0.0403
37	-0.7216	-0.1152	0.0067	1.0505	-0.1137	0.0235
38	-0.6967	-0.1154	0.0067	1.0544	-0.1153	0.0380
39	-0.7078	-0.1179	0.0070	1.0539	-0.1179	0.0407
40	-0.7761	-0.1290	0.0084	1.0484	-0.1290	0.0437
41	-0.7804	-0.1306	0.0086	1.0484	-0.1306	0.0464
42	-0.6598	-0.1104	0.0062	1.0576	-0.1104	0.0392
43	-0.7867	-0.1313	0.0087	1.0477	-0.1312	0.0456
44	-0.7840	-0.1313	0.0087	1.0482	-0.1313	0.0470
45	-0.7725	-0.1294	0.0085	1.0491	-0.1294	0.0463
46	0.5453	0.0864	0.0038	1.0621	0.0846	-0.0142
47	* 5.0116	0.8260	0.2128	0.3998	0.8251	-0.2608
48	1.7649	0.2931	0.0408	0.9270	0.2930	-0.0983
49	0.1763	0.0328	0.0005	1.0865	0.0195	0.0175
50	-0.2473	-0.0436	0.0010	1.0813	-0.0290	-0.0200
51	0.8651	0.1391	0.0097	1.0389	0.1379	-0.0327

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
10	245.0000	-3.1573	|.....	-0.4168	|.....	-0.4125	|.....
11	6.0000	4.7582	|.....	0.2246	|.....	0.2219	|.....
12	46.9000	-9.6587	|.....	-0.4595	|.....	-0.4549	|.....
13	1.2000	-3.1544	|.....	-0.1490	|.....	-0.1472	|.....
14	39.6000	-3.5570	|.....	-0.1686	|.....	-0.1666	|.....
15	4.1000	-15.6040	||.....	-0.7367	||.....	-0.7324	||.....
16	0.7100	-6.3225	|.....	-0.2987	|.....	-0.2953	|.....
17	5.1000	-16.1823	||.....	-0.7639	||.....	-0.7598	||.....
18	0.3500	-15.2177	||.....	-0.7190	||.....	-0.7146	|.....
19	3.6000	-16.0665	||.....	-0.7586	||.....	-0.7545	||.....
20	2.6000	-16.1315	||.....	-0.7618	||.....	-0.7577	||.....
21	0.6600	-17.1247	||.....	-0.8090	||.....	-0.8055	||.....
22	45.6000	10.6129	|.....	0.5045	|.....	0.4998	|.....
23	4.5000	-10.4260	|.....	-0.4922	|.....	-0.4875	|.....
24	5.8000	18.5025	|||.....	0.8733	|||.....	0.8706	||.....
25	6.8000	12.0475	|.....	0.5685	|.....	0.5637	|.....
26	9.2000	18.3154	|||.....	0.8641	|||.....	0.8613	||.....
27	7.4000	35.0378	|||||.....	1.6534	|||||.....	1.6914	||||.....
28	10.8000	14.7274	||.....	0.6947	||.....	0.6902	|.....
29	3.6000	36.2235	|||||.....	1.7103	|||||.....	1.7541	|||||.....
30	18.1000	4.3758	|.....	0.2064	|.....	0.2039	|.....
31	42.9000	-1.2686	|.....	-0.0602	|.....	-0.0595	|.....
32	1.9000	-12.0029	|.....	-0.5669	|.....	-0.5620	|.....
33	4.0000	30.1015	|||||.....	1.4211	|||||.....	1.4401	||||.....
34	0.4600	-13.9504	||.....	-0.6591	||.....	-0.6544	|.....
35	1.5000	-15.0743	||.....	-0.7120	||.....	-0.7076	|.....
36	1.8000	-16.2374	||.....	-0.7669	||.....	-0.7629	||.....
37	6.8000	-15.3825	||.....	-0.7259	||.....	-0.7216	||.....
38	1.4000	-14.8454	||.....	-0.7012	||.....	-0.6967	|.....
39	0.6700	-15.0753	||.....	-0.7122	||.....	-0.7078	|.....
40	0.9400	-16.5101	||.....	-0.7800	||.....	-0.7761	||.....
41	0.1800	-16.5983	||.....	-0.7843	||.....	-0.7804	||.....
42	0.2100	-14.0633	||.....	-0.6645	||.....	-0.6598	|.....
43	0.5400	-16.7315	||.....	-0.7905	||.....	-0.7867	||.....
44	0.0730	-16.6724	||.....	-0.7878	||.....	-0.7840	||.....
45	0.0770	-16.4327	||.....	-0.7765	||.....	-0.7725	||.....
46	8.4000	11.6594	|.....	0.5501	|.....	0.5453	|.....
47	2.0000	83.8116	|||||||||||||||	3.9584	|||||||||||||||	* 5.0116	|||||||||||||||
48	1.1000	36.4111	|||||.....	1.7200	|||||.....	1.7649	|||||.....
49	39.2000	3.7650	|.....	0.1785	|.....	0.1763	|.....
50	34.7000	-5.2875	|.....	-0.2502	|.....	-0.2473	|.....
51	5.5000	18.3857	|||.....	0.8678	|||.....	0.8651	||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
10	245.0000	-1.0934	|||||||||||||||	* 0.6104	|||||||||||||||	-1.0784	|||||||||||||||
11	6.0000	0.0356	|.....	0.0006	|.....	-0.0079	|.....
12	46.9000	-0.0933	|.....	0.0044	|.....	-0.0597	|.....
13	1.2000	-0.0244	|.....	0.0003	|.....	0.0081	|.....
14	39.6000	-0.0311	|.....	0.0005	|.....	-0.0168	|.....
15	4.1000	-0.1188	|.....	0.0071	|.....	0.0319	|.....
16	0.7100	-0.0492	|.....	0.0012	|.....	0.0169	|.....
17	5.1000	-0.1225	|.....	0.0076	|.....	0.0300	|.....
18	0.3500	-0.1194	|.....	0.0072	|.....	0.0420	|.....
19	3.6000	-0.1229	|.....	0.0076	|.....	0.0343	|.....
20	2.6000	-0.1243	|.....	0.0078	|.....	0.0376	|.....
21	0.6600	-0.1342	|.....	0.0091	|.....	0.0463	|.....
22	45.6000	0.1007	|.....	0.0052	|.....	0.0629	|.....
23	4.5000	-0.0789	|.....	0.0032	|.....	0.0204	|.....
24	5.8000	0.1397	|.....	0.0098	|.....	-0.0318	|.....
25	6.8000	0.0900	|.....	0.0041	|.....	-0.0183	|.....
26	9.2000	0.1360	|.....	0.0093	|.....	-0.0196	|.....
27	7.4000	0.2691	|||.....	0.0346	|.....	-0.0509	|.....
28	10.8000	0.1084	|.....	0.0060	|.....	-0.0112	|.....
29	3.6000	0.2856	|||.....	0.0388	|.....	-0.0799	|.....
30	18.1000	0.0320	|.....	0.0005	|.....	0.0027	|.....
31	42.9000	-0.0116	|.....	0.0001	|.....	-0.0068	|.....
32	1.9000	-0.0927	|.....	0.0044	|.....	0.0295	|.....
33	4.0000	0.2338	|||.....	0.0266	|.....	-0.0632	|.....
34	0.4600	-0.1093	|.....	0.0061	|.....	0.0382	|.....
35	1.5000	-0.1171	|.....	0.0069	|.....	0.0383	|.....
36	1.8000	-0.1259	|.....	0.0080	|.....	0.0403	|.....
37	6.8000	-0.1152	|.....	0.0067	|.....	0.0235	|.....
38	1.4000	-0.1154	|.....	0.0067	|.....	0.0380	|.....
39	0.6700	-0.1179	|.....	0.0070	|.....	0.0407	|.....
40	0.9400	-0.1290	|.....	0.0084	|.....	0.0437	|.....
41	0.1800	-0.1306	|.....	0.0086	|.....	0.0464	|.....
42	0.2100	-0.1104	|.....	0.0062	|.....	0.0392	|.....
43	0.5400	-0.1313	|.....	0.0087	|.....	0.0456	|.....
44	0.0730	-0.1313	|.....	0.0087	|.....	0.0470	|.....
45	0.0770	-0.1294	|.....	0.0085	|.....	0.0463	|.....
46	8.4000	0.0864	|.....	0.0038	|.....	-0.0142	|.....
47	2.0000	0.8260	||||||||||....	0.2128	|||||.....	-0.2608	|||.....
48	1.1000	0.2931	|||.....	0.0408	|.....	-0.0983	|.....
49	39.2000	0.0328	|.....	0.0005	|.....	0.0175	|.....
50	34.7000	-0.0436	|.....	0.0010	|.....	-0.0200	|.....
51	5.5000	0.1391	|.....	0.0097	|.....	-0.0327	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	245.0000	-0.4125	|.....	* 0.6104	||||||||||||||	0.8754	||||||||||||||
11	6.0000	0.2219	|.....	0.0006	|.....	0.0251	|.....
12	46.9000	-0.4549	|.....	0.0044	|.....	0.0404	|.....
13	1.2000	-0.1472	|.....	0.0003	|.....	0.0268	|.....
14	39.6000	-0.1666	|.....	0.0005	|.....	0.0337	|.....
15	4.1000	-0.7324	||.....	0.0071	|.....	0.0257	|.....
16	0.7100	-0.2953	|.....	0.0012	|.....	0.0270	|.....
17	5.1000	-0.7598	||.....	0.0076	|.....	0.0253	|.....
18	0.3500	-0.7146	|.....	0.0072	|.....	0.0272	|.....
19	3.6000	-0.7545	||.....	0.0076	|.....	0.0258	|.....
20	2.6000	-0.7577	||.....	0.0078	|.....	0.0262	|.....
21	0.6600	-0.8055	||.....	0.0091	|.....	0.0270	|.....
22	45.6000	0.4998	|.....	0.0052	|.....	0.0390	|.....
23	4.5000	-0.4875	|.....	0.0032	|.....	0.0255	|.....
24	5.8000	0.8706	||.....	0.0098	|.....	0.0251	|.....
25	6.8000	0.5637	|.....	0.0041	|.....	0.0248	|.....
26	9.2000	0.8613	||.....	0.0093	|.....	0.0243	|.....
27	7.4000	1.6914	||||.....	0.0346	|.....	0.0247	|.....
28	10.8000	0.6902	|.....	0.0060	|.....	0.0241	|.....
29	3.6000	1.7541	|||||.....	0.0388	|.....	0.0258	|.....
30	18.1000	0.2039	|.....	0.0005	|.....	0.0240	|.....
31	42.9000	-0.0595	|.....	0.0001	|.....	0.0365	|.....
32	1.9000	-0.5620	|.....	0.0044	|.....	0.0265	|.....
33	4.0000	1.4401	||||.....	0.0266	|.....	0.0257	|.....
34	0.4600	-0.6544	|.....	0.0061	|.....	0.0271	|.....
35	1.5000	-0.7076	|.....	0.0069	|.....	0.0267	|.....
36	1.8000	-0.7629	||.....	0.0080	|.....	0.0265	|.....
37	6.8000	-0.7216	||.....	0.0067	|.....	0.0248	|.....
38	1.4000	-0.6967	|.....	0.0067	|.....	0.0267	|.....
39	0.6700	-0.7078	|.....	0.0070	|.....	0.0270	|.....
40	0.9400	-0.7761	||.....	0.0084	|.....	0.0269	|.....
41	0.1800	-0.7804	||.....	0.0086	|.....	0.0272	|.....
42	0.2100	-0.6598	|.....	0.0062	|.....	0.0272	|.....
43	0.5400	-0.7867	||.....	0.0087	|.....	0.0271	|.....
44	0.0730	-0.7840	||.....	0.0087	|.....	0.0273	|.....
45	0.0770	-0.7725	||.....	0.0085	|.....	0.0273	|.....
46	8.4000	0.5453	|.....	0.0038	|.....	0.0245	|.....
47	2.0000	* 5.0116	||||||||||||||	0.2128	|||||.....	0.0264	|.....
48	1.1000	1.7649	|||||.....	0.0408	|.....	0.0268	|.....
49	39.2000	0.1763	|.....	0.0005	|.....	0.0334	|.....
50	34.7000	-0.2473	|.....	0.0010	|.....	0.0302	|.....
51	5.5000	0.8651	||.....	0.0097	|.....	0.0252	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Inverse Prediction of X Means

Row	Mammal (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	28.3000	245.0000	187.6117	57.3883	-49.6504	40.8133
11	23.0667	6.0000	92.4873	-86.4873	-23.8380	36.1695
12	10.9000	46.9000	-128.6619	175.5619	0.7918	60.7531
13	14.8900	1.2000	-56.1371	57.3371	-9.2964	54.7020
14	16.6000	39.6000	-25.0550	64.6550	-18.8321	57.3208
15	2.6000	4.1000	-279.5280	283.6280	-47.6557	142.7735
16	11.6950	0.7100	-114.2115	114.9215	8.8677	49.4614
17	2.0767	5.1000	-289.0405	294.1405	-50.2230	147.4576
18	2.7800	0.3500	-276.2563	276.6063	-46.7679	141.1576
19	2.1100	3.6000	-288.4346	292.0346	-50.0600	147.1598
20	1.9900	2.6000	-290.6158	293.2158	-50.6462	148.2314
21	0.8900	0.6600	-310.6101	311.2701	-55.9765	158.0111
22	31.1000	45.6000	238.5063	-192.9063	-77.4691	57.3063
23	7.8000	4.5000	-185.0095	189.5095	-20.3219	94.4060
24	36.8000	5.8000	342.1132	-336.3132	-129.3121	86.0931
25	30.4000	6.8000	225.7827	-218.9827	-70.7725	53.4411
26	36.8000	9.2000	342.1132	-332.9132	-129.3121	86.0931
27	53.4233	7.4000	644.2696	-636.8696	-272.8199	162.3606
28	33.3000	10.8000	278.4949	-267.6949	-97.9033	68.8416
29	54.4000	3.6000	662.0221	-658.4221	-281.1422	166.7324
30	23.3500	18.1000	97.6373	-79.5373	-22.6564	33.8418
31	19.0700	42.9000	19.8413	23.0587	-26.2872	54.7850
32	6.0800	1.9000	-216.2733	218.1733	-29.8807	110.9221
33	48.3000	4.0000	551.1446	-547.1446	-229.0464	139.3107
34	4.0533	0.4600	-253.1113	253.5713	-40.4056	129.6447
35	2.9867	1.5000	-272.4997	273.9997	-45.7453	139.2990
36	1.8400	1.8000	-293.3423	295.1423	-51.3776	149.5695
37	2.9700	6.8000	-272.8027	279.6027	-45.8279	139.4490
38	3.2100	1.4000	-268.4403	269.8403	-44.6361	137.2865
39	2.9400	0.6700	-273.3480	274.0180	-45.9765	139.7190
40	1.5200	0.9400	-299.1588	300.0988	-52.9328	152.4191
41	1.3900	0.1800	-301.5218	301.7018	-53.5628	153.5750
42	3.9267	0.2100	-255.4137	255.6237	-41.0456	130.7971
43	1.2767	0.5400	-303.5818	304.1218	-54.1112	154.5818
44	1.3100	0.0730	-302.9759	303.0489	-53.9500	154.2857
45	1.5500	0.0770	-298.6135	298.6905	-52.7873	152.1523
46	30.1000	8.4000	220.3297	-211.9297	-67.8622	51.7443
47	101.9000	2.0000	1525.4128	-1523.4128	-682.9027	376.3585
48	54.4500	1.1000	662.9310	-661.8310	-281.5681	166.9560
49	23.9000	39.2000	107.6345	-68.4345	-19.6212	28.5819
50	14.6000	34.7000	-61.4083	96.1083	-7.1743	53.7529
51	36.6667	5.5000	339.6896	-334.1896	-128.1313	85.4516

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Inverse Prediction of X Individuals

Row	Mammal (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	28.3000	245.0000	187.6117	57.3883	-263.4532	254.6162
11	23.0667	6.0000	92.4873	-86.4873	-258.4947	270.8261
12	10.9000	46.9000	-128.6619	175.5619	-230.4671	292.0119
13	14.8900	1.2000	-56.1371	57.3371	-242.1913	287.5968
14	16.6000	39.6000	-25.0550	64.6550	-246.4523	284.9410
15	2.6000	4.1000	-279.5280	283.6280	-197.5515	292.6692
16	11.6950	0.7100	-114.2115	114.9215	-233.0051	291.3342
17	2.0767	5.1000	-289.0405	294.1405	-195.0536	292.2882
18	2.7800	0.3500	-276.2563	276.6063	-198.3981	292.7878
19	2.1100	3.6000	-288.4346	292.0346	-195.2143	292.3141
20	1.9900	2.6000	-290.6158	293.2158	-194.6346	292.2198
21	0.8900	0.6600	-310.6101	311.2701	-189.1851	291.2198
22	31.1000	45.6000	238.5063	-192.9063	-264.2542	244.0914
23	7.8000	4.5000	-185.0095	189.5095	-219.5788	293.6629
24	36.8000	5.8000	342.1132	-336.3132	-261.4950	218.2760
25	30.4000	6.8000	225.7827	-218.9827	-264.1802	246.8488
26	36.8000	9.2000	342.1132	-332.9132	-261.4950	218.2760
27	53.4233	7.4000	644.2696	-636.8696	-202.8757	92.4165
28	33.3000	10.8000	278.4949	-267.6949	-263.9180	234.8563
29	54.4000	3.6000	662.0221	-658.4221	-195.0345	80.6247
30	23.3500	18.1000	97.6373	-79.5373	-258.8745	270.0599
31	19.0700	42.9000	19.8413	23.0587	-251.8114	280.3091
32	6.0800	1.9000	-216.2733	218.1733	-212.8339	293.8753
33	48.3000	4.0000	551.1446	-547.1446	-232.5462	142.8105
34	4.0533	0.4600	-253.1113	253.5713	-204.2089	293.4481
35	2.9867	1.5000	-272.4997	273.9997	-199.3624	292.9162
36	1.8400	1.8000	-293.3423	295.1423	-193.9060	292.0980
37	2.9700	6.8000	-272.8027	279.6027	-199.2850	292.9061
38	3.2100	1.4000	-268.4403	269.8403	-200.3952	293.0456
39	2.9400	0.6700	-273.3480	274.0180	-199.1454	292.8879
40	1.5200	0.9400	-299.1588	300.0988	-192.3365	291.8228
41	1.3900	0.1800	-301.5218	301.7018	-191.6929	291.7050
42	3.9267	0.2100	-255.4137	255.6237	-203.6447	293.3962
43	1.2767	0.5400	-303.5818	304.1218	-191.1290	291.5996
44	1.3100	0.0730	-302.9759	303.0489	-191.2951	291.6309
45	1.5500	0.0770	-298.6135	298.6905	-192.4845	291.8495
46	30.1000	8.4000	220.3297	-211.9297	-264.1224	248.0045
47	101.9000	2.0000	1525.4128	-1523.4128	-613.0151	306.4709
48	54.4500	1.1000	662.9310	-661.8310	-194.6065	79.9945
49	23.9000	39.2000	107.6345	-68.4345	-259.5761	268.5367
50	14.6000	34.7000	-61.4083	96.1083	-241.4236	288.0022
51	36.6667	5.5000	339.6896	-334.1896	-261.6323	218.9527

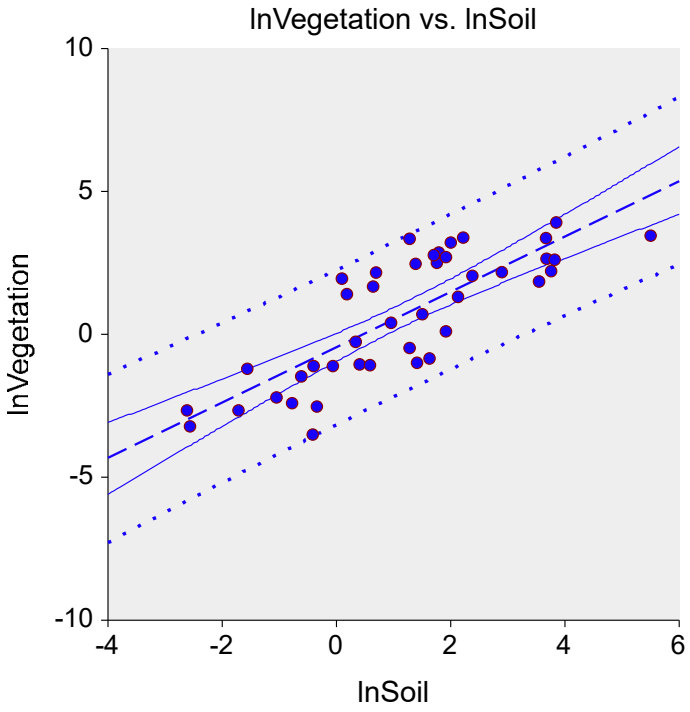
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Soil to Tissue Linear Regressions
ln Transformation - All Data

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnVegetation	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	-0.4508	Rows Prediction Only	0
Slope	0.9710	Sum of Frequencies	42
R-Squared	0.6484	Sum of Weights	42.0000
Correlation	0.8053	Coefficient of Variation	1.9504
Mean Square Error	1.745938	Square Root of MSE	1.321339

Linear Regression Report

Y = lnVegetation X = lnSoil

Summary Statement

The equation of the straight line relating lnVegetation and lnSoil is estimated as: lnVegetation = (-0.4508) + (0.9710) lnSoil using the 42 observations in this dataset. The y-intercept, the estimated value of lnVegetation when lnSoil is zero, is -0.4508 with a standard error of 0.2425. The slope, the estimated change in lnVegetation per unit change in lnSoil, is 0.9710 with a standard error of 0.1130. The value of R-Squared, the proportion of the variation in lnVegetation that can be accounted for by variation in lnSoil, is 0.6484. The correlation between lnVegetation and lnSoil is 0.8053.

A significance test that the slope is zero resulted in a t-value of 8.5896. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.9710. The lower limit of the 95% confidence interval for the slope is 0.7425 and the upper limit is 1.1994. The estimated intercept is -0.4508. The lower limit of the 95% confidence interval for the intercept is -0.9410 and the upper limit is 0.0394.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnVegetation	lnSoil
Count	42	42
Mean	0.6775	1.1620
Standard Deviation	2.2012	1.8255
Minimum	-3.5066	-2.6173
Maximum	3.9140	5.5013

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	-0.4508	0.9710
Lower 95% Confidence Limit	-0.9410	0.7425
Upper 95% Confidence Limit	0.0394	1.1994
Standard Error	0.2425	0.1130
Standardized Coefficient	0.0000	0.8053
T Value	-1.8588	8.5896
Prob Level (T Test)	0.0704	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	No	Yes
Power (Alpha = 0.0500)	0.4421	1.0000
Regression of Y on X	-0.4508	0.9710
Inverse Regression from X on Y	-1.0625	1.4974
Orthogonal Regression of Y and X	-0.7875	1.2607

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(-0.450826820430194) + (0.970966941059202) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	-0.4508	0.9000	-0.8507	-0.0992
Bootstrap Mean	-0.4432	0.9500	-0.9319	-0.0434
Bias (BM - OV)	0.0076	0.9900	-1.1220	0.1211
Bias Corrected	-0.4584			
Standard Error	0.2318			
Slope				
Original Value	0.9710	0.9000	0.8099	1.1038
Bootstrap Mean	0.9767	0.9500	0.7758	1.1303
Bias (BM - OV)	0.0057	0.9900	0.7176	1.1878
Bias Corrected	0.9653			
Standard Error	0.0898			
Correlation				
Original Value	0.8053	0.9000	0.7447	0.8863
Bootstrap Mean	0.8036	0.9500	0.7350	0.9108
Bias (BM - OV)	-0.0017	0.9900	0.7158	0.9566
Bias Corrected	0.8069			
Standard Error	0.0444			
R-Squared				
Original Value	0.6484	0.9000	0.5473	0.7724
Bootstrap Mean	0.6478	0.9500	0.5304	0.8072
Bias (BM - OV)	-0.0007	0.9900	0.4964	0.8693
Bias Corrected	0.6491			
Standard Error	0.0697			
Standard Error of Estimate				
Original Value	1.3213	0.9000	1.1766	1.5309
Bootstrap Mean	1.2910	0.9500	1.1459	1.5621
Bias (BM - OV)	-0.0303	0.9900	1.0746	1.6319
Bias Corrected	1.3517			
Standard Error	0.1077			
Orthogonal Intercept				
Original Value	-0.7875	0.9000	-1.1808	-0.3611
Bootstrap Mean	-0.7957	0.9500	-1.2489	-0.2711
Bias (BM - OV)	-0.0082	0.9900	-1.3793	-0.0907
Bias Corrected	-0.7793			
Standard Error	0.2456			
Orthogonal Slope				
Original Value	1.2607	0.9000	0.9692	1.4556
Bootstrap Mean	1.2804	0.9500	0.8959	1.4868
Bias (BM - OV)	0.0198	0.9900	0.7230	1.5431
Bias Corrected	1.2409			
Standard Error	0.1516			

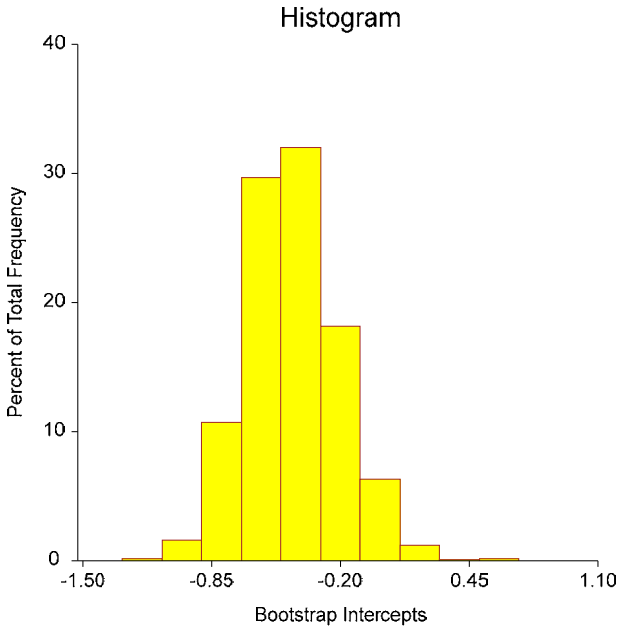
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

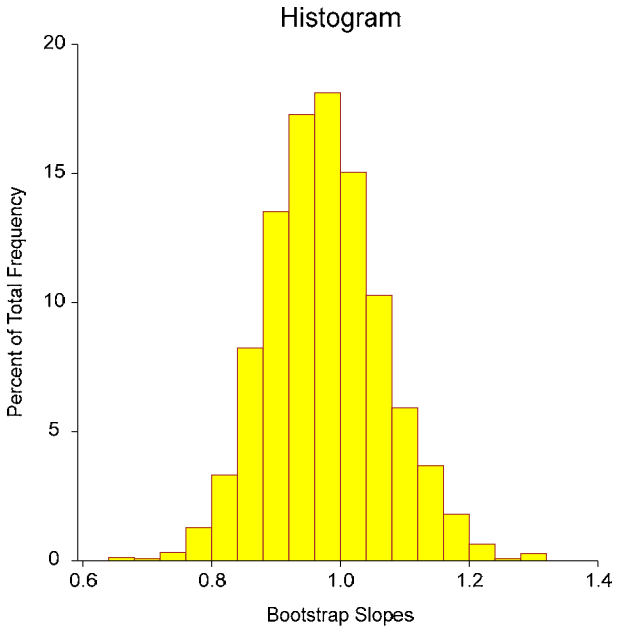
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

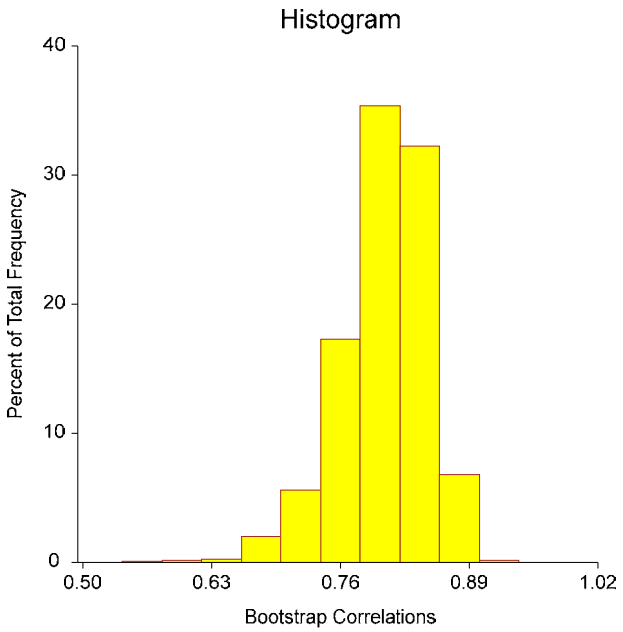
Linear Regression Report

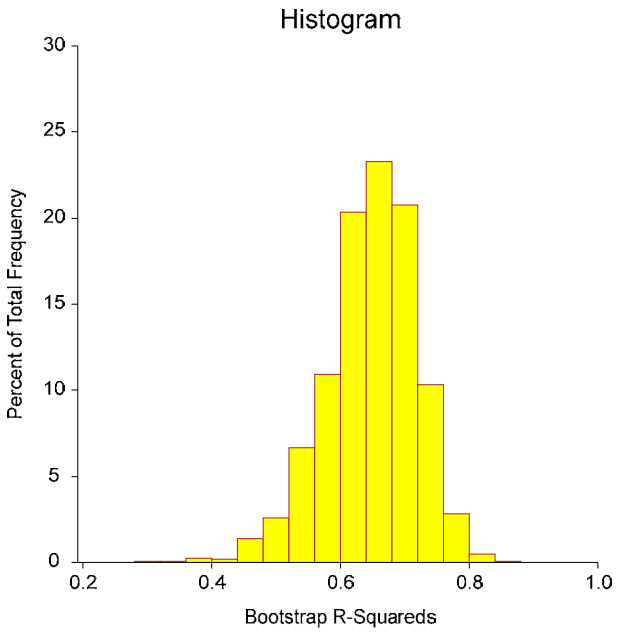
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Bootstrap Histograms Section



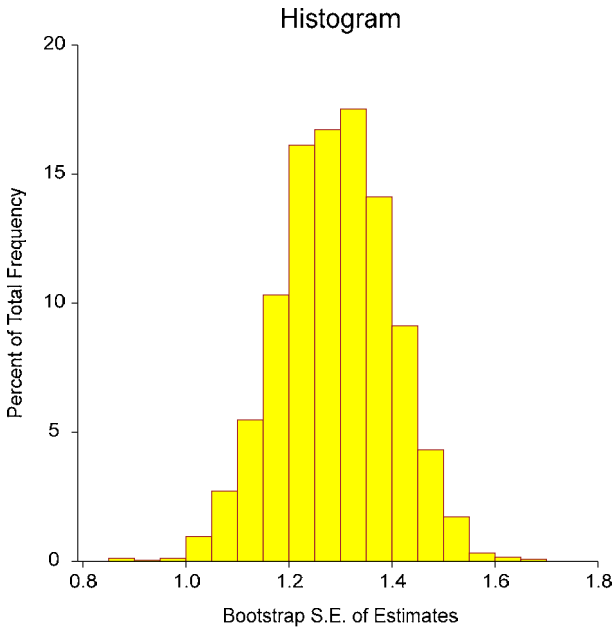


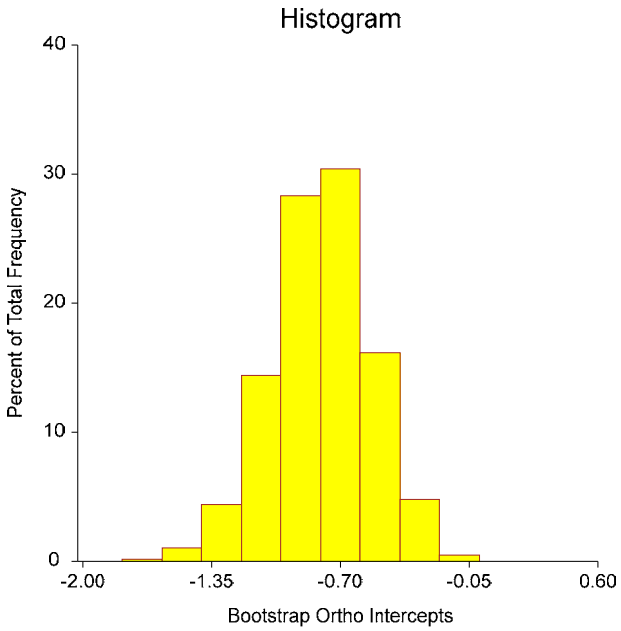


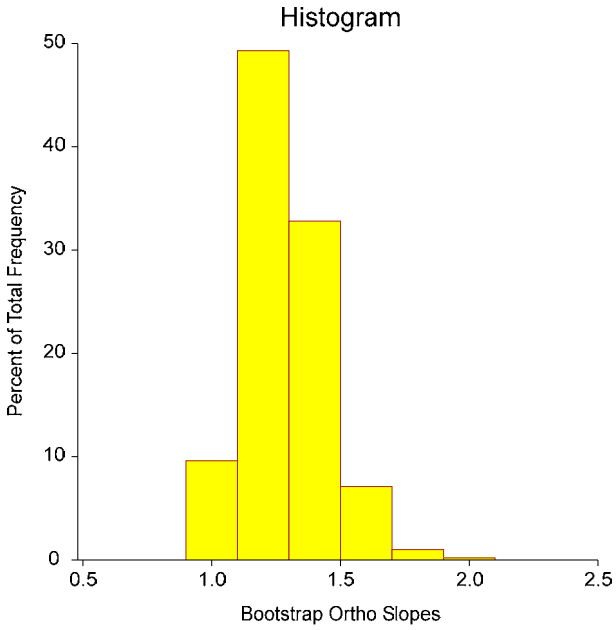


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.8053	0.6484	0.8324
Lower 95% Conf. Limit (r dist'n)	0.6592		
Upper 95% Conf. Limit (r dist'n)	0.8885		
Lower 95% Conf. Limit (Fisher's z)	0.6638		0.7074
Upper 95% Conf. Limit (Fisher's z)	0.8911		0.9069
Adjusted (Rbar)		0.6397	
T-Value for H0: Rho = 0	8.5896	8.5896	9.4999
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	19.27681	19.27681			
Slope	1	128.817	128.817	73.7810	0.0000	1.0000
Error	40	69.8375	1.745938			
Lack of Fit	38	59.16567	1.556991	0.2918	0.9572	
Pure Error	2	10.67184	5.335918			
Adj. Total	41	198.6545	4.845232			
Total	42	217.9313				

s = Square Root(1.745938) = 1.321339

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	48.80563	28.45393	0.03369226	-0.008504649
1	48.80563	193.3498	165.7334	-0.008504649	0.00731873
2 (Y'Y)			217.9313		
Determinant		5738.701			0.0001742555

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.05882458	-0.01484859
1	-0.01484859	0.01277805

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9616	0.168753	No
Anderson Darling	0.6886	0.072183	No
D'Agostino Skewness	0.5444	0.586143	Yes
D'Agostino Kurtosis	-1.6285	0.103425	No
D'Agostino Omnibus	2.9483	0.228971	Yes
Constant Residual Variance?			
Modified Levene Test	0.0025	0.960226	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	0.2918	0.957181	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

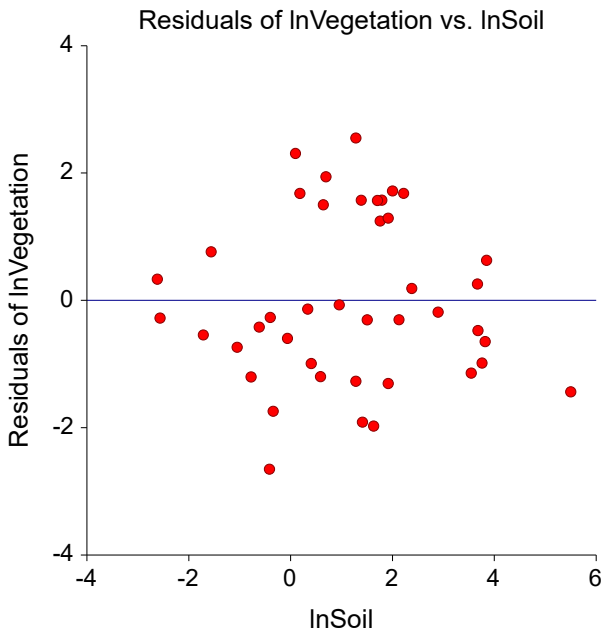
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

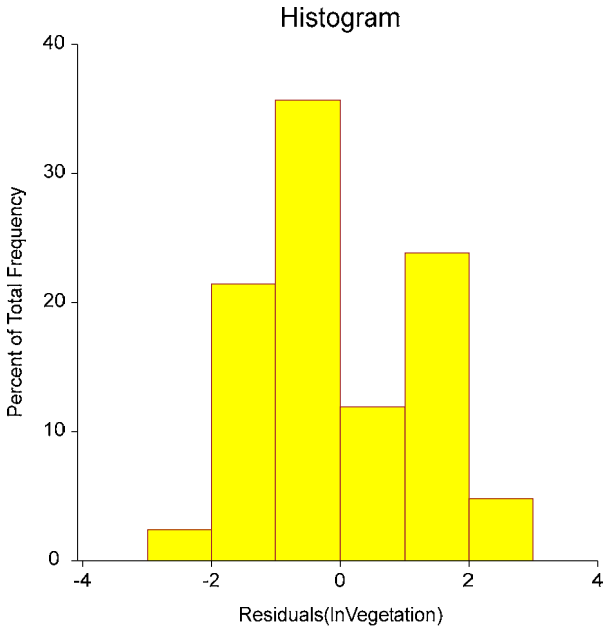
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

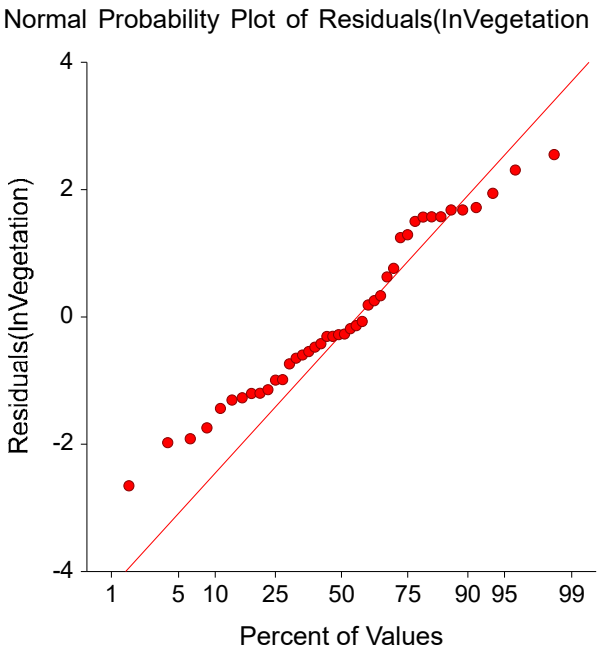
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Original Data Section

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Residual
10	5.5013	3.4532	4.8907	-1.4376
11	1.7918	2.8622	1.2889	1.5733
12	3.8480	3.9140	3.2855	0.6285
13	0.1823	1.4061	-0.2738	1.6799
14	3.6788	2.6462	3.1212	-0.4750
15	1.4110	-0.9943	0.9192	-1.9134
16	-0.3425	-2.5257	-0.7834	-1.7424
17	1.6292	-0.8440	1.1311	-1.9751
18	-1.0498	-2.2073	-1.4702	-0.7371
19	1.2809	-0.4780	0.7929	-1.2710
20	0.9555	0.4055	0.4769	-0.0715
21	-0.4155	-3.5066	-0.8543	-2.6523
22	3.8199	2.6101	3.2582	-0.6481
23	1.5041	0.7031	1.0096	-0.3065
24	1.7579	2.5014	1.2560	1.2454
25	1.9169	2.7014	1.4104	1.2909
26	2.2192	3.3844	1.7039	1.6804
27	2.0015	3.2108	1.4925	1.7183
28	2.3795	2.0464	1.8596	0.1868
29	1.2809	3.3429	0.7929	2.5499
30	2.8959	2.1759	2.3610	-0.1851
31	3.7589	2.2138	3.1989	-0.9852
32	0.6419	1.6734	0.1724	1.5010
33	1.3863	2.4681	0.8952	1.5729
34	-0.7765	-2.4079	-1.2048	-1.2031
35	0.4055	-1.0498	-0.0571	-0.9927
36	0.5878	-1.0788	0.1199	-1.1987
37	1.9169	0.1044	1.4104	-1.3061
38	0.3365	-0.2614	-0.1241	-0.1372
39	-0.4005	-1.1087	-0.8397	-0.2690
40	-0.0619	-1.1087	-0.5109	-0.5978
41	-1.7148	-2.6593	-2.1158	-0.5434
42	-1.5606	-1.2040	-1.9662	0.7622
43	-0.6162	-1.4697	-1.0491	-0.4206
44	-2.6173	-2.6593	-2.9921	0.3329
45	-2.5639	-3.2189	-2.9403	-0.2785
46	2.1282	1.3110	1.6156	-0.3046
47	0.6931	2.1633	0.2222	1.9411
48	0.0953	1.9488	-0.3583	2.3070
49	3.6687	3.3673	3.1113	0.2560
50	3.5467	1.8500	2.9929	-1.1429
51	1.7047	2.7726	1.2044	1.5682

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	5.5013	3.4532	4.8907	0.5312	3.8171	5.9643
11	1.7918	2.8622	1.2889	0.2160	0.8524	1.7254
12	3.8480	3.9140	3.2855	0.3657	2.5463	4.0246
13	0.1823	1.4061	-0.2738	0.2320	-0.7427	0.1951
14	3.6788	2.6462	3.1212	0.3500	2.4138	3.8286
15	1.4110	-0.9943	0.9192	0.2058	0.5032	1.3352
16	-0.3425	-2.5257	-0.7834	0.2655	-1.3200	-0.2468
17	1.6292	-0.8440	1.1311	0.2106	0.7054	1.5568
18	-1.0498	-2.2073	-1.4702	0.3226	-2.1222	-0.8181
19	1.2809	-0.4780	0.7929	0.2043	0.3800	1.2059
20	0.9555	0.4055	0.4769	0.2052	0.0622	0.8917
21	-0.4155	-3.5066	-0.8543	0.2709	-1.4017	-0.3068
22	3.8199	2.6101	3.2582	0.3631	2.5243	3.9920
23	1.5041	0.7031	1.0096	0.2075	0.5902	1.4290
24	1.7579	2.5014	1.2560	0.2147	0.8220	1.6900
25	1.9169	2.7014	1.4104	0.2210	0.9637	1.8571
26	2.2192	3.3844	1.7039	0.2363	1.2263	2.1816
27	2.0015	3.2108	1.4925	0.2249	1.0380	1.9471
28	2.3795	2.0464	1.8596	0.2460	1.3625	2.3568
29	1.2809	3.3429	0.7929	0.2043	0.3800	1.2059
30	2.8959	2.1759	2.3610	0.2828	1.7894	2.9326
31	3.7589	2.2138	3.1989	0.3574	2.4766	3.9213
32	0.6419	1.6734	0.1724	0.2122	-0.2565	0.6013
33	1.3863	2.4681	0.8952	0.2055	0.4800	1.3105
34	-0.7765	-2.4079	-1.2048	0.2993	-1.8098	-0.5999
35	0.4055	-1.0498	-0.0571	0.2211	-0.5040	0.3897
36	0.5878	-1.0788	0.1199	0.2140	-0.3126	0.5523
37	1.9169	0.1044	1.4104	0.2210	0.9637	1.8571
38	0.3365	-0.2614	-0.1241	0.2242	-0.5773	0.3291
39	-0.4005	-1.1087	-0.8397	0.2698	-1.3849	-0.2945
40	-0.0619	-1.1087	-0.5109	0.2464	-1.0089	-0.0129
41	-1.7148	-2.6593	-2.1158	0.3838	-2.8916	-1.3401
42	-1.5606	-1.2040	-1.9662	0.3692	-2.7123	-1.2200
43	-0.6162	-1.4697	-1.0491	0.2863	-1.6278	-0.4705
44	-2.6173	-2.6593	-2.9921	0.4734	-3.9489	-2.0354
45	-2.5639	-3.2189	-2.9403	0.4679	-3.8861	-1.9946
46	2.1282	1.3110	1.6156	0.2313	1.1481	2.0831
47	0.6931	2.1633	0.2222	0.2107	-0.2036	0.6480
48	0.0953	1.9488	-0.3583	0.2369	-0.8370	0.1205
49	3.6687	3.3673	3.1113	0.3491	2.4058	3.8169
50	3.5467	1.8500	2.9929	0.3380	2.3098	3.6760
51	1.7047	2.7726	1.2044	0.2129	0.7741	1.6347

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	5.5013	3.4532	4.8907	1.4241	2.0125	7.7690
11	1.7918	2.8622	1.2889	1.3389	-1.4170	3.9949
12	3.8480	3.9140	3.2855	1.3710	0.5145	6.0564
13	0.1823	1.4061	-0.2738	1.3416	-2.9852	2.4376
14	3.6788	2.6462	3.1212	1.3669	0.3586	5.8838
15	1.4110	-0.9943	0.9192	1.3373	-1.7835	3.6219
16	-0.3425	-2.5257	-0.7834	1.3478	-3.5073	1.9405
17	1.6292	-0.8440	1.1311	1.3380	-1.5731	3.8354
18	-1.0498	-2.2073	-1.4702	1.3602	-4.2191	1.2788
19	1.2809	-0.4780	0.7929	1.3370	-1.9094	3.4952
20	0.9555	0.4055	0.4769	1.3372	-2.2256	3.1795
21	-0.4155	-3.5066	-0.8543	1.3488	-3.5803	1.8718
22	3.8199	2.6101	3.2582	1.3703	0.4887	6.0277
23	1.5041	0.7031	1.0096	1.3375	-1.6937	3.7128
24	1.7579	2.5014	1.2560	1.3387	-1.4496	3.9616
25	1.9169	2.7014	1.4104	1.3397	-1.2972	4.1181
26	2.2192	3.3844	1.7039	1.3423	-1.0090	4.4169
27	2.0015	3.2108	1.4925	1.3403	-1.2164	4.2015
28	2.3795	2.0464	1.8596	1.3440	-0.8568	4.5760
29	1.2809	3.3429	0.7929	1.3370	-1.9094	3.4952
30	2.8959	2.1759	2.3610	1.3513	-0.3700	5.0920
31	3.7589	2.2138	3.1989	1.3688	0.4324	5.9654
32	0.6419	1.6734	0.1724	1.3383	-2.5324	2.8771
33	1.3863	2.4681	0.8952	1.3372	-1.8074	3.5978
34	-0.7765	-2.4079	-1.2048	1.3548	-3.9430	1.5334
35	0.4055	-1.0498	-0.0571	1.3397	-2.7648	2.6505
36	0.5878	-1.0788	0.1199	1.3386	-2.5854	2.8252
37	1.9169	0.1044	1.4104	1.3397	-1.2972	4.1181
38	0.3365	-0.2614	-0.1241	1.3402	-2.8328	2.5846
39	-0.4005	-1.1087	-0.8397	1.3486	-3.5653	1.8859
40	-0.0619	-1.1087	-0.5109	1.3441	-3.2275	2.2057
41	-1.7148	-2.6593	-2.1158	1.3760	-4.8968	0.6651
42	-1.5606	-1.2040	-1.9662	1.3719	-4.7390	0.8066
43	-0.6162	-1.4697	-1.0491	1.3520	-3.7816	1.6834
44	-2.6173	-2.6593	-2.9921	1.4036	-5.8289	-0.1554
45	-2.5639	-3.2189	-2.9403	1.4018	-5.7734	-0.1073
46	2.1282	1.3110	1.6156	1.3414	-1.0955	4.3267
47	0.6931	2.1633	0.2222	1.3380	-2.4821	2.9265
48	0.0953	1.9488	-0.3583	1.3424	-3.0714	2.3548
49	3.6687	3.3673	3.1113	1.3667	0.3492	5.8735
50	3.5467	1.8500	2.9929	1.3639	0.2364	5.7494
51	1.7047	2.7726	1.2044	1.3384	-1.5005	3.9094

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	5.5013	3.4532	4.8907	0.5312	3.3787	6.4027
11	1.7918	2.8622	1.2889	0.2160	0.6742	1.9036
12	3.8480	3.9140	3.2855	0.3657	2.2445	4.3265
13	0.1823	1.4061	-0.2738	0.2320	-0.9342	0.3866
14	3.6788	2.6462	3.1212	0.3500	2.1249	4.1175
15	1.4110	-0.9943	0.9192	0.2058	0.3333	1.5050
16	-0.3425	-2.5257	-0.7834	0.2655	-1.5391	-0.0276
17	1.6292	-0.8440	1.1311	0.2106	0.5316	1.7306
18	-1.0498	-2.2073	-1.4702	0.3226	-2.3885	-0.5519
19	1.2809	-0.4780	0.7929	0.2043	0.2113	1.3745
20	0.9555	0.4055	0.4769	0.2052	-0.1072	1.0611
21	-0.4155	-3.5066	-0.8543	0.2709	-1.6253	-0.0833
22	3.8199	2.6101	3.2582	0.3631	2.2247	4.2917
23	1.5041	0.7031	1.0096	0.2075	0.4189	1.6003
24	1.7579	2.5014	1.2560	0.2147	0.6448	1.8672
25	1.9169	2.7014	1.4104	0.2210	0.7813	2.0396
26	2.2192	3.3844	1.7039	0.2363	1.0313	2.3766
27	2.0015	3.2108	1.4925	0.2249	0.8524	2.1327
28	2.3795	2.0464	1.8596	0.2460	1.1594	2.5598
29	1.2809	3.3429	0.7929	0.2043	0.2113	1.3745
30	2.8959	2.1759	2.3610	0.2828	1.5560	3.1660
31	3.7589	2.2138	3.1989	0.3574	2.1816	4.2162
32	0.6419	1.6734	0.1724	0.2122	-0.4316	0.7764
33	1.3863	2.4681	0.8952	0.2055	0.3104	1.4800
34	-0.7765	-2.4079	-1.2048	0.2993	-2.0568	-0.3528
35	0.4055	-1.0498	-0.0571	0.2211	-0.6865	0.5722
36	0.5878	-1.0788	0.1199	0.2140	-0.4892	0.7289
37	1.9169	0.1044	1.4104	0.2210	0.7813	2.0396
38	0.3365	-0.2614	-0.1241	0.2242	-0.7624	0.5141
39	-0.4005	-1.1087	-0.8397	0.2698	-1.6075	-0.0719
40	-0.0619	-1.1087	-0.5109	0.2464	-1.2122	0.1904
41	-1.7148	-2.6593	-2.1158	0.3838	-3.2084	-1.0233
42	-1.5606	-1.2040	-1.9662	0.3692	-3.0170	-0.9153
43	-0.6162	-1.4697	-1.0491	0.2863	-1.8641	-0.2342
44	-2.6173	-2.6593	-2.9921	0.4734	-4.3395	-1.6447
45	-2.5639	-3.2189	-2.9403	0.4679	-4.2723	-1.6084
46	2.1282	1.3110	1.6156	0.2313	0.9573	2.2740
47	0.6931	2.1633	0.2222	0.2107	-0.3774	0.8218
48	0.0953	1.9488	-0.3583	0.2369	-1.0325	0.3160
49	3.6687	3.3673	3.1113	0.3491	2.1177	4.1050
50	3.5467	1.8500	2.9929	0.3380	2.0309	3.9550
51	1.7047	2.7726	1.2044	0.2129	0.5984	1.8105

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Section

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	5.5013	3.4532	4.8907	-1.4376	-1.1882	41.6302
11	1.7918	2.8622	1.2889	1.5733	1.2069	54.9678
12	3.8480	3.9140	3.2855	0.6285	0.4950	16.0589
13	0.1823	1.4061	-0.2738	1.6799	1.2914	119.4722
14	3.6788	2.6462	3.1212	-0.4750	-0.3728	17.9512
15	1.4110	-0.9943	0.9192	-1.9134	-1.4660	192.4509
16	-0.3425	-2.5257	-0.7834	-1.7424	-1.3461	68.9843
17	1.6292	-0.8440	1.1311	-1.9751	-1.5141	234.0227
18	-1.0498	-2.2073	-1.4702	-0.7371	-0.5753	33.3944
19	1.2809	-0.4780	0.7929	-1.2710	-0.9736	265.8699
20	0.9555	0.4055	0.4769	-0.0715	-0.0548	17.6287
21	-0.4155	-3.5066	-0.8543	-2.6523	-2.0508	75.6377
22	3.8199	2.6101	3.2582	-0.6481	-0.5101	24.8310
23	1.5041	0.7031	1.0096	-0.3065	-0.2349	43.5907
24	1.7579	2.5014	1.2560	1.2454	0.9553	49.7890
25	1.9169	2.7014	1.4104	1.2909	0.9909	47.7877
26	2.2192	3.3844	1.7039	1.6804	1.2926	49.6528
27	2.0015	3.2108	1.4925	1.7183	1.3197	53.5155
28	2.3795	2.0464	1.8596	0.1868	0.1439	9.1266
29	1.2809	3.3429	0.7929	2.5499	1.9533	76.2803
30	2.8959	2.1759	2.3610	-0.1851	-0.1434	8.5078
31	3.7589	2.2138	3.1989	-0.9852	-0.7744	44.5018
32	0.6419	1.6734	0.1724	1.5010	1.1509	89.6978
33	1.3863	2.4681	0.8952	1.5729	1.2050	63.7284
34	-0.7765	-2.4079	-1.2048	-1.2031	-0.9348	49.9652
35	0.4055	-1.0498	-0.0571	-0.9927	-0.7620	94.5578
36	0.5878	-1.0788	0.1199	-1.1987	-0.9193	111.1136
37	1.9169	0.1044	1.4104	-1.3061	-1.0026	1251.5154
38	0.3365	-0.2614	-0.1241	-0.1372	-0.1054	52.5095
39	-0.4005	-1.1087	-0.8397	-0.2690	-0.2079	24.2621
40	-0.0619	-1.1087	-0.5109	-0.5978	-0.4605	53.9169
41	-1.7148	-2.6593	-2.1158	-0.5434	-0.4298	20.4350
42	-1.5606	-1.2040	-1.9662	0.7622	0.6008	63.3064
43	-0.6162	-1.4697	-1.0491	-0.4206	-0.3260	28.6153
44	-2.6173	-2.6593	-2.9921	0.3329	0.2698	12.5176
45	-2.5639	-3.2189	-2.9403	-0.2785	-0.2254	8.6533
46	2.1282	1.3110	1.6156	-0.3046	-0.2341	23.2324
47	0.6931	2.1633	0.2222	1.9411	1.4881	89.7289
48	0.0953	1.9488	-0.3583	2.3070	1.7747	118.3852
49	3.6687	3.3673	3.1113	0.2560	0.2008	7.6013
50	3.5467	1.8500	2.9929	-1.1429	-0.8947	61.7781
51	1.7047	2.7726	1.2044	1.5682	1.2025	56.5595

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	5.5013	-1.4376	*-1.1945	0.1616	0.1361	1.7275
11	1.7918	1.5733	1.2140	0.0267	0.0200	1.7255
12	3.8480	0.6285	0.4903	0.0766	0.0102	1.7797
13	0.1823	1.6799	1.3026	0.0308	0.0265	1.7160
14	3.6788	-0.4750	-0.3688	0.0702	0.0052	1.7845
15	1.4110	-1.9134	-1.4881	0.0243	0.0267	1.6945
16	-0.3425	-1.7424	-1.3603	0.0404	0.0381	1.7096
17	1.6292	-1.9751	-1.5398	0.0254	0.0299	1.6881
18	-1.0498	-0.7371	-0.5704	0.0596	0.0105	1.7759
19	1.2809	-1.2710	-0.9729	0.0239	0.0116	1.7483
20	0.9555	-0.0715	-0.0541	0.0241	0.0000	1.7906
21	-0.4155	-2.6523	*-2.1407	0.0420	0.0922	1.6024
22	3.8199	-0.6481	-0.5054	0.0755	0.0106	1.7791
23	1.5041	-0.3065	-0.2321	0.0247	0.0007	1.7882
24	1.7579	1.2454	0.9542	0.0264	0.0124	1.7499
25	1.9169	1.2909	0.9907	0.0280	0.0141	1.7467
26	2.2192	1.6804	1.3039	0.0320	0.0276	1.7159
27	2.0015	1.7183	1.3324	0.0290	0.0260	1.7127
28	2.3795	0.1868	0.1421	0.0347	0.0004	1.7898
29	1.2809	2.5499	*2.0279	0.0239	0.0467	1.6199
30	2.8959	-0.1851	-0.1417	0.0458	0.0005	1.7898
31	3.7589	-0.9852	-0.7705	0.0732	0.0237	1.7639
32	0.6419	1.5010	1.1557	0.0258	0.0175	1.7314
33	1.3863	1.5729	1.2121	0.0242	0.0180	1.7257
34	-0.7765	-1.2031	-0.9333	0.0513	0.0236	1.7516
35	0.4055	-0.9927	-0.7580	0.0280	0.0084	1.7647
36	0.5878	-1.1987	-0.9175	0.0262	0.0114	1.7529
37	1.9169	-1.3061	-1.0026	0.0280	0.0145	1.7457
38	0.3365	-0.1372	-0.1041	0.0288	0.0002	1.7902
39	-0.4005	-0.2690	-0.2054	0.0417	0.0009	1.7888
40	-0.0619	-0.5978	-0.4559	0.0348	0.0038	1.7812
41	-1.7148	-0.5434	-0.4254	0.0844	0.0085	1.7824
42	-1.5606	0.7622	0.5959	0.0781	0.0153	1.7745
43	-0.6162	-0.4206	-0.3224	0.0470	0.0026	1.7859
44	-2.6173	0.3329	*0.2667	0.1283	0.0054	1.7874
45	-2.5639	-0.2785	*-0.2227	0.1254	0.0036	1.7884
46	2.1282	-0.3046	-0.2313	0.0306	0.0009	1.7883
47	0.6931	1.9411	1.5118	0.0254	0.0289	1.6916
48	0.0953	2.3070	1.8258	0.0321	0.0523	1.6497
49	3.6687	0.2560	0.1984	0.0698	0.0015	1.7889
50	3.5467	-1.1429	-0.8925	0.0654	0.0280	1.7549
51	1.7047	1.5682	1.2094	0.0260	0.0193	1.7260

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-1.1945	-0.5245	0.1361	* 1.1677	0.0931	-0.4843
11	1.2140	0.2011	0.0200	1.0035	0.1237	0.0663
12	0.4903	0.1412	0.0102	1.1253	0.0027	0.1172
13	1.3026	0.2323	0.0265	0.9968	0.2317	-0.1109
14	-0.3688	-0.1013	0.0052	1.1235	-0.0050	-0.0823
15	-1.4881	-0.2347	0.0267	0.9654	-0.1780	-0.0321
16	-1.3603	-0.2790	0.0381	0.9991	-0.2769	0.1787
17	-1.5398	-0.2486	0.0299	0.9592	-0.1686	-0.0623
18	-0.5704	-0.1436	0.0105	1.1002	-0.1366	0.1113
19	-0.9729	-0.1523	0.0116	1.0272	-0.1223	-0.0100
20	-0.0541	-0.0085	0.0000	1.0778	-0.0076	0.0010
21	* -2.1407	-0.4484	0.0922	0.8793	-0.4436	0.2952
22	-0.5054	-0.1444	0.0106	1.1231	-0.0035	-0.1195
23	-0.2321	-0.0369	0.0007	1.0756	-0.0268	-0.0069
24	0.9542	0.1571	0.0124	1.0317	0.0987	0.0493
25	0.9907	0.1681	0.0141	1.0297	0.0952	0.0649
26	1.3039	0.2370	0.0276	0.9978	0.1070	0.1199
27	1.3324	0.2301	0.0260	0.9910	0.1228	0.0971
28	0.1421	0.0269	0.0004	1.0886	0.0106	0.0151
29	* 2.0279	0.3174	0.0467	0.8819	0.2549	0.0209
30	-0.1417	-0.0310	0.0005	1.1013	-0.0072	-0.0215
31	-0.7705	-0.2165	0.0237	1.1012	-0.0075	-0.1778
32	1.1557	0.1880	0.0175	1.0095	0.1801	-0.0521
33	1.2121	0.1908	0.0180	1.0012	0.1464	0.0235
34	-0.9333	-0.2171	0.0236	1.0609	-0.2104	0.1589
35	-0.7580	-0.1286	0.0084	1.0510	-0.1267	0.0498
36	-0.9175	-0.1506	0.0114	1.0351	-0.1453	0.0457
37	-1.0026	-0.1701	0.0145	1.0285	-0.0963	-0.0657
38	-0.1041	-0.0179	0.0002	1.0825	-0.0177	0.0075
39	-0.2054	-0.0428	0.0009	1.0953	-0.0424	0.0281
40	-0.4559	-0.0865	0.0038	1.0783	-0.0865	0.0486
41	-0.4254	-0.1291	0.0085	1.1383	-0.1169	0.1094
42	0.5959	0.1734	0.0153	1.1205	0.1588	-0.1446
43	-0.3224	-0.0715	0.0026	1.0979	-0.0700	0.0502
44	0.2667	0.1023	0.0054	* 1.2024	0.0871	-0.0924
45	-0.2227	-0.0843	0.0036	* 1.1997	-0.0720	0.0759
46	-0.2313	-0.0411	0.0009	1.0822	-0.0200	-0.0194
47	1.5118	0.2442	0.0289	0.9632	0.2319	-0.0614
48	1.8258	0.3327	0.0523	0.9224	0.3325	-0.1694
49	0.1984	0.0544	0.0015	1.1286	0.0028	0.0441
50	-0.8925	-0.2361	0.0280	1.0810	-0.0177	-0.1883
51	1.2094	0.1975	0.0193	1.0033	0.1281	0.0569

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
10	5.5013	-1.4376	|||||||.....	-1.1882	||||||||.....	-1.1945	||||||||.....
11	1.7918	1.5733	|||||||.....	1.2069	||||||||.....	1.2140	||||||||.....
12	3.8480	0.6285	|||.....	0.4950	|||.....	0.4903	|||.....
13	0.1823	1.6799	||||||||.....	1.2914	||||||||.....	1.3026	|||||||.....
14	3.6788	-0.4750	||.....	-0.3728	||.....	-0.3688	||.....
15	1.4110	-1.9134	|||||||||.....	-1.4660	|||||||||.....	-1.4881	|||||||||.....
16	-0.3425	-1.7424	||||||||.....	-1.3461	||||||||.....	-1.3603	||||||||.....
17	1.6292	-1.9751	||||||||||....	-1.5141	|||||||||.....	-1.5398	|||||||||.....
18	-1.0498	-0.7371	|||.....	-0.5753	|||.....	-0.5704	|||.....
19	1.2809	-1.2710	||||||.....	-0.9736	||||||.....	-0.9729	||||||.....
20	0.9555	-0.0715	|.....	-0.0548	|.....	-0.0541	|.....
21	-0.4155	-2.6523	||||||||||||||	-2.0508	||||||||||||||	* -2.1407	||||||||||||||
22	3.8199	-0.6481	|||.....	-0.5101	|||.....	-0.5054	|||.....
23	1.5041	-0.3065	|.....	-0.2349	|.....	-0.2321	|.....
24	1.7579	1.2454	||||||.....	0.9553	||||||.....	0.9542	||||||.....
25	1.9169	1.2909	|||||||.....	0.9909	|||||||.....	0.9907	||||||.....
26	2.2192	1.6804	||||||||.....	1.2926	||||||||.....	1.3039	|||||||.....
27	2.0015	1.7183	||||||||.....	1.3197	||||||||.....	1.3324	||||||||.....
28	2.3795	0.1868	|.....	0.1439	|.....	0.1421	|.....
29	1.2809	2.5499	|||||||||||||.	1.9533	|||||||||||||.	* 2.0279	|||||||||||||.
30	2.8959	-0.1851	|.....	-0.1434	|.....	-0.1417	|.....
31	3.7589	-0.9852	|||||.....	-0.7744	|||||.....	-0.7705	|||||.....
32	0.6419	1.5010	|||||||.....	1.1509	|||||||.....	1.1557	||||||.....
33	1.3863	1.5729	|||||||.....	1.2050	|||||||.....	1.2121	|||||||.....
34	-0.7765	-1.2031	||||||.....	-0.9348	|||||.....	-0.9333	|||||.....
35	0.4055	-0.9927	|||||.....	-0.7620	|||||.....	-0.7580	|||||.....
36	0.5878	-1.1987	||||||.....	-0.9193	||||||.....	-0.9175	||||||.....
37	1.9169	-1.3061	|||||||.....	-1.0026	|||||||.....	-1.0026	||||||.....
38	0.3365	-0.1372	|.....	-0.1054	|.....	-0.1041	|.....
39	-0.4005	-0.2690	|.....	-0.2079	|.....	-0.2054	|.....
40	-0.0619	-0.5978	|||.....	-0.4605	|||.....	-0.4559	||.....
41	-1.7148	-0.5434	||.....	-0.4298	||.....	-0.4254	||.....
42	-1.5606	0.7622	||||.....	0.6008	||||.....	0.5959	|||.....
43	-0.6162	-0.4206	||.....	-0.3260	||.....	-0.3224	|.....
44	-2.6173	0.3329	|.....	0.2698	|.....	0.2667	|.....
45	-2.5639	-0.2785	|.....	-0.2254	|.....	-0.2227	|.....
46	2.1282	-0.3046	|.....	-0.2341	|.....	-0.2313	|.....
47	0.6931	1.9411	|||||||||.....	1.4881	|||||||||.....	1.5118	|||||||||.....
48	0.0953	2.3070	||||||||||...	1.7747	||||||||||...	1.8258	||||||||||...
49	3.6687	0.2560	|.....	0.2008	|.....	0.1984	|.....
50	3.5467	-1.1429	||||||.....	-0.8947	||||||.....	-0.8925	||||||.....
51	1.7047	1.5682	|||||||.....	1.2025	|||||||.....	1.2094	|||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
10	5.5013	-0.5245	|||||||||||||||	0.1361	|||||||||||||||	-0.4843	|||||||||||||||
11	1.7918	0.2011	|||||.....	0.0200	||.....	0.0663	||.....
12	3.8480	0.1412	|||.....	0.0102	|.....	0.1172	|||.....
13	0.1823	0.2323	|||||.....	0.0265	||.....	-0.1109	|||.....
14	3.6788	-0.1013	||.....	0.0052	|.....	-0.0823	||.....
15	1.4110	-0.2347	|||||.....	0.0267	||.....	-0.0321	|.....
16	-0.3425	-0.2790	||||||.....	0.0381	||||.....	0.1787	|||||.....
17	1.6292	-0.2486	|||||.....	0.0299	|||.....	-0.0623	|.....
18	-1.0498	-0.1436	|||.....	0.0105	|.....	0.1113	|||.....
19	1.2809	-0.1523	||||.....	0.0116	|.....	-0.0100	|.....
20	0.9555	-0.0085	|.....	0.0000	|.....	0.0010	|.....
21	-0.4155	-0.4484	||||||||||...	0.0922	|||||||||.....	0.2952	|||||||||.....
22	3.8199	-0.1444	|||.....	0.0106	|.....	-0.1195	|||.....
23	1.5041	-0.0369	|.....	0.0007	|.....	-0.0069	|.....
24	1.7579	0.1571	||||.....	0.0124	|.....	0.0493	|.....
25	1.9169	0.1681	||||.....	0.0141	|.....	0.0649	|.....
26	2.2192	0.2370	|||||.....	0.0276	|||.....	0.1199	|||.....
27	2.0015	0.2301	|||||.....	0.0260	||.....	0.0971	||.....
28	2.3795	0.0269	|.....	0.0004	|.....	0.0151	|.....
29	1.2809	0.3174	|||||||.....	0.0467	|||||.....	0.0209	|.....
30	2.8959	-0.0310	|.....	0.0005	|.....	-0.0215	|.....
31	3.7589	-0.2165	|||||.....	0.0237	||.....	-0.1778	|||||.....
32	0.6419	0.1880	|||||.....	0.0175	|.....	-0.0521	|.....
33	1.3863	0.1908	|||||.....	0.0180	|.....	0.0235	|.....
34	-0.7765	-0.2171	|||||.....	0.0236	||.....	0.1589	||||.....
35	0.4055	-0.1286	|||.....	0.0084	|.....	0.0498	|.....
36	0.5878	-0.1506	||||.....	0.0114	|.....	0.0457	|.....
37	1.9169	-0.1701	||||.....	0.0145	|.....	-0.0657	||.....
38	0.3365	-0.0179	|.....	0.0002	|.....	0.0075	|.....
39	-0.4005	-0.0428	|.....	0.0009	|.....	0.0281	|.....
40	-0.0619	-0.0865	||.....	0.0038	|.....	0.0486	|.....
41	-1.7148	-0.1291	|||.....	0.0085	|.....	0.1094	|||.....
42	-1.5606	0.1734	||||.....	0.0153	|.....	-0.1446	||||.....
43	-0.6162	-0.0715	|.....	0.0026	|.....	0.0502	|.....
44	-2.6173	0.1023	||.....	0.0054	|.....	-0.0924	||.....
45	-2.5639	-0.0843	||.....	0.0036	|.....	0.0759	||.....
46	2.1282	-0.0411	|.....	0.0009	|.....	-0.0194	|.....
47	0.6931	0.2442	|||||.....	0.0289	|||.....	-0.0614	|.....
48	0.0953	0.3327	|||||||||.....	0.0523	|||||.....	-0.1694	|||||.....
49	3.6687	0.0544	|.....	0.0015	|.....	0.0441	|.....
50	3.5467	-0.2361	|||||.....	0.0280	|||.....	-0.1883	|||||.....
51	1.7047	0.1975	|||||.....	0.0193	||.....	0.0569	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	5.5013	-1.1945	########.....	0.1361	###############	0.1616	###############
11	1.7918	1.2140	########.....	0.0200	||.....	0.0267	|.....
12	3.8480	0.4903	|||.....	0.0102	|.....	0.0766	|||||.....
13	0.1823	1.3026	########.....	0.0265	||.....	0.0308	|.....
14	3.6788	-0.3688	||.....	0.0052	|.....	0.0702	|||||.....
15	1.4110	-1.4881	#########.....	0.0267	||.....	0.0243	|.....
16	-0.3425	-1.3603	#########.....	0.0381	||||.....	0.0404	|.....
17	1.6292	-1.5398	#########.....	0.0299	|||.....	0.0254	|.....
18	-1.0498	-0.5704	|||.....	0.0105	|.....	0.0596	|||.....
19	1.2809	-0.9729	######.....	0.0116	|.....	0.0239	|.....
20	0.9555	-0.0541	|.....	0.0000	|.....	0.0241	|.....
21	-0.4155	* -2.1407	###############	0.0922	##########.....	0.0420	|.....
22	3.8199	-0.5054	|||.....	0.0106	|.....	0.0755	|||||.....
23	1.5041	-0.2321	|.....	0.0007	|.....	0.0247	|.....
24	1.7579	0.9542	######.....	0.0124	|.....	0.0264	|.....
25	1.9169	0.9907	######.....	0.0141	|.....	0.0280	|.....
26	2.2192	1.3039	########.....	0.0276	|||.....	0.0320	|.....
27	2.0015	1.3324	########.....	0.0260	||.....	0.0290	|.....
28	2.3795	0.1421	|.....	0.0004	|.....	0.0347	|.....
29	1.2809	* 2.0279	##############.	0.0467	|||||.....	0.0239	|.....
30	2.8959	-0.1417	|.....	0.0005	|.....	0.0458	||.....
31	3.7589	-0.7705	|||||.....	0.0237	||.....	0.0732	|||||.....
32	0.6419	1.1557	#######.....	0.0175	|.....	0.0258	|.....
33	1.3863	1.2121	########.....	0.0180	|.....	0.0242	|.....
34	-0.7765	-0.9333	######.....	0.0236	||.....	0.0513	||.....
35	0.4055	-0.7580	|||||.....	0.0084	|.....	0.0280	|.....
36	0.5878	-0.9175	######.....	0.0114	|.....	0.0262	|.....
37	1.9169	-1.0026	######.....	0.0145	|.....	0.0280	|.....
38	0.3365	-0.1041	|.....	0.0002	|.....	0.0288	|.....
39	-0.4005	-0.2054	|.....	0.0009	|.....	0.0417	|.....
40	-0.0619	-0.4559	||.....	0.0038	|.....	0.0348	|.....
41	-1.7148	-0.4254	||.....	0.0085	|.....	0.0844	######.....
42	-1.5606	0.5959	|||.....	0.0153	|.....	0.0781	|||||.....
43	-0.6162	-0.3224	|.....	0.0026	|.....	0.0470	||.....
44	-2.6173	0.2667	|.....	0.0054	|.....	0.1283	##########....
45	-2.5639	-0.2227	|.....	0.0036	|.....	0.1254	##########....
46	2.1282	-0.2313	|.....	0.0009	|.....	0.0306	|.....
47	0.6931	1.5118	#########.....	0.0289	|||.....	0.0254	|.....
48	0.0953	1.8258	##########...	0.0523	|||||.....	0.0321	|.....
49	3.6687	0.1984	|.....	0.0015	|.....	0.0698	||||.....
50	3.5467	-0.8925	######.....	0.0280	|||.....	0.0654	||||.....
51	1.7047	1.2094	########.....	0.0193	||.....	0.0260	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Inverse Prediction of X Means

Row	lnVegetation (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	3.4532	5.5013	4.0207	1.4805	3.3530	5.0235
11	2.8622	1.7918	3.4121	-1.6203	2.8335	4.2544
12	3.9140	3.8480	4.4954	-0.6473	3.7526	5.6288
13	1.4061	0.1823	1.9124	-1.7301	1.4815	2.4314
14	2.6462	3.6788	3.1896	0.4892	2.6408	3.9761
15	-0.9943	1.4110	-0.5597	1.9707	-1.2726	-0.0486
16	-2.5257	-0.3425	-2.1369	1.7945	-3.2608	-1.3998
17	-0.8440	1.6292	-0.4049	2.0341	-1.0824	0.0889
18	-2.2073	-1.0498	-1.8090	0.7591	-2.8423	-1.1238
19	-0.4780	1.2809	-0.0280	1.3090	-0.6255	0.4300
20	0.4055	0.9555	0.8819	0.0736	0.4233	1.3077
21	-3.5066	-0.4155	-3.1471	2.7316	-4.5584	-2.2409
22	2.6101	3.8199	3.1524	0.6675	2.6084	3.9297
23	0.7031	1.5041	1.1884	0.3156	0.7533	1.6267
24	2.5014	1.7579	3.0405	-1.2827	2.5106	3.7906
25	2.7014	1.9169	3.2464	-1.3295	2.6902	4.0470
26	3.3844	2.2192	3.9499	-1.7307	3.2930	4.9336
27	3.2108	2.0015	3.7712	-1.7697	3.1411	4.7070
28	2.0464	2.3795	2.5719	-0.1924	2.0942	3.2149
29	3.3429	1.2809	3.9071	-2.6262	3.2567	4.8793
30	2.1759	2.8959	2.7053	0.1907	2.2140	3.3774
31	2.2138	3.7589	2.7443	1.0146	2.2488	3.4252
32	1.6734	0.6419	2.1877	-1.5458	1.7419	2.7537
33	2.4681	1.3863	3.0062	-1.6199	2.4805	3.7481
34	-2.4079	-0.7765	-2.0156	1.2391	-3.1058	-1.2979
35	-1.0498	0.4055	-0.6169	1.0224	-1.3433	-0.0991
36	-1.0788	0.5878	-0.6468	1.2345	-1.3802	-0.1254
37	0.1044	1.9169	0.5718	1.3451	0.0765	0.9979
38	-0.2614	0.3365	0.1951	0.1413	-0.3602	0.6371
39	-1.1087	-0.4005	-0.6775	0.2770	-1.4183	-0.1524
40	-1.1087	-0.0619	-0.6775	0.6156	-1.4183	-0.1524
41	-2.6593	-1.7148	-2.2745	0.5597	-3.4368	-1.5150
42	-1.2040	-1.5606	-0.7757	-0.7850	-1.5401	-0.2384
43	-1.4697	-0.6162	-1.0493	0.4331	-1.8818	-0.4760
44	-2.6593	-2.6173	-2.2745	-0.3428	-3.4368	-1.5150
45	-3.2189	-2.5639	-2.8508	0.2869	-4.1768	-1.9952
46	1.3110	2.1282	1.8145	0.3137	1.3869	2.3187
47	2.1633	0.6931	2.6923	-1.9992	2.2024	3.3616
48	1.9488	0.0953	2.4713	-2.3760	2.0031	3.0931
49	3.3673	3.6687	3.9323	-0.2636	3.2781	4.9112
50	1.8500	3.5467	2.3697	1.1771	1.9102	2.9707
51	2.7726	1.7047	3.3198	-1.6151	2.7538	4.1387

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Inverse Prediction of X Individuals

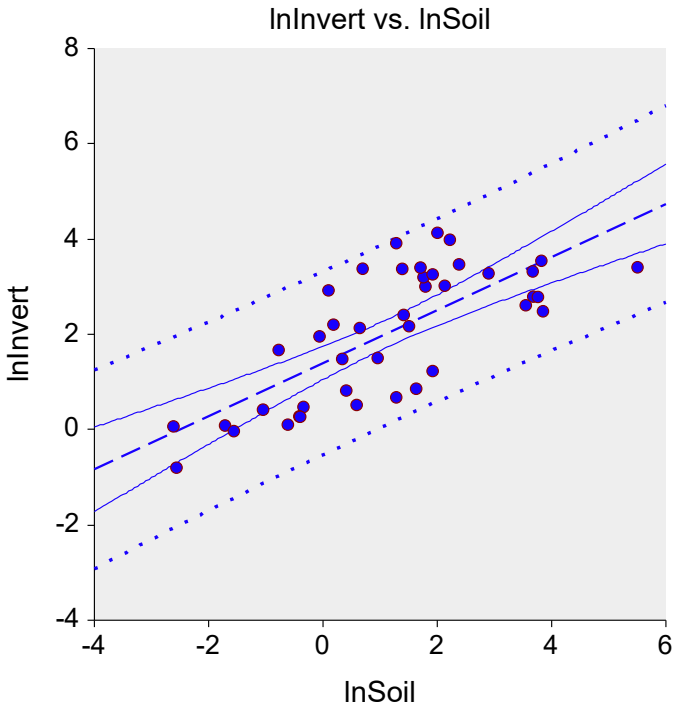
Row	lnVegetation (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	3.4532	5.5013	4.0207	1.4805	1.2377	7.1388
11	2.8622	1.7918	3.4121	-1.6203	0.6263	6.4616
12	3.9140	3.8480	4.4954	-0.6473	1.7095	7.6720
13	1.4061	0.1823	1.9124	-1.7301	-0.9130	4.8258
14	2.6462	3.6788	3.1896	0.4892	0.4009	6.2160
15	-0.9943	1.4110	-0.5597	1.9707	-3.5558	2.2347
16	-2.5257	-0.3425	-2.1369	1.7945	-5.3092	0.6486
17	-0.8440	1.6292	-0.4049	2.0341	-3.3865	2.3931
18	-2.2073	-1.0498	-1.8090	0.7591	-4.9405	0.9743
19	-0.4780	1.2809	-0.0280	1.3090	-2.9764	2.7809
20	0.4055	0.9555	0.8819	0.0736	-1.9987	3.7296
21	-3.5066	-0.4155	-3.1471	2.7316	-6.4575	-0.3418
22	2.6101	3.8199	3.1524	0.6675	0.3632	6.1750
23	0.7031	1.5041	1.1884	0.3156	-1.6734	4.0533
24	2.5014	1.7579	3.0405	-1.2827	0.2493	6.0519
25	2.7014	1.9169	3.2464	-1.3295	0.4586	6.2786
26	3.3844	2.2192	3.9499	-1.7307	1.1670	7.0596
27	3.2108	2.0015	3.7712	-1.7697	0.9879	6.8602
28	2.0464	2.3795	2.5719	-0.1924	-0.2302	5.5393
29	3.3429	1.2809	3.9071	-2.6262	1.1242	7.0118
30	2.1759	2.8959	2.7053	0.1907	-0.0933	5.6847
31	2.2138	3.7589	2.7443	1.0146	-0.0533	5.7273
32	1.6734	0.6419	2.1877	-1.5458	-0.6269	5.1225
33	2.4681	1.3863	3.0062	-1.6199	0.2144	6.0142
34	-2.4079	-0.7765	-2.0156	1.2391	-5.1726	0.7688
35	-1.0498	0.4055	-0.6169	1.0224	-3.6186	2.1762
36	-1.0788	0.5878	-0.6468	1.2345	-3.6513	2.1458
37	0.1044	1.9169	0.5718	1.3451	-2.3299	3.4043
38	-0.2614	0.3365	0.1951	0.1413	-2.7350	3.0119
39	-1.1087	-0.4005	-0.6775	0.2770	-3.6851	2.1144
40	-1.1087	-0.0619	-0.6775	0.6156	-3.6851	2.1144
41	-2.6593	-1.7148	-2.2745	0.5597	-5.4644	0.5127
42	-1.2040	-1.5606	-0.7757	-0.7850	-3.7929	2.0145
43	-1.4697	-0.6162	-1.0493	0.4331	-4.0947	1.7369
44	-2.6593	-2.6173	-2.2745	-0.3428	-5.4644	0.5127
45	-3.2189	-2.5639	-2.8508	0.2869	-6.1188	-0.0532
46	1.3110	2.1282	1.8145	0.3137	-1.0151	4.7207
47	2.1633	0.6931	2.6923	-1.9992	-0.1066	5.6706
48	1.9488	0.0953	2.4713	-2.3760	-0.3338	5.4299
49	3.3673	3.6687	3.9323	-0.2636	1.1494	7.0399
50	1.8500	3.5467	2.3697	1.1771	-0.4386	5.3195
51	2.7726	1.7047	3.3198	-1.6151	0.5329	6.3596

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnInvert	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.3957	Rows Prediction Only	0
Slope	0.5568	Sum of Frequencies	42
R-Squared	0.5478	Sum of Weights	42.0000
Correlation	0.7401	Coefficient of Variation	0.4578
Mean Square Error	0.8744082	Square Root of MSE	0.9350979

Linear Regression Report

Y = lnInvert X = lnSoil

Summary Statement

The equation of the straight line relating lnInvert and lnSoil is estimated as: lnInvert = (1.3957) + (0.5568) lnSoil using the 42 observations in this dataset. The y-intercept, the estimated value of lnInvert when lnSoil is zero, is 1.3957 with a standard error of 0.1716. The slope, the estimated change in lnInvert per unit change in lnSoil, is 0.5568 with a standard error of 0.0800. The value of R-Squared, the proportion of the variation in lnInvert that can be accounted for by variation in lnSoil, is 0.5478. The correlation between lnInvert and lnSoil is 0.7401.

A significance test that the slope is zero resulted in a t-value of 6.9605. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.5568. The lower limit of the 95% confidence interval for the slope is 0.3951 and the upper limit is 0.7185. The estimated intercept is 1.3957. The lower limit of the 95% confidence interval for the intercept is 1.0488 and the upper limit is 1.7426.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnInvert	lnSoil
Count	42	42
Mean	2.0427	1.1620
Standard Deviation	1.3734	1.8255
Minimum	-0.7985	-2.6173
Maximum	4.1320	5.5013

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.3957	0.5568
Lower 95% Confidence Limit	1.0488	0.3951
Upper 95% Confidence Limit	1.7426	0.7185
Standard Error	0.1716	0.0800
Standardized Coefficient	0.0000	0.7401
T Value	8.1314	6.9605
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	1.0000
Regression of Y on X	1.3957	0.5568
Inverse Regression from X on Y	0.8615	1.0165
Orthogonal Regression of Y and X	1.2484	0.6836

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.39569100604983) + (0.556823766760658) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.3957	0.9000	1.1111	1.6299
Bootstrap Mean	1.4038	0.9500	1.0490	1.6824
Bias (BM - OV)	0.0081	0.9900	0.9179	1.7577
Bias Corrected	1.3876			
Standard Error	0.1577			
Slope				
Original Value	0.5568	0.9000	0.4316	0.6614
Bootstrap Mean	0.5609	0.9500	0.4064	0.6814
Bias (BM - OV)	0.0041	0.9900	0.3503	0.7204
Bias Corrected	0.5527			
Standard Error	0.0693			
Correlation				
Original Value	0.7401	0.9000	0.6583	0.8479
Bootstrap Mean	0.7379	0.9500	0.6459	0.8793
Bias (BM - OV)	-0.0022	0.9900	0.6234	0.9384
Bias Corrected	0.7423			
Standard Error	0.0586			
R-Squared				
Original Value	0.5478	0.9000	0.4200	0.6957
Bootstrap Mean	0.5480	0.9500	0.3994	0.7345
Bias (BM - OV)	0.0002	0.9900	0.3615	0.8019
Bias Corrected	0.5475			
Standard Error	0.0842			
Standard Error of Estimate				
Original Value	0.9351	0.9000	0.8409	1.0785
Bootstrap Mean	0.9133	0.9500	0.8193	1.1056
Bias (BM - OV)	-0.0218	0.9900	0.7782	1.1586
Bias Corrected	0.9569			
Standard Error	0.0725			
Orthogonal Intercept				
Original Value	1.2484	0.9000	0.9935	1.4956
Bootstrap Mean	1.2489	0.9500	0.9341	1.5359
Bias (BM - OV)	0.0005	0.9900	0.7934	1.6678
Bias Corrected	1.2479			
Standard Error	0.1530			
Orthogonal Slope				
Original Value	0.6836	0.9000	0.4960	0.8139
Bootstrap Mean	0.6951	0.9500	0.4356	0.8323
Bias (BM - OV)	0.0115	0.9900	0.3375	0.8717
Bias Corrected	0.6720			
Standard Error	0.0983			

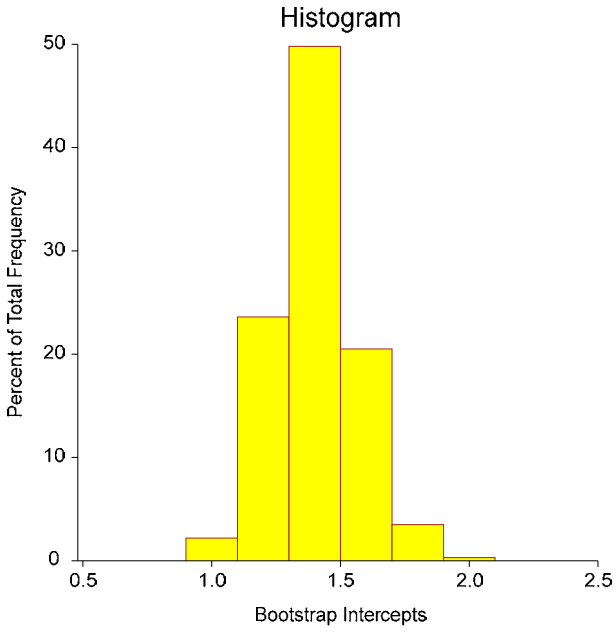
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

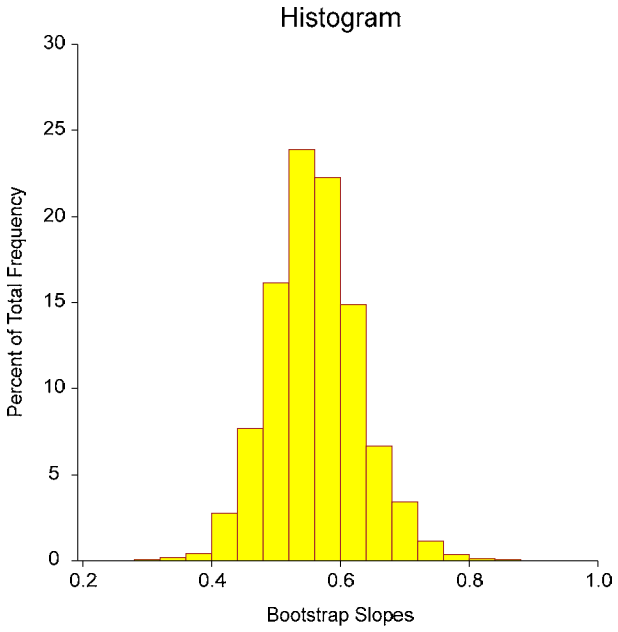
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

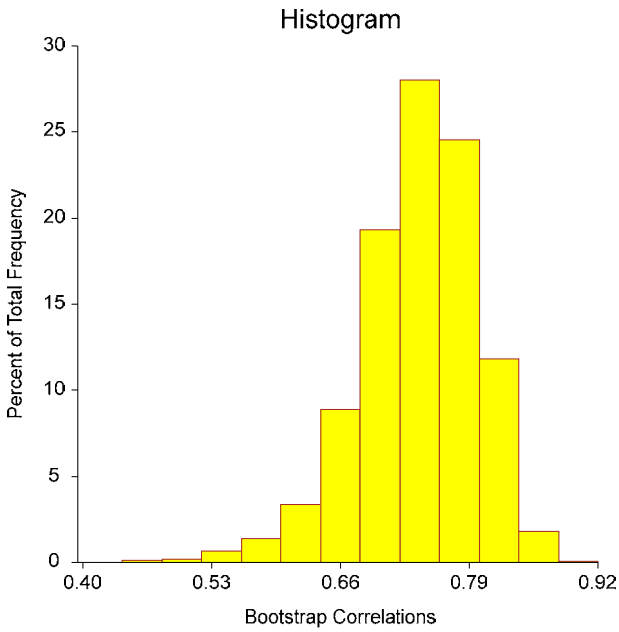
Linear Regression Report

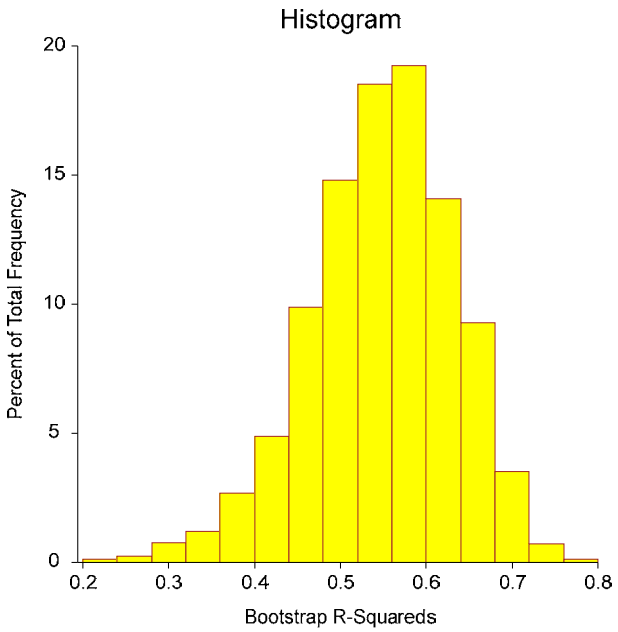
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Bootstrap Histograms Section



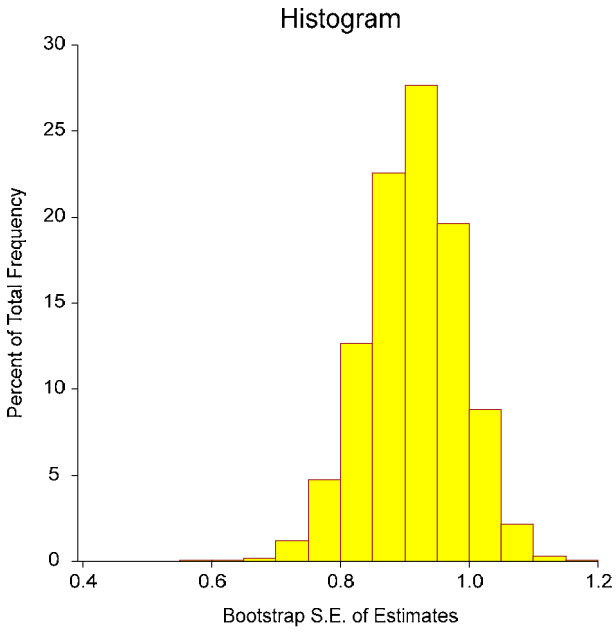


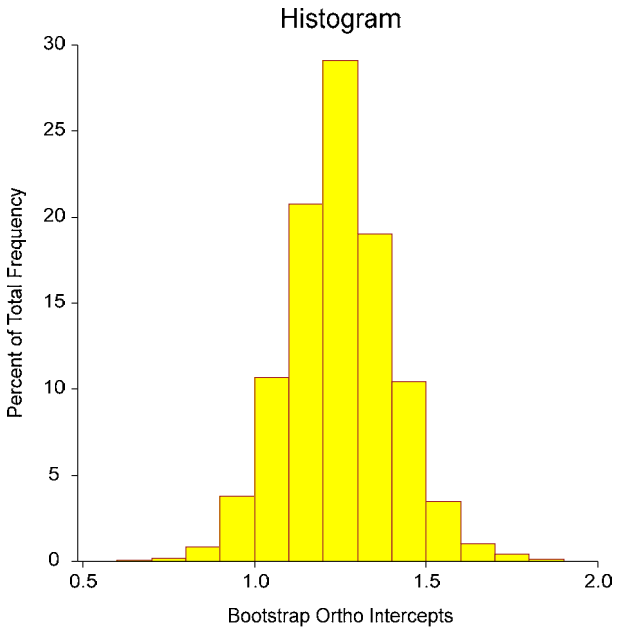


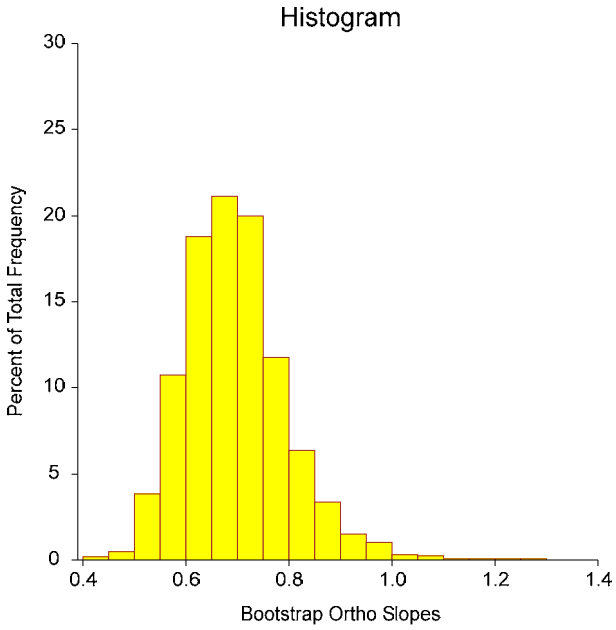


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.7401	0.5478	0.7539
Lower 95% Conf. Limit (r dist'n)	0.5580		
Upper 95% Conf. Limit (r dist'n)	0.8491		
Lower 95% Conf. Limit (Fisher's z)	0.5628		0.5837
Upper 95% Conf. Limit (Fisher's z)	0.8523		0.8606
Adjusted (Rbar)		0.5365	
T-Value for H0: Rho = 0	6.9605	6.9605	7.2572
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	175.2574	175.2574			
Slope	1	42.36428	42.36428	48.4491	0.0000	1.0000
Error	40	34.97633	0.8744082			
Lack of Fit	38	27.6832	0.7285053	0.1998	0.9882	
Pure Error	2	7.293124	3.646562			
Adj. Total	41	77.34061	1.886356			
Total	42	252.598				

s = Square Root(0.8744082) = 0.9350979

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	48.80563	85.79516	0.03369226	-0.008504649
1	48.80563	193.3498	175.7793	-0.008504649	0.00731873
2 (Y'Y)			252.598		
Determinant		5738.701			0.0001742555

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.02946078	-0.007436534
1	-0.007436534	0.006399557

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9540	0.089668	No
Anderson Darling	0.5929	0.121903	No
D'Agostino Skewness	0.8057	0.420434	Yes
D'Agostino Kurtosis	-2.2170	0.026621	No
D'Agostino Omnibus	5.5643	0.061904	No
Constant Residual Variance?			
Modified Levene Test	0.0114	0.915529	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	0.1998	0.988240	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

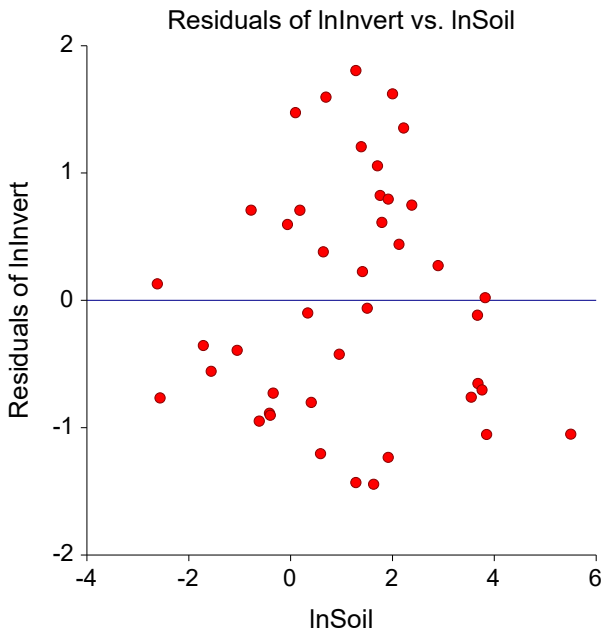
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

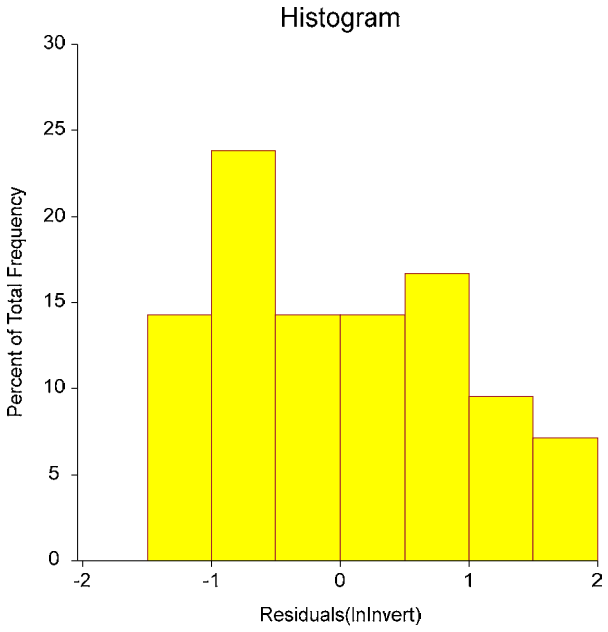
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

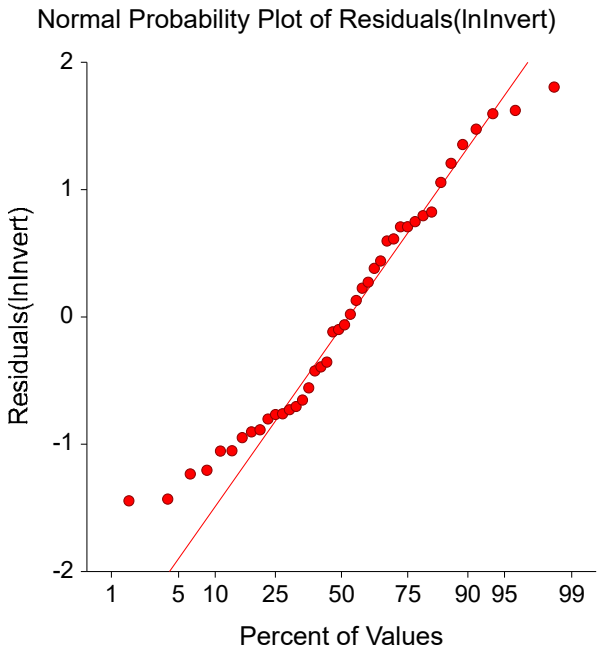
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Original Data Section

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual
10	5.5013	3.4078	4.4589	-1.0511
11	1.7918	3.0057	2.3934	0.6123
12	3.8480	2.4849	3.5384	-1.0535
13	0.1823	2.2050	1.4972	0.7078
14	3.6788	2.7912	3.4442	-0.6530
15	1.4110	2.4069	2.1814	0.2256
16	-0.3425	0.4762	1.2050	-0.7288
17	1.6292	0.8587	2.3029	-1.4442
18	-1.0498	0.4187	0.8111	-0.3924
19	1.2809	0.6780	2.1089	-1.4309
20	0.9555	1.5041	1.9277	-0.4237
21	-0.4155	0.2776	1.1643	-0.8867
22	3.8199	3.5439	3.5227	0.0211
23	1.5041	2.1713	2.2332	-0.0619
24	1.7579	3.1987	2.3745	0.8242
25	1.9169	3.2581	2.4631	0.7950
26	2.2192	3.9853	2.6314	1.3539
27	2.0015	4.1320	2.5102	1.6218
28	2.3795	3.4689	2.7207	0.7482
29	1.2809	3.9140	2.1089	1.8051
30	2.8959	3.2809	3.0082	0.2727
31	3.7589	2.7850	3.4887	-0.7037
32	0.6419	2.1342	1.7531	0.3811
33	1.3863	3.3742	2.1676	1.2066
34	-0.7765	1.6715	0.9633	0.7082
35	0.4055	0.8198	1.6215	-0.8017
36	0.5878	0.5188	1.7230	-1.2042
37	1.9169	1.2296	2.4631	-1.2334
38	0.3365	1.4839	1.5830	-0.0992
39	-0.4005	0.2700	1.1727	-0.9027
40	-0.0619	1.9573	1.3612	0.5960
41	-1.7148	0.0862	0.4409	-0.3547
42	-1.5606	-0.0305	0.5267	-0.5571
43	-0.6162	0.1044	1.0526	-0.9482
44	-2.6173	0.0677	-0.0617	0.1293
45	-2.5639	-0.7985	-0.0320	-0.7665
46	2.1282	3.0204	2.5807	0.4397
47	0.6931	3.3776	1.7817	1.5959
48	0.0953	2.9232	1.4488	1.4744
49	3.6687	3.3214	3.4385	-0.1171
50	3.5467	2.6101	3.3706	-0.7605
51	1.7047	3.4012	2.3449	1.0563

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	5.5013	3.4078	4.4589	0.3759	3.6992	5.2187
11	1.7918	3.0057	2.3934	0.1528	2.0845	2.7023
12	3.8480	2.4849	3.5384	0.2588	3.0153	4.0615
13	0.1823	2.2050	1.4972	0.1642	1.1654	1.8291
14	3.6788	2.7912	3.4442	0.2477	2.9435	3.9448
15	1.4110	2.4069	2.1814	0.1457	1.8870	2.4757
16	-0.3425	0.4762	1.2050	0.1879	0.8252	1.5847
17	1.6292	0.8587	2.3029	0.1491	2.0016	2.6041
18	-1.0498	0.4187	0.8111	0.2283	0.3497	1.2726
19	1.2809	0.6780	2.1089	0.1446	1.8167	2.4012
20	0.9555	1.5041	1.9277	0.1452	1.6342	2.2213
21	-0.4155	0.2776	1.1643	0.1917	0.7769	1.5517
22	3.8199	3.5439	3.5227	0.2570	3.0034	4.0420
23	1.5041	2.1713	2.2332	0.1469	1.9364	2.5300
24	1.7579	3.1987	2.3745	0.1520	2.0674	2.6816
25	1.9169	3.2581	2.4631	0.1564	2.1470	2.7792
26	2.2192	3.9853	2.6314	0.1672	2.2934	2.9694
27	2.0015	4.1320	2.5102	0.1592	2.1885	2.8318
28	2.3795	3.4689	2.7207	0.1741	2.3688	3.0725
29	1.2809	3.9140	2.1089	0.1446	1.8167	2.4012
30	2.8959	3.2809	3.0082	0.2001	2.6037	3.4127
31	3.7589	2.7850	3.4887	0.2529	2.9775	3.9999
32	0.6419	2.1342	1.7531	0.1502	1.4496	2.0566
33	1.3863	3.3742	2.1676	0.1454	1.8737	2.4615
34	-0.7765	1.6715	0.9633	0.2118	0.5352	1.3914
35	0.4055	0.8198	1.6215	0.1565	1.3052	1.9377
36	0.5878	0.5188	1.7230	0.1514	1.4169	2.0290
37	1.9169	1.2296	2.4631	0.1564	2.1470	2.7792
38	0.3365	1.4839	1.5830	0.1587	1.2623	1.9038
39	-0.4005	0.2700	1.1727	0.1909	0.7869	1.5585
40	-0.0619	1.9573	1.3612	0.1744	1.0088	1.7137
41	-1.7148	0.0862	0.4409	0.2716	-0.1081	0.9898
42	-1.5606	-0.0305	0.5267	0.2613	-0.0014	1.0547
43	-0.6162	0.1044	1.0526	0.2026	0.6431	1.4621
44	-2.6173	0.0677	-0.0617	0.3350	-0.7387	0.6154
45	-2.5639	-0.7985	-0.0320	0.3312	-0.7013	0.6373
46	2.1282	3.0204	2.5807	0.1637	2.2499	2.9116
47	0.6931	3.3776	1.7817	0.1491	1.4803	2.0830
48	0.0953	2.9232	1.4488	0.1676	1.1100	1.7876
49	3.6687	3.3214	3.4385	0.2470	2.9392	3.9378
50	3.5467	2.6101	3.3706	0.2392	2.8872	3.8540
51	1.7047	3.4012	2.3449	0.1507	2.0404	2.6495

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	5.5013	3.4078	4.4589	1.0078	2.4220	6.4958
11	1.7918	3.0057	2.3934	0.9475	0.4784	4.3084
12	3.8480	2.4849	3.5384	0.9703	1.5774	5.4993
13	0.1823	2.2050	1.4972	0.9494	-0.4216	3.4160
14	3.6788	2.7912	3.4442	0.9673	1.4891	5.3992
15	1.4110	2.4069	2.1814	0.9464	0.2687	4.0941
16	-0.3425	0.4762	1.2050	0.9538	-0.7227	3.1327
17	1.6292	0.8587	2.3029	0.9469	0.3891	4.2167
18	-1.0498	0.4187	0.8111	0.9626	-1.1343	2.7565
19	1.2809	0.6780	2.1089	0.9462	0.1966	4.0213
20	0.9555	1.5041	1.9277	0.9463	0.0152	3.8403
21	-0.4155	0.2776	1.1643	0.9545	-0.7649	3.0935
22	3.8199	3.5439	3.5227	0.9698	1.5627	5.4827
23	1.5041	2.1713	2.2332	0.9466	0.3201	4.1463
24	1.7579	3.1987	2.3745	0.9474	0.4598	4.2892
25	1.9169	3.2581	2.4631	0.9481	0.5469	4.3792
26	2.2192	3.9853	2.6314	0.9499	0.7115	4.5513
27	2.0015	4.1320	2.5102	0.9485	0.5931	4.4272
28	2.3795	3.4689	2.7207	0.9512	0.7983	4.6431
29	1.2809	3.9140	2.1089	0.9462	0.1966	4.0213
30	2.8959	3.2809	3.0082	0.9563	1.0755	4.9409
31	3.7589	2.7850	3.4887	0.9687	1.5309	5.4465
32	0.6419	2.1342	1.7531	0.9471	-0.1610	3.6672
33	1.3863	3.3742	2.1676	0.9463	0.2550	4.0802
34	-0.7765	1.6715	0.9633	0.9588	-0.9745	2.9011
35	0.4055	0.8198	1.6215	0.9481	-0.2947	3.5376
36	0.5878	0.5188	1.7230	0.9473	-0.1915	3.6375
37	1.9169	1.2296	2.4631	0.9481	0.5469	4.3792
38	0.3365	1.4839	1.5830	0.9485	-0.3339	3.5000
39	-0.4005	0.2700	1.1727	0.9544	-0.7562	3.1016
40	-0.0619	1.9573	1.3612	0.9512	-0.5612	3.2837
41	-1.7148	0.0862	0.4409	0.9738	-1.5272	2.4089
42	-1.5606	-0.0305	0.5267	0.9709	-1.4356	2.4890
43	-0.6162	0.1044	1.0526	0.9568	-0.8812	2.9863
44	-2.6173	0.0677	-0.0617	0.9933	-2.0692	1.9458
45	-2.5639	-0.7985	-0.0320	0.9920	-2.0369	1.9729
46	2.1282	3.0204	2.5807	0.9493	0.6621	4.4994
47	0.6931	3.3776	1.7817	0.9469	-0.1321	3.6954
48	0.0953	2.9232	1.4488	0.9500	-0.4713	3.3688
49	3.6687	3.3214	3.4385	0.9672	1.4838	5.3932
50	3.5467	2.6101	3.3706	0.9652	1.4198	5.3214
51	1.7047	3.4012	2.3449	0.9472	0.4307	4.2592

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	5.5013	3.4078	4.4589	0.3759	3.3889	5.5289
11	1.7918	3.0057	2.3934	0.1528	1.9584	2.8284
12	3.8480	2.4849	3.5384	0.2588	2.8016	4.2751
13	0.1823	2.2050	1.4972	0.1642	1.0298	1.9646
14	3.6788	2.7912	3.4442	0.2477	2.7391	4.1492
15	1.4110	2.4069	2.1814	0.1457	1.7668	2.5960
16	-0.3425	0.4762	1.2050	0.1879	0.6702	1.7398
17	1.6292	0.8587	2.3029	0.1491	1.8786	2.7271
18	-1.0498	0.4187	0.8111	0.2283	0.1612	1.4610
19	1.2809	0.6780	2.1089	0.1446	1.6974	2.5205
20	0.9555	1.5041	1.9277	0.1452	1.5144	2.3411
21	-0.4155	0.2776	1.1643	0.1917	0.6187	1.7100
22	3.8199	3.5439	3.5227	0.2570	2.7913	4.2541
23	1.5041	2.1713	2.2332	0.1469	1.8152	2.6512
24	1.7579	3.1987	2.3745	0.1520	1.9420	2.8070
25	1.9169	3.2581	2.4631	0.1564	2.0179	2.9083
26	2.2192	3.9853	2.6314	0.1672	2.1553	3.1074
27	2.0015	4.1320	2.5102	0.1592	2.0572	2.9632
28	2.3795	3.4689	2.7207	0.1741	2.2252	3.2162
29	1.2809	3.9140	2.1089	0.1446	1.6974	2.5205
30	2.8959	3.2809	3.0082	0.2001	2.4385	3.5779
31	3.7589	2.7850	3.4887	0.2529	2.7688	4.2087
32	0.6419	2.1342	1.7531	0.1502	1.3256	2.1805
33	1.3863	3.3742	2.1676	0.1454	1.7537	2.5815
34	-0.7765	1.6715	0.9633	0.2118	0.3604	1.5662
35	0.4055	0.8198	1.6215	0.1565	1.1761	2.0668
36	0.5878	0.5188	1.7230	0.1514	1.2920	2.1540
37	1.9169	1.2296	2.4631	0.1564	2.0179	2.9083
38	0.3365	1.4839	1.5830	0.1587	1.1314	2.0347
39	-0.4005	0.2700	1.1727	0.1909	0.6293	1.7161
40	-0.0619	1.9573	1.3612	0.1744	0.8649	1.8576
41	-1.7148	0.0862	0.4409	0.2716	-0.3323	1.2140
42	-1.5606	-0.0305	0.5267	0.2613	-0.2170	1.2703
43	-0.6162	0.1044	1.0526	0.2026	0.4758	1.6293
44	-2.6173	0.0677	-0.0617	0.3350	-1.0152	0.8919
45	-2.5639	-0.7985	-0.0320	0.3312	-0.9746	0.9106
46	2.1282	3.0204	2.5807	0.1637	2.1148	3.0467
47	0.6931	3.3776	1.7817	0.1491	1.3573	2.2060
48	0.0953	2.9232	1.4488	0.1676	0.9716	1.9259
49	3.6687	3.3214	3.4385	0.2470	2.7353	4.1417
50	3.5467	2.6101	3.3706	0.2392	2.6898	4.0514
51	1.7047	3.4012	2.3449	0.1507	1.9160	2.7738

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Section

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	5.5013	3.4078	4.4589	-1.0511	-1.2276	30.8430
11	1.7918	3.0057	2.3934	0.6123	0.6637	20.3713
12	3.8480	2.4849	3.5384	-1.0535	-1.1724	42.3940
13	0.1823	2.2050	1.4972	0.7078	0.7688	32.0984
14	3.6788	2.7912	3.4442	-0.6530	-0.7242	23.3947
15	1.4110	2.4069	2.1814	0.2256	0.2442	9.3722
16	-0.3425	0.4762	1.2050	-0.7288	-0.7956	153.0235
17	1.6292	0.8587	2.3029	-1.4442	-1.5645	168.1954
18	-1.0498	0.4187	0.8111	-0.3924	-0.4327	93.7199
19	1.2809	0.6780	2.1089	-1.4309	-1.5489	211.0385
20	0.9555	1.5041	1.9277	-0.4237	-0.4586	28.1678
21	-0.4155	0.2776	1.1643	-0.8867	-0.9688	319.3765
22	3.8199	3.5439	3.5227	0.0211	0.0235	0.5967
23	1.5041	2.1713	2.2332	-0.0619	-0.0670	2.8489
24	1.7579	3.1987	2.3745	0.8242	0.8932	25.7658
25	1.9169	3.2581	2.4631	0.7950	0.8623	24.4013
26	2.2192	3.9853	2.6314	1.3539	1.4716	33.9720
27	2.0015	4.1320	2.5102	1.6218	1.7600	39.2501
28	2.3795	3.4689	2.7207	0.7482	0.8143	21.5684
29	1.2809	3.9140	2.1089	1.8051	1.9539	46.1182
30	2.8959	3.2809	3.0082	0.2727	0.2986	8.3119
31	3.7589	2.7850	3.4887	-0.7037	-0.7817	25.2677
32	0.6419	2.1342	1.7531	0.3811	0.4129	17.8560
33	1.3863	3.3742	2.1676	1.2066	1.3062	35.7586
34	-0.7765	1.6715	0.9633	0.7082	0.7775	42.3681
35	0.4055	0.8198	1.6215	-0.8017	-0.8696	97.7926
36	0.5878	0.5188	1.7230	-1.2042	-1.3050	232.1136
37	1.9169	1.2296	2.4631	-1.2334	-1.3379	100.3089
38	0.3365	1.4839	1.5830	-0.0992	-0.1076	6.6833
39	-0.4005	0.2700	1.1727	-0.9027	-0.9861	334.2880
40	-0.0619	1.9573	1.3612	0.5960	0.6488	30.4524
41	-1.7148	0.0862	0.4409	-0.3547	-0.3964	411.5598
42	-1.5606	-0.0305	0.5267	-0.5571	-0.6205	1829.1495
43	-0.6162	0.1044	1.0526	-0.9482	-1.0387	908.6084
44	-2.6173	0.0677	-0.0617	0.1293	0.1482	191.1658
45	-2.5639	-0.7985	-0.0320	-0.7665	-0.8765	95.9954
46	2.1282	3.0204	2.5807	0.4397	0.4776	14.5570
47	0.6931	3.3776	1.7817	1.5959	1.7288	47.2508
48	0.0953	2.9232	1.4488	1.4744	1.6027	50.4385
49	3.6687	3.3214	3.4385	-0.1171	-0.1298	3.5245
50	3.5467	2.6101	3.3706	-0.7605	-0.8413	29.1383
51	1.7047	3.4012	2.3449	1.0563	1.1445	31.0556

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	5.5013	-1.0511	*-1.2357	0.1616	0.1452	0.8630
11	1.7918	0.6123	0.6590	0.0267	0.0060	0.8870
12	3.8480	-1.0535	-1.1780	0.0766	0.0570	0.8660
13	0.1823	0.7078	0.7648	0.0308	0.0094	0.8836
14	3.6788	-0.6530	-0.7198	0.0702	0.0198	0.8851
15	1.4110	0.2256	0.2413	0.0243	0.0007	0.8955
16	-0.3425	-0.7288	-0.7918	0.0404	0.0133	0.8826
17	1.6292	-1.4442	-1.5943	0.0254	0.0319	0.8420
18	-1.0498	-0.3924	-0.4283	0.0596	0.0059	0.8926
19	1.2809	-1.4309	-1.5774	0.0239	0.0294	0.8430
20	0.9555	-0.4237	-0.4541	0.0241	0.0026	0.8921
21	-0.4155	-0.8867	-0.9680	0.0420	0.0206	0.8758
22	3.8199	0.0211	0.0232	0.0755	0.0000	0.8968
23	1.5041	-0.0619	-0.0661	0.0247	0.0001	0.8967
24	1.7579	0.8242	0.8909	0.0264	0.0108	0.8789
25	1.9169	0.7950	0.8595	0.0280	0.0107	0.8802
26	2.2192	1.3539	1.4941	0.0320	0.0358	0.8483
27	2.0015	1.6218	1.8094	0.0290	0.0462	0.8274
28	2.3795	0.7482	0.8108	0.0347	0.0119	0.8820
29	1.2809	1.8051	*2.0285	0.0239	0.0468	0.8112
30	2.8959	0.2727	0.2951	0.0458	0.0021	0.8948
31	3.7589	-0.7037	-0.7778	0.0732	0.0241	0.8831
32	0.6419	0.3811	0.4086	0.0258	0.0023	0.8930
33	1.3863	1.2066	1.3182	0.0242	0.0211	0.8586
34	-0.7765	0.7082	0.7736	0.0513	0.0164	0.8833
35	0.4055	-0.8017	-0.8669	0.0280	0.0109	0.8799
36	0.5878	-1.2042	-1.3169	0.0262	0.0229	0.8586
37	1.9169	-1.2334	-1.3517	0.0280	0.0258	0.8567
38	0.3365	-0.0992	-0.1063	0.0288	0.0002	0.8966
39	-0.4005	-0.9027	-0.9857	0.0417	0.0211	0.8750
40	-0.0619	0.5960	0.6440	0.0348	0.0076	0.8874
41	-1.7148	-0.3547	-0.3922	0.0844	0.0072	0.8933
42	-1.5606	-0.5571	-0.6157	0.0781	0.0163	0.8882
43	-0.6162	-0.9482	-1.0398	0.0470	0.0266	0.8726
44	-2.6173	0.1293	*0.1463	0.1283	0.0016	0.8963
45	-2.5639	-0.7665	*-0.8739	0.1254	0.0551	0.8796
46	2.1282	0.4397	0.4729	0.0306	0.0036	0.8917
47	0.6931	1.5959	1.7747	0.0254	0.0390	0.8298
48	0.0953	1.4744	1.6359	0.0321	0.0426	0.8392
49	3.6687	-0.1171	-0.1282	0.0698	0.0006	0.8965
50	3.5467	-0.7605	-0.8382	0.0654	0.0248	0.8810
51	1.7047	1.0563	1.1491	0.0260	0.0175	0.8675

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-1.2357	-0.5425	0.1452	* 1.1620	0.0963	-0.5010
11	0.6590	0.1092	0.0060	1.0571	0.0672	0.0360
12	-1.1780	-0.3393	0.0570	1.0623	-0.0065	-0.2817
13	0.7648	0.1364	0.0094	1.0536	0.1360	-0.0651
14	-0.7198	-0.1977	0.0198	1.1019	-0.0098	-0.1607
15	0.2413	0.0381	0.0007	1.0749	0.0289	0.0052
16	-0.7918	-0.1624	0.0133	1.0618	-0.1612	0.1040
17	-1.5943	-0.2574	0.0319	0.9513	-0.1745	-0.0645
18	-0.4283	-0.1078	0.0059	1.1082	-0.1026	0.0836
19	-1.5774	-0.2469	0.0294	0.9523	-0.1983	-0.0162
20	-0.4541	-0.0714	0.0026	1.0666	-0.0640	0.0081
21	-0.9680	-0.2028	0.0206	1.0472	-0.2006	0.1335
22	0.0232	0.0066	0.0000	1.1378	0.0002	0.0055
23	-0.0661	-0.0105	0.0001	1.0783	-0.0076	-0.0020
24	0.8909	0.1467	0.0108	1.0378	0.0922	0.0460
25	0.8595	0.1458	0.0107	1.0424	0.0826	0.0563
26	1.4941	0.2716	0.0358	0.9722	0.1226	0.1373
27	1.8094	0.3125	0.0462	0.9220	0.1668	0.1319
28	0.8108	0.1536	0.0119	1.0539	0.0605	0.0860
29	* 2.0285	0.3175	0.0468	0.8818	0.2550	0.0209
30	0.2951	0.0647	0.0021	1.0975	0.0149	0.0448
31	-0.7778	-0.2185	0.0241	1.1006	-0.0076	-0.1795
32	0.4086	0.0665	0.0023	1.0706	0.0637	-0.0184
33	1.3182	0.2075	0.0211	0.9880	0.1592	0.0256
34	0.7736	0.1799	0.0164	1.0756	0.1744	-0.1317
35	-0.8669	-0.1471	0.0109	1.0417	-0.1449	0.0569
36	-1.3169	-0.2161	0.0229	0.9902	-0.2086	0.0656
37	-1.3517	-0.2293	0.0258	0.9875	-0.1299	-0.0885
38	-0.1063	-0.0183	0.0002	1.0825	-0.0181	0.0076
39	-0.9857	-0.2056	0.0211	1.0450	-0.2035	0.1346
40	0.6440	0.1222	0.0076	1.0670	0.1222	-0.0686
41	-0.3922	-0.1191	0.0072	1.1399	-0.1078	0.1009
42	-0.6157	-0.1792	0.0163	1.1191	-0.1641	0.1494
43	-1.0398	-0.2308	0.0266	1.0450	-0.2259	0.1620
44	0.1463	0.0561	0.0016	* 1.2055	0.0478	-0.0507
45	-0.8739	-0.3309	0.0551	* 1.1570	-0.2825	0.2979
46	0.4729	0.0841	0.0036	1.0729	0.0408	0.0397
47	1.7747	0.2866	0.0390	0.9241	0.2722	-0.0721
48	1.6359	0.2981	0.0426	0.9518	0.2979	-0.1518
49	-0.1282	-0.0351	0.0006	1.1299	-0.0018	-0.0285
50	-0.8382	-0.2218	0.0248	1.0861	-0.0167	-0.1769
51	1.1491	0.1876	0.0175	1.0104	0.1218	0.0541

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
10	5.5013	-1.0511	||||||||.....	-1.2276	|||||||||.....	-1.2357	|||||||||.....
11	1.7918	0.6123	||||.....	0.6637	||||.....	0.6590	||||.....
12	3.8480	-1.0535	|||||||.....	-1.1724	|||||||.....	-1.1780	|||||||.....
13	0.1823	0.7078	|||||.....	0.7688	|||||.....	0.7648	|||||.....
14	3.6788	-0.6530	|||||.....	-0.7242	|||||.....	-0.7198	|||||.....
15	1.4110	0.2256	|.....	0.2442	|.....	0.2413	|.....
16	-0.3425	-0.7288	|||||.....	-0.7956	|||||.....	-0.7918	|||||.....
17	1.6292	-1.4442	||||||||||....	-1.5645	||||||||||....	-1.5943	||||||||||....
18	-1.0498	-0.3924	|||.....	-0.4327	|||.....	-0.4283	|||.....
19	1.2809	-1.4309	||||||||||....	-1.5489	||||||||||....	-1.5774	||||||||||....
20	0.9555	-0.4237	|||.....	-0.4586	|||.....	-0.4541	|||.....
21	-0.4155	-0.8867	|||||||.....	-0.9688	|||||||.....	-0.9680	|||||||.....
22	3.8199	0.0211	|.....	0.0235	|.....	0.0232	|.....
23	1.5041	-0.0619	|.....	-0.0670	|.....	-0.0661	|.....
24	1.7579	0.8242	||||||.....	0.8932	||||||.....	0.8909	||||||.....
25	1.9169	0.7950	||||||.....	0.8623	||||||.....	0.8595	||||||.....
26	2.2192	1.3539	||||||||||....	1.4716	||||||||||....	1.4941	||||||||||....
27	2.0015	1.6218	|||||||||||..	1.7600	|||||||||||..	1.8094	|||||||||||..
28	2.3795	0.7482	|||||.....	0.8143	|||||.....	0.8108	||||.....
29	1.2809	1.8051	|||||||||||||	1.9539	|||||||||||||	* 2.0285	|||||||||||||
30	2.8959	0.2727	||.....	0.2986	||.....	0.2951	||.....
31	3.7589	-0.7037	|||||.....	-0.7817	|||||.....	-0.7778	|||||.....
32	0.6419	0.3811	|||.....	0.4129	|||.....	0.4086	||.....
33	1.3863	1.2066	||||||||.....	1.3062	||||||||.....	1.3182	||||||||.....
34	-0.7765	0.7082	|||||.....	0.7775	|||||.....	0.7736	|||||.....
35	0.4055	-0.8017	||||||.....	-0.8696	||||||.....	-0.8669	||||||.....
36	0.5878	-1.2042	||||||||.....	-1.3050	||||||||.....	-1.3169	||||||||.....
37	1.9169	-1.2334	||||||||.....	-1.3379	||||||||.....	-1.3517	||||||||.....
38	0.3365	-0.0992	|.....	-0.1076	|.....	-0.1063	|.....
39	-0.4005	-0.9027	|||||||.....	-0.9861	|||||||.....	-0.9857	|||||||.....
40	-0.0619	0.5960	||||.....	0.6488	||||.....	0.6440	||||.....
41	-1.7148	-0.3547	||.....	-0.3964	||.....	-0.3922	||.....
42	-1.5606	-0.5571	||||.....	-0.6205	||||.....	-0.6157	||||.....
43	-0.6162	-0.9482	|||||||.....	-1.0387	|||||||.....	-1.0398	|||||||.....
44	-2.6173	0.1293	|.....	0.1482	|.....	0.1463	|.....
45	-2.5639	-0.7665	||||||.....	-0.8765	||||||.....	-0.8739	||||||.....
46	2.1282	0.4397	|||.....	0.4776	|||.....	0.4729	|||.....
47	0.6931	1.5959	|||||||||||..	1.7288	|||||||||||..	1.7747	|||||||||||..
48	0.0953	1.4744	||||||||||...	1.6027	||||||||||...	1.6359	||||||||||...
49	3.6687	-0.1171	|.....	-0.1298	|.....	-0.1282	|.....
50	3.5467	-0.7605	||||||.....	-0.8413	||||||.....	-0.8382	||||||.....
51	1.7047	1.0563	|||||||.....	1.1445	|||||||.....	1.1491	|||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
10	5.5013	-0.5425	|||||||||||||||	0.1452	|||||||||||||||	-0.5010	|||||||||||||||
11	1.7918	0.1092	||.....	0.0060	|.....	0.0360	|.....
12	3.8480	-0.3393	||||||||.....	0.0570	|||||.....	-0.2817	|||||||.....
13	0.1823	0.1364	|||.....	0.0094	|.....	-0.0651	|.....
14	3.6788	-0.1977	|||||.....	0.0198	||.....	-0.1607	||||.....
15	1.4110	0.0381	|.....	0.0007	|.....	0.0052	|.....
16	-0.3425	-0.1624	||||.....	0.0133	|.....	0.1040	|||.....
17	1.6292	-0.2574	|||||||.....	0.0319	|||.....	-0.0645	|.....
18	-1.0498	-0.1078	||.....	0.0059	|.....	0.0836	||.....
19	1.2809	-0.2469	||||||.....	0.0294	|||.....	-0.0162	|.....
20	0.9555	-0.0714	|.....	0.0026	|.....	0.0081	|.....
21	-0.4155	-0.2028	|||||.....	0.0206	||.....	0.1335	|||.....
22	3.8199	0.0066	|.....	0.0000	|.....	0.0055	|.....
23	1.5041	-0.0105	|.....	0.0001	|.....	-0.0020	|.....
24	1.7579	0.1467	|||.....	0.0108	|.....	0.0460	|.....
25	1.9169	0.1458	|||.....	0.0107	|.....	0.0563	|.....
26	2.2192	0.2716	|||||||.....	0.0358	|||.....	0.1373	||||.....
27	2.0015	0.3125	|||||||.....	0.0462	||||.....	0.1319	|||.....
28	2.3795	0.1536	||||.....	0.0119	|.....	0.0860	||.....
29	1.2809	0.3175	|||||||.....	0.0468	||||.....	0.0209	|.....
30	2.8959	0.0647	|.....	0.0021	|.....	0.0448	|.....
31	3.7589	-0.2185	|||||.....	0.0241	||.....	-0.1795	|||||.....
32	0.6419	0.0665	|.....	0.0023	|.....	-0.0184	|.....
33	1.3863	0.2075	|||||.....	0.0211	||.....	0.0256	|.....
34	-0.7765	0.1799	||||.....	0.0164	|.....	-0.1317	|||.....
35	0.4055	-0.1471	|||.....	0.0109	|.....	0.0569	|.....
36	0.5878	-0.2161	|||||.....	0.0229	||.....	0.0656	|.....
37	1.9169	-0.2293	||||||.....	0.0258	||.....	-0.0885	||.....
38	0.3365	-0.0183	|.....	0.0002	|.....	0.0076	|.....
39	-0.4005	-0.2056	|||||.....	0.0211	||.....	0.1346	|||.....
40	-0.0619	0.1222	|||.....	0.0076	|.....	-0.0686	||.....
41	-1.7148	-0.1191	|||.....	0.0072	|.....	0.1009	||.....
42	-1.5606	-0.1792	||||.....	0.0163	|.....	0.1494	||||.....
43	-0.6162	-0.2308	||||||.....	0.0266	||.....	0.1620	||||.....
44	-2.6173	0.0561	|.....	0.0016	|.....	-0.0507	|.....
45	-2.5639	-0.3309	||||||||.....	0.0551	|||||.....	0.2979	|||||||.....
46	2.1282	0.0841	||.....	0.0036	|.....	0.0397	|.....
47	0.6931	0.2866	|||||||.....	0.0390	||||.....	-0.0721	||.....
48	0.0953	0.2981	|||||||.....	0.0426	||||.....	-0.1518	||||.....
49	3.6687	-0.0351	|.....	0.0006	|.....	-0.0285	|.....
50	3.5467	-0.2218	||||||.....	0.0248	||.....	-0.1769	|||||.....
51	1.7047	0.1876	|||||.....	0.0175	|.....	0.0541	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	5.5013	-1.2357	||||||||.....	0.1452	||||||||||||||	0.1616	||||||||||||||
11	1.7918	0.6590	||||.....	0.0060	|.....	0.0267	|.....
12	3.8480	-1.1780	|||||||.....	0.0570	|||||.....	0.0766	|||||.....
13	0.1823	0.7648	|||||.....	0.0094	|.....	0.0308	|.....
14	3.6788	-0.7198	|||||.....	0.0198	||.....	0.0702	|||||.....
15	1.4110	0.2413	|.....	0.0007	|.....	0.0243	|.....
16	-0.3425	-0.7918	|||||.....	0.0133	|.....	0.0404	|.....
17	1.6292	-1.5943	||||||||||....	0.0319	|||.....	0.0254	|.....
18	-1.0498	-0.4283	|||.....	0.0059	|.....	0.0596	|||.....
19	1.2809	-1.5774	||||||||||....	0.0294	|||.....	0.0239	|.....
20	0.9555	-0.4541	|||.....	0.0026	|.....	0.0241	|.....
21	-0.4155	-0.9680	|||||||.....	0.0206	||.....	0.0420	|.....
22	3.8199	0.0232	|.....	0.0000	|.....	0.0755	|||||.....
23	1.5041	-0.0661	|.....	0.0001	|.....	0.0247	|.....
24	1.7579	0.8909	||||||.....	0.0108	|.....	0.0264	|.....
25	1.9169	0.8595	||||||.....	0.0107	|.....	0.0280	|.....
26	2.2192	1.4941	||||||||||....	0.0358	|||.....	0.0320	|.....
27	2.0015	1.8094	|||||||||||..	0.0462	||||.....	0.0290	|.....
28	2.3795	0.8108	|||||.....	0.0119	|.....	0.0347	|.....
29	1.2809	* 2.0285	||||||||||||||	0.0468	||||.....	0.0239	|.....
30	2.8959	0.2951	||.....	0.0021	|.....	0.0458	||.....
31	3.7589	-0.7778	|||||.....	0.0241	||.....	0.0732	|||||.....
32	0.6419	0.4086	||.....	0.0023	|.....	0.0258	|.....
33	1.3863	1.3182	||||||||.....	0.0211	||.....	0.0242	|.....
34	-0.7765	0.7736	|||||.....	0.0164	|.....	0.0513	||.....
35	0.4055	-0.8669	||||||.....	0.0109	|.....	0.0280	|.....
36	0.5878	-1.3169	||||||||.....	0.0229	||.....	0.0262	|.....
37	1.9169	-1.3517	||||||||.....	0.0258	||.....	0.0280	|.....
38	0.3365	-0.1063	|.....	0.0002	|.....	0.0288	|.....
39	-0.4005	-0.9857	||||||.....	0.0211	||.....	0.0417	|.....
40	-0.0619	0.6440	||||.....	0.0076	|.....	0.0348	|.....
41	-1.7148	-0.3922	||.....	0.0072	|.....	0.0844	|||||.....
42	-1.5606	-0.6157	||||.....	0.0163	|.....	0.0781	|||||.....
43	-0.6162	-1.0398	||||||.....	0.0266	||.....	0.0470	||.....
44	-2.6173	0.1463	|.....	0.0016	|.....	0.1283	||||||||||....
45	-2.5639	-0.8739	||||||.....	0.0551	|||||.....	0.1254	||||||||||....
46	2.1282	0.4729	|||.....	0.0036	|.....	0.0306	|.....
47	0.6931	1.7747	|||||||||||..	0.0390	||||.....	0.0254	|.....
48	0.0953	1.6359	||||||||||...	0.0426	||||.....	0.0321	|.....
49	3.6687	-0.1282	|.....	0.0006	|.....	0.0698	||||.....
50	3.5467	-0.8382	||||||.....	0.0248	||.....	0.0654	||||.....
51	1.7047	1.1491	|||||||.....	0.0175	|.....	0.0260	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Inverse Prediction of X Means

Row	lnInvert (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	3.4078	5.5013	3.6136	1.8876	2.8886	4.7901
11	3.0057	1.7918	2.8914	-1.0996	2.2759	3.8254
12	2.4849	3.8480	1.9561	1.8919	1.4268	2.6317
13	2.2050	0.1823	1.4534	-1.2711	0.9252	2.0353
14	2.7912	3.6788	2.5061	1.1727	1.9362	3.3236
15	2.4069	1.4110	1.8161	-0.4051	1.2911	2.4616
16	0.4762	-0.3425	-1.6513	1.3088	-2.9569	-0.8637
17	0.8587	1.6292	-0.9645	2.5937	-2.0287	-0.2918
18	0.4187	-1.0498	-1.7546	0.7047	-3.0977	-0.9485
19	0.6780	1.2809	-1.2888	2.5698	-2.4650	-0.5640
20	1.5041	0.9555	0.1947	0.7609	-0.5218	0.7330
21	0.2776	-0.4155	-2.0079	1.5924	-3.4443	-1.1553
22	3.5439	3.8199	3.8579	-0.0380	3.0911	5.1211
23	2.1713	1.5041	1.3930	0.1111	0.8621	1.9664
24	3.1987	1.7579	3.2380	-1.4801	2.5730	4.2852
25	3.2581	1.9169	3.3447	-1.4278	2.6633	4.4280
26	3.9853	2.2192	4.6506	-2.4314	3.7376	6.2060
27	4.1320	2.0015	4.9141	-2.9126	3.9499	6.5691
28	3.4689	2.3795	3.7232	-1.3437	2.9797	4.9383
29	3.9140	1.2809	4.5227	-3.2417	3.6341	6.0301
30	3.2809	2.8959	3.3857	-0.4898	2.6978	4.4830
31	2.7850	3.7589	2.4951	1.2638	1.9263	3.3093
32	2.1342	0.6419	1.3262	-0.6844	0.7916	1.8911
33	3.3742	1.3863	3.5531	-2.1669	2.8382	4.7084
34	1.6715	-0.7765	0.4953	-1.2718	-0.1528	1.0206
35	0.8198	0.4055	-1.0343	1.4397	-2.1223	-0.3507
36	0.5188	0.5878	-1.5748	2.1626	-2.8528	-0.8008
37	1.2296	1.9169	-0.2982	2.2151	-1.1496	0.2842
38	1.4839	0.3365	0.1584	0.1781	-0.5671	0.6991
39	0.2700	-0.4005	-2.0216	1.6211	-3.4630	-1.1664
40	1.9573	-0.0619	1.0085	-1.0704	0.4450	1.5439
41	0.0862	-1.7148	-2.3518	0.6370	-3.9167	-1.4339
42	-0.0305	-1.5606	-2.5612	1.0006	-4.2054	-1.6027
43	0.1044	-0.6162	-2.3191	1.7029	-3.8717	-1.4075
44	0.0677	-2.6173	-2.3850	-0.2323	-3.9624	-1.4608
45	-0.7985	-2.5639	-3.9406	1.3766	-6.1184	-2.7023
46	3.0204	2.1282	2.9179	-0.7896	2.2988	3.8602
47	3.3776	0.6931	3.5593	-2.8661	2.8433	4.7167
48	2.9232	0.0953	2.7432	-2.6479	2.1465	3.6310
49	3.3214	3.6687	3.4584	0.2102	2.7590	4.5808
50	2.6101	3.5467	2.1809	1.3658	1.6392	2.9103
51	3.4012	1.7047	3.6017	-1.8969	2.8787	4.7739

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Inverse Prediction of X Individuals

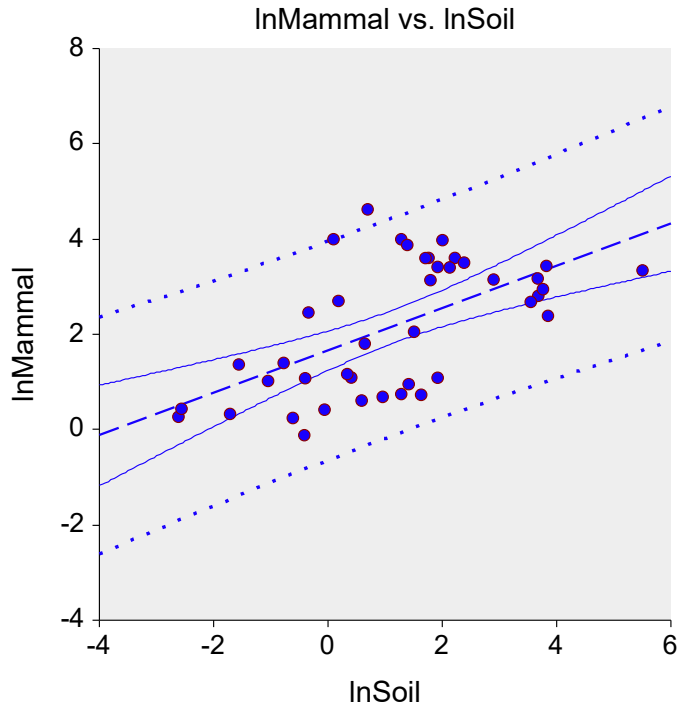
Row	lnInvert (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	3.4078	5.5013	3.6136	1.8876	0.1673	7.5114
11	3.0057	1.7918	2.8914	-1.0996	-0.5799	6.6811
12	2.4849	3.8480	1.9561	1.8919	-1.5685	5.6269
13	2.2050	0.1823	1.4534	-1.2711	-2.1098	5.0703
14	2.7912	3.6788	2.5061	1.1727	-0.9842	6.2440
15	2.4069	1.4110	1.8161	-0.4051	-1.7185	5.4712
16	0.4762	-0.3425	-1.6513	1.3088	-5.6084	1.7878
17	0.8587	1.6292	-0.9645	2.5937	-4.8119	2.4914
18	0.4187	-1.0498	-1.7546	0.7047	-5.7292	1.6830
19	0.6780	1.2809	-1.2888	2.5698	-5.1865	2.1575
20	1.5041	0.9555	0.1947	0.7609	-3.4964	3.7075
21	0.2776	-0.4155	-2.0079	1.5924	-6.0268	1.4272
22	3.5439	3.8199	3.8579	-0.0380	0.4168	7.7954
23	2.1713	1.5041	1.3930	0.1111	-2.1754	5.0039
24	3.1987	1.7579	3.2380	-1.4801	-0.2196	7.0779
25	3.2581	1.9169	3.3447	-1.4278	-0.1093	7.2007
26	3.9853	2.2192	4.6506	-2.4314	1.2163	8.7273
27	4.1320	2.0015	4.9141	-2.9126	1.4786	9.0405
28	3.4689	2.3795	3.7232	-1.3437	0.2794	7.6386
29	3.9140	1.2809	4.5227	-3.2417	1.0884	8.5758
30	3.2809	2.8959	3.3857	-0.4898	-0.0671	7.2479
31	2.7850	3.7589	2.4951	1.2638	-0.9959	6.2315
32	2.1342	0.6419	1.3262	-0.6844	-2.2479	4.9306
33	3.3742	1.3863	3.5531	-2.1669	0.1052	7.4414
34	1.6715	-0.7765	0.4953	-1.2718	-3.1612	4.0290
35	0.8198	0.4055	-1.0343	1.4397	-4.8923	2.4193
36	0.5188	0.5878	-1.5748	2.1626	-5.5191	1.8655
37	1.2296	1.9169	-0.2982	2.2151	-4.0513	3.1860
38	1.4839	0.3365	0.1584	0.1781	-3.5370	3.6689
39	0.2700	-0.4005	-2.0216	1.6211	-6.0429	1.4134
40	1.9573	-0.0619	1.0085	-1.0704	-2.5948	4.5836
41	0.0862	-1.7148	-2.3518	0.6370	-6.4331	1.0826
42	-0.0305	-1.5606	-2.5612	1.0006	-6.6821	0.8740
43	0.1044	-0.6162	-2.3191	1.7029	-6.3944	1.1152
44	0.0677	-2.6173	-2.3850	-0.2323	-6.4726	1.0494
45	-0.7985	-2.5639	-3.9406	1.3766	-8.3471	-0.4736
46	3.0204	2.1282	2.9179	-0.7896	-0.5523	6.7113
47	3.3776	0.6931	3.5593	-2.8661	0.1115	7.4485
48	2.9232	0.0953	2.7432	-2.6479	-0.7350	6.5125
49	3.3214	3.6687	3.4584	0.2102	0.0079	7.3319
50	2.6101	3.5467	2.1809	1.3658	-1.3287	5.8781
51	3.4012	1.7047	3.6017	-1.8969	0.1550	7.4976

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnMammal	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.6555	Rows Prediction Only	0
Slope	0.4446	Sum of Frequencies	42
R-Squared	0.3512	Sum of Weights	42.0000
Correlation	0.5926	Coefficient of Variation	0.5142
Mean Square Error	1.247638	Square Root of MSE	1.116977

Linear Regression Report

Y = lnMammal X = lnSoil

Summary Statement

The equation of the straight line relating lnMammal and lnSoil is estimated as: lnMammal = (1.6555) + (0.4446) lnSoil using the 42 observations in this dataset. The y-intercept, the estimated value of lnMammal when lnSoil is zero, is 1.6555 with a standard error of 0.2050. The slope, the estimated change in lnMammal per unit change in lnSoil, is 0.4446 with a standard error of 0.0956. The value of R-Squared, the proportion of the variation in lnMammal that can be accounted for by variation in lnSoil, is 0.3512. The correlation between lnMammal and lnSoil is 0.5926.

A significance test that the slope is zero resulted in a t-value of 4.6529. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.4446. The lower limit of the 95% confidence interval for the slope is 0.2515 and the upper limit is 0.6377. The estimated intercept is 1.6555. The lower limit of the 95% confidence interval for the intercept is 1.2412 and the upper limit is 2.0699.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnMammal	lnSoil
Count	42	42
Mean	2.1722	1.1620
Standard Deviation	1.3697	1.8255
Minimum	-0.1165	-2.6173
Maximum	4.6240	5.5013

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.6555	0.4446
Lower 95% Confidence Limit	1.2412	0.2515
Upper 95% Confidence Limit	2.0699	0.6377
Standard Error	0.2050	0.0956
Standardized Coefficient	0.0000	0.5926
T Value	8.0747	4.6529
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	0.9950
Regression of Y on X	1.6555	0.4446
Inverse Regression from X on Y	0.7009	1.2661
Orthogonal Regression of Y and X	1.4485	0.6228

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.65552632707018) + (0.444618320809551) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.6555	0.9000	1.3312	1.9533
Bootstrap Mean	1.6625	0.9500	1.2607	2.0067
Bias (BM - OV)	0.0070	0.9900	1.0994	2.1230
Bias Corrected	1.6485			
Standard Error	0.1922			
Slope				
Original Value	0.4446	0.9000	0.3343	0.5414
Bootstrap Mean	0.4483	0.9500	0.3086	0.5590
Bias (BM - OV)	0.0037	0.9900	0.2444	0.5998
Bias Corrected	0.4410			
Standard Error	0.0633			
Correlation				
Original Value	0.5926	0.9000	0.4720	0.7368
Bootstrap Mean	0.5914	0.9500	0.4509	0.7693
Bias (BM - OV)	-0.0012	0.9900	0.4198	0.8360
Bias Corrected	0.5938			
Standard Error	0.0803			
R-Squared				
Original Value	0.3512	0.9000	0.1938	0.5013
Bootstrap Mean	0.3562	0.9500	0.1632	0.5294
Bias (BM - OV)	0.0050	0.9900	0.1166	0.5804
Bias Corrected	0.3462			
Standard Error	0.0926			
Standard Error of Estimate				
Original Value	1.1170	0.9000	0.9689	1.3131
Bootstrap Mean	1.0943	0.9500	0.9366	1.3527
Bias (BM - OV)	-0.0226	0.9900	0.8607	1.4137
Bias Corrected	1.1396			
Standard Error	0.1051			
Orthogonal Intercept				
Original Value	1.4485	0.9000	1.1453	1.8038
Bootstrap Mean	1.4329	0.9500	1.0876	1.8830
Bias (BM - OV)	-0.0156	0.9900	0.9658	2.1195
Bias Corrected	1.4641			
Standard Error	0.2058			
Orthogonal Slope				
Original Value	0.6228	0.9000	0.3600	0.7581
Bootstrap Mean	0.6482	0.9500	0.2871	0.7806
Bias (BM - OV)	0.0255	0.9900	0.0015	0.8130
Bias Corrected	0.5973			
Standard Error	0.1291			

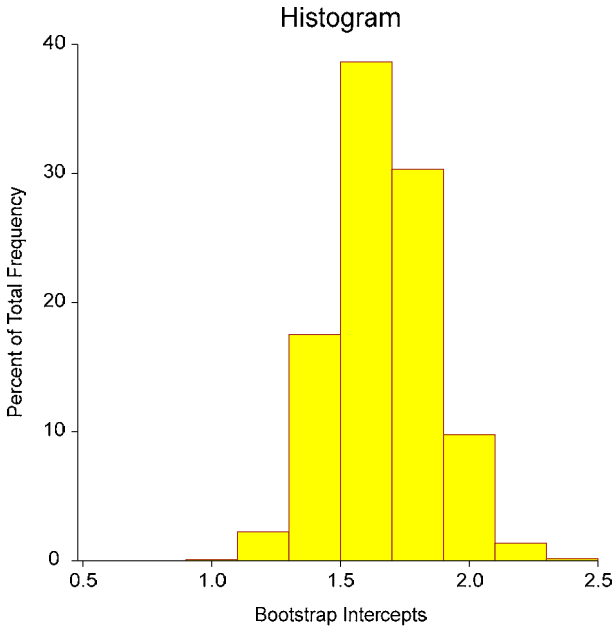
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

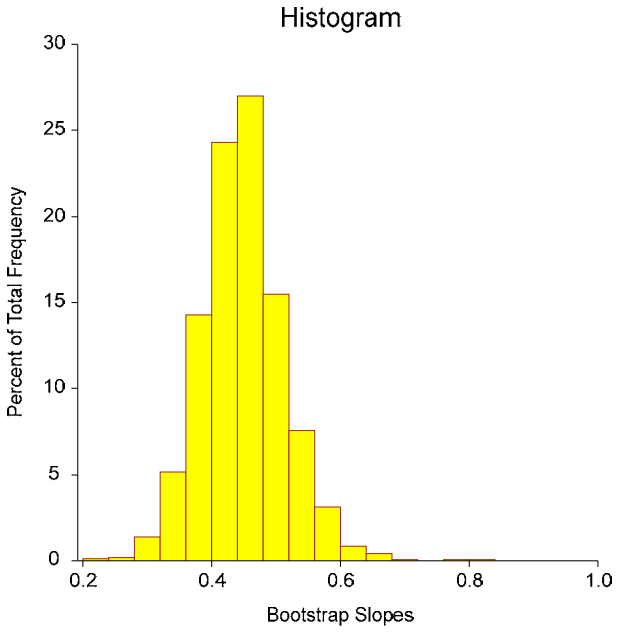
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

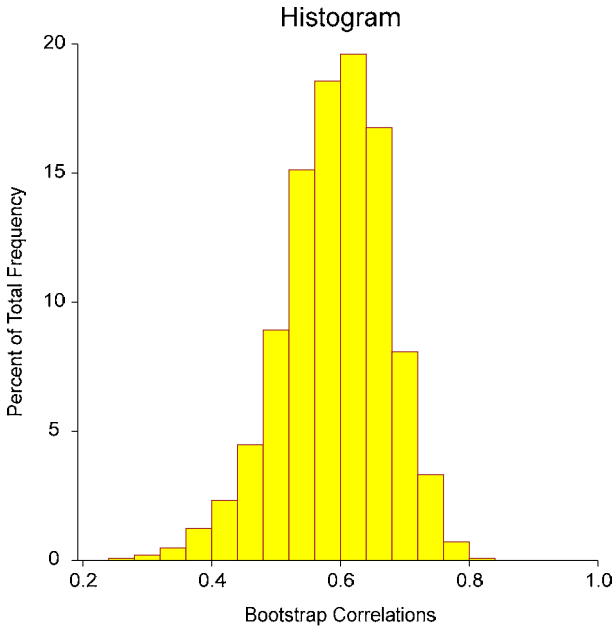
Linear Regression Report

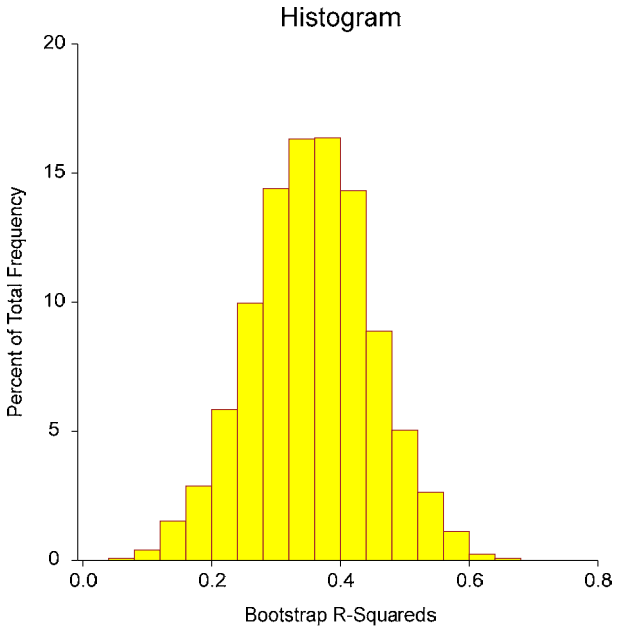
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Bootstrap Histograms Section



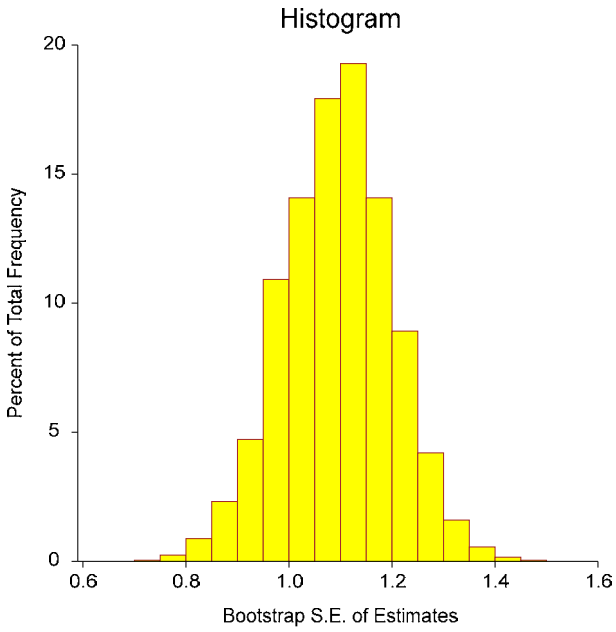


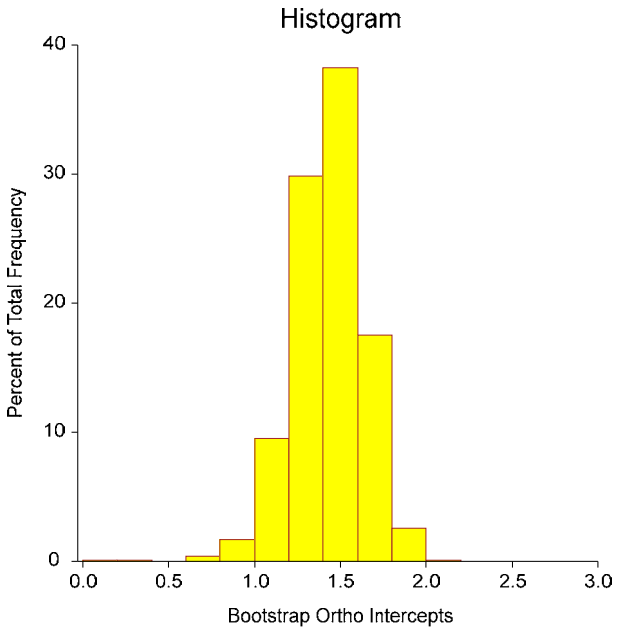


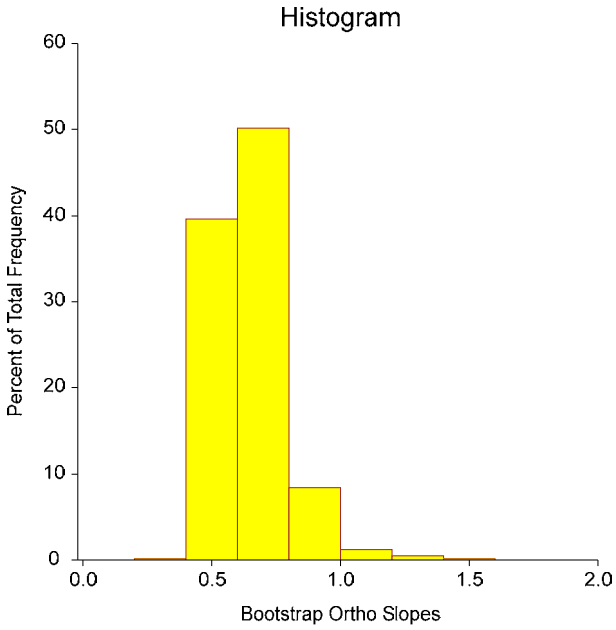


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.5926	0.3512	0.5727
Lower 95% Conf. Limit (r dist'n)	0.3480		
Upper 95% Conf. Limit (r dist'n)	0.7553		
Lower 95% Conf. Limit (Fisher's z)	0.3521		0.3254
Upper 95% Conf. Limit (Fisher's z)	0.7597		0.7467
Adjusted (Rbar)		0.3350	
T-Value for H0: Rho = 0	4.6529	4.6529	4.4186
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0001
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	198.1732	198.1732			
Slope	1	27.01089	27.01089	21.6496	0.0000	0.9950
Error	40	49.90554	1.247638			
Lack of Fit	38	41.92048	1.103171	0.2763	0.9636	
Pure Error	2	7.985058	3.992529			
Adj. Total	41	76.91644	1.876011			
Total	42	275.0897				

s = Square Root(1.247638) = 1.116977

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	48.80563	91.23199	0.03369226	-0.008504649
1	48.80563	193.3498	166.7659	-0.008504649	0.00731873
2 (Y'Y)			275.0897		
Determinant		5738.701			0.0001742555

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.04203575	-0.01061073
1	-0.01061073	0.009131129

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9609	0.159602	No
Anderson Darling	0.4614	0.259122	Yes
D'Agostino Skewness	1.2829	0.199516	No
D'Agostino Kurtosis	-0.6161	0.537834	Yes
D'Agostino Omnibus	2.0255	0.363222	Yes
Constant Residual Variance?			
Modified Levene Test	0.1298	0.720579	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	0.2763	0.963586	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

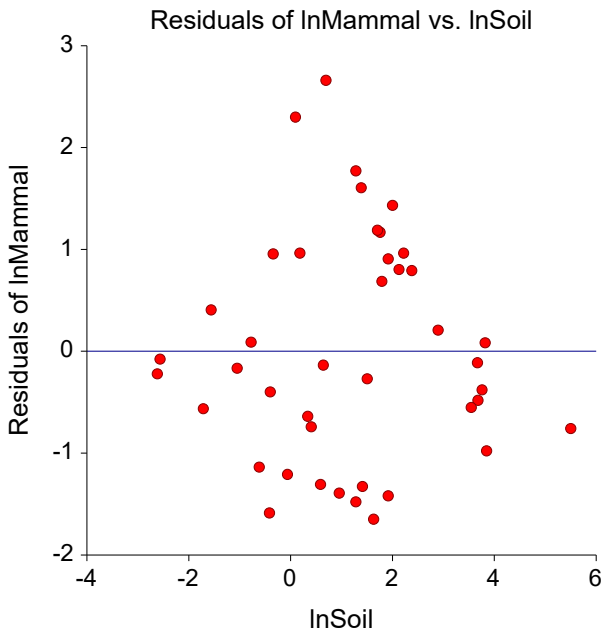
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

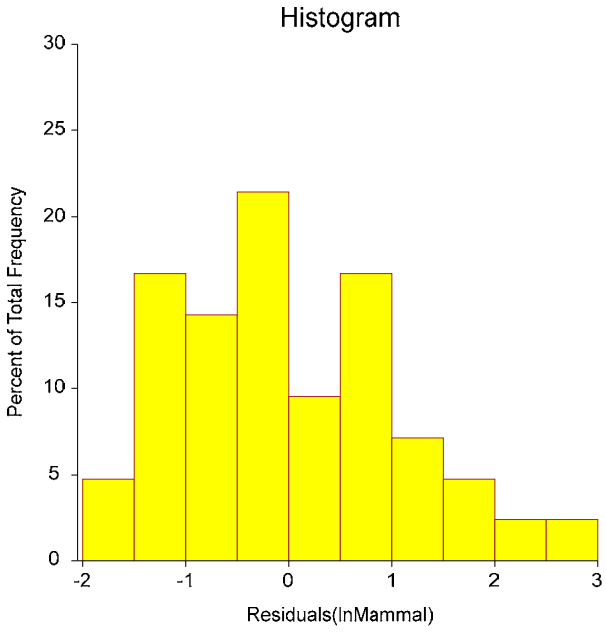
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

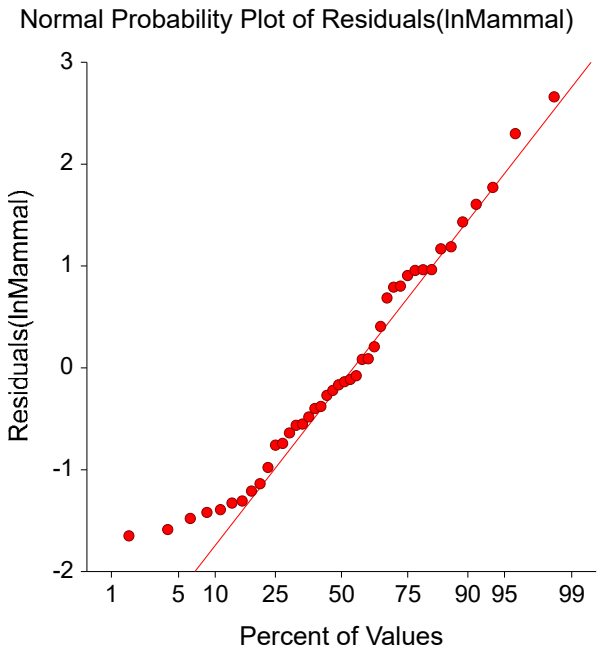
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Original Data Section

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual
10	5.5013	3.3429	4.1015	-0.7586
11	1.7918	3.1384	2.4522	0.6862
12	3.8480	2.3888	3.3664	-0.9777
13	0.1823	2.7007	1.7366	0.9641
14	3.6788	2.8094	3.2912	-0.4818
15	1.4110	0.9555	2.2829	-1.3274
16	-0.3425	2.4592	1.5032	0.9559
17	1.6292	0.7308	2.3799	-1.6492
18	-1.0498	1.0225	1.1888	-0.1663
19	1.2809	0.7467	2.2251	-1.4784
20	0.9555	0.6881	2.0804	-1.3922
21	-0.4155	-0.1165	1.4708	-1.5873
22	3.8199	3.4372	3.3539	0.0833
23	1.5041	2.0541	2.3243	-0.2701
24	1.7579	3.6055	2.4371	1.1684
25	1.9169	3.4144	2.5078	0.9066
26	2.2192	3.6055	2.6422	0.9633
27	2.0015	3.9782	2.5454	1.4328
28	2.3795	3.5056	2.7135	0.7920
29	1.2809	3.9964	2.2251	1.7713
30	2.8959	3.1506	2.9431	0.2075
31	3.7589	2.9481	3.3268	-0.3787
32	0.6419	1.8050	1.9409	-0.1359
33	1.3863	3.8774	2.2719	1.6055
34	-0.7765	1.3995	1.3103	0.0893
35	0.4055	1.0942	1.8358	-0.7416
36	0.5878	0.6098	1.9169	-1.3071
37	1.9169	1.0886	2.5078	-1.4193
38	0.3365	1.1663	1.8051	-0.6389
39	-0.4005	1.0784	1.4775	-0.3991
40	-0.0619	0.4187	1.6280	-1.2093
41	-1.7148	0.3293	0.8931	-0.5638
42	-1.5606	1.3678	0.9616	0.4062
43	-0.6162	0.2443	1.3816	-1.1373
44	-2.6173	0.2700	0.4918	-0.2218
45	-2.5639	0.4383	0.5155	-0.0773
46	2.1282	3.4045	2.6018	0.8027
47	0.6931	4.6240	1.9637	2.6603
48	0.0953	3.9973	1.6979	2.2994
49	3.6687	3.1739	3.2867	-0.1128
50	3.5467	2.6810	3.2325	-0.5515
51	1.7047	3.6019	2.4135	1.1884

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	5.5013	3.3429	4.1015	0.4490	3.1939	5.0090
11	1.7918	3.1384	2.4522	0.1826	2.0832	2.8211
12	3.8480	2.3888	3.3664	0.3092	2.7416	3.9913
13	0.1823	2.7007	1.7366	0.1961	1.3402	2.1330
14	3.6788	2.8094	3.2912	0.2959	2.6932	3.8892
15	1.4110	0.9555	2.2829	0.1740	1.9312	2.6345
16	-0.3425	2.4592	1.5032	0.2244	1.0496	1.9569
17	1.6292	0.7308	2.3799	0.1780	2.0201	2.7398
18	-1.0498	1.0225	1.1888	0.2727	0.6376	1.7400
19	1.2809	0.7467	2.2251	0.1727	1.8760	2.5741
20	0.9555	0.6881	2.0804	0.1735	1.7297	2.4310
21	-0.4155	-0.1165	1.4708	0.2290	1.0080	1.9336
22	3.8199	3.4372	3.3539	0.3069	2.7336	3.9743
23	1.5041	2.0541	2.3243	0.1754	1.9697	2.6788
24	1.7579	3.6055	2.4371	0.1815	2.0702	2.8040
25	1.9169	3.4144	2.5078	0.1868	2.1302	2.8854
26	2.2192	3.6055	2.6422	0.1998	2.2385	3.0460
27	2.0015	3.9782	2.5454	0.1901	2.1612	2.9296
28	2.3795	3.5056	2.7135	0.2079	2.2932	3.1338
29	1.2809	3.9964	2.2251	0.1727	1.8760	2.5741
30	2.8959	3.1506	2.9431	0.2391	2.4599	3.4263
31	3.7589	2.9481	3.3268	0.3021	2.7162	3.9374
32	0.6419	1.8050	1.9409	0.1794	1.5784	2.3034
33	1.3863	3.8774	2.2719	0.1737	1.9209	2.6229
34	-0.7765	1.3995	1.3103	0.2530	0.7989	1.8216
35	0.4055	1.0942	1.8358	0.1869	1.4581	2.2135
36	0.5878	0.6098	1.9169	0.1809	1.5513	2.2824
37	1.9169	1.0886	2.5078	0.1868	2.1302	2.8854
38	0.3365	1.1663	1.8051	0.1895	1.4220	2.1882
39	-0.4005	1.0784	1.4775	0.2280	1.0166	1.9383
40	-0.0619	0.4187	1.6280	0.2083	1.2071	2.0490
41	-1.7148	0.3293	0.8931	0.3245	0.2373	1.5489
42	-1.5606	1.3678	0.9616	0.3121	0.3309	1.5924
43	-0.6162	0.2443	1.3816	0.2420	0.8924	1.8707
44	-2.6173	0.2700	0.4918	0.4002	-0.3169	1.3006
45	-2.5639	0.4383	0.5155	0.3956	-0.2839	1.3150
46	2.1282	3.4045	2.6018	0.1955	2.2066	2.9969
47	0.6931	4.6240	1.9637	0.1781	1.6038	2.3236
48	0.0953	3.9973	1.6979	0.2002	1.2932	2.1026
49	3.6687	3.1739	3.2867	0.2951	2.6903	3.8831
50	3.5467	2.6810	3.2325	0.2857	2.6550	3.8099
51	1.7047	3.6019	2.4135	0.1800	2.0497	2.7773

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	5.5013	3.3429	4.1015	1.2039	1.6684	6.5346
11	1.7918	3.1384	2.4522	1.1318	0.1647	4.7396
12	3.8480	2.3888	3.3664	1.1590	1.0241	5.7088
13	0.1823	2.7007	1.7366	1.1341	-0.5554	4.0286
14	3.6788	2.8094	3.2912	1.1555	0.9558	5.6266
15	1.4110	0.9555	2.2829	1.1304	-0.0018	4.5676
16	-0.3425	2.4592	1.5032	1.1393	-0.7994	3.8059
17	1.6292	0.7308	2.3799	1.1311	0.0939	4.6659
18	-1.0498	1.0225	1.1888	1.1498	-1.1351	3.5126
19	1.2809	0.7467	2.2251	1.1303	-0.0593	4.5094
20	0.9555	0.6881	2.0804	1.1304	-0.2042	4.3649
21	-0.4155	-0.1165	1.4708	1.1402	-0.8337	3.7752
22	3.8199	3.4372	3.3539	1.1584	1.0127	5.6951
23	1.5041	2.0541	2.3243	1.1307	0.0391	4.6094
24	1.7579	3.6055	2.4371	1.1316	0.1500	4.7242
25	1.9169	3.4144	2.5078	1.1325	0.2190	4.7967
26	2.2192	3.6055	2.6422	1.1347	0.3489	4.9355
27	2.0015	3.9782	2.5454	1.1330	0.2555	4.8354
28	2.3795	3.5056	2.7135	1.1362	0.4172	5.0098
29	1.2809	3.9964	2.2251	1.1303	-0.0593	4.5094
30	2.8959	3.1506	2.9431	1.1423	0.6345	5.2517
31	3.7589	2.9481	3.3268	1.1571	0.9882	5.6654
32	0.6419	1.8050	1.9409	1.1313	-0.3455	4.2273
33	1.3863	3.8774	2.2719	1.1304	-0.0127	4.5565
34	-0.7765	1.3995	1.3103	1.1453	-1.0044	3.6250
35	0.4055	1.0942	1.8358	1.1325	-0.4531	4.1247
36	0.5878	0.6098	1.9169	1.1315	-0.3700	4.2038
37	1.9169	1.0886	2.5078	1.1325	0.2190	4.7967
38	0.3365	1.1663	1.8051	1.1329	-0.4846	4.0949
39	-0.4005	1.0784	1.4775	1.1400	-0.8266	3.7815
40	-0.0619	0.4187	1.6280	1.1362	-0.6684	3.9244
41	-1.7148	0.3293	0.8931	1.1631	-1.4577	3.2439
42	-1.5606	1.3678	0.9616	1.1598	-1.3823	3.3056
43	-0.6162	0.2443	1.3816	1.1429	-0.9283	3.6914
44	-2.6173	0.2700	0.4918	1.1865	-1.9062	2.8898
45	-2.5639	0.4383	0.5155	1.1850	-1.8793	2.9104
46	2.1282	3.4045	2.6018	1.1340	0.3100	4.8936
47	0.6931	4.6240	1.9637	1.1311	-0.3223	4.2497
48	0.0953	3.9973	1.6979	1.1348	-0.5956	3.9914
49	3.6687	3.1739	3.2867	1.1553	0.9517	5.6216
50	3.5467	2.6810	3.2325	1.1529	0.9023	5.5627
51	1.7047	3.6019	2.4135	1.1314	0.1269	4.7001

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	5.5013	3.3429	4.1015	0.4490	2.8233	5.3796
11	1.7918	3.1384	2.4522	0.1826	1.9325	2.9718
12	3.8480	2.3888	3.3664	0.3092	2.4864	4.2464
13	0.1823	2.7007	1.7366	0.1961	1.1783	2.2949
14	3.6788	2.8094	3.2912	0.2959	2.4490	4.1334
15	1.4110	0.9555	2.2829	0.1740	1.7876	2.7781
16	-0.3425	2.4592	1.5032	0.2244	0.8644	2.1421
17	1.6292	0.7308	2.3799	0.1780	1.8731	2.8867
18	-1.0498	1.0225	1.1888	0.2727	0.4125	1.9650
19	1.2809	0.7467	2.2251	0.1727	1.7334	2.7167
20	0.9555	0.6881	2.0804	0.1735	1.5866	2.5742
21	-0.4155	-0.1165	1.4708	0.2290	0.8190	2.1225
22	3.8199	3.4372	3.3539	0.3069	2.4803	4.2276
23	1.5041	2.0541	2.3243	0.1754	1.8249	2.8236
24	1.7579	3.6055	2.4371	0.1815	1.9204	2.9538
25	1.9169	3.4144	2.5078	0.1868	1.9760	3.0396
26	2.2192	3.6055	2.6422	0.1998	2.0736	3.2109
27	2.0015	3.9782	2.5454	0.1901	2.0043	3.0865
28	2.3795	3.5056	2.7135	0.2079	2.1216	3.3054
29	1.2809	3.9964	2.2251	0.1727	1.7334	2.7167
30	2.8959	3.1506	2.9431	0.2391	2.2626	3.6236
31	3.7589	2.9481	3.3268	0.3021	2.4668	4.1868
32	0.6419	1.8050	1.9409	0.1794	1.4303	2.4515
33	1.3863	3.8774	2.2719	0.1737	1.7775	2.7663
34	-0.7765	1.3995	1.3103	0.2530	0.5901	2.0305
35	0.4055	1.0942	1.8358	0.1869	1.3038	2.3678
36	0.5878	0.6098	1.9169	0.1809	1.4020	2.4317
37	1.9169	1.0886	2.5078	0.1868	1.9760	3.0396
38	0.3365	1.1663	1.8051	0.1895	1.2656	2.3447
39	-0.4005	1.0784	1.4775	0.2280	0.8284	2.1265
40	-0.0619	0.4187	1.6280	0.2083	1.0351	2.2209
41	-1.7148	0.3293	0.8931	0.3245	-0.0305	1.8166
42	-1.5606	1.3678	0.9616	0.3121	0.0733	1.8499
43	-0.6162	0.2443	1.3816	0.2420	0.6926	2.0705
44	-2.6173	0.2700	0.4918	0.4002	-0.6472	1.6308
45	-2.5639	0.4383	0.5155	0.3956	-0.6104	1.6415
46	2.1282	3.4045	2.6018	0.1955	2.0452	3.1583
47	0.6931	4.6240	1.9637	0.1781	1.4568	2.4706
48	0.0953	3.9973	1.6979	0.2002	1.1279	2.2679
49	3.6687	3.1739	3.2867	0.2951	2.4467	4.1266
50	3.5467	2.6810	3.2325	0.2857	2.4192	4.0457
51	1.7047	3.6019	2.4135	0.1800	1.9012	2.9258

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Section

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	5.5013	3.3429	4.1015	-0.7586	-0.7418	22.6939
11	1.7918	3.1384	2.4522	0.6862	0.6227	21.8651
12	3.8480	2.3888	3.3664	-0.9777	-0.9109	40.9276
13	0.1823	2.7007	1.7366	0.9641	0.8768	35.6983
14	3.6788	2.8094	3.2912	-0.4818	-0.4473	17.1495
15	1.4110	0.9555	2.2829	-1.3274	-1.2030	138.9168
16	-0.3425	2.4592	1.5032	0.9559	0.8736	38.8715
17	1.6292	0.7308	2.3799	-1.6492	-1.4956	225.6751
18	-1.0498	1.0225	1.1888	-0.1663	-0.1535	16.2654
19	1.2809	0.7467	2.2251	-1.4784	-1.3397	197.9897
20	0.9555	0.6881	2.0804	-1.3922	-1.2617	202.3194
21	-0.4155	-0.1165	1.4708	-1.5873	-1.4519	1362.1062
22	3.8199	3.4372	3.3539	0.0833	0.0775	2.4229
23	1.5041	2.0541	2.3243	-0.2701	-0.2449	13.1513
24	1.7579	3.6055	2.4371	1.1684	1.0601	32.4059
25	1.9169	3.4144	2.5078	0.9066	0.8233	26.5524
26	2.2192	3.6055	2.6422	0.9633	0.8765	26.7168
27	2.0015	3.9782	2.5454	1.4328	1.3018	36.0165
28	2.3795	3.5056	2.7135	0.7920	0.7217	22.5939
29	1.2809	3.9964	2.2251	1.7713	1.6051	44.3231
30	2.8959	3.1506	2.9431	0.2075	0.1902	6.5859
31	3.7589	2.9481	3.3268	-0.3787	-0.3521	12.8446
32	0.6419	1.8050	1.9409	-0.1359	-0.1233	7.5292
33	1.3863	3.8774	2.2719	1.6055	1.4551	41.4071
34	-0.7765	1.3995	1.3103	0.0893	0.0821	6.3787
35	0.4055	1.0942	1.8358	-0.7416	-0.6735	67.7823
36	0.5878	0.6098	1.9169	-1.3071	-1.1859	214.3613
37	1.9169	1.0886	2.5078	-1.4193	-1.2888	130.3797
38	0.3365	1.1663	1.8051	-0.6389	-0.5804	54.7778
39	-0.4005	1.0784	1.4775	-0.3991	-0.3650	37.0042
40	-0.0619	0.4187	1.6280	-1.2093	-1.1020	288.8166
41	-1.7148	0.3293	0.8931	-0.5638	-0.5275	171.2072
42	-1.5606	1.3678	0.9616	0.4062	0.3787	29.6944
43	-0.6162	0.2443	1.3816	-1.1373	-1.0430	465.6272
44	-2.6173	0.2700	0.4918	-0.2218	-0.2127	82.1405
45	-2.5639	0.4383	0.5155	-0.0773	-0.0740	17.6364
46	2.1282	3.4045	2.6018	0.8027	0.7299	23.5789
47	0.6931	4.6240	1.9637	2.6603	2.4125	57.5321
48	0.0953	3.9973	1.6979	2.2994	2.0925	57.5236
49	3.6687	3.1739	3.2867	-0.1128	-0.1047	3.5543
50	3.5467	2.6810	3.2325	-0.5515	-0.5107	20.5687
51	1.7047	3.6019	2.4135	1.1884	1.0780	32.9934

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	5.5013	-0.7586	*-0.7375	0.1616	0.0530	1.2620
11	1.7918	0.6862	0.6179	0.0267	0.0053	1.2672
12	3.8480	-0.9777	-0.9089	0.0766	0.0344	1.2531
13	0.1823	0.9641	0.8742	0.0308	0.0122	1.2550
14	3.6788	-0.4818	-0.4428	0.0702	0.0075	1.2732
15	1.4110	-1.3274	-1.2100	0.0243	0.0180	1.2333
16	-0.3425	0.9559	0.8710	0.0404	0.0161	1.2552
17	1.6292	-1.6492	-1.5199	0.0254	0.0292	1.2081
18	-1.0498	-0.1663	-0.1516	0.0596	0.0007	1.2789
19	1.2809	-1.4784	-1.3535	0.0239	0.0220	1.2222
20	0.9555	-1.3922	-1.2714	0.0241	0.0197	1.2287
21	-0.4155	-1.5873	-1.4730	0.0420	0.0462	1.2122
22	3.8199	0.0833	0.0766	0.0755	0.0002	1.2794
23	1.5041	-0.2701	-0.2420	0.0247	0.0008	1.2777
24	1.7579	1.1684	1.0618	0.0264	0.0152	1.2437
25	1.9169	0.9066	0.8199	0.0280	0.0098	1.2579
26	2.2192	0.9633	0.8739	0.0320	0.0127	1.2551
27	2.0015	1.4328	1.3135	0.0290	0.0253	1.2254
28	2.3795	0.7920	0.7173	0.0347	0.0094	1.2630
29	1.2809	1.7713	1.6386	0.0239	0.0316	1.1972
30	2.8959	0.2075	0.1879	0.0458	0.0009	1.2785
31	3.7589	-0.3787	-0.3483	0.0732	0.0049	1.2757
32	0.6419	-0.1359	-0.1217	0.0258	0.0002	1.2791
33	1.3863	1.6055	1.4764	0.0242	0.0262	1.2119
34	-0.7765	0.0893	0.0810	0.0513	0.0002	1.2794
35	0.4055	-0.7416	-0.6688	0.0280	0.0065	1.2651
36	0.5878	-1.3071	-1.1921	0.0262	0.0189	1.2346
37	1.9169	-1.4193	-1.2998	0.0280	0.0239	1.2265
38	0.3365	-0.6389	-0.5755	0.0288	0.0050	1.2689
39	-0.4005	-0.3991	-0.3610	0.0417	0.0029	1.2754
40	-0.0619	-1.2093	-1.1050	0.0348	0.0219	1.2408
41	-1.7148	-0.5638	-0.5227	0.0844	0.0128	1.2707
42	-1.5606	0.4062	0.3746	0.0781	0.0061	1.2750
43	-0.6162	-1.1373	-1.0442	0.0470	0.0268	1.2448
44	-2.6173	-0.2218	*-0.2101	0.1283	0.0033	1.2782
45	-2.5639	-0.0773	*-0.0731	0.1254	0.0004	1.2795
46	2.1282	0.8027	0.7256	0.0306	0.0084	1.2626
47	0.6931	2.6603	*2.5770	0.0254	0.0759	1.0934
48	0.0953	2.2994	*2.1895	0.0321	0.0727	1.1396
49	3.6687	-0.1128	-0.1034	0.0698	0.0004	1.2793
50	3.5467	-0.5515	-0.5059	0.0654	0.0091	1.2713
51	1.7047	1.1884	1.0803	0.0260	0.0155	1.2425

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.7375	-0.3238	0.0530	* 1.2204	0.0575	-0.2990
11	0.6179	0.1024	0.0053	1.0600	0.0630	0.0337
12	-0.9089	-0.2618	0.0344	1.0924	-0.0050	-0.2173
13	0.8742	0.1559	0.0122	1.0441	0.1555	-0.0744
14	-0.4428	-0.1216	0.0075	1.1200	-0.0060	-0.0989
15	-1.2100	-0.1908	0.0180	1.0015	-0.1448	-0.0261
16	0.8710	0.1787	0.0161	1.0548	0.1773	-0.1144
17	-1.5199	-0.2454	0.0292	0.9620	-0.1664	-0.0615
18	-0.1516	-0.0382	0.0007	1.1173	-0.0363	0.0296
19	-1.3535	-0.2119	0.0220	0.9832	-0.1702	-0.0139
20	-1.2714	-0.1999	0.0197	0.9938	-0.1793	0.0227
21	-1.4730	-0.3085	0.0462	0.9854	-0.3052	0.2031
22	0.0766	0.0219	0.0002	1.1375	0.0005	0.0181
23	-0.2420	-0.0385	0.0008	1.0753	-0.0279	-0.0072
24	1.0618	0.1749	0.0152	1.0206	0.1099	0.0549
25	0.8199	0.1391	0.0098	1.0459	0.0788	0.0537
26	0.8739	0.1589	0.0127	1.0454	0.0717	0.0803
27	1.3135	0.2269	0.0253	0.9935	0.1211	0.0957
28	0.7173	0.1359	0.0094	1.0615	0.0535	0.0760
29	1.6386	0.2565	0.0316	0.9434	0.2060	0.0169
30	0.1879	0.0412	0.0009	1.1005	0.0095	0.0285
31	-0.3483	-0.0978	0.0049	1.1280	-0.0034	-0.0804
32	-0.1217	-0.0198	0.0002	1.0790	-0.0190	0.0055
33	1.4764	0.2324	0.0262	0.9669	0.1783	0.0287
34	0.0810	0.0188	0.0002	1.1085	0.0183	-0.0138
35	-0.6688	-0.1135	0.0065	1.0578	-0.1118	0.0439
36	-1.1921	-0.1956	0.0189	1.0056	-0.1888	0.0593
37	-1.2998	-0.2205	0.0239	0.9942	-0.1249	-0.0851
38	-0.5755	-0.0991	0.0050	1.0650	-0.0981	0.0412
39	-0.3610	-0.0753	0.0029	1.0904	-0.0745	0.0493
40	-1.1050	-0.2097	0.0219	1.0247	-0.2097	0.1178
41	-0.5227	-0.1587	0.0128	1.1330	-0.1437	0.1344
42	0.3746	0.1090	0.0061	1.1328	0.0998	-0.0909
43	-1.0442	-0.2318	0.0268	1.0445	-0.2269	0.1627
44	-0.2101	-0.0806	0.0033	* 1.2041	-0.0686	0.0728
45	-0.0731	-0.0277	0.0004	* 1.2025	-0.0236	0.0249
46	0.7256	0.1290	0.0084	1.0565	0.0626	0.0609
47	* 2.5770	0.4162	0.0759	0.7881	0.3953	-0.1047
48	* 2.1895	0.3990	0.0727	0.8620	0.3987	-0.2031
49	-0.1034	-0.0283	0.0004	1.1302	-0.0015	-0.0230
50	-0.5059	-0.1339	0.0091	1.1110	-0.0101	-0.1068
51	1.0803	0.1764	0.0155	1.0181	0.1145	0.0508

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
10	5.5013	-0.7586	|||.....	-0.7418	||||.....	-0.7375	|||.....
11	1.7918	0.6862	|||.....	0.6227	|||.....	0.6179	|||.....
12	3.8480	-0.9777	|||||.....	-0.9109	|||||.....	-0.9089	|||||.....
13	0.1823	0.9641	|||||.....	0.8768	|||||.....	0.8742	||||.....
14	3.6788	-0.4818	||.....	-0.4473	||.....	-0.4428	||.....
15	1.4110	-1.3274	|||||||.....	-1.2030	|||||||.....	-1.2100	||||||.....
16	-0.3425	0.9559	|||||.....	0.8736	|||||.....	0.8710	||||.....
17	1.6292	-1.6492	||||||||.....	-1.4956	||||||||.....	-1.5199	|||||||.....
18	-1.0498	-0.1663	|.....	-0.1535	|.....	-0.1516	|.....
19	1.2809	-1.4784	|||||||.....	-1.3397	|||||||.....	-1.3535	||||||.....
20	0.9555	-1.3922	||||||.....	-1.2617	||||||.....	-1.2714	||||||.....
21	-0.4155	-1.5873	|||||||.....	-1.4519	|||||||.....	-1.4730	|||||||.....
22	3.8199	0.0833	|.....	0.0775	|.....	0.0766	|.....
23	1.5041	-0.2701	|.....	-0.2449	|.....	-0.2420	|.....
24	1.7579	1.1684	|||||.....	1.0601	|||||.....	1.0618	||||.....
25	1.9169	0.9066	||||.....	0.8233	||||.....	0.8199	||||.....
26	2.2192	0.9633	|||||.....	0.8765	|||||.....	0.8739	||||.....
27	2.0015	1.4328	||||||.....	1.3018	||||||.....	1.3135	||||||.....
28	2.3795	0.7920	||||.....	0.7217	||||.....	0.7173	|||.....
29	1.2809	1.7713	||||||||.....	1.6051	||||||||.....	1.6386	||||||||.....
30	2.8959	0.2075	|.....	0.1902	|.....	0.1879	|.....
31	3.7589	-0.3787	|.....	-0.3521	|.....	-0.3483	|.....
32	0.6419	-0.1359	|.....	-0.1233	|.....	-0.1217	|.....
33	1.3863	1.6055	|||||||.....	1.4551	|||||||.....	1.4764	|||||||.....
34	-0.7765	0.0893	|.....	0.0821	|.....	0.0810	|.....
35	0.4055	-0.7416	|||.....	-0.6735	|||.....	-0.6688	|||.....
36	0.5878	-1.3071	|||||||.....	-1.1859	|||||||.....	-1.1921	||||||.....
37	1.9169	-1.4193	|||||||.....	-1.2888	|||||||.....	-1.2998	|||||||.....
38	0.3365	-0.6389	|||.....	-0.5804	|||.....	-0.5755	|||.....
39	-0.4005	-0.3991	|.....	-0.3650	|.....	-0.3610	|.....
40	-0.0619	-1.2093	||||||.....	-1.1020	||||||.....	-1.1050	||||||.....
41	-1.7148	-0.5638	||.....	-0.5275	||.....	-0.5227	||.....
42	-1.5606	0.4062	|.....	0.3787	|.....	0.3746	|.....
43	-0.6162	-1.1373	||||||.....	-1.0430	||||||.....	-1.0442	|||||.....
44	-2.6173	-0.2218	|.....	-0.2127	|.....	-0.2101	|.....
45	-2.5639	-0.0773	|.....	-0.0740	|.....	-0.0731	|.....
46	2.1282	0.8027	||||.....	0.7299	||||.....	0.7256	|||.....
47	0.6931	2.6603	|||||||||||||||	2.4125	|||||||||||||||	* 2.5770	|||||||||||||||
48	0.0953	2.2994	|||||||||||...	2.0925	|||||||||||...	* 2.1895	|||||||||||...
49	3.6687	-0.1128	|.....	-0.1047	|.....	-0.1034	|.....
50	3.5467	-0.5515	||.....	-0.5107	||.....	-0.5059	||.....
51	1.7047	1.1884	||||||.....	1.0780	||||||.....	1.0803	||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
10	5.5013	-0.3238	||||||||||....	0.0530	|||||||||.....	-0.2990	|||||||||||||
11	1.7918	0.1024	|||.....	0.0053	|.....	0.0337	|.....
12	3.8480	-0.2618	||||||||.....	0.0344	||||||.....	-0.2173	|||||||||.....
13	0.1823	0.1559	|||||.....	0.0122	||.....	-0.0744	|||.....
14	3.6788	-0.1216	|||.....	0.0075	|.....	-0.0989	||||.....
15	1.4110	-0.1908	||||||.....	0.0180	|||.....	-0.0261	|.....
16	-0.3425	0.1787	||||||.....	0.0161	|||.....	-0.1144	|||||.....
17	1.6292	-0.2454	|||||||.....	0.0292	|||||.....	-0.0615	||.....
18	-1.0498	-0.0382	|.....	0.0007	|.....	0.0296	|.....
19	1.2809	-0.2119	||||||.....	0.0220	||||.....	-0.0139	|.....
20	0.9555	-0.1999	||||||.....	0.0197	|||.....	0.0227	|.....
21	-0.4155	-0.3085	|||||||||.....	0.0462	||||||||.....	0.2031	|||||||||.....
22	3.8199	0.0219	|.....	0.0002	|.....	0.0181	|.....
23	1.5041	-0.0385	|.....	0.0008	|.....	-0.0072	|.....
24	1.7579	0.1749	|||||.....	0.0152	||.....	0.0549	||.....
25	1.9169	0.1391	||||.....	0.0098	|.....	0.0537	||.....
26	2.2192	0.1589	|||||.....	0.0127	||.....	0.0803	|||.....
27	2.0015	0.2269	|||||||.....	0.0253	||||.....	0.0957	||||.....
28	2.3795	0.1359	||||.....	0.0094	|.....	0.0760	|||.....
29	1.2809	0.2565	|||||||.....	0.0316	||||||.....	0.0169	|.....
30	2.8959	0.0412	|.....	0.0009	|.....	0.0285	|.....
31	3.7589	-0.0978	||.....	0.0049	|.....	-0.0804	|||.....
32	0.6419	-0.0198	|.....	0.0002	|.....	0.0055	|.....
33	1.3863	0.2324	|||||||.....	0.0262	|||||.....	0.0287	|.....
34	-0.7765	0.0188	|.....	0.0002	|.....	-0.0138	|.....
35	0.4055	-0.1135	|||.....	0.0065	|.....	0.0439	|.....
36	0.5878	-0.1956	||||||.....	0.0189	|||.....	0.0593	||.....
37	1.9169	-0.2205	|||||||.....	0.0239	||||.....	-0.0851	||||.....
38	0.3365	-0.0991	|||.....	0.0050	|.....	0.0412	|.....
39	-0.4005	-0.0753	||.....	0.0029	|.....	0.0493	||.....
40	-0.0619	-0.2097	|||||||.....	0.0219	||||.....	0.1178	|||||.....
41	-1.7148	-0.1587	|||||.....	0.0128	||.....	0.1344	||||||.....
42	-1.5606	0.1090	|||.....	0.0061	|.....	-0.0909	||||.....
43	-0.6162	-0.2318	|||||||.....	0.0268	|||||.....	0.1627	|||||||.....
44	-2.6173	-0.0806	||.....	0.0033	|.....	0.0728	|||.....
45	-2.5639	-0.0277	|.....	0.0004	|.....	0.0249	|.....
46	2.1282	0.1290	||||.....	0.0084	|.....	0.0609	||.....
47	0.6931	0.4162	||||||||||||||	0.0759	||||||||||||||	-0.1047	|||||.....
48	0.0953	0.3990	|||||||||||||.	0.0727	|||||||||||||.	-0.2031	|||||||||.....
49	3.6687	-0.0283	|.....	0.0004	|.....	-0.0230	|.....
50	3.5467	-0.1339	||||.....	0.0091	|.....	-0.1068	|||||.....
51	1.7047	0.1764	|||||.....	0.0155	|||.....	0.0508	||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	5.5013	-0.7375	|||.....	0.0530	|||||||||.....	0.1616	||||||||||||||
11	1.7918	0.6179	|||.....	0.0053	|.....	0.0267	|.....
12	3.8480	-0.9089	|||||.....	0.0344	|||||.....	0.0766	|||||.....
13	0.1823	0.8742	||||.....	0.0122	||.....	0.0308	|.....
14	3.6788	-0.4428	||.....	0.0075	|.....	0.0702	|||||.....
15	1.4110	-1.2100	||||||.....	0.0180	|||.....	0.0243	|.....
16	-0.3425	0.8710	||||.....	0.0161	|||.....	0.0404	|.....
17	1.6292	-1.5199	|||||||.....	0.0292	|||||.....	0.0254	|.....
18	-1.0498	-0.1516	|.....	0.0007	|.....	0.0596	|||.....
19	1.2809	-1.3535	||||||.....	0.0220	||||.....	0.0239	|.....
20	0.9555	-1.2714	||||||.....	0.0197	|||.....	0.0241	|.....
21	-0.4155	-1.4730	|||||||.....	0.0462	||||||||.....	0.0420	|.....
22	3.8199	0.0766	|.....	0.0002	|.....	0.0755	|||||.....
23	1.5041	-0.2420	|.....	0.0008	|.....	0.0247	|.....
24	1.7579	1.0618	|||||.....	0.0152	||.....	0.0264	|.....
25	1.9169	0.8199	||||.....	0.0098	|.....	0.0280	|.....
26	2.2192	0.8739	||||.....	0.0127	||.....	0.0320	|.....
27	2.0015	1.3135	||||||.....	0.0253	||||.....	0.0290	|.....
28	2.3795	0.7173	|||.....	0.0094	|.....	0.0347	|.....
29	1.2809	1.6386	||||||||.....	0.0316	|||||.....	0.0239	|.....
30	2.8959	0.1879	|.....	0.0009	|.....	0.0458	||.....
31	3.7589	-0.3483	|.....	0.0049	|.....	0.0732	|||||.....
32	0.6419	-0.1217	|.....	0.0002	|.....	0.0258	|.....
33	1.3863	1.4764	|||||||.....	0.0262	|||||.....	0.0242	|.....
34	-0.7765	0.0810	|.....	0.0002	|.....	0.0513	||.....
35	0.4055	-0.6688	|||.....	0.0065	|.....	0.0280	|.....
36	0.5878	-1.1921	||||||.....	0.0189	|||.....	0.0262	|.....
37	1.9169	-1.2998	||||||.....	0.0239	||||.....	0.0280	|.....
38	0.3365	-0.5755	|||.....	0.0050	|.....	0.0288	|.....
39	-0.4005	-0.3610	|.....	0.0029	|.....	0.0417	|.....
40	-0.0619	-1.1050	||||||.....	0.0219	||||.....	0.0348	|.....
41	-1.7148	-0.5227	||.....	0.0128	||.....	0.0844	|||||.....
42	-1.5606	0.3746	|.....	0.0061	|.....	0.0781	|||||.....
43	-0.6162	-1.0442	|||||.....	0.0268	|||||.....	0.0470	||.....
44	-2.6173	-0.2101	|.....	0.0033	|.....	0.1283	||||||||||....
45	-2.5639	-0.0731	|.....	0.0004	|.....	0.1254	||||||||||....
46	2.1282	0.7256	|||.....	0.0084	|.....	0.0306	|.....
47	0.6931	* 2.5770	|||||||||||||||	0.0759	|||||||||||||||	0.0254	|.....
48	0.0953	* 2.1895	|||||||||||...	0.0727	|||||||||||||.	0.0321	|.....
49	3.6687	-0.1034	|.....	0.0004	|.....	0.0698	||||.....
50	3.5467	-0.5059	||.....	0.0091	|.....	0.0654	||||.....
51	1.7047	1.0803	||||||.....	0.0155	|||.....	0.0260	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Inverse Prediction of X Means

Row	lnMammal (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	3.3429	5.5013	3.7950	1.7062	2.7509	6.0637
11	3.1384	1.7918	3.3351	-1.5434	2.3879	5.2931
12	2.3888	3.8480	1.6491	2.1989	0.8544	2.6705
13	2.7007	0.1823	2.3507	-2.1684	1.5494	3.7049
14	2.8094	3.6788	2.5952	1.0836	1.7686	4.0884
15	0.9555	1.4110	-1.5744	2.9854	-3.9146	-0.5070
16	2.4592	-0.3425	1.8075	-2.1500	1.0216	2.8935
17	0.7308	1.6292	-2.0799	3.7091	-4.7752	-0.8924
18	1.0225	-1.0498	-1.4239	0.3740	-3.6602	-0.3902
19	0.7467	1.2809	-2.0441	3.3250	-4.7140	-0.8654
20	0.6881	0.9555	-2.1758	3.1313	-4.9394	-0.9646
21	-0.1165	-0.4155	-3.9856	3.5701	-8.0726	-2.2927
22	3.4372	3.8199	4.0072	-0.1873	2.9148	6.4230
23	2.0541	1.5041	0.8965	0.6076	-0.0466	1.7161
24	3.6055	1.7579	4.3857	-2.6279	3.2027	7.0681
25	3.4144	1.9169	3.9560	-2.0391	2.8754	6.3361
26	3.6055	2.2192	4.3857	-2.1665	3.2027	7.0681
27	3.9782	2.0015	5.2241	-3.2226	3.8265	8.5109
28	3.5056	2.3795	4.1609	-1.7814	3.0323	6.6844
29	3.9964	1.2809	5.2648	-3.9839	3.8564	8.5814
30	3.1506	2.8959	3.3626	-0.4667	2.4099	5.3388
31	2.9481	3.7589	2.9072	0.8517	2.0365	4.5895
32	1.8050	0.6419	0.3362	0.3057	-0.8316	1.1199
33	3.8774	1.3863	4.9973	-3.6110	3.6593	8.1192
34	1.3995	-0.7765	-0.5757	-0.2008	-2.2535	0.2938
35	1.0942	0.4055	-1.2626	1.6681	-3.3890	-0.2639
36	0.6098	0.5878	-2.3520	2.9398	-5.2420	-1.0965
37	1.0886	1.9169	-1.2752	3.1921	-3.4101	-0.2738
38	1.1663	0.3365	-1.1004	1.4369	-3.1177	-0.1353
39	1.0784	-0.4005	-1.2980	0.8975	-3.4484	-0.2917
40	0.4187	-0.0619	-2.7817	2.7199	-5.9824	-1.4153
41	0.3293	-1.7148	-2.9828	1.2680	-6.3302	-1.5633
42	1.3678	-1.5606	-0.6472	-0.9135	-2.3697	0.2339
43	0.2443	-0.6162	-3.1741	2.5579	-6.6616	-1.7034
44	0.2700	-2.6173	-3.1162	0.4989	-6.5611	-1.6610
45	0.4383	-2.5639	-2.7378	0.1738	-5.9065	-1.3829
46	3.4045	2.1282	3.9337	-1.8055	2.8582	6.2983
47	4.6240	0.6931	6.6764	-5.9833	4.8811	11.0366
48	3.9973	0.0953	5.2669	-5.1716	3.8580	8.5850
49	3.1739	3.6687	3.4150	0.2537	2.4518	5.4260
50	2.6810	3.5467	2.3065	1.2403	1.5087	3.6365
51	3.6019	1.7047	4.3776	-2.6728	3.1966	7.0541

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Inverse Prediction of X Individuals

Row	lnMammal (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	3.3429	5.5013	3.7950	1.7062	-1.4679	10.2826
11	3.1384	1.7918	3.3351	-1.5434	-1.9806	9.6616
12	2.3888	3.8480	1.6491	2.1989	-3.9472	7.4720
13	2.7007	0.1823	2.3507	-2.1684	-3.1119	8.3662
14	2.8094	3.6788	2.5952	1.0836	-2.8265	8.6835
15	0.9555	1.4110	-1.5744	2.9854	-8.0996	3.6780
16	2.4592	-0.3425	1.8075	-2.1500	-3.7565	7.6717
17	0.7308	1.6292	-2.0799	3.7091	-8.7957	3.1281
18	1.0225	-1.0498	-1.4239	0.3740	-7.8945	3.8440
19	0.7467	1.2809	-2.0441	3.3250	-8.7460	3.1666
20	0.6881	0.9555	-2.1758	3.1313	-8.9290	3.0250
21	-0.1165	-0.4155	-3.9856	3.5701	-11.5172	1.1519
22	3.4372	3.8199	4.0072	-0.1873	-1.2347	10.5724
23	2.0541	1.5041	0.8965	0.6076	-4.8707	6.5401
24	3.6055	1.7579	4.3857	-2.6279	-0.8236	11.0944
25	3.4144	1.9169	3.9560	-2.0391	-1.2908	10.5023
26	3.6055	2.2192	4.3857	-2.1665	-0.8236	11.0944
27	3.9782	2.0015	5.2241	-3.2226	0.0645	12.2729
28	3.5056	2.3795	4.1609	-1.7814	-1.0670	10.7836
29	3.9964	1.2809	5.2648	-3.9839	0.1070	12.3309
30	3.1506	2.8959	3.3626	-0.4667	-1.9497	9.6984
31	2.9481	3.7589	2.9072	0.8517	-2.4666	9.0927
32	1.8050	0.6419	0.3362	0.3057	-5.5766	5.8649
33	3.8774	1.3863	4.9973	-3.6110	-0.1727	11.9512
34	1.3995	-0.7765	-0.5757	-0.2008	-6.7589	4.7991
35	1.0942	0.4055	-1.2626	1.6681	-7.6759	4.0231
36	0.6098	0.5878	-2.3520	2.9398	-9.1752	2.8367
37	1.0886	1.9169	-1.2752	3.1921	-7.6929	4.0090
38	1.1663	0.3365	-1.1004	1.4369	-7.4574	4.2043
39	1.0784	-0.4005	-1.2980	0.8975	-7.7238	3.9836
40	0.4187	-0.0619	-2.7817	2.7199	-9.7808	2.3830
41	0.3293	-1.7148	-2.9828	1.2680	-10.0668	2.1734
42	1.3678	-1.5606	-0.6472	-0.9135	-6.8532	4.7174
43	0.2443	-0.6162	-3.1741	2.5579	-10.3405	1.9755
44	0.2700	-2.6173	-3.1162	0.4989	-10.2574	2.0353
45	0.4383	-2.5639	-2.7378	0.1738	-9.7185	2.4291
46	3.4045	2.1282	3.9337	-1.8055	-1.3152	10.4718
47	4.6240	0.6931	6.6764	-5.9833	1.5364	14.3812
48	3.9973	0.0953	5.2669	-5.1716	0.1091	12.3339
49	3.1739	3.6687	3.4150	0.2537	-1.8909	9.7687
50	2.6810	3.5467	2.3065	1.2403	-3.1639	8.3090
51	3.6019	1.7047	4.3776	-2.6728	-0.8324	11.0831

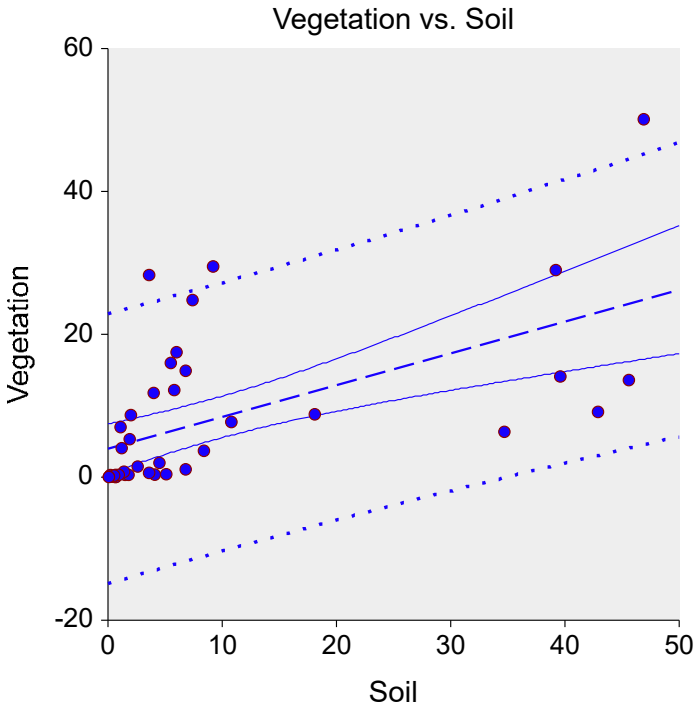
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Soil to Tissue Linear Regressions
No Transformation – APL10 Excluded

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Vegetation	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	3.9966	Rows Prediction Only	0
Slope	0.4457	Sum of Frequencies	41
R-Squared	0.3245	Sum of Weights	41.0000
Correlation	0.5697	Coefficient of Variation	1.1336
Mean Square Error	84.20187	Square Root of MSE	9.176158

Linear Regression Report

Y = Vegetation X = Soil

Summary Statement

The equation of the straight line relating Vegetation and Soil is estimated as: Vegetation = (3.9966) + (0.4457) Soil using the 41 observations in this dataset. The y-intercept, the estimated value of Vegetation when Soil is zero, is 3.9966 with a standard error of 1.7176. The slope, the estimated change in Vegetation per unit change in Soil, is 0.4457 with a standard error of 0.1030. The value of R-Squared, the proportion of the variation in Vegetation that can be accounted for by variation in Soil, is 0.3245. The correlation between Vegetation and Soil is 0.5697.

A significance test that the slope is zero resulted in a t-value of 4.3288. The significance level of this t-test is 0.0001. Since 0.0001 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.4457. The lower limit of the 95% confidence interval for the slope is 0.2375 and the upper limit is 0.6540. The estimated intercept is 3.9966. The lower limit of the 95% confidence interval for the intercept is 0.5225 and the upper limit is 7.4707.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Vegetation	Soil
Count	41	41
Mean	8.0949	9.1944
Standard Deviation	11.0246	14.0901
Minimum	0.0300	0.0730
Maximum	50.1000	46.9000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	3.9966	0.4457
Lower 95% Confidence Limit	0.5225	0.2375
Upper 95% Confidence Limit	7.4707	0.6540
Standard Error	1.7176	0.1030
Standardized Coefficient	0.0000	0.5697
T Value	2.3269	4.3288
Prob Level (T Test)	0.0253	0.0001
Prob Level (Randomization Test N =1000)		0.0030
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.6215	0.9881
Regression of Y on X	3.9966	0.4457
Inverse Regression from X on Y	-4.5332	1.3735
Orthogonal Regression of Y and X	2.0678	0.6555

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(3.99657676301078) + (0.44573932333225) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	3.9966	0.9000	1.4657	6.1541
Bootstrap Mean	4.0460	0.9500	0.9851	6.4960
Bias (BM - OV)	0.0494	0.9900	-0.0970	7.1531
Bias Corrected	3.9471			
Standard Error	1.4214			
Slope				
Original Value	0.4457	0.9000	0.1592	0.6881
Bootstrap Mean	0.4446	0.9500	0.1000	0.7107
Bias (BM - OV)	-0.0011	0.9900	-0.0933	0.7573
Bias Corrected	0.4469			
Standard Error	0.1638			
Correlation				
Original Value	0.5697	0.9000	0.3788	0.8323
Bootstrap Mean	0.5548	0.9500	0.3471	0.8837
Bias (BM - OV)	-0.0149	0.9900	0.2867	0.9467
Bias Corrected	0.5846			
Standard Error	0.1380			
R-Squared				
Original Value	0.3245	0.9000	0.0706	0.5548
Bootstrap Mean	0.3268	0.9500	0.0214	0.5837
Bias (BM - OV)	0.0023	0.9900	0.0000	0.6119
Bias Corrected	0.3222			
Standard Error	0.1483			
Standard Error of Estimate				
Original Value	9.1762	0.9000	7.5295	12.0055
Bootstrap Mean	8.6805	0.9500	7.2085	12.5424
Bias (BM - OV)	-0.4957	0.9900	6.5290	13.7257
Bias Corrected	9.6718			
Standard Error	1.3613			
Orthogonal Intercept				
Original Value	2.0678	0.9000	-0.5738	4.0871
Bootstrap Mean	2.1724	0.9500	-1.0539	4.4571
Bias (BM - OV)	0.1046	0.9900	-2.1255	6.0485
Bias Corrected	1.9632			
Standard Error	1.4859			
Orthogonal Slope				
Original Value	0.6555	0.9000	0.2223	1.0115
Bootstrap Mean	0.6679	0.9500	0.0939	1.0588
Bias (BM - OV)	0.0124	0.9900	-0.6052	1.1233
Bias Corrected	0.6432			
Standard Error	0.2886			

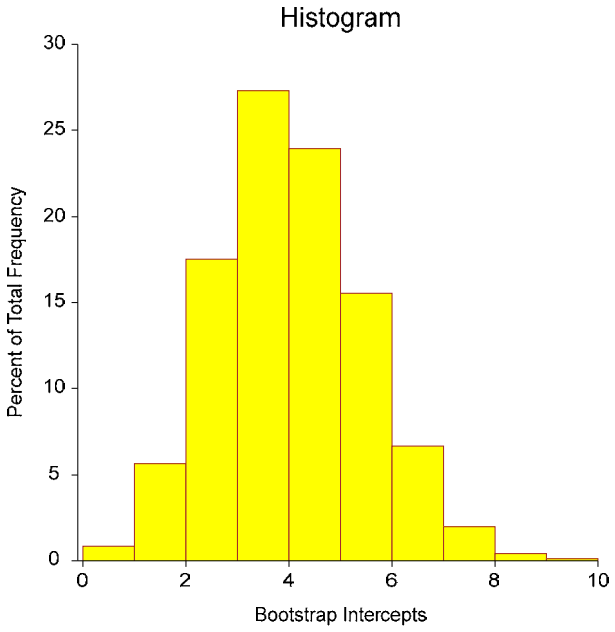
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

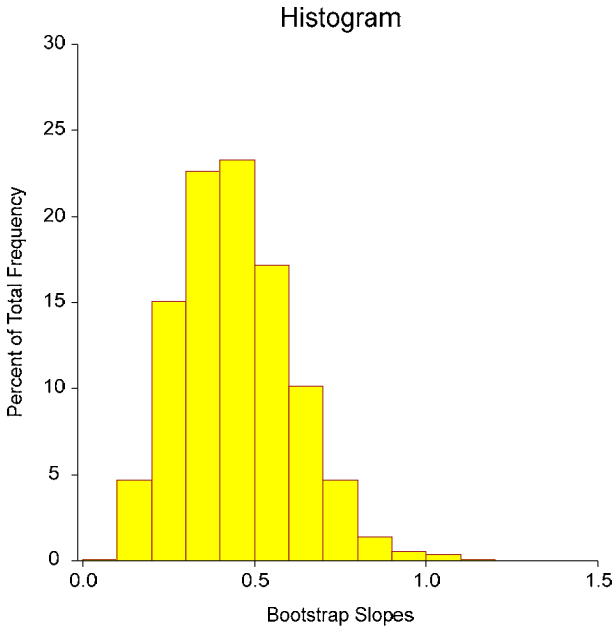
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

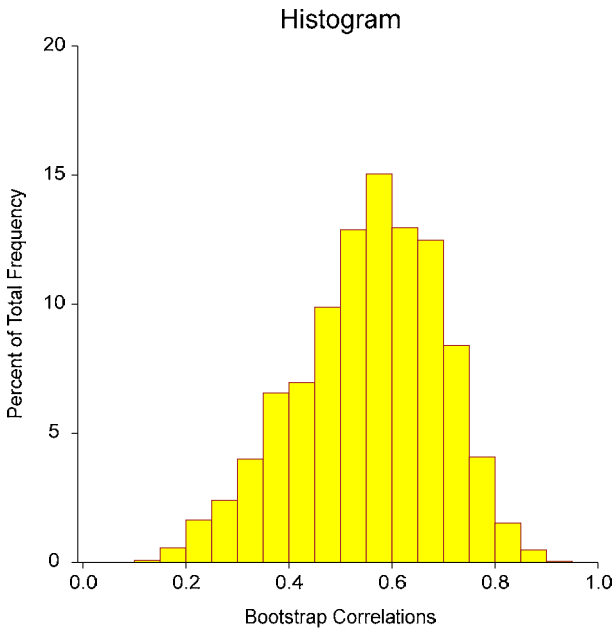
Linear Regression Report

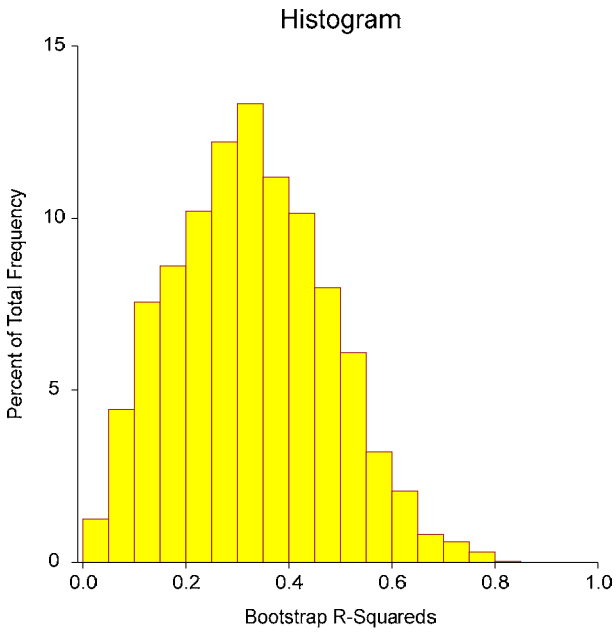
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Bootstrap Histograms Section



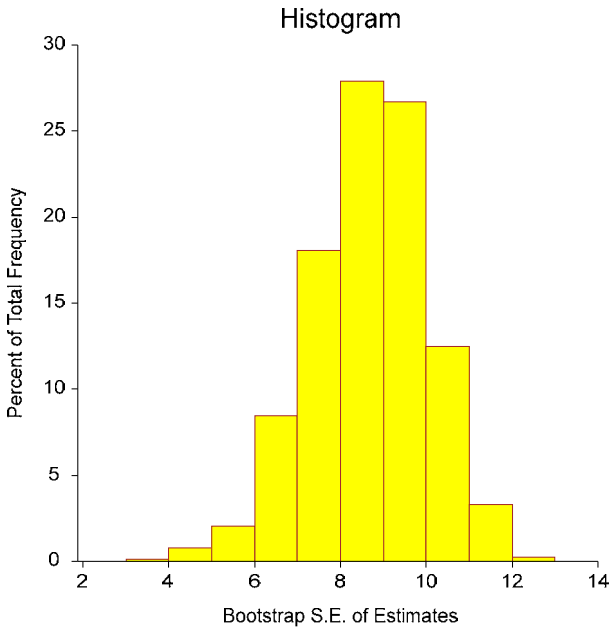


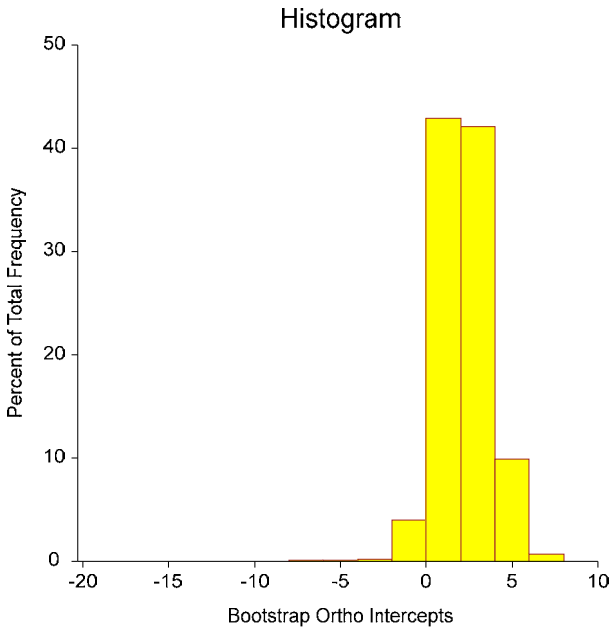


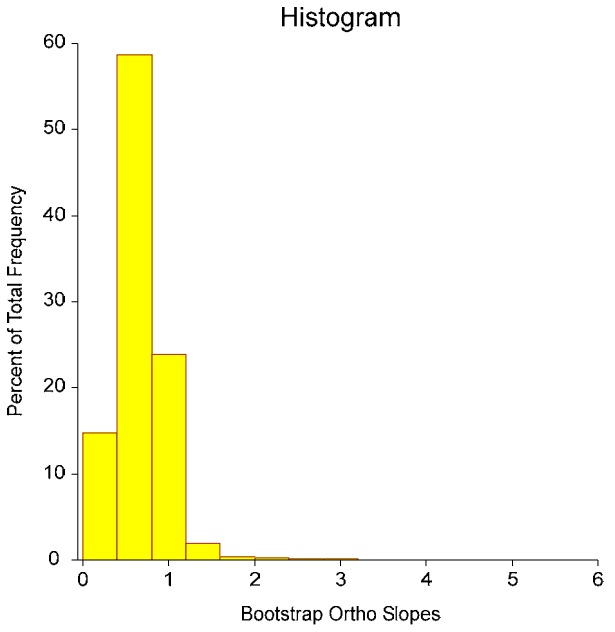


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.5697	0.3245	0.8200
Lower 95% Conf. Limit (r dist'n)	0.3138		
Upper 95% Conf. Limit (r dist'n)	0.7419		
Lower 95% Conf. Limit (Fisher's z)	0.3177		0.6852
Upper 95% Conf. Limit (Fisher's z)	0.7465		0.9005
Adjusted (Rbar)		0.3072	
T-Value for H0: Rho = 0	4.3288	4.3288	8.9470
Prob Level for H0: Rho = 0	0.0001	0.0001	0.0000
Prob Level (Randomization Test N =1000)	0.0030		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	2686.609	2686.609			
Slope	1	1577.803	1577.803	18.7383	0.0001	0.9881
Error	39	3283.873	84.20187			
Lack of Fit	37	2805.7	75.82972	0.3172	0.9456	
Pure Error	2	478.1732	239.0866			
Adj. Total	40	4861.676	121.5419			
Total	41	7548.285				

s = Square Root(84.20187) = 9.176158

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	376.97	331.89	0.03503547	-0.001157796
1	376.97	11407.3	6591.27	-0.001157796	0.0001259242
2 (Y'Y)			7548.285		
Determinant		325592.8			3.071322E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	2.950052	-0.0974886
1	-0.0974886	0.01060305

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.8300	0.000025	No
Anderson Darling	3.1227	0.000000	No
D'Agostino Skewness	3.2081	0.001336	No
D'Agostino Kurtosis	1.7450	0.080984	No
D'Agostino Omnibus	13.3367	0.001270	No
Constant Residual Variance?			
Modified Levene Test	10.3146	0.002645	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.3172	0.945598	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

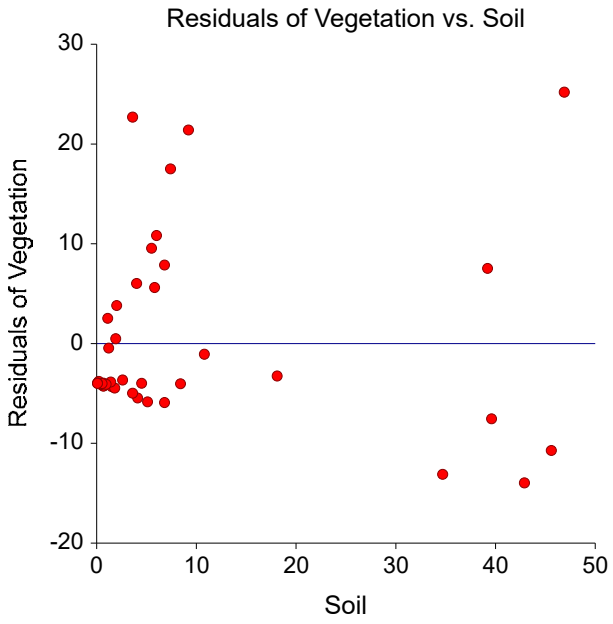
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

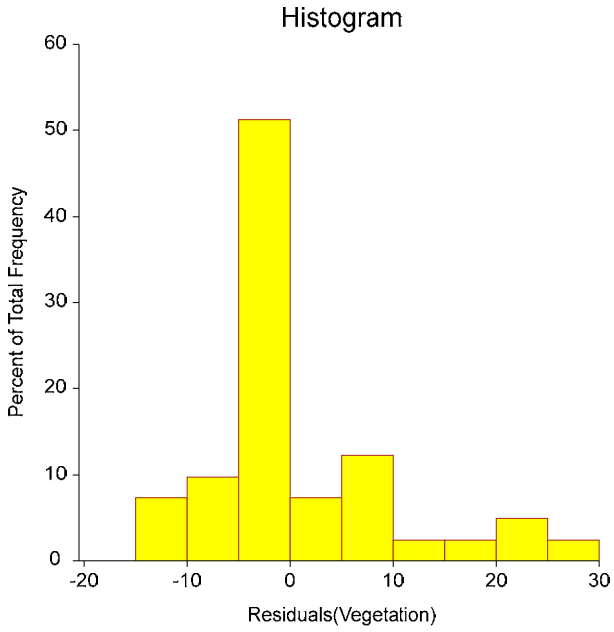
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

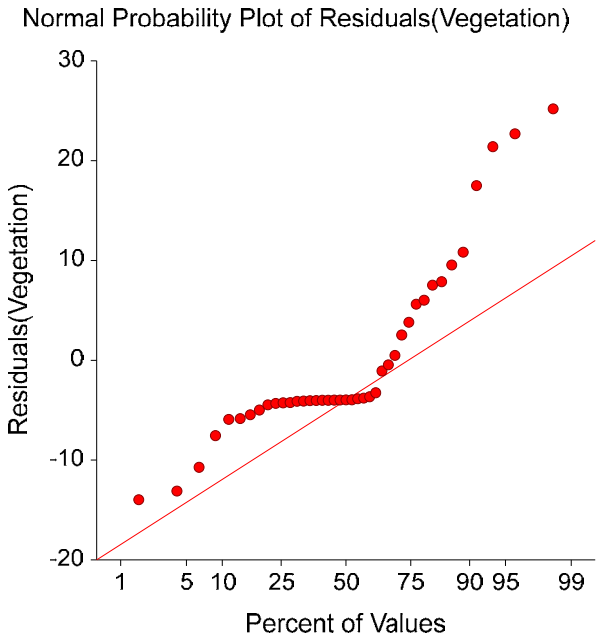
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Original Data Section

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Residual
11	6.0000	17.5000	6.6710	10.8290
12	46.9000	50.1000	24.9018	25.1982
13	1.2000	4.0800	4.5315	-0.4515
14	39.6000	14.1000	21.6479	-7.5479
15	4.1000	0.3700	5.8241	-5.4541
16	0.7100	0.0800	4.3131	-4.2331
17	5.1000	0.4300	6.2698	-5.8398
18	0.3500	0.1100	4.1526	-4.0426
19	3.6000	0.6200	5.6012	-4.9812
20	2.6000	1.5000	5.1555	-3.6555
21	0.6600	0.0300	4.2908	-4.2608
22	45.6000	13.6000	24.3223	-10.7223
23	4.5000	2.0200	6.0024	-3.9824
24	5.8000	12.2000	6.5819	5.6181
25	6.8000	14.9000	7.0276	7.8724
26	9.2000	29.5000	8.0974	21.4026
27	7.4000	24.8000	7.2950	17.5050
28	10.8000	7.7400	8.8106	-1.0706
29	3.6000	28.3000	5.6012	22.6988
30	18.1000	8.8100	12.0645	-3.2545
31	42.9000	9.1500	23.1188	-13.9688
32	1.9000	5.3300	4.8435	0.4865
33	4.0000	11.8000	5.7795	6.0205
34	0.4600	0.0900	4.2016	-4.1116
35	1.5000	0.3500	4.6652	-4.3152
36	1.8000	0.3400	4.7989	-4.4589
37	6.8000	1.1100	7.0276	-5.9176
38	1.4000	0.7700	4.6206	-3.8506
39	0.6700	0.3300	4.2952	-3.9652
40	0.9400	0.3300	4.4156	-4.0856
41	0.1800	0.0700	4.0768	-4.0068
42	0.2100	0.3000	4.0902	-3.7902
43	0.5400	0.2300	4.2373	-4.0073
44	0.0730	0.0700	4.0291	-3.9591
45	0.0770	0.0400	4.0309	-3.9909
46	8.4000	3.7100	7.7408	-4.0308
47	2.0000	8.7000	4.8881	3.8119
48	1.1000	7.0200	4.4869	2.5331
49	39.2000	29.0000	21.4696	7.5304
50	34.7000	6.3600	19.4637	-13.1037
51	5.5000	16.0000	6.4481	9.5519

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	6.0000	17.5000	6.6710	1.4703	3.6970	9.6451
12	46.9000	50.1000	24.9018	4.1386	16.5306	33.2729
13	1.2000	4.0800	4.5315	1.6527	1.1886	7.8743
14	39.6000	14.1000	21.6479	3.4433	14.6831	28.6126
15	4.1000	0.3700	5.8241	1.5261	2.7373	8.9109
16	0.7100	0.0800	4.3131	1.6784	0.9182	7.7079
17	5.1000	0.4300	6.2698	1.4938	3.2483	9.2914
18	0.3500	0.1100	4.1526	1.6980	0.7181	7.5871
19	3.6000	0.6200	5.6012	1.5445	2.4771	8.7253
20	2.6000	1.5000	5.1555	1.5858	1.9479	8.3631
21	0.6600	0.0300	4.2908	1.6811	0.8905	7.6910
22	45.6000	13.6000	24.3223	4.0133	16.2046	32.4400
23	4.5000	2.0200	6.0024	1.5124	2.9433	9.0615
24	5.8000	12.2000	6.5819	1.4751	3.5982	9.5655
25	6.8000	14.9000	7.0276	1.4541	4.0863	9.9689
26	9.2000	29.5000	8.0974	1.4331	5.1987	10.9960
27	7.4000	24.8000	7.2950	1.4449	4.3724	10.2177
28	10.8000	7.7400	8.8106	1.4426	5.8927	11.7285
29	3.6000	28.3000	5.6012	1.5445	2.4771	8.7253
30	18.1000	8.8100	12.0645	1.7014	8.6231	15.5058
31	42.9000	9.1500	23.1188	3.7549	15.5237	30.7139
32	1.9000	5.3300	4.8435	1.6180	1.5708	8.1162
33	4.0000	11.8000	5.7795	1.5296	2.6855	8.8735
34	0.4600	0.0900	4.2016	1.6919	0.7794	7.6239
35	1.5000	0.3500	4.6652	1.6375	1.3530	7.9774
36	1.8000	0.3400	4.7989	1.6228	1.5165	8.0813
37	6.8000	1.1100	7.0276	1.4541	4.0863	9.9689
38	1.4000	0.7700	4.6206	1.6425	1.2983	7.9429
39	0.6700	0.3300	4.2952	1.6805	0.8960	7.6944
40	0.9400	0.3300	4.4156	1.6662	1.0454	7.7857
41	0.1800	0.0700	4.0768	1.7074	0.6232	7.5304
42	0.2100	0.3000	4.0902	1.7057	0.6400	7.5404
43	0.5400	0.2300	4.2373	1.6876	0.8239	7.6507
44	0.0730	0.0700	4.0291	1.7134	0.5634	7.4949
45	0.0770	0.0400	4.0309	1.7132	0.5656	7.4962
46	8.4000	3.7100	7.7408	1.4354	4.8374	10.6442
47	2.0000	8.7000	4.8881	1.6132	1.6250	8.1511
48	1.1000	7.0200	4.4869	1.6578	1.1336	7.8402
49	39.2000	29.0000	21.4696	3.4059	14.5805	28.3586
50	34.7000	6.3600	19.4637	2.9919	13.4121	25.5154
51	5.5000	16.0000	6.4481	1.4827	3.4491	9.4472

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	6.0000	17.5000	6.6710	9.2932	-12.1263	25.4683
12	46.9000	50.1000	24.9018	10.0663	4.5408	45.2627
13	1.2000	4.0800	4.5315	9.3238	-14.3277	23.3906
14	39.6000	14.1000	21.6479	9.8009	1.8236	41.4721
15	4.1000	0.3700	5.8241	9.3022	-12.9913	24.6396
16	0.7100	0.0800	4.3131	9.3284	-14.5554	23.1815
17	5.1000	0.4300	6.2698	9.2970	-12.5350	25.0747
18	0.3500	0.1100	4.1526	9.3319	-14.7230	23.0282
19	3.6000	0.6200	5.6012	9.3052	-13.2204	24.4229
20	2.6000	1.5000	5.1555	9.3122	-13.6802	23.9912
21	0.6600	0.0300	4.2908	9.3289	-14.5787	23.1602
22	45.6000	13.6000	24.3223	10.0154	4.0642	44.5804
23	4.5000	2.0200	6.0024	9.3000	-12.8085	24.8133
24	5.8000	12.2000	6.5819	9.2940	-12.2169	25.3807
25	6.8000	14.9000	7.0276	9.2907	-11.7645	25.8197
26	9.2000	29.5000	8.0974	9.2874	-10.6881	26.8829
27	7.4000	24.8000	7.2950	9.2892	-11.4942	26.0843
28	10.8000	7.7400	8.8106	9.2889	-9.9779	27.5991
29	3.6000	28.3000	5.6012	9.3052	-13.2204	24.4229
30	18.1000	8.8100	12.0645	9.3326	-6.8124	30.9413
31	42.9000	9.1500	23.1188	9.9147	3.0644	43.1732
32	1.9000	5.3300	4.8435	9.3177	-14.0034	23.6903
33	4.0000	11.8000	5.7795	9.3028	-13.0371	24.5962
34	0.4600	0.0900	4.2016	9.3308	-14.6718	23.0750
35	1.5000	0.3500	4.6652	9.3211	-14.1886	23.5189
36	1.8000	0.3400	4.7989	9.3185	-14.0496	23.6474
37	6.8000	1.1100	7.0276	9.2907	-11.7645	25.8197
38	1.4000	0.7700	4.6206	9.3220	-14.2349	23.4761
39	0.6700	0.3300	4.2952	9.3288	-14.5740	23.1645
40	0.9400	0.3300	4.4156	9.3262	-14.4484	23.2796
41	0.1800	0.0700	4.0768	9.3337	-14.8023	22.9559
42	0.2100	0.3000	4.0902	9.3334	-14.7883	22.9687
43	0.5400	0.2300	4.2373	9.3300	-14.6345	23.1091
44	0.0730	0.0700	4.0291	9.3348	-14.8522	22.9105
45	0.0770	0.0400	4.0309	9.3347	-14.8504	22.9121
46	8.4000	3.7100	7.7408	9.2877	-11.0455	26.5270
47	2.0000	8.7000	4.8881	9.3169	-13.9571	23.7332
48	1.1000	7.0200	4.4869	9.3247	-14.3741	23.3479
49	39.2000	29.0000	21.4696	9.7878	1.6718	41.2673
50	34.7000	6.3600	19.4637	9.6516	-0.0585	38.9859
51	5.5000	16.0000	6.4481	9.2952	-12.3531	25.2494

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	6.0000	17.5000	6.6710	1.4703	2.4807	10.8613
12	46.9000	50.1000	24.9018	4.1386	13.1072	36.6963
13	1.2000	4.0800	4.5315	1.6527	-0.1785	9.2414
14	39.6000	14.1000	21.6479	3.4433	11.8349	31.4608
15	4.1000	0.3700	5.8241	1.5261	1.4750	10.1732
16	0.7100	0.0800	4.3131	1.6784	-0.4701	9.0962
17	5.1000	0.4300	6.2698	1.4938	2.0127	10.5270
18	0.3500	0.1100	4.1526	1.6980	-0.6864	8.9916
19	3.6000	0.6200	5.6012	1.5445	1.1995	10.0029
20	2.6000	1.5000	5.1555	1.5858	0.6362	9.6748
21	0.6600	0.0300	4.2908	1.6811	-0.5001	9.0816
22	45.6000	13.6000	24.3223	4.0133	12.8849	35.7597
23	4.5000	2.0200	6.0024	1.5124	1.6922	10.3126
24	5.8000	12.2000	6.5819	1.4751	2.3781	10.7857
25	6.8000	14.9000	7.0276	1.4541	2.8835	11.1717
26	9.2000	29.5000	8.0974	1.4331	4.0133	12.1815
27	7.4000	24.8000	7.2950	1.4449	3.1772	11.4129
28	10.8000	7.7400	8.8106	1.4426	4.6994	12.9217
29	3.6000	28.3000	5.6012	1.5445	1.1995	10.0029
30	18.1000	8.8100	12.0645	1.7014	7.2158	16.9131
31	42.9000	9.1500	23.1188	3.7549	12.4177	33.8199
32	1.9000	5.3300	4.8435	1.6180	0.2324	9.4545
33	4.0000	11.8000	5.7795	1.5296	1.4203	10.1388
34	0.4600	0.0900	4.2016	1.6919	-0.6201	9.0234
35	1.5000	0.3500	4.6652	1.6375	-0.0015	9.3319
36	1.8000	0.3400	4.7989	1.6228	0.1742	9.4236
37	6.8000	1.1100	7.0276	1.4541	2.8835	11.1717
38	1.4000	0.7700	4.6206	1.6425	-0.0604	9.3016
39	0.6700	0.3300	4.2952	1.6805	-0.4941	9.0845
40	0.9400	0.3300	4.4156	1.6662	-0.3328	9.1640
41	0.1800	0.0700	4.0768	1.7074	-0.7891	8.9428
42	0.2100	0.3000	4.0902	1.7057	-0.7710	8.9513
43	0.5400	0.2300	4.2373	1.6876	-0.5720	9.0466
44	0.0730	0.0700	4.0291	1.7134	-0.8540	8.9122
45	0.0770	0.0400	4.0309	1.7132	-0.8515	8.9133
46	8.4000	3.7100	7.7408	1.4354	3.6501	11.8315
47	2.0000	8.7000	4.8881	1.6132	0.2906	9.4856
48	1.1000	7.0200	4.4869	1.6578	-0.2377	9.2115
49	39.2000	29.0000	21.4696	3.4059	11.7632	31.1759
50	34.7000	6.3600	19.4637	2.9919	10.9372	27.9902
51	5.5000	16.0000	6.4481	1.4827	2.2226	10.6737

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Section

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	6.0000	17.5000	6.6710	10.8290	1.1956	61.8799
12	46.9000	50.1000	24.9018	25.1982	3.0768	50.2959
13	1.2000	4.0800	4.5315	-0.4515	-0.0500	11.0653
14	39.6000	14.1000	21.6479	-7.5479	-0.8874	53.5309
15	4.1000	0.3700	5.8241	-5.4541	-0.6028	1474.0832
16	0.7100	0.0800	4.3131	-4.2331	-0.4692	5291.3146
17	5.1000	0.4300	6.2698	-5.8398	-0.6450	1358.1040
18	0.3500	0.1100	4.1526	-4.0426	-0.4483	3675.0778
19	3.6000	0.6200	5.6012	-4.9812	-0.5507	803.4255
20	2.6000	1.5000	5.1555	-3.6555	-0.4045	243.6999
21	0.6600	0.0300	4.2908	-4.2608	-0.4723	14202.5491
22	45.6000	13.6000	24.3223	-10.7223	-1.2994	78.8404
23	4.5000	2.0200	6.0024	-3.9824	-0.4400	197.1487
24	5.8000	12.2000	6.5819	5.6181	0.6203	46.0503
25	6.8000	14.9000	7.0276	7.8724	0.8689	52.8349
26	9.2000	29.5000	8.0974	21.4026	2.3614	72.5513
27	7.4000	24.8000	7.2950	17.5050	1.9318	70.5845
28	10.8000	7.7400	8.8106	-1.0706	-0.1181	13.8315
29	3.6000	28.3000	5.6012	22.6988	2.5095	80.2076
30	18.1000	8.8100	12.0645	-3.2545	-0.3609	36.9405
31	42.9000	9.1500	23.1188	-13.9688	-1.6684	152.6644
32	1.9000	5.3300	4.8435	0.4865	0.0539	9.1279
33	4.0000	11.8000	5.7795	6.0205	0.6654	51.0209
34	0.4600	0.0900	4.2016	-4.1116	-0.4559	4568.4632
35	1.5000	0.3500	4.6652	-4.3152	-0.4779	1232.9102
36	1.8000	0.3400	4.7989	-4.4589	-0.4937	1311.4434
37	6.8000	1.1100	7.0276	-5.9176	-0.6531	533.1175
38	1.4000	0.7700	4.6206	-3.8506	-0.4265	500.0795
39	0.6700	0.3300	4.2952	-3.9652	-0.4396	1201.5825
40	0.9400	0.3300	4.4156	-4.0856	-0.4528	1238.0520
41	0.1800	0.0700	4.0768	-4.0068	-0.4444	5724.0141
42	0.2100	0.3000	4.0902	-3.7902	-0.4204	1263.3940
43	0.5400	0.2300	4.2373	-4.0073	-0.4443	1742.2939
44	0.0730	0.0700	4.0291	-3.9591	-0.4392	5655.8796
45	0.0770	0.0400	4.0309	-3.9909	-0.4427	9977.2467
46	8.4000	3.7100	7.7408	-4.0308	-0.4447	108.6466
47	2.0000	8.7000	4.8881	3.8119	0.4220	43.8155
48	1.1000	7.0200	4.4869	2.5331	0.2807	36.0842
49	39.2000	29.0000	21.4696	7.5304	0.8838	25.9670
50	34.7000	6.3600	19.4637	-13.1037	-1.5106	206.0335
51	5.5000	16.0000	6.4481	9.5519	1.0548	59.6991

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	6.0000	10.8290	1.2024	0.0257	0.0188	83.2504
12	46.9000	25.1982	**3.4900	0.2034	*1.2087	65.4415
13	1.2000	-0.4515	-0.0494	0.0324	0.0000	86.4122
14	39.6000	-7.5479	*-0.8849	0.1408	0.0645	84.6728
15	4.1000	-5.4541	-0.5978	0.0277	0.0052	85.6126
16	0.7100	-4.2331	-0.4645	0.0335	0.0038	85.9298
17	5.1000	-5.8398	-0.6401	0.0265	0.0057	85.4958
18	0.3500	-4.0426	-0.4437	0.0342	0.0036	85.9724
19	3.6000	-4.9812	-0.5457	0.0283	0.0044	85.7457
20	2.6000	-3.6555	-0.4001	0.0299	0.0025	86.0552
21	0.6600	-4.2608	-0.4676	0.0336	0.0039	85.9234
22	45.6000	-10.7223	*-1.3113	0.1913	0.1997	82.6766
23	4.5000	-3.9824	-0.4354	0.0272	0.0027	85.9887
24	5.8000	5.6181	0.6154	0.0258	0.0051	85.5651
25	6.8000	7.8724	0.8661	0.0251	0.0097	84.7448
26	9.2000	21.4026	*2.5179	0.0244	0.0697	74.0618
27	7.4000	17.5050	*2.0052	0.0248	0.0474	78.1489
28	10.8000	-1.0706	-0.1166	0.0247	0.0002	86.3868
29	3.6000	22.6988	*2.7051	0.0283	0.0918	72.4636
30	18.1000	-3.2545	-0.3569	0.0344	0.0023	86.1291
31	42.9000	-13.9688	*-1.7090	0.1674	0.2799	80.2500
32	1.9000	0.4865	0.0532	0.0311	0.0000	86.4113
33	4.0000	6.0205	0.6606	0.0278	0.0063	85.4366
34	0.4600	-4.1116	-0.4512	0.0340	0.0037	85.9572
35	1.5000	-4.3152	-0.4732	0.0318	0.0038	85.9116
36	1.8000	-4.4589	-0.4889	0.0313	0.0039	85.8776
37	6.8000	-5.9176	-0.6483	0.0251	0.0055	85.4724
38	1.4000	-3.8506	-0.4220	0.0320	0.0030	86.0146
39	0.6700	-3.9652	-0.4350	0.0335	0.0034	85.9896
40	0.9400	-4.0856	-0.4481	0.0330	0.0035	85.9635
41	0.1800	-4.0068	-0.4398	0.0346	0.0035	85.9801
42	0.2100	-3.7902	-0.4159	0.0346	0.0032	86.0261
43	0.5400	-4.0073	-0.4397	0.0338	0.0035	85.9803
44	0.0730	-3.9591	-0.4346	0.0349	0.0035	85.9903
45	0.0770	-3.9909	-0.4381	0.0349	0.0035	85.9834
46	8.4000	-4.0308	-0.4401	0.0245	0.0025	85.9794
47	2.0000	3.8119	0.4175	0.0309	0.0028	86.0231
48	1.1000	2.5331	0.2773	0.0326	0.0013	86.2432
49	39.2000	7.5304	*0.8813	0.1378	0.0624	84.6870
50	34.7000	-13.1037	*-1.5367	0.1063	0.1357	81.3616
51	5.5000	9.5519	1.0564	0.0261	0.0149	83.9523

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	1.2024	0.1952	0.0188	1.0033	0.1828	-0.0437
12	* 3.4900	1.7636	** 1.2087	0.7583	-0.4025	1.6545
13	-0.0494	-0.0090	0.0000	1.0885	-0.0090	0.0045
14	-0.8849	-0.3582	0.0645	* 1.1769	0.0552	-0.3257
15	-0.5978	-0.1008	0.0052	1.0632	-0.0981	0.0347
16	-0.4645	-0.0864	0.0038	1.0775	-0.0864	0.0450
17	-0.6401	-0.1056	0.0057	1.0590	-0.1010	0.0298
18	-0.4437	-0.0835	0.0036	1.0795	-0.0835	0.0448
19	-0.5457	-0.0932	0.0044	1.0672	-0.0913	0.0348
20	-0.4001	-0.0702	0.0025	1.0767	-0.0695	0.0301
21	-0.4676	-0.0871	0.0039	1.0775	-0.0871	0.0455
22	-1.3113	-0.6377	0.1997	* 1.1921	0.1384	-0.5957
23	-0.4354	-0.0728	0.0027	1.0720	-0.0703	0.0233
24	0.6154	0.1002	0.0051	1.0600	0.0943	-0.0237
25	0.8661	0.1390	0.0097	1.0390	0.1273	-0.0236
26	* 2.5179	0.3981	0.0697	0.7930	0.3321	0.0002
27	* 2.0052	0.3197	0.0474	0.8833	0.2871	-0.0409
28	-0.1166	-0.0186	0.0002	1.0792	-0.0142	-0.0021
29	* 2.7051	0.4619	0.0918	0.7622	0.4526	-0.1723
30	-0.3569	-0.0673	0.0023	1.0835	-0.0273	-0.0363
31	-1.7090	-0.7664	0.2799	1.0910	0.1464	-0.7084
32	0.0532	0.0095	0.0000	1.0870	0.0095	-0.0044
33	0.6606	0.1117	0.0063	1.0590	0.1088	-0.0391
34	-0.4512	-0.0846	0.0037	1.0788	-0.0846	0.0450
35	-0.4732	-0.0858	0.0038	1.0753	-0.0855	0.0415
36	-0.4889	-0.0878	0.0039	1.0738	-0.0874	0.0412
37	-0.6483	-0.1040	0.0055	1.0569	-0.0953	0.0176
38	-0.4220	-0.0768	0.0030	1.0781	-0.0766	0.0375
39	-0.4350	-0.0810	0.0034	1.0791	-0.0810	0.0423
40	-0.4481	-0.0827	0.0035	1.0778	-0.0826	0.0422
41	-0.4398	-0.0833	0.0035	1.0801	-0.0833	0.0453
42	-0.4159	-0.0787	0.0032	1.0812	-0.0787	0.0427
43	-0.4397	-0.0823	0.0035	1.0792	-0.0822	0.0434
44	-0.4346	-0.0826	0.0035	1.0806	-0.0826	0.0453
45	-0.4381	-0.0833	0.0035	1.0804	-0.0833	0.0456
46	-0.4401	-0.0697	0.0025	1.0688	-0.0603	0.0040
47	0.4175	0.0746	0.0028	1.0770	0.0741	-0.0342
48	0.2773	0.0509	0.0013	1.0845	0.0509	-0.0256
49	0.8813	0.3523	0.0624	* 1.1732	-0.0525	0.3196
50	-1.5367	-0.5300	0.1357	1.0447	0.0446	-0.4653
51	1.0564	0.1730	0.0149	1.0207	0.1639	-0.0444

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
11	6.0000	10.8290	||||||.....	1.1956	|||||.....	1.2024	|||||.....
12	46.9000	25.1982	||||||||||||||	3.0768	||||||||||||||	* 3.4900	||||||||||||||
13	1.2000	-0.4515	|.....	-0.0500	|.....	-0.0494	|.....
14	39.6000	-7.5479	||||.....	-0.8874	||||.....	-0.8849	|||.....
15	4.1000	-5.4541	|||.....	-0.6028	||.....	-0.5978	||.....
16	0.7100	-4.2331	||.....	-0.4692	||.....	-0.4645	|.....
17	5.1000	-5.8398	|||.....	-0.6450	||.....	-0.6401	||.....
18	0.3500	-4.0426	||.....	-0.4483	|.....	-0.4437	|.....
19	3.6000	-4.9812	||.....	-0.5507	||.....	-0.5457	||.....
20	2.6000	-3.6555	|.....	-0.4045	|.....	-0.4001	|.....
21	0.6600	-4.2608	||.....	-0.4723	||.....	-0.4676	|.....
22	45.6000	-10.7223	||||||.....	-1.2994	||||||.....	-1.3113	|||||.....
23	4.5000	-3.9824	||.....	-0.4400	|.....	-0.4354	|.....
24	5.8000	5.6181	|||.....	0.6203	||.....	0.6154	||.....
25	6.8000	7.8724	||||.....	0.8689	||||.....	0.8661	|||.....
26	9.2000	21.4026	||||||||||...	2.3614	||||||||||....	* 2.5179	|||||||||.....
27	7.4000	17.5050	|||||||||.....	1.9318	|||||||||.....	* 2.0052	|||||||.....
28	10.8000	-1.0706	|.....	-0.1181	|.....	-0.1166	|.....
29	3.6000	22.6988	||||||||||..	2.5095	||||||||||...	* 2.7051	||||||||||....
30	18.1000	-3.2545	|.....	-0.3609	|.....	-0.3569	|.....
31	42.9000	-13.9688	||||||||.....	-1.6684	||||||||.....	-1.7090	|||||||.....
32	1.9000	0.4865	|.....	0.0539	|.....	0.0532	|.....
33	4.0000	6.0205	|||.....	0.6654	|||.....	0.6606	||.....
34	0.4600	-4.1116	||.....	-0.4559	||.....	-0.4512	|.....
35	1.5000	-4.3152	||.....	-0.4779	||.....	-0.4732	|.....
36	1.8000	-4.4589	||.....	-0.4937	||.....	-0.4889	|.....
37	6.8000	-5.9176	|||.....	-0.6531	||.....	-0.6483	||.....
38	1.4000	-3.8506	||.....	-0.4265	|.....	-0.4220	|.....
39	0.6700	-3.9652	||.....	-0.4396	|.....	-0.4350	|.....
40	0.9400	-4.0856	||.....	-0.4528	|.....	-0.4481	|.....
41	0.1800	-4.0068	||.....	-0.4444	|.....	-0.4398	|.....
42	0.2100	-3.7902	||.....	-0.4204	|.....	-0.4159	|.....
43	0.5400	-4.0073	||.....	-0.4443	|.....	-0.4397	|.....
44	0.0730	-3.9591	||.....	-0.4392	|.....	-0.4346	|.....
45	0.0770	-3.9909	||.....	-0.4427	|.....	-0.4381	|.....
46	8.4000	-4.0308	||.....	-0.4447	|.....	-0.4401	|.....
47	2.0000	3.8119	||.....	0.4220	|.....	0.4175	|.....
48	1.1000	2.5331	|.....	0.2807	|.....	0.2773	|.....
49	39.2000	7.5304	||||.....	0.8838	||||.....	0.8813	|||.....
50	34.7000	-13.1037	|||||||.....	-1.5106	|||||||.....	-1.5367	||||||.....
51	5.5000	9.5519	|||||.....	1.0548	||||.....	1.0564	||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	6.0000	0.1952	|.....	0.0188	|.....	-0.0437	|.....
12	46.9000	1.7636	||||||||||||||	** 1.2087	||||||||||||||	1.6545	||||||||||||||
13	1.2000	-0.0090	|.....	0.0000	|.....	0.0045	|.....
14	39.6000	-0.3582	||.....	0.0645	|.....	-0.3257	||.....
15	4.1000	-0.1008	|.....	0.0052	|.....	0.0347	|.....
16	0.7100	-0.0864	|.....	0.0038	|.....	0.0450	|.....
17	5.1000	-0.1056	|.....	0.0057	|.....	0.0298	|.....
18	0.3500	-0.0835	|.....	0.0036	|.....	0.0448	|.....
19	3.6000	-0.0932	|.....	0.0044	|.....	0.0348	|.....
20	2.6000	-0.0702	|.....	0.0025	|.....	0.0301	|.....
21	0.6600	-0.0871	|.....	0.0039	|.....	0.0455	|.....
22	45.6000	-0.6377	|||||.....	0.1997	||.....	-0.5957	|||||.....
23	4.5000	-0.0728	|.....	0.0027	|.....	0.0233	|.....
24	5.8000	0.1002	|.....	0.0051	|.....	-0.0237	|.....
25	6.8000	0.1390	|.....	0.0097	|.....	-0.0236	|.....
26	9.2000	0.3981	|||.....	0.0697	|.....	0.0002	|.....
27	7.4000	0.3197	||.....	0.0474	|.....	-0.0409	|.....
28	10.8000	-0.0186	|.....	0.0002	|.....	-0.0021	|.....
29	3.6000	0.4619	|||.....	0.0918	|.....	-0.1723	|.....
30	18.1000	-0.0673	|.....	0.0023	|.....	-0.0363	|.....
31	42.9000	-0.7664	||||||.....	0.2799	|||.....	-0.7084	||||||.....
32	1.9000	0.0095	|.....	0.0000	|.....	-0.0044	|.....
33	4.0000	0.1117	|.....	0.0063	|.....	-0.0391	|.....
34	0.4600	-0.0846	|.....	0.0037	|.....	0.0450	|.....
35	1.5000	-0.0858	|.....	0.0038	|.....	0.0415	|.....
36	1.8000	-0.0878	|.....	0.0039	|.....	0.0412	|.....
37	6.8000	-0.1040	|.....	0.0055	|.....	0.0176	|.....
38	1.4000	-0.0768	|.....	0.0030	|.....	0.0375	|.....
39	0.6700	-0.0810	|.....	0.0034	|.....	0.0423	|.....
40	0.9400	-0.0827	|.....	0.0035	|.....	0.0422	|.....
41	0.1800	-0.0833	|.....	0.0035	|.....	0.0453	|.....
42	0.2100	-0.0787	|.....	0.0032	|.....	0.0427	|.....
43	0.5400	-0.0823	|.....	0.0035	|.....	0.0434	|.....
44	0.0730	-0.0826	|.....	0.0035	|.....	0.0453	|.....
45	0.0770	-0.0833	|.....	0.0035	|.....	0.0456	|.....
46	8.4000	-0.0697	|.....	0.0025	|.....	0.0040	|.....
47	2.0000	0.0746	|.....	0.0028	|.....	-0.0342	|.....
48	1.1000	0.0509	|.....	0.0013	|.....	-0.0256	|.....
49	39.2000	0.3523	||.....	0.0624	|.....	0.3196	||.....
50	34.7000	-0.5300	||||.....	0.1357	|.....	-0.4653	||||.....
51	5.5000	0.1730	|.....	0.0149	|.....	-0.0444	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked. DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	6.0000	1.2024	|||||.....	0.0188	|.....	0.0257	|.....
12	46.9000	* 3.4900	||||||||||||||	** 1.2087	||||||||||||||	0.2034	||||||||||||||
13	1.2000	-0.0494	|.....	0.0000	|.....	0.0324	|.....
14	39.6000	-0.8849	|||.....	0.0645	|.....	0.1408	||||||||.....
15	4.1000	-0.5978	||.....	0.0052	|.....	0.0277	|.....
16	0.7100	-0.4645	|.....	0.0038	|.....	0.0335	|.....
17	5.1000	-0.6401	||.....	0.0057	|.....	0.0265	|.....
18	0.3500	-0.4437	|.....	0.0036	|.....	0.0342	|.....
19	3.6000	-0.5457	||.....	0.0044	|.....	0.0283	|.....
20	2.6000	-0.4001	|.....	0.0025	|.....	0.0299	|.....
21	0.6600	-0.4676	|.....	0.0039	|.....	0.0336	|.....
22	45.6000	-1.3113	|||||.....	0.1997	||.....	0.1913	|||||||||||..
23	4.5000	-0.4354	|.....	0.0027	|.....	0.0272	|.....
24	5.8000	0.6154	||.....	0.0051	|.....	0.0258	|.....
25	6.8000	0.8661	|||.....	0.0097	|.....	0.0251	|.....
26	9.2000	* 2.5179	|||||||||.....	0.0697	|.....	0.0244	|.....
27	7.4000	* 2.0052	|||||||.....	0.0474	|.....	0.0248	|.....
28	10.8000	-0.1166	|.....	0.0002	|.....	0.0247	|.....
29	3.6000	* 2.7051	||||||||||....	0.0918	|.....	0.0283	|.....
30	18.1000	-0.3569	|.....	0.0023	|.....	0.0344	|.....
31	42.9000	-1.7090	|||||||.....	0.2799	|||.....	0.1674	||||||||||....
32	1.9000	0.0532	|.....	0.0000	|.....	0.0311	|.....
33	4.0000	0.6606	||.....	0.0063	|.....	0.0278	|.....
34	0.4600	-0.4512	|.....	0.0037	|.....	0.0340	|.....
35	1.5000	-0.4732	|.....	0.0038	|.....	0.0318	|.....
36	1.8000	-0.4889	|.....	0.0039	|.....	0.0313	|.....
37	6.8000	-0.6483	||.....	0.0055	|.....	0.0251	|.....
38	1.4000	-0.4220	|.....	0.0030	|.....	0.0320	|.....
39	0.6700	-0.4350	|.....	0.0034	|.....	0.0335	|.....
40	0.9400	-0.4481	|.....	0.0035	|.....	0.0330	|.....
41	0.1800	-0.4398	|.....	0.0035	|.....	0.0346	|.....
42	0.2100	-0.4159	|.....	0.0032	|.....	0.0346	|.....
43	0.5400	-0.4397	|.....	0.0035	|.....	0.0338	|.....
44	0.0730	-0.4346	|.....	0.0035	|.....	0.0349	|.....
45	0.0770	-0.4381	|.....	0.0035	|.....	0.0349	|.....
46	8.4000	-0.4401	|.....	0.0025	|.....	0.0245	|.....
47	2.0000	0.4175	|.....	0.0028	|.....	0.0309	|.....
48	1.1000	0.2773	|.....	0.0013	|.....	0.0326	|.....
49	39.2000	0.8813	|||.....	0.0624	|.....	0.1378	||||||||.....
50	34.7000	-1.5367	||||||.....	0.1357	|.....	0.1063	||||||.....
51	5.5000	1.0564	||||.....	0.0149	|.....	0.0261	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Inverse Prediction of X Means

Row	Vegetation (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	17.5000	6.0000	30.2944	-24.2944	21.5869	50.7895
12	50.1000	46.9000	103.4314	-56.5314	72.9425	186.5656
13	4.0800	1.2000	0.1872	1.0128	-11.4444	6.7868
14	14.1000	39.6000	22.6667	16.9333	15.5229	37.3367
15	0.3700	4.1000	-8.1361	12.2361	-25.6824	-0.2714
16	0.0800	0.7100	-8.7867	9.4967	-26.8338	-0.7847
17	0.4300	5.1000	-8.0015	13.1015	-25.4447	-0.1647
18	0.1100	0.3500	-8.7194	9.0694	-26.7145	-0.7318
19	0.6200	3.6000	-7.5752	11.1752	-24.6930	0.1742
20	1.5000	2.6000	-5.6010	8.2010	-21.2370	1.7696
21	0.0300	0.6600	-8.8989	9.5589	-27.0327	-0.8728
22	13.6000	45.6000	21.5449	24.0551	14.5731	35.4164
23	2.0200	4.5000	-4.4344	8.9344	-19.2174	2.7350
24	12.2000	5.8000	18.4041	-12.6041	11.7890	30.1642
25	14.9000	6.8000	24.4614	-17.6614	17.0044	40.4474
26	29.5000	9.2000	57.2160	-48.0160	40.9957	100.2635
27	24.8000	7.4000	46.6717	-39.2717	33.5601	80.7200
28	7.7400	10.8000	8.3982	2.4018	0.8050	15.5467
29	28.3000	3.6000	54.5238	-50.9238	39.1077	95.2633
30	8.8100	18.1000	10.7987	7.3013	3.8292	18.6646
31	9.1500	42.9000	11.5615	31.3385	4.7324	19.7130
32	5.3300	1.9000	2.9915	-1.0915	-6.9783	9.4961
33	11.8000	4.0000	17.5067	-13.5067	10.9520	28.7051
34	0.0900	0.4600	-8.7643	9.2243	-26.7941	-0.7670
35	0.3500	1.5000	-8.1810	9.6810	-25.7617	-0.3069
36	0.3400	1.8000	-8.2034	10.0034	-25.8013	-0.3247
37	1.1100	6.8000	-6.4759	13.2759	-22.7632	1.0571
38	0.7700	1.4000	-7.2387	8.6387	-24.1009	0.4431
39	0.3300	0.6700	-8.2258	8.8958	-25.8410	-0.3424
40	0.3300	0.9400	-8.2258	9.1658	-25.8410	-0.3424
41	0.0700	0.1800	-8.8091	8.9891	-26.8736	-0.8023
42	0.3000	0.2100	-8.2931	8.5031	-25.9600	-0.3957
43	0.2300	0.5400	-8.4502	8.9902	-26.2378	-0.5197
44	0.0700	0.0730	-8.8091	8.8821	-26.8736	-0.8023
45	0.0400	0.0770	-8.8764	8.9534	-26.9929	-0.8552
46	3.7100	8.4000	-0.6429	9.0429	-12.8079	6.0265
47	8.7000	2.0000	10.5520	-8.5520	3.5311	18.3312
48	7.0200	1.1000	6.7829	-5.6829	-1.3860	13.6047
49	29.0000	39.2000	56.0943	-16.8943	40.2097	98.1794
50	6.3600	34.7000	5.3023	29.3977	-3.4996	11.9297
51	16.0000	5.5000	26.9292	-21.4292	18.9797	44.7864

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Inverse Prediction of X Individuals

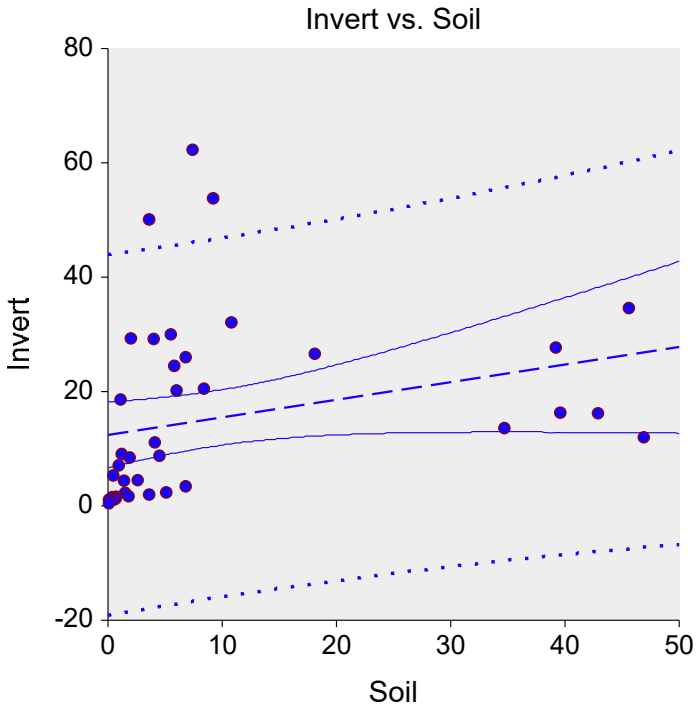
Row	Vegetation (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	17.5000	6.0000	30.2944	-24.2944	-13.1209	85.4973
12	50.1000	46.9000	103.4314	-56.5314	55.9587	203.5493
13	4.0800	1.2000	0.1872	1.0128	-50.3005	45.6430
14	14.1000	39.6000	22.6667	16.9333	-21.9143	74.7739
15	0.3700	4.1000	-8.1361	12.2361	-61.7583	35.8045
16	0.0800	0.7100	-8.7867	9.4967	-62.6747	35.0562
17	0.4300	5.1000	-8.0015	13.1015	-61.5691	35.9597
18	0.1100	0.3500	-8.7194	9.0694	-62.5798	35.1335
19	0.6200	3.6000	-7.5752	11.1752	-60.9707	36.4519
20	1.5000	2.6000	-5.6010	8.2010	-58.2159	38.7485
21	0.0300	0.6600	-8.8989	9.5589	-62.8330	34.9275
22	13.6000	45.6000	21.5449	24.0551	-23.2422	73.2317
23	2.0200	4.5000	-4.4344	8.9344	-56.6010	40.1186
24	12.2000	5.8000	18.4041	-12.6041	-27.0089	68.9620
25	14.9000	6.8000	24.4614	-17.6614	-19.8085	77.2603
26	29.5000	9.2000	57.2160	-48.0160	14.9846	126.2746
27	24.8000	7.4000	46.6717	-39.2717	4.4693	109.8108
28	7.7400	10.8000	8.3982	2.4018	-39.4951	55.8468
29	28.3000	3.6000	54.5238	-50.9238	12.3534	122.0175
30	8.8100	18.1000	10.7987	7.3013	-36.4314	58.9251
31	9.1500	42.9000	11.5615	31.3385	-35.4669	59.9123
32	5.3300	1.9000	2.9915	-1.0915	-46.5537	49.0715
33	11.8000	4.0000	17.5067	-13.5067	-28.0984	67.7554
34	0.0900	0.4600	-8.7643	9.2243	-62.6431	35.0820
35	0.3500	1.5000	-8.1810	9.6810	-61.8214	35.7528
36	0.3400	1.8000	-8.2034	10.0034	-61.8530	35.7269
37	1.1100	6.8000	-6.4759	13.2759	-59.4333	37.7273
38	0.7700	1.4000	-7.2387	8.6387	-60.4992	36.8414
39	0.3300	0.6700	-8.2258	8.8958	-61.8845	35.7011
40	0.3300	0.9400	-8.2258	9.1658	-61.8845	35.7011
41	0.0700	0.1800	-8.8091	8.9891	-62.7064	35.0305
42	0.3000	0.2100	-8.2931	8.5031	-61.9792	35.6236
43	0.2300	0.5400	-8.4502	8.9902	-62.2003	35.4429
44	0.0700	0.0730	-8.8091	8.8821	-62.7064	35.0305
45	0.0400	0.0770	-8.8764	8.9534	-62.8013	34.9532
46	3.7100	8.4000	-0.6429	9.0429	-51.4207	44.6392
47	8.7000	2.0000	10.5520	-8.5520	-36.7444	58.6067
48	7.0200	1.1000	6.7829	-5.6829	-41.5810	53.7998
49	29.0000	39.2000	56.0943	-16.8943	13.8925	124.4966
50	6.3600	34.7000	5.3023	29.3977	-43.5103	51.9404
51	16.0000	5.5000	26.9292	-21.4292	-16.9503	80.7163

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Invert	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	12.4203	Rows Prediction Only	0
Slope	0.3056	Sum of Frequencies	41
R-Squared	0.0749	Sum of Weights	41.0000
Correlation	0.2736	Coefficient of Variation	1.0067
Mean Square Error	235.0882	Square Root of MSE	15.33259

Linear Regression Report

Y = Invert X = Soil

Summary Statement

The equation of the straight line relating Invert and Soil is estimated as: Invert = (12.4203) + (0.3056) Soil using the 41 observations in this dataset. The y-intercept, the estimated value of Invert when Soil is zero, is 12.4203 with a standard error of 2.8699. The slope, the estimated change in Invert per unit change in Soil, is 0.3056 with a standard error of 0.1721. The value of R-Squared, the proportion of the variation in Invert that can be accounted for by variation in Soil, is 0.0749. The correlation between Invert and Soil is 0.2736.

A significance test that the slope is zero resulted in a t-value of 1.7764. The significance level of this t-test is 0.0835. Since 0.0835 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is 0.3056. The lower limit of the 95% confidence interval for the slope is -0.0424 and the upper limit is 0.6537. The estimated intercept is 12.4203. The lower limit of the 95% confidence interval for the intercept is 6.6153 and the upper limit is 18.2252.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Invert	Soil
Count	41	41
Mean	15.2305	9.1944
Standard Deviation	15.7403	14.0901
Minimum	0.4500	0.0730
Maximum	62.3000	46.9000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	12.4203	0.3056
Lower 95% Confidence Limit	6.6153	-0.0424
Upper 95% Confidence Limit	18.2252	0.6537
Standard Error	2.8699	0.1721
Standardized Coefficient	0.0000	0.2736
T Value	4.3277	1.7764
Prob Level (T Test)	0.0001	0.0835
Prob Level (Randomization Test N =1000)		0.0940
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.9881	0.4102
Regression of Y on X	12.4203	0.3056
Inverse Regression from X on Y	-22.3101	4.0830
Orthogonal Regression of Y and X	1.5792	1.4847

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(12.4202591360387) + (0.305646007434053) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	12.4203	0.9000	7.6982	16.6992
Bootstrap Mean	12.3514	0.9500	6.7076	17.4345
Bias (BM - OV)	-0.0688	0.9900	4.0755	18.8331
Bias Corrected	12.4891			
Standard Error	2.7563			
Slope				
Original Value	0.3056	0.9000	0.0455	0.4783
Bootstrap Mean	0.3305	0.9500	-0.0469	0.5105
Bias (BM - OV)	0.0248	0.9900	-0.3809	0.5830
Bias Corrected	0.2808			
Standard Error	0.1560			
Correlation				
Original Value	0.2736	0.9000	0.0737	0.4283
Bootstrap Mean	0.2903	0.9500	0.0298	0.4603
Bias (BM - OV)	0.0167	0.9900	-0.0696	0.5232
Bias Corrected	0.2569			
Standard Error	0.1110			
R-Squared				
Original Value	0.0749	0.9000	0.0000	0.1356
Bootstrap Mean	0.0966	0.9500	0.0000	0.1421
Bias (BM - OV)	0.0218	0.9900	0.0000	0.1489
Bias Corrected	0.0531			
Standard Error	0.0695			
Standard Error of Estimate				
Original Value	15.3326	0.9000	12.0649	19.8926
Bootstrap Mean	14.8293	0.9500	11.3461	20.5997
Bias (BM - OV)	-0.5033	0.9900	10.4025	22.1638
Bias Corrected	15.8359			
Standard Error	2.3837			
Orthogonal Intercept				
Original Value	1.5792	0.9000	-5.5938	25.8911
Bootstrap Mean	-1.9135	0.9500	-6.9482	38.6138
Bias (BM - OV)	-3.4927	0.9900	-10.1249	89.5612
Bias Corrected	5.0719			
Standard Error	24.0286			
Orthogonal Slope				
Original Value	1.4847	0.9000	-2.4982	2.4942
Bootstrap Mean	2.0588	0.9500	-4.2029	2.5769
Bias (BM - OV)	0.5740	0.9900	-9.3481	2.7352
Bias Corrected	0.9107			
Standard Error	2.6862			

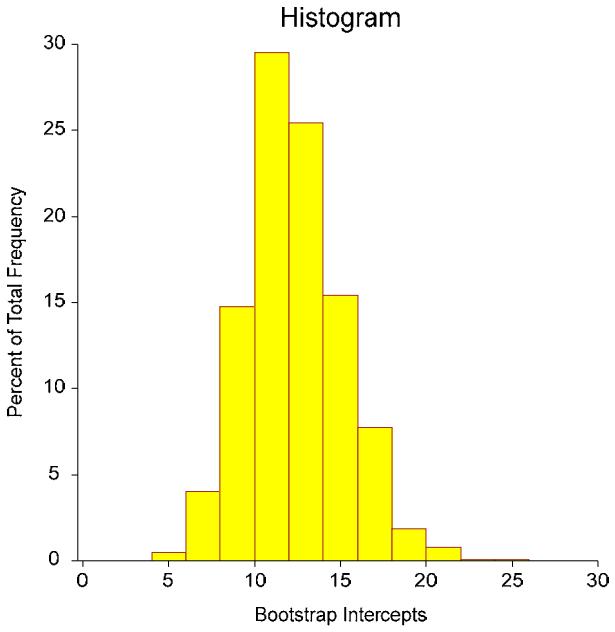
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

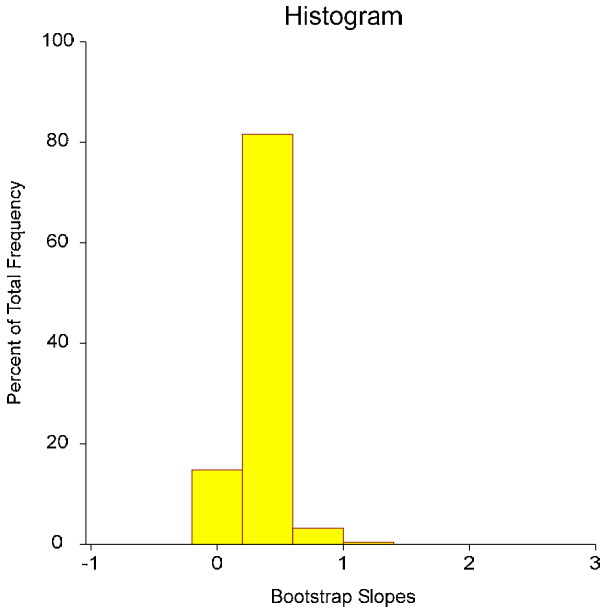
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

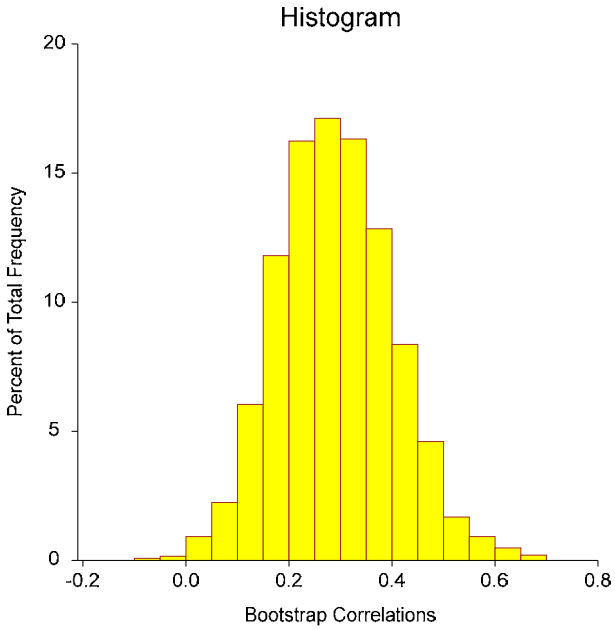
Linear Regression Report

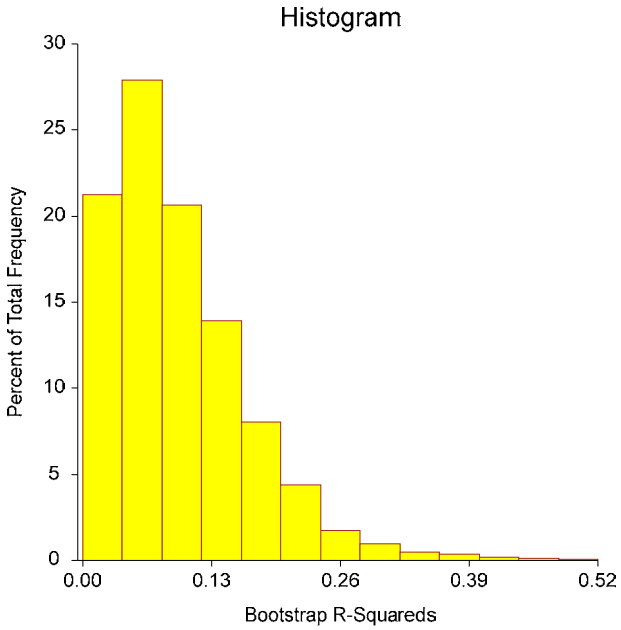
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Bootstrap Histograms Section



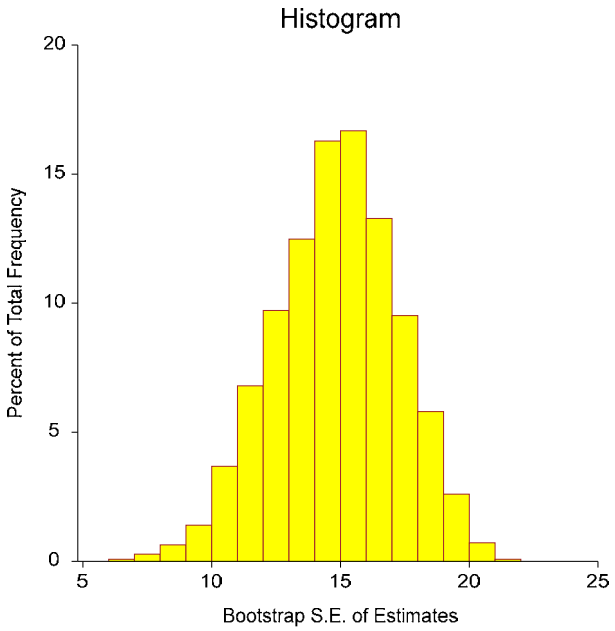


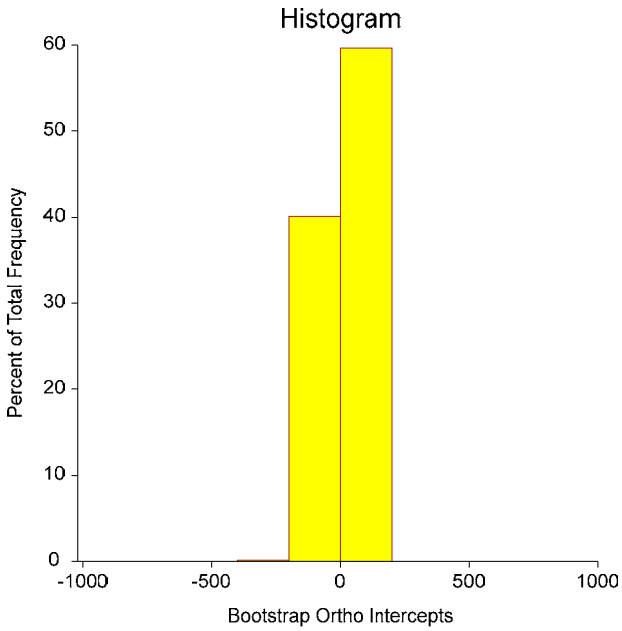


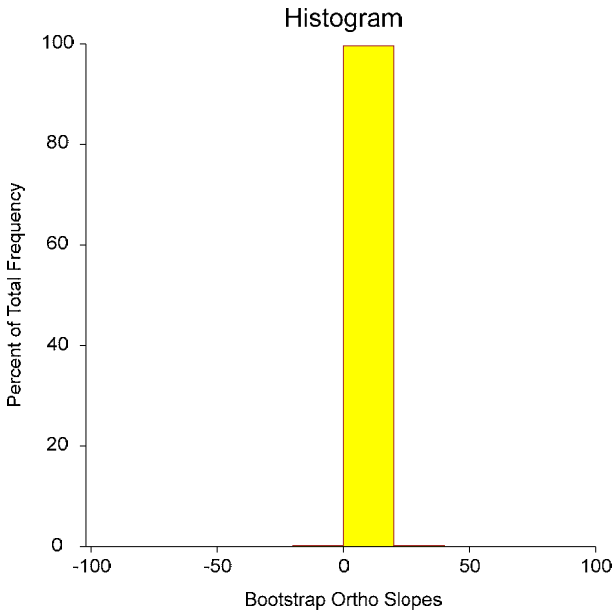


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.2736	0.0749	0.7444
Lower 95% Conf. Limit (r dist'n)	-0.0372		
Upper 95% Conf. Limit (r dist'n)	0.5312		
Lower 95% Conf. Limit (Fisher's z)	-0.0372		0.5665
Upper 95% Conf. Limit (Fisher's z)	0.5361		0.8560
Adjusted (Rbar)		0.0511	
T-Value for H0: Rho = 0	1.7764	1.7764	6.9621
Prob Level for H0: Rho = 0	0.0835	0.0835	0.0000
Prob Level (Randomization Test N =1000)	0.0940		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	9510.678	9510.678			
Slope	1	741.8708	741.8708	3.1557	0.0835	0.4102
Error	39	9168.439	235.0882			
Lack of Fit	37	7755.263	209.6017	0.2966	0.9548	
Pure Error	2	1413.177	706.5883			
Adj. Total	40	9910.311	247.7578			
Total	41	19420.99				

s = Square Root(235.0882) = 15.33259

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	376.97	624.45	0.03503547	-0.001157796
1	376.97	11407.3	8168.66	-0.001157796	0.0001259242
2 (Y'Y)			19420.99		
Determinant		325592.8			3.071322E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	8.236426	-0.2721842
1	-0.2721842	0.02960329

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7907	0.000004	No
Anderson Darling	3.0181	0.000000	No
D'Agostino Skewness	3.6012	0.000317	No
D'Agostino Kurtosis	2.1723	0.029836	No
D'Agostino Omnibus	17.6876	0.000144	No
Constant Residual Variance?			
Modified Levene Test	3.1567	0.083416	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.2966	0.954807	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

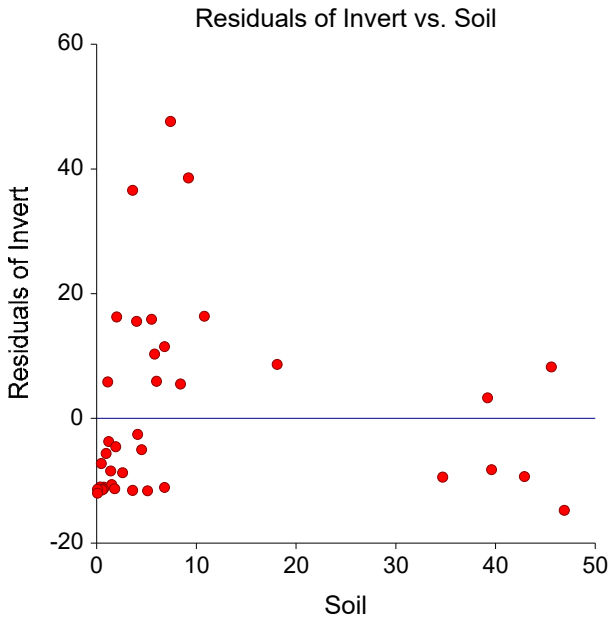
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

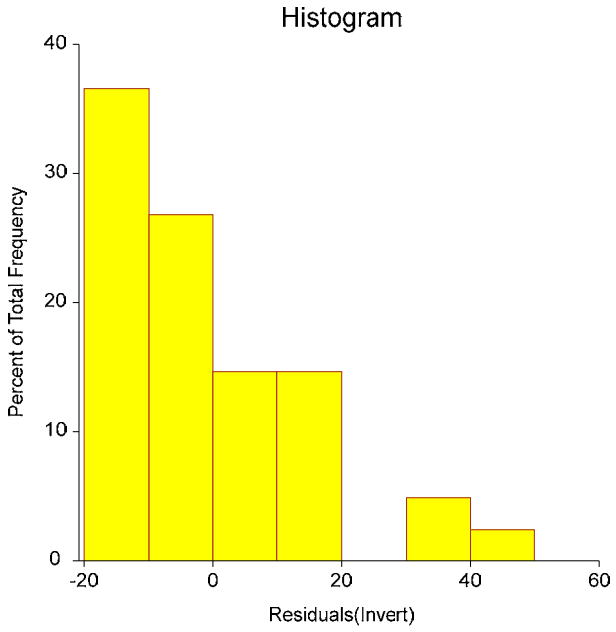
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

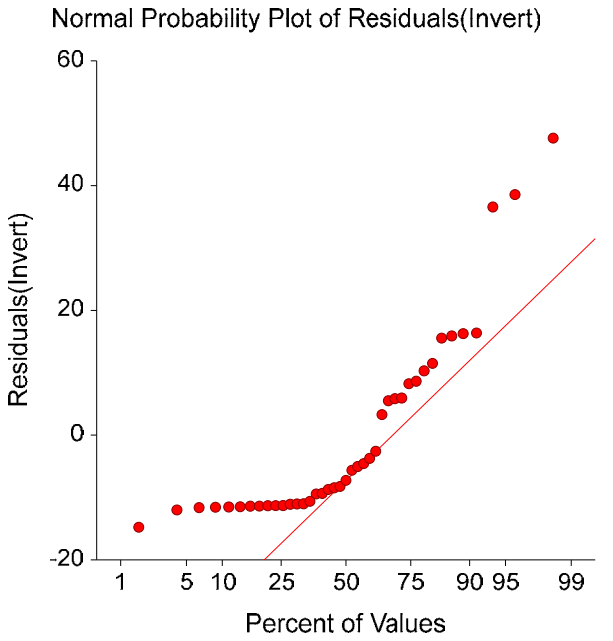
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Original Data Section

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual
11	6.0000	20.2000	14.2541	5.9459
12	46.9000	12.0000	26.7551	-14.7551
13	1.2000	9.0700	12.7870	-3.7170
14	39.6000	16.3000	24.5238	-8.2238
15	4.1000	11.1000	13.6734	-2.5734
16	0.7100	1.6100	12.6373	-11.0273
17	5.1000	2.3600	13.9791	-11.6191
18	0.3500	1.5200	12.5272	-11.0072
19	3.6000	1.9700	13.5206	-11.5506
20	2.6000	4.5000	13.2149	-8.7149
21	0.6600	1.3200	12.6220	-11.3020
22	45.6000	34.6000	26.3577	8.2423
23	4.5000	8.7700	13.7957	-5.0257
24	5.8000	24.5000	14.1930	10.3070
25	6.8000	26.0000	14.4987	11.5013
26	9.2000	53.8000	15.2322	38.5678
27	7.4000	62.3000	14.6820	47.6180
28	10.8000	32.1000	15.7212	16.3788
29	3.6000	50.1000	13.5206	36.5794
30	18.1000	26.6000	17.9525	8.6475
31	42.9000	16.2000	25.5325	-9.3325
32	1.9000	8.4500	13.0010	-4.5510
33	4.0000	29.2000	13.6428	15.5572
34	0.4600	5.3200	12.5609	-7.2409
35	1.5000	2.2700	12.8787	-10.6087
36	1.8000	1.6800	12.9704	-11.2904
37	6.8000	3.4200	14.4987	-11.0787
38	1.4000	4.4100	12.8482	-8.4382
39	0.6700	1.3100	12.6250	-11.3150
40	0.9400	7.0800	12.7076	-5.6276
41	0.1800	1.0900	12.4753	-11.3853
42	0.2100	0.9700	12.4844	-11.5144
43	0.5400	1.1100	12.5853	-11.4753
44	0.0730	1.0700	12.4426	-11.3726
45	0.0770	0.4500	12.4438	-11.9938
46	8.4000	20.5000	14.9877	5.5123
47	2.0000	29.3000	13.0316	16.2684
48	1.1000	18.6000	12.7565	5.8435
49	39.2000	27.7000	24.4016	3.2984
50	34.7000	13.6000	23.0262	-9.4262
51	5.5000	30.0000	14.1013	15.8987

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	6.0000	20.2000	14.2541	2.4568	9.2848	19.2235
12	46.9000	12.0000	26.7551	6.9153	12.7676	40.7426
13	1.2000	9.0700	12.7870	2.7615	7.2014	18.3727
14	39.6000	16.3000	24.5238	5.7534	12.8864	36.1613
15	4.1000	11.1000	13.6734	2.5499	8.5157	18.8311
16	0.7100	1.6100	12.6373	2.8044	6.9648	18.3098
17	5.1000	2.3600	13.9791	2.4960	8.9304	19.0277
18	0.3500	1.5200	12.5272	2.8372	6.7885	18.2659
19	3.6000	1.9700	13.5206	2.5808	8.3005	18.7407
20	2.6000	4.5000	13.2149	2.6498	7.8553	18.5746
21	0.6600	1.3200	12.6220	2.8089	6.9404	18.3036
22	45.6000	34.6000	26.3577	6.7059	12.7937	39.9217
23	4.5000	8.7700	13.7957	2.5271	8.6841	18.9072
24	5.8000	24.5000	14.1930	2.4647	9.2076	19.1784
25	6.8000	26.0000	14.4987	2.4297	9.5841	19.4132
26	9.2000	53.8000	15.2322	2.3945	10.3888	20.0756
27	7.4000	62.3000	14.6820	2.4144	9.7985	19.5656
28	10.8000	32.1000	15.7212	2.4104	10.8457	20.5968
29	3.6000	50.1000	13.5206	2.5808	8.3005	18.7407
30	18.1000	26.6000	17.9525	2.8428	12.2023	23.7026
31	42.9000	16.2000	25.5325	6.2742	12.8418	38.2232
32	1.9000	8.4500	13.0010	2.7035	7.5326	18.4694
33	4.0000	29.2000	13.6428	2.5559	8.4731	18.8126
34	0.4600	5.3200	12.5609	2.8271	6.8426	18.2791
35	1.5000	2.2700	12.8787	2.7361	7.3444	18.4131
36	1.8000	1.6800	12.9704	2.7115	7.4858	18.4550
37	6.8000	3.4200	14.4987	2.4297	9.5841	19.4132
38	1.4000	4.4100	12.8482	2.7445	7.2969	18.3995
39	0.6700	1.3100	12.6250	2.8080	6.9453	18.3048
40	0.9400	7.0800	12.7076	2.7840	7.0763	18.3388
41	0.1800	1.0900	12.4753	2.8530	6.7046	18.2459
42	0.2100	0.9700	12.4844	2.8502	6.7195	18.2494
43	0.5400	1.1100	12.5853	2.8198	6.8818	18.2888
44	0.0730	1.0700	12.4426	2.8630	6.6516	18.2336
45	0.0770	0.4500	12.4438	2.8626	6.6536	18.2340
46	8.4000	20.5000	14.9877	2.3984	10.1364	19.8390
47	2.0000	29.3000	13.0316	2.6956	7.5792	18.4839
48	1.1000	18.6000	12.7565	2.7701	7.1534	18.3595
49	39.2000	27.7000	24.4016	5.6909	12.8906	35.9126
50	34.7000	13.6000	23.0262	4.9992	12.9144	33.1380
51	5.5000	30.0000	14.1013	2.4775	9.0901	19.1125

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	6.0000	20.2000	14.2541	15.5282	-17.1546	45.6628
12	46.9000	12.0000	26.7551	16.8199	-7.2664	60.7765
13	1.2000	9.0700	12.7870	15.5793	-18.7250	44.2991
14	39.6000	16.3000	24.5238	16.3765	-8.6008	57.6485
15	4.1000	11.1000	13.6734	15.5432	-17.7656	45.1125
16	0.7100	1.6100	12.6373	15.5870	-18.8903	44.1649
17	5.1000	2.3600	13.9791	15.5344	-17.4423	45.4004
18	0.3500	1.5200	12.5272	15.5929	-19.0123	44.0668
19	3.6000	1.9700	13.5206	15.5483	-17.9288	44.9699
20	2.6000	4.5000	13.2149	15.5599	-18.2579	44.6877
21	0.6600	1.3200	12.6220	15.5878	-18.9072	44.1512
22	45.6000	34.6000	26.3577	16.7349	-7.4918	60.2073
23	4.5000	8.7700	13.7957	15.5394	-17.6358	45.2272
24	5.8000	24.5000	14.1930	15.5294	-17.2182	45.6042
25	6.8000	26.0000	14.4987	15.5239	-16.9014	45.8987
26	9.2000	53.8000	15.2322	15.5184	-16.1568	46.6212
27	7.4000	62.3000	14.6820	15.5215	-16.7132	46.0773
28	10.8000	32.1000	15.7212	15.5209	-15.6728	47.1152
29	3.6000	50.1000	13.5206	15.5483	-17.9288	44.9699
30	18.1000	26.6000	17.9525	15.5939	-13.5892	49.4941
31	42.9000	16.2000	25.5325	16.5666	-7.9767	59.0417
32	1.9000	8.4500	13.0010	15.5691	-18.4905	44.4925
33	4.0000	29.2000	13.6428	15.5442	-17.7982	45.0839
34	0.4600	5.3200	12.5609	15.5910	-18.9750	44.0967
35	1.5000	2.2700	12.8787	15.5748	-18.6243	44.3818
36	1.8000	1.6800	12.9704	15.5705	-18.5239	44.4647
37	6.8000	3.4200	14.4987	15.5239	-16.9014	45.8987
38	1.4000	4.4100	12.8482	15.5763	-18.6578	44.3542
39	0.6700	1.3100	12.6250	15.5876	-18.9038	44.1539
40	0.9400	7.0800	12.7076	15.5833	-18.8126	44.2278
41	0.1800	1.0900	12.4753	15.5958	-19.0701	44.0207
42	0.2100	0.9700	12.4844	15.5952	-19.0599	44.0288
43	0.5400	1.1100	12.5853	15.5897	-18.9479	44.1185
44	0.0730	1.0700	12.4426	15.5976	-19.1065	43.9917
45	0.0770	0.4500	12.4438	15.5975	-19.1052	43.9928
46	8.4000	20.5000	14.9877	15.5190	-16.4025	46.3779
47	2.0000	29.3000	13.0316	15.5677	-18.4572	44.5203
48	1.1000	18.6000	12.7565	15.5808	-18.7587	44.2716
49	39.2000	27.7000	24.4016	16.3547	-8.6788	57.4820
50	34.7000	13.6000	23.0262	16.1270	-9.5938	55.6461
51	5.5000	30.0000	14.1013	15.5315	-17.3140	45.5166

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	6.0000	20.2000	14.2541	2.4568	7.2525	21.2557
12	46.9000	12.0000	26.7551	6.9153	7.0474	46.4627
13	1.2000	9.0700	12.7870	2.7615	4.9172	20.6569
14	39.6000	16.3000	24.5238	5.7534	8.1273	40.9204
15	4.1000	11.1000	13.6734	2.5499	6.4064	20.9404
16	0.7100	1.6100	12.6373	2.8044	4.6450	20.6295
17	5.1000	2.3600	13.9791	2.4960	6.8657	21.0924
18	0.3500	1.5200	12.5272	2.8372	4.4417	20.6128
19	3.6000	1.9700	13.5206	2.5808	6.1657	20.8754
20	2.6000	4.5000	13.2149	2.6498	5.6635	20.7664
21	0.6600	1.3200	12.6220	2.8089	4.6169	20.6270
22	45.6000	34.6000	26.3577	6.7059	7.2468	45.4687
23	4.5000	8.7700	13.7957	2.5271	6.5938	20.9976
24	5.8000	24.5000	14.1930	2.4647	7.1688	21.2172
25	6.8000	26.0000	14.4987	2.4297	7.5742	21.4231
26	9.2000	53.8000	15.2322	2.3945	8.4081	22.0564
27	7.4000	62.3000	14.6820	2.4144	7.8014	21.5627
28	10.8000	32.1000	15.7212	2.4104	8.8518	22.5907
29	3.6000	50.1000	13.5206	2.5808	6.1657	20.8754
30	18.1000	26.6000	17.9525	2.8428	9.8507	26.0542
31	42.9000	16.2000	25.5325	6.2742	7.6519	43.4130
32	1.9000	8.4500	13.0010	2.7035	5.2963	20.7057
33	4.0000	29.2000	13.6428	2.5559	6.3589	20.9268
34	0.4600	5.3200	12.5609	2.8271	4.5041	20.6176
35	1.5000	2.2700	12.8787	2.7361	5.0811	20.6764
36	1.8000	1.6800	12.9704	2.7115	5.2429	20.6980
37	6.8000	3.4200	14.4987	2.4297	7.5742	21.4231
38	1.4000	4.4100	12.8482	2.7445	5.0267	20.6697
39	0.6700	1.3100	12.6250	2.8080	4.6225	20.6275
40	0.9400	7.0800	12.7076	2.7840	4.7734	20.6417
41	0.1800	1.0900	12.4753	2.8530	4.3447	20.6059
42	0.2100	0.9700	12.4844	2.8502	4.3619	20.6070
43	0.5400	1.1100	12.5853	2.8198	4.5493	20.6213
44	0.0730	1.0700	12.4426	2.8630	4.2834	20.6018
45	0.0770	0.4500	12.4438	2.8626	4.2857	20.6019
46	8.4000	20.5000	14.9877	2.3984	8.1524	21.8229
47	2.0000	29.3000	13.0316	2.6956	5.3495	20.7136
48	1.1000	18.6000	12.7565	2.7701	4.8620	20.6509
49	39.2000	27.7000	24.4016	5.6909	8.1831	40.6200
50	34.7000	13.6000	23.0262	4.9992	8.7791	37.2732
51	5.5000	30.0000	14.1013	2.4775	7.0408	21.1618

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Section

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	6.0000	20.2000	14.2541	5.9459	0.3929	29.4350
12	46.9000	12.0000	26.7551	-14.7551	-1.0782	122.9588
13	1.2000	9.0700	12.7870	-3.7170	-0.2465	40.9816
14	39.6000	16.3000	24.5238	-8.2238	-0.5786	50.4530
15	4.1000	11.1000	13.6734	-2.5734	-0.1702	23.1839
16	0.7100	1.6100	12.6373	-11.0273	-0.7315	684.9235
17	5.1000	2.3600	13.9791	-11.6191	-0.7680	492.3328
18	0.3500	1.5200	12.5272	-11.0072	-0.7305	724.1602
19	3.6000	1.9700	13.5206	-11.5506	-0.7642	586.3241
20	2.6000	4.5000	13.2149	-8.7149	-0.5771	193.6653
21	0.6600	1.3200	12.6220	-11.3020	-0.7498	856.2110
22	45.6000	34.6000	26.3577	8.2423	0.5978	23.8216
23	4.5000	8.7700	13.7957	-5.0257	-0.3323	57.3052
24	5.8000	24.5000	14.1930	10.3070	0.6811	42.0694
25	6.8000	26.0000	14.4987	11.5013	0.7597	44.2360
26	9.2000	53.8000	15.2322	38.5678	2.5467	71.6874
27	7.4000	62.3000	14.6820	47.6180	3.1449	76.4333
28	10.8000	32.1000	15.7212	16.3788	1.0817	51.0242
29	3.6000	50.1000	13.5206	36.5794	2.4203	73.0128
30	18.1000	26.6000	17.9525	8.6475	0.5739	32.5096
31	42.9000	16.2000	25.5325	-9.3325	-0.6671	57.6079
32	1.9000	8.4500	13.0010	-4.5510	-0.3015	53.8578
33	4.0000	29.2000	13.6428	15.5572	1.0290	53.2779
34	0.4600	5.3200	12.5609	-7.2409	-0.4805	136.1063
35	1.5000	2.2700	12.8787	-10.6087	-0.7032	467.3449
36	1.8000	1.6800	12.9704	-11.2904	-0.7482	672.0489
37	6.8000	3.4200	14.4987	-11.0787	-0.7318	323.9372
38	1.4000	4.4100	12.8482	-8.4382	-0.5594	191.3416
39	0.6700	1.3100	12.6250	-11.3150	-0.7507	863.7437
40	0.9400	7.0800	12.7076	-5.6276	-0.3732	79.4854
41	0.1800	1.0900	12.4753	-11.3853	-0.7558	1044.5207
42	0.2100	0.9700	12.4844	-11.5144	-0.7643	1187.0562
43	0.5400	1.1100	12.5853	-11.4753	-0.7614	1033.8115
44	0.0730	1.0700	12.4426	-11.3726	-0.7550	1062.8571
45	0.0770	0.4500	12.4438	-11.9938	-0.7962	2665.2875
46	8.4000	20.5000	14.9877	5.5123	0.3640	26.8893
47	2.0000	29.3000	13.0316	16.2684	1.0778	55.5237
48	1.1000	18.6000	12.7565	5.8435	0.3875	31.4168
49	39.2000	27.7000	24.4016	3.2984	0.2317	11.9076
50	34.7000	13.6000	23.0262	-9.4262	-0.6503	69.3101
51	5.5000	30.0000	14.1013	15.8987	1.0507	52.9956

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	6.0000	5.9459	0.3886	0.0257	0.0020	240.3199
12	46.9000	-14.7551	*-1.0805	0.2034	0.1484	234.0824
13	1.2000	-3.7170	-0.2435	0.0324	0.0010	240.8990
14	39.6000	-8.2238	*-0.5736	0.1408	0.0274	239.2033
15	4.1000	-2.5734	-0.1681	0.0277	0.0004	241.0955
16	0.7100	-11.0273	-0.7271	0.0335	0.0093	237.9640
17	5.1000	-11.6191	-0.7639	0.0265	0.0080	237.6253
18	0.3500	-11.0072	-0.7261	0.0342	0.0095	237.9733
19	3.6000	-11.5506	-0.7601	0.0283	0.0085	237.6614
20	2.6000	-8.7149	-0.5721	0.0299	0.0051	239.2145
21	0.6600	-11.3020	-0.7455	0.0336	0.0098	237.7966
22	45.6000	8.2423	*0.5928	0.1913	0.0423	239.0641
23	4.5000	-5.0257	-0.3285	0.0272	0.0015	240.5915
24	5.8000	10.3070	0.6763	0.0258	0.0062	238.4049
25	6.8000	11.5013	0.7555	0.0251	0.0074	237.7040
26	9.2000	38.5678	*2.7531	0.0244	0.0811	201.1521
27	7.4000	47.6180	*3.5932	0.0248	0.1257	180.0873
28	10.8000	16.3788	1.0841	0.0247	0.0148	234.0363
29	3.6000	36.5794	*2.5916	0.0283	0.0854	205.0361
30	18.1000	8.6475	0.5690	0.0344	0.0059	239.2368
31	42.9000	-9.3325	*-0.6623	0.1674	0.0447	238.5218
32	1.9000	-4.5510	-0.2980	0.0311	0.0015	240.7122
33	4.0000	15.5572	1.0298	0.0278	0.0151	234.7236
34	0.4600	-7.2409	-0.4757	0.0340	0.0041	239.8464
35	1.5000	-10.6087	-0.6986	0.0318	0.0081	238.2156
36	1.8000	-11.2904	-0.7439	0.0313	0.0090	237.8119
37	6.8000	-11.0787	-0.7274	0.0251	0.0069	237.9616
38	1.4000	-8.4382	-0.5544	0.0320	0.0052	239.3390
39	0.6700	-11.3150	-0.7464	0.0335	0.0098	237.7886
40	0.9400	-5.6276	-0.3691	0.0330	0.0024	240.4129
41	0.1800	-11.3853	-0.7515	0.0346	0.0102	237.7412
42	0.2100	-11.5144	-0.7602	0.0346	0.0105	237.6608
43	0.5400	-11.4753	-0.7572	0.0338	0.0101	237.6881
44	0.0730	-11.3726	-0.7508	0.0349	0.0103	237.7482
45	0.0770	-11.9938	-0.7924	0.0349	0.0114	237.3525
46	8.4000	5.5123	0.3599	0.0245	0.0017	240.4551
47	2.0000	16.2684	1.0801	0.0309	0.0185	234.0878
48	1.1000	5.8435	0.3832	0.0326	0.0025	240.3458
49	39.2000	3.2984	*0.2288	0.1378	0.0043	240.9427
50	34.7000	-9.4262	*-0.6454	0.1063	0.0252	238.6584
51	5.5000	15.8987	1.0522	0.0261	0.0148	234.4446

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.3886	0.0631	0.0020	1.0725	0.0591	-0.0141
12	-1.0805	-0.5460	0.1484	* 1.2446	0.1246	-0.5123
13	-0.2435	-0.0446	0.0010	1.0852	-0.0445	0.0222
14	-0.5736	-0.2322	0.0274	* 1.2050	0.0358	-0.2112
15	-0.1681	-0.0283	0.0004	1.0817	-0.0276	0.0097
16	-0.7271	-0.1353	0.0093	1.0601	-0.1352	0.0704
17	-0.7639	-0.1260	0.0080	1.0495	-0.1205	0.0356
18	-0.7261	-0.1367	0.0095	1.0610	-0.1367	0.0733
19	-0.7601	-0.1298	0.0085	1.0518	-0.1272	0.0484
20	-0.5721	-0.1004	0.0051	1.0673	-0.0994	0.0430
21	-0.7455	-0.1389	0.0098	1.0587	-0.1389	0.0726
22	0.5928	0.2883	0.0423	* 1.2787	-0.0625	0.2693
23	-0.3285	-0.0549	0.0015	1.0766	-0.0531	0.0175
24	0.6763	0.1102	0.0062	1.0557	0.1037	-0.0261
25	0.7555	0.1213	0.0074	1.0487	0.1110	-0.0206
26	* 2.7531	0.4353	0.0811	0.7504	0.3631	0.0002
27	* 3.5932	0.5730	0.1257	0.6017	0.5145	-0.0733
28	1.0841	0.1726	0.0148	1.0162	0.1321	0.0198
29	* 2.5916	0.4425	0.0854	0.7829	0.4336	-0.1650
30	0.5690	0.1074	0.0059	1.0725	0.0436	0.0579
31	-0.6623	-0.2970	0.0447	* 1.2365	0.0567	-0.2745
32	-0.2980	-0.0534	0.0015	1.0821	-0.0531	0.0248
33	1.0298	0.1741	0.0151	1.0254	0.1697	-0.0609
34	-0.4757	-0.0892	0.0041	1.0775	-0.0892	0.0474
35	-0.6986	-0.1267	0.0081	1.0606	-0.1263	0.0613
36	-0.7439	-0.1337	0.0090	1.0563	-0.1330	0.0627
37	-0.7274	-0.1167	0.0069	1.0510	-0.1069	0.0198
38	-0.5544	-0.1009	0.0052	1.0708	-0.1006	0.0493
39	-0.7464	-0.1390	0.0098	1.0586	-0.1390	0.0726
40	-0.3691	-0.0681	0.0024	1.0815	-0.0681	0.0348
41	-0.7515	-0.1423	0.0102	1.0594	-0.1423	0.0774
42	-0.7602	-0.1438	0.0105	1.0586	-0.1438	0.0780
43	-0.7572	-0.1417	0.0101	1.0580	-0.1416	0.0748
44	-0.7508	-0.1427	0.0103	1.0597	-0.1427	0.0782
45	-0.7924	-0.1506	0.0114	1.0562	-0.1506	0.0825
46	0.3599	0.0570	0.0017	1.0724	0.0493	-0.0032
47	1.0801	0.1929	0.0185	1.0231	0.1918	-0.0886
48	0.3832	0.0704	0.0025	1.0805	0.0703	-0.0354
49	0.2288	0.0915	0.0043	* 1.2183	-0.0136	0.0830
50	-0.6454	-0.2226	0.0252	* 1.1532	0.0187	-0.1954
51	1.0522	0.1723	0.0148	1.0212	0.1633	-0.0442

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
11	6.0000	5.9459	|.....	0.3929	|.....	0.3886	|.....
12	46.9000	-14.7551	////.....	-1.0782	////.....	-1.0805	///.....
13	1.2000	-3.7170	|.....	-0.2465	|.....	-0.2435	|.....
14	39.6000	-8.2238	|.....	-0.5786	||.....	-0.5736	|.....
15	4.1000	-2.5734	|.....	-0.1702	|.....	-0.1681	|.....
16	0.7100	-11.0273	||.....	-0.7315	||.....	-0.7271	||.....
17	5.1000	-11.6191	///.....	-0.7680	///.....	-0.7639	||.....
18	0.3500	-11.0072	||.....	-0.7305	||.....	-0.7261	||.....
19	3.6000	-11.5506	||.....	-0.7642	||.....	-0.7601	||.....
20	2.6000	-8.7149	||.....	-0.5771	||.....	-0.5721	|.....
21	0.6600	-11.3020	||.....	-0.7498	||.....	-0.7455	||.....
22	45.6000	8.2423	|.....	0.5978	||.....	0.5928	|.....
23	4.5000	-5.0257	|.....	-0.3323	|.....	-0.3285	|.....
24	5.8000	10.3070	||.....	0.6811	||.....	0.6763	||.....
25	6.8000	11.5013	||.....	0.7597	||.....	0.7555	||.....
26	9.2000	38.5678	||||||||||....	2.5467	||||||||||....	* 2.7531	||||||||||....
27	7.4000	47.6180	||||||||||||||	3.1449	||||||||||||||	* 3.5932	||||||||||||||
28	10.8000	16.3788	////.....	1.0817	////.....	1.0841	////.....
29	3.6000	36.5794	||||||||||....	2.4203	||||||||||....	* 2.5916	|||||||||.....
30	18.1000	8.6475	||.....	0.5739	||.....	0.5690	|.....
31	42.9000	-9.3325	||.....	-0.6671	||.....	-0.6623	||.....
32	1.9000	-4.5510	|.....	-0.3015	|.....	-0.2980	|.....
33	4.0000	15.5572	////.....	1.0290	////.....	1.0298	///.....
34	0.4600	-7.2409	|.....	-0.4805	|.....	-0.4757	|.....
35	1.5000	-10.6087	||.....	-0.7032	||.....	-0.6986	||.....
36	1.8000	-11.2904	||.....	-0.7482	||.....	-0.7439	||.....
37	6.8000	-11.0787	||.....	-0.7318	||.....	-0.7274	||.....
38	1.4000	-8.4382	|.....	-0.5594	|.....	-0.5544	|.....
39	0.6700	-11.3150	||.....	-0.7507	||.....	-0.7464	||.....
40	0.9400	-5.6276	|.....	-0.3732	|.....	-0.3691	|.....
41	0.1800	-11.3853	||.....	-0.7558	||.....	-0.7515	||.....
42	0.2100	-11.5144	||.....	-0.7643	||.....	-0.7602	||.....
43	0.5400	-11.4753	||.....	-0.7614	||.....	-0.7572	||.....
44	0.0730	-11.3726	||.....	-0.7550	||.....	-0.7508	||.....
45	0.0770	-11.9938	///.....	-0.7962	///.....	-0.7924	||.....
46	8.4000	5.5123	|.....	0.3640	|.....	0.3599	|.....
47	2.0000	16.2684	////.....	1.0778	////.....	1.0801	///.....
48	1.1000	5.8435	|.....	0.3875	|.....	0.3832	|.....
49	39.2000	3.2984	|.....	0.2317	|.....	0.2288	|.....
50	34.7000	-9.4262	||.....	-0.6503	||.....	-0.6454	||.....
51	5.5000	15.8987	////.....	1.0507	////.....	1.0522	///.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	6.0000	0.0631	|.....	0.0020	|.....	-0.0141	|.....
12	46.9000	-0.5460	|||||||||||||.	0.1484	|||||||||||||	-0.5123	|||||||||||||
13	1.2000	-0.0446	|.....	0.0010	|.....	0.0222	|.....
14	39.6000	-0.2322	|||||.....	0.0274	||.....	-0.2112	|||||.....
15	4.1000	-0.0283	|.....	0.0004	|.....	0.0097	|.....
16	0.7100	-0.1353	||.....	0.0093	|.....	0.0704	||.....
17	5.1000	-0.1260	||.....	0.0080	|.....	0.0356	|.....
18	0.3500	-0.1367	||.....	0.0095	|.....	0.0733	||.....
19	3.6000	-0.1298	||.....	0.0085	|.....	0.0484	|.....
20	2.6000	-0.1004	|.....	0.0051	|.....	0.0430	|.....
21	0.6600	-0.1389	|||.....	0.0098	|.....	0.0726	||.....
22	45.6000	0.2883	|||||||.....	0.0423	||||.....	0.2693	|||||||.....
23	4.5000	-0.0549	|.....	0.0015	|.....	0.0175	|.....
24	5.8000	0.1102	||.....	0.0062	|.....	-0.0261	|.....
25	6.8000	0.1213	||.....	0.0074	|.....	-0.0206	|.....
26	9.2000	0.4353	||||||||||....	0.0811	||||||||.....	0.0002	|.....
27	7.4000	0.5730	||||||||||||||	0.1257	|||||||||||...	-0.0733	||.....
28	10.8000	0.1726	|||.....	0.0148	|.....	0.0198	|.....
29	3.6000	0.4425	||||||||||....	0.0854	||||||||.....	-0.1650	||||.....
30	18.1000	0.1074	||.....	0.0059	|.....	0.0579	|.....
31	42.9000	-0.2970	|||||||.....	0.0447	||||.....	-0.2745	||||||||.....
32	1.9000	-0.0534	|.....	0.0015	|.....	0.0248	|.....
33	4.0000	0.1741	||||.....	0.0151	|.....	-0.0609	|.....
34	0.4600	-0.0892	|.....	0.0041	|.....	0.0474	|.....
35	1.5000	-0.1267	||.....	0.0081	|.....	0.0613	|.....
36	1.8000	-0.1337	||.....	0.0090	|.....	0.0627	|.....
37	6.8000	-0.1167	||.....	0.0069	|.....	0.0198	|.....
38	1.4000	-0.1009	|.....	0.0052	|.....	0.0493	|.....
39	0.6700	-0.1390	|||.....	0.0098	|.....	0.0726	||.....
40	0.9400	-0.0681	|.....	0.0024	|.....	0.0348	|.....
41	0.1800	-0.1423	|||.....	0.0102	|.....	0.0774	||.....
42	0.2100	-0.1438	|||.....	0.0105	|.....	0.0780	||.....
43	0.5400	-0.1417	|||.....	0.0101	|.....	0.0748	||.....
44	0.0730	-0.1427	|||.....	0.0103	|.....	0.0782	||.....
45	0.0770	-0.1506	|||.....	0.0114	|.....	0.0825	||.....
46	8.4000	0.0570	|.....	0.0017	|.....	-0.0032	|.....
47	2.0000	0.1929	||||.....	0.0185	|.....	-0.0886	||.....
48	1.1000	0.0704	|.....	0.0025	|.....	-0.0354	|.....
49	39.2000	0.0915	|.....	0.0043	|.....	0.0830	||.....
50	34.7000	-0.2226	|||||.....	0.0252	||.....	-0.1954	|||||.....
51	5.5000	0.1723	|||.....	0.0148	|.....	-0.0442	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	6.0000	0.3886	|.....	0.0020	|.....	0.0257	|.....
12	46.9000	-1.0805	|||.....	0.1484	||||||||||||||	0.2034	||||||||||||||
13	1.2000	-0.2435	|.....	0.0010	|.....	0.0324	|.....
14	39.6000	-0.5736	|.....	0.0274	||.....	0.1408	||||||||.....
15	4.1000	-0.1681	|.....	0.0004	|.....	0.0277	|.....
16	0.7100	-0.7271	||.....	0.0093	|.....	0.0335	|.....
17	5.1000	-0.7639	||.....	0.0080	|.....	0.0265	|.....
18	0.3500	-0.7261	||.....	0.0095	|.....	0.0342	|.....
19	3.6000	-0.7601	||.....	0.0085	|.....	0.0283	|.....
20	2.6000	-0.5721	|.....	0.0051	|.....	0.0299	|.....
21	0.6600	-0.7455	||.....	0.0098	|.....	0.0336	|.....
22	45.6000	0.5928	|.....	0.0423	||||.....	0.1913	|||||||||||..
23	4.5000	-0.3285	|.....	0.0015	|.....	0.0272	|.....
24	5.8000	0.6763	||.....	0.0062	|.....	0.0258	|.....
25	6.8000	0.7555	||.....	0.0074	|.....	0.0251	|.....
26	9.2000	* 2.7531	||||||||||....	0.0811	|||||||.....	0.0244	|.....
27	7.4000	* 3.5932	||||||||||||||	0.1257	||||||||||...	0.0248	|.....
28	10.8000	1.0841	||||.....	0.0148	|.....	0.0247	|.....
29	3.6000	* 2.5916	|||||||||.....	0.0854	|||||||.....	0.0283	|.....
30	18.1000	0.5690	|.....	0.0059	|.....	0.0344	|.....
31	42.9000	-0.6623	||.....	0.0447	||||.....	0.1674	||||||||||....
32	1.9000	-0.2980	|.....	0.0015	|.....	0.0311	|.....
33	4.0000	1.0298	|||.....	0.0151	|.....	0.0278	|.....
34	0.4600	-0.4757	|.....	0.0041	|.....	0.0340	|.....
35	1.5000	-0.6986	||.....	0.0081	|.....	0.0318	|.....
36	1.8000	-0.7439	||.....	0.0090	|.....	0.0313	|.....
37	6.8000	-0.7274	||.....	0.0069	|.....	0.0251	|.....
38	1.4000	-0.5544	|.....	0.0052	|.....	0.0320	|.....
39	0.6700	-0.7464	||.....	0.0098	|.....	0.0335	|.....
40	0.9400	-0.3691	|.....	0.0024	|.....	0.0330	|.....
41	0.1800	-0.7515	||.....	0.0102	|.....	0.0346	|.....
42	0.2100	-0.7602	||.....	0.0105	|.....	0.0346	|.....
43	0.5400	-0.7572	||.....	0.0101	|.....	0.0338	|.....
44	0.0730	-0.7508	||.....	0.0103	|.....	0.0349	|.....
45	0.0770	-0.7924	||.....	0.0114	|.....	0.0349	|.....
46	8.4000	0.3599	|.....	0.0017	|.....	0.0245	|.....
47	2.0000	1.0801	|||.....	0.0185	|.....	0.0309	|.....
48	1.1000	0.3832	|.....	0.0025	|.....	0.0326	|.....
49	39.2000	0.2288	|.....	0.0043	|.....	0.1378	||||||||.....
50	34.7000	-0.6454	||.....	0.0252	||.....	0.1063	|||||.....
51	5.5000	1.0522	|||.....	0.0148	|.....	0.0261	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Inverse Prediction of X Means

Row	Invert (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	20.2000	6.0000	25.4534	-19.4534	-100.8966	9.6002
12	12.0000	46.9000	-1.3750	48.2750	16.5472	73.1437
13	9.0700	1.2000	-10.9612	12.1612	5.4491	148.9117
14	16.3000	39.6000	12.6936	26.9064	-28.4234	23.2063
15	11.1000	4.1000	-4.3196	8.4196	11.8029	97.7525
16	1.6100	0.7100	-35.3686	36.0786	-9.1502	328.1653
17	2.3600	5.1000	-32.9147	38.0147	-7.8552	310.3166
18	1.5200	0.3500	-35.6630	36.0130	-9.3045	330.3061
19	1.9700	3.6000	-34.1907	37.7907	-8.5307	319.6001
20	4.5000	2.6000	-25.9132	28.5132	-4.0432	259.2713
21	1.3200	0.6600	-36.3174	36.9774	-9.6465	335.0625
22	34.6000	45.6000	72.5668	-26.9668	-446.2083	37.0804
23	8.7700	4.5000	-11.9428	16.4428	4.7071	156.2752
24	24.5000	5.8000	39.5220	-33.7220	-205.8852	19.6807
25	26.0000	6.8000	44.4296	-37.6296	-241.8154	22.5035
26	53.8000	9.2000	135.3845	-126.1845	-900.2283	67.3250
27	62.3000	7.4000	163.1945	-155.7945	-1100.9990	80.4868
28	32.1000	10.8000	64.3874	-53.5874	-386.9435	32.9947
29	50.1000	3.6000	123.2790	-119.6790	-812.8098	61.5716
30	26.6000	18.1000	46.3927	-28.2927	-256.1471	23.5922
31	16.2000	42.9000	12.3664	30.5336	-27.9360	24.9261
32	8.4500	1.9000	-12.9897	14.8897	3.9461	164.0991
33	29.2000	4.0000	54.8993	-50.8993	-318.0772	28.1361
34	5.3200	0.4600	-23.2303	23.6903	-2.5185	239.6480
35	2.2700	1.5000	-33.2092	34.7092	-8.0115	312.4594
36	1.6800	1.8000	-35.1395	36.9395	-9.0300	326.5002
37	3.4200	6.8000	-29.4467	36.2467	-5.9921	285.0576
38	4.4100	1.4000	-26.2076	27.6076	-4.2079	261.4225
39	1.3100	0.6700	-36.3501	37.0201	-9.6636	335.3003
40	7.0800	0.9400	-17.4720	18.4120	0.9476	197.3357
41	1.0900	0.1800	-37.0699	37.2499	-10.0386	340.5311
42	0.9700	0.2100	-37.4625	37.6725	-10.2427	343.3837
43	1.1100	0.5400	-37.0044	37.5444	-10.0046	340.0556
44	1.0700	0.0730	-37.1353	37.2083	-10.0727	341.0065
45	0.4500	0.0770	-39.1638	39.2408	-11.1230	355.7412
46	20.5000	8.4000	26.4350	-18.0350	-108.4350	10.5170
47	29.3000	2.0000	55.2264	-53.2264	-320.4549	28.3066
48	18.6000	1.1000	20.2186	-19.1186	-58.7427	2.7608
49	27.7000	39.2000	49.9916	-10.7916	-282.3779	25.5442
50	13.6000	34.7000	3.8598	30.8402	6.5181	47.8582
51	30.0000	5.5000	57.5167	-52.0167	-337.0917	29.4932

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Inverse Prediction of X Individuals

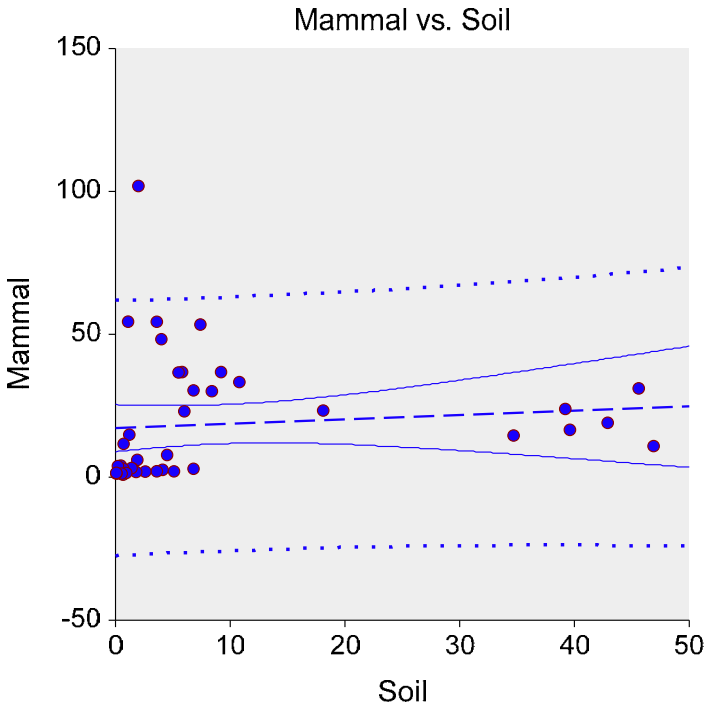
Row	Invert (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	20.2000	6.0000	25.4534	-19.4534	-223.6237	132.3273
12	12.0000	46.9000	-1.3750	48.2750	-139.3470	229.0380
13	9.0700	1.2000	-10.9612	12.1612	-94.8146	249.1754
14	16.3000	39.6000	12.6936	26.9064	-190.7417	185.5246
15	11.1000	4.1000	-4.3196	8.4196	-126.5530	236.1084
16	1.6100	0.7100	-35.3686	36.0786	80.2471	238.7681
17	2.3600	5.1000	-32.9147	38.0147	54.1775	248.2840
18	1.5200	0.3500	-35.6630	36.0130	83.7295	237.2721
19	1.9700	3.6000	-34.1907	37.7907	67.1593	243.9101
20	4.5000	2.6000	-25.9132	28.5132	-4.2724	259.5005
21	1.3200	0.6600	-36.3174	36.9774	91.8448	233.5711
22	34.6000	45.6000	72.5668	-26.9668	-358.3961	-50.7318
23	8.7700	4.5000	-11.9428	16.4428	-89.7570	250.7393
24	24.5000	5.8000	39.5220	-33.7220	-241.4521	55.2476
25	26.0000	6.8000	44.4296	-37.6296	-241.0392	21.7273
26	53.8000	9.2000	135.3845	-126.1845	-862.8956	29.9923
27	62.3000	7.4000	163.1945	-155.7945	-1070.8357	50.3236
28	32.1000	10.8000	64.3874	-53.5874	-273.7182	-80.2306
29	50.1000	3.6000	123.2790	-119.6790	-771.1037	19.8655
30	26.6000	18.1000	46.3927	-28.2927	-239.4203	6.8654
31	16.2000	42.9000	12.3664	30.5336	-189.7236	186.7137
32	8.4500	1.9000	-12.9897	14.8897	-84.2493	252.2945
33	29.2000	4.0000	54.8993	-50.8993	-213.9761	-75.9651
34	5.3200	0.4600	-23.2303	23.6903	-23.0916	260.2210
35	2.2700	1.5000	-33.2092	34.7092	57.0806	247.3673
36	1.6800	1.8000	-35.1395	36.9395	77.6022	239.8679
37	3.4200	6.8000	-29.4467	36.2467	23.1275	255.9380
38	4.4100	1.4000	-26.2076	27.6076	-2.1129	259.3275
39	1.3100	0.6700	-36.3501	37.0201	92.2659	233.3708
40	7.0800	0.9400	-17.4720	18.4120	-59.2427	257.5260
41	1.0900	0.1800	-37.0699	37.2499	101.9778	228.5146
42	0.9700	0.2100	-37.4625	37.6725	107.7083	225.4327
43	1.1100	0.5400	-37.0044	37.5444	101.0557	228.9953
44	1.0700	0.0730	-37.1353	37.2083	102.9088	228.0250
45	0.4500	0.0770	-39.1638	39.2408	139.4407	205.1775
46	20.5000	8.4000	26.4350	-18.0350	-225.5667	127.6487
47	29.3000	2.0000	55.2264	-53.2264	-211.7935	-80.3548
48	18.6000	1.1000	20.2186	-19.1186	-211.7897	155.8079
49	27.7000	39.2000	49.9916	-10.7916	-233.4105	-23.4232
50	13.6000	34.7000	3.8598	30.8402	-160.3083	214.6846
51	30.0000	5.5000	57.5167	-52.0167	-187.4376	-120.1608

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Mammal	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	17.1934	Rows Prediction Only	0
Slope	0.1488	Sum of Frequencies	41
R-Squared	0.0095	Sum of Weights	41.0000
Correlation	0.0974	Coefficient of Variation	1.1683
Mean Square Error	470.2239	Square Root of MSE	21.68465

Linear Regression Report

Y = Mammal X = Soil

Summary Statement

The equation of the straight line relating Mammal and Soil is estimated as: Mammal = (17.1934) + (0.1488) Soil using the 41 observations in this dataset. The y-intercept, the estimated value of Mammal when Soil is zero, is 17.1934 with a standard error of 4.0589. The slope, the estimated change in Mammal per unit change in Soil, is 0.1488 with a standard error of 0.2433. The value of R-Squared, the proportion of the variation in Mammal that can be accounted for by variation in Soil, is 0.0095. The correlation between Mammal and Soil is 0.0974.

A significance test that the slope is zero resulted in a t-value of 0.6114. The significance level of this t-test is 0.5445. Since 0.5445 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is 0.1488. The lower limit of the 95% confidence interval for the slope is -0.3434 and the upper limit is 0.6410. The estimated intercept is 17.1934. The lower limit of the 95% confidence interval for the intercept is 8.9836 and the upper limit is 25.4033.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Mammal	Soil
Count	41	41
Mean	18.5613	9.1944
Standard Deviation	21.5142	14.0901
Minimum	0.8900	0.0730
Maximum	101.9000	46.9000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	17.1934	0.1488
Lower 95% Confidence Limit	8.9836	-0.3434
Upper 95% Confidence Limit	25.4033	0.6410
Standard Error	4.0589	0.2433
Standardized Coefficient	0.0000	0.0974
T Value	4.2360	0.6114
Prob Level (T Test)	0.0001	0.5445
Prob Level (Randomization Test N =1000)		0.5390
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.9850	0.0916
Regression of Y on X	17.1934	0.1488
Inverse Regression from X on Y	-125.5308	15.6717
Orthogonal Regression of Y and X	-64.7412	9.0601

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(17.1934476825897) + (0.148765980530249) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	17.1934	0.9000	9.5978	23.9403
Bootstrap Mean	17.1540	0.9500	7.7286	24.7563
Bias (BM - OV)	-0.0395	0.9900	4.3809	26.3971
Bias Corrected	17.2329			
Standard Error	4.3642			
Slope				
Original Value	0.1488	0.9000	-0.1161	0.3870
Bootstrap Mean	0.1703	0.9500	-0.1878	0.4364
Bias (BM - OV)	0.0215	0.9900	-0.4918	0.5397
Bias Corrected	0.1273			
Standard Error	0.1839			
Correlation				
Original Value	0.0974	0.9000	-0.1236	0.2480
Bootstrap Mean	0.1184	0.9500	-0.1733	0.2756
Bias (BM - OV)	0.0210	0.9900	-0.2530	0.3315
Bias Corrected	0.0764			
Standard Error	0.1116			
R-Squared				
Original Value	0.0095	0.9000	0.0000	0.0189
Bootstrap Mean	0.0265	0.9500	0.0000	0.0190
Bias (BM - OV)	0.0170	0.9900	0.0000	0.0190
Bias Corrected	-0.0075			
Standard Error	0.0366			
Standard Error of Estimate				
Original Value	21.6846	0.9000	15.3243	29.0661
Bootstrap Mean	20.8787	0.9500	14.3411	29.8388
Bias (BM - OV)	-0.8060	0.9900	12.4884	31.3913
Bias Corrected	22.4906			
Standard Error	4.1650			
Orthogonal Intercept				
Original Value	-64.7412	0.9000	-553.6402	372.7975
Bootstrap Mean	-119.2628	0.9500	-937.4990	952.3407
Bias (BM - OV)	-54.5216	0.9900	-9149.6189	8081.2406
Bias Corrected	-10.2196			
Standard Error	9895.8517			
Orthogonal Slope				
Original Value	9.0601	0.9000	-47.2086	62.1134
Bootstrap Mean	14.7059	0.9500	-106.1062	108.9818
Bias (BM - OV)	5.6458	0.9900	-945.9856	928.5713
Bias Corrected	3.4144			
Standard Error	987.9544			

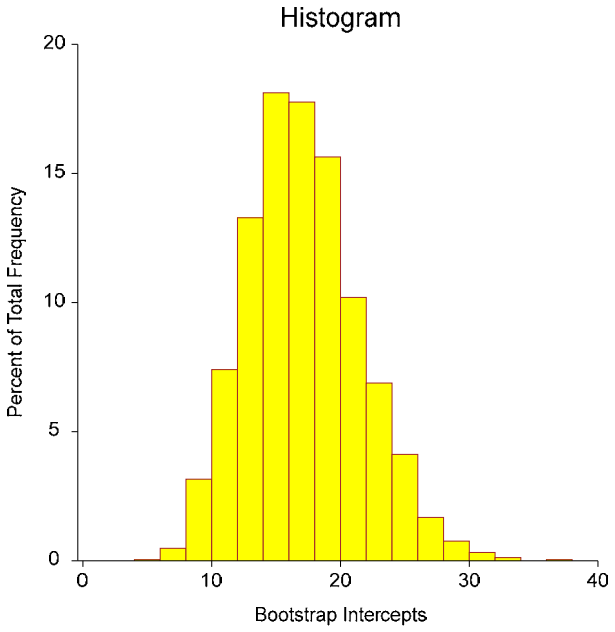
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

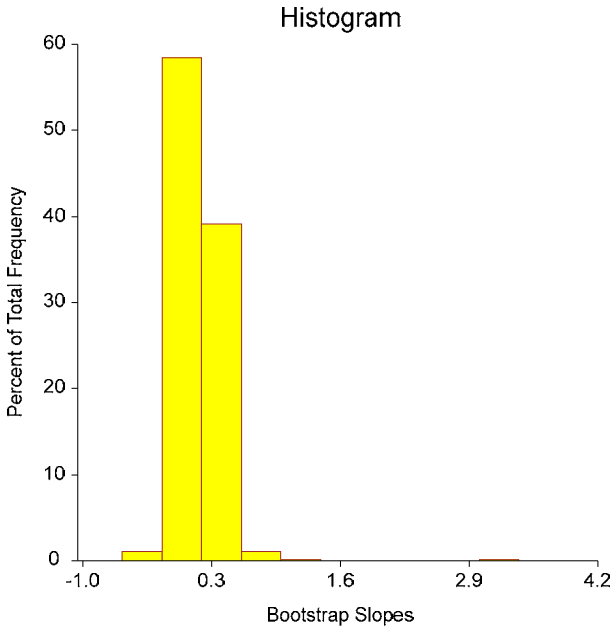
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

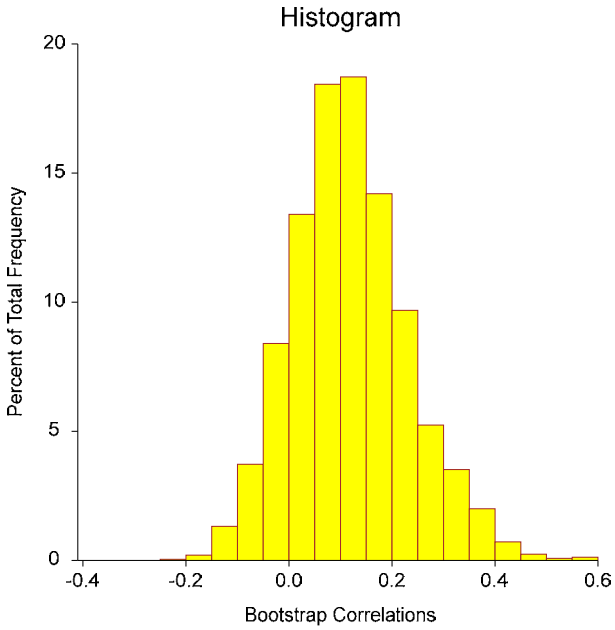
Linear Regression Report

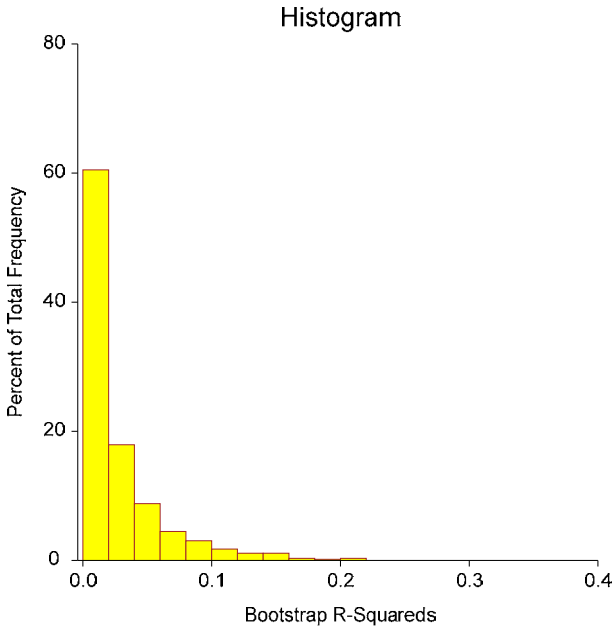
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Bootstrap Histograms Section



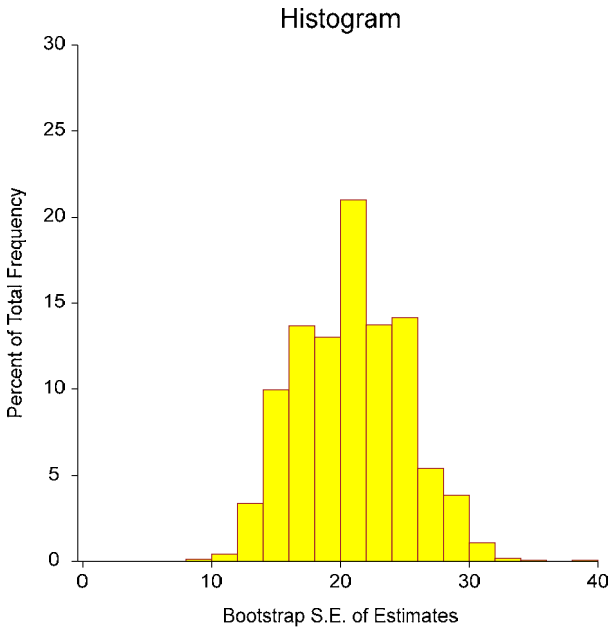


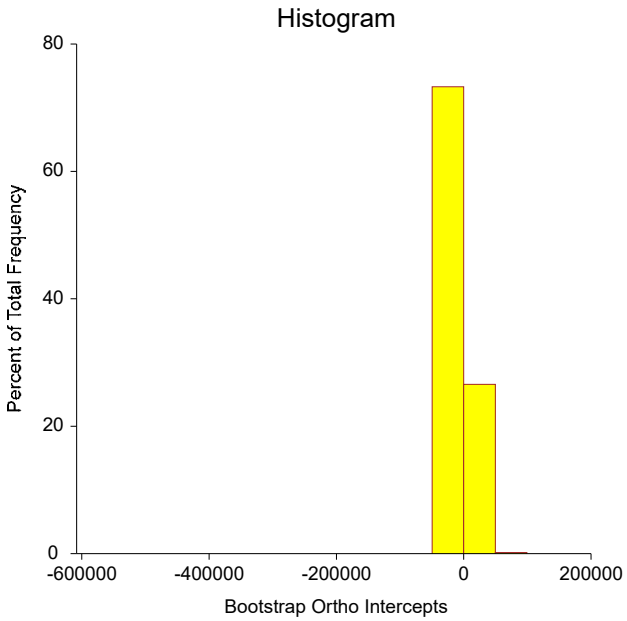


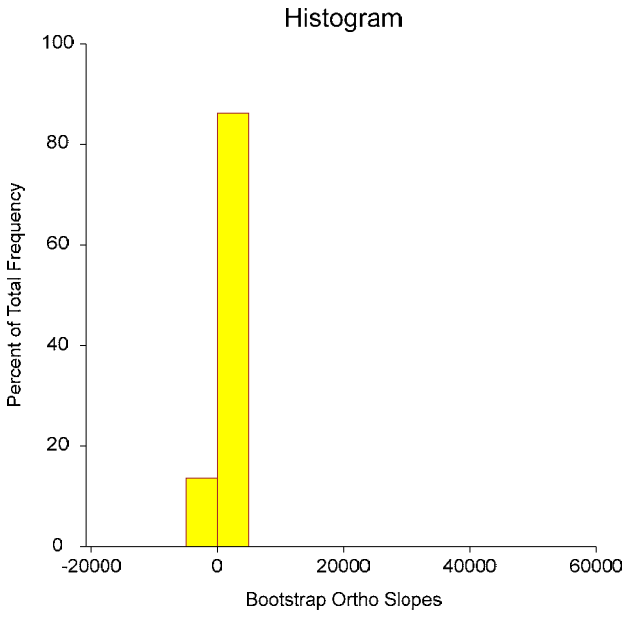


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.0974	0.0095	0.5719
Lower 95% Conf. Limit (r dist'n)	-0.2145		
Upper 95% Conf. Limit (r dist'n)	0.3892		
Lower 95% Conf. Limit (Fisher's z)	-0.2167		0.3206
Upper 95% Conf. Limit (Fisher's z)	0.3933		0.7479
Adjusted (Rbar)		0.0159	
T-Value for H0: Rho = 0	0.6114	0.6114	4.3532
Prob Level for H0: Rho = 0	0.5445	0.5445	0.0001
Prob Level (Randomization Test N =1000)	0.5390		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	14125.34	14125.34			
Slope	1	175.7511	175.7511	0.3738	0.5445	0.0916
Error	39	18338.73	470.2239			
Lack of Fit	37	16595.41	448.5245	0.5146	0.8424	
Pure Error	2	1743.324	871.6622			
Adj. Total	40	18514.48	462.8621			
Total	41	32639.82				

s = Square Root(470.2239) = 21.68465

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	376.97	761.0117	0.03503547	-0.001157796
1	376.97	11407.3	8178.432	-0.001157796	0.0001259242
2 (Y'Y)			32639.82		
Determinant		325592.8			3.071322E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	16.47452	-0.5444234
1	-0.5444234	0.05921256

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7572	0.000001	No
Anderson Darling	3.1758	0.000000	No
D'Agostino Skewness	4.1762	0.000030	No
D'Agostino Kurtosis	3.2455	0.001172	No
D'Agostino Omnibus	27.9744	0.000001	No
Constant Residual Variance?			
Modified Levene Test	0.0518	0.821223	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.5146	0.842441	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

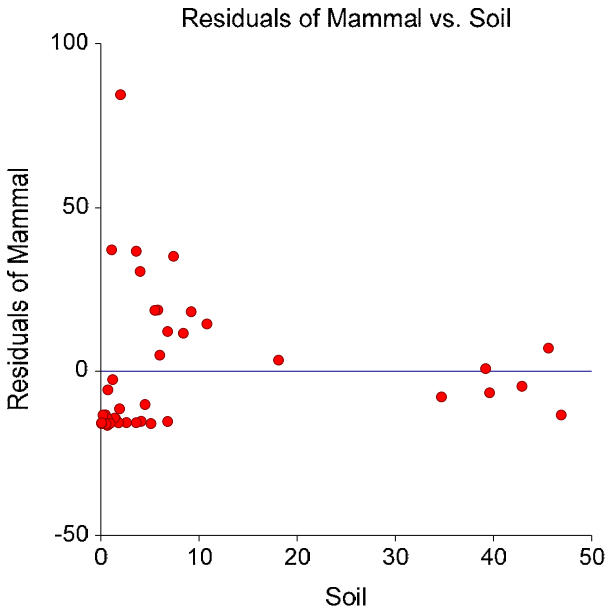
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

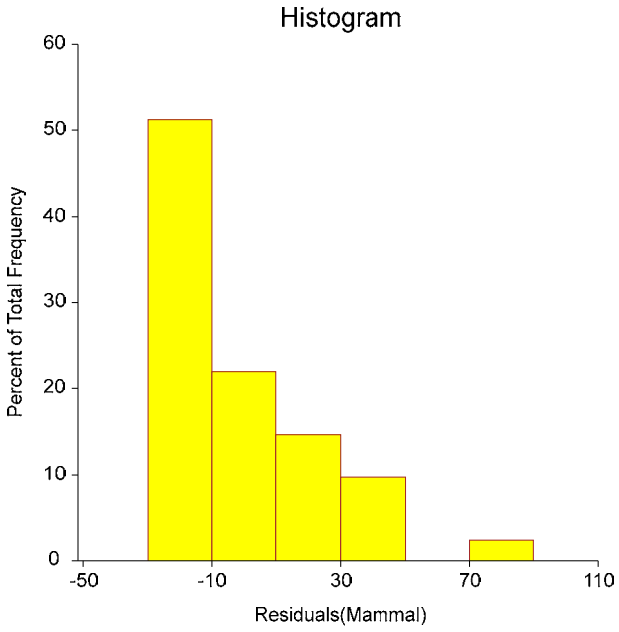
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

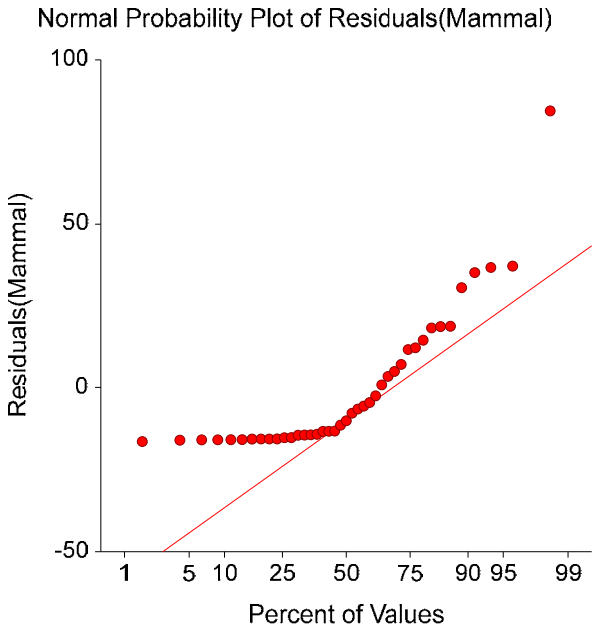
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Original Data Section

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual
11	6.0000	23.0667	18.0860	4.9806
12	46.9000	10.9000	24.1706	-13.2706
13	1.2000	14.8900	17.3720	-2.4820
14	39.6000	16.6000	23.0846	-6.4846
15	4.1000	2.6000	17.8034	-15.2034
16	0.7100	11.6950	17.2991	-5.6041
17	5.1000	2.0767	17.9522	-15.8755
18	0.3500	2.7800	17.2455	-14.4655
19	3.6000	2.1100	17.7290	-15.6190
20	2.6000	1.9900	17.5802	-15.5902
21	0.6600	0.8900	17.2916	-16.4016
22	45.6000	31.1000	23.9772	7.1228
23	4.5000	7.8000	17.8629	-10.0629
24	5.8000	36.8000	18.0563	18.7437
25	6.8000	30.4000	18.2051	12.1949
26	9.2000	36.8000	18.5621	18.2379
27	7.4000	53.4233	18.2943	35.1290
28	10.8000	33.3000	18.8001	14.4999
29	3.6000	54.4000	17.7290	36.6710
30	18.1000	23.3500	19.8861	3.4639
31	42.9000	19.0700	23.5755	-4.5055
32	1.9000	6.0800	17.4761	-11.3961
33	4.0000	48.3000	17.7885	30.5115
34	0.4600	4.0533	17.2619	-13.2085
35	1.5000	2.9867	17.4166	-14.4299
36	1.8000	1.8400	17.4612	-15.6212
37	6.8000	2.9700	18.2051	-15.2351
38	1.4000	3.2100	17.4017	-14.1917
39	0.6700	2.9400	17.2931	-14.3531
40	0.9400	1.5200	17.3333	-15.8133
41	0.1800	1.3900	17.2202	-15.8302
42	0.2100	3.9267	17.2247	-13.2980
43	0.5400	1.2767	17.2738	-15.9971
44	0.0730	1.3100	17.2043	-15.8943
45	0.0770	1.5500	17.2049	-15.6549
46	8.4000	30.1000	18.4431	11.6569
47	2.0000	101.9000	17.4910	84.4090
48	1.1000	54.4500	17.3571	37.0929
49	39.2000	23.9000	23.0251	0.8749
50	34.7000	14.6000	22.3556	-7.7556
51	5.5000	36.6667	18.0117	18.6550

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	6.0000	23.0667	18.0860	3.4746	11.0579	25.1142
12	46.9000	10.9000	24.1706	9.7802	4.3883	43.9529
13	1.2000	14.8900	17.3720	3.9055	9.4723	25.2716
14	39.6000	16.6000	23.0846	8.1370	6.6259	39.5432
15	4.1000	2.6000	17.8034	3.6063	10.5089	25.0979
16	0.7100	11.6950	17.2991	3.9663	9.2765	25.3216
17	5.1000	2.0767	17.9522	3.5301	10.8119	25.0924
18	0.3500	2.7800	17.2455	4.0126	9.1293	25.3617
19	3.6000	2.1100	17.7290	3.6499	10.3463	25.1117
20	2.6000	1.9900	17.5802	3.7475	10.0002	25.1603
21	0.6600	0.8900	17.2916	3.9726	9.2563	25.3270
22	45.6000	31.1000	23.9772	9.4841	4.7939	43.1605
23	4.5000	7.8000	17.8629	3.5740	10.6337	25.0921
24	5.8000	36.8000	18.0563	3.4858	11.0055	25.1071
25	6.8000	30.4000	18.2051	3.4363	11.2544	25.1557
26	9.2000	36.8000	18.5621	3.3866	11.7121	25.4121
27	7.4000	53.4233	18.2943	3.4146	11.3876	25.2010
28	10.8000	33.3000	18.8001	3.4090	11.9047	25.6955
29	3.6000	54.4000	17.7290	3.6499	10.3463	25.1117
30	18.1000	23.3500	19.8861	4.0206	11.7537	28.0185
31	42.9000	19.0700	23.5755	8.8735	5.6272	41.5238
32	1.9000	6.0800	17.4761	3.8235	9.7423	25.2099
33	4.0000	48.3000	17.7885	3.6148	10.4770	25.1001
34	0.4600	4.0533	17.2619	3.9983	9.1746	25.3491
35	1.5000	2.9867	17.4166	3.8697	9.5894	25.2438
36	1.8000	1.8400	17.4612	3.8349	9.7044	25.2180
37	6.8000	2.9700	18.2051	3.4363	11.2544	25.1557
38	1.4000	3.2100	17.4017	3.8815	9.5506	25.2528
39	0.6700	2.9400	17.2931	3.9713	9.2603	25.3259
40	0.9400	1.5200	17.3333	3.9374	9.3691	25.2975
41	0.1800	1.3900	17.2202	4.0349	9.0589	25.3816
42	0.2100	3.9267	17.2247	4.0309	9.0713	25.3780
43	0.5400	1.2767	17.2738	3.9880	9.2074	25.3402
44	0.0730	1.3100	17.2043	4.0491	9.0142	25.3944
45	0.0770	1.5500	17.2049	4.0486	9.0159	25.3939
46	8.4000	30.1000	18.4431	3.3921	11.5819	25.3042
47	2.0000	101.9000	17.4910	3.8123	9.7799	25.2021
48	1.1000	54.4500	17.3571	3.9177	9.4328	25.2814
49	39.2000	23.9000	23.0251	8.0486	6.7452	39.3049
50	34.7000	14.6000	22.3556	7.0703	8.0546	36.6566
51	5.5000	36.6667	18.0117	3.5039	10.9244	25.0989

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	6.0000	23.0667	18.0860	21.9613	-26.3348	62.5069
12	46.9000	10.9000	24.1706	23.7881	-23.9455	72.2866
13	1.2000	14.8900	17.3720	22.0335	-27.1951	61.9390
14	39.6000	16.6000	23.0846	23.1611	-23.7631	69.9323
15	4.1000	2.6000	17.8034	21.9825	-26.6604	62.2672
16	0.7100	11.6950	17.2991	22.0444	-27.2899	61.8881
17	5.1000	2.0767	17.9522	21.9701	-26.4866	62.3909
18	0.3500	2.7800	17.2455	22.0528	-27.3604	61.8514
19	3.6000	2.1100	17.7290	21.9897	-26.7493	62.2073
20	2.6000	1.9900	17.5802	22.0061	-26.9313	62.0917
21	0.6600	0.8900	17.2916	22.0455	-27.2997	61.8829
22	45.6000	31.1000	23.9772	23.6679	-23.8957	71.8501
23	4.5000	7.8000	17.8629	21.9772	-26.5902	62.3160
24	5.8000	36.8000	18.0563	21.9630	-26.3681	62.4807
25	6.8000	30.4000	18.2051	21.9552	-26.2036	62.6137
26	9.2000	36.8000	18.5621	21.9475	-25.8309	62.9551
27	7.4000	53.4233	18.2943	21.9518	-26.1075	62.6961
28	10.8000	33.3000	18.8001	21.9510	-25.5999	63.2002
29	3.6000	54.4000	17.7290	21.9897	-26.7493	62.2073
30	18.1000	23.3500	19.8861	22.0542	-24.7228	64.4950
31	42.9000	19.0700	23.5755	23.4299	-23.8160	70.9670
32	1.9000	6.0800	17.4761	22.0192	-27.0618	62.0141
33	4.0000	48.3000	17.7885	21.9839	-26.6781	62.2551
34	0.4600	4.0533	17.2619	22.0502	-27.3388	61.8626
35	1.5000	2.9867	17.4166	22.0272	-27.1377	61.9709
36	1.8000	1.8400	17.4612	22.0211	-27.0807	62.0032
37	6.8000	2.9700	18.2051	21.9552	-26.2036	62.6137
38	1.4000	3.2100	17.4017	22.0293	-27.1567	61.9602
39	0.6700	2.9400	17.2931	22.0453	-27.2977	61.8840
40	0.9400	1.5200	17.3333	22.0392	-27.2452	61.9118
41	0.1800	1.3900	17.2202	22.0568	-27.3940	61.8344
42	0.2100	3.9267	17.2247	22.0561	-27.3880	61.8374
43	0.5400	1.2767	17.2738	22.0483	-27.3231	61.8707
44	0.0730	1.3100	17.2043	22.0594	-27.4151	61.8238
45	0.0770	1.5500	17.2049	22.0593	-27.4143	61.8241
46	8.4000	30.1000	18.4431	21.9484	-25.9516	62.8378
47	2.0000	101.9000	17.4910	22.0172	-27.0430	62.0250
48	1.1000	54.4500	17.3571	22.0357	-27.2143	61.9285
49	39.2000	23.9000	23.0251	23.1302	-23.7601	69.8102
50	34.7000	14.6000	22.3556	22.8082	-23.7783	68.4895
51	5.5000	36.6667	18.0117	21.9659	-26.4186	62.4419

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	6.0000	23.0667	18.0860	3.4746	8.1838	27.9883
12	46.9000	10.9000	24.1706	9.7802	-3.7017	52.0429
13	1.2000	14.8900	17.3720	3.9055	6.2417	28.5022
14	39.6000	16.6000	23.0846	8.1370	-0.1048	46.2740
15	4.1000	2.6000	17.8034	3.6063	7.5258	28.0810
16	0.7100	11.6950	17.2991	3.9663	5.9957	28.6024
17	5.1000	2.0767	17.9522	3.5301	7.8919	28.0124
18	0.3500	2.7800	17.2455	4.0126	5.8102	28.6808
19	3.6000	2.1100	17.7290	3.6499	7.3271	28.1309
20	2.6000	1.9900	17.5802	3.7475	6.9003	28.2601
21	0.6600	0.8900	17.2916	3.9726	5.9702	28.6131
22	45.6000	31.1000	23.9772	9.4841	-3.0512	51.0055
23	4.5000	7.8000	17.8629	3.5740	7.6773	28.0484
24	5.8000	36.8000	18.0563	3.4858	8.1221	27.9905
25	6.8000	30.4000	18.2051	3.4363	8.4120	27.9981
26	9.2000	36.8000	18.5621	3.3866	8.9108	28.2134
27	7.4000	53.4233	18.2943	3.4146	8.5631	28.0255
28	10.8000	33.3000	18.8001	3.4090	9.0848	28.5154
29	3.6000	54.4000	17.7290	3.6499	7.3271	28.1309
30	18.1000	23.3500	19.8861	4.0206	8.4280	31.3442
31	42.9000	19.0700	23.5755	8.8735	-1.7127	48.8637
32	1.9000	6.0800	17.4761	3.8235	6.5795	28.3727
33	4.0000	48.3000	17.7885	3.6148	7.4869	28.0901
34	0.4600	4.0533	17.2619	3.9983	5.8673	28.6564
35	1.5000	2.9867	17.4166	3.8697	6.3885	28.4447
36	1.8000	1.8400	17.4612	3.8349	6.5323	28.3902
37	6.8000	2.9700	18.2051	3.4363	8.4120	27.9981
38	1.4000	3.2100	17.4017	3.8815	6.3399	28.4635
39	0.6700	2.9400	17.2931	3.9713	5.9753	28.6109
40	0.9400	1.5200	17.3333	3.9374	6.1121	28.5544
41	0.1800	1.3900	17.2202	4.0349	5.7213	28.7192
42	0.2100	3.9267	17.2247	4.0309	5.7370	28.7123
43	0.5400	1.2767	17.2738	3.9880	5.9086	28.6389
44	0.0730	1.3100	17.2043	4.0491	5.6648	28.7438
45	0.0770	1.5500	17.2049	4.0486	5.6670	28.7428
46	8.4000	30.1000	18.4431	3.3921	8.7761	28.1101
47	2.0000	101.9000	17.4910	3.8123	6.6264	28.3556
48	1.1000	54.4500	17.3571	3.9177	6.1921	28.5221
49	39.2000	23.9000	23.0251	8.0486	0.0876	45.9626
50	34.7000	14.6000	22.3556	7.0703	2.2063	42.5050
51	5.5000	36.6667	18.0117	3.5039	8.0261	27.9972

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Section

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	6.0000	23.0667	18.0860	4.9806	0.2327	21.5923
12	46.9000	10.9000	24.1706	-13.2706	-0.6857	121.7484
13	1.2000	14.8900	17.3720	-2.4820	-0.1164	16.6687
14	39.6000	16.6000	23.0846	-6.4846	-0.3226	39.0637
15	4.1000	2.6000	17.8034	-15.2034	-0.7110	584.7457
16	0.7100	11.6950	17.2991	-5.6041	-0.2629	47.9185
17	5.1000	2.0767	17.9522	-15.8755	-0.7420	764.4697
18	0.3500	2.7800	17.2455	-14.4655	-0.6788	520.3423
19	3.6000	2.1100	17.7290	-15.6190	-0.7307	740.2372
20	2.6000	1.9900	17.5802	-15.5902	-0.7299	783.4291
21	0.6600	0.8900	17.2916	-16.4016	-0.7694	1842.8801
22	45.6000	31.1000	23.9772	7.1228	0.3653	22.9030
23	4.5000	7.8000	17.8629	-10.0629	-0.4705	129.0115
24	5.8000	36.8000	18.0563	18.7437	0.8758	50.9340
25	6.8000	30.4000	18.2051	12.1949	0.5696	40.1149
26	9.2000	36.8000	18.5621	18.2379	0.8515	49.5595
27	7.4000	53.4233	18.2943	35.1290	1.6405	65.7559
28	10.8000	33.3000	18.8001	14.4999	0.6771	43.5432
29	3.6000	54.4000	17.7290	36.6710	1.7156	67.4099
30	18.1000	23.3500	19.8861	3.4639	0.1626	14.8346
31	42.9000	19.0700	23.5755	-4.5055	-0.2277	23.6262
32	1.9000	6.0800	17.4761	-11.3961	-0.5339	187.4359
33	4.0000	48.3000	17.7885	30.5115	1.4270	63.1708
34	0.4600	4.0533	17.2619	-13.2085	-0.6197	325.8688
35	1.5000	2.9867	17.4166	-14.4299	-0.6763	483.1450
36	1.8000	1.8400	17.4612	-15.6212	-0.7319	848.9797
37	6.8000	2.9700	18.2051	-15.2351	-0.7116	512.9649
38	1.4000	3.2100	17.4017	-14.1917	-0.6652	442.1097
39	0.6700	2.9400	17.2931	-14.3531	-0.6733	488.2014
40	0.9400	1.5200	17.3333	-15.8133	-0.7416	1040.3479
41	0.1800	1.3900	17.2202	-15.8302	-0.7430	1138.8651
42	0.2100	3.9267	17.2247	-13.2980	-0.6241	338.6593
43	0.5400	1.2767	17.2738	-15.9971	-0.7505	1253.0377
44	0.0730	1.3100	17.2043	-15.8943	-0.7461	1213.3059
45	0.0770	1.5500	17.2049	-15.6549	-0.7349	1009.9937
46	8.4000	30.1000	18.4431	11.6569	0.5443	38.7273
47	2.0000	101.9000	17.4910	84.4090	3.9542	82.8352
48	1.1000	54.4500	17.3571	37.0929	1.7392	68.1229
49	39.2000	23.9000	23.0251	0.8749	0.0435	3.6608
50	34.7000	14.6000	22.3556	-7.7556	-0.3783	53.1207
51	5.5000	36.6667	18.0117	18.6550	0.8717	50.8773

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	6.0000	4.9806	0.2298	0.0257	0.0007	481.9282
12	46.9000	-13.2706	*-0.6810	0.2034	0.0600	476.7803
13	1.2000	-2.4820	-0.1149	0.0324	0.0002	482.4307
14	39.6000	-6.4846	*-0.3189	0.1408	0.0085	481.3103
15	4.1000	-15.2034	-0.7064	0.0277	0.0072	476.3425
16	0.7100	-5.6041	-0.2597	0.0335	0.0012	481.7431
17	5.1000	-15.8755	-0.7377	0.0265	0.0075	475.7853
18	0.3500	-14.4655	-0.6740	0.0342	0.0082	476.8964
19	3.6000	-15.6190	-0.7263	0.0283	0.0078	475.9912
20	2.6000	-15.5902	-0.7255	0.0299	0.0082	476.0051
21	0.6600	-16.4016	-0.7653	0.0336	0.0103	475.2731
22	45.6000	7.1228	*0.3612	0.1913	0.0158	480.9473
23	4.5000	-10.0629	-0.4657	0.0272	0.0031	479.8590
24	5.8000	18.7437	0.8731	0.0258	0.0102	473.1075
25	6.8000	12.1949	0.5646	0.0251	0.0042	478.5838
26	9.2000	18.2379	0.8484	0.0244	0.0091	473.6262
27	7.4000	35.1290	1.6782	0.0248	0.0342	449.2975
28	10.8000	14.4999	0.6723	0.0247	0.0058	476.9252
29	3.6000	36.6710	1.7612	0.0283	0.0429	446.1779
30	18.1000	3.4639	0.1605	0.0344	0.0005	482.2712
31	42.9000	-4.5055	*-0.2249	0.1674	0.0052	481.9566
32	1.9000	-11.3961	-0.5290	0.0311	0.0046	479.0709
33	4.0000	30.5115	1.4469	0.0278	0.0291	457.3993
34	0.4600	-13.2085	-0.6148	0.0340	0.0068	477.8454
35	1.5000	-14.4299	-0.6715	0.0318	0.0075	476.9384
36	1.8000	-15.6212	-0.7275	0.0313	0.0086	475.9692
37	6.8000	-15.2351	-0.7070	0.0251	0.0065	476.3328
38	1.4000	-14.1917	-0.6604	0.0320	0.0073	477.1226
39	0.6700	-14.3531	-0.6685	0.0335	0.0079	476.9887
40	0.9400	-15.8133	-0.7372	0.0330	0.0094	475.7933
41	0.1800	-15.8302	-0.7387	0.0346	0.0099	475.7671
42	0.2100	-13.2980	-0.6192	0.0346	0.0070	477.7780
43	0.5400	-15.9971	-0.7462	0.0338	0.0099	475.6280
44	0.0730	-15.8943	-0.7418	0.0349	0.0101	475.7099
45	0.0770	-15.6549	-0.7304	0.0349	0.0098	475.9159
46	8.4000	11.6569	0.5393	0.0245	0.0037	478.9326
47	2.0000	84.4090	*5.0427	0.0309	0.2493	289.1213
48	1.1000	37.0929	1.7875	0.0326	0.0510	445.1690
49	39.2000	0.8749	*0.0429	0.1378	0.0002	482.5748
50	34.7000	-7.7556	*-0.3741	0.1063	0.0085	480.8270
51	5.5000	18.6550	0.8690	0.0261	0.0102	473.1945

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.2298	0.0373	0.0007	1.0781	0.0349	-0.0083
12	-0.6810	-0.3441	0.0600	* 1.2906	0.0785	-0.3228
13	-0.1149	-0.0210	0.0002	1.0879	-0.0210	0.0105
14	-0.3189	-0.1291	0.0085	* 1.2194	0.0199	-0.1174
15	-0.7064	-0.1191	0.0072	1.0554	-0.1159	0.0410
16	-0.2597	-0.0483	0.0012	1.0859	-0.0483	0.0252
17	-0.7377	-0.1217	0.0075	1.0517	-0.1164	0.0344
18	-0.6740	-0.1269	0.0082	1.0650	-0.1269	0.0681
19	-0.7263	-0.1240	0.0078	1.0546	-0.1215	0.0463
20	-0.7255	-0.1273	0.0082	1.0563	-0.1260	0.0545
21	-0.7653	-0.1426	0.0103	1.0571	-0.1425	0.0746
22	0.3612	0.1757	0.0158	* 1.2936	-0.0381	0.1641
23	-0.4657	-0.0778	0.0031	1.0705	-0.0752	0.0249
24	0.8731	0.1422	0.0102	1.0392	0.1338	-0.0337
25	0.5646	0.0906	0.0042	1.0626	0.0830	-0.0154
26	0.8484	0.1341	0.0091	1.0399	0.1119	0.0001
27	1.6782	0.2676	0.0342	0.9362	0.2403	-0.0342
28	0.6723	0.1070	0.0058	1.0548	0.0819	0.0123
29	1.7612	0.3007	0.0429	0.9266	0.2946	-0.1122
30	0.1605	0.0303	0.0005	1.0893	0.0123	0.0163
31	-0.2249	-0.1009	0.0052	* 1.2618	0.0193	-0.0932
32	-0.5290	-0.0948	0.0046	1.0713	-0.0943	0.0440
33	1.4469	0.2446	0.0291	0.9732	0.2384	-0.0855
34	-0.6148	-0.1153	0.0068	1.0690	-0.1153	0.0613
35	-0.6715	-0.1218	0.0075	1.0626	-0.1214	0.0589
36	-0.7275	-0.1307	0.0086	1.0577	-0.1301	0.0613
37	-0.7070	-0.1135	0.0065	1.0526	-0.1039	0.0192
38	-0.6604	-0.1201	0.0073	1.0636	-0.1198	0.0587
39	-0.6685	-0.1245	0.0079	1.0647	-0.1245	0.0650
40	-0.7372	-0.1361	0.0094	1.0587	-0.1360	0.0694
41	-0.7387	-0.1399	0.0099	1.0604	-0.1399	0.0760
42	-0.6192	-0.1171	0.0070	1.0693	-0.1171	0.0635
43	-0.7462	-0.1396	0.0099	1.0589	-0.1396	0.0737
44	-0.7418	-0.1410	0.0101	1.0604	-0.1410	0.0773
45	-0.7304	-0.1388	0.0098	1.0614	-0.1388	0.0761
46	0.5393	0.0854	0.0037	1.0634	0.0738	-0.0049
47	* 5.0427	0.9006	0.2493	0.3901	0.8955	-0.4136
48	1.7875	0.3283	0.0510	0.9265	0.3278	-0.1651
49	0.0429	0.0171	0.0002	* 1.2215	-0.0026	0.0156
50	-0.3741	-0.1290	0.0085	* 1.1700	0.0109	-0.1133
51	0.8690	0.1423	0.0102	1.0398	0.1349	-0.0365

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
11	6.0000	4.9806	|.....	0.2327	|.....	0.2298	|.....
12	46.9000	-13.2706	||.....	-0.6857	||.....	-0.6810	|.....
13	1.2000	-2.4820	|.....	-0.1164	|.....	-0.1149	|.....
14	39.6000	-6.4846	|.....	-0.3226	|.....	-0.3189	|.....
15	4.1000	-15.2034	||.....	-0.7110	||.....	-0.7064	|.....
16	0.7100	-5.6041	|.....	-0.2629	|.....	-0.2597	|.....
17	5.1000	-15.8755	||.....	-0.7420	||.....	-0.7377	||.....
18	0.3500	-14.4655	||.....	-0.6788	||.....	-0.6740	|.....
19	3.6000	-15.6190	||.....	-0.7307	||.....	-0.7263	||.....
20	2.6000	-15.5902	||.....	-0.7299	||.....	-0.7255	||.....
21	0.6600	-16.4016	||.....	-0.7694	||.....	-0.7653	||.....
22	45.6000	7.1228	|.....	0.3653	|.....	0.3612	|.....
23	4.5000	-10.0629	|.....	-0.4705	|.....	-0.4657	|.....
24	5.8000	18.7437	|||.....	0.8758	|||.....	0.8731	||.....
25	6.8000	12.1949	||.....	0.5696	||.....	0.5646	|.....
26	9.2000	18.2379	|||.....	0.8515	|||.....	0.8484	||.....
27	7.4000	35.1290	||||||.....	1.6405	||||||.....	1.6782	||||.....
28	10.8000	14.4999	||.....	0.6771	||.....	0.6723	|.....
29	3.6000	36.6710	||||||.....	1.7156	||||||.....	1.7612	|||||.....
30	18.1000	3.4639	|.....	0.1626	|.....	0.1605	|.....
31	42.9000	-4.5055	|.....	-0.2277	|.....	-0.2249	|.....
32	1.9000	-11.3961	|.....	-0.5339	|.....	-0.5290	|.....
33	4.0000	30.5115	|||||.....	1.4270	|||||.....	1.4469	||||.....
34	0.4600	-13.2085	||.....	-0.6197	||.....	-0.6148	|.....
35	1.5000	-14.4299	||.....	-0.6763	||.....	-0.6715	|.....
36	1.8000	-15.6212	||.....	-0.7319	||.....	-0.7275	||.....
37	6.8000	-15.2351	||.....	-0.7116	||.....	-0.7070	|.....
38	1.4000	-14.1917	||.....	-0.6652	||.....	-0.6604	|.....
39	0.6700	-14.3531	||.....	-0.6733	||.....	-0.6685	|.....
40	0.9400	-15.8133	||.....	-0.7416	||.....	-0.7372	||.....
41	0.1800	-15.8302	||.....	-0.7430	||.....	-0.7387	||.....
42	0.2100	-13.2980	||.....	-0.6241	||.....	-0.6192	|.....
43	0.5400	-15.9971	||.....	-0.7505	||.....	-0.7462	||.....
44	0.0730	-15.8943	||.....	-0.7461	||.....	-0.7418	||.....
45	0.0770	-15.6549	||.....	-0.7349	||.....	-0.7304	||.....
46	8.4000	11.6569	|.....	0.5443	|.....	0.5393	|.....
47	2.0000	84.4090	||||||||||||||	3.9542	||||||||||||||	* 5.0427	||||||||||||||
48	1.1000	37.0929	||||||.....	1.7392	||||||.....	1.7875	|||||.....
49	39.2000	0.8749	|.....	0.0435	|.....	0.0429	|.....
50	34.7000	-7.7556	|.....	-0.3783	|.....	-0.3741	|.....
51	5.5000	18.6550	|||.....	0.8717	|||.....	0.8690	||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	6.0000	0.0373	|.....	0.0007	|.....	-0.0083	|.....
12	46.9000	-0.3441	|||||.....	0.0600	|||.....	-0.3228	||||||||||....
13	1.2000	-0.0210	|.....	0.0002	|.....	0.0105	|.....
14	39.6000	-0.1291	|.....	0.0085	|.....	-0.1174	||||.....
15	4.1000	-0.1191	|.....	0.0072	|.....	0.0410	|.....
16	0.7100	-0.0483	|.....	0.0012	|.....	0.0252	|.....
17	5.1000	-0.1217	|.....	0.0075	|.....	0.0344	|.....
18	0.3500	-0.1269	|.....	0.0082	|.....	0.0681	||.....
19	3.6000	-0.1240	|.....	0.0078	|.....	0.0463	|.....
20	2.6000	-0.1273	|.....	0.0082	|.....	0.0545	|.....
21	0.6600	-0.1426	||.....	0.0103	|.....	0.0746	||.....
22	45.6000	0.1757	||.....	0.0158	|.....	0.1641	|||||.....
23	4.5000	-0.0778	|.....	0.0031	|.....	0.0249	|.....
24	5.8000	0.1422	||.....	0.0102	|.....	-0.0337	|.....
25	6.8000	0.0906	|.....	0.0042	|.....	-0.0154	|.....
26	9.2000	0.1341	|.....	0.0091	|.....	0.0001	|.....
27	7.4000	0.2676	||||.....	0.0342	||.....	-0.0342	|.....
28	10.8000	0.1070	|.....	0.0058	|.....	0.0123	|.....
29	3.6000	0.3007	||||.....	0.0429	||.....	-0.1122	||||.....
30	18.1000	0.0303	|.....	0.0005	|.....	0.0163	|.....
31	42.9000	-0.1009	|.....	0.0052	|.....	-0.0932	|||.....
32	1.9000	-0.0948	|.....	0.0046	|.....	0.0440	|.....
33	4.0000	0.2446	|||.....	0.0291	|.....	-0.0855	|||.....
34	0.4600	-0.1153	|.....	0.0068	|.....	0.0613	||.....
35	1.5000	-0.1218	|.....	0.0075	|.....	0.0589	||.....
36	1.8000	-0.1307	|.....	0.0086	|.....	0.0613	||.....
37	6.8000	-0.1135	|.....	0.0065	|.....	0.0192	|.....
38	1.4000	-0.1201	|.....	0.0073	|.....	0.0587	||.....
39	0.6700	-0.1245	|.....	0.0079	|.....	0.0650	||.....
40	0.9400	-0.1361	||.....	0.0094	|.....	0.0694	||.....
41	0.1800	-0.1399	||.....	0.0099	|.....	0.0760	||.....
42	0.2100	-0.1171	|.....	0.0070	|.....	0.0635	||.....
43	0.5400	-0.1396	||.....	0.0099	|.....	0.0737	||.....
44	0.0730	-0.1410	||.....	0.0101	|.....	0.0773	||.....
45	0.0770	-0.1388	||.....	0.0098	|.....	0.0761	||.....
46	8.4000	0.0854	|.....	0.0037	|.....	-0.0049	|.....
47	2.0000	0.9006	|||||||||||||||	0.2493	|||||||||||||||	-0.4136	|||||||||||||||
48	1.1000	0.3283	|||||.....	0.0510	|||.....	-0.1651	|||||.....
49	39.2000	0.0171	|.....	0.0002	|.....	0.0156	|.....
50	34.7000	-0.1290	|.....	0.0085	|.....	-0.1133	||||.....
51	5.5000	0.1423	||.....	0.0102	|.....	-0.0365	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	6.0000	0.2298	|.....	0.0007	|.....	0.0257	|.....
12	46.9000	-0.6810	|.....	0.0600	|||.....	0.2034	||||||||||||||
13	1.2000	-0.1149	|.....	0.0002	|.....	0.0324	|.....
14	39.6000	-0.3189	|.....	0.0085	|.....	0.1408	||||||||.....
15	4.1000	-0.7064	|.....	0.0072	|.....	0.0277	|.....
16	0.7100	-0.2597	|.....	0.0012	|.....	0.0335	|.....
17	5.1000	-0.7377	||.....	0.0075	|.....	0.0265	|.....
18	0.3500	-0.6740	|.....	0.0082	|.....	0.0342	|.....
19	3.6000	-0.7263	||.....	0.0078	|.....	0.0283	|.....
20	2.6000	-0.7255	||.....	0.0082	|.....	0.0299	|.....
21	0.6600	-0.7653	||.....	0.0103	|.....	0.0336	|.....
22	45.6000	0.3612	|.....	0.0158	|.....	0.1913	|||||||||||..
23	4.5000	-0.4657	|.....	0.0031	|.....	0.0272	|.....
24	5.8000	0.8731	||.....	0.0102	|.....	0.0258	|.....
25	6.8000	0.5646	|.....	0.0042	|.....	0.0251	|.....
26	9.2000	0.8484	||.....	0.0091	|.....	0.0244	|.....
27	7.4000	1.6782	||||.....	0.0342	||.....	0.0248	|.....
28	10.8000	0.6723	|.....	0.0058	|.....	0.0247	|.....
29	3.6000	1.7612	|||||.....	0.0429	||.....	0.0283	|.....
30	18.1000	0.1605	|.....	0.0005	|.....	0.0344	|.....
31	42.9000	-0.2249	|.....	0.0052	|.....	0.1674	||||||||||....
32	1.9000	-0.5290	|.....	0.0046	|.....	0.0311	|.....
33	4.0000	1.4469	||||.....	0.0291	|.....	0.0278	|.....
34	0.4600	-0.6148	|.....	0.0068	|.....	0.0340	|.....
35	1.5000	-0.6715	|.....	0.0075	|.....	0.0318	|.....
36	1.8000	-0.7275	||.....	0.0086	|.....	0.0313	|.....
37	6.8000	-0.7070	|.....	0.0065	|.....	0.0251	|.....
38	1.4000	-0.6604	|.....	0.0073	|.....	0.0320	|.....
39	0.6700	-0.6685	|.....	0.0079	|.....	0.0335	|.....
40	0.9400	-0.7372	||.....	0.0094	|.....	0.0330	|.....
41	0.1800	-0.7387	||.....	0.0099	|.....	0.0346	|.....
42	0.2100	-0.6192	|.....	0.0070	|.....	0.0346	|.....
43	0.5400	-0.7462	||.....	0.0099	|.....	0.0338	|.....
44	0.0730	-0.7418	||.....	0.0101	|.....	0.0349	|.....
45	0.0770	-0.7304	||.....	0.0098	|.....	0.0349	|.....
46	8.4000	0.5393	|.....	0.0037	|.....	0.0245	|.....
47	2.0000	* 5.0427	|||||||||||||||	0.2493	|||||||||||||||	0.0309	|.....
48	1.1000	1.7875	|||||.....	0.0510	|||.....	0.0326	|.....
49	39.2000	0.0429	|.....	0.0002	|.....	0.1378	||||||||.....
50	34.7000	-0.3741	|.....	0.0085	|.....	0.1063	||||||.....
51	5.5000	0.8690	||.....	0.0102	|.....	0.0261	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Inverse Prediction of X Means

Row	Mammal (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	23.0667	6.0000	39.4796	-33.4796	-4.4182	16.7173
12	10.9000	46.9000	-42.3043	89.2043	5.4116	23.3326
13	14.8900	1.2000	-15.4837	16.6837	-0.3983	23.7494
14	16.6000	39.6000	-3.9891	43.5891	-3.4061	24.4458
15	2.6000	4.1000	-98.0967	102.1967	-12.5847	52.5476
16	11.6950	0.7100	-36.9604	37.6704	9.0864	18.5832
17	2.0767	5.1000	-101.6145	106.7145	-13.5093	54.1796
18	2.7800	0.3500	-96.8867	97.2367	-12.2648	51.9844
19	2.1100	3.6000	-101.3904	104.9904	-13.4507	54.0759
20	1.9900	2.6000	-102.1971	104.7971	-13.6617	54.4491
21	0.8900	0.6600	-109.5912	110.2512	-15.5792	57.8535
22	31.1000	45.6000	93.4794	-47.8794	-23.2146	24.6553
23	7.8000	4.5000	-63.1424	67.6424	-2.6592	35.5935
24	36.8000	5.8000	131.7946	-125.9946	-41.2104	34.9467
25	30.4000	6.8000	88.7740	-81.9740	-20.8875	23.2743
26	36.8000	9.2000	131.7946	-122.5946	-41.2104	34.9467
27	53.4233	7.4000	243.5361	-236.1361	-90.9381	62.2053
28	33.3000	10.8000	108.2677	-97.4677	-30.3115	28.7786
29	54.4000	3.6000	250.1012	-246.5012	-93.8202	63.7673
30	23.3500	18.1000	41.3841	-23.2841	-3.9673	15.8833
31	19.0700	42.9000	12.6141	30.2859	-5.7052	23.4063
32	6.0800	1.9000	-74.7042	76.6042	-6.1547	41.4138
33	48.3000	4.0000	209.0972	-205.0972	-75.7767	53.9689
34	4.0533	0.4600	-88.3274	88.7874	-9.9690	47.9675
35	2.9867	1.5000	-95.4975	96.9975	-11.8961	51.3364
36	1.8400	1.8000	-103.2054	105.0054	-13.9249	54.9151
37	2.9700	6.8000	-95.6095	102.4095	-11.9259	51.3887
38	3.2100	1.4000	-93.9963	95.3963	-11.4962	50.6346
39	2.9400	0.6700	-95.8112	96.4812	-11.9795	51.4829
40	1.5200	0.9400	-105.3564	106.2964	-14.4846	55.9073
41	1.3900	0.1800	-106.2303	106.4103	-14.7112	56.3097
42	3.9267	0.2100	-89.1789	89.3889	-10.2002	48.3700
43	1.2767	0.5400	-106.9921	107.5321	-14.9085	56.6601
44	1.3100	0.0730	-106.7680	106.8410	-14.8505	56.5571
45	1.5500	0.0770	-105.1547	105.2317	-14.4322	55.8144
46	30.1000	8.4000	86.7574	-78.3574	-19.8759	22.6683
47	101.9000	2.0000	569.3946	-567.3946	-232.8999	138.6433
48	54.4500	1.1000	250.4373	-249.3373	-93.9677	63.8472
49	23.9000	39.2000	45.0812	-5.8812	-2.8198	13.9924
50	14.6000	34.7000	-17.4331	52.1331	0.2650	23.4780
51	36.6667	5.5000	130.8983	-125.3983	-40.8008	34.7173

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Inverse Prediction of X Individuals

Row	Mammal (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	23.0667	6.0000	39.4796	-33.4796	-87.9323	100.2313
12	10.9000	46.9000	-42.3043	89.2043	-78.6839	107.4281
13	14.8900	1.2000	-15.4837	16.6837	-82.5873	105.9384
14	16.6000	39.6000	-3.9891	43.5891	-83.9981	105.0378
15	2.6000	4.1000	-98.0967	102.1967	-67.6493	107.6122
16	11.6950	0.7100	-36.9604	37.6704	-79.5309	107.2005
17	2.0767	5.1000	-101.6145	106.7145	-66.8099	107.4802
18	2.7800	0.3500	-96.8867	97.2367	-67.9338	107.6534
19	2.1100	3.6000	-101.3904	104.9904	-66.8639	107.4891
20	1.9900	2.6000	-102.1971	104.7971	-66.6691	107.4565
21	0.8900	0.6600	-109.5912	110.2512	-64.8374	107.1116
22	31.1000	45.6000	93.4794	-47.8794	-89.6501	91.0908
23	7.8000	4.5000	-63.1424	67.6424	-75.0418	107.9761
24	36.8000	5.8000	131.7946	-125.9946	-88.5118	82.2480
25	30.4000	6.8000	88.7740	-81.9740	-89.6479	92.0347
26	36.8000	9.2000	131.7946	-122.5946	-88.5118	82.2480
27	53.4233	7.4000	243.5361	-236.1361	-67.9992	39.2664
28	33.3000	10.8000	108.2677	-97.4677	-89.4614	87.9285
29	54.4000	3.6000	250.1012	-246.5012	-65.3380	35.2851
30	23.3500	18.1000	41.3841	-23.2841	-88.0538	99.9698
31	19.0700	42.9000	12.6141	30.2859	-85.7622	103.4633
32	6.0800	1.9000	-74.7042	76.6042	-72.7807	108.0398
33	48.3000	4.0000	209.0972	-205.0972	-78.2183	56.4104
34	4.0533	0.4600	-88.3274	88.7874	-69.8857	107.8843
35	2.9867	1.5000	-95.4975	96.9975	-68.2578	107.6981
36	1.8400	1.8000	-103.2054	105.0054	-66.4242	107.4144
37	2.9700	6.8000	-95.6095	102.4095	-68.2318	107.6946
38	3.2100	1.4000	-93.9963	95.3963	-68.6047	107.7432
39	2.9400	0.6700	-95.8112	96.4812	-68.1849	107.6882
40	1.5200	0.9400	-105.3564	106.2964	-65.8967	107.3194
41	1.3900	0.1800	-106.2303	106.4103	-65.6803	107.2788
42	3.9267	0.2100	-89.1789	89.3889	-69.6963	107.8660
43	1.2767	0.5400	-106.9921	107.5321	-65.4908	107.2424
44	1.3100	0.0730	-106.7680	106.8410	-65.5466	107.2532
45	1.5500	0.0770	-105.1547	105.2317	-65.9464	107.3286
46	30.1000	8.4000	86.7574	-78.3574	-89.6379	92.4303
47	101.9000	2.0000	569.3946	-567.3946	-207.6630	113.4063
48	54.4500	1.1000	250.4373	-249.3373	-65.1933	35.0728
49	23.9000	39.2000	45.0812	-5.8812	-88.2772	99.4499
50	14.6000	34.7000	-17.4331	52.1331	-82.3326	106.0756
51	36.6667	5.5000	130.8983	-125.3983	-88.5634	82.4799

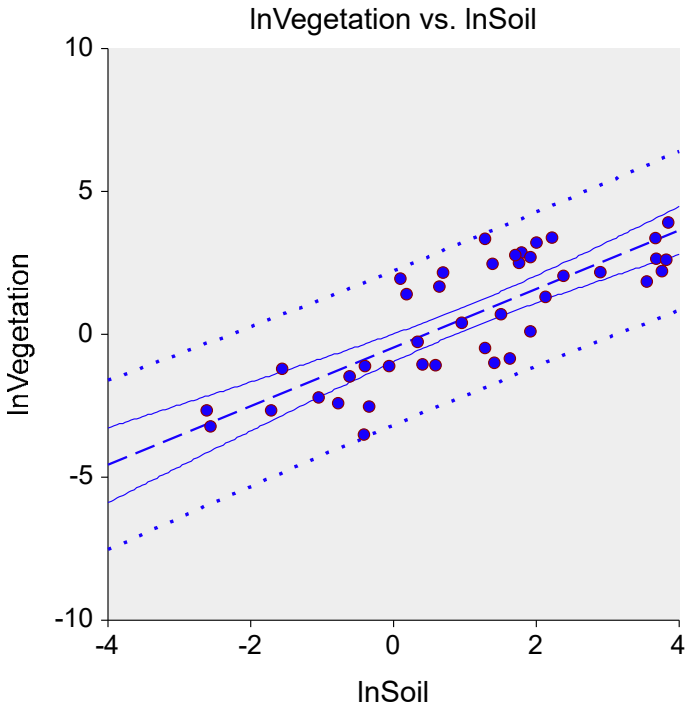
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Soil to Tissue Linear Regressions
ln Transformation – APL 10 Excluded

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnVegetation	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	-0.4733	Rows Prediction Only	0
Slope	1.0254	Sum of Frequencies	41
R-Squared	0.6468	Sum of Weights	41.0000
Correlation	0.8043	Coefficient of Variation	2.1555
Mean Square Error	1.727502	Square Root of MSE	1.314345

Linear Regression Report

Y = lnVegetation X = lnSoil

Summary Statement

The equation of the straight line relating lnVegetation and lnSoil is estimated as: lnVegetation = (-0.4733) + (1.0254) lnSoil using the 41 observations in this dataset. The y-intercept, the estimated value of lnVegetation when lnSoil is zero, is -0.4733 with a standard error of 0.2420. The slope, the estimated change in lnVegetation per unit change in lnSoil, is 1.0254 with a standard error of 0.1213. The value of R-Squared, the proportion of the variation in lnVegetation that can be accounted for by variation in lnSoil, is 0.6468. The correlation between lnVegetation and lnSoil is 0.8043.

A significance test that the slope is zero resulted in a t-value of 8.4514. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 1.0254. The lower limit of the 95% confidence interval for the slope is 0.7800 and the upper limit is 1.2708. The estimated intercept is -0.4733. The lower limit of the 95% confidence interval for the intercept is -0.9627 and the upper limit is 0.0162.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnVegetation	lnSoil
Count	41	41
Mean	0.6098	1.0562
Standard Deviation	2.1838	1.7128
Minimum	-3.5066	-2.6173
Maximum	3.9140	3.8480

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	-0.4733	1.0254
Lower 95% Confidence Limit	-0.9627	0.7800
Upper 95% Confidence Limit	0.0162	1.2708
Standard Error	0.2420	0.1213
Standardized Coefficient	0.0000	0.8043
T Value	-1.9558	8.4514
Prob Level (T Test)	0.0577	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	No	Yes
Power (Alpha = 0.0500)	0.4792	1.0000
Regression of Y on X	-0.4733	1.0254
Inverse Regression from X on Y	-1.0646	1.5853
Orthogonal Regression of Y and X	-0.8167	1.3505

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(-0.473278702218619) + (1.02542063324731) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	-0.4733	0.9000	-0.8585	-0.1121
Bootstrap Mean	-0.4712	0.9500	-0.9386	-0.0403
Bias (BM - OV)	0.0021	0.9900	-1.0754	0.1058
Bias Corrected	-0.4754			
Standard Error	0.2286			
Slope				
Original Value	1.0254	0.9000	0.8685	1.1571
Bootstrap Mean	1.0323	0.9500	0.8323	1.1915
Bias (BM - OV)	0.0069	0.9900	0.7552	1.2547
Bias Corrected	1.0186			
Standard Error	0.0897			
Correlation				
Original Value	0.8043	0.9000	0.7400	0.8864
Bootstrap Mean	0.8021	0.9500	0.7289	0.9107
Bias (BM - OV)	-0.0021	0.9900	0.7085	0.9564
Bias Corrected	0.8064			
Standard Error	0.0459			
R-Squared				
Original Value	0.6468	0.9000	0.5393	0.7723
Bootstrap Mean	0.6455	0.9500	0.5199	0.8066
Bias (BM - OV)	-0.0013	0.9900	0.4836	0.8684
Bias Corrected	0.6481			
Standard Error	0.0723			
Standard Error of Estimate				
Original Value	1.3143	0.9000	1.1671	1.5273
Bootstrap Mean	1.2869	0.9500	1.1345	1.5652
Bias (BM - OV)	-0.0274	0.9900	1.0814	1.6500
Bias Corrected	1.3417			
Standard Error	0.1087			
Orthogonal Intercept				
Original Value	-0.8167	0.9000	-1.2068	-0.3463
Bootstrap Mean	-0.8354	0.9500	-1.2728	-0.2538
Bias (BM - OV)	-0.0187	0.9900	-1.4214	-0.0244
Bias Corrected	-0.7980			
Standard Error	0.2607			
Orthogonal Slope				
Original Value	1.3505	0.9000	1.0313	1.5466
Bootstrap Mean	1.3752	0.9500	0.9515	1.5793
Bias (BM - OV)	0.0247	0.9900	0.7699	1.6416
Bias Corrected	1.3259			
Standard Error	0.1589			

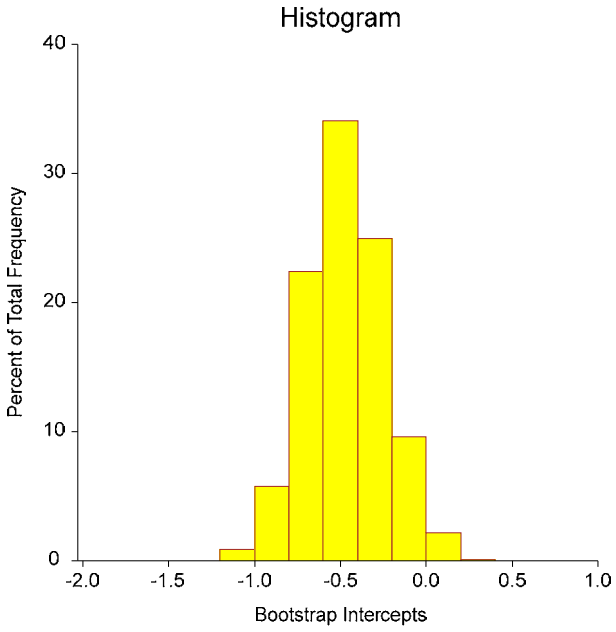
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

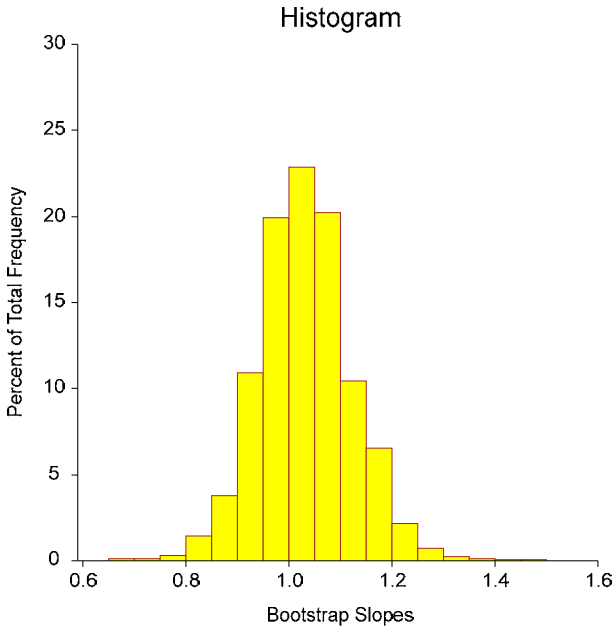
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

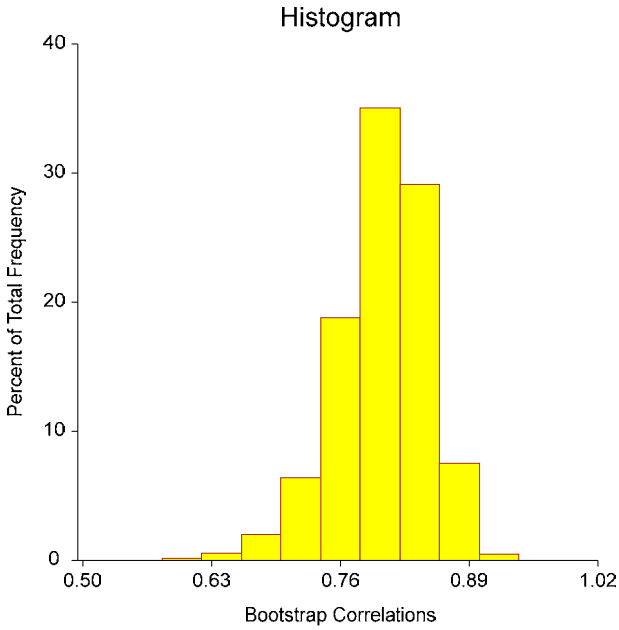
Linear Regression Report

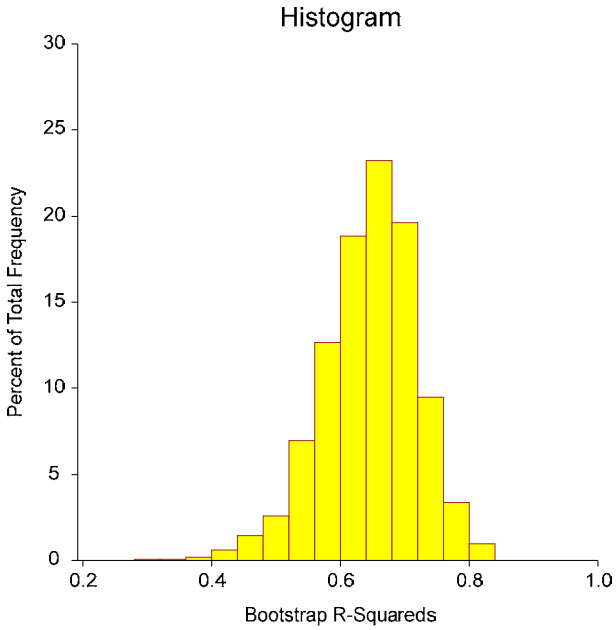
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Bootstrap Histograms Section



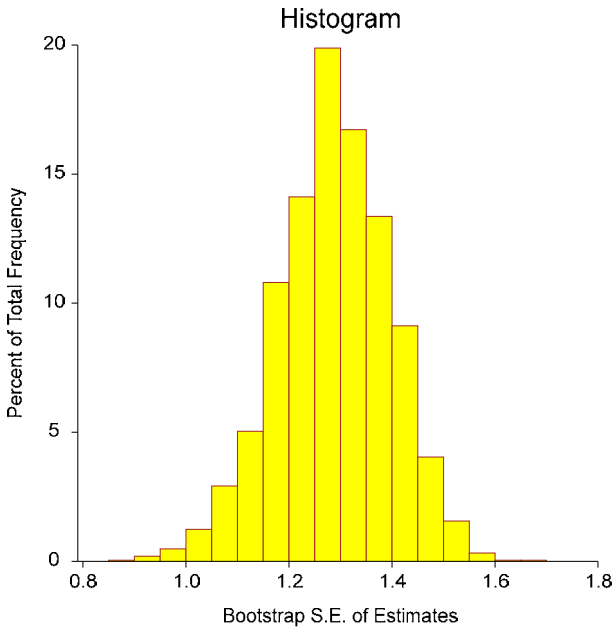


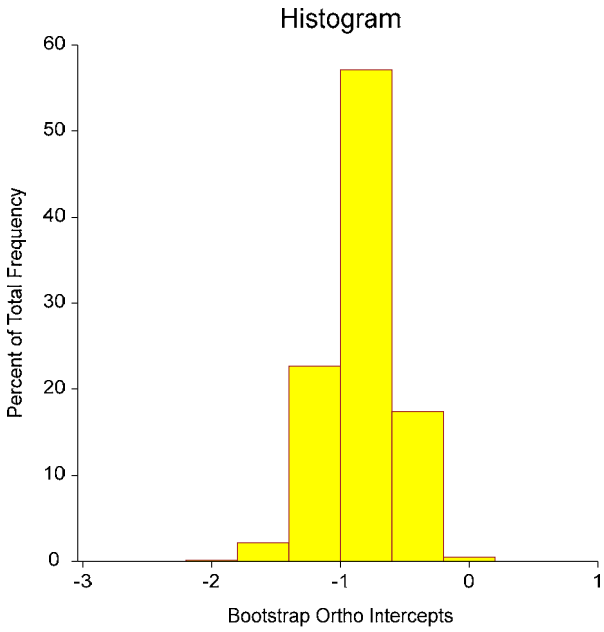


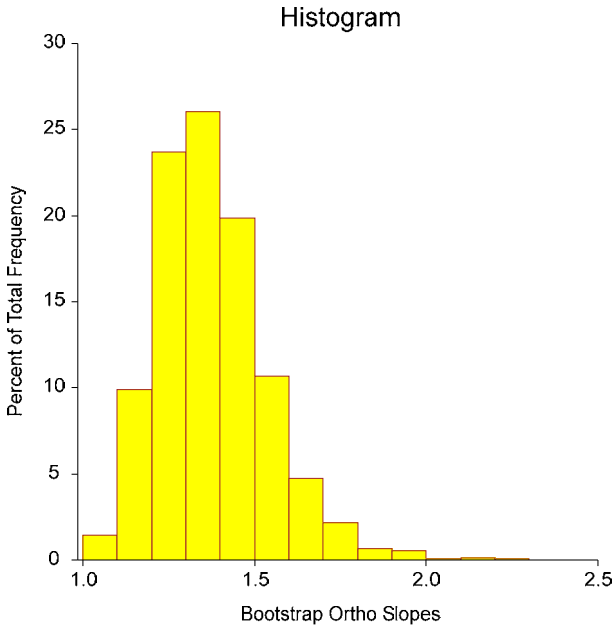


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.8043	0.6468	0.8200
Lower 95% Conf. Limit (r dist'n)	0.6552		
Upper 95% Conf. Limit (r dist'n)	0.8887		
Lower 95% Conf. Limit (Fisher's z)	0.6599		0.6852
Upper 95% Conf. Limit (Fisher's z)	0.8914		0.9005
Adjusted (Rbar)		0.6378	
T-Value for H0: Rho = 0	8.4514	8.4514	8.9470
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	15.24484	15.24484			
Slope	1	123.3896	123.3896	71.4266	0.0000	1.0000
Error	39	67.37257	1.727502			
Lack of Fit	37	56.70074	1.532452	0.2872	0.9588	
Pure Error	2	10.67184	5.335918			
Adj. Total	40	190.7622	4.769054			
Total	41	206.007				

s = Square Root(1.727502) = 1.314345

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	43.30437	25.00077	0.03389676	-0.009000641
1	43.30437	163.0859	146.7366	-0.009000641	0.008521686
2 (Y'Y)			206.007		
Determinant		4811.254			0.000207846

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.05855672	-0.01554863
1	-0.01554863	0.01472123

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9642	0.219796	Yes
Anderson Darling	0.6197	0.106752	No
D'Agostino Skewness	0.4406	0.659494	Yes
D'Agostino Kurtosis	-1.5904	0.111756	No
D'Agostino Omnibus	2.7234	0.256230	Yes
Constant Residual Variance?			
Modified Levene Test	0.0030	0.956345	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.2872	0.958842	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

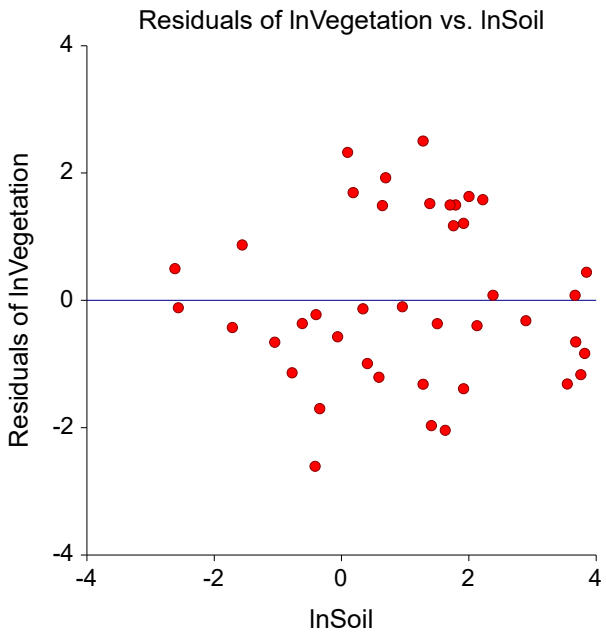
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

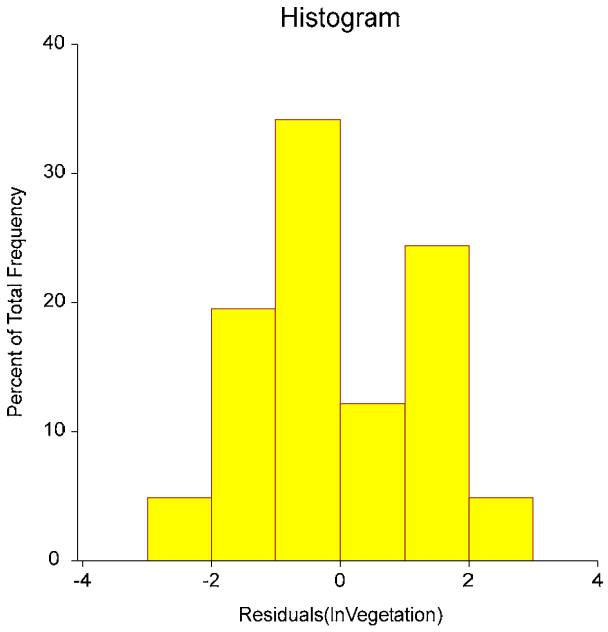
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

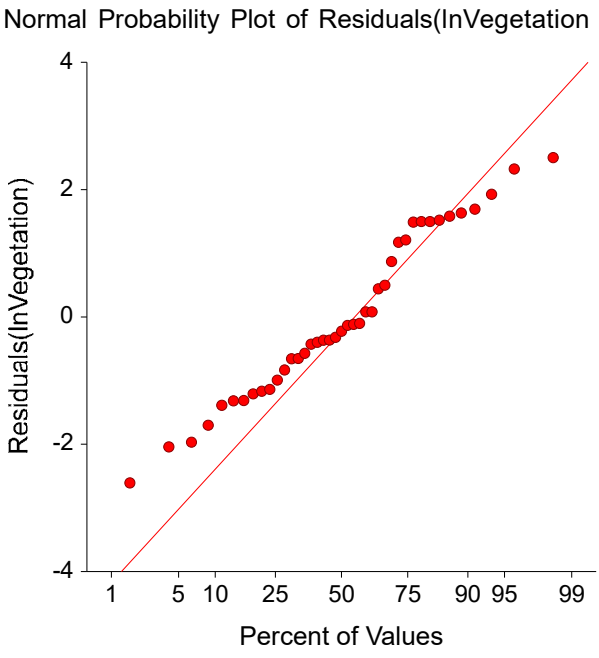
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Original Data Section

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Residual
11	1.7918	2.8622	1.3640	1.4982
12	3.8480	3.9140	3.4726	0.4415
13	0.1823	1.4061	-0.2863	1.6924
14	3.6788	2.6462	3.2991	-0.6529
15	1.4110	-0.9943	0.9736	-1.9678
16	-0.3425	-2.5257	-0.8245	-1.7013
17	1.6292	-0.8440	1.1974	-2.0413
18	-1.0498	-2.2073	-1.5498	-0.6575
19	1.2809	-0.4780	0.8402	-1.3183
20	0.9555	0.4055	0.5065	-0.1011
21	-0.4155	-3.5066	-0.8994	-2.6072
22	3.8199	2.6101	3.4437	-0.8337
23	1.5041	0.7031	1.0690	-0.3659
24	1.7579	2.5014	1.3293	1.1722
25	1.9169	2.7014	1.4924	1.2090
26	2.2192	3.3844	1.8023	1.5821
27	2.0015	3.2108	1.5791	1.6318
28	2.3795	2.0464	1.9668	0.0796
29	1.2809	3.3429	0.8402	2.5026
30	2.8959	2.1759	2.4962	-0.3204
31	3.7589	2.2138	3.3811	-1.1674
32	0.6419	1.6734	0.1849	1.4885
33	1.3863	2.4681	0.9483	1.5198
34	-0.7765	-2.4079	-1.2695	-1.1384
35	0.4055	-1.0498	-0.0575	-0.9923
36	0.5878	-1.0788	0.1294	-1.2083
37	1.9169	0.1044	1.4924	-1.3880
38	0.3365	-0.2614	-0.1283	-0.1331
39	-0.4005	-1.1087	-0.8839	-0.2247
40	-0.0619	-1.1087	-0.5367	-0.5719
41	-1.7148	-2.6593	-2.2317	-0.4276
42	-1.5606	-1.2040	-2.0736	0.8696
43	-0.6162	-1.4697	-1.1051	-0.3645
44	-2.6173	-2.6593	-3.1571	0.4978
45	-2.5639	-3.2189	-3.1024	-0.1165
46	2.1282	1.3110	1.7091	-0.3980
47	0.6931	2.1633	0.2375	1.9258
48	0.0953	1.9488	-0.3755	2.3243
49	3.6687	3.3673	3.2887	0.0786
50	3.5467	1.8500	3.1636	-1.3136
51	1.7047	2.7726	1.2748	1.4978

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	1.7918	2.8622	1.3640	0.2238	0.9113	1.8168
12	3.8480	3.9140	3.4726	0.3961	2.6714	4.2737
13	0.1823	1.4061	-0.2863	0.2310	-0.7536	0.1810
14	3.6788	2.6462	3.2991	0.3787	2.5331	4.0650
15	1.4110	-0.9943	0.9736	0.2097	0.5494	1.3978
16	-0.3425	-2.5257	-0.8245	0.2663	-1.3632	-0.2858
17	1.6292	-0.8440	1.1974	0.2167	0.7590	1.6357
18	-1.0498	-2.2073	-1.5498	0.3278	-2.2127	-0.8868
19	1.2809	-0.4780	0.8402	0.2071	0.4214	1.2591
20	0.9555	0.4055	0.5065	0.2056	0.0906	0.9224
21	-0.4155	-3.5066	-0.8994	0.2721	-1.4497	-0.3491
22	3.8199	2.6101	3.4437	0.3932	2.6485	4.2390
23	1.5041	0.7031	1.0690	0.2123	0.6395	1.4985
24	1.7579	2.5014	1.3293	0.2222	0.8798	1.7787
25	1.9169	2.7014	1.4924	0.2303	1.0265	1.9582
26	2.2192	3.3844	1.8023	0.2491	1.2985	2.3062
27	2.0015	3.2108	1.5791	0.2351	1.1035	2.0547
28	2.3795	2.0464	1.9668	0.2606	1.4396	2.4939
29	1.2809	3.3429	0.8402	0.2071	0.4214	1.2591
30	2.8959	2.1759	2.4962	0.3032	1.8829	3.1096
31	3.7589	2.2138	3.3811	0.3869	2.5986	4.1637
32	0.6419	1.6734	0.1849	0.2113	-0.2426	0.6124
33	1.3863	2.4681	0.9483	0.2091	0.5252	1.3713
34	-0.7765	-2.4079	-1.2695	0.3026	-1.8817	-0.6574
35	0.4055	-1.0498	-0.0575	0.2199	-0.5024	0.3873
36	0.5878	-1.0788	0.1294	0.2130	-0.3014	0.5603
37	1.9169	0.1044	1.4924	0.2303	1.0265	1.9582
38	0.3365	-0.2614	-0.1283	0.2231	-0.5795	0.3229
39	-0.4005	-1.1087	-0.8839	0.2709	-1.4318	-0.3360
40	-0.0619	-1.1087	-0.5367	0.2460	-1.0344	-0.0391
41	-1.7148	-2.6593	-2.2317	0.3939	-3.0284	-1.4349
42	-1.5606	-1.2040	-2.0736	0.3781	-2.8383	-1.3089
43	-0.6162	-1.4697	-1.1051	0.2886	-1.6889	-0.5213
44	-2.6173	-2.6593	-3.1571	0.4907	-4.1497	-2.1646
45	-2.5639	-3.2189	-3.1024	0.4848	-4.0831	-2.1217
46	2.1282	1.3110	1.7091	0.2430	1.2175	2.2006
47	0.6931	2.1633	0.2375	0.2099	-0.1872	0.6621
48	0.0953	1.9488	-0.3755	0.2361	-0.8530	0.1019
49	3.6687	3.3673	3.2887	0.3776	2.5248	4.0525
50	3.5467	1.8500	3.1636	0.3653	2.4247	3.9025
51	1.7047	2.7726	1.2748	0.2198	0.8302	1.7195

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	1.7918	2.8622	1.3640	1.3333	-1.3328	4.0608
12	3.8480	3.9140	3.4726	1.3727	0.6960	6.2492
13	0.1823	1.4061	-0.2863	1.3345	-2.9856	2.4129
14	3.6788	2.6462	3.2991	1.3678	0.5324	6.0657
15	1.4110	-0.9943	0.9736	1.3310	-1.7186	3.6657
16	-0.3425	-2.5257	-0.8245	1.3411	-3.5370	1.8881
17	1.6292	-0.8440	1.1974	1.3321	-1.4970	3.8918
18	-1.0498	-2.2073	-1.5498	1.3546	-4.2897	1.1901
19	1.2809	-0.4780	0.8402	1.3306	-1.8511	3.5315
20	0.9555	0.4055	0.5065	1.3303	-2.1843	3.1974
21	-0.4155	-3.5066	-0.8994	1.3422	-3.6142	1.8155
22	3.8199	2.6101	3.4437	1.3719	0.6688	6.2186
23	1.5041	0.7031	1.0690	1.3314	-1.6239	3.7620
24	1.7579	2.5014	1.3293	1.3330	-1.3670	4.0255
25	1.9169	2.7014	1.4924	1.3344	-1.2066	4.1914
26	2.2192	3.3844	1.8023	1.3377	-0.9035	4.5082
27	2.0015	3.2108	1.5791	1.3352	-1.1216	4.2798
28	2.3795	2.0464	1.9668	1.3399	-0.7435	4.6770
29	1.2809	3.3429	0.8402	1.3306	-1.8511	3.5315
30	2.8959	2.1759	2.4962	1.3489	-0.2321	5.2246
31	3.7589	2.2138	3.3811	1.3701	0.6099	6.1524
32	0.6419	1.6734	0.1849	1.3312	-2.5078	2.8776
33	1.3863	2.4681	0.9483	1.3309	-1.7437	3.6402
34	-0.7765	-2.4079	-1.2695	1.3487	-3.9976	1.4585
35	0.4055	-1.0498	-0.0575	1.3326	-2.7530	2.6380
36	0.5878	-1.0788	0.1294	1.3315	-2.5637	2.8226
37	1.9169	0.1044	1.4924	1.3344	-1.2066	4.1914
38	0.3365	-0.2614	-0.1283	1.3331	-2.8248	2.5683
39	-0.4005	-1.1087	-0.8839	1.3420	-3.5983	1.8304
40	-0.0619	-1.1087	-0.5367	1.3372	-3.2414	2.1680
41	-1.7148	-2.6593	-2.2317	1.3721	-5.0070	0.5437
42	-1.5606	-1.2040	-2.0736	1.3676	-4.8399	0.6927
43	-0.6162	-1.4697	-1.1051	1.3457	-3.8270	1.6167
44	-2.6173	-2.6593	-3.1571	1.4030	-5.9949	-0.3194
45	-2.5639	-3.2189	-3.1024	1.4009	-5.9360	-0.2688
46	2.1282	1.3110	1.7091	1.3366	-0.9945	4.4126
47	0.6931	2.1633	0.2375	1.3310	-2.4547	2.9297
48	0.0953	1.9488	-0.3755	1.3354	-3.0766	2.3255
49	3.6687	3.3673	3.2887	1.3675	0.5226	6.0547
50	3.5467	1.8500	3.1636	1.3642	0.4043	5.9229
51	1.7047	2.7726	1.2748	1.3326	-1.4206	3.9702

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	1.7918	2.8622	1.3640	0.2238	0.7261	2.0019
12	3.8480	3.9140	3.4726	0.3961	2.3438	4.6013
13	0.1823	1.4061	-0.2863	0.2310	-0.9447	0.3721
14	3.6788	2.6462	3.2991	0.3787	2.2199	4.3782
15	1.4110	-0.9943	0.9736	0.2097	0.3759	1.5713
16	-0.3425	-2.5257	-0.8245	0.2663	-1.5835	-0.0655
17	1.6292	-0.8440	1.1974	0.2167	0.5797	1.8150
18	-1.0498	-2.2073	-1.5498	0.3278	-2.4839	-0.6157
19	1.2809	-0.4780	0.8402	0.2071	0.2501	1.4303
20	0.9555	0.4055	0.5065	0.2056	-0.0795	1.0925
21	-0.4155	-3.5066	-0.8994	0.2721	-1.6747	-0.1240
22	3.8199	2.6101	3.4437	0.3932	2.3233	4.5642
23	1.5041	0.7031	1.0690	0.2123	0.4639	1.6742
24	1.7579	2.5014	1.3293	0.2222	0.6960	1.9626
25	1.9169	2.7014	1.4924	0.2303	0.8360	2.1487
26	2.2192	3.3844	1.8023	0.2491	1.0925	2.5122
27	2.0015	3.2108	1.5791	0.2351	0.9090	2.2492
28	2.3795	2.0464	1.9668	0.2606	1.2241	2.7094
29	1.2809	3.3429	0.8402	0.2071	0.2501	1.4303
30	2.8959	2.1759	2.4962	0.3032	1.6320	3.3605
31	3.7589	2.2138	3.3811	0.3869	2.2786	4.4837
32	0.6419	1.6734	0.1849	0.2113	-0.4174	0.7872
33	1.3863	2.4681	0.9483	0.2091	0.3522	1.5443
34	-0.7765	-2.4079	-1.2695	0.3026	-2.1320	-0.4071
35	0.4055	-1.0498	-0.0575	0.2199	-0.6843	0.5693
36	0.5878	-1.0788	0.1294	0.2130	-0.4775	0.7364
37	1.9169	0.1044	1.4924	0.2303	0.8360	2.1487
38	0.3365	-0.2614	-0.1283	0.2231	-0.7640	0.5075
39	-0.4005	-1.1087	-0.8839	0.2709	-1.6559	-0.1120
40	-0.0619	-1.1087	-0.5367	0.2460	-1.2379	0.1645
41	-1.7148	-2.6593	-2.2317	0.3939	-3.3543	-1.1091
42	-1.5606	-1.2040	-2.0736	0.3781	-3.1511	-0.9961
43	-0.6162	-1.4697	-1.1051	0.2886	-1.9277	-0.2826
44	-2.6173	-2.6593	-3.1571	0.4907	-4.5556	-1.7587
45	-2.5639	-3.2189	-3.1024	0.4848	-4.4841	-1.7207
46	2.1282	1.3110	1.7091	0.2430	1.0165	2.4016
47	0.6931	2.1633	0.2375	0.2099	-0.3608	0.8358
48	0.0953	1.9488	-0.3755	0.2361	-1.0483	0.2972
49	3.6687	3.3673	3.2887	0.3776	2.2125	4.3649
50	3.5467	1.8500	3.1636	0.3653	2.1226	4.2047
51	1.7047	2.7726	1.2748	0.2198	0.6483	1.9013

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Section

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	1.7918	2.8622	1.3640	1.4982	1.1568	52.3434
12	3.8480	3.9140	3.4726	0.4415	0.3523	11.2790
13	0.1823	1.4061	-0.2863	1.6924	1.3080	120.3629
14	3.6788	2.6462	3.2991	-0.6529	-0.5187	24.6731
15	1.4110	-0.9943	0.9736	-1.9678	-1.5166	197.9205
16	-0.3425	-2.5257	-0.8245	-1.7013	-1.3218	67.3569
17	1.6292	-0.8440	1.1974	-2.0413	-1.5747	241.8745
18	-1.0498	-2.2073	-1.5498	-0.6575	-0.5166	29.7873
19	1.2809	-0.4780	0.8402	-1.3183	-1.0157	275.7645
20	0.9555	0.4055	0.5065	-0.1011	-0.0778	24.9238
21	-0.4155	-3.5066	-0.8994	-2.6072	-2.0276	74.3521
22	3.8199	2.6101	3.4437	-0.8337	-0.6647	31.9403
23	1.5041	0.7031	1.0690	-0.3659	-0.2821	52.0462
24	1.7579	2.5014	1.3293	1.1722	0.9049	46.8599
25	1.9169	2.7014	1.4924	1.2090	0.9343	44.7548
26	2.2192	3.3844	1.8023	1.5821	1.2259	46.7456
27	2.0015	3.2108	1.5791	1.6318	1.2619	50.8204
28	2.3795	2.0464	1.9668	0.0796	0.0618	3.8919
29	1.2809	3.3429	0.8402	2.5026	1.9282	74.8653
30	2.8959	2.1759	2.4962	-0.3204	-0.2505	14.7233
31	3.7589	2.2138	3.3811	-1.1674	-0.9294	52.7336
32	0.6419	1.6734	0.1849	1.4885	1.1474	88.9508
33	1.3863	2.4681	0.9483	1.5198	1.1713	61.5795
34	-0.7765	-2.4079	-1.2695	-1.1384	-0.8900	47.2767
35	0.4055	-1.0498	-0.0575	-0.9923	-0.7658	94.5223
36	0.5878	-1.0788	0.1294	-1.2083	-0.9316	111.9993
37	1.9169	0.1044	1.4924	-1.3880	-1.0726	1330.0240
38	0.3365	-0.2614	-0.1283	-0.1331	-0.1028	50.9294
39	-0.4005	-1.1087	-0.8839	-0.2247	-0.1747	20.2700
40	-0.0619	-1.1087	-0.5367	-0.5719	-0.4430	51.5879
41	-1.7148	-2.6593	-2.2317	-0.4276	-0.3410	16.0793
42	-1.5606	-1.2040	-2.0736	0.8696	0.6908	72.2297
43	-0.6162	-1.4697	-1.1051	-0.3645	-0.2843	24.8046
44	-2.6173	-2.6593	-3.1571	0.4978	0.4083	18.7213
45	-2.5639	-3.2189	-3.1024	-0.1165	-0.0953	3.6183
46	2.1282	1.3110	1.7091	-0.3980	-0.3081	30.3595
47	0.6931	2.1633	0.2375	1.9258	1.4843	89.0220
48	0.0953	1.9488	-0.3755	2.3243	1.7976	119.2710
49	3.6687	3.3673	3.2887	0.0786	0.0625	2.3353
50	3.5467	1.8500	3.1636	-1.3136	-1.0404	71.0039
51	1.7047	2.7726	1.2748	1.4978	1.1558	54.0211

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	1.7918	1.4982	1.1619	0.0290	0.0200	1.7121
12	3.8480	0.4415	0.3483	0.0908	0.0062	1.7673
13	0.1823	1.6924	1.3204	0.0309	0.0273	1.6952
14	3.6788	-0.6529	-0.5138	0.0830	0.0122	1.7607
15	1.4110	-1.9678	-1.5433	0.0255	0.0300	1.6684
16	-0.3425	-1.7013	-1.3350	0.0411	0.0374	1.6935
17	1.6292	-2.0413	-1.6063	0.0272	0.0347	1.6602
18	-1.0498	-0.6575	-0.5116	0.0622	0.0088	1.7608
19	1.2809	-1.3183	-1.0161	0.0248	0.0131	1.7261
20	0.9555	-0.1011	-0.0768	0.0245	0.0001	1.7727
21	-0.4155	-2.6072	*-2.1160	0.0428	0.0920	1.5861
22	3.8199	-0.8337	-0.6599	0.0895	0.0217	1.7529
23	1.5041	-0.3659	-0.2788	0.0261	0.0011	1.7693
24	1.7579	1.1722	0.9027	0.0286	0.0120	1.7357
25	1.9169	1.2090	0.9327	0.0307	0.0138	1.7333
26	2.2192	1.5821	1.2341	0.0359	0.0280	1.7046
27	2.0015	1.6318	1.2718	0.0320	0.0263	1.7006
28	2.3795	0.0796	0.0610	0.0393	0.0001	1.7728
29	1.2809	2.5026	*2.0011	0.0248	0.0473	1.6039
30	2.8959	-0.3204	-0.2475	0.0532	0.0018	1.7701
31	3.7589	-1.1674	-0.9277	0.0866	0.0410	1.7337
32	0.6419	1.4885	1.1522	0.0259	0.0175	1.7131
33	1.3863	1.5198	1.1770	0.0253	0.0178	1.7106
34	-0.7765	-1.1384	-0.8876	0.0530	0.0222	1.7369
35	0.4055	-0.9923	-0.7617	0.0280	0.0084	1.7463
36	0.5878	-1.2083	-0.9300	0.0263	0.0117	1.7335
37	1.9169	-1.3880	-1.0748	0.0307	0.0182	1.7207
38	0.3365	-0.1331	-0.1015	0.0288	0.0002	1.7725
39	-0.4005	-0.2247	-0.1725	0.0425	0.0007	1.7716
40	-0.0619	-0.5719	-0.4384	0.0350	0.0036	1.7640
41	-1.7148	-0.4276	-0.3371	0.0898	0.0057	1.7677
42	-1.5606	0.8696	0.6861	0.0827	0.0215	1.7513
43	-0.6162	-0.3645	-0.2809	0.0482	0.0020	1.7693
44	-2.6173	0.4978	*0.4039	0.1394	0.0135	1.7654
45	-2.5639	-0.1165	*-0.0941	0.1361	0.0007	1.7725
46	2.1282	-0.3980	-0.3045	0.0342	0.0017	1.7686
47	0.6931	1.9258	1.5084	0.0255	0.0288	1.6728
48	0.0953	2.3243	1.8529	0.0323	0.0539	1.6261
49	3.6687	0.0786	0.0617	0.0826	0.0002	1.7728
50	3.5467	-1.3136	-1.0416	0.0772	0.0453	1.7238
51	1.7047	1.4978	1.1610	0.0280	0.0192	1.7122

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	1.1619	0.2008	0.0200	1.0116	0.1138	0.0801
12	0.3483	0.1101	0.0062	* 1.1512	-0.0015	0.0941
13	1.3204	0.2358	0.0273	0.9936	0.2350	-0.1082
14	-0.5138	-0.1546	0.0122	1.1329	-0.0023	-0.1299
15	-1.5433	-0.2495	0.0300	0.9571	-0.1800	-0.0512
16	-1.3350	-0.2762	0.0374	1.0022	-0.2738	0.1760
17	-1.6063	-0.2685	0.0347	0.9495	-0.1701	-0.0861
18	-0.5116	-0.1318	0.0088	1.1079	-0.1244	0.1027
19	-1.0161	-0.1621	0.0131	1.0237	-0.1250	-0.0213
20	-0.0768	-0.0122	0.0001	1.0794	-0.0107	0.0007
21	* -2.1160	-0.4477	0.0920	0.8807	-0.4421	0.2938
22	-0.6599	-0.2069	0.0217	1.1308	0.0018	-0.1764
23	-0.2788	-0.0456	0.0011	1.0771	-0.0312	-0.0117
24	0.9027	0.1549	0.0120	1.0393	0.0899	0.0593
25	0.9327	0.1660	0.0138	1.0386	0.0856	0.0753
26	1.2341	0.2382	0.0280	1.0100	0.0950	0.1349
27	1.2718	0.2313	0.0263	1.0011	0.1115	0.1128
28	0.0610	0.0123	0.0001	1.0962	0.0042	0.0076
29	* 2.0011	0.3192	0.0473	0.8840	0.2462	0.0420
30	-0.2475	-0.0587	0.0018	1.1090	-0.0108	-0.0432
31	-0.9277	-0.2857	0.0410	1.1027	-0.0003	-0.2422
32	1.1522	0.1877	0.0175	1.0095	0.1783	-0.0447
33	1.1770	0.1897	0.0178	1.0060	0.1387	0.0363
34	-0.8876	-0.2100	0.0222	1.0676	-0.2026	0.1543
35	-0.7617	-0.1293	0.0084	1.0513	-0.1269	0.0464
36	-0.9300	-0.1527	0.0117	1.0341	-0.1464	0.0408
37	-1.0748	-0.1913	0.0182	1.0235	-0.0987	-0.0867
38	-0.1015	-0.0175	0.0002	1.0840	-0.0173	0.0068
39	-0.1725	-0.0363	0.0007	1.0983	-0.0359	0.0237
40	-0.4384	-0.0835	0.0036	1.0806	-0.0835	0.0461
41	-0.3371	-0.1059	0.0057	* 1.1504	-0.0947	0.0904
42	0.6861	0.2061	0.0215	1.1204	0.1866	-0.1731
43	-0.2809	-0.0632	0.0020	1.1021	-0.0617	0.0445
44	0.4039	0.1625	0.0135	* 1.2135	0.1359	-0.1476
45	-0.0941	-0.0374	0.0007	* 1.2187	-0.0313	0.0338
46	-0.3045	-0.0573	0.0017	1.0853	-0.0248	-0.0307
47	1.5084	0.2441	0.0288	0.9622	0.2295	-0.0512
48	1.8529	0.3383	0.0539	0.9155	0.3380	-0.1671
49	0.0617	0.0185	0.0002	* 1.1479	0.0003	0.0155
50	-1.0416	-0.3014	0.0453	1.0790	-0.0116	-0.2493
51	1.1610	0.1970	0.0192	1.0107	0.1187	0.0705

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
11	1.7918	1.4982	||||||||.....	1.1568	||||||||.....	1.1619	||||||||.....
12	3.8480	0.4415	||.....	0.3523	||.....	0.3483	||.....
13	0.1823	1.6924	||||||||.....	1.3080	||||||||.....	1.3204	||||||||.....
14	3.6788	-0.6529	|||.....	-0.5187	|||.....	-0.5138	|||.....
15	1.4110	-1.9678	||||||||||....	-1.5166	||||||||||....	-1.5433	|||||||||.....
16	-0.3425	-1.7013	||||||||.....	-1.3218	||||||||.....	-1.3350	||||||||.....
17	1.6292	-2.0413	||||||||||....	-1.5747	||||||||||....	-1.6063	||||||||||....
18	-1.0498	-0.6575	|||.....	-0.5166	|||.....	-0.5116	|||.....
19	1.2809	-1.3183	||||||.....	-1.0157	||||||.....	-1.0161	|||||.....
20	0.9555	-0.1011	|.....	-0.0778	|.....	-0.0768	|.....
21	-0.4155	-2.6072	||||||||||||||	-2.0276	||||||||||||||	* -2.1160	||||||||||||||
22	3.8199	-0.8337	||||.....	-0.6647	||||.....	-0.6599	||||.....
23	1.5041	-0.3659	|.....	-0.2821	|.....	-0.2788	|.....
24	1.7579	1.1722	|||||.....	0.9049	|||||.....	0.9027	|||||.....
25	1.9169	1.2090	|||||.....	0.9343	|||||.....	0.9327	|||||.....
26	2.2192	1.5821	|||||||.....	1.2259	|||||||.....	1.2341	|||||||.....
27	2.0015	1.6318	||||||||.....	1.2619	||||||||.....	1.2718	|||||||.....
28	2.3795	0.0796	|.....	0.0618	|.....	0.0610	|.....
29	1.2809	2.5026	||||||||||||.	1.9282	||||||||||||.	* 2.0011	||||||||||||.
30	2.8959	-0.3204	|.....	-0.2505	|.....	-0.2475	|.....
31	3.7589	-1.1674	||||||.....	-0.9294	||||||.....	-0.9277	||||||.....
32	0.6419	1.4885	||||||||.....	1.1474	||||||||.....	1.1522	|||||||.....
33	1.3863	1.5198	||||||||.....	1.1713	||||||||.....	1.1770	|||||||.....
34	-0.7765	-1.1384	||||||.....	-0.8900	|||||.....	-0.8876	|||||.....
35	0.4055	-0.9923	|||||.....	-0.7658	||||.....	-0.7617	||||.....
36	0.5878	-1.2083	||||||.....	-0.9316	|||||.....	-0.9300	|||||.....
37	1.9169	-1.3880	|||||||.....	-1.0726	|||||||.....	-1.0748	|||||||.....
38	0.3365	-0.1331	|.....	-0.1028	|.....	-0.1015	|.....
39	-0.4005	-0.2247	|.....	-0.1747	|.....	-0.1725	|.....
40	-0.0619	-0.5719	||.....	-0.4430	||.....	-0.4384	||.....
41	-1.7148	-0.4276	||.....	-0.3410	||.....	-0.3371	||.....
42	-1.5606	0.8696	||||.....	0.6908	||||.....	0.6861	||||.....
43	-0.6162	-0.3645	|.....	-0.2843	|.....	-0.2809	|.....
44	-2.6173	0.4978	||.....	0.4083	||.....	0.4039	||.....
45	-2.5639	-0.1165	|.....	-0.0953	|.....	-0.0941	|.....
46	2.1282	-0.3980	|.....	-0.3081	|.....	-0.3045	|.....
47	0.6931	1.9258	|||||||||.....	1.4843	|||||||||.....	1.5084	|||||||||.....
48	0.0953	2.3243	|||||||||||..	1.7976	|||||||||||..	1.8529	|||||||||||..
49	3.6687	0.0786	|.....	0.0625	|.....	0.0617	|.....
50	3.5467	-1.3136	||||||.....	-1.0404	||||||.....	-1.0416	||||||.....
51	1.7047	1.4978	|||||||.....	1.1558	|||||||.....	1.1610	|||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	1.7918	0.2008	||||.....	0.0200	|||.....	0.0801	||||.....
12	3.8480	0.1101	|||.....	0.0062	|.....	0.0941	||||.....
13	0.1823	0.2358	|||||.....	0.0273	||||.....	-0.1082	|||||.....
14	3.6788	-0.1546	||||.....	0.0122	|.....	-0.1299	||||||.....
15	1.4110	-0.2495	|||||.....	0.0300	||||.....	-0.0512	||.....
16	-0.3425	-0.2762	|||||||.....	0.0374	||||||.....	0.1760	|||||||.....
17	1.6292	-0.2685	|||||.....	0.0347	|||||.....	-0.0861	||||.....
18	-1.0498	-0.1318	||||.....	0.0088	|.....	0.1027	|||||.....
19	1.2809	-0.1621	|||||.....	0.0131	||.....	-0.0213	|.....
20	0.9555	-0.0122	|.....	0.0001	|.....	0.0007	|.....
21	-0.4155	-0.4477	|||||||||||||||	0.0920	|||||||||||||||	0.2938	|||||||||||||||
22	3.8199	-0.2069	||||||.....	0.0217	|||.....	-0.1764	|||||||.....
23	1.5041	-0.0456	|.....	0.0011	|.....	-0.0117	|.....
24	1.7579	0.1549	||||.....	0.0120	|.....	0.0593	||.....
25	1.9169	0.1660	|||||.....	0.0138	||.....	0.0753	|||.....
26	2.2192	0.2382	|||||||.....	0.0280	||||.....	0.1349	||||||.....
27	2.0015	0.2313	|||||||.....	0.0263	||||.....	0.1128	|||||.....
28	2.3795	0.0123	|.....	0.0001	|.....	0.0076	|.....
29	1.2809	0.3192	|||||||||.....	0.0473	|||||||.....	0.0420	||.....
30	2.8959	-0.0587	|.....	0.0018	|.....	-0.0432	||.....
31	3.7589	-0.2857	|||||||||.....	0.0410	||||||.....	-0.2422	||||||||||...
32	0.6419	0.1877	||||||.....	0.0175	||.....	-0.0447	||.....
33	1.3863	0.1897	||||||.....	0.0178	||.....	0.0363	|.....
34	-0.7765	-0.2100	||||||.....	0.0222	|||.....	0.1543	|||||||.....
35	0.4055	-0.1293	||||.....	0.0084	|.....	0.0464	||.....
36	0.5878	-0.1527	||||.....	0.0117	|.....	0.0408	||.....
37	1.9169	-0.1913	||||||.....	0.0182	||.....	-0.0867	||||.....
38	0.3365	-0.0175	|.....	0.0002	|.....	0.0068	|.....
39	-0.4005	-0.0363	|.....	0.0007	|.....	0.0237	|.....
40	-0.0619	-0.0835	||.....	0.0036	|.....	0.0461	||.....
41	-1.7148	-0.1059	|||.....	0.0057	|.....	0.0904	||||.....
42	-1.5606	0.2061	||||||.....	0.0215	|||.....	-0.1731	|||||||.....
43	-0.6162	-0.0632	|.....	0.0020	|.....	0.0445	||.....
44	-2.6173	0.1625	|||||.....	0.0135	||.....	-0.1476	|||||||.....
45	-2.5639	-0.0374	|.....	0.0007	|.....	0.0338	|.....
46	2.1282	-0.0573	|.....	0.0017	|.....	-0.0307	|.....
47	0.6931	0.2441	|||||||.....	0.0288	||||.....	-0.0512	||.....
48	0.0953	0.3383	||||||||||....	0.0539	|||||||.....	-0.1671	|||||||.....
49	3.6687	0.0185	|.....	0.0002	|.....	0.0155	|.....
50	3.5467	-0.3014	|||||||||.....	0.0453	|||||||.....	-0.2493	||||||||||...
51	1.7047	0.1970	||||||.....	0.0192	|||.....	0.0705	|||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	1.7918	1.1619	||||||.....	0.0200	|||.....	0.0290	|.....
12	3.8480	0.3483	||.....	0.0062	|.....	0.0908	|||||||.....
13	0.1823	1.3204	||||||||.....	0.0273	||||.....	0.0309	|.....
14	3.6788	-0.5138	|||.....	0.0122	|.....	0.0830	|||||||.....
15	1.4110	-1.5433	|||||||||.....	0.0300	||||.....	0.0255	|.....
16	-0.3425	-1.3350	|||||||||.....	0.0374	||||||.....	0.0411	||.....
17	1.6292	-1.6063	|||||||||||....	0.0347	|||||.....	0.0272	|.....
18	-1.0498	-0.5116	|||.....	0.0088	|.....	0.0622	||||.....
19	1.2809	-1.0161	||||||.....	0.0131	||.....	0.0248	|.....
20	0.9555	-0.0768	|.....	0.0001	|.....	0.0245	|.....
21	-0.4155	* -2.1160	||||||||||||||||	0.0920	||||||||||||||||	0.0428	||.....
22	3.8199	-0.6599	||||.....	0.0217	|||.....	0.0895	|||||||.....
23	1.5041	-0.2788	|.....	0.0011	|.....	0.0261	|.....
24	1.7579	0.9027	||||||.....	0.0120	|.....	0.0286	|.....
25	1.9169	0.9327	||||||.....	0.0138	||.....	0.0307	|.....
26	2.2192	1.2341	|||||||.....	0.0280	||||.....	0.0359	|.....
27	2.0015	1.2718	|||||||.....	0.0263	||||.....	0.0320	|.....
28	2.3795	0.0610	|.....	0.0001	|.....	0.0393	|.....
29	1.2809	* 2.0011	||||||||||||.	0.0473	||||||.....	0.0248	|.....
30	2.8959	-0.2475	|.....	0.0018	|.....	0.0532	|||.....
31	3.7589	-0.9277	||||||.....	0.0410	||||||.....	0.0866	|||||||.....
32	0.6419	1.1522	|||||||.....	0.0175	||.....	0.0259	|.....
33	1.3863	1.1770	|||||||.....	0.0178	||.....	0.0253	|.....
34	-0.7765	-0.8876	||||||.....	0.0222	|||.....	0.0530	|||.....
35	0.4055	-0.7617	|||||.....	0.0084	|.....	0.0280	|.....
36	0.5878	-0.9300	||||||.....	0.0117	|.....	0.0263	|.....
37	1.9169	-1.0748	|||||||.....	0.0182	||.....	0.0307	|.....
38	0.3365	-0.1015	|.....	0.0002	|.....	0.0288	|.....
39	-0.4005	-0.1725	|.....	0.0007	|.....	0.0425	||.....
40	-0.0619	-0.4384	||.....	0.0036	|.....	0.0350	|.....
41	-1.7148	-0.3371	||.....	0.0057	|.....	0.0898	|||||||.....
42	-1.5606	0.6861	||||.....	0.0215	|||.....	0.0827	|||||||.....
43	-0.6162	-0.2809	|.....	0.0020	|.....	0.0482	|||.....
44	-2.6173	0.4039	||.....	0.0135	||.....	0.1394	||||||||||||||
45	-2.5639	-0.0941	|.....	0.0007	|.....	0.1361	||||||||||||.
46	2.1282	-0.3045	|.....	0.0017	|.....	0.0342	|.....
47	0.6931	1.5084	|||||||||.....	0.0288	||||.....	0.0255	|.....
48	0.0953	1.8529	||||||||||||..	0.0539	||||||||.....	0.0323	|.....
49	3.6687	0.0617	|.....	0.0002	|.....	0.0826	|||||||.....
50	3.5467	-1.0416	|||||||.....	0.0453	|||||||.....	0.0772	||||||.....
51	1.7047	1.1610	|||||||.....	0.0192	|||.....	0.0280	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Inverse Prediction of X Means

Row	lnVegetation (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	2.8622	1.7918	3.2528	-1.4610	2.6899	4.0826
12	3.9140	3.8480	4.2785	-0.4305	3.5561	5.3925
13	1.4061	0.1823	1.8328	-1.6505	1.4187	2.3412
14	2.6462	3.6788	3.0421	0.6367	2.5085	3.8171
15	-0.9943	1.4110	-0.5081	1.9190	-1.1790	-0.0272
16	-2.5257	-0.3425	-2.0016	1.6591	-3.0686	-1.3062
17	-0.8440	1.6292	-0.3615	1.9907	-0.9985	0.1032
18	-2.2073	-1.0498	-1.6910	0.6412	-2.6705	-1.0453
19	-0.4780	1.2809	-0.0046	1.2856	-0.5655	0.4273
20	0.4055	0.9555	0.8570	0.0986	0.4248	1.2649
21	-3.5066	-0.4155	-2.9581	2.5426	-4.3031	-2.1009
22	2.6101	3.8199	3.0069	0.8130	2.4780	3.7729
23	0.7031	1.5041	1.1472	0.3569	0.7351	1.5704
24	2.5014	1.7579	2.9010	-1.1431	2.3860	3.6401
25	2.7014	1.9169	3.0959	-1.1790	2.5550	3.8847
26	3.3844	2.2192	3.7620	-1.5428	3.1228	4.7300
27	3.2108	2.0015	3.5928	-1.5913	2.9797	4.5141
28	2.0464	2.3795	2.4572	-0.0777	1.9942	3.0904
29	3.3429	1.2809	3.7215	-2.4406	3.0886	4.6783
30	2.1759	2.8959	2.5835	0.3124	2.1069	3.2457
31	2.2138	3.7589	2.6204	1.1385	2.1396	3.2913
32	1.6734	0.6419	2.0934	-1.4516	1.6632	2.6496
33	2.4681	1.3863	2.8685	-1.4822	2.3576	3.5995
34	-2.4079	-0.7765	-1.8867	1.1102	-2.9211	-1.2099
35	-1.0498	0.4055	-0.5623	0.9677	-1.2460	-0.0752
36	-1.0788	0.5878	-0.5905	1.1783	-1.2811	-0.1001
37	0.1044	1.9169	0.5633	1.3536	0.0980	0.9688
38	-0.2614	0.3365	0.2067	0.1298	-0.3144	0.6245
39	-1.1087	-0.4005	-0.6196	0.2192	-1.3172	-0.1257
40	-1.1087	-0.0619	-0.6196	0.5578	-1.3172	-0.1257
41	-2.6593	-1.7148	-2.1318	0.4170	-3.2360	-1.4150
42	-1.2040	-1.5606	-0.7126	-0.8481	-1.4329	-0.2072
43	-1.4697	-0.6162	-0.9717	0.3555	-1.7574	-0.4324
44	-2.6593	-2.6173	-2.1318	-0.4855	-3.2360	-1.4150
45	-3.2189	-2.5639	-2.6775	0.1136	-3.9400	-1.8688
46	1.3110	2.1282	1.7401	0.3882	1.3299	2.2333
47	2.1633	0.6931	2.5712	-1.8781	2.0960	3.2306
48	1.9488	0.0953	2.3620	-2.2667	1.9086	2.9741
49	3.3673	3.6687	3.7454	-0.0767	3.1088	4.7088
50	1.8500	3.5467	2.2657	1.2810	1.8213	2.8571
51	2.7726	1.7047	3.1654	-1.4607	2.6149	3.9723

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Inverse Prediction of X Individuals

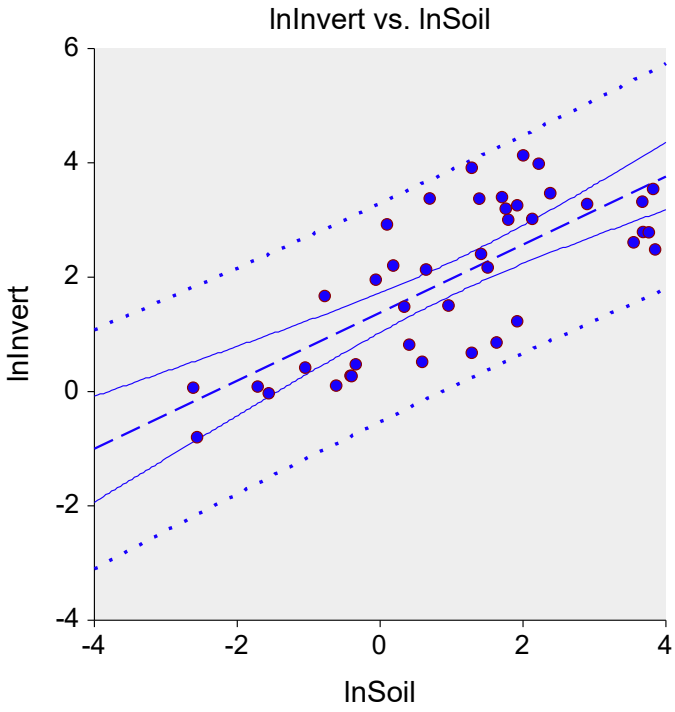
Row	lnVegetation (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	2.8622	1.7918	3.2528	-1.4610	0.6267	6.1458
12	3.9140	3.8480	4.2785	-0.4305	1.6506	7.2980
13	1.4061	0.1823	1.8328	-1.6505	-0.8298	4.5897
14	2.6462	3.6788	3.0421	0.6367	0.4136	5.9120
15	-0.9943	1.4110	-0.5081	1.9190	-3.3347	2.1285
16	-2.5257	-0.3425	-2.0016	1.6591	-4.9992	0.6245
17	-0.8440	1.6292	-0.3615	1.9907	-3.1741	2.2788
18	-2.2073	-1.0498	-1.6910	0.6412	-4.6490	0.9332
19	-0.4780	1.2809	-0.0046	1.2856	-2.7851	2.6469
20	0.4055	0.9555	0.8570	0.0986	-1.8582	3.5479
21	-3.5066	-0.4155	-2.9581	2.5426	-6.0903	-0.3136
22	2.6101	3.8199	3.0069	0.8130	0.3779	5.8730
23	0.7031	1.5041	1.1472	0.3569	-1.5499	3.8554
24	2.5014	1.7579	2.9010	-1.1431	0.2702	5.7559
25	2.7014	1.9169	3.0959	-1.1790	0.4681	5.9716
26	3.3844	2.2192	3.7620	-1.5428	1.1379	6.7150
27	3.2108	2.0015	3.5928	-1.5913	0.9687	6.5252
28	2.0464	2.3795	2.4572	-0.0777	-0.1835	5.2682
29	3.3429	1.2809	3.7215	-2.4406	1.0975	6.6695
30	2.1759	2.8959	2.5835	0.3124	-0.0540	5.4065
31	2.2138	3.7589	2.6204	1.1385	-0.0161	5.4471
32	1.6734	0.6419	2.0934	-1.4516	-0.5589	4.8718
33	2.4681	1.3863	2.8685	-1.4822	0.2371	5.7200
34	-2.4079	-0.7765	-1.8867	1.1102	-4.8695	0.7384
35	-1.0498	0.4055	-0.5623	0.9677	-3.3942	2.0730
36	-1.0788	0.5878	-0.5905	1.1783	-3.4253	2.0441
37	0.1044	1.9169	0.5633	1.3536	-2.1721	3.2388
38	-0.2614	0.3365	0.2067	0.1298	-2.5561	2.8662
39	-1.1087	-0.4005	-0.6196	0.2192	-3.4573	2.0144
40	-1.1087	-0.0619	-0.6196	0.5578	-3.4573	2.0144
41	-2.6593	-1.7148	-2.1318	0.4170	-5.1467	0.4957
42	-1.2040	-1.5606	-0.7126	-0.8481	-3.5597	1.9196
43	-1.4697	-0.6162	-0.9717	0.3555	-3.8461	1.6563
44	-2.6593	-2.6173	-2.1318	-0.4855	-5.1467	0.4957
45	-3.2189	-2.5639	-2.6775	0.1136	-5.7684	-0.0404
46	1.3110	2.1282	1.7401	0.3882	-0.9265	4.4898
47	2.1633	0.6931	2.5712	-1.8781	-0.0665	5.3931
48	1.9488	0.0953	2.3620	-2.2667	-0.2815	5.1642
49	3.3673	3.6687	3.7454	-0.0767	1.1213	6.6962
50	1.8500	3.5467	2.2657	1.2810	-0.3808	5.0592
51	2.7726	1.7047	3.1654	-1.4607	0.5384	6.0487

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnInvert	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.3793	Rows Prediction Only	0
Slope	0.5966	Sum of Frequencies	41
R-Squared	0.5538	Sum of Weights	41.0000
Correlation	0.7442	Coefficient of Variation	0.4623
Mean Square Error	0.8630409	Square Root of MSE	0.929

Linear Regression Report

Y = lnInvert X = lnSoil

Summary Statement

The equation of the straight line relating lnInvert and lnSoil is estimated as: lnInvert = (1.3793) + (0.5966) lnSoil using the 41 observations in this dataset. The y-intercept, the estimated value of lnInvert when lnSoil is zero, is 1.3793 with a standard error of 0.1710. The slope, the estimated change in lnInvert per unit change in lnSoil, is 0.5966 with a standard error of 0.0858. The value of R-Squared, the proportion of the variation in lnInvert that can be accounted for by variation in lnSoil, is 0.5538. The correlation between lnInvert and lnSoil is 0.7442.

A significance test that the slope is zero resulted in a t-value of 6.9572. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.5966. The lower limit of the 95% confidence interval for the slope is 0.4232 and the upper limit is 0.7701. The estimated intercept is 1.3793. The lower limit of the 95% confidence interval for the intercept is 1.0333 and the upper limit is 1.7252.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnInvert	lnSoil
Count	41	41
Mean	2.0094	1.0562
Standard Deviation	1.3732	1.7128
Minimum	-0.7985	-2.6173
Maximum	4.1320	3.8480

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.3793	0.5966
Lower 95% Confidence Limit	1.0333	0.4232
Upper 95% Confidence Limit	1.7252	0.7701
Standard Error	0.1710	0.0858
Standardized Coefficient	0.0000	0.7442
T Value	8.0641	6.9572
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	1.0000
Regression of Y on X	1.3793	0.5966
Inverse Regression from X on Y	0.8715	1.0774
Orthogonal Regression of Y and X	1.2231	0.7445

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.37927513474856) + (0.596638015350715) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.3793	0.9000	1.1235	1.6146
Bootstrap Mean	1.3824	0.9500	1.0655	1.6665
Bias (BM - OV)	0.0032	0.9900	0.9301	1.7459
Bias Corrected	1.3761			
Standard Error	0.1513			
Slope				
Original Value	0.5966	0.9000	0.4752	0.7030
Bootstrap Mean	0.6007	0.9500	0.4526	0.7260
Bias (BM - OV)	0.0040	0.9900	0.3918	0.7718
Bias Corrected	0.5926			
Standard Error	0.0696			
Correlation				
Original Value	0.7442	0.9000	0.6555	0.8563
Bootstrap Mean	0.7424	0.9500	0.6449	0.8777
Bias (BM - OV)	-0.0017	0.9900	0.6240	0.9457
Bias Corrected	0.7459			
Standard Error	0.0604			
R-Squared				
Original Value	0.5538	0.9000	0.4139	0.7082
Bootstrap Mean	0.5549	0.9500	0.3961	0.7347
Bias (BM - OV)	0.0011	0.9900	0.3604	0.8131
Bias Corrected	0.5527			
Standard Error	0.0875			
Standard Error of Estimate				
Original Value	0.9290	0.9000	0.8333	1.0713
Bootstrap Mean	0.9071	0.9500	0.8095	1.0961
Bias (BM - OV)	-0.0219	0.9900	0.7630	1.1489
Bias Corrected	0.9509			
Standard Error	0.0733			
Orthogonal Intercept				
Original Value	1.2231	0.9000	0.9807	1.4798
Bootstrap Mean	1.2167	0.9500	0.9290	1.5308
Bias (BM - OV)	-0.0064	0.9900	0.8424	1.6492
Bias Corrected	1.2295			
Standard Error	0.1528			
Orthogonal Slope				
Original Value	0.7445	0.9000	0.5632	0.8705
Bootstrap Mean	0.7560	0.9500	0.5146	0.8949
Bias (BM - OV)	0.0115	0.9900	0.4138	0.9475
Bias Corrected	0.7330			
Standard Error	0.0964			

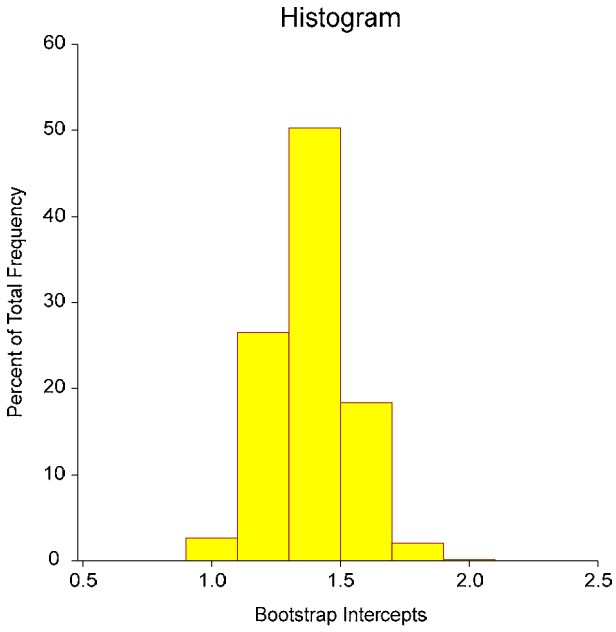
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

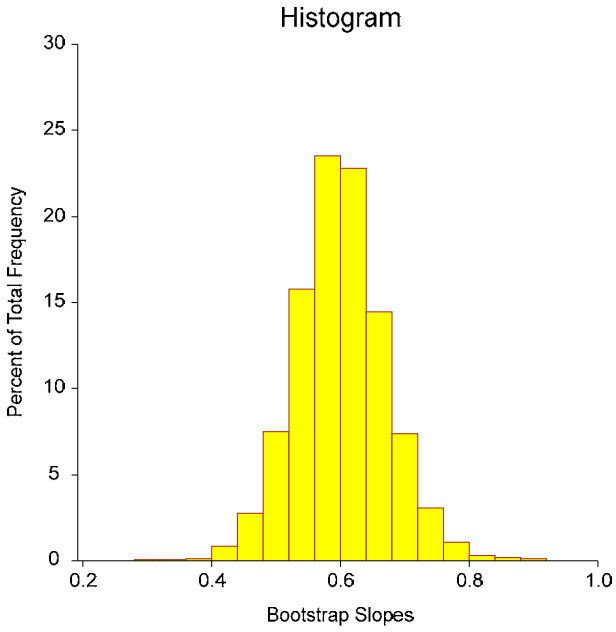
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

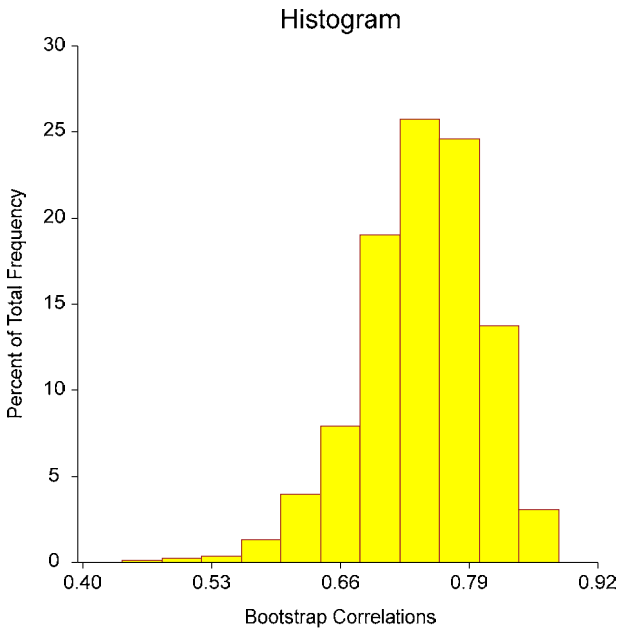
Linear Regression Report

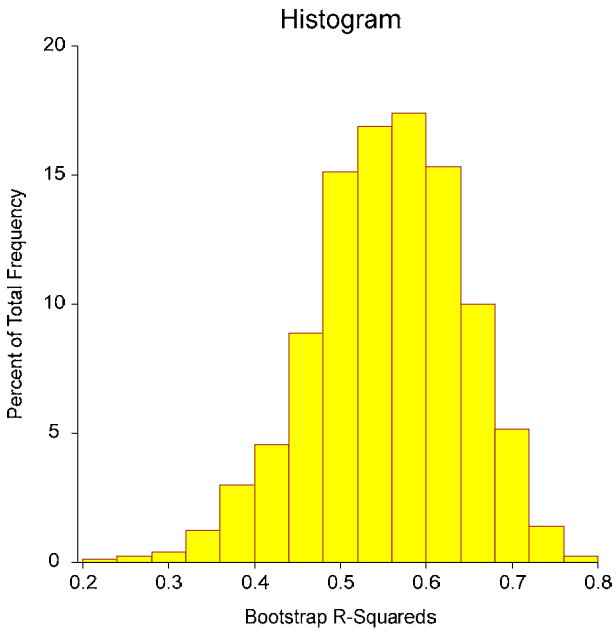
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Bootstrap Histograms Section



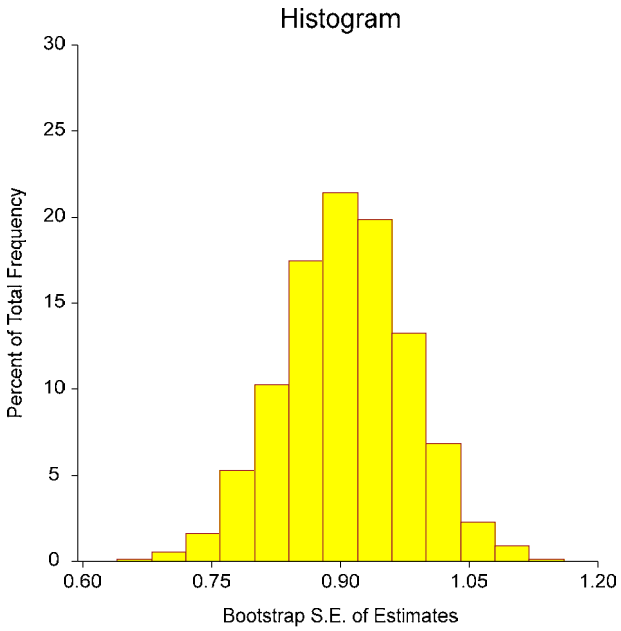


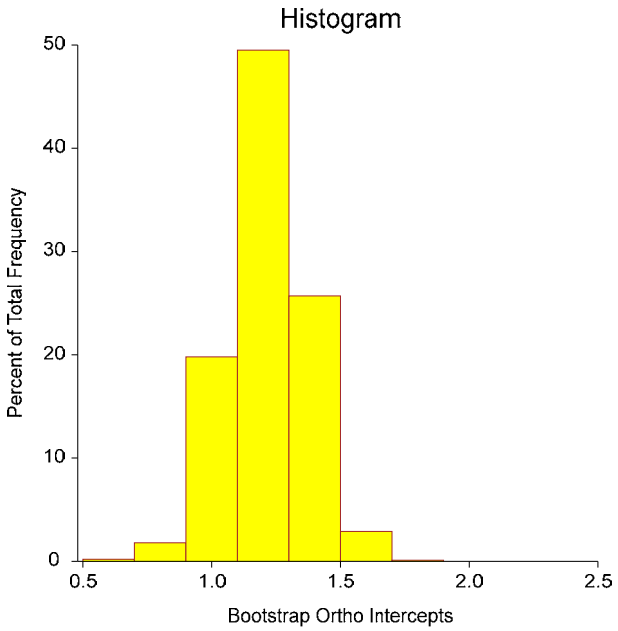


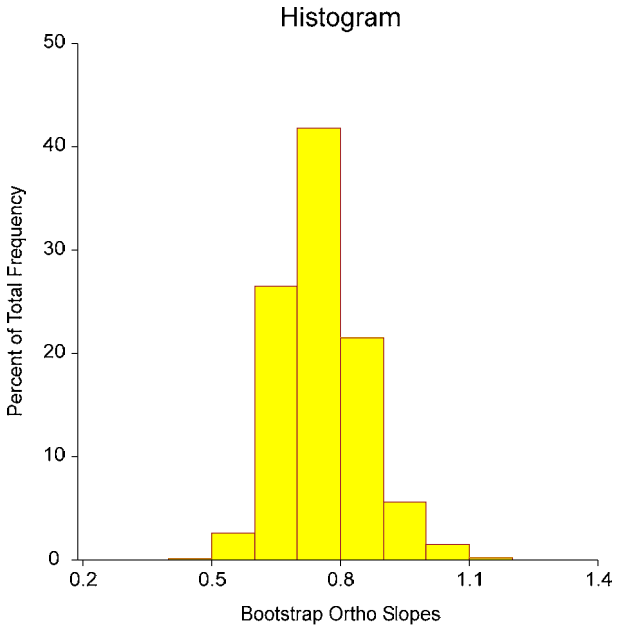


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.7442	0.5538	0.7444
Lower 95% Conf. Limit (r dist'n)	0.5612		
Upper 95% Conf. Limit (r dist'n)	0.8526		
Lower 95% Conf. Limit (Fisher's z)	0.5661		0.5665
Upper 95% Conf. Limit (Fisher's z)	0.8559		0.8560
Adjusted (Rbar)		0.5423	
T-Value for H0: Rho = 0	6.9572	6.9572	6.9621
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	165.5529	165.5529			
Slope	1	41.77306	41.77306	48.4022	0.0000	1.0000
Error	39	33.6586	0.8630409			
Lack of Fit	37	26.36547	0.7125803	0.1954	0.9891	
Pure Error	2	7.293124	3.646562			
Adj. Total	40	75.43166	1.885791			
Total	41	240.9846				

s = Square Root(0.8630409) = 0.929

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	43.30437	82.38731	0.03389676	-0.009000641
1	43.30437	163.0859	157.0319	-0.009000641	0.008521686
2 (Y'Y)			240.9846		
Determinant		4811.254			0.000207846

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.02925429	-0.007767921
1	-0.007767921	0.007354564

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9602	0.160175	No
Anderson Darling	0.4811	0.232211	Yes
D'Agostino Skewness	0.6295	0.529007	Yes
D'Agostino Kurtosis	-2.0347	0.041877	No
D'Agostino Omnibus	4.5365	0.103495	No
Constant Residual Variance?			
Modified Levene Test	0.0053	0.942532	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.1954	0.989089	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

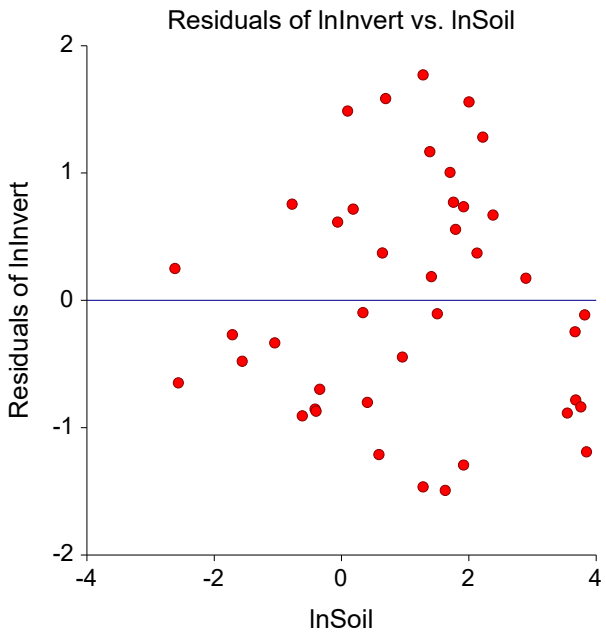
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

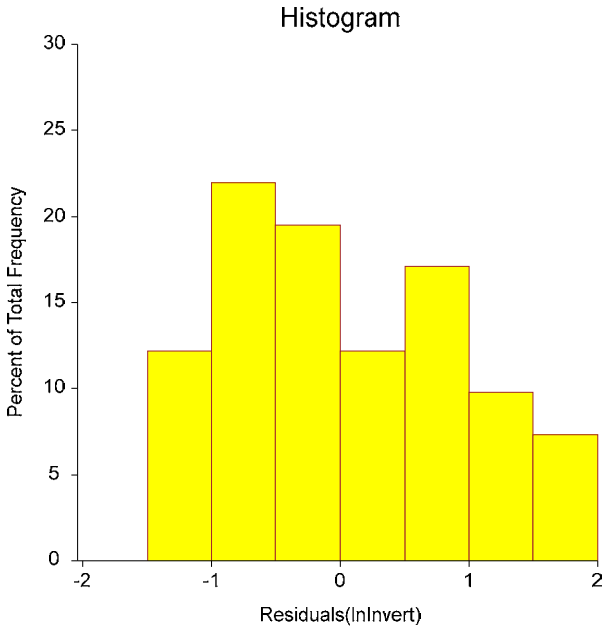
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

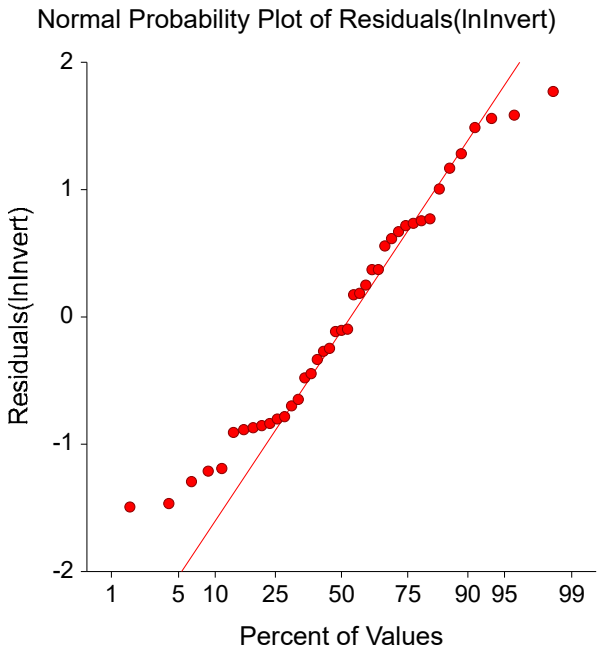
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Original Data Section

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual
11	1.7918	3.0057	2.4483	0.5574
12	3.8480	2.4849	3.6751	-1.1902
13	0.1823	2.2050	1.4881	0.7169
14	3.6788	2.7912	3.5742	-0.7830
15	1.4110	2.4069	2.2211	0.1858
16	-0.3425	0.4762	1.1749	-0.6987
17	1.6292	0.8587	2.3513	-1.4927
18	-1.0498	0.4187	0.7529	-0.3342
19	1.2809	0.6780	2.1435	-1.4655
20	0.9555	1.5041	1.9494	-0.4453
21	-0.4155	0.2776	1.1314	-0.8537
22	3.8199	3.5439	3.6584	-0.1145
23	1.5041	2.1713	2.2767	-0.1053
24	1.7579	3.1987	2.4281	0.7706
25	1.9169	3.2581	2.5230	0.7351
26	2.2192	3.9853	2.7033	1.2819
27	2.0015	4.1320	2.5734	1.5585
28	2.3795	3.4689	2.7990	0.6699
29	1.2809	3.9140	2.1435	1.7705
30	2.8959	3.2809	3.1071	0.1738
31	3.7589	2.7850	3.6220	-0.8369
32	0.6419	2.1342	1.7622	0.3719
33	1.3863	3.3742	2.2064	1.1678
34	-0.7765	1.6715	0.9160	0.7555
35	0.4055	0.8198	1.6212	-0.8014
36	0.5878	0.5188	1.7300	-1.2112
37	1.9169	1.2296	2.5230	-1.2933
38	0.3365	1.4839	1.5800	-0.0962
39	-0.4005	0.2700	1.1403	-0.8703
40	-0.0619	1.9573	1.3424	0.6149
41	-1.7148	0.0862	0.3562	-0.2700
42	-1.5606	-0.0305	0.4481	-0.4786
43	-0.6162	0.1044	1.0116	-0.9073
44	-2.6173	0.0677	-0.1823	0.2500
45	-2.5639	-0.7985	-0.1505	-0.6480
46	2.1282	3.0204	2.6491	0.3714
47	0.6931	3.3776	1.7928	1.5848
48	0.0953	2.9232	1.4361	1.4870
49	3.6687	3.3214	3.5681	-0.2467
50	3.5467	2.6101	3.4954	-0.8853
51	1.7047	3.4012	2.3964	1.0048

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	1.7918	3.0057	2.4483	0.1582	2.1283	2.7683
12	3.8480	2.4849	3.6751	0.2800	3.1089	4.2414
13	0.1823	2.2050	1.4881	0.1633	1.1578	1.8184
14	3.6788	2.7912	3.5742	0.2676	3.0328	4.1156
15	1.4110	2.4069	2.2211	0.1482	1.9213	2.5210
16	-0.3425	0.4762	1.1749	0.1882	0.7942	1.5557
17	1.6292	0.8587	2.3513	0.1532	2.0415	2.6612
18	-1.0498	0.4187	0.7529	0.2317	0.2843	1.2215
19	1.2809	0.6780	2.1435	0.1464	1.8475	2.4396
20	0.9555	1.5041	1.9494	0.1453	1.6554	2.2434
21	-0.4155	0.2776	1.1314	0.1923	0.7424	1.5203
22	3.8199	3.5439	3.6584	0.2779	3.0963	4.2205
23	1.5041	2.1713	2.2767	0.1501	1.9731	2.5802
24	1.7579	3.1987	2.4281	0.1571	2.1104	2.7458
25	1.9169	3.2581	2.5230	0.1628	2.1937	2.8522
26	2.2192	3.9853	2.7033	0.1761	2.3472	3.0595
27	2.0015	4.1320	2.5734	0.1662	2.2373	2.9096
28	2.3795	3.4689	2.7990	0.1842	2.4264	3.1716
29	1.2809	3.9140	2.1435	0.1464	1.8475	2.4396
30	2.8959	3.2809	3.1071	0.2143	2.6735	3.5406
31	3.7589	2.7850	3.6220	0.2734	3.0689	4.1750
32	0.6419	2.1342	1.7622	0.1494	1.4601	2.0644
33	1.3863	3.3742	2.2064	0.1478	1.9074	2.5054
34	-0.7765	1.6715	0.9160	0.2139	0.4833	1.3486
35	0.4055	0.8198	1.6212	0.1554	1.3068	1.9356
36	0.5878	0.5188	1.7300	0.1505	1.4255	2.0345
37	1.9169	1.2296	2.5230	0.1628	2.1937	2.8522
38	0.3365	1.4839	1.5800	0.1577	1.2611	1.8989
39	-0.4005	0.2700	1.1403	0.1915	0.7531	1.5276
40	-0.0619	1.9573	1.3424	0.1739	0.9906	1.6941
41	-1.7148	0.0862	0.3562	0.2784	-0.2070	0.9193
42	-1.5606	-0.0305	0.4481	0.2672	-0.0924	0.9887
43	-0.6162	0.1044	1.0116	0.2040	0.5990	1.4243
44	-2.6173	0.0677	-0.1823	0.3468	-0.8838	0.5192
45	-2.5639	-0.7985	-0.1505	0.3427	-0.8436	0.5427
46	2.1282	3.0204	2.6491	0.1718	2.3016	2.9965
47	0.6931	3.3776	1.7928	0.1484	1.4927	2.0930
48	0.0953	2.9232	1.4361	0.1669	1.0986	1.7736
49	3.6687	3.3214	3.5681	0.2669	3.0283	4.1080
50	3.5467	2.6101	3.4954	0.2582	2.9731	4.0177
51	1.7047	3.4012	2.3964	0.1554	2.0821	2.7107

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	1.7918	3.0057	2.4483	0.9424	0.5422	4.3544
12	3.8480	2.4849	3.6751	0.9703	1.7126	5.6377
13	0.1823	2.2050	1.4881	0.9432	-0.4198	3.3959
14	3.6788	2.7912	3.5742	0.9668	1.6187	5.5297
15	1.4110	2.4069	2.2211	0.9408	0.3183	4.1240
16	-0.3425	0.4762	1.1749	0.9479	-0.7423	3.0922
17	1.6292	0.8587	2.3513	0.9415	0.4469	4.2558
18	-1.0498	0.4187	0.7529	0.9575	-1.1837	2.6895
19	1.2809	0.6780	2.1435	0.9405	0.2413	4.0458
20	0.9555	1.5041	1.9494	0.9403	0.0474	3.8513
21	-0.4155	0.2776	1.1314	0.9487	-0.7876	3.0503
22	3.8199	3.5439	3.6584	0.9697	1.6970	5.6197
23	1.5041	2.1713	2.2767	0.9410	0.3732	4.1801
24	1.7579	3.1987	2.4281	0.9422	0.5223	4.3338
25	1.9169	3.2581	2.5230	0.9432	0.6153	4.4307
26	2.2192	3.9853	2.7033	0.9455	0.7908	4.6159
27	2.0015	4.1320	2.5734	0.9437	0.6645	4.4823
28	2.3795	3.4689	2.7990	0.9471	0.8833	4.7147
29	1.2809	3.9140	2.1435	0.9405	0.2413	4.0458
30	2.8959	3.2809	3.1071	0.9534	1.1786	5.0355
31	3.7589	2.7850	3.6220	0.9684	1.6632	5.5807
32	0.6419	2.1342	1.7622	0.9409	-0.1410	3.6654
33	1.3863	3.3742	2.2064	0.9407	0.3037	4.1091
34	-0.7765	1.6715	0.9160	0.9533	-1.0123	2.8442
35	0.4055	0.8198	1.6212	0.9419	-0.2840	3.5264
36	0.5878	0.5188	1.7300	0.9411	-0.1736	3.6336
37	1.9169	1.2296	2.5230	0.9432	0.6153	4.4307
38	0.3365	1.4839	1.5800	0.9423	-0.3259	3.4860
39	-0.4005	0.2700	1.1403	0.9485	-0.7782	3.0589
40	-0.0619	1.9573	1.3424	0.9451	-0.5694	3.2541
41	-1.7148	0.0862	0.3562	0.9698	-1.6055	2.3178
42	-1.5606	-0.0305	0.4481	0.9667	-1.5071	2.4034
43	-0.6162	0.1044	1.0116	0.9511	-0.9122	2.9355
44	-2.6173	0.0677	-0.1823	0.9916	-2.1881	1.8235
45	-2.5639	-0.7985	-0.1505	0.9902	-2.1533	1.8524
46	2.1282	3.0204	2.6491	0.9447	0.7381	4.5600
47	0.6931	3.3776	1.7928	0.9408	-0.1101	3.6957
48	0.0953	2.9232	1.4361	0.9439	-0.4730	3.3453
49	3.6687	3.3214	3.5681	0.9666	1.6130	5.5232
50	3.5467	2.6101	3.4954	0.9642	1.5451	5.4457
51	1.7047	3.4012	2.3964	0.9419	0.4912	4.3016

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	1.7918	3.0057	2.4483	0.1582	1.9974	2.8992
12	3.8480	2.4849	3.6751	0.2800	2.8773	4.4730
13	0.1823	2.2050	1.4881	0.1633	1.0227	1.9534
14	3.6788	2.7912	3.5742	0.2676	2.8114	4.3370
15	1.4110	2.4069	2.2211	0.1482	1.7987	2.6436
16	-0.3425	0.4762	1.1749	0.1882	0.6384	1.7114
17	1.6292	0.8587	2.3513	0.1532	1.9148	2.7879
18	-1.0498	0.4187	0.7529	0.2317	0.0927	1.4131
19	1.2809	0.6780	2.1435	0.1464	1.7264	2.5606
20	0.9555	1.5041	1.9494	0.1453	1.5352	2.3636
21	-0.4155	0.2776	1.1314	0.1923	0.5833	1.6794
22	3.8199	3.5439	3.6584	0.2779	2.8664	4.4503
23	1.5041	2.1713	2.2767	0.1501	1.8489	2.7044
24	1.7579	3.1987	2.4281	0.1571	1.9805	2.8757
25	1.9169	3.2581	2.5230	0.1628	2.0591	2.9869
26	2.2192	3.9853	2.7033	0.1761	2.2016	3.2051
27	2.0015	4.1320	2.5734	0.1662	2.0998	3.0471
28	2.3795	3.4689	2.7990	0.1842	2.2741	3.3239
29	1.2809	3.9140	2.1435	0.1464	1.7264	2.5606
30	2.8959	3.2809	3.1071	0.2143	2.4962	3.7179
31	3.7589	2.7850	3.6220	0.2734	2.8427	4.4012
32	0.6419	2.1342	1.7622	0.1494	1.3365	2.1879
33	1.3863	3.3742	2.2064	0.1478	1.7851	2.6277
34	-0.7765	1.6715	0.9160	0.2139	0.3064	1.5256
35	0.4055	0.8198	1.6212	0.1554	1.1782	2.0642
36	0.5878	0.5188	1.7300	0.1505	1.3009	2.1590
37	1.9169	1.2296	2.5230	0.1628	2.0591	2.9869
38	0.3365	1.4839	1.5800	0.1577	1.1307	2.0294
39	-0.4005	0.2700	1.1403	0.1915	0.5947	1.6860
40	-0.0619	1.9573	1.3424	0.1739	0.8467	1.8380
41	-1.7148	0.0862	0.3562	0.2784	-0.4373	1.1496
42	-1.5606	-0.0305	0.4481	0.2672	-0.3134	1.2097
43	-0.6162	0.1044	1.0116	0.2040	0.4302	1.5930
44	-2.6173	0.0677	-0.1823	0.3468	-1.1707	0.8061
45	-2.5639	-0.7985	-0.1505	0.3427	-1.1271	0.8261
46	2.1282	3.0204	2.6491	0.1718	2.1596	3.1386
47	0.6931	3.3776	1.7928	0.1484	1.3699	2.2157
48	0.0953	2.9232	1.4361	0.1669	0.9606	1.9117
49	3.6687	3.3214	3.5681	0.2669	2.8075	4.3288
50	3.5467	2.6101	3.4954	0.2582	2.7596	4.2312
51	1.7047	3.4012	2.3964	0.1554	1.9536	2.8392

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Section

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	1.7918	3.0057	2.4483	0.5574	0.6089	18.5441
12	3.8480	2.4849	3.6751	-1.1902	-1.3437	47.8989
13	0.1823	2.2050	1.4881	0.7169	0.7839	32.5137
14	3.6788	2.7912	3.5742	-0.7830	-0.8802	28.0542
15	1.4110	2.4069	2.2211	0.1858	0.2026	7.7202
16	-0.3425	0.4762	1.1749	-0.6987	-0.7680	146.7132
17	1.6292	0.8587	2.3513	-1.4927	-1.6291	173.8380
18	-1.0498	0.4187	0.7529	-0.3342	-0.3715	79.8168
19	1.2809	0.6780	2.1435	-1.4655	-1.5974	216.1391
20	0.9555	1.5041	1.9494	-0.4453	-0.4853	29.6057
21	-0.4155	0.2776	1.1314	-0.8537	-0.9393	307.5049
22	3.8199	3.5439	3.6584	-0.1145	-0.1292	3.2316
23	1.5041	2.1713	2.2767	-0.1053	-0.1149	4.8508
24	1.7579	3.1987	2.4281	0.7706	0.8416	24.0910
25	1.9169	3.2581	2.5230	0.7351	0.8037	22.5626
26	2.2192	3.9853	2.7033	1.2819	1.4054	32.1669
27	2.0015	4.1320	2.5734	1.5585	1.7051	37.7188
28	2.3795	3.4689	2.7990	0.6699	0.7357	19.3105
29	1.2809	3.9140	2.1435	1.7705	1.9299	45.2346
30	2.8959	3.2809	3.1071	0.1738	0.1923	5.2981
31	3.7589	2.7850	3.6220	-0.8369	-0.9427	30.0519
32	0.6419	2.1342	1.7622	0.3719	0.4056	17.4277
33	1.3863	3.3742	2.2064	1.1678	1.2732	34.6093
34	-0.7765	1.6715	0.9160	0.7555	0.8357	45.1999
35	0.4055	0.8198	1.6212	-0.8014	-0.8750	97.7593
36	0.5878	0.5188	1.7300	-1.2112	-1.3212	233.4602
37	1.9169	1.2296	2.5230	-1.2933	-1.4141	105.1806
38	0.3365	1.4839	1.5800	-0.0962	-0.1050	6.4798
39	-0.4005	0.2700	1.1403	-0.8703	-0.9574	322.3038
40	-0.0619	1.9573	1.3424	0.6149	0.6738	31.4170
41	-1.7148	0.0862	0.3562	-0.2700	-0.3046	313.2870
42	-1.5606	-0.0305	0.4481	-0.4786	-0.5379	1571.2575
43	-0.6162	0.1044	1.0116	-0.9073	-1.0011	869.3704
44	-2.6173	0.0677	-0.1823	0.2500	0.2900	369.4453
45	-2.5639	-0.7985	-0.1505	-0.6480	-0.7505	81.1555
46	2.1282	3.0204	2.6491	0.3714	0.4068	12.2952
47	0.6931	3.3776	1.7928	1.5848	1.7281	46.9197
48	0.0953	2.9232	1.4361	1.4870	1.6271	50.8703
49	3.6687	3.3214	3.5681	-0.2467	-0.2773	7.4280
50	3.5467	2.6101	3.4954	-0.8853	-0.9921	33.9196
51	1.7047	3.4012	2.3964	1.0048	1.0971	29.5427

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	1.7918	0.5574	0.6039	0.0290	0.0055	0.8773
12	3.8480	-1.1902	-1.3581	0.0908	0.0902	0.8447
13	0.1823	0.7169	0.7800	0.0309	0.0098	0.8718
14	3.6788	-0.7830	-0.8776	0.0830	0.0351	0.8682
15	1.4110	0.1858	0.2001	0.0255	0.0005	0.8848
16	-0.3425	-0.6987	-0.7639	0.0411	0.0126	0.8724
17	1.6292	-1.4927	-1.6657	0.0272	0.0371	0.8255
18	-1.0498	-0.3342	-0.3673	0.0622	0.0046	0.8826
19	1.2809	-1.4655	-1.6311	0.0248	0.0325	0.8278
20	0.9555	-0.4453	-0.4805	0.0245	0.0030	0.8804
21	-0.4155	-0.8537	-0.9379	0.0428	0.0197	0.8657
22	3.8199	-0.1145	-0.1276	0.0895	0.0008	0.8854
23	1.5041	-0.1053	-0.1134	0.0261	0.0002	0.8855
24	1.7579	0.7706	0.8384	0.0286	0.0104	0.8697
25	1.9169	0.7351	0.8000	0.0307	0.0102	0.8711
26	2.2192	1.2819	1.4238	0.0359	0.0368	0.8409
27	2.0015	1.5585	1.7496	0.0320	0.0481	0.8197
28	2.3795	0.6699	0.7313	0.0393	0.0111	0.8735
29	1.2809	1.7705	*2.0030	0.0248	0.0474	0.8012
30	2.8959	0.1738	0.1899	0.0532	0.0010	0.8849
31	3.7589	-0.8369	-0.9413	0.0866	0.0421	0.8656
32	0.6419	0.3719	0.4013	0.0259	0.0022	0.8820
33	1.3863	1.1678	1.2838	0.0253	0.0211	0.8489
34	-0.7765	0.7555	0.8324	0.0530	0.0195	0.8699
35	0.4055	-0.8014	-0.8723	0.0280	0.0110	0.8684
36	0.5878	-1.2112	-1.3344	0.0263	0.0235	0.8461
37	1.9169	-1.2933	-1.4330	0.0307	0.0317	0.8403
38	0.3365	-0.0962	-0.1037	0.0288	0.0002	0.8855
39	-0.4005	-0.8703	-0.9563	0.0425	0.0203	0.8649
40	-0.0619	0.6149	0.6690	0.0350	0.0082	0.8754
41	-1.7148	-0.2700	-0.3010	0.0898	0.0046	0.8836
42	-1.5606	-0.4786	-0.5329	0.0827	0.0131	0.8792
43	-0.6162	-0.9073	-1.0011	0.0482	0.0254	0.8630
44	-2.6173	0.2500	*0.2866	0.1394	0.0068	0.8838
45	-2.5639	-0.6480	*-0.7462	0.1361	0.0444	0.8730
46	2.1282	0.3714	0.4024	0.0342	0.0029	0.8820
47	0.6931	1.5848	1.7751	0.0255	0.0391	0.8179
48	0.0953	1.4870	1.6636	0.0323	0.0441	0.8256
49	3.6687	-0.2467	-0.2740	0.0826	0.0035	0.8840
50	3.5467	-0.8853	-0.9919	0.0772	0.0412	0.8634
51	1.7047	1.0048	1.1000	0.0280	0.0173	0.8584

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.6039	0.1044	0.0055	1.0643	0.0591	0.0416
12	-1.3581	-0.4292	0.0902	1.0537	0.0057	-0.3671
13	0.7800	0.1393	0.0098	1.0529	0.1388	-0.0639
14	-0.8776	-0.2640	0.0351	1.1035	-0.0039	-0.2219
15	0.2001	0.0323	0.0005	1.0786	0.0233	0.0066
16	-0.7639	-0.1581	0.0126	1.0655	-0.1567	0.1007
17	-1.6657	-0.2785	0.0371	0.9404	-0.1764	-0.0893
18	-0.3673	-0.0946	0.0046	1.1152	-0.0893	0.0737
19	-1.6311	-0.2602	0.0325	0.9434	-0.2007	-0.0343
20	-0.4805	-0.0761	0.0030	1.0668	-0.0668	0.0045
21	-0.9379	-0.1984	0.0197	1.0512	-0.1960	0.1302
22	-0.1276	-0.0400	0.0008	* 1.1558	0.0004	-0.0341
23	-0.1134	-0.0186	0.0002	1.0808	-0.0127	-0.0048
24	0.8384	0.1438	0.0104	1.0453	0.0835	0.0551
25	0.8000	0.1424	0.0102	1.0510	0.0735	0.0646
26	1.4238	0.2748	0.0368	0.9847	0.1097	0.1557
27	1.7496	0.3181	0.0481	0.9320	0.1534	0.1552
28	0.7313	0.1479	0.0111	1.0662	0.0506	0.0911
29	* 2.0030	0.3196	0.0474	0.8837	0.2464	0.0421
30	0.1899	0.0450	0.0010	1.1104	0.0083	0.0331
31	-0.9413	-0.2899	0.0421	1.1013	-0.0003	-0.2457
32	0.4013	0.0654	0.0022	1.0722	0.0621	-0.0156
33	1.2838	0.2069	0.0211	0.9927	0.1513	0.0396
34	0.8324	0.1969	0.0195	1.0728	0.1900	-0.1447
35	-0.8723	-0.1480	0.0110	1.0415	-0.1454	0.0532
36	-1.3344	-0.2191	0.0235	0.9871	-0.2101	0.0585
37	-1.4330	-0.2550	0.0317	0.9781	-0.1316	-0.1157
38	-0.1037	-0.0179	0.0002	1.0840	-0.0176	0.0070
39	-0.9563	-0.2014	0.0203	1.0489	-0.1991	0.1314
40	0.6690	0.1275	0.0082	1.0663	0.1275	-0.0703
41	-0.3010	-0.0946	0.0046	* 1.1518	-0.0846	0.0807
42	-0.5329	-0.1601	0.0131	1.1314	-0.1449	0.1344
43	-1.0011	-0.2253	0.0254	1.0506	-0.2198	0.1584
44	0.2866	0.1153	0.0068	* 1.2186	0.0964	-0.1048
45	-0.7462	-0.2961	0.0444	* 1.1843	-0.2484	0.2683
46	0.4024	0.0757	0.0029	1.0814	0.0328	0.0405
47	1.7751	0.2872	0.0391	0.9217	0.2701	-0.0603
48	1.6636	0.3037	0.0441	0.9457	0.3035	-0.1500
49	-0.2740	-0.0822	0.0035	1.1436	-0.0014	-0.0690
50	-0.9919	-0.2870	0.0412	1.0846	-0.0111	-0.2374
51	1.1000	0.1866	0.0173	1.0178	0.1124	0.0668

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
11	1.7918	0.5574	||||.....	0.6089	||||.....	0.6039	|||.....
12	3.8480	-1.1902	|||||||||.....	-1.3437	|||||||||.....	-1.3581	|||||||||.....
13	0.1823	0.7169	|||||.....	0.7839	|||||.....	0.7800	|||||.....
14	3.6788	-0.7830	||||||.....	-0.8802	||||||.....	-0.8776	||||||.....
15	1.4110	0.1858	|.....	0.2026	|.....	0.2001	|.....
16	-0.3425	-0.6987	|||||.....	-0.7680	|||||.....	-0.7639	|||||.....
17	1.6292	-1.4927	||||||||||...	-1.6291	||||||||||...	-1.6657	||||||||||...
18	-1.0498	-0.3342	||.....	-0.3715	||.....	-0.3673	||.....
19	1.2809	-1.4655	||||||||||...	-1.5974	||||||||||...	-1.6311	||||||||||...
20	0.9555	-0.4453	|||.....	-0.4853	|||.....	-0.4805	||.....
21	-0.4155	-0.8537	||||||.....	-0.9393	||||||.....	-0.9379	||||||.....
22	3.8199	-0.1145	|.....	-0.1292	|.....	-0.1276	|.....
23	1.5041	-0.1053	|.....	-0.1149	|.....	-0.1134	|.....
24	1.7579	0.7706	||||||.....	0.8416	||||||.....	0.8384	|||||.....
25	1.9169	0.7351	|||||.....	0.8037	|||||.....	0.8000	|||||.....
26	2.2192	1.2819	|||||||||.....	1.4054	|||||||||.....	1.4238	|||||||||.....
27	2.0015	1.5585	|||||||||||..	1.7051	|||||||||||..	1.7496	|||||||||||...
28	2.3795	0.6699	|||||.....	0.7357	|||||.....	0.7313	||||.....
29	1.2809	1.7705	||||||||||||||	1.9299	||||||||||||||	* 2.0030	||||||||||||||
30	2.8959	0.1738	|.....	0.1923	|.....	0.1899	|.....
31	3.7589	-0.8369	||||||.....	-0.9427	||||||.....	-0.9413	||||||.....
32	0.6419	0.3719	||.....	0.4056	||.....	0.4013	||.....
33	1.3863	1.1678	|||||||||.....	1.2732	|||||||||.....	1.2838	|||||||||.....
34	-0.7765	0.7555	|||||.....	0.8357	|||||.....	0.8324	|||||.....
35	0.4055	-0.8014	||||||.....	-0.8750	||||||.....	-0.8723	||||||.....
36	0.5878	-1.2112	|||||||||.....	-1.3212	|||||||||.....	-1.3344	|||||||||.....
37	1.9169	-1.2933	|||||||||.....	-1.4141	|||||||||.....	-1.4330	|||||||||.....
38	0.3365	-0.0962	|.....	-0.1050	|.....	-0.1037	|.....
39	-0.4005	-0.8703	||||||.....	-0.9574	||||||.....	-0.9563	||||||.....
40	-0.0619	0.6149	||||.....	0.6738	||||.....	0.6690	||||.....
41	-1.7148	-0.2700	|.....	-0.3046	|.....	-0.3010	|.....
42	-1.5606	-0.4786	|||.....	-0.5379	|||.....	-0.5329	|||.....
43	-0.6162	-0.9073	|||||||.....	-1.0011	|||||||.....	-1.0011	|||||||.....
44	-2.6173	0.2500	|.....	0.2900	|.....	0.2866	|.....
45	-2.5639	-0.6480	||||.....	-0.7505	|||||.....	-0.7462	|||||.....
46	2.1282	0.3714	||.....	0.4068	||.....	0.4024	||.....
47	0.6931	1.5848	|||||||||||..	1.7281	|||||||||||..	1.7751	|||||||||||..
48	0.0953	1.4870	|||||||||||...	1.6271	|||||||||||...	1.6636	|||||||||||...
49	3.6687	-0.2467	|.....	-0.2773	|.....	-0.2740	|.....
50	3.5467	-0.8853	|||||||.....	-0.9921	|||||||.....	-0.9919	|||||||.....
51	1.7047	1.0048	|||||||.....	1.0971	|||||||.....	1.1000	|||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	1.7918	0.1044	|||.....	0.0055	|.....	0.0416	|.....
12	3.8480	-0.4292	||||||||||||||	0.0902	||||||||||||||	-0.3671	||||||||||||||
13	0.1823	0.1393	||||.....	0.0098	|.....	-0.0639	||.....
14	3.6788	-0.2640	|||||||.....	0.0351	|||||.....	-0.2219	|||||||.....
15	1.4110	0.0323	|.....	0.0005	|.....	0.0066	|.....
16	-0.3425	-0.1581	|||||.....	0.0126	||.....	0.1007	|||.....
17	1.6292	-0.2785	|||||||||.....	0.0371	||||||.....	-0.0893	|||.....
18	-1.0498	-0.0946	||.....	0.0046	|.....	0.0737	||.....
19	1.2809	-0.2602	|||||||.....	0.0325	|||||.....	-0.0343	|.....
20	0.9555	-0.0761	||.....	0.0030	|.....	0.0045	|.....
21	-0.4155	-0.1984	||||||.....	0.0197	|||.....	0.1302	|||||.....
22	3.8199	-0.0400	|.....	0.0008	|.....	-0.0341	|.....
23	1.5041	-0.0186	|.....	0.0002	|.....	-0.0048	|.....
24	1.7579	0.1438	||||.....	0.0104	|.....	0.0551	||.....
25	1.9169	0.1424	||||.....	0.0102	|.....	0.0646	||.....
26	2.2192	0.2748	||||||||.....	0.0368	||||||.....	0.1557	||||||.....
27	2.0015	0.3181	|||||||||.....	0.0481	||||||.....	0.1552	||||||.....
28	2.3795	0.1479	||||.....	0.0111	|.....	0.0911	|||.....
29	1.2809	0.3196	||||||||||....	0.0474	||||||.....	0.0421	|.....
30	2.8959	0.0450	|.....	0.0010	|.....	0.0331	|.....
31	3.7589	-0.2899	||||||||.....	0.0421	||||||.....	-0.2457	||||||||.....
32	0.6419	0.0654	|.....	0.0022	|.....	-0.0156	|.....
33	1.3863	0.2069	||||||.....	0.0211	|||.....	0.0396	|.....
34	-0.7765	0.1969	||||||.....	0.0195	|||.....	-0.1447	|||||.....
35	0.4055	-0.1480	||||.....	0.0110	|.....	0.0532	||.....
36	0.5878	-0.2191	|||||||.....	0.0235	|||.....	0.0585	||.....
37	1.9169	-0.2550	||||||||.....	0.0317	|||||.....	-0.1157	||||.....
38	0.3365	-0.0179	|.....	0.0002	|.....	0.0070	|.....
39	-0.4005	-0.2014	||||||.....	0.0203	|||.....	0.1314	|||||.....
40	-0.0619	0.1275	|||.....	0.0082	|.....	-0.0703	||.....
41	-1.7148	-0.0946	||.....	0.0046	|.....	0.0807	|||.....
42	-1.5606	-0.1601	|||||.....	0.0131	||.....	0.1344	|||||.....
43	-0.6162	-0.2253	|||||||.....	0.0254	||||.....	0.1584	||||||.....
44	-2.6173	0.1153	|||.....	0.0068	|.....	-0.1048	||||.....
45	-2.5639	-0.2961	|||||||||.....	0.0444	|||||||.....	0.2683	|||||||||.....
46	2.1282	0.0757	||.....	0.0029	|.....	0.0405	|.....
47	0.6931	0.2872	||||||||.....	0.0391	||||||.....	-0.0603	||.....
48	0.0953	0.3037	|||||||||.....	0.0441	|||||||.....	-0.1500	||||||.....
49	3.6687	-0.0822	||.....	0.0035	|.....	-0.0690	||.....
50	3.5467	-0.2870	||||||||.....	0.0412	||||||.....	-0.2374	||||||||.....
51	1.7047	0.1866	||||||.....	0.0173	||.....	0.0668	||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	1.7918	0.6039	|||.....	0.0055	|.....	0.0290	|.....
12	3.8480	-1.3581	||||||||.....	0.0902	||||||||||||||	0.0908	|||||||.....
13	0.1823	0.7800	|||||.....	0.0098	|.....	0.0309	|.....
14	3.6788	-0.8776	||||||.....	0.0351	||||.....	0.0830	||||||.....
15	1.4110	0.2001	|.....	0.0005	|.....	0.0255	|.....
16	-0.3425	-0.7639	|||||.....	0.0126	||.....	0.0411	||.....
17	1.6292	-1.6657	|||||||||||...	0.0371	||||||.....	0.0272	|.....
18	-1.0498	-0.3673	||.....	0.0046	|.....	0.0622	||||.....
19	1.2809	-1.6311	|||||||||||...	0.0325	||||.....	0.0248	|.....
20	0.9555	-0.4805	||.....	0.0030	|.....	0.0245	|.....
21	-0.4155	-0.9379	||||||.....	0.0197	|||.....	0.0428	||.....
22	3.8199	-0.1276	|.....	0.0008	|.....	0.0895	|||||||.....
23	1.5041	-0.1134	|.....	0.0002	|.....	0.0261	|.....
24	1.7579	0.8384	|||||.....	0.0104	|.....	0.0286	|.....
25	1.9169	0.8000	|||||.....	0.0102	|.....	0.0307	|.....
26	2.2192	1.4238	|||||||||.....	0.0368	||||||.....	0.0359	|.....
27	2.0015	1.7496	|||||||||||...	0.0481	||||||.....	0.0320	|.....
28	2.3795	0.7313	||||.....	0.0111	|.....	0.0393	|.....
29	1.2809	* 2.0030	|||||||||||||	0.0474	||||||.....	0.0248	|.....
30	2.8959	0.1899	|.....	0.0010	|.....	0.0532	|||.....
31	3.7589	-0.9413	||||||.....	0.0421	||||||.....	0.0866	|||||||.....
32	0.6419	0.4013	||.....	0.0022	|.....	0.0259	|.....
33	1.3863	1.2838	||||||||.....	0.0211	|||.....	0.0253	|.....
34	-0.7765	0.8324	|||||.....	0.0195	|||.....	0.0530	|||.....
35	0.4055	-0.8723	|||||.....	0.0110	|.....	0.0280	|.....
36	0.5878	-1.3344	||||||||.....	0.0235	|||.....	0.0263	|.....
37	1.9169	-1.4330	|||||||||.....	0.0317	||||.....	0.0307	|.....
38	0.3365	-0.1037	|.....	0.0002	|.....	0.0288	|.....
39	-0.4005	-0.9563	||||||.....	0.0203	|||.....	0.0425	||.....
40	-0.0619	0.6690	||||.....	0.0082	|.....	0.0350	|.....
41	-1.7148	-0.3010	|.....	0.0046	|.....	0.0898	|||||||.....
42	-1.5606	-0.5329	|||.....	0.0131	||.....	0.0827	||||||.....
43	-0.6162	-1.0011	||||||.....	0.0254	||||.....	0.0482	|||.....
44	-2.6173	0.2866	|.....	0.0068	|.....	0.1394	|||||||||||||
45	-2.5639	-0.7462	|||||.....	0.0444	||||||.....	0.1361	||||||||||||.
46	2.1282	0.4024	||.....	0.0029	|.....	0.0342	|.....
47	0.6931	1.7751	||||||||||||..	0.0391	|||||.....	0.0255	|.....
48	0.0953	1.6636	|||||||||||...	0.0441	||||||.....	0.0323	|.....
49	3.6687	-0.2740	|.....	0.0035	|.....	0.0826	||||||.....
50	3.5467	-0.9919	||||||.....	0.0412	|||||.....	0.0772	|||||.....
51	1.7047	1.1000	||||||.....	0.0173	||.....	0.0280	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Inverse Prediction of X Means

Row	lnInvert (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	3.0057	1.7918	2.7260	-0.9342	2.1416	3.6187
12	2.4849	3.8480	1.8531	1.9949	1.3537	2.4997
13	2.2050	0.1823	1.3839	-1.2016	0.8897	1.9387
14	2.7912	3.6788	2.3664	1.3124	1.8260	3.1487
15	2.4069	1.4110	1.7224	-0.3114	1.2280	2.3399
16	0.4762	-0.3425	-1.5135	1.1711	-2.7153	-0.7863
17	0.8587	1.6292	-0.8726	2.5018	-1.8503	-0.2510
18	0.4187	-1.0498	-1.6100	0.5601	-2.8467	-0.8656
19	0.6780	1.2809	-1.1753	2.4563	-2.2569	-0.5059
20	1.5041	0.9555	0.2092	0.7463	-0.4492	0.7112
21	0.2776	-0.4155	-1.8464	1.4309	-3.1699	-1.0590
22	3.5439	3.8199	3.6280	0.1919	2.9004	4.8305
23	2.1713	1.5041	1.3275	0.1765	0.8314	1.8738
24	3.1987	1.7579	3.0494	-1.2916	2.4180	4.0489
25	3.2581	1.9169	3.1490	-1.2321	2.5020	4.1825
26	3.9853	2.2192	4.3678	-2.1486	3.5030	5.8442
27	4.1320	2.0015	4.6137	-2.6122	3.7009	6.1834
28	3.4689	2.3795	3.5023	-1.1227	2.7966	4.6596
29	3.9140	1.2809	4.2484	-2.9674	3.4065	5.6798
30	3.2809	2.8959	3.1873	-0.2913	2.5341	4.2339
31	2.7850	3.7589	2.3561	1.4028	1.8168	3.1354
32	2.1342	0.6419	1.2652	-0.6234	0.7662	1.8029
33	3.3742	1.3863	3.3436	-1.9573	2.6648	4.4447
34	1.6715	-0.7765	0.4897	-1.2663	-0.1072	0.9821
35	0.8198	0.4055	-0.9377	1.3432	-1.9375	-0.3062
36	0.5188	0.5878	-1.4422	2.0300	-2.6183	-0.7275
37	1.2296	1.9169	-0.2508	2.1677	-1.0322	0.2892
38	1.4839	0.3365	0.1753	0.1612	-0.4913	0.6792
39	0.2700	-0.4005	-1.8592	1.4587	-3.1873	-1.0693
40	1.9573	-0.0619	0.9688	-1.0306	0.4459	1.4755
41	0.0862	-1.7148	-2.1673	0.4525	-3.6105	-1.3194
42	-0.0305	-1.5606	-2.3628	0.8021	-3.8798	-1.4771
43	0.1044	-0.6162	-2.1368	1.5206	-3.5685	-1.2947
44	0.0677	-2.6173	-2.1983	-0.4190	-3.6532	-1.3445
45	-0.7985	-2.5639	-3.6501	1.0861	-5.6652	-2.5041
46	3.0204	2.1282	2.7507	-0.6224	2.1629	3.6513
47	3.3776	0.6931	3.3493	-2.6561	2.6696	4.4524
48	2.9232	0.0953	2.5876	-2.4923	2.0214	3.4367
49	3.3214	3.6687	3.2552	0.4135	2.5911	4.3254
50	2.6101	3.5467	2.0629	1.4839	1.5505	2.7612
51	3.4012	1.7047	3.3889	-1.6841	2.7025	4.5059

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Inverse Prediction of X Individuals

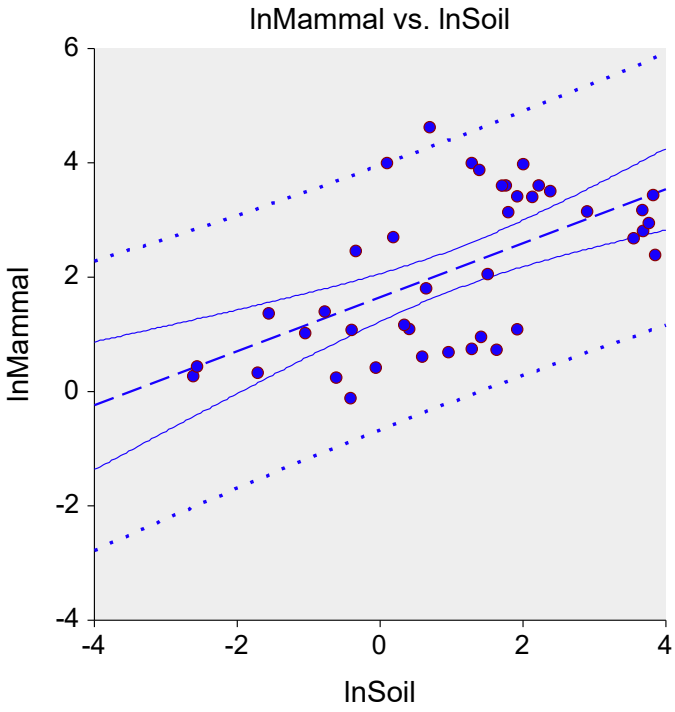
Row	lnInvert (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	3.0057	1.7918	2.7260	-0.9342	-0.4933	6.2536
12	2.4849	3.8480	1.8531	1.9949	-1.4145	5.2678
13	2.2050	0.1823	1.3839	-1.2016	-1.9190	4.7473
14	2.7912	3.6788	2.3664	1.3124	-0.8700	5.8448
15	2.4069	1.4110	1.7224	-0.3114	-1.5543	5.1222
16	0.4762	-0.3425	-1.5135	1.1711	-5.1809	1.6792
17	0.8587	1.6292	-0.8726	2.5018	-4.4380	2.3367
18	0.4187	-1.0498	-1.6100	0.5601	-5.2936	1.5813
19	0.6780	1.2809	-1.1753	2.4563	-4.7874	2.0247
20	1.5041	0.9555	0.2092	0.7463	-3.2114	3.4733
21	0.2776	-0.4155	-1.8464	1.4309	-5.5711	1.3423
22	3.5439	3.8199	3.6280	0.1919	0.4352	7.2956
23	2.1713	1.5041	1.3275	0.1765	-1.9801	4.6852
24	3.1987	1.7579	3.0494	-1.2916	-0.1577	6.6246
25	3.2581	1.9169	3.1490	-1.2321	-0.0549	6.7394
26	3.9853	2.2192	4.3678	-2.1486	1.1800	8.1672
27	4.1320	2.0015	4.6137	-2.6122	1.4242	8.4600
28	3.4689	2.3795	3.5023	-1.1227	0.3072	7.1490
29	3.9140	1.2809	4.2484	-2.9674	1.0608	8.0255
30	3.2809	2.8959	3.1873	-0.2913	-0.0156	6.7836
31	2.7850	3.7589	2.3561	1.4028	-0.8809	5.8331
32	2.1342	0.6419	1.2652	-0.6234	-2.0477	4.6167
33	3.3742	1.3863	3.3436	-1.9573	0.1449	6.9646
34	1.6715	-0.7765	0.4897	-1.2663	-2.8989	3.7738
35	0.8198	0.4055	-0.9377	1.3432	-4.5130	2.2693
36	0.5188	0.5878	-1.4422	2.0300	-5.0976	1.7518
37	1.2296	1.9169	-0.2508	2.1677	-3.7288	2.9858
38	1.4839	0.3365	0.1753	0.1612	-3.2493	3.4372
39	0.2700	-0.4005	-1.8592	1.4587	-5.5861	1.3294
40	1.9573	-0.0619	0.9688	-1.0306	-2.3710	4.2923
41	0.0862	-1.7148	-2.1673	0.4525	-5.9502	1.0203
42	-0.0305	-1.5606	-2.3628	0.8021	-6.1825	0.8255
43	0.1044	-0.6162	-2.1368	1.5206	-5.9141	1.0508
44	0.0677	-2.6173	-2.1983	-0.4190	-5.9870	0.9893
45	-0.7985	-2.5639	-3.6501	1.0861	-7.7361	-0.4332
46	3.0204	2.1282	2.7507	-0.6224	-0.4676	6.2818
47	3.3776	0.6931	3.3493	-2.6561	0.1508	6.9712
48	2.9232	0.0953	2.5876	-2.4923	-0.6378	6.0959
49	3.3214	3.6687	3.2552	0.4135	0.0543	6.8621
50	2.6101	3.5467	2.0629	1.4839	-1.1910	5.5027
51	3.4012	1.7047	3.3889	-1.6841	0.1913	7.0171

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnMammal	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.6437	Rows Prediction Only	0
Slope	0.4734	Sum of Frequencies	41
R-Squared	0.3482	Sum of Weights	41.0000
Correlation	0.5901	Coefficient of Variation	0.5241
Mean Square Error	1.262028	Square Root of MSE	1.1234

Linear Regression Report

Y = lnMammal X = lnSoil

Summary Statement

The equation of the straight line relating lnMammal and lnSoil is estimated as: lnMammal = (1.6437) + (0.4734) lnSoil using the 41 observations in this dataset. The y-intercept, the estimated value of lnMammal when lnSoil is zero, is 1.6437 with a standard error of 0.2068. The slope, the estimated change in lnMammal per unit change in lnSoil, is 0.4734 with a standard error of 0.1037. The value of R-Squared, the proportion of the variation in lnMammal that can be accounted for by variation in lnSoil, is 0.3482. The correlation between lnMammal and lnSoil is 0.5901.

A significance test that the slope is zero resulted in a t-value of 4.5645. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.4734. The lower limit of the 95% confidence interval for the slope is 0.2636 and the upper limit is 0.6831. The estimated intercept is 1.6437. The lower limit of the 95% confidence interval for the intercept is 1.2253 and the upper limit is 2.0620.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnMammal	lnSoil
Count	41	41
Mean	2.1436	1.0562
Standard Deviation	1.3740	1.7128
Minimum	-0.1165	-2.6173
Maximum	4.6240	3.8480

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.6437	0.4734
Lower 95% Confidence Limit	1.2253	0.2636
Upper 95% Confidence Limit	2.0620	0.6831
Standard Error	0.2068	0.1037
Standardized Coefficient	0.0000	0.5901
T Value	7.9470	4.5645
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	0.9936
Regression of Y on X	1.6437	0.4734
Inverse Regression from X on Y	0.7078	1.3594
Orthogonal Regression of Y and X	1.4128	0.6920

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.64367805589492) + (0.473354536224307) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.6437	0.9000	1.3238	1.9539
Bootstrap Mean	1.6426	0.9500	1.2651	2.0107
Bias (BM - OV)	-0.0010	0.9900	1.1080	2.1046
Bias Corrected	1.6447			
Standard Error	0.1897			
Slope				
Original Value	0.4734	0.9000	0.3621	0.5743
Bootstrap Mean	0.4775	0.9500	0.3347	0.5935
Bias (BM - OV)	0.0041	0.9900	0.2701	0.6324
Bias Corrected	0.4692			
Standard Error	0.0649			
Correlation				
Original Value	0.5901	0.9000	0.4628	0.7293
Bootstrap Mean	0.5932	0.9500	0.4395	0.7609
Bias (BM - OV)	0.0031	0.9900	0.4008	0.8250
Bias Corrected	0.5870			
Standard Error	0.0815			
R-Squared				
Original Value	0.3482	0.9000	0.1818	0.4931
Bootstrap Mean	0.3585	0.9500	0.1478	0.5206
Bias (BM - OV)	0.0103	0.9900	0.0891	0.5702
Bias Corrected	0.3379			
Standard Error	0.0946			
Standard Error of Estimate				
Original Value	1.1234	0.9000	0.9679	1.3267
Bootstrap Mean	1.0975	0.9500	0.9363	1.3612
Bias (BM - OV)	-0.0259	0.9900	0.8764	1.4417
Bias Corrected	1.1493			
Standard Error	0.1084			
Orthogonal Intercept				
Original Value	1.4128	0.9000	1.1029	1.8006
Bootstrap Mean	1.3867	0.9500	1.0394	1.9057
Bias (BM - OV)	-0.0260	0.9900	0.9219	2.2242
Bias Corrected	1.4388			
Standard Error	0.2239			
Orthogonal Slope				
Original Value	0.6920	0.9000	0.3992	0.8492
Bootstrap Mean	0.7186	0.9500	0.3071	0.8715
Bias (BM - OV)	0.0266	0.9900	0.0045	0.9200
Bias Corrected	0.6654			
Standard Error	0.1497			

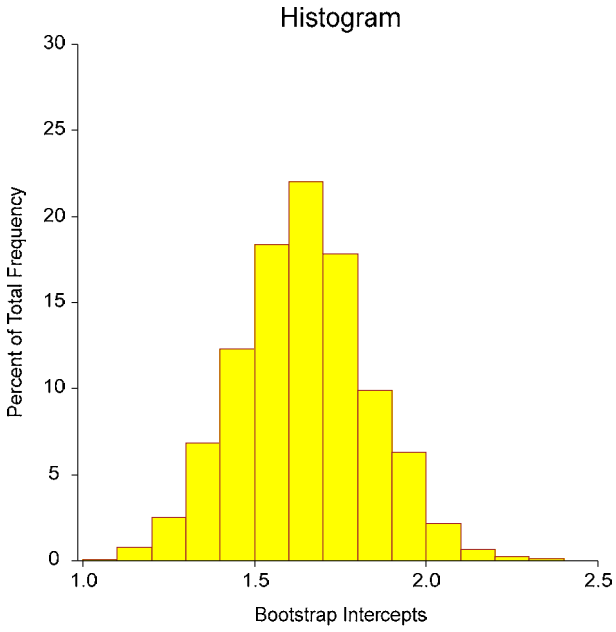
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

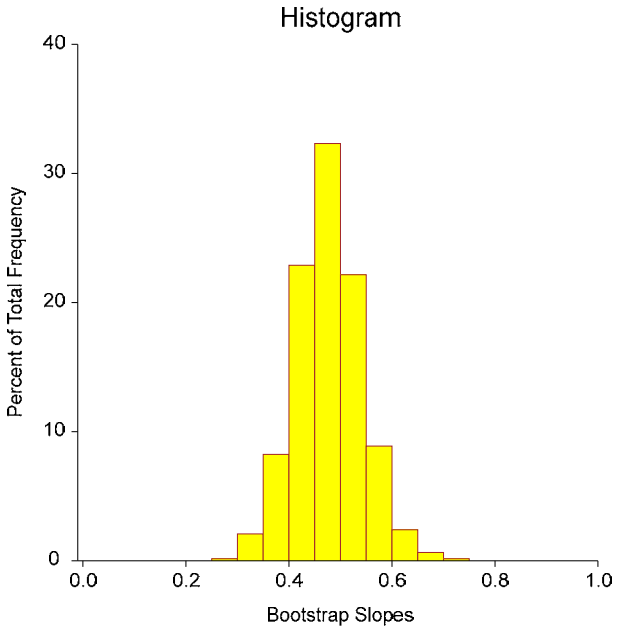
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

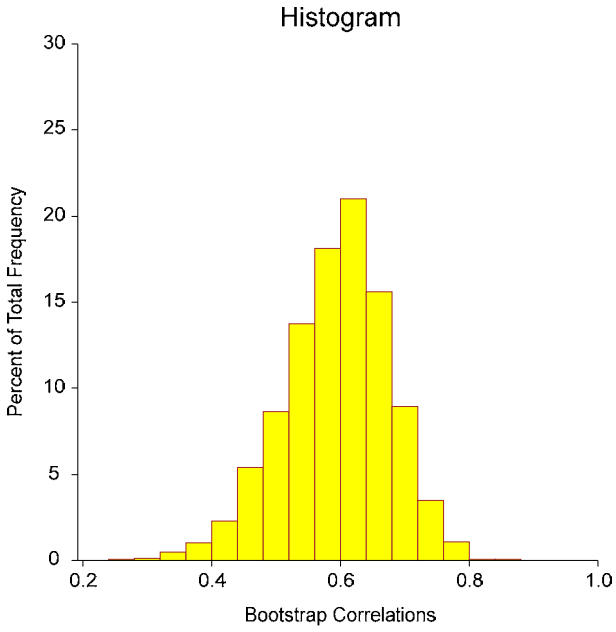
Linear Regression Report

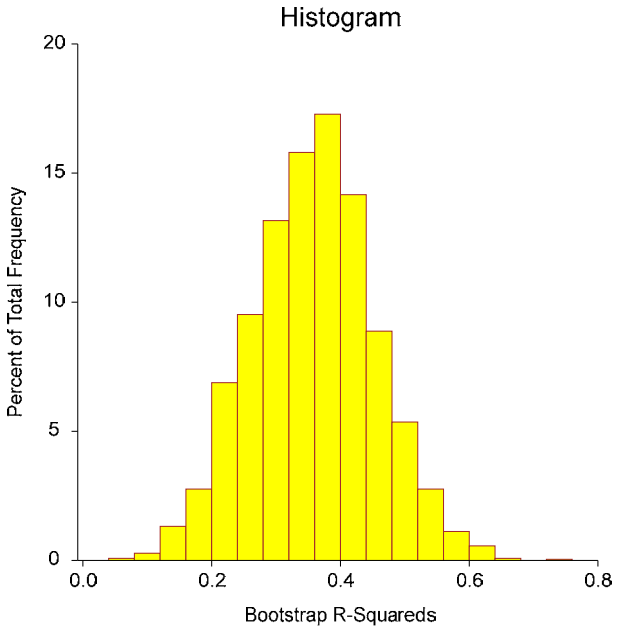
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Bootstrap Histograms Section



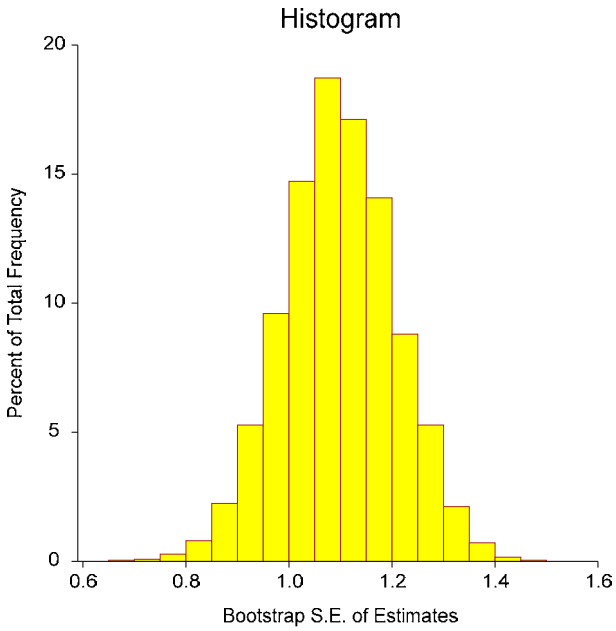


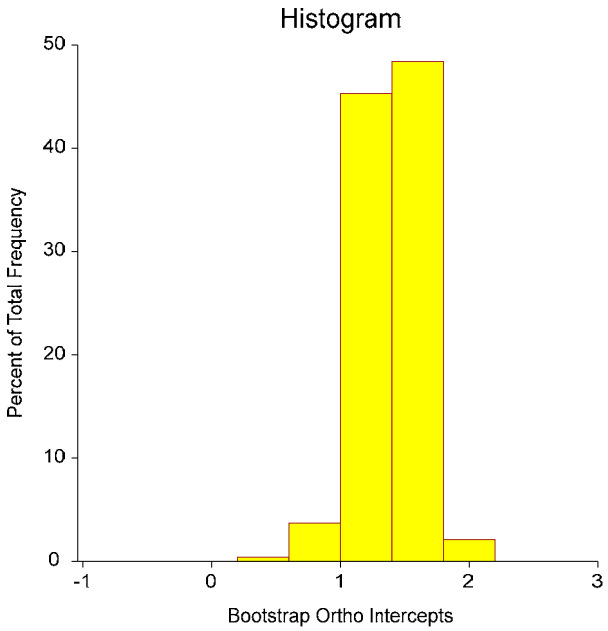


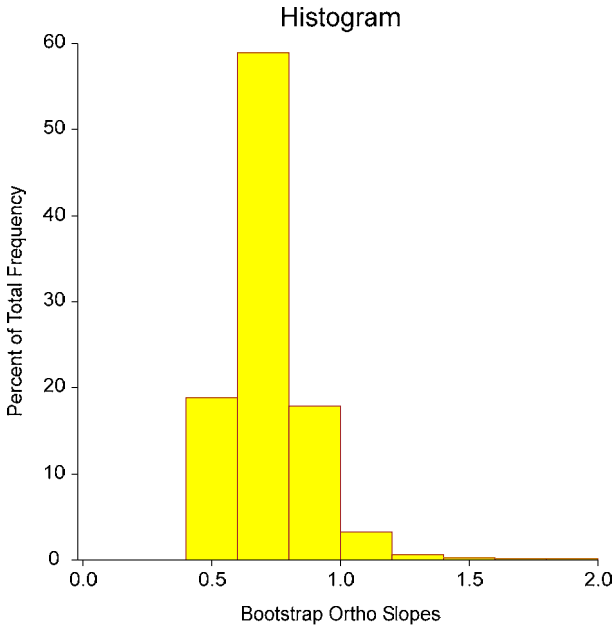


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.5901	0.3482	0.5719
Lower 95% Conf. Limit (r dist'n)	0.3409		
Upper 95% Conf. Limit (r dist'n)	0.7553		
Lower 95% Conf. Limit (Fisher's z)	0.3451		0.3206
Upper 95% Conf. Limit (Fisher's z)	0.7598		0.7479
Adjusted (Rbar)		0.3315	
T-Value for H0: Rho = 0	4.5645	4.5645	4.3532
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0001
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	188.4024	188.4024			
Slope	1	26.29345	26.29345	20.8343	0.0000	0.9936
Error	39	49.21909	1.262028			
Lack of Fit	37	41.23403	1.114433	0.2791	0.9622	
Pure Error	2	7.985058	3.992529			
Adj. Total	40	75.51254	1.887813			
Total	41	263.9149				

s = Square Root(1.262028) = 1.1234

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	43.30437	87.88912	0.03389676	-0.009000641
1	43.30437	163.0859	148.3759	-0.009000641	0.008521686
2 (Y'Y)			263.9149		
Determinant		4811.254			0.000207846

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.04277866	-0.01135906
1	-0.01135906	0.01075461

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9631	0.201044	Yes
Anderson Darling	0.4099	0.343615	Yes
D'Agostino Skewness	1.1736	0.240562	Yes
D'Agostino Kurtosis	-0.6192	0.535795	Yes
D'Agostino Omnibus	1.7607	0.414641	Yes
Constant Residual Variance?			
Modified Levene Test	0.1059	0.746581	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.2791	0.962177	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

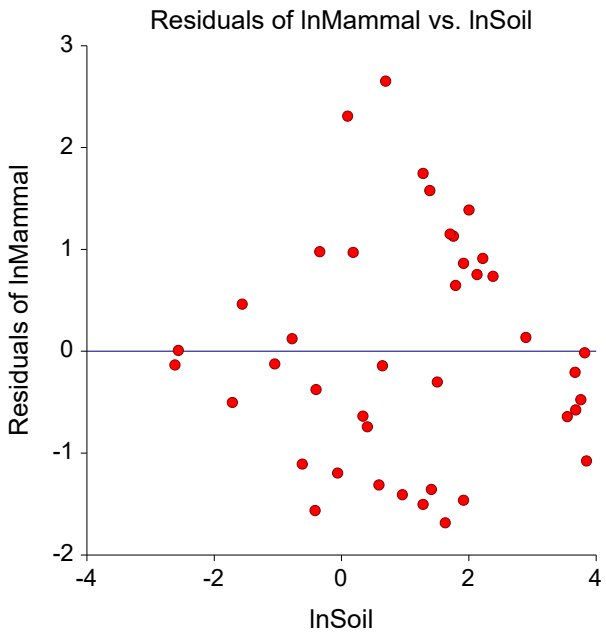
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

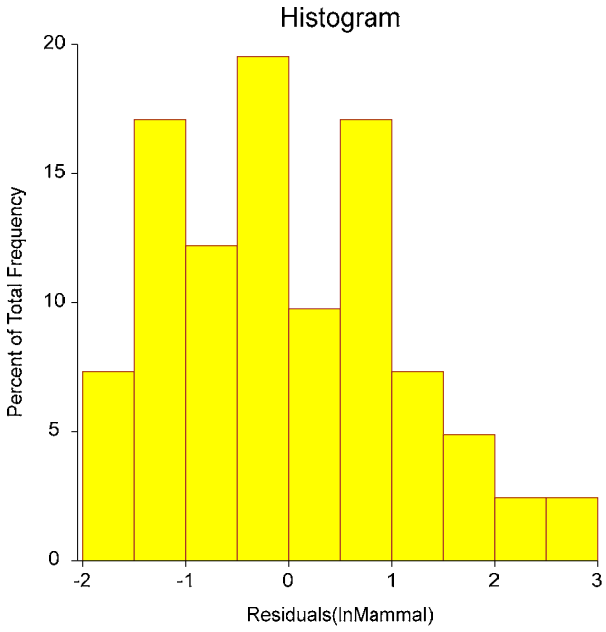
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

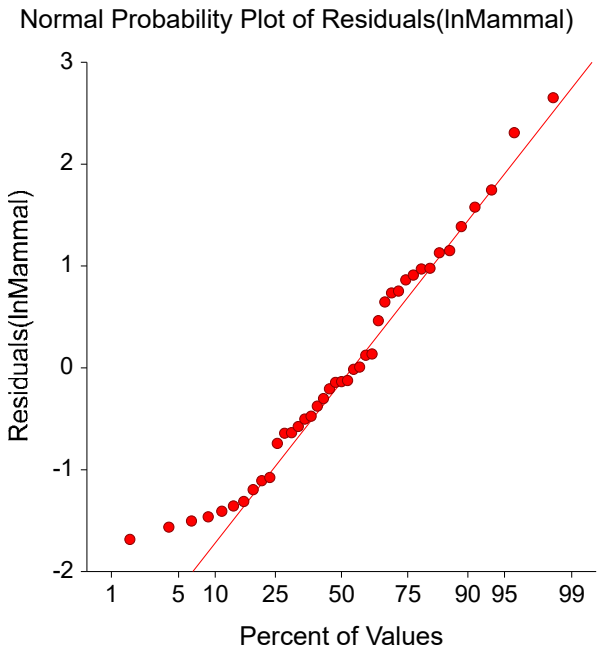
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Original Data Section

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual
11	1.7918	3.1384	2.4918	0.6466
12	3.8480	2.3888	3.4652	-1.0764
13	0.1823	2.7007	1.7300	0.9707
14	3.6788	2.8094	3.3851	-0.5757
15	1.4110	0.9555	2.3116	-1.3561
16	-0.3425	2.4592	1.4816	0.9776
17	1.6292	0.7308	2.4149	-1.6841
18	-1.0498	1.0225	1.1467	-0.1243
19	1.2809	0.7467	2.2500	-1.5033
20	0.9555	0.6881	2.0960	-1.4078
21	-0.4155	-0.1165	1.4470	-1.5635
22	3.8199	3.4372	3.4518	-0.0146
23	1.5041	2.0541	2.3556	-0.3015
24	1.7579	3.6055	2.4758	1.1297
25	1.9169	3.4144	2.5511	0.8634
26	2.2192	3.6055	2.6941	0.9113
27	2.0015	3.9782	2.5911	1.3872
28	2.3795	3.5056	2.7700	0.7355
29	1.2809	3.9964	2.2500	1.7464
30	2.8959	3.1506	3.0145	0.1361
31	3.7589	2.9481	3.4230	-0.4748
32	0.6419	1.8050	1.9475	-0.1425
33	1.3863	3.8774	2.2999	1.5775
34	-0.7765	1.3995	1.2761	0.1234
35	0.4055	1.0942	1.8356	-0.7414
36	0.5878	0.6098	1.9219	-1.3121
37	1.9169	1.0886	2.5511	-1.4625
38	0.3365	1.1663	1.8029	-0.6367
39	-0.4005	1.0784	1.4541	-0.3757
40	-0.0619	0.4187	1.6144	-1.1957
41	-1.7148	0.3293	0.8320	-0.5027
42	-1.5606	1.3678	0.9049	0.4629
43	-0.6162	0.2443	1.3520	-1.1078
44	-2.6173	0.2700	0.4048	-0.1347
45	-2.5639	0.4383	0.4300	0.0082
46	2.1282	3.4045	2.6511	0.7534
47	0.6931	4.6240	1.9718	2.6522
48	0.0953	3.9973	1.6888	2.3085
49	3.6687	3.1739	3.3803	-0.2064
50	3.5467	2.6810	3.3225	-0.6415
51	1.7047	3.6019	2.4506	1.1512

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	1.7918	3.1384	2.4918	0.1913	2.1049	2.8788
12	3.8480	2.3888	3.4652	0.3385	2.7804	4.1499
13	0.1823	2.7007	1.7300	0.1975	1.3306	2.1294
14	3.6788	2.8094	3.3851	0.3237	2.7304	4.0397
15	1.4110	0.9555	2.3116	0.1793	1.9490	2.6742
16	-0.3425	2.4592	1.4816	0.2276	1.0211	1.9420
17	1.6292	0.7308	2.4149	0.1852	2.0402	2.7896
18	-1.0498	1.0225	1.1467	0.2801	0.5801	1.7134
19	1.2809	0.7467	2.2500	0.1770	1.8920	2.6080
20	0.9555	0.6881	2.0960	0.1758	1.7405	2.4515
21	-0.4155	-0.1165	1.4470	0.2325	0.9766	1.9174
22	3.8199	3.4372	3.4518	0.3360	2.7721	4.1316
23	1.5041	2.0541	2.3556	0.1815	1.9885	2.7227
24	1.7579	3.6055	2.4758	0.1899	2.0916	2.8600
25	1.9169	3.4144	2.5511	0.1968	2.1529	2.9492
26	2.2192	3.6055	2.6941	0.2129	2.2635	3.1248
27	2.0015	3.9782	2.5911	0.2010	2.1846	2.9976
28	2.3795	3.5056	2.7700	0.2227	2.3195	3.2206
29	1.2809	3.9964	2.2500	0.1770	1.8920	2.6080
30	2.8959	3.1506	3.0145	0.2592	2.4902	3.5387
31	3.7589	2.9481	3.4230	0.3307	2.7541	4.0918
32	0.6419	1.8050	1.9475	0.1806	1.5821	2.3129
33	1.3863	3.8774	2.2999	0.1788	1.9383	2.6615
34	-0.7765	1.3995	1.2761	0.2587	0.7529	1.7993
35	0.4055	1.0942	1.8356	0.1880	1.4554	2.2158
36	0.5878	0.6098	1.9219	0.1820	1.5537	2.2901
37	1.9169	1.0886	2.5511	0.1968	2.1529	2.9492
38	0.3365	1.1663	1.8029	0.1907	1.4173	2.1886
39	-0.4005	1.0784	1.4541	0.2315	0.9858	1.9224
40	-0.0619	0.4187	1.6144	0.2103	1.1890	2.0398
41	-1.7148	0.3293	0.8320	0.3367	0.1510	1.5130
42	-1.5606	1.3678	0.9049	0.3232	0.2513	1.5586
43	-0.6162	0.2443	1.3520	0.2467	0.8530	1.8510
44	-2.6173	0.2700	0.4048	0.4194	-0.4436	1.2531
45	-2.5639	0.4383	0.4300	0.4144	-0.4082	1.2682
46	2.1282	3.4045	2.6511	0.2077	2.2310	3.0712
47	0.6931	4.6240	1.9718	0.1794	1.6088	2.3347
48	0.0953	3.9973	1.6888	0.2018	1.2807	2.0969
49	3.6687	3.1739	3.3803	0.3228	2.7274	4.0331
50	3.5467	2.6810	3.3225	0.3122	2.6910	3.9541
51	1.7047	3.6019	2.4506	0.1879	2.0706	2.8307

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	1.7918	3.1384	2.4918	1.1396	0.1868	4.7968
12	3.8480	2.3888	3.4652	1.1733	1.0919	5.8384
13	0.1823	2.7007	1.7300	1.1406	-0.5771	4.0371
14	3.6788	2.8094	3.3851	1.1691	1.0204	5.7498
15	1.4110	0.9555	2.3116	1.1376	0.0105	4.6126
16	-0.3425	2.4592	1.4816	1.1462	-0.8369	3.8000
17	1.6292	0.7308	2.4149	1.1386	0.1119	4.7179
18	-1.0498	1.0225	1.1467	1.1578	-1.1951	3.4886
19	1.2809	0.7467	2.2500	1.1373	-0.0503	4.5503
20	0.9555	0.6881	2.0960	1.1371	-0.2040	4.3959
21	-0.4155	-0.1165	1.4470	1.1472	-0.8735	3.7675
22	3.8199	3.4372	3.4518	1.1726	1.0801	5.8236
23	1.5041	2.0541	2.3556	1.1380	0.0539	4.6574
24	1.7579	3.6055	2.4758	1.1393	0.1712	4.7803
25	1.9169	3.4144	2.5511	1.1405	0.2442	4.8580
26	2.2192	3.6055	2.6941	1.1434	0.3814	5.0069
27	2.0015	3.9782	2.5911	1.1412	0.2827	4.8995
28	2.3795	3.5056	2.7700	1.1453	0.4535	5.0866
29	1.2809	3.9964	2.2500	1.1373	-0.0503	4.5503
30	2.8959	3.1506	3.0145	1.1529	0.6825	5.3465
31	3.7589	2.9481	3.4230	1.1711	1.0543	5.7916
32	0.6419	1.8050	1.9475	1.1378	-0.3540	4.2490
33	1.3863	3.8774	2.2999	1.1375	-0.0010	4.6008
34	-0.7765	1.3995	1.2761	1.1528	-1.0556	3.6078
35	0.4055	1.0942	1.8356	1.1390	-0.4683	4.1395
36	0.5878	0.6098	1.9219	1.1381	-0.3800	4.2238
37	1.9169	1.0886	2.5511	1.1405	0.2442	4.8580
38	0.3365	1.1663	1.8029	1.1395	-0.5018	4.1077
39	-0.4005	1.0784	1.4541	1.1470	-0.8659	3.7742
40	-0.0619	0.4187	1.6144	1.1429	-0.6974	3.9262
41	-1.7148	0.3293	0.8320	1.1728	-1.5402	3.2041
42	-1.5606	1.3678	0.9049	1.1690	-1.4595	3.2694
43	-0.6162	0.2443	1.3520	1.1502	-0.9744	3.6784
44	-2.6173	0.2700	0.4048	1.1991	-2.0207	2.8303
45	-2.5639	0.4383	0.4300	1.1974	-1.9919	2.8520
46	2.1282	3.4045	2.6511	1.1424	0.3403	4.9619
47	0.6931	4.6240	1.9718	1.1376	-0.3293	4.2729
48	0.0953	3.9973	1.6888	1.1414	-0.6199	3.9974
49	3.6687	3.1739	3.3803	1.1688	1.0160	5.7445
50	3.5467	2.6810	3.3225	1.1660	0.9641	5.6810
51	1.7047	3.6019	2.4506	1.1390	0.1468	4.7545

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	1.7918	3.1384	2.4918	0.1913	1.9466	3.0370
12	3.8480	2.3888	3.4652	0.3385	2.5004	4.4299
13	0.1823	2.7007	1.7300	0.1975	1.1672	2.2927
14	3.6788	2.8094	3.3851	0.3237	2.4627	4.3074
15	1.4110	0.9555	2.3116	0.1793	1.8007	2.8224
16	-0.3425	2.4592	1.4816	0.2276	0.8328	2.1303
17	1.6292	0.7308	2.4149	0.1852	1.8870	2.9428
18	-1.0498	1.0225	1.1467	0.2801	0.3484	1.9451
19	1.2809	0.7467	2.2500	0.1770	1.7456	2.7544
20	0.9555	0.6881	2.0960	0.1758	1.5951	2.5969
21	-0.4155	-0.1165	1.4470	0.2325	0.7843	2.1097
22	3.8199	3.4372	3.4518	0.3360	2.4942	4.4095
23	1.5041	2.0541	2.3556	0.1815	1.8384	2.8729
24	1.7579	3.6055	2.4758	0.1899	1.9345	3.0171
25	1.9169	3.4144	2.5511	0.1968	1.9901	3.1120
26	2.2192	3.6055	2.6941	0.2129	2.0874	3.3009
27	2.0015	3.9782	2.5911	0.2010	2.0183	3.1638
28	2.3795	3.5056	2.7700	0.2227	2.1353	3.4048
29	1.2809	3.9964	2.2500	0.1770	1.7456	2.7544
30	2.8959	3.1506	3.0145	0.2592	2.2758	3.7531
31	3.7589	2.9481	3.4230	0.3307	2.4806	4.3653
32	0.6419	1.8050	1.9475	0.1806	1.4327	2.4623
33	1.3863	3.8774	2.2999	0.1788	1.7905	2.8093
34	-0.7765	1.3995	1.2761	0.2587	0.5390	2.0133
35	0.4055	1.0942	1.8356	0.1880	1.2999	2.3713
36	0.5878	0.6098	1.9219	0.1820	1.4031	2.4407
37	1.9169	1.0886	2.5511	0.1968	1.9901	3.1120
38	0.3365	1.1663	1.8029	0.1907	1.2596	2.3463
39	-0.4005	1.0784	1.4541	0.2315	0.7943	2.1139
40	-0.0619	0.4187	1.6144	0.2103	1.0151	2.2137
41	-1.7148	0.3293	0.8320	0.3367	-0.1276	1.7915
42	-1.5606	1.3678	0.9049	0.3232	-0.0160	1.8259
43	-0.6162	0.2443	1.3520	0.2467	0.6489	2.0551
44	-2.6173	0.2700	0.4048	0.4194	-0.7905	1.6001
45	-2.5639	0.4383	0.4300	0.4144	-0.7510	1.6110
46	2.1282	3.4045	2.6511	0.2077	2.0592	3.2430
47	0.6931	4.6240	1.9718	0.1794	1.4604	2.4832
48	0.0953	3.9973	1.6888	0.2018	1.1138	2.2638
49	3.6687	3.1739	3.3803	0.3228	2.4604	4.3001
50	3.5467	2.6810	3.3225	0.3122	2.4327	4.2124
51	1.7047	3.6019	2.4506	0.1879	1.9152	2.9861

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Section

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	1.7918	3.1384	2.4918	0.6466	0.5841	20.6021
12	3.8480	2.3888	3.4652	-1.0764	-1.0049	45.0606
13	0.1823	2.7007	1.7300	0.9707	0.8777	35.9430
14	3.6788	2.8094	3.3851	-0.5757	-0.5351	20.4907
15	1.4110	0.9555	2.3116	-1.3561	-1.2228	141.9202
16	-0.3425	2.4592	1.4816	0.9776	0.8887	39.7535
17	1.6292	0.7308	2.4149	-1.6841	-1.5199	230.4605
18	-1.0498	1.0225	1.1467	-0.1243	-0.1142	12.1560
19	1.2809	0.7467	2.2500	-1.5033	-1.3551	201.3326
20	0.9555	0.6881	2.0960	-1.4078	-1.2688	204.5877
21	-0.4155	-0.1165	1.4470	-1.5635	-1.4226	1341.6927
22	3.8199	3.4372	3.4518	-0.0146	-0.0137	0.4260
23	1.5041	2.0541	2.3556	-0.3015	-0.2720	14.6786
24	1.7579	3.6055	2.4758	1.1297	1.0203	31.3335
25	1.9169	3.4144	2.5511	0.8634	0.7806	25.2861
26	2.2192	3.6055	2.6941	0.9113	0.8262	25.2767
27	2.0015	3.9782	2.5911	1.3872	1.2550	34.8686
28	2.3795	3.5056	2.7700	0.7355	0.6680	20.9813
29	1.2809	3.9964	2.2500	1.7464	1.5742	43.6985
30	2.8959	3.1506	3.0145	0.1361	0.1245	4.3206
31	3.7589	2.9481	3.4230	-0.4748	-0.4423	16.1066
32	0.6419	1.8050	1.9475	-0.1425	-0.1285	7.8946
33	1.3863	3.8774	2.2999	1.5775	1.4224	40.6853
34	-0.7765	1.3995	1.2761	0.1234	0.1129	8.8197
35	0.4055	1.0942	1.8356	-0.7414	-0.6694	67.7643
36	0.5878	0.6098	1.9219	-1.3121	-1.1837	215.1883
37	1.9169	1.0886	2.5511	-1.4625	-1.3223	134.3516
38	0.3365	1.1663	1.8029	-0.6367	-0.5751	54.5909
39	-0.4005	1.0784	1.4541	-0.3757	-0.3418	34.8384
40	-0.0619	0.4187	1.6144	-1.1957	-1.0835	285.5623
41	-1.7148	0.3293	0.8320	-0.5027	-0.4690	152.6453
42	-1.5606	1.3678	0.9049	0.4629	0.4302	33.8394
43	-0.6162	0.2443	1.3520	-1.1078	-1.0107	453.5270
44	-2.6173	0.2700	0.4048	-0.1347	-0.1293	49.8995
45	-2.5639	0.4383	0.4300	0.0082	0.0079	1.8789
46	2.1282	3.4045	2.6511	0.7534	0.6824	22.1305
47	0.6931	4.6240	1.9718	2.6522	2.3916	57.3576
48	0.0953	3.9973	1.6888	2.3085	2.0889	57.7515
49	3.6687	3.1739	3.3803	-0.2064	-0.1918	6.5026
50	3.5467	2.6810	3.3225	-0.6415	-0.5945	23.9283
51	1.7047	3.6019	2.4506	1.1512	1.0394	31.9623

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	1.7918	0.6466	0.5791	0.0290	0.0051	1.2839
12	3.8480	-1.0764	-1.0050	0.0908	0.0504	1.2617
13	0.1823	0.9707	0.8751	0.0309	0.0123	1.2697
14	3.6788	-0.5757	-0.5302	0.0830	0.0130	1.2857
15	1.4110	-1.3561	-1.2308	0.0255	0.0195	1.2456
16	-0.3425	0.9776	0.8862	0.0411	0.0169	1.2690
17	1.6292	-1.6841	-1.5468	0.0272	0.0323	1.2185
18	-1.0498	-0.1243	-0.1128	0.0622	0.0004	1.2948
19	1.2809	-1.5033	-1.3703	0.0248	0.0234	1.2343
20	0.9555	-1.4078	-1.2791	0.0245	0.0202	1.2418
21	-0.4155	-1.5635	-1.4422	0.0428	0.0453	1.2280
22	3.8199	-0.0146	-0.0135	0.0895	0.0000	1.2952
23	1.5041	-0.3015	-0.2687	0.0261	0.0010	1.2928
24	1.7579	1.1297	1.0209	0.0286	0.0153	1.2607
25	1.9169	0.8634	0.7766	0.0307	0.0097	1.2750
26	2.2192	0.9113	0.8228	0.0359	0.0127	1.2726
27	2.0015	1.3872	1.2646	0.0320	0.0260	1.2429
28	2.3795	0.7355	0.6632	0.0393	0.0091	1.2804
29	1.2809	1.7464	1.6057	0.0248	0.0315	1.2129
30	2.8959	0.1361	0.1230	0.0532	0.0004	1.2947
31	3.7589	-0.4748	-0.4377	0.0866	0.0093	1.2887
32	0.6419	-0.1425	-0.1269	0.0259	0.0002	1.2947
33	1.3863	1.5775	1.4419	0.0253	0.0263	1.2280
34	-0.7765	0.1234	0.1115	0.0530	0.0004	1.2948
35	0.4055	-0.7414	-0.6646	0.0280	0.0065	1.2804
36	0.5878	-1.3121	-1.1900	0.0263	0.0189	1.2487
37	1.9169	-1.4625	-1.3355	0.0307	0.0277	1.2372
38	0.3365	-0.6367	-0.5701	0.0288	0.0049	1.2843
39	-0.4005	-0.3757	-0.3379	0.0425	0.0026	1.2914
40	-0.0619	-1.1957	-1.0860	0.0350	0.0213	1.2563
41	-1.7148	-0.5027	-0.4643	0.0898	0.0109	1.2879
42	-1.5606	0.4629	0.4257	0.0827	0.0083	1.2891
43	-0.6162	-1.1078	-1.0110	0.0482	0.0259	1.2613
44	-2.6173	-0.1347	*-0.1276	0.1394	0.0014	1.2947
45	-2.5639	0.0082	*0.0078	0.1361	0.0000	1.2952
46	2.1282	0.7534	0.6777	0.0342	0.0082	1.2798
47	0.6931	2.6522	*2.5555	0.0255	0.0749	1.1053
48	0.0953	2.3085	*2.1880	0.0323	0.0727	1.1503
49	3.6687	-0.2064	-0.1894	0.0826	0.0017	1.2940
50	3.5467	-0.6415	-0.5895	0.0772	0.0148	1.2835
51	1.7047	1.1512	1.0405	0.0280	0.0155	1.2594

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.5791	0.1001	0.0051	1.0659	0.0567	0.0399
12	-1.0050	-0.3176	0.0504	1.0993	0.0042	-0.2716
13	0.8751	0.1563	0.0123	1.0444	0.1557	-0.0717
14	-0.5302	-0.1595	0.0130	1.1319	-0.0024	-0.1340
15	-1.2308	-0.1990	0.0195	0.9996	-0.1435	-0.0408
16	0.8862	0.1834	0.0169	1.0544	0.1818	-0.1168
17	-1.5468	-0.2586	0.0323	0.9583	-0.1638	-0.0830
18	-0.1128	-0.0290	0.0004	1.1224	-0.0274	0.0226
19	-1.3703	-0.2186	0.0234	0.9808	-0.1686	-0.0288
20	-1.2791	-0.2026	0.0202	0.9924	-0.1779	0.0120
21	-1.4422	-0.3051	0.0453	0.9892	-0.3013	0.2003
22	-0.0135	-0.0042	0.0000	* 1.1568	0.0000	-0.0036
23	-0.2687	-0.0440	0.0010	1.0775	-0.0301	-0.0113
24	1.0209	0.1751	0.0153	1.0272	0.1017	0.0671
25	0.7766	0.1382	0.0097	1.0530	0.0713	0.0627
26	0.8228	0.1588	0.0127	1.0547	0.0634	0.0900
27	1.2646	0.2300	0.0260	1.0020	0.1109	0.1122
28	0.6632	0.1342	0.0091	1.0715	0.0459	0.0827
29	1.6057	0.2562	0.0315	0.9472	0.1975	0.0337
30	0.1230	0.0292	0.0004	1.1117	0.0054	0.0215
31	-0.4377	-0.1348	0.0093	1.1417	-0.0002	-0.1143
32	-0.1269	-0.0207	0.0002	1.0804	-0.0196	0.0049
33	1.4419	0.2324	0.0263	0.9715	0.1699	0.0445
34	0.1115	0.0264	0.0004	1.1116	0.0254	-0.0194
35	-0.6646	-0.1128	0.0065	1.0589	-0.1108	0.0405
36	-1.1900	-0.1954	0.0189	1.0054	-0.1874	0.0521
37	-1.3355	-0.2377	0.0277	0.9914	-0.1226	-0.1078
38	-0.5701	-0.0982	0.0049	1.0662	-0.0970	0.0384
39	-0.3379	-0.0712	0.0026	1.0935	-0.0703	0.0464
40	-1.0860	-0.2070	0.0213	1.0268	-0.2069	0.1141
41	-0.4643	-0.1458	0.0109	1.1443	-0.1304	0.1245
42	0.4257	0.1278	0.0083	1.1375	0.1157	-0.1074
43	-1.0110	-0.2276	0.0259	1.0495	-0.2220	0.1600
44	-0.1276	-0.0514	0.0014	* 1.2229	-0.0429	0.0467
45	0.0078	0.0031	0.0000	* 1.2192	0.0026	-0.0028
46	0.6777	0.1275	0.0082	1.0647	0.0552	0.0682
47	* 2.5555	0.4135	0.0749	0.7871	0.3889	-0.0868
48	* 2.1880	0.3995	0.0727	0.8585	0.3991	-0.1973
49	-0.1894	-0.0568	0.0017	1.1459	-0.0009	-0.0477
50	-0.5895	-0.1706	0.0148	1.1209	-0.0066	-0.1411
51	1.0405	0.1765	0.0155	1.0244	0.1064	0.0632

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
11	1.7918	0.6466	|||.....	0.5841	|||.....	0.5791	|||.....
12	3.8480	-1.0764	|||||.....	-1.0049	|||||.....	-1.0050	|||||.....
13	0.1823	0.9707	|||||.....	0.8777	|||||.....	0.8751	|||||.....
14	3.6788	-0.5757	|||.....	-0.5351	|||.....	-0.5302	|||.....
15	1.4110	-1.3561	|||||||.....	-1.2228	|||||||.....	-1.2308	|||||||.....
16	-0.3425	0.9776	|||||.....	0.8887	|||||.....	0.8862	|||||.....
17	1.6292	-1.6841	||||||||.....	-1.5199	||||||||.....	-1.5468	||||||||.....
18	-1.0498	-0.1243	|.....	-0.1142	|.....	-0.1128	|.....
19	1.2809	-1.5033	|||||||.....	-1.3551	|||||||.....	-1.3703	|||||||.....
20	0.9555	-1.4078	||||||.....	-1.2688	||||||.....	-1.2791	||||||.....
21	-0.4155	-1.5635	|||||||.....	-1.4226	|||||||.....	-1.4422	|||||||.....
22	3.8199	-0.0146	|.....	-0.0137	|.....	-0.0135	|.....
23	1.5041	-0.3015	|.....	-0.2720	|.....	-0.2687	|.....
24	1.7579	1.1297	|||||.....	1.0203	|||||.....	1.0209	|||||.....
25	1.9169	0.8634	||||.....	0.7806	||||.....	0.7766	||||.....
26	2.2192	0.9113	|||||.....	0.8262	|||||.....	0.8228	||||.....
27	2.0015	1.3872	||||||.....	1.2550	||||||.....	1.2646	||||||.....
28	2.3795	0.7355	||||.....	0.6680	||||.....	0.6632	|||.....
29	1.2809	1.7464	||||||||.....	1.5742	||||||||.....	1.6057	||||||||.....
30	2.8959	0.1361	|.....	0.1245	|.....	0.1230	|.....
31	3.7589	-0.4748	||.....	-0.4423	||.....	-0.4377	||.....
32	0.6419	-0.1425	|.....	-0.1285	|.....	-0.1269	|.....
33	1.3863	1.5775	|||||||.....	1.4224	|||||||.....	1.4419	|||||||.....
34	-0.7765	0.1234	|.....	0.1129	|.....	0.1115	|.....
35	0.4055	-0.7414	||||.....	-0.6694	||||.....	-0.6646	|||.....
36	0.5878	-1.3121	||||||.....	-1.1837	||||||.....	-1.1900	|||||.....
37	1.9169	-1.4625	|||||||.....	-1.3223	|||||||.....	-1.3355	|||||||.....
38	0.3365	-0.6367	|||.....	-0.5751	|||.....	-0.5701	|||.....
39	-0.4005	-0.3757	||.....	-0.3418	||.....	-0.3379	|.....
40	-0.0619	-1.1957	|||||.....	-1.0835	|||||.....	-1.0860	|||||.....
41	-1.7148	-0.5027	||.....	-0.4690	||.....	-0.4643	||.....
42	-1.5606	0.4629	||.....	0.4302	||.....	0.4257	||.....
43	-0.6162	-1.1078	|||||.....	-1.0107	|||||.....	-1.0110	|||||.....
44	-2.6173	-0.1347	|.....	-0.1293	|.....	-0.1276	|.....
45	-2.5639	0.0082	|.....	0.0079	|.....	0.0078	|.....
46	2.1282	0.7534	||||.....	0.6824	||||.....	0.6777	|||.....
47	0.6931	2.6522	||||||||||||||	2.3916	||||||||||||||	* 2.5555	||||||||||||||
48	0.0953	2.3085	||||||||||||..	2.0889	||||||||||||..	* 2.1880	||||||||||||...
49	3.6687	-0.2064	|.....	-0.1918	|.....	-0.1894	|.....
50	3.5467	-0.6415	|||.....	-0.5945	|||.....	-0.5895	|||.....
51	1.7047	1.1512	|||||.....	1.0394	|||||.....	1.0405	|||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	1.7918	0.1001	|||.....	0.0051	|.....	0.0399	||.....
12	3.8480	-0.3176	||||||||||....	0.0504	|||||||||.....	-0.2716	||||||||||||||
13	0.1823	0.1563	|||||.....	0.0123	||.....	-0.0717	|||.....
14	3.6788	-0.1595	|||||.....	0.0130	||.....	-0.1340	||||||.....
15	1.4110	-0.1990	||||||.....	0.0195	|||.....	-0.0408	||.....
16	-0.3425	0.1834	||||||.....	0.0169	|||.....	-0.1168	|||||.....
17	1.6292	-0.2586	||||||||.....	0.0323	|||||.....	-0.0830	||||.....
18	-1.0498	-0.0290	|.....	0.0004	|.....	0.0226	|.....
19	1.2809	-0.2186	||||||.....	0.0234	||||.....	-0.0288	|.....
20	0.9555	-0.2026	||||||.....	0.0202	||||.....	0.0120	|.....
21	-0.4155	-0.3051	||||||||||....	0.0453	||||||||.....	0.2003	||||||||||....
22	3.8199	-0.0042	|.....	0.0000	|.....	-0.0036	|.....
23	1.5041	-0.0440	|.....	0.0010	|.....	-0.0113	|.....
24	1.7579	0.1751	|||||.....	0.0153	|||.....	0.0671	|||.....
25	1.9169	0.1382	||||.....	0.0097	|.....	0.0627	|||.....
26	2.2192	0.1588	|||||.....	0.0127	||.....	0.0900	||||.....
27	2.0015	0.2300	|||||||.....	0.0260	||||.....	0.1122	|||||.....
28	2.3795	0.1342	||||.....	0.0091	|.....	0.0827	||||.....
29	1.2809	0.2562	||||||||.....	0.0315	|||||.....	0.0337	|.....
30	2.8959	0.0292	|.....	0.0004	|.....	0.0215	|.....
31	3.7589	-0.1348	||||.....	0.0093	|.....	-0.1143	|||||.....
32	0.6419	-0.0207	|.....	0.0002	|.....	0.0049	|.....
33	1.3863	0.2324	|||||||.....	0.0263	||||.....	0.0445	||.....
34	-0.7765	0.0264	|.....	0.0004	|.....	-0.0194	|.....
35	0.4055	-0.1128	||||.....	0.0065	|.....	0.0405	||.....
36	0.5878	-0.1954	||||||.....	0.0189	|||.....	0.0521	||.....
37	1.9169	-0.2377	|||||||.....	0.0277	||||.....	-0.1078	||||.....
38	0.3365	-0.0982	|||.....	0.0049	|.....	0.0384	|.....
39	-0.4005	-0.0712	||.....	0.0026	|.....	0.0464	||.....
40	-0.0619	-0.2070	||||||.....	0.0213	||||.....	0.1141	|||||.....
41	-1.7148	-0.1458	||||.....	0.0109	||.....	0.1245	|||||.....
42	-1.5606	0.1278	||||.....	0.0083	|.....	-0.1074	||||.....
43	-0.6162	-0.2276	|||||||.....	0.0259	||||.....	0.1600	|||||||.....
44	-2.6173	-0.0514	|.....	0.0014	|.....	0.0467	||.....
45	-2.5639	0.0031	|.....	0.0000	|.....	-0.0028	|.....
46	2.1282	0.1275	||||.....	0.0082	|.....	0.0682	|||.....
47	0.6931	0.4135	|||||||||||||	0.0749	|||||||||||||	-0.0868	||||.....
48	0.0953	0.3995	|||||||||||||.	0.0727	|||||||||||||.	-0.1973	|||||||||.....
49	3.6687	-0.0568	|.....	0.0017	|.....	-0.0477	||.....
50	3.5467	-0.1706	|||||.....	0.0148	||.....	-0.1411	||||||.....
51	1.7047	0.1765	|||||.....	0.0155	|||.....	0.0632	|||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	1.7918	0.5791	|||.....	0.0051	|.....	0.0290	|.....
12	3.8480	-1.0050	|||||.....	0.0504	|||||||||.....	0.0908	|||||||.....
13	0.1823	0.8751	|||||.....	0.0123	||.....	0.0309	|.....
14	3.6788	-0.5302	|||.....	0.0130	||.....	0.0830	||||||.....
15	1.4110	-1.2308	||||||.....	0.0195	|||.....	0.0255	|.....
16	-0.3425	0.8862	|||||.....	0.0169	|||.....	0.0411	||.....
17	1.6292	-1.5468	|||||||||.....	0.0323	||||||.....	0.0272	|.....
18	-1.0498	-0.1128	|.....	0.0004	|.....	0.0622	||||.....
19	1.2809	-1.3703	|||||||.....	0.0234	||||.....	0.0248	|.....
20	0.9555	-1.2791	||||||.....	0.0202	||||.....	0.0245	|.....
21	-0.4155	-1.4422	|||||||.....	0.0453	|||||||||.....	0.0428	||.....
22	3.8199	-0.0135	|.....	0.0000	|.....	0.0895	|||||||.....
23	1.5041	-0.2687	|.....	0.0010	|.....	0.0261	|.....
24	1.7579	1.0209	|||||.....	0.0153	|||.....	0.0286	|.....
25	1.9169	0.7766	||||.....	0.0097	|.....	0.0307	|.....
26	2.2192	0.8228	||||.....	0.0127	||.....	0.0359	|.....
27	2.0015	1.2646	||||||.....	0.0260	|||||.....	0.0320	|.....
28	2.3795	0.6632	|||.....	0.0091	|.....	0.0393	|.....
29	1.2809	1.6057	|||||||||.....	0.0315	||||||.....	0.0248	|.....
30	2.8959	0.1230	|.....	0.0004	|.....	0.0532	|||.....
31	3.7589	-0.4377	||.....	0.0093	|.....	0.0866	|||||||.....
32	0.6419	-0.1269	|.....	0.0002	|.....	0.0259	|.....
33	1.3863	1.4419	|||||||.....	0.0263	|||||.....	0.0253	|.....
34	-0.7765	0.1115	|.....	0.0004	|.....	0.0530	|||.....
35	0.4055	-0.6646	|||.....	0.0065	|.....	0.0280	|.....
36	0.5878	-1.1900	||||||.....	0.0189	|||.....	0.0263	|.....
37	1.9169	-1.3355	|||||||.....	0.0277	|||||.....	0.0307	|.....
38	0.3365	-0.5701	|||.....	0.0049	|.....	0.0288	|.....
39	-0.4005	-0.3379	|.....	0.0026	|.....	0.0425	||.....
40	-0.0619	-1.0860	||||||.....	0.0213	||||.....	0.0350	|.....
41	-1.7148	-0.4643	||.....	0.0109	||.....	0.0898	|||||||.....
42	-1.5606	0.4257	||.....	0.0083	|.....	0.0827	||||||.....
43	-0.6162	-1.0110	|||||.....	0.0259	|||||.....	0.0482	|||.....
44	-2.6173	-0.1276	|.....	0.0014	|.....	0.1394	|||||||||||||
45	-2.5639	0.0078	|.....	0.0000	|.....	0.1361	||||||||||||.
46	2.1282	0.6777	|||.....	0.0082	|.....	0.0342	|.....
47	0.6931	* 2.5555	||||||||||||||	0.0749	||||||||||||||	0.0255	|.....
48	0.0953	* 2.1880	|||||||||||...	0.0727	|||||||||||||.	0.0323	|.....
49	3.6687	-0.1894	|.....	0.0017	|.....	0.0826	||||||.....
50	3.5467	-0.5895	|||.....	0.0148	||.....	0.0772	|||||.....
51	1.7047	1.0405	|||||.....	0.0155	|||.....	0.0280	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Inverse Prediction of X Means

Row	lnMammal (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	3.1384	1.7918	3.1577	-1.3659	2.2421	5.1003
12	2.3888	3.8480	1.5741	2.2740	0.8169	2.5843
13	2.7007	0.1823	2.2330	-2.0507	1.4621	3.5791
14	2.8094	3.6788	2.4627	1.2161	1.6658	3.9469
15	0.9555	1.4110	-1.4538	2.8648	-3.6843	-0.4500
16	2.4592	-0.3425	1.7228	-2.0653	0.9722	2.7992
17	0.7308	1.6292	-1.9286	3.5578	-4.5041	-0.8118
18	1.0225	-1.0498	-1.3124	0.2626	-3.4421	-0.3403
19	0.7467	1.2809	-1.8950	3.1759	-4.4458	-0.7865
20	0.6881	0.9555	-2.0187	2.9742	-4.6606	-0.8795
21	-0.1165	-0.4155	-3.7186	3.3031	-7.6479	-2.1228
22	3.4372	3.8199	3.7890	0.0309	2.7333	6.1802
23	2.0541	1.5041	0.8671	0.6370	-0.0219	1.6637
24	3.6055	1.7579	4.1445	-2.3866	3.0019	6.7964
25	3.4144	1.9169	3.7409	-1.8240	2.6966	6.0972
26	3.6055	2.2192	4.1445	-1.9253	3.0019	6.7964
27	3.9782	2.0015	4.9320	-2.9305	3.5841	8.1740
28	3.5056	2.3795	3.9334	-1.5538	2.8430	6.4299
29	3.9964	1.2809	4.9702	-3.6893	3.6120	8.2413
30	3.1506	2.8959	3.1835	-0.2876	2.2627	5.1439
31	2.9481	3.7589	2.7557	1.0031	1.9150	4.4271
32	1.8050	0.6419	0.3408	0.3010	-0.7587	1.0907
33	3.8774	1.3863	4.7190	-3.3327	3.4280	7.8001
34	1.3995	-0.7765	-0.5158	-0.2608	-2.1044	0.3046
35	1.0942	0.4055	-1.1609	1.5664	-3.1839	-0.2214
36	0.6098	0.5878	-2.1842	2.7720	-4.9489	-1.0032
37	1.0886	1.9169	-1.1727	3.0897	-3.2040	-0.2308
38	1.1663	0.3365	-1.0086	1.3450	-2.9258	-0.1004
39	1.0784	-0.4005	-1.1942	0.7937	-3.2405	-0.2477
40	0.4187	-0.0619	-2.5878	2.5260	-5.6548	-1.3018
41	0.3293	-1.7148	-2.7767	1.0619	-5.9863	-1.4403
42	1.3678	-1.5606	-0.5828	-0.9778	-2.2147	0.2480
43	0.2443	-0.6162	-2.9564	2.3402	-6.3023	-1.5715
44	0.2700	-2.6173	-2.9019	0.2847	-6.2065	-1.5318
45	0.4383	-2.5639	-2.5466	-0.0174	-5.5824	-1.2714
46	3.4045	2.1282	3.7199	-1.5917	2.6806	6.0611
47	4.6240	0.6931	6.2962	-5.6030	4.5686	10.5846
48	3.9973	0.0953	4.9722	-4.8769	3.6134	8.2447
49	3.1739	3.6687	3.2327	0.4360	2.3017	5.2273
50	2.6810	3.5467	2.1915	1.3553	1.4242	3.5135
51	3.6019	1.7047	4.1368	-2.4321	2.9962	6.7830

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Inverse Prediction of X Individuals

Row	lnMammal (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	3.1384	1.7918	3.1577	-1.3659	-1.8711	9.2135
12	2.3888	3.8480	1.5741	2.2740	-3.7267	7.1279
13	2.7007	0.1823	2.2330	-2.0507	-2.9379	7.9791
14	2.8094	3.6788	2.4627	1.2161	-2.6686	8.2814
15	0.9555	1.4110	-1.4538	2.8648	-7.6609	3.5266
16	2.4592	-0.3425	1.7228	-2.0653	-3.5466	7.3179
17	0.7308	1.6292	-1.9286	3.5578	-8.3222	3.0062
18	1.0225	-1.0498	-1.3124	0.2626	-7.4661	3.6838
19	0.7467	1.2809	-1.8950	3.1759	-8.2749	3.0427
20	0.6881	0.9555	-2.0187	2.9742	-8.4489	2.9088
21	-0.1165	-0.4155	-3.7186	3.3031	-10.9108	1.1401
22	3.4372	3.8199	3.7890	0.0309	-1.1686	10.0821
23	2.0541	1.5041	0.8671	0.6370	-4.5999	6.2417
24	3.6055	1.7579	4.1445	-2.3866	-0.7819	10.5802
25	3.4144	1.9169	3.7409	-1.8240	-1.2214	10.0152
26	3.6055	2.2192	4.1445	-1.9253	-0.7819	10.5802
27	3.9782	2.0015	4.9320	-2.9305	0.0531	11.7050
28	3.5056	2.3795	3.9334	-1.5538	-1.0108	10.2837
29	3.9964	1.2809	4.9702	-3.6893	0.0929	11.7604
30	3.1506	2.8959	3.1835	-0.2876	-1.8420	9.2486
31	2.9481	3.7589	2.7557	1.0031	-2.3292	8.6712
32	1.8050	0.6419	0.3408	0.3010	-5.2681	5.6001
33	3.8774	1.3863	4.7190	-3.3327	-0.1699	11.3979
34	1.3995	-0.7765	-0.5158	-0.2608	-6.3886	4.5888
35	1.0942	0.4055	-1.1609	1.5664	-7.2586	3.8533
36	0.6098	0.5878	-2.1842	2.7720	-8.6828	2.7307
37	1.0886	1.9169	-1.1727	3.0897	-7.2748	3.8400
38	1.1663	0.3365	-1.0086	1.3450	-7.0512	4.0250
39	1.0784	-0.4005	-1.1942	0.7937	-7.3041	3.8160
40	0.4187	-0.0619	-2.5878	2.5260	-9.2586	2.3020
41	0.3293	-1.7148	-2.7767	1.0619	-9.5307	2.1040
42	1.3678	-1.5606	-0.5828	-0.9778	-6.4780	4.5113
43	0.2443	-0.6162	-2.9564	2.3402	-9.7910	1.9171
44	0.2700	-2.6173	-2.9019	0.2847	-9.7119	1.9736
45	0.4383	-2.5639	-2.5466	-0.0174	-9.1993	2.3455
46	3.4045	2.1282	3.7199	-1.5917	-1.2445	9.9861
47	4.6240	0.6931	6.2962	-5.6030	1.4347	13.7185
48	3.9973	0.0953	4.9722	-4.8769	0.0950	11.7632
49	3.1739	3.6687	3.2327	0.4360	-1.7866	9.3156
50	2.6810	3.5467	2.1915	1.3553	-2.9869	7.9247
51	3.6019	1.7047	4.1368	-2.4321	-0.7902	10.5694

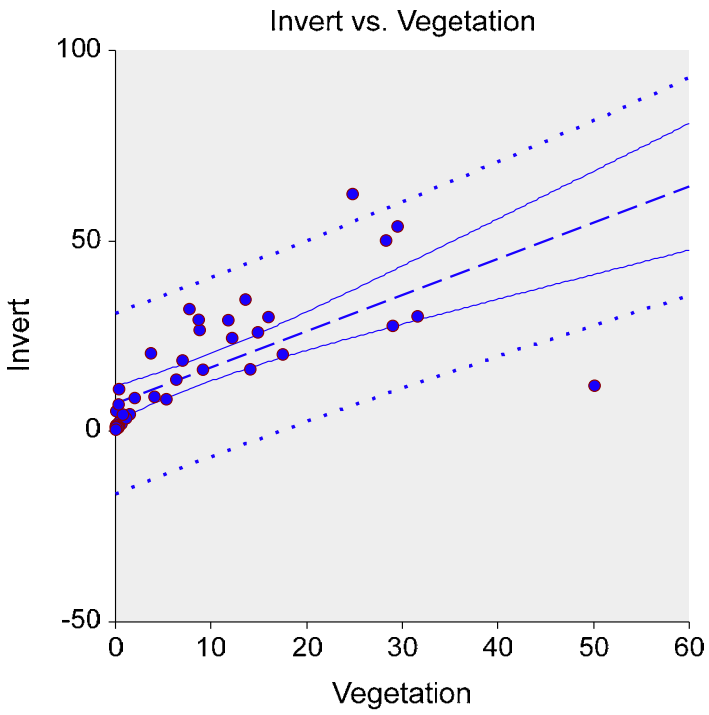
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Vegetation to Prey Tissue Linear Regressions
No Transformation – All Data

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Invert	Rows Processed	58
Independent Variable	Vegetation	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	7.3945	Rows Prediction Only	0
Slope	0.9466	Sum of Frequencies	42
R-Squared	0.4778	Sum of Weights	42.0000
Correlation	0.6912	Coefficient of Variation	0.7378
Mean Square Error	132.2355	Square Root of MSE	11.49937

Linear Regression Report

Y = Invert X = Vegetation

Summary Statement

The equation of the straight line relating Invert and Vegetation is estimated as: Invert = (7.3945) + (0.9466) Vegetation using the 42 observations in this dataset. The y-intercept, the estimated value of Invert when Vegetation is zero, is 7.3945 with a standard error of 2.2321. The slope, the estimated change in Invert per unit change in Vegetation, is 0.9466 with a standard error of 0.1565. The value of R-Squared, the proportion of the variation in Invert that can be accounted for by variation in Vegetation, is 0.4778. The correlation between Invert and Vegetation is 0.6912.

A significance test that the slope is zero resulted in a t-value of 6.0497. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.9466. The lower limit of the 95% confidence interval for the slope is 0.6304 and the upper limit is 1.2628. The estimated intercept is 7.3945. The lower limit of the 95% confidence interval for the intercept is 2.8832 and the upper limit is 11.9057.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Invert	Vegetation
Count	42	42
Mean	15.5869	8.6545
Standard Deviation	15.7178	11.4775
Minimum	0.4500	0.0300
Maximum	62.3000	50.1000

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Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	7.3945	0.9466
Lower 95% Confidence Limit	2.8832	0.6304
Upper 95% Confidence Limit	11.9057	1.2628
Standard Error	2.2321	0.1565
Standardized Coefficient	0.0000	0.6912
T Value	3.3128	6.0497
Prob Level (T Test)	0.0020	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.8984	1.0000
Regression of Y on X	7.3945	0.9466
Inverse Regression from X on Y	-1.5593	1.9812
Orthogonal Regression of Y and X	2.0502	1.5641

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(7.39448462746372) + (0.946605534255479) * (Vegetation)

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Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	7.3945	0.9000	4.3433	11.5246
Bootstrap Mean	6.8016	0.9500	3.5408	11.8692
Bias (BM - OV)	-0.5929	0.9900	1.9916	12.5177
Bias Corrected	7.9874			
Standard Error	2.2465			
Slope				
Original Value	0.9466	0.9000	0.1819	1.3754
Bootstrap Mean	1.0565	0.9500	0.0715	1.4380
Bias (BM - OV)	0.1099	0.9900	-0.1486	1.5713
Bias Corrected	0.8367			
Standard Error	0.3807			
Correlation				
Original Value	0.6912	0.9000	0.4682	0.8847
Bootstrap Mean	0.7217	0.9500	0.4512	0.9249
Bias (BM - OV)	0.0304	0.9900	0.4276	1.0000
Bias Corrected	0.6608			
Standard Error	0.1374			
R-Squared				
Original Value	0.4778	0.9000	0.1197	0.7078
Bootstrap Mean	0.5397	0.9500	0.0884	0.7462
Bias (BM - OV)	0.0619	0.9900	0.0438	0.8125
Bias Corrected	0.4159			
Standard Error	0.1953			
Standard Error of Estimate				
Original Value	11.4994	0.9000	8.9351	16.7478
Bootstrap Mean	10.2197	0.9500	8.2761	17.2981
Bias (BM - OV)	-1.2796	0.9900	7.3088	18.3358
Bias Corrected	12.7790			
Standard Error	2.4893			
Orthogonal Intercept				
Original Value	2.0502	0.9000	-0.5567	3.8141
Bootstrap Mean	2.3301	0.9500	-1.1678	4.1940
Bias (BM - OV)	0.2799	0.9900	-3.2541	5.3749
Bias Corrected	1.7703			
Standard Error	1.3574			
Orthogonal Slope				
Original Value	1.5641	0.9000	1.0845	2.1195
Bootstrap Mean	1.5621	0.9500	1.0023	2.2356
Bias (BM - OV)	-0.0021	0.9900	0.8251	2.5146
Bias Corrected	1.5662			
Standard Error	0.3164			

Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

Linear Regression Report

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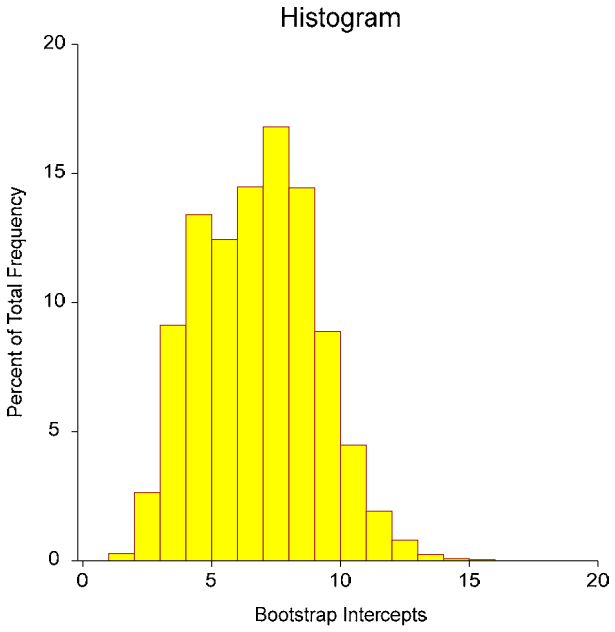
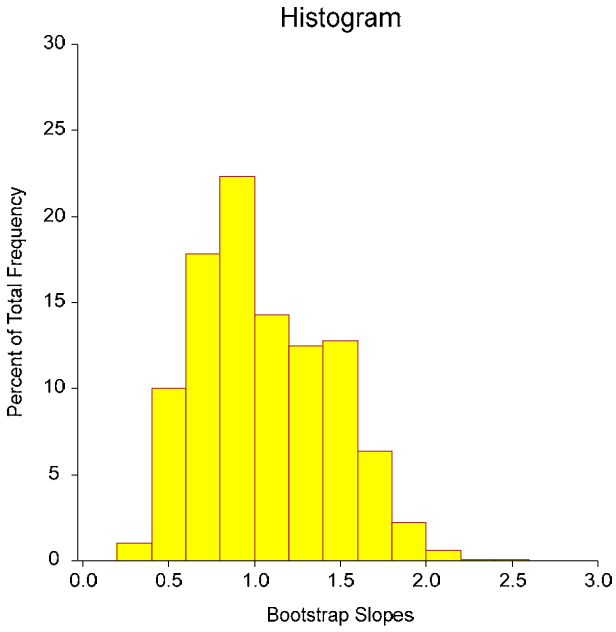
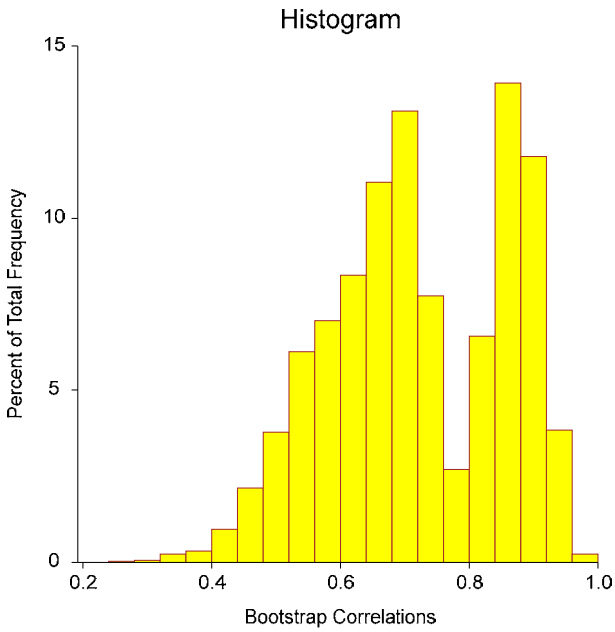
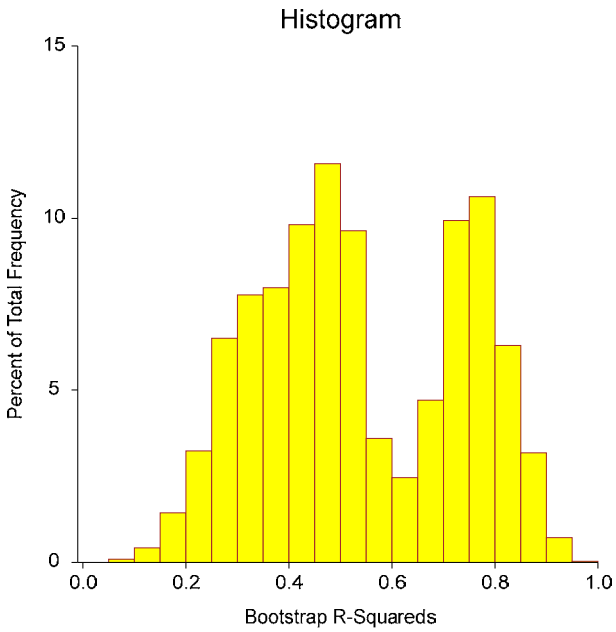
Bootstrap Histograms Section









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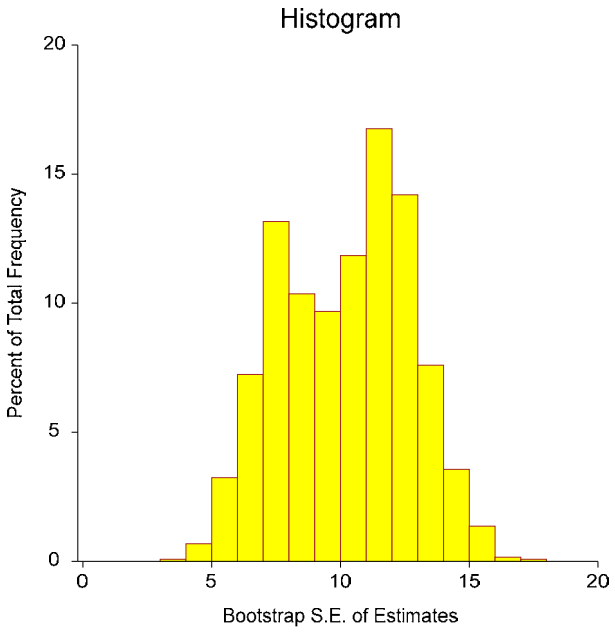

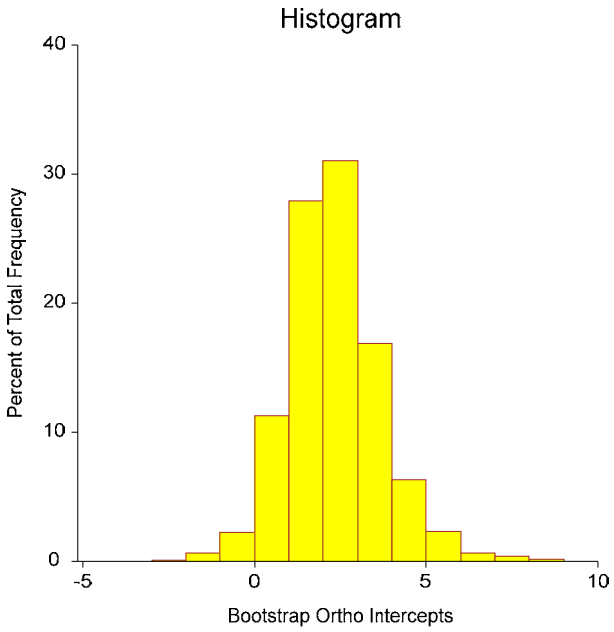

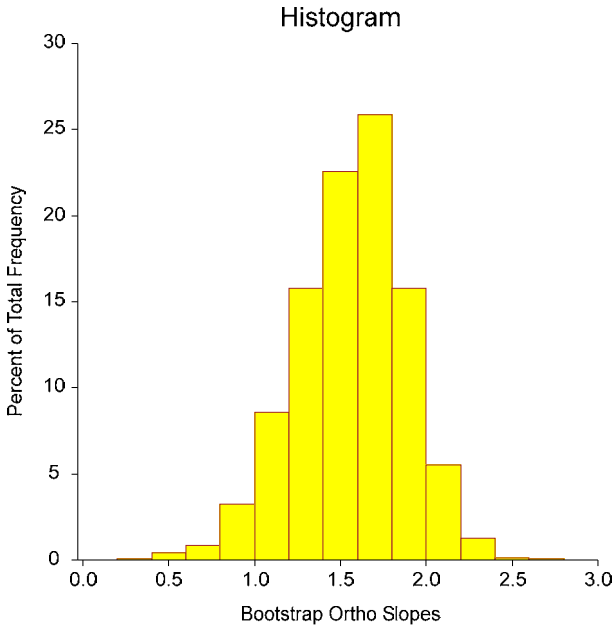

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Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.6912	0.4778	0.8870
Lower 95% Conf. Limit (r dist'n)	0.4856		
Upper 95% Conf. Limit (r dist'n)	0.8187		
Lower 95% Conf. Limit (Fisher's z)	0.4903		0.7983
Upper 95% Conf. Limit (Fisher's z)	0.8224		0.9381
Adjusted (Rbar)		0.4647	
T-Value for H0: Rho = 0	6.0497	6.0497	12.1508
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	10203.97	10203.97			
Slope	1	4839.642	4839.642	36.5987	0.0000	1.0000
Error	40	5289.42	132.2355			
Lack of Fit	38	5272.773	138.7572	16.6709	0.0581	
Pure Error	2	16.64665	8.323325			
Adj. Total	41	10129.06	247.0503			
Total	42	20333.03				

s = Square Root(132.2355) = 11.49937

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

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Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	363.49	654.65	0.03767744	-0.001602389
1	363.49	8546.845	10778.31	-0.001602389	0.0001851505
2 (Y'Y)			20333.03		
Determinant		226842.5			4.408345E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	4.982295	-0.2118927
1	-0.2118927	0.02448347

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.8345	0.000026	No
Anderson Darling	2.3512	0.000006	No
D'Agostino Skewness	-1.2986	0.194096	No
D'Agostino Kurtosis	3.2673	0.001086	No
D'Agostino Omnibus	12.3612	0.002069	No
Constant Residual Variance?			
Modified Levene Test	10.3887	0.002524	No
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	16.6709	0.058132	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

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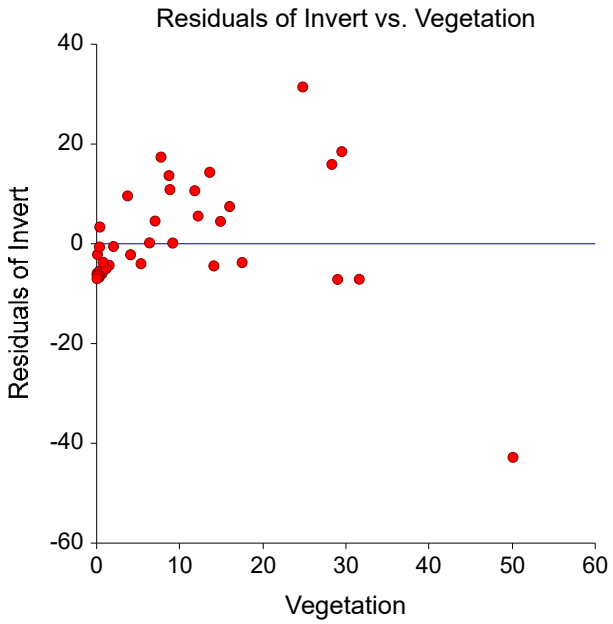
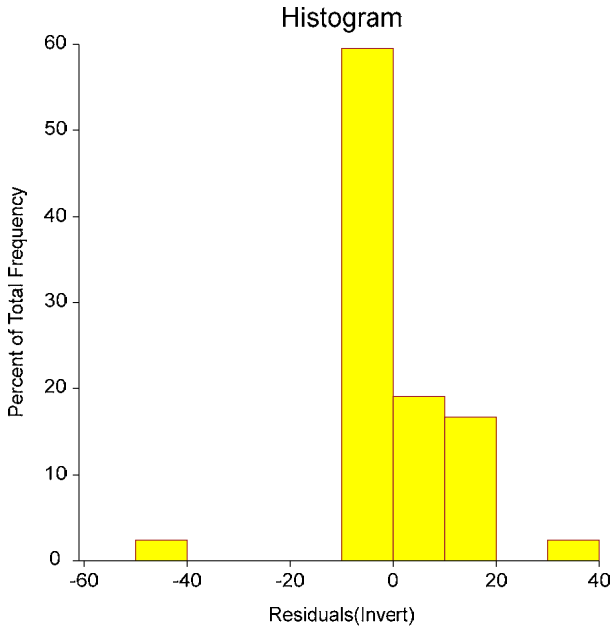
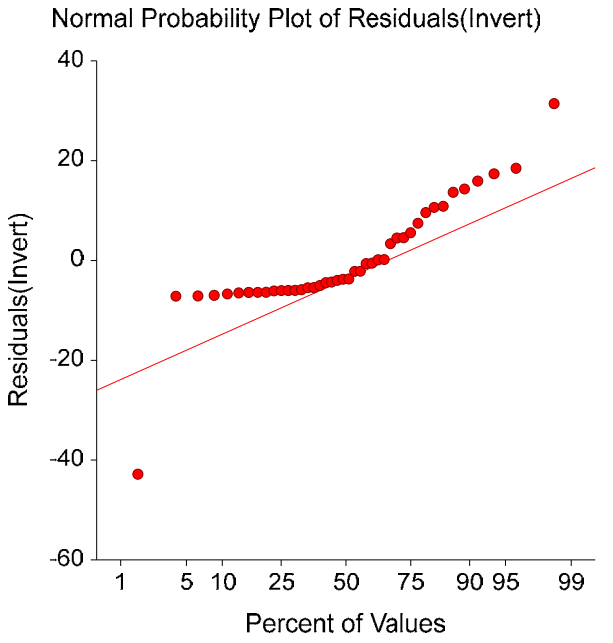
Residual Plots Section







Linear Regression Report

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Filter Type = "UPL"
Y = Invert X = Vegetation

Original Data Section

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual
10	31.6000	30.2000	37.3072	-7.1072
11	17.5000	20.2000	23.9601	-3.7601
12	50.1000	12.0000	54.8194	-42.8194
13	4.0800	9.0700	11.2566	-2.1866
14	14.1000	16.3000	20.7416	-4.4416
15	0.3700	11.1000	7.7447	3.3553
16	0.0800	1.6100	7.4702	-5.8602
17	0.4300	2.3600	7.8015	-5.4415
18	0.1100	1.5200	7.4986	-5.9786
19	0.6200	1.9700	7.9814	-6.0114
20	1.5000	4.5000	8.8144	-4.3144
21	0.0300	1.3200	7.4229	-6.1029
22	13.6000	34.6000	20.2683	14.3317
23	2.0200	8.7700	9.3066	-0.5366
24	12.2000	24.5000	18.9431	5.5569
25	14.9000	26.0000	21.4989	4.5011
26	29.5000	53.8000	35.3193	18.4807
27	24.8000	62.3000	30.8703	31.4297
28	7.7400	32.1000	14.7212	17.3788
29	28.3000	50.1000	34.1834	15.9166
30	8.8100	26.6000	15.7341	10.8659
31	9.1500	16.2000	16.0559	0.1441
32	5.3300	8.4500	12.4399	-3.9899
33	11.8000	29.2000	18.5644	10.6356
34	0.0900	5.3200	7.4797	-2.1597
35	0.3500	2.2700	7.7258	-5.4558
36	0.3400	1.6800	7.7163	-6.0363
37	1.1100	3.4200	8.4452	-5.0252
38	0.7700	4.4100	8.1234	-3.7134
39	0.3300	1.3100	7.7069	-6.3969
40	0.3300	7.0800	7.7069	-0.6269
41	0.0700	1.0900	7.4607	-6.3707
42	0.3000	0.9700	7.6785	-6.7085
43	0.2300	1.1100	7.6122	-6.5022
44	0.0700	1.0700	7.4607	-6.3907
45	0.0400	0.4500	7.4323	-6.9823
46	3.7100	20.5000	10.9064	9.5936
47	8.7000	29.3000	15.6300	13.6700
48	7.0200	18.6000	14.0397	4.5603
49	29.0000	27.7000	34.8460	-7.1460
50	6.3600	13.6000	13.4149	0.1851
51	16.0000	30.0000	22.5402	7.4598

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

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Filter Type = "UPL"
Y = Invert X = Vegetation

Predicted Values and Confidence Limits of Means

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	31.6000	30.2000	37.3072	4.0049	29.2131	45.4013
11	17.5000	20.2000	23.9601	2.2504	19.4119	28.5082
12	50.1000	12.0000	54.8194	6.7234	41.2309	68.4080
13	4.0800	9.0700	11.2566	1.9133	7.3897	15.1236
14	14.1000	16.3000	20.7416	1.9684	16.7634	24.7198
15	0.3700	11.1000	7.7447	2.1975	3.3035	12.1860
16	0.0800	1.6100	7.4702	2.2245	2.9743	11.9662
17	0.4300	2.3600	7.8015	2.1919	3.3715	12.2316
18	0.1100	1.5200	7.4986	2.2217	3.0084	11.9888
19	0.6200	1.9700	7.9814	2.1746	3.5863	12.3764
20	1.5000	4.5000	8.8144	2.0980	4.5741	13.0547
21	0.0300	1.3200	7.4229	2.2293	2.9174	11.9284
22	13.6000	34.6000	20.2683	1.9358	16.3559	24.1807
23	2.0200	8.7700	9.3066	2.0558	5.1518	13.4615
24	12.2000	24.5000	18.9431	1.8591	15.1857	22.7004
25	14.9000	26.0000	21.4989	2.0257	17.4048	25.5930
26	29.5000	53.8000	35.3193	3.7131	27.8148	42.8239
27	24.8000	62.3000	30.8703	3.0872	24.6309	37.1097
28	7.7400	32.1000	14.7212	1.7802	11.1234	18.3190
29	28.3000	50.1000	34.1834	3.5493	27.0100	41.3569
30	8.8100	26.6000	15.7341	1.7746	12.1476	19.3206
31	9.1500	16.2000	16.0559	1.7761	12.4663	19.6455
32	5.3300	8.4500	12.4399	1.8491	8.7028	16.1770
33	11.8000	29.2000	18.5644	1.8414	14.8428	22.2860
34	0.0900	5.3200	7.4797	2.2236	2.9856	11.9737
35	0.3500	2.2700	7.7258	2.1993	3.2808	12.1708
36	0.3400	1.6800	7.7163	2.2002	3.2695	12.1632
37	1.1100	3.4200	8.4452	2.1312	4.1379	12.7526
38	0.7700	4.4100	8.1234	2.1611	3.7556	12.4912
39	0.3300	1.3100	7.7069	2.2012	3.2582	12.1556
40	0.3300	7.0800	7.7069	2.2012	3.2582	12.1556
41	0.0700	1.0900	7.4607	2.2255	2.9629	11.9586
42	0.3000	0.9700	7.6785	2.2039	3.2241	12.1328
43	0.2300	1.1100	7.6122	2.2105	3.1447	12.0797
44	0.0700	1.0700	7.4607	2.2255	2.9629	11.9586
45	0.0400	0.4500	7.4323	2.2283	2.9288	11.9359
46	3.7100	20.5000	10.9064	1.9357	6.9941	14.8186
47	8.7000	29.3000	15.6300	1.7744	12.0437	19.2162
48	7.0200	18.6000	14.0397	1.7927	10.4164	17.6629
49	29.0000	27.7000	34.8460	3.6446	27.4800	42.2121
50	6.3600	13.6000	13.4149	1.8103	9.7560	17.0737
51	16.0000	30.0000	22.5402	2.1141	18.2674	26.8130

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

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Filter Type = "UPL"
Y = Invert X = Vegetation

Predicted Values and Prediction Limits

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	31.6000	30.2000	37.3072	12.1768	12.6970	61.9174
11	17.5000	20.2000	23.9601	11.7175	0.2781	47.6420
12	50.1000	12.0000	54.8194	13.3207	27.8974	81.7415
13	4.0800	9.0700	11.2566	11.6575	-12.3040	34.8172
14	14.1000	16.3000	20.7416	11.6666	-2.8375	44.3207
15	0.3700	11.1000	7.7447	11.7074	-15.9169	31.4064
16	0.0800	1.6100	7.4702	11.7126	-16.2018	31.1422
17	0.4300	2.3600	7.8015	11.7064	-15.8580	31.4611
18	0.1100	1.5200	7.4986	11.7120	-16.1723	31.1695
19	0.6200	1.9700	7.9814	11.7032	-15.6716	31.6344
20	1.5000	4.5000	8.8144	11.6892	-14.8103	32.4391
21	0.0300	1.3200	7.4229	11.7135	-16.2509	31.0967
22	13.6000	34.6000	20.2683	11.6612	-3.2998	43.8364
23	2.0200	8.7700	9.3066	11.6817	-14.3029	32.9162
24	12.2000	24.5000	18.9431	11.6487	-4.5998	42.4859
25	14.9000	26.0000	21.4989	11.6764	-2.1000	45.0978
26	29.5000	53.8000	35.3193	12.0840	10.8967	59.7420
27	24.8000	62.3000	30.8703	11.9066	6.8062	54.9344
28	7.7400	32.1000	14.7212	11.6363	-8.7967	38.2391
29	28.3000	50.1000	34.1834	12.0347	9.8605	58.5064
30	8.8100	26.6000	15.7341	11.6355	-7.7821	39.2503
31	9.1500	16.2000	16.0559	11.6357	-7.4607	39.5726
32	5.3300	8.4500	12.4399	11.6471	-11.0997	35.9795
33	11.8000	29.2000	18.5644	11.6459	-4.9727	42.1016
34	0.0900	5.3200	7.4797	11.7124	-16.1919	31.1513
35	0.3500	2.2700	7.7258	11.7078	-15.9365	31.3881
36	0.3400	1.6800	7.7163	11.7080	-15.9464	31.3790
37	1.1100	3.4200	8.4452	11.6952	-15.1917	32.0821
38	0.7700	4.4100	8.1234	11.7007	-15.5246	31.7713
39	0.3300	1.3100	7.7069	11.7081	-15.9562	31.3699
40	0.3300	7.0800	7.7069	11.7081	-15.9562	31.3699
41	0.0700	1.0900	7.4607	11.7127	-16.2116	31.1331
42	0.3000	0.9700	7.6785	11.7087	-15.9856	31.3426
43	0.2300	1.1100	7.6122	11.7099	-16.0544	31.2788
44	0.0700	1.0700	7.4607	11.7127	-16.2116	31.1331
45	0.0400	0.4500	7.4323	11.7133	-16.2411	31.1058
46	3.7100	20.5000	10.9064	11.6612	-12.6617	34.4745
47	8.7000	29.3000	15.6300	11.6355	-7.8862	39.1461
48	7.0200	18.6000	14.0397	11.6383	-9.4822	37.5615
49	29.0000	27.7000	34.8460	12.0631	10.4656	59.2265
50	6.3600	13.6000	13.4149	11.6410	-10.1124	36.9422
51	16.0000	30.0000	22.5402	11.6921	-1.0904	46.1708

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Working-Hotelling Simultaneous Confidence Band

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	31.6000	30.2000	37.3072	4.0049	25.9078	48.7066
11	17.5000	20.2000	23.9601	2.2504	17.5547	30.3655
12	50.1000	12.0000	54.8194	6.7234	35.6819	73.9570
13	4.0800	9.0700	11.2566	1.9133	5.8106	16.7027
14	14.1000	16.3000	20.7416	1.9684	15.1389	26.3444
15	0.3700	11.1000	7.7447	2.1975	1.4899	13.9996
16	0.0800	1.6100	7.4702	2.2245	1.1383	13.8021
17	0.4300	2.3600	7.8015	2.1919	1.5624	14.0407
18	0.1100	1.5200	7.4986	2.2217	1.1748	13.8225
19	0.6200	1.9700	7.9814	2.1746	1.7916	14.1712
20	1.5000	4.5000	8.8144	2.0980	2.8426	14.7862
21	0.0300	1.3200	7.4229	2.2293	1.0775	13.7682
22	13.6000	34.6000	20.2683	1.9358	14.7583	25.7783
23	2.0200	8.7700	9.3066	2.0558	3.4551	15.1581
24	12.2000	24.5000	18.9431	1.8591	13.6513	24.2348
25	14.9000	26.0000	21.4989	2.0257	15.7330	27.2649
26	29.5000	53.8000	35.3193	3.7131	24.7503	45.8884
27	24.8000	62.3000	30.8703	3.0872	22.0829	39.6577
28	7.7400	32.1000	14.7212	1.7802	9.6542	19.7882
29	28.3000	50.1000	34.1834	3.5493	24.0806	44.2862
30	8.8100	26.6000	15.7341	1.7746	10.6830	20.7852
31	9.1500	16.2000	16.0559	1.7761	11.0005	21.1114
32	5.3300	8.4500	12.4399	1.8491	7.1767	17.7031
33	11.8000	29.2000	18.5644	1.8414	13.3231	23.8057
34	0.0900	5.3200	7.4797	2.2236	1.1505	13.8089
35	0.3500	2.2700	7.7258	2.1993	1.4657	13.9859
36	0.3400	1.6800	7.7163	2.2002	1.4536	13.9791
37	1.1100	3.4200	8.4452	2.1312	2.3789	14.5115
38	0.7700	4.4100	8.1234	2.1611	1.9719	14.2748
39	0.3300	1.3100	7.7069	2.2012	1.4415	13.9722
40	0.3300	7.0800	7.7069	2.2012	1.4415	13.9722
41	0.0700	1.0900	7.4607	2.2255	1.1262	13.7953
42	0.3000	0.9700	7.6785	2.2039	1.4052	13.9518
43	0.2300	1.1100	7.6122	2.2105	1.3204	13.9040
44	0.0700	1.0700	7.4607	2.2255	1.1262	13.7953
45	0.0400	0.4500	7.4323	2.2283	1.0897	13.7750
46	3.7100	20.5000	10.9064	1.9357	5.3965	16.4162
47	8.7000	29.3000	15.6300	1.7744	10.5793	20.6806
48	7.0200	18.6000	14.0397	1.7927	8.9368	19.1425
49	29.0000	27.7000	34.8460	3.6446	24.4721	45.2200
50	6.3600	13.6000	13.4149	1.8103	8.2619	18.5679
51	16.0000	30.0000	22.5402	2.1141	16.5226	28.5578

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Residual Section

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	31.6000	30.2000	37.3072	-7.1072	-0.6593	23.5338
11	17.5000	20.2000	23.9601	-3.7601	-0.3334	18.6143
12	50.1000	12.0000	54.8194	-42.8194	-4.5899	356.8285
13	4.0800	9.0700	11.2566	-2.1866	-0.1928	24.1084
14	14.1000	16.3000	20.7416	-4.4416	-0.3920	27.2492
15	0.3700	11.1000	7.7447	3.3553	0.2973	30.2277
16	0.0800	1.6100	7.4702	-5.8602	-0.5194	363.9884
17	0.4300	2.3600	7.8015	-5.4415	-0.4820	230.5731
18	0.1100	1.5200	7.4986	-5.9786	-0.5299	393.3297
19	0.6200	1.9700	7.9814	-6.0114	-0.5324	305.1462
20	1.5000	4.5000	8.8144	-4.3144	-0.3816	95.8754
21	0.0300	1.3200	7.4229	-6.1029	-0.5410	462.3396
22	13.6000	34.6000	20.2683	14.3317	1.2643	41.4210
23	2.0200	8.7700	9.3066	-0.5366	-0.0474	6.1189
24	12.2000	24.5000	18.9431	5.5569	0.4897	22.6813
25	14.9000	26.0000	21.4989	4.5011	0.3976	17.3119
26	29.5000	53.8000	35.3193	18.4807	1.6981	34.3507
27	24.8000	62.3000	30.8703	31.4297	2.8373	50.4490
28	7.7400	32.1000	14.7212	17.3788	1.5297	54.1395
29	28.3000	50.1000	34.1834	15.9166	1.4552	31.7696
30	8.8100	26.6000	15.7341	10.8659	0.9564	40.8493
31	9.1500	16.2000	16.0559	0.1441	0.0127	0.8894
32	5.3300	8.4500	12.4399	-3.9899	-0.3515	47.2177
33	11.8000	29.2000	18.5644	10.6356	0.9370	36.4232
34	0.0900	5.3200	7.4797	-2.1597	-0.1914	40.5955
35	0.3500	2.2700	7.7258	-5.4558	-0.4834	240.3435
36	0.3400	1.6800	7.7163	-6.0363	-0.5348	359.3054
37	1.1100	3.4200	8.4452	-5.0252	-0.4447	146.9362
38	0.7700	4.4100	8.1234	-3.7134	-0.3288	84.2034
39	0.3300	1.3100	7.7069	-6.3969	-0.5668	488.3103
40	0.3300	7.0800	7.7069	-0.6269	-0.0555	8.8540
41	0.0700	1.0900	7.4607	-6.3707	-0.5647	584.4722
42	0.3000	0.9700	7.6785	-6.7085	-0.5944	691.5945
43	0.2300	1.1100	7.6122	-6.5022	-0.5762	585.7841
44	0.0700	1.0700	7.4607	-6.3907	-0.5665	597.2661
45	0.0400	0.4500	7.4323	-6.9823	-0.6189	1551.6331
46	3.7100	20.5000	10.9064	9.5936	0.8463	46.7981
47	8.7000	29.3000	15.6300	13.6700	1.2032	46.6555
48	7.0200	18.6000	14.0397	4.5603	0.4015	24.5180
49	29.0000	27.7000	34.8460	-7.1460	-0.6552	25.7980
50	6.3600	13.6000	13.4149	0.1851	0.0163	1.3611
51	16.0000	30.0000	22.5402	7.4598	0.6600	24.8661

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Residual Diagnostics Section

Row	Vegetation (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	31.6000	-7.1072	*-0.6546	0.1213	0.0300	134.1522
11	17.5000	-3.7601	-0.3297	0.0383	0.0022	135.2492
12	50.1000	-42.8194	**-6.5876	0.3418	*5.4712	64.1945
13	4.0800	-2.1866	-0.1905	0.0277	0.0005	135.5001
14	14.1000	-4.4416	-0.3878	0.0293	0.0023	135.1050
15	0.3700	3.3553	0.2938	0.0365	0.0017	135.3265
16	0.0800	-5.8602	-0.5146	0.0374	0.0052	134.7113
17	0.4300	-5.4415	-0.4774	0.0363	0.0044	134.8383
18	0.1100	-5.9786	-0.5251	0.0373	0.0054	134.6741
19	0.6200	-6.0114	-0.5275	0.0358	0.0053	134.6652
20	1.5000	-4.3144	-0.3775	0.0333	0.0025	135.1324
21	0.0300	-6.1029	-0.5361	0.0376	0.0057	134.6339
22	13.6000	14.3317	1.2742	0.0283	0.0233	130.2060
23	2.0200	-0.5366	-0.0468	0.0320	0.0000	135.6185
24	12.2000	5.5569	0.4850	0.0261	0.0032	134.8131
25	14.9000	4.5011	0.3934	0.0310	0.0025	135.0900
26	29.5000	18.4807	*1.7406	0.1043	0.1678	125.8495
27	24.8000	31.4297	*3.1348	0.0721	0.3126	108.3299
28	7.7400	17.3788	1.5567	0.0240	0.0287	127.6918
29	28.3000	15.9166	*1.4765	0.0953	0.1115	128.4463
30	8.8100	10.8659	0.9553	0.0238	0.0112	132.5249
31	9.1500	0.1441	0.0125	0.0239	0.0000	135.6256
32	5.3300	-3.9899	-0.3477	0.0259	0.0016	135.2071
33	11.8000	10.6356	0.9355	0.0256	0.0116	132.6494
34	0.0900	-2.1597	-0.1891	0.0374	0.0007	135.5019
35	0.3500	-5.4558	-0.4787	0.0366	0.0044	134.8339
36	0.3400	-6.0363	-0.5300	0.0366	0.0054	134.6564
37	1.1100	-5.0252	-0.4402	0.0343	0.0035	134.9556
38	0.7700	-3.7134	-0.3251	0.0353	0.0020	135.2596
39	0.3300	-6.3969	-0.5619	0.0366	0.0061	134.5370
40	0.3300	-0.6269	-0.0548	0.0366	0.0001	135.6157
41	0.0700	-6.3707	-0.5598	0.0375	0.0062	134.5450
42	0.3000	-6.7085	-0.5895	0.0367	0.0067	134.4282
43	0.2300	-6.5022	-0.5713	0.0370	0.0064	134.5005
44	0.0700	-6.3907	-0.5616	0.0375	0.0062	134.5382
45	0.0400	-6.9823	-0.6141	0.0375	0.0075	134.3273
46	3.7100	9.5936	0.8433	0.0283	0.0104	133.1974
47	8.7000	13.6700	1.2101	0.0238	0.0177	130.7177
48	7.0200	4.5603	0.3972	0.0243	0.0020	135.0796
49	29.0000	-7.1460	*-0.6505	0.1005	0.0240	134.1706
50	6.3600	0.1851	0.0161	0.0248	0.0000	135.6252
51	16.0000	7.4598	0.6552	0.0338	0.0076	134.1493

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.6546	-0.2432	0.0300	* 1.1713	0.0466	-0.2180
11	-0.3297	-0.0658	0.0022	1.0878	-0.0167	-0.0405
12	* -6.5876	-4.7477	** 5.4712	0.3581	1.7822	-4.5794
13	-0.1905	-0.0321	0.0005	1.0799	-0.0310	0.0120
14	-0.3878	-0.0674	0.0023	1.0754	-0.0306	-0.0292
15	0.2938	0.0572	0.0017	1.0870	0.0572	-0.0337
16	-0.5146	-0.1015	0.0052	1.0781	-0.1015	0.0612
17	-0.4774	-0.0927	0.0044	1.0790	-0.0927	0.0544
18	-0.5251	-0.1034	0.0054	1.0774	-0.1034	0.0622
19	-0.5275	-0.1016	0.0053	1.0755	-0.1015	0.0587
20	-0.3775	-0.0700	0.0025	1.0803	-0.0698	0.0374
21	-0.5361	-0.1059	0.0057	1.0771	-0.1059	0.0641
22	1.2742	0.2176	0.0233	0.9978	0.1058	0.0870
23	-0.0468	-0.0085	0.0000	1.0865	-0.0084	0.0043
24	0.4850	0.0795	0.0032	1.0673	0.0459	0.0237
25	0.3934	0.0704	0.0025	1.0771	0.0284	0.0340
26	1.7406	0.5939	0.1678	1.0112	-0.0909	0.5217
27	* 3.1348	0.8737	0.3126	0.7232	-0.0346	0.7149
28	1.5567	0.2439	0.0287	0.9554	0.2052	-0.0196
29	1.4765	0.4791	0.1115	1.0429	-0.0613	0.4149
30	0.9553	0.1492	0.0112	1.0289	0.1174	0.0020
31	0.0125	0.0020	0.0000	1.0776	0.0015	0.0001
32	-0.3477	-0.0566	0.0016	1.0732	-0.0529	0.0159
33	0.9355	0.1518	0.0116	1.0328	0.0916	0.0406
34	-0.1891	-0.0373	0.0007	1.0908	-0.0373	0.0225
35	-0.4787	-0.0933	0.0044	1.0792	-0.0933	0.0551
36	-0.5300	-0.1033	0.0054	1.0764	-0.1033	0.0611
37	-0.4402	-0.0830	0.0035	1.0786	-0.0828	0.0460
38	-0.3251	-0.0622	0.0020	1.0846	-0.0621	0.0355
39	-0.5619	-0.1096	0.0061	1.0745	-0.1096	0.0648
40	-0.0548	-0.0107	0.0001	1.0918	-0.0107	0.0063
41	-0.5598	-0.1104	0.0062	1.0755	-0.1104	0.0667
42	-0.5895	-0.1151	0.0067	1.0728	-0.1151	0.0683
43	-0.5713	-0.1119	0.0064	1.0742	-0.1119	0.0667
44	-0.5616	-0.1108	0.0062	1.0754	-0.1108	0.0669
45	-0.6141	-0.1213	0.0075	1.0721	-0.1213	0.0734
46	0.8433	0.1440	0.0104	1.0442	0.1399	-0.0576
47	1.2101	0.1890	0.0177	1.0010	0.1498	0.0008
48	0.3972	0.0627	0.0020	1.0695	0.0548	-0.0089
49	-0.6505	-0.2174	0.0240	* 1.1444	0.0311	-0.1899
50	0.0161	0.0026	0.0000	1.0787	0.0023	-0.0005
51	0.6552	0.1226	0.0076	1.0652	0.0413	0.0666

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Outlier Detection Chart

Row	Vegetation (X)	Residual		Standardized Residual		RStudent	
10	31.6000	-7.1072	||.....	-0.6593	||.....	-0.6546	|.....
11	17.5000	-3.7601	|.....	-0.3334	|.....	-0.3297	|.....
12	50.1000	-42.8194	||||||||||||||	-4.5899	||||||||||||||	* -6.5876	||||||||||||||
13	4.0800	-2.1866	|.....	-0.1928	|.....	-0.1905	|.....
14	14.1000	-4.4416	|.....	-0.3920	|.....	-0.3878	|.....
15	0.3700	3.3553	|.....	0.2973	|.....	0.2938	|.....
16	0.0800	-5.8602	||.....	-0.5194	|.....	-0.5146	|.....
17	0.4300	-5.4415	|.....	-0.4820	|.....	-0.4774	|.....
18	0.1100	-5.9786	||.....	-0.5299	|.....	-0.5251	|.....
19	0.6200	-6.0114	||.....	-0.5324	|.....	-0.5275	|.....
20	1.5000	-4.3144	|.....	-0.3816	|.....	-0.3775	|.....
21	0.0300	-6.1029	||.....	-0.5410	|.....	-0.5361	|.....
22	13.6000	14.3317	||||.....	1.2643	||||.....	1.2742	||.....
23	2.0200	-0.5366	|.....	-0.0474	|.....	-0.0468	|.....
24	12.2000	5.5569	|.....	0.4897	|.....	0.4850	|.....
25	14.9000	4.5011	|.....	0.3976	|.....	0.3934	|.....
26	29.5000	18.4807	||||||.....	1.6981	|||||.....	1.7406	|||.....
27	24.8000	31.4297	|||||||||.....	2.8373	|||||||||.....	* 3.1348	|||||||.....
28	7.7400	17.3788	||||||.....	1.5297	||||.....	1.5567	|||.....
29	28.3000	15.9166	|||||.....	1.4552	||||.....	1.4765	|||.....
30	8.8100	10.8659	|||.....	0.9564	|||.....	0.9553	||.....
31	9.1500	0.1441	|.....	0.0127	|.....	0.0125	|.....
32	5.3300	-3.9899	|.....	-0.3515	|.....	-0.3477	|.....
33	11.8000	10.6356	|||.....	0.9370	|||.....	0.9355	||.....
34	0.0900	-2.1597	|.....	-0.1914	|.....	-0.1891	|.....
35	0.3500	-5.4558	|.....	-0.4834	|.....	-0.4787	|.....
36	0.3400	-6.0363	||.....	-0.5348	|.....	-0.5300	|.....
37	1.1100	-5.0252	|.....	-0.4447	|.....	-0.4402	|.....
38	0.7700	-3.7134	|.....	-0.3288	|.....	-0.3251	|.....
39	0.3300	-6.3969	||.....	-0.5668	|.....	-0.5619	|.....
40	0.3300	-0.6269	|.....	-0.0555	|.....	-0.0548	|.....
41	0.0700	-6.3707	||.....	-0.5647	|.....	-0.5598	|.....
42	0.3000	-6.7085	||.....	-0.5944	|.....	-0.5895	|.....
43	0.2300	-6.5022	||.....	-0.5762	|.....	-0.5713	|.....
44	0.0700	-6.3907	||.....	-0.5665	|.....	-0.5616	|.....
45	0.0400	-6.9823	||.....	-0.6189	|.....	-0.6141	|.....
46	3.7100	9.5936	|||.....	0.8463	||.....	0.8433	|.....
47	8.7000	13.6700	||||.....	1.2032	|||.....	1.2101	||.....
48	7.0200	4.5603	|.....	0.4015	|.....	0.3972	|.....
49	29.0000	-7.1460	||.....	-0.6552	||.....	-0.6505	|.....
50	6.3600	0.1851	|.....	0.0163	|.....	0.0161	|.....
51	16.0000	7.4598	||.....	0.6600	||.....	0.6552	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Influence Detection Chart

Row	Vegetation (X)	DFFITS		Cook's D		DFBETAS(1)	
10	31.6000	-0.2432	|.....	0.0300	|.....	-0.2180	|.....
11	17.5000	-0.0658	|.....	0.0022	|.....	-0.0405	|.....
12	50.1000	-4.7477	||||||||||||||	** 5.4712	||||||||||||||	-4.5794	||||||||||||||
13	4.0800	-0.0321	|.....	0.0005	|.....	0.0120	|.....
14	14.1000	-0.0674	|.....	0.0023	|.....	-0.0292	|.....
15	0.3700	0.0572	|.....	0.0017	|.....	-0.0337	|.....
16	0.0800	-0.1015	|.....	0.0052	|.....	0.0612	|.....
17	0.4300	-0.0927	|.....	0.0044	|.....	0.0544	|.....
18	0.1100	-0.1034	|.....	0.0054	|.....	0.0622	|.....
19	0.6200	-0.1016	|.....	0.0053	|.....	0.0587	|.....
20	1.5000	-0.0700	|.....	0.0025	|.....	0.0374	|.....
21	0.0300	-0.1059	|.....	0.0057	|.....	0.0641	|.....
22	13.6000	0.2176	|.....	0.0233	|.....	0.0870	|.....
23	2.0200	-0.0085	|.....	0.0000	|.....	0.0043	|.....
24	12.2000	0.0795	|.....	0.0032	|.....	0.0237	|.....
25	14.9000	0.0704	|.....	0.0025	|.....	0.0340	|.....
26	29.5000	0.5939	|.....	0.1678	|.....	0.5217	|.....
27	24.8000	0.8737	||.....	0.3126	|.....	0.7149	||.....
28	7.7400	0.2439	|.....	0.0287	|.....	-0.0196	|.....
29	28.3000	0.4791	|.....	0.1115	|.....	0.4149	|.....
30	8.8100	0.1492	|.....	0.0112	|.....	0.0020	|.....
31	9.1500	0.0020	|.....	0.0000	|.....	0.0001	|.....
32	5.3300	-0.0566	|.....	0.0016	|.....	0.0159	|.....
33	11.8000	0.1518	|.....	0.0116	|.....	0.0406	|.....
34	0.0900	-0.0373	|.....	0.0007	|.....	0.0225	|.....
35	0.3500	-0.0933	|.....	0.0044	|.....	0.0551	|.....
36	0.3400	-0.1033	|.....	0.0054	|.....	0.0611	|.....
37	1.1100	-0.0830	|.....	0.0035	|.....	0.0460	|.....
38	0.7700	-0.0622	|.....	0.0020	|.....	0.0355	|.....
39	0.3300	-0.1096	|.....	0.0061	|.....	0.0648	|.....
40	0.3300	-0.0107	|.....	0.0001	|.....	0.0063	|.....
41	0.0700	-0.1104	|.....	0.0062	|.....	0.0667	|.....
42	0.3000	-0.1151	|.....	0.0067	|.....	0.0683	|.....
43	0.2300	-0.1119	|.....	0.0064	|.....	0.0667	|.....
44	0.0700	-0.1108	|.....	0.0062	|.....	0.0669	|.....
45	0.0400	-0.1213	|.....	0.0075	|.....	0.0734	|.....
46	3.7100	0.1440	|.....	0.0104	|.....	-0.0576	|.....
47	8.7000	0.1890	|.....	0.0177	|.....	0.0008	|.....
48	7.0200	0.0627	|.....	0.0020	|.....	-0.0089	|.....
49	29.0000	-0.2174	|.....	0.0240	|.....	-0.1899	|.....
50	6.3600	0.0026	|.....	0.0000	|.....	-0.0005	|.....
51	16.0000	0.1226	|.....	0.0076	|.....	0.0666	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Outlier & Influence Chart

Row	Vegetation (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	31.6000	-0.6546	|.....	0.0300	|.....	0.1213	||||.....
11	17.5000	-0.3297	|.....	0.0022	|.....	0.0383	|.....
12	50.1000	* -6.5876	|||||||||||||||	** 5.4712	|||||||||||||||	0.3418	|||||||||||||||
13	4.0800	-0.1905	|.....	0.0005	|.....	0.0277	|.....
14	14.1000	-0.3878	|.....	0.0023	|.....	0.0293	|.....
15	0.3700	0.2938	|.....	0.0017	|.....	0.0365	|.....
16	0.0800	-0.5146	|.....	0.0052	|.....	0.0374	|.....
17	0.4300	-0.4774	|.....	0.0044	|.....	0.0363	|.....
18	0.1100	-0.5251	|.....	0.0054	|.....	0.0373	|.....
19	0.6200	-0.5275	|.....	0.0053	|.....	0.0358	|.....
20	1.5000	-0.3775	|.....	0.0025	|.....	0.0333	|.....
21	0.0300	-0.5361	|.....	0.0057	|.....	0.0376	|.....
22	13.6000	1.2742	||.....	0.0233	|.....	0.0283	|.....
23	2.0200	-0.0468	|.....	0.0000	|.....	0.0320	|.....
24	12.2000	0.4850	|.....	0.0032	|.....	0.0261	|.....
25	14.9000	0.3934	|.....	0.0025	|.....	0.0310	|.....
26	29.5000	1.7406	|||.....	0.1678	|.....	0.1043	|||.....
27	24.8000	* 3.1348	|||||||.....	0.3126	|.....	0.0721	||.....
28	7.7400	1.5567	|||.....	0.0287	|.....	0.0240	|.....
29	28.3000	1.4765	|||.....	0.1115	|.....	0.0953	|||.....
30	8.8100	0.9553	||.....	0.0112	|.....	0.0238	|.....
31	9.1500	0.0125	|.....	0.0000	|.....	0.0239	|.....
32	5.3300	-0.3477	|.....	0.0016	|.....	0.0259	|.....
33	11.8000	0.9355	||.....	0.0116	|.....	0.0256	|.....
34	0.0900	-0.1891	|.....	0.0007	|.....	0.0374	|.....
35	0.3500	-0.4787	|.....	0.0044	|.....	0.0366	|.....
36	0.3400	-0.5300	|.....	0.0054	|.....	0.0366	|.....
37	1.1100	-0.4402	|.....	0.0035	|.....	0.0343	|.....
38	0.7700	-0.3251	|.....	0.0020	|.....	0.0353	|.....
39	0.3300	-0.5619	|.....	0.0061	|.....	0.0366	|.....
40	0.3300	-0.0548	|.....	0.0001	|.....	0.0366	|.....
41	0.0700	-0.5598	|.....	0.0062	|.....	0.0375	|.....
42	0.3000	-0.5895	|.....	0.0067	|.....	0.0367	|.....
43	0.2300	-0.5713	|.....	0.0064	|.....	0.0370	|.....
44	0.0700	-0.5616	|.....	0.0062	|.....	0.0375	|.....
45	0.0400	-0.6141	|.....	0.0075	|.....	0.0375	|.....
46	3.7100	0.8433	|.....	0.0104	|.....	0.0283	|.....
47	8.7000	1.2101	||.....	0.0177	|.....	0.0238	|.....
48	7.0200	0.3972	|.....	0.0020	|.....	0.0243	|.....
49	29.0000	-0.6505	|.....	0.0240	|.....	0.1005	|||.....
50	6.3600	0.0161	|.....	0.0000	|.....	0.0248	|.....
51	16.0000	0.6552	|.....	0.0076	|.....	0.0338	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Inverse Prediction of X Means

Row	Invert (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	30.2000	31.6000	24.0919	7.5081	18.9704	33.0922
11	20.2000	17.5000	13.5278	3.9722	9.7226	18.5575
12	12.0000	50.1000	4.8653	45.2347	0.1247	8.6538
13	9.0700	4.0800	1.7700	2.3100	-3.8759	5.6861
14	16.3000	14.1000	9.4078	4.6922	5.4731	13.5318
15	11.1000	0.3700	3.9145	-3.5445	-1.0779	7.7159
16	1.6100	0.0800	-6.1108	6.1908	-14.8204	-1.1111
17	2.3600	0.4300	-5.3185	5.7485	-13.6895	-0.4583
18	1.5200	0.1100	-6.2058	6.3158	-14.9564	-1.1892
19	1.9700	0.6200	-5.7305	6.3505	-14.2769	-0.7984
20	4.5000	1.5000	-3.0578	4.5578	-10.4919	1.4336
21	1.3200	0.0300	-6.4171	6.4471	-15.2588	-1.3623
22	34.6000	13.6000	28.7401	-15.1401	22.7074	39.8195
23	8.7700	2.0200	1.4531	0.5669	-4.2982	5.3950
24	24.5000	12.2000	18.0704	-5.8704	13.8967	24.6099
25	26.0000	14.9000	19.6550	-4.7550	15.2691	26.8048
26	53.8000	29.5000	49.0231	-19.5231	38.3909	69.7983
27	62.3000	24.8000	58.0025	-33.2025	45.2145	83.1898
28	32.1000	7.7400	26.0991	-18.3591	20.5972	35.9841
29	50.1000	28.3000	45.1144	-16.8144	35.4071	63.9826
30	26.6000	8.8100	20.2888	-11.4788	15.8093	27.6916
31	16.2000	9.1500	9.3022	-0.1522	5.3568	13.4103
32	8.4500	5.3300	1.1151	4.2149	-4.7509	5.0866
33	29.2000	11.8000	23.0355	-11.2355	18.1041	31.5802
34	5.3200	0.0900	-2.1915	2.2815	-9.2804	2.1722
35	2.2700	0.3500	-5.4135	5.7635	-13.8249	-0.5369
36	1.6800	0.3400	-6.0368	6.3768	-14.7146	-1.0504
37	3.4200	1.1100	-4.1987	5.3087	-12.0997	0.4729
38	4.4100	0.7700	-3.1528	3.9228	-10.6254	1.3530
39	1.3100	0.3300	-6.4277	6.7577	-15.2740	-1.3710
40	7.0800	0.3300	-0.3322	0.6622	-6.7126	3.7901
41	1.0900	0.0700	-6.6601	6.7301	-15.6071	-1.5611
42	0.9700	0.3000	-6.7869	7.0869	-15.7889	-1.6646
43	1.1100	0.2300	-6.6390	6.8690	-15.5768	-1.5438
44	1.0700	0.0700	-6.6812	6.7512	-15.6374	-1.5784
45	0.4500	0.0400	-7.3362	7.3762	-16.5781	-2.1122
46	20.5000	3.7100	13.8447	-10.1347	10.0286	18.9650
47	29.3000	8.7000	23.1411	-14.4411	18.1911	31.7311
48	18.6000	7.0200	11.8376	-4.8176	8.0436	16.4313
49	27.7000	29.0000	21.4509	7.5491	16.7886	29.3284
50	13.6000	6.3600	6.5555	-0.1955	2.1957	10.3880
51	30.0000	16.0000	23.8806	-7.8806	18.7978	32.7892

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Inverse Prediction of X Individuals

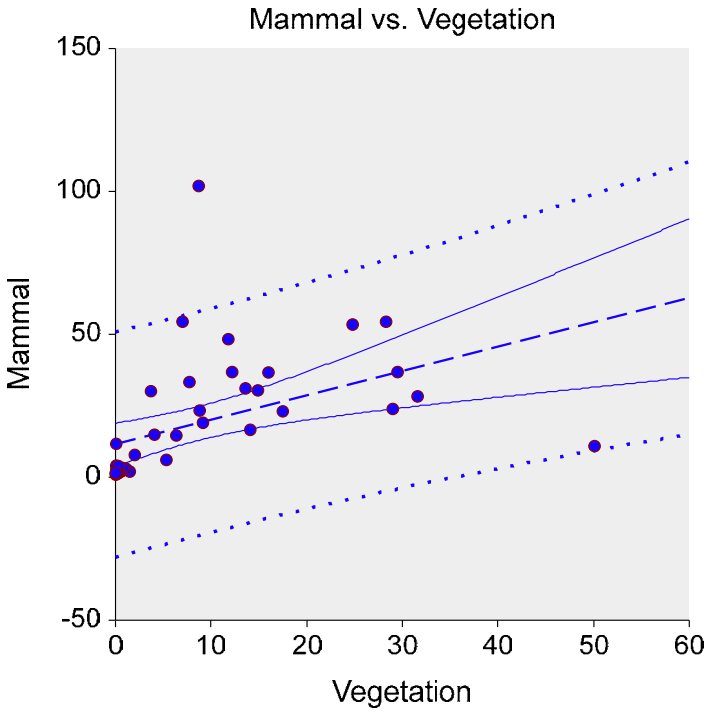
Row	Invert (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	30.2000	31.6000	24.0919	7.5081	-0.9574	53.0200
11	20.2000	17.5000	13.5278	3.9722	-12.2805	40.5606
12	12.0000	50.1000	4.8653	45.2347	-22.0062	30.7847
13	9.0700	4.0800	1.7700	2.3100	-25.5787	27.3889
14	16.3000	14.1000	9.4078	4.6922	-16.8560	35.8609
15	11.1000	0.3700	3.9145	-3.5445	-23.0981	29.7362
16	1.6100	0.0800	-6.1108	6.1908	-34.9012	18.9697
17	2.3600	0.4300	-5.3185	5.7485	-33.9495	19.8017
18	1.5200	0.1100	-6.2058	6.3158	-35.0156	18.8701
19	1.9700	0.6200	-5.7305	6.3505	-34.4440	19.3687
20	4.5000	1.5000	-3.0578	4.5578	-31.2516	22.1932
21	1.3200	0.0300	-6.4171	6.4471	-35.2700	18.6489
22	34.6000	13.6000	28.7401	-15.1401	3.8456	58.6813
23	8.7700	2.0200	1.4531	0.5669	-25.9473	27.0441
24	24.5000	12.2000	18.0704	-5.8704	-7.3404	45.8470
25	26.0000	14.9000	19.6550	-4.7550	-5.6426	47.7166
26	53.8000	29.5000	49.0231	-19.5231	23.6785	84.5107
27	62.3000	24.8000	58.0025	-33.2025	31.9677	96.4367
28	32.1000	7.7400	26.0991	-18.3591	1.1296	55.4517
29	50.1000	28.3000	45.1144	-16.8144	19.9850	79.4047
30	26.6000	8.8100	20.2888	-11.4788	-4.9671	48.4680
31	16.2000	9.1500	9.3022	-0.1522	-16.9745	35.7416
32	8.4500	5.3300	1.1151	4.2149	-26.3411	26.6769
33	29.2000	11.8000	23.0355	-11.2355	-2.0639	51.7482
34	5.3200	0.0900	-2.1915	2.2815	-30.2247	23.1166
35	2.2700	0.3500	-5.4135	5.7635	-34.0635	19.7017
36	1.6800	0.3400	-6.0368	6.3768	-34.8122	19.0472
37	3.4200	1.1100	-4.1987	5.3087	-32.6099	20.9830
38	4.4100	0.7700	-3.1528	3.9228	-31.3645	22.0921
39	1.3100	0.3300	-6.4277	6.7577	-35.2827	18.6378
40	7.0800	0.3300	-0.3322	0.6622	-28.0340	25.1115
41	1.0900	0.0700	-6.6601	6.7301	-35.5629	18.3947
42	0.9700	0.3000	-6.7869	7.0869	-35.7158	18.2622
43	1.1100	0.2300	-6.6390	6.8690	-35.5374	18.4168
44	1.0700	0.0700	-6.6812	6.7512	-35.5884	18.3726
45	0.4500	0.0400	-7.3362	7.3762	-36.3793	17.6891
46	20.5000	3.7100	13.8447	-10.1347	-11.9323	40.9259
47	29.3000	8.7000	23.1411	-14.4411	-1.9530	51.8751
48	18.6000	7.0200	11.8376	-4.8176	-14.1466	38.6216
49	27.7000	29.0000	21.4509	7.5491	-3.7341	49.8511
50	13.6000	6.3600	6.5555	-0.1955	-20.0769	32.6606
51	30.0000	16.0000	23.8806	-7.8806	-1.1782	52.7652

This prediction interval estimates the predicted value of X for a single individual with this value of Y. This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Mammal	Rows Processed	58
Independent Variable	Vegetation	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	11.4059	Rows Prediction Only	0
Slope	0.8536	Sum of Frequencies	42
R-Squared	0.2115	Sum of Weights	42.0000
Correlation	0.4599	Coefficient of Variation	1.0191
Mean Square Error	366.7991	Square Root of MSE	19.152

Linear Regression Report

Y = Mammal X = Vegetation

Summary Statement

The equation of the straight line relating Mammal and Vegetation is estimated as: Mammal = (11.4059) + (0.8536) Vegetation using the 42 observations in this dataset. The y-intercept, the estimated value of Mammal when Vegetation is zero, is 11.4059 with a standard error of 3.7175. The slope, the estimated change in Mammal per unit change in Vegetation, is 0.8536 with a standard error of 0.2606. The value of R-Squared, the proportion of the variation in Mammal that can be accounted for by variation in Vegetation, is 0.2115. The correlation between Mammal and Vegetation is 0.4599.

A significance test that the slope is zero resulted in a t-value of 3.2754. The significance level of this t-test is 0.0022. Since 0.0022 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.8536. The lower limit of the 95% confidence interval for the slope is 0.3269 and the upper limit is 1.3803. The estimated intercept is 11.4059. The lower limit of the 95% confidence interval for the intercept is 3.8925 and the upper limit is 18.9193.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Mammal	Vegetation
Count	42	42
Mean	18.7931	8.6545
Standard Deviation	21.3033	11.4775
Minimum	0.8900	0.0300
Maximum	101.9000	50.1000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	11.4059	0.8536
Lower 95% Confidence Limit	3.8925	0.3269
Upper 95% Confidence Limit	18.9193	1.3803
Standard Error	3.7175	0.2606
Standardized Coefficient	0.0000	0.4599
T Value	3.0681	3.2754
Prob Level (T Test)	0.0039	0.0022
Prob Level (Randomization Test N =1000)		0.0070
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.8494	0.8917
Regression of Y on X	11.4059	0.8536
Inverse Regression from X on Y	-16.1374	4.0361
Orthogonal Regression of Y and X	-8.7206	3.1791

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(11.4058706413247) + (0.853572587226686) * (Vegetation)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	11.4059	0.9000	5.9146	17.1649
Bootstrap Mean	10.8142	0.9500	4.5388	17.7883
Bias (BM - OV)	-0.5917	0.9900	1.6801	19.0405
Bias Corrected	11.9975			
Standard Error	3.4259			
Slope				
Original Value	0.8536	0.9000	-0.0099	1.2880
Bootstrap Mean	0.9713	0.9500	-0.1684	1.3642
Bias (BM - OV)	0.1177	0.9900	-0.6842	1.4532
Bias Corrected	0.7358			
Standard Error	0.4144			
Correlation				
Original Value	0.4599	0.9000	0.1413	0.6534
Bootstrap Mean	0.5046	0.9500	0.1021	0.6903
Bias (BM - OV)	0.0448	0.9900	0.0396	0.7600
Bias Corrected	0.4151			
Standard Error	0.1529			
R-Squared				
Original Value	0.2115	0.9000	0.0000	0.3520
Bootstrap Mean	0.2780	0.9500	0.0000	0.3703
Bias (BM - OV)	0.0665	0.9900	0.0000	0.3975
Bias Corrected	0.1450			
Standard Error	0.1610			
Standard Error of Estimate				
Original Value	19.1520	0.9000	13.0355	27.8964
Bootstrap Mean	17.8071	0.9500	11.6409	28.8864
Bias (BM - OV)	-1.3449	0.9900	8.9817	30.4559
Bias Corrected	20.4969			
Standard Error	4.5467			
Orthogonal Intercept				
Original Value	-8.7206	0.9000	-19.9590	14.1309
Bootstrap Mean	-9.5050	0.9500	-20.5996	22.9439
Bias (BM - OV)	-0.7844	0.9900	-22.0703	53.3913
Bias Corrected	-7.9361			
Standard Error	12.9600			
Orthogonal Slope				
Original Value	3.1791	0.9000	-0.0235	4.9420
Bootstrap Mean	3.3213	0.9500	-0.9788	5.1243
Bias (BM - OV)	0.1422	0.9900	-3.1648	5.3950
Bias Corrected	3.0369			
Standard Error	1.6164			

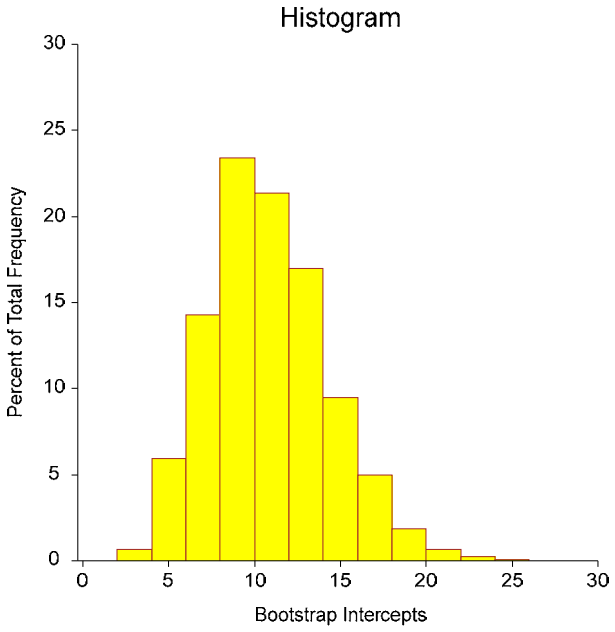
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

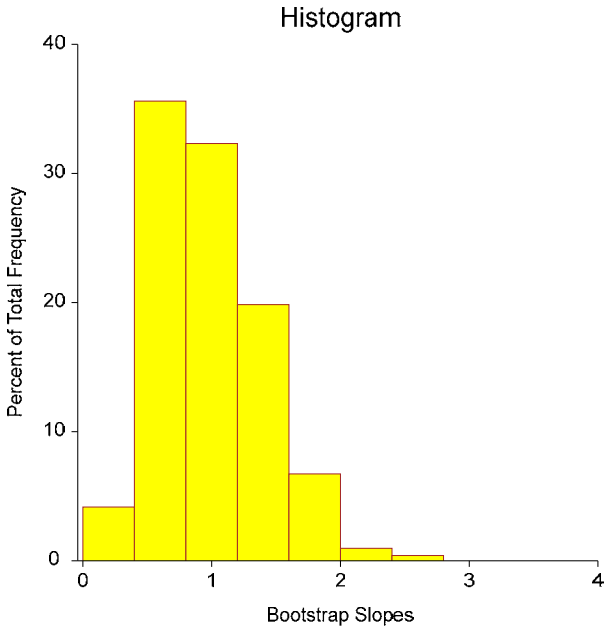
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

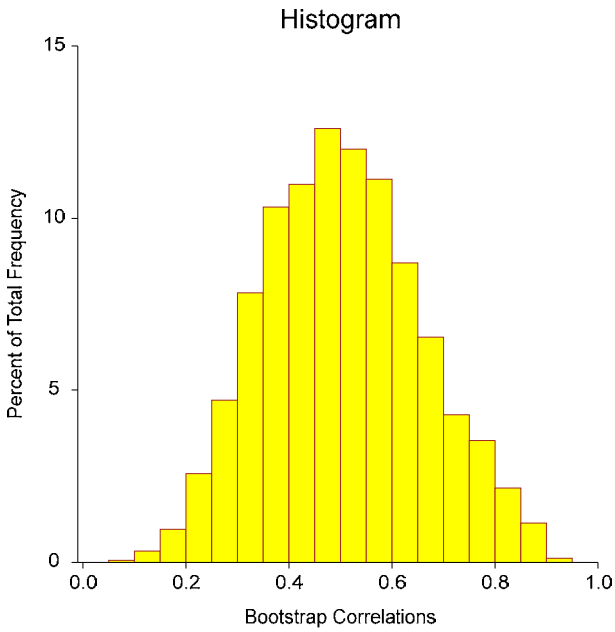
Linear Regression Report

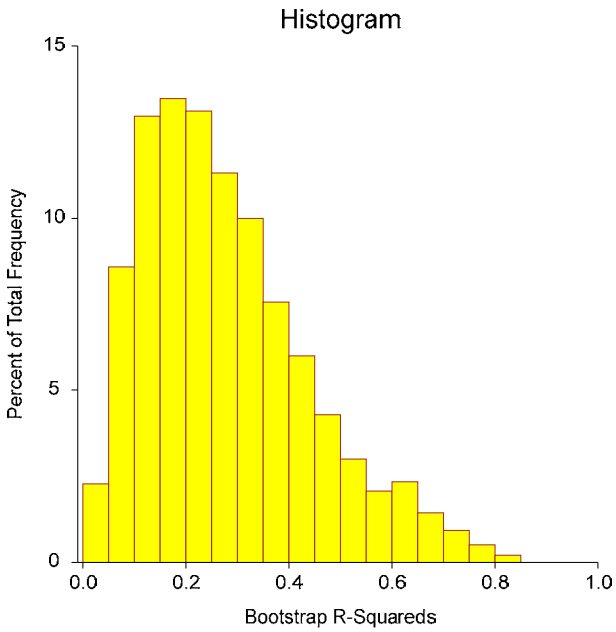
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Bootstrap Histograms Section



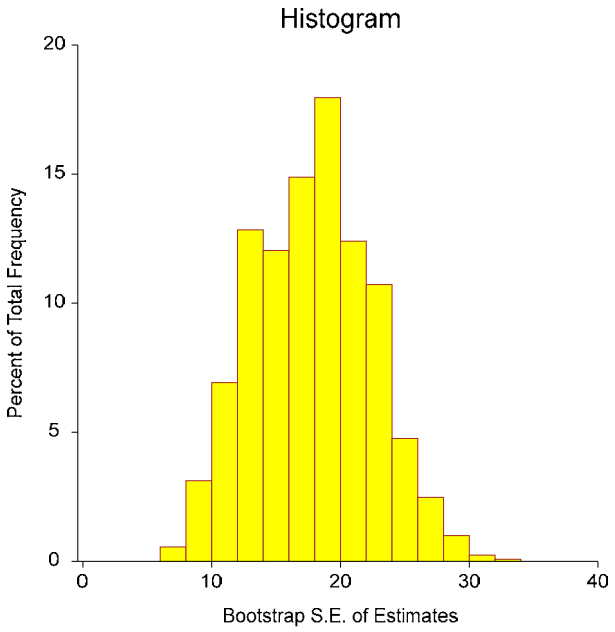


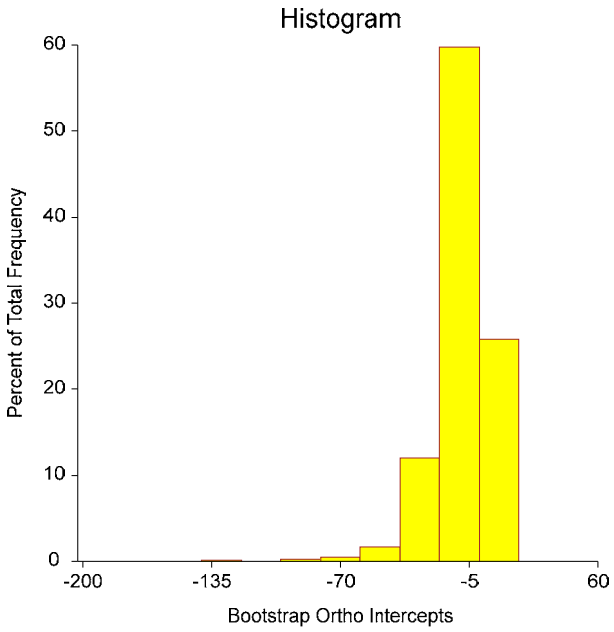


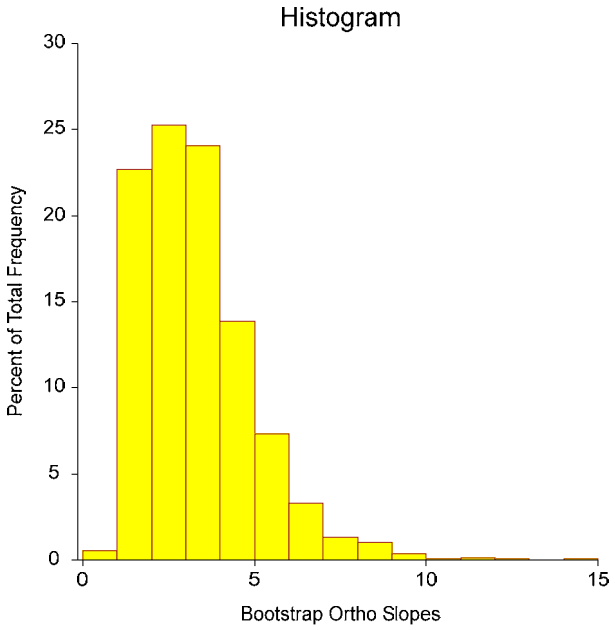


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.4599	0.2115	0.8006
Lower 95% Conf. Limit (r dist'n)	0.1787		
Upper 95% Conf. Limit (r dist'n)	0.6652		
Lower 95% Conf. Limit (Fisher's z)	0.1813		0.6564
Upper 95% Conf. Limit (Fisher's z)	0.6701		0.8884
Adjusted (Rbar)		0.1918	
T-Value for H0: Rho = 0	3.2754	3.2754	8.4503
Prob Level for H0: Rho = 0	0.0022	0.0022	0.0000
Prob Level (Randomization Test N =1000)	0.0070		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	14833.64	14833.64			
Slope	1	3935.103	3935.103	10.7282	0.0022	0.8917
Error	40	14671.96	366.7991			
Lack of Fit	38	14670.95	386.0777	763.4521	0.0013	
Pure Error	2	1.0114	0.5057			
Adj. Total	41	18607.07	453.8309			
Total	42	33440.71				

s = Square Root(366.7991) = 19.152

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	363.49	789.3116	0.03767744	-0.001602389
1	363.49	8546.845	11441.27	-0.001602389	0.0001851505
2 (Y'Y)			33440.71		
Determinant		226842.5			4.408345E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	13.82005	-0.587755
1	-0.587755	0.06791303

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7503	0.000000	No
Anderson Darling	3.5029	0.000000	No
D'Agostino Skewness	4.4859	0.000007	No
D'Agostino Kurtosis	4.1061	0.000040	No
D'Agostino Omnibus	36.9834	0.000000	No
Constant Residual Variance?			
Modified Levene Test	10.2581	0.002670	No
Relationship is a Straight Line?			
Lack of Linear Fit F(38, 2) Test	763.4521	0.001309	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

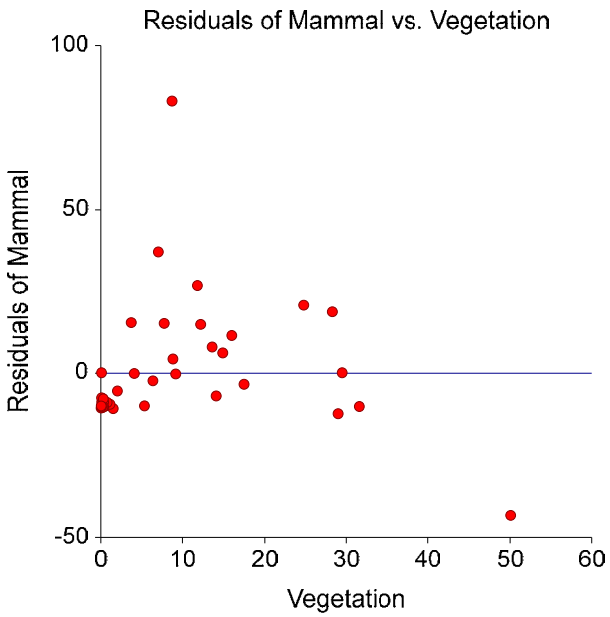
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

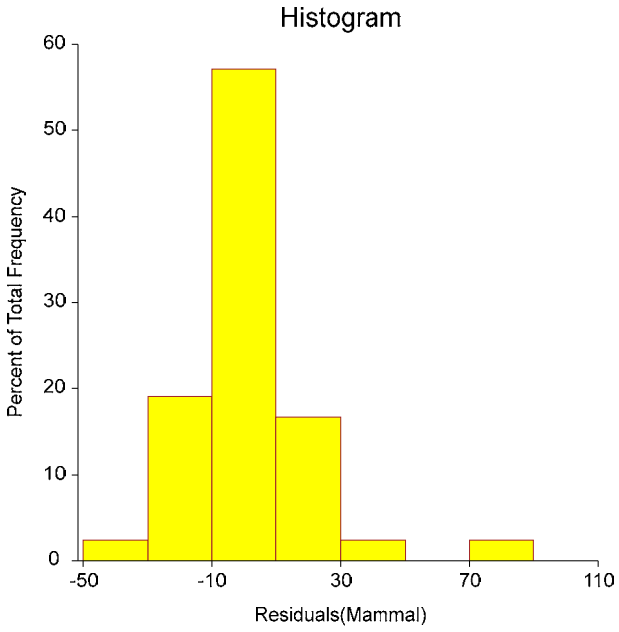
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

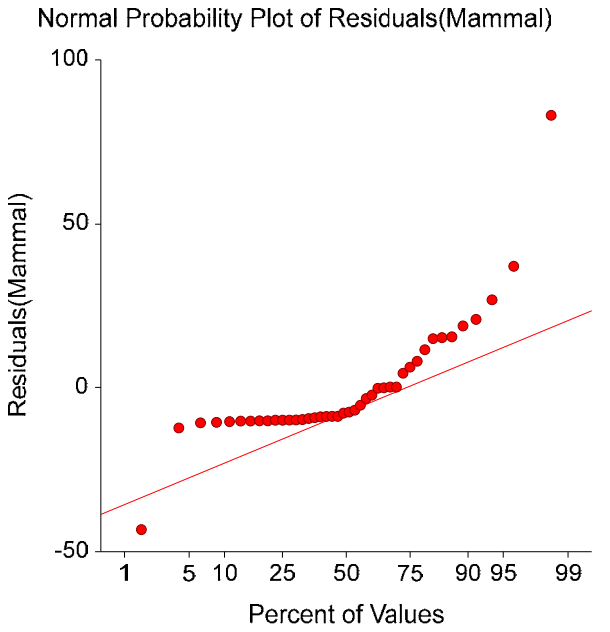
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Original Data Section

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual
10	31.6000	28.3000	38.3788	-10.0788
11	17.5000	23.0667	26.3434	-3.2767
12	50.1000	10.9000	54.1699	-43.2699
13	4.0800	14.8900	14.8884	0.0016
14	14.1000	16.6000	23.4412	-6.8412
15	0.3700	2.6000	11.7217	-9.1217
16	0.0800	11.6950	11.4742	0.2208
17	0.4300	2.0767	11.7729	-9.6962
18	0.1100	2.7800	11.4998	-8.7198
19	0.6200	2.1100	11.9351	-9.8251
20	1.5000	1.9900	12.6862	-10.6962
21	0.0300	0.8900	11.4315	-10.5415
22	13.6000	31.1000	23.0145	8.0855
23	2.0200	7.8000	13.1301	-5.3301
24	12.2000	36.8000	21.8195	14.9805
25	14.9000	30.4000	24.1241	6.2759
26	29.5000	36.8000	36.5863	0.2137
27	24.8000	53.4233	32.5745	20.8489
28	7.7400	33.3000	18.0125	15.2875
29	28.3000	54.4000	35.5620	18.8380
30	8.8100	23.3500	18.9258	4.4242
31	9.1500	19.0700	19.2161	-0.1461
32	5.3300	6.0800	15.9554	-9.8754
33	11.8000	48.3000	21.4780	26.8220
34	0.0900	4.0533	11.4827	-7.4294
35	0.3500	2.9867	11.7046	-8.7180
36	0.3400	1.8400	11.6961	-9.8561
37	1.1100	2.9700	12.3533	-9.3833
38	0.7700	3.2100	12.0631	-8.8531
39	0.3300	2.9400	11.6875	-8.7475
40	0.3300	1.5200	11.6875	-10.1675
41	0.0700	1.3900	11.4656	-10.0756
42	0.3000	3.9267	11.6619	-7.7353
43	0.2300	1.2767	11.6022	-10.3255
44	0.0700	1.3100	11.4656	-10.1556
45	0.0400	1.5500	11.4400	-9.8900
46	3.7100	30.1000	14.5726	15.5274
47	8.7000	101.9000	18.8320	83.0680
48	7.0200	54.4500	17.3980	37.0520
49	29.0000	23.9000	36.1595	-12.2595
50	6.3600	14.6000	16.8346	-2.2346
51	16.0000	36.6667	25.0630	11.6036

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Predicted Values and Confidence Limits of Means

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	31.6000	28.3000	38.3788	6.6700	24.8981	51.8594
11	17.5000	23.0667	26.3434	3.7479	18.7685	33.9182
12	50.1000	10.9000	54.1699	11.1977	31.5384	76.8013
13	4.0800	14.8900	14.8884	3.1866	8.4481	21.3288
14	14.1000	16.6000	23.4412	3.2783	16.8156	30.0669
15	0.3700	2.6000	11.7217	3.6598	4.3249	19.1185
16	0.0800	11.6950	11.4742	3.7049	3.9862	18.9621
17	0.4300	2.0767	11.7729	3.6506	4.3947	19.1511
18	0.1100	2.7800	11.4998	3.7002	4.0214	18.9782
19	0.6200	2.1100	11.9351	3.6218	4.6152	19.2550
20	1.5000	1.9900	12.6862	3.4942	5.6241	19.7483
21	0.0300	0.8900	11.4315	3.7128	3.9276	18.9353
22	13.6000	31.1000	23.0145	3.2240	16.4985	29.5304
23	2.0200	7.8000	13.1301	3.4238	6.2103	20.0499
24	12.2000	36.8000	21.8195	3.0963	15.5616	28.0773
25	14.9000	30.4000	24.1241	3.3738	17.3055	30.9427
26	29.5000	36.8000	36.5863	6.1842	24.0876	49.0849
27	24.8000	53.4233	32.5745	5.1417	22.1828	42.9661
28	7.7400	33.3000	18.0125	2.9648	12.0204	24.0046
29	28.3000	54.4000	35.5620	5.9113	23.6147	47.5092
30	8.8100	23.3500	18.9258	2.9555	12.9526	24.8991
31	9.1500	19.0700	19.2161	2.9580	13.2376	25.1945
32	5.3300	6.0800	15.9554	3.0796	9.7313	22.1795
33	11.8000	48.3000	21.4780	3.0668	15.2798	27.6763
34	0.0900	4.0533	11.4827	3.7034	3.9979	18.9674
35	0.3500	2.9867	11.7046	3.6629	4.3016	19.1076
36	0.3400	1.8400	11.6961	3.6645	4.2899	19.1022
37	1.1100	2.9700	12.3533	3.5495	5.1795	19.5271
38	0.7700	3.2100	12.0631	3.5993	4.7886	19.3376
39	0.3300	2.9400	11.6875	3.6660	4.2783	19.0968
40	0.3300	1.5200	11.6875	3.6660	4.2783	19.0968
41	0.0700	1.3900	11.4656	3.7065	3.9745	18.9567
42	0.3000	3.9267	11.6619	3.6706	4.2433	19.0806
43	0.2300	1.2767	11.6022	3.6815	4.1616	19.0427
44	0.0700	1.3100	11.4656	3.7065	3.9745	18.9567
45	0.0400	1.5500	11.4400	3.7112	3.9394	18.9407
46	3.7100	30.1000	14.5726	3.2239	8.0568	21.0884
47	8.7000	101.9000	18.8320	2.9552	12.8592	24.8047
48	7.0200	54.4500	17.3980	2.9858	11.3635	23.4324
49	29.0000	23.9000	36.1595	6.0700	23.8915	48.4274
50	6.3600	14.6000	16.8346	3.0151	10.7408	22.9283
51	16.0000	36.6667	25.0630	3.5210	17.9468	32.1793

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Predicted Values and Prediction Limits

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	31.6000	28.3000	38.3788	20.2802	-2.6091	79.3667
11	17.5000	23.0667	26.3434	19.5153	-13.0985	65.7852
12	50.1000	10.9000	54.1699	22.1853	9.3316	99.0081
13	4.0800	14.8900	14.8884	19.4153	-24.3513	54.1282
14	14.1000	16.6000	23.4412	19.4306	-15.8294	62.7119
15	0.3700	2.6000	11.7217	19.4986	-27.6864	51.1297
16	0.0800	11.6950	11.4742	19.5071	-27.9511	50.8994
17	0.4300	2.0767	11.7729	19.4968	-27.6317	51.1775
18	0.1100	2.7800	11.4998	19.5062	-27.9237	50.9232
19	0.6200	2.1100	11.9351	19.4914	-27.4586	51.3288
20	1.5000	1.9900	12.6862	19.4681	-26.6604	52.0328
21	0.0300	0.8900	11.4315	19.5086	-27.9968	50.8598
22	13.6000	31.1000	23.0145	19.4215	-16.2378	62.2667
23	2.0200	7.8000	13.1301	19.4556	-26.1912	52.4514
24	12.2000	36.8000	21.8195	19.4007	-17.3908	61.0297
25	14.9000	30.4000	24.1241	19.4469	-15.1795	63.4277
26	29.5000	36.8000	36.5863	20.1257	-4.0893	77.2618
27	24.8000	53.4233	32.5745	19.8302	-7.5038	72.6527
28	7.7400	33.3000	18.0125	19.3801	-21.1562	57.1812
29	28.3000	54.4000	35.5620	20.0435	-4.9475	76.0715
30	8.8100	23.3500	18.9258	19.3787	-20.2400	58.0917
31	9.1500	19.0700	19.2161	19.3791	-19.9505	58.3827
32	5.3300	6.0800	15.9554	19.3980	-23.2494	55.1603
33	11.8000	48.3000	21.4780	19.3960	-17.7227	60.6788
34	0.0900	4.0533	11.4827	19.5068	-27.9420	50.9073
35	0.3500	2.9867	11.7046	19.4991	-27.7046	51.1138
36	0.3400	1.8400	11.6961	19.4994	-27.7137	51.1059
37	1.1100	2.9700	12.3533	19.4781	-27.0135	51.7201
38	0.7700	3.2100	12.0631	19.4873	-27.3222	51.4484
39	0.3300	2.9400	11.6875	19.4997	-27.7228	51.0979
40	0.3300	1.5200	11.6875	19.4997	-27.7228	51.0979
41	0.0700	1.3900	11.4656	19.5074	-27.9602	50.8915
42	0.3000	3.9267	11.6619	19.5006	-27.7502	51.0741
43	0.2300	1.2767	11.6022	19.5026	-27.8141	51.0185
44	0.0700	1.3100	11.4656	19.5074	-27.9602	50.8915
45	0.0400	1.5500	11.4400	19.5083	-27.9877	50.8677
46	3.7100	30.1000	14.5726	19.4215	-24.6796	53.8248
47	8.7000	101.9000	18.8320	19.3787	-20.3338	57.9977
48	7.0200	54.4500	17.3980	19.3833	-21.7772	56.5731
49	29.0000	23.9000	36.1595	20.0909	-4.4457	76.7647
50	6.3600	14.6000	16.8346	19.3879	-22.3498	56.0190
51	16.0000	36.6667	25.0630	19.4730	-14.2933	64.4194

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Working-Hotelling Simultaneous Confidence Band

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	31.6000	28.3000	38.3788	6.6700	19.3932	57.3643
11	17.5000	23.0667	26.3434	3.7479	15.6753	37.0115
12	50.1000	10.9000	54.1699	11.1977	22.2966	86.0431
13	4.0800	14.8900	14.8884	3.1866	5.8181	23.9588
14	14.1000	16.6000	23.4412	3.2783	14.1099	32.7725
15	0.3700	2.6000	11.7217	3.6598	1.3043	22.1390
16	0.0800	11.6950	11.4742	3.7049	0.9285	22.0198
17	0.4300	2.0767	11.7729	3.6506	1.3817	22.1641
18	0.1100	2.7800	11.4998	3.7002	0.9675	22.0320
19	0.6200	2.1100	11.9351	3.6218	1.6260	22.2441
20	1.5000	1.9900	12.6862	3.4942	2.7403	22.6322
21	0.0300	0.8900	11.4315	3.7128	0.8634	21.9996
22	13.6000	31.1000	23.0145	3.2240	13.8376	32.1913
23	2.0200	7.8000	13.1301	3.4238	3.3845	22.8757
24	12.2000	36.8000	21.8195	3.0963	13.0062	30.6327
25	14.9000	30.4000	24.1241	3.3738	14.5210	33.7272
26	29.5000	36.8000	36.5863	6.1842	18.9837	54.1888
27	24.8000	53.4233	32.5745	5.1417	17.9393	47.2097
28	7.7400	33.3000	18.0125	2.9648	9.5735	26.4516
29	28.3000	54.4000	35.5620	5.9113	18.7359	52.3880
30	8.8100	23.3500	18.9258	2.9555	10.5133	27.3384
31	9.1500	19.0700	19.2161	2.9580	10.7963	27.6358
32	5.3300	6.0800	15.9554	3.0796	7.1897	24.7212
33	11.8000	48.3000	21.4780	3.0668	12.7487	30.2074
34	0.0900	4.0533	11.4827	3.7034	0.9415	22.0239
35	0.3500	2.9867	11.7046	3.6629	1.2785	22.1307
36	0.3400	1.8400	11.6961	3.6645	1.2656	22.1266
37	1.1100	2.9700	12.3533	3.5495	2.2501	22.4566
38	0.7700	3.2100	12.0631	3.5993	1.8180	22.3082
39	0.3300	2.9400	11.6875	3.6660	1.2527	22.1224
40	0.3300	1.5200	11.6875	3.6660	1.2527	22.1224
41	0.0700	1.3900	11.4656	3.7065	0.9155	22.0158
42	0.3000	3.9267	11.6619	3.6706	1.2139	22.1100
43	0.2300	1.2767	11.6022	3.6815	1.1232	22.0811
44	0.0700	1.3100	11.4656	3.7065	0.9155	22.0158
45	0.0400	1.5500	11.4400	3.7112	0.8764	22.0036
46	3.7100	30.1000	14.5726	3.2239	5.3961	23.7492
47	8.7000	101.9000	18.8320	2.9552	10.4202	27.2437
48	7.0200	54.4500	17.3980	2.9858	8.8993	25.8966
49	29.0000	23.9000	36.1595	6.0700	18.8818	53.4372
50	6.3600	14.6000	16.8346	3.0151	8.2524	25.4168
51	16.0000	36.6667	25.0630	3.5210	15.0408	35.0853

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Residual Section

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	31.6000	28.3000	38.3788	-10.0788	-0.5614	35.6140
11	17.5000	23.0667	26.3434	-3.2767	-0.1745	14.2055
12	50.1000	10.9000	54.1699	-43.2699	-2.7849	396.9712
13	4.0800	14.8900	14.8884	0.0016	0.0001	0.0104
14	14.1000	16.6000	23.4412	-6.8412	-0.3626	41.2123
15	0.3700	2.6000	11.7217	-9.1217	-0.4852	350.8343
16	0.0800	11.6950	11.4742	0.2208	0.0118	1.8884
17	0.4300	2.0767	11.7729	-9.6962	-0.5157	466.9137
18	0.1100	2.7800	11.4998	-8.7198	-0.4640	313.6606
19	0.6200	2.1100	11.9351	-9.8251	-0.5224	465.6439
20	1.5000	1.9900	12.6862	-10.6962	-0.5680	537.4990
21	0.0300	0.8900	11.4315	-10.5415	-0.5611	1184.4357
22	13.6000	31.1000	23.0145	8.0855	0.4283	25.9985
23	2.0200	7.8000	13.1301	-5.3301	-0.2829	68.3345
24	12.2000	36.8000	21.8195	14.9805	0.7926	40.7080
25	14.9000	30.4000	24.1241	6.2759	0.3329	20.6444
26	29.5000	36.8000	36.5863	0.2137	0.0118	0.5808
27	24.8000	53.4233	32.5745	20.8489	1.1301	39.0258
28	7.7400	33.3000	18.0125	15.2875	0.8080	45.9083
29	28.3000	54.4000	35.5620	18.8380	1.0341	34.6287
30	8.8100	23.3500	18.9258	4.4242	0.2338	18.9471
31	9.1500	19.0700	19.2161	-0.1461	-0.0077	0.7659
32	5.3300	6.0800	15.9554	-9.8754	-0.5224	162.4245
33	11.8000	48.3000	21.4780	26.8220	1.4188	55.5320
34	0.0900	4.0533	11.4827	-7.4294	-0.3954	183.2901
35	0.3500	2.9867	11.7046	-8.7180	-0.4638	291.8958
36	0.3400	1.8400	11.6961	-9.8561	-0.5243	535.6568
37	1.1100	2.9700	12.3533	-9.3833	-0.4986	315.9372
38	0.7700	3.2100	12.0631	-8.8531	-0.4706	275.7982
39	0.3300	2.9400	11.6875	-8.7475	-0.4653	297.5357
40	0.3300	1.5200	11.6875	-10.1675	-0.5409	668.9177
41	0.0700	1.3900	11.4656	-10.0756	-0.5362	724.8648
42	0.3000	3.9267	11.6619	-7.7353	-0.4115	196.9934
43	0.2300	1.2767	11.6022	-10.3255	-0.5494	808.7879
44	0.0700	1.3100	11.4656	-10.1556	-0.5405	775.2382
45	0.0400	1.5500	11.4400	-9.8900	-0.5264	638.0654
46	3.7100	30.1000	14.5726	15.5274	0.8225	51.5860
47	8.7000	101.9000	18.8320	83.0680	4.3899	81.5192
48	7.0200	54.4500	17.3980	37.0520	1.9586	68.0478
49	29.0000	23.9000	36.1595	-12.2595	-0.6749	51.2949
50	6.3600	14.6000	16.8346	-2.2346	-0.1182	15.3054
51	16.0000	36.6667	25.0630	11.6036	0.6164	31.6463

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Residual Diagnostics Section

Row	Vegetation (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	31.6000	-10.0788	*-0.5565	0.1213	0.0218	373.2401
11	17.5000	-3.2767	-0.1723	0.0383	0.0006	375.9180
12	50.1000	-43.2699	**-3.0628	0.3418	*2.0142	303.2619
13	4.0800	0.0016	0.0001	0.0277	0.0000	376.2042
14	14.1000	-6.8412	-0.3586	0.0293	0.0020	374.9679
15	0.3700	-9.1217	-0.4805	0.0365	0.0045	373.9899
16	0.0800	0.2208	0.0116	0.0374	0.0000	376.2029
17	0.4300	-9.6962	-0.5109	0.0363	0.0050	373.7026
18	0.1100	-8.7198	-0.4594	0.0373	0.0042	374.1790
19	0.6200	-9.8251	-0.5176	0.0358	0.0051	373.6372
20	1.5000	-10.6962	-0.5632	0.0333	0.0056	373.1696
21	0.0300	-10.5415	-0.5562	0.0376	0.0061	373.2437
22	13.6000	8.0855	0.4239	0.0283	0.0027	374.4790
23	2.0200	-5.3301	-0.2796	0.0320	0.0013	375.4517
24	12.2000	14.9805	0.7889	0.0261	0.0084	370.2955
25	14.9000	6.2759	0.3292	0.0310	0.0018	375.1620
26	29.5000	0.2137	*0.0116	0.1043	0.0000	376.2029
27	24.8000	20.8489	1.1341	0.0721	0.0496	364.1930
28	7.7400	15.2875	0.8044	0.0240	0.0080	370.0646
29	28.3000	18.8380	*1.0350	0.0953	0.0563	366.1468
30	8.8100	4.4242	0.2310	0.0238	0.0007	375.6901
31	9.1500	-0.1461	-0.0076	0.0239	0.0000	376.2037
32	5.3300	-9.8754	-0.5176	0.0259	0.0036	373.6373
33	11.8000	26.8220	1.4376	0.0256	0.0265	357.2722
34	0.0900	-7.4294	-0.3912	0.0374	0.0030	374.7340
35	0.3500	-8.7180	-0.4592	0.0366	0.0041	374.1815
36	0.3400	-9.8561	-0.5195	0.0366	0.0052	373.6187
37	1.1100	-9.3833	-0.4938	0.0343	0.0044	373.8663
38	0.7700	-8.8531	-0.4660	0.0353	0.0041	374.1210
39	0.3300	-8.7475	-0.4607	0.0366	0.0041	374.1676
40	0.3300	-10.1675	-0.5360	0.0366	0.0056	373.4527
41	0.0700	-10.0756	-0.5314	0.0375	0.0056	373.4999
42	0.3000	-7.7353	-0.4072	0.0367	0.0032	374.6115
43	0.2300	-10.3255	-0.5445	0.0370	0.0058	373.3656
44	0.0700	-10.1556	-0.5356	0.0375	0.0057	373.4568
45	0.0400	-9.8900	-0.5216	0.0375	0.0054	373.5984
46	3.7100	15.5274	0.8191	0.0283	0.0099	369.8419
47	8.7000	83.0680	*6.0214	0.0238	0.2350	194.9580
48	7.0200	37.0520	*2.0339	0.0243	0.0478	340.1260
49	29.0000	-12.2595	*-0.6702	0.1005	0.0254	371.9202
50	6.3600	-2.2346	-0.1167	0.0248	0.0002	376.0729
51	16.0000	11.6036	0.6115	0.0338	0.0066	372.6310

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.5565	-0.2068	0.0218	* 1.1784	0.0396	-0.1854
11	-0.1723	-0.0344	0.0006	1.0922	-0.0087	-0.0212
12	* -3.0628	-2.2073	** 2.0142	1.0386	0.8286	-2.1291
13	0.0001	0.0000	0.0000	1.0819	0.0000	0.0000
14	-0.3586	-0.0623	0.0020	1.0766	-0.0283	-0.0270
15	-0.4805	-0.0936	0.0045	1.0790	-0.0935	0.0552
16	0.0116	0.0023	0.0000	1.0928	0.0023	-0.0014
17	-0.5109	-0.0992	0.0050	1.0771	-0.0992	0.0582
18	-0.4594	-0.0905	0.0042	1.0810	-0.0905	0.0544
19	-0.5176	-0.0997	0.0051	1.0761	-0.0996	0.0576
20	-0.5632	-0.1045	0.0056	1.0707	-0.1041	0.0558
21	-0.5562	-0.1099	0.0061	1.0759	-0.1099	0.0665
22	0.4239	0.0724	0.0027	1.0727	0.0352	0.0289
23	-0.2796	-0.0508	0.0013	1.0823	-0.0504	0.0257
24	0.7889	0.1292	0.0084	1.0465	0.0747	0.0386
25	0.3292	0.0589	0.0018	1.0796	0.0238	0.0284
26	0.0116	0.0040	0.0000	* 1.1744	-0.0006	0.0035
27	1.1341	0.3161	0.0496	1.0624	-0.0125	0.2587
28	0.8044	0.1260	0.0080	1.0429	0.1060	-0.0101
29	1.0350	0.3359	0.0563	1.1014	-0.0430	0.2909
30	0.2310	0.0361	0.0007	1.0747	0.0284	0.0005
31	-0.0076	-0.0012	0.0000	1.0776	-0.0009	-0.0001
32	-0.5176	-0.0843	0.0036	1.0652	-0.0787	0.0237
33	1.4376	0.2332	0.0265	0.9737	0.1408	0.0623
34	-0.3912	-0.0771	0.0030	1.0843	-0.0771	0.0465
35	-0.4592	-0.0895	0.0041	1.0802	-0.0895	0.0529
36	-0.5195	-0.1013	0.0052	1.0770	-0.1013	0.0599
37	-0.4938	-0.0931	0.0044	1.0759	-0.0929	0.0516
38	-0.4660	-0.0892	0.0041	1.0784	-0.0891	0.0509
39	-0.4607	-0.0899	0.0041	1.0802	-0.0898	0.0532
40	-0.5360	-0.1045	0.0056	1.0760	-0.1045	0.0619
41	-0.5314	-0.1048	0.0056	1.0772	-0.1048	0.0633
42	-0.4072	-0.0795	0.0032	1.0828	-0.0795	0.0472
43	-0.5445	-0.1067	0.0058	1.0759	-0.1067	0.0636
44	-0.5356	-0.1057	0.0057	1.0770	-0.1057	0.0638
45	-0.5216	-0.1030	0.0054	1.0779	-0.1030	0.0623
46	0.8191	0.1399	0.0099	1.0463	0.1358	-0.0559
47	* 6.0214	0.9404	0.2350	0.2894	0.7453	0.0038
48	* 2.0339	0.3210	0.0478	0.8813	0.2804	-0.0458
49	-0.6702	-0.2240	0.0254	* 1.1429	0.0320	-0.1956
50	-0.1167	-0.0186	0.0002	1.0779	-0.0167	0.0037
51	0.6115	0.1144	0.0066	1.0682	0.0386	0.0622

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Outlier Detection Chart

Row	Vegetation (X)	Residual		Standardized Residual		RStudent	
10	31.6000	-10.0788	|.....	-0.5614	|.....	-0.5565	|.....
11	17.5000	-3.2767	|.....	-0.1745	|.....	-0.1723	|.....
12	50.1000	-43.2699	|||||||.....	-2.7849	|||||||||.....	* -3.0628	|||||||.....
13	4.0800	0.0016	|.....	0.0001	|.....	0.0001	|.....
14	14.1000	-6.8412	|.....	-0.3626	|.....	-0.3586	|.....
15	0.3700	-9.1217	|.....	-0.4852	|.....	-0.4805	|.....
16	0.0800	0.2208	|.....	0.0118	|.....	0.0116	|.....
17	0.4300	-9.6962	|.....	-0.5157	|.....	-0.5109	|.....
18	0.1100	-8.7198	|.....	-0.4640	|.....	-0.4594	|.....
19	0.6200	-9.8251	|.....	-0.5224	|.....	-0.5176	|.....
20	1.5000	-10.6962	|.....	-0.5680	|.....	-0.5632	|.....
21	0.0300	-10.5415	|.....	-0.5611	|.....	-0.5562	|.....
22	13.6000	8.0855	|.....	0.4283	|.....	0.4239	|.....
23	2.0200	-5.3301	|.....	-0.2829	|.....	-0.2796	|.....
24	12.2000	14.9805	||.....	0.7926	||.....	0.7889	|.....
25	14.9000	6.2759	|.....	0.3329	|.....	0.3292	|.....
26	29.5000	0.2137	|.....	0.0118	|.....	0.0116	|.....
27	24.8000	20.8489	|||.....	1.1301	|||.....	1.1341	||.....
28	7.7400	15.2875	||.....	0.8080	||.....	0.8044	||.....
29	28.3000	18.8380	|||.....	1.0341	|||.....	1.0350	||.....
30	8.8100	4.4242	|.....	0.2338	|.....	0.2310	|.....
31	9.1500	-0.1461	|.....	-0.0077	|.....	-0.0076	|.....
32	5.3300	-9.8754	|.....	-0.5224	|.....	-0.5176	|.....
33	11.8000	26.8220	||||.....	1.4188	||||.....	1.4376	|||.....
34	0.0900	-7.4294	|.....	-0.3954	|.....	-0.3912	|.....
35	0.3500	-8.7180	|.....	-0.4638	|.....	-0.4592	|.....
36	0.3400	-9.8561	|.....	-0.5243	|.....	-0.5195	|.....
37	1.1100	-9.3833	|.....	-0.4986	|.....	-0.4938	|.....
38	0.7700	-8.8531	|.....	-0.4706	|.....	-0.4660	|.....
39	0.3300	-8.7475	|.....	-0.4653	|.....	-0.4607	|.....
40	0.3300	-10.1675	|.....	-0.5409	|.....	-0.5360	|.....
41	0.0700	-10.0756	|.....	-0.5362	|.....	-0.5314	|.....
42	0.3000	-7.7353	|.....	-0.4115	|.....	-0.4072	|.....
43	0.2300	-10.3255	|.....	-0.5494	|.....	-0.5445	|.....
44	0.0700	-10.1556	|.....	-0.5405	|.....	-0.5356	|.....
45	0.0400	-9.8900	|.....	-0.5264	|.....	-0.5216	|.....
46	3.7100	15.5274	||.....	0.8225	||.....	0.8191	||.....
47	8.7000	83.0680	|||||||||||||||	4.3899	|||||||||||||||	* 6.0214	|||||||||||||||
48	7.0200	37.0520	||||||.....	1.9586	||||||.....	* 2.0339	|||||.....
49	29.0000	-12.2595	||.....	-0.6749	||.....	-0.6702	|.....
50	6.3600	-2.2346	|.....	-0.1182	|.....	-0.1167	|.....
51	16.0000	11.6036	||.....	0.6164	||.....	0.6115	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Influence Detection Chart

Row	Vegetation (X)	DFFITS		Cook's D		DFBETAS(1)	
10	31.6000	-0.2068	|.....	0.0218	|.....	-0.1854	|.....
11	17.5000	-0.0344	|.....	0.0006	|.....	-0.0212	|.....
12	50.1000	-2.2073	||||||||||||||	** 2.0142	||||||||||||||	-2.1291	||||||||||||||
13	4.0800	0.0000	|.....	0.0000	|.....	0.0000	|.....
14	14.1000	-0.0623	|.....	0.0020	|.....	-0.0270	|.....
15	0.3700	-0.0936	|.....	0.0045	|.....	0.0552	|.....
16	0.0800	0.0023	|.....	0.0000	|.....	-0.0014	|.....
17	0.4300	-0.0992	|.....	0.0050	|.....	0.0582	|.....
18	0.1100	-0.0905	|.....	0.0042	|.....	0.0544	|.....
19	0.6200	-0.0997	|.....	0.0051	|.....	0.0576	|.....
20	1.5000	-0.1045	|.....	0.0056	|.....	0.0558	|.....
21	0.0300	-0.1099	|.....	0.0061	|.....	0.0665	|.....
22	13.6000	0.0724	|.....	0.0027	|.....	0.0289	|.....
23	2.0200	-0.0508	|.....	0.0013	|.....	0.0257	|.....
24	12.2000	0.1292	|.....	0.0084	|.....	0.0386	|.....
25	14.9000	0.0589	|.....	0.0018	|.....	0.0284	|.....
26	29.5000	0.0040	|.....	0.0000	|.....	0.0035	|.....
27	24.8000	0.3161	||.....	0.0496	|.....	0.2587	|.....
28	7.7400	0.1260	|.....	0.0080	|.....	-0.0101	|.....
29	28.3000	0.3359	||.....	0.0563	|.....	0.2909	||.....
30	8.8100	0.0361	|.....	0.0007	|.....	0.0005	|.....
31	9.1500	-0.0012	|.....	0.0000	|.....	-0.0001	|.....
32	5.3300	-0.0843	|.....	0.0036	|.....	0.0237	|.....
33	11.8000	0.2332	|.....	0.0265	|.....	0.0623	|.....
34	0.0900	-0.0771	|.....	0.0030	|.....	0.0465	|.....
35	0.3500	-0.0895	|.....	0.0041	|.....	0.0529	|.....
36	0.3400	-0.1013	|.....	0.0052	|.....	0.0599	|.....
37	1.1100	-0.0931	|.....	0.0044	|.....	0.0516	|.....
38	0.7700	-0.0892	|.....	0.0041	|.....	0.0509	|.....
39	0.3300	-0.0899	|.....	0.0041	|.....	0.0532	|.....
40	0.3300	-0.1045	|.....	0.0056	|.....	0.0619	|.....
41	0.0700	-0.1048	|.....	0.0056	|.....	0.0633	|.....
42	0.3000	-0.0795	|.....	0.0032	|.....	0.0472	|.....
43	0.2300	-0.1067	|.....	0.0058	|.....	0.0636	|.....
44	0.0700	-0.1057	|.....	0.0057	|.....	0.0638	|.....
45	0.0400	-0.1030	|.....	0.0054	|.....	0.0623	|.....
46	3.7100	0.1399	|.....	0.0099	|.....	-0.0559	|.....
47	8.7000	0.9404	||||||.....	0.2350	|.....	0.0038	|.....
48	7.0200	0.3210	||.....	0.0478	|.....	-0.0458	|.....
49	29.0000	-0.2240	|.....	0.0254	|.....	-0.1956	|.....
50	6.3600	-0.0186	|.....	0.0002	|.....	0.0037	|.....
51	16.0000	0.1144	|.....	0.0066	|.....	0.0622	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked. DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Outlier & Influence Chart

Row	Vegetation (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	31.6000	-0.5565	|.....	0.0218	|.....	0.1213	||||.....
11	17.5000	-0.1723	|.....	0.0006	|.....	0.0383	|.....
12	50.1000	* -3.0628	||||||.....	** 2.0142	|||||||||||||||	0.3418	|||||||||||||||
13	4.0800	0.0001	|.....	0.0000	|.....	0.0277	|.....
14	14.1000	-0.3586	|.....	0.0020	|.....	0.0293	|.....
15	0.3700	-0.4805	|.....	0.0045	|.....	0.0365	|.....
16	0.0800	0.0116	|.....	0.0000	|.....	0.0374	|.....
17	0.4300	-0.5109	|.....	0.0050	|.....	0.0363	|.....
18	0.1100	-0.4594	|.....	0.0042	|.....	0.0373	|.....
19	0.6200	-0.5176	|.....	0.0051	|.....	0.0358	|.....
20	1.5000	-0.5632	|.....	0.0056	|.....	0.0333	|.....
21	0.0300	-0.5562	|.....	0.0061	|.....	0.0376	|.....
22	13.6000	0.4239	|.....	0.0027	|.....	0.0283	|.....
23	2.0200	-0.2796	|.....	0.0013	|.....	0.0320	|.....
24	12.2000	0.7889	|.....	0.0084	|.....	0.0261	|.....
25	14.9000	0.3292	|.....	0.0018	|.....	0.0310	|.....
26	29.5000	0.0116	|.....	0.0000	|.....	0.1043	|||.....
27	24.8000	1.1341	||.....	0.0496	|.....	0.0721	||.....
28	7.7400	0.8044	||.....	0.0080	|.....	0.0240	|.....
29	28.3000	1.0350	||.....	0.0563	|.....	0.0953	|||.....
30	8.8100	0.2310	|.....	0.0007	|.....	0.0238	|.....
31	9.1500	-0.0076	|.....	0.0000	|.....	0.0239	|.....
32	5.3300	-0.5176	|.....	0.0036	|.....	0.0259	|.....
33	11.8000	1.4376	|||.....	0.0265	|.....	0.0256	|.....
34	0.0900	-0.3912	|.....	0.0030	|.....	0.0374	|.....
35	0.3500	-0.4592	|.....	0.0041	|.....	0.0366	|.....
36	0.3400	-0.5195	|.....	0.0052	|.....	0.0366	|.....
37	1.1100	-0.4938	|.....	0.0044	|.....	0.0343	|.....
38	0.7700	-0.4660	|.....	0.0041	|.....	0.0353	|.....
39	0.3300	-0.4607	|.....	0.0041	|.....	0.0366	|.....
40	0.3300	-0.5360	|.....	0.0056	|.....	0.0366	|.....
41	0.0700	-0.5314	|.....	0.0056	|.....	0.0375	|.....
42	0.3000	-0.4072	|.....	0.0032	|.....	0.0367	|.....
43	0.2300	-0.5445	|.....	0.0058	|.....	0.0370	|.....
44	0.0700	-0.5356	|.....	0.0057	|.....	0.0375	|.....
45	0.0400	-0.5216	|.....	0.0054	|.....	0.0375	|.....
46	3.7100	0.8191	||.....	0.0099	|.....	0.0283	|.....
47	8.7000	* 6.0214	||||||||||||||	0.2350	|.....	0.0238	|.....
48	7.0200	* 2.0339	|||||.....	0.0478	|.....	0.0243	|.....
49	29.0000	-0.6702	|.....	0.0254	|.....	0.1005	|||.....
50	6.3600	-0.1167	|.....	0.0002	|.....	0.0248	|.....
51	16.0000	0.6115	|.....	0.0066	|.....	0.0338	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Inverse Prediction of X Means

Row	Mammal (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	28.3000	31.6000	19.7923	11.8077	12.4194	40.8612
11	23.0667	17.5000	13.6612	3.8388	6.5437	26.9353
12	10.9000	50.1000	-0.5927	50.6927	-19.0833	6.5268
13	14.8900	4.0800	4.0818	-0.0018	-8.7211	11.2617
14	16.6000	14.1000	6.0852	8.0148	-4.7478	13.7586
15	2.6000	0.3700	-10.3165	10.6865	-42.8712	-1.0904
16	11.6950	0.0800	0.3387	-0.2587	-16.9286	7.3801
17	2.0767	0.4300	-10.9296	11.3596	-44.4157	-1.5261
18	2.7800	0.1100	-10.1056	10.2156	-42.3407	-0.9399
19	2.1100	0.6200	-10.8905	11.5105	-44.3172	-1.4985
20	1.9900	1.5000	-11.0311	12.5311	-44.6718	-1.5980
21	0.8900	0.0300	-12.3198	12.3498	-47.9286	-2.5033
22	31.1000	13.6000	23.0726	-9.4726	15.0417	48.8334
23	7.8000	2.0200	-4.2244	6.2444	-27.7558	3.4696
24	36.8000	12.2000	29.7504	-17.5504	19.8971	65.5453
25	30.4000	14.9000	22.2525	-7.3525	14.4065	46.8200
26	36.8000	29.5000	29.7504	-0.2504	19.8971	65.5453
27	53.4233	24.8000	49.2254	-24.4254	32.7776	115.5633
28	33.3000	7.7400	25.6500	-17.9100	16.9722	55.2271
29	54.4000	28.3000	50.3696	-22.0696	33.5112	118.5252
30	23.3500	8.8100	13.9931	-5.1831	6.9138	27.6372
31	19.0700	9.1500	8.9789	0.1711	0.2805	18.0762
32	6.0800	5.3300	-6.2395	11.5695	-32.6980	1.9038
33	48.3000	11.8000	43.2232	-31.4232	28.9030	100.0525
34	4.0533	0.0900	-8.6138	8.7038	-38.5999	0.1373
35	2.9867	0.3500	-9.8635	10.2135	-41.7321	-0.7665
36	1.8400	0.3400	-11.2069	11.5469	-45.1151	-1.7222
37	2.9700	1.1100	-9.8830	10.9930	-41.7812	-0.7805
38	3.2100	0.7700	-9.6018	10.3718	-41.0751	-0.5785
39	2.9400	0.3300	-9.9182	10.2482	-41.8695	-0.8057
40	1.5200	0.3300	-11.5818	11.9118	-46.0618	-1.9863
41	1.3900	0.0700	-11.7341	11.8041	-46.4467	-2.0933
42	3.9267	0.3000	-8.7622	9.0622	-38.9711	0.0292
43	1.2767	0.2300	-11.8668	12.0968	-46.7824	-2.1864
44	1.3100	0.0700	-11.8278	11.8978	-46.6836	-2.1590
45	1.5500	0.0400	-11.5466	11.5866	-45.9730	-1.9616
46	30.1000	3.7100	21.9010	-18.1910	14.1306	45.9608
47	101.9000	8.7000	106.0181	-97.3181	68.4586	263.3057
48	54.4500	7.0200	50.4282	-43.4082	33.5487	118.6769
49	23.9000	29.0000	14.6375	14.3625	7.6105	29.0216
50	14.6000	6.3600	3.7421	2.6179	-9.4286	10.8719
51	36.6667	16.0000	29.5942	-13.5942	19.7881	65.1498

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Inverse Prediction of X Individuals

Row	Mammal (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	28.3000	31.6000	19.7923	11.8077	-32.7150	85.9956
11	23.0667	17.5000	13.6612	3.8388	-41.7820	75.2610
12	10.9000	50.1000	-0.5927	50.6927	-65.3103	52.7538
13	14.8900	4.0800	4.0818	-0.0018	-57.2160	59.7566
14	16.6000	14.1000	6.0852	8.0148	-53.8593	62.8701
15	2.6000	0.3700	-10.3165	10.6865	-83.2770	39.3154
16	11.6950	0.0800	0.3387	-0.2587	-63.6686	54.1201
17	2.0767	0.4300	-10.9296	11.3596	-84.4583	38.5164
18	2.7800	0.1100	-10.1056	10.2156	-82.8720	39.5914
19	2.1100	0.6200	-10.8905	11.5105	-84.3829	38.5672
20	1.9900	1.5000	-11.0311	12.5311	-84.6544	38.3847
21	0.8900	0.0300	-12.3198	12.3498	-87.1569	36.7250
22	31.1000	13.6000	23.0726	-9.4726	-28.1148	91.9899
23	7.8000	2.0200	-4.2244	6.2444	-71.8471	47.5609
24	36.8000	12.2000	29.7504	-17.5504	-19.2607	104.7031
25	30.4000	14.9000	22.2525	-7.3525	-29.2489	90.4754
26	36.8000	29.5000	29.7504	-0.2504	-19.2607	104.7031
27	53.4233	24.8000	49.2254	-24.4254	3.2185	145.1224
28	33.3000	7.7400	25.6500	-17.9100	-24.6183	96.8177
29	54.4000	28.3000	50.3696	-22.0696	4.4105	147.6259
30	23.3500	8.8100	13.9931	-5.1831	-41.2751	75.8262
31	19.0700	9.1500	8.9789	0.1711	-49.1311	67.4877
32	6.0800	5.3300	-6.2395	11.5695	-75.5647	44.7705
33	48.3000	11.8000	43.2232	-31.4232	-3.2451	132.2006
34	4.0533	0.0900	-8.6138	8.7038	-80.0257	41.5631
35	2.9867	0.3500	-9.8635	10.2135	-82.4078	39.9092
36	1.8400	0.3400	-11.2069	11.5469	-84.9942	38.1569
37	2.9700	1.1100	-9.8830	10.9930	-82.4452	39.8835
38	3.2100	0.7700	-9.6018	10.3718	-81.9071	40.2536
39	2.9400	0.3300	-9.9182	10.2482	-82.5125	39.8374
40	1.5200	0.3300	-11.5818	11.9118	-85.7207	37.6726
41	1.3900	0.0700	-11.7341	11.8041	-86.0164	37.4764
42	3.9267	0.3000	-8.7622	9.0622	-80.3074	41.3655
43	1.2767	0.2300	-11.8668	12.0968	-86.2745	37.3057
44	1.3100	0.0700	-11.8278	11.8978	-86.1986	37.3559
45	1.5500	0.0400	-11.5466	11.5866	-85.6525	37.7179
46	30.1000	3.7100	21.9010	-18.1910	-29.7382	89.8295
47	101.9000	8.7000	106.0181	-97.3181	52.6913	279.0730
48	54.4500	7.0200	50.4282	-43.4082	4.4712	147.7544
49	23.9000	29.0000	14.6375	14.3625	-40.2964	76.9285
50	14.6000	6.3600	3.7421	2.6179	-57.7920	59.2353
51	36.6667	16.0000	29.5942	-13.5942	-19.4603	104.3983

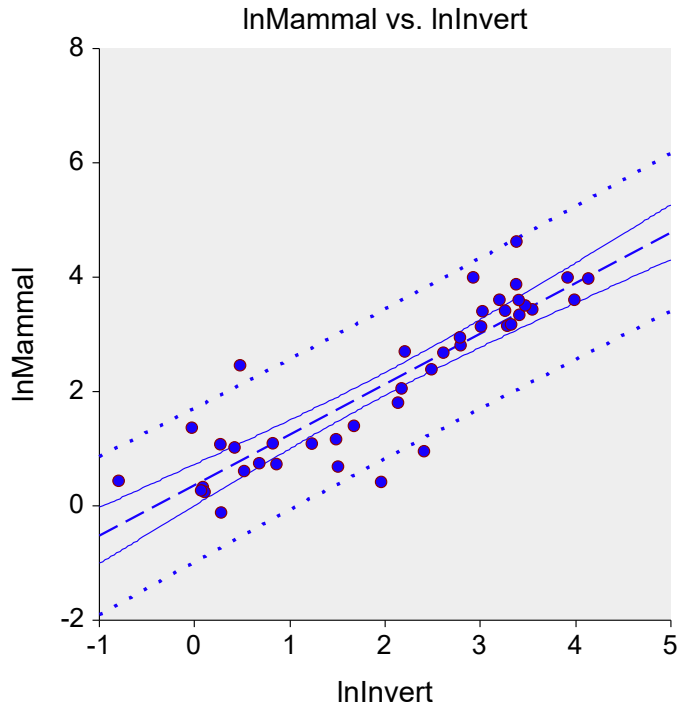
This prediction interval estimates the predicted value of X for a single individual with this value of Y. This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Invertebrate to Small Mammal Tissue Linear Regressions
In Transformation – All Data

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnMammal	Rows Processed	58
Independent Variable	lnInvert	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	0.3654	Rows Prediction Only	0
Slope	0.8845	Sum of Frequencies	42
R-Squared	0.7867	Sum of Weights	42.0000
Correlation	0.8869	Coefficient of Variation	0.2949
Mean Square Error	0.4102131	Square Root of MSE	0.6404788

Linear Regression Report

Y = lnMammal X = lnInvert

Summary Statement

The equation of the straight line relating lnMammal and lnInvert is estimated as: lnMammal = (0.3654) + (0.8845) lnInvert using the 42 observations in this dataset. The y-intercept, the estimated value of lnMammal when lnInvert is zero, is 0.3654 with a standard error of 0.1786. The slope, the estimated change in lnMammal per unit change in lnInvert, is 0.8845 with a standard error of 0.0728. The value of R-Squared, the proportion of the variation in lnMammal that can be accounted for by variation in lnInvert, is 0.7867. The correlation between lnMammal and lnInvert is 0.8869.

A significance test that the slope is zero resulted in a t-value of 12.1451. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.8845. The lower limit of the 95% confidence interval for the slope is 0.7373 and the upper limit is 1.0317. The estimated intercept is 0.3654. The lower limit of the 95% confidence interval for the intercept is 0.0044 and the upper limit is 0.7263.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnMammal	lnInvert
Count	42	42
Mean	2.1722	2.0427
Standard Deviation	1.3697	1.3734
Minimum	-0.1165	-0.7985
Maximum	4.6240	4.1320

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	0.3654	0.8845
Lower 95% Confidence Limit	0.0044	0.7373
Upper 95% Confidence Limit	0.7263	1.0317
Standard Error	0.1786	0.0728
Standardized Coefficient	0.0000	0.8869
T Value	2.0457	12.1451
Prob Level (T Test)	0.0474	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.5146	1.0000
Regression of Y on X	0.3654	0.8845
Inverse Regression from X on Y	-0.1246	1.1244
Orthogonal Regression of Y and X	0.1358	0.9969

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(0.365366347344721) + (0.884509090571269) * (lnInvert)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	0.3654	0.9000	0.0713	0.7040
Bootstrap Mean	0.3576	0.9500	0.0067	0.7915
Bias (BM - OV)	-0.0078	0.9900	-0.1058	0.9153
Bias Corrected	0.3731			
Standard Error	0.1946			
Slope				
Original Value	0.8845	0.9000	0.7612	0.9920
Bootstrap Mean	0.8872	0.9500	0.7394	1.0115
Bias (BM - OV)	0.0026	0.9900	0.6879	1.0527
Bias Corrected	0.8819			
Standard Error	0.0690			
Correlation				
Original Value	0.8869	0.9000	0.8356	0.9498
Bootstrap Mean	0.8865	0.9500	0.8285	0.9649
Bias (BM - OV)	-0.0005	0.9900	0.8119	1.0000
Bias Corrected	0.8874			
Standard Error	0.0359			
R-Squared				
Original Value	0.7867	0.9000	0.6929	0.8942
Bootstrap Mean	0.7871	0.9500	0.6795	0.9189
Bias (BM - OV)	0.0004	0.9900	0.6479	0.9875
Bias Corrected	0.7862			
Standard Error	0.0628			
Standard Error of Estimate				
Original Value	0.6405	0.9000	0.5109	0.8139
Bootstrap Mean	0.6216	0.9500	0.4862	0.8415
Bias (BM - OV)	-0.0189	0.9900	0.4277	0.9120
Bias Corrected	0.6593			
Standard Error	0.0922			
Orthogonal Intercept				
Original Value	0.1358	0.9000	-0.1861	0.5382
Bootstrap Mean	0.1238	0.9500	-0.2526	0.6370
Bias (BM - OV)	-0.0120	0.9900	-0.3722	0.8510
Bias Corrected	0.1477			
Standard Error	0.2225			
Orthogonal Slope				
Original Value	0.9969	0.9000	0.8543	1.1097
Bootstrap Mean	1.0015	0.9500	0.8240	1.1310
Bias (BM - OV)	0.0046	0.9900	0.7573	1.1640
Bias Corrected	0.9923			
Standard Error	0.0777			

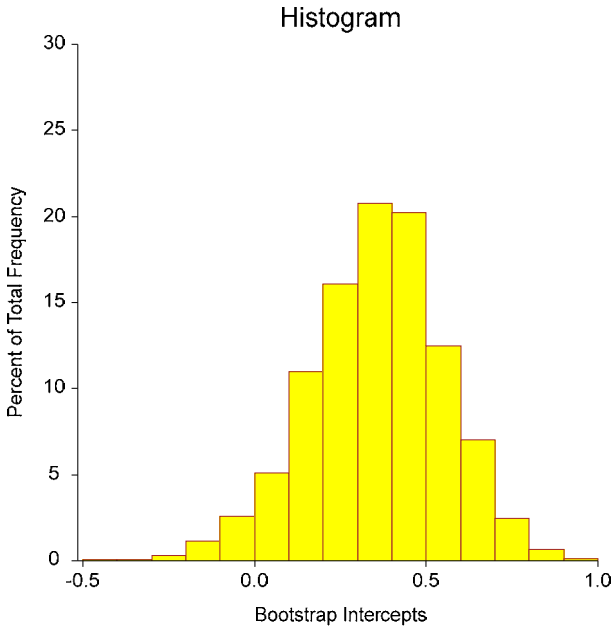
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

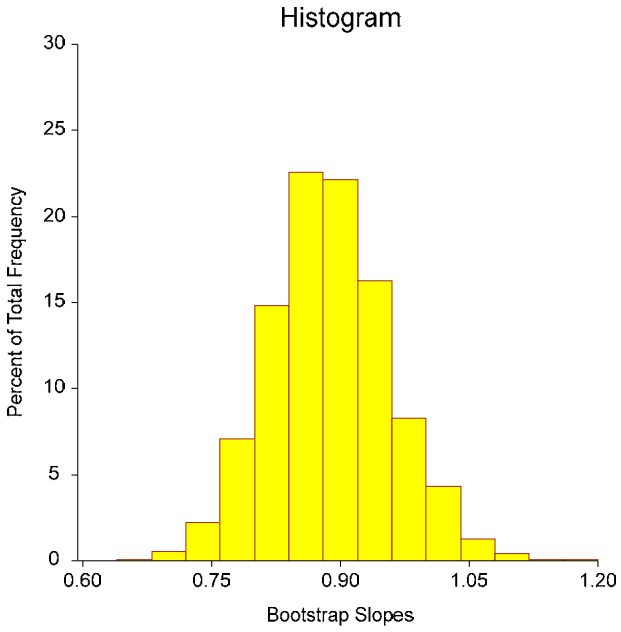
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

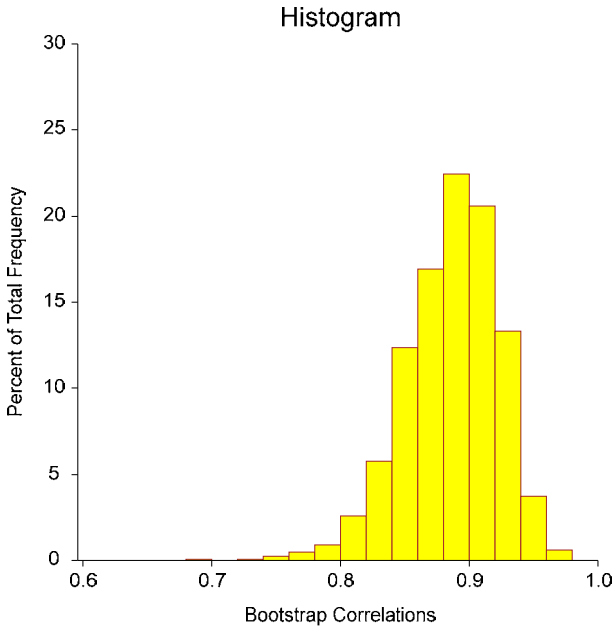
Linear Regression Report

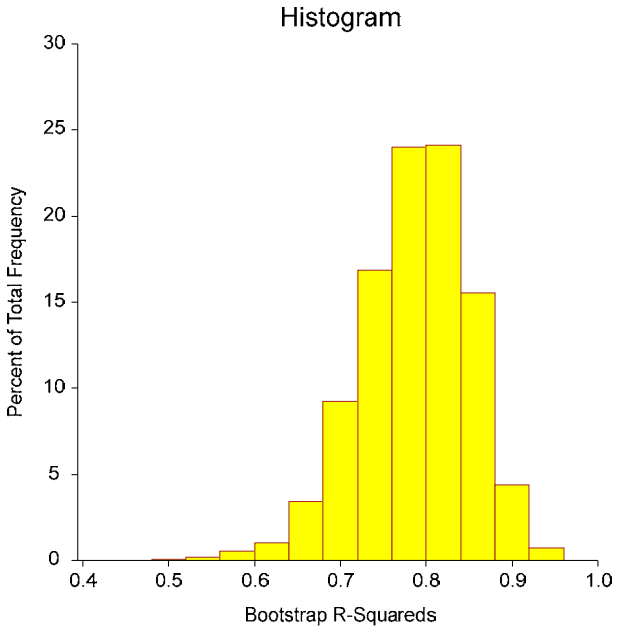
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Bootstrap Histograms Section



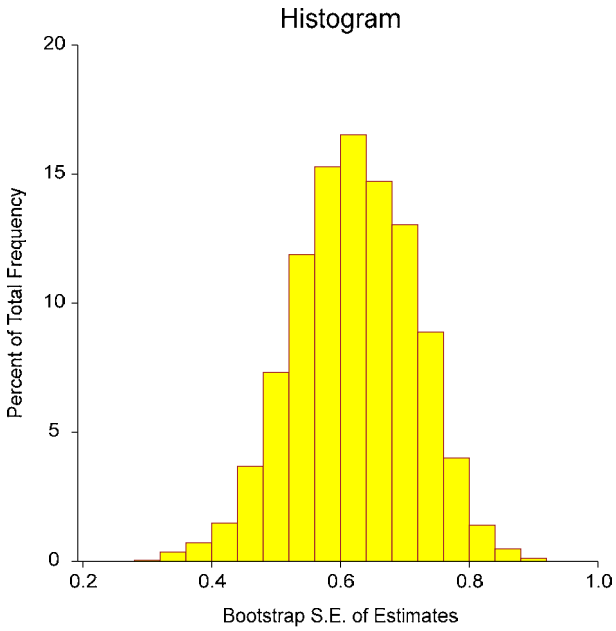


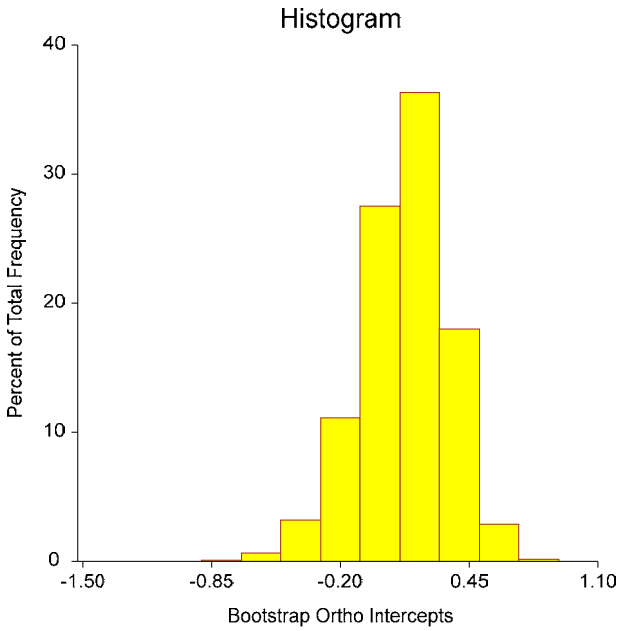


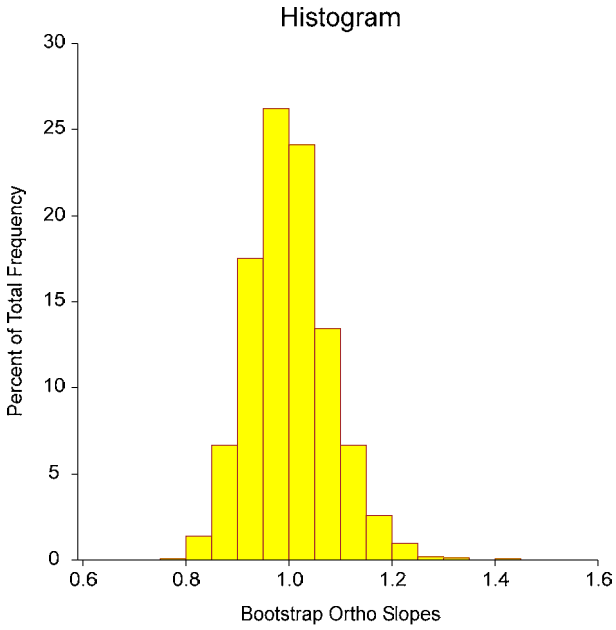


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.8869	0.7867	0.8859
Lower 95% Conf. Limit (r dist'n)	0.7947		
Upper 95% Conf. Limit (r dist'n)	0.9364		
Lower 95% Conf. Limit (Fisher's z)	0.7982		0.7963
Upper 95% Conf. Limit (Fisher's z)	0.9380		0.9374
Adjusted (Rbar)		0.7813	
T-Value for H0: Rho = 0	12.1451	12.1451	12.0762
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	198.1732	198.1732			
Slope	1	60.50791	60.50791	147.5036	0.0000	1.0000
Error	40	16.40852	0.4102131			
Adj. Total	41	76.91644	1.876011			
Total	42	275.0897				

s = Square Root(0.4102131) = 0.6404788

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	85.79516	91.23199	0.077763	-0.02641228
1	85.79516	252.598	254.7719	-0.02641228	0.01292982
2 (Y'Y)			275.0897		
Determinant		3248.305			0.0003078528

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.0318994	-0.01083466
1	-0.01083466	0.005303981

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9454	0.044122	No
Anderson Darling	0.9994	0.012359	No
D'Agostino Skewness	-0.1041	0.917051	Yes
D'Agostino Kurtosis	1.9505	0.051122	No
D'Agostino Omnibus	3.8151	0.148443	No
Constant Residual Variance?			
Modified Levene Test	1.1699	0.285894	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(0, 0) Test	0.0000	0.000000	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

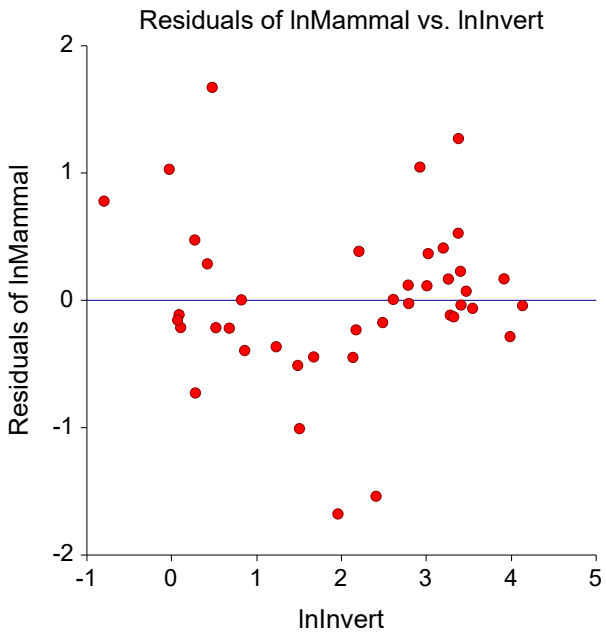
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

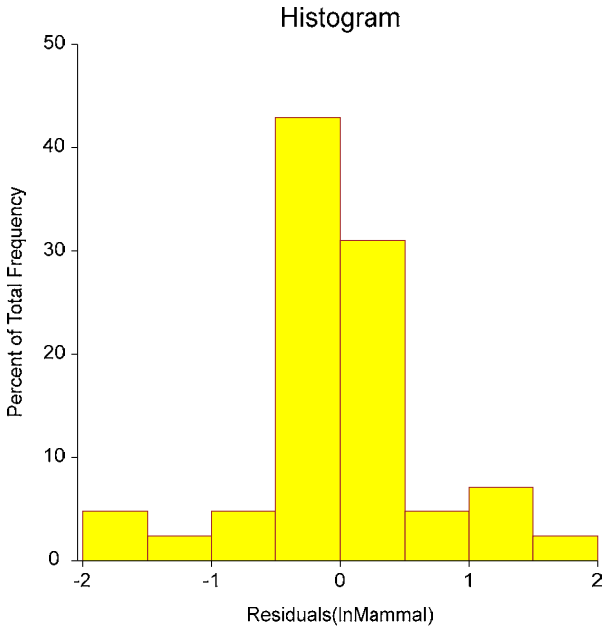
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

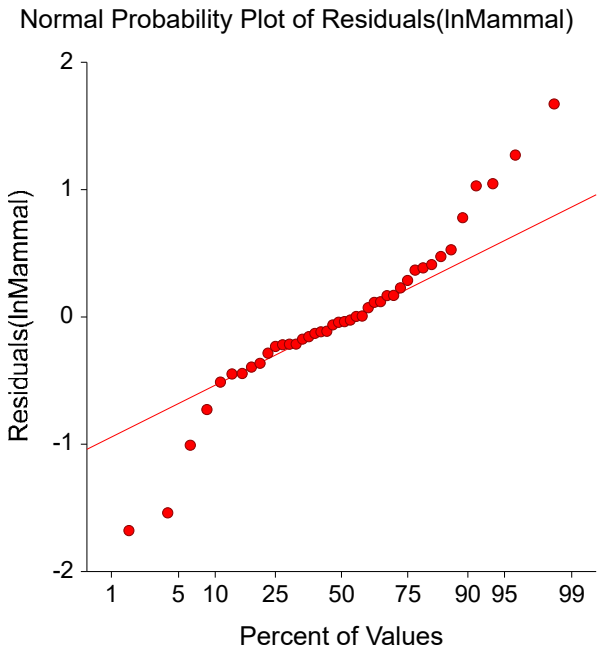
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Original Data Section

Row	lnInvert (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual
10	3.4078	3.3429	3.3796	-0.0368
11	3.0057	3.1384	3.0239	0.1145
12	2.4849	2.3888	2.5633	-0.1745
13	2.2050	2.7007	2.3157	0.3850
14	2.7912	2.8094	2.8342	-0.0248
15	2.4069	0.9555	2.4943	-1.5388
16	0.4762	2.4592	0.7866	1.6726
17	0.8587	0.7308	1.1249	-0.3941
18	0.4187	1.0225	0.7357	0.2867
19	0.6780	0.7467	0.9651	-0.2184
20	1.5041	0.6881	1.6957	-1.0076
21	0.2776	-0.1165	0.6109	-0.7275
22	3.5439	3.4372	3.4999	-0.0627
23	2.1713	2.0541	2.2859	-0.2318
24	3.1987	3.6055	3.1946	0.4109
25	3.2581	3.4144	3.2472	0.1673
26	3.9853	3.6055	3.8904	-0.2849
27	4.1320	3.9782	4.0201	-0.0419
28	3.4689	3.5056	3.4336	0.0720
29	3.9140	3.9964	3.8274	0.1690
30	3.2809	3.1506	3.2674	-0.1168
31	2.7850	2.9481	2.8287	0.1194
32	2.1342	1.8050	2.2531	-0.4481
33	3.3742	3.8774	3.3498	0.5276
34	1.6715	1.3995	1.8438	-0.4443
35	0.8198	1.0942	1.0905	0.0037
36	0.5188	0.6098	0.8242	-0.2145
37	1.2296	1.0886	1.4530	-0.3644
38	1.4839	1.1663	1.6779	-0.5116
39	0.2700	1.0784	0.6042	0.4742
40	1.9573	0.4187	2.0966	-1.6779
41	0.0862	0.3293	0.4416	-0.1123
42	-0.0305	1.3678	0.3384	1.0294
43	0.1044	0.2443	0.4577	-0.2134
44	0.0677	0.2700	0.4252	-0.1552
45	-0.7985	0.4383	-0.3409	0.7792
46	3.0204	3.4045	3.0370	0.3676
47	3.3776	4.6240	3.3529	1.2711
48	2.9232	3.9973	2.9509	1.0464
49	3.3214	3.1739	3.3032	-0.1293
50	2.6101	2.6810	2.6740	0.0070
51	3.4012	3.6019	3.3738	0.2281

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Predicted Values and Confidence Limits of Means

Row	lnInvert (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	3.4078	3.3429	3.3796	0.1402	3.0963	3.6630
11	3.0057	3.1384	3.0239	0.1212	2.7790	3.2688
12	2.4849	2.3888	2.5633	0.1039	2.3532	2.7734
13	2.2050	2.7007	2.3157	0.0995	2.1145	2.5168
14	2.7912	2.8094	2.8342	0.1129	2.6061	3.0623
15	2.4069	0.9555	2.4943	0.1023	2.2875	2.7011
16	0.4762	2.4592	0.7866	0.1509	0.4815	1.0917
17	0.8587	0.7308	1.1249	0.1312	0.8598	1.3899
18	0.4187	1.0225	0.7357	0.1541	0.4242	1.0472
19	0.6780	0.7467	0.9651	0.1402	0.6818	1.2484
20	1.5041	0.6881	1.6957	0.1063	1.4808	1.9106
21	0.2776	-0.1165	0.6109	0.1621	0.2832	0.9386
22	3.5439	3.4372	3.4999	0.1474	3.2021	3.7978
23	2.1713	2.0541	2.2859	0.0993	2.0853	2.4866
24	3.1987	3.6055	3.1946	0.1298	2.9322	3.4570
25	3.2581	3.4144	3.2472	0.1327	2.9790	3.5153
26	3.9853	3.6055	3.8904	0.1726	3.5416	4.2392
27	4.1320	3.9782	4.0201	0.1814	3.6534	4.3868
28	3.4689	3.5056	3.4336	0.1434	3.1438	3.7234
29	3.9140	3.9964	3.8274	0.1683	3.4871	4.1676
30	3.2809	3.1506	3.2674	0.1338	2.9970	3.5378
31	2.7850	2.9481	2.8287	0.1126	2.6011	3.0564
32	2.1342	1.8050	2.2531	0.0991	2.0529	2.4532
33	3.3742	3.8774	3.3498	0.1385	3.0700	3.6297
34	1.6715	1.3995	1.8438	0.1025	1.6367	2.0509
35	0.8198	1.0942	1.0905	0.1330	0.8216	1.3594
36	0.5188	0.6098	0.8242	0.1486	0.5239	1.1246
37	1.2296	1.0886	1.4530	0.1152	1.2201	1.6858
38	1.4839	1.1663	1.6779	0.1069	1.4619	1.8939
39	0.2700	1.0784	0.6042	0.1626	0.2756	0.9328
40	1.9573	0.4187	2.0966	0.0990	1.8965	2.2967
41	0.0862	0.3293	0.4416	0.1734	0.0911	0.7921
42	-0.0305	1.3678	0.3384	0.1805	-0.0263	0.7031
43	0.1044	0.2443	0.4577	0.1723	0.1094	0.8060
44	0.0677	0.2700	0.4252	0.1745	0.0725	0.7779
45	-0.7985	0.4383	-0.3409	0.2293	-0.8044	0.1225
46	3.0204	3.4045	3.0370	0.1218	2.7908	3.2831
47	3.3776	4.6240	3.3529	0.1386	3.0727	3.6331
48	2.9232	3.9973	2.9509	0.1178	2.7128	3.1890
49	3.3214	3.1739	3.3032	0.1358	3.0288	3.5776
50	2.6101	2.6810	2.6740	0.1071	2.4575	2.8905
51	3.4012	3.6019	3.3738	0.1398	3.0911	3.6564

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Predicted Values and Prediction Limits

Row	lnInvert (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	3.4078	3.3429	3.3796	0.6556	2.0545	4.7047
11	3.0057	3.1384	3.0239	0.6518	1.7065	4.3413
12	2.4849	2.3888	2.5633	0.6489	1.2519	3.8747
13	2.2050	2.7007	2.3157	0.6482	1.0057	3.6257
14	2.7912	2.8094	2.8342	0.6503	1.5198	4.1486
15	2.4069	0.9555	2.4943	0.6486	1.1835	3.8052
16	0.4762	2.4592	0.7866	0.6580	-0.5433	2.1165
17	0.8587	0.7308	1.1249	0.6538	-0.1965	2.4462
18	0.4187	1.0225	0.7357	0.6588	-0.5957	2.0671
19	0.6780	0.7467	0.9651	0.6556	-0.3600	2.2902
20	1.5041	0.6881	1.6957	0.6492	0.3836	3.0079
21	0.2776	-0.1165	0.6109	0.6607	-0.7244	1.9462
22	3.5439	3.4372	3.4999	0.6572	2.1717	4.8282
23	2.1713	2.0541	2.2859	0.6481	0.9760	3.5958
24	3.1987	3.6055	3.1946	0.6535	1.8738	4.5154
25	3.2581	3.4144	3.2472	0.6541	1.9252	4.5691
26	3.9853	3.6055	3.8904	0.6633	2.5498	5.2310
27	4.1320	3.9782	4.0201	0.6657	2.6747	5.3655
28	3.4689	3.5056	3.4336	0.6563	2.1071	4.7601
29	3.9140	3.9964	3.8274	0.6622	2.4889	5.1658
30	3.2809	3.1506	3.2674	0.6543	1.9450	4.5898
31	2.7850	2.9481	2.8287	0.6503	1.5144	4.1431
32	2.1342	1.8050	2.2531	0.6481	0.9432	3.5629
33	3.3742	3.8774	3.3498	0.6553	2.0255	4.6742
34	1.6715	1.3995	1.8438	0.6486	0.5329	3.1547
35	0.8198	1.0942	1.0905	0.6542	-0.2316	2.4126
36	0.5188	0.6098	0.8242	0.6575	-0.5046	2.1531
37	1.2296	1.0886	1.4530	0.6508	0.1378	2.7682
38	1.4839	1.1663	1.6779	0.6493	0.3655	2.9902
39	0.2700	1.0784	0.6042	0.6608	-0.7313	1.9397
40	1.9573	0.4187	2.0966	0.6481	0.7868	3.4064
41	0.0862	0.3293	0.4416	0.6635	-0.8995	1.7827
42	-0.0305	1.3678	0.3384	0.6654	-1.0064	1.6833
43	0.1044	0.2443	0.4577	0.6633	-0.8828	1.7982
44	0.0677	0.2700	0.4252	0.6638	-0.9164	1.7669
45	-0.7985	0.4383	-0.3409	0.6803	-1.7158	1.0340
46	3.0204	3.4045	3.0370	0.6520	1.7193	4.3546
47	3.3776	4.6240	3.3529	0.6553	2.0284	4.6773
48	2.9232	3.9973	2.9509	0.6512	1.6348	4.2671
49	3.3214	3.1739	3.3032	0.6547	1.9800	4.6264
50	2.6101	2.6810	2.6740	0.6494	1.3616	3.9864
51	3.4012	3.6019	3.3738	0.6556	2.0488	4.6987

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Working-Hotelling Simultaneous Confidence Band

Row	lnInvert (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	3.4078	3.3429	3.3796	0.1402	2.9806	3.7786
11	3.0057	3.1384	3.0239	0.1212	2.6790	3.3689
12	2.4849	2.3888	2.5633	0.1039	2.2674	2.8591
13	2.2050	2.7007	2.3157	0.0995	2.0324	2.5990
14	2.7912	2.8094	2.8342	0.1129	2.5129	3.1554
15	2.4069	0.9555	2.4943	0.1023	2.2031	2.7856
16	0.4762	2.4592	0.7866	0.1509	0.3570	1.2162
17	0.8587	0.7308	1.1249	0.1312	0.7515	1.4982
18	0.4187	1.0225	0.7357	0.1541	0.2970	1.1744
19	0.6780	0.7467	0.9651	0.1402	0.5661	1.3640
20	1.5041	0.6881	1.6957	0.1063	1.3931	1.9984
21	0.2776	-0.1165	0.6109	0.1621	0.1494	1.0725
22	3.5439	3.4372	3.4999	0.1474	3.0805	3.9194
23	2.1713	2.0541	2.2859	0.0993	2.0034	2.5685
24	3.1987	3.6055	3.1946	0.1298	2.8251	3.5642
25	3.2581	3.4144	3.2472	0.1327	2.8695	3.6248
26	3.9853	3.6055	3.8904	0.1726	3.3992	4.3816
27	4.1320	3.9782	4.0201	0.1814	3.5037	4.5366
28	3.4689	3.5056	3.4336	0.1434	3.0255	3.8417
29	3.9140	3.9964	3.8274	0.1683	3.3482	4.3065
30	3.2809	3.1506	3.2674	0.1338	2.8866	3.6482
31	2.7850	2.9481	2.8287	0.1126	2.5081	3.1494
32	2.1342	1.8050	2.2531	0.0991	1.9711	2.5350
33	3.3742	3.8774	3.3498	0.1385	2.9558	3.7439
34	1.6715	1.3995	1.8438	0.1025	1.5522	2.1354
35	0.8198	1.0942	1.0905	0.1330	0.7118	1.4692
36	0.5188	0.6098	0.8242	0.1486	0.4012	1.2472
37	1.2296	1.0886	1.4530	0.1152	1.1251	1.7809
38	1.4839	1.1663	1.6779	0.1069	1.3736	1.9821
39	0.2700	1.0784	0.6042	0.1626	0.1414	1.0670
40	1.9573	0.4187	2.0966	0.0990	1.8147	2.3785
41	0.0862	0.3293	0.4416	0.1734	-0.0520	0.9352
42	-0.0305	1.3678	0.3384	0.1805	-0.1752	0.8521
43	0.1044	0.2443	0.4577	0.1723	-0.0328	0.9482
44	0.0677	0.2700	0.4252	0.1745	-0.0715	0.9220
45	-0.7985	0.4383	-0.3409	0.2293	-0.9936	0.3118
46	3.0204	3.4045	3.0370	0.1218	2.6902	3.3837
47	3.3776	4.6240	3.3529	0.1386	2.9583	3.7475
48	2.9232	3.9973	2.9509	0.1178	2.6156	3.2863
49	3.3214	3.1739	3.3032	0.1358	2.9167	3.6897
50	2.6101	2.6810	2.6740	0.1071	2.3691	2.9789
51	3.4012	3.6019	3.3738	0.1398	2.9757	3.7718

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Residual Section

Row	lnInvert (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	3.4078	3.3429	3.3796	-0.0368	-0.0588	1.1000
11	3.0057	3.1384	3.0239	0.1145	0.1820	3.6474
12	2.4849	2.3888	2.5633	-0.1745	-0.2762	7.3061
13	2.2050	2.7007	2.3157	0.3850	0.6085	14.2558
14	2.7912	2.8094	2.8342	-0.0248	-0.0393	0.8818
15	2.4069	0.9555	2.4943	-1.5388	-2.4339	161.0467
16	0.4762	2.4592	0.7866	1.6726	2.6871	68.0135
17	0.8587	0.7308	1.1249	-0.3941	-0.6286	53.9294
18	0.4187	1.0225	0.7357	0.2867	0.4612	28.0435
19	0.6780	0.7467	0.9651	-0.2184	-0.3495	29.2499
20	1.5041	0.6881	1.6957	-1.0076	-1.5953	146.4251
21	0.2776	-0.1165	0.6109	-0.7275	-1.1741	624.2548
22	3.5439	3.4372	3.4999	-0.0627	-0.1006	1.8250
23	2.1713	2.0541	2.2859	-0.2318	-0.3664	11.2851
24	3.1987	3.6055	3.1946	0.4109	0.6551	11.3958
25	3.2581	3.4144	3.2472	0.1673	0.2669	4.8986
26	3.9853	3.6055	3.8904	-0.2849	-0.4619	7.9012
27	4.1320	3.9782	4.0201	-0.0419	-0.0682	1.0526
28	3.4689	3.5056	3.4336	0.0720	0.1153	2.0526
29	3.9140	3.9964	3.8274	0.1690	0.2735	4.2291
30	3.2809	3.1506	3.2674	-0.1168	-0.1864	3.7061
31	2.7850	2.9481	2.8287	0.1194	0.1893	4.0494
32	2.1342	1.8050	2.2531	-0.4481	-0.7081	24.8227
33	3.3742	3.8774	3.3498	0.5276	0.8437	13.6065
34	1.6715	1.3995	1.8438	-0.4443	-0.7027	31.7433
35	0.8198	1.0942	1.0905	0.0037	0.0059	0.3371
36	0.5188	0.6098	0.8242	-0.2145	-0.3443	35.1739
37	1.2296	1.0886	1.4530	-0.3644	-0.5784	33.4784
38	1.4839	1.1663	1.6779	-0.5116	-0.8101	43.8660
39	0.2700	1.0784	0.6042	0.4742	0.7655	43.9723
40	1.9573	0.4187	2.0966	-1.6779	-2.6516	400.7263
41	0.0862	0.3293	0.4416	-0.1123	-0.1821	34.0985
42	-0.0305	1.3678	0.3384	1.0294	1.6750	75.2576
43	0.1044	0.2443	0.4577	-0.2134	-0.3460	87.3773
44	0.0677	0.2700	0.4252	-0.1552	-0.2518	57.4697
45	-0.7985	0.4383	-0.3409	0.7792	1.3029	177.7906
46	3.0204	3.4045	3.0370	0.3676	0.5846	10.7964
47	3.3776	4.6240	3.3529	1.2711	2.0328	27.4896
48	2.9232	3.9973	2.9509	1.0464	1.6621	26.1766
49	3.3214	3.1739	3.3032	-0.1293	-0.2066	4.0747
50	2.6101	2.6810	2.6740	0.0070	0.0111	0.2620
51	3.4012	3.6019	3.3738	0.2281	0.3650	6.3332

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Residual Diagnostics Section

Row	lnInvert (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	3.4078	-0.0368	-0.0581	0.0479	0.0001	0.4207
11	3.0057	0.1145	0.1798	0.0358	0.0006	0.4204
12	2.4849	-0.1745	-0.2729	0.0263	0.0010	0.4199
13	2.2050	0.3850	0.6037	0.0241	0.0046	0.4168
14	2.7912	-0.0248	-0.0388	0.0311	0.0000	0.4207
15	2.4069	-1.5388	*-2.6038	0.0255	0.0776	0.3584
16	0.4762	1.6726	*2.9310	0.0555	0.2123	0.3448
17	0.8587	-0.3941	-0.6238	0.0419	0.0086	0.4166
18	0.4187	0.2867	0.4567	0.0579	0.0065	0.4185
19	0.6780	-0.2184	-0.3456	0.0479	0.0031	0.4194
20	1.5041	-1.0076	-1.6279	0.0276	0.0361	0.3940
21	0.2776	-0.7275	-1.1798	0.0641	0.0472	0.4062
22	3.5439	-0.0627	-0.0994	0.0529	0.0003	0.4206
23	2.1713	-0.2318	-0.3624	0.0240	0.0017	0.4193
24	3.1987	0.4109	0.6504	0.0411	0.0092	0.4162
25	3.2581	0.1673	0.2638	0.0429	0.0016	0.4200
26	3.9853	-0.2849	-0.4573	0.0726	0.0083	0.4185
27	4.1320	-0.0419	-0.0673	0.0802	0.0002	0.4207
28	3.4689	0.0720	0.1138	0.0501	0.0004	0.4206
29	3.9140	0.1690	0.2703	0.0691	0.0028	0.4199
30	3.2809	-0.1168	-0.1842	0.0436	0.0008	0.4204
31	2.7850	0.1194	0.1870	0.0309	0.0006	0.4204
32	2.1342	-0.4481	-0.7036	0.0239	0.0061	0.4155
33	3.3742	0.5276	0.8406	0.0467	0.0174	0.4132
34	1.6715	-0.4443	-0.6982	0.0256	0.0065	0.4155
35	0.8198	0.0037	0.0058	0.0431	0.0000	0.4207
36	0.5188	-0.2145	-0.3404	0.0538	0.0034	0.4195
37	1.2296	-0.3644	-0.5736	0.0324	0.0056	0.4172
38	1.4839	-0.5116	-0.8066	0.0278	0.0094	0.4138
39	0.2700	0.4742	0.7614	0.0644	0.0202	0.4146
40	1.9573	-1.6779	*-2.8840	0.0239	0.0861	0.3468
41	0.0862	-0.1123	-0.1799	0.0733	0.0013	0.4204
42	-0.0305	1.0294	1.7152	0.0794	0.1210	0.3912
43	0.1044	-0.2134	-0.3421	0.0724	0.0047	0.4195
44	0.0677	-0.1552	-0.2489	0.0742	0.0025	0.4201
45	-0.7985	0.7792	*1.3147	0.1282	0.1248	0.4029
46	3.0204	0.3676	0.5797	0.0362	0.0064	0.4171
47	3.3776	1.2711	*2.1197	0.0468	0.1016	0.3773
48	2.9232	1.0464	1.7009	0.0338	0.0484	0.3917
49	3.3214	-0.1293	-0.2041	0.0450	0.0010	0.4203
50	2.6101	0.0070	0.0110	0.0280	0.0000	0.4207
51	3.4012	0.2281	0.3610	0.0477	0.0033	0.4193

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.0581	-0.0130	0.0001	1.1047	0.0026	-0.0092
11	0.1798	0.0346	0.0006	1.0892	-0.0011	0.0200
12	-0.2729	-0.0449	0.0010	1.0763	-0.0120	-0.0139
13	0.6037	0.0950	0.0046	1.0581	0.0428	0.0113
14	-0.0388	-0.0069	0.0000	1.0856	-0.0006	-0.0034
15	* -2.6038	-0.4214	0.0776	0.7834	-0.1342	-0.1092
16	* 2.9310	0.7108	0.2123	0.7480	0.7050	-0.5372
17	-0.6238	-0.1305	0.0086	1.0764	-0.1259	0.0858
18	0.4567	0.1132	0.0065	1.1048	0.1125	-0.0869
19	-0.3456	-0.0775	0.0031	1.0981	-0.0760	0.0550
20	-1.6279	-0.2741	0.0361	0.9485	-0.2252	0.1011
21	-1.1798	-0.3087	0.0472	1.0478	-0.3080	0.2448
22	-0.0994	-0.0235	0.0003	1.1102	0.0058	-0.0174
23	-0.3624	-0.0569	0.0017	1.0706	-0.0268	-0.0054
24	0.6504	0.1346	0.0092	1.0736	-0.0160	0.0873
25	0.2638	0.0559	0.0016	1.0952	-0.0080	0.0373
26	-0.4573	-0.1279	0.0083	1.1222	0.0468	-0.1049
27	-0.0673	-0.0199	0.0002	* 1.1435	0.0079	-0.0167
28	0.1138	0.0261	0.0004	1.1067	-0.0058	0.0189
29	0.2703	0.0736	0.0028	1.1258	-0.0257	0.0596
30	-0.1842	-0.0393	0.0008	1.0980	0.0060	-0.0265
31	0.1870	0.0334	0.0006	1.0836	0.0029	0.0160
32	-0.7036	-0.1101	0.0061	1.0509	-0.0546	-0.0074
33	0.8406	0.1861	0.0174	1.0646	-0.0351	0.1303
34	-0.6982	-0.1131	0.0065	1.0531	-0.0853	0.0299
35	0.0058	0.0012	0.0000	1.0994	0.0012	-0.0008
36	-0.3404	-0.0812	0.0034	1.1052	-0.0804	0.0606
37	-0.5736	-0.1049	0.0056	1.0690	-0.0947	0.0539
38	-0.8066	-0.1365	0.0094	1.0469	-0.1131	0.0520
39	0.7614	0.1998	0.0202	1.0917	0.1994	-0.1587
40	* -2.8840	-0.4513	0.0861	0.7321	-0.2729	0.0284
41	-0.1799	-0.0506	0.0013	1.1333	-0.0506	0.0416
42	1.7152	0.5037	0.1210	0.9880	0.5037	-0.4214
43	-0.3421	-0.0956	0.0047	1.1273	-0.0956	0.0783
44	-0.2489	-0.0705	0.0025	1.1327	-0.0705	0.0581
45	1.3147	0.5041	0.1248	1.1064	0.4992	-0.4549
46	0.5797	0.1123	0.0064	1.0728	-0.0043	0.0656
47	* 2.1197	0.4699	0.1016	0.8874	-0.0891	0.3296
48	1.7009	0.3183	0.0484	0.9436	0.0034	0.1732
49	-0.2041	-0.0443	0.0010	1.0991	0.0075	-0.0304
50	0.0110	0.0019	0.0000	1.0822	0.0004	0.0007
51	0.3610	0.0808	0.0033	1.0973	-0.0160	0.0571

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Outlier Detection Chart

Row	lnInvert (X)	Residual		Standardized Residual		RStudent	
10	3.4078	-0.0368	|.....	-0.0588	|.....	-0.0581	|.....
11	3.0057	0.1145	|.....	0.1820	|.....	0.1798	|.....
12	2.4849	-0.1745	|.....	-0.2762	|.....	-0.2729	|.....
13	2.2050	0.3850	|||.....	0.6085	|||.....	0.6037	|||.....
14	2.7912	-0.0248	|.....	-0.0393	|.....	-0.0388	|.....
15	2.4069	-1.5388	||||||||||||..	-2.4339	||||||||||||..	* -2.6038	||||||||||||..
16	0.4762	1.6726	||||||||||||.	2.6871	|||||||||||||	* 2.9310	|||||||||||||
17	0.8587	-0.3941	|||.....	-0.6286	|||.....	-0.6238	|||.....
18	0.4187	0.2867	||.....	0.4612	||.....	0.4567	||.....
19	0.6780	-0.2184	|.....	-0.3495	|.....	-0.3456	|.....
20	1.5041	-1.0076	|||||||.....	-1.5953	|||||||.....	-1.6279	|||||||.....
21	0.2776	-0.7275	||||||.....	-1.1741	||||||.....	-1.1798	||||||.....
22	3.5439	-0.0627	|.....	-0.1006	|.....	-0.0994	|.....
23	2.1713	-0.2318	||.....	-0.3664	||.....	-0.3624	|.....
24	3.1987	0.4109	|||.....	0.6551	|||.....	0.6504	|||.....
25	3.2581	0.1673	|.....	0.2669	|.....	0.2638	|.....
26	3.9853	-0.2849	||.....	-0.4619	||.....	-0.4573	||.....
27	4.1320	-0.0419	|.....	-0.0682	|.....	-0.0673	|.....
28	3.4689	0.0720	|.....	0.1153	|.....	0.1138	|.....
29	3.9140	0.1690	|.....	0.2735	|.....	0.2703	|.....
30	3.2809	-0.1168	|.....	-0.1864	|.....	-0.1842	|.....
31	2.7850	0.1194	|.....	0.1893	|.....	0.1870	|.....
32	2.1342	-0.4481	|||.....	-0.7081	|||.....	-0.7036	|||.....
33	3.3742	0.5276	||||.....	0.8437	||||.....	0.8406	||||.....
34	1.6715	-0.4443	|||.....	-0.7027	|||.....	-0.6982	|||.....
35	0.8198	0.0037	|.....	0.0059	|.....	0.0058	|.....
36	0.5188	-0.2145	|.....	-0.3443	|.....	-0.3404	|.....
37	1.2296	-0.3644	|||.....	-0.5784	|||.....	-0.5736	||.....
38	1.4839	-0.5116	||||.....	-0.8101	||||.....	-0.8066	||||.....
39	0.2700	0.4742	||||.....	0.7655	||||.....	0.7614	|||.....
40	1.9573	-1.6779	|||||||||||||	-2.6516	||||||||||||.	* -2.8840	||||||||||||.
41	0.0862	-0.1123	|.....	-0.1821	|.....	-0.1799	|.....
42	-0.0305	1.0294	||||||||.....	1.6750	||||||||.....	1.7152	|||||||.....
43	0.1044	-0.2134	|.....	-0.3460	|.....	-0.3421	|.....
44	0.0677	-0.1552	|.....	-0.2518	|.....	-0.2489	|.....
45	-0.7985	0.7792	||||||.....	1.3029	||||||.....	1.3147	|||||.....
46	3.0204	0.3676	|||.....	0.5846	|||.....	0.5797	||.....
47	3.3776	1.2711	||||||||||....	2.0328	||||||||||....	* 2.1197	|||||||||.....
48	2.9232	1.0464	||||||||.....	1.6621	||||||||.....	1.7009	|||||||.....
49	3.3214	-0.1293	|.....	-0.2066	|.....	-0.2041	|.....
50	2.6101	0.0070	|.....	0.0111	|.....	0.0110	|.....
51	3.4012	0.2281	||.....	0.3650	||.....	0.3610	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Influence Detection Chart

Row	lnInvert (X)	DFFITS		Cook's D		DFBETAS(1)	
10	3.4078	-0.0130	|.....	0.0001	|.....	-0.0092	|.....
11	3.0057	0.0346	|.....	0.0006	|.....	0.0200	|.....
12	2.4849	-0.0449	|.....	0.0010	|.....	-0.0139	|.....
13	2.2050	0.0950	|.....	0.0046	|.....	0.0113	|.....
14	2.7912	-0.0069	|.....	0.0000	|.....	-0.0034	|.....
15	2.4069	-0.4214	|||||||.....	0.0776	|||||.....	-0.1092	|||.....
16	0.4762	0.7108	||||||||||||||	0.2123	||||||||||||||	-0.5372	||||||||||||||
17	0.8587	-0.1305	||.....	0.0086	|.....	0.0858	||.....
18	0.4187	0.1132	||.....	0.0065	|.....	-0.0869	||.....
19	0.6780	-0.0775	|.....	0.0031	|.....	0.0550	|.....
20	1.5041	-0.2741	|||||.....	0.0361	||.....	0.1011	||.....
21	0.2776	-0.3087	||||||.....	0.0472	|||.....	0.2448	||||||.....
22	3.5439	-0.0235	|.....	0.0003	|.....	-0.0174	|.....
23	2.1713	-0.0569	|.....	0.0017	|.....	-0.0054	|.....
24	3.1987	0.1346	||.....	0.0092	|.....	0.0873	||.....
25	3.2581	0.0559	|.....	0.0016	|.....	0.0373	|.....
26	3.9853	-0.1279	||.....	0.0083	|.....	-0.1049	||.....
27	4.1320	-0.0199	|.....	0.0002	|.....	-0.0167	|.....
28	3.4689	0.0261	|.....	0.0004	|.....	0.0189	|.....
29	3.9140	0.0736	|.....	0.0028	|.....	0.0596	|.....
30	3.2809	-0.0393	|.....	0.0008	|.....	-0.0265	|.....
31	2.7850	0.0334	|.....	0.0006	|.....	0.0160	|.....
32	2.1342	-0.1101	||.....	0.0061	|.....	-0.0074	|.....
33	3.3742	0.1861	|||.....	0.0174	|.....	0.1303	|||.....
34	1.6715	-0.1131	||.....	0.0065	|.....	0.0299	|.....
35	0.8198	0.0012	|.....	0.0000	|.....	-0.0008	|.....
36	0.5188	-0.0812	|.....	0.0034	|.....	0.0606	|.....
37	1.2296	-0.1049	||.....	0.0056	|.....	0.0539	|.....
38	1.4839	-0.1365	||.....	0.0094	|.....	0.0520	|.....
39	0.2700	0.1998	||||.....	0.0202	|.....	-0.1587	||||.....
40	1.9573	-0.4513	||||||||.....	0.0861	|||||.....	0.0284	|.....
41	0.0862	-0.0506	|.....	0.0013	|.....	0.0416	|.....
42	-0.0305	0.5037	|||||||||.....	0.1210	|||||||.....	-0.4214	||||||||||....
43	0.1044	-0.0956	|.....	0.0047	|.....	0.0783	||.....
44	0.0677	-0.0705	|.....	0.0025	|.....	0.0581	|.....
45	-0.7985	0.5041	|||||||||.....	0.1248	|||||||.....	-0.4549	||||||||||...
46	3.0204	0.1123	||.....	0.0064	|.....	0.0656	|.....
47	3.3776	0.4699	|||||||||.....	0.1016	||||||.....	0.3296	||||||||.....
48	2.9232	0.3183	||||||.....	0.0484	|||.....	0.1732	||||.....
49	3.3214	-0.0443	|.....	0.0010	|.....	-0.0304	|.....
50	2.6101	0.0019	|.....	0.0000	|.....	0.0007	|.....
51	3.4012	0.0808	|.....	0.0033	|.....	0.0571	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Outlier & Influence Chart

Row	lnInvert (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	3.4078	-0.0581	|.....	0.0001	|.....	0.0479	|||.....
11	3.0057	0.1798	|.....	0.0006	|.....	0.0358	|.....
12	2.4849	-0.2729	|.....	0.0010	|.....	0.0263	|.....
13	2.2050	0.6037	|||.....	0.0046	|.....	0.0241	|.....
14	2.7912	-0.0388	|.....	0.0000	|.....	0.0311	|.....
15	2.4069	* -2.6038	|||||||||||..	0.0776	|||||.....	0.0255	|.....
16	0.4762	* 2.9310	|||||||||||||	0.2123	|||||||||||||	0.0555	||||.....
17	0.8587	-0.6238	|||.....	0.0086	|.....	0.0419	||.....
18	0.4187	0.4567	||.....	0.0065	|.....	0.0579	||||.....
19	0.6780	-0.3456	|.....	0.0031	|.....	0.0479	|||.....
20	1.5041	-1.6279	|||||||.....	0.0361	||.....	0.0276	|.....
21	0.2776	-1.1798	||||||.....	0.0472	|||.....	0.0641	|||||.....
22	3.5439	-0.0994	|.....	0.0003	|.....	0.0529	||||.....
23	2.1713	-0.3624	|.....	0.0017	|.....	0.0240	|.....
24	3.1987	0.6504	|||.....	0.0092	|.....	0.0411	||.....
25	3.2581	0.2638	|.....	0.0016	|.....	0.0429	||.....
26	3.9853	-0.4573	||.....	0.0083	|.....	0.0726	|||||||.....
27	4.1320	-0.0673	|.....	0.0002	|.....	0.0802	|||||||.....
28	3.4689	0.1138	|.....	0.0004	|.....	0.0501	|||.....
29	3.9140	0.2703	|.....	0.0028	|.....	0.0691	|||||.....
30	3.2809	-0.1842	|.....	0.0008	|.....	0.0436	||.....
31	2.7850	0.1870	|.....	0.0006	|.....	0.0309	|.....
32	2.1342	-0.7036	|||.....	0.0061	|.....	0.0239	|.....
33	3.3742	0.8406	||||.....	0.0174	|.....	0.0467	|||.....
34	1.6715	-0.6982	|||.....	0.0065	|.....	0.0256	|.....
35	0.8198	0.0058	|.....	0.0000	|.....	0.0431	||.....
36	0.5188	-0.3404	|.....	0.0034	|.....	0.0538	||||.....
37	1.2296	-0.5736	||.....	0.0056	|.....	0.0324	|.....
38	1.4839	-0.8066	||||.....	0.0094	|.....	0.0278	|.....
39	0.2700	0.7614	|||.....	0.0202	|.....	0.0644	|||||.....
40	1.9573	* -2.8840	||||||||||||.	0.0861	|||||.....	0.0239	|.....
41	0.0862	-0.1799	|.....	0.0013	|.....	0.0733	||||||.....
42	-0.0305	1.7152	|||||||.....	0.1210	|||||||.....	0.0794	||||||.....
43	0.1044	-0.3421	|.....	0.0047	|.....	0.0724	|||||.....
44	0.0677	-0.2489	|.....	0.0025	|.....	0.0742	||||||.....
45	-0.7985	1.3147	|||||.....	0.1248	|||||||.....	0.1282	||||||||||||
46	3.0204	0.5797	||.....	0.0064	|.....	0.0362	|.....
47	3.3776	* 2.1197	|||||||||.....	0.1016	||||||.....	0.0468	|||.....
48	2.9232	1.7009	|||||||.....	0.0484	|||.....	0.0338	|.....
49	3.3214	-0.2041	|.....	0.0010	|.....	0.0450	|||.....
50	2.6101	0.0110	|.....	0.0000	|.....	0.0280	|.....
51	3.4012	0.3610	|.....	0.0033	|.....	0.0477	|||.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Inverse Prediction of X Means

Row	lnMammal (Y)	lnInvert (X)	Predicted lnInvert (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	3.3429	3.4078	3.3663	0.0416	3.0818	3.7261
11	3.1384	3.0057	3.1351	-0.1294	2.8706	3.4618
12	2.3888	2.4849	2.2876	0.1973	2.0618	2.5274
13	2.7007	2.2050	2.6402	-0.4353	2.4065	2.9081
14	2.8094	2.7912	2.7632	0.0280	2.5236	3.0438
15	0.9555	2.4069	0.6672	1.7397	0.2996	0.9565
16	2.4592	0.4762	2.3672	-1.8909	2.1408	2.6121
17	0.7308	0.8587	0.4131	0.4456	0.0058	0.7276
18	1.0225	0.4187	0.7429	-0.3242	0.3866	1.0251
19	0.7467	0.6780	0.4311	0.2469	0.0267	0.7437
20	0.6881	1.5041	0.3649	1.1392	-0.0502	0.6844
21	-0.1165	0.2776	-0.5448	0.8225	-1.1171	-0.1199
22	3.4372	3.5439	3.4729	0.0709	3.1785	3.8489
23	2.0541	2.1713	1.9093	0.2621	1.6753	2.1356
24	3.6055	3.1987	3.6632	-0.4645	3.3497	4.0690
25	3.4144	3.2581	3.4472	-0.1891	3.1552	3.8192
26	3.6055	3.9853	3.6632	0.3221	3.3497	4.0690
27	3.9782	4.1320	4.0846	0.0473	3.7250	4.5606
28	3.5056	3.4689	3.5502	-0.0814	3.2482	3.9381
29	3.9964	3.9140	4.1051	-0.1911	3.7431	4.5846
30	3.1506	3.2809	3.1489	0.1320	2.8833	3.4775
31	2.9481	2.7850	2.9200	-0.1350	2.6711	3.2188
32	1.8050	2.1342	1.6276	0.5066	1.3760	1.8556
33	3.8774	3.3742	3.9706	-0.5965	3.6239	4.4272
34	1.3995	1.6715	1.1692	0.5023	0.8708	1.4178
35	1.0942	0.8198	0.8240	-0.0042	0.4795	1.0990
36	0.6098	0.5188	0.2763	0.2425	-0.1533	0.6053
37	1.0886	1.2296	0.8176	0.4120	0.4722	1.0932
38	1.1663	1.4839	0.9055	0.5784	0.5725	1.1736
39	1.0784	0.2700	0.8061	-0.5361	0.4591	1.0828
40	0.4187	1.9573	0.0603	1.8970	-0.4055	0.4132
41	0.3293	0.0862	-0.0408	0.1269	-0.5239	0.3237
42	1.3678	-0.0305	1.1333	-1.1638	0.8305	1.3843
43	0.2443	0.1044	-0.1369	0.2413	-0.6367	0.2387
44	0.2700	0.0677	-0.1078	0.1754	-0.6025	0.2645
45	0.4383	-0.7985	0.0824	-0.8809	-0.3796	0.4328
46	3.4045	3.0204	3.4360	-0.4156	3.1450	3.8063
47	4.6240	3.3776	4.8147	-1.4371	4.3668	5.4204
48	3.9973	2.9232	4.1061	-1.1830	3.7440	4.5858
49	3.1739	3.3214	3.1752	0.1462	2.9075	3.5075
50	2.6810	2.6101	2.6180	-0.0079	2.3851	2.8837
51	3.6019	3.4012	3.6591	-0.2579	3.3460	4.0643

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnInvert

Inverse Prediction of X Individuals

Row	lnMammal (Y)	lnInvert (X)	Predicted lnInvert (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	3.3429	3.4078	3.3663	0.0416	1.8852	4.9227
11	3.1384	3.0057	3.1351	-0.1294	1.6529	4.6795
12	2.3888	2.4849	2.2876	0.1973	0.7922	3.7969
13	2.7007	2.2050	2.6402	-0.4353	1.1521	4.1625
14	2.8094	2.7912	2.7632	0.0280	1.2769	4.2905
15	0.9555	2.4069	0.6672	1.7397	-0.8921	2.1481
16	2.4592	0.4762	2.3672	-1.8909	0.8737	3.8792
17	0.7308	0.8587	0.4131	0.4456	-1.1607	1.8941
18	1.0225	0.4187	0.7429	-0.3242	-0.8123	2.2240
19	0.7467	0.6780	0.4311	0.2469	-1.1416	1.9121
20	0.6881	1.5041	0.3649	1.1392	-1.2118	1.8461
21	-0.1165	0.2776	-0.5448	0.8225	-2.1842	0.9472
22	3.4372	3.5439	3.4729	0.0709	1.9921	5.0352
23	2.0541	2.1713	1.9093	0.2621	0.4036	3.4074
24	3.6055	3.1987	3.6632	-0.4645	2.1822	5.2365
25	3.4144	3.2581	3.4472	-0.1891	1.9663	5.0080
26	3.6055	3.9853	3.6632	0.3221	2.1822	5.2365
27	3.9782	4.1320	4.0846	0.0473	2.6009	5.6846
28	3.5056	3.4689	3.5502	-0.0814	2.0694	5.1169
29	3.9964	3.9140	4.1051	-0.1911	2.6212	5.7065
30	3.1506	3.2809	3.1489	0.1320	1.6668	4.6940
31	2.9481	2.7850	2.9200	-0.1350	1.4357	4.4542
32	1.8050	2.1342	1.6276	0.5066	0.1124	3.1192
33	3.8774	3.3742	3.9706	-0.5965	2.4880	5.5631
34	1.3995	1.6715	1.1692	0.5023	-0.3648	2.6535
35	1.0942	0.8198	0.8240	-0.0042	-0.7269	2.3054
36	0.6098	0.5188	0.2763	0.2425	-1.3059	1.7579
37	1.0886	1.2296	0.8176	0.4120	-0.7336	2.2990
38	1.1663	1.4839	0.9055	0.5784	-0.6412	2.3874
39	1.0784	0.2700	0.8061	-0.5361	-0.7456	2.2875
40	0.4187	1.9573	0.0603	1.8970	-1.5357	1.5434
41	0.3293	0.0862	-0.0408	0.1269	-1.6436	1.4434
42	1.3678	-0.0305	1.1333	-1.1638	-0.4024	2.6172
43	0.2443	0.1044	-0.1369	0.2413	-1.7464	1.3484
44	0.2700	0.0677	-0.1078	0.1754	-1.7152	1.3771
45	0.4383	-0.7985	0.0824	-0.8809	-1.5122	1.5653
46	3.4045	3.0204	3.4360	-0.4156	1.9551	4.9962
47	4.6240	3.3776	4.8147	-1.4371	3.3187	6.4685
48	3.9973	2.9232	4.1061	-1.1830	2.6222	5.7076
49	3.1739	3.3214	3.1752	0.1462	1.6933	4.7217
50	2.6810	2.6101	2.6180	-0.0079	1.1294	4.1394
51	3.6019	3.4012	3.6591	-0.2579	2.1781	5.2321

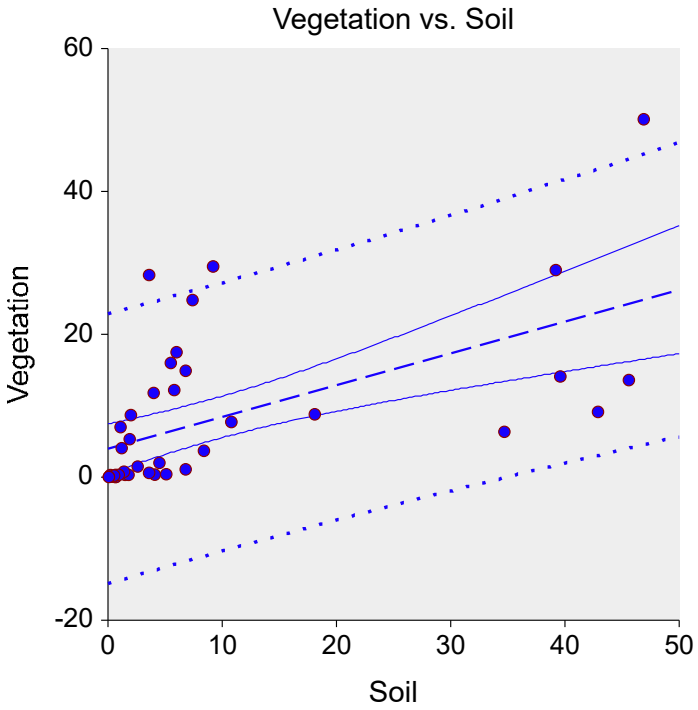
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Soil to Tissue Linear Regressions
No Transformation – APL10 Excluded

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Vegetation	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	3.9966	Rows Prediction Only	0
Slope	0.4457	Sum of Frequencies	41
R-Squared	0.3245	Sum of Weights	41.0000
Correlation	0.5697	Coefficient of Variation	1.1336
Mean Square Error	84.20187	Square Root of MSE	9.176158

Linear Regression Report

Y = Vegetation X = Soil

Summary Statement

The equation of the straight line relating Vegetation and Soil is estimated as: Vegetation = (3.9966) + (0.4457) Soil using the 41 observations in this dataset. The y-intercept, the estimated value of Vegetation when Soil is zero, is 3.9966 with a standard error of 1.7176. The slope, the estimated change in Vegetation per unit change in Soil, is 0.4457 with a standard error of 0.1030. The value of R-Squared, the proportion of the variation in Vegetation that can be accounted for by variation in Soil, is 0.3245. The correlation between Vegetation and Soil is 0.5697.

A significance test that the slope is zero resulted in a t-value of 4.3288. The significance level of this t-test is 0.0001. Since 0.0001 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.4457. The lower limit of the 95% confidence interval for the slope is 0.2375 and the upper limit is 0.6540. The estimated intercept is 3.9966. The lower limit of the 95% confidence interval for the intercept is 0.5225 and the upper limit is 7.4707.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Vegetation	Soil
Count	41	41
Mean	8.0949	9.1944
Standard Deviation	11.0246	14.0901
Minimum	0.0300	0.0730
Maximum	50.1000	46.9000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	3.9966	0.4457
Lower 95% Confidence Limit	0.5225	0.2375
Upper 95% Confidence Limit	7.4707	0.6540
Standard Error	1.7176	0.1030
Standardized Coefficient	0.0000	0.5697
T Value	2.3269	4.3288
Prob Level (T Test)	0.0253	0.0001
Prob Level (Randomization Test N =1000)		0.0030
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.6215	0.9881
Regression of Y on X	3.9966	0.4457
Inverse Regression from X on Y	-4.5332	1.3735
Orthogonal Regression of Y and X	2.0678	0.6555

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(3.99657676301078) + (0.44573932333225) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	3.9966	0.9000	1.4657	6.1541
Bootstrap Mean	4.0460	0.9500	0.9851	6.4960
Bias (BM - OV)	0.0494	0.9900	-0.0970	7.1531
Bias Corrected	3.9471			
Standard Error	1.4214			
Slope				
Original Value	0.4457	0.9000	0.1592	0.6881
Bootstrap Mean	0.4446	0.9500	0.1000	0.7107
Bias (BM - OV)	-0.0011	0.9900	-0.0933	0.7573
Bias Corrected	0.4469			
Standard Error	0.1638			
Correlation				
Original Value	0.5697	0.9000	0.3788	0.8323
Bootstrap Mean	0.5548	0.9500	0.3471	0.8837
Bias (BM - OV)	-0.0149	0.9900	0.2867	0.9467
Bias Corrected	0.5846			
Standard Error	0.1380			
R-Squared				
Original Value	0.3245	0.9000	0.0706	0.5548
Bootstrap Mean	0.3268	0.9500	0.0214	0.5837
Bias (BM - OV)	0.0023	0.9900	0.0000	0.6119
Bias Corrected	0.3222			
Standard Error	0.1483			
Standard Error of Estimate				
Original Value	9.1762	0.9000	7.5295	12.0055
Bootstrap Mean	8.6805	0.9500	7.2085	12.5424
Bias (BM - OV)	-0.4957	0.9900	6.5290	13.7257
Bias Corrected	9.6718			
Standard Error	1.3613			
Orthogonal Intercept				
Original Value	2.0678	0.9000	-0.5738	4.0871
Bootstrap Mean	2.1724	0.9500	-1.0539	4.4571
Bias (BM - OV)	0.1046	0.9900	-2.1255	6.0485
Bias Corrected	1.9632			
Standard Error	1.4859			
Orthogonal Slope				
Original Value	0.6555	0.9000	0.2223	1.0115
Bootstrap Mean	0.6679	0.9500	0.0939	1.0588
Bias (BM - OV)	0.0124	0.9900	-0.6052	1.1233
Bias Corrected	0.6432			
Standard Error	0.2886			

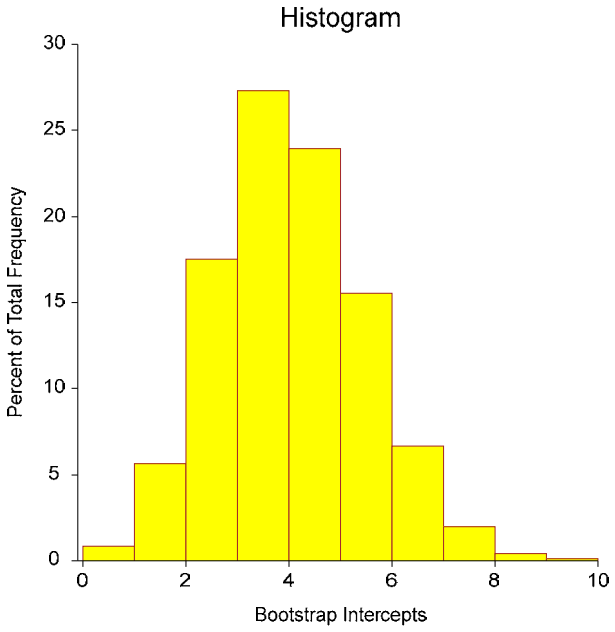
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

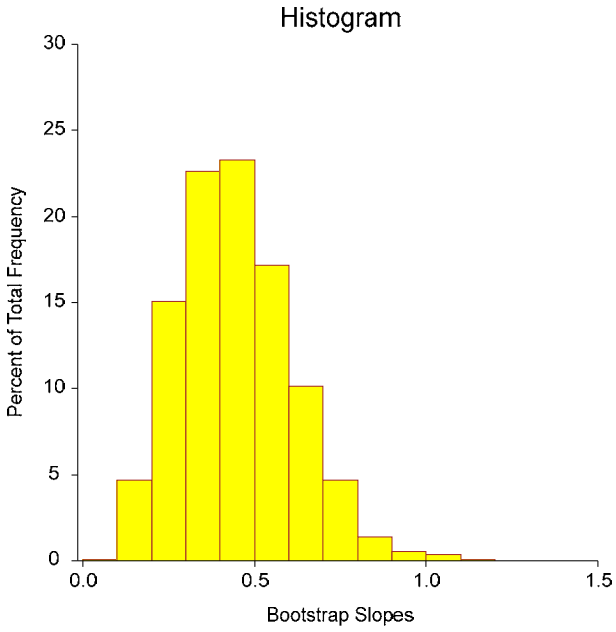
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

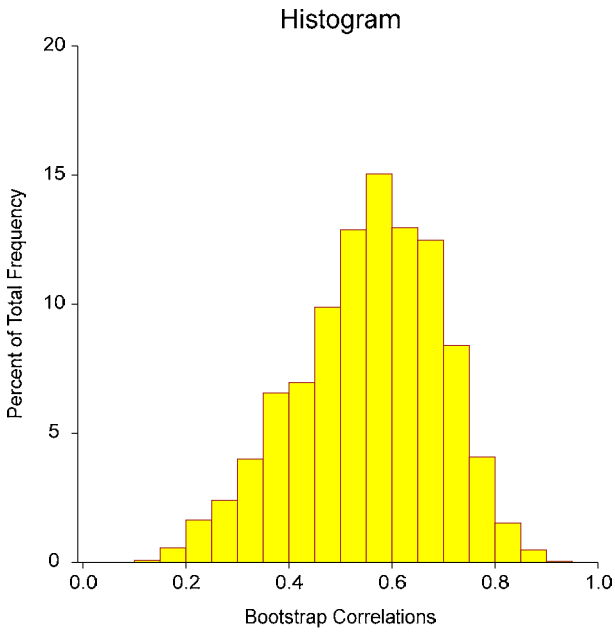
Linear Regression Report

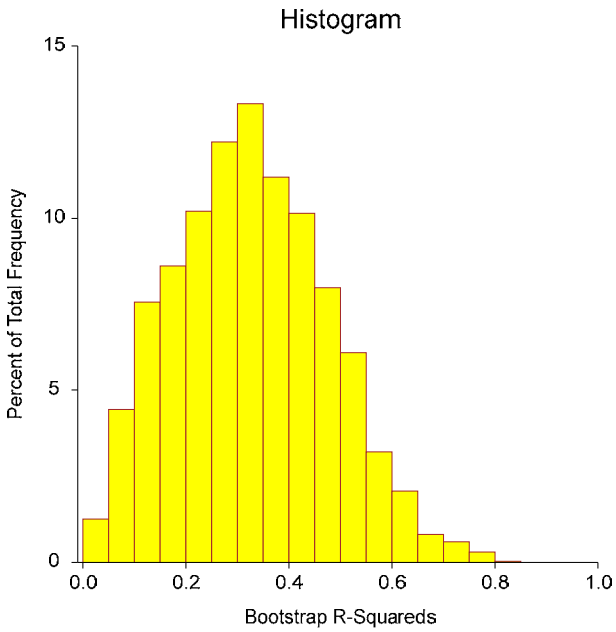
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Bootstrap Histograms Section



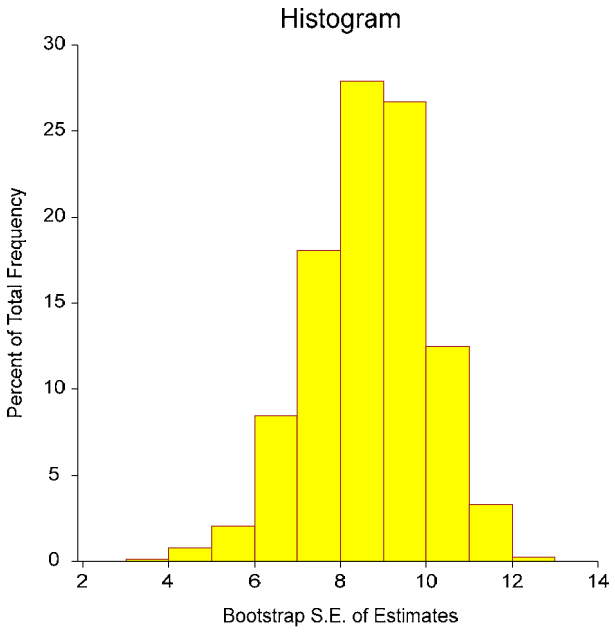


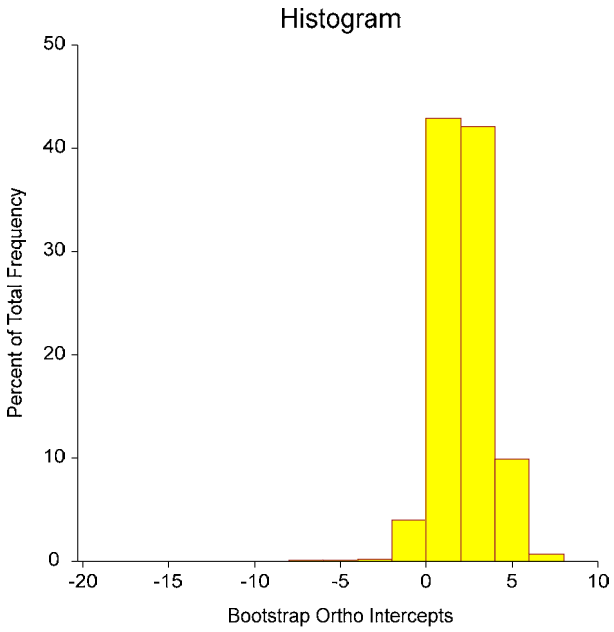


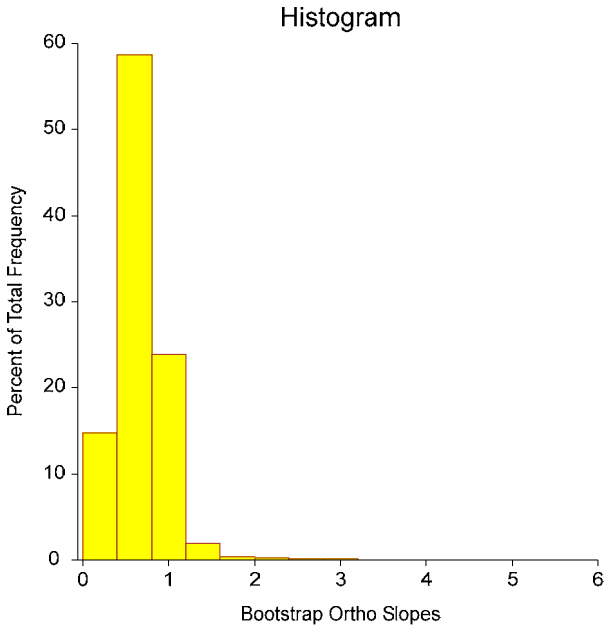


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.5697	0.3245	0.8200
Lower 95% Conf. Limit (r dist'n)	0.3138		
Upper 95% Conf. Limit (r dist'n)	0.7419		
Lower 95% Conf. Limit (Fisher's z)	0.3177		0.6852
Upper 95% Conf. Limit (Fisher's z)	0.7465		0.9005
Adjusted (Rbar)		0.3072	
T-Value for H0: Rho = 0	4.3288	4.3288	8.9470
Prob Level for H0: Rho = 0	0.0001	0.0001	0.0000
Prob Level (Randomization Test N =1000)	0.0030		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	2686.609	2686.609			
Slope	1	1577.803	1577.803	18.7383	0.0001	0.9881
Error	39	3283.873	84.20187			
Lack of Fit	37	2805.7	75.82972	0.3172	0.9456	
Pure Error	2	478.1732	239.0866			
Adj. Total	40	4861.676	121.5419			
Total	41	7548.285				

s = Square Root(84.20187) = 9.176158

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	376.97	331.89	0.03503547	-0.001157796
1	376.97	11407.3	6591.27	-0.001157796	0.0001259242
2 (Y'Y)			7548.285		
Determinant		325592.8			3.071322E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	2.950052	-0.0974886
1	-0.0974886	0.01060305

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.8300	0.000025	No
Anderson Darling	3.1227	0.000000	No
D'Agostino Skewness	3.2081	0.001336	No
D'Agostino Kurtosis	1.7450	0.080984	No
D'Agostino Omnibus	13.3367	0.001270	No
Constant Residual Variance?			
Modified Levene Test	10.3146	0.002645	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.3172	0.945598	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

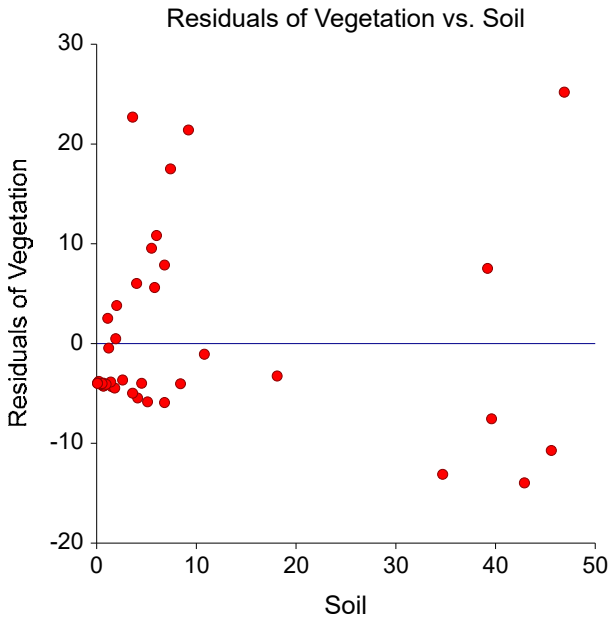
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

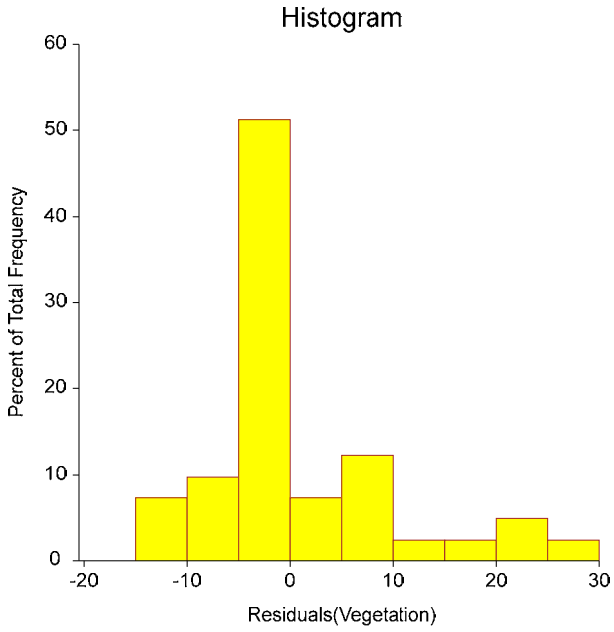
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

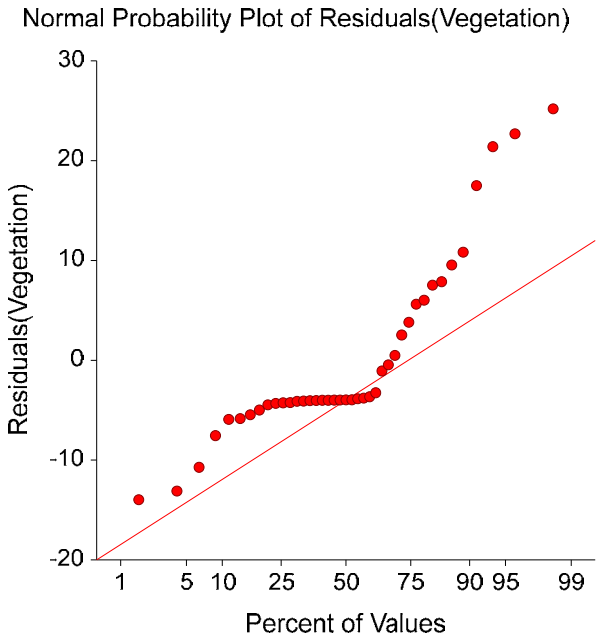
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Original Data Section

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Residual
11	6.0000	17.5000	6.6710	10.8290
12	46.9000	50.1000	24.9018	25.1982
13	1.2000	4.0800	4.5315	-0.4515
14	39.6000	14.1000	21.6479	-7.5479
15	4.1000	0.3700	5.8241	-5.4541
16	0.7100	0.0800	4.3131	-4.2331
17	5.1000	0.4300	6.2698	-5.8398
18	0.3500	0.1100	4.1526	-4.0426
19	3.6000	0.6200	5.6012	-4.9812
20	2.6000	1.5000	5.1555	-3.6555
21	0.6600	0.0300	4.2908	-4.2608
22	45.6000	13.6000	24.3223	-10.7223
23	4.5000	2.0200	6.0024	-3.9824
24	5.8000	12.2000	6.5819	5.6181
25	6.8000	14.9000	7.0276	7.8724
26	9.2000	29.5000	8.0974	21.4026
27	7.4000	24.8000	7.2950	17.5050
28	10.8000	7.7400	8.8106	-1.0706
29	3.6000	28.3000	5.6012	22.6988
30	18.1000	8.8100	12.0645	-3.2545
31	42.9000	9.1500	23.1188	-13.9688
32	1.9000	5.3300	4.8435	0.4865
33	4.0000	11.8000	5.7795	6.0205
34	0.4600	0.0900	4.2016	-4.1116
35	1.5000	0.3500	4.6652	-4.3152
36	1.8000	0.3400	4.7989	-4.4589
37	6.8000	1.1100	7.0276	-5.9176
38	1.4000	0.7700	4.6206	-3.8506
39	0.6700	0.3300	4.2952	-3.9652
40	0.9400	0.3300	4.4156	-4.0856
41	0.1800	0.0700	4.0768	-4.0068
42	0.2100	0.3000	4.0902	-3.7902
43	0.5400	0.2300	4.2373	-4.0073
44	0.0730	0.0700	4.0291	-3.9591
45	0.0770	0.0400	4.0309	-3.9909
46	8.4000	3.7100	7.7408	-4.0308
47	2.0000	8.7000	4.8881	3.8119
48	1.1000	7.0200	4.4869	2.5331
49	39.2000	29.0000	21.4696	7.5304
50	34.7000	6.3600	19.4637	-13.1037
51	5.5000	16.0000	6.4481	9.5519

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	6.0000	17.5000	6.6710	1.4703	3.6970	9.6451
12	46.9000	50.1000	24.9018	4.1386	16.5306	33.2729
13	1.2000	4.0800	4.5315	1.6527	1.1886	7.8743
14	39.6000	14.1000	21.6479	3.4433	14.6831	28.6126
15	4.1000	0.3700	5.8241	1.5261	2.7373	8.9109
16	0.7100	0.0800	4.3131	1.6784	0.9182	7.7079
17	5.1000	0.4300	6.2698	1.4938	3.2483	9.2914
18	0.3500	0.1100	4.1526	1.6980	0.7181	7.5871
19	3.6000	0.6200	5.6012	1.5445	2.4771	8.7253
20	2.6000	1.5000	5.1555	1.5858	1.9479	8.3631
21	0.6600	0.0300	4.2908	1.6811	0.8905	7.6910
22	45.6000	13.6000	24.3223	4.0133	16.2046	32.4400
23	4.5000	2.0200	6.0024	1.5124	2.9433	9.0615
24	5.8000	12.2000	6.5819	1.4751	3.5982	9.5655
25	6.8000	14.9000	7.0276	1.4541	4.0863	9.9689
26	9.2000	29.5000	8.0974	1.4331	5.1987	10.9960
27	7.4000	24.8000	7.2950	1.4449	4.3724	10.2177
28	10.8000	7.7400	8.8106	1.4426	5.8927	11.7285
29	3.6000	28.3000	5.6012	1.5445	2.4771	8.7253
30	18.1000	8.8100	12.0645	1.7014	8.6231	15.5058
31	42.9000	9.1500	23.1188	3.7549	15.5237	30.7139
32	1.9000	5.3300	4.8435	1.6180	1.5708	8.1162
33	4.0000	11.8000	5.7795	1.5296	2.6855	8.8735
34	0.4600	0.0900	4.2016	1.6919	0.7794	7.6239
35	1.5000	0.3500	4.6652	1.6375	1.3530	7.9774
36	1.8000	0.3400	4.7989	1.6228	1.5165	8.0813
37	6.8000	1.1100	7.0276	1.4541	4.0863	9.9689
38	1.4000	0.7700	4.6206	1.6425	1.2983	7.9429
39	0.6700	0.3300	4.2952	1.6805	0.8960	7.6944
40	0.9400	0.3300	4.4156	1.6662	1.0454	7.7857
41	0.1800	0.0700	4.0768	1.7074	0.6232	7.5304
42	0.2100	0.3000	4.0902	1.7057	0.6400	7.5404
43	0.5400	0.2300	4.2373	1.6876	0.8239	7.6507
44	0.0730	0.0700	4.0291	1.7134	0.5634	7.4949
45	0.0770	0.0400	4.0309	1.7132	0.5656	7.4962
46	8.4000	3.7100	7.7408	1.4354	4.8374	10.6442
47	2.0000	8.7000	4.8881	1.6132	1.6250	8.1511
48	1.1000	7.0200	4.4869	1.6578	1.1336	7.8402
49	39.2000	29.0000	21.4696	3.4059	14.5805	28.3586
50	34.7000	6.3600	19.4637	2.9919	13.4121	25.5154
51	5.5000	16.0000	6.4481	1.4827	3.4491	9.4472

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	6.0000	17.5000	6.6710	9.2932	-12.1263	25.4683
12	46.9000	50.1000	24.9018	10.0663	4.5408	45.2627
13	1.2000	4.0800	4.5315	9.3238	-14.3277	23.3906
14	39.6000	14.1000	21.6479	9.8009	1.8236	41.4721
15	4.1000	0.3700	5.8241	9.3022	-12.9913	24.6396
16	0.7100	0.0800	4.3131	9.3284	-14.5554	23.1815
17	5.1000	0.4300	6.2698	9.2970	-12.5350	25.0747
18	0.3500	0.1100	4.1526	9.3319	-14.7230	23.0282
19	3.6000	0.6200	5.6012	9.3052	-13.2204	24.4229
20	2.6000	1.5000	5.1555	9.3122	-13.6802	23.9912
21	0.6600	0.0300	4.2908	9.3289	-14.5787	23.1602
22	45.6000	13.6000	24.3223	10.0154	4.0642	44.5804
23	4.5000	2.0200	6.0024	9.3000	-12.8085	24.8133
24	5.8000	12.2000	6.5819	9.2940	-12.2169	25.3807
25	6.8000	14.9000	7.0276	9.2907	-11.7645	25.8197
26	9.2000	29.5000	8.0974	9.2874	-10.6881	26.8829
27	7.4000	24.8000	7.2950	9.2892	-11.4942	26.0843
28	10.8000	7.7400	8.8106	9.2889	-9.9779	27.5991
29	3.6000	28.3000	5.6012	9.3052	-13.2204	24.4229
30	18.1000	8.8100	12.0645	9.3326	-6.8124	30.9413
31	42.9000	9.1500	23.1188	9.9147	3.0644	43.1732
32	1.9000	5.3300	4.8435	9.3177	-14.0034	23.6903
33	4.0000	11.8000	5.7795	9.3028	-13.0371	24.5962
34	0.4600	0.0900	4.2016	9.3308	-14.6718	23.0750
35	1.5000	0.3500	4.6652	9.3211	-14.1886	23.5189
36	1.8000	0.3400	4.7989	9.3185	-14.0496	23.6474
37	6.8000	1.1100	7.0276	9.2907	-11.7645	25.8197
38	1.4000	0.7700	4.6206	9.3220	-14.2349	23.4761
39	0.6700	0.3300	4.2952	9.3288	-14.5740	23.1645
40	0.9400	0.3300	4.4156	9.3262	-14.4484	23.2796
41	0.1800	0.0700	4.0768	9.3337	-14.8023	22.9559
42	0.2100	0.3000	4.0902	9.3334	-14.7883	22.9687
43	0.5400	0.2300	4.2373	9.3300	-14.6345	23.1091
44	0.0730	0.0700	4.0291	9.3348	-14.8522	22.9105
45	0.0770	0.0400	4.0309	9.3347	-14.8504	22.9121
46	8.4000	3.7100	7.7408	9.2877	-11.0455	26.5270
47	2.0000	8.7000	4.8881	9.3169	-13.9571	23.7332
48	1.1000	7.0200	4.4869	9.3247	-14.3741	23.3479
49	39.2000	29.0000	21.4696	9.7878	1.6718	41.2673
50	34.7000	6.3600	19.4637	9.6516	-0.0585	38.9859
51	5.5000	16.0000	6.4481	9.2952	-12.3531	25.2494

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	6.0000	17.5000	6.6710	1.4703	2.4807	10.8613
12	46.9000	50.1000	24.9018	4.1386	13.1072	36.6963
13	1.2000	4.0800	4.5315	1.6527	-0.1785	9.2414
14	39.6000	14.1000	21.6479	3.4433	11.8349	31.4608
15	4.1000	0.3700	5.8241	1.5261	1.4750	10.1732
16	0.7100	0.0800	4.3131	1.6784	-0.4701	9.0962
17	5.1000	0.4300	6.2698	1.4938	2.0127	10.5270
18	0.3500	0.1100	4.1526	1.6980	-0.6864	8.9916
19	3.6000	0.6200	5.6012	1.5445	1.1995	10.0029
20	2.6000	1.5000	5.1555	1.5858	0.6362	9.6748
21	0.6600	0.0300	4.2908	1.6811	-0.5001	9.0816
22	45.6000	13.6000	24.3223	4.0133	12.8849	35.7597
23	4.5000	2.0200	6.0024	1.5124	1.6922	10.3126
24	5.8000	12.2000	6.5819	1.4751	2.3781	10.7857
25	6.8000	14.9000	7.0276	1.4541	2.8835	11.1717
26	9.2000	29.5000	8.0974	1.4331	4.0133	12.1815
27	7.4000	24.8000	7.2950	1.4449	3.1772	11.4129
28	10.8000	7.7400	8.8106	1.4426	4.6994	12.9217
29	3.6000	28.3000	5.6012	1.5445	1.1995	10.0029
30	18.1000	8.8100	12.0645	1.7014	7.2158	16.9131
31	42.9000	9.1500	23.1188	3.7549	12.4177	33.8199
32	1.9000	5.3300	4.8435	1.6180	0.2324	9.4545
33	4.0000	11.8000	5.7795	1.5296	1.4203	10.1388
34	0.4600	0.0900	4.2016	1.6919	-0.6201	9.0234
35	1.5000	0.3500	4.6652	1.6375	-0.0015	9.3319
36	1.8000	0.3400	4.7989	1.6228	0.1742	9.4236
37	6.8000	1.1100	7.0276	1.4541	2.8835	11.1717
38	1.4000	0.7700	4.6206	1.6425	-0.0604	9.3016
39	0.6700	0.3300	4.2952	1.6805	-0.4941	9.0845
40	0.9400	0.3300	4.4156	1.6662	-0.3328	9.1640
41	0.1800	0.0700	4.0768	1.7074	-0.7891	8.9428
42	0.2100	0.3000	4.0902	1.7057	-0.7710	8.9513
43	0.5400	0.2300	4.2373	1.6876	-0.5720	9.0466
44	0.0730	0.0700	4.0291	1.7134	-0.8540	8.9122
45	0.0770	0.0400	4.0309	1.7132	-0.8515	8.9133
46	8.4000	3.7100	7.7408	1.4354	3.6501	11.8315
47	2.0000	8.7000	4.8881	1.6132	0.2906	9.4856
48	1.1000	7.0200	4.4869	1.6578	-0.2377	9.2115
49	39.2000	29.0000	21.4696	3.4059	11.7632	31.1759
50	34.7000	6.3600	19.4637	2.9919	10.9372	27.9902
51	5.5000	16.0000	6.4481	1.4827	2.2226	10.6737

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Section

Row	Soil (X)	Vegetation (Y)	Predicted Vegetation (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	6.0000	17.5000	6.6710	10.8290	1.1956	61.8799
12	46.9000	50.1000	24.9018	25.1982	3.0768	50.2959
13	1.2000	4.0800	4.5315	-0.4515	-0.0500	11.0653
14	39.6000	14.1000	21.6479	-7.5479	-0.8874	53.5309
15	4.1000	0.3700	5.8241	-5.4541	-0.6028	1474.0832
16	0.7100	0.0800	4.3131	-4.2331	-0.4692	5291.3146
17	5.1000	0.4300	6.2698	-5.8398	-0.6450	1358.1040
18	0.3500	0.1100	4.1526	-4.0426	-0.4483	3675.0778
19	3.6000	0.6200	5.6012	-4.9812	-0.5507	803.4255
20	2.6000	1.5000	5.1555	-3.6555	-0.4045	243.6999
21	0.6600	0.0300	4.2908	-4.2608	-0.4723	14202.5491
22	45.6000	13.6000	24.3223	-10.7223	-1.2994	78.8404
23	4.5000	2.0200	6.0024	-3.9824	-0.4400	197.1487
24	5.8000	12.2000	6.5819	5.6181	0.6203	46.0503
25	6.8000	14.9000	7.0276	7.8724	0.8689	52.8349
26	9.2000	29.5000	8.0974	21.4026	2.3614	72.5513
27	7.4000	24.8000	7.2950	17.5050	1.9318	70.5845
28	10.8000	7.7400	8.8106	-1.0706	-0.1181	13.8315
29	3.6000	28.3000	5.6012	22.6988	2.5095	80.2076
30	18.1000	8.8100	12.0645	-3.2545	-0.3609	36.9405
31	42.9000	9.1500	23.1188	-13.9688	-1.6684	152.6644
32	1.9000	5.3300	4.8435	0.4865	0.0539	9.1279
33	4.0000	11.8000	5.7795	6.0205	0.6654	51.0209
34	0.4600	0.0900	4.2016	-4.1116	-0.4559	4568.4632
35	1.5000	0.3500	4.6652	-4.3152	-0.4779	1232.9102
36	1.8000	0.3400	4.7989	-4.4589	-0.4937	1311.4434
37	6.8000	1.1100	7.0276	-5.9176	-0.6531	533.1175
38	1.4000	0.7700	4.6206	-3.8506	-0.4265	500.0795
39	0.6700	0.3300	4.2952	-3.9652	-0.4396	1201.5825
40	0.9400	0.3300	4.4156	-4.0856	-0.4528	1238.0520
41	0.1800	0.0700	4.0768	-4.0068	-0.4444	5724.0141
42	0.2100	0.3000	4.0902	-3.7902	-0.4204	1263.3940
43	0.5400	0.2300	4.2373	-4.0073	-0.4443	1742.2939
44	0.0730	0.0700	4.0291	-3.9591	-0.4392	5655.8796
45	0.0770	0.0400	4.0309	-3.9909	-0.4427	9977.2467
46	8.4000	3.7100	7.7408	-4.0308	-0.4447	108.6466
47	2.0000	8.7000	4.8881	3.8119	0.4220	43.8155
48	1.1000	7.0200	4.4869	2.5331	0.2807	36.0842
49	39.2000	29.0000	21.4696	7.5304	0.8838	25.9670
50	34.7000	6.3600	19.4637	-13.1037	-1.5106	206.0335
51	5.5000	16.0000	6.4481	9.5519	1.0548	59.6991

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	6.0000	10.8290	1.2024	0.0257	0.0188	83.2504
12	46.9000	25.1982	**3.4900	0.2034	*1.2087	65.4415
13	1.2000	-0.4515	-0.0494	0.0324	0.0000	86.4122
14	39.6000	-7.5479	*-0.8849	0.1408	0.0645	84.6728
15	4.1000	-5.4541	-0.5978	0.0277	0.0052	85.6126
16	0.7100	-4.2331	-0.4645	0.0335	0.0038	85.9298
17	5.1000	-5.8398	-0.6401	0.0265	0.0057	85.4958
18	0.3500	-4.0426	-0.4437	0.0342	0.0036	85.9724
19	3.6000	-4.9812	-0.5457	0.0283	0.0044	85.7457
20	2.6000	-3.6555	-0.4001	0.0299	0.0025	86.0552
21	0.6600	-4.2608	-0.4676	0.0336	0.0039	85.9234
22	45.6000	-10.7223	*-1.3113	0.1913	0.1997	82.6766
23	4.5000	-3.9824	-0.4354	0.0272	0.0027	85.9887
24	5.8000	5.6181	0.6154	0.0258	0.0051	85.5651
25	6.8000	7.8724	0.8661	0.0251	0.0097	84.7448
26	9.2000	21.4026	*2.5179	0.0244	0.0697	74.0618
27	7.4000	17.5050	*2.0052	0.0248	0.0474	78.1489
28	10.8000	-1.0706	-0.1166	0.0247	0.0002	86.3868
29	3.6000	22.6988	*2.7051	0.0283	0.0918	72.4636
30	18.1000	-3.2545	-0.3569	0.0344	0.0023	86.1291
31	42.9000	-13.9688	*-1.7090	0.1674	0.2799	80.2500
32	1.9000	0.4865	0.0532	0.0311	0.0000	86.4113
33	4.0000	6.0205	0.6606	0.0278	0.0063	85.4366
34	0.4600	-4.1116	-0.4512	0.0340	0.0037	85.9572
35	1.5000	-4.3152	-0.4732	0.0318	0.0038	85.9116
36	1.8000	-4.4589	-0.4889	0.0313	0.0039	85.8776
37	6.8000	-5.9176	-0.6483	0.0251	0.0055	85.4724
38	1.4000	-3.8506	-0.4220	0.0320	0.0030	86.0146
39	0.6700	-3.9652	-0.4350	0.0335	0.0034	85.9896
40	0.9400	-4.0856	-0.4481	0.0330	0.0035	85.9635
41	0.1800	-4.0068	-0.4398	0.0346	0.0035	85.9801
42	0.2100	-3.7902	-0.4159	0.0346	0.0032	86.0261
43	0.5400	-4.0073	-0.4397	0.0338	0.0035	85.9803
44	0.0730	-3.9591	-0.4346	0.0349	0.0035	85.9903
45	0.0770	-3.9909	-0.4381	0.0349	0.0035	85.9834
46	8.4000	-4.0308	-0.4401	0.0245	0.0025	85.9794
47	2.0000	3.8119	0.4175	0.0309	0.0028	86.0231
48	1.1000	2.5331	0.2773	0.0326	0.0013	86.2432
49	39.2000	7.5304	*0.8813	0.1378	0.0624	84.6870
50	34.7000	-13.1037	*-1.5367	0.1063	0.1357	81.3616
51	5.5000	9.5519	1.0564	0.0261	0.0149	83.9523

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	1.2024	0.1952	0.0188	1.0033	0.1828	-0.0437
12	* 3.4900	1.7636	** 1.2087	0.7583	-0.4025	1.6545
13	-0.0494	-0.0090	0.0000	1.0885	-0.0090	0.0045
14	-0.8849	-0.3582	0.0645	* 1.1769	0.0552	-0.3257
15	-0.5978	-0.1008	0.0052	1.0632	-0.0981	0.0347
16	-0.4645	-0.0864	0.0038	1.0775	-0.0864	0.0450
17	-0.6401	-0.1056	0.0057	1.0590	-0.1010	0.0298
18	-0.4437	-0.0835	0.0036	1.0795	-0.0835	0.0448
19	-0.5457	-0.0932	0.0044	1.0672	-0.0913	0.0348
20	-0.4001	-0.0702	0.0025	1.0767	-0.0695	0.0301
21	-0.4676	-0.0871	0.0039	1.0775	-0.0871	0.0455
22	-1.3113	-0.6377	0.1997	* 1.1921	0.1384	-0.5957
23	-0.4354	-0.0728	0.0027	1.0720	-0.0703	0.0233
24	0.6154	0.1002	0.0051	1.0600	0.0943	-0.0237
25	0.8661	0.1390	0.0097	1.0390	0.1273	-0.0236
26	* 2.5179	0.3981	0.0697	0.7930	0.3321	0.0002
27	* 2.0052	0.3197	0.0474	0.8833	0.2871	-0.0409
28	-0.1166	-0.0186	0.0002	1.0792	-0.0142	-0.0021
29	* 2.7051	0.4619	0.0918	0.7622	0.4526	-0.1723
30	-0.3569	-0.0673	0.0023	1.0835	-0.0273	-0.0363
31	-1.7090	-0.7664	0.2799	1.0910	0.1464	-0.7084
32	0.0532	0.0095	0.0000	1.0870	0.0095	-0.0044
33	0.6606	0.1117	0.0063	1.0590	0.1088	-0.0391
34	-0.4512	-0.0846	0.0037	1.0788	-0.0846	0.0450
35	-0.4732	-0.0858	0.0038	1.0753	-0.0855	0.0415
36	-0.4889	-0.0878	0.0039	1.0738	-0.0874	0.0412
37	-0.6483	-0.1040	0.0055	1.0569	-0.0953	0.0176
38	-0.4220	-0.0768	0.0030	1.0781	-0.0766	0.0375
39	-0.4350	-0.0810	0.0034	1.0791	-0.0810	0.0423
40	-0.4481	-0.0827	0.0035	1.0778	-0.0826	0.0422
41	-0.4398	-0.0833	0.0035	1.0801	-0.0833	0.0453
42	-0.4159	-0.0787	0.0032	1.0812	-0.0787	0.0427
43	-0.4397	-0.0823	0.0035	1.0792	-0.0822	0.0434
44	-0.4346	-0.0826	0.0035	1.0806	-0.0826	0.0453
45	-0.4381	-0.0833	0.0035	1.0804	-0.0833	0.0456
46	-0.4401	-0.0697	0.0025	1.0688	-0.0603	0.0040
47	0.4175	0.0746	0.0028	1.0770	0.0741	-0.0342
48	0.2773	0.0509	0.0013	1.0845	0.0509	-0.0256
49	0.8813	0.3523	0.0624	* 1.1732	-0.0525	0.3196
50	-1.5367	-0.5300	0.1357	1.0447	0.0446	-0.4653
51	1.0564	0.1730	0.0149	1.0207	0.1639	-0.0444

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
11	6.0000	10.8290	||||||.....	1.1956	|||||.....	1.2024	|||||.....
12	46.9000	25.1982	||||||||||||||	3.0768	||||||||||||||	* 3.4900	||||||||||||||
13	1.2000	-0.4515	|.....	-0.0500	|.....	-0.0494	|.....
14	39.6000	-7.5479	||||.....	-0.8874	||||.....	-0.8849	|||.....
15	4.1000	-5.4541	|||.....	-0.6028	||.....	-0.5978	||.....
16	0.7100	-4.2331	||.....	-0.4692	||.....	-0.4645	|.....
17	5.1000	-5.8398	|||.....	-0.6450	||.....	-0.6401	||.....
18	0.3500	-4.0426	||.....	-0.4483	|.....	-0.4437	|.....
19	3.6000	-4.9812	||.....	-0.5507	||.....	-0.5457	||.....
20	2.6000	-3.6555	|.....	-0.4045	|.....	-0.4001	|.....
21	0.6600	-4.2608	||.....	-0.4723	||.....	-0.4676	|.....
22	45.6000	-10.7223	||||||.....	-1.2994	||||||.....	-1.3113	|||||.....
23	4.5000	-3.9824	||.....	-0.4400	|.....	-0.4354	|.....
24	5.8000	5.6181	|||.....	0.6203	||.....	0.6154	||.....
25	6.8000	7.8724	||||.....	0.8689	||||.....	0.8661	|||.....
26	9.2000	21.4026	||||||||||...	2.3614	||||||||||....	* 2.5179	|||||||||.....
27	7.4000	17.5050	|||||||||.....	1.9318	|||||||||.....	* 2.0052	|||||||.....
28	10.8000	-1.0706	|.....	-0.1181	|.....	-0.1166	|.....
29	3.6000	22.6988	||||||||||..	2.5095	||||||||||...	* 2.7051	||||||||||....
30	18.1000	-3.2545	|.....	-0.3609	|.....	-0.3569	|.....
31	42.9000	-13.9688	||||||||.....	-1.6684	||||||||.....	-1.7090	|||||||.....
32	1.9000	0.4865	|.....	0.0539	|.....	0.0532	|.....
33	4.0000	6.0205	|||.....	0.6654	|||.....	0.6606	||.....
34	0.4600	-4.1116	||.....	-0.4559	||.....	-0.4512	|.....
35	1.5000	-4.3152	||.....	-0.4779	||.....	-0.4732	|.....
36	1.8000	-4.4589	||.....	-0.4937	||.....	-0.4889	|.....
37	6.8000	-5.9176	|||.....	-0.6531	||.....	-0.6483	||.....
38	1.4000	-3.8506	||.....	-0.4265	|.....	-0.4220	|.....
39	0.6700	-3.9652	||.....	-0.4396	|.....	-0.4350	|.....
40	0.9400	-4.0856	||.....	-0.4528	|.....	-0.4481	|.....
41	0.1800	-4.0068	||.....	-0.4444	|.....	-0.4398	|.....
42	0.2100	-3.7902	||.....	-0.4204	|.....	-0.4159	|.....
43	0.5400	-4.0073	||.....	-0.4443	|.....	-0.4397	|.....
44	0.0730	-3.9591	||.....	-0.4392	|.....	-0.4346	|.....
45	0.0770	-3.9909	||.....	-0.4427	|.....	-0.4381	|.....
46	8.4000	-4.0308	||.....	-0.4447	|.....	-0.4401	|.....
47	2.0000	3.8119	||.....	0.4220	|.....	0.4175	|.....
48	1.1000	2.5331	|.....	0.2807	|.....	0.2773	|.....
49	39.2000	7.5304	||||.....	0.8838	||||.....	0.8813	|||.....
50	34.7000	-13.1037	|||||||.....	-1.5106	|||||||.....	-1.5367	||||||.....
51	5.5000	9.5519	|||||.....	1.0548	||||.....	1.0564	||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	6.0000	0.1952	|.....	0.0188	|.....	-0.0437	|.....
12	46.9000	1.7636	||||||||||||||	** 1.2087	||||||||||||||	1.6545	||||||||||||||
13	1.2000	-0.0090	|.....	0.0000	|.....	0.0045	|.....
14	39.6000	-0.3582	||.....	0.0645	|.....	-0.3257	||.....
15	4.1000	-0.1008	|.....	0.0052	|.....	0.0347	|.....
16	0.7100	-0.0864	|.....	0.0038	|.....	0.0450	|.....
17	5.1000	-0.1056	|.....	0.0057	|.....	0.0298	|.....
18	0.3500	-0.0835	|.....	0.0036	|.....	0.0448	|.....
19	3.6000	-0.0932	|.....	0.0044	|.....	0.0348	|.....
20	2.6000	-0.0702	|.....	0.0025	|.....	0.0301	|.....
21	0.6600	-0.0871	|.....	0.0039	|.....	0.0455	|.....
22	45.6000	-0.6377	|||||.....	0.1997	||.....	-0.5957	|||||.....
23	4.5000	-0.0728	|.....	0.0027	|.....	0.0233	|.....
24	5.8000	0.1002	|.....	0.0051	|.....	-0.0237	|.....
25	6.8000	0.1390	|.....	0.0097	|.....	-0.0236	|.....
26	9.2000	0.3981	|||.....	0.0697	|.....	0.0002	|.....
27	7.4000	0.3197	||.....	0.0474	|.....	-0.0409	|.....
28	10.8000	-0.0186	|.....	0.0002	|.....	-0.0021	|.....
29	3.6000	0.4619	|||.....	0.0918	|.....	-0.1723	|.....
30	18.1000	-0.0673	|.....	0.0023	|.....	-0.0363	|.....
31	42.9000	-0.7664	||||||.....	0.2799	|||.....	-0.7084	||||||.....
32	1.9000	0.0095	|.....	0.0000	|.....	-0.0044	|.....
33	4.0000	0.1117	|.....	0.0063	|.....	-0.0391	|.....
34	0.4600	-0.0846	|.....	0.0037	|.....	0.0450	|.....
35	1.5000	-0.0858	|.....	0.0038	|.....	0.0415	|.....
36	1.8000	-0.0878	|.....	0.0039	|.....	0.0412	|.....
37	6.8000	-0.1040	|.....	0.0055	|.....	0.0176	|.....
38	1.4000	-0.0768	|.....	0.0030	|.....	0.0375	|.....
39	0.6700	-0.0810	|.....	0.0034	|.....	0.0423	|.....
40	0.9400	-0.0827	|.....	0.0035	|.....	0.0422	|.....
41	0.1800	-0.0833	|.....	0.0035	|.....	0.0453	|.....
42	0.2100	-0.0787	|.....	0.0032	|.....	0.0427	|.....
43	0.5400	-0.0823	|.....	0.0035	|.....	0.0434	|.....
44	0.0730	-0.0826	|.....	0.0035	|.....	0.0453	|.....
45	0.0770	-0.0833	|.....	0.0035	|.....	0.0456	|.....
46	8.4000	-0.0697	|.....	0.0025	|.....	0.0040	|.....
47	2.0000	0.0746	|.....	0.0028	|.....	-0.0342	|.....
48	1.1000	0.0509	|.....	0.0013	|.....	-0.0256	|.....
49	39.2000	0.3523	||.....	0.0624	|.....	0.3196	||.....
50	34.7000	-0.5300	||||.....	0.1357	|.....	-0.4653	||||.....
51	5.5000	0.1730	|.....	0.0149	|.....	-0.0444	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked. DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	6.0000	1.2024	|||||.....	0.0188	|.....	0.0257	|.....
12	46.9000	* 3.4900	||||||||||||||	** 1.2087	||||||||||||||	0.2034	||||||||||||||
13	1.2000	-0.0494	|.....	0.0000	|.....	0.0324	|.....
14	39.6000	-0.8849	|||.....	0.0645	|.....	0.1408	||||||||.....
15	4.1000	-0.5978	||.....	0.0052	|.....	0.0277	|.....
16	0.7100	-0.4645	|.....	0.0038	|.....	0.0335	|.....
17	5.1000	-0.6401	||.....	0.0057	|.....	0.0265	|.....
18	0.3500	-0.4437	|.....	0.0036	|.....	0.0342	|.....
19	3.6000	-0.5457	||.....	0.0044	|.....	0.0283	|.....
20	2.6000	-0.4001	|.....	0.0025	|.....	0.0299	|.....
21	0.6600	-0.4676	|.....	0.0039	|.....	0.0336	|.....
22	45.6000	-1.3113	|||||.....	0.1997	||.....	0.1913	|||||||||||..
23	4.5000	-0.4354	|.....	0.0027	|.....	0.0272	|.....
24	5.8000	0.6154	||.....	0.0051	|.....	0.0258	|.....
25	6.8000	0.8661	|||.....	0.0097	|.....	0.0251	|.....
26	9.2000	* 2.5179	|||||||||.....	0.0697	|.....	0.0244	|.....
27	7.4000	* 2.0052	|||||||.....	0.0474	|.....	0.0248	|.....
28	10.8000	-0.1166	|.....	0.0002	|.....	0.0247	|.....
29	3.6000	* 2.7051	||||||||||....	0.0918	|.....	0.0283	|.....
30	18.1000	-0.3569	|.....	0.0023	|.....	0.0344	|.....
31	42.9000	-1.7090	|||||||.....	0.2799	|||.....	0.1674	||||||||||....
32	1.9000	0.0532	|.....	0.0000	|.....	0.0311	|.....
33	4.0000	0.6606	||.....	0.0063	|.....	0.0278	|.....
34	0.4600	-0.4512	|.....	0.0037	|.....	0.0340	|.....
35	1.5000	-0.4732	|.....	0.0038	|.....	0.0318	|.....
36	1.8000	-0.4889	|.....	0.0039	|.....	0.0313	|.....
37	6.8000	-0.6483	||.....	0.0055	|.....	0.0251	|.....
38	1.4000	-0.4220	|.....	0.0030	|.....	0.0320	|.....
39	0.6700	-0.4350	|.....	0.0034	|.....	0.0335	|.....
40	0.9400	-0.4481	|.....	0.0035	|.....	0.0330	|.....
41	0.1800	-0.4398	|.....	0.0035	|.....	0.0346	|.....
42	0.2100	-0.4159	|.....	0.0032	|.....	0.0346	|.....
43	0.5400	-0.4397	|.....	0.0035	|.....	0.0338	|.....
44	0.0730	-0.4346	|.....	0.0035	|.....	0.0349	|.....
45	0.0770	-0.4381	|.....	0.0035	|.....	0.0349	|.....
46	8.4000	-0.4401	|.....	0.0025	|.....	0.0245	|.....
47	2.0000	0.4175	|.....	0.0028	|.....	0.0309	|.....
48	1.1000	0.2773	|.....	0.0013	|.....	0.0326	|.....
49	39.2000	0.8813	|||.....	0.0624	|.....	0.1378	||||||||.....
50	34.7000	-1.5367	||||||.....	0.1357	|.....	0.1063	||||||.....
51	5.5000	1.0564	||||.....	0.0149	|.....	0.0261	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Inverse Prediction of X Means

Row	Vegetation (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	17.5000	6.0000	30.2944	-24.2944	21.5869	50.7895
12	50.1000	46.9000	103.4314	-56.5314	72.9425	186.5656
13	4.0800	1.2000	0.1872	1.0128	-11.4444	6.7868
14	14.1000	39.6000	22.6667	16.9333	15.5229	37.3367
15	0.3700	4.1000	-8.1361	12.2361	-25.6824	-0.2714
16	0.0800	0.7100	-8.7867	9.4967	-26.8338	-0.7847
17	0.4300	5.1000	-8.0015	13.1015	-25.4447	-0.1647
18	0.1100	0.3500	-8.7194	9.0694	-26.7145	-0.7318
19	0.6200	3.6000	-7.5752	11.1752	-24.6930	0.1742
20	1.5000	2.6000	-5.6010	8.2010	-21.2370	1.7696
21	0.0300	0.6600	-8.8989	9.5589	-27.0327	-0.8728
22	13.6000	45.6000	21.5449	24.0551	14.5731	35.4164
23	2.0200	4.5000	-4.4344	8.9344	-19.2174	2.7350
24	12.2000	5.8000	18.4041	-12.6041	11.7890	30.1642
25	14.9000	6.8000	24.4614	-17.6614	17.0044	40.4474
26	29.5000	9.2000	57.2160	-48.0160	40.9957	100.2635
27	24.8000	7.4000	46.6717	-39.2717	33.5601	80.7200
28	7.7400	10.8000	8.3982	2.4018	0.8050	15.5467
29	28.3000	3.6000	54.5238	-50.9238	39.1077	95.2633
30	8.8100	18.1000	10.7987	7.3013	3.8292	18.6646
31	9.1500	42.9000	11.5615	31.3385	4.7324	19.7130
32	5.3300	1.9000	2.9915	-1.0915	-6.9783	9.4961
33	11.8000	4.0000	17.5067	-13.5067	10.9520	28.7051
34	0.0900	0.4600	-8.7643	9.2243	-26.7941	-0.7670
35	0.3500	1.5000	-8.1810	9.6810	-25.7617	-0.3069
36	0.3400	1.8000	-8.2034	10.0034	-25.8013	-0.3247
37	1.1100	6.8000	-6.4759	13.2759	-22.7632	1.0571
38	0.7700	1.4000	-7.2387	8.6387	-24.1009	0.4431
39	0.3300	0.6700	-8.2258	8.8958	-25.8410	-0.3424
40	0.3300	0.9400	-8.2258	9.1658	-25.8410	-0.3424
41	0.0700	0.1800	-8.8091	8.9891	-26.8736	-0.8023
42	0.3000	0.2100	-8.2931	8.5031	-25.9600	-0.3957
43	0.2300	0.5400	-8.4502	8.9902	-26.2378	-0.5197
44	0.0700	0.0730	-8.8091	8.8821	-26.8736	-0.8023
45	0.0400	0.0770	-8.8764	8.9534	-26.9929	-0.8552
46	3.7100	8.4000	-0.6429	9.0429	-12.8079	6.0265
47	8.7000	2.0000	10.5520	-8.5520	3.5311	18.3312
48	7.0200	1.1000	6.7829	-5.6829	-1.3860	13.6047
49	29.0000	39.2000	56.0943	-16.8943	40.2097	98.1794
50	6.3600	34.7000	5.3023	29.3977	-3.4996	11.9297
51	16.0000	5.5000	26.9292	-21.4292	18.9797	44.7864

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Vegetation X = Soil

Inverse Prediction of X Individuals

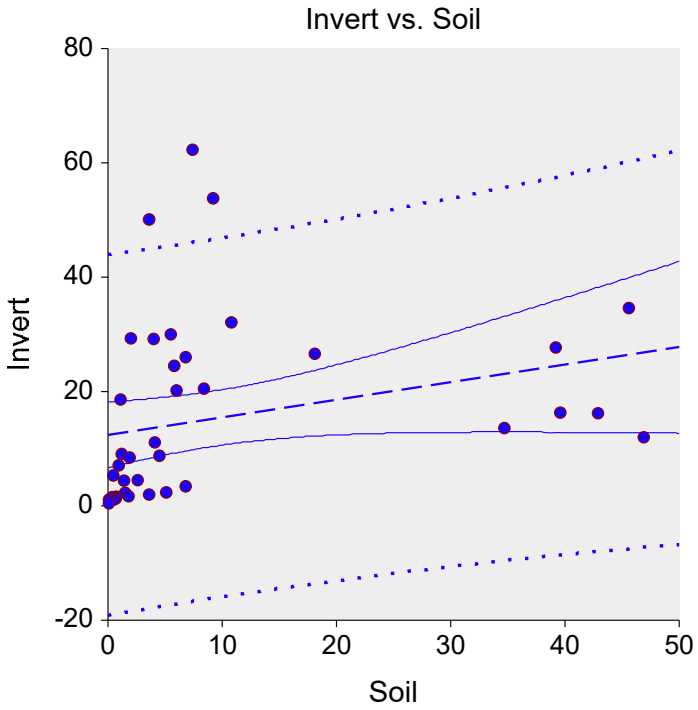
Row	Vegetation (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	17.5000	6.0000	30.2944	-24.2944	-13.1209	85.4973
12	50.1000	46.9000	103.4314	-56.5314	55.9587	203.5493
13	4.0800	1.2000	0.1872	1.0128	-50.3005	45.6430
14	14.1000	39.6000	22.6667	16.9333	-21.9143	74.7739
15	0.3700	4.1000	-8.1361	12.2361	-61.7583	35.8045
16	0.0800	0.7100	-8.7867	9.4967	-62.6747	35.0562
17	0.4300	5.1000	-8.0015	13.1015	-61.5691	35.9597
18	0.1100	0.3500	-8.7194	9.0694	-62.5798	35.1335
19	0.6200	3.6000	-7.5752	11.1752	-60.9707	36.4519
20	1.5000	2.6000	-5.6010	8.2010	-58.2159	38.7485
21	0.0300	0.6600	-8.8989	9.5589	-62.8330	34.9275
22	13.6000	45.6000	21.5449	24.0551	-23.2422	73.2317
23	2.0200	4.5000	-4.4344	8.9344	-56.6010	40.1186
24	12.2000	5.8000	18.4041	-12.6041	-27.0089	68.9620
25	14.9000	6.8000	24.4614	-17.6614	-19.8085	77.2603
26	29.5000	9.2000	57.2160	-48.0160	14.9846	126.2746
27	24.8000	7.4000	46.6717	-39.2717	4.4693	109.8108
28	7.7400	10.8000	8.3982	2.4018	-39.4951	55.8468
29	28.3000	3.6000	54.5238	-50.9238	12.3534	122.0175
30	8.8100	18.1000	10.7987	7.3013	-36.4314	58.9251
31	9.1500	42.9000	11.5615	31.3385	-35.4669	59.9123
32	5.3300	1.9000	2.9915	-1.0915	-46.5537	49.0715
33	11.8000	4.0000	17.5067	-13.5067	-28.0984	67.7554
34	0.0900	0.4600	-8.7643	9.2243	-62.6431	35.0820
35	0.3500	1.5000	-8.1810	9.6810	-61.8214	35.7528
36	0.3400	1.8000	-8.2034	10.0034	-61.8530	35.7269
37	1.1100	6.8000	-6.4759	13.2759	-59.4333	37.7273
38	0.7700	1.4000	-7.2387	8.6387	-60.4992	36.8414
39	0.3300	0.6700	-8.2258	8.8958	-61.8845	35.7011
40	0.3300	0.9400	-8.2258	9.1658	-61.8845	35.7011
41	0.0700	0.1800	-8.8091	8.9891	-62.7064	35.0305
42	0.3000	0.2100	-8.2931	8.5031	-61.9792	35.6236
43	0.2300	0.5400	-8.4502	8.9902	-62.2003	35.4429
44	0.0700	0.0730	-8.8091	8.8821	-62.7064	35.0305
45	0.0400	0.0770	-8.8764	8.9534	-62.8013	34.9532
46	3.7100	8.4000	-0.6429	9.0429	-51.4207	44.6392
47	8.7000	2.0000	10.5520	-8.5520	-36.7444	58.6067
48	7.0200	1.1000	6.7829	-5.6829	-41.5810	53.7998
49	29.0000	39.2000	56.0943	-16.8943	13.8925	124.4966
50	6.3600	34.7000	5.3023	29.3977	-43.5103	51.9404
51	16.0000	5.5000	26.9292	-21.4292	-16.9503	80.7163

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Invert	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	12.4203	Rows Prediction Only	0
Slope	0.3056	Sum of Frequencies	41
R-Squared	0.0749	Sum of Weights	41.0000
Correlation	0.2736	Coefficient of Variation	1.0067
Mean Square Error	235.0882	Square Root of MSE	15.33259

Linear Regression Report

Y = Invert X = Soil

Summary Statement

The equation of the straight line relating Invert and Soil is estimated as: Invert = (12.4203) + (0.3056) Soil using the 41 observations in this dataset. The y-intercept, the estimated value of Invert when Soil is zero, is 12.4203 with a standard error of 2.8699. The slope, the estimated change in Invert per unit change in Soil, is 0.3056 with a standard error of 0.1721. The value of R-Squared, the proportion of the variation in Invert that can be accounted for by variation in Soil, is 0.0749. The correlation between Invert and Soil is 0.2736.

A significance test that the slope is zero resulted in a t-value of 1.7764. The significance level of this t-test is 0.0835. Since 0.0835 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is 0.3056. The lower limit of the 95% confidence interval for the slope is -0.0424 and the upper limit is 0.6537. The estimated intercept is 12.4203. The lower limit of the 95% confidence interval for the intercept is 6.6153 and the upper limit is 18.2252.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Invert	Soil
Count	41	41
Mean	15.2305	9.1944
Standard Deviation	15.7403	14.0901
Minimum	0.4500	0.0730
Maximum	62.3000	46.9000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	12.4203	0.3056
Lower 95% Confidence Limit	6.6153	-0.0424
Upper 95% Confidence Limit	18.2252	0.6537
Standard Error	2.8699	0.1721
Standardized Coefficient	0.0000	0.2736
T Value	4.3277	1.7764
Prob Level (T Test)	0.0001	0.0835
Prob Level (Randomization Test N =1000)		0.0940
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.9881	0.4102
Regression of Y on X	12.4203	0.3056
Inverse Regression from X on Y	-22.3101	4.0830
Orthogonal Regression of Y and X	1.5792	1.4847

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(12.4202591360387) + (0.305646007434053) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	12.4203	0.9000	7.6982	16.6992
Bootstrap Mean	12.3514	0.9500	6.7076	17.4345
Bias (BM - OV)	-0.0688	0.9900	4.0755	18.8331
Bias Corrected	12.4891			
Standard Error	2.7563			
Slope				
Original Value	0.3056	0.9000	0.0455	0.4783
Bootstrap Mean	0.3305	0.9500	-0.0469	0.5105
Bias (BM - OV)	0.0248	0.9900	-0.3809	0.5830
Bias Corrected	0.2808			
Standard Error	0.1560			
Correlation				
Original Value	0.2736	0.9000	0.0737	0.4283
Bootstrap Mean	0.2903	0.9500	0.0298	0.4603
Bias (BM - OV)	0.0167	0.9900	-0.0696	0.5232
Bias Corrected	0.2569			
Standard Error	0.1110			
R-Squared				
Original Value	0.0749	0.9000	0.0000	0.1356
Bootstrap Mean	0.0966	0.9500	0.0000	0.1421
Bias (BM - OV)	0.0218	0.9900	0.0000	0.1489
Bias Corrected	0.0531			
Standard Error	0.0695			
Standard Error of Estimate				
Original Value	15.3326	0.9000	12.0649	19.8926
Bootstrap Mean	14.8293	0.9500	11.3461	20.5997
Bias (BM - OV)	-0.5033	0.9900	10.4025	22.1638
Bias Corrected	15.8359			
Standard Error	2.3837			
Orthogonal Intercept				
Original Value	1.5792	0.9000	-5.5938	25.8911
Bootstrap Mean	-1.9135	0.9500	-6.9482	38.6138
Bias (BM - OV)	-3.4927	0.9900	-10.1249	89.5612
Bias Corrected	5.0719			
Standard Error	24.0286			
Orthogonal Slope				
Original Value	1.4847	0.9000	-2.4982	2.4942
Bootstrap Mean	2.0588	0.9500	-4.2029	2.5769
Bias (BM - OV)	0.5740	0.9900	-9.3481	2.7352
Bias Corrected	0.9107			
Standard Error	2.6862			

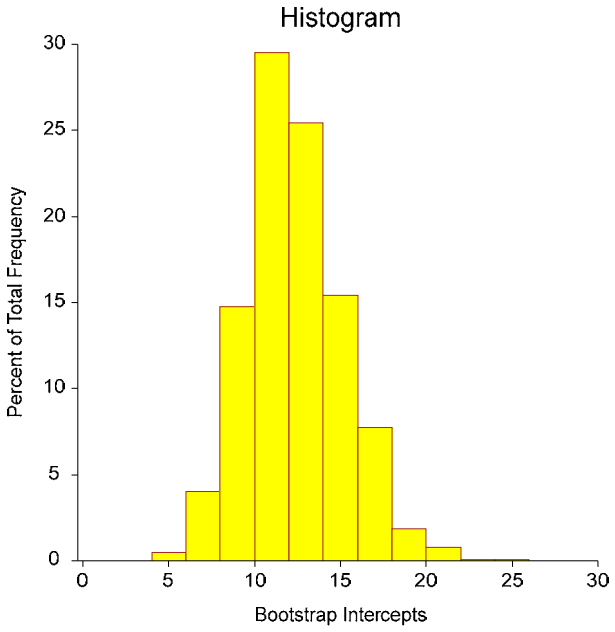
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

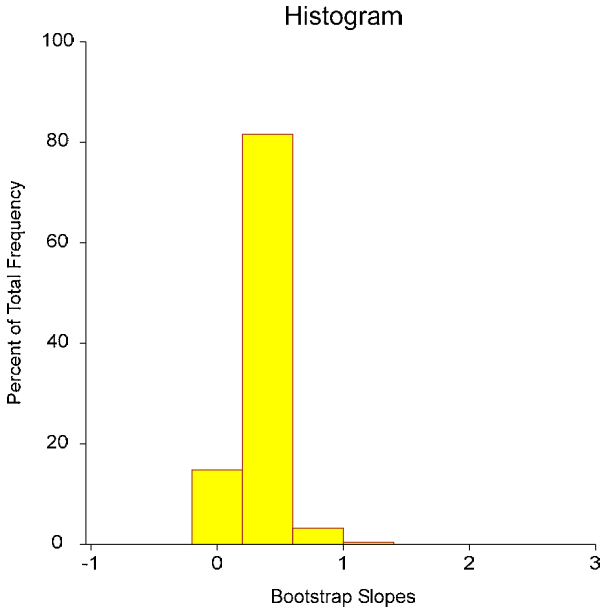
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

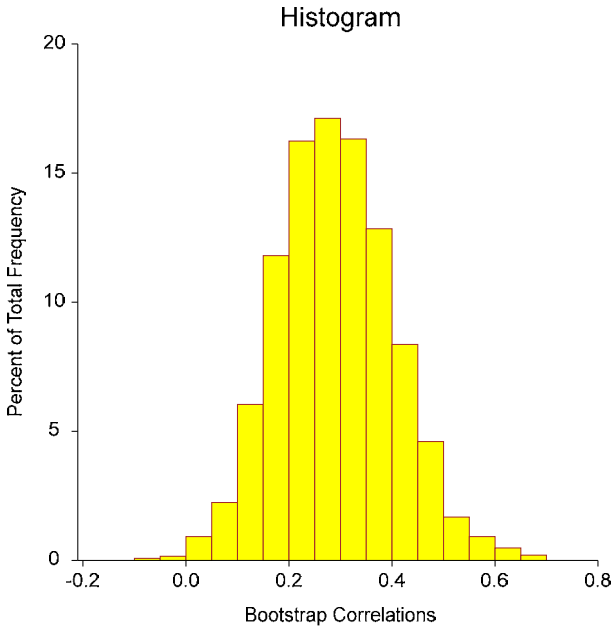
Linear Regression Report

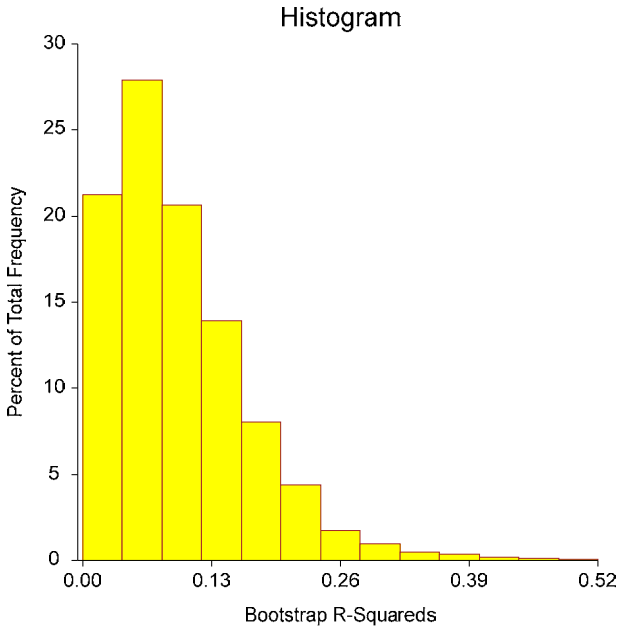
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Bootstrap Histograms Section



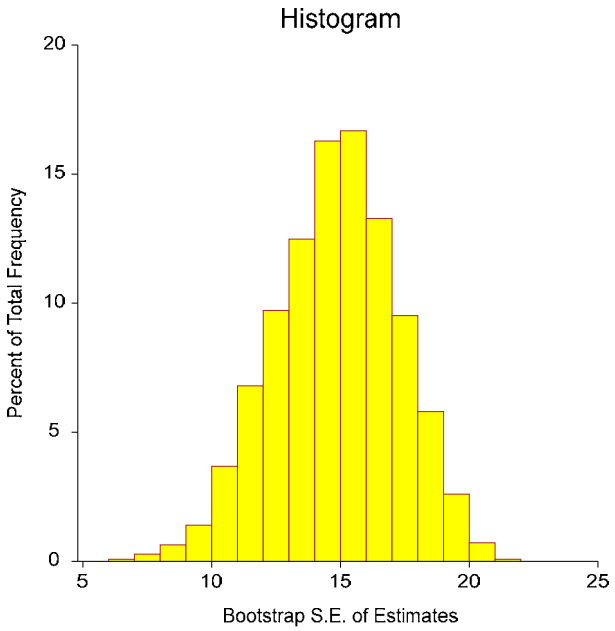


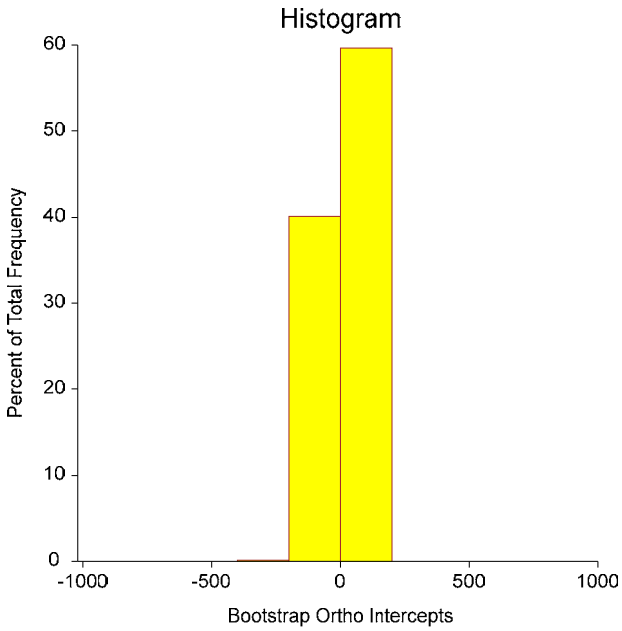


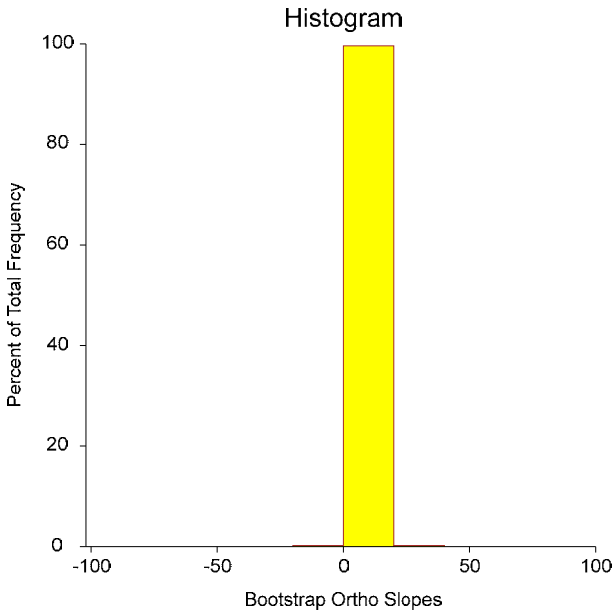


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.2736	0.0749	0.7444
Lower 95% Conf. Limit (r dist'n)	-0.0372		
Upper 95% Conf. Limit (r dist'n)	0.5312		
Lower 95% Conf. Limit (Fisher's z)	-0.0372		0.5665
Upper 95% Conf. Limit (Fisher's z)	0.5361		0.8560
Adjusted (Rbar)		0.0511	
T-Value for H0: Rho = 0	1.7764	1.7764	6.9621
Prob Level for H0: Rho = 0	0.0835	0.0835	0.0000
Prob Level (Randomization Test N =1000)	0.0940		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	9510.678	9510.678			
Slope	1	741.8708	741.8708	3.1557	0.0835	0.4102
Error	39	9168.439	235.0882			
Lack of Fit	37	7755.263	209.6017	0.2966	0.9548	
Pure Error	2	1413.177	706.5883			
Adj. Total	40	9910.311	247.7578			
Total	41	19420.99				

s = Square Root(235.0882) = 15.33259

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	376.97	624.45	0.03503547	-0.001157796
1	376.97	11407.3	8168.66	-0.001157796	0.0001259242
2 (Y'Y)			19420.99		
Determinant		325592.8			3.071322E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	8.236426	-0.2721842
1	-0.2721842	0.02960329

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7907	0.000004	No
Anderson Darling	3.0181	0.000000	No
D'Agostino Skewness	3.6012	0.000317	No
D'Agostino Kurtosis	2.1723	0.029836	No
D'Agostino Omnibus	17.6876	0.000144	No
Constant Residual Variance?			
Modified Levene Test	3.1567	0.083416	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.2966	0.954807	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

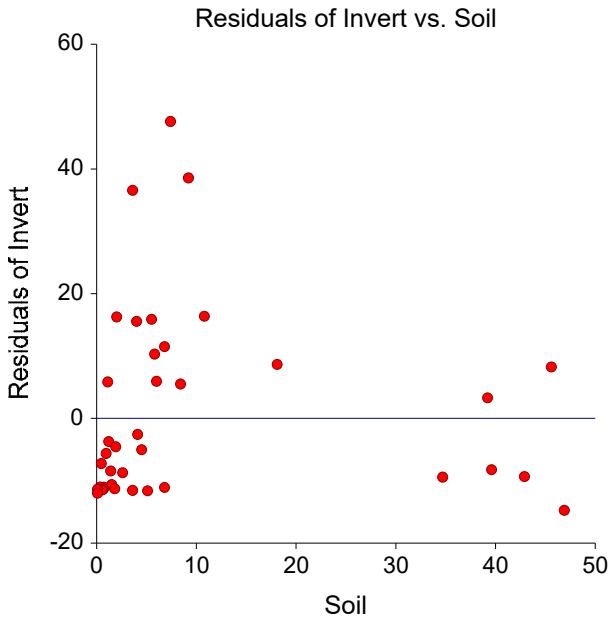
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

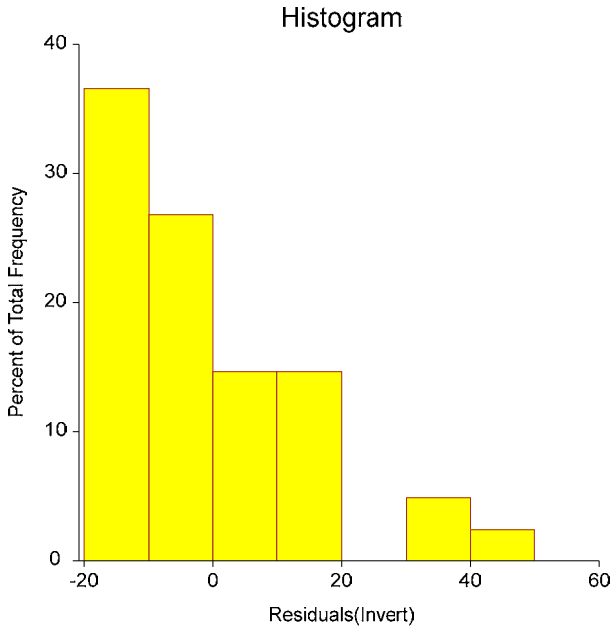
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

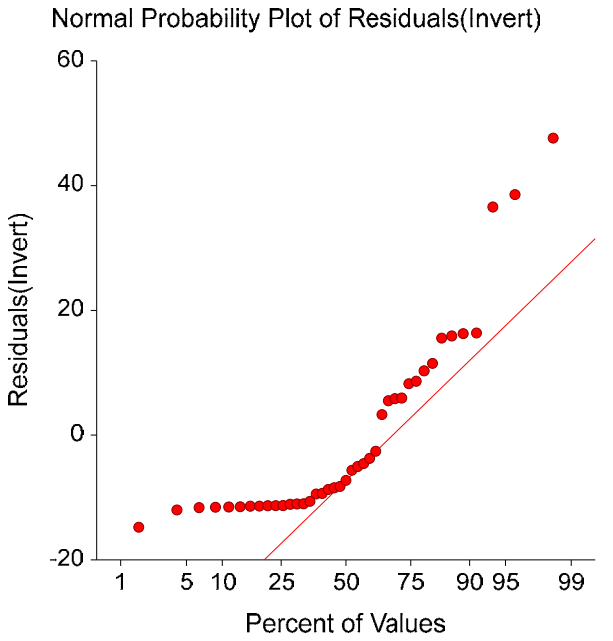
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Original Data Section

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual
11	6.0000	20.2000	14.2541	5.9459
12	46.9000	12.0000	26.7551	-14.7551
13	1.2000	9.0700	12.7870	-3.7170
14	39.6000	16.3000	24.5238	-8.2238
15	4.1000	11.1000	13.6734	-2.5734
16	0.7100	1.6100	12.6373	-11.0273
17	5.1000	2.3600	13.9791	-11.6191
18	0.3500	1.5200	12.5272	-11.0072
19	3.6000	1.9700	13.5206	-11.5506
20	2.6000	4.5000	13.2149	-8.7149
21	0.6600	1.3200	12.6220	-11.3020
22	45.6000	34.6000	26.3577	8.2423
23	4.5000	8.7700	13.7957	-5.0257
24	5.8000	24.5000	14.1930	10.3070
25	6.8000	26.0000	14.4987	11.5013
26	9.2000	53.8000	15.2322	38.5678
27	7.4000	62.3000	14.6820	47.6180
28	10.8000	32.1000	15.7212	16.3788
29	3.6000	50.1000	13.5206	36.5794
30	18.1000	26.6000	17.9525	8.6475
31	42.9000	16.2000	25.5325	-9.3325
32	1.9000	8.4500	13.0010	-4.5510
33	4.0000	29.2000	13.6428	15.5572
34	0.4600	5.3200	12.5609	-7.2409
35	1.5000	2.2700	12.8787	-10.6087
36	1.8000	1.6800	12.9704	-11.2904
37	6.8000	3.4200	14.4987	-11.0787
38	1.4000	4.4100	12.8482	-8.4382
39	0.6700	1.3100	12.6250	-11.3150
40	0.9400	7.0800	12.7076	-5.6276
41	0.1800	1.0900	12.4753	-11.3853
42	0.2100	0.9700	12.4844	-11.5144
43	0.5400	1.1100	12.5853	-11.4753
44	0.0730	1.0700	12.4426	-11.3726
45	0.0770	0.4500	12.4438	-11.9938
46	8.4000	20.5000	14.9877	5.5123
47	2.0000	29.3000	13.0316	16.2684
48	1.1000	18.6000	12.7565	5.8435
49	39.2000	27.7000	24.4016	3.2984
50	34.7000	13.6000	23.0262	-9.4262
51	5.5000	30.0000	14.1013	15.8987

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	6.0000	20.2000	14.2541	2.4568	9.2848	19.2235
12	46.9000	12.0000	26.7551	6.9153	12.7676	40.7426
13	1.2000	9.0700	12.7870	2.7615	7.2014	18.3727
14	39.6000	16.3000	24.5238	5.7534	12.8864	36.1613
15	4.1000	11.1000	13.6734	2.5499	8.5157	18.8311
16	0.7100	1.6100	12.6373	2.8044	6.9648	18.3098
17	5.1000	2.3600	13.9791	2.4960	8.9304	19.0277
18	0.3500	1.5200	12.5272	2.8372	6.7885	18.2659
19	3.6000	1.9700	13.5206	2.5808	8.3005	18.7407
20	2.6000	4.5000	13.2149	2.6498	7.8553	18.5746
21	0.6600	1.3200	12.6220	2.8089	6.9404	18.3036
22	45.6000	34.6000	26.3577	6.7059	12.7937	39.9217
23	4.5000	8.7700	13.7957	2.5271	8.6841	18.9072
24	5.8000	24.5000	14.1930	2.4647	9.2076	19.1784
25	6.8000	26.0000	14.4987	2.4297	9.5841	19.4132
26	9.2000	53.8000	15.2322	2.3945	10.3888	20.0756
27	7.4000	62.3000	14.6820	2.4144	9.7985	19.5656
28	10.8000	32.1000	15.7212	2.4104	10.8457	20.5968
29	3.6000	50.1000	13.5206	2.5808	8.3005	18.7407
30	18.1000	26.6000	17.9525	2.8428	12.2023	23.7026
31	42.9000	16.2000	25.5325	6.2742	12.8418	38.2232
32	1.9000	8.4500	13.0010	2.7035	7.5326	18.4694
33	4.0000	29.2000	13.6428	2.5559	8.4731	18.8126
34	0.4600	5.3200	12.5609	2.8271	6.8426	18.2791
35	1.5000	2.2700	12.8787	2.7361	7.3444	18.4131
36	1.8000	1.6800	12.9704	2.7115	7.4858	18.4550
37	6.8000	3.4200	14.4987	2.4297	9.5841	19.4132
38	1.4000	4.4100	12.8482	2.7445	7.2969	18.3995
39	0.6700	1.3100	12.6250	2.8080	6.9453	18.3048
40	0.9400	7.0800	12.7076	2.7840	7.0763	18.3388
41	0.1800	1.0900	12.4753	2.8530	6.7046	18.2459
42	0.2100	0.9700	12.4844	2.8502	6.7195	18.2494
43	0.5400	1.1100	12.5853	2.8198	6.8818	18.2888
44	0.0730	1.0700	12.4426	2.8630	6.6516	18.2336
45	0.0770	0.4500	12.4438	2.8626	6.6536	18.2340
46	8.4000	20.5000	14.9877	2.3984	10.1364	19.8390
47	2.0000	29.3000	13.0316	2.6956	7.5792	18.4839
48	1.1000	18.6000	12.7565	2.7701	7.1534	18.3595
49	39.2000	27.7000	24.4016	5.6909	12.8906	35.9126
50	34.7000	13.6000	23.0262	4.9992	12.9144	33.1380
51	5.5000	30.0000	14.1013	2.4775	9.0901	19.1125

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	6.0000	20.2000	14.2541	15.5282	-17.1546	45.6628
12	46.9000	12.0000	26.7551	16.8199	-7.2664	60.7765
13	1.2000	9.0700	12.7870	15.5793	-18.7250	44.2991
14	39.6000	16.3000	24.5238	16.3765	-8.6008	57.6485
15	4.1000	11.1000	13.6734	15.5432	-17.7656	45.1125
16	0.7100	1.6100	12.6373	15.5870	-18.8903	44.1649
17	5.1000	2.3600	13.9791	15.5344	-17.4423	45.4004
18	0.3500	1.5200	12.5272	15.5929	-19.0123	44.0668
19	3.6000	1.9700	13.5206	15.5483	-17.9288	44.9699
20	2.6000	4.5000	13.2149	15.5599	-18.2579	44.6877
21	0.6600	1.3200	12.6220	15.5878	-18.9072	44.1512
22	45.6000	34.6000	26.3577	16.7349	-7.4918	60.2073
23	4.5000	8.7700	13.7957	15.5394	-17.6358	45.2272
24	5.8000	24.5000	14.1930	15.5294	-17.2182	45.6042
25	6.8000	26.0000	14.4987	15.5239	-16.9014	45.8987
26	9.2000	53.8000	15.2322	15.5184	-16.1568	46.6212
27	7.4000	62.3000	14.6820	15.5215	-16.7132	46.0773
28	10.8000	32.1000	15.7212	15.5209	-15.6728	47.1152
29	3.6000	50.1000	13.5206	15.5483	-17.9288	44.9699
30	18.1000	26.6000	17.9525	15.5939	-13.5892	49.4941
31	42.9000	16.2000	25.5325	16.5666	-7.9767	59.0417
32	1.9000	8.4500	13.0010	15.5691	-18.4905	44.4925
33	4.0000	29.2000	13.6428	15.5442	-17.7982	45.0839
34	0.4600	5.3200	12.5609	15.5910	-18.9750	44.0967
35	1.5000	2.2700	12.8787	15.5748	-18.6243	44.3818
36	1.8000	1.6800	12.9704	15.5705	-18.5239	44.4647
37	6.8000	3.4200	14.4987	15.5239	-16.9014	45.8987
38	1.4000	4.4100	12.8482	15.5763	-18.6578	44.3542
39	0.6700	1.3100	12.6250	15.5876	-18.9038	44.1539
40	0.9400	7.0800	12.7076	15.5833	-18.8126	44.2278
41	0.1800	1.0900	12.4753	15.5958	-19.0701	44.0207
42	0.2100	0.9700	12.4844	15.5952	-19.0599	44.0288
43	0.5400	1.1100	12.5853	15.5897	-18.9479	44.1185
44	0.0730	1.0700	12.4426	15.5976	-19.1065	43.9917
45	0.0770	0.4500	12.4438	15.5975	-19.1052	43.9928
46	8.4000	20.5000	14.9877	15.5190	-16.4025	46.3779
47	2.0000	29.3000	13.0316	15.5677	-18.4572	44.5203
48	1.1000	18.6000	12.7565	15.5808	-18.7587	44.2716
49	39.2000	27.7000	24.4016	16.3547	-8.6788	57.4820
50	34.7000	13.6000	23.0262	16.1270	-9.5938	55.6461
51	5.5000	30.0000	14.1013	15.5315	-17.3140	45.5166

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	6.0000	20.2000	14.2541	2.4568	7.2525	21.2557
12	46.9000	12.0000	26.7551	6.9153	7.0474	46.4627
13	1.2000	9.0700	12.7870	2.7615	4.9172	20.6569
14	39.6000	16.3000	24.5238	5.7534	8.1273	40.9204
15	4.1000	11.1000	13.6734	2.5499	6.4064	20.9404
16	0.7100	1.6100	12.6373	2.8044	4.6450	20.6295
17	5.1000	2.3600	13.9791	2.4960	6.8657	21.0924
18	0.3500	1.5200	12.5272	2.8372	4.4417	20.6128
19	3.6000	1.9700	13.5206	2.5808	6.1657	20.8754
20	2.6000	4.5000	13.2149	2.6498	5.6635	20.7664
21	0.6600	1.3200	12.6220	2.8089	4.6169	20.6270
22	45.6000	34.6000	26.3577	6.7059	7.2468	45.4687
23	4.5000	8.7700	13.7957	2.5271	6.5938	20.9976
24	5.8000	24.5000	14.1930	2.4647	7.1688	21.2172
25	6.8000	26.0000	14.4987	2.4297	7.5742	21.4231
26	9.2000	53.8000	15.2322	2.3945	8.4081	22.0564
27	7.4000	62.3000	14.6820	2.4144	7.8014	21.5627
28	10.8000	32.1000	15.7212	2.4104	8.8518	22.5907
29	3.6000	50.1000	13.5206	2.5808	6.1657	20.8754
30	18.1000	26.6000	17.9525	2.8428	9.8507	26.0542
31	42.9000	16.2000	25.5325	6.2742	7.6519	43.4130
32	1.9000	8.4500	13.0010	2.7035	5.2963	20.7057
33	4.0000	29.2000	13.6428	2.5559	6.3589	20.9268
34	0.4600	5.3200	12.5609	2.8271	4.5041	20.6176
35	1.5000	2.2700	12.8787	2.7361	5.0811	20.6764
36	1.8000	1.6800	12.9704	2.7115	5.2429	20.6980
37	6.8000	3.4200	14.4987	2.4297	7.5742	21.4231
38	1.4000	4.4100	12.8482	2.7445	5.0267	20.6697
39	0.6700	1.3100	12.6250	2.8080	4.6225	20.6275
40	0.9400	7.0800	12.7076	2.7840	4.7734	20.6417
41	0.1800	1.0900	12.4753	2.8530	4.3447	20.6059
42	0.2100	0.9700	12.4844	2.8502	4.3619	20.6070
43	0.5400	1.1100	12.5853	2.8198	4.5493	20.6213
44	0.0730	1.0700	12.4426	2.8630	4.2834	20.6018
45	0.0770	0.4500	12.4438	2.8626	4.2857	20.6019
46	8.4000	20.5000	14.9877	2.3984	8.1524	21.8229
47	2.0000	29.3000	13.0316	2.6956	5.3495	20.7136
48	1.1000	18.6000	12.7565	2.7701	4.8620	20.6509
49	39.2000	27.7000	24.4016	5.6909	8.1831	40.6200
50	34.7000	13.6000	23.0262	4.9992	8.7791	37.2732
51	5.5000	30.0000	14.1013	2.4775	7.0408	21.1618

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Section

Row	Soil (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	6.0000	20.2000	14.2541	5.9459	0.3929	29.4350
12	46.9000	12.0000	26.7551	-14.7551	-1.0782	122.9588
13	1.2000	9.0700	12.7870	-3.7170	-0.2465	40.9816
14	39.6000	16.3000	24.5238	-8.2238	-0.5786	50.4530
15	4.1000	11.1000	13.6734	-2.5734	-0.1702	23.1839
16	0.7100	1.6100	12.6373	-11.0273	-0.7315	684.9235
17	5.1000	2.3600	13.9791	-11.6191	-0.7680	492.3328
18	0.3500	1.5200	12.5272	-11.0072	-0.7305	724.1602
19	3.6000	1.9700	13.5206	-11.5506	-0.7642	586.3241
20	2.6000	4.5000	13.2149	-8.7149	-0.5771	193.6653
21	0.6600	1.3200	12.6220	-11.3020	-0.7498	856.2110
22	45.6000	34.6000	26.3577	8.2423	0.5978	23.8216
23	4.5000	8.7700	13.7957	-5.0257	-0.3323	57.3052
24	5.8000	24.5000	14.1930	10.3070	0.6811	42.0694
25	6.8000	26.0000	14.4987	11.5013	0.7597	44.2360
26	9.2000	53.8000	15.2322	38.5678	2.5467	71.6874
27	7.4000	62.3000	14.6820	47.6180	3.1449	76.4333
28	10.8000	32.1000	15.7212	16.3788	1.0817	51.0242
29	3.6000	50.1000	13.5206	36.5794	2.4203	73.0128
30	18.1000	26.6000	17.9525	8.6475	0.5739	32.5096
31	42.9000	16.2000	25.5325	-9.3325	-0.6671	57.6079
32	1.9000	8.4500	13.0010	-4.5510	-0.3015	53.8578
33	4.0000	29.2000	13.6428	15.5572	1.0290	53.2779
34	0.4600	5.3200	12.5609	-7.2409	-0.4805	136.1063
35	1.5000	2.2700	12.8787	-10.6087	-0.7032	467.3449
36	1.8000	1.6800	12.9704	-11.2904	-0.7482	672.0489
37	6.8000	3.4200	14.4987	-11.0787	-0.7318	323.9372
38	1.4000	4.4100	12.8482	-8.4382	-0.5594	191.3416
39	0.6700	1.3100	12.6250	-11.3150	-0.7507	863.7437
40	0.9400	7.0800	12.7076	-5.6276	-0.3732	79.4854
41	0.1800	1.0900	12.4753	-11.3853	-0.7558	1044.5207
42	0.2100	0.9700	12.4844	-11.5144	-0.7643	1187.0562
43	0.5400	1.1100	12.5853	-11.4753	-0.7614	1033.8115
44	0.0730	1.0700	12.4426	-11.3726	-0.7550	1062.8571
45	0.0770	0.4500	12.4438	-11.9938	-0.7962	2665.2875
46	8.4000	20.5000	14.9877	5.5123	0.3640	26.8893
47	2.0000	29.3000	13.0316	16.2684	1.0778	55.5237
48	1.1000	18.6000	12.7565	5.8435	0.3875	31.4168
49	39.2000	27.7000	24.4016	3.2984	0.2317	11.9076
50	34.7000	13.6000	23.0262	-9.4262	-0.6503	69.3101
51	5.5000	30.0000	14.1013	15.8987	1.0507	52.9956

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	6.0000	5.9459	0.3886	0.0257	0.0020	240.3199
12	46.9000	-14.7551	*-1.0805	0.2034	0.1484	234.0824
13	1.2000	-3.7170	-0.2435	0.0324	0.0010	240.8990
14	39.6000	-8.2238	*-0.5736	0.1408	0.0274	239.2033
15	4.1000	-2.5734	-0.1681	0.0277	0.0004	241.0955
16	0.7100	-11.0273	-0.7271	0.0335	0.0093	237.9640
17	5.1000	-11.6191	-0.7639	0.0265	0.0080	237.6253
18	0.3500	-11.0072	-0.7261	0.0342	0.0095	237.9733
19	3.6000	-11.5506	-0.7601	0.0283	0.0085	237.6614
20	2.6000	-8.7149	-0.5721	0.0299	0.0051	239.2145
21	0.6600	-11.3020	-0.7455	0.0336	0.0098	237.7966
22	45.6000	8.2423	*0.5928	0.1913	0.0423	239.0641
23	4.5000	-5.0257	-0.3285	0.0272	0.0015	240.5915
24	5.8000	10.3070	0.6763	0.0258	0.0062	238.4049
25	6.8000	11.5013	0.7555	0.0251	0.0074	237.7040
26	9.2000	38.5678	*2.7531	0.0244	0.0811	201.1521
27	7.4000	47.6180	*3.5932	0.0248	0.1257	180.0873
28	10.8000	16.3788	1.0841	0.0247	0.0148	234.0363
29	3.6000	36.5794	*2.5916	0.0283	0.0854	205.0361
30	18.1000	8.6475	0.5690	0.0344	0.0059	239.2368
31	42.9000	-9.3325	*-0.6623	0.1674	0.0447	238.5218
32	1.9000	-4.5510	-0.2980	0.0311	0.0015	240.7122
33	4.0000	15.5572	1.0298	0.0278	0.0151	234.7236
34	0.4600	-7.2409	-0.4757	0.0340	0.0041	239.8464
35	1.5000	-10.6087	-0.6986	0.0318	0.0081	238.2156
36	1.8000	-11.2904	-0.7439	0.0313	0.0090	237.8119
37	6.8000	-11.0787	-0.7274	0.0251	0.0069	237.9616
38	1.4000	-8.4382	-0.5544	0.0320	0.0052	239.3390
39	0.6700	-11.3150	-0.7464	0.0335	0.0098	237.7886
40	0.9400	-5.6276	-0.3691	0.0330	0.0024	240.4129
41	0.1800	-11.3853	-0.7515	0.0346	0.0102	237.7412
42	0.2100	-11.5144	-0.7602	0.0346	0.0105	237.6608
43	0.5400	-11.4753	-0.7572	0.0338	0.0101	237.6881
44	0.0730	-11.3726	-0.7508	0.0349	0.0103	237.7482
45	0.0770	-11.9938	-0.7924	0.0349	0.0114	237.3525
46	8.4000	5.5123	0.3599	0.0245	0.0017	240.4551
47	2.0000	16.2684	1.0801	0.0309	0.0185	234.0878
48	1.1000	5.8435	0.3832	0.0326	0.0025	240.3458
49	39.2000	3.2984	*0.2288	0.1378	0.0043	240.9427
50	34.7000	-9.4262	*-0.6454	0.1063	0.0252	238.6584
51	5.5000	15.8987	1.0522	0.0261	0.0148	234.4446

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.3886	0.0631	0.0020	1.0725	0.0591	-0.0141
12	-1.0805	-0.5460	0.1484	* 1.2446	0.1246	-0.5123
13	-0.2435	-0.0446	0.0010	1.0852	-0.0445	0.0222
14	-0.5736	-0.2322	0.0274	* 1.2050	0.0358	-0.2112
15	-0.1681	-0.0283	0.0004	1.0817	-0.0276	0.0097
16	-0.7271	-0.1353	0.0093	1.0601	-0.1352	0.0704
17	-0.7639	-0.1260	0.0080	1.0495	-0.1205	0.0356
18	-0.7261	-0.1367	0.0095	1.0610	-0.1367	0.0733
19	-0.7601	-0.1298	0.0085	1.0518	-0.1272	0.0484
20	-0.5721	-0.1004	0.0051	1.0673	-0.0994	0.0430
21	-0.7455	-0.1389	0.0098	1.0587	-0.1389	0.0726
22	0.5928	0.2883	0.0423	* 1.2787	-0.0625	0.2693
23	-0.3285	-0.0549	0.0015	1.0766	-0.0531	0.0175
24	0.6763	0.1102	0.0062	1.0557	0.1037	-0.0261
25	0.7555	0.1213	0.0074	1.0487	0.1110	-0.0206
26	* 2.7531	0.4353	0.0811	0.7504	0.3631	0.0002
27	* 3.5932	0.5730	0.1257	0.6017	0.5145	-0.0733
28	1.0841	0.1726	0.0148	1.0162	0.1321	0.0198
29	* 2.5916	0.4425	0.0854	0.7829	0.4336	-0.1650
30	0.5690	0.1074	0.0059	1.0725	0.0436	0.0579
31	-0.6623	-0.2970	0.0447	* 1.2365	0.0567	-0.2745
32	-0.2980	-0.0534	0.0015	1.0821	-0.0531	0.0248
33	1.0298	0.1741	0.0151	1.0254	0.1697	-0.0609
34	-0.4757	-0.0892	0.0041	1.0775	-0.0892	0.0474
35	-0.6986	-0.1267	0.0081	1.0606	-0.1263	0.0613
36	-0.7439	-0.1337	0.0090	1.0563	-0.1330	0.0627
37	-0.7274	-0.1167	0.0069	1.0510	-0.1069	0.0198
38	-0.5544	-0.1009	0.0052	1.0708	-0.1006	0.0493
39	-0.7464	-0.1390	0.0098	1.0586	-0.1390	0.0726
40	-0.3691	-0.0681	0.0024	1.0815	-0.0681	0.0348
41	-0.7515	-0.1423	0.0102	1.0594	-0.1423	0.0774
42	-0.7602	-0.1438	0.0105	1.0586	-0.1438	0.0780
43	-0.7572	-0.1417	0.0101	1.0580	-0.1416	0.0748
44	-0.7508	-0.1427	0.0103	1.0597	-0.1427	0.0782
45	-0.7924	-0.1506	0.0114	1.0562	-0.1506	0.0825
46	0.3599	0.0570	0.0017	1.0724	0.0493	-0.0032
47	1.0801	0.1929	0.0185	1.0231	0.1918	-0.0886
48	0.3832	0.0704	0.0025	1.0805	0.0703	-0.0354
49	0.2288	0.0915	0.0043	* 1.2183	-0.0136	0.0830
50	-0.6454	-0.2226	0.0252	* 1.1532	0.0187	-0.1954
51	1.0522	0.1723	0.0148	1.0212	0.1633	-0.0442

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
11	6.0000	5.9459	|.....	0.3929	|.....	0.3886	|.....
12	46.9000	-14.7551	////.....	-1.0782	////.....	-1.0805	///.....
13	1.2000	-3.7170	|.....	-0.2465	|.....	-0.2435	|.....
14	39.6000	-8.2238	|.....	-0.5786	||.....	-0.5736	|.....
15	4.1000	-2.5734	|.....	-0.1702	|.....	-0.1681	|.....
16	0.7100	-11.0273	||.....	-0.7315	||.....	-0.7271	||.....
17	5.1000	-11.6191	///.....	-0.7680	///.....	-0.7639	||.....
18	0.3500	-11.0072	||.....	-0.7305	||.....	-0.7261	||.....
19	3.6000	-11.5506	||.....	-0.7642	||.....	-0.7601	||.....
20	2.6000	-8.7149	||.....	-0.5771	||.....	-0.5721	|.....
21	0.6600	-11.3020	||.....	-0.7498	||.....	-0.7455	||.....
22	45.6000	8.2423	|.....	0.5978	||.....	0.5928	|.....
23	4.5000	-5.0257	|.....	-0.3323	|.....	-0.3285	|.....
24	5.8000	10.3070	||.....	0.6811	||.....	0.6763	||.....
25	6.8000	11.5013	||.....	0.7597	||.....	0.7555	||.....
26	9.2000	38.5678	||||||||||....	2.5467	||||||||||....	* 2.7531	||||||||||....
27	7.4000	47.6180	||||||||||||||	3.1449	||||||||||||||	* 3.5932	||||||||||||||
28	10.8000	16.3788	////.....	1.0817	////.....	1.0841	////.....
29	3.6000	36.5794	||||||||||....	2.4203	||||||||||....	* 2.5916	|||||||||.....
30	18.1000	8.6475	||.....	0.5739	||.....	0.5690	|.....
31	42.9000	-9.3325	||.....	-0.6671	||.....	-0.6623	||.....
32	1.9000	-4.5510	|.....	-0.3015	|.....	-0.2980	|.....
33	4.0000	15.5572	////.....	1.0290	////.....	1.0298	///.....
34	0.4600	-7.2409	|.....	-0.4805	|.....	-0.4757	|.....
35	1.5000	-10.6087	||.....	-0.7032	||.....	-0.6986	||.....
36	1.8000	-11.2904	||.....	-0.7482	||.....	-0.7439	||.....
37	6.8000	-11.0787	||.....	-0.7318	||.....	-0.7274	||.....
38	1.4000	-8.4382	|.....	-0.5594	|.....	-0.5544	|.....
39	0.6700	-11.3150	||.....	-0.7507	||.....	-0.7464	||.....
40	0.9400	-5.6276	|.....	-0.3732	|.....	-0.3691	|.....
41	0.1800	-11.3853	||.....	-0.7558	||.....	-0.7515	||.....
42	0.2100	-11.5144	||.....	-0.7643	||.....	-0.7602	||.....
43	0.5400	-11.4753	||.....	-0.7614	||.....	-0.7572	||.....
44	0.0730	-11.3726	||.....	-0.7550	||.....	-0.7508	||.....
45	0.0770	-11.9938	///.....	-0.7962	///.....	-0.7924	||.....
46	8.4000	5.5123	|.....	0.3640	|.....	0.3599	|.....
47	2.0000	16.2684	////.....	1.0778	////.....	1.0801	///.....
48	1.1000	5.8435	|.....	0.3875	|.....	0.3832	|.....
49	39.2000	3.2984	|.....	0.2317	|.....	0.2288	|.....
50	34.7000	-9.4262	||.....	-0.6503	||.....	-0.6454	||.....
51	5.5000	15.8987	////.....	1.0507	////.....	1.0522	///.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	6.0000	0.0631	|.....	0.0020	|.....	-0.0141	|.....
12	46.9000	-0.5460	|||||||||||||.	0.1484	|||||||||||||	-0.5123	|||||||||||||
13	1.2000	-0.0446	|.....	0.0010	|.....	0.0222	|.....
14	39.6000	-0.2322	|||||.....	0.0274	||.....	-0.2112	|||||.....
15	4.1000	-0.0283	|.....	0.0004	|.....	0.0097	|.....
16	0.7100	-0.1353	||.....	0.0093	|.....	0.0704	||.....
17	5.1000	-0.1260	||.....	0.0080	|.....	0.0356	|.....
18	0.3500	-0.1367	||.....	0.0095	|.....	0.0733	||.....
19	3.6000	-0.1298	||.....	0.0085	|.....	0.0484	|.....
20	2.6000	-0.1004	|.....	0.0051	|.....	0.0430	|.....
21	0.6600	-0.1389	|||.....	0.0098	|.....	0.0726	||.....
22	45.6000	0.2883	|||||||.....	0.0423	||||.....	0.2693	|||||||.....
23	4.5000	-0.0549	|.....	0.0015	|.....	0.0175	|.....
24	5.8000	0.1102	||.....	0.0062	|.....	-0.0261	|.....
25	6.8000	0.1213	||.....	0.0074	|.....	-0.0206	|.....
26	9.2000	0.4353	||||||||||....	0.0811	||||||||.....	0.0002	|.....
27	7.4000	0.5730	||||||||||||||	0.1257	|||||||||||...	-0.0733	||.....
28	10.8000	0.1726	|||.....	0.0148	|.....	0.0198	|.....
29	3.6000	0.4425	||||||||||....	0.0854	||||||||.....	-0.1650	||||.....
30	18.1000	0.1074	||.....	0.0059	|.....	0.0579	|.....
31	42.9000	-0.2970	|||||||.....	0.0447	||||.....	-0.2745	||||||||.....
32	1.9000	-0.0534	|.....	0.0015	|.....	0.0248	|.....
33	4.0000	0.1741	||||.....	0.0151	|.....	-0.0609	|.....
34	0.4600	-0.0892	|.....	0.0041	|.....	0.0474	|.....
35	1.5000	-0.1267	||.....	0.0081	|.....	0.0613	|.....
36	1.8000	-0.1337	||.....	0.0090	|.....	0.0627	|.....
37	6.8000	-0.1167	||.....	0.0069	|.....	0.0198	|.....
38	1.4000	-0.1009	|.....	0.0052	|.....	0.0493	|.....
39	0.6700	-0.1390	|||.....	0.0098	|.....	0.0726	||.....
40	0.9400	-0.0681	|.....	0.0024	|.....	0.0348	|.....
41	0.1800	-0.1423	|||.....	0.0102	|.....	0.0774	||.....
42	0.2100	-0.1438	|||.....	0.0105	|.....	0.0780	||.....
43	0.5400	-0.1417	|||.....	0.0101	|.....	0.0748	||.....
44	0.0730	-0.1427	|||.....	0.0103	|.....	0.0782	||.....
45	0.0770	-0.1506	|||.....	0.0114	|.....	0.0825	||.....
46	8.4000	0.0570	|.....	0.0017	|.....	-0.0032	|.....
47	2.0000	0.1929	||||.....	0.0185	|.....	-0.0886	||.....
48	1.1000	0.0704	|.....	0.0025	|.....	-0.0354	|.....
49	39.2000	0.0915	|.....	0.0043	|.....	0.0830	||.....
50	34.7000	-0.2226	|||||.....	0.0252	||.....	-0.1954	|||||.....
51	5.5000	0.1723	|||.....	0.0148	|.....	-0.0442	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	6.0000	0.3886	|.....	0.0020	|.....	0.0257	|.....
12	46.9000	-1.0805	|||.....	0.1484	||||||||||||||	0.2034	||||||||||||||
13	1.2000	-0.2435	|.....	0.0010	|.....	0.0324	|.....
14	39.6000	-0.5736	|.....	0.0274	||.....	0.1408	||||||||.....
15	4.1000	-0.1681	|.....	0.0004	|.....	0.0277	|.....
16	0.7100	-0.7271	||.....	0.0093	|.....	0.0335	|.....
17	5.1000	-0.7639	||.....	0.0080	|.....	0.0265	|.....
18	0.3500	-0.7261	||.....	0.0095	|.....	0.0342	|.....
19	3.6000	-0.7601	||.....	0.0085	|.....	0.0283	|.....
20	2.6000	-0.5721	|.....	0.0051	|.....	0.0299	|.....
21	0.6600	-0.7455	||.....	0.0098	|.....	0.0336	|.....
22	45.6000	0.5928	|.....	0.0423	||||.....	0.1913	|||||||||||..
23	4.5000	-0.3285	|.....	0.0015	|.....	0.0272	|.....
24	5.8000	0.6763	||.....	0.0062	|.....	0.0258	|.....
25	6.8000	0.7555	||.....	0.0074	|.....	0.0251	|.....
26	9.2000	* 2.7531	||||||||||....	0.0811	|||||||.....	0.0244	|.....
27	7.4000	* 3.5932	||||||||||||||	0.1257	||||||||||...	0.0248	|.....
28	10.8000	1.0841	||||.....	0.0148	|.....	0.0247	|.....
29	3.6000	* 2.5916	|||||||||.....	0.0854	|||||||.....	0.0283	|.....
30	18.1000	0.5690	|.....	0.0059	|.....	0.0344	|.....
31	42.9000	-0.6623	||.....	0.0447	||||.....	0.1674	||||||||||....
32	1.9000	-0.2980	|.....	0.0015	|.....	0.0311	|.....
33	4.0000	1.0298	|||.....	0.0151	|.....	0.0278	|.....
34	0.4600	-0.4757	|.....	0.0041	|.....	0.0340	|.....
35	1.5000	-0.6986	||.....	0.0081	|.....	0.0318	|.....
36	1.8000	-0.7439	||.....	0.0090	|.....	0.0313	|.....
37	6.8000	-0.7274	||.....	0.0069	|.....	0.0251	|.....
38	1.4000	-0.5544	|.....	0.0052	|.....	0.0320	|.....
39	0.6700	-0.7464	||.....	0.0098	|.....	0.0335	|.....
40	0.9400	-0.3691	|.....	0.0024	|.....	0.0330	|.....
41	0.1800	-0.7515	||.....	0.0102	|.....	0.0346	|.....
42	0.2100	-0.7602	||.....	0.0105	|.....	0.0346	|.....
43	0.5400	-0.7572	||.....	0.0101	|.....	0.0338	|.....
44	0.0730	-0.7508	||.....	0.0103	|.....	0.0349	|.....
45	0.0770	-0.7924	||.....	0.0114	|.....	0.0349	|.....
46	8.4000	0.3599	|.....	0.0017	|.....	0.0245	|.....
47	2.0000	1.0801	|||.....	0.0185	|.....	0.0309	|.....
48	1.1000	0.3832	|.....	0.0025	|.....	0.0326	|.....
49	39.2000	0.2288	|.....	0.0043	|.....	0.1378	||||||||.....
50	34.7000	-0.6454	||.....	0.0252	||.....	0.1063	|||||.....
51	5.5000	1.0522	|||.....	0.0148	|.....	0.0261	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Inverse Prediction of X Means

Row	Invert (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	20.2000	6.0000	25.4534	-19.4534	-100.8966	9.6002
12	12.0000	46.9000	-1.3750	48.2750	16.5472	73.1437
13	9.0700	1.2000	-10.9612	12.1612	5.4491	148.9117
14	16.3000	39.6000	12.6936	26.9064	-28.4234	23.2063
15	11.1000	4.1000	-4.3196	8.4196	11.8029	97.7525
16	1.6100	0.7100	-35.3686	36.0786	-9.1502	328.1653
17	2.3600	5.1000	-32.9147	38.0147	-7.8552	310.3166
18	1.5200	0.3500	-35.6630	36.0130	-9.3045	330.3061
19	1.9700	3.6000	-34.1907	37.7907	-8.5307	319.6001
20	4.5000	2.6000	-25.9132	28.5132	-4.0432	259.2713
21	1.3200	0.6600	-36.3174	36.9774	-9.6465	335.0625
22	34.6000	45.6000	72.5668	-26.9668	-446.2083	37.0804
23	8.7700	4.5000	-11.9428	16.4428	4.7071	156.2752
24	24.5000	5.8000	39.5220	-33.7220	-205.8852	19.6807
25	26.0000	6.8000	44.4296	-37.6296	-241.8154	22.5035
26	53.8000	9.2000	135.3845	-126.1845	-900.2283	67.3250
27	62.3000	7.4000	163.1945	-155.7945	-1100.9990	80.4868
28	32.1000	10.8000	64.3874	-53.5874	-386.9435	32.9947
29	50.1000	3.6000	123.2790	-119.6790	-812.8098	61.5716
30	26.6000	18.1000	46.3927	-28.2927	-256.1471	23.5922
31	16.2000	42.9000	12.3664	30.5336	-27.9360	24.9261
32	8.4500	1.9000	-12.9897	14.8897	3.9461	164.0991
33	29.2000	4.0000	54.8993	-50.8993	-318.0772	28.1361
34	5.3200	0.4600	-23.2303	23.6903	-2.5185	239.6480
35	2.2700	1.5000	-33.2092	34.7092	-8.0115	312.4594
36	1.6800	1.8000	-35.1395	36.9395	-9.0300	326.5002
37	3.4200	6.8000	-29.4467	36.2467	-5.9921	285.0576
38	4.4100	1.4000	-26.2076	27.6076	-4.2079	261.4225
39	1.3100	0.6700	-36.3501	37.0201	-9.6636	335.3003
40	7.0800	0.9400	-17.4720	18.4120	0.9476	197.3357
41	1.0900	0.1800	-37.0699	37.2499	-10.0386	340.5311
42	0.9700	0.2100	-37.4625	37.6725	-10.2427	343.3837
43	1.1100	0.5400	-37.0044	37.5444	-10.0046	340.0556
44	1.0700	0.0730	-37.1353	37.2083	-10.0727	341.0065
45	0.4500	0.0770	-39.1638	39.2408	-11.1230	355.7412
46	20.5000	8.4000	26.4350	-18.0350	-108.4350	10.5170
47	29.3000	2.0000	55.2264	-53.2264	-320.4549	28.3066
48	18.6000	1.1000	20.2186	-19.1186	-58.7427	2.7608
49	27.7000	39.2000	49.9916	-10.7916	-282.3779	25.5442
50	13.6000	34.7000	3.8598	30.8402	6.5181	47.8582
51	30.0000	5.5000	57.5167	-52.0167	-337.0917	29.4932

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Soil

Inverse Prediction of X Individuals

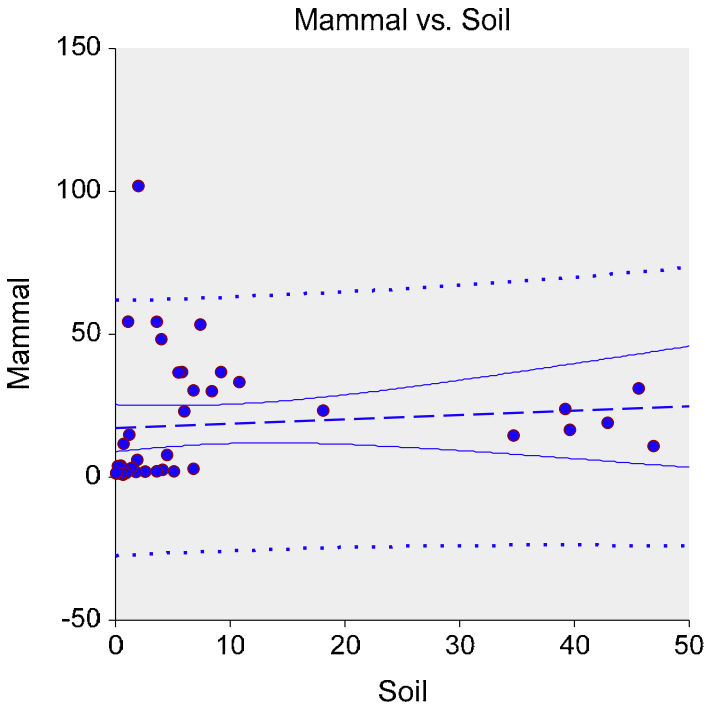
Row	Invert (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	20.2000	6.0000	25.4534	-19.4534	-223.6237	132.3273
12	12.0000	46.9000	-1.3750	48.2750	-139.3470	229.0380
13	9.0700	1.2000	-10.9612	12.1612	-94.8146	249.1754
14	16.3000	39.6000	12.6936	26.9064	-190.7417	185.5246
15	11.1000	4.1000	-4.3196	8.4196	-126.5530	236.1084
16	1.6100	0.7100	-35.3686	36.0786	80.2471	238.7681
17	2.3600	5.1000	-32.9147	38.0147	54.1775	248.2840
18	1.5200	0.3500	-35.6630	36.0130	83.7295	237.2721
19	1.9700	3.6000	-34.1907	37.7907	67.1593	243.9101
20	4.5000	2.6000	-25.9132	28.5132	-4.2724	259.5005
21	1.3200	0.6600	-36.3174	36.9774	91.8448	233.5711
22	34.6000	45.6000	72.5668	-26.9668	-358.3961	-50.7318
23	8.7700	4.5000	-11.9428	16.4428	-89.7570	250.7393
24	24.5000	5.8000	39.5220	-33.7220	-241.4521	55.2476
25	26.0000	6.8000	44.4296	-37.6296	-241.0392	21.7273
26	53.8000	9.2000	135.3845	-126.1845	-862.8956	29.9923
27	62.3000	7.4000	163.1945	-155.7945	-1070.8357	50.3236
28	32.1000	10.8000	64.3874	-53.5874	-273.7182	-80.2306
29	50.1000	3.6000	123.2790	-119.6790	-771.1037	19.8655
30	26.6000	18.1000	46.3927	-28.2927	-239.4203	6.8654
31	16.2000	42.9000	12.3664	30.5336	-189.7236	186.7137
32	8.4500	1.9000	-12.9897	14.8897	-84.2493	252.2945
33	29.2000	4.0000	54.8993	-50.8993	-213.9761	-75.9651
34	5.3200	0.4600	-23.2303	23.6903	-23.0916	260.2210
35	2.2700	1.5000	-33.2092	34.7092	57.0806	247.3673
36	1.6800	1.8000	-35.1395	36.9395	77.6022	239.8679
37	3.4200	6.8000	-29.4467	36.2467	23.1275	255.9380
38	4.4100	1.4000	-26.2076	27.6076	-2.1129	259.3275
39	1.3100	0.6700	-36.3501	37.0201	92.2659	233.3708
40	7.0800	0.9400	-17.4720	18.4120	-59.2427	257.5260
41	1.0900	0.1800	-37.0699	37.2499	101.9778	228.5146
42	0.9700	0.2100	-37.4625	37.6725	107.7083	225.4327
43	1.1100	0.5400	-37.0044	37.5444	101.0557	228.9953
44	1.0700	0.0730	-37.1353	37.2083	102.9088	228.0250
45	0.4500	0.0770	-39.1638	39.2408	139.4407	205.1775
46	20.5000	8.4000	26.4350	-18.0350	-225.5667	127.6487
47	29.3000	2.0000	55.2264	-53.2264	-211.7935	-80.3548
48	18.6000	1.1000	20.2186	-19.1186	-211.7897	155.8079
49	27.7000	39.2000	49.9916	-10.7916	-233.4105	-23.4232
50	13.6000	34.7000	3.8598	30.8402	-160.3083	214.6846
51	30.0000	5.5000	57.5167	-52.0167	-187.4376	-120.1608

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Mammal	Rows Processed	58
Independent Variable	Soil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	17.1934	Rows Prediction Only	0
Slope	0.1488	Sum of Frequencies	41
R-Squared	0.0095	Sum of Weights	41.0000
Correlation	0.0974	Coefficient of Variation	1.1683
Mean Square Error	470.2239	Square Root of MSE	21.68465

Linear Regression Report

Y = Mammal X = Soil

Summary Statement

The equation of the straight line relating Mammal and Soil is estimated as: Mammal = (17.1934) + (0.1488) Soil using the 41 observations in this dataset. The y-intercept, the estimated value of Mammal when Soil is zero, is 17.1934 with a standard error of 4.0589. The slope, the estimated change in Mammal per unit change in Soil, is 0.1488 with a standard error of 0.2433. The value of R-Squared, the proportion of the variation in Mammal that can be accounted for by variation in Soil, is 0.0095. The correlation between Mammal and Soil is 0.0974.

A significance test that the slope is zero resulted in a t-value of 0.6114. The significance level of this t-test is 0.5445. Since 0.5445 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is 0.1488. The lower limit of the 95% confidence interval for the slope is -0.3434 and the upper limit is 0.6410. The estimated intercept is 17.1934. The lower limit of the 95% confidence interval for the intercept is 8.9836 and the upper limit is 25.4033.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Mammal	Soil
Count	41	41
Mean	18.5613	9.1944
Standard Deviation	21.5142	14.0901
Minimum	0.8900	0.0730
Maximum	101.9000	46.9000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	17.1934	0.1488
Lower 95% Confidence Limit	8.9836	-0.3434
Upper 95% Confidence Limit	25.4033	0.6410
Standard Error	4.0589	0.2433
Standardized Coefficient	0.0000	0.0974
T Value	4.2360	0.6114
Prob Level (T Test)	0.0001	0.5445
Prob Level (Randomization Test N =1000)		0.5390
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.9850	0.0916
Regression of Y on X	17.1934	0.1488
Inverse Regression from X on Y	-125.5308	15.6717
Orthogonal Regression of Y and X	-64.7412	9.0601

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(17.1934476825897) + (0.148765980530249) * (Soil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	17.1934	0.9000	9.5978	23.9403
Bootstrap Mean	17.1540	0.9500	7.7286	24.7563
Bias (BM - OV)	-0.0395	0.9900	4.3809	26.3971
Bias Corrected	17.2329			
Standard Error	4.3642			
Slope				
Original Value	0.1488	0.9000	-0.1161	0.3870
Bootstrap Mean	0.1703	0.9500	-0.1878	0.4364
Bias (BM - OV)	0.0215	0.9900	-0.4918	0.5397
Bias Corrected	0.1273			
Standard Error	0.1839			
Correlation				
Original Value	0.0974	0.9000	-0.1236	0.2480
Bootstrap Mean	0.1184	0.9500	-0.1733	0.2756
Bias (BM - OV)	0.0210	0.9900	-0.2530	0.3315
Bias Corrected	0.0764			
Standard Error	0.1116			
R-Squared				
Original Value	0.0095	0.9000	0.0000	0.0189
Bootstrap Mean	0.0265	0.9500	0.0000	0.0190
Bias (BM - OV)	0.0170	0.9900	0.0000	0.0190
Bias Corrected	-0.0075			
Standard Error	0.0366			
Standard Error of Estimate				
Original Value	21.6846	0.9000	15.3243	29.0661
Bootstrap Mean	20.8787	0.9500	14.3411	29.8388
Bias (BM - OV)	-0.8060	0.9900	12.4884	31.3913
Bias Corrected	22.4906			
Standard Error	4.1650			
Orthogonal Intercept				
Original Value	-64.7412	0.9000	-553.6402	372.7975
Bootstrap Mean	-119.2628	0.9500	-937.4990	952.3407
Bias (BM - OV)	-54.5216	0.9900	-9149.6189	8081.2406
Bias Corrected	-10.2196			
Standard Error	9895.8517			
Orthogonal Slope				
Original Value	9.0601	0.9000	-47.2086	62.1134
Bootstrap Mean	14.7059	0.9500	-106.1062	108.9818
Bias (BM - OV)	5.6458	0.9900	-945.9856	928.5713
Bias Corrected	3.4144			
Standard Error	987.9544			

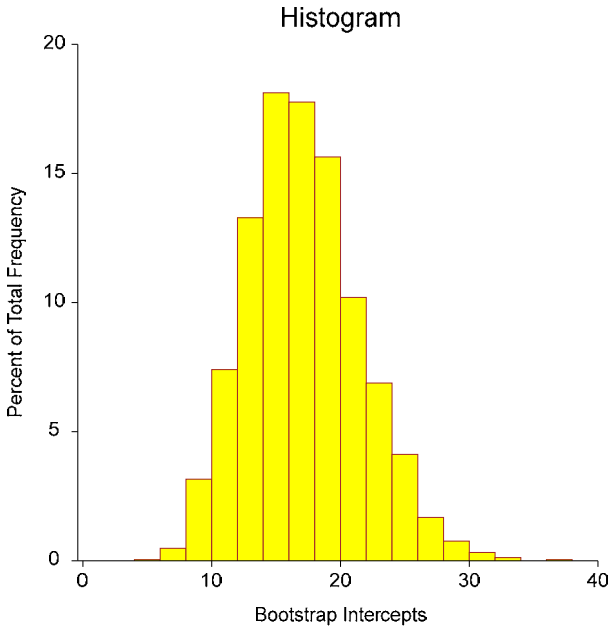
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

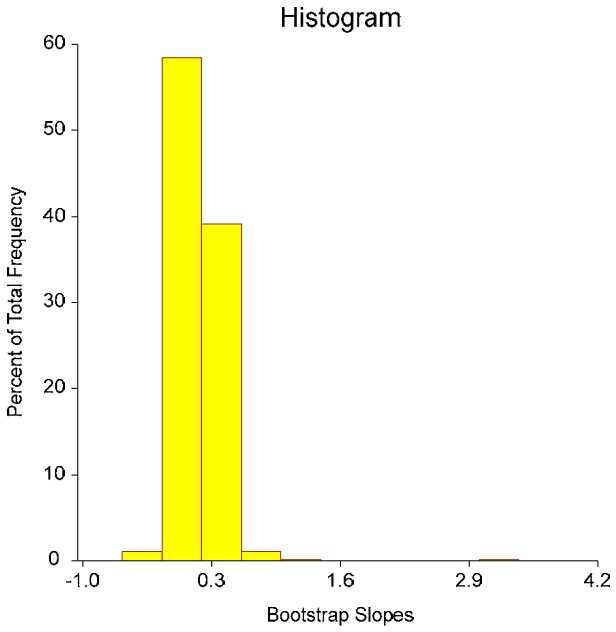
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

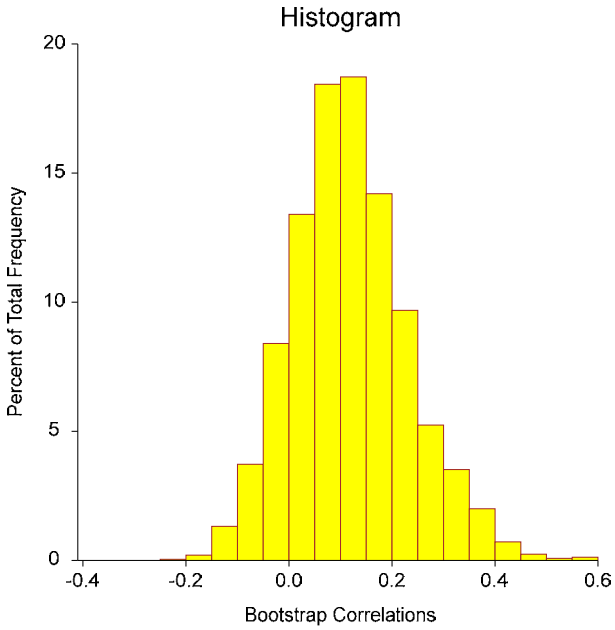
Linear Regression Report

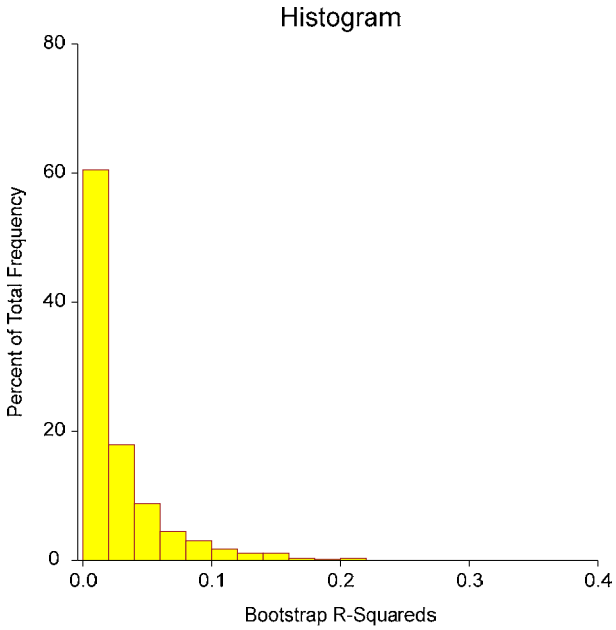
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Bootstrap Histograms Section



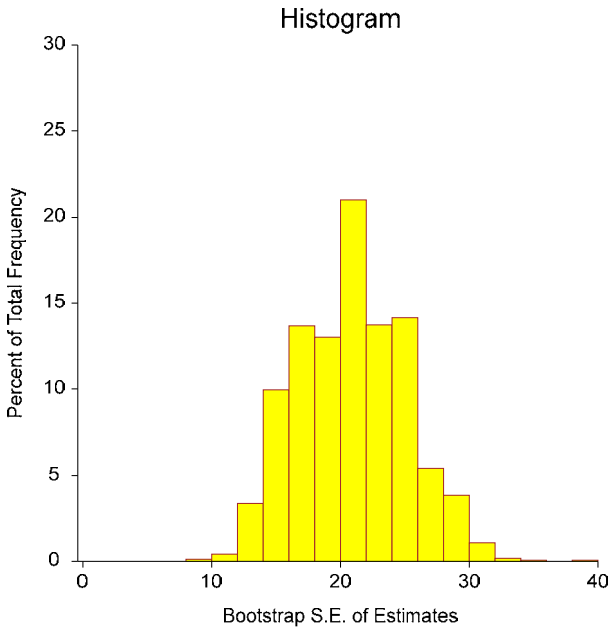


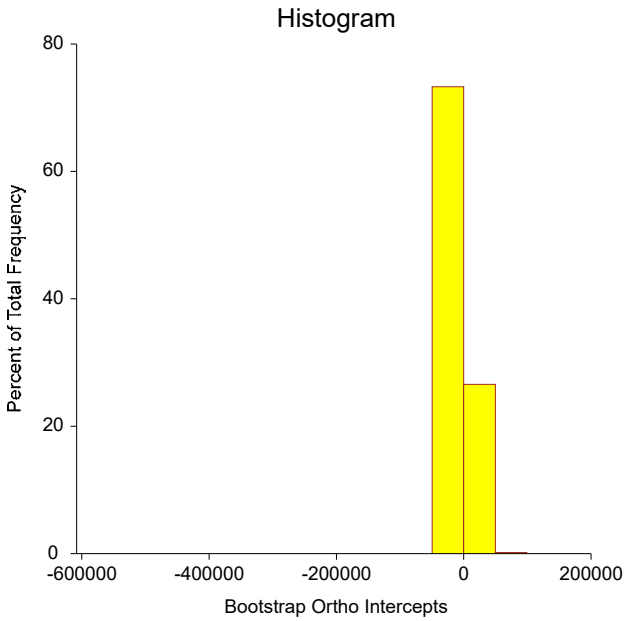


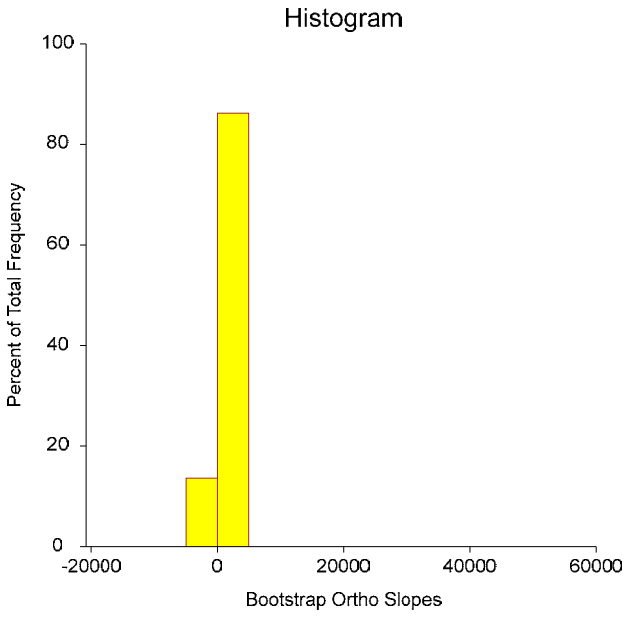


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.0974	0.0095	0.5719
Lower 95% Conf. Limit (r dist'n)	-0.2145		
Upper 95% Conf. Limit (r dist'n)	0.3892		
Lower 95% Conf. Limit (Fisher's z)	-0.2167		0.3206
Upper 95% Conf. Limit (Fisher's z)	0.3933		0.7479
Adjusted (Rbar)		0.0159	
T-Value for H0: Rho = 0	0.6114	0.6114	4.3532
Prob Level for H0: Rho = 0	0.5445	0.5445	0.0001
Prob Level (Randomization Test N =1000)	0.5390		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	14125.34	14125.34			
Slope	1	175.7511	175.7511	0.3738	0.5445	0.0916
Error	39	18338.73	470.2239			
Lack of Fit	37	16595.41	448.5245	0.5146	0.8424	
Pure Error	2	1743.324	871.6622			
Adj. Total	40	18514.48	462.8621			
Total	41	32639.82				

s = Square Root(470.2239) = 21.68465

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	376.97	761.0117	0.03503547	-0.001157796
1	376.97	11407.3	8178.432	-0.001157796	0.0001259242
2 (Y'Y)			32639.82		
Determinant		325592.8			3.071322E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	16.47452	-0.5444234
1	-0.5444234	0.05921256

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7572	0.000001	No
Anderson Darling	3.1758	0.000000	No
D'Agostino Skewness	4.1762	0.000030	No
D'Agostino Kurtosis	3.2455	0.001172	No
D'Agostino Omnibus	27.9744	0.000001	No
Constant Residual Variance?			
Modified Levene Test	0.0518	0.821223	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.5146	0.842441	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

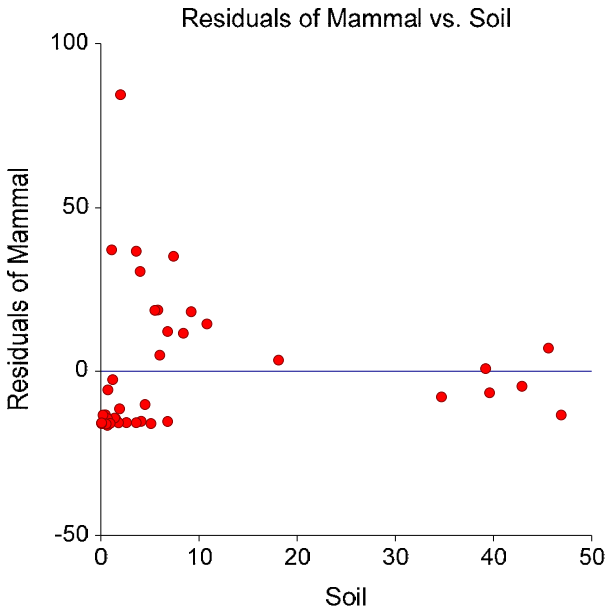
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

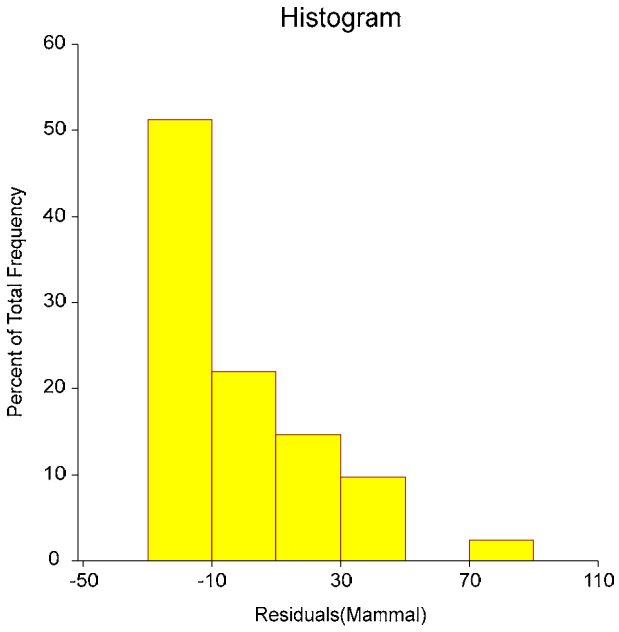
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

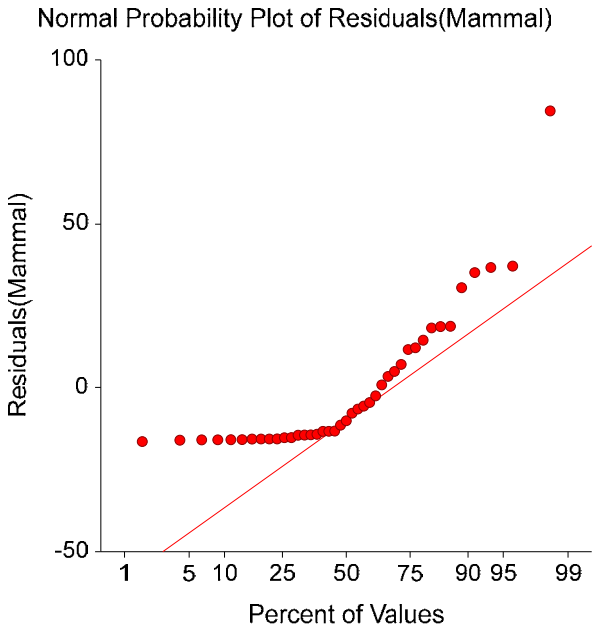
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Original Data Section

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual
11	6.0000	23.0667	18.0860	4.9806
12	46.9000	10.9000	24.1706	-13.2706
13	1.2000	14.8900	17.3720	-2.4820
14	39.6000	16.6000	23.0846	-6.4846
15	4.1000	2.6000	17.8034	-15.2034
16	0.7100	11.6950	17.2991	-5.6041
17	5.1000	2.0767	17.9522	-15.8755
18	0.3500	2.7800	17.2455	-14.4655
19	3.6000	2.1100	17.7290	-15.6190
20	2.6000	1.9900	17.5802	-15.5902
21	0.6600	0.8900	17.2916	-16.4016
22	45.6000	31.1000	23.9772	7.1228
23	4.5000	7.8000	17.8629	-10.0629
24	5.8000	36.8000	18.0563	18.7437
25	6.8000	30.4000	18.2051	12.1949
26	9.2000	36.8000	18.5621	18.2379
27	7.4000	53.4233	18.2943	35.1290
28	10.8000	33.3000	18.8001	14.4999
29	3.6000	54.4000	17.7290	36.6710
30	18.1000	23.3500	19.8861	3.4639
31	42.9000	19.0700	23.5755	-4.5055
32	1.9000	6.0800	17.4761	-11.3961
33	4.0000	48.3000	17.7885	30.5115
34	0.4600	4.0533	17.2619	-13.2085
35	1.5000	2.9867	17.4166	-14.4299
36	1.8000	1.8400	17.4612	-15.6212
37	6.8000	2.9700	18.2051	-15.2351
38	1.4000	3.2100	17.4017	-14.1917
39	0.6700	2.9400	17.2931	-14.3531
40	0.9400	1.5200	17.3333	-15.8133
41	0.1800	1.3900	17.2202	-15.8302
42	0.2100	3.9267	17.2247	-13.2980
43	0.5400	1.2767	17.2738	-15.9971
44	0.0730	1.3100	17.2043	-15.8943
45	0.0770	1.5500	17.2049	-15.6549
46	8.4000	30.1000	18.4431	11.6569
47	2.0000	101.9000	17.4910	84.4090
48	1.1000	54.4500	17.3571	37.0929
49	39.2000	23.9000	23.0251	0.8749
50	34.7000	14.6000	22.3556	-7.7556
51	5.5000	36.6667	18.0117	18.6550

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Predicted Values and Confidence Limits of Means

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	6.0000	23.0667	18.0860	3.4746	11.0579	25.1142
12	46.9000	10.9000	24.1706	9.7802	4.3883	43.9529
13	1.2000	14.8900	17.3720	3.9055	9.4723	25.2716
14	39.6000	16.6000	23.0846	8.1370	6.6259	39.5432
15	4.1000	2.6000	17.8034	3.6063	10.5089	25.0979
16	0.7100	11.6950	17.2991	3.9663	9.2765	25.3216
17	5.1000	2.0767	17.9522	3.5301	10.8119	25.0924
18	0.3500	2.7800	17.2455	4.0126	9.1293	25.3617
19	3.6000	2.1100	17.7290	3.6499	10.3463	25.1117
20	2.6000	1.9900	17.5802	3.7475	10.0002	25.1603
21	0.6600	0.8900	17.2916	3.9726	9.2563	25.3270
22	45.6000	31.1000	23.9772	9.4841	4.7939	43.1605
23	4.5000	7.8000	17.8629	3.5740	10.6337	25.0921
24	5.8000	36.8000	18.0563	3.4858	11.0055	25.1071
25	6.8000	30.4000	18.2051	3.4363	11.2544	25.1557
26	9.2000	36.8000	18.5621	3.3866	11.7121	25.4121
27	7.4000	53.4233	18.2943	3.4146	11.3876	25.2010
28	10.8000	33.3000	18.8001	3.4090	11.9047	25.6955
29	3.6000	54.4000	17.7290	3.6499	10.3463	25.1117
30	18.1000	23.3500	19.8861	4.0206	11.7537	28.0185
31	42.9000	19.0700	23.5755	8.8735	5.6272	41.5238
32	1.9000	6.0800	17.4761	3.8235	9.7423	25.2099
33	4.0000	48.3000	17.7885	3.6148	10.4770	25.1001
34	0.4600	4.0533	17.2619	3.9983	9.1746	25.3491
35	1.5000	2.9867	17.4166	3.8697	9.5894	25.2438
36	1.8000	1.8400	17.4612	3.8349	9.7044	25.2180
37	6.8000	2.9700	18.2051	3.4363	11.2544	25.1557
38	1.4000	3.2100	17.4017	3.8815	9.5506	25.2528
39	0.6700	2.9400	17.2931	3.9713	9.2603	25.3259
40	0.9400	1.5200	17.3333	3.9374	9.3691	25.2975
41	0.1800	1.3900	17.2202	4.0349	9.0589	25.3816
42	0.2100	3.9267	17.2247	4.0309	9.0713	25.3780
43	0.5400	1.2767	17.2738	3.9880	9.2074	25.3402
44	0.0730	1.3100	17.2043	4.0491	9.0142	25.3944
45	0.0770	1.5500	17.2049	4.0486	9.0159	25.3939
46	8.4000	30.1000	18.4431	3.3921	11.5819	25.3042
47	2.0000	101.9000	17.4910	3.8123	9.7799	25.2021
48	1.1000	54.4500	17.3571	3.9177	9.4328	25.2814
49	39.2000	23.9000	23.0251	8.0486	6.7452	39.3049
50	34.7000	14.6000	22.3556	7.0703	8.0546	36.6566
51	5.5000	36.6667	18.0117	3.5039	10.9244	25.0989

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Predicted Values and Prediction Limits

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	6.0000	23.0667	18.0860	21.9613	-26.3348	62.5069
12	46.9000	10.9000	24.1706	23.7881	-23.9455	72.2866
13	1.2000	14.8900	17.3720	22.0335	-27.1951	61.9390
14	39.6000	16.6000	23.0846	23.1611	-23.7631	69.9323
15	4.1000	2.6000	17.8034	21.9825	-26.6604	62.2672
16	0.7100	11.6950	17.2991	22.0444	-27.2899	61.8881
17	5.1000	2.0767	17.9522	21.9701	-26.4866	62.3909
18	0.3500	2.7800	17.2455	22.0528	-27.3604	61.8514
19	3.6000	2.1100	17.7290	21.9897	-26.7493	62.2073
20	2.6000	1.9900	17.5802	22.0061	-26.9313	62.0917
21	0.6600	0.8900	17.2916	22.0455	-27.2997	61.8829
22	45.6000	31.1000	23.9772	23.6679	-23.8957	71.8501
23	4.5000	7.8000	17.8629	21.9772	-26.5902	62.3160
24	5.8000	36.8000	18.0563	21.9630	-26.3681	62.4807
25	6.8000	30.4000	18.2051	21.9552	-26.2036	62.6137
26	9.2000	36.8000	18.5621	21.9475	-25.8309	62.9551
27	7.4000	53.4233	18.2943	21.9518	-26.1075	62.6961
28	10.8000	33.3000	18.8001	21.9510	-25.5999	63.2002
29	3.6000	54.4000	17.7290	21.9897	-26.7493	62.2073
30	18.1000	23.3500	19.8861	22.0542	-24.7228	64.4950
31	42.9000	19.0700	23.5755	23.4299	-23.8160	70.9670
32	1.9000	6.0800	17.4761	22.0192	-27.0618	62.0141
33	4.0000	48.3000	17.7885	21.9839	-26.6781	62.2551
34	0.4600	4.0533	17.2619	22.0502	-27.3388	61.8626
35	1.5000	2.9867	17.4166	22.0272	-27.1377	61.9709
36	1.8000	1.8400	17.4612	22.0211	-27.0807	62.0032
37	6.8000	2.9700	18.2051	21.9552	-26.2036	62.6137
38	1.4000	3.2100	17.4017	22.0293	-27.1567	61.9602
39	0.6700	2.9400	17.2931	22.0453	-27.2977	61.8840
40	0.9400	1.5200	17.3333	22.0392	-27.2452	61.9118
41	0.1800	1.3900	17.2202	22.0568	-27.3940	61.8344
42	0.2100	3.9267	17.2247	22.0561	-27.3880	61.8374
43	0.5400	1.2767	17.2738	22.0483	-27.3231	61.8707
44	0.0730	1.3100	17.2043	22.0594	-27.4151	61.8238
45	0.0770	1.5500	17.2049	22.0593	-27.4143	61.8241
46	8.4000	30.1000	18.4431	21.9484	-25.9516	62.8378
47	2.0000	101.9000	17.4910	22.0172	-27.0430	62.0250
48	1.1000	54.4500	17.3571	22.0357	-27.2143	61.9285
49	39.2000	23.9000	23.0251	23.1302	-23.7601	69.8102
50	34.7000	14.6000	22.3556	22.8082	-23.7783	68.4895
51	5.5000	36.6667	18.0117	21.9659	-26.4186	62.4419

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Working-Hotelling Simultaneous Confidence Band

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	6.0000	23.0667	18.0860	3.4746	8.1838	27.9883
12	46.9000	10.9000	24.1706	9.7802	-3.7017	52.0429
13	1.2000	14.8900	17.3720	3.9055	6.2417	28.5022
14	39.6000	16.6000	23.0846	8.1370	-0.1048	46.2740
15	4.1000	2.6000	17.8034	3.6063	7.5258	28.0810
16	0.7100	11.6950	17.2991	3.9663	5.9957	28.6024
17	5.1000	2.0767	17.9522	3.5301	7.8919	28.0124
18	0.3500	2.7800	17.2455	4.0126	5.8102	28.6808
19	3.6000	2.1100	17.7290	3.6499	7.3271	28.1309
20	2.6000	1.9900	17.5802	3.7475	6.9003	28.2601
21	0.6600	0.8900	17.2916	3.9726	5.9702	28.6131
22	45.6000	31.1000	23.9772	9.4841	-3.0512	51.0055
23	4.5000	7.8000	17.8629	3.5740	7.6773	28.0484
24	5.8000	36.8000	18.0563	3.4858	8.1221	27.9905
25	6.8000	30.4000	18.2051	3.4363	8.4120	27.9981
26	9.2000	36.8000	18.5621	3.3866	8.9108	28.2134
27	7.4000	53.4233	18.2943	3.4146	8.5631	28.0255
28	10.8000	33.3000	18.8001	3.4090	9.0848	28.5154
29	3.6000	54.4000	17.7290	3.6499	7.3271	28.1309
30	18.1000	23.3500	19.8861	4.0206	8.4280	31.3442
31	42.9000	19.0700	23.5755	8.8735	-1.7127	48.8637
32	1.9000	6.0800	17.4761	3.8235	6.5795	28.3727
33	4.0000	48.3000	17.7885	3.6148	7.4869	28.0901
34	0.4600	4.0533	17.2619	3.9983	5.8673	28.6564
35	1.5000	2.9867	17.4166	3.8697	6.3885	28.4447
36	1.8000	1.8400	17.4612	3.8349	6.5323	28.3902
37	6.8000	2.9700	18.2051	3.4363	8.4120	27.9981
38	1.4000	3.2100	17.4017	3.8815	6.3399	28.4635
39	0.6700	2.9400	17.2931	3.9713	5.9753	28.6109
40	0.9400	1.5200	17.3333	3.9374	6.1121	28.5544
41	0.1800	1.3900	17.2202	4.0349	5.7213	28.7192
42	0.2100	3.9267	17.2247	4.0309	5.7370	28.7123
43	0.5400	1.2767	17.2738	3.9880	5.9086	28.6389
44	0.0730	1.3100	17.2043	4.0491	5.6648	28.7438
45	0.0770	1.5500	17.2049	4.0486	5.6670	28.7428
46	8.4000	30.1000	18.4431	3.3921	8.7761	28.1101
47	2.0000	101.9000	17.4910	3.8123	6.6264	28.3556
48	1.1000	54.4500	17.3571	3.9177	6.1921	28.5221
49	39.2000	23.9000	23.0251	8.0486	0.0876	45.9626
50	34.7000	14.6000	22.3556	7.0703	2.2063	42.5050
51	5.5000	36.6667	18.0117	3.5039	8.0261	27.9972

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Section

Row	Soil (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	6.0000	23.0667	18.0860	4.9806	0.2327	21.5923
12	46.9000	10.9000	24.1706	-13.2706	-0.6857	121.7484
13	1.2000	14.8900	17.3720	-2.4820	-0.1164	16.6687
14	39.6000	16.6000	23.0846	-6.4846	-0.3226	39.0637
15	4.1000	2.6000	17.8034	-15.2034	-0.7110	584.7457
16	0.7100	11.6950	17.2991	-5.6041	-0.2629	47.9185
17	5.1000	2.0767	17.9522	-15.8755	-0.7420	764.4697
18	0.3500	2.7800	17.2455	-14.4655	-0.6788	520.3423
19	3.6000	2.1100	17.7290	-15.6190	-0.7307	740.2372
20	2.6000	1.9900	17.5802	-15.5902	-0.7299	783.4291
21	0.6600	0.8900	17.2916	-16.4016	-0.7694	1842.8801
22	45.6000	31.1000	23.9772	7.1228	0.3653	22.9030
23	4.5000	7.8000	17.8629	-10.0629	-0.4705	129.0115
24	5.8000	36.8000	18.0563	18.7437	0.8758	50.9340
25	6.8000	30.4000	18.2051	12.1949	0.5696	40.1149
26	9.2000	36.8000	18.5621	18.2379	0.8515	49.5595
27	7.4000	53.4233	18.2943	35.1290	1.6405	65.7559
28	10.8000	33.3000	18.8001	14.4999	0.6771	43.5432
29	3.6000	54.4000	17.7290	36.6710	1.7156	67.4099
30	18.1000	23.3500	19.8861	3.4639	0.1626	14.8346
31	42.9000	19.0700	23.5755	-4.5055	-0.2277	23.6262
32	1.9000	6.0800	17.4761	-11.3961	-0.5339	187.4359
33	4.0000	48.3000	17.7885	30.5115	1.4270	63.1708
34	0.4600	4.0533	17.2619	-13.2085	-0.6197	325.8688
35	1.5000	2.9867	17.4166	-14.4299	-0.6763	483.1450
36	1.8000	1.8400	17.4612	-15.6212	-0.7319	848.9797
37	6.8000	2.9700	18.2051	-15.2351	-0.7116	512.9649
38	1.4000	3.2100	17.4017	-14.1917	-0.6652	442.1097
39	0.6700	2.9400	17.2931	-14.3531	-0.6733	488.2014
40	0.9400	1.5200	17.3333	-15.8133	-0.7416	1040.3479
41	0.1800	1.3900	17.2202	-15.8302	-0.7430	1138.8651
42	0.2100	3.9267	17.2247	-13.2980	-0.6241	338.6593
43	0.5400	1.2767	17.2738	-15.9971	-0.7505	1253.0377
44	0.0730	1.3100	17.2043	-15.8943	-0.7461	1213.3059
45	0.0770	1.5500	17.2049	-15.6549	-0.7349	1009.9937
46	8.4000	30.1000	18.4431	11.6569	0.5443	38.7273
47	2.0000	101.9000	17.4910	84.4090	3.9542	82.8352
48	1.1000	54.4500	17.3571	37.0929	1.7392	68.1229
49	39.2000	23.9000	23.0251	0.8749	0.0435	3.6608
50	34.7000	14.6000	22.3556	-7.7556	-0.3783	53.1207
51	5.5000	36.6667	18.0117	18.6550	0.8717	50.8773

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Residual Diagnostics Section

Row	Soil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	6.0000	4.9806	0.2298	0.0257	0.0007	481.9282
12	46.9000	-13.2706	*-0.6810	0.2034	0.0600	476.7803
13	1.2000	-2.4820	-0.1149	0.0324	0.0002	482.4307
14	39.6000	-6.4846	*-0.3189	0.1408	0.0085	481.3103
15	4.1000	-15.2034	-0.7064	0.0277	0.0072	476.3425
16	0.7100	-5.6041	-0.2597	0.0335	0.0012	481.7431
17	5.1000	-15.8755	-0.7377	0.0265	0.0075	475.7853
18	0.3500	-14.4655	-0.6740	0.0342	0.0082	476.8964
19	3.6000	-15.6190	-0.7263	0.0283	0.0078	475.9912
20	2.6000	-15.5902	-0.7255	0.0299	0.0082	476.0051
21	0.6600	-16.4016	-0.7653	0.0336	0.0103	475.2731
22	45.6000	7.1228	*0.3612	0.1913	0.0158	480.9473
23	4.5000	-10.0629	-0.4657	0.0272	0.0031	479.8590
24	5.8000	18.7437	0.8731	0.0258	0.0102	473.1075
25	6.8000	12.1949	0.5646	0.0251	0.0042	478.5838
26	9.2000	18.2379	0.8484	0.0244	0.0091	473.6262
27	7.4000	35.1290	1.6782	0.0248	0.0342	449.2975
28	10.8000	14.4999	0.6723	0.0247	0.0058	476.9252
29	3.6000	36.6710	1.7612	0.0283	0.0429	446.1779
30	18.1000	3.4639	0.1605	0.0344	0.0005	482.2712
31	42.9000	-4.5055	*-0.2249	0.1674	0.0052	481.9566
32	1.9000	-11.3961	-0.5290	0.0311	0.0046	479.0709
33	4.0000	30.5115	1.4469	0.0278	0.0291	457.3993
34	0.4600	-13.2085	-0.6148	0.0340	0.0068	477.8454
35	1.5000	-14.4299	-0.6715	0.0318	0.0075	476.9384
36	1.8000	-15.6212	-0.7275	0.0313	0.0086	475.9692
37	6.8000	-15.2351	-0.7070	0.0251	0.0065	476.3328
38	1.4000	-14.1917	-0.6604	0.0320	0.0073	477.1226
39	0.6700	-14.3531	-0.6685	0.0335	0.0079	476.9887
40	0.9400	-15.8133	-0.7372	0.0330	0.0094	475.7933
41	0.1800	-15.8302	-0.7387	0.0346	0.0099	475.7671
42	0.2100	-13.2980	-0.6192	0.0346	0.0070	477.7780
43	0.5400	-15.9971	-0.7462	0.0338	0.0099	475.6280
44	0.0730	-15.8943	-0.7418	0.0349	0.0101	475.7099
45	0.0770	-15.6549	-0.7304	0.0349	0.0098	475.9159
46	8.4000	11.6569	0.5393	0.0245	0.0037	478.9326
47	2.0000	84.4090	*5.0427	0.0309	0.2493	289.1213
48	1.1000	37.0929	1.7875	0.0326	0.0510	445.1690
49	39.2000	0.8749	*0.0429	0.1378	0.0002	482.5748
50	34.7000	-7.7556	*-0.3741	0.1063	0.0085	480.8270
51	5.5000	18.6550	0.8690	0.0261	0.0102	473.1945

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.2298	0.0373	0.0007	1.0781	0.0349	-0.0083
12	-0.6810	-0.3441	0.0600	* 1.2906	0.0785	-0.3228
13	-0.1149	-0.0210	0.0002	1.0879	-0.0210	0.0105
14	-0.3189	-0.1291	0.0085	* 1.2194	0.0199	-0.1174
15	-0.7064	-0.1191	0.0072	1.0554	-0.1159	0.0410
16	-0.2597	-0.0483	0.0012	1.0859	-0.0483	0.0252
17	-0.7377	-0.1217	0.0075	1.0517	-0.1164	0.0344
18	-0.6740	-0.1269	0.0082	1.0650	-0.1269	0.0681
19	-0.7263	-0.1240	0.0078	1.0546	-0.1215	0.0463
20	-0.7255	-0.1273	0.0082	1.0563	-0.1260	0.0545
21	-0.7653	-0.1426	0.0103	1.0571	-0.1425	0.0746
22	0.3612	0.1757	0.0158	* 1.2936	-0.0381	0.1641
23	-0.4657	-0.0778	0.0031	1.0705	-0.0752	0.0249
24	0.8731	0.1422	0.0102	1.0392	0.1338	-0.0337
25	0.5646	0.0906	0.0042	1.0626	0.0830	-0.0154
26	0.8484	0.1341	0.0091	1.0399	0.1119	0.0001
27	1.6782	0.2676	0.0342	0.9362	0.2403	-0.0342
28	0.6723	0.1070	0.0058	1.0548	0.0819	0.0123
29	1.7612	0.3007	0.0429	0.9266	0.2946	-0.1122
30	0.1605	0.0303	0.0005	1.0893	0.0123	0.0163
31	-0.2249	-0.1009	0.0052	* 1.2618	0.0193	-0.0932
32	-0.5290	-0.0948	0.0046	1.0713	-0.0943	0.0440
33	1.4469	0.2446	0.0291	0.9732	0.2384	-0.0855
34	-0.6148	-0.1153	0.0068	1.0690	-0.1153	0.0613
35	-0.6715	-0.1218	0.0075	1.0626	-0.1214	0.0589
36	-0.7275	-0.1307	0.0086	1.0577	-0.1301	0.0613
37	-0.7070	-0.1135	0.0065	1.0526	-0.1039	0.0192
38	-0.6604	-0.1201	0.0073	1.0636	-0.1198	0.0587
39	-0.6685	-0.1245	0.0079	1.0647	-0.1245	0.0650
40	-0.7372	-0.1361	0.0094	1.0587	-0.1360	0.0694
41	-0.7387	-0.1399	0.0099	1.0604	-0.1399	0.0760
42	-0.6192	-0.1171	0.0070	1.0693	-0.1171	0.0635
43	-0.7462	-0.1396	0.0099	1.0589	-0.1396	0.0737
44	-0.7418	-0.1410	0.0101	1.0604	-0.1410	0.0773
45	-0.7304	-0.1388	0.0098	1.0614	-0.1388	0.0761
46	0.5393	0.0854	0.0037	1.0634	0.0738	-0.0049
47	* 5.0427	0.9006	0.2493	0.3901	0.8955	-0.4136
48	1.7875	0.3283	0.0510	0.9265	0.3278	-0.1651
49	0.0429	0.0171	0.0002	* 1.2215	-0.0026	0.0156
50	-0.3741	-0.1290	0.0085	* 1.1700	0.0109	-0.1133
51	0.8690	0.1423	0.0102	1.0398	0.1349	-0.0365

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Outlier Detection Chart

Row	Soil (X)	Residual		Standardized Residual		RStudent	
11	6.0000	4.9806	|.....	0.2327	|.....	0.2298	|.....
12	46.9000	-13.2706	||.....	-0.6857	||.....	-0.6810	|.....
13	1.2000	-2.4820	|.....	-0.1164	|.....	-0.1149	|.....
14	39.6000	-6.4846	|.....	-0.3226	|.....	-0.3189	|.....
15	4.1000	-15.2034	||.....	-0.7110	||.....	-0.7064	|.....
16	0.7100	-5.6041	|.....	-0.2629	|.....	-0.2597	|.....
17	5.1000	-15.8755	||.....	-0.7420	||.....	-0.7377	||.....
18	0.3500	-14.4655	||.....	-0.6788	||.....	-0.6740	|.....
19	3.6000	-15.6190	||.....	-0.7307	||.....	-0.7263	||.....
20	2.6000	-15.5902	||.....	-0.7299	||.....	-0.7255	||.....
21	0.6600	-16.4016	||.....	-0.7694	||.....	-0.7653	||.....
22	45.6000	7.1228	|.....	0.3653	|.....	0.3612	|.....
23	4.5000	-10.0629	|.....	-0.4705	|.....	-0.4657	|.....
24	5.8000	18.7437	|||.....	0.8758	|||.....	0.8731	||.....
25	6.8000	12.1949	||.....	0.5696	||.....	0.5646	|.....
26	9.2000	18.2379	|||.....	0.8515	|||.....	0.8484	||.....
27	7.4000	35.1290	||||||.....	1.6405	||||||.....	1.6782	||||.....
28	10.8000	14.4999	||.....	0.6771	||.....	0.6723	|.....
29	3.6000	36.6710	||||||.....	1.7156	||||||.....	1.7612	|||||.....
30	18.1000	3.4639	|.....	0.1626	|.....	0.1605	|.....
31	42.9000	-4.5055	|.....	-0.2277	|.....	-0.2249	|.....
32	1.9000	-11.3961	|.....	-0.5339	|.....	-0.5290	|.....
33	4.0000	30.5115	|||||.....	1.4270	|||||.....	1.4469	||||.....
34	0.4600	-13.2085	||.....	-0.6197	||.....	-0.6148	|.....
35	1.5000	-14.4299	||.....	-0.6763	||.....	-0.6715	|.....
36	1.8000	-15.6212	||.....	-0.7319	||.....	-0.7275	||.....
37	6.8000	-15.2351	||.....	-0.7116	||.....	-0.7070	|.....
38	1.4000	-14.1917	||.....	-0.6652	||.....	-0.6604	|.....
39	0.6700	-14.3531	||.....	-0.6733	||.....	-0.6685	|.....
40	0.9400	-15.8133	||.....	-0.7416	||.....	-0.7372	||.....
41	0.1800	-15.8302	||.....	-0.7430	||.....	-0.7387	||.....
42	0.2100	-13.2980	||.....	-0.6241	||.....	-0.6192	|.....
43	0.5400	-15.9971	||.....	-0.7505	||.....	-0.7462	||.....
44	0.0730	-15.8943	||.....	-0.7461	||.....	-0.7418	||.....
45	0.0770	-15.6549	||.....	-0.7349	||.....	-0.7304	||.....
46	8.4000	11.6569	|.....	0.5443	|.....	0.5393	|.....
47	2.0000	84.4090	||||||||||||||	3.9542	||||||||||||||	* 5.0427	||||||||||||||
48	1.1000	37.0929	||||||.....	1.7392	||||||.....	1.7875	|||||.....
49	39.2000	0.8749	|.....	0.0435	|.....	0.0429	|.....
50	34.7000	-7.7556	|.....	-0.3783	|.....	-0.3741	|.....
51	5.5000	18.6550	|||.....	0.8717	|||.....	0.8690	||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Influence Detection Chart

Row	Soil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	6.0000	0.0373	|.....	0.0007	|.....	-0.0083	|.....
12	46.9000	-0.3441	|||||.....	0.0600	|||.....	-0.3228	||||||||||....
13	1.2000	-0.0210	|.....	0.0002	|.....	0.0105	|.....
14	39.6000	-0.1291	|.....	0.0085	|.....	-0.1174	||||.....
15	4.1000	-0.1191	|.....	0.0072	|.....	0.0410	|.....
16	0.7100	-0.0483	|.....	0.0012	|.....	0.0252	|.....
17	5.1000	-0.1217	|.....	0.0075	|.....	0.0344	|.....
18	0.3500	-0.1269	|.....	0.0082	|.....	0.0681	||.....
19	3.6000	-0.1240	|.....	0.0078	|.....	0.0463	|.....
20	2.6000	-0.1273	|.....	0.0082	|.....	0.0545	|.....
21	0.6600	-0.1426	||.....	0.0103	|.....	0.0746	||.....
22	45.6000	0.1757	||.....	0.0158	|.....	0.1641	|||||.....
23	4.5000	-0.0778	|.....	0.0031	|.....	0.0249	|.....
24	5.8000	0.1422	||.....	0.0102	|.....	-0.0337	|.....
25	6.8000	0.0906	|.....	0.0042	|.....	-0.0154	|.....
26	9.2000	0.1341	|.....	0.0091	|.....	0.0001	|.....
27	7.4000	0.2676	||||.....	0.0342	||.....	-0.0342	|.....
28	10.8000	0.1070	|.....	0.0058	|.....	0.0123	|.....
29	3.6000	0.3007	||||.....	0.0429	||.....	-0.1122	||||.....
30	18.1000	0.0303	|.....	0.0005	|.....	0.0163	|.....
31	42.9000	-0.1009	|.....	0.0052	|.....	-0.0932	|||.....
32	1.9000	-0.0948	|.....	0.0046	|.....	0.0440	|.....
33	4.0000	0.2446	|||.....	0.0291	|.....	-0.0855	|||.....
34	0.4600	-0.1153	|.....	0.0068	|.....	0.0613	||.....
35	1.5000	-0.1218	|.....	0.0075	|.....	0.0589	||.....
36	1.8000	-0.1307	|.....	0.0086	|.....	0.0613	||.....
37	6.8000	-0.1135	|.....	0.0065	|.....	0.0192	|.....
38	1.4000	-0.1201	|.....	0.0073	|.....	0.0587	||.....
39	0.6700	-0.1245	|.....	0.0079	|.....	0.0650	||.....
40	0.9400	-0.1361	||.....	0.0094	|.....	0.0694	||.....
41	0.1800	-0.1399	||.....	0.0099	|.....	0.0760	||.....
42	0.2100	-0.1171	|.....	0.0070	|.....	0.0635	||.....
43	0.5400	-0.1396	||.....	0.0099	|.....	0.0737	||.....
44	0.0730	-0.1410	||.....	0.0101	|.....	0.0773	||.....
45	0.0770	-0.1388	||.....	0.0098	|.....	0.0761	||.....
46	8.4000	0.0854	|.....	0.0037	|.....	-0.0049	|.....
47	2.0000	0.9006	|||||||||||||||	0.2493	|||||||||||||||	-0.4136	|||||||||||||||
48	1.1000	0.3283	|||||.....	0.0510	|||.....	-0.1651	|||||.....
49	39.2000	0.0171	|.....	0.0002	|.....	0.0156	|.....
50	34.7000	-0.1290	|.....	0.0085	|.....	-0.1133	||||.....
51	5.5000	0.1423	||.....	0.0102	|.....	-0.0365	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Outlier & Influence Chart

Row	Soil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	6.0000	0.2298	|.....	0.0007	|.....	0.0257	|.....
12	46.9000	-0.6810	|.....	0.0600	|||.....	0.2034	||||||||||||||
13	1.2000	-0.1149	|.....	0.0002	|.....	0.0324	|.....
14	39.6000	-0.3189	|.....	0.0085	|.....	0.1408	||||||||.....
15	4.1000	-0.7064	|.....	0.0072	|.....	0.0277	|.....
16	0.7100	-0.2597	|.....	0.0012	|.....	0.0335	|.....
17	5.1000	-0.7377	||.....	0.0075	|.....	0.0265	|.....
18	0.3500	-0.6740	|.....	0.0082	|.....	0.0342	|.....
19	3.6000	-0.7263	||.....	0.0078	|.....	0.0283	|.....
20	2.6000	-0.7255	||.....	0.0082	|.....	0.0299	|.....
21	0.6600	-0.7653	||.....	0.0103	|.....	0.0336	|.....
22	45.6000	0.3612	|.....	0.0158	|.....	0.1913	|||||||||||..
23	4.5000	-0.4657	|.....	0.0031	|.....	0.0272	|.....
24	5.8000	0.8731	||.....	0.0102	|.....	0.0258	|.....
25	6.8000	0.5646	|.....	0.0042	|.....	0.0251	|.....
26	9.2000	0.8484	||.....	0.0091	|.....	0.0244	|.....
27	7.4000	1.6782	||||.....	0.0342	||.....	0.0248	|.....
28	10.8000	0.6723	|.....	0.0058	|.....	0.0247	|.....
29	3.6000	1.7612	|||||.....	0.0429	||.....	0.0283	|.....
30	18.1000	0.1605	|.....	0.0005	|.....	0.0344	|.....
31	42.9000	-0.2249	|.....	0.0052	|.....	0.1674	||||||||||....
32	1.9000	-0.5290	|.....	0.0046	|.....	0.0311	|.....
33	4.0000	1.4469	||||.....	0.0291	|.....	0.0278	|.....
34	0.4600	-0.6148	|.....	0.0068	|.....	0.0340	|.....
35	1.5000	-0.6715	|.....	0.0075	|.....	0.0318	|.....
36	1.8000	-0.7275	||.....	0.0086	|.....	0.0313	|.....
37	6.8000	-0.7070	|.....	0.0065	|.....	0.0251	|.....
38	1.4000	-0.6604	|.....	0.0073	|.....	0.0320	|.....
39	0.6700	-0.6685	|.....	0.0079	|.....	0.0335	|.....
40	0.9400	-0.7372	||.....	0.0094	|.....	0.0330	|.....
41	0.1800	-0.7387	||.....	0.0099	|.....	0.0346	|.....
42	0.2100	-0.6192	|.....	0.0070	|.....	0.0346	|.....
43	0.5400	-0.7462	||.....	0.0099	|.....	0.0338	|.....
44	0.0730	-0.7418	||.....	0.0101	|.....	0.0349	|.....
45	0.0770	-0.7304	||.....	0.0098	|.....	0.0349	|.....
46	8.4000	0.5393	|.....	0.0037	|.....	0.0245	|.....
47	2.0000	* 5.0427	|||||||||||||||	0.2493	|||||||||||||||	0.0309	|.....
48	1.1000	1.7875	|||||.....	0.0510	|||.....	0.0326	|.....
49	39.2000	0.0429	|.....	0.0002	|.....	0.1378	||||||||.....
50	34.7000	-0.3741	|.....	0.0085	|.....	0.1063	||||||.....
51	5.5000	0.8690	||.....	0.0102	|.....	0.0261	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Inverse Prediction of X Means

Row	Mammal (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	23.0667	6.0000	39.4796	-33.4796	-4.4182	16.7173
12	10.9000	46.9000	-42.3043	89.2043	5.4116	23.3326
13	14.8900	1.2000	-15.4837	16.6837	-0.3983	23.7494
14	16.6000	39.6000	-3.9891	43.5891	-3.4061	24.4458
15	2.6000	4.1000	-98.0967	102.1967	-12.5847	52.5476
16	11.6950	0.7100	-36.9604	37.6704	9.0864	18.5832
17	2.0767	5.1000	-101.6145	106.7145	-13.5093	54.1796
18	2.7800	0.3500	-96.8867	97.2367	-12.2648	51.9844
19	2.1100	3.6000	-101.3904	104.9904	-13.4507	54.0759
20	1.9900	2.6000	-102.1971	104.7971	-13.6617	54.4491
21	0.8900	0.6600	-109.5912	110.2512	-15.5792	57.8535
22	31.1000	45.6000	93.4794	-47.8794	-23.2146	24.6553
23	7.8000	4.5000	-63.1424	67.6424	-2.6592	35.5935
24	36.8000	5.8000	131.7946	-125.9946	-41.2104	34.9467
25	30.4000	6.8000	88.7740	-81.9740	-20.8875	23.2743
26	36.8000	9.2000	131.7946	-122.5946	-41.2104	34.9467
27	53.4233	7.4000	243.5361	-236.1361	-90.9381	62.2053
28	33.3000	10.8000	108.2677	-97.4677	-30.3115	28.7786
29	54.4000	3.6000	250.1012	-246.5012	-93.8202	63.7673
30	23.3500	18.1000	41.3841	-23.2841	-3.9673	15.8833
31	19.0700	42.9000	12.6141	30.2859	-5.7052	23.4063
32	6.0800	1.9000	-74.7042	76.6042	-6.1547	41.4138
33	48.3000	4.0000	209.0972	-205.0972	-75.7767	53.9689
34	4.0533	0.4600	-88.3274	88.7874	-9.9690	47.9675
35	2.9867	1.5000	-95.4975	96.9975	-11.8961	51.3364
36	1.8400	1.8000	-103.2054	105.0054	-13.9249	54.9151
37	2.9700	6.8000	-95.6095	102.4095	-11.9259	51.3887
38	3.2100	1.4000	-93.9963	95.3963	-11.4962	50.6346
39	2.9400	0.6700	-95.8112	96.4812	-11.9795	51.4829
40	1.5200	0.9400	-105.3564	106.2964	-14.4846	55.9073
41	1.3900	0.1800	-106.2303	106.4103	-14.7112	56.3097
42	3.9267	0.2100	-89.1789	89.3889	-10.2002	48.3700
43	1.2767	0.5400	-106.9921	107.5321	-14.9085	56.6601
44	1.3100	0.0730	-106.7680	106.8410	-14.8505	56.5571
45	1.5500	0.0770	-105.1547	105.2317	-14.4322	55.8144
46	30.1000	8.4000	86.7574	-78.3574	-19.8759	22.6683
47	101.9000	2.0000	569.3946	-567.3946	-232.8999	138.6433
48	54.4500	1.1000	250.4373	-249.3373	-93.9677	63.8472
49	23.9000	39.2000	45.0812	-5.8812	-2.8198	13.9924
50	14.6000	34.7000	-17.4331	52.1331	0.2650	23.4780
51	36.6667	5.5000	130.8983	-125.3983	-40.8008	34.7173

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Soil

Inverse Prediction of X Individuals

Row	Mammal (Y)	Soil (X)	Predicted Soil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	23.0667	6.0000	39.4796	-33.4796	-87.9323	100.2313
12	10.9000	46.9000	-42.3043	89.2043	-78.6839	107.4281
13	14.8900	1.2000	-15.4837	16.6837	-82.5873	105.9384
14	16.6000	39.6000	-3.9891	43.5891	-83.9981	105.0378
15	2.6000	4.1000	-98.0967	102.1967	-67.6493	107.6122
16	11.6950	0.7100	-36.9604	37.6704	-79.5309	107.2005
17	2.0767	5.1000	-101.6145	106.7145	-66.8099	107.4802
18	2.7800	0.3500	-96.8867	97.2367	-67.9338	107.6534
19	2.1100	3.6000	-101.3904	104.9904	-66.8639	107.4891
20	1.9900	2.6000	-102.1971	104.7971	-66.6691	107.4565
21	0.8900	0.6600	-109.5912	110.2512	-64.8374	107.1116
22	31.1000	45.6000	93.4794	-47.8794	-89.6501	91.0908
23	7.8000	4.5000	-63.1424	67.6424	-75.0418	107.9761
24	36.8000	5.8000	131.7946	-125.9946	-88.5118	82.2480
25	30.4000	6.8000	88.7740	-81.9740	-89.6479	92.0347
26	36.8000	9.2000	131.7946	-122.5946	-88.5118	82.2480
27	53.4233	7.4000	243.5361	-236.1361	-67.9992	39.2664
28	33.3000	10.8000	108.2677	-97.4677	-89.4614	87.9285
29	54.4000	3.6000	250.1012	-246.5012	-65.3380	35.2851
30	23.3500	18.1000	41.3841	-23.2841	-88.0538	99.9698
31	19.0700	42.9000	12.6141	30.2859	-85.7622	103.4633
32	6.0800	1.9000	-74.7042	76.6042	-72.7807	108.0398
33	48.3000	4.0000	209.0972	-205.0972	-78.2183	56.4104
34	4.0533	0.4600	-88.3274	88.7874	-69.8857	107.8843
35	2.9867	1.5000	-95.4975	96.9975	-68.2578	107.6981
36	1.8400	1.8000	-103.2054	105.0054	-66.4242	107.4144
37	2.9700	6.8000	-95.6095	102.4095	-68.2318	107.6946
38	3.2100	1.4000	-93.9963	95.3963	-68.6047	107.7432
39	2.9400	0.6700	-95.8112	96.4812	-68.1849	107.6882
40	1.5200	0.9400	-105.3564	106.2964	-65.8967	107.3194
41	1.3900	0.1800	-106.2303	106.4103	-65.6803	107.2788
42	3.9267	0.2100	-89.1789	89.3889	-69.6963	107.8660
43	1.2767	0.5400	-106.9921	107.5321	-65.4908	107.2424
44	1.3100	0.0730	-106.7680	106.8410	-65.5466	107.2532
45	1.5500	0.0770	-105.1547	105.2317	-65.9464	107.3286
46	30.1000	8.4000	86.7574	-78.3574	-89.6379	92.4303
47	101.9000	2.0000	569.3946	-567.3946	-207.6630	113.4063
48	54.4500	1.1000	250.4373	-249.3373	-65.1933	35.0728
49	23.9000	39.2000	45.0812	-5.8812	-88.2772	99.4499
50	14.6000	34.7000	-17.4331	52.1331	-82.3326	106.0756
51	36.6667	5.5000	130.8983	-125.3983	-88.5634	82.4799

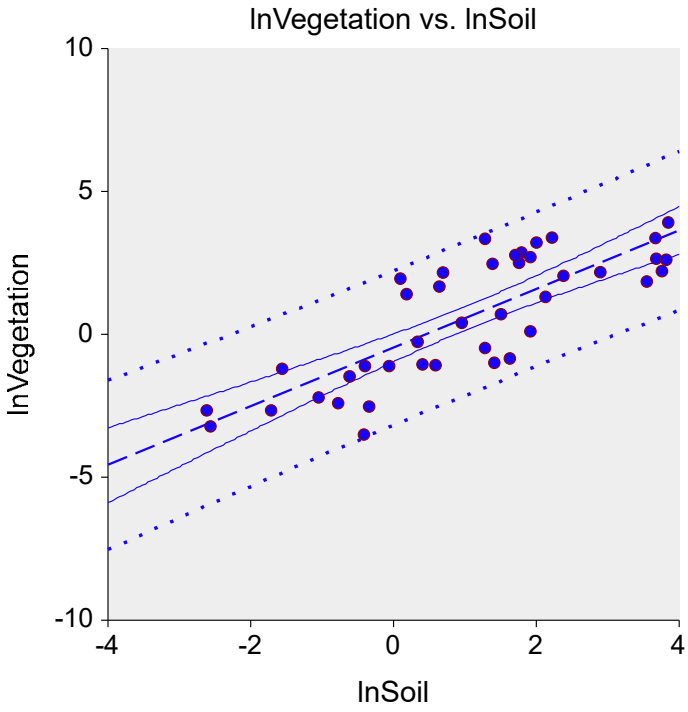
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Soil to Tissue Linear Regressions
ln Transformation – APL 10 Excluded

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnVegetation	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	-0.4733	Rows Prediction Only	0
Slope	1.0254	Sum of Frequencies	41
R-Squared	0.6468	Sum of Weights	41.0000
Correlation	0.8043	Coefficient of Variation	2.1555
Mean Square Error	1.727502	Square Root of MSE	1.314345

Linear Regression Report

Y = lnVegetation X = lnSoil

Summary Statement

The equation of the straight line relating lnVegetation and lnSoil is estimated as: lnVegetation = (-0.4733) + (1.0254) lnSoil using the 41 observations in this dataset. The y-intercept, the estimated value of lnVegetation when lnSoil is zero, is -0.4733 with a standard error of 0.2420. The slope, the estimated change in lnVegetation per unit change in lnSoil, is 1.0254 with a standard error of 0.1213. The value of R-Squared, the proportion of the variation in lnVegetation that can be accounted for by variation in lnSoil, is 0.6468. The correlation between lnVegetation and lnSoil is 0.8043.

A significance test that the slope is zero resulted in a t-value of 8.4514. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 1.0254. The lower limit of the 95% confidence interval for the slope is 0.7800 and the upper limit is 1.2708. The estimated intercept is -0.4733. The lower limit of the 95% confidence interval for the intercept is -0.9627 and the upper limit is 0.0162.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnVegetation	lnSoil
Count	41	41
Mean	0.6098	1.0562
Standard Deviation	2.1838	1.7128
Minimum	-3.5066	-2.6173
Maximum	3.9140	3.8480

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	-0.4733	1.0254
Lower 95% Confidence Limit	-0.9627	0.7800
Upper 95% Confidence Limit	0.0162	1.2708
Standard Error	0.2420	0.1213
Standardized Coefficient	0.0000	0.8043
T Value	-1.9558	8.4514
Prob Level (T Test)	0.0577	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	No	Yes
Power (Alpha = 0.0500)	0.4792	1.0000
Regression of Y on X	-0.4733	1.0254
Inverse Regression from X on Y	-1.0646	1.5853
Orthogonal Regression of Y and X	-0.8167	1.3505

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(-0.473278702218619) + (1.02542063324731) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	-0.4733	0.9000	-0.8585	-0.1121
Bootstrap Mean	-0.4712	0.9500	-0.9386	-0.0403
Bias (BM - OV)	0.0021	0.9900	-1.0754	0.1058
Bias Corrected	-0.4754			
Standard Error	0.2286			
Slope				
Original Value	1.0254	0.9000	0.8685	1.1571
Bootstrap Mean	1.0323	0.9500	0.8323	1.1915
Bias (BM - OV)	0.0069	0.9900	0.7552	1.2547
Bias Corrected	1.0186			
Standard Error	0.0897			
Correlation				
Original Value	0.8043	0.9000	0.7400	0.8864
Bootstrap Mean	0.8021	0.9500	0.7289	0.9107
Bias (BM - OV)	-0.0021	0.9900	0.7085	0.9564
Bias Corrected	0.8064			
Standard Error	0.0459			
R-Squared				
Original Value	0.6468	0.9000	0.5393	0.7723
Bootstrap Mean	0.6455	0.9500	0.5199	0.8066
Bias (BM - OV)	-0.0013	0.9900	0.4836	0.8684
Bias Corrected	0.6481			
Standard Error	0.0723			
Standard Error of Estimate				
Original Value	1.3143	0.9000	1.1671	1.5273
Bootstrap Mean	1.2869	0.9500	1.1345	1.5652
Bias (BM - OV)	-0.0274	0.9900	1.0814	1.6500
Bias Corrected	1.3417			
Standard Error	0.1087			
Orthogonal Intercept				
Original Value	-0.8167	0.9000	-1.2068	-0.3463
Bootstrap Mean	-0.8354	0.9500	-1.2728	-0.2538
Bias (BM - OV)	-0.0187	0.9900	-1.4214	-0.0244
Bias Corrected	-0.7980			
Standard Error	0.2607			
Orthogonal Slope				
Original Value	1.3505	0.9000	1.0313	1.5466
Bootstrap Mean	1.3752	0.9500	0.9515	1.5793
Bias (BM - OV)	0.0247	0.9900	0.7699	1.6416
Bias Corrected	1.3259			
Standard Error	0.1589			

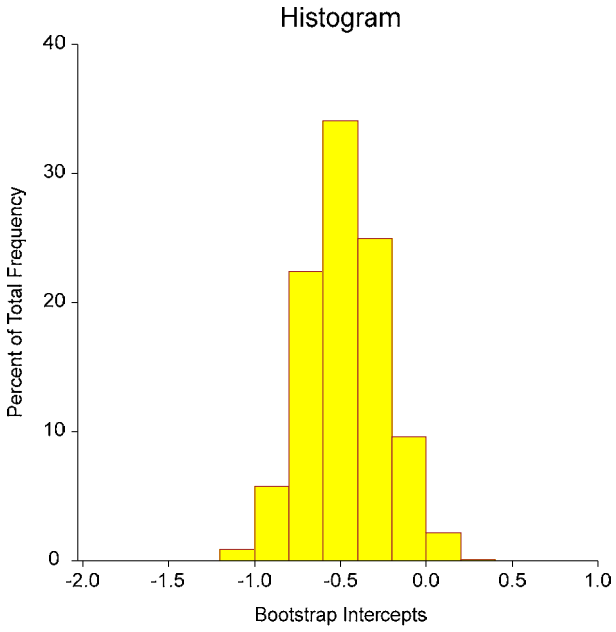
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

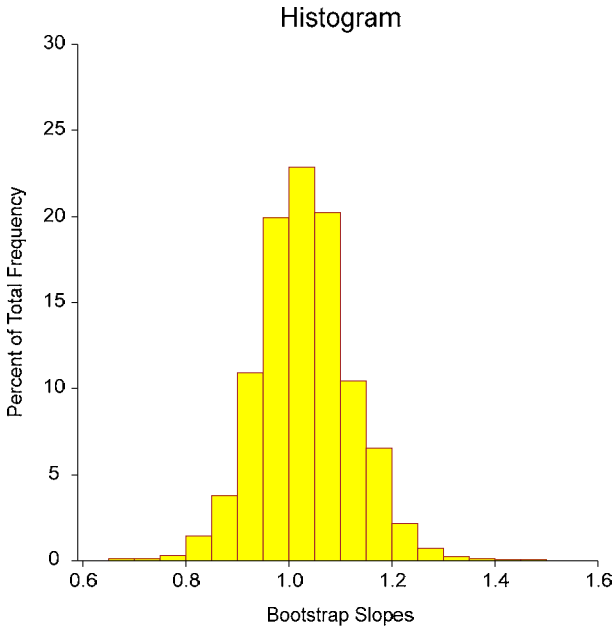
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

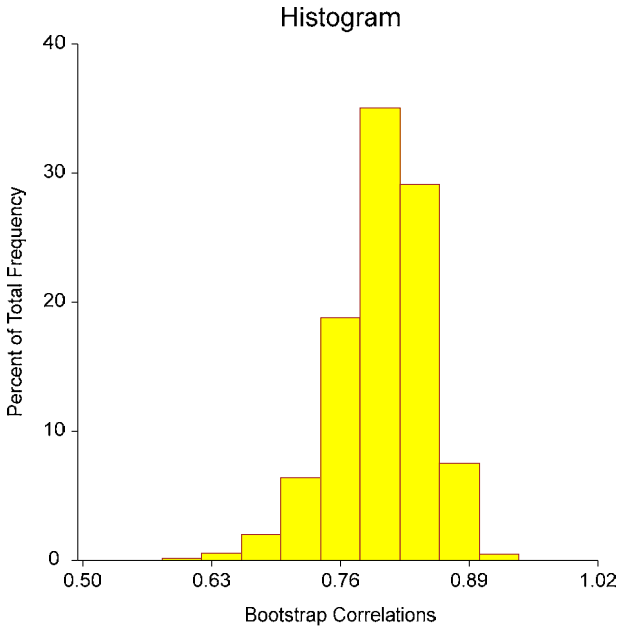
Linear Regression Report

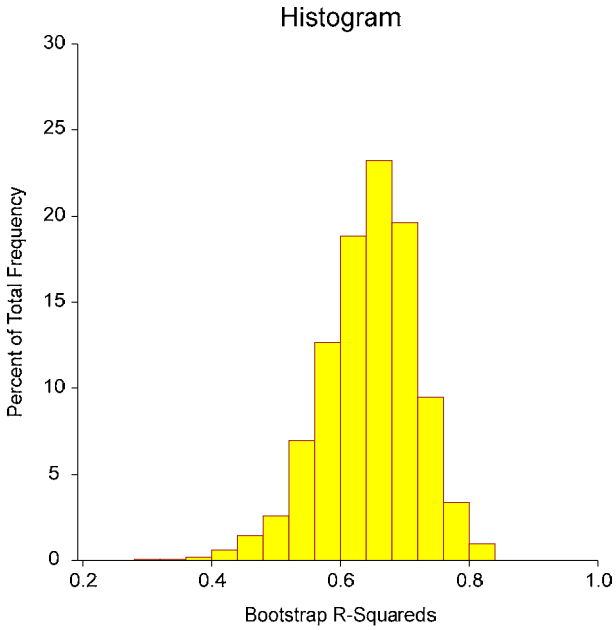
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Bootstrap Histograms Section



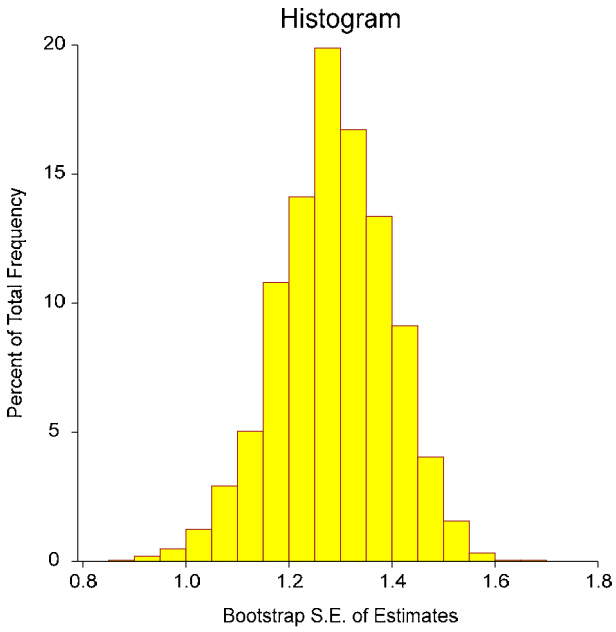


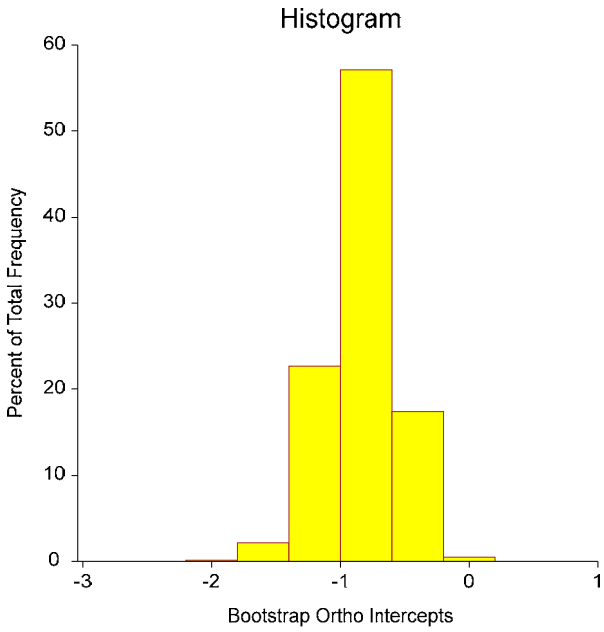


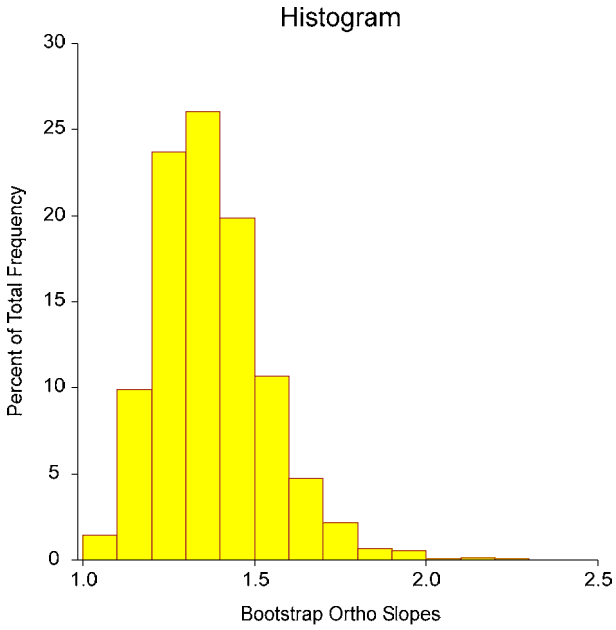


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.8043	0.6468	0.8200
Lower 95% Conf. Limit (r dist'n)	0.6552		
Upper 95% Conf. Limit (r dist'n)	0.8887		
Lower 95% Conf. Limit (Fisher's z)	0.6599		0.6852
Upper 95% Conf. Limit (Fisher's z)	0.8914		0.9005
Adjusted (Rbar)		0.6378	
T-Value for H0: Rho = 0	8.4514	8.4514	8.9470
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	15.24484	15.24484			
Slope	1	123.3896	123.3896	71.4266	0.0000	1.0000
Error	39	67.37257	1.727502			
Lack of Fit	37	56.70074	1.532452	0.2872	0.9588	
Pure Error	2	10.67184	5.335918			
Adj. Total	40	190.7622	4.769054			
Total	41	206.007				

s = Square Root(1.727502) = 1.314345

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	43.30437	25.00077	0.03389676	-0.009000641
1	43.30437	163.0859	146.7366	-0.009000641	0.008521686
2 (Y'Y)			206.007		
Determinant		4811.254			0.000207846

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.05855672	-0.01554863
1	-0.01554863	0.01472123

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9642	0.219796	Yes
Anderson Darling	0.6197	0.106752	No
D'Agostino Skewness	0.4406	0.659494	Yes
D'Agostino Kurtosis	-1.5904	0.111756	No
D'Agostino Omnibus	2.7234	0.256230	Yes
Constant Residual Variance?			
Modified Levene Test	0.0030	0.956345	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.2872	0.958842	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

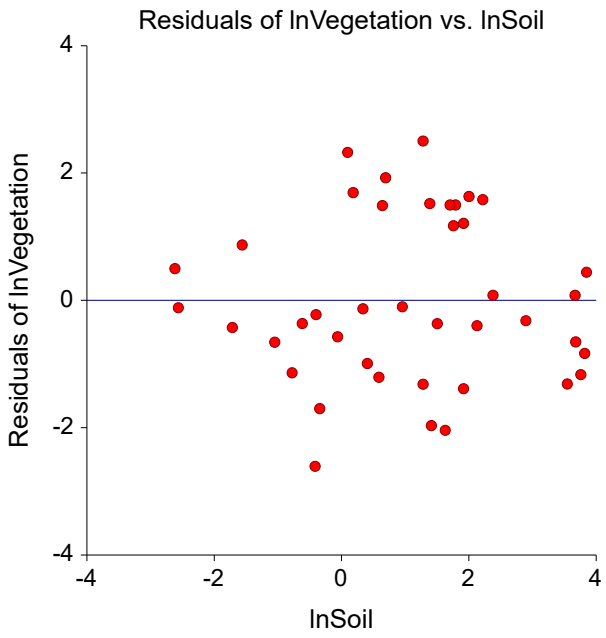
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

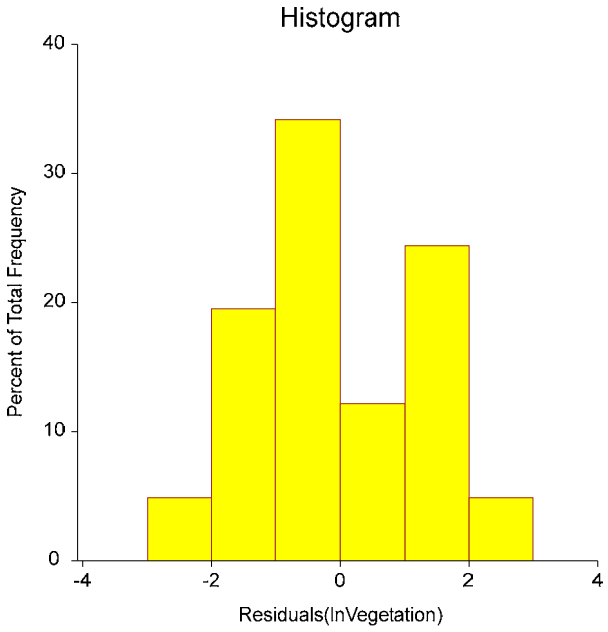
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

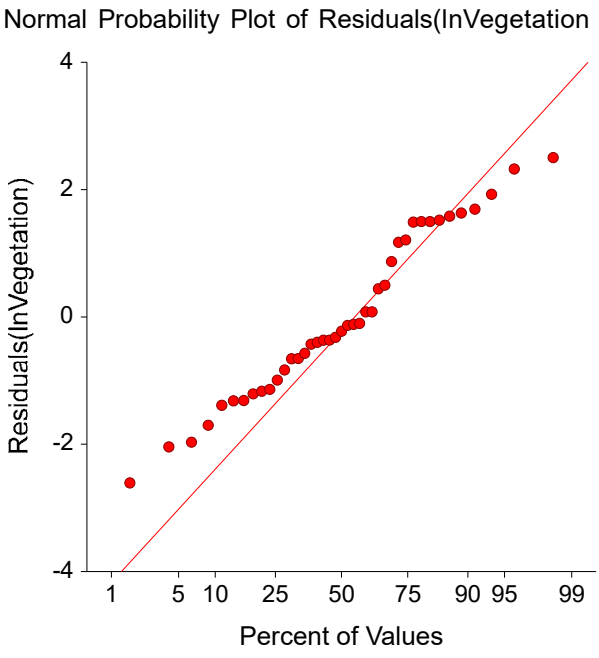
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Original Data Section

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Residual
11	1.7918	2.8622	1.3640	1.4982
12	3.8480	3.9140	3.4726	0.4415
13	0.1823	1.4061	-0.2863	1.6924
14	3.6788	2.6462	3.2991	-0.6529
15	1.4110	-0.9943	0.9736	-1.9678
16	-0.3425	-2.5257	-0.8245	-1.7013
17	1.6292	-0.8440	1.1974	-2.0413
18	-1.0498	-2.2073	-1.5498	-0.6575
19	1.2809	-0.4780	0.8402	-1.3183
20	0.9555	0.4055	0.5065	-0.1011
21	-0.4155	-3.5066	-0.8994	-2.6072
22	3.8199	2.6101	3.4437	-0.8337
23	1.5041	0.7031	1.0690	-0.3659
24	1.7579	2.5014	1.3293	1.1722
25	1.9169	2.7014	1.4924	1.2090
26	2.2192	3.3844	1.8023	1.5821
27	2.0015	3.2108	1.5791	1.6318
28	2.3795	2.0464	1.9668	0.0796
29	1.2809	3.3429	0.8402	2.5026
30	2.8959	2.1759	2.4962	-0.3204
31	3.7589	2.2138	3.3811	-1.1674
32	0.6419	1.6734	0.1849	1.4885
33	1.3863	2.4681	0.9483	1.5198
34	-0.7765	-2.4079	-1.2695	-1.1384
35	0.4055	-1.0498	-0.0575	-0.9923
36	0.5878	-1.0788	0.1294	-1.2083
37	1.9169	0.1044	1.4924	-1.3880
38	0.3365	-0.2614	-0.1283	-0.1331
39	-0.4005	-1.1087	-0.8839	-0.2247
40	-0.0619	-1.1087	-0.5367	-0.5719
41	-1.7148	-2.6593	-2.2317	-0.4276
42	-1.5606	-1.2040	-2.0736	0.8696
43	-0.6162	-1.4697	-1.1051	-0.3645
44	-2.6173	-2.6593	-3.1571	0.4978
45	-2.5639	-3.2189	-3.1024	-0.1165
46	2.1282	1.3110	1.7091	-0.3980
47	0.6931	2.1633	0.2375	1.9258
48	0.0953	1.9488	-0.3755	2.3243
49	3.6687	3.3673	3.2887	0.0786
50	3.5467	1.8500	3.1636	-1.3136
51	1.7047	2.7726	1.2748	1.4978

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	1.7918	2.8622	1.3640	0.2238	0.9113	1.8168
12	3.8480	3.9140	3.4726	0.3961	2.6714	4.2737
13	0.1823	1.4061	-0.2863	0.2310	-0.7536	0.1810
14	3.6788	2.6462	3.2991	0.3787	2.5331	4.0650
15	1.4110	-0.9943	0.9736	0.2097	0.5494	1.3978
16	-0.3425	-2.5257	-0.8245	0.2663	-1.3632	-0.2858
17	1.6292	-0.8440	1.1974	0.2167	0.7590	1.6357
18	-1.0498	-2.2073	-1.5498	0.3278	-2.2127	-0.8868
19	1.2809	-0.4780	0.8402	0.2071	0.4214	1.2591
20	0.9555	0.4055	0.5065	0.2056	0.0906	0.9224
21	-0.4155	-3.5066	-0.8994	0.2721	-1.4497	-0.3491
22	3.8199	2.6101	3.4437	0.3932	2.6485	4.2390
23	1.5041	0.7031	1.0690	0.2123	0.6395	1.4985
24	1.7579	2.5014	1.3293	0.2222	0.8798	1.7787
25	1.9169	2.7014	1.4924	0.2303	1.0265	1.9582
26	2.2192	3.3844	1.8023	0.2491	1.2985	2.3062
27	2.0015	3.2108	1.5791	0.2351	1.1035	2.0547
28	2.3795	2.0464	1.9668	0.2606	1.4396	2.4939
29	1.2809	3.3429	0.8402	0.2071	0.4214	1.2591
30	2.8959	2.1759	2.4962	0.3032	1.8829	3.1096
31	3.7589	2.2138	3.3811	0.3869	2.5986	4.1637
32	0.6419	1.6734	0.1849	0.2113	-0.2426	0.6124
33	1.3863	2.4681	0.9483	0.2091	0.5252	1.3713
34	-0.7765	-2.4079	-1.2695	0.3026	-1.8817	-0.6574
35	0.4055	-1.0498	-0.0575	0.2199	-0.5024	0.3873
36	0.5878	-1.0788	0.1294	0.2130	-0.3014	0.5603
37	1.9169	0.1044	1.4924	0.2303	1.0265	1.9582
38	0.3365	-0.2614	-0.1283	0.2231	-0.5795	0.3229
39	-0.4005	-1.1087	-0.8839	0.2709	-1.4318	-0.3360
40	-0.0619	-1.1087	-0.5367	0.2460	-1.0344	-0.0391
41	-1.7148	-2.6593	-2.2317	0.3939	-3.0284	-1.4349
42	-1.5606	-1.2040	-2.0736	0.3781	-2.8383	-1.3089
43	-0.6162	-1.4697	-1.1051	0.2886	-1.6889	-0.5213
44	-2.6173	-2.6593	-3.1571	0.4907	-4.1497	-2.1646
45	-2.5639	-3.2189	-3.1024	0.4848	-4.0831	-2.1217
46	2.1282	1.3110	1.7091	0.2430	1.2175	2.2006
47	0.6931	2.1633	0.2375	0.2099	-0.1872	0.6621
48	0.0953	1.9488	-0.3755	0.2361	-0.8530	0.1019
49	3.6687	3.3673	3.2887	0.3776	2.5248	4.0525
50	3.5467	1.8500	3.1636	0.3653	2.4247	3.9025
51	1.7047	2.7726	1.2748	0.2198	0.8302	1.7195

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	1.7918	2.8622	1.3640	1.3333	-1.3328	4.0608
12	3.8480	3.9140	3.4726	1.3727	0.6960	6.2492
13	0.1823	1.4061	-0.2863	1.3345	-2.9856	2.4129
14	3.6788	2.6462	3.2991	1.3678	0.5324	6.0657
15	1.4110	-0.9943	0.9736	1.3310	-1.7186	3.6657
16	-0.3425	-2.5257	-0.8245	1.3411	-3.5370	1.8881
17	1.6292	-0.8440	1.1974	1.3321	-1.4970	3.8918
18	-1.0498	-2.2073	-1.5498	1.3546	-4.2897	1.1901
19	1.2809	-0.4780	0.8402	1.3306	-1.8511	3.5315
20	0.9555	0.4055	0.5065	1.3303	-2.1843	3.1974
21	-0.4155	-3.5066	-0.8994	1.3422	-3.6142	1.8155
22	3.8199	2.6101	3.4437	1.3719	0.6688	6.2186
23	1.5041	0.7031	1.0690	1.3314	-1.6239	3.7620
24	1.7579	2.5014	1.3293	1.3330	-1.3670	4.0255
25	1.9169	2.7014	1.4924	1.3344	-1.2066	4.1914
26	2.2192	3.3844	1.8023	1.3377	-0.9035	4.5082
27	2.0015	3.2108	1.5791	1.3352	-1.1216	4.2798
28	2.3795	2.0464	1.9668	1.3399	-0.7435	4.6770
29	1.2809	3.3429	0.8402	1.3306	-1.8511	3.5315
30	2.8959	2.1759	2.4962	1.3489	-0.2321	5.2246
31	3.7589	2.2138	3.3811	1.3701	0.6099	6.1524
32	0.6419	1.6734	0.1849	1.3312	-2.5078	2.8776
33	1.3863	2.4681	0.9483	1.3309	-1.7437	3.6402
34	-0.7765	-2.4079	-1.2695	1.3487	-3.9976	1.4585
35	0.4055	-1.0498	-0.0575	1.3326	-2.7530	2.6380
36	0.5878	-1.0788	0.1294	1.3315	-2.5637	2.8226
37	1.9169	0.1044	1.4924	1.3344	-1.2066	4.1914
38	0.3365	-0.2614	-0.1283	1.3331	-2.8248	2.5683
39	-0.4005	-1.1087	-0.8839	1.3420	-3.5983	1.8304
40	-0.0619	-1.1087	-0.5367	1.3372	-3.2414	2.1680
41	-1.7148	-2.6593	-2.2317	1.3721	-5.0070	0.5437
42	-1.5606	-1.2040	-2.0736	1.3676	-4.8399	0.6927
43	-0.6162	-1.4697	-1.1051	1.3457	-3.8270	1.6167
44	-2.6173	-2.6593	-3.1571	1.4030	-5.9949	-0.3194
45	-2.5639	-3.2189	-3.1024	1.4009	-5.9360	-0.2688
46	2.1282	1.3110	1.7091	1.3366	-0.9945	4.4126
47	0.6931	2.1633	0.2375	1.3310	-2.4547	2.9297
48	0.0953	1.9488	-0.3755	1.3354	-3.0766	2.3255
49	3.6687	3.3673	3.2887	1.3675	0.5226	6.0547
50	3.5467	1.8500	3.1636	1.3642	0.4043	5.9229
51	1.7047	2.7726	1.2748	1.3326	-1.4206	3.9702

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	1.7918	2.8622	1.3640	0.2238	0.7261	2.0019
12	3.8480	3.9140	3.4726	0.3961	2.3438	4.6013
13	0.1823	1.4061	-0.2863	0.2310	-0.9447	0.3721
14	3.6788	2.6462	3.2991	0.3787	2.2199	4.3782
15	1.4110	-0.9943	0.9736	0.2097	0.3759	1.5713
16	-0.3425	-2.5257	-0.8245	0.2663	-1.5835	-0.0655
17	1.6292	-0.8440	1.1974	0.2167	0.5797	1.8150
18	-1.0498	-2.2073	-1.5498	0.3278	-2.4839	-0.6157
19	1.2809	-0.4780	0.8402	0.2071	0.2501	1.4303
20	0.9555	0.4055	0.5065	0.2056	-0.0795	1.0925
21	-0.4155	-3.5066	-0.8994	0.2721	-1.6747	-0.1240
22	3.8199	2.6101	3.4437	0.3932	2.3233	4.5642
23	1.5041	0.7031	1.0690	0.2123	0.4639	1.6742
24	1.7579	2.5014	1.3293	0.2222	0.6960	1.9626
25	1.9169	2.7014	1.4924	0.2303	0.8360	2.1487
26	2.2192	3.3844	1.8023	0.2491	1.0925	2.5122
27	2.0015	3.2108	1.5791	0.2351	0.9090	2.2492
28	2.3795	2.0464	1.9668	0.2606	1.2241	2.7094
29	1.2809	3.3429	0.8402	0.2071	0.2501	1.4303
30	2.8959	2.1759	2.4962	0.3032	1.6320	3.3605
31	3.7589	2.2138	3.3811	0.3869	2.2786	4.4837
32	0.6419	1.6734	0.1849	0.2113	-0.4174	0.7872
33	1.3863	2.4681	0.9483	0.2091	0.3522	1.5443
34	-0.7765	-2.4079	-1.2695	0.3026	-2.1320	-0.4071
35	0.4055	-1.0498	-0.0575	0.2199	-0.6843	0.5693
36	0.5878	-1.0788	0.1294	0.2130	-0.4775	0.7364
37	1.9169	0.1044	1.4924	0.2303	0.8360	2.1487
38	0.3365	-0.2614	-0.1283	0.2231	-0.7640	0.5075
39	-0.4005	-1.1087	-0.8839	0.2709	-1.6559	-0.1120
40	-0.0619	-1.1087	-0.5367	0.2460	-1.2379	0.1645
41	-1.7148	-2.6593	-2.2317	0.3939	-3.3543	-1.1091
42	-1.5606	-1.2040	-2.0736	0.3781	-3.1511	-0.9961
43	-0.6162	-1.4697	-1.1051	0.2886	-1.9277	-0.2826
44	-2.6173	-2.6593	-3.1571	0.4907	-4.5556	-1.7587
45	-2.5639	-3.2189	-3.1024	0.4848	-4.4841	-1.7207
46	2.1282	1.3110	1.7091	0.2430	1.0165	2.4016
47	0.6931	2.1633	0.2375	0.2099	-0.3608	0.8358
48	0.0953	1.9488	-0.3755	0.2361	-1.0483	0.2972
49	3.6687	3.3673	3.2887	0.3776	2.2125	4.3649
50	3.5467	1.8500	3.1636	0.3653	2.1226	4.2047
51	1.7047	2.7726	1.2748	0.2198	0.6483	1.9013

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Section

Row	lnSoil (X)	lnVegetation (Y)	Predicted lnVegetation (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	1.7918	2.8622	1.3640	1.4982	1.1568	52.3434
12	3.8480	3.9140	3.4726	0.4415	0.3523	11.2790
13	0.1823	1.4061	-0.2863	1.6924	1.3080	120.3629
14	3.6788	2.6462	3.2991	-0.6529	-0.5187	24.6731
15	1.4110	-0.9943	0.9736	-1.9678	-1.5166	197.9205
16	-0.3425	-2.5257	-0.8245	-1.7013	-1.3218	67.3569
17	1.6292	-0.8440	1.1974	-2.0413	-1.5747	241.8745
18	-1.0498	-2.2073	-1.5498	-0.6575	-0.5166	29.7873
19	1.2809	-0.4780	0.8402	-1.3183	-1.0157	275.7645
20	0.9555	0.4055	0.5065	-0.1011	-0.0778	24.9238
21	-0.4155	-3.5066	-0.8994	-2.6072	-2.0276	74.3521
22	3.8199	2.6101	3.4437	-0.8337	-0.6647	31.9403
23	1.5041	0.7031	1.0690	-0.3659	-0.2821	52.0462
24	1.7579	2.5014	1.3293	1.1722	0.9049	46.8599
25	1.9169	2.7014	1.4924	1.2090	0.9343	44.7548
26	2.2192	3.3844	1.8023	1.5821	1.2259	46.7456
27	2.0015	3.2108	1.5791	1.6318	1.2619	50.8204
28	2.3795	2.0464	1.9668	0.0796	0.0618	3.8919
29	1.2809	3.3429	0.8402	2.5026	1.9282	74.8653
30	2.8959	2.1759	2.4962	-0.3204	-0.2505	14.7233
31	3.7589	2.2138	3.3811	-1.1674	-0.9294	52.7336
32	0.6419	1.6734	0.1849	1.4885	1.1474	88.9508
33	1.3863	2.4681	0.9483	1.5198	1.1713	61.5795
34	-0.7765	-2.4079	-1.2695	-1.1384	-0.8900	47.2767
35	0.4055	-1.0498	-0.0575	-0.9923	-0.7658	94.5223
36	0.5878	-1.0788	0.1294	-1.2083	-0.9316	111.9993
37	1.9169	0.1044	1.4924	-1.3880	-1.0726	1330.0240
38	0.3365	-0.2614	-0.1283	-0.1331	-0.1028	50.9294
39	-0.4005	-1.1087	-0.8839	-0.2247	-0.1747	20.2700
40	-0.0619	-1.1087	-0.5367	-0.5719	-0.4430	51.5879
41	-1.7148	-2.6593	-2.2317	-0.4276	-0.3410	16.0793
42	-1.5606	-1.2040	-2.0736	0.8696	0.6908	72.2297
43	-0.6162	-1.4697	-1.1051	-0.3645	-0.2843	24.8046
44	-2.6173	-2.6593	-3.1571	0.4978	0.4083	18.7213
45	-2.5639	-3.2189	-3.1024	-0.1165	-0.0953	3.6183
46	2.1282	1.3110	1.7091	-0.3980	-0.3081	30.3595
47	0.6931	2.1633	0.2375	1.9258	1.4843	89.0220
48	0.0953	1.9488	-0.3755	2.3243	1.7976	119.2710
49	3.6687	3.3673	3.2887	0.0786	0.0625	2.3353
50	3.5467	1.8500	3.1636	-1.3136	-1.0404	71.0039
51	1.7047	2.7726	1.2748	1.4978	1.1558	54.0211

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	1.7918	1.4982	1.1619	0.0290	0.0200	1.7121
12	3.8480	0.4415	0.3483	0.0908	0.0062	1.7673
13	0.1823	1.6924	1.3204	0.0309	0.0273	1.6952
14	3.6788	-0.6529	-0.5138	0.0830	0.0122	1.7607
15	1.4110	-1.9678	-1.5433	0.0255	0.0300	1.6684
16	-0.3425	-1.7013	-1.3350	0.0411	0.0374	1.6935
17	1.6292	-2.0413	-1.6063	0.0272	0.0347	1.6602
18	-1.0498	-0.6575	-0.5116	0.0622	0.0088	1.7608
19	1.2809	-1.3183	-1.0161	0.0248	0.0131	1.7261
20	0.9555	-0.1011	-0.0768	0.0245	0.0001	1.7727
21	-0.4155	-2.6072	*-2.1160	0.0428	0.0920	1.5861
22	3.8199	-0.8337	-0.6599	0.0895	0.0217	1.7529
23	1.5041	-0.3659	-0.2788	0.0261	0.0011	1.7693
24	1.7579	1.1722	0.9027	0.0286	0.0120	1.7357
25	1.9169	1.2090	0.9327	0.0307	0.0138	1.7333
26	2.2192	1.5821	1.2341	0.0359	0.0280	1.7046
27	2.0015	1.6318	1.2718	0.0320	0.0263	1.7006
28	2.3795	0.0796	0.0610	0.0393	0.0001	1.7728
29	1.2809	2.5026	*2.0011	0.0248	0.0473	1.6039
30	2.8959	-0.3204	-0.2475	0.0532	0.0018	1.7701
31	3.7589	-1.1674	-0.9277	0.0866	0.0410	1.7337
32	0.6419	1.4885	1.1522	0.0259	0.0175	1.7131
33	1.3863	1.5198	1.1770	0.0253	0.0178	1.7106
34	-0.7765	-1.1384	-0.8876	0.0530	0.0222	1.7369
35	0.4055	-0.9923	-0.7617	0.0280	0.0084	1.7463
36	0.5878	-1.2083	-0.9300	0.0263	0.0117	1.7335
37	1.9169	-1.3880	-1.0748	0.0307	0.0182	1.7207
38	0.3365	-0.1331	-0.1015	0.0288	0.0002	1.7725
39	-0.4005	-0.2247	-0.1725	0.0425	0.0007	1.7716
40	-0.0619	-0.5719	-0.4384	0.0350	0.0036	1.7640
41	-1.7148	-0.4276	-0.3371	0.0898	0.0057	1.7677
42	-1.5606	0.8696	0.6861	0.0827	0.0215	1.7513
43	-0.6162	-0.3645	-0.2809	0.0482	0.0020	1.7693
44	-2.6173	0.4978	*0.4039	0.1394	0.0135	1.7654
45	-2.5639	-0.1165	*-0.0941	0.1361	0.0007	1.7725
46	2.1282	-0.3980	-0.3045	0.0342	0.0017	1.7686
47	0.6931	1.9258	1.5084	0.0255	0.0288	1.6728
48	0.0953	2.3243	1.8529	0.0323	0.0539	1.6261
49	3.6687	0.0786	0.0617	0.0826	0.0002	1.7728
50	3.5467	-1.3136	-1.0416	0.0772	0.0453	1.7238
51	1.7047	1.4978	1.1610	0.0280	0.0192	1.7122

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	1.1619	0.2008	0.0200	1.0116	0.1138	0.0801
12	0.3483	0.1101	0.0062	* 1.1512	-0.0015	0.0941
13	1.3204	0.2358	0.0273	0.9936	0.2350	-0.1082
14	-0.5138	-0.1546	0.0122	1.1329	-0.0023	-0.1299
15	-1.5433	-0.2495	0.0300	0.9571	-0.1800	-0.0512
16	-1.3350	-0.2762	0.0374	1.0022	-0.2738	0.1760
17	-1.6063	-0.2685	0.0347	0.9495	-0.1701	-0.0861
18	-0.5116	-0.1318	0.0088	1.1079	-0.1244	0.1027
19	-1.0161	-0.1621	0.0131	1.0237	-0.1250	-0.0213
20	-0.0768	-0.0122	0.0001	1.0794	-0.0107	0.0007
21	* -2.1160	-0.4477	0.0920	0.8807	-0.4421	0.2938
22	-0.6599	-0.2069	0.0217	1.1308	0.0018	-0.1764
23	-0.2788	-0.0456	0.0011	1.0771	-0.0312	-0.0117
24	0.9027	0.1549	0.0120	1.0393	0.0899	0.0593
25	0.9327	0.1660	0.0138	1.0386	0.0856	0.0753
26	1.2341	0.2382	0.0280	1.0100	0.0950	0.1349
27	1.2718	0.2313	0.0263	1.0011	0.1115	0.1128
28	0.0610	0.0123	0.0001	1.0962	0.0042	0.0076
29	* 2.0011	0.3192	0.0473	0.8840	0.2462	0.0420
30	-0.2475	-0.0587	0.0018	1.1090	-0.0108	-0.0432
31	-0.9277	-0.2857	0.0410	1.1027	-0.0003	-0.2422
32	1.1522	0.1877	0.0175	1.0095	0.1783	-0.0447
33	1.1770	0.1897	0.0178	1.0060	0.1387	0.0363
34	-0.8876	-0.2100	0.0222	1.0676	-0.2026	0.1543
35	-0.7617	-0.1293	0.0084	1.0513	-0.1269	0.0464
36	-0.9300	-0.1527	0.0117	1.0341	-0.1464	0.0408
37	-1.0748	-0.1913	0.0182	1.0235	-0.0987	-0.0867
38	-0.1015	-0.0175	0.0002	1.0840	-0.0173	0.0068
39	-0.1725	-0.0363	0.0007	1.0983	-0.0359	0.0237
40	-0.4384	-0.0835	0.0036	1.0806	-0.0835	0.0461
41	-0.3371	-0.1059	0.0057	* 1.1504	-0.0947	0.0904
42	0.6861	0.2061	0.0215	1.1204	0.1866	-0.1731
43	-0.2809	-0.0632	0.0020	1.1021	-0.0617	0.0445
44	0.4039	0.1625	0.0135	* 1.2135	0.1359	-0.1476
45	-0.0941	-0.0374	0.0007	* 1.2187	-0.0313	0.0338
46	-0.3045	-0.0573	0.0017	1.0853	-0.0248	-0.0307
47	1.5084	0.2441	0.0288	0.9622	0.2295	-0.0512
48	1.8529	0.3383	0.0539	0.9155	0.3380	-0.1671
49	0.0617	0.0185	0.0002	* 1.1479	0.0003	0.0155
50	-1.0416	-0.3014	0.0453	1.0790	-0.0116	-0.2493
51	1.1610	0.1970	0.0192	1.0107	0.1187	0.0705

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
11	1.7918	1.4982	||||||||.....	1.1568	||||||||.....	1.1619	||||||||.....
12	3.8480	0.4415	||.....	0.3523	||.....	0.3483	||.....
13	0.1823	1.6924	||||||||.....	1.3080	||||||||.....	1.3204	||||||||.....
14	3.6788	-0.6529	|||.....	-0.5187	|||.....	-0.5138	|||.....
15	1.4110	-1.9678	||||||||||....	-1.5166	||||||||||....	-1.5433	|||||||||.....
16	-0.3425	-1.7013	||||||||.....	-1.3218	||||||||.....	-1.3350	||||||||.....
17	1.6292	-2.0413	||||||||||....	-1.5747	||||||||||....	-1.6063	||||||||||....
18	-1.0498	-0.6575	|||.....	-0.5166	|||.....	-0.5116	|||.....
19	1.2809	-1.3183	||||||.....	-1.0157	||||||.....	-1.0161	|||||.....
20	0.9555	-0.1011	|.....	-0.0778	|.....	-0.0768	|.....
21	-0.4155	-2.6072	||||||||||||||	-2.0276	||||||||||||||	* -2.1160	||||||||||||||
22	3.8199	-0.8337	||||.....	-0.6647	||||.....	-0.6599	||||.....
23	1.5041	-0.3659	|.....	-0.2821	|.....	-0.2788	|.....
24	1.7579	1.1722	|||||.....	0.9049	|||||.....	0.9027	|||||.....
25	1.9169	1.2090	|||||.....	0.9343	|||||.....	0.9327	|||||.....
26	2.2192	1.5821	|||||||.....	1.2259	|||||||.....	1.2341	|||||||.....
27	2.0015	1.6318	||||||||.....	1.2619	||||||||.....	1.2718	|||||||.....
28	2.3795	0.0796	|.....	0.0618	|.....	0.0610	|.....
29	1.2809	2.5026	||||||||||||.	1.9282	||||||||||||.	* 2.0011	||||||||||||.
30	2.8959	-0.3204	|.....	-0.2505	|.....	-0.2475	|.....
31	3.7589	-1.1674	||||||.....	-0.9294	||||||.....	-0.9277	||||||.....
32	0.6419	1.4885	||||||||.....	1.1474	||||||||.....	1.1522	|||||||.....
33	1.3863	1.5198	||||||||.....	1.1713	||||||||.....	1.1770	|||||||.....
34	-0.7765	-1.1384	||||||.....	-0.8900	|||||.....	-0.8876	|||||.....
35	0.4055	-0.9923	|||||.....	-0.7658	||||.....	-0.7617	||||.....
36	0.5878	-1.2083	||||||.....	-0.9316	|||||.....	-0.9300	|||||.....
37	1.9169	-1.3880	|||||||.....	-1.0726	|||||||.....	-1.0748	|||||||.....
38	0.3365	-0.1331	|.....	-0.1028	|.....	-0.1015	|.....
39	-0.4005	-0.2247	|.....	-0.1747	|.....	-0.1725	|.....
40	-0.0619	-0.5719	||.....	-0.4430	||.....	-0.4384	||.....
41	-1.7148	-0.4276	||.....	-0.3410	||.....	-0.3371	||.....
42	-1.5606	0.8696	||||.....	0.6908	||||.....	0.6861	||||.....
43	-0.6162	-0.3645	|.....	-0.2843	|.....	-0.2809	|.....
44	-2.6173	0.4978	||.....	0.4083	||.....	0.4039	||.....
45	-2.5639	-0.1165	|.....	-0.0953	|.....	-0.0941	|.....
46	2.1282	-0.3980	|.....	-0.3081	|.....	-0.3045	|.....
47	0.6931	1.9258	|||||||||.....	1.4843	|||||||||.....	1.5084	|||||||||.....
48	0.0953	2.3243	|||||||||||..	1.7976	|||||||||||..	1.8529	|||||||||||..
49	3.6687	0.0786	|.....	0.0625	|.....	0.0617	|.....
50	3.5467	-1.3136	||||||.....	-1.0404	||||||.....	-1.0416	||||||.....
51	1.7047	1.4978	|||||||.....	1.1558	|||||||.....	1.1610	|||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	1.7918	0.2008	||||.....	0.0200	|||.....	0.0801	||||.....
12	3.8480	0.1101	|||.....	0.0062	|.....	0.0941	||||.....
13	0.1823	0.2358	|||||.....	0.0273	||||.....	-0.1082	|||||.....
14	3.6788	-0.1546	||||.....	0.0122	|.....	-0.1299	||||||.....
15	1.4110	-0.2495	|||||.....	0.0300	||||.....	-0.0512	||.....
16	-0.3425	-0.2762	|||||||.....	0.0374	||||||.....	0.1760	|||||||.....
17	1.6292	-0.2685	|||||.....	0.0347	|||||.....	-0.0861	||||.....
18	-1.0498	-0.1318	||||.....	0.0088	|.....	0.1027	|||||.....
19	1.2809	-0.1621	|||||.....	0.0131	||.....	-0.0213	|.....
20	0.9555	-0.0122	|.....	0.0001	|.....	0.0007	|.....
21	-0.4155	-0.4477	|||||||||||||||	0.0920	|||||||||||||||	0.2938	|||||||||||||||
22	3.8199	-0.2069	||||||.....	0.0217	|||.....	-0.1764	|||||||.....
23	1.5041	-0.0456	|.....	0.0011	|.....	-0.0117	|.....
24	1.7579	0.1549	||||.....	0.0120	|.....	0.0593	||.....
25	1.9169	0.1660	|||||.....	0.0138	||.....	0.0753	|||.....
26	2.2192	0.2382	|||||||.....	0.0280	||||.....	0.1349	||||||.....
27	2.0015	0.2313	|||||||.....	0.0263	||||.....	0.1128	|||||.....
28	2.3795	0.0123	|.....	0.0001	|.....	0.0076	|.....
29	1.2809	0.3192	|||||||||.....	0.0473	|||||||.....	0.0420	||.....
30	2.8959	-0.0587	|.....	0.0018	|.....	-0.0432	||.....
31	3.7589	-0.2857	|||||||||.....	0.0410	||||||.....	-0.2422	||||||||||...
32	0.6419	0.1877	||||||.....	0.0175	||.....	-0.0447	||.....
33	1.3863	0.1897	||||||.....	0.0178	||.....	0.0363	|.....
34	-0.7765	-0.2100	||||||.....	0.0222	|||.....	0.1543	|||||||.....
35	0.4055	-0.1293	||||.....	0.0084	|.....	0.0464	||.....
36	0.5878	-0.1527	||||.....	0.0117	|.....	0.0408	||.....
37	1.9169	-0.1913	||||||.....	0.0182	||.....	-0.0867	||||.....
38	0.3365	-0.0175	|.....	0.0002	|.....	0.0068	|.....
39	-0.4005	-0.0363	|.....	0.0007	|.....	0.0237	|.....
40	-0.0619	-0.0835	||.....	0.0036	|.....	0.0461	||.....
41	-1.7148	-0.1059	|||.....	0.0057	|.....	0.0904	||||.....
42	-1.5606	0.2061	||||||.....	0.0215	|||.....	-0.1731	|||||||.....
43	-0.6162	-0.0632	|.....	0.0020	|.....	0.0445	||.....
44	-2.6173	0.1625	|||||.....	0.0135	||.....	-0.1476	|||||||.....
45	-2.5639	-0.0374	|.....	0.0007	|.....	0.0338	|.....
46	2.1282	-0.0573	|.....	0.0017	|.....	-0.0307	|.....
47	0.6931	0.2441	|||||||.....	0.0288	||||.....	-0.0512	||.....
48	0.0953	0.3383	||||||||||....	0.0539	|||||||.....	-0.1671	|||||||.....
49	3.6687	0.0185	|.....	0.0002	|.....	0.0155	|.....
50	3.5467	-0.3014	|||||||||.....	0.0453	|||||||.....	-0.2493	||||||||||...
51	1.7047	0.1970	||||||.....	0.0192	|||.....	0.0705	|||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	1.7918	1.1619	||||||.....	0.0200	|||.....	0.0290	|.....
12	3.8480	0.3483	||.....	0.0062	|.....	0.0908	|||||||.....
13	0.1823	1.3204	||||||||.....	0.0273	||||.....	0.0309	|.....
14	3.6788	-0.5138	|||.....	0.0122	|.....	0.0830	|||||||.....
15	1.4110	-1.5433	|||||||||.....	0.0300	||||.....	0.0255	|.....
16	-0.3425	-1.3350	|||||||||.....	0.0374	||||||.....	0.0411	||.....
17	1.6292	-1.6063	|||||||||||....	0.0347	|||||.....	0.0272	|.....
18	-1.0498	-0.5116	|||.....	0.0088	|.....	0.0622	||||.....
19	1.2809	-1.0161	||||||.....	0.0131	||.....	0.0248	|.....
20	0.9555	-0.0768	|.....	0.0001	|.....	0.0245	|.....
21	-0.4155	* -2.1160	||||||||||||||||	0.0920	||||||||||||||||	0.0428	||.....
22	3.8199	-0.6599	||||.....	0.0217	|||.....	0.0895	|||||||.....
23	1.5041	-0.2788	|.....	0.0011	|.....	0.0261	|.....
24	1.7579	0.9027	||||||.....	0.0120	|.....	0.0286	|.....
25	1.9169	0.9327	||||||.....	0.0138	||.....	0.0307	|.....
26	2.2192	1.2341	|||||||.....	0.0280	||||.....	0.0359	|.....
27	2.0015	1.2718	|||||||.....	0.0263	||||.....	0.0320	|.....
28	2.3795	0.0610	|.....	0.0001	|.....	0.0393	|.....
29	1.2809	* 2.0011	||||||||||||.	0.0473	||||||.....	0.0248	|.....
30	2.8959	-0.2475	|.....	0.0018	|.....	0.0532	|||.....
31	3.7589	-0.9277	||||||.....	0.0410	||||||.....	0.0866	|||||||.....
32	0.6419	1.1522	|||||||.....	0.0175	||.....	0.0259	|.....
33	1.3863	1.1770	|||||||.....	0.0178	||.....	0.0253	|.....
34	-0.7765	-0.8876	||||||.....	0.0222	|||.....	0.0530	|||.....
35	0.4055	-0.7617	|||||.....	0.0084	|.....	0.0280	|.....
36	0.5878	-0.9300	||||||.....	0.0117	|.....	0.0263	|.....
37	1.9169	-1.0748	|||||||.....	0.0182	||.....	0.0307	|.....
38	0.3365	-0.1015	|.....	0.0002	|.....	0.0288	|.....
39	-0.4005	-0.1725	|.....	0.0007	|.....	0.0425	||.....
40	-0.0619	-0.4384	||.....	0.0036	|.....	0.0350	|.....
41	-1.7148	-0.3371	||.....	0.0057	|.....	0.0898	|||||||.....
42	-1.5606	0.6861	||||.....	0.0215	|||.....	0.0827	|||||||.....
43	-0.6162	-0.2809	|.....	0.0020	|.....	0.0482	|||.....
44	-2.6173	0.4039	||.....	0.0135	||.....	0.1394	||||||||||||||
45	-2.5639	-0.0941	|.....	0.0007	|.....	0.1361	||||||||||||.
46	2.1282	-0.3045	|.....	0.0017	|.....	0.0342	|.....
47	0.6931	1.5084	|||||||||.....	0.0288	||||.....	0.0255	|.....
48	0.0953	1.8529	||||||||||||..	0.0539	||||||||.....	0.0323	|.....
49	3.6687	0.0617	|.....	0.0002	|.....	0.0826	|||||||.....
50	3.5467	-1.0416	|||||||.....	0.0453	|||||||.....	0.0772	||||||.....
51	1.7047	1.1610	|||||||.....	0.0192	|||.....	0.0280	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Inverse Prediction of X Means

Row	lnVegetation (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	2.8622	1.7918	3.2528	-1.4610	2.6899	4.0826
12	3.9140	3.8480	4.2785	-0.4305	3.5561	5.3925
13	1.4061	0.1823	1.8328	-1.6505	1.4187	2.3412
14	2.6462	3.6788	3.0421	0.6367	2.5085	3.8171
15	-0.9943	1.4110	-0.5081	1.9190	-1.1790	-0.0272
16	-2.5257	-0.3425	-2.0016	1.6591	-3.0686	-1.3062
17	-0.8440	1.6292	-0.3615	1.9907	-0.9985	0.1032
18	-2.2073	-1.0498	-1.6910	0.6412	-2.6705	-1.0453
19	-0.4780	1.2809	-0.0046	1.2856	-0.5655	0.4273
20	0.4055	0.9555	0.8570	0.0986	0.4248	1.2649
21	-3.5066	-0.4155	-2.9581	2.5426	-4.3031	-2.1009
22	2.6101	3.8199	3.0069	0.8130	2.4780	3.7729
23	0.7031	1.5041	1.1472	0.3569	0.7351	1.5704
24	2.5014	1.7579	2.9010	-1.1431	2.3860	3.6401
25	2.7014	1.9169	3.0959	-1.1790	2.5550	3.8847
26	3.3844	2.2192	3.7620	-1.5428	3.1228	4.7300
27	3.2108	2.0015	3.5928	-1.5913	2.9797	4.5141
28	2.0464	2.3795	2.4572	-0.0777	1.9942	3.0904
29	3.3429	1.2809	3.7215	-2.4406	3.0886	4.6783
30	2.1759	2.8959	2.5835	0.3124	2.1069	3.2457
31	2.2138	3.7589	2.6204	1.1385	2.1396	3.2913
32	1.6734	0.6419	2.0934	-1.4516	1.6632	2.6496
33	2.4681	1.3863	2.8685	-1.4822	2.3576	3.5995
34	-2.4079	-0.7765	-1.8867	1.1102	-2.9211	-1.2099
35	-1.0498	0.4055	-0.5623	0.9677	-1.2460	-0.0752
36	-1.0788	0.5878	-0.5905	1.1783	-1.2811	-0.1001
37	0.1044	1.9169	0.5633	1.3536	0.0980	0.9688
38	-0.2614	0.3365	0.2067	0.1298	-0.3144	0.6245
39	-1.1087	-0.4005	-0.6196	0.2192	-1.3172	-0.1257
40	-1.1087	-0.0619	-0.6196	0.5578	-1.3172	-0.1257
41	-2.6593	-1.7148	-2.1318	0.4170	-3.2360	-1.4150
42	-1.2040	-1.5606	-0.7126	-0.8481	-1.4329	-0.2072
43	-1.4697	-0.6162	-0.9717	0.3555	-1.7574	-0.4324
44	-2.6593	-2.6173	-2.1318	-0.4855	-3.2360	-1.4150
45	-3.2189	-2.5639	-2.6775	0.1136	-3.9400	-1.8688
46	1.3110	2.1282	1.7401	0.3882	1.3299	2.2333
47	2.1633	0.6931	2.5712	-1.8781	2.0960	3.2306
48	1.9488	0.0953	2.3620	-2.2667	1.9086	2.9741
49	3.3673	3.6687	3.7454	-0.0767	3.1088	4.7088
50	1.8500	3.5467	2.2657	1.2810	1.8213	2.8571
51	2.7726	1.7047	3.1654	-1.4607	2.6149	3.9723

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnVegetation X = lnSoil

Inverse Prediction of X Individuals

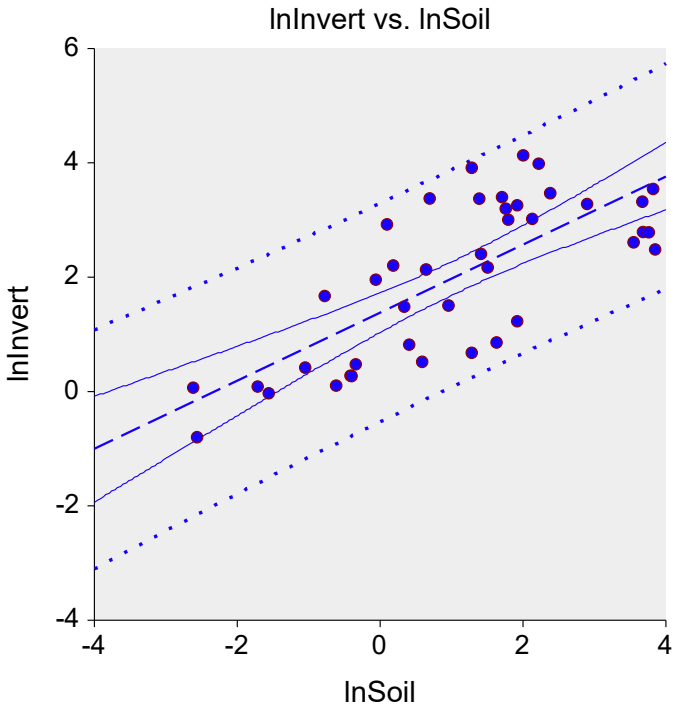
Row	lnVegetation (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	2.8622	1.7918	3.2528	-1.4610	0.6267	6.1458
12	3.9140	3.8480	4.2785	-0.4305	1.6506	7.2980
13	1.4061	0.1823	1.8328	-1.6505	-0.8298	4.5897
14	2.6462	3.6788	3.0421	0.6367	0.4136	5.9120
15	-0.9943	1.4110	-0.5081	1.9190	-3.3347	2.1285
16	-2.5257	-0.3425	-2.0016	1.6591	-4.9992	0.6245
17	-0.8440	1.6292	-0.3615	1.9907	-3.1741	2.2788
18	-2.2073	-1.0498	-1.6910	0.6412	-4.6490	0.9332
19	-0.4780	1.2809	-0.0046	1.2856	-2.7851	2.6469
20	0.4055	0.9555	0.8570	0.0986	-1.8582	3.5479
21	-3.5066	-0.4155	-2.9581	2.5426	-6.0903	-0.3136
22	2.6101	3.8199	3.0069	0.8130	0.3779	5.8730
23	0.7031	1.5041	1.1472	0.3569	-1.5499	3.8554
24	2.5014	1.7579	2.9010	-1.1431	0.2702	5.7559
25	2.7014	1.9169	3.0959	-1.1790	0.4681	5.9716
26	3.3844	2.2192	3.7620	-1.5428	1.1379	6.7150
27	3.2108	2.0015	3.5928	-1.5913	0.9687	6.5252
28	2.0464	2.3795	2.4572	-0.0777	-0.1835	5.2682
29	3.3429	1.2809	3.7215	-2.4406	1.0975	6.6695
30	2.1759	2.8959	2.5835	0.3124	-0.0540	5.4065
31	2.2138	3.7589	2.6204	1.1385	-0.0161	5.4471
32	1.6734	0.6419	2.0934	-1.4516	-0.5589	4.8718
33	2.4681	1.3863	2.8685	-1.4822	0.2371	5.7200
34	-2.4079	-0.7765	-1.8867	1.1102	-4.8695	0.7384
35	-1.0498	0.4055	-0.5623	0.9677	-3.3942	2.0730
36	-1.0788	0.5878	-0.5905	1.1783	-3.4253	2.0441
37	0.1044	1.9169	0.5633	1.3536	-2.1721	3.2388
38	-0.2614	0.3365	0.2067	0.1298	-2.5561	2.8662
39	-1.1087	-0.4005	-0.6196	0.2192	-3.4573	2.0144
40	-1.1087	-0.0619	-0.6196	0.5578	-3.4573	2.0144
41	-2.6593	-1.7148	-2.1318	0.4170	-5.1467	0.4957
42	-1.2040	-1.5606	-0.7126	-0.8481	-3.5597	1.9196
43	-1.4697	-0.6162	-0.9717	0.3555	-3.8461	1.6563
44	-2.6593	-2.6173	-2.1318	-0.4855	-5.1467	0.4957
45	-3.2189	-2.5639	-2.6775	0.1136	-5.7684	-0.0404
46	1.3110	2.1282	1.7401	0.3882	-0.9265	4.4898
47	2.1633	0.6931	2.5712	-1.8781	-0.0665	5.3931
48	1.9488	0.0953	2.3620	-2.2667	-0.2815	5.1642
49	3.3673	3.6687	3.7454	-0.0767	1.1213	6.6962
50	1.8500	3.5467	2.2657	1.2810	-0.3808	5.0592
51	2.7726	1.7047	3.1654	-1.4607	0.5384	6.0487

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnInvert	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.3793	Rows Prediction Only	0
Slope	0.5966	Sum of Frequencies	41
R-Squared	0.5538	Sum of Weights	41.0000
Correlation	0.7442	Coefficient of Variation	0.4623
Mean Square Error	0.8630409	Square Root of MSE	0.929

Linear Regression Report

Y = lnInvert X = lnSoil

Summary Statement

The equation of the straight line relating lnInvert and lnSoil is estimated as: lnInvert = (1.3793) + (0.5966) lnSoil using the 41 observations in this dataset. The y-intercept, the estimated value of lnInvert when lnSoil is zero, is 1.3793 with a standard error of 0.1710. The slope, the estimated change in lnInvert per unit change in lnSoil, is 0.5966 with a standard error of 0.0858. The value of R-Squared, the proportion of the variation in lnInvert that can be accounted for by variation in lnSoil, is 0.5538. The correlation between lnInvert and lnSoil is 0.7442.

A significance test that the slope is zero resulted in a t-value of 6.9572. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.5966. The lower limit of the 95% confidence interval for the slope is 0.4232 and the upper limit is 0.7701. The estimated intercept is 1.3793. The lower limit of the 95% confidence interval for the intercept is 1.0333 and the upper limit is 1.7252.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnInvert	lnSoil
Count	41	41
Mean	2.0094	1.0562
Standard Deviation	1.3732	1.7128
Minimum	-0.7985	-2.6173
Maximum	4.1320	3.8480

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.3793	0.5966
Lower 95% Confidence Limit	1.0333	0.4232
Upper 95% Confidence Limit	1.7252	0.7701
Standard Error	0.1710	0.0858
Standardized Coefficient	0.0000	0.7442
T Value	8.0641	6.9572
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	1.0000
Regression of Y on X	1.3793	0.5966
Inverse Regression from X on Y	0.8715	1.0774
Orthogonal Regression of Y and X	1.2231	0.7445

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.37927513474856) + (0.596638015350715) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.3793	0.9000	1.1235	1.6146
Bootstrap Mean	1.3824	0.9500	1.0655	1.6665
Bias (BM - OV)	0.0032	0.9900	0.9301	1.7459
Bias Corrected	1.3761			
Standard Error	0.1513			
Slope				
Original Value	0.5966	0.9000	0.4752	0.7030
Bootstrap Mean	0.6007	0.9500	0.4526	0.7260
Bias (BM - OV)	0.0040	0.9900	0.3918	0.7718
Bias Corrected	0.5926			
Standard Error	0.0696			
Correlation				
Original Value	0.7442	0.9000	0.6555	0.8563
Bootstrap Mean	0.7424	0.9500	0.6449	0.8777
Bias (BM - OV)	-0.0017	0.9900	0.6240	0.9457
Bias Corrected	0.7459			
Standard Error	0.0604			
R-Squared				
Original Value	0.5538	0.9000	0.4139	0.7082
Bootstrap Mean	0.5549	0.9500	0.3961	0.7347
Bias (BM - OV)	0.0011	0.9900	0.3604	0.8131
Bias Corrected	0.5527			
Standard Error	0.0875			
Standard Error of Estimate				
Original Value	0.9290	0.9000	0.8333	1.0713
Bootstrap Mean	0.9071	0.9500	0.8095	1.0961
Bias (BM - OV)	-0.0219	0.9900	0.7630	1.1489
Bias Corrected	0.9509			
Standard Error	0.0733			
Orthogonal Intercept				
Original Value	1.2231	0.9000	0.9807	1.4798
Bootstrap Mean	1.2167	0.9500	0.9290	1.5308
Bias (BM - OV)	-0.0064	0.9900	0.8424	1.6492
Bias Corrected	1.2295			
Standard Error	0.1528			
Orthogonal Slope				
Original Value	0.7445	0.9000	0.5632	0.8705
Bootstrap Mean	0.7560	0.9500	0.5146	0.8949
Bias (BM - OV)	0.0115	0.9900	0.4138	0.9475
Bias Corrected	0.7330			
Standard Error	0.0964			

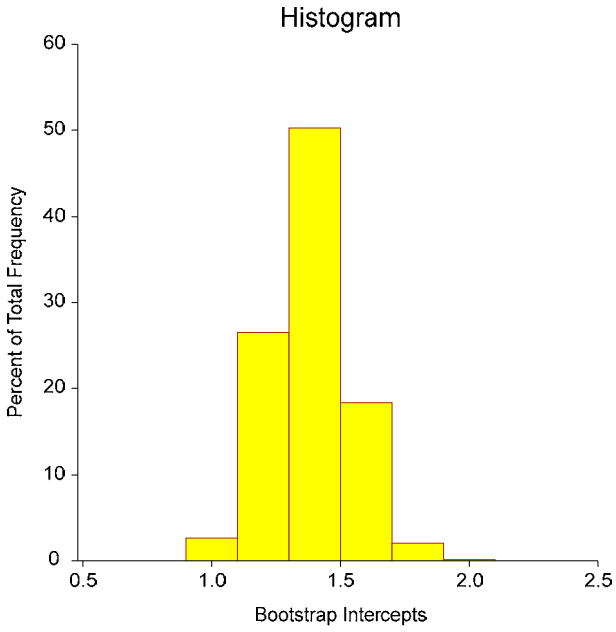
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

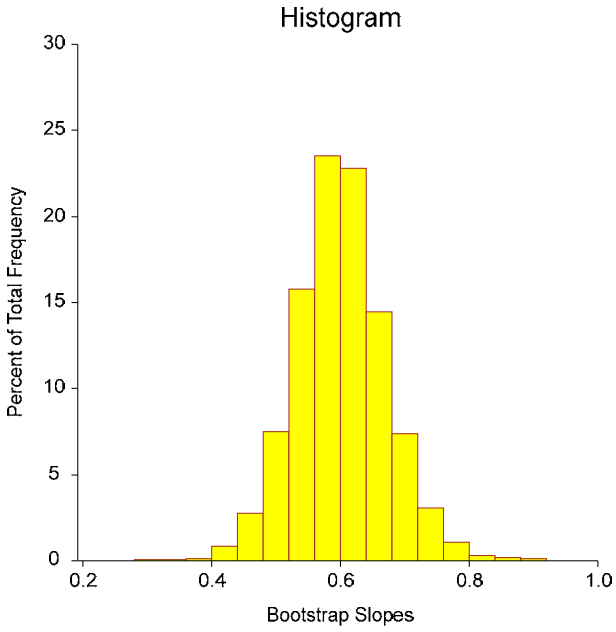
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

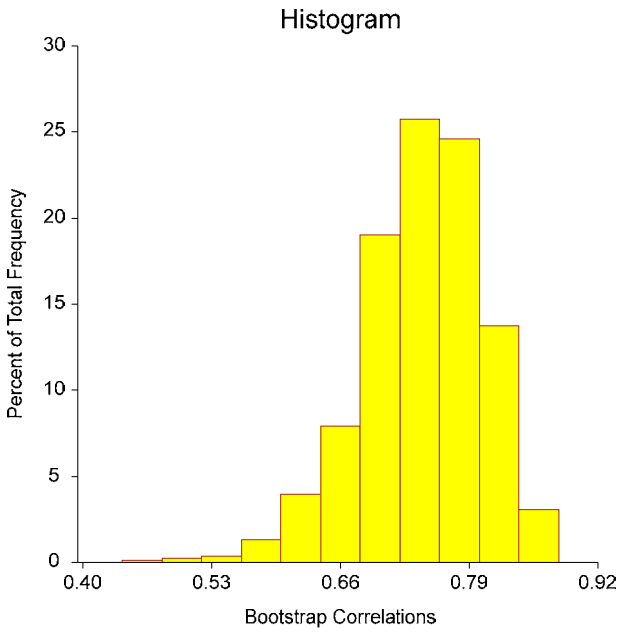
Linear Regression Report

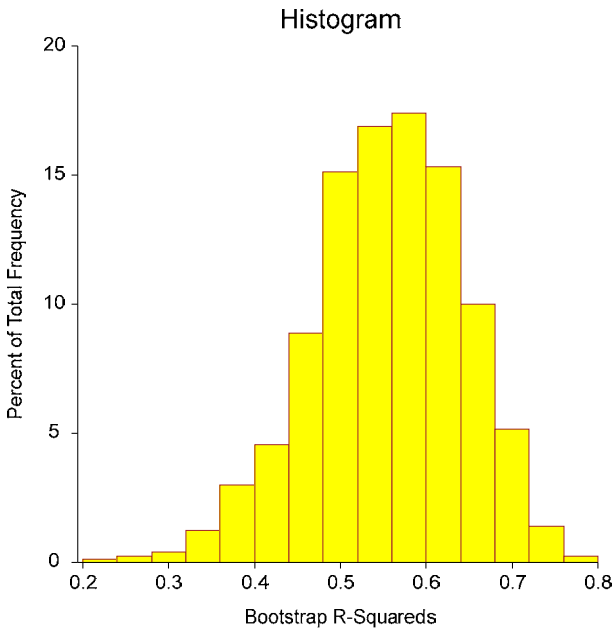
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Bootstrap Histograms Section



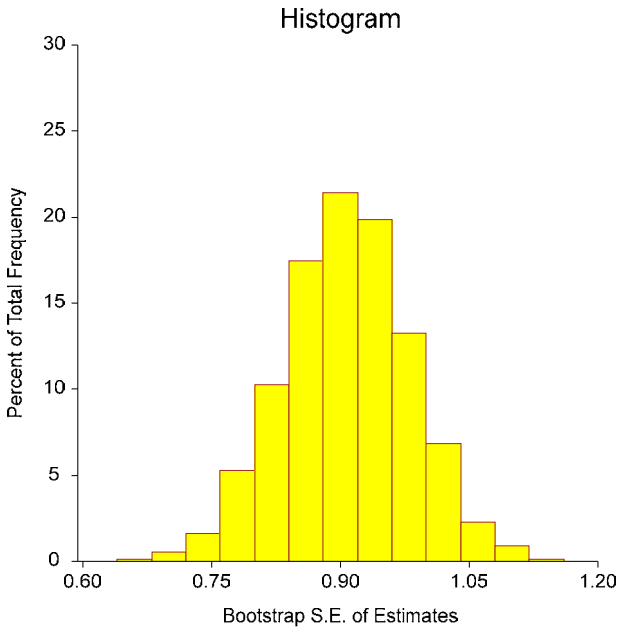


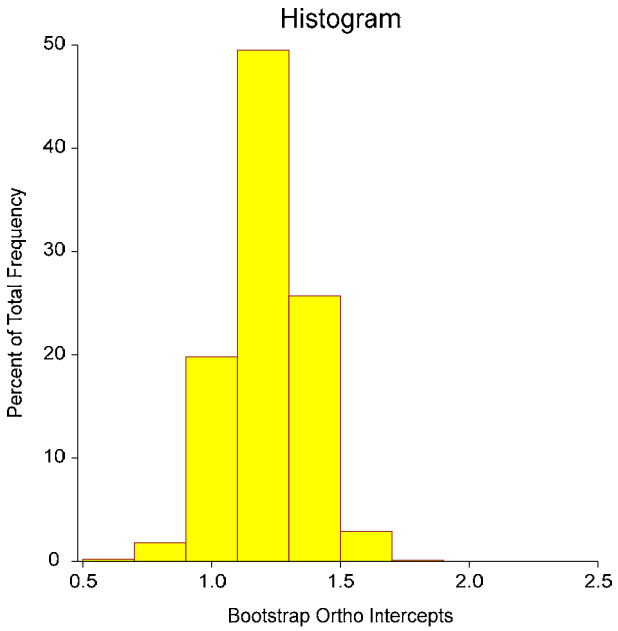


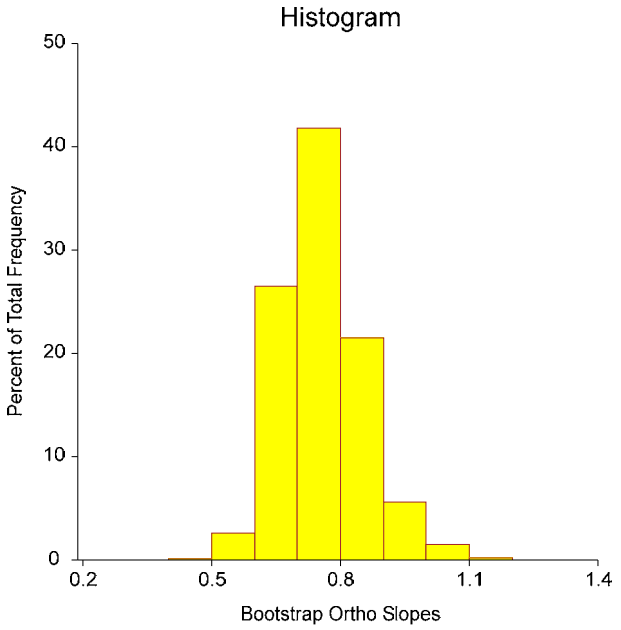


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.7442	0.5538	0.7444
Lower 95% Conf. Limit (r dist'n)	0.5612		
Upper 95% Conf. Limit (r dist'n)	0.8526		
Lower 95% Conf. Limit (Fisher's z)	0.5661		0.5665
Upper 95% Conf. Limit (Fisher's z)	0.8559		0.8560
Adjusted (Rbar)		0.5423	
T-Value for H0: Rho = 0	6.9572	6.9572	6.9621
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	165.5529	165.5529			
Slope	1	41.77306	41.77306	48.4022	0.0000	1.0000
Error	39	33.6586	0.8630409			
Lack of Fit	37	26.36547	0.7125803	0.1954	0.9891	
Pure Error	2	7.293124	3.646562			
Adj. Total	40	75.43166	1.885791			
Total	41	240.9846				

s = Square Root(0.8630409) = 0.929

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	43.30437	82.38731	0.03389676	-0.009000641
1	43.30437	163.0859	157.0319	-0.009000641	0.008521686
2 (Y'Y)			240.9846		
Determinant		4811.254			0.000207846

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.02925429	-0.007767921
1	-0.007767921	0.007354564

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9602	0.160175	No
Anderson Darling	0.4811	0.232211	Yes
D'Agostino Skewness	0.6295	0.529007	Yes
D'Agostino Kurtosis	-2.0347	0.041877	No
D'Agostino Omnibus	4.5365	0.103495	No
Constant Residual Variance?			
Modified Levene Test	0.0053	0.942532	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.1954	0.989089	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

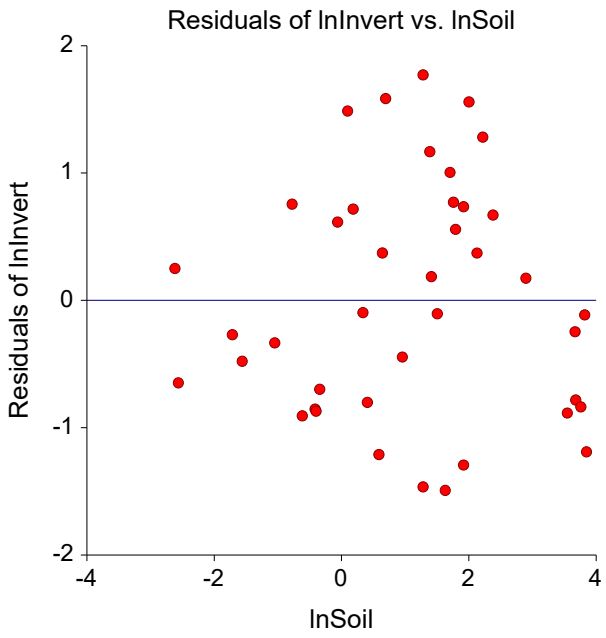
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

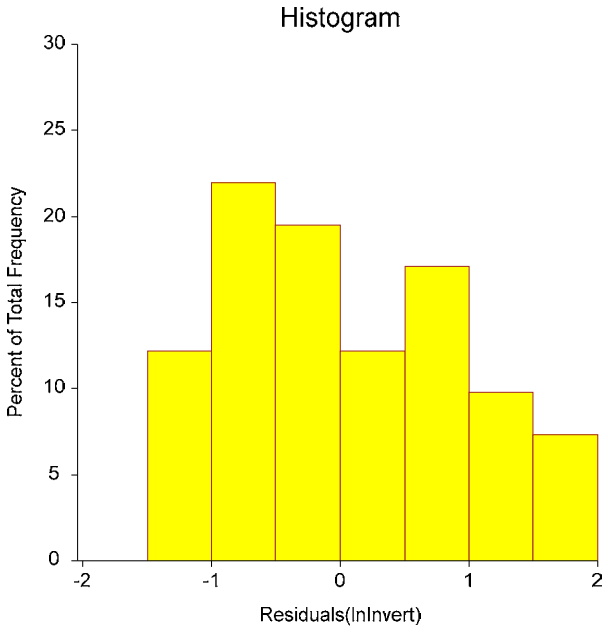
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

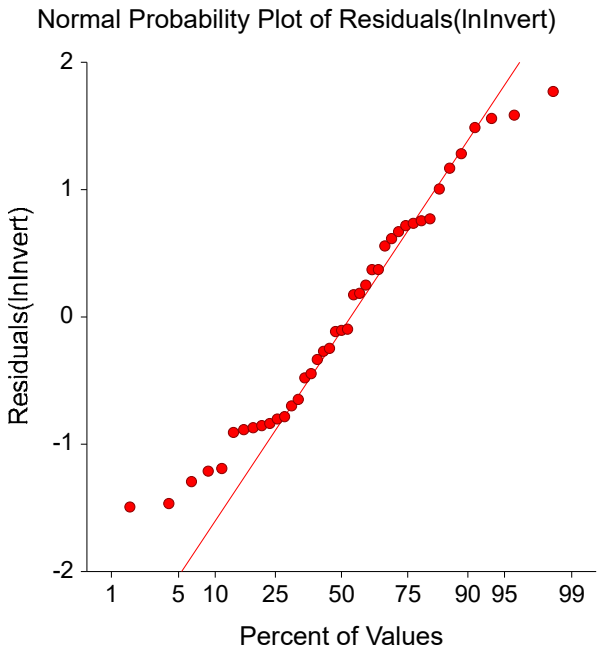
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Original Data Section

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual
11	1.7918	3.0057	2.4483	0.5574
12	3.8480	2.4849	3.6751	-1.1902
13	0.1823	2.2050	1.4881	0.7169
14	3.6788	2.7912	3.5742	-0.7830
15	1.4110	2.4069	2.2211	0.1858
16	-0.3425	0.4762	1.1749	-0.6987
17	1.6292	0.8587	2.3513	-1.4927
18	-1.0498	0.4187	0.7529	-0.3342
19	1.2809	0.6780	2.1435	-1.4655
20	0.9555	1.5041	1.9494	-0.4453
21	-0.4155	0.2776	1.1314	-0.8537
22	3.8199	3.5439	3.6584	-0.1145
23	1.5041	2.1713	2.2767	-0.1053
24	1.7579	3.1987	2.4281	0.7706
25	1.9169	3.2581	2.5230	0.7351
26	2.2192	3.9853	2.7033	1.2819
27	2.0015	4.1320	2.5734	1.5585
28	2.3795	3.4689	2.7990	0.6699
29	1.2809	3.9140	2.1435	1.7705
30	2.8959	3.2809	3.1071	0.1738
31	3.7589	2.7850	3.6220	-0.8369
32	0.6419	2.1342	1.7622	0.3719
33	1.3863	3.3742	2.2064	1.1678
34	-0.7765	1.6715	0.9160	0.7555
35	0.4055	0.8198	1.6212	-0.8014
36	0.5878	0.5188	1.7300	-1.2112
37	1.9169	1.2296	2.5230	-1.2933
38	0.3365	1.4839	1.5800	-0.0962
39	-0.4005	0.2700	1.1403	-0.8703
40	-0.0619	1.9573	1.3424	0.6149
41	-1.7148	0.0862	0.3562	-0.2700
42	-1.5606	-0.0305	0.4481	-0.4786
43	-0.6162	0.1044	1.0116	-0.9073
44	-2.6173	0.0677	-0.1823	0.2500
45	-2.5639	-0.7985	-0.1505	-0.6480
46	2.1282	3.0204	2.6491	0.3714
47	0.6931	3.3776	1.7928	1.5848
48	0.0953	2.9232	1.4361	1.4870
49	3.6687	3.3214	3.5681	-0.2467
50	3.5467	2.6101	3.4954	-0.8853
51	1.7047	3.4012	2.3964	1.0048

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	1.7918	3.0057	2.4483	0.1582	2.1283	2.7683
12	3.8480	2.4849	3.6751	0.2800	3.1089	4.2414
13	0.1823	2.2050	1.4881	0.1633	1.1578	1.8184
14	3.6788	2.7912	3.5742	0.2676	3.0328	4.1156
15	1.4110	2.4069	2.2211	0.1482	1.9213	2.5210
16	-0.3425	0.4762	1.1749	0.1882	0.7942	1.5557
17	1.6292	0.8587	2.3513	0.1532	2.0415	2.6612
18	-1.0498	0.4187	0.7529	0.2317	0.2843	1.2215
19	1.2809	0.6780	2.1435	0.1464	1.8475	2.4396
20	0.9555	1.5041	1.9494	0.1453	1.6554	2.2434
21	-0.4155	0.2776	1.1314	0.1923	0.7424	1.5203
22	3.8199	3.5439	3.6584	0.2779	3.0963	4.2205
23	1.5041	2.1713	2.2767	0.1501	1.9731	2.5802
24	1.7579	3.1987	2.4281	0.1571	2.1104	2.7458
25	1.9169	3.2581	2.5230	0.1628	2.1937	2.8522
26	2.2192	3.9853	2.7033	0.1761	2.3472	3.0595
27	2.0015	4.1320	2.5734	0.1662	2.2373	2.9096
28	2.3795	3.4689	2.7990	0.1842	2.4264	3.1716
29	1.2809	3.9140	2.1435	0.1464	1.8475	2.4396
30	2.8959	3.2809	3.1071	0.2143	2.6735	3.5406
31	3.7589	2.7850	3.6220	0.2734	3.0689	4.1750
32	0.6419	2.1342	1.7622	0.1494	1.4601	2.0644
33	1.3863	3.3742	2.2064	0.1478	1.9074	2.5054
34	-0.7765	1.6715	0.9160	0.2139	0.4833	1.3486
35	0.4055	0.8198	1.6212	0.1554	1.3068	1.9356
36	0.5878	0.5188	1.7300	0.1505	1.4255	2.0345
37	1.9169	1.2296	2.5230	0.1628	2.1937	2.8522
38	0.3365	1.4839	1.5800	0.1577	1.2611	1.8989
39	-0.4005	0.2700	1.1403	0.1915	0.7531	1.5276
40	-0.0619	1.9573	1.3424	0.1739	0.9906	1.6941
41	-1.7148	0.0862	0.3562	0.2784	-0.2070	0.9193
42	-1.5606	-0.0305	0.4481	0.2672	-0.0924	0.9887
43	-0.6162	0.1044	1.0116	0.2040	0.5990	1.4243
44	-2.6173	0.0677	-0.1823	0.3468	-0.8838	0.5192
45	-2.5639	-0.7985	-0.1505	0.3427	-0.8436	0.5427
46	2.1282	3.0204	2.6491	0.1718	2.3016	2.9965
47	0.6931	3.3776	1.7928	0.1484	1.4927	2.0930
48	0.0953	2.9232	1.4361	0.1669	1.0986	1.7736
49	3.6687	3.3214	3.5681	0.2669	3.0283	4.1080
50	3.5467	2.6101	3.4954	0.2582	2.9731	4.0177
51	1.7047	3.4012	2.3964	0.1554	2.0821	2.7107

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	1.7918	3.0057	2.4483	0.9424	0.5422	4.3544
12	3.8480	2.4849	3.6751	0.9703	1.7126	5.6377
13	0.1823	2.2050	1.4881	0.9432	-0.4198	3.3959
14	3.6788	2.7912	3.5742	0.9668	1.6187	5.5297
15	1.4110	2.4069	2.2211	0.9408	0.3183	4.1240
16	-0.3425	0.4762	1.1749	0.9479	-0.7423	3.0922
17	1.6292	0.8587	2.3513	0.9415	0.4469	4.2558
18	-1.0498	0.4187	0.7529	0.9575	-1.1837	2.6895
19	1.2809	0.6780	2.1435	0.9405	0.2413	4.0458
20	0.9555	1.5041	1.9494	0.9403	0.0474	3.8513
21	-0.4155	0.2776	1.1314	0.9487	-0.7876	3.0503
22	3.8199	3.5439	3.6584	0.9697	1.6970	5.6197
23	1.5041	2.1713	2.2767	0.9410	0.3732	4.1801
24	1.7579	3.1987	2.4281	0.9422	0.5223	4.3338
25	1.9169	3.2581	2.5230	0.9432	0.6153	4.4307
26	2.2192	3.9853	2.7033	0.9455	0.7908	4.6159
27	2.0015	4.1320	2.5734	0.9437	0.6645	4.4823
28	2.3795	3.4689	2.7990	0.9471	0.8833	4.7147
29	1.2809	3.9140	2.1435	0.9405	0.2413	4.0458
30	2.8959	3.2809	3.1071	0.9534	1.1786	5.0355
31	3.7589	2.7850	3.6220	0.9684	1.6632	5.5807
32	0.6419	2.1342	1.7622	0.9409	-0.1410	3.6654
33	1.3863	3.3742	2.2064	0.9407	0.3037	4.1091
34	-0.7765	1.6715	0.9160	0.9533	-1.0123	2.8442
35	0.4055	0.8198	1.6212	0.9419	-0.2840	3.5264
36	0.5878	0.5188	1.7300	0.9411	-0.1736	3.6336
37	1.9169	1.2296	2.5230	0.9432	0.6153	4.4307
38	0.3365	1.4839	1.5800	0.9423	-0.3259	3.4860
39	-0.4005	0.2700	1.1403	0.9485	-0.7782	3.0589
40	-0.0619	1.9573	1.3424	0.9451	-0.5694	3.2541
41	-1.7148	0.0862	0.3562	0.9698	-1.6055	2.3178
42	-1.5606	-0.0305	0.4481	0.9667	-1.5071	2.4034
43	-0.6162	0.1044	1.0116	0.9511	-0.9122	2.9355
44	-2.6173	0.0677	-0.1823	0.9916	-2.1881	1.8235
45	-2.5639	-0.7985	-0.1505	0.9902	-2.1533	1.8524
46	2.1282	3.0204	2.6491	0.9447	0.7381	4.5600
47	0.6931	3.3776	1.7928	0.9408	-0.1101	3.6957
48	0.0953	2.9232	1.4361	0.9439	-0.4730	3.3453
49	3.6687	3.3214	3.5681	0.9666	1.6130	5.5232
50	3.5467	2.6101	3.4954	0.9642	1.5451	5.4457
51	1.7047	3.4012	2.3964	0.9419	0.4912	4.3016

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	1.7918	3.0057	2.4483	0.1582	1.9974	2.8992
12	3.8480	2.4849	3.6751	0.2800	2.8773	4.4730
13	0.1823	2.2050	1.4881	0.1633	1.0227	1.9534
14	3.6788	2.7912	3.5742	0.2676	2.8114	4.3370
15	1.4110	2.4069	2.2211	0.1482	1.7987	2.6436
16	-0.3425	0.4762	1.1749	0.1882	0.6384	1.7114
17	1.6292	0.8587	2.3513	0.1532	1.9148	2.7879
18	-1.0498	0.4187	0.7529	0.2317	0.0927	1.4131
19	1.2809	0.6780	2.1435	0.1464	1.7264	2.5606
20	0.9555	1.5041	1.9494	0.1453	1.5352	2.3636
21	-0.4155	0.2776	1.1314	0.1923	0.5833	1.6794
22	3.8199	3.5439	3.6584	0.2779	2.8664	4.4503
23	1.5041	2.1713	2.2767	0.1501	1.8489	2.7044
24	1.7579	3.1987	2.4281	0.1571	1.9805	2.8757
25	1.9169	3.2581	2.5230	0.1628	2.0591	2.9869
26	2.2192	3.9853	2.7033	0.1761	2.2016	3.2051
27	2.0015	4.1320	2.5734	0.1662	2.0998	3.0471
28	2.3795	3.4689	2.7990	0.1842	2.2741	3.3239
29	1.2809	3.9140	2.1435	0.1464	1.7264	2.5606
30	2.8959	3.2809	3.1071	0.2143	2.4962	3.7179
31	3.7589	2.7850	3.6220	0.2734	2.8427	4.4012
32	0.6419	2.1342	1.7622	0.1494	1.3365	2.1879
33	1.3863	3.3742	2.2064	0.1478	1.7851	2.6277
34	-0.7765	1.6715	0.9160	0.2139	0.3064	1.5256
35	0.4055	0.8198	1.6212	0.1554	1.1782	2.0642
36	0.5878	0.5188	1.7300	0.1505	1.3009	2.1590
37	1.9169	1.2296	2.5230	0.1628	2.0591	2.9869
38	0.3365	1.4839	1.5800	0.1577	1.1307	2.0294
39	-0.4005	0.2700	1.1403	0.1915	0.5947	1.6860
40	-0.0619	1.9573	1.3424	0.1739	0.8467	1.8380
41	-1.7148	0.0862	0.3562	0.2784	-0.4373	1.1496
42	-1.5606	-0.0305	0.4481	0.2672	-0.3134	1.2097
43	-0.6162	0.1044	1.0116	0.2040	0.4302	1.5930
44	-2.6173	0.0677	-0.1823	0.3468	-1.1707	0.8061
45	-2.5639	-0.7985	-0.1505	0.3427	-1.1271	0.8261
46	2.1282	3.0204	2.6491	0.1718	2.1596	3.1386
47	0.6931	3.3776	1.7928	0.1484	1.3699	2.2157
48	0.0953	2.9232	1.4361	0.1669	0.9606	1.9117
49	3.6687	3.3214	3.5681	0.2669	2.8075	4.3288
50	3.5467	2.6101	3.4954	0.2582	2.7596	4.2312
51	1.7047	3.4012	2.3964	0.1554	1.9536	2.8392

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Section

Row	lnSoil (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	1.7918	3.0057	2.4483	0.5574	0.6089	18.5441
12	3.8480	2.4849	3.6751	-1.1902	-1.3437	47.8989
13	0.1823	2.2050	1.4881	0.7169	0.7839	32.5137
14	3.6788	2.7912	3.5742	-0.7830	-0.8802	28.0542
15	1.4110	2.4069	2.2211	0.1858	0.2026	7.7202
16	-0.3425	0.4762	1.1749	-0.6987	-0.7680	146.7132
17	1.6292	0.8587	2.3513	-1.4927	-1.6291	173.8380
18	-1.0498	0.4187	0.7529	-0.3342	-0.3715	79.8168
19	1.2809	0.6780	2.1435	-1.4655	-1.5974	216.1391
20	0.9555	1.5041	1.9494	-0.4453	-0.4853	29.6057
21	-0.4155	0.2776	1.1314	-0.8537	-0.9393	307.5049
22	3.8199	3.5439	3.6584	-0.1145	-0.1292	3.2316
23	1.5041	2.1713	2.2767	-0.1053	-0.1149	4.8508
24	1.7579	3.1987	2.4281	0.7706	0.8416	24.0910
25	1.9169	3.2581	2.5230	0.7351	0.8037	22.5626
26	2.2192	3.9853	2.7033	1.2819	1.4054	32.1669
27	2.0015	4.1320	2.5734	1.5585	1.7051	37.7188
28	2.3795	3.4689	2.7990	0.6699	0.7357	19.3105
29	1.2809	3.9140	2.1435	1.7705	1.9299	45.2346
30	2.8959	3.2809	3.1071	0.1738	0.1923	5.2981
31	3.7589	2.7850	3.6220	-0.8369	-0.9427	30.0519
32	0.6419	2.1342	1.7622	0.3719	0.4056	17.4277
33	1.3863	3.3742	2.2064	1.1678	1.2732	34.6093
34	-0.7765	1.6715	0.9160	0.7555	0.8357	45.1999
35	0.4055	0.8198	1.6212	-0.8014	-0.8750	97.7593
36	0.5878	0.5188	1.7300	-1.2112	-1.3212	233.4602
37	1.9169	1.2296	2.5230	-1.2933	-1.4141	105.1806
38	0.3365	1.4839	1.5800	-0.0962	-0.1050	6.4798
39	-0.4005	0.2700	1.1403	-0.8703	-0.9574	322.3038
40	-0.0619	1.9573	1.3424	0.6149	0.6738	31.4170
41	-1.7148	0.0862	0.3562	-0.2700	-0.3046	313.2870
42	-1.5606	-0.0305	0.4481	-0.4786	-0.5379	1571.2575
43	-0.6162	0.1044	1.0116	-0.9073	-1.0011	869.3704
44	-2.6173	0.0677	-0.1823	0.2500	0.2900	369.4453
45	-2.5639	-0.7985	-0.1505	-0.6480	-0.7505	81.1555
46	2.1282	3.0204	2.6491	0.3714	0.4068	12.2952
47	0.6931	3.3776	1.7928	1.5848	1.7281	46.9197
48	0.0953	2.9232	1.4361	1.4870	1.6271	50.8703
49	3.6687	3.3214	3.5681	-0.2467	-0.2773	7.4280
50	3.5467	2.6101	3.4954	-0.8853	-0.9921	33.9196
51	1.7047	3.4012	2.3964	1.0048	1.0971	29.5427

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	1.7918	0.5574	0.6039	0.0290	0.0055	0.8773
12	3.8480	-1.1902	-1.3581	0.0908	0.0902	0.8447
13	0.1823	0.7169	0.7800	0.0309	0.0098	0.8718
14	3.6788	-0.7830	-0.8776	0.0830	0.0351	0.8682
15	1.4110	0.1858	0.2001	0.0255	0.0005	0.8848
16	-0.3425	-0.6987	-0.7639	0.0411	0.0126	0.8724
17	1.6292	-1.4927	-1.6657	0.0272	0.0371	0.8255
18	-1.0498	-0.3342	-0.3673	0.0622	0.0046	0.8826
19	1.2809	-1.4655	-1.6311	0.0248	0.0325	0.8278
20	0.9555	-0.4453	-0.4805	0.0245	0.0030	0.8804
21	-0.4155	-0.8537	-0.9379	0.0428	0.0197	0.8657
22	3.8199	-0.1145	-0.1276	0.0895	0.0008	0.8854
23	1.5041	-0.1053	-0.1134	0.0261	0.0002	0.8855
24	1.7579	0.7706	0.8384	0.0286	0.0104	0.8697
25	1.9169	0.7351	0.8000	0.0307	0.0102	0.8711
26	2.2192	1.2819	1.4238	0.0359	0.0368	0.8409
27	2.0015	1.5585	1.7496	0.0320	0.0481	0.8197
28	2.3795	0.6699	0.7313	0.0393	0.0111	0.8735
29	1.2809	1.7705	*2.0030	0.0248	0.0474	0.8012
30	2.8959	0.1738	0.1899	0.0532	0.0010	0.8849
31	3.7589	-0.8369	-0.9413	0.0866	0.0421	0.8656
32	0.6419	0.3719	0.4013	0.0259	0.0022	0.8820
33	1.3863	1.1678	1.2838	0.0253	0.0211	0.8489
34	-0.7765	0.7555	0.8324	0.0530	0.0195	0.8699
35	0.4055	-0.8014	-0.8723	0.0280	0.0110	0.8684
36	0.5878	-1.2112	-1.3344	0.0263	0.0235	0.8461
37	1.9169	-1.2933	-1.4330	0.0307	0.0317	0.8403
38	0.3365	-0.0962	-0.1037	0.0288	0.0002	0.8855
39	-0.4005	-0.8703	-0.9563	0.0425	0.0203	0.8649
40	-0.0619	0.6149	0.6690	0.0350	0.0082	0.8754
41	-1.7148	-0.2700	-0.3010	0.0898	0.0046	0.8836
42	-1.5606	-0.4786	-0.5329	0.0827	0.0131	0.8792
43	-0.6162	-0.9073	-1.0011	0.0482	0.0254	0.8630
44	-2.6173	0.2500	*0.2866	0.1394	0.0068	0.8838
45	-2.5639	-0.6480	*-0.7462	0.1361	0.0444	0.8730
46	2.1282	0.3714	0.4024	0.0342	0.0029	0.8820
47	0.6931	1.5848	1.7751	0.0255	0.0391	0.8179
48	0.0953	1.4870	1.6636	0.0323	0.0441	0.8256
49	3.6687	-0.2467	-0.2740	0.0826	0.0035	0.8840
50	3.5467	-0.8853	-0.9919	0.0772	0.0412	0.8634
51	1.7047	1.0048	1.1000	0.0280	0.0173	0.8584

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.6039	0.1044	0.0055	1.0643	0.0591	0.0416
12	-1.3581	-0.4292	0.0902	1.0537	0.0057	-0.3671
13	0.7800	0.1393	0.0098	1.0529	0.1388	-0.0639
14	-0.8776	-0.2640	0.0351	1.1035	-0.0039	-0.2219
15	0.2001	0.0323	0.0005	1.0786	0.0233	0.0066
16	-0.7639	-0.1581	0.0126	1.0655	-0.1567	0.1007
17	-1.6657	-0.2785	0.0371	0.9404	-0.1764	-0.0893
18	-0.3673	-0.0946	0.0046	1.1152	-0.0893	0.0737
19	-1.6311	-0.2602	0.0325	0.9434	-0.2007	-0.0343
20	-0.4805	-0.0761	0.0030	1.0668	-0.0668	0.0045
21	-0.9379	-0.1984	0.0197	1.0512	-0.1960	0.1302
22	-0.1276	-0.0400	0.0008	* 1.1558	0.0004	-0.0341
23	-0.1134	-0.0186	0.0002	1.0808	-0.0127	-0.0048
24	0.8384	0.1438	0.0104	1.0453	0.0835	0.0551
25	0.8000	0.1424	0.0102	1.0510	0.0735	0.0646
26	1.4238	0.2748	0.0368	0.9847	0.1097	0.1557
27	1.7496	0.3181	0.0481	0.9320	0.1534	0.1552
28	0.7313	0.1479	0.0111	1.0662	0.0506	0.0911
29	* 2.0030	0.3196	0.0474	0.8837	0.2464	0.0421
30	0.1899	0.0450	0.0010	1.1104	0.0083	0.0331
31	-0.9413	-0.2899	0.0421	1.1013	-0.0003	-0.2457
32	0.4013	0.0654	0.0022	1.0722	0.0621	-0.0156
33	1.2838	0.2069	0.0211	0.9927	0.1513	0.0396
34	0.8324	0.1969	0.0195	1.0728	0.1900	-0.1447
35	-0.8723	-0.1480	0.0110	1.0415	-0.1454	0.0532
36	-1.3344	-0.2191	0.0235	0.9871	-0.2101	0.0585
37	-1.4330	-0.2550	0.0317	0.9781	-0.1316	-0.1157
38	-0.1037	-0.0179	0.0002	1.0840	-0.0176	0.0070
39	-0.9563	-0.2014	0.0203	1.0489	-0.1991	0.1314
40	0.6690	0.1275	0.0082	1.0663	0.1275	-0.0703
41	-0.3010	-0.0946	0.0046	* 1.1518	-0.0846	0.0807
42	-0.5329	-0.1601	0.0131	1.1314	-0.1449	0.1344
43	-1.0011	-0.2253	0.0254	1.0506	-0.2198	0.1584
44	0.2866	0.1153	0.0068	* 1.2186	0.0964	-0.1048
45	-0.7462	-0.2961	0.0444	* 1.1843	-0.2484	0.2683
46	0.4024	0.0757	0.0029	1.0814	0.0328	0.0405
47	1.7751	0.2872	0.0391	0.9217	0.2701	-0.0603
48	1.6636	0.3037	0.0441	0.9457	0.3035	-0.1500
49	-0.2740	-0.0822	0.0035	1.1436	-0.0014	-0.0690
50	-0.9919	-0.2870	0.0412	1.0846	-0.0111	-0.2374
51	1.1000	0.1866	0.0173	1.0178	0.1124	0.0668

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
11	1.7918	0.5574	||||.....	0.6089	||||.....	0.6039	|||.....
12	3.8480	-1.1902	|||||||||.....	-1.3437	|||||||||.....	-1.3581	|||||||||.....
13	0.1823	0.7169	|||||.....	0.7839	|||||.....	0.7800	|||||.....
14	3.6788	-0.7830	||||||.....	-0.8802	||||||.....	-0.8776	||||||.....
15	1.4110	0.1858	|.....	0.2026	|.....	0.2001	|.....
16	-0.3425	-0.6987	|||||.....	-0.7680	|||||.....	-0.7639	|||||.....
17	1.6292	-1.4927	||||||||||...	-1.6291	||||||||||...	-1.6657	||||||||||...
18	-1.0498	-0.3342	||.....	-0.3715	||.....	-0.3673	||.....
19	1.2809	-1.4655	||||||||||...	-1.5974	||||||||||...	-1.6311	||||||||||...
20	0.9555	-0.4453	|||.....	-0.4853	|||.....	-0.4805	||.....
21	-0.4155	-0.8537	||||||.....	-0.9393	||||||.....	-0.9379	||||||.....
22	3.8199	-0.1145	|.....	-0.1292	|.....	-0.1276	|.....
23	1.5041	-0.1053	|.....	-0.1149	|.....	-0.1134	|.....
24	1.7579	0.7706	||||||.....	0.8416	||||||.....	0.8384	|||||.....
25	1.9169	0.7351	|||||.....	0.8037	|||||.....	0.8000	|||||.....
26	2.2192	1.2819	|||||||||.....	1.4054	|||||||||.....	1.4238	|||||||||.....
27	2.0015	1.5585	|||||||||||..	1.7051	|||||||||||..	1.7496	|||||||||||...
28	2.3795	0.6699	|||||.....	0.7357	|||||.....	0.7313	||||.....
29	1.2809	1.7705	||||||||||||||	1.9299	||||||||||||||	* 2.0030	||||||||||||||
30	2.8959	0.1738	|.....	0.1923	|.....	0.1899	|.....
31	3.7589	-0.8369	||||||.....	-0.9427	||||||.....	-0.9413	||||||.....
32	0.6419	0.3719	||.....	0.4056	||.....	0.4013	||.....
33	1.3863	1.1678	|||||||||.....	1.2732	|||||||||.....	1.2838	|||||||||.....
34	-0.7765	0.7555	|||||.....	0.8357	|||||.....	0.8324	|||||.....
35	0.4055	-0.8014	||||||.....	-0.8750	||||||.....	-0.8723	||||||.....
36	0.5878	-1.2112	|||||||||.....	-1.3212	|||||||||.....	-1.3344	|||||||||.....
37	1.9169	-1.2933	|||||||||.....	-1.4141	|||||||||.....	-1.4330	|||||||||.....
38	0.3365	-0.0962	|.....	-0.1050	|.....	-0.1037	|.....
39	-0.4005	-0.8703	||||||.....	-0.9574	||||||.....	-0.9563	||||||.....
40	-0.0619	0.6149	||||.....	0.6738	||||.....	0.6690	||||.....
41	-1.7148	-0.2700	|.....	-0.3046	|.....	-0.3010	|.....
42	-1.5606	-0.4786	|||.....	-0.5379	|||.....	-0.5329	|||.....
43	-0.6162	-0.9073	|||||||.....	-1.0011	|||||||.....	-1.0011	|||||||.....
44	-2.6173	0.2500	|.....	0.2900	|.....	0.2866	|.....
45	-2.5639	-0.6480	||||.....	-0.7505	|||||.....	-0.7462	|||||.....
46	2.1282	0.3714	||.....	0.4068	||.....	0.4024	||.....
47	0.6931	1.5848	|||||||||||..	1.7281	|||||||||||..	1.7751	|||||||||||..
48	0.0953	1.4870	|||||||||||...	1.6271	|||||||||||...	1.6636	|||||||||||...
49	3.6687	-0.2467	|.....	-0.2773	|.....	-0.2740	|.....
50	3.5467	-0.8853	|||||||.....	-0.9921	|||||||.....	-0.9919	|||||||.....
51	1.7047	1.0048	|||||||.....	1.0971	|||||||.....	1.1000	|||||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	1.7918	0.1044	|||.....	0.0055	|.....	0.0416	|.....
12	3.8480	-0.4292	||||||||||||||	0.0902	||||||||||||||	-0.3671	||||||||||||||
13	0.1823	0.1393	||||.....	0.0098	|.....	-0.0639	||.....
14	3.6788	-0.2640	|||||||.....	0.0351	|||||.....	-0.2219	|||||||.....
15	1.4110	0.0323	|.....	0.0005	|.....	0.0066	|.....
16	-0.3425	-0.1581	|||||.....	0.0126	||.....	0.1007	|||.....
17	1.6292	-0.2785	|||||||||.....	0.0371	||||||.....	-0.0893	|||.....
18	-1.0498	-0.0946	||.....	0.0046	|.....	0.0737	||.....
19	1.2809	-0.2602	|||||||.....	0.0325	|||||.....	-0.0343	|.....
20	0.9555	-0.0761	||.....	0.0030	|.....	0.0045	|.....
21	-0.4155	-0.1984	||||||.....	0.0197	|||.....	0.1302	|||||.....
22	3.8199	-0.0400	|.....	0.0008	|.....	-0.0341	|.....
23	1.5041	-0.0186	|.....	0.0002	|.....	-0.0048	|.....
24	1.7579	0.1438	||||.....	0.0104	|.....	0.0551	||.....
25	1.9169	0.1424	||||.....	0.0102	|.....	0.0646	||.....
26	2.2192	0.2748	||||||||.....	0.0368	||||||.....	0.1557	||||||.....
27	2.0015	0.3181	|||||||||.....	0.0481	||||||.....	0.1552	||||||.....
28	2.3795	0.1479	||||.....	0.0111	|.....	0.0911	|||.....
29	1.2809	0.3196	||||||||||....	0.0474	||||||.....	0.0421	|.....
30	2.8959	0.0450	|.....	0.0010	|.....	0.0331	|.....
31	3.7589	-0.2899	||||||||.....	0.0421	||||||.....	-0.2457	||||||||.....
32	0.6419	0.0654	|.....	0.0022	|.....	-0.0156	|.....
33	1.3863	0.2069	||||||.....	0.0211	|||.....	0.0396	|.....
34	-0.7765	0.1969	||||||.....	0.0195	|||.....	-0.1447	|||||.....
35	0.4055	-0.1480	||||.....	0.0110	|.....	0.0532	||.....
36	0.5878	-0.2191	|||||||.....	0.0235	|||.....	0.0585	||.....
37	1.9169	-0.2550	||||||||.....	0.0317	|||||.....	-0.1157	||||.....
38	0.3365	-0.0179	|.....	0.0002	|.....	0.0070	|.....
39	-0.4005	-0.2014	||||||.....	0.0203	|||.....	0.1314	|||||.....
40	-0.0619	0.1275	|||.....	0.0082	|.....	-0.0703	||.....
41	-1.7148	-0.0946	||.....	0.0046	|.....	0.0807	|||.....
42	-1.5606	-0.1601	|||||.....	0.0131	||.....	0.1344	|||||.....
43	-0.6162	-0.2253	|||||||.....	0.0254	||||.....	0.1584	||||||.....
44	-2.6173	0.1153	|||.....	0.0068	|.....	-0.1048	||||.....
45	-2.5639	-0.2961	|||||||||.....	0.0444	|||||||.....	0.2683	|||||||||.....
46	2.1282	0.0757	||.....	0.0029	|.....	0.0405	|.....
47	0.6931	0.2872	||||||||.....	0.0391	||||||.....	-0.0603	||.....
48	0.0953	0.3037	|||||||||.....	0.0441	|||||||.....	-0.1500	||||||.....
49	3.6687	-0.0822	||.....	0.0035	|.....	-0.0690	||.....
50	3.5467	-0.2870	||||||||.....	0.0412	||||||.....	-0.2374	||||||||.....
51	1.7047	0.1866	||||||.....	0.0173	||.....	0.0668	||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	1.7918	0.6039	|||.....	0.0055	|.....	0.0290	|.....
12	3.8480	-1.3581	||||||||.....	0.0902	||||||||||||||	0.0908	|||||||.....
13	0.1823	0.7800	|||||.....	0.0098	|.....	0.0309	|.....
14	3.6788	-0.8776	||||||.....	0.0351	||||.....	0.0830	||||||.....
15	1.4110	0.2001	|.....	0.0005	|.....	0.0255	|.....
16	-0.3425	-0.7639	|||||.....	0.0126	||.....	0.0411	||.....
17	1.6292	-1.6657	|||||||||||...	0.0371	||||||.....	0.0272	|.....
18	-1.0498	-0.3673	||.....	0.0046	|.....	0.0622	||||.....
19	1.2809	-1.6311	|||||||||||...	0.0325	||||.....	0.0248	|.....
20	0.9555	-0.4805	||.....	0.0030	|.....	0.0245	|.....
21	-0.4155	-0.9379	||||||.....	0.0197	|||.....	0.0428	||.....
22	3.8199	-0.1276	|.....	0.0008	|.....	0.0895	|||||||.....
23	1.5041	-0.1134	|.....	0.0002	|.....	0.0261	|.....
24	1.7579	0.8384	|||||.....	0.0104	|.....	0.0286	|.....
25	1.9169	0.8000	|||||.....	0.0102	|.....	0.0307	|.....
26	2.2192	1.4238	|||||||||.....	0.0368	||||||.....	0.0359	|.....
27	2.0015	1.7496	|||||||||||...	0.0481	||||||.....	0.0320	|.....
28	2.3795	0.7313	||||.....	0.0111	|.....	0.0393	|.....
29	1.2809	* 2.0030	|||||||||||||	0.0474	||||||.....	0.0248	|.....
30	2.8959	0.1899	|.....	0.0010	|.....	0.0532	|||.....
31	3.7589	-0.9413	||||||.....	0.0421	||||||.....	0.0866	|||||||.....
32	0.6419	0.4013	||.....	0.0022	|.....	0.0259	|.....
33	1.3863	1.2838	||||||||.....	0.0211	|||.....	0.0253	|.....
34	-0.7765	0.8324	|||||.....	0.0195	|||.....	0.0530	|||.....
35	0.4055	-0.8723	|||||.....	0.0110	|.....	0.0280	|.....
36	0.5878	-1.3344	||||||||.....	0.0235	|||.....	0.0263	|.....
37	1.9169	-1.4330	|||||||||.....	0.0317	||||.....	0.0307	|.....
38	0.3365	-0.1037	|.....	0.0002	|.....	0.0288	|.....
39	-0.4005	-0.9563	||||||.....	0.0203	|||.....	0.0425	||.....
40	-0.0619	0.6690	||||.....	0.0082	|.....	0.0350	|.....
41	-1.7148	-0.3010	|.....	0.0046	|.....	0.0898	|||||||.....
42	-1.5606	-0.5329	|||.....	0.0131	||.....	0.0827	||||||.....
43	-0.6162	-1.0011	||||||.....	0.0254	||||.....	0.0482	|||.....
44	-2.6173	0.2866	|.....	0.0068	|.....	0.1394	|||||||||||||
45	-2.5639	-0.7462	|||||.....	0.0444	||||||.....	0.1361	||||||||||||.
46	2.1282	0.4024	||.....	0.0029	|.....	0.0342	|.....
47	0.6931	1.7751	||||||||||||..	0.0391	|||||.....	0.0255	|.....
48	0.0953	1.6636	|||||||||||...	0.0441	||||||.....	0.0323	|.....
49	3.6687	-0.2740	|.....	0.0035	|.....	0.0826	||||||.....
50	3.5467	-0.9919	||||||.....	0.0412	|||||.....	0.0772	|||||.....
51	1.7047	1.1000	||||||.....	0.0173	||.....	0.0280	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Inverse Prediction of X Means

Row	lnInvert (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	3.0057	1.7918	2.7260	-0.9342	2.1416	3.6187
12	2.4849	3.8480	1.8531	1.9949	1.3537	2.4997
13	2.2050	0.1823	1.3839	-1.2016	0.8897	1.9387
14	2.7912	3.6788	2.3664	1.3124	1.8260	3.1487
15	2.4069	1.4110	1.7224	-0.3114	1.2280	2.3399
16	0.4762	-0.3425	-1.5135	1.1711	-2.7153	-0.7863
17	0.8587	1.6292	-0.8726	2.5018	-1.8503	-0.2510
18	0.4187	-1.0498	-1.6100	0.5601	-2.8467	-0.8656
19	0.6780	1.2809	-1.1753	2.4563	-2.2569	-0.5059
20	1.5041	0.9555	0.2092	0.7463	-0.4492	0.7112
21	0.2776	-0.4155	-1.8464	1.4309	-3.1699	-1.0590
22	3.5439	3.8199	3.6280	0.1919	2.9004	4.8305
23	2.1713	1.5041	1.3275	0.1765	0.8314	1.8738
24	3.1987	1.7579	3.0494	-1.2916	2.4180	4.0489
25	3.2581	1.9169	3.1490	-1.2321	2.5020	4.1825
26	3.9853	2.2192	4.3678	-2.1486	3.5030	5.8442
27	4.1320	2.0015	4.6137	-2.6122	3.7009	6.1834
28	3.4689	2.3795	3.5023	-1.1227	2.7966	4.6596
29	3.9140	1.2809	4.2484	-2.9674	3.4065	5.6798
30	3.2809	2.8959	3.1873	-0.2913	2.5341	4.2339
31	2.7850	3.7589	2.3561	1.4028	1.8168	3.1354
32	2.1342	0.6419	1.2652	-0.6234	0.7662	1.8029
33	3.3742	1.3863	3.3436	-1.9573	2.6648	4.4447
34	1.6715	-0.7765	0.4897	-1.2663	-0.1072	0.9821
35	0.8198	0.4055	-0.9377	1.3432	-1.9375	-0.3062
36	0.5188	0.5878	-1.4422	2.0300	-2.6183	-0.7275
37	1.2296	1.9169	-0.2508	2.1677	-1.0322	0.2892
38	1.4839	0.3365	0.1753	0.1612	-0.4913	0.6792
39	0.2700	-0.4005	-1.8592	1.4587	-3.1873	-1.0693
40	1.9573	-0.0619	0.9688	-1.0306	0.4459	1.4755
41	0.0862	-1.7148	-2.1673	0.4525	-3.6105	-1.3194
42	-0.0305	-1.5606	-2.3628	0.8021	-3.8798	-1.4771
43	0.1044	-0.6162	-2.1368	1.5206	-3.5685	-1.2947
44	0.0677	-2.6173	-2.1983	-0.4190	-3.6532	-1.3445
45	-0.7985	-2.5639	-3.6501	1.0861	-5.6652	-2.5041
46	3.0204	2.1282	2.7507	-0.6224	2.1629	3.6513
47	3.3776	0.6931	3.3493	-2.6561	2.6696	4.4524
48	2.9232	0.0953	2.5876	-2.4923	2.0214	3.4367
49	3.3214	3.6687	3.2552	0.4135	2.5911	4.3254
50	2.6101	3.5467	2.0629	1.4839	1.5505	2.7612
51	3.4012	1.7047	3.3889	-1.6841	2.7025	4.5059

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnSoil

Inverse Prediction of X Individuals

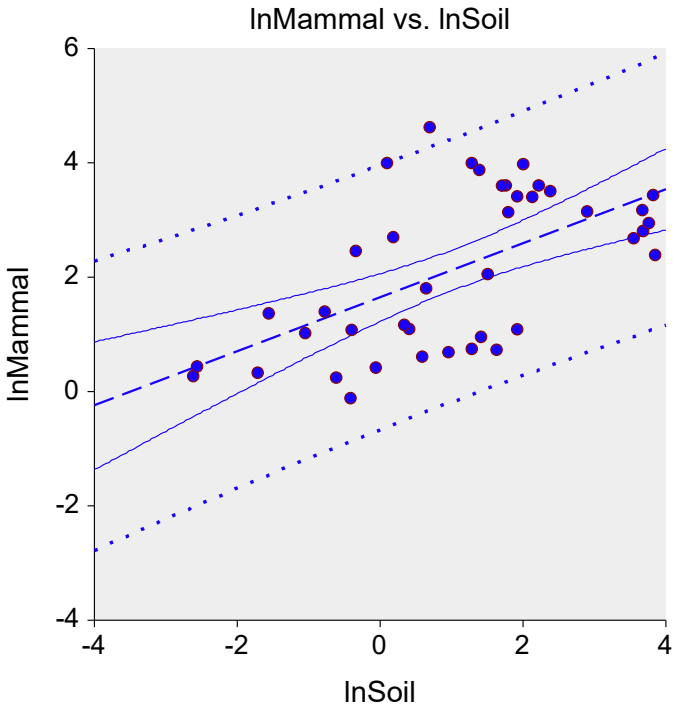
Row	lnInvert (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	3.0057	1.7918	2.7260	-0.9342	-0.4933	6.2536
12	2.4849	3.8480	1.8531	1.9949	-1.4145	5.2678
13	2.2050	0.1823	1.3839	-1.2016	-1.9190	4.7473
14	2.7912	3.6788	2.3664	1.3124	-0.8700	5.8448
15	2.4069	1.4110	1.7224	-0.3114	-1.5543	5.1222
16	0.4762	-0.3425	-1.5135	1.1711	-5.1809	1.6792
17	0.8587	1.6292	-0.8726	2.5018	-4.4380	2.3367
18	0.4187	-1.0498	-1.6100	0.5601	-5.2936	1.5813
19	0.6780	1.2809	-1.1753	2.4563	-4.7874	2.0247
20	1.5041	0.9555	0.2092	0.7463	-3.2114	3.4733
21	0.2776	-0.4155	-1.8464	1.4309	-5.5711	1.3423
22	3.5439	3.8199	3.6280	0.1919	0.4352	7.2956
23	2.1713	1.5041	1.3275	0.1765	-1.9801	4.6852
24	3.1987	1.7579	3.0494	-1.2916	-0.1577	6.6246
25	3.2581	1.9169	3.1490	-1.2321	-0.0549	6.7394
26	3.9853	2.2192	4.3678	-2.1486	1.1800	8.1672
27	4.1320	2.0015	4.6137	-2.6122	1.4242	8.4600
28	3.4689	2.3795	3.5023	-1.1227	0.3072	7.1490
29	3.9140	1.2809	4.2484	-2.9674	1.0608	8.0255
30	3.2809	2.8959	3.1873	-0.2913	-0.0156	6.7836
31	2.7850	3.7589	2.3561	1.4028	-0.8809	5.8331
32	2.1342	0.6419	1.2652	-0.6234	-2.0477	4.6167
33	3.3742	1.3863	3.3436	-1.9573	0.1449	6.9646
34	1.6715	-0.7765	0.4897	-1.2663	-2.8989	3.7738
35	0.8198	0.4055	-0.9377	1.3432	-4.5130	2.2693
36	0.5188	0.5878	-1.4422	2.0300	-5.0976	1.7518
37	1.2296	1.9169	-0.2508	2.1677	-3.7288	2.9858
38	1.4839	0.3365	0.1753	0.1612	-3.2493	3.4372
39	0.2700	-0.4005	-1.8592	1.4587	-5.5861	1.3294
40	1.9573	-0.0619	0.9688	-1.0306	-2.3710	4.2923
41	0.0862	-1.7148	-2.1673	0.4525	-5.9502	1.0203
42	-0.0305	-1.5606	-2.3628	0.8021	-6.1825	0.8255
43	0.1044	-0.6162	-2.1368	1.5206	-5.9141	1.0508
44	0.0677	-2.6173	-2.1983	-0.4190	-5.9870	0.9893
45	-0.7985	-2.5639	-3.6501	1.0861	-7.7361	-0.4332
46	3.0204	2.1282	2.7507	-0.6224	-0.4676	6.2818
47	3.3776	0.6931	3.3493	-2.6561	0.1508	6.9712
48	2.9232	0.0953	2.5876	-2.4923	-0.6378	6.0959
49	3.3214	3.6687	3.2552	0.4135	0.0543	6.8621
50	2.6101	3.5467	2.0629	1.4839	-1.1910	5.5027
51	3.4012	1.7047	3.3889	-1.6841	0.1913	7.0171

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnMammal	Rows Processed	58
Independent Variable	lnSoil	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.6437	Rows Prediction Only	0
Slope	0.4734	Sum of Frequencies	41
R-Squared	0.3482	Sum of Weights	41.0000
Correlation	0.5901	Coefficient of Variation	0.5241
Mean Square Error	1.262028	Square Root of MSE	1.1234

Linear Regression Report

Y = lnMammal X = lnSoil

Summary Statement

The equation of the straight line relating lnMammal and lnSoil is estimated as: lnMammal = (1.6437) + (0.4734) lnSoil using the 41 observations in this dataset. The y-intercept, the estimated value of lnMammal when lnSoil is zero, is 1.6437 with a standard error of 0.2068. The slope, the estimated change in lnMammal per unit change in lnSoil, is 0.4734 with a standard error of 0.1037. The value of R-Squared, the proportion of the variation in lnMammal that can be accounted for by variation in lnSoil, is 0.3482. The correlation between lnMammal and lnSoil is 0.5901.

A significance test that the slope is zero resulted in a t-value of 4.5645. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.4734. The lower limit of the 95% confidence interval for the slope is 0.2636 and the upper limit is 0.6831. The estimated intercept is 1.6437. The lower limit of the 95% confidence interval for the intercept is 1.2253 and the upper limit is 2.0620.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnMammal	lnSoil
Count	41	41
Mean	2.1436	1.0562
Standard Deviation	1.3740	1.7128
Minimum	-0.1165	-2.6173
Maximum	4.6240	3.8480

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.6437	0.4734
Lower 95% Confidence Limit	1.2253	0.2636
Upper 95% Confidence Limit	2.0620	0.6831
Standard Error	0.2068	0.1037
Standardized Coefficient	0.0000	0.5901
T Value	7.9470	4.5645
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	0.9936
Regression of Y on X	1.6437	0.4734
Inverse Regression from X on Y	0.7078	1.3594
Orthogonal Regression of Y and X	1.4128	0.6920

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.64367805589492) + (0.473354536224307) * (lnSoil)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.6437	0.9000	1.3238	1.9539
Bootstrap Mean	1.6426	0.9500	1.2651	2.0107
Bias (BM - OV)	-0.0010	0.9900	1.1080	2.1046
Bias Corrected	1.6447			
Standard Error	0.1897			
Slope				
Original Value	0.4734	0.9000	0.3621	0.5743
Bootstrap Mean	0.4775	0.9500	0.3347	0.5935
Bias (BM - OV)	0.0041	0.9900	0.2701	0.6324
Bias Corrected	0.4692			
Standard Error	0.0649			
Correlation				
Original Value	0.5901	0.9000	0.4628	0.7293
Bootstrap Mean	0.5932	0.9500	0.4395	0.7609
Bias (BM - OV)	0.0031	0.9900	0.4008	0.8250
Bias Corrected	0.5870			
Standard Error	0.0815			
R-Squared				
Original Value	0.3482	0.9000	0.1818	0.4931
Bootstrap Mean	0.3585	0.9500	0.1478	0.5206
Bias (BM - OV)	0.0103	0.9900	0.0891	0.5702
Bias Corrected	0.3379			
Standard Error	0.0946			
Standard Error of Estimate				
Original Value	1.1234	0.9000	0.9679	1.3267
Bootstrap Mean	1.0975	0.9500	0.9363	1.3612
Bias (BM - OV)	-0.0259	0.9900	0.8764	1.4417
Bias Corrected	1.1493			
Standard Error	0.1084			
Orthogonal Intercept				
Original Value	1.4128	0.9000	1.1029	1.8006
Bootstrap Mean	1.3867	0.9500	1.0394	1.9057
Bias (BM - OV)	-0.0260	0.9900	0.9219	2.2242
Bias Corrected	1.4388			
Standard Error	0.2239			
Orthogonal Slope				
Original Value	0.6920	0.9000	0.3992	0.8492
Bootstrap Mean	0.7186	0.9500	0.3071	0.8715
Bias (BM - OV)	0.0266	0.9900	0.0045	0.9200
Bias Corrected	0.6654			
Standard Error	0.1497			

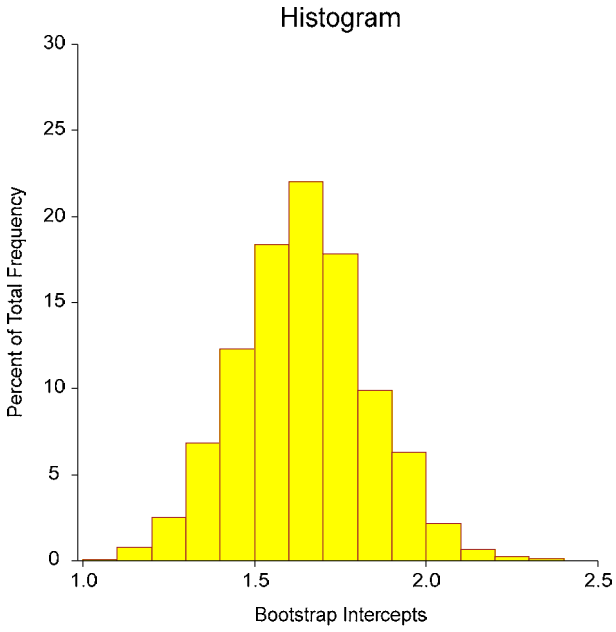
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

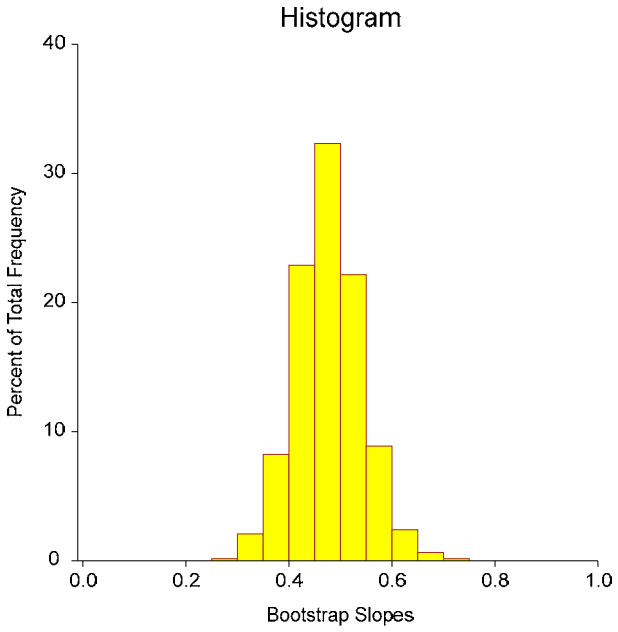
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

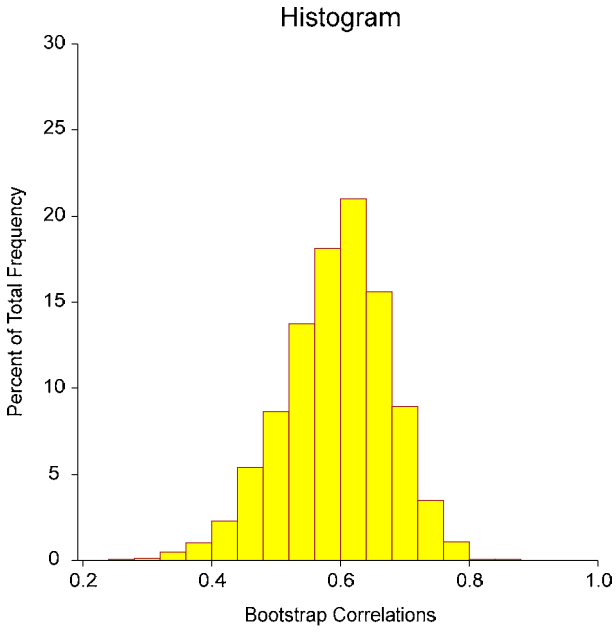
Linear Regression Report

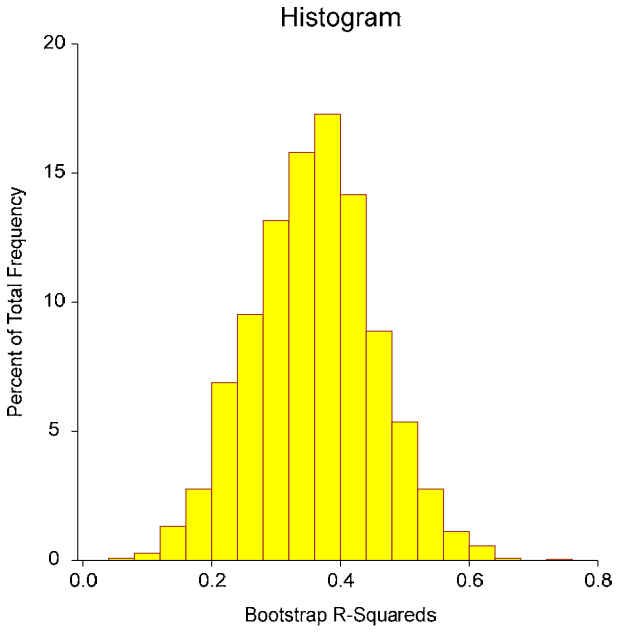
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Bootstrap Histograms Section



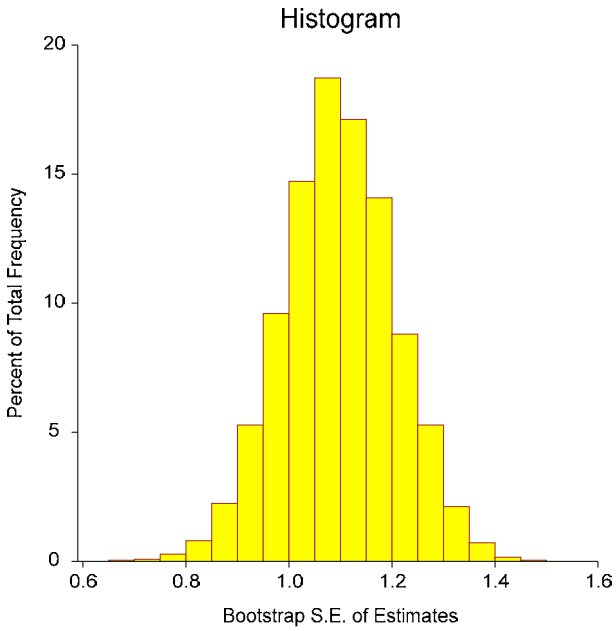


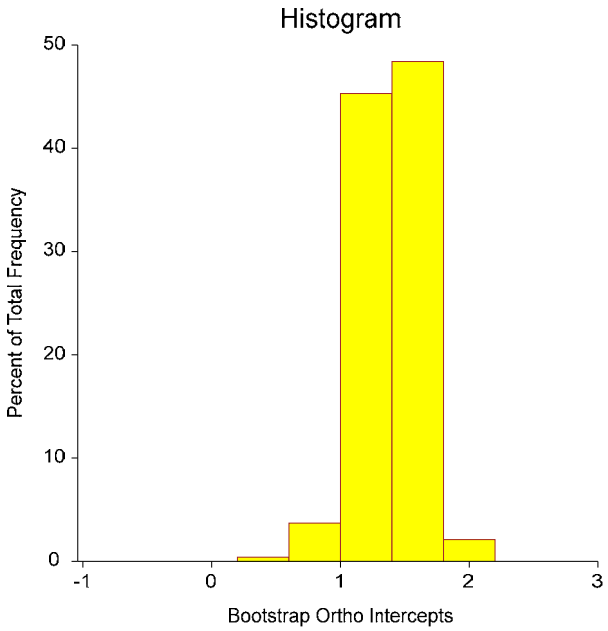


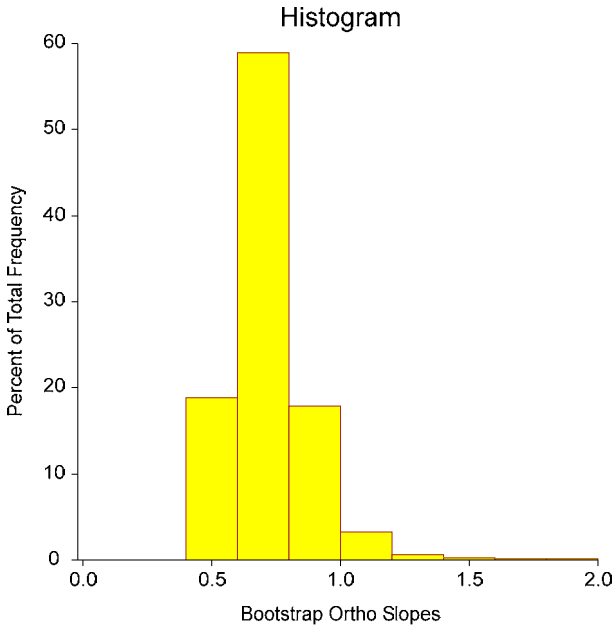


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.5901	0.3482	0.5719
Lower 95% Conf. Limit (r dist'n)	0.3409		
Upper 95% Conf. Limit (r dist'n)	0.7553		
Lower 95% Conf. Limit (Fisher's z)	0.3451		0.3206
Upper 95% Conf. Limit (Fisher's z)	0.7598		0.7479
Adjusted (Rbar)		0.3315	
T-Value for H0: Rho = 0	4.5645	4.5645	4.3532
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0001
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	188.4024	188.4024			
Slope	1	26.29345	26.29345	20.8343	0.0000	0.9936
Error	39	49.21909	1.262028			
Lack of Fit	37	41.23403	1.114433	0.2791	0.9622	
Pure Error	2	7.985058	3.992529			
Adj. Total	40	75.51254	1.887813			
Total	41	263.9149				

s = Square Root(1.262028) = 1.1234

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	43.30437	87.88912	0.03389676	-0.009000641
1	43.30437	163.0859	148.3759	-0.009000641	0.008521686
2 (Y'Y)			263.9149		
Determinant		4811.254			0.000207846

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.04277866	-0.01135906
1	-0.01135906	0.01075461

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9631	0.201044	Yes
Anderson Darling	0.4099	0.343615	Yes
D'Agostino Skewness	1.1736	0.240562	Yes
D'Agostino Kurtosis	-0.6192	0.535795	Yes
D'Agostino Omnibus	1.7607	0.414641	Yes
Constant Residual Variance?			
Modified Levene Test	0.1059	0.746581	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.2791	0.962177	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

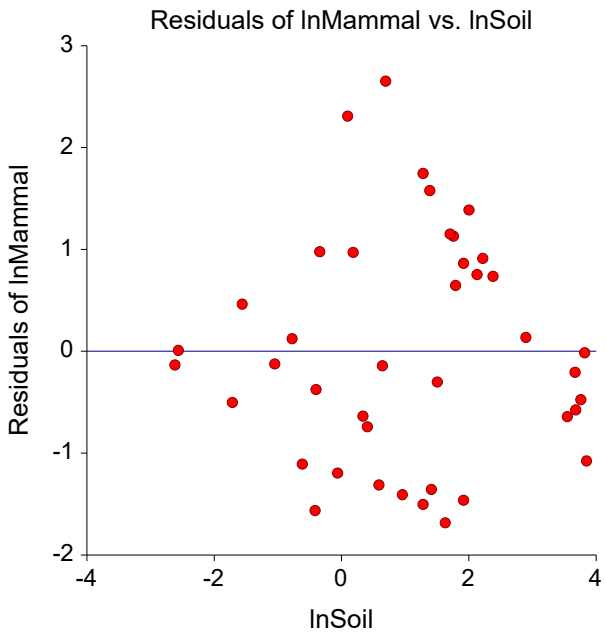
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

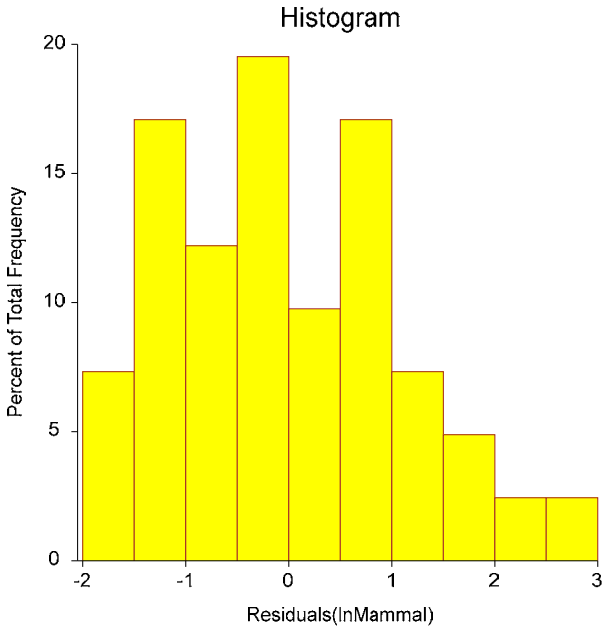
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

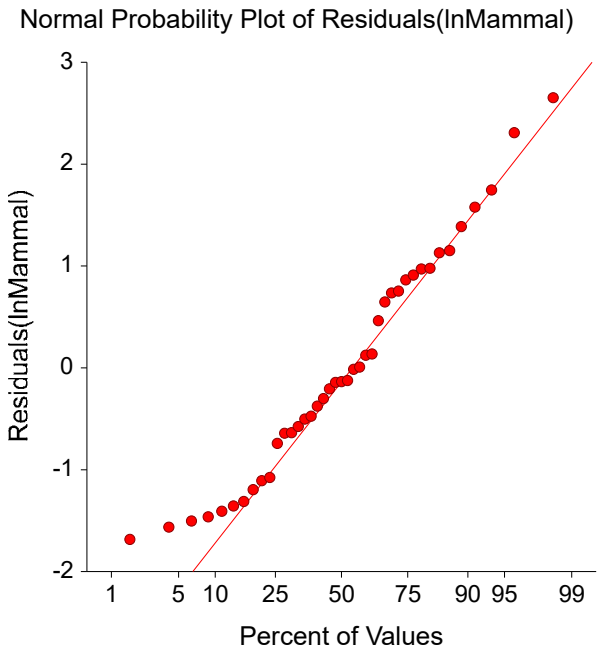
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Original Data Section

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual
11	1.7918	3.1384	2.4918	0.6466
12	3.8480	2.3888	3.4652	-1.0764
13	0.1823	2.7007	1.7300	0.9707
14	3.6788	2.8094	3.3851	-0.5757
15	1.4110	0.9555	2.3116	-1.3561
16	-0.3425	2.4592	1.4816	0.9776
17	1.6292	0.7308	2.4149	-1.6841
18	-1.0498	1.0225	1.1467	-0.1243
19	1.2809	0.7467	2.2500	-1.5033
20	0.9555	0.6881	2.0960	-1.4078
21	-0.4155	-0.1165	1.4470	-1.5635
22	3.8199	3.4372	3.4518	-0.0146
23	1.5041	2.0541	2.3556	-0.3015
24	1.7579	3.6055	2.4758	1.1297
25	1.9169	3.4144	2.5511	0.8634
26	2.2192	3.6055	2.6941	0.9113
27	2.0015	3.9782	2.5911	1.3872
28	2.3795	3.5056	2.7700	0.7355
29	1.2809	3.9964	2.2500	1.7464
30	2.8959	3.1506	3.0145	0.1361
31	3.7589	2.9481	3.4230	-0.4748
32	0.6419	1.8050	1.9475	-0.1425
33	1.3863	3.8774	2.2999	1.5775
34	-0.7765	1.3995	1.2761	0.1234
35	0.4055	1.0942	1.8356	-0.7414
36	0.5878	0.6098	1.9219	-1.3121
37	1.9169	1.0886	2.5511	-1.4625
38	0.3365	1.1663	1.8029	-0.6367
39	-0.4005	1.0784	1.4541	-0.3757
40	-0.0619	0.4187	1.6144	-1.1957
41	-1.7148	0.3293	0.8320	-0.5027
42	-1.5606	1.3678	0.9049	0.4629
43	-0.6162	0.2443	1.3520	-1.1078
44	-2.6173	0.2700	0.4048	-0.1347
45	-2.5639	0.4383	0.4300	0.0082
46	2.1282	3.4045	2.6511	0.7534
47	0.6931	4.6240	1.9718	2.6522
48	0.0953	3.9973	1.6888	2.3085
49	3.6687	3.1739	3.3803	-0.2064
50	3.5467	2.6810	3.3225	-0.6415
51	1.7047	3.6019	2.4506	1.1512

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Predicted Values and Confidence Limits of Means

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
11	1.7918	3.1384	2.4918	0.1913	2.1049	2.8788
12	3.8480	2.3888	3.4652	0.3385	2.7804	4.1499
13	0.1823	2.7007	1.7300	0.1975	1.3306	2.1294
14	3.6788	2.8094	3.3851	0.3237	2.7304	4.0397
15	1.4110	0.9555	2.3116	0.1793	1.9490	2.6742
16	-0.3425	2.4592	1.4816	0.2276	1.0211	1.9420
17	1.6292	0.7308	2.4149	0.1852	2.0402	2.7896
18	-1.0498	1.0225	1.1467	0.2801	0.5801	1.7134
19	1.2809	0.7467	2.2500	0.1770	1.8920	2.6080
20	0.9555	0.6881	2.0960	0.1758	1.7405	2.4515
21	-0.4155	-0.1165	1.4470	0.2325	0.9766	1.9174
22	3.8199	3.4372	3.4518	0.3360	2.7721	4.1316
23	1.5041	2.0541	2.3556	0.1815	1.9885	2.7227
24	1.7579	3.6055	2.4758	0.1899	2.0916	2.8600
25	1.9169	3.4144	2.5511	0.1968	2.1529	2.9492
26	2.2192	3.6055	2.6941	0.2129	2.2635	3.1248
27	2.0015	3.9782	2.5911	0.2010	2.1846	2.9976
28	2.3795	3.5056	2.7700	0.2227	2.3195	3.2206
29	1.2809	3.9964	2.2500	0.1770	1.8920	2.6080
30	2.8959	3.1506	3.0145	0.2592	2.4902	3.5387
31	3.7589	2.9481	3.4230	0.3307	2.7541	4.0918
32	0.6419	1.8050	1.9475	0.1806	1.5821	2.3129
33	1.3863	3.8774	2.2999	0.1788	1.9383	2.6615
34	-0.7765	1.3995	1.2761	0.2587	0.7529	1.7993
35	0.4055	1.0942	1.8356	0.1880	1.4554	2.2158
36	0.5878	0.6098	1.9219	0.1820	1.5537	2.2901
37	1.9169	1.0886	2.5511	0.1968	2.1529	2.9492
38	0.3365	1.1663	1.8029	0.1907	1.4173	2.1886
39	-0.4005	1.0784	1.4541	0.2315	0.9858	1.9224
40	-0.0619	0.4187	1.6144	0.2103	1.1890	2.0398
41	-1.7148	0.3293	0.8320	0.3367	0.1510	1.5130
42	-1.5606	1.3678	0.9049	0.3232	0.2513	1.5586
43	-0.6162	0.2443	1.3520	0.2467	0.8530	1.8510
44	-2.6173	0.2700	0.4048	0.4194	-0.4436	1.2531
45	-2.5639	0.4383	0.4300	0.4144	-0.4082	1.2682
46	2.1282	3.4045	2.6511	0.2077	2.2310	3.0712
47	0.6931	4.6240	1.9718	0.1794	1.6088	2.3347
48	0.0953	3.9973	1.6888	0.2018	1.2807	2.0969
49	3.6687	3.1739	3.3803	0.3228	2.7274	4.0331
50	3.5467	2.6810	3.3225	0.3122	2.6910	3.9541
51	1.7047	3.6019	2.4506	0.1879	2.0706	2.8307

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Predicted Values and Prediction Limits

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
11	1.7918	3.1384	2.4918	1.1396	0.1868	4.7968
12	3.8480	2.3888	3.4652	1.1733	1.0919	5.8384
13	0.1823	2.7007	1.7300	1.1406	-0.5771	4.0371
14	3.6788	2.8094	3.3851	1.1691	1.0204	5.7498
15	1.4110	0.9555	2.3116	1.1376	0.0105	4.6126
16	-0.3425	2.4592	1.4816	1.1462	-0.8369	3.8000
17	1.6292	0.7308	2.4149	1.1386	0.1119	4.7179
18	-1.0498	1.0225	1.1467	1.1578	-1.1951	3.4886
19	1.2809	0.7467	2.2500	1.1373	-0.0503	4.5503
20	0.9555	0.6881	2.0960	1.1371	-0.2040	4.3959
21	-0.4155	-0.1165	1.4470	1.1472	-0.8735	3.7675
22	3.8199	3.4372	3.4518	1.1726	1.0801	5.8236
23	1.5041	2.0541	2.3556	1.1380	0.0539	4.6574
24	1.7579	3.6055	2.4758	1.1393	0.1712	4.7803
25	1.9169	3.4144	2.5511	1.1405	0.2442	4.8580
26	2.2192	3.6055	2.6941	1.1434	0.3814	5.0069
27	2.0015	3.9782	2.5911	1.1412	0.2827	4.8995
28	2.3795	3.5056	2.7700	1.1453	0.4535	5.0866
29	1.2809	3.9964	2.2500	1.1373	-0.0503	4.5503
30	2.8959	3.1506	3.0145	1.1529	0.6825	5.3465
31	3.7589	2.9481	3.4230	1.1711	1.0543	5.7916
32	0.6419	1.8050	1.9475	1.1378	-0.3540	4.2490
33	1.3863	3.8774	2.2999	1.1375	-0.0010	4.6008
34	-0.7765	1.3995	1.2761	1.1528	-1.0556	3.6078
35	0.4055	1.0942	1.8356	1.1390	-0.4683	4.1395
36	0.5878	0.6098	1.9219	1.1381	-0.3800	4.2238
37	1.9169	1.0886	2.5511	1.1405	0.2442	4.8580
38	0.3365	1.1663	1.8029	1.1395	-0.5018	4.1077
39	-0.4005	1.0784	1.4541	1.1470	-0.8659	3.7742
40	-0.0619	0.4187	1.6144	1.1429	-0.6974	3.9262
41	-1.7148	0.3293	0.8320	1.1728	-1.5402	3.2041
42	-1.5606	1.3678	0.9049	1.1690	-1.4595	3.2694
43	-0.6162	0.2443	1.3520	1.1502	-0.9744	3.6784
44	-2.6173	0.2700	0.4048	1.1991	-2.0207	2.8303
45	-2.5639	0.4383	0.4300	1.1974	-1.9919	2.8520
46	2.1282	3.4045	2.6511	1.1424	0.3403	4.9619
47	0.6931	4.6240	1.9718	1.1376	-0.3293	4.2729
48	0.0953	3.9973	1.6888	1.1414	-0.6199	3.9974
49	3.6687	3.1739	3.3803	1.1688	1.0160	5.7445
50	3.5467	2.6810	3.3225	1.1660	0.9641	5.6810
51	1.7047	3.6019	2.4506	1.1390	0.1468	4.7545

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Working-Hotelling Simultaneous Confidence Band

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
11	1.7918	3.1384	2.4918	0.1913	1.9466	3.0370
12	3.8480	2.3888	3.4652	0.3385	2.5004	4.4299
13	0.1823	2.7007	1.7300	0.1975	1.1672	2.2927
14	3.6788	2.8094	3.3851	0.3237	2.4627	4.3074
15	1.4110	0.9555	2.3116	0.1793	1.8007	2.8224
16	-0.3425	2.4592	1.4816	0.2276	0.8328	2.1303
17	1.6292	0.7308	2.4149	0.1852	1.8870	2.9428
18	-1.0498	1.0225	1.1467	0.2801	0.3484	1.9451
19	1.2809	0.7467	2.2500	0.1770	1.7456	2.7544
20	0.9555	0.6881	2.0960	0.1758	1.5951	2.5969
21	-0.4155	-0.1165	1.4470	0.2325	0.7843	2.1097
22	3.8199	3.4372	3.4518	0.3360	2.4942	4.4095
23	1.5041	2.0541	2.3556	0.1815	1.8384	2.8729
24	1.7579	3.6055	2.4758	0.1899	1.9345	3.0171
25	1.9169	3.4144	2.5511	0.1968	1.9901	3.1120
26	2.2192	3.6055	2.6941	0.2129	2.0874	3.3009
27	2.0015	3.9782	2.5911	0.2010	2.0183	3.1638
28	2.3795	3.5056	2.7700	0.2227	2.1353	3.4048
29	1.2809	3.9964	2.2500	0.1770	1.7456	2.7544
30	2.8959	3.1506	3.0145	0.2592	2.2758	3.7531
31	3.7589	2.9481	3.4230	0.3307	2.4806	4.3653
32	0.6419	1.8050	1.9475	0.1806	1.4327	2.4623
33	1.3863	3.8774	2.2999	0.1788	1.7905	2.8093
34	-0.7765	1.3995	1.2761	0.2587	0.5390	2.0133
35	0.4055	1.0942	1.8356	0.1880	1.2999	2.3713
36	0.5878	0.6098	1.9219	0.1820	1.4031	2.4407
37	1.9169	1.0886	2.5511	0.1968	1.9901	3.1120
38	0.3365	1.1663	1.8029	0.1907	1.2596	2.3463
39	-0.4005	1.0784	1.4541	0.2315	0.7943	2.1139
40	-0.0619	0.4187	1.6144	0.2103	1.0151	2.2137
41	-1.7148	0.3293	0.8320	0.3367	-0.1276	1.7915
42	-1.5606	1.3678	0.9049	0.3232	-0.0160	1.8259
43	-0.6162	0.2443	1.3520	0.2467	0.6489	2.0551
44	-2.6173	0.2700	0.4048	0.4194	-0.7905	1.6001
45	-2.5639	0.4383	0.4300	0.4144	-0.7510	1.6110
46	2.1282	3.4045	2.6511	0.2077	2.0592	3.2430
47	0.6931	4.6240	1.9718	0.1794	1.4604	2.4832
48	0.0953	3.9973	1.6888	0.2018	1.1138	2.2638
49	3.6687	3.1739	3.3803	0.3228	2.4604	4.3001
50	3.5467	2.6810	3.3225	0.3122	2.4327	4.2124
51	1.7047	3.6019	2.4506	0.1879	1.9152	2.9861

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Section

Row	lnSoil (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
11	1.7918	3.1384	2.4918	0.6466	0.5841	20.6021
12	3.8480	2.3888	3.4652	-1.0764	-1.0049	45.0606
13	0.1823	2.7007	1.7300	0.9707	0.8777	35.9430
14	3.6788	2.8094	3.3851	-0.5757	-0.5351	20.4907
15	1.4110	0.9555	2.3116	-1.3561	-1.2228	141.9202
16	-0.3425	2.4592	1.4816	0.9776	0.8887	39.7535
17	1.6292	0.7308	2.4149	-1.6841	-1.5199	230.4605
18	-1.0498	1.0225	1.1467	-0.1243	-0.1142	12.1560
19	1.2809	0.7467	2.2500	-1.5033	-1.3551	201.3326
20	0.9555	0.6881	2.0960	-1.4078	-1.2688	204.5877
21	-0.4155	-0.1165	1.4470	-1.5635	-1.4226	1341.6927
22	3.8199	3.4372	3.4518	-0.0146	-0.0137	0.4260
23	1.5041	2.0541	2.3556	-0.3015	-0.2720	14.6786
24	1.7579	3.6055	2.4758	1.1297	1.0203	31.3335
25	1.9169	3.4144	2.5511	0.8634	0.7806	25.2861
26	2.2192	3.6055	2.6941	0.9113	0.8262	25.2767
27	2.0015	3.9782	2.5911	1.3872	1.2550	34.8686
28	2.3795	3.5056	2.7700	0.7355	0.6680	20.9813
29	1.2809	3.9964	2.2500	1.7464	1.5742	43.6985
30	2.8959	3.1506	3.0145	0.1361	0.1245	4.3206
31	3.7589	2.9481	3.4230	-0.4748	-0.4423	16.1066
32	0.6419	1.8050	1.9475	-0.1425	-0.1285	7.8946
33	1.3863	3.8774	2.2999	1.5775	1.4224	40.6853
34	-0.7765	1.3995	1.2761	0.1234	0.1129	8.8197
35	0.4055	1.0942	1.8356	-0.7414	-0.6694	67.7643
36	0.5878	0.6098	1.9219	-1.3121	-1.1837	215.1883
37	1.9169	1.0886	2.5511	-1.4625	-1.3223	134.3516
38	0.3365	1.1663	1.8029	-0.6367	-0.5751	54.5909
39	-0.4005	1.0784	1.4541	-0.3757	-0.3418	34.8384
40	-0.0619	0.4187	1.6144	-1.1957	-1.0835	285.5623
41	-1.7148	0.3293	0.8320	-0.5027	-0.4690	152.6453
42	-1.5606	1.3678	0.9049	0.4629	0.4302	33.8394
43	-0.6162	0.2443	1.3520	-1.1078	-1.0107	453.5270
44	-2.6173	0.2700	0.4048	-0.1347	-0.1293	49.8995
45	-2.5639	0.4383	0.4300	0.0082	0.0079	1.8789
46	2.1282	3.4045	2.6511	0.7534	0.6824	22.1305
47	0.6931	4.6240	1.9718	2.6522	2.3916	57.3576
48	0.0953	3.9973	1.6888	2.3085	2.0889	57.7515
49	3.6687	3.1739	3.3803	-0.2064	-0.1918	6.5026
50	3.5467	2.6810	3.3225	-0.6415	-0.5945	23.9283
51	1.7047	3.6019	2.4506	1.1512	1.0394	31.9623

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Residual Diagnostics Section

Row	lnSoil (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
11	1.7918	0.6466	0.5791	0.0290	0.0051	1.2839
12	3.8480	-1.0764	-1.0050	0.0908	0.0504	1.2617
13	0.1823	0.9707	0.8751	0.0309	0.0123	1.2697
14	3.6788	-0.5757	-0.5302	0.0830	0.0130	1.2857
15	1.4110	-1.3561	-1.2308	0.0255	0.0195	1.2456
16	-0.3425	0.9776	0.8862	0.0411	0.0169	1.2690
17	1.6292	-1.6841	-1.5468	0.0272	0.0323	1.2185
18	-1.0498	-0.1243	-0.1128	0.0622	0.0004	1.2948
19	1.2809	-1.5033	-1.3703	0.0248	0.0234	1.2343
20	0.9555	-1.4078	-1.2791	0.0245	0.0202	1.2418
21	-0.4155	-1.5635	-1.4422	0.0428	0.0453	1.2280
22	3.8199	-0.0146	-0.0135	0.0895	0.0000	1.2952
23	1.5041	-0.3015	-0.2687	0.0261	0.0010	1.2928
24	1.7579	1.1297	1.0209	0.0286	0.0153	1.2607
25	1.9169	0.8634	0.7766	0.0307	0.0097	1.2750
26	2.2192	0.9113	0.8228	0.0359	0.0127	1.2726
27	2.0015	1.3872	1.2646	0.0320	0.0260	1.2429
28	2.3795	0.7355	0.6632	0.0393	0.0091	1.2804
29	1.2809	1.7464	1.6057	0.0248	0.0315	1.2129
30	2.8959	0.1361	0.1230	0.0532	0.0004	1.2947
31	3.7589	-0.4748	-0.4377	0.0866	0.0093	1.2887
32	0.6419	-0.1425	-0.1269	0.0259	0.0002	1.2947
33	1.3863	1.5775	1.4419	0.0253	0.0263	1.2280
34	-0.7765	0.1234	0.1115	0.0530	0.0004	1.2948
35	0.4055	-0.7414	-0.6646	0.0280	0.0065	1.2804
36	0.5878	-1.3121	-1.1900	0.0263	0.0189	1.2487
37	1.9169	-1.4625	-1.3355	0.0307	0.0277	1.2372
38	0.3365	-0.6367	-0.5701	0.0288	0.0049	1.2843
39	-0.4005	-0.3757	-0.3379	0.0425	0.0026	1.2914
40	-0.0619	-1.1957	-1.0860	0.0350	0.0213	1.2563
41	-1.7148	-0.5027	-0.4643	0.0898	0.0109	1.2879
42	-1.5606	0.4629	0.4257	0.0827	0.0083	1.2891
43	-0.6162	-1.1078	-1.0110	0.0482	0.0259	1.2613
44	-2.6173	-0.1347	*-0.1276	0.1394	0.0014	1.2947
45	-2.5639	0.0082	*0.0078	0.1361	0.0000	1.2952
46	2.1282	0.7534	0.6777	0.0342	0.0082	1.2798
47	0.6931	2.6522	*2.5555	0.0255	0.0749	1.1053
48	0.0953	2.3085	*2.1880	0.0323	0.0727	1.1503
49	3.6687	-0.2064	-0.1894	0.0826	0.0017	1.2940
50	3.5467	-0.6415	-0.5895	0.0772	0.0148	1.2835
51	1.7047	1.1512	1.0405	0.0280	0.0155	1.2594

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
11	0.5791	0.1001	0.0051	1.0659	0.0567	0.0399
12	-1.0050	-0.3176	0.0504	1.0993	0.0042	-0.2716
13	0.8751	0.1563	0.0123	1.0444	0.1557	-0.0717
14	-0.5302	-0.1595	0.0130	1.1319	-0.0024	-0.1340
15	-1.2308	-0.1990	0.0195	0.9996	-0.1435	-0.0408
16	0.8862	0.1834	0.0169	1.0544	0.1818	-0.1168
17	-1.5468	-0.2586	0.0323	0.9583	-0.1638	-0.0830
18	-0.1128	-0.0290	0.0004	1.1224	-0.0274	0.0226
19	-1.3703	-0.2186	0.0234	0.9808	-0.1686	-0.0288
20	-1.2791	-0.2026	0.0202	0.9924	-0.1779	0.0120
21	-1.4422	-0.3051	0.0453	0.9892	-0.3013	0.2003
22	-0.0135	-0.0042	0.0000	* 1.1568	0.0000	-0.0036
23	-0.2687	-0.0440	0.0010	1.0775	-0.0301	-0.0113
24	1.0209	0.1751	0.0153	1.0272	0.1017	0.0671
25	0.7766	0.1382	0.0097	1.0530	0.0713	0.0627
26	0.8228	0.1588	0.0127	1.0547	0.0634	0.0900
27	1.2646	0.2300	0.0260	1.0020	0.1109	0.1122
28	0.6632	0.1342	0.0091	1.0715	0.0459	0.0827
29	1.6057	0.2562	0.0315	0.9472	0.1975	0.0337
30	0.1230	0.0292	0.0004	1.1117	0.0054	0.0215
31	-0.4377	-0.1348	0.0093	1.1417	-0.0002	-0.1143
32	-0.1269	-0.0207	0.0002	1.0804	-0.0196	0.0049
33	1.4419	0.2324	0.0263	0.9715	0.1699	0.0445
34	0.1115	0.0264	0.0004	1.1116	0.0254	-0.0194
35	-0.6646	-0.1128	0.0065	1.0589	-0.1108	0.0405
36	-1.1900	-0.1954	0.0189	1.0054	-0.1874	0.0521
37	-1.3355	-0.2377	0.0277	0.9914	-0.1226	-0.1078
38	-0.5701	-0.0982	0.0049	1.0662	-0.0970	0.0384
39	-0.3379	-0.0712	0.0026	1.0935	-0.0703	0.0464
40	-1.0860	-0.2070	0.0213	1.0268	-0.2069	0.1141
41	-0.4643	-0.1458	0.0109	1.1443	-0.1304	0.1245
42	0.4257	0.1278	0.0083	1.1375	0.1157	-0.1074
43	-1.0110	-0.2276	0.0259	1.0495	-0.2220	0.1600
44	-0.1276	-0.0514	0.0014	* 1.2229	-0.0429	0.0467
45	0.0078	0.0031	0.0000	* 1.2192	0.0026	-0.0028
46	0.6777	0.1275	0.0082	1.0647	0.0552	0.0682
47	* 2.5555	0.4135	0.0749	0.7871	0.3889	-0.0868
48	* 2.1880	0.3995	0.0727	0.8585	0.3991	-0.1973
49	-0.1894	-0.0568	0.0017	1.1459	-0.0009	-0.0477
50	-0.5895	-0.1706	0.0148	1.1209	-0.0066	-0.1411
51	1.0405	0.1765	0.0155	1.0244	0.1064	0.0632

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Outlier Detection Chart

Row	lnSoil (X)	Residual		Standardized Residual		RStudent	
11	1.7918	0.6466	|||.....	0.5841	|||.....	0.5791	|||.....
12	3.8480	-1.0764	|||||.....	-1.0049	|||||.....	-1.0050	|||||.....
13	0.1823	0.9707	|||||.....	0.8777	|||||.....	0.8751	|||||.....
14	3.6788	-0.5757	|||.....	-0.5351	|||.....	-0.5302	|||.....
15	1.4110	-1.3561	|||||||.....	-1.2228	|||||||.....	-1.2308	|||||||.....
16	-0.3425	0.9776	|||||.....	0.8887	|||||.....	0.8862	|||||.....
17	1.6292	-1.6841	||||||||.....	-1.5199	||||||||.....	-1.5468	||||||||.....
18	-1.0498	-0.1243	|.....	-0.1142	|.....	-0.1128	|.....
19	1.2809	-1.5033	|||||||.....	-1.3551	|||||||.....	-1.3703	|||||||.....
20	0.9555	-1.4078	||||||.....	-1.2688	||||||.....	-1.2791	||||||.....
21	-0.4155	-1.5635	|||||||.....	-1.4226	|||||||.....	-1.4422	|||||||.....
22	3.8199	-0.0146	|.....	-0.0137	|.....	-0.0135	|.....
23	1.5041	-0.3015	|.....	-0.2720	|.....	-0.2687	|.....
24	1.7579	1.1297	|||||.....	1.0203	|||||.....	1.0209	|||||.....
25	1.9169	0.8634	||||.....	0.7806	||||.....	0.7766	||||.....
26	2.2192	0.9113	|||||.....	0.8262	|||||.....	0.8228	||||.....
27	2.0015	1.3872	||||||.....	1.2550	||||||.....	1.2646	||||||.....
28	2.3795	0.7355	||||.....	0.6680	||||.....	0.6632	|||.....
29	1.2809	1.7464	||||||||.....	1.5742	||||||||.....	1.6057	||||||||.....
30	2.8959	0.1361	|.....	0.1245	|.....	0.1230	|.....
31	3.7589	-0.4748	||.....	-0.4423	||.....	-0.4377	||.....
32	0.6419	-0.1425	|.....	-0.1285	|.....	-0.1269	|.....
33	1.3863	1.5775	|||||||.....	1.4224	|||||||.....	1.4419	|||||||.....
34	-0.7765	0.1234	|.....	0.1129	|.....	0.1115	|.....
35	0.4055	-0.7414	||||.....	-0.6694	||||.....	-0.6646	|||.....
36	0.5878	-1.3121	||||||.....	-1.1837	||||||.....	-1.1900	|||||.....
37	1.9169	-1.4625	|||||||.....	-1.3223	|||||||.....	-1.3355	|||||||.....
38	0.3365	-0.6367	|||.....	-0.5751	|||.....	-0.5701	|||.....
39	-0.4005	-0.3757	||.....	-0.3418	||.....	-0.3379	|.....
40	-0.0619	-1.1957	|||||.....	-1.0835	|||||.....	-1.0860	|||||.....
41	-1.7148	-0.5027	||.....	-0.4690	||.....	-0.4643	||.....
42	-1.5606	0.4629	||.....	0.4302	||.....	0.4257	||.....
43	-0.6162	-1.1078	|||||.....	-1.0107	|||||.....	-1.0110	|||||.....
44	-2.6173	-0.1347	|.....	-0.1293	|.....	-0.1276	|.....
45	-2.5639	0.0082	|.....	0.0079	|.....	0.0078	|.....
46	2.1282	0.7534	||||.....	0.6824	||||.....	0.6777	|||.....
47	0.6931	2.6522	||||||||||||||	2.3916	||||||||||||||	* 2.5555	||||||||||||||
48	0.0953	2.3085	||||||||||||..	2.0889	||||||||||||..	* 2.1880	||||||||||||...
49	3.6687	-0.2064	|.....	-0.1918	|.....	-0.1894	|.....
50	3.5467	-0.6415	|||.....	-0.5945	|||.....	-0.5895	|||.....
51	1.7047	1.1512	|||||.....	1.0394	|||||.....	1.0405	|||||.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Influence Detection Chart

Row	lnSoil (X)	DFFITS		Cook's D		DFBETAS(1)	
11	1.7918	0.1001	|||.....	0.0051	|.....	0.0399	||.....
12	3.8480	-0.3176	||||||||||....	0.0504	|||||||||.....	-0.2716	||||||||||||||
13	0.1823	0.1563	|||||.....	0.0123	||.....	-0.0717	|||.....
14	3.6788	-0.1595	|||||.....	0.0130	||.....	-0.1340	||||||.....
15	1.4110	-0.1990	||||||.....	0.0195	|||.....	-0.0408	||.....
16	-0.3425	0.1834	||||||.....	0.0169	|||.....	-0.1168	|||||.....
17	1.6292	-0.2586	||||||||.....	0.0323	|||||.....	-0.0830	||||.....
18	-1.0498	-0.0290	|.....	0.0004	|.....	0.0226	|.....
19	1.2809	-0.2186	||||||.....	0.0234	||||.....	-0.0288	|.....
20	0.9555	-0.2026	||||||.....	0.0202	||||.....	0.0120	|.....
21	-0.4155	-0.3051	||||||||||....	0.0453	||||||||.....	0.2003	||||||||||....
22	3.8199	-0.0042	|.....	0.0000	|.....	-0.0036	|.....
23	1.5041	-0.0440	|.....	0.0010	|.....	-0.0113	|.....
24	1.7579	0.1751	|||||.....	0.0153	|||.....	0.0671	|||.....
25	1.9169	0.1382	||||.....	0.0097	|.....	0.0627	|||.....
26	2.2192	0.1588	|||||.....	0.0127	||.....	0.0900	||||.....
27	2.0015	0.2300	|||||||.....	0.0260	||||.....	0.1122	|||||.....
28	2.3795	0.1342	||||.....	0.0091	|.....	0.0827	||||.....
29	1.2809	0.2562	||||||||.....	0.0315	|||||.....	0.0337	|.....
30	2.8959	0.0292	|.....	0.0004	|.....	0.0215	|.....
31	3.7589	-0.1348	||||.....	0.0093	|.....	-0.1143	|||||.....
32	0.6419	-0.0207	|.....	0.0002	|.....	0.0049	|.....
33	1.3863	0.2324	|||||||.....	0.0263	||||.....	0.0445	||.....
34	-0.7765	0.0264	|.....	0.0004	|.....	-0.0194	|.....
35	0.4055	-0.1128	||||.....	0.0065	|.....	0.0405	||.....
36	0.5878	-0.1954	||||||.....	0.0189	|||.....	0.0521	||.....
37	1.9169	-0.2377	|||||||.....	0.0277	||||.....	-0.1078	||||.....
38	0.3365	-0.0982	|||.....	0.0049	|.....	0.0384	|.....
39	-0.4005	-0.0712	||.....	0.0026	|.....	0.0464	||.....
40	-0.0619	-0.2070	||||||.....	0.0213	||||.....	0.1141	|||||.....
41	-1.7148	-0.1458	||||.....	0.0109	||.....	0.1245	|||||.....
42	-1.5606	0.1278	||||.....	0.0083	|.....	-0.1074	||||.....
43	-0.6162	-0.2276	|||||||.....	0.0259	||||.....	0.1600	|||||||.....
44	-2.6173	-0.0514	|.....	0.0014	|.....	0.0467	||.....
45	-2.5639	0.0031	|.....	0.0000	|.....	-0.0028	|.....
46	2.1282	0.1275	||||.....	0.0082	|.....	0.0682	|||.....
47	0.6931	0.4135	|||||||||||||	0.0749	|||||||||||||	-0.0868	||||.....
48	0.0953	0.3995	|||||||||||||.	0.0727	|||||||||||||.	-0.1973	|||||||||.....
49	3.6687	-0.0568	|.....	0.0017	|.....	-0.0477	||.....
50	3.5467	-0.1706	|||||.....	0.0148	||.....	-0.1411	||||||.....
51	1.7047	0.1765	|||||.....	0.0155	|||.....	0.0632	|||.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Outlier & Influence Chart

Row	lnSoil (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
11	1.7918	0.5791	|||.....	0.0051	|.....	0.0290	|.....
12	3.8480	-1.0050	|||||.....	0.0504	|||||||||.....	0.0908	|||||||.....
13	0.1823	0.8751	|||||.....	0.0123	||.....	0.0309	|.....
14	3.6788	-0.5302	|||.....	0.0130	||.....	0.0830	||||||.....
15	1.4110	-1.2308	||||||.....	0.0195	|||.....	0.0255	|.....
16	-0.3425	0.8862	|||||.....	0.0169	|||.....	0.0411	||.....
17	1.6292	-1.5468	|||||||||.....	0.0323	||||||.....	0.0272	|.....
18	-1.0498	-0.1128	|.....	0.0004	|.....	0.0622	||||.....
19	1.2809	-1.3703	|||||||.....	0.0234	||||.....	0.0248	|.....
20	0.9555	-1.2791	||||||.....	0.0202	||||.....	0.0245	|.....
21	-0.4155	-1.4422	|||||||.....	0.0453	|||||||||.....	0.0428	||.....
22	3.8199	-0.0135	|.....	0.0000	|.....	0.0895	|||||||.....
23	1.5041	-0.2687	|.....	0.0010	|.....	0.0261	|.....
24	1.7579	1.0209	|||||.....	0.0153	|||.....	0.0286	|.....
25	1.9169	0.7766	||||.....	0.0097	|.....	0.0307	|.....
26	2.2192	0.8228	||||.....	0.0127	||.....	0.0359	|.....
27	2.0015	1.2646	||||||.....	0.0260	|||||.....	0.0320	|.....
28	2.3795	0.6632	|||.....	0.0091	|.....	0.0393	|.....
29	1.2809	1.6057	|||||||||.....	0.0315	||||||.....	0.0248	|.....
30	2.8959	0.1230	|.....	0.0004	|.....	0.0532	|||.....
31	3.7589	-0.4377	||.....	0.0093	|.....	0.0866	|||||||.....
32	0.6419	-0.1269	|.....	0.0002	|.....	0.0259	|.....
33	1.3863	1.4419	|||||||.....	0.0263	|||||.....	0.0253	|.....
34	-0.7765	0.1115	|.....	0.0004	|.....	0.0530	|||.....
35	0.4055	-0.6646	|||.....	0.0065	|.....	0.0280	|.....
36	0.5878	-1.1900	||||||.....	0.0189	|||.....	0.0263	|.....
37	1.9169	-1.3355	|||||||.....	0.0277	|||||.....	0.0307	|.....
38	0.3365	-0.5701	|||.....	0.0049	|.....	0.0288	|.....
39	-0.4005	-0.3379	|.....	0.0026	|.....	0.0425	||.....
40	-0.0619	-1.0860	||||||.....	0.0213	||||.....	0.0350	|.....
41	-1.7148	-0.4643	||.....	0.0109	||.....	0.0898	|||||||.....
42	-1.5606	0.4257	||.....	0.0083	|.....	0.0827	||||||.....
43	-0.6162	-1.0110	|||||.....	0.0259	|||||.....	0.0482	|||.....
44	-2.6173	-0.1276	|.....	0.0014	|.....	0.1394	|||||||||||||
45	-2.5639	0.0078	|.....	0.0000	|.....	0.1361	||||||||||||.
46	2.1282	0.6777	|||.....	0.0082	|.....	0.0342	|.....
47	0.6931	* 2.5555	||||||||||||||	0.0749	||||||||||||||	0.0255	|.....
48	0.0953	* 2.1880	|||||||||||...	0.0727	|||||||||||||.	0.0323	|.....
49	3.6687	-0.1894	|.....	0.0017	|.....	0.0826	||||||.....
50	3.5467	-0.5895	|||.....	0.0148	||.....	0.0772	|||||.....
51	1.7047	1.0405	|||||.....	0.0155	|||.....	0.0280	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Inverse Prediction of X Means

Row	lnMammal (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
11	3.1384	1.7918	3.1577	-1.3659	2.2421	5.1003
12	2.3888	3.8480	1.5741	2.2740	0.8169	2.5843
13	2.7007	0.1823	2.2330	-2.0507	1.4621	3.5791
14	2.8094	3.6788	2.4627	1.2161	1.6658	3.9469
15	0.9555	1.4110	-1.4538	2.8648	-3.6843	-0.4500
16	2.4592	-0.3425	1.7228	-2.0653	0.9722	2.7992
17	0.7308	1.6292	-1.9286	3.5578	-4.5041	-0.8118
18	1.0225	-1.0498	-1.3124	0.2626	-3.4421	-0.3403
19	0.7467	1.2809	-1.8950	3.1759	-4.4458	-0.7865
20	0.6881	0.9555	-2.0187	2.9742	-4.6606	-0.8795
21	-0.1165	-0.4155	-3.7186	3.3031	-7.6479	-2.1228
22	3.4372	3.8199	3.7890	0.0309	2.7333	6.1802
23	2.0541	1.5041	0.8671	0.6370	-0.0219	1.6637
24	3.6055	1.7579	4.1445	-2.3866	3.0019	6.7964
25	3.4144	1.9169	3.7409	-1.8240	2.6966	6.0972
26	3.6055	2.2192	4.1445	-1.9253	3.0019	6.7964
27	3.9782	2.0015	4.9320	-2.9305	3.5841	8.1740
28	3.5056	2.3795	3.9334	-1.5538	2.8430	6.4299
29	3.9964	1.2809	4.9702	-3.6893	3.6120	8.2413
30	3.1506	2.8959	3.1835	-0.2876	2.2627	5.1439
31	2.9481	3.7589	2.7557	1.0031	1.9150	4.4271
32	1.8050	0.6419	0.3408	0.3010	-0.7587	1.0907
33	3.8774	1.3863	4.7190	-3.3327	3.4280	7.8001
34	1.3995	-0.7765	-0.5158	-0.2608	-2.1044	0.3046
35	1.0942	0.4055	-1.1609	1.5664	-3.1839	-0.2214
36	0.6098	0.5878	-2.1842	2.7720	-4.9489	-1.0032
37	1.0886	1.9169	-1.1727	3.0897	-3.2040	-0.2308
38	1.1663	0.3365	-1.0086	1.3450	-2.9258	-0.1004
39	1.0784	-0.4005	-1.1942	0.7937	-3.2405	-0.2477
40	0.4187	-0.0619	-2.5878	2.5260	-5.6548	-1.3018
41	0.3293	-1.7148	-2.7767	1.0619	-5.9863	-1.4403
42	1.3678	-1.5606	-0.5828	-0.9778	-2.2147	0.2480
43	0.2443	-0.6162	-2.9564	2.3402	-6.3023	-1.5715
44	0.2700	-2.6173	-2.9019	0.2847	-6.2065	-1.5318
45	0.4383	-2.5639	-2.5466	-0.0174	-5.5824	-1.2714
46	3.4045	2.1282	3.7199	-1.5917	2.6806	6.0611
47	4.6240	0.6931	6.2962	-5.6030	4.5686	10.5846
48	3.9973	0.0953	4.9722	-4.8769	3.6134	8.2447
49	3.1739	3.6687	3.2327	0.4360	2.3017	5.2273
50	2.6810	3.5467	2.1915	1.3553	1.4242	3.5135
51	3.6019	1.7047	4.1368	-2.4321	2.9962	6.7830

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnSoil

Inverse Prediction of X Individuals

Row	lnMammal (Y)	lnSoil (X)	Predicted lnSoil (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
11	3.1384	1.7918	3.1577	-1.3659	-1.8711	9.2135
12	2.3888	3.8480	1.5741	2.2740	-3.7267	7.1279
13	2.7007	0.1823	2.2330	-2.0507	-2.9379	7.9791
14	2.8094	3.6788	2.4627	1.2161	-2.6686	8.2814
15	0.9555	1.4110	-1.4538	2.8648	-7.6609	3.5266
16	2.4592	-0.3425	1.7228	-2.0653	-3.5466	7.3179
17	0.7308	1.6292	-1.9286	3.5578	-8.3222	3.0062
18	1.0225	-1.0498	-1.3124	0.2626	-7.4661	3.6838
19	0.7467	1.2809	-1.8950	3.1759	-8.2749	3.0427
20	0.6881	0.9555	-2.0187	2.9742	-8.4489	2.9088
21	-0.1165	-0.4155	-3.7186	3.3031	-10.9108	1.1401
22	3.4372	3.8199	3.7890	0.0309	-1.1686	10.0821
23	2.0541	1.5041	0.8671	0.6370	-4.5999	6.2417
24	3.6055	1.7579	4.1445	-2.3866	-0.7819	10.5802
25	3.4144	1.9169	3.7409	-1.8240	-1.2214	10.0152
26	3.6055	2.2192	4.1445	-1.9253	-0.7819	10.5802
27	3.9782	2.0015	4.9320	-2.9305	0.0531	11.7050
28	3.5056	2.3795	3.9334	-1.5538	-1.0108	10.2837
29	3.9964	1.2809	4.9702	-3.6893	0.0929	11.7604
30	3.1506	2.8959	3.1835	-0.2876	-1.8420	9.2486
31	2.9481	3.7589	2.7557	1.0031	-2.3292	8.6712
32	1.8050	0.6419	0.3408	0.3010	-5.2681	5.6001
33	3.8774	1.3863	4.7190	-3.3327	-0.1699	11.3979
34	1.3995	-0.7765	-0.5158	-0.2608	-6.3886	4.5888
35	1.0942	0.4055	-1.1609	1.5664	-7.2586	3.8533
36	0.6098	0.5878	-2.1842	2.7720	-8.6828	2.7307
37	1.0886	1.9169	-1.1727	3.0897	-7.2748	3.8400
38	1.1663	0.3365	-1.0086	1.3450	-7.0512	4.0250
39	1.0784	-0.4005	-1.1942	0.7937	-7.3041	3.8160
40	0.4187	-0.0619	-2.5878	2.5260	-9.2586	2.3020
41	0.3293	-1.7148	-2.7767	1.0619	-9.5307	2.1040
42	1.3678	-1.5606	-0.5828	-0.9778	-6.4780	4.5113
43	0.2443	-0.6162	-2.9564	2.3402	-9.7910	1.9171
44	0.2700	-2.6173	-2.9019	0.2847	-9.7119	1.9736
45	0.4383	-2.5639	-2.5466	-0.0174	-9.1993	2.3455
46	3.4045	2.1282	3.7199	-1.5917	-1.2445	9.9861
47	4.6240	0.6931	6.2962	-5.6030	1.4347	13.7185
48	3.9973	0.0953	4.9722	-4.8769	0.0950	11.7632
49	3.1739	3.6687	3.2327	0.4360	-1.7866	9.3156
50	2.6810	3.5467	2.1915	1.3553	-2.9869	7.9247
51	3.6019	1.7047	4.1368	-2.4321	-0.7902	10.5694

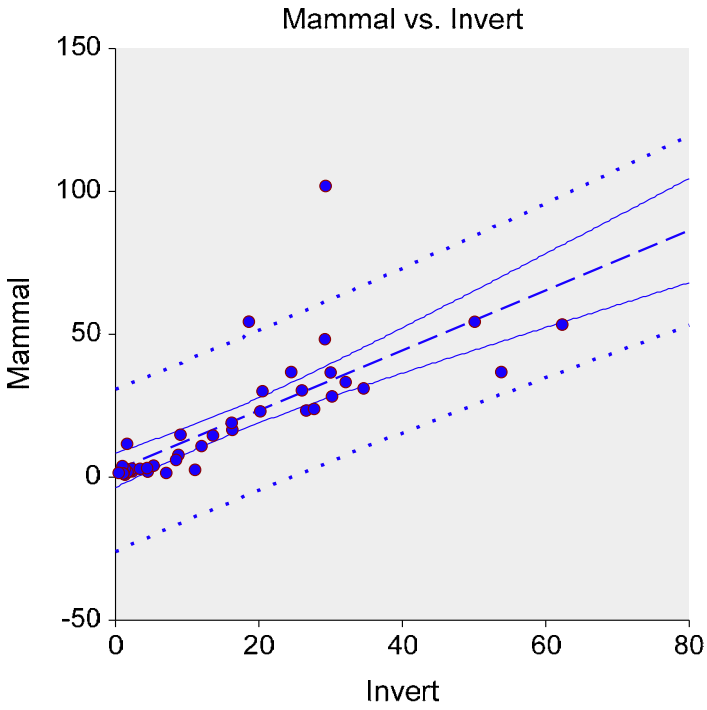
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Invertebrate to Small Mammal Tissue Linear Regressions
No Transformation – All Data

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Mammal	Rows Processed	58
Independent Variable	Invert	Rows Used in Estimation	42
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	2.4643	Rows Prediction Only	0
Slope	1.0476	Sum of Frequencies	42
R-Squared	0.5974	Sum of Weights	42.0000
Correlation	0.7729	Coefficient of Variation	0.7282
Mean Square Error	187.2681	Square Root of MSE	13.68459

Linear Regression Report

Y = Mammal X = Invert

Summary Statement

The equation of the straight line relating Mammal and Invert is estimated as: Mammal = (2.4643) + (1.0476) Invert using the 42 observations in this dataset. The y-intercept, the estimated value of Mammal when Invert is zero, is 2.4643 with a standard error of 2.9917. The slope, the estimated change in Mammal per unit change in Invert, is 1.0476 with a standard error of 0.1360. The value of R-Squared, the proportion of the variation in Mammal that can be accounted for by variation in Invert, is 0.5974. The correlation between Mammal and Invert is 0.7729.

A significance test that the slope is zero resulted in a t-value of 7.7046. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 1.0476. The lower limit of the 95% confidence interval for the slope is 0.7728 and the upper limit is 1.3224. The estimated intercept is 2.4643. The lower limit of the 95% confidence interval for the intercept is -3.5823 and the upper limit is 8.5108.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Mammal	Invert
Count	42	42
Mean	18.7931	15.5869
Standard Deviation	21.3033	15.7178
Minimum	0.8900	0.4500
Maximum	101.9000	62.3000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	2.4643	1.0476
Lower 95% Confidence Limit	-3.5823	0.7728
Upper 95% Confidence Limit	8.5108	1.3224
Standard Error	2.9917	0.1360
Standardized Coefficient	0.0000	0.7729
T Value	0.8237	7.7046
Prob Level (T Test)	0.4150	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	No	Yes
Power (Alpha = 0.0500)	0.1267	1.0000
Regression of Y on X	2.4643	1.0476
Inverse Regression from X on Y	-8.5389	1.7535
Orthogonal Regression of Y and X	-4.2182	1.4763

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(2.4642608076503) + (1.04760209691492) * (Invert)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	2.4643	0.9000	-0.0453	5.2452
Bootstrap Mean	2.2432	0.9500	-0.7903	5.9580
Bias (BM - OV)	-0.2211	0.9900	-1.9674	7.1243
Bias Corrected	2.6854			
Standard Error	1.6435			
Slope				
Original Value	1.0476	0.9000	0.7137	1.2392
Bootstrap Mean	1.0704	0.9500	0.6256	1.2632
Bias (BM - OV)	0.0228	0.9900	0.4657	1.2982
Bias Corrected	1.0248			
Standard Error	0.1638			
Correlation				
Original Value	0.7729	0.9000	0.6076	0.8610
Bootstrap Mean	0.7985	0.9500	0.5969	0.8758
Bias (BM - OV)	0.0256	0.9900	0.5821	0.9127
Bias Corrected	0.7473			
Standard Error	0.0778			
R-Squared				
Original Value	0.5974	0.9000	0.3145	0.7258
Bootstrap Mean	0.6437	0.9500	0.2944	0.7458
Bias (BM - OV)	0.0463	0.9900	0.2660	0.7939
Bias Corrected	0.5512			
Standard Error	0.1263			
Standard Error of Estimate				
Original Value	13.6846	0.9000	7.5742	21.8846
Bootstrap Mean	12.6092	0.9500	6.7383	22.5032
Bias (BM - OV)	-1.0754	0.9900	4.5490	23.3380
Bias Corrected	14.7600			
Standard Error	4.3476			
Orthogonal Intercept				
Original Value	-4.2182	0.9000	-9.7228	5.3287
Bootstrap Mean	-4.5912	0.9500	-10.1568	7.4275
Bias (BM - OV)	-0.3730	0.9900	-10.8676	11.6034
Bias Corrected	-3.8452			
Standard Error	4.7920			
Orthogonal Slope				
Original Value	1.4763	0.9000	0.6411	1.9899
Bootstrap Mean	1.5069	0.9500	0.4543	2.0337
Bias (BM - OV)	0.0305	0.9900	0.1776	2.0900
Bias Corrected	1.4458			
Standard Error	0.4268			

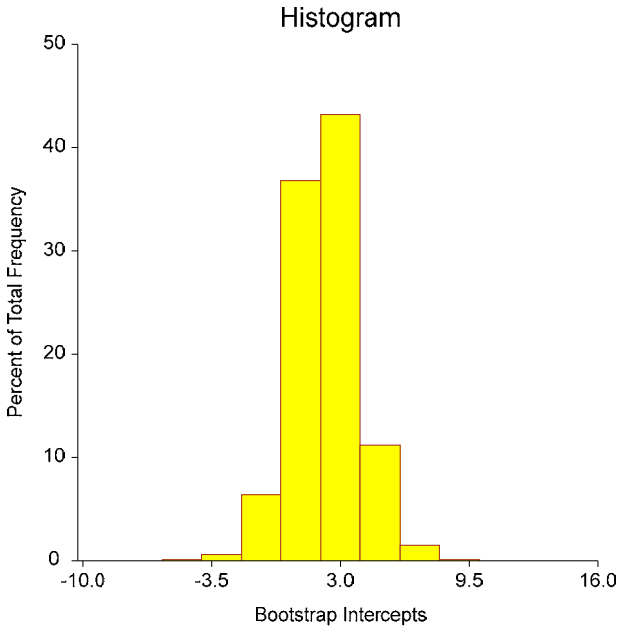
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

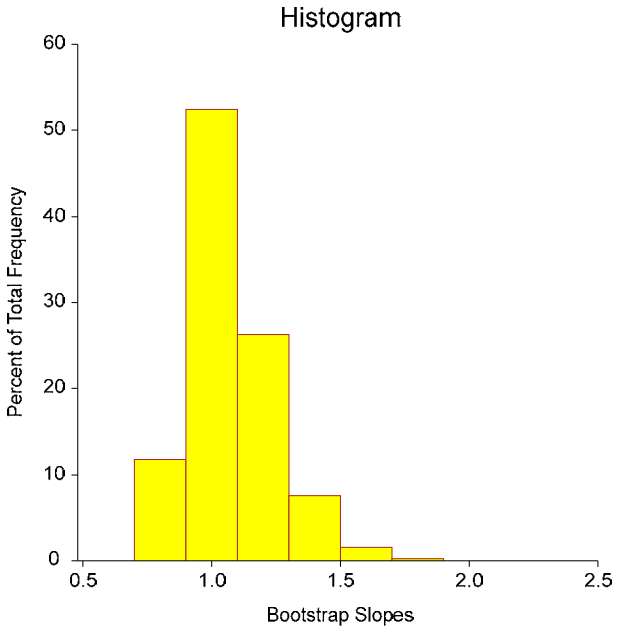
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

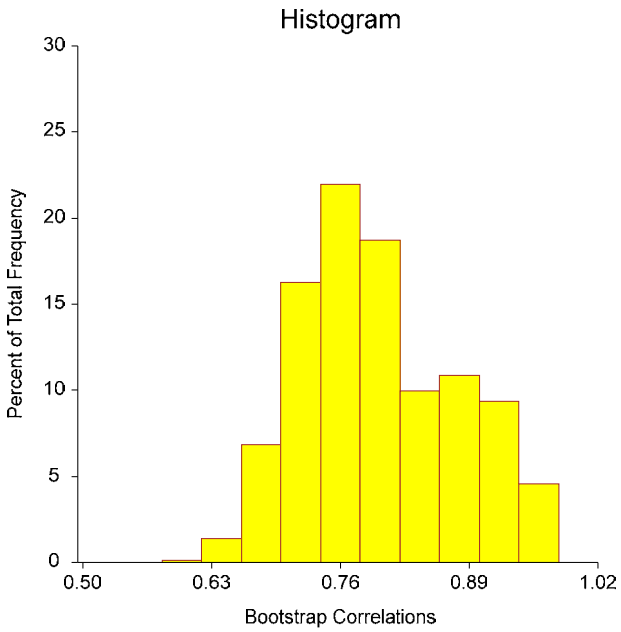
Linear Regression Report

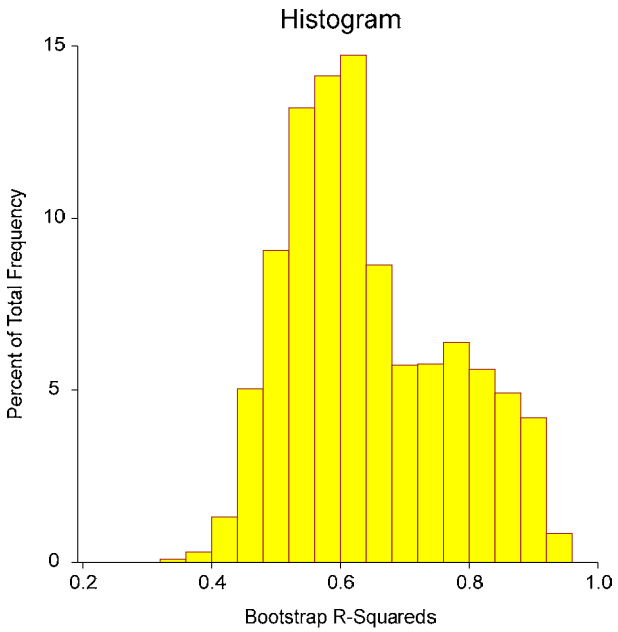
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Bootstrap Histograms Section



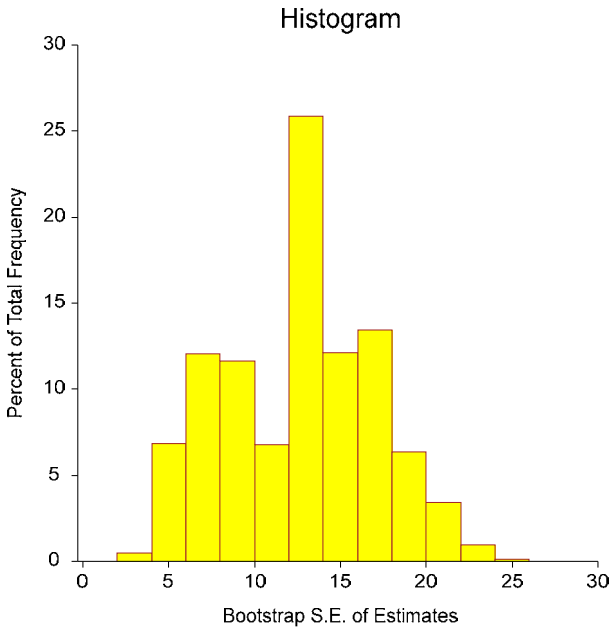


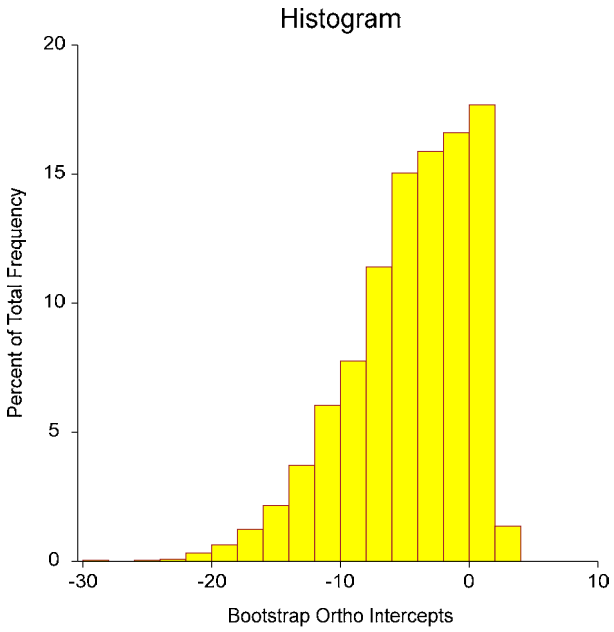


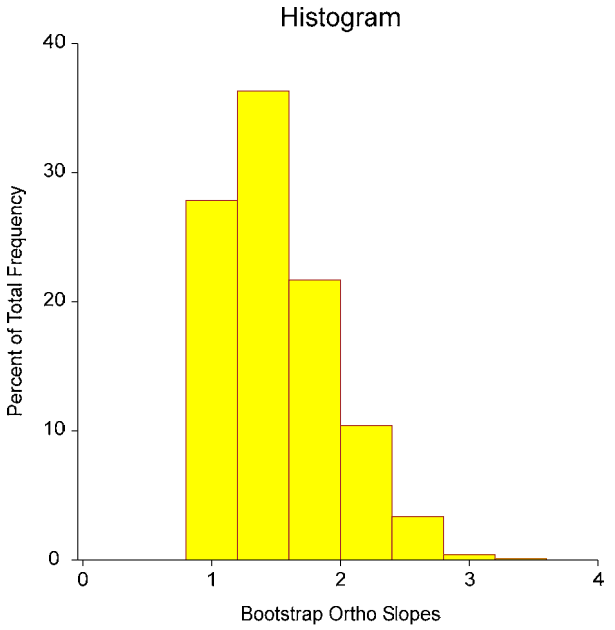


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.7729	0.5974	0.8859
Lower 95% Conf. Limit (r dist'n)	0.6083		
Upper 95% Conf. Limit (r dist'n)	0.8691		
Lower 95% Conf. Limit (Fisher's z)	0.6130		0.7963
Upper 95% Conf. Limit (Fisher's z)	0.8720		0.9374
Adjusted (Rbar)		0.5874	
T-Value for H0: Rho = 0	7.7046	7.7046	12.0762
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	14833.64	14833.64			
Slope	1	11116.34	11116.34	59.3606	0.0000	1.0000
Error	40	7490.725	187.2681			
Adj. Total	41	18607.07	453.8309			
Total	42	33440.71				

s = Square Root(187.2681) = 13.68459

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	42	654.65	789.3116	0.04779512	-0.00153883
1	654.65	20333.03	22914.15	-0.00153883	9.872582E-05
2 (Y'Y)			33440.71		
Determinant		425420.6			2.350615E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	8.950502	-0.2881738
1	-0.2881738	0.0184882

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.6125	0.000000	No
Anderson Darling	5.2766	0.000000	No
D'Agostino Skewness	5.9452	0.000000	No
D'Agostino Kurtosis	4.9983	0.000001	No
D'Agostino Omnibus	60.3285	0.000000	No
Constant Residual Variance?			
Modified Levene Test	5.7078	0.021695	No
Relationship is a Straight Line?			
Lack of Linear Fit F(0, 0) Test	0.0000	0.000000	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

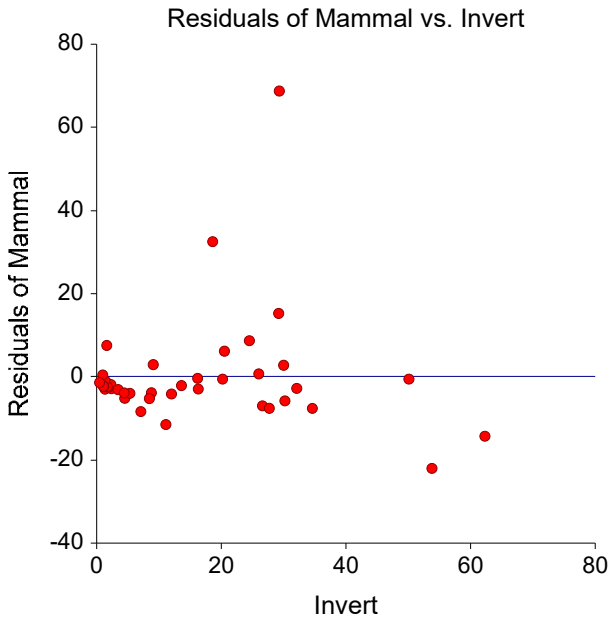
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

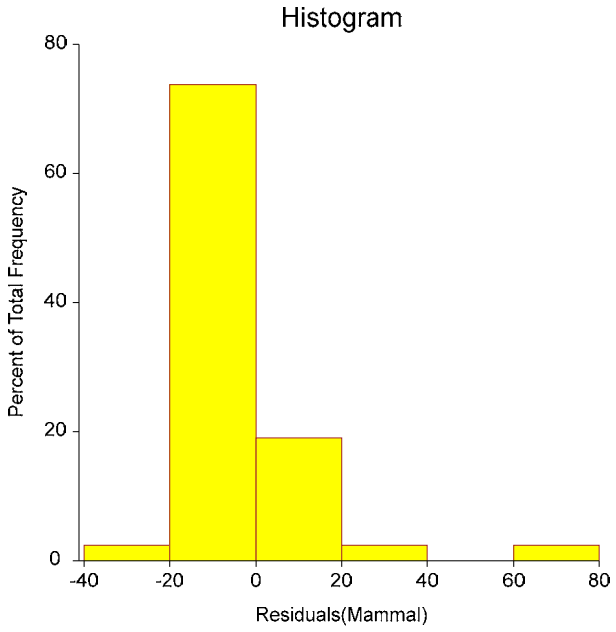
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

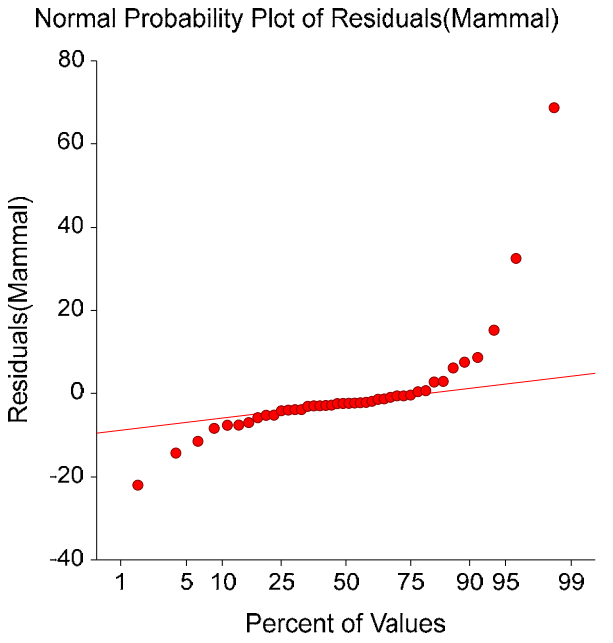
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Original Data Section

Row	Invert (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual
10	30.2000	28.3000	34.1018	-5.8018
11	20.2000	23.0667	23.6258	-0.5592
12	12.0000	10.9000	15.0355	-4.1355
13	9.0700	14.8900	11.9660	2.9240
14	16.3000	16.6000	19.5402	-2.9402
15	11.1000	2.6000	14.0926	-11.4926
16	1.6100	11.6950	4.1509	7.5441
17	2.3600	2.0767	4.9366	-2.8599
18	1.5200	2.7800	4.0566	-1.2766
19	1.9700	2.1100	4.5280	-2.4180
20	4.5000	1.9900	7.1785	-5.1885
21	1.3200	0.8900	3.8471	-2.9571
22	34.6000	31.1000	38.7113	-7.6113
23	8.7700	7.8000	11.6517	-3.8517
24	24.5000	36.8000	28.1305	8.6695
25	26.0000	30.4000	29.7019	0.6981
26	53.8000	36.8000	58.8253	-22.0253
27	62.3000	53.4233	67.7299	-14.3065
28	32.1000	33.3000	36.0923	-2.7923
29	50.1000	54.4000	54.9491	-0.5491
30	26.6000	23.3500	30.3305	-6.9805
31	16.2000	19.0700	19.4354	-0.3654
32	8.4500	6.0800	11.3165	-5.2365
33	29.2000	48.3000	33.0542	15.2458
34	5.3200	4.0533	8.0375	-3.9842
35	2.2700	2.9867	4.8423	-1.8557
36	1.6800	1.8400	4.2242	-2.3842
37	3.4200	2.9700	6.0471	-3.0771
38	4.4100	3.2100	7.0842	-3.8742
39	1.3100	2.9400	3.8366	-0.8966
40	7.0800	1.5200	9.8813	-8.3613
41	1.0900	1.3900	3.6061	-2.2161
42	0.9700	3.9267	3.4804	0.4462
43	1.1100	1.2767	3.6271	-2.3504
44	1.0700	1.3100	3.5852	-2.2752
45	0.4500	1.5500	2.9357	-1.3857
46	20.5000	30.1000	23.9401	6.1599
47	29.3000	101.9000	33.1590	68.7410
48	18.6000	54.4500	21.9497	32.5003
49	27.7000	23.9000	31.4828	-7.5828
50	13.6000	14.6000	16.7116	-2.1116
51	30.0000	36.6667	33.8923	2.7743

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Predicted Values and Confidence Limits of Means

Row	Invert (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	30.2000	28.3000	34.1018	2.8994	28.2418	39.9618
11	20.2000	23.0667	23.6258	2.2028	19.1739	28.0778
12	12.0000	10.9000	15.0355	2.1672	10.6555	19.4155
13	9.0700	14.8900	11.9660	2.2900	7.3378	16.5942
14	16.3000	16.6000	19.5402	2.1138	15.2680	23.8123
15	11.1000	2.6000	14.0926	2.1979	9.6504	18.5349
16	1.6100	11.6950	4.1509	2.8409	-1.5907	9.8925
17	2.3600	2.0767	4.9366	2.7737	-0.6692	10.5424
18	1.5200	2.7800	4.0566	2.8491	-1.7016	9.8148
19	1.9700	2.1100	4.5280	2.8084	-1.1479	10.2039
20	4.5000	1.9900	7.1785	2.5945	1.9348	12.4221
21	1.3200	0.8900	3.8471	2.8674	-1.9481	9.6423
22	34.6000	31.1000	38.7113	3.3380	31.9650	45.4576
23	8.7700	7.8000	11.6517	2.3061	6.9910	16.3125
24	24.5000	36.8000	28.1305	2.4347	23.2099	33.0511
25	26.0000	30.4000	29.7019	2.5423	24.5637	34.8402
26	53.8000	36.8000	58.8253	5.6086	47.4899	70.1606
27	62.3000	53.4233	67.7299	6.6934	54.2019	81.2578
28	32.1000	33.3000	36.0923	3.0822	29.8629	42.3217
29	50.1000	54.4000	54.9491	5.1460	44.5487	65.3495
30	26.6000	23.3500	30.3305	2.5887	25.0986	35.5624
31	16.2000	19.0700	19.4354	2.1132	15.1644	23.7064
32	8.4500	6.0800	11.3165	2.3239	6.6197	16.0133
33	29.2000	48.3000	33.0542	2.8080	27.3790	38.7294
34	5.3200	4.0533	8.0375	2.5313	2.9215	13.1535
35	2.2700	2.9867	4.8423	2.7816	-0.7796	10.4642
36	1.6800	1.8400	4.2242	2.8345	-1.5045	9.9530
37	3.4200	2.9700	6.0471	2.6825	0.6256	11.4685
38	4.4100	3.2100	7.0842	2.6016	1.8261	12.3422
39	1.3100	2.9400	3.8366	2.8683	-1.9605	9.6337
40	7.0800	1.5200	9.8813	2.4076	5.0153	14.7473
41	1.0900	1.3900	3.6061	2.8886	-2.2320	9.4443
42	0.9700	3.9267	3.4804	2.8998	-2.3803	9.3411
43	1.1100	1.2767	3.6271	2.8868	-2.2073	9.4615
44	1.0700	1.3100	3.5852	2.8905	-2.2567	9.4271
45	0.4500	1.5500	2.9357	2.9487	-3.0239	8.8952
46	20.5000	30.1000	23.9401	2.2147	19.4640	28.4162
47	29.3000	101.9000	33.1590	2.8170	27.4656	38.8524
48	18.6000	54.4500	21.9497	2.1510	17.6024	26.2969
49	27.7000	23.9000	31.4828	2.6780	26.0705	36.8952
50	13.6000	14.6000	16.7116	2.1288	12.4092	21.0141
51	30.0000	36.6667	33.8923	2.8809	28.0699	39.7148

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Predicted Values and Prediction Limits

Row	Invert (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	30.2000	28.3000	34.1018	13.9884	5.8303	62.3734
11	20.2000	23.0667	23.6258	13.8607	-4.3878	51.6394
12	12.0000	10.9000	15.0355	13.8551	-12.9668	43.0378
13	9.0700	14.8900	11.9660	13.8749	-16.0762	40.0082
14	16.3000	16.6000	19.5402	13.8469	-8.4454	47.5258
15	11.1000	2.6000	14.0926	13.8600	-13.9194	42.1047
16	1.6100	11.6950	4.1509	13.9764	-24.0964	32.3982
17	2.3600	2.0767	4.9366	13.9629	-23.2834	33.1566
18	1.5200	2.7800	4.0566	13.9780	-24.1940	32.3073
19	1.9700	2.1100	4.5280	13.9698	-23.7060	32.7620
20	4.5000	1.9900	7.1785	13.9284	-20.9718	35.3288
21	1.3200	0.8900	3.8471	13.9818	-24.4111	32.1053
22	34.6000	31.1000	38.7113	14.0858	10.2428	67.1798
23	8.7700	7.8000	11.6517	13.8775	-16.3958	39.6993
24	24.5000	36.8000	28.1305	13.8995	0.0386	56.2224
25	26.0000	30.4000	29.7019	13.9188	1.5711	57.8328
26	53.8000	36.8000	58.8253	14.7893	28.9349	88.7156
27	62.3000	53.4233	67.7299	15.2339	36.9411	98.5186
28	32.1000	33.3000	36.0923	14.0274	7.7418	64.4427
29	50.1000	54.4000	54.9491	14.6202	25.4007	84.4976
30	26.6000	23.3500	30.3305	13.9273	2.1824	58.4786
31	16.2000	19.0700	19.4354	13.8468	-8.5500	47.4208
32	8.4500	6.0800	11.3165	13.8805	-16.7371	39.3701
33	29.2000	48.3000	33.0542	13.9697	4.8204	61.2881
34	5.3200	4.0533	8.0375	13.9167	-20.0893	36.1643
35	2.2700	2.9867	4.8423	13.9644	-23.3809	33.0655
36	1.6800	1.8400	4.2242	13.9751	-24.0204	32.4689
37	3.4200	2.9700	6.0471	13.9450	-22.1369	34.2310
38	4.4100	3.2100	7.0842	13.9297	-21.0688	35.2372
39	1.3100	2.9400	3.8366	13.9820	-24.4220	32.0952
40	7.0800	1.5200	9.8813	13.8948	-18.2011	37.9637
41	1.0900	1.3900	3.6061	13.9861	-24.6609	31.8732
42	0.9700	3.9267	3.4804	13.9885	-24.7913	31.7522
43	1.1100	1.2767	3.6271	13.9858	-24.6392	31.8934
44	1.0700	1.3100	3.5852	13.9865	-24.6826	31.8530
45	0.4500	1.5500	2.9357	13.9987	-25.3567	31.2281
46	20.5000	30.1000	23.9401	13.8627	-4.0774	51.9576
47	29.3000	101.9000	33.1590	13.9715	4.9215	61.3965
48	18.6000	54.4500	21.9497	13.8526	-6.0475	49.9468
49	27.7000	23.9000	31.4828	13.9442	3.3006	59.6650
50	13.6000	14.6000	16.7116	13.8492	-11.2786	44.7019
51	30.0000	36.6667	33.8923	13.9845	5.6285	62.1561

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Working-Hotelling Simultaneous Confidence Band

Row	Invert (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	30.2000	28.3000	34.1018	2.8994	25.8489	42.3548
11	20.2000	23.0667	23.6258	2.2028	17.3559	29.8958
12	12.0000	10.9000	15.0355	2.1672	8.8669	21.2041
13	9.0700	14.8900	11.9660	2.2900	5.4478	18.4842
14	16.3000	16.6000	19.5402	2.1138	13.5234	25.5569
15	11.1000	2.6000	14.0926	2.1979	7.8364	20.3489
16	1.6100	11.6950	4.1509	2.8409	-3.9353	12.2371
17	2.3600	2.0767	4.9366	2.7737	-2.9584	12.8316
18	1.5200	2.7800	4.0566	2.8491	-4.0530	12.1662
19	1.9700	2.1100	4.5280	2.8084	-3.4657	12.5217
20	4.5000	1.9900	7.1785	2.5945	-0.2065	14.5634
21	1.3200	0.8900	3.8471	2.8674	-4.3146	12.0088
22	34.6000	31.1000	38.7113	3.3380	29.2100	48.2126
23	8.7700	7.8000	11.6517	2.3061	5.0878	18.2157
24	24.5000	36.8000	28.1305	2.4347	21.2005	35.0605
25	26.0000	30.4000	29.7019	2.5423	22.4654	36.9384
26	53.8000	36.8000	58.8253	5.6086	42.8610	74.7895
27	62.3000	53.4233	67.7299	6.6934	48.6777	86.7821
28	32.1000	33.3000	36.0923	3.0822	27.3190	44.8656
29	50.1000	54.4000	54.9491	5.1460	40.3016	69.5966
30	26.6000	23.3500	30.3305	2.5887	22.9621	37.6988
31	16.2000	19.0700	19.4354	2.1132	13.4203	25.4505
32	8.4500	6.0800	11.3165	2.3239	4.7018	17.9312
33	29.2000	48.3000	33.0542	2.8080	25.0615	41.0470
34	5.3200	4.0533	8.0375	2.5313	0.8324	15.2427
35	2.2700	2.9867	4.8423	2.7816	-3.0753	12.7599
36	1.6800	1.8400	4.2242	2.8345	-3.8439	12.2924
37	3.4200	2.9700	6.0471	2.6825	-1.5883	13.6824
38	4.4100	3.2100	7.0842	2.6016	-0.3210	14.4894
39	1.3100	2.9400	3.8366	2.8683	-4.3277	12.0010
40	7.0800	1.5200	9.8813	2.4076	3.0282	16.7344
41	1.0900	1.3900	3.6061	2.8886	-4.6161	11.8284
42	0.9700	3.9267	3.4804	2.8998	-4.7736	11.7344
43	1.1100	1.2767	3.6271	2.8868	-4.5898	11.8440
44	1.0700	1.3100	3.5852	2.8905	-4.6423	11.8127
45	0.4500	1.5500	2.9357	2.9487	-5.4575	11.3289
46	20.5000	30.1000	23.9401	2.2147	17.6361	30.2441
47	29.3000	101.9000	33.1590	2.8170	25.1407	41.1773
48	18.6000	54.4500	21.9497	2.1510	15.8272	28.0721
49	27.7000	23.9000	31.4828	2.6780	23.8603	39.1054
50	13.6000	14.6000	16.7116	2.1288	10.6523	22.7710
51	30.0000	36.6667	33.8923	2.8809	25.6922	42.0924

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Residual Section

Row	Invert (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	30.2000	28.3000	34.1018	-5.8018	-0.4338	20.5012
11	20.2000	23.0667	23.6258	-0.5592	-0.0414	2.4241
12	12.0000	10.9000	15.0355	-4.1355	-0.3061	37.9402
13	9.0700	14.8900	11.9660	2.9240	0.2167	19.6373
14	16.3000	16.6000	19.5402	-2.9402	-0.2175	17.7119
15	11.1000	2.6000	14.0926	-11.4926	-0.8509	442.0248
16	1.6100	11.6950	4.1509	7.5441	0.5636	64.5071
17	2.3600	2.0767	4.9366	-2.8599	-0.2134	137.7176
18	1.5200	2.7800	4.0566	-1.2766	-0.0954	45.9214
19	1.9700	2.1100	4.5280	-2.4180	-0.1805	114.5989
20	4.5000	1.9900	7.1785	-5.1885	-0.3862	260.7271
21	1.3200	0.8900	3.8471	-2.9571	-0.2210	332.2579
22	34.6000	31.1000	38.7113	-7.6113	-0.5735	24.4736
23	8.7700	7.8000	11.6517	-3.8517	-0.2855	49.3812
24	24.5000	36.8000	28.1305	8.6695	0.6438	23.5584
25	26.0000	30.4000	29.7019	0.6981	0.0519	2.2963
26	53.8000	36.8000	58.8253	-22.0253	-1.7645	59.8512
27	62.3000	53.4233	67.7299	-14.3065	-1.1986	26.7796
28	32.1000	33.3000	36.0923	-2.7923	-0.2094	8.3852
29	50.1000	54.4000	54.9491	-0.5491	-0.0433	1.0094
30	26.6000	23.3500	30.3305	-6.9805	-0.5195	29.8950
31	16.2000	19.0700	19.4354	-0.3654	-0.0270	1.9162
32	8.4500	6.0800	11.3165	-5.2365	-0.3883	86.1266
33	29.2000	48.3000	33.0542	15.2458	1.1383	31.5647
34	5.3200	4.0533	8.0375	-3.9842	-0.2963	98.2937
35	2.2700	2.9867	4.8423	-1.8557	-0.1385	62.1312
36	1.6800	1.8400	4.2242	-2.3842	-0.1781	129.5778
37	3.4200	2.9700	6.0471	-3.0771	-0.2293	103.6047
38	4.4100	3.2100	7.0842	-3.8742	-0.2884	120.6912
39	1.3100	2.9400	3.8366	-0.8966	-0.0670	30.4973
40	7.0800	1.5200	9.8813	-8.3613	-0.6207	550.0845
41	1.0900	1.3900	3.6061	-2.2161	-0.1657	159.4350
42	0.9700	3.9267	3.4804	0.4462	0.0334	11.3641
43	1.1100	1.2767	3.6271	-2.3504	-0.1757	184.1070
44	1.0700	1.3100	3.5852	-2.2752	-0.1701	173.6790
45	0.4500	1.5500	2.9357	-1.3857	-0.1037	89.3988
46	20.5000	30.1000	23.9401	6.1599	0.4561	20.4648
47	29.3000	101.9000	33.1590	68.7410	5.1332	67.4593
48	18.6000	54.4500	21.9497	32.5003	2.4049	59.6884
49	27.7000	23.9000	31.4828	-7.5828	-0.5650	31.7274
50	13.6000	14.6000	16.7116	-2.1116	-0.1562	14.4634
51	30.0000	36.6667	33.8923	2.7743	0.2074	7.5664

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Residual Diagnostics Section

Row	Invert (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	30.2000	-5.8018	-0.4294	0.0449	0.0044	191.1662
11	20.2000	-0.5592	-0.0409	0.0259	0.0000	192.0616
12	12.0000	-4.1355	-0.3026	0.0251	0.0012	191.6201
13	9.0700	2.9240	0.2141	0.0280	0.0007	191.8443
14	16.3000	-2.9402	-0.2149	0.0239	0.0006	191.8428
15	11.1000	-11.4926	-0.8479	0.0258	0.0096	188.5935
16	1.6100	7.5441	0.5587	0.0431	0.0072	190.5448
17	2.3600	-2.8599	-0.2109	0.0411	0.0010	191.8512
18	1.5200	-1.2766	-0.0942	0.0433	0.0002	192.0262
19	1.9700	-2.4180	-0.1783	0.0421	0.0007	191.9134
20	4.5000	-5.1885	-0.3820	0.0359	0.0028	191.3539
21	1.3200	-2.9571	-0.2183	0.0439	0.0011	191.8354
22	34.6000	-7.6113	-0.5686	0.0595	0.0104	190.4905
23	8.7700	-3.8517	-0.2822	0.0284	0.0012	191.6783
24	24.5000	8.6695	0.6390	0.0317	0.0068	190.0797
25	26.0000	0.6981	0.0513	0.0345	0.0000	192.0569
26	53.8000	-22.0253	*-1.8143	0.1680	0.3143	177.1199
27	62.3000	-14.3065	*-1.2054	0.2392	0.2259	185.1713
28	32.1000	-2.7923	-0.2069	0.0507	0.0012	191.8593
29	50.1000	-0.5491	*-0.0428	0.1414	0.0002	192.0609
30	26.6000	-6.9805	-0.5147	0.0358	0.0050	190.7741
31	16.2000	-0.3654	-0.0267	0.0238	0.0000	192.0664
32	8.4500	-5.2365	-0.3841	0.0288	0.0022	191.3459
33	29.2000	15.2458	1.1426	0.0421	0.0285	185.8481
34	5.3200	-3.9842	-0.2929	0.0342	0.0016	191.6484
35	2.2700	-1.8557	-0.1368	0.0413	0.0004	191.9778
36	1.6800	-2.3842	-0.1759	0.0429	0.0007	191.9176
37	3.4200	-3.0771	-0.2266	0.0384	0.0011	191.8174
38	4.4100	-3.8742	-0.2850	0.0361	0.0016	191.6706
39	1.3100	-0.8966	-0.0662	0.0439	0.0001	192.0483
40	7.0800	-8.3613	-0.6158	0.0310	0.0062	190.2200
41	1.0900	-2.2161	-0.1636	0.0446	0.0006	191.9381
42	0.9700	0.4462	0.0329	0.0449	0.0000	192.0645
43	1.1100	-2.3504	-0.1736	0.0445	0.0007	191.9216
44	1.0700	-2.2752	-0.1680	0.0446	0.0007	191.9309
45	0.4500	-1.3857	-0.1024	0.0464	0.0003	192.0182
46	20.5000	6.1599	0.4516	0.0262	0.0028	191.0708
47	29.3000	68.7410	*8.6765	0.0424	0.5830	65.5463
48	18.6000	32.5003	*2.5674	0.0247	0.0733	164.2999
49	27.7000	-7.5828	-0.5602	0.0383	0.0064	190.5368
50	13.6000	-2.1116	-0.1543	0.0242	0.0003	191.9527
51	30.0000	2.7743	0.2049	0.0443	0.0010	191.8634

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.4294	-0.0931	0.0044	1.0910	-0.0027	-0.0638
11	-0.0409	-0.0067	0.0000	1.0798	-0.0032	-0.0019
12	-0.3026	-0.0485	0.0012	1.0740	-0.0411	0.0109
13	0.2141	0.0363	0.0007	1.0797	0.0336	-0.0141
14	-0.2149	-0.0336	0.0006	1.0751	-0.0226	-0.0015
15	-0.8479	-0.1380	0.0096	1.0411	-0.1207	0.0383
16	0.5587	0.1186	0.0072	1.0819	0.1184	-0.0793
17	-0.2109	-0.0436	0.0010	1.0945	-0.0435	0.0283
18	-0.0942	-0.0200	0.0002	1.0991	-0.0200	0.0135
19	-0.1783	-0.0374	0.0007	1.0964	-0.0373	0.0247
20	-0.3820	-0.0738	0.0028	1.0830	-0.0727	0.0429
21	-0.2183	-0.0468	0.0011	1.0976	-0.0467	0.0317
22	-0.5686	-0.1430	0.0104	1.1002	0.0146	-0.1108
23	-0.2822	-0.0483	0.0012	1.0783	-0.0449	0.0194
24	0.6390	0.1155	0.0068	1.0639	0.0300	0.0575
25	0.0513	0.0097	0.0000	1.0894	0.0019	0.0054
26	-1.8143	-0.8152	0.3143	1.0752	0.3184	-0.7552
27	-1.2054	-0.6760	0.2259	* 1.2852	0.3039	-0.6414
28	-0.2069	-0.0478	0.0012	1.1057	0.0016	-0.0348
29	-0.0428	-0.0174	0.0002	* 1.2251	0.0062	-0.0158
30	-0.5147	-0.0992	0.0050	1.0763	-0.0165	-0.0574
31	-0.0267	-0.0042	0.0000	1.0776	-0.0028	-0.0002
32	-0.3841	-0.0662	0.0022	1.0750	-0.0620	0.0276
33	1.1426	0.2396	0.0285	1.0282	0.0153	0.1579
34	-0.2929	-0.0551	0.0016	1.0844	-0.0540	0.0304
35	-0.1368	-0.0284	0.0004	1.0962	-0.0283	0.0185
36	-0.1759	-0.0372	0.0007	1.0974	-0.0372	0.0248
37	-0.2266	-0.0453	0.0011	1.0911	-0.0450	0.0279
38	-0.2850	-0.0552	0.0016	1.0869	-0.0545	0.0322
39	-0.0662	-0.0142	0.0001	1.1000	-0.0142	0.0096
40	-0.6158	-0.1101	0.0062	1.0647	-0.1056	0.0529
41	-0.1636	-0.0353	0.0006	1.0995	-0.0353	0.0241
42	0.0329	0.0071	0.0000	1.1013	0.0071	-0.0049
43	-0.1736	-0.0375	0.0007	1.0992	-0.0374	0.0255
44	-0.1680	-0.0363	0.0007	1.0995	-0.0363	0.0248
45	-0.1024	-0.0226	0.0003	1.1026	-0.0226	0.0158
46	0.4516	0.0741	0.0028	1.0690	0.0340	0.0223
47	* 8.6765	1.8252	* 0.5830	0.1279	0.1098	1.2081
48	* 2.5674	0.4086	0.0733	0.7892	0.2280	0.0778
49	-0.5602	-0.1118	0.0064	1.0764	-0.0135	-0.0687
50	-0.1543	-0.0243	0.0003	1.0767	-0.0192	0.0031
51	0.2049	0.0441	0.0010	1.0984	0.0016	0.0300

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Outlier Detection Chart

Row	Invert (X)	Residual		Standardized Residual		RStudent	
10	30.2000	-5.8018	|.....	-0.4338	|.....	-0.4294	|.....
11	20.2000	-0.5592	|.....	-0.0414	|.....	-0.0409	|.....
12	12.0000	-4.1355	|.....	-0.3061	|.....	-0.3026	|.....
13	9.0700	2.9240	|.....	0.2167	|.....	0.2141	|.....
14	16.3000	-2.9402	|.....	-0.2175	|.....	-0.2149	|.....
15	11.1000	-11.4926	||.....	-0.8509	||.....	-0.8479	|.....
16	1.6100	7.5441	|.....	0.5636	|.....	0.5587	|.....
17	2.3600	-2.8599	|.....	-0.2134	|.....	-0.2109	|.....
18	1.5200	-1.2766	|.....	-0.0954	|.....	-0.0942	|.....
19	1.9700	-2.4180	|.....	-0.1805	|.....	-0.1783	|.....
20	4.5000	-5.1885	|.....	-0.3862	|.....	-0.3820	|.....
21	1.3200	-2.9571	|.....	-0.2210	|.....	-0.2183	|.....
22	34.6000	-7.6113	|.....	-0.5735	|.....	-0.5686	|.....
23	8.7700	-3.8517	|.....	-0.2855	|.....	-0.2822	|.....
24	24.5000	8.6695	|.....	0.6438	|.....	0.6390	|.....
25	26.0000	0.6981	|.....	0.0519	|.....	0.0513	|.....
26	53.8000	-22.0253	||||.....	-1.7645	|||||.....	-1.8143	|||.....
27	62.3000	-14.3065	|||.....	-1.1986	|||.....	-1.2054	||.....
28	32.1000	-2.7923	|.....	-0.2094	|.....	-0.2069	|.....
29	50.1000	-0.5491	|.....	-0.0433	|.....	-0.0428	|.....
30	26.6000	-6.9805	|.....	-0.5195	|.....	-0.5147	|.....
31	16.2000	-0.3654	|.....	-0.0270	|.....	-0.0267	|.....
32	8.4500	-5.2365	|.....	-0.3883	|.....	-0.3841	|.....
33	29.2000	15.2458	|||.....	1.1383	|||.....	1.1426	|.....
34	5.3200	-3.9842	|.....	-0.2963	|.....	-0.2929	|.....
35	2.2700	-1.8557	|.....	-0.1385	|.....	-0.1368	|.....
36	1.6800	-2.3842	|.....	-0.1781	|.....	-0.1759	|.....
37	3.4200	-3.0771	|.....	-0.2293	|.....	-0.2266	|.....
38	4.4100	-3.8742	|.....	-0.2884	|.....	-0.2850	|.....
39	1.3100	-0.8966	|.....	-0.0670	|.....	-0.0662	|.....
40	7.0800	-8.3613	|.....	-0.6207	|.....	-0.6158	|.....
41	1.0900	-2.2161	|.....	-0.1657	|.....	-0.1636	|.....
42	0.9700	0.4462	|.....	0.0334	|.....	0.0329	|.....
43	1.1100	-2.3504	|.....	-0.1757	|.....	-0.1736	|.....
44	1.0700	-2.2752	|.....	-0.1701	|.....	-0.1680	|.....
45	0.4500	-1.3857	|.....	-0.1037	|.....	-0.1024	|.....
46	20.5000	6.1599	|.....	0.4561	|.....	0.4516	|.....
47	29.3000	68.7410	|||||||||||||||	5.1332	|||||||||||||||	* 8.6765	|||||||||||||||
48	18.6000	32.5003	|||||||.....	2.4049	||||||.....	* 2.5674	||||.....
49	27.7000	-7.5828	|.....	-0.5650	|.....	-0.5602	|.....
50	13.6000	-2.1116	|.....	-0.1562	|.....	-0.1543	|.....
51	30.0000	2.7743	|.....	0.2074	|.....	0.2049	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Influence Detection Chart

Row	Invert (X)	DFFITS		Cook's D		DFBETAS(1)	
10	30.2000	-0.0931	|.....	0.0044	|.....	-0.0638	|.....
11	20.2000	-0.0067	|.....	0.0000	|.....	-0.0019	|.....
12	12.0000	-0.0485	|.....	0.0012	|.....	0.0109	|.....
13	9.0700	0.0363	|.....	0.0007	|.....	-0.0141	|.....
14	16.3000	-0.0336	|.....	0.0006	|.....	-0.0015	|.....
15	11.1000	-0.1380	|.....	0.0096	|.....	0.0383	|.....
16	1.6100	0.1186	|.....	0.0072	|.....	-0.0793	|.....
17	2.3600	-0.0436	|.....	0.0010	|.....	0.0283	|.....
18	1.5200	-0.0200	|.....	0.0002	|.....	0.0135	|.....
19	1.9700	-0.0374	|.....	0.0007	|.....	0.0247	|.....
20	4.5000	-0.0738	|.....	0.0028	|.....	0.0429	|.....
21	1.3200	-0.0468	|.....	0.0011	|.....	0.0317	|.....
22	34.6000	-0.1430	|.....	0.0104	|.....	-0.1108	|.....
23	8.7700	-0.0483	|.....	0.0012	|.....	0.0194	|.....
24	24.5000	0.1155	|.....	0.0068	|.....	0.0575	|.....
25	26.0000	0.0097	|.....	0.0000	|.....	0.0054	|.....
26	53.8000	-0.8152	||||||.....	0.3143	||||||||.....	-0.7552	||||||||.....
27	62.3000	-0.6760	|||||.....	0.2259	|||||.....	-0.6414	|||||||.....
28	32.1000	-0.0478	|.....	0.0012	|.....	-0.0348	|.....
29	50.1000	-0.0174	|.....	0.0002	|.....	-0.0158	|.....
30	26.6000	-0.0992	|.....	0.0050	|.....	-0.0574	|.....
31	16.2000	-0.0042	|.....	0.0000	|.....	-0.0002	|.....
32	8.4500	-0.0662	|.....	0.0022	|.....	0.0276	|.....
33	29.2000	0.2396	|.....	0.0285	|.....	0.1579	|.....
34	5.3200	-0.0551	|.....	0.0016	|.....	0.0304	|.....
35	2.2700	-0.0284	|.....	0.0004	|.....	0.0185	|.....
36	1.6800	-0.0372	|.....	0.0007	|.....	0.0248	|.....
37	3.4200	-0.0453	|.....	0.0011	|.....	0.0279	|.....
38	4.4100	-0.0552	|.....	0.0016	|.....	0.0322	|.....
39	1.3100	-0.0142	|.....	0.0001	|.....	0.0096	|.....
40	7.0800	-0.1101	|.....	0.0062	|.....	0.0529	|.....
41	1.0900	-0.0353	|.....	0.0006	|.....	0.0241	|.....
42	0.9700	0.0071	|.....	0.0000	|.....	-0.0049	|.....
43	1.1100	-0.0375	|.....	0.0007	|.....	0.0255	|.....
44	1.0700	-0.0363	|.....	0.0007	|.....	0.0248	|.....
45	0.4500	-0.0226	|.....	0.0003	|.....	0.0158	|.....
46	20.5000	0.0741	|.....	0.0028	|.....	0.0223	|.....
47	29.3000	1.8252	||||||||||||||	* 0.5830	||||||||||||||	1.2081	||||||||||||||
48	18.6000	0.4086	|||.....	0.0733	|.....	0.0778	|.....
49	27.7000	-0.1118	|.....	0.0064	|.....	-0.0687	|.....
50	13.6000	-0.0243	|.....	0.0003	|.....	0.0031	|.....
51	30.0000	0.0441	|.....	0.0010	|.....	0.0300	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked. DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Outlier & Influence Chart

Row	Invert (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	30.2000	-0.4294	|.....	0.0044	|.....	0.0449	|.....
11	20.2000	-0.0409	|.....	0.0000	|.....	0.0259	|.....
12	12.0000	-0.3026	|.....	0.0012	|.....	0.0251	|.....
13	9.0700	0.2141	|.....	0.0007	|.....	0.0280	|.....
14	16.3000	-0.2149	|.....	0.0006	|.....	0.0239	|.....
15	11.1000	-0.8479	|.....	0.0096	|.....	0.0258	|.....
16	1.6100	0.5587	|.....	0.0072	|.....	0.0431	|.....
17	2.3600	-0.2109	|.....	0.0010	|.....	0.0411	|.....
18	1.5200	-0.0942	|.....	0.0002	|.....	0.0433	|.....
19	1.9700	-0.1783	|.....	0.0007	|.....	0.0421	|.....
20	4.5000	-0.3820	|.....	0.0028	|.....	0.0359	|.....
21	1.3200	-0.2183	|.....	0.0011	|.....	0.0439	|.....
22	34.6000	-0.5686	|.....	0.0104	|.....	0.0595	||.....
23	8.7700	-0.2822	|.....	0.0012	|.....	0.0284	|.....
24	24.5000	0.6390	|.....	0.0068	|.....	0.0317	|.....
25	26.0000	0.0513	|.....	0.0000	|.....	0.0345	|.....
26	53.8000	-1.8143	|||.....	0.3143	||||||||.....	0.1680	|||||||||.....
27	62.3000	-1.2054	||.....	0.2259	|||||.....	0.2392	||||||||||||||
28	32.1000	-0.2069	|.....	0.0012	|.....	0.0507	|.....
29	50.1000	-0.0428	|.....	0.0002	|.....	0.1414	||||||||.....
30	26.6000	-0.5147	|.....	0.0050	|.....	0.0358	|.....
31	16.2000	-0.0267	|.....	0.0000	|.....	0.0238	|.....
32	8.4500	-0.3841	|.....	0.0022	|.....	0.0288	|.....
33	29.2000	1.1426	|.....	0.0285	|.....	0.0421	|.....
34	5.3200	-0.2929	|.....	0.0016	|.....	0.0342	|.....
35	2.2700	-0.1368	|.....	0.0004	|.....	0.0413	|.....
36	1.6800	-0.1759	|.....	0.0007	|.....	0.0429	|.....
37	3.4200	-0.2266	|.....	0.0011	|.....	0.0384	|.....
38	4.4100	-0.2850	|.....	0.0016	|.....	0.0361	|.....
39	1.3100	-0.0662	|.....	0.0001	|.....	0.0439	|.....
40	7.0800	-0.6158	|.....	0.0062	|.....	0.0310	|.....
41	1.0900	-0.1636	|.....	0.0006	|.....	0.0446	|.....
42	0.9700	0.0329	|.....	0.0000	|.....	0.0449	|.....
43	1.1100	-0.1736	|.....	0.0007	|.....	0.0445	|.....
44	1.0700	-0.1680	|.....	0.0007	|.....	0.0446	|.....
45	0.4500	-0.1024	|.....	0.0003	|.....	0.0464	|.....
46	20.5000	0.4516	|.....	0.0028	|.....	0.0262	|.....
47	29.3000	* 8.6765	||||||||||||||	* 0.5830	||||||||||||||	0.0424	|.....
48	18.6000	* 2.5674	||||.....	0.0733	|.....	0.0247	|.....
49	27.7000	-0.5602	|.....	0.0064	|.....	0.0383	|.....
50	13.6000	-0.1543	|.....	0.0003	|.....	0.0242	|.....
51	30.0000	0.2049	|.....	0.0010	|.....	0.0443	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Inverse Prediction of X Means

Row	Mammal (Y)	Invert (X)	Predicted Invert (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	28.3000	30.2000	24.6618	5.5382	20.3971	30.2677
11	23.0667	20.2000	19.6663	0.5337	15.5925	24.3429
12	10.9000	12.0000	8.0524	3.9476	2.7705	12.2208
13	14.8900	9.0700	11.8611	-2.7911	7.2357	15.9359
14	16.6000	16.3000	13.4934	2.8066	9.0761	17.6013
15	2.6000	11.1000	0.1296	10.9704	-7.0776	5.0522
16	11.6950	1.6100	8.8113	-7.2013	3.6776	12.9436
17	2.0767	2.3600	-0.3700	2.7300	-7.7159	4.6175
18	2.7800	1.5200	0.3014	1.2186	-6.8584	5.2021
19	2.1100	1.9700	-0.3382	2.3082	-7.6752	4.6452
20	1.9900	4.5000	-0.4527	4.9527	-7.8217	4.5457
21	0.8900	1.3200	-1.5027	2.8227	-9.1686	3.6374
22	31.1000	34.6000	27.3346	7.2654	22.8386	33.5668
23	7.8000	8.7700	5.0933	3.6767	-0.8358	9.4715
24	36.8000	24.5000	32.7756	-8.2756	27.6217	40.4698
25	30.4000	26.0000	26.6664	-0.6664	22.2350	32.7352
26	36.8000	53.8000	32.7756	21.0244	27.6217	40.4698
27	53.4233	62.3000	48.6435	13.6565	40.8619	61.3108
28	33.3000	32.1000	29.4346	2.6654	24.7099	36.2059
29	54.4000	50.1000	49.5758	0.5242	41.6233	62.5518
30	23.3500	26.6000	19.9367	6.6633	15.8623	24.6540
31	19.0700	16.2000	15.8512	0.3488	11.6485	20.0930
32	6.0800	8.4500	3.4514	4.9986	-2.8775	7.9869
33	48.3000	29.2000	43.7530	-14.5530	36.8467	54.8221
34	4.0533	5.3200	1.5169	3.8031	-5.3136	6.2678
35	2.9867	2.2700	0.4987	1.7713	-6.6070	5.3743
36	1.8400	1.6800	-0.5959	2.2759	-8.0050	4.4215
37	2.9700	3.4200	0.4828	2.9372	-6.6272	5.3604
38	3.2100	4.4100	0.7119	3.6981	-6.3356	5.5608
39	2.9400	1.3100	0.4541	0.8559	-6.6637	5.3354
40	1.5200	7.0800	-0.9014	7.9814	-8.3964	4.1569
41	1.3900	1.0900	-1.0254	2.1154	-8.5556	4.0495
42	3.9267	0.9700	1.3960	-0.4260	-5.4668	6.1613
43	1.2767	1.1100	-1.1336	2.2436	-8.6945	3.9560
44	1.3100	1.0700	-1.1018	2.1718	-8.6536	3.9835
45	1.5500	0.4500	-0.8727	1.3227	-8.3597	4.1816
46	30.1000	20.5000	26.3800	-5.8800	21.9751	32.3801
47	101.9000	29.3000	94.9175	-65.6175	78.0367	123.5229
48	54.4500	18.6000	49.6236	-31.0236	41.6622	62.6153
49	23.9000	27.7000	20.4617	7.2383	16.3826	25.2613
50	14.6000	13.6000	11.5843	2.0157	6.9190	15.6581
51	36.6667	30.0000	32.6483	-2.6483	27.5120	40.3061

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Invert

Inverse Prediction of X Individuals

Row	Mammal (Y)	Invert (X)	Predicted Invert (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	28.3000	30.2000	24.6618	5.5382	-2.4681	53.1329
11	23.0667	20.2000	19.6663	0.5337	-7.7389	47.6743
12	10.9000	12.0000	8.0524	3.9476	-20.2683	35.2596
13	14.8900	9.0700	11.8611	-2.7911	-16.1168	39.2884
14	16.6000	16.3000	13.4934	2.8066	-14.3503	41.0277
15	2.6000	11.1000	0.1296	10.9704	-29.0358	27.0104
16	11.6950	1.6100	8.8113	-7.2013	-19.4379	36.0591
17	2.0767	2.3600	-0.3700	2.7300	-29.5945	26.4962
18	2.7800	1.5200	0.3014	1.2186	-28.8438	27.1875
19	2.1100	1.9700	-0.3382	2.3082	-29.5589	26.5289
20	1.9900	4.5000	-0.4527	4.9527	-29.6871	26.4111
21	0.8900	1.3200	-1.5027	2.8227	-30.8639	25.3326
22	31.1000	34.6000	27.3346	7.2654	0.3228	56.0825
23	7.8000	8.7700	5.0933	3.6767	-23.5223	32.1580
24	36.8000	24.5000	32.7756	-8.2756	5.9427	62.1488
25	30.4000	26.0000	26.6664	-0.6664	-0.3730	55.3432
26	36.8000	53.8000	32.7756	21.0244	5.9427	62.1488
27	53.4233	62.3000	48.6435	13.6565	21.8793	80.2934
28	33.3000	32.1000	29.4346	2.6654	2.5017	58.4141
29	54.4000	50.1000	49.5758	0.5242	22.7957	81.3794
30	23.3500	26.6000	19.9367	6.6633	-7.4517	47.9680
31	19.0700	16.2000	15.8512	0.3488	-11.8121	43.5536
32	6.0800	8.4500	3.4514	4.9986	-25.3384	30.4477
33	48.3000	29.2000	43.7530	-14.5530	17.0370	74.6318
34	4.0533	5.3200	1.5169	3.8031	-27.4879	28.4422
35	2.9867	2.2700	0.4987	1.7713	-28.6235	27.3908
36	1.8400	1.6800	-0.5959	2.2759	-29.8474	26.2638
37	2.9700	3.4200	0.4828	2.9372	-28.6412	27.3744
38	3.2100	4.4100	0.7119	3.6981	-28.3855	27.6107
39	2.9400	1.3100	0.4541	0.8559	-28.6732	27.3449
40	1.5200	7.0800	-0.9014	7.9814	-30.1895	25.9499
41	1.3900	1.0900	-1.0254	2.1154	-30.3286	25.8225
42	3.9267	0.9700	1.3960	-0.4260	-27.6226	28.3172
43	1.2767	1.1100	-1.1336	2.2436	-30.4498	25.7114
44	1.3100	1.0700	-1.1018	2.1718	-30.4142	25.7440
45	1.5500	0.4500	-0.8727	1.3227	-30.1574	25.9793
46	30.1000	20.5000	26.3800	-5.8800	-0.6716	55.0268
47	101.9000	29.3000	94.9175	-65.6175	65.2022	136.3574
48	54.4500	18.6000	49.6236	-31.0236	22.8425	81.4350
49	23.9000	27.7000	20.4617	7.2383	-6.8948	48.5387
50	14.6000	13.6000	11.5843	2.0157	-16.4172	38.9942
51	36.6667	30.0000	32.6483	-2.6483	5.8122	62.0060

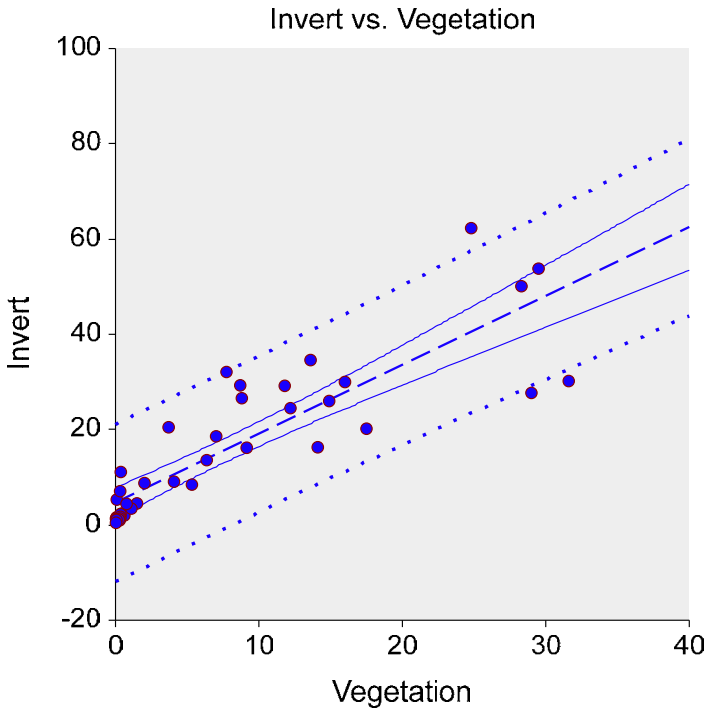
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Vegetation to Prey Tissue Linear Regressions
No Transformation – APL10 and PCO06 (SM Only) Removed

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Invert	Rows Processed	58
Independent Variable	Vegetation	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	4.6228	Rows Prediction Only	0
Slope	1.4459	Sum of Frequencies	41
R-Squared	0.7525	Sum of Weights	41.0000
Correlation	0.8675	Coefficient of Variation	0.5112
Mean Square Error	64.19453	Square Root of MSE	8.012149

Linear Regression Report

Y = Invert X = Vegetation

Summary Statement

The equation of the straight line relating Invert and Vegetation is estimated as: Invert = (4.6228) + (1.4459) Vegetation using the 41 observations in this dataset. The y-intercept, the estimated value of Invert when Vegetation is zero, is 4.6228 with a standard error of 1.6111. The slope, the estimated change in Invert per unit change in Vegetation, is 1.4459 with a standard error of 0.1328. The value of R-Squared, the proportion of the variation in Invert that can be accounted for by variation in Vegetation, is 0.7525. The correlation between Invert and Vegetation is 0.8675.

A significance test that the slope is zero resulted in a t-value of 10.8895. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 1.4459. The lower limit of the 95% confidence interval for the slope is 1.1773 and the upper limit is 1.7144. The estimated intercept is 4.6228. The lower limit of the 95% confidence interval for the intercept is 1.3640 and the upper limit is 7.8816.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Invert	Vegetation
Count	41	41
Mean	15.6744	7.6437
Standard Deviation	15.9027	9.5412
Minimum	0.4500	0.0300
Maximum	62.3000	31.6000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	4.6228	1.4459
Lower 95% Confidence Limit	1.3640	1.1773
Upper 95% Confidence Limit	7.8816	1.7144
Standard Error	1.6111	0.1328
Standardized Coefficient	0.0000	0.8675
T Value	2.8693	10.8895
Prob Level (T Test)	0.0066	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.7990	1.0000
Regression of Y on X	4.6228	1.4459
Inverse Regression from X on Y	0.9880	1.9214
Orthogonal Regression of Y and X	2.0015	1.7888

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(4.62277964766951) + (1.4458535194025) * (Vegetation)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	4.6228	0.9000	2.6611	6.5324
Bootstrap Mean	4.5561	0.9500	2.1680	6.8149
Bias (BM - OV)	-0.0666	0.9900	1.2313	7.4428
Bias Corrected	4.6894			
Standard Error	1.1832			
Slope				
Original Value	1.4459	0.9000	1.0351	1.7719
Bootstrap Mean	1.4731	0.9500	0.9462	1.8286
Bias (BM - OV)	0.0272	0.9900	0.7937	1.9227
Bias Corrected	1.4186			
Standard Error	0.2253			
Correlation				
Original Value	0.8675	0.9000	0.7965	0.9326
Bootstrap Mean	0.8720	0.9500	0.7860	0.9451
Bias (BM - OV)	0.0045	0.9900	0.7720	0.9772
Bias Corrected	0.8630			
Standard Error	0.0415			
R-Squared				
Original Value	0.7525	0.9000	0.6243	0.8612
Bootstrap Mean	0.7621	0.9500	0.6046	0.8812
Bias (BM - OV)	0.0096	0.9900	0.5778	0.9309
Bias Corrected	0.7429			
Standard Error	0.0721			
Standard Error of Estimate				
Original Value	8.0121	0.9000	6.4538	10.6229
Bootstrap Mean	7.5695	0.9500	6.0631	11.0559
Bias (BM - OV)	-0.4426	0.9900	5.3206	11.8927
Bias Corrected	8.4548			
Standard Error	1.2487			
Orthogonal Intercept				
Original Value	2.0015	0.9000	0.4708	3.5530
Bootstrap Mean	2.0408	0.9500	0.1664	3.9020
Bias (BM - OV)	0.0392	0.9900	-0.4940	4.7235
Bias Corrected	1.9623			
Standard Error	0.9483			
Orthogonal Slope				
Original Value	1.7888	0.9000	1.4139	2.1515
Bootstrap Mean	1.7991	0.9500	1.3460	2.2233
Bias (BM - OV)	0.0104	0.9900	1.2039	2.3402
Bias Corrected	1.7784			
Standard Error	0.2207			

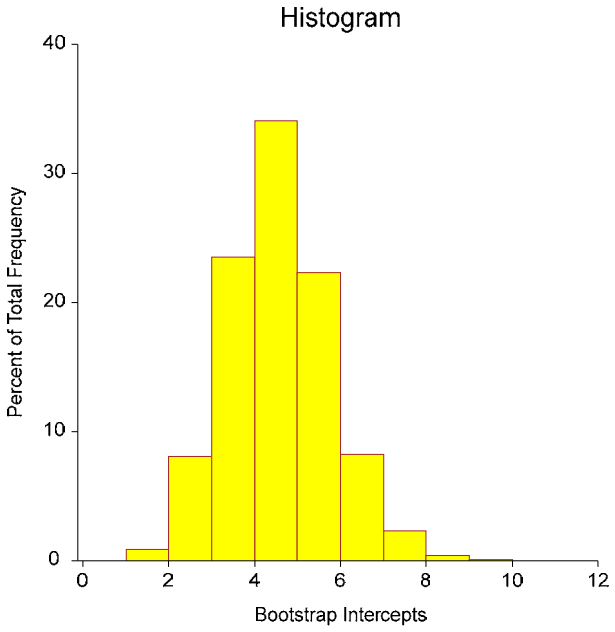
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

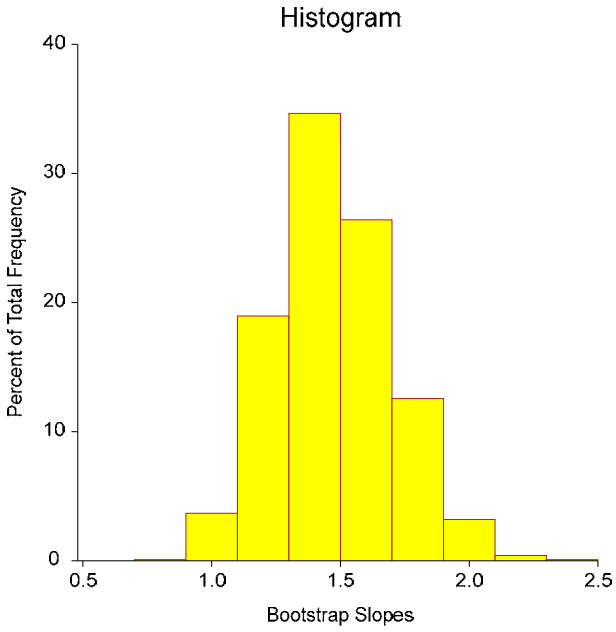
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

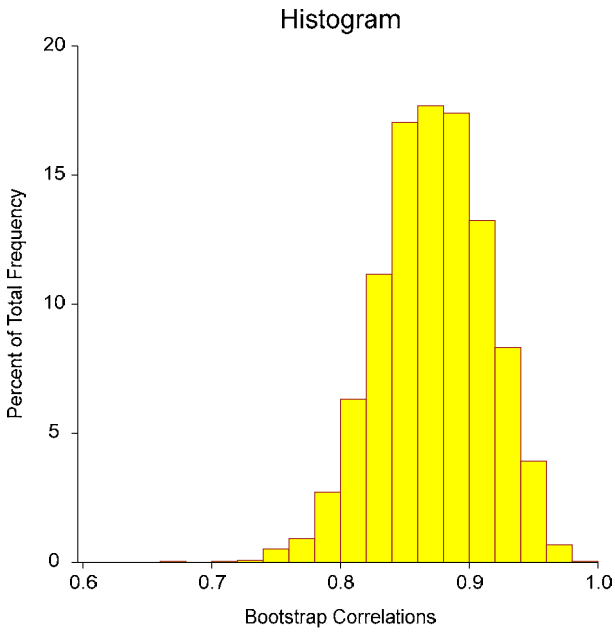
Linear Regression Report

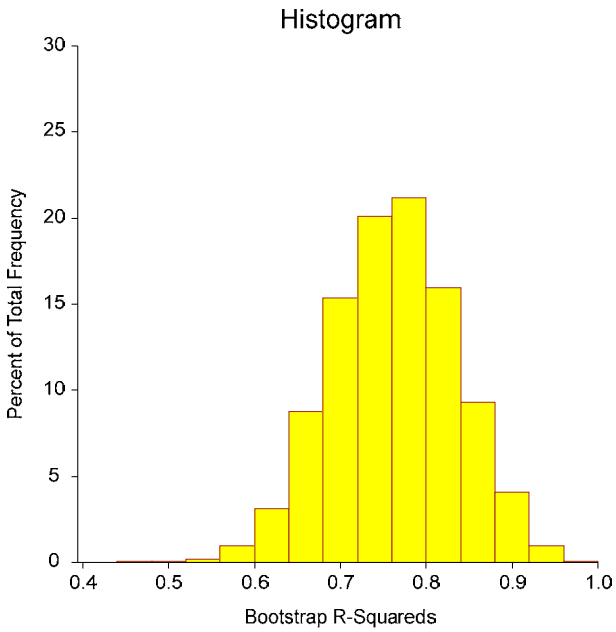
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Bootstrap Histograms Section



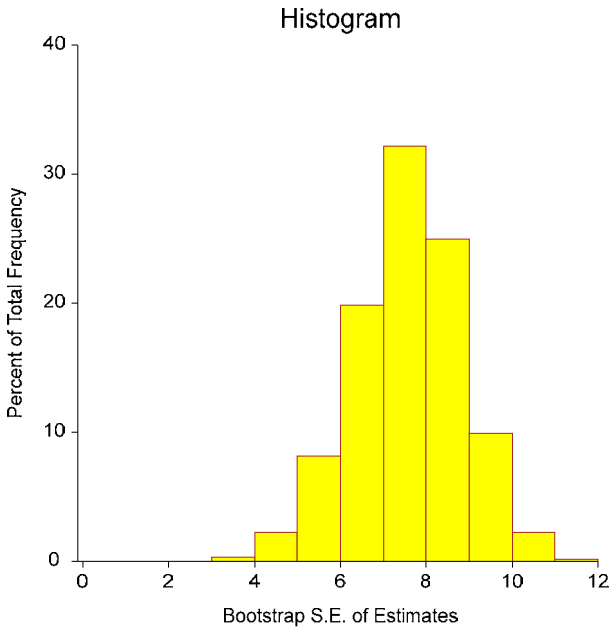


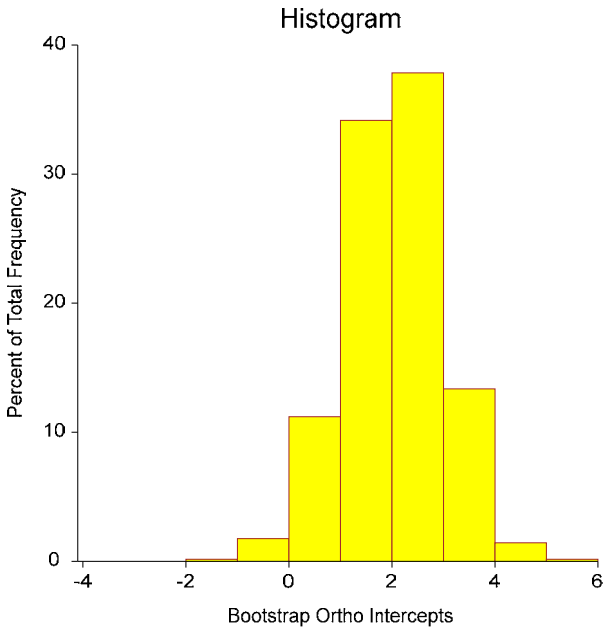


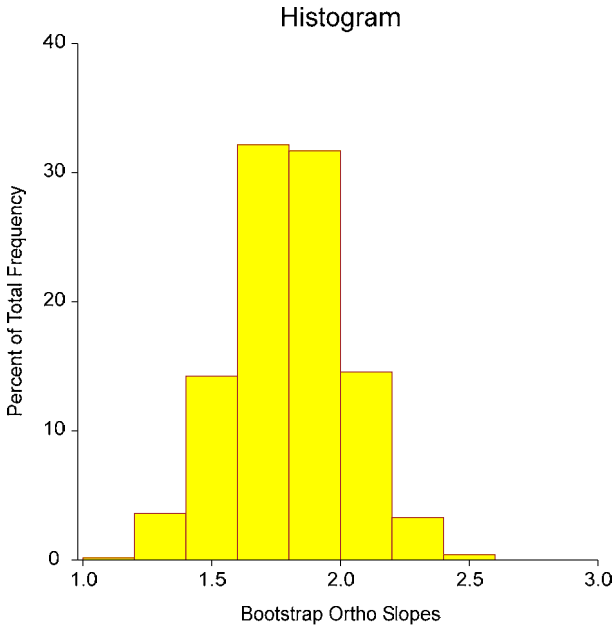


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.8675	0.7525	0.9120
Lower 95% Conf. Limit (r dist'n)	0.7597		
Upper 95% Conf. Limit (r dist'n)	0.9257		
Lower 95% Conf. Limit (Fisher's z)	0.7636		0.8401
Upper 95% Conf. Limit (Fisher's z)	0.9276		0.9524
Adjusted (Rbar)		0.7462	
T-Value for H0: Rho = 0	10.8895	10.8895	13.8861
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	10073.15	10073.15			
Slope	1	7612.295	7612.295	118.5817	0.0000	1.0000
Error	39	2503.586	64.19453			
Lack of Fit	37	2486.94	67.21459	8.0754	0.1161	
Pure Error	2	16.64665	8.323325			
Adj. Total	40	10115.88	252.897			
Total	41	20189.03				

s = Square Root(64.19453) = 8.012149

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	313.39	642.65	0.04043509	-0.002099105
1	313.39	6036.835	10177.11	-0.002099105	0.0002746205
2 (Y'Y)			20189.03		
Determinant		149296.9			6.698061E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	2.595711	-0.1347511
1	-0.1347511	0.01762913

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9263	0.010931	No
Anderson Darling	1.3936	0.001325	No
D'Agostino Skewness	0.5305	0.595752	Yes
D'Agostino Kurtosis	1.8775	0.060448	No
D'Agostino Omnibus	3.8065	0.149083	No
Constant Residual Variance?			
Modified Levene Test	11.4344	0.001651	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	8.0754	0.116107	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

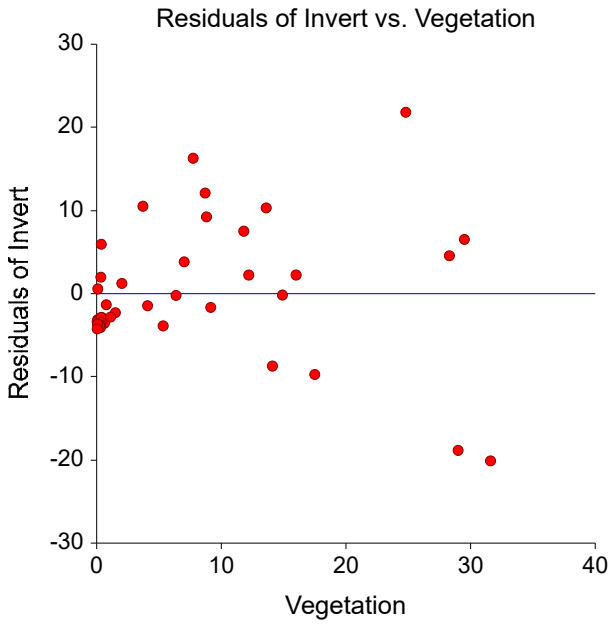
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

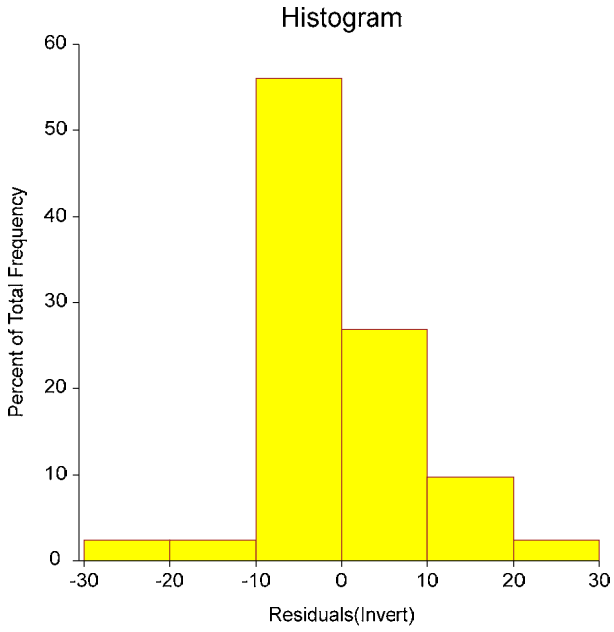
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

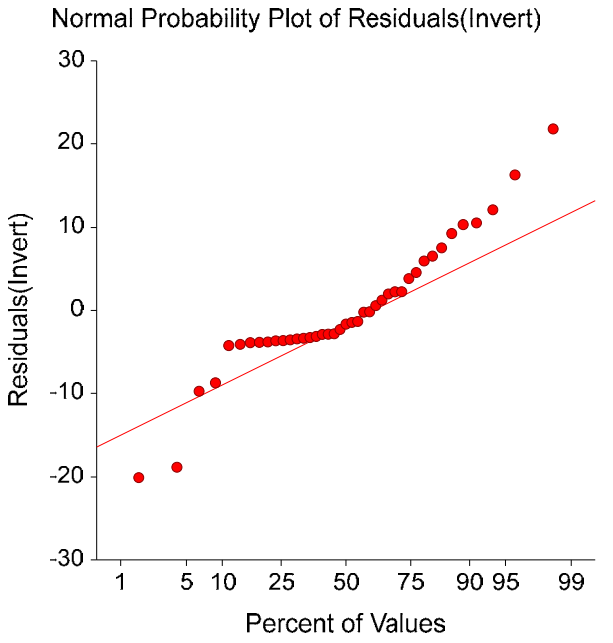
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Original Data Section

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual
10	31.6000	30.2000	50.3118	-20.1118
11	17.5000	20.2000	29.9252	-9.7252
13	4.0800	9.0700	10.5219	-1.4519
14	14.1000	16.3000	25.0093	-8.7093
15	0.3700	11.1000	5.1577	5.9423
16	0.0800	1.6100	4.7384	-3.1284
17	0.4300	2.3600	5.2445	-2.8845
18	0.1100	1.5200	4.7818	-3.2618
19	0.6200	1.9700	5.5192	-3.5492
20	1.5000	4.5000	6.7916	-2.2916
21	0.0300	1.3200	4.6662	-3.3462
22	13.6000	34.6000	24.2864	10.3136
23	2.0200	8.7700	7.5434	1.2266
24	12.2000	24.5000	22.2622	2.2378
25	14.9000	26.0000	26.1660	-0.1660
26	29.5000	53.8000	47.2755	6.5245
27	24.8000	62.3000	40.4799	21.8201
28	7.7400	32.1000	15.8137	16.2863
29	28.3000	50.1000	45.5404	4.5596
30	8.8100	26.6000	17.3607	9.2393
31	9.1500	16.2000	17.8523	-1.6523
32	5.3300	8.4500	12.3292	-3.8792
33	11.8000	29.2000	21.6839	7.5161
34	0.0900	5.3200	4.7529	0.5671
35	0.3500	2.2700	5.1288	-2.8588
36	0.3400	1.6800	5.1144	-3.4344
37	1.1100	3.4200	6.2277	-2.8077
38	0.7700	4.4100	5.7361	-1.3261
39	0.3300	1.3100	5.0999	-3.7899
40	0.3300	7.0800	5.0999	1.9801
41	0.0700	1.0900	4.7240	-3.6340
42	0.3000	0.9700	5.0565	-4.0865
43	0.2300	1.1100	4.9553	-3.8453
44	0.0700	1.0700	4.7240	-3.6540
45	0.0400	0.4500	4.6806	-4.2306
46	3.7100	20.5000	9.9869	10.5131
47	8.7000	29.3000	17.2017	12.0983
48	7.0200	18.6000	14.7727	3.8273
49	29.0000	27.7000	46.5525	-18.8525
50	6.3600	13.6000	13.8184	-0.2184
51	16.0000	30.0000	27.7564	2.2436

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Predicted Values and Confidence Limits of Means

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	31.6000	30.2000	50.3118	3.4181	43.3981	57.2254
11	17.5000	20.2000	29.9252	1.8106	26.2629	33.5875
13	4.0800	9.0700	10.5219	1.3378	7.8160	13.2277
14	14.1000	16.3000	25.0093	1.5168	21.9414	28.0773
15	0.3700	11.1000	5.1577	1.5806	1.9606	8.3549
16	0.0800	1.6100	4.7384	1.6045	1.4931	7.9838
17	0.4300	2.3600	5.2445	1.5758	2.0572	8.4318
18	0.1100	1.5200	4.7818	1.6020	1.5416	8.0221
19	0.6200	1.9700	5.5192	1.5606	2.3626	8.6758
20	1.5000	4.5000	6.7916	1.4937	3.7703	9.8128
21	0.0300	1.3200	4.6662	1.6086	1.4124	7.9199
22	13.6000	34.6000	24.2864	1.4803	21.2923	27.2805
23	2.0200	8.7700	7.5434	1.4571	4.5961	10.4907
24	12.2000	24.5000	22.2622	1.3899	19.4509	25.0734
25	14.9000	26.0000	26.1660	1.5792	22.9717	29.3603
26	29.5000	53.8000	47.2755	3.1602	40.8833	53.6677
27	24.8000	62.3000	40.4799	2.5990	35.2230	45.7369
28	7.7400	32.1000	15.8137	1.2514	13.2826	18.3448
29	28.3000	50.1000	45.5404	3.0146	39.4428	51.6380
30	8.8100	26.6000	17.3607	1.2608	14.8105	19.9110
31	9.1500	16.2000	17.8523	1.2672	15.2892	20.4154
32	5.3300	8.4500	12.3292	1.2884	9.7231	14.9353
33	11.8000	29.2000	21.6839	1.3676	18.9177	24.4500
34	0.0900	5.3200	4.7529	1.6036	1.5093	7.9965
35	0.3500	2.2700	5.1288	1.5823	1.9284	8.3293
36	0.3400	1.6800	5.1144	1.5831	1.9123	8.3164
37	1.1100	3.4200	6.2277	1.5226	3.1479	9.3074
38	0.7700	4.4100	5.7361	1.5488	2.6034	8.8687
39	0.3300	1.3100	5.0999	1.5839	1.8962	8.3036
40	0.3300	7.0800	5.0999	1.5839	1.8962	8.3036
41	0.0700	1.0900	4.7240	1.6053	1.4770	7.9710
42	0.3000	0.9700	5.0565	1.5863	1.8479	8.2652
43	0.2300	1.1100	4.9553	1.5921	1.7351	8.1756
44	0.0700	1.0700	4.7240	1.6053	1.4770	7.9710
45	0.0400	0.4500	4.6806	1.6078	1.4286	7.9327
46	3.7100	20.5000	9.9869	1.3559	7.2443	12.7295
47	8.7000	29.3000	17.2017	1.2591	14.6549	19.7485
48	7.0200	18.6000	14.7727	1.2540	12.2362	17.3092
49	29.0000	27.7000	46.5525	3.0994	40.2834	52.8216
50	6.3600	13.6000	13.8184	1.2628	11.2641	16.3727
51	16.0000	30.0000	27.7564	1.6723	24.3738	31.1391

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Predicted Values and Prediction Limits

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	31.6000	30.2000	50.3118	8.7108	32.6925	67.9310
11	17.5000	20.2000	29.9252	8.2142	13.3105	46.5400
13	4.0800	9.0700	10.5219	8.1231	-5.9086	26.9523
14	14.1000	16.3000	25.0093	8.1545	8.5154	41.5033
15	0.3700	11.1000	5.1577	8.1666	-11.3607	21.6762
16	0.0800	1.6100	4.7384	8.1712	-11.7894	21.2663
17	0.4300	2.3600	5.2445	8.1656	-11.2721	21.7611
18	0.1100	1.5200	4.7818	8.1707	-11.7450	21.3087
19	0.6200	1.9700	5.5192	8.1627	-10.9914	22.0299
20	1.5000	4.5000	6.7916	8.1502	-9.6938	23.2769
21	0.0300	1.3200	4.6662	8.1720	-11.8633	21.1957
22	13.6000	34.6000	24.2864	8.1477	7.8060	40.7668
23	2.0200	8.7700	7.5434	8.1436	-8.9285	24.0153
24	12.2000	24.5000	22.2622	8.1318	5.8141	38.7103
25	14.9000	26.0000	26.1660	8.1663	9.6481	42.6839
26	29.5000	53.8000	47.2755	8.6129	29.8543	64.6966
27	24.8000	62.3000	40.4799	8.4231	23.4425	57.5173
28	7.7400	32.1000	15.8137	8.1093	-0.5889	32.2163
29	28.3000	50.1000	45.5404	8.5605	28.2252	62.8557
30	8.8100	26.6000	17.3607	8.1107	0.9552	33.7663
31	9.1500	16.2000	17.8523	8.1117	1.4448	34.2599
32	5.3300	8.4500	12.3292	8.1151	-4.0851	28.7435
33	11.8000	29.2000	21.6839	8.1280	5.2434	38.1243
34	0.0900	5.3200	4.7529	8.1711	-11.7746	21.2804
35	0.3500	2.2700	5.1288	8.1669	-11.3903	21.6479
36	0.3400	1.6800	5.1144	8.1670	-11.4050	21.6338
37	1.1100	3.4200	6.2277	8.1555	-10.2685	22.7238
38	0.7700	4.4100	5.7361	8.1605	-10.7700	22.2422
39	0.3300	1.3100	5.0999	8.1672	-11.4198	21.6196
40	0.3300	7.0800	5.0999	8.1672	-11.4198	21.6196
41	0.0700	1.0900	4.7240	8.1714	-11.8042	21.2522
42	0.3000	0.9700	5.0565	8.1677	-11.4642	21.5772
43	0.2300	1.1100	4.9553	8.1688	-11.5676	21.4783
44	0.0700	1.0700	4.7240	8.1714	-11.8042	21.2522
45	0.0400	0.4500	4.6806	8.1719	-11.8486	21.2098
46	3.7100	20.5000	9.9869	8.1261	-6.4496	26.4234
47	8.7000	29.3000	17.2017	8.1105	0.7967	33.6067
48	7.0200	18.6000	14.7727	8.1097	-1.6307	31.1761
49	29.0000	27.7000	46.5525	8.5907	29.1761	63.9289
50	6.3600	13.6000	13.8184	8.1111	-2.5878	30.2246
51	16.0000	30.0000	27.7564	8.1848	11.2011	44.3118

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Working-Hotelling Simultaneous Confidence Band

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	31.6000	30.2000	50.3118	3.4181	40.5707	60.0528
11	17.5000	20.2000	29.9252	1.8106	24.7652	35.0852
13	4.0800	9.0700	10.5219	1.3378	6.7094	14.3343
14	14.1000	16.3000	25.0093	1.5168	20.6867	29.3319
15	0.3700	11.1000	5.1577	1.5806	0.6531	9.6624
16	0.0800	1.6100	4.7384	1.6045	0.1660	9.3109
17	0.4300	2.3600	5.2445	1.5758	0.7537	9.7353
18	0.1100	1.5200	4.7818	1.6020	0.2164	9.3472
19	0.6200	1.9700	5.5192	1.5606	1.0718	9.9666
20	1.5000	4.5000	6.7916	1.4937	2.5347	11.0484
21	0.0300	1.3200	4.6662	1.6086	0.0818	9.2505
22	13.6000	34.6000	24.2864	1.4803	20.0678	28.5049
23	2.0200	8.7700	7.5434	1.4571	3.3907	11.6961
24	12.2000	24.5000	22.2622	1.3899	18.3013	26.2231
25	14.9000	26.0000	26.1660	1.5792	21.6654	30.6666
26	29.5000	53.8000	47.2755	3.1602	38.2692	56.2817
27	24.8000	62.3000	40.4799	2.5990	33.0732	47.8867
28	7.7400	32.1000	15.8137	1.2514	12.2475	19.3799
29	28.3000	50.1000	45.5404	3.0146	36.9492	54.1316
30	8.8100	26.6000	17.3607	1.2608	13.7675	20.9540
31	9.1500	16.2000	17.8523	1.2672	14.2411	21.4636
32	5.3300	8.4500	12.3292	1.2884	8.6573	16.0011
33	11.8000	29.2000	21.6839	1.3676	17.7864	25.5813
34	0.0900	5.3200	4.7529	1.6036	0.1828	9.3230
35	0.3500	2.2700	5.1288	1.5823	0.6196	9.6381
36	0.3400	1.6800	5.1144	1.5831	0.6028	9.6259
37	1.1100	3.4200	6.2277	1.5226	1.8885	10.5669
38	0.7700	4.4100	5.7361	1.5488	1.3223	10.1498
39	0.3300	1.3100	5.0999	1.5839	0.5860	9.6138
40	0.3300	7.0800	5.0999	1.5839	0.5860	9.6138
41	0.0700	1.0900	4.7240	1.6053	0.1491	9.2988
42	0.3000	0.9700	5.0565	1.5863	0.5357	9.5774
43	0.2300	1.1100	4.9553	1.5921	0.4182	9.4925
44	0.0700	1.0700	4.7240	1.6053	0.1491	9.2988
45	0.0400	0.4500	4.6806	1.6078	0.0986	9.2626
46	3.7100	20.5000	9.9869	1.3559	6.1227	13.8511
47	8.7000	29.3000	17.2017	1.2591	13.6134	20.7900
48	7.0200	18.6000	14.7727	1.2540	11.1989	18.3465
49	29.0000	27.7000	46.5525	3.0994	37.7197	55.3854
50	6.3600	13.6000	13.8184	1.2628	10.2195	17.4173
51	16.0000	30.0000	27.7564	1.6723	22.9905	32.5224

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Residual Section

Row	Vegetation (X)	Invert (Y)	Predicted Invert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	31.6000	30.2000	50.3118	-20.1118	-2.7754	66.5952
11	17.5000	20.2000	29.9252	-9.7252	-1.2460	48.1446
13	4.0800	9.0700	10.5219	-1.4519	-0.1838	16.0073
14	14.1000	16.3000	25.0093	-8.7093	-1.1070	53.4314
15	0.3700	11.1000	5.1577	5.9423	0.7565	53.5338
16	0.0800	1.6100	4.7384	-3.1284	-0.3985	194.3135
17	0.4300	2.3600	5.2445	-2.8845	-0.3672	122.2244
18	0.1100	1.5200	4.7818	-3.2618	-0.4155	214.5937
19	0.6200	1.9700	5.5192	-3.5492	-0.4516	180.1629
20	1.5000	4.5000	6.7916	-2.2916	-0.2911	50.9236
21	0.0300	1.3200	4.6662	-3.3462	-0.4263	253.4966
22	13.6000	34.6000	24.2864	10.3136	1.3098	29.8081
23	2.0200	8.7700	7.5434	1.2266	0.1557	13.9863
24	12.2000	24.5000	22.2622	2.2378	0.2836	9.1339
25	14.9000	26.0000	26.1660	-0.1660	-0.0211	0.6385
26	29.5000	53.8000	47.2755	6.5245	0.8862	12.1274
27	24.8000	62.3000	40.4799	21.8201	2.8790	35.0242
28	7.7400	32.1000	15.8137	16.2863	2.0580	50.7362
29	28.3000	50.1000	45.5404	4.5596	0.6142	9.1009
30	8.8100	26.6000	17.3607	9.2393	1.1677	34.7340
31	9.1500	16.2000	17.8523	-1.6523	-0.2089	10.1996
32	5.3300	8.4500	12.3292	-3.8792	-0.4905	45.9074
33	11.8000	29.2000	21.6839	7.5161	0.9521	25.7402
34	0.0900	5.3200	4.7529	0.5671	0.0722	10.6597
35	0.3500	2.2700	5.1288	-2.8588	-0.3640	125.9396
36	0.3400	1.6800	5.1144	-3.4344	-0.4373	204.4268
37	1.1100	3.4200	6.2277	-2.8077	-0.3569	82.0958
38	0.7700	4.4100	5.7361	-1.3261	-0.1687	30.0700
39	0.3300	1.3100	5.0999	-3.7899	-0.4825	289.3062
40	0.3300	7.0800	5.0999	1.9801	0.2521	27.9674
41	0.0700	1.0900	4.7240	-3.6340	-0.4629	333.3935
42	0.3000	0.9700	5.0565	-4.0865	-0.5203	421.2923
43	0.2300	1.1100	4.9553	-3.8453	-0.4897	346.4258
44	0.0700	1.0700	4.7240	-3.6540	-0.4655	341.4943
45	0.0400	0.4500	4.6806	-4.2306	-0.5390	940.1364
46	3.7100	20.5000	9.9869	10.5131	1.3313	51.2834
47	8.7000	29.3000	17.2017	12.0983	1.5290	41.2911
48	7.0200	18.6000	14.7727	3.8273	0.4837	20.5770
49	29.0000	27.7000	46.5525	-18.8525	-2.5516	68.0597
50	6.3600	13.6000	13.8184	-0.2184	-0.0276	1.6059
51	16.0000	30.0000	27.7564	2.2436	0.2863	7.4785

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Residual Diagnostics Section

Row	Vegetation (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	31.6000	-20.1118	**-3.0582	0.1820	0.8569	52.8713
11	17.5000	-9.7252	-1.2552	0.0511	0.0418	63.2610
13	4.0800	-1.4519	-0.1815	0.0279	0.0005	65.8268
14	14.1000	-8.7093	-1.1103	0.0358	0.0228	63.8136
15	0.3700	5.9423	0.7523	0.0389	0.0116	64.9170
16	0.0800	-3.1284	-0.3942	0.0401	0.0033	65.6155
17	0.4300	-2.8845	-0.3631	0.0387	0.0027	65.6561
18	0.1100	-3.2618	-0.4110	0.0400	0.0036	65.5922
19	0.6200	-3.5492	-0.4470	0.0379	0.0040	65.5393
20	1.5000	-2.2916	-0.2877	0.0348	0.0015	65.7407
21	0.0300	-3.3462	-0.4218	0.0403	0.0038	65.5768
22	13.6000	10.3136	1.3223	0.0341	0.0303	62.9857
23	2.0200	1.2266	0.1537	0.0331	0.0004	65.8429
24	12.2000	2.2378	0.2802	0.0301	0.0012	65.7480
25	14.9000	-0.1660	-0.0209	0.0389	0.0000	65.8831
26	29.5000	6.5245	*0.8837	0.1556	0.0723	64.5572
27	24.8000	21.8201	**3.2025	0.1052	0.4874	51.8811
28	7.7400	16.2863	*2.1516	0.0244	0.0529	58.7292
29	28.3000	4.5596	*0.6092	0.1416	0.0311	65.2465
30	8.8100	9.2393	1.1733	0.0248	0.0173	63.5804
31	9.1500	-1.6523	-0.2063	0.0250	0.0006	65.8102
32	5.3300	-3.8792	-0.4857	0.0259	0.0032	65.4773
33	11.8000	7.5161	0.9509	0.0291	0.0136	64.3526
34	0.0900	0.5671	0.0713	0.0401	0.0001	65.8750
35	0.3500	-2.8588	-0.3599	0.0390	0.0027	65.6601
36	0.3400	-3.4344	-0.4327	0.0390	0.0039	65.5609
37	1.1100	-2.8077	-0.3529	0.0361	0.0024	65.6686
38	0.7700	-1.3261	-0.1666	0.0374	0.0006	65.8358
39	0.3300	-3.7899	-0.4777	0.0391	0.0047	65.4905
40	0.3300	1.9801	0.2491	0.0391	0.0013	65.7765
41	0.0700	-3.6340	-0.4582	0.0401	0.0045	65.5218
42	0.3000	-4.0865	-0.5154	0.0392	0.0055	65.4265
43	0.2300	-3.8453	-0.4849	0.0395	0.0049	65.4787
44	0.0700	-3.6540	-0.4608	0.0401	0.0045	65.5178
45	0.0400	-4.2306	-0.5340	0.0403	0.0061	65.3931
46	3.7100	10.5131	1.3451	0.0286	0.0261	62.8895
47	8.7000	12.0983	1.5566	0.0247	0.0296	61.9345
48	7.0200	3.8273	0.4788	0.0245	0.0029	65.4887
49	29.0000	-18.8525	**-2.7596	0.1496	0.5729	54.8848
50	6.3600	-0.2184	-0.0272	0.0248	0.0000	65.8826
51	16.0000	2.2436	0.2829	0.0436	0.0019	65.7454

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	* -3.0582	-1.4425	* 0.8569	0.8293	0.4355	-1.3424
11	-1.2552	-0.2912	0.0418	1.0234	-0.0237	-0.2105
13	-0.1815	-0.0307	0.0005	1.0817	-0.0292	0.0109
14	-1.1103	-0.2141	0.0228	1.0249	-0.0609	-0.1210
15	0.7523	0.1514	0.0116	1.0640	0.1513	-0.0925
16	-0.3942	-0.0806	0.0033	1.0884	-0.0806	0.0504
17	-0.3631	-0.0728	0.0027	1.0881	-0.0728	0.0443
18	-0.4110	-0.0839	0.0036	1.0875	-0.0839	0.0524
19	-0.4470	-0.0888	0.0040	1.0834	-0.0887	0.0530
20	-0.2877	-0.0546	0.0015	1.0865	-0.0543	0.0298
21	-0.4218	-0.0864	0.0038	1.0874	-0.0864	0.0543
22	1.3223	0.2486	0.0303	0.9967	0.0795	0.1328
23	0.1537	0.0284	0.0004	1.0880	0.0281	-0.0146
24	0.2802	0.0494	0.0012	1.0815	0.0210	0.0215
25	-0.0209	-0.0042	0.0000	1.0959	-0.0010	-0.0026
26	0.8837	0.3793	0.0723	* 1.1977	-0.1028	0.3483
27	* 3.2025	1.0982	0.4874	0.7300	-0.1957	0.9626
28	* 2.1516	0.3402	0.0529	0.8579	0.2620	0.0035
29	0.6092	0.2474	0.0311	* 1.2034	-0.0620	0.2251
30	1.1733	0.1870	0.0173	1.0059	0.1296	0.0230
31	-0.2063	-0.0330	0.0006	1.0779	-0.0221	-0.0052
32	-0.4857	-0.0791	0.0032	1.0680	-0.0716	0.0189
33	0.9509	0.1647	0.0136	1.0351	0.0752	0.0665
34	0.0713	0.0146	0.0001	1.0970	0.0146	-0.0091
35	-0.3599	-0.0725	0.0027	1.0886	-0.0725	0.0444
36	-0.4327	-0.0872	0.0039	1.0854	-0.0872	0.0534
37	-0.3529	-0.0683	0.0024	1.0857	-0.0681	0.0389
38	-0.1666	-0.0328	0.0006	1.0926	-0.0328	0.0193
39	-0.4777	-0.0963	0.0047	1.0831	-0.0963	0.0591
40	0.2491	0.0502	0.0013	1.0926	0.0502	-0.0308
41	-0.4582	-0.0937	0.0045	1.0853	-0.0937	0.0587
42	-0.5154	-0.1041	0.0055	1.0811	-0.1041	0.0640
43	-0.4849	-0.0983	0.0049	1.0832	-0.0983	0.0608
44	-0.4608	-0.0942	0.0045	1.0852	-0.0942	0.0590
45	-0.5340	-0.1094	0.0061	1.0812	-0.1094	0.0687
46	1.3451	0.2310	0.0261	0.9881	0.2216	-0.0890
47	1.5566	0.2477	0.0296	0.9544	0.1738	0.0276
48	0.4788	0.0759	0.0029	1.0669	0.0620	-0.0050
49	* -2.7596	-1.1576	* 0.5729	0.8596	0.3042	-1.0591
50	-0.0272	-0.0043	0.0000	1.0801	-0.0037	0.0006
51	0.2829	0.0604	0.0019	1.0967	0.0099	0.0401

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Outlier Detection Chart

Row	Vegetation (X)	Residual		Standardized Residual		RStudent	
10	31.6000	-20.1118	||||||||||||..	-2.7754	||||||||||||.	* -3.0582	||||||||||||.
11	17.5000	-9.7252	||||||.....	-1.2460	||||||.....	-1.2552	|||||.....
13	4.0800	-1.4519	|.....	-0.1838	|.....	-0.1815	|.....
14	14.1000	-8.7093	|||||.....	-1.1070	|||||.....	-1.1103	|||||.....
15	0.3700	5.9423	||||.....	0.7565	|||.....	0.7523	|||.....
16	0.0800	-3.1284	||.....	-0.3985	|.....	-0.3942	|.....
17	0.4300	-2.8845	|.....	-0.3672	|.....	-0.3631	|.....
18	0.1100	-3.2618	||.....	-0.4155	||.....	-0.4110	|.....
19	0.6200	-3.5492	||.....	-0.4516	||.....	-0.4470	||.....
20	1.5000	-2.2916	|.....	-0.2911	|.....	-0.2877	|.....
21	0.0300	-3.3462	||.....	-0.4263	||.....	-0.4218	|.....
22	13.6000	10.3136	|||||||.....	1.3098	||||||.....	1.3223	||||||.....
23	2.0200	1.2266	|.....	0.1557	|.....	0.1537	|.....
24	12.2000	2.2378	|.....	0.2836	|.....	0.2802	|.....
25	14.9000	-0.1660	|.....	-0.0211	|.....	-0.0209	|.....
26	29.5000	6.5245	||||.....	0.8862	||||.....	0.8837	||||.....
27	24.8000	21.8201	||||||||||||||||	2.8790	||||||||||||||	* 3.2025	||||||||||||||
28	7.7400	16.2863	||||||||||....	2.0580	|||||||||.....	* 2.1516	|||||||||.....
29	28.3000	4.5596	|||.....	0.6142	|||.....	0.6092	||.....
30	8.8100	9.2393	||||||.....	1.1677	||||||.....	1.1733	|||||.....
31	9.1500	-1.6523	|.....	-0.2089	|.....	-0.2063	|.....
32	5.3300	-3.8792	||.....	-0.4905	||.....	-0.4857	||.....
33	11.8000	7.5161	|||||.....	0.9521	||||.....	0.9509	||||.....
34	0.0900	0.5671	|.....	0.0722	|.....	0.0713	|.....
35	0.3500	-2.8588	|.....	-0.3640	|.....	-0.3599	|.....
36	0.3400	-3.4344	||.....	-0.4373	||.....	-0.4327	|.....
37	1.1100	-2.8077	|.....	-0.3569	|.....	-0.3529	|.....
38	0.7700	-1.3261	|.....	-0.1687	|.....	-0.1666	|.....
39	0.3300	-3.7899	||.....	-0.4825	||.....	-0.4777	||.....
40	0.3300	1.9801	|.....	0.2521	|.....	0.2491	|.....
41	0.0700	-3.6340	||.....	-0.4629	||.....	-0.4582	||.....
42	0.3000	-4.0865	||.....	-0.5203	||.....	-0.5154	||.....
43	0.2300	-3.8453	||.....	-0.4897	||.....	-0.4849	||.....
44	0.0700	-3.6540	||.....	-0.4655	||.....	-0.4608	||.....
45	0.0400	-4.2306	||.....	-0.5390	||.....	-0.5340	||.....
46	3.7100	10.5131	|||||||.....	1.3313	||||||.....	1.3451	||||||.....
47	8.7000	12.0983	||||||||.....	1.5290	|||||||.....	1.5566	|||||||.....
48	7.0200	3.8273	||.....	0.4837	||.....	0.4788	||.....
49	29.0000	-18.8525	||||||||||...	-2.5516	||||||||||..	* -2.7596	||||||||||...
50	6.3600	-0.2184	|.....	-0.0276	|.....	-0.0272	|.....
51	16.0000	2.2436	|.....	0.2863	|.....	0.2829	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Influence Detection Chart

Row	Vegetation (X)	DFFITS		Cook's D		DFBETAS(1)	
10	31.6000	-1.4425	|||||||||||||||	* 0.8569	||||||||||||||||	-1.3424															
11	17.5000	-0.2912	||.....	0.0418	|.....	-0.2105	||.....
13	4.0800	-0.0307	|.....	0.0005	|.....	0.0109	|.....
14	14.1000	-0.2141	||.....	0.0228	|.....	-0.1210	|.....
15	0.3700	0.1514	|.....	0.0116	|.....	-0.0925	|.....
16	0.0800	-0.0806	|.....	0.0033	|.....	0.0504	|.....
17	0.4300	-0.0728	|.....	0.0027	|.....	0.0443	|.....
18	0.1100	-0.0839	|.....	0.0036	|.....	0.0524	|.....
19	0.6200	-0.0888	|.....	0.0040	|.....	0.0530	|.....
20	1.5000	-0.0546	|.....	0.0015	|.....	0.0298	|.....
21	0.0300	-0.0864	|.....	0.0038	|.....	0.0543	|.....
22	13.6000	0.2486	||.....	0.0303	|.....	0.1328	|.....
23	2.0200	0.0284	|.....	0.0004	|.....	-0.0146	|.....
24	12.2000	0.0494	|.....	0.0012	|.....	0.0215	|.....
25	14.9000	-0.0042	|.....	0.0000	|.....	-0.0026	|.....
26	29.5000	0.3793	|||.....	0.0723	|.....	0.3483	|||.....
27	24.8000	1.0982	||||||||||....	0.4874	|||||||.....	0.9626	|||||||||.....
28	7.7400	0.3402	|||.....	0.0529	|.....	0.0035	|.....
29	28.3000	0.2474	||.....	0.0311	|.....	0.2251	||.....
30	8.8100	0.1870	|.....	0.0173	|.....	0.0230	|.....
31	9.1500	-0.0330	|.....	0.0006	|.....	-0.0052	|.....
32	5.3300	-0.0791	|.....	0.0032	|.....	0.0189	|.....
33	11.8000	0.1647	|.....	0.0136	|.....	0.0665	|.....
34	0.0900	0.0146	|.....	0.0001	|.....	-0.0091	|.....
35	0.3500	-0.0725	|.....	0.0027	|.....	0.0444	|.....
36	0.3400	-0.0872	|.....	0.0039	|.....	0.0534	|.....
37	1.1100	-0.0683	|.....	0.0024	|.....	0.0389	|.....
38	0.7700	-0.0328	|.....	0.0006	|.....	0.0193	|.....
39	0.3300	-0.0963	|.....	0.0047	|.....	0.0591	|.....
40	0.3300	0.0502	|.....	0.0013	|.....	-0.0308	|.....
41	0.0700	-0.0937	|.....	0.0045	|.....	0.0587	|.....
42	0.3000	-0.1041	|.....	0.0055	|.....	0.0640	|.....
43	0.2300	-0.0983	|.....	0.0049	|.....	0.0608	|.....
44	0.0700	-0.0942	|.....	0.0045	|.....	0.0590	|.....
45	0.0400	-0.1094	|.....	0.0061	|.....	0.0687	|.....
46	3.7100	0.2310	||.....	0.0261	|.....	-0.0890	|.....
47	8.7000	0.2477	||.....	0.0296	|.....	0.0276	|.....
48	7.0200	0.0759	|.....	0.0029	|.....	-0.0050	|.....
49	29.0000	-1.1576	||||||||||...	* 0.5729	|||||||||.....	-1.0591	||||||||||....
50	6.3600	-0.0043	|.....	0.0000	|.....	0.0006	|.....
51	16.0000	0.0604	|.....	0.0019	|.....	0.0401	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Outlier & Influence Chart

Row	Vegetation (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	31.6000	* -3.0582	||||||||||||||.	* 0.8569	|||||||||||||||	0.1820	||||||||||||||
11	17.5000	-1.2552	|||||.....	0.0418	|.....	0.0511	||.....
13	4.0800	-0.1815	|.....	0.0005	|.....	0.0279	|.....
14	14.1000	-1.1103	|||||.....	0.0228	|.....	0.0358	|.....
15	0.3700	0.7523	|||.....	0.0116	|.....	0.0389	|.....
16	0.0800	-0.3942	|.....	0.0033	|.....	0.0401	|.....
17	0.4300	-0.3631	|.....	0.0027	|.....	0.0387	|.....
18	0.1100	-0.4110	|.....	0.0036	|.....	0.0400	|.....
19	0.6200	-0.4470	||.....	0.0040	|.....	0.0379	|.....
20	1.5000	-0.2877	|.....	0.0015	|.....	0.0348	|.....
21	0.0300	-0.4218	|.....	0.0038	|.....	0.0403	|.....
22	13.6000	1.3223	||||||.....	0.0303	|.....	0.0341	|.....
23	2.0200	0.1537	|.....	0.0004	|.....	0.0331	|.....
24	12.2000	0.2802	|.....	0.0012	|.....	0.0301	|.....
25	14.9000	-0.0209	|.....	0.0000	|.....	0.0389	|.....
26	29.5000	0.8837	||||.....	0.0723	|.....	0.1556	||||||||||...
27	24.8000	* 3.2025	||||||||||||||||	0.4874	||||||||.....	0.1052	|||||||.....
28	7.7400	* 2.1516	|||||||||.....	0.0529	|.....	0.0244	|.....
29	28.3000	0.6092	||.....	0.0311	|.....	0.1416	||||||||||....
30	8.8100	1.1733	|||||.....	0.0173	|.....	0.0248	|.....
31	9.1500	-0.2063	|.....	0.0006	|.....	0.0250	|.....
32	5.3300	-0.4857	||.....	0.0032	|.....	0.0259	|.....
33	11.8000	0.9509	||||.....	0.0136	|.....	0.0291	|.....
34	0.0900	0.0713	|.....	0.0001	|.....	0.0401	|.....
35	0.3500	-0.3599	|.....	0.0027	|.....	0.0390	|.....
36	0.3400	-0.4327	|.....	0.0039	|.....	0.0390	|.....
37	1.1100	-0.3529	|.....	0.0024	|.....	0.0361	|.....
38	0.7700	-0.1666	|.....	0.0006	|.....	0.0374	|.....
39	0.3300	-0.4777	||.....	0.0047	|.....	0.0391	|.....
40	0.3300	0.2491	|.....	0.0013	|.....	0.0391	|.....
41	0.0700	-0.4582	||.....	0.0045	|.....	0.0401	|.....
42	0.3000	-0.5154	||.....	0.0055	|.....	0.0392	|.....
43	0.2300	-0.4849	||.....	0.0049	|.....	0.0395	|.....
44	0.0700	-0.4608	||.....	0.0045	|.....	0.0401	|.....
45	0.0400	-0.5340	||.....	0.0061	|.....	0.0403	|.....
46	3.7100	1.3451	||||||.....	0.0261	|.....	0.0286	|.....
47	8.7000	1.5566	|||||||.....	0.0296	|.....	0.0247	|.....
48	7.0200	0.4788	||.....	0.0029	|.....	0.0245	|.....
49	29.0000	* -2.7596	||||||||||...	* 0.5729	|||||||||.....	0.1496	||||||||||....
50	6.3600	-0.0272	|.....	0.0000	|.....	0.0248	|.....
51	16.0000	0.2829	|.....	0.0019	|.....	0.0436	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Inverse Prediction of X Means

Row	Invert (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	30.2000	31.6000	17.6900	13.9100	15.4205	20.6776
11	20.2000	17.5000	10.7737	6.7263	9.0050	12.7661
13	9.0700	4.0800	3.0758	1.0042	0.9262	4.8991
14	16.3000	14.1000	8.0764	6.0236	6.3084	9.8753
15	11.1000	0.3700	4.4799	-4.1099	2.4842	6.2494
16	1.6100	0.0800	-2.0837	2.1637	-5.0151	0.1524
17	2.3600	0.4300	-1.5650	1.9950	-4.4065	0.6184
18	1.5200	0.1100	-2.1460	2.2560	-5.0883	0.0966
19	1.9700	0.6200	-1.8347	2.4547	-4.7227	0.3758
20	4.5000	1.5000	-0.0849	1.5849	-2.6815	1.9594
21	1.3200	0.0300	-2.2843	2.3143	-5.2509	-0.0272
22	34.6000	13.6000	20.7332	-7.1332	18.1163	24.2857
23	8.7700	2.0200	2.8684	-0.8484	0.6933	4.7021
24	24.5000	12.2000	13.7477	-1.5477	11.8321	16.0996
25	26.0000	14.9000	14.7852	0.1148	12.7906	17.2901
26	53.8000	29.5000	34.0126	-4.5126	29.5782	40.3316
27	62.3000	24.8000	39.8915	-15.0915	34.5891	47.4985
28	32.1000	7.7400	19.0042	-11.2642	16.5905	22.2298
29	50.1000	28.3000	31.4535	-3.1535	27.3895	37.2193
30	26.6000	8.8100	15.2002	-6.3902	13.1708	17.7696
31	16.2000	9.1500	8.0072	1.1428	6.2373	9.8031
32	8.4500	5.3300	2.6470	2.6830	0.4442	4.4928
33	29.2000	11.8000	16.9984	-5.1984	14.8004	19.8650
34	5.3200	0.0900	0.4822	-0.3922	-2.0258	2.4784
35	2.2700	0.3500	-1.6273	1.9773	-4.4794	0.5623
36	1.6800	0.3400	-2.0353	2.3753	-4.9582	0.1958
37	3.4200	1.1100	-0.8319	1.9419	-3.5498	1.2803
38	4.4100	0.7700	-0.1472	0.9172	-2.7537	1.9026
39	1.3100	0.3300	-2.2912	2.6212	-5.2591	-0.0334
40	7.0800	0.3300	1.6995	-1.3695	-0.6299	3.6040
41	1.0900	0.0700	-2.4434	2.5134	-5.4382	-0.1695
42	0.9700	0.3000	-2.5264	2.8264	-5.5359	-0.2437
43	1.1100	0.2300	-2.4296	2.6596	-5.4219	-0.1572
44	1.0700	0.0700	-2.4572	2.5272	-5.4545	-0.1819
45	0.4500	0.0400	-2.8860	2.9260	-5.9600	-0.5646
46	20.5000	3.7100	10.9812	-7.2712	9.2068	12.9942
47	29.3000	8.7000	17.0676	-8.3676	14.8625	19.9461
48	18.6000	7.0200	9.6671	-2.6471	7.9159	11.5630
49	27.7000	29.0000	15.9610	13.0390	13.8636	18.6528
50	13.6000	6.3600	6.2089	0.1511	4.3549	7.9604
51	30.0000	16.0000	17.5517	-1.5517	15.2967	20.5148

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Invert X = Vegetation

Inverse Prediction of X Individuals

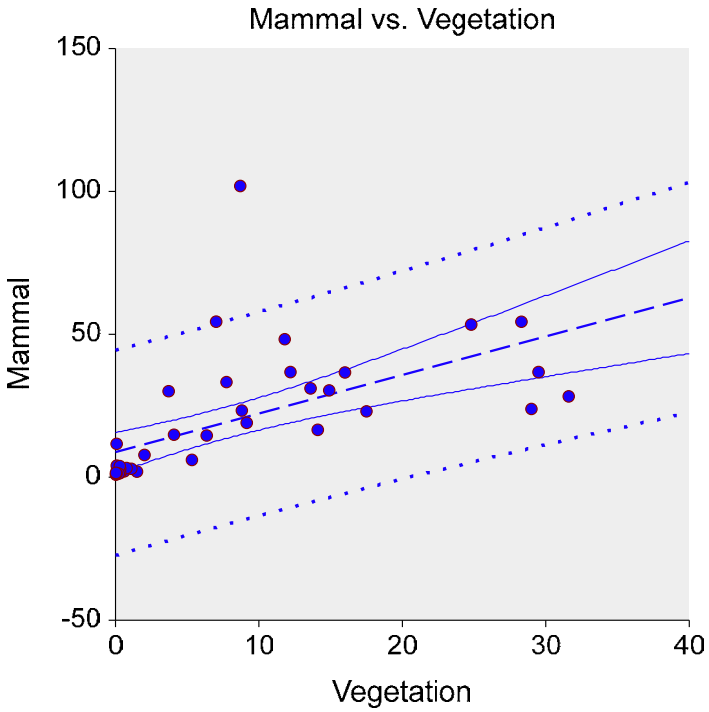
Row	Invert (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	30.2000	31.6000	17.6900	13.9100	6.3429	29.7552
11	20.2000	17.5000	10.7737	6.7263	-0.6756	22.4467
13	9.0700	4.0800	3.0758	1.0042	-8.6662	14.4915
14	16.3000	14.1000	8.0764	6.0236	-3.4539	19.6376
15	11.1000	0.3700	4.4799	-4.1099	-7.1947	15.9283
16	1.6100	0.0800	-2.0837	2.1637	-14.1275	9.2648
17	2.3600	0.4300	-1.5650	1.9950	-13.5747	9.7865
18	1.5200	0.1100	-2.1460	2.2560	-14.1939	9.2022
19	1.9700	0.6200	-1.8347	2.4547	-13.8620	9.5151
20	4.5000	1.5000	-0.0849	1.5849	-12.0019	11.2797
21	1.3200	0.0300	-2.2843	2.3143	-14.3415	9.0633
22	34.6000	13.6000	20.7332	-7.1332	9.3841	33.0179
23	8.7700	2.0200	2.8684	-0.8484	-8.8842	14.2797
24	24.5000	12.2000	13.7477	-1.5477	2.3608	25.5709
25	26.0000	14.9000	14.7852	0.1148	3.4135	26.6673
26	53.8000	29.5000	34.0126	-4.5126	22.3441	47.5657
27	62.3000	24.8000	39.8915	-15.0915	27.9371	54.1506
28	32.1000	7.7400	19.0042	-11.2642	7.6596	31.1606
29	50.1000	28.3000	31.4535	-3.1535	19.8834	44.7253
30	26.6000	8.8100	15.2002	-6.3902	3.8336	27.1068
31	16.2000	9.1500	8.0072	1.1428	-3.5255	19.5658
32	8.4500	5.3300	2.6470	2.6830	-9.1169	14.0539
33	29.2000	11.8000	16.9984	-5.1984	5.6478	29.0176
34	5.3200	0.0900	0.4822	-0.3922	-11.4011	11.8537
35	2.2700	0.3500	-1.6273	1.9773	-13.6410	9.7239
36	1.6800	0.3400	-2.0353	2.3753	-14.0759	9.3135
37	3.4200	1.1100	-0.8319	1.9419	-12.7948	10.5253
38	4.4100	0.7700	-0.1472	0.9172	-12.0679	11.2168
39	1.3100	0.3300	-2.2912	2.6212	-14.3488	9.0563
40	7.0800	0.3300	1.6995	-1.3695	-10.1149	13.0890
41	1.0900	0.0700	-2.4434	2.5134	-14.5113	8.9036
42	0.9700	0.3000	-2.5264	2.8264	-14.5999	8.8203
43	1.1100	0.2300	-2.4296	2.6596	-14.4965	8.9175
44	1.0700	0.0700	-2.4572	2.5272	-14.5260	8.8897
45	0.4500	0.0400	-2.8860	2.9260	-14.9841	8.4595
46	20.5000	3.7100	10.9812	-7.2712	-0.4628	22.6638
47	29.3000	8.7000	17.0676	-8.3676	5.7174	29.0913
48	18.6000	7.0200	9.6671	-2.6471	-1.8126	21.2914
49	27.7000	29.0000	15.9610	13.0390	4.6024	27.9140
50	13.6000	6.3600	6.2089	0.1511	-5.3911	17.7064
51	30.0000	16.0000	17.5517	-1.5517	6.2040	29.6075

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Mammal	Rows Processed	58
Independent Variable	Vegetation	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	8.6050	Rows Prediction Only	0
Slope	1.3581	Sum of Frequencies	41
R-Squared	0.3622	Sum of Weights	41.0000
Correlation	0.6018	Coefficient of Variation	0.9172
Mean Square Error	303.2619	Square Root of MSE	17.41442

Linear Regression Report

Y = Mammal X = Vegetation

Summary Statement

The equation of the straight line relating Mammal and Vegetation is estimated as: Mammal = (8.6050) + (1.3581) Vegetation using the 41 observations in this dataset. The y-intercept, the estimated value of Mammal when Vegetation is zero, is 8.6050 with a standard error of 3.5018. The slope, the estimated change in Mammal per unit change in Vegetation, is 1.3581 with a standard error of 0.2886. The value of R-Squared, the proportion of the variation in Mammal that can be accounted for by variation in Vegetation, is 0.3622. The correlation between Mammal and Vegetation is 0.6018.

A significance test that the slope is zero resulted in a t-value of 4.7060. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 1.3581. The lower limit of the 95% confidence interval for the slope is 0.7744 and the upper limit is 1.9418. The estimated intercept is 8.6050. The lower limit of the 95% confidence interval for the intercept is 1.5220 and the upper limit is 15.6880.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	Mammal	Vegetation
Count	41	41
Mean	18.9857	7.6437
Standard Deviation	21.5309	9.5412
Minimum	0.8900	0.0300
Maximum	101.9000	31.6000

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	8.6050	1.3581
Lower 95% Confidence Limit	1.5220	0.7744
Upper 95% Confidence Limit	15.6880	1.9418
Standard Error	3.5018	0.2886
Standardized Coefficient	0.0000	0.6018
T Value	2.4573	4.7060
Prob Level (T Test)	0.0185	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	0.6688	0.9957
Regression of Y on X	8.6050	1.3581
Inverse Regression from X on Y	-9.6757	3.7497
Orthogonal Regression of Y and X	-6.3532	3.3150

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(8.60500894019781) + (1.35807237026885) * (Vegetation)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	8.6050	0.9000	3.8584	12.6622
Bootstrap Mean	8.4467	0.9500	2.6455	13.2695
Bias (BM - OV)	-0.1583	0.9900	-0.0921	14.1003
Bias Corrected	8.7633			
Standard Error	2.7216			
Slope				
Original Value	1.3581	0.9000	0.8136	1.6920
Bootstrap Mean	1.4033	0.9500	0.6539	1.7482
Bias (BM - OV)	0.0453	0.9900	0.2861	1.8697
Bias Corrected	1.3128			
Standard Error	0.2864			
Correlation				
Original Value	0.6018	0.9000	0.3594	0.7574
Bootstrap Mean	0.6352	0.9500	0.3378	0.7883
Bias (BM - OV)	0.0333	0.9900	0.2925	0.8541
Bias Corrected	0.5685			
Standard Error	0.1235			
R-Squared				
Original Value	0.3622	0.9000	0.0117	0.5253
Bootstrap Mean	0.4187	0.9500	0.0000	0.5519
Bias (BM - OV)	0.0565	0.9900	0.0000	0.6022
Bias Corrected	0.3057			
Standard Error	0.1594			
Standard Error of Estimate				
Original Value	17.4144	0.9000	10.2188	26.0426
Bootstrap Mean	16.2243	0.9500	9.2485	26.9073
Bias (BM - OV)	-1.1901	0.9900	6.6040	28.2396
Bias Corrected	18.6045			
Standard Error	4.8762			
Orthogonal Intercept				
Original Value	-6.3532	0.9000	-15.0633	9.9329
Bootstrap Mean	-6.8905	0.9500	-15.4230	15.1807
Bias (BM - OV)	-0.5373	0.9900	-16.2848	32.6780
Bias Corrected	-5.8159			
Standard Error	9.3268			
Orthogonal Slope				
Original Value	3.3150	0.9000	0.4334	4.8959
Bootstrap Mean	3.4238	0.9500	-0.2073	5.0192
Bias (BM - OV)	0.1088	0.9900	-2.0134	5.2016
Bias Corrected	3.2062			
Standard Error	1.4440			

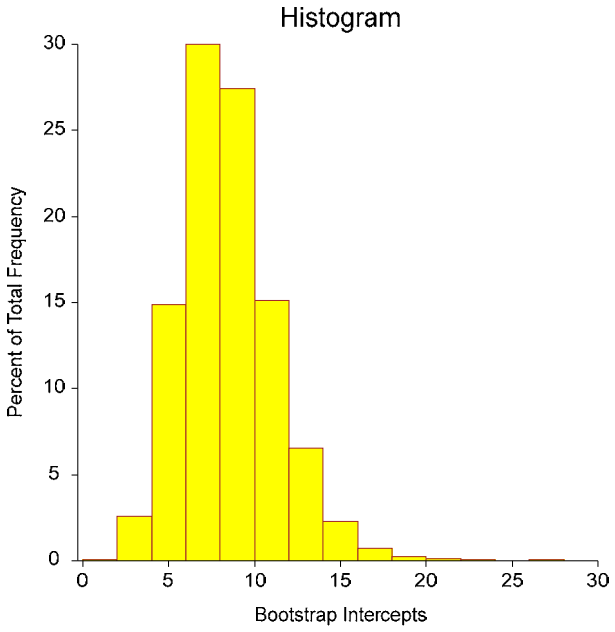
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

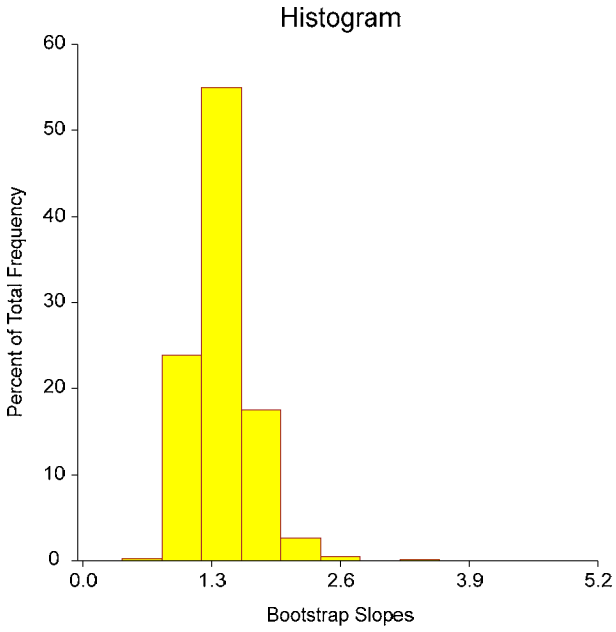
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

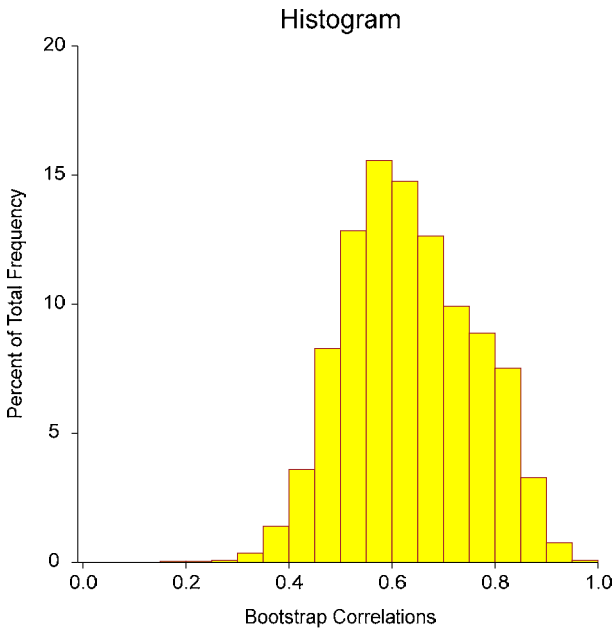
Linear Regression Report

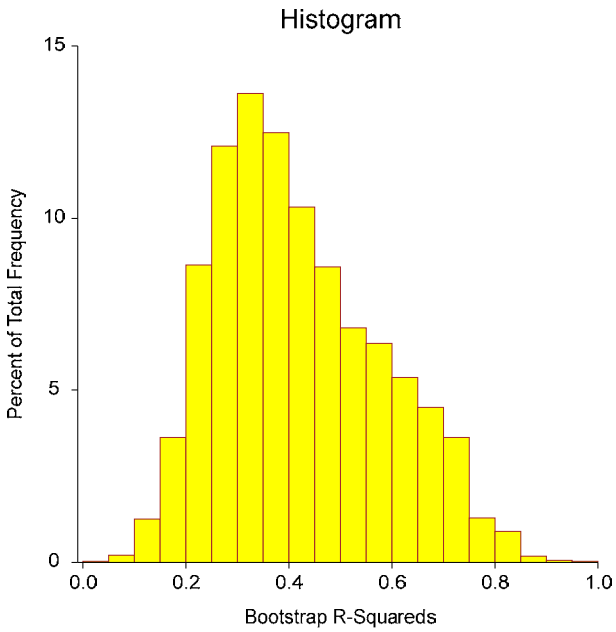
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Bootstrap Histograms Section



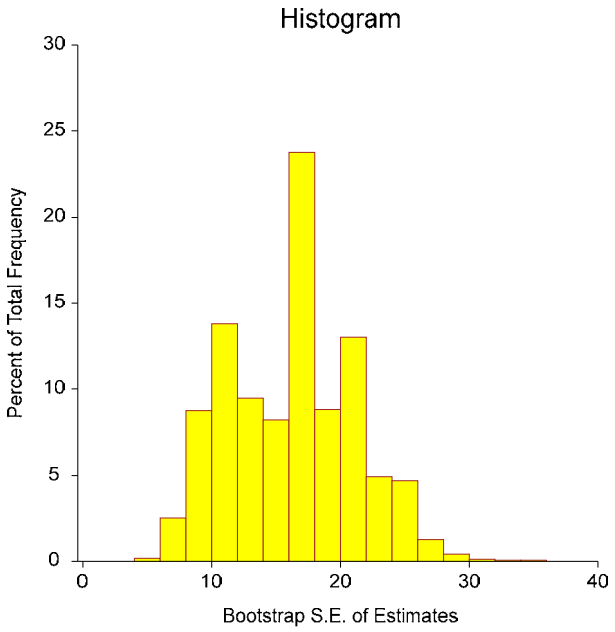


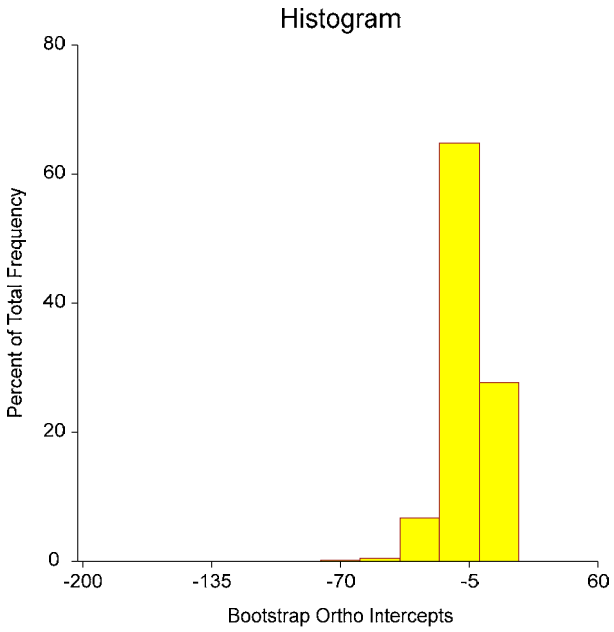


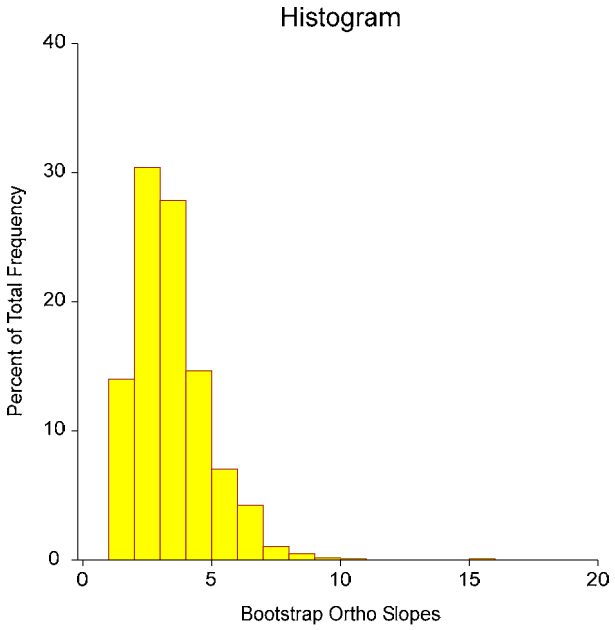


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.6018	0.3622	0.8290
Lower 95% Conf. Limit (r dist'n)	0.3567		
Upper 95% Conf. Limit (r dist'n)	0.7630		
Lower 95% Conf. Limit (Fisher's z)	0.3610		0.6999
Upper 95% Conf. Limit (Fisher's z)	0.7674		0.9057
Adjusted (Rbar)		0.3458	
T-Value for H0: Rho = 0	4.7060	4.7060	9.2583
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	14778.65	14778.65			
Slope	1	6716.034	6716.034	22.1460	0.0000	0.9957
Error	39	11827.21	303.2619			
Lack of Fit	37	11826.2	319.6271	632.0488	0.0016	
Pure Error	2	1.0114	0.5057			
Adj. Total	40	18543.25	463.5812			
Total	41	33321.9				

s = Square Root(303.2619) = 17.41442

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	313.39	778.4117	0.04043509	-0.002099105
1	313.39	6036.835	10895.18	-0.002099105	0.0002746205
2 (Y'Y)			33321.9		
Determinant		149296.9			6.698061E-06

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	12.26242	-0.6365786
1	-0.6365786	0.08328193

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.7027	0.000000	No
Anderson Darling	3.6474	0.000000	No
D'Agostino Skewness	5.3518	0.000000	No
D'Agostino Kurtosis	4.5656	0.000005	No
D'Agostino Omnibus	49.4869	0.000000	No
Constant Residual Variance?			
Modified Levene Test	8.8596	0.004988	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	632.0488	0.001581	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

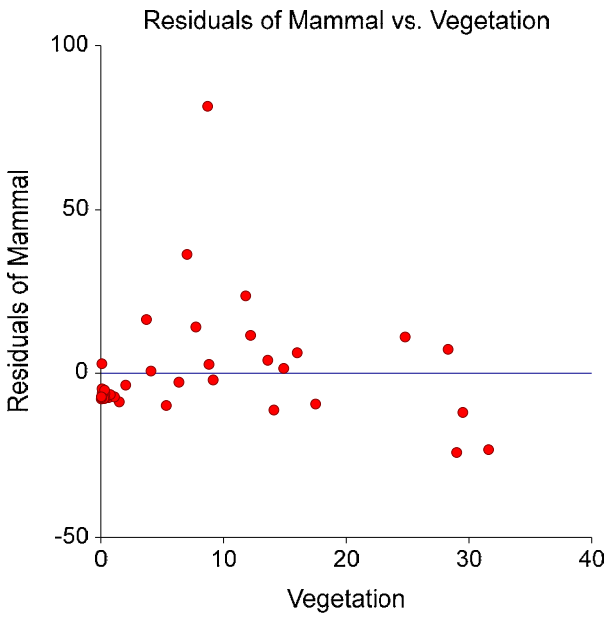
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

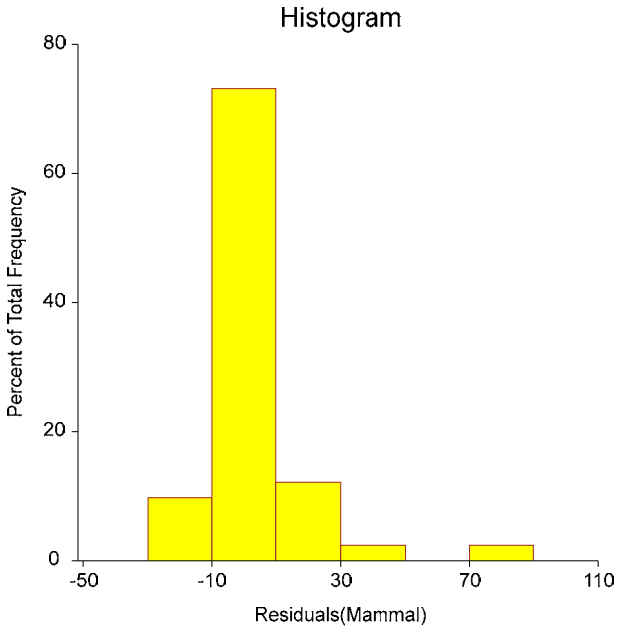
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

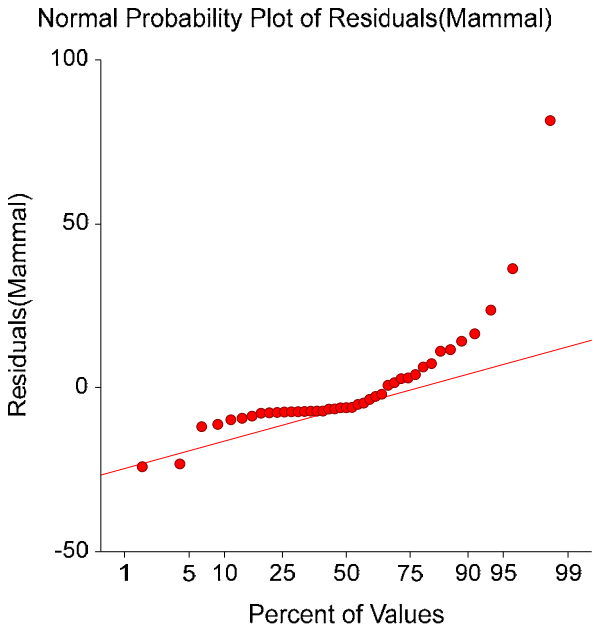
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Original Data Section

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual
10	31.6000	28.3000	51.5201	-23.2201
11	17.5000	23.0667	32.3713	-9.3046
13	4.0800	14.8900	14.1459	0.7441
14	14.1000	16.6000	27.7538	-11.1538
15	0.3700	2.6000	9.1075	-6.5075
16	0.0800	11.6950	8.7137	2.9813
17	0.4300	2.0767	9.1890	-7.1123
18	0.1100	2.7800	8.7544	-5.9744
19	0.6200	2.1100	9.4470	-7.3370
20	1.5000	1.9900	10.6421	-8.6521
21	0.0300	0.8900	8.6458	-7.7558
22	13.6000	31.1000	27.0748	4.0252
23	2.0200	7.8000	11.3483	-3.5483
24	12.2000	36.8000	25.1735	11.6265
25	14.9000	30.4000	28.8403	1.5597
26	29.5000	36.8000	48.6681	-11.8681
27	24.8000	53.4233	42.2852	11.1381
28	7.7400	33.3000	19.1165	14.1835
29	28.3000	54.4000	47.0385	7.3615
30	8.8100	23.3500	20.5696	2.7804
31	9.1500	19.0700	21.0314	-1.9614
32	5.3300	6.0800	15.8435	-9.7635
33	11.8000	48.3000	24.6303	23.6697
34	0.0900	4.0533	8.7272	-4.6739
35	0.3500	2.9867	9.0803	-6.0937
36	0.3400	1.8400	9.0668	-7.2268
37	1.1100	2.9700	10.1125	-7.1425
38	0.7700	3.2100	9.6507	-6.4407
39	0.3300	2.9400	9.0532	-6.1132
40	0.3300	1.5200	9.0532	-7.5332
41	0.0700	1.3900	8.7001	-7.3101
42	0.3000	3.9267	9.0124	-5.0858
43	0.2300	1.2767	8.9174	-7.6407
44	0.0700	1.3100	8.7001	-7.3901
45	0.0400	1.5500	8.6593	-7.1093
46	3.7100	30.1000	13.6435	16.4565
47	8.7000	101.9000	20.4202	81.4798
48	7.0200	54.4500	18.1387	36.3113
49	29.0000	23.9000	47.9891	-24.0891
50	6.3600	14.6000	17.2423	-2.6423
51	16.0000	36.6667	30.3342	6.3325

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Predicted Values and Confidence Limits of Means

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	31.6000	28.3000	51.5201	7.4292	36.4932	66.5470
11	17.5000	23.0667	32.3713	3.9354	24.4112	40.3313
13	4.0800	14.8900	14.1459	2.9076	8.2647	20.0272
14	14.1000	16.6000	27.7538	3.2967	21.0856	34.4220
15	0.3700	2.6000	9.1075	3.4355	2.1585	16.0565
16	0.0800	11.6950	8.7137	3.4873	1.6600	15.7673
17	0.4300	2.0767	9.1890	3.4250	2.2613	16.1166
18	0.1100	2.7800	8.7544	3.4819	1.7117	15.7971
19	0.6200	2.1100	9.4470	3.3919	2.5862	16.3078
20	1.5000	1.9900	10.6421	3.2465	4.0754	17.2089
21	0.0300	0.8900	8.6458	3.4963	1.5738	15.7177
22	13.6000	31.1000	27.0748	3.2173	20.5671	33.5825
23	2.0200	7.8000	11.3483	3.1671	4.9423	17.7544
24	12.2000	36.8000	25.1735	3.0209	19.0632	31.2838
25	14.9000	30.4000	28.8403	3.4325	21.8975	35.7831
26	29.5000	36.8000	48.6681	6.8688	34.7747	62.5616
27	24.8000	53.4233	42.2852	5.6489	30.8593	53.7111
28	7.7400	33.3000	19.1165	2.7198	13.6151	24.6178
29	28.3000	54.4000	47.0385	6.5522	33.7853	60.2916
30	8.8100	23.3500	20.5696	2.7404	15.0266	26.1127
31	9.1500	19.0700	21.0314	2.7542	15.4605	26.6023
32	5.3300	6.0800	15.8435	2.8004	10.1791	21.5080
33	11.8000	48.3000	24.6303	2.9724	18.6180	30.6426
34	0.0900	4.0533	8.7272	3.4855	1.6772	15.7773
35	0.3500	2.9867	9.0803	3.4390	2.1242	16.0365
36	0.3400	1.8400	9.0668	3.4408	2.1071	16.0264
37	1.1100	2.9700	10.1125	3.3094	3.4187	16.8063
38	0.7700	3.2100	9.6507	3.3662	2.8419	16.4596
39	0.3300	2.9400	9.0532	3.4426	2.0899	16.0164
40	0.3300	1.5200	9.0532	3.4426	2.0899	16.0164
41	0.0700	1.3900	8.7001	3.4891	1.6427	15.7574
42	0.3000	3.9267	9.0124	3.4479	2.0384	15.9865
43	0.2300	1.2767	8.9174	3.4603	1.9182	15.9166
44	0.0700	1.3100	8.7001	3.4891	1.6427	15.7574
45	0.0400	1.5500	8.6593	3.4945	1.5910	15.7277
46	3.7100	30.1000	13.6435	2.9471	7.6824	19.6045
47	8.7000	101.9000	20.4202	2.7367	14.8847	25.9557
48	7.0200	54.4500	18.1387	2.7256	12.6256	23.6518
49	29.0000	23.9000	47.9891	6.7365	34.3632	61.6150
50	6.3600	14.6000	17.2423	2.7448	11.6905	22.7942
51	16.0000	36.6667	30.3342	3.6348	22.9820	37.6863

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Predicted Values and Prediction Limits

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	31.6000	28.3000	51.5201	18.9329	13.2247	89.8155
11	17.5000	23.0667	32.3713	17.8535	-3.7409	68.4835
13	4.0800	14.8900	14.1459	17.6555	-21.5656	49.8575
14	14.1000	16.6000	27.7538	17.7237	-8.0958	63.6034
15	0.3700	2.6000	9.1075	17.7501	-26.7954	45.0104
16	0.0800	11.6950	8.7137	17.7602	-27.2096	44.6370
17	0.4300	2.0767	9.1890	17.7480	-26.7098	45.0877
18	0.1100	2.7800	8.7544	17.7591	-27.1668	44.6755
19	0.6200	2.1100	9.4470	17.7417	-26.4389	45.3329
20	1.5000	1.9900	10.6421	17.7145	-25.1888	46.4730
21	0.0300	0.8900	8.6458	17.7619	-27.2811	44.5726
22	13.6000	31.1000	27.0748	17.7091	-8.7453	62.8949
23	2.0200	7.8000	11.3483	17.7001	-24.4534	47.1501
24	12.2000	36.8000	25.1735	17.6745	-10.5765	60.9235
25	14.9000	30.4000	28.8403	17.7495	-7.0614	64.7420
26	29.5000	36.8000	48.6681	18.7201	10.8032	86.5331
27	24.8000	53.4233	42.2852	18.3077	5.2544	79.3160
28	7.7400	33.3000	19.1165	17.6255	-16.5345	54.7675
29	28.3000	54.4000	47.0385	18.6063	9.4037	84.6732
30	8.8100	23.3500	20.5696	17.6287	-15.0878	56.2271
31	9.1500	19.0700	21.0314	17.6309	-14.6304	56.6932
32	5.3300	6.0800	15.8435	17.6381	-19.8330	51.5201
33	11.8000	48.3000	24.6303	17.6663	-11.1031	60.3637
34	0.0900	4.0533	8.7272	17.7598	-27.1953	44.6498
35	0.3500	2.9867	9.0803	17.7507	-26.8239	44.9846
36	0.3400	1.8400	9.0668	17.7511	-26.8382	44.9717
37	1.1100	2.9700	10.1125	17.7261	-25.7419	45.9668
38	0.7700	3.2100	9.6507	17.7368	-26.2253	45.5267
39	0.3300	2.9400	9.0532	17.7514	-26.8525	44.9588
40	0.3300	1.5200	9.0532	17.7514	-26.8525	44.9588
41	0.0700	1.3900	8.7001	17.7605	-27.2239	44.6241
42	0.3000	3.9267	9.0124	17.7525	-26.8953	44.9202
43	0.2300	1.2767	8.9174	17.7549	-26.9953	44.8300
44	0.0700	1.3100	8.7001	17.7605	-27.2239	44.6241
45	0.0400	1.5500	8.6593	17.7616	-27.2668	44.5855
46	3.7100	30.1000	13.6435	17.6620	-22.0814	49.3683
47	8.7000	101.9000	20.4202	17.6281	-15.2360	56.0765
48	7.0200	54.4500	18.1387	17.6264	-17.5141	53.7915
49	29.0000	23.9000	47.9891	18.6720	10.2215	85.7568
50	6.3600	14.6000	17.2423	17.6294	-18.4165	52.9012
51	16.0000	36.6667	30.3342	17.7897	-5.6489	66.3173

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Working-Hotelling Simultaneous Confidence Band

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	31.6000	28.3000	51.5201	7.4292	30.3479	72.6923
11	17.5000	23.0667	32.3713	3.9354	21.1559	43.5866
13	4.0800	14.8900	14.1459	2.9076	5.8596	22.4323
14	14.1000	16.6000	27.7538	3.2967	18.3587	37.1490
15	0.3700	2.6000	9.1075	3.4355	-0.6833	18.8983
16	0.0800	11.6950	8.7137	3.4873	-1.2246	18.6519
17	0.4300	2.0767	9.1890	3.4250	-0.5717	18.9497
18	0.1100	2.7800	8.7544	3.4819	-1.1685	18.6773
19	0.6200	2.1100	9.4470	3.3919	-0.2195	19.1135
20	1.5000	1.9900	10.6421	3.2465	1.3899	19.8944
21	0.0300	0.8900	8.6458	3.4963	-1.3183	18.6098
22	13.6000	31.1000	27.0748	3.2173	17.9058	36.2438
23	2.0200	7.8000	11.3483	3.1671	2.3225	20.3741
24	12.2000	36.8000	25.1735	3.0209	16.5644	33.7825
25	14.9000	30.4000	28.8403	3.4325	19.0582	38.6224
26	29.5000	36.8000	48.6681	6.8688	29.0930	68.2433
27	24.8000	53.4233	42.2852	5.6489	26.1866	58.3838
28	7.7400	33.3000	19.1165	2.7198	11.3654	26.8676
29	28.3000	54.4000	47.0385	6.5522	28.3654	65.7115
30	8.8100	23.3500	20.5696	2.7404	12.7598	28.3795
31	9.1500	19.0700	21.0314	2.7542	13.1823	28.8805
32	5.3300	6.0800	15.8435	2.8004	7.8627	23.8244
33	11.8000	48.3000	24.6303	2.9724	16.1592	33.1013
34	0.0900	4.0533	8.7272	3.4855	-1.2059	18.6604
35	0.3500	2.9867	9.0803	3.4390	-0.7205	18.8812
36	0.3400	1.8400	9.0668	3.4408	-0.7391	18.8726
37	1.1100	2.9700	10.1125	3.3094	0.6812	19.5437
38	0.7700	3.2100	9.6507	3.3662	0.0574	19.2440
39	0.3300	2.9400	9.0532	3.4426	-0.7577	18.8641
40	0.3300	1.5200	9.0532	3.4426	-0.7577	18.8641
41	0.0700	1.3900	8.7001	3.4891	-1.2434	18.6435
42	0.3000	3.9267	9.0124	3.4479	-0.8136	18.8385
43	0.2300	1.2767	8.9174	3.4603	-0.9442	18.7789
44	0.0700	1.3100	8.7001	3.4891	-1.2434	18.6435
45	0.0400	1.5500	8.6593	3.4945	-1.2996	18.6182
46	3.7100	30.1000	13.6435	2.9471	5.2446	22.0423
47	8.7000	101.9000	20.4202	2.7367	12.6210	28.2195
48	7.0200	54.4500	18.1387	2.7256	10.3710	25.9064
49	29.0000	23.9000	47.9891	6.7365	28.7908	67.1874
50	6.3600	14.6000	17.2423	2.7448	9.4201	25.0646
51	16.0000	36.6667	30.3342	3.6348	19.9753	40.6930

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Residual Section

Row	Vegetation (X)	Mammal (Y)	Predicted Mammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	31.6000	28.3000	51.5201	-23.2201	-1.4743	82.0498
11	17.5000	23.0667	32.3713	-9.3046	-0.5485	40.3379
13	4.0800	14.8900	14.1459	0.7441	0.0433	4.9970
14	14.1000	16.6000	27.7538	-11.1538	-0.6523	67.1917
15	0.3700	2.6000	9.1075	-6.5075	-0.3812	250.2883
16	0.0800	11.6950	8.7137	2.9813	0.1747	25.4925
17	0.4300	2.0767	9.1890	-7.1123	-0.4166	342.4870
18	0.1100	2.7800	8.7544	-5.9744	-0.3501	214.9064
19	0.6200	2.1100	9.4470	-7.3370	-0.4295	347.7258
20	1.5000	1.9900	10.6421	-8.6521	-0.5057	434.7798
21	0.0300	0.8900	8.6458	-7.7558	-0.4546	871.4327
22	13.6000	31.1000	27.0748	4.0252	0.2352	12.9428
23	2.0200	7.8000	11.3483	-3.5483	-0.2072	45.4912
24	12.2000	36.8000	25.1735	11.6265	0.6779	31.5938
25	14.9000	30.4000	28.8403	1.5597	0.0914	5.1306
26	29.5000	36.8000	48.6681	-11.8681	-0.7416	32.2504
27	24.8000	53.4233	42.2852	11.1381	0.6762	20.8488
28	7.7400	33.3000	19.1165	14.1835	0.8246	42.5931
29	28.3000	54.4000	47.0385	7.3615	0.4563	13.5322
30	8.8100	23.3500	20.5696	2.7804	0.1617	11.9074
31	9.1500	19.0700	21.0314	-1.9614	-0.1141	10.2851
32	5.3300	6.0800	15.8435	-9.7635	-0.5681	160.5845
33	11.8000	48.3000	24.6303	23.6697	1.3794	49.0057
34	0.0900	4.0533	8.7272	-4.6739	-0.2739	115.3101
35	0.3500	2.9867	9.0803	-6.0937	-0.3570	204.0290
36	0.3400	1.8400	9.0668	-7.2268	-0.4233	392.7583
37	1.1100	2.9700	10.1125	-7.1425	-0.4178	240.4872
38	0.7700	3.2100	9.6507	-6.4407	-0.3770	200.6456
39	0.3300	2.9400	9.0532	-6.1132	-0.3581	207.9310
40	0.3300	1.5200	9.0532	-7.5332	-0.4413	495.6035
41	0.0700	1.3900	8.7001	-7.3101	-0.4285	525.9046
42	0.3000	3.9267	9.0124	-5.0858	-0.2979	129.5186
43	0.2300	1.2767	8.9174	-7.6407	-0.4477	598.4882
44	0.0700	1.3100	8.7001	-7.3901	-0.4331	564.1278
45	0.0400	1.5500	8.6593	-7.1093	-0.4167	458.6666
46	3.7100	30.1000	13.6435	16.4565	0.9588	54.6729
47	8.7000	101.9000	20.4202	81.4798	4.7377	79.9605
48	7.0200	54.4500	18.1387	36.3113	2.1111	66.6875
49	29.0000	23.9000	47.9891	-24.0891	-1.5001	100.7912
50	6.3600	14.6000	17.2423	-2.6423	-0.1537	18.0983
51	16.0000	36.6667	30.3342	6.3325	0.3718	17.2705

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Residual Diagnostics Section

Row	Vegetation (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	31.6000	-23.2201	*-1.4976	0.1820	0.2418	293.8968
11	17.5000	-9.3046	-0.5435	0.0511	0.0081	308.8415
13	4.0800	0.7441	0.0428	0.0279	0.0000	311.2275
14	14.1000	-11.1538	-0.6474	0.0358	0.0079	307.8469
15	0.3700	-6.5075	-0.3770	0.0389	0.0029	310.0829
16	0.0800	2.9813	0.1726	0.0401	0.0006	310.9988
17	0.4300	-7.1123	-0.4121	0.0387	0.0035	309.8577
18	0.1100	-5.9744	-0.3462	0.0400	0.0026	310.2640
19	0.6200	-7.3370	-0.4250	0.0379	0.0036	309.7700
20	1.5000	-8.6521	-0.5008	0.0348	0.0046	309.2015
21	0.0300	-7.7558	-0.4499	0.0403	0.0043	309.5930
22	13.6000	4.0252	0.2323	0.0341	0.0010	310.8010
23	2.0200	-3.5483	-0.2047	0.0331	0.0007	310.8998
24	12.2000	11.6265	0.6731	0.0301	0.0071	307.5748
25	14.9000	1.5597	0.0902	0.0389	0.0002	311.1758
26	29.5000	-11.8681	*-0.7373	0.1556	0.0507	306.8529
27	24.8000	11.1381	*0.6714	0.1052	0.0269	307.5938
28	7.7400	14.1835	0.8211	0.0244	0.0085	305.8161
29	28.3000	7.3615	*0.4516	0.1416	0.0172	309.5811
30	8.8100	2.7804	0.1596	0.0248	0.0003	311.0338
31	9.1500	-1.9614	-0.1126	0.0250	0.0002	311.1386
32	5.3300	-9.7635	-0.5631	0.0259	0.0043	308.6673
33	11.8000	23.6697	1.3961	0.0291	0.0286	296.0564
34	0.0900	-4.6739	-0.2707	0.0401	0.0016	310.6436
35	0.3500	-6.0937	-0.3529	0.0390	0.0026	310.2256
36	0.3400	-7.2268	-0.4188	0.0390	0.0036	309.8122
37	1.1100	-7.1425	-0.4133	0.0361	0.0033	309.8496
38	0.7700	-6.4407	-0.3728	0.0374	0.0028	310.1084
39	0.3300	-6.1132	-0.3541	0.0391	0.0026	310.2190
40	0.3300	-7.5332	-0.4367	0.0391	0.0040	309.6883
41	0.0700	-7.3101	-0.4239	0.0401	0.0038	309.7774
42	0.3000	-5.0858	-0.2944	0.0392	0.0018	310.5340
43	0.2300	-7.6407	-0.4430	0.0395	0.0041	309.6430
44	0.0700	-7.3901	-0.4286	0.0401	0.0039	309.7451
45	0.0400	-7.1093	-0.4123	0.0403	0.0036	309.8566
46	3.7100	16.4565	0.9578	0.0286	0.0136	303.9055
47	8.7000	81.4798	*7.1782	0.0247	0.2842	132.1092
48	7.0200	36.3113	*2.2143	0.0245	0.0560	275.6734
49	29.0000	-24.0891	*-1.5254	0.1496	0.1980	293.2845
50	6.3600	-2.6423	-0.1517	0.0248	0.0003	311.0540
51	16.0000	6.3325	0.3677	0.0436	0.0031	310.1391

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-1.4976	-0.7064	0.2418	* 1.1482	0.2132	-0.6574
11	-0.5435	-0.1261	0.0081	1.0930	-0.0103	-0.0911
13	0.0428	0.0072	0.0000	1.0834	0.0069	-0.0026
14	-0.6474	-0.1248	0.0079	1.0688	-0.0355	-0.0705
15	-0.3770	-0.0759	0.0029	1.0878	-0.0758	0.0463
16	0.1726	0.0353	0.0006	1.0956	0.0353	-0.0221
17	-0.4121	-0.0827	0.0035	1.0860	-0.0826	0.0502
18	-0.3462	-0.0706	0.0026	1.0903	-0.0706	0.0441
19	-0.4250	-0.0844	0.0036	1.0845	-0.0843	0.0504
20	-0.5008	-0.0950	0.0046	1.0770	-0.0945	0.0519
21	-0.4499	-0.0922	0.0043	1.0860	-0.0922	0.0580
22	0.2323	0.0437	0.0010	1.0875	0.0140	0.0233
23	-0.2047	-0.0379	0.0007	1.0870	-0.0375	0.0194
24	0.6731	0.1186	0.0071	1.0606	0.0504	0.0516
25	0.0902	0.0181	0.0002	1.0954	0.0042	0.0111
26	-0.7373	-0.3165	0.0507	* 1.2125	0.0857	-0.2906
27	0.6714	0.2302	0.0269	* 1.1498	-0.0410	0.2018
28	0.8211	0.1298	0.0085	1.0423	0.1000	0.0013
29	0.4516	0.1834	0.0172	* 1.2140	-0.0460	0.1668
30	0.1596	0.0254	0.0003	1.0786	0.0176	0.0031
31	-0.1126	-0.0180	0.0002	1.0796	-0.0120	-0.0028
32	-0.5631	-0.0917	0.0043	1.0635	-0.0830	0.0219
33	1.3961	0.2419	0.0286	0.9816	0.1104	0.0976
34	-0.2707	-0.0553	0.0016	1.0931	-0.0553	0.0346
35	-0.3529	-0.0711	0.0026	1.0889	-0.0711	0.0435
36	-0.4188	-0.0844	0.0036	1.0861	-0.0844	0.0517
37	-0.4133	-0.0800	0.0033	1.0830	-0.0798	0.0456
38	-0.3728	-0.0734	0.0028	1.0863	-0.0733	0.0433
39	-0.3541	-0.0714	0.0026	1.0890	-0.0714	0.0438
40	-0.4367	-0.0881	0.0040	1.0852	-0.0880	0.0540
41	-0.4239	-0.0867	0.0038	1.0871	-0.0867	0.0543
42	-0.2944	-0.0595	0.0018	1.0913	-0.0595	0.0366
43	-0.4430	-0.0898	0.0041	1.0854	-0.0898	0.0555
44	-0.4286	-0.0876	0.0039	1.0868	-0.0876	0.0549
45	-0.4123	-0.0844	0.0036	1.0878	-0.0844	0.0530
46	0.9578	0.1645	0.0136	1.0339	0.1578	-0.0634
47	* 7.1782	1.1423	0.2842	0.1946	0.8015	0.1272
48	* 2.2143	0.3509	0.0560	0.8471	0.2865	-0.0232
49	-1.5254	-0.6399	0.1980	1.0999	0.1681	-0.5854
50	-0.1517	-0.0242	0.0003	1.0789	-0.0207	0.0033
51	0.3677	0.0785	0.0031	1.0935	0.0128	0.0521

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Outlier Detection Chart

Row	Vegetation (X)	Residual		Standardized Residual		RStudent	
10	31.6000	-23.2201	||||.....	-1.4743	||||.....	-1.4976	|||.....
11	17.5000	-9.3046	|.....	-0.5485	|.....	-0.5435	|.....
13	4.0800	0.7441	|.....	0.0433	|.....	0.0428	|.....
14	14.1000	-11.1538	|.....	-0.6523	|.....	-0.6474	|.....
15	0.3700	-6.5075	|.....	-0.3812	|.....	-0.3770	|.....
16	0.0800	2.9813	|.....	0.1747	|.....	0.1726	|.....
17	0.4300	-7.1123	|.....	-0.4166	|.....	-0.4121	|.....
18	0.1100	-5.9744	|.....	-0.3501	|.....	-0.3462	|.....
19	0.6200	-7.3370	|.....	-0.4295	|.....	-0.4250	|.....
20	1.5000	-8.6521	|.....	-0.5057	|.....	-0.5008	|.....
21	0.0300	-7.7558	|.....	-0.4546	|.....	-0.4499	|.....
22	13.6000	4.0252	|.....	0.2352	|.....	0.2323	|.....
23	2.0200	-3.5483	|.....	-0.2072	|.....	-0.2047	|.....
24	12.2000	11.6265	||.....	0.6779	||.....	0.6731	|.....
25	14.9000	1.5597	|.....	0.0914	|.....	0.0902	|.....
26	29.5000	-11.8681	||.....	-0.7416	||.....	-0.7373	|.....
27	24.8000	11.1381	|.....	0.6762	||.....	0.6714	|.....
28	7.7400	14.1835	||.....	0.8246	||.....	0.8211	|.....
29	28.3000	7.3615	|.....	0.4563	|.....	0.4516	|.....
30	8.8100	2.7804	|.....	0.1617	|.....	0.1596	|.....
31	9.1500	-1.9614	|.....	-0.1141	|.....	-0.1126	|.....
32	5.3300	-9.7635	|.....	-0.5681	|.....	-0.5631	|.....
33	11.8000	23.6697	||||.....	1.3794	||||.....	1.3961	||.....
34	0.0900	-4.6739	|.....	-0.2739	|.....	-0.2707	|.....
35	0.3500	-6.0937	|.....	-0.3570	|.....	-0.3529	|.....
36	0.3400	-7.2268	|.....	-0.4233	|.....	-0.4188	|.....
37	1.1100	-7.1425	|.....	-0.4178	|.....	-0.4133	|.....
38	0.7700	-6.4407	|.....	-0.3770	|.....	-0.3728	|.....
39	0.3300	-6.1132	|.....	-0.3581	|.....	-0.3541	|.....
40	0.3300	-7.5332	|.....	-0.4413	|.....	-0.4367	|.....
41	0.0700	-7.3101	|.....	-0.4285	|.....	-0.4239	|.....
42	0.3000	-5.0858	|.....	-0.2979	|.....	-0.2944	|.....
43	0.2300	-7.6407	|.....	-0.4477	|.....	-0.4430	|.....
44	0.0700	-7.3901	|.....	-0.4331	|.....	-0.4286	|.....
45	0.0400	-7.1093	|.....	-0.4167	|.....	-0.4123	|.....
46	3.7100	16.4565	||.....	0.9588	||.....	0.9578	|.....
47	8.7000	81.4798	||||||||||||||||	4.7377	||||||||||||||||	* 7.1782	||||||||||||||
48	7.0200	36.3113	||||||.....	2.1111	||||||.....	* 2.2143	||||.....
49	29.0000	-24.0891	||||.....	-1.5001	||||.....	-1.5254	|||.....
50	6.3600	-2.6423	|.....	-0.1537	|.....	-0.1517	|.....
51	16.0000	6.3325	|.....	0.3718	|.....	0.3677	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Influence Detection Chart

Row	Vegetation (X)	DFFITS		Cook's D		DFBETAS(1)	
10	31.6000	-0.7064	||||||||.....	0.2418	||||||||||...	-0.6574	||||||||||||||
11	17.5000	-0.1261	|.....	0.0081	|.....	-0.0911	||.....
13	4.0800	0.0072	|.....	0.0000	|.....	-0.0026	|.....
14	14.1000	-0.1248	|.....	0.0079	|.....	-0.0705	|.....
15	0.3700	-0.0759	|.....	0.0029	|.....	0.0463	|.....
16	0.0800	0.0353	|.....	0.0006	|.....	-0.0221	|.....
17	0.4300	-0.0827	|.....	0.0035	|.....	0.0502	|.....
18	0.1100	-0.0706	|.....	0.0026	|.....	0.0441	|.....
19	0.6200	-0.0844	|.....	0.0036	|.....	0.0504	|.....
20	1.5000	-0.0950	|.....	0.0046	|.....	0.0519	|.....
21	0.0300	-0.0922	|.....	0.0043	|.....	0.0580	|.....
22	13.6000	0.0437	|.....	0.0010	|.....	0.0233	|.....
23	2.0200	-0.0379	|.....	0.0007	|.....	0.0194	|.....
24	12.2000	0.1186	|.....	0.0071	|.....	0.0516	|.....
25	14.9000	0.0181	|.....	0.0002	|.....	0.0111	|.....
26	29.5000	-0.3165	||||.....	0.0507	||.....	-0.2906	||||||.....
27	24.8000	0.2302	||.....	0.0269	|.....	0.2018	||||.....
28	7.7400	0.1298	|.....	0.0085	|.....	0.0013	|.....
29	28.3000	0.1834	||.....	0.0172	|.....	0.1668	|||.....
30	8.8100	0.0254	|.....	0.0003	|.....	0.0031	|.....
31	9.1500	-0.0180	|.....	0.0002	|.....	-0.0028	|.....
32	5.3300	-0.0917	|.....	0.0043	|.....	0.0219	|.....
33	11.8000	0.2419	|||.....	0.0286	|.....	0.0976	||.....
34	0.0900	-0.0553	|.....	0.0016	|.....	0.0346	|.....
35	0.3500	-0.0711	|.....	0.0026	|.....	0.0435	|.....
36	0.3400	-0.0844	|.....	0.0036	|.....	0.0517	|.....
37	1.1100	-0.0800	|.....	0.0033	|.....	0.0456	|.....
38	0.7700	-0.0734	|.....	0.0028	|.....	0.0433	|.....
39	0.3300	-0.0714	|.....	0.0026	|.....	0.0438	|.....
40	0.3300	-0.0881	|.....	0.0040	|.....	0.0540	|.....
41	0.0700	-0.0867	|.....	0.0038	|.....	0.0543	|.....
42	0.3000	-0.0595	|.....	0.0018	|.....	0.0366	|.....
43	0.2300	-0.0898	|.....	0.0041	|.....	0.0555	|.....
44	0.0700	-0.0876	|.....	0.0039	|.....	0.0549	|.....
45	0.0400	-0.0844	|.....	0.0036	|.....	0.0530	|.....
46	3.7100	0.1645	||.....	0.0136	|.....	-0.0634	|.....
47	8.7000	1.1423	||||||||||||||	0.2842	||||||||||||||	0.1272	||.....
48	7.0200	0.3509	||||.....	0.0560	||.....	-0.0232	|.....
49	29.0000	-0.6399	||||||||.....	0.1980	|||||||||.....	-0.5854	||||||||||||..
50	6.3600	-0.0242	|.....	0.0003	|.....	0.0033	|.....
51	16.0000	0.0785	|.....	0.0031	|.....	0.0521	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Outlier & Influence Chart

Row	Vegetation (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	31.6000	-1.4976	|||.....	0.2418	||||||||||...	0.1820	||||||||||||||
11	17.5000	-0.5435	|.....	0.0081	|.....	0.0511	||.....
13	4.0800	0.0428	|.....	0.0000	|.....	0.0279	|.....
14	14.1000	-0.6474	|.....	0.0079	|.....	0.0358	|.....
15	0.3700	-0.3770	|.....	0.0029	|.....	0.0389	|.....
16	0.0800	0.1726	|.....	0.0006	|.....	0.0401	|.....
17	0.4300	-0.4121	|.....	0.0035	|.....	0.0387	|.....
18	0.1100	-0.3462	|.....	0.0026	|.....	0.0400	|.....
19	0.6200	-0.4250	|.....	0.0036	|.....	0.0379	|.....
20	1.5000	-0.5008	|.....	0.0046	|.....	0.0348	|.....
21	0.0300	-0.4499	|.....	0.0043	|.....	0.0403	|.....
22	13.6000	0.2323	|.....	0.0010	|.....	0.0341	|.....
23	2.0200	-0.2047	|.....	0.0007	|.....	0.0331	|.....
24	12.2000	0.6731	|.....	0.0071	|.....	0.0301	|.....
25	14.9000	0.0902	|.....	0.0002	|.....	0.0389	|.....
26	29.5000	-0.7373	|.....	0.0507	||.....	0.1556	||||||||||...
27	24.8000	0.6714	|.....	0.0269	|.....	0.1052	||||||.....
28	7.7400	0.8211	|.....	0.0085	|.....	0.0244	|.....
29	28.3000	0.4516	|.....	0.0172	|.....	0.1416	||||||||||....
30	8.8100	0.1596	|.....	0.0003	|.....	0.0248	|.....
31	9.1500	-0.1126	|.....	0.0002	|.....	0.0250	|.....
32	5.3300	-0.5631	|.....	0.0043	|.....	0.0259	|.....
33	11.8000	1.3961	||.....	0.0286	|.....	0.0291	|.....
34	0.0900	-0.2707	|.....	0.0016	|.....	0.0401	|.....
35	0.3500	-0.3529	|.....	0.0026	|.....	0.0390	|.....
36	0.3400	-0.4188	|.....	0.0036	|.....	0.0390	|.....
37	1.1100	-0.4133	|.....	0.0033	|.....	0.0361	|.....
38	0.7700	-0.3728	|.....	0.0028	|.....	0.0374	|.....
39	0.3300	-0.3541	|.....	0.0026	|.....	0.0391	|.....
40	0.3300	-0.4367	|.....	0.0040	|.....	0.0391	|.....
41	0.0700	-0.4239	|.....	0.0038	|.....	0.0401	|.....
42	0.3000	-0.2944	|.....	0.0018	|.....	0.0392	|.....
43	0.2300	-0.4430	|.....	0.0041	|.....	0.0395	|.....
44	0.0700	-0.4286	|.....	0.0039	|.....	0.0401	|.....
45	0.0400	-0.4123	|.....	0.0036	|.....	0.0403	|.....
46	3.7100	0.9578	|.....	0.0136	|.....	0.0286	|.....
47	8.7000	* 7.1782	|||||||||||||||	0.2842	||||||||||||||	0.0247	|.....
48	7.0200	* 2.2143	||||.....	0.0560	||.....	0.0245	|.....
49	29.0000	-1.5254	|||.....	0.1980	|||||||||.....	0.1496	||||||||||....
50	6.3600	-0.1517	|.....	0.0003	|.....	0.0248	|.....
51	16.0000	0.3677	|.....	0.0031	|.....	0.0436	|.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Inverse Prediction of X Means

Row	Mammal (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	28.3000	31.6000	14.5022	17.0978	10.2944	21.8183
11	23.0667	17.5000	10.6487	6.8513	6.5719	16.0873
13	14.8900	4.0800	4.6279	-0.5479	-0.8151	8.7041
14	16.6000	14.1000	5.8870	8.2130	0.9082	10.0697
15	2.6000	0.3700	-4.4217	4.7917	-14.9396	0.6281
16	11.6950	0.0800	2.2753	-2.1953	-4.2456	6.3631
17	2.0767	0.4300	-4.8071	5.2371	-15.5792	0.3223
18	2.7800	0.1100	-4.2892	4.3992	-14.7201	0.7336
19	2.1100	0.6200	-4.7825	5.4025	-15.5384	0.3417
20	1.9900	1.5000	-4.8709	6.3709	-15.6853	0.2718
21	0.8900	0.0300	-5.6809	5.7109	-17.0354	-0.3651
22	31.1000	13.6000	16.5639	-2.9639	12.0858	25.0847
23	7.8000	2.0200	-0.5928	2.6128	-8.7027	3.7844
24	36.8000	12.2000	20.7610	-8.5610	15.4902	31.9768
25	30.4000	14.9000	16.0485	-1.1485	11.6474	24.2587
26	36.8000	29.5000	20.7610	8.7390	15.4902	31.9768
27	53.4233	24.8000	33.0014	-8.2014	24.6460	52.8492
28	33.3000	7.7400	18.1839	-10.4439	13.4305	27.7141
29	54.4000	28.3000	33.7206	-5.4206	25.1682	54.0913
30	23.3500	8.8100	10.8573	-2.0473	6.7901	16.3810
31	19.0700	9.1500	7.7058	1.4442	3.2336	12.2061
32	6.0800	5.3300	-1.8593	7.1893	-10.7377	2.7124
33	48.3000	11.8000	29.2289	-17.4289	21.8879	46.3526
34	4.0533	0.0900	-3.3516	3.4416	-13.1731	1.4869
35	2.9867	0.3500	-4.1370	4.4870	-14.4682	0.8551
36	1.8400	0.3400	-4.9813	5.3213	-15.8690	0.1846
37	2.9700	1.1100	-4.1493	5.2593	-14.4885	0.8453
38	3.2100	0.7700	-3.9725	4.7425	-14.1964	0.9867
39	2.9400	0.3300	-4.1714	4.5014	-14.5251	0.8277
40	1.5200	0.3300	-5.2170	5.5470	-16.2613	-0.0012
41	1.3900	0.0700	-5.3127	5.3827	-16.4209	-0.0764
42	3.9267	0.3000	-3.4448	3.7448	-13.3265	1.4114
43	1.2767	0.2300	-5.3961	5.6261	-16.5600	-0.1420
44	1.3100	0.0700	-5.3716	5.4416	-16.5191	-0.1227
45	1.5500	0.0400	-5.1949	5.2349	-16.2245	0.0162
46	30.1000	3.7100	15.8276	-12.1176	11.4578	23.9064
47	101.9000	8.7000	68.6966	-59.9966	50.0324	115.0306
48	54.4500	7.0200	33.7574	-26.7374	25.1949	54.1549
49	23.9000	29.0000	11.2623	17.7377	7.2073	16.9573
50	14.6000	6.3600	4.4143	1.9457	-1.1158	8.4809
51	36.6667	16.0000	20.6629	-4.6629	15.4131	31.8130

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = Mammal X = Vegetation

Inverse Prediction of X Individuals

Row	Mammal (Y)	Vegetation (X)	Predicted Vegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	28.3000	31.6000	14.5022	17.0978	-13.2414	45.3540
11	23.0667	17.5000	10.6487	6.8513	-17.7872	40.4465
13	14.8900	4.0800	4.6279	-0.5479	-25.1727	33.0616
14	16.6000	14.1000	5.8870	8.2130	-23.5995	34.5774
15	2.6000	0.3700	-4.4217	4.7917	-36.9172	22.6057
16	11.6950	0.0800	2.2753	-2.1953	-28.1524	30.2699
17	2.0767	0.4300	-4.8071	5.2371	-37.4340	22.1771
18	2.7800	0.1100	-4.2892	4.3992	-36.7398	22.7534
19	2.1100	0.6200	-4.7825	5.4025	-37.4010	22.2043
20	1.9900	1.5000	-4.8709	6.3709	-37.5197	22.1062
21	0.8900	0.0300	-5.6809	5.7109	-38.6106	21.2101
22	31.1000	13.6000	16.5639	-2.9639	-10.8663	48.0369
23	7.8000	2.0200	-0.5928	2.6128	-31.8554	26.9370
24	36.8000	12.2000	20.7610	-8.5610	-6.1514	53.6184
25	30.4000	14.9000	16.0485	-1.1485	-11.4564	47.3625
26	36.8000	29.5000	20.7610	8.7390	-6.1514	53.6184
27	53.4233	24.8000	33.0014	-8.2014	6.7475	70.7478
28	33.3000	7.7400	18.1839	-10.4439	-9.0277	50.1723
29	54.4000	28.3000	33.7206	-5.4206	7.4693	71.7901
30	23.3500	8.8100	10.8573	-2.0473	-17.5375	40.7086
31	19.0700	9.1500	7.7058	1.4442	-21.3539	36.7936
32	6.0800	5.3300	-1.8593	7.1893	-33.5149	25.4896
33	48.3000	11.8000	29.2289	-17.4289	2.8987	65.3418
34	4.0533	0.0900	-3.3516	3.4416	-35.4891	23.8028
35	2.9867	0.3500	-4.1370	4.4870	-36.5363	22.9232
36	1.8400	0.3400	-4.9813	5.3213	-37.6681	21.9837
37	2.9700	1.1100	-4.1493	5.2593	-36.5527	22.9095
38	3.2100	0.7700	-3.9725	4.7425	-36.3166	23.1069
39	2.9400	0.3300	-4.1714	4.5014	-36.5822	22.8848
40	1.5200	0.3300	-5.2170	5.5470	-37.9851	21.7226
41	1.3900	0.0700	-5.3127	5.3827	-38.1140	21.6167
42	3.9267	0.3000	-3.4448	3.7448	-35.6132	23.6981
43	1.2767	0.2300	-5.3961	5.6261	-38.2265	21.5244
44	1.3100	0.0700	-5.3716	5.4416	-38.1934	21.5516
45	1.5500	0.0400	-5.1949	5.2349	-37.9554	21.7471
46	30.1000	3.7100	15.8276	-12.1176	-11.7100	47.0742
47	101.9000	8.7000	68.6966	-59.9966	39.1570	125.9060
48	54.4500	7.0200	33.7574	-26.7374	7.5062	71.8436
49	23.9000	29.0000	11.2623	17.7377	-17.0540	41.2185
50	14.6000	6.3600	4.4143	1.9457	-25.4410	32.8061
51	36.6667	16.0000	20.6629	-4.6629	-6.2599	53.4860

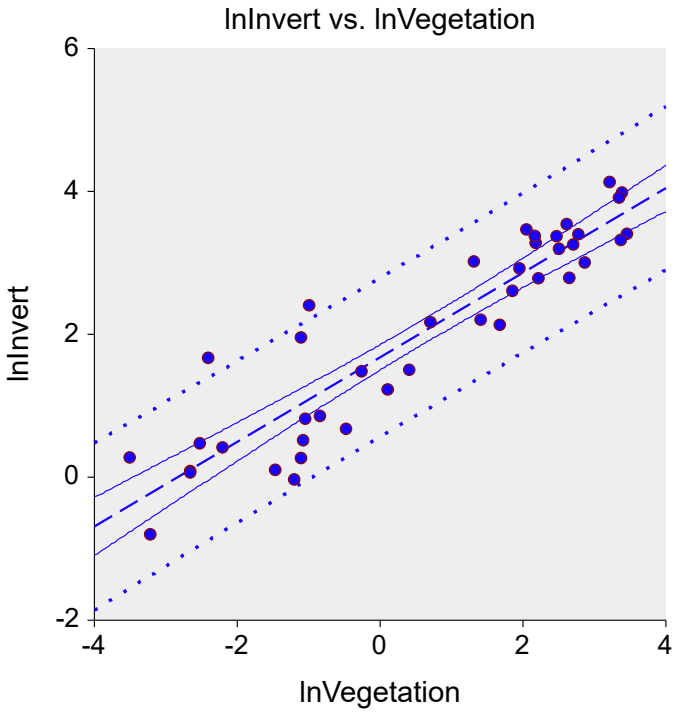
This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Vegetation to Prey Tissue Linear Regressions
ln Transformation – APL10 and PCO06 (SM Only) Removed

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnInvert	Rows Processed	58
Independent Variable	lnVegetation	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.6782	Rows Prediction Only	0
Slope	0.5910	Sum of Frequencies	41
R-Squared	0.8508	Sum of Weights	41.0000
Correlation	0.9224	Coefficient of Variation	0.2673
Mean Square Error	0.295112	Square Root of MSE	0.5432421

Linear Regression Report

Y = lnInvert X = lnVegetation

Summary Statement

The equation of the straight line relating lnInvert and lnVegetation is estimated as: lnInvert = (1.6782) + (0.5910) lnVegetation using the 41 observations in this dataset. The y-intercept, the estimated value of lnInvert when lnVegetation is zero, is 1.6782 with a standard error of 0.0881. The slope, the estimated change in lnInvert per unit change in lnVegetation, is 0.5910 with a standard error of 0.0396. The value of R-Squared, the proportion of the variation in lnInvert that can be accounted for by variation in lnVegetation, is 0.8508. The correlation between lnInvert and lnVegetation is 0.9224.

A significance test that the slope is zero resulted in a t-value of 14.9129. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.5910. The lower limit of the 95% confidence interval for the slope is 0.5108 and the upper limit is 0.6711. The estimated intercept is 1.6782. The lower limit of the 95% confidence interval for the intercept is 1.5001 and the upper limit is 1.8564.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnInvert	lnVegetation
Count	41	41
Mean	2.0320	0.5985
Standard Deviation	1.3887	2.1675
Minimum	-0.7985	-3.5066
Maximum	4.1320	3.4532

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.6782	0.5910
Lower 95% Confidence Limit	1.5001	0.5108
Upper 95% Confidence Limit	1.8564	0.6711
Standard Error	0.0881	0.0396
Standardized Coefficient	0.0000	0.9224
T Value	19.0507	14.9129
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	1.0000
Regression of Y on X	1.6782	0.5910
Inverse Regression from X on Y	1.6162	0.6946
Orthogonal Regression of Y and X	1.6616	0.6187

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.67824307965955) + (0.590967387917872) * (lnVegetation)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.6782	0.9000	1.5109	1.8444
Bootstrap Mean	1.6742	0.9500	1.4799	1.8779
Bias (BM - OV)	-0.0041	0.9900	1.4118	1.9425
Bias Corrected	1.6823			
Standard Error	0.1016			
Slope				
Original Value	0.5910	0.9000	0.5189	0.6567
Bootstrap Mean	0.5921	0.9500	0.5065	0.6709
Bias (BM - OV)	0.0012	0.9900	0.4798	0.6970
Bias Corrected	0.5898			
Standard Error	0.0419			
Correlation				
Original Value	0.9224	0.9000	0.8870	0.9668
Bootstrap Mean	0.9218	0.9500	0.8820	0.9777
Bias (BM - OV)	-0.0006	0.9900	0.8761	0.9985
Bias Corrected	0.9230			
Standard Error	0.0243			
R-Squared				
Original Value	0.8508	0.9000	0.7843	0.9308
Bootstrap Mean	0.8503	0.9500	0.7746	0.9497
Bias (BM - OV)	-0.0005	0.9900	0.7633	0.9854
Bias Corrected	0.8513			
Standard Error	0.0444			
Standard Error of Estimate				
Original Value	0.5432	0.9000	0.4572	0.6726
Bootstrap Mean	0.5256	0.9500	0.4387	0.6928
Bias (BM - OV)	-0.0177	0.9900	0.4057	0.7269
Bias Corrected	0.5609			
Standard Error	0.0653			
Orthogonal Intercept				
Original Value	1.6616	0.9000	1.4971	1.8269
Bootstrap Mean	1.6579	0.9500	1.4650	1.8612
Bias (BM - OV)	-0.0037	0.9900	1.3934	1.9274
Bias Corrected	1.6654			
Standard Error	0.1011			
Orthogonal Slope				
Original Value	0.6187	0.9000	0.5497	0.6832
Bootstrap Mean	0.6198	0.9500	0.5355	0.6964
Bias (BM - OV)	0.0011	0.9900	0.5112	0.7276
Bias Corrected	0.6176			
Standard Error	0.0409			

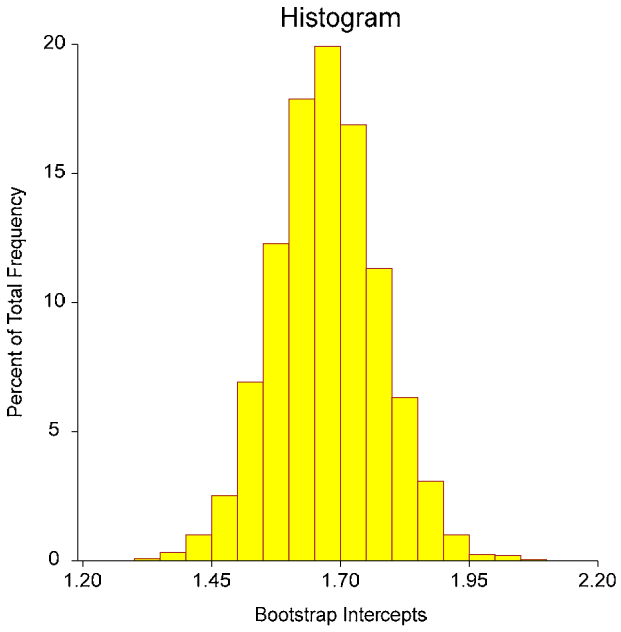
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

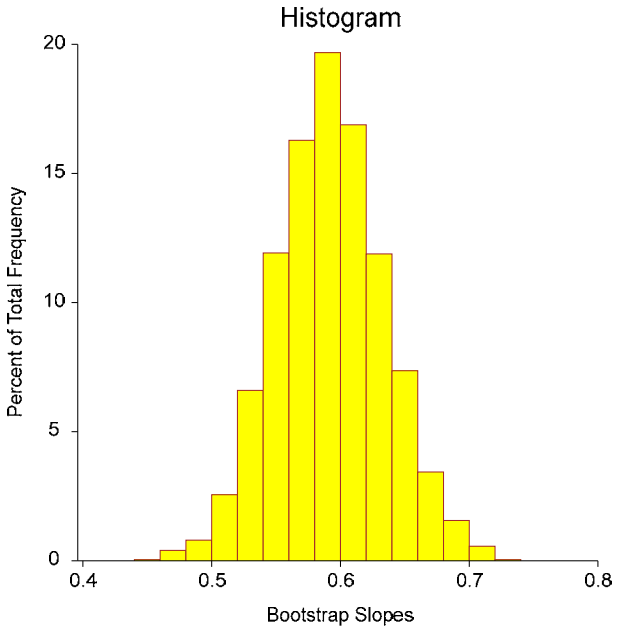
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

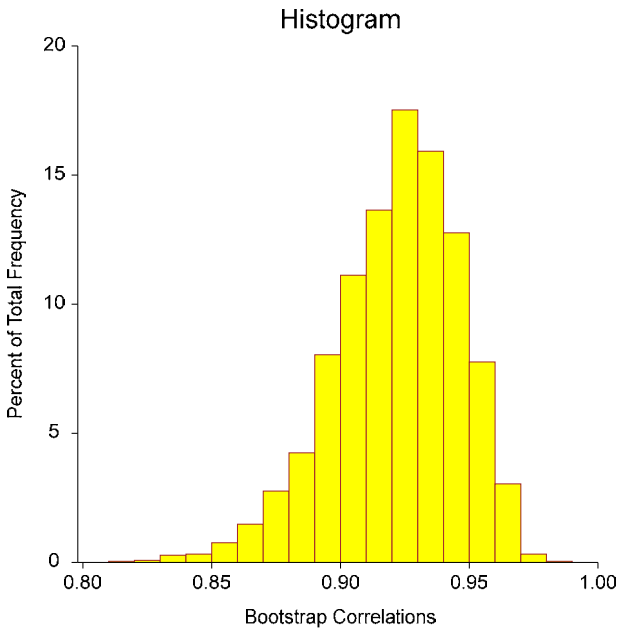
Linear Regression Report

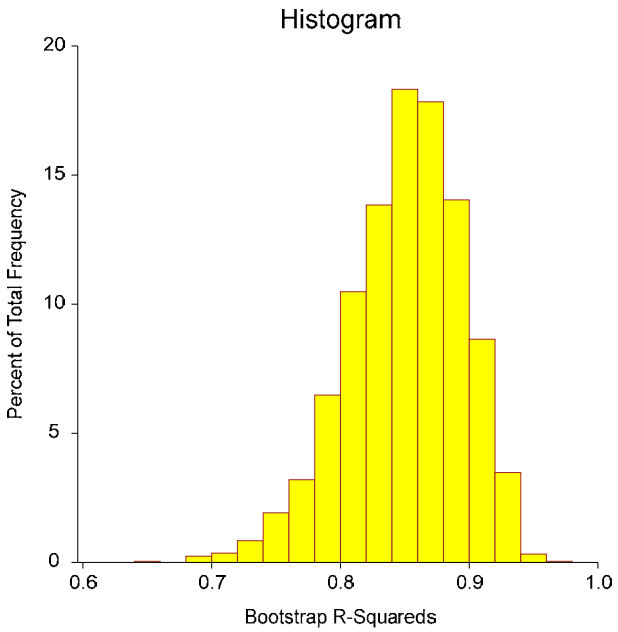
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Bootstrap Histograms Section



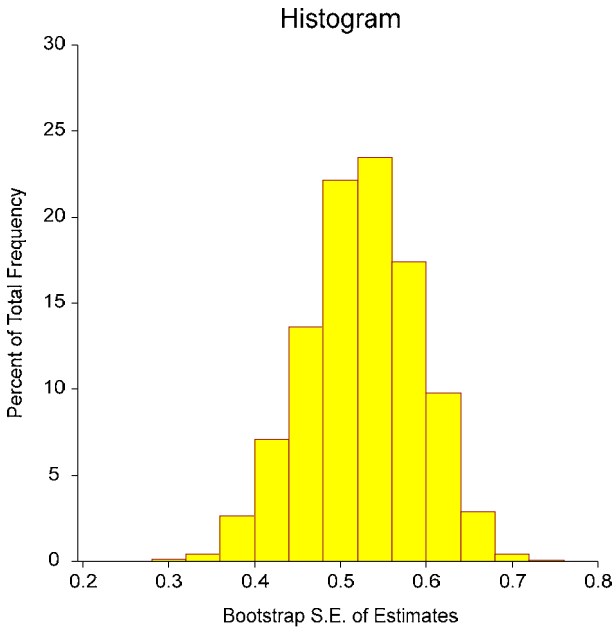


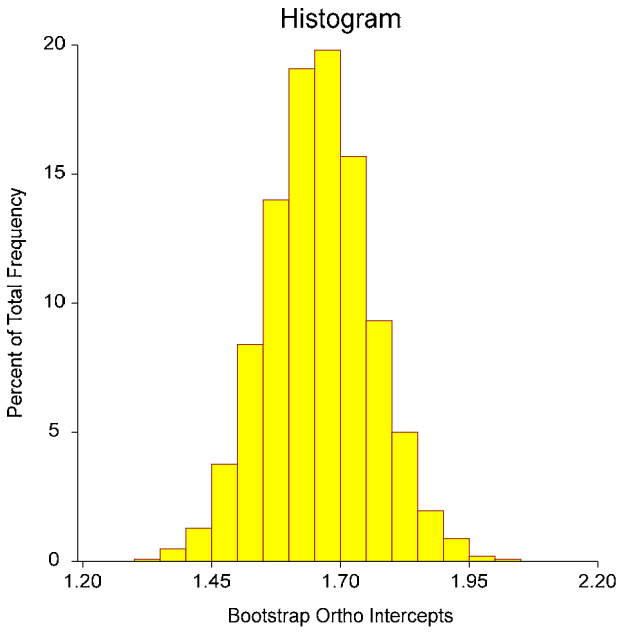


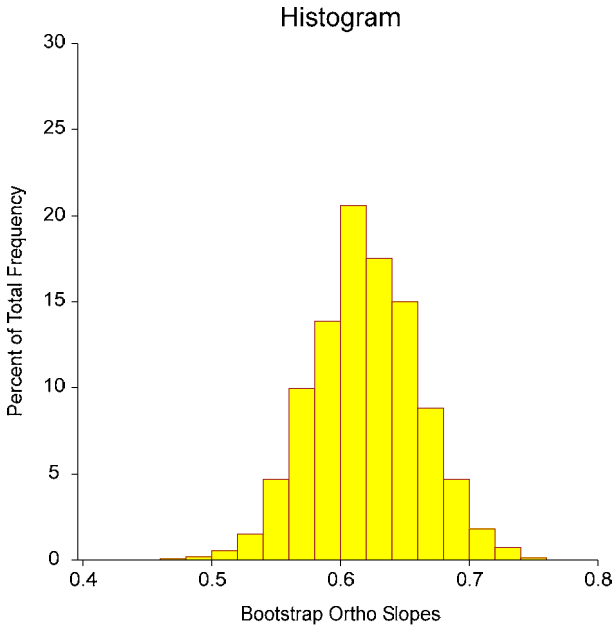


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.9224	0.8508	0.9120
Lower 95% Conf. Limit (r dist'n)	0.8556		
Upper 95% Conf. Limit (r dist'n)	0.9570		
Lower 95% Conf. Limit (Fisher's z)	0.8583		0.8401
Upper 95% Conf. Limit (Fisher's z)	0.9581		0.9524
Adjusted (Rbar)		0.8470	
T-Value for H0: Rho = 0	14.9129	14.9129	13.8861
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	169.2829	169.2829			
Slope	1	65.63096	65.63096	222.3934	0.0000	1.0000
Error	39	11.50937	0.295112			
Lack of Fit	37	10.08579	0.272589	0.3830	0.9131	
Pure Error	2	1.423572	0.7117862			
Adj. Total	40	77.14033	1.928508			
Total	41	246.4232				

s = Square Root(0.295112) = 0.5432421

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	24.53991	83.31025	0.02629657	-0.003184985
1	24.53991	202.6118	160.9209	-0.003184985	0.005321307
2 (Y'Y)			246.4232		
Determinant		7704.875			0.000129788

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.007760431	-0.0009399271
1	-0.0009399271	0.001570381

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9658	0.249391	Yes
Anderson Darling	0.3817	0.399878	Yes
D'Agostino Skewness	1.7901	0.073444	No
D'Agostino Kurtosis	0.8743	0.381936	Yes
D'Agostino Omnibus	3.9688	0.137464	No
Constant Residual Variance?			
Modified Levene Test	5.3674	0.025859	No
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	0.3830	0.913067	Yes

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

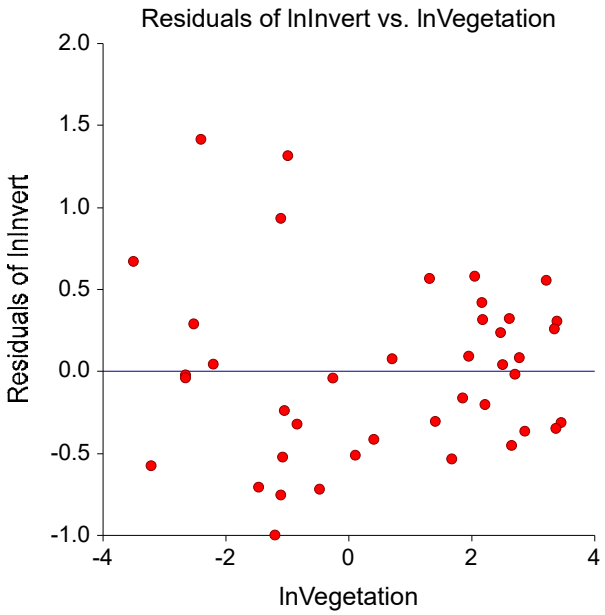
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

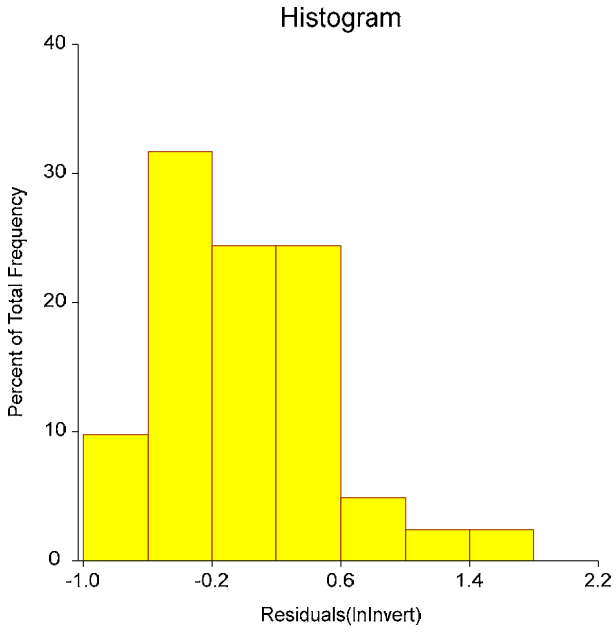
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

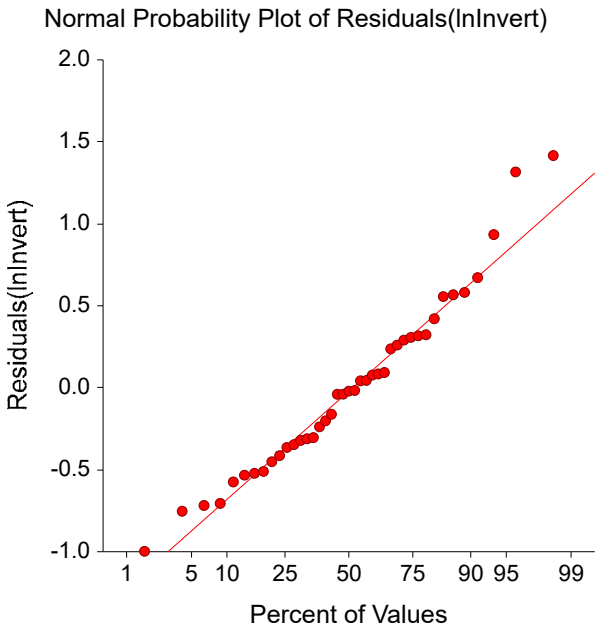
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Original Data Section

Row	lnVegetation (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual
10	3.4532	3.4078	3.7189	-0.3111
11	2.8622	3.0057	3.3697	-0.3640
13	1.4061	2.2050	2.5092	-0.3042
14	2.6462	2.7912	3.2420	-0.4509
15	-0.9943	2.4069	1.0907	1.3163
16	-2.5257	0.4762	0.1856	0.2906
17	-0.8440	0.8587	1.1795	-0.3208
18	-2.2073	0.4187	0.3738	0.0449
19	-0.4780	0.6780	1.3957	-0.7177
20	0.4055	1.5041	1.9179	-0.4138
21	-3.5066	0.2776	-0.3940	0.6717
22	2.6101	3.5439	3.2207	0.3231
23	0.7031	2.1713	2.0938	0.0776
24	2.5014	3.1987	3.1565	0.0422
25	2.7014	3.2581	3.2747	-0.0166
26	3.3844	3.9853	3.6783	0.3070
27	3.2108	4.1320	3.5757	0.5562
28	2.0464	3.4689	2.8876	0.5813
29	3.3429	3.9140	3.6538	0.2603
30	2.1759	3.2809	2.9641	0.3168
31	2.2138	2.7850	2.9865	-0.2015
32	1.6734	2.1342	2.6671	-0.5330
33	2.4681	3.3742	3.1368	0.2374
34	-2.4079	1.6715	0.2552	1.4162
35	-1.0498	0.8198	1.0578	-0.2381
36	-1.0788	0.5188	1.0407	-0.5219
37	0.1044	1.2296	1.7399	-0.5103
38	-0.2614	1.4839	1.5238	-0.0399
39	-1.1087	0.2700	1.0231	-0.7530
40	-1.1087	1.9573	1.0231	0.9342
41	-2.6593	0.0862	0.1067	-0.0205
42	-1.2040	-0.0305	0.9667	-0.9972
43	-1.4697	0.1044	0.8097	-0.7054
44	-2.6593	0.0677	0.1067	-0.0390
45	-3.2189	-0.7985	-0.2240	-0.5745
46	1.3110	3.0204	2.4530	0.5674
47	2.1633	3.3776	2.9567	0.4209
48	1.9488	2.9232	2.8299	0.0933
49	3.3673	3.3214	3.6682	-0.3468
50	1.8500	2.6101	2.7715	-0.1615
51	2.7726	3.4012	3.3168	0.0844

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Predicted Values and Confidence Limits of Means

Row	lnVegetation (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	3.4532	3.4078	3.7189	0.1414	3.4329	4.0050
11	2.8622	3.0057	3.3697	0.1235	3.1200	3.6195
13	1.4061	2.2050	2.5092	0.0907	2.3258	2.6926
14	2.6462	2.7912	3.2420	0.1174	3.0046	3.4795
15	-0.9943	2.4069	1.0907	0.1057	0.8768	1.3046
16	-2.5257	0.4762	0.1856	0.1501	-0.1180	0.4892
17	-0.8440	0.8587	1.1795	0.1023	0.9726	1.3864
18	-2.2073	0.4187	0.3738	0.1399	0.0909	0.6567
19	-0.4780	0.6780	1.3957	0.0950	1.2037	1.5878
20	0.4055	1.5041	1.9179	0.0852	1.7456	2.0902
21	-3.5066	0.2776	-0.3940	0.1835	-0.7651	-0.0229
22	2.6101	3.5439	3.2207	0.1164	2.9852	3.4562
23	0.7031	2.1713	2.0938	0.0849	1.9219	2.2656
24	2.5014	3.1987	3.1565	0.1135	2.9269	3.3861
25	2.7014	3.2581	3.2747	0.1189	3.0341	3.5152
26	3.3844	3.9853	3.6783	0.1392	3.3967	3.9599
27	3.2108	4.1320	3.5757	0.1338	3.3050	3.8465
28	2.0464	3.4689	2.8876	0.1024	2.6804	3.0948
29	3.3429	3.9140	3.6538	0.1379	3.3748	3.9328
30	2.1759	3.2809	2.9641	0.1054	2.7510	3.1773
31	2.2138	2.7850	2.9865	0.1063	2.7715	3.2015
32	1.6734	2.1342	2.6671	0.0949	2.4751	2.8592
33	2.4681	3.3742	3.1368	0.1126	2.9090	3.3646
34	-2.4079	1.6715	0.2552	0.1463	-0.0406	0.5511
35	-1.0498	0.8198	1.0578	0.1071	0.8413	1.2744
36	-1.0788	0.5188	1.0407	0.1078	0.8227	1.2587
37	0.1044	1.2296	1.7399	0.0871	1.5638	1.9160
38	-0.2614	1.4839	1.5238	0.0914	1.3389	1.7087
39	-1.1087	0.2700	1.0231	0.1085	0.8036	1.2425
40	-1.1087	1.9573	1.0231	0.1085	0.8036	1.2425
41	-2.6593	0.0862	0.1067	0.1545	-0.2058	0.4192
42	-1.2040	-0.0305	0.9667	0.1109	0.7424	1.1911
43	-1.4697	0.1044	0.8097	0.1180	0.5711	1.0483
44	-2.6593	0.0677	0.1067	0.1545	-0.2058	0.4192
45	-3.2189	-0.7985	-0.2240	0.1734	-0.5748	0.1268
46	1.3110	3.0204	2.4530	0.0894	2.2722	2.6339
47	2.1633	3.3776	2.9567	0.1051	2.7441	3.1693
48	1.9488	2.9232	2.8299	0.1003	2.6270	3.0328
49	3.3673	3.3214	3.6682	0.1387	3.3877	3.9487
50	1.8500	2.6101	2.7715	0.0983	2.5728	2.9703
51	2.7726	3.4012	3.3168	0.1209	3.0722	3.5613

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Predicted Values and Prediction Limits

Row	lnVegetation (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	3.4532	3.4078	3.7189	0.5613	2.5835	4.8544
11	2.8622	3.0057	3.3697	0.5571	2.2429	4.4965
13	1.4061	2.2050	2.5092	0.5508	1.3952	3.6232
14	2.6462	2.7912	3.2420	0.5558	2.1179	4.3662
15	-0.9943	2.4069	1.0907	0.5534	-0.0288	2.2101
16	-2.5257	0.4762	0.1856	0.5636	-0.9544	1.3256
17	-0.8440	0.8587	1.1795	0.5528	0.0614	2.2976
18	-2.2073	0.4187	0.3738	0.5610	-0.7608	1.5085
19	-0.4780	0.6780	1.3957	0.5515	0.2803	2.5112
20	0.4055	1.5041	1.9179	0.5499	0.8056	3.0301
21	-3.5066	0.2776	-0.3940	0.5734	-1.5538	0.7658
22	2.6101	3.5439	3.2207	0.5556	2.0970	4.3445
23	0.7031	2.1713	2.0938	0.5498	0.9816	3.2059
24	2.5014	3.1987	3.1565	0.5550	2.0340	4.2791
25	2.7014	3.2581	3.2747	0.5561	2.1498	4.3995
26	3.3844	3.9853	3.6783	0.5608	2.5440	4.8126
27	3.2108	4.1320	3.5757	0.5595	2.4441	4.7074
28	2.0464	3.4689	2.8876	0.5528	1.7694	4.0058
29	3.3429	3.9140	3.6538	0.5605	2.5201	4.7874
30	2.1759	3.2809	2.9641	0.5534	1.8448	4.0834
31	2.2138	2.7850	2.9865	0.5535	1.8669	4.1061
32	1.6734	2.1342	2.6671	0.5515	1.5517	3.7826
33	2.4681	3.3742	3.1368	0.5548	2.0146	4.2590
34	-2.4079	1.6715	0.2552	0.5626	-0.8827	1.3932
35	-1.0498	0.8198	1.0578	0.5537	-0.0621	2.1778
36	-1.0788	0.5188	1.0407	0.5538	-0.0795	2.1609
37	0.1044	1.2296	1.7399	0.5502	0.6271	2.8528
38	-0.2614	1.4839	1.5238	0.5509	0.4095	2.6380
39	-1.1087	0.2700	1.0231	0.5540	-0.0975	2.1436
40	-1.1087	1.9573	1.0231	0.5540	-0.0975	2.1436
41	-2.6593	0.0862	0.1067	0.5648	-1.0357	1.2491
42	-1.2040	-0.0305	0.9667	0.5544	-0.1547	2.0882
43	-1.4697	0.1044	0.8097	0.5559	-0.3147	1.9341
44	-2.6593	0.0677	0.1067	0.5648	-1.0357	1.2491
45	-3.2189	-0.7985	-0.2240	0.5703	-1.3775	0.9294
46	1.3110	3.0204	2.4530	0.5506	1.3394	3.5666
47	2.1633	3.3776	2.9567	0.5533	1.8375	4.0759
48	1.9488	2.9232	2.8299	0.5524	1.7125	3.9473
49	3.3673	3.3214	3.6682	0.5607	2.5341	4.8023
50	1.8500	2.6101	2.7715	0.5521	1.6549	3.8882
51	2.7726	3.4012	3.3168	0.5565	2.1911	4.4425

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Working-Hotelling Simultaneous Confidence Band

Row	lnVegetation (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	3.4532	3.4078	3.7189	0.1414	3.3160	4.1219
11	2.8622	3.0057	3.3697	0.1235	3.0178	3.7216
13	1.4061	2.2050	2.5092	0.0907	2.2508	2.7676
14	2.6462	2.7912	3.2420	0.1174	2.9075	3.5766
15	-0.9943	2.4069	1.0907	0.1057	0.7893	1.3920
16	-2.5257	0.4762	0.1856	0.1501	-0.2421	0.6134
17	-0.8440	0.8587	1.1795	0.1023	0.8879	1.4710
18	-2.2073	0.4187	0.3738	0.1399	-0.0248	0.7724
19	-0.4780	0.6780	1.3957	0.0950	1.1251	1.6664
20	0.4055	1.5041	1.9179	0.0852	1.6751	2.1606
21	-3.5066	0.2776	-0.3940	0.1835	-0.9169	0.1289
22	2.6101	3.5439	3.2207	0.1164	2.8889	3.5525
23	0.7031	2.1713	2.0938	0.0849	1.8517	2.3358
24	2.5014	3.1987	3.1565	0.1135	2.8330	3.4800
25	2.7014	3.2581	3.2747	0.1189	2.9358	3.6136
26	3.3844	3.9853	3.6783	0.1392	3.2815	4.0751
27	3.2108	4.1320	3.5757	0.1338	3.1943	3.9572
28	2.0464	3.4689	2.8876	0.1024	2.5957	3.1795
29	3.3429	3.9140	3.6538	0.1379	3.2607	4.0469
30	2.1759	3.2809	2.9641	0.1054	2.6638	3.2644
31	2.2138	2.7850	2.9865	0.1063	2.6836	3.2894
32	1.6734	2.1342	2.6671	0.0949	2.3966	2.9377
33	2.4681	3.3742	3.1368	0.1126	2.8158	3.4578
34	-2.4079	1.6715	0.2552	0.1463	-0.1616	0.6721
35	-1.0498	0.8198	1.0578	0.1071	0.7527	1.3630
36	-1.0788	0.5188	1.0407	0.1078	0.7335	1.3479
37	0.1044	1.2296	1.7399	0.0871	1.4918	1.9881
38	-0.2614	1.4839	1.5238	0.0914	1.2632	1.7843
39	-1.1087	0.2700	1.0231	0.1085	0.7138	1.3323
40	-1.1087	1.9573	1.0231	0.1085	0.7138	1.3323
41	-2.6593	0.0862	0.1067	0.1545	-0.3335	0.5470
42	-1.2040	-0.0305	0.9667	0.1109	0.6507	1.2828
43	-1.4697	0.1044	0.8097	0.1180	0.4735	1.1459
44	-2.6593	0.0677	0.1067	0.1545	-0.3335	0.5470
45	-3.2189	-0.7985	-0.2240	0.1734	-0.7183	0.2703
46	1.3110	3.0204	2.4530	0.0894	2.1982	2.7078
47	2.1633	3.3776	2.9567	0.1051	2.6572	3.2562
48	1.9488	2.9232	2.8299	0.1003	2.5440	3.1158
49	3.3673	3.3214	3.6682	0.1387	3.2729	4.0635
50	1.8500	2.6101	2.7715	0.0983	2.4915	3.0516
51	2.7726	3.4012	3.3168	0.1209	2.9722	3.6613

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Residual Section

Row	lnVegetation (X)	lnInvert (Y)	Predicted lnInvert (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	3.4532	3.4078	3.7189	-0.3111	-0.5931	9.1291
11	2.8622	3.0057	3.3697	-0.3640	-0.6881	12.1113
13	1.4061	2.2050	2.5092	-0.3042	-0.5680	13.7974
14	2.6462	2.7912	3.2420	-0.4509	-0.8501	16.1539
15	-0.9943	2.4069	1.0907	1.3163	2.4702	54.6864
16	-2.5257	0.4762	0.1856	0.2906	0.5566	61.0234
17	-0.8440	0.8587	1.1795	-0.3208	-0.6013	37.3631
18	-2.2073	0.4187	0.3738	0.0449	0.0855	10.7221
19	-0.4780	0.6780	1.3957	-0.7177	-1.3418	105.8511
20	0.4055	1.5041	1.9179	-0.4138	-0.7712	27.5107
21	-3.5066	0.2776	-0.3940	0.6717	1.3136	241.9212
22	2.6101	3.5439	3.2207	0.3231	0.6090	9.1184
23	0.7031	2.1713	2.0938	0.0776	0.1446	3.5732
24	2.5014	3.1987	3.1565	0.0422	0.0794	1.3181
25	2.7014	3.2581	3.2747	-0.0166	-0.0312	0.5084
26	3.3844	3.9853	3.6783	0.3070	0.5846	7.7025
27	3.2108	4.1320	3.5757	0.5562	1.0564	13.4613
28	2.0464	3.4689	2.8876	0.5813	1.0895	16.7564
29	3.3429	3.9140	3.6538	0.2603	0.4953	6.6493
30	2.1759	3.2809	2.9641	0.3168	0.5944	9.6555
31	2.2138	2.7850	2.9865	-0.2015	-0.3782	7.2347
32	1.6734	2.1342	2.6671	-0.5330	-0.9964	24.9733
33	2.4681	3.3742	3.1368	0.2374	0.4466	7.0346
34	-2.4079	1.6715	0.2552	1.4162	2.7070	84.7305
35	-1.0498	0.8198	1.0578	-0.2381	-0.4470	29.0386
36	-1.0788	0.5188	1.0407	-0.5219	-0.9802	100.6003
37	0.1044	1.2296	1.7399	-0.5103	-0.9516	41.4980
38	-0.2614	1.4839	1.5238	-0.0399	-0.0745	2.6896
39	-1.1087	0.2700	1.0231	-0.7530	-1.4147	278.8729
40	-1.1087	1.9573	1.0231	0.9342	1.7551	47.7304
41	-2.6593	0.0862	0.1067	-0.0205	-0.0394	23.8222
42	-1.2040	-0.0305	0.9667	-0.9972	-1.8751	3273.8660
43	-1.4697	0.1044	0.8097	-0.7054	-1.3302	675.8839
44	-2.6593	0.0677	0.1067	-0.0390	-0.0750	57.7139
45	-3.2189	-0.7985	-0.2240	-0.5745	-1.1159	71.9467
46	1.3110	3.0204	2.4530	0.5674	1.0589	18.7856
47	2.1633	3.3776	2.9567	0.4209	0.7897	12.4613
48	1.9488	2.9232	2.8299	0.0933	0.1747	3.1905
49	3.3673	3.3214	3.6682	-0.3468	-0.6602	10.4405
50	1.8500	2.6101	2.7715	-0.1615	-0.3022	6.1868
51	2.7726	3.4012	3.3168	0.0844	0.1594	2.4828

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Residual Diagnostics Section

Row	lnVegetation (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	3.4532	-0.3111	-0.5881	0.0678	0.0128	0.3001
11	2.8622	-0.3640	-0.6834	0.0517	0.0129	0.2992
13	1.4061	-0.3042	-0.5630	0.0279	0.0046	0.3004
14	2.6462	-0.4509	-0.8470	0.0467	0.0177	0.2973
15	-0.9943	1.3163	*2.6549	0.0379	0.1202	0.2555
16	-2.5257	0.2906	0.5516	0.0763	0.0128	0.3005
17	-0.8440	-0.3208	-0.5963	0.0355	0.0066	0.3001
18	-2.2073	0.0449	0.0844	0.0663	0.0003	0.3028
19	-0.4780	-0.7177	-1.3562	0.0306	0.0284	0.2889
20	0.4055	-0.4138	-0.7672	0.0246	0.0075	0.2983
21	-3.5066	0.6717	*1.3263	0.1141	0.1111	0.2895
22	2.6101	0.3231	0.6040	0.0459	0.0089	0.3000
23	0.7031	0.0776	0.1428	0.0244	0.0003	0.3027
24	2.5014	0.0422	0.0783	0.0437	0.0001	0.3028
25	2.7014	-0.0166	-0.0308	0.0479	0.0000	0.3029
26	3.3844	0.3070	0.5796	0.0657	0.0120	0.3002
27	3.2108	0.5562	1.0581	0.0607	0.0361	0.2942
28	2.0464	0.5813	1.0922	0.0355	0.0219	0.2937
29	3.3429	0.2603	0.4905	0.0645	0.0085	0.3010
30	2.1759	0.3168	0.5894	0.0376	0.0069	0.3001
31	2.2138	-0.2015	-0.3740	0.0383	0.0028	0.3018
32	1.6734	-0.5330	-0.9963	0.0305	0.0156	0.2952
33	2.4681	0.2374	0.4420	0.0430	0.0045	0.3013
34	-2.4079	1.4162	*2.9651	0.0725	0.2863	0.2460
35	-1.0498	-0.2381	-0.4423	0.0388	0.0040	0.3013
36	-1.0788	-0.5219	-0.9797	0.0394	0.0197	0.2954
37	0.1044	-0.5103	-0.9504	0.0257	0.0119	0.2958
38	-0.2614	-0.0399	-0.0736	0.0283	0.0001	0.3028
39	-1.1087	-0.7530	-1.4337	0.0399	0.0416	0.2873
40	-1.1087	0.9342	1.8052	0.0399	0.0640	0.2790
41	-2.6593	-0.0205	-0.0389	0.0809	0.0001	0.3029
42	-1.2040	-0.9972	-1.9405	0.0417	0.0765	0.2756
43	-1.4697	-0.7054	-1.3438	0.0472	0.0438	0.2891
44	-2.6593	-0.0390	-0.0740	0.0809	0.0002	0.3028
45	-3.2189	-0.5745	*-1.1196	0.1019	0.0707	0.2932
46	1.3110	0.5674	1.0606	0.0271	0.0156	0.2942
47	2.1633	0.4209	0.7858	0.0374	0.0121	0.2980
48	1.9488	0.0933	0.1725	0.0341	0.0005	0.3026
49	3.3673	-0.3468	-0.6554	0.0652	0.0152	0.2995
50	1.8500	-0.1615	-0.2987	0.0327	0.0015	0.3022
51	2.7726	0.0844	0.1574	0.0495	0.0007	0.3027

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.5881	-0.1586	0.0128	1.1096	-0.0575	-0.1268
11	-0.6834	-0.1595	0.0129	1.0839	-0.0743	-0.1159
13	-0.5630	-0.0953	0.0046	1.0657	-0.0768	-0.0336
14	-0.8470	-0.1875	0.0177	1.0644	-0.0956	-0.1296
15	* 2.6549	0.5269	0.1202	0.7790	0.4918	-0.3145
16	0.5516	0.1586	0.0128	1.1223	0.1216	-0.1308
17	-0.5963	-0.1143	0.0066	1.0719	-0.1085	0.0639
18	0.0844	0.0225	0.0003	1.1277	0.0180	-0.0179
19	-1.3562	-0.2408	0.0284	0.9885	-0.2363	0.1082
20	-0.7672	-0.1218	0.0075	1.0472	-0.1198	0.0109
21	1.3263	0.4759	0.1111	1.0861	0.3255	-0.4220
22	0.6040	0.1325	0.0089	1.0831	0.0686	0.0907
23	0.1428	0.0226	0.0003	1.0786	0.0214	0.0011
24	0.0783	0.0167	0.0001	1.1011	0.0091	0.0111
25	-0.0308	-0.0069	0.0000	1.1063	-0.0034	-0.0048
26	0.5796	0.1537	0.0120	1.1077	0.0574	0.1219
27	1.0581	0.2690	0.0361	1.0581	0.1082	0.2080
28	1.0922	0.2097	0.0219	1.0267	0.1356	0.1175
29	0.4905	0.1287	0.0085	1.1118	0.0489	0.1015
30	0.5894	0.1166	0.0069	1.0748	0.0718	0.0691
31	-0.3740	-0.0746	0.0028	1.0872	-0.0453	-0.0449
32	-0.9963	-0.1768	0.0156	1.0319	-0.1308	-0.0793
33	0.4420	0.0937	0.0045	1.0894	0.0514	0.0616
34	* 2.9651	0.8289	0.2863	0.7490	0.6449	-0.6752
35	-0.4423	-0.0889	0.0040	1.0847	-0.0825	0.0543
36	-0.9797	-0.1983	0.0197	1.0431	-0.1833	0.1223
37	-0.9504	-0.1543	0.0119	1.0315	-0.1542	0.0347
38	-0.0736	-0.0126	0.0001	1.0837	-0.0125	0.0047
39	-1.4337	-0.2923	0.0416	0.9874	-0.2691	0.1822
40	1.8052	0.3680	0.0640	0.9306	0.3389	-0.2294
41	-0.0389	-0.0115	0.0001	1.1459	-0.0087	0.0096
42	-1.9405	-0.4047	0.0765	0.9099	-0.3683	0.2606
43	-1.3438	-0.2989	0.0438	1.0074	-0.2630	0.2077
44	-0.0740	-0.0220	0.0002	1.1457	-0.0166	0.0183
45	-1.1196	-0.3772	0.0707	1.0992	-0.2663	0.3290
46	1.0606	0.1770	0.0156	1.0213	0.1467	0.0559
47	0.7858	0.1549	0.0121	1.0596	0.0959	0.0914
48	0.1725	0.0324	0.0005	1.0888	0.0217	0.0173
49	-0.6554	-0.1731	0.0152	1.1017	-0.0651	-0.1369
50	-0.2987	-0.0549	0.0015	1.0839	-0.0382	-0.0277
51	0.1574	0.0359	0.0007	1.1068	0.0174	0.0256

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Outlier Detection Chart

Row	lnVegetation (X)	Residual		Standardized Residual		RStudent	
10	3.4532	-0.3111	|||.....	-0.5931	|||.....	-0.5881	||.....
11	2.8622	-0.3640	|||.....	-0.6881	|||.....	-0.6834	|||.....
13	1.4061	-0.3042	|||.....	-0.5680	|||.....	-0.5630	||.....
14	2.6462	-0.4509	||||.....	-0.8501	||||.....	-0.8470	||||.....
15	-0.9943	1.3163	||||||||||||..	2.4702	||||||||||||..	* 2.6549	||||||||||||..
16	-2.5257	0.2906	||.....	0.5566	||.....	0.5516	||.....
17	-0.8440	-0.3208	|||.....	-0.6013	|||.....	-0.5963	||.....
18	-2.2073	0.0449	|.....	0.0855	|.....	0.0844	|.....
19	-0.4780	-0.7177	|||||||.....	-1.3418	|||||||.....	-1.3562	||||||.....
20	0.4055	-0.4138	||||.....	-0.7712	||||.....	-0.7672	|||.....
21	-3.5066	0.6717	|||||||.....	1.3136	|||||||.....	1.3263	||||||.....
22	2.6101	0.3231	|||.....	0.6090	|||.....	0.6040	||.....
23	0.7031	0.0776	|.....	0.1446	|.....	0.1428	|.....
24	2.5014	0.0422	|.....	0.0794	|.....	0.0783	|.....
25	2.7014	-0.0166	|.....	-0.0312	|.....	-0.0308	|.....
26	3.3844	0.3070	|||.....	0.5846	|||.....	0.5796	||.....
27	3.2108	0.5562	|||||.....	1.0564	|||||.....	1.0581	|||||.....
28	2.0464	0.5813	||||||.....	1.0895	|||||.....	1.0922	|||||.....
29	3.3429	0.2603	||.....	0.4953	||.....	0.4905	||.....
30	2.1759	0.3168	|||.....	0.5944	|||.....	0.5894	||.....
31	2.2138	-0.2015	|.....	-0.3782	|.....	-0.3740	|.....
32	1.6734	-0.5330	|||||.....	-0.9964	|||||.....	-0.9963	||||.....
33	2.4681	0.2374	||.....	0.4466	||.....	0.4420	||.....
34	-2.4079	1.4162	||||||||||||||	2.7070	||||||||||||||	* 2.9651	||||||||||||||
35	-1.0498	-0.2381	||.....	-0.4470	||.....	-0.4423	||.....
36	-1.0788	-0.5219	|||||.....	-0.9802	|||||.....	-0.9797	||||.....
37	0.1044	-0.5103	|||||.....	-0.9516	|||||.....	-0.9504	||||.....
38	-0.2614	-0.0399	|.....	-0.0745	|.....	-0.0736	|.....
39	-1.1087	-0.7530	|||||||.....	-1.4147	|||||||.....	-1.4337	|||||||.....
40	-1.1087	0.9342	||||||||.....	1.7551	||||||||.....	1.8052	||||||||.....
41	-2.6593	-0.0205	|.....	-0.0394	|.....	-0.0389	|.....
42	-1.2040	-0.9972	|||||||||.....	-1.8751	|||||||||.....	-1.9405	||||||||.....
43	-1.4697	-0.7054	|||||||.....	-1.3302	|||||||.....	-1.3438	||||||.....
44	-2.6593	-0.0390	|.....	-0.0750	|.....	-0.0740	|.....
45	-3.2189	-0.5745	|||||.....	-1.1159	||||||.....	-1.1196	|||||.....
46	1.3110	0.5674	|||||.....	1.0589	|||||.....	1.0606	|||||.....
47	2.1633	0.4209	||||.....	0.7897	||||.....	0.7858	|||.....
48	1.9488	0.0933	|.....	0.1747	|.....	0.1725	|.....
49	3.3673	-0.3468	|||.....	-0.6602	|||.....	-0.6554	|||.....
50	1.8500	-0.1615	|.....	-0.3022	|.....	-0.2987	|.....
51	2.7726	0.0844	|.....	0.1594	|.....	0.1574	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Influence Detection Chart

Row	lnVegetation (X)	DFFITS		Cook's D		DFBETAS(1)	
10	3.4532	-0.1586	||.....	0.0128	|.....	-0.1268	||.....
11	2.8622	-0.1595	||.....	0.0129	|.....	-0.1159	||.....
13	1.4061	-0.0953	|.....	0.0046	|.....	-0.0336	|.....
14	2.6462	-0.1875	|||.....	0.0177	|.....	-0.1296	||.....
15	-0.9943	0.5269	|||||||||.....	0.1202	||||||.....	-0.3145	||||||.....
16	-2.5257	0.1586	||.....	0.0128	|.....	-0.1308	||.....
17	-0.8440	-0.1143	|.....	0.0066	|.....	0.0639	|.....
18	-2.2073	0.0225	|.....	0.0003	|.....	-0.0179	|.....
19	-0.4780	-0.2408	||||.....	0.0284	|.....	0.1082	||.....
20	0.4055	-0.1218	||.....	0.0075	|.....	0.0109	|.....
21	-3.5066	0.4759	|||||||.....	0.1111	|||||.....	-0.4220	|||||||||.....
22	2.6101	0.1325	||.....	0.0089	|.....	0.0907	|.....
23	0.7031	0.0226	|.....	0.0003	|.....	0.0011	|.....
24	2.5014	0.0167	|.....	0.0001	|.....	0.0111	|.....
25	2.7014	-0.0069	|.....	0.0000	|.....	-0.0048	|.....
26	3.3844	0.1537	||.....	0.0120	|.....	0.1219	||.....
27	3.2108	0.2690	||||.....	0.0361	|.....	0.2080	||||.....
28	2.0464	0.2097	|||.....	0.0219	|.....	0.1175	||.....
29	3.3429	0.1287	||.....	0.0085	|.....	0.1015	||.....
30	2.1759	0.1166	||.....	0.0069	|.....	0.0691	|.....
31	2.2138	-0.0746	|.....	0.0028	|.....	-0.0449	|.....
32	1.6734	-0.1768	|||.....	0.0156	|.....	-0.0793	|.....
33	2.4681	0.0937	|.....	0.0045	|.....	0.0616	|.....
34	-2.4079	0.8289	||||||||||||||	0.2863	||||||||||||||	-0.6752	||||||||||||||
35	-1.0498	-0.0889	|.....	0.0040	|.....	0.0543	|.....
36	-1.0788	-0.1983	|||.....	0.0197	|.....	0.1223	||.....
37	0.1044	-0.1543	||.....	0.0119	|.....	0.0347	|.....
38	-0.2614	-0.0126	|.....	0.0001	|.....	0.0047	|.....
39	-1.1087	-0.2923	|||||.....	0.0416	||.....	0.1822	||||.....
40	-1.1087	0.3680	||||||.....	0.0640	|||.....	-0.2294	|||||.....
41	-2.6593	-0.0115	|.....	0.0001	|.....	0.0096	|.....
42	-1.2040	-0.4047	|||||||.....	0.0765	||||.....	0.2606	|||||.....
43	-1.4697	-0.2989	|||||.....	0.0438	||.....	0.2077	||||.....
44	-2.6593	-0.0220	|.....	0.0002	|.....	0.0183	|.....
45	-3.2189	-0.3772	||||||.....	0.0707	|||.....	0.3290	|||||||.....
46	1.3110	0.1770	|||.....	0.0156	|.....	0.0559	|.....
47	2.1633	0.1549	||.....	0.0121	|.....	0.0914	||.....
48	1.9488	0.0324	|.....	0.0005	|.....	0.0173	|.....
49	3.3673	-0.1731	|||.....	0.0152	|.....	-0.1369	|||.....
50	1.8500	-0.0549	|.....	0.0015	|.....	-0.0277	|.....
51	2.7726	0.0359	|.....	0.0007	|.....	0.0256	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Outlier & Influence Chart

Row	lnVegetation (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	3.4532	-0.5881	||.....	0.0128	|.....	0.0678	|||||||.....
11	2.8622	-0.6834	|||.....	0.0129	|.....	0.0517	||||.....
13	1.4061	-0.5630	||.....	0.0046	|.....	0.0279	|.....
14	2.6462	-0.8470	||||.....	0.0177	|.....	0.0467	|||.....
15	-0.9943	* 2.6549	||||||||||||..	0.1202	|||||.....	0.0379	||.....
16	-2.5257	0.5516	||.....	0.0128	|.....	0.0763	|||||||.....
17	-0.8440	-0.5963	||.....	0.0066	|.....	0.0355	|.....
18	-2.2073	0.0844	|.....	0.0003	|.....	0.0663	||||||.....
19	-0.4780	-1.3562	|||||.....	0.0284	|.....	0.0306	|.....
20	0.4055	-0.7672	|||.....	0.0075	|.....	0.0246	|.....
21	-3.5066	1.3263	|||||.....	0.1111	||||.....	0.1141	|||||||||||||
22	2.6101	0.6040	||.....	0.0089	|.....	0.0459	|||.....
23	0.7031	0.1428	|.....	0.0003	|.....	0.0244	|.....
24	2.5014	0.0783	|.....	0.0001	|.....	0.0437	|||.....
25	2.7014	-0.0308	|.....	0.0000	|.....	0.0479	|||.....
26	3.3844	0.5796	||.....	0.0120	|.....	0.0657	|||||.....
27	3.2108	1.0581	|||||.....	0.0361	|.....	0.0607	|||||.....
28	2.0464	1.0922	|||||.....	0.0219	|.....	0.0355	|.....
29	3.3429	0.4905	||.....	0.0085	|.....	0.0645	|||||.....
30	2.1759	0.5894	||.....	0.0069	|.....	0.0376	||.....
31	2.2138	-0.3740	|.....	0.0028	|.....	0.0383	||.....
32	1.6734	-0.9963	||||.....	0.0156	|.....	0.0305	|.....
33	2.4681	0.4420	||.....	0.0045	|.....	0.0430	|||.....
34	-2.4079	* 2.9651	||||||||||||||	0.2863	||||||||||||||	0.0725	|||||||.....
35	-1.0498	-0.4423	||.....	0.0040	|.....	0.0388	||.....
36	-1.0788	-0.9797	||||.....	0.0197	|.....	0.0394	||.....
37	0.1044	-0.9504	||||.....	0.0119	|.....	0.0257	|.....
38	-0.2614	-0.0736	|.....	0.0001	|.....	0.0283	|.....
39	-1.1087	-1.4337	|||||||.....	0.0416	||.....	0.0399	||.....
40	-1.1087	1.8052	|||||||||.....	0.0640	|||.....	0.0399	||.....
41	-2.6593	-0.0389	|.....	0.0001	|.....	0.0809	|||||||||.....
42	-1.2040	-1.9405	|||||||||.....	0.0765	||||.....	0.0417	||.....
43	-1.4697	-1.3438	||||||.....	0.0438	||.....	0.0472	|||.....
44	-2.6593	-0.0740	|.....	0.0002	|.....	0.0809	|||||||||.....
45	-3.2189	-1.1196	|||||.....	0.0707	|||.....	0.1019	|||||||||||...
46	1.3110	1.0606	|||||.....	0.0156	|.....	0.0271	|.....
47	2.1633	0.7858	|||.....	0.0121	|.....	0.0374	||.....
48	1.9488	0.1725	|.....	0.0005	|.....	0.0341	|.....
49	3.3673	-0.6554	|||.....	0.0152	|.....	0.0652	|||||.....
50	1.8500	-0.2987	|.....	0.0015	|.....	0.0327	|.....
51	2.7726	0.1574	|.....	0.0007	|.....	0.0495	||||.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Inverse Prediction of X Means

Row	lnInvert (Y)	lnVegetation (X)	Predicted lnVegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	3.4078	3.4532	2.9267	0.5264	2.5352	3.4056
11	3.0057	2.8622	2.2462	0.6160	1.9060	2.6482
13	2.2050	1.4061	0.8913	0.5148	0.6009	1.1927
14	2.7912	2.6462	1.8832	0.7630	1.5646	2.2500
15	2.4069	-0.9943	1.2331	-2.2273	0.9390	1.5509
16	0.4762	-2.5257	-2.0340	-0.4918	-2.5504	-1.6162
17	0.8587	-0.8440	-1.3868	0.5429	-1.8255	-1.0226
18	0.4187	-2.2073	-2.1313	-0.0760	-2.6601	-1.7048
19	0.6780	-0.4780	-1.6925	1.2145	-2.1668	-1.3040
20	1.5041	0.4055	-0.2947	0.7002	-0.6295	0.0066
21	0.2776	-3.5066	-2.3700	-1.1365	-2.9298	-1.9215
22	3.5439	2.6101	3.1569	-0.5468	2.7456	3.6640
23	2.1713	0.7031	0.8344	-0.1313	0.5439	1.1337
24	3.1987	2.5014	2.5728	-0.0713	2.2094	3.0102
25	3.2581	2.7014	2.6733	0.0280	2.3022	3.1222
26	3.9853	3.3844	3.9038	-0.5194	3.4231	4.5084
27	4.1320	3.2108	4.1520	-0.9412	3.6468	4.7905
28	3.4689	2.0464	3.0300	-0.9836	2.6297	3.5214
29	3.9140	3.3429	3.7833	-0.4404	3.3142	4.3717
30	3.2809	2.1759	2.7119	-0.5361	2.3378	3.1653
31	2.7850	2.2138	1.8728	0.3409	1.5548	2.2386
32	2.1342	1.6734	0.7715	0.9019	0.4807	1.0688
33	3.3742	2.4681	2.8697	-0.4016	2.4829	3.3417
34	1.6715	-2.4079	-0.0115	-2.3965	-0.3279	0.2821
35	0.8198	-1.0498	-1.4526	0.4028	-1.8988	-1.0834
36	0.5188	-1.0788	-1.9620	0.8831	-2.4694	-1.5505
37	1.2296	0.1044	-0.7591	0.8635	-1.1325	-0.4366
38	1.4839	-0.2614	-0.3289	0.0675	-0.6662	-0.0264
39	0.2700	-1.1087	-2.3829	1.2742	-2.9444	-1.9332
40	1.9573	-1.1087	0.4722	-1.5808	0.1762	0.7634
41	0.0862	-2.6593	-2.6940	0.0347	-3.2969	-2.2145
42	-0.0305	-1.2040	-2.8914	1.6874	-3.5211	-2.3925
43	0.1044	-1.4697	-2.6632	1.1936	-3.2620	-2.1867
44	0.0677	-2.6593	-2.7253	0.0661	-3.3325	-2.2428
45	-0.7985	-3.2189	-4.1910	0.9721	-5.0046	-3.5570
46	3.0204	1.3110	2.2712	-0.9601	1.9293	2.6758
47	3.3776	2.1633	2.8755	-0.7122	2.4882	3.3482
48	2.9232	1.9488	2.1066	-0.1578	1.7752	2.4945
49	3.3214	3.3673	2.7805	0.5868	2.4009	3.2419
50	2.6101	1.8500	1.5768	0.2732	1.2724	1.9179
51	3.4012	2.7726	2.9155	-0.1429	2.5249	3.3929

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnInvert X = lnVegetation

Inverse Prediction of X Individuals

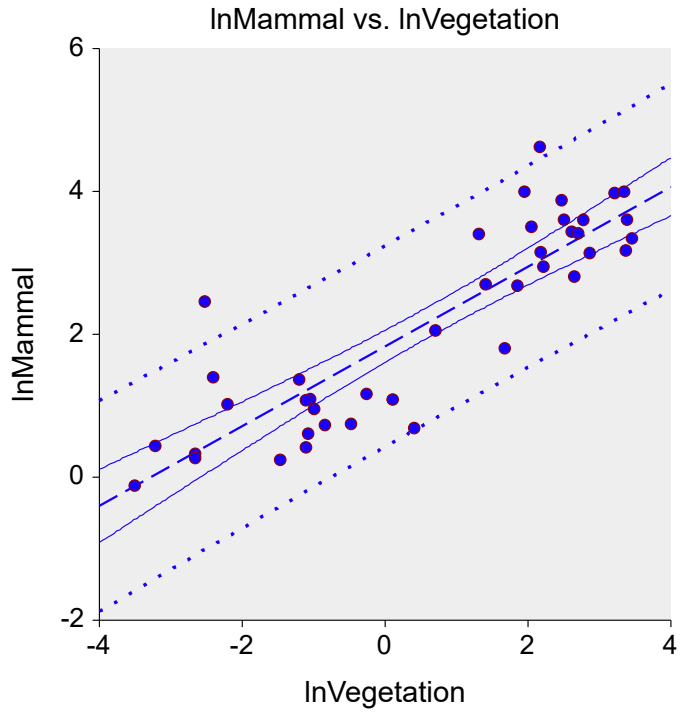
Row	lnInvert (Y)	lnVegetation (X)	Predicted lnVegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	3.4078	3.4532	2.9267	0.5264	1.0439	4.8968
11	3.0057	2.8622	2.2462	0.6160	0.3641	4.1901
13	2.2050	1.4061	0.8913	0.5148	-1.0031	2.7967
14	2.7912	2.6462	1.8832	0.7630	-0.0004	3.8150
15	2.4069	-0.9943	1.2331	-2.2273	-0.6565	3.1464
16	0.4762	-2.5257	-2.0340	-0.4918	-4.0173	-0.1494
17	0.8587	-0.8440	-1.3868	0.5429	-3.3432	0.4951
18	0.4187	-2.2073	-2.1313	-0.0760	-4.1190	-0.2459
19	0.6780	-0.4780	-1.6925	1.2145	-3.6611	0.1902
20	1.5041	0.4055	-0.2947	0.7002	-2.2149	1.5920
21	0.2776	-3.5066	-2.3700	-1.1365	-4.3689	-0.4824
22	3.5439	2.6101	3.1569	-0.5468	1.2728	5.1369
23	2.1713	0.7031	0.8344	-0.1313	-1.0609	2.7385
24	3.1987	2.5014	2.5728	-0.0713	0.6909	4.5287
25	3.2581	2.7014	2.6733	0.0280	0.7913	4.6332
26	3.9853	3.3844	3.9038	-0.5194	2.0122	5.9193
27	4.1320	3.2108	4.1520	-0.9412	2.2568	6.1805
28	3.4689	2.0464	3.0300	-0.9836	1.1466	5.0045
29	3.9140	3.3429	3.7833	-0.4404	1.8932	5.7927
30	3.2809	2.1759	2.7119	-0.5361	0.8298	4.6733
31	2.7850	2.2138	1.8728	0.3409	-0.0109	3.8043
32	2.1342	1.6734	0.7715	0.9019	-1.1249	2.6743
33	3.3742	2.4681	2.8697	-0.4016	0.9871	4.8375
34	1.6715	-2.4079	-0.0115	-2.3965	-1.9242	1.8784
35	0.8198	-1.0498	-1.4526	0.4028	-3.4115	0.4294
36	0.5188	-1.0788	-1.9620	0.8831	-3.9420	-0.0778
37	1.2296	0.1044	-0.7591	0.8635	-2.6932	1.1241
38	1.4839	-0.2614	-0.3289	0.0675	-2.2500	1.5575
39	0.2700	-1.1087	-2.3829	1.2742	-4.3824	-0.4952
40	1.9573	-1.1087	0.4722	-1.5808	-1.4297	2.3693
41	0.0862	-2.6593	-2.6940	0.0347	-4.7089	-0.8025
42	-0.0305	-1.2040	-2.8914	1.6874	-4.9165	-0.9971
43	0.1044	-1.4697	-2.6632	1.1936	-4.6765	-0.7722
44	0.0677	-2.6593	-2.7253	0.0661	-4.7418	-0.8335
45	-0.7985	-3.2189	-4.1910	0.9721	-6.2922	-2.2693
46	3.0204	1.3110	2.2712	-0.9601	0.3891	4.2160
47	3.3776	2.1633	2.8755	-0.7122	0.9929	4.8435
48	2.9232	1.9488	2.1066	-0.1578	0.2240	4.0457
49	3.3214	3.3673	2.7805	0.5868	0.8982	4.7446
50	2.6101	1.8500	1.5768	0.2732	-0.3091	3.4994
51	3.4012	2.7726	2.9155	-0.1429	1.0327	4.8851

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Linear Regression Plot Section



Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	lnMammal	Rows Processed	58
Independent Variable	lnVegetation	Rows Used in Estimation	41
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	1.8329	Rows Prediction Only	0
Slope	0.5580	Sum of Frequencies	41
R-Squared	0.7613	Sum of Weights	41.0000
Correlation	0.8725	Coefficient of Variation	0.3165
Mean Square Error	0.4704242	Square Root of MSE	0.6858748

Linear Regression Report

Y = lnMammal X = lnVegetation

Summary Statement

The equation of the straight line relating lnMammal and lnVegetation is estimated as: lnMammal = (1.8329) + (0.5580) lnVegetation using the 41 observations in this dataset. The y-intercept, the estimated value of lnMammal when lnVegetation is zero, is 1.8329 with a standard error of 0.1112. The slope, the estimated change in lnMammal per unit change in lnVegetation, is 0.5580 with a standard error of 0.0500. The value of R-Squared, the proportion of the variation in lnMammal that can be accounted for by variation in lnVegetation, is 0.7613. The correlation between lnMammal and lnVegetation is 0.8725.

A significance test that the slope is zero resulted in a t-value of 11.1536. The significance level of this t-test is 0.0000. Since 0.0000 < 0.0500, the hypothesis that the slope is zero is rejected.

The estimated slope is 0.5580. The lower limit of the 95% confidence interval for the slope is 0.4568 and the upper limit is 0.6592. The estimated intercept is 1.8329. The lower limit of the 95% confidence interval for the intercept is 1.6079 and the upper limit is 2.0579.

Descriptive Statistics Section

Parameter	Dependent	Independent
Variable	lnMammal	lnVegetation
Count	41	41
Mean	2.1669	0.5985
Standard Deviation	1.3863	2.1675
Minimum	-0.1165	-3.5066
Maximum	4.6240	3.4532

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Regression Estimation Section

Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	1.8329	0.5580
Lower 95% Confidence Limit	1.6079	0.4568
Upper 95% Confidence Limit	2.0579	0.6592
Standard Error	0.1112	0.0500
Standardized Coefficient	0.0000	0.8725
T Value	16.4795	11.1536
Prob Level (T Test)	0.0000	0.0000
Prob Level (Randomization Test N =1000)		0.0010
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	1.0000
Regression of Y on X	1.8329	0.5580
Inverse Regression from X on Y	1.7282	0.7330
Orthogonal Regression of Y and X	1.8066	0.6020

Notes:
The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

Estimated Model
(1.83289957235926) + (0.558043604714138) * (lnVegetation)

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Bootstrap Section

Estimation Results		Bootstrap Confidence Limits		
Parameter	**Estimate**	**Conf. Level**	**Lower**	**Upper**
Intercept				
Original Value	1.8329	0.9000	1.6403	2.0257
Bootstrap Mean	1.8291	0.9500	1.5994	2.0631
Bias (BM - OV)	-0.0038	0.9900	1.5070	2.1355
Bias Corrected	1.8367			
Standard Error	0.1173			
Slope				
Original Value	0.5580	0.9000	0.4751	0.6374
Bootstrap Mean	0.5606	0.9500	0.4607	0.6564
Bias (BM - OV)	0.0026	0.9900	0.4191	0.6857
Bias Corrected	0.5554			
Standard Error	0.0492			
Correlation				
Original Value	0.8725	0.9000	0.8147	0.9443
Bootstrap Mean	0.8735	0.9500	0.8078	0.9586
Bias (BM - OV)	0.0010	0.9900	0.7944	0.9929
Bias Corrected	0.8716			
Standard Error	0.0394			
R-Squared				
Original Value	0.7613	0.9000	0.6571	0.8814
Bootstrap Mean	0.7645	0.9500	0.6442	0.9041
Bias (BM - OV)	0.0032	0.9900	0.6188	0.9569
Bias Corrected	0.7581			
Standard Error	0.0680			
Standard Error of Estimate				
Original Value	0.6859	0.9000	0.5590	0.8652
Bootstrap Mean	0.6628	0.9500	0.5316	0.8937
Bias (BM - OV)	-0.0231	0.9900	0.4842	0.9352
Bias Corrected	0.7090			
Standard Error	0.0930			
Orthogonal Intercept				
Original Value	1.8066	0.9000	1.6143	2.0026
Bootstrap Mean	1.8027	0.9500	1.5723	2.0441
Bias (BM - OV)	-0.0038	0.9900	1.4933	2.1071
Bias Corrected	1.8104			
Standard Error	0.1179			
Orthogonal Slope				
Original Value	0.6020	0.9000	0.5125	0.6827
Bootstrap Mean	0.6046	0.9500	0.4938	0.6985
Bias (BM - OV)	0.0025	0.9900	0.4484	0.7306
Bias Corrected	0.5995			
Standard Error	0.0519			

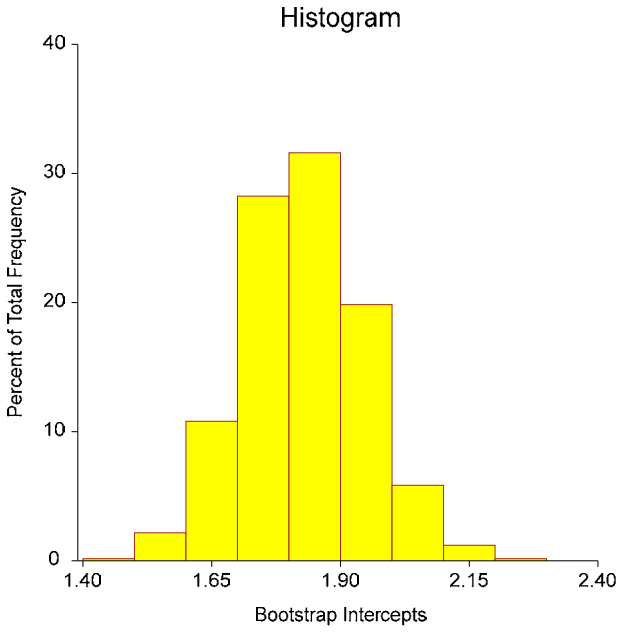
Sampling Method = Observation, Confidence Limit Type = Reflection, Number of Samples = 3000.

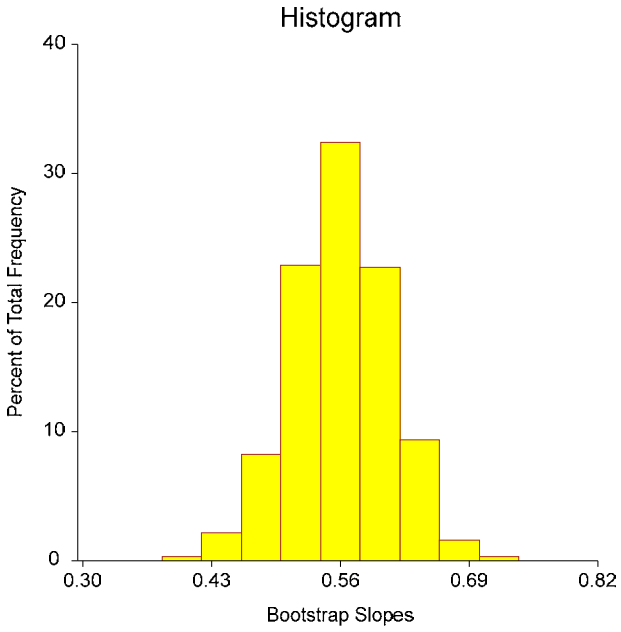
Notes:
The main purpose of this report is to present the bootstrap confidence intervals of various parameters. All gross outliers should have been removed. The sample size should be at least 50 and the sample should be 'representative' of the population it was drawn from.

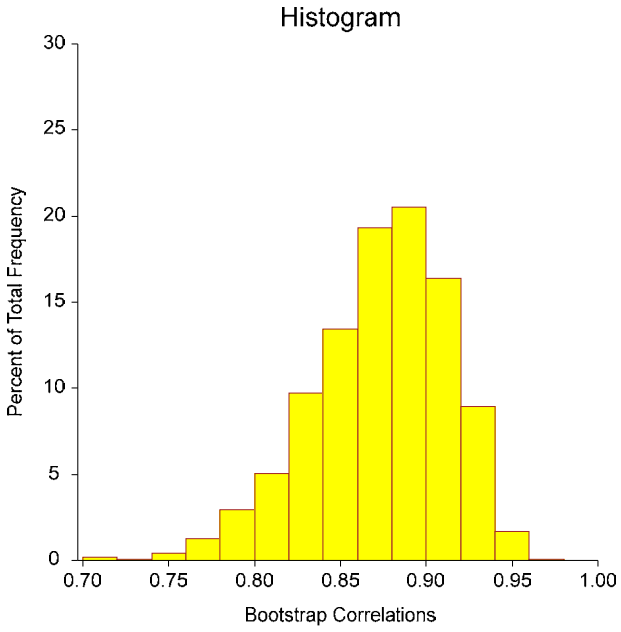
Linear Regression Report

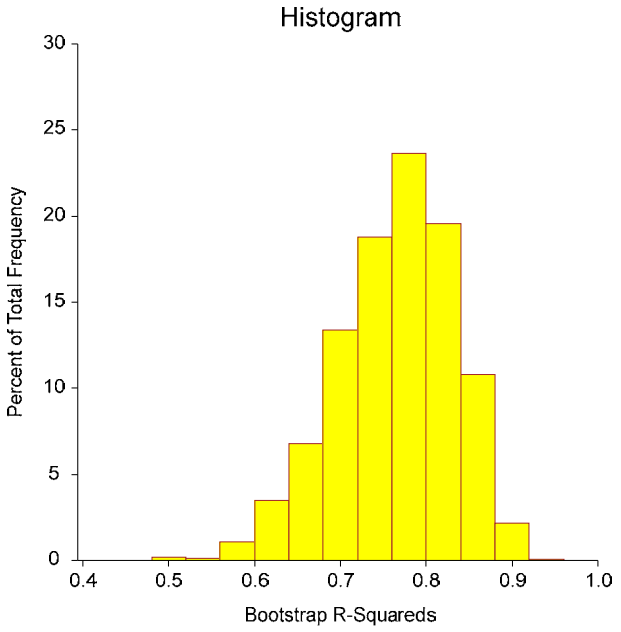
Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Bootstrap Histograms Section



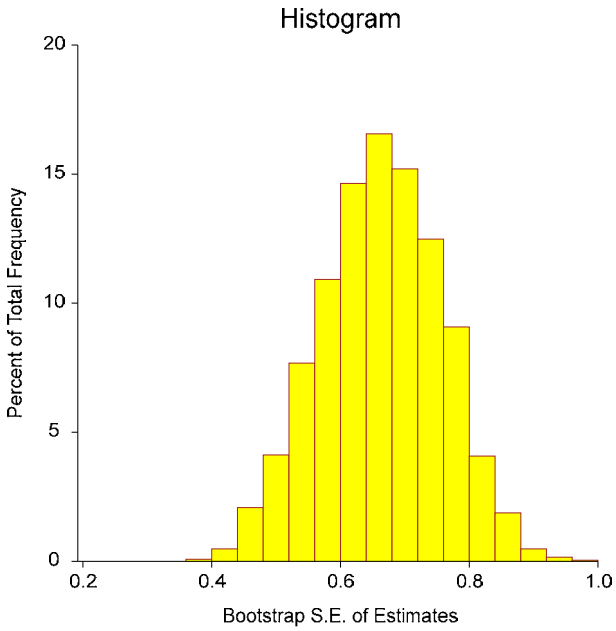


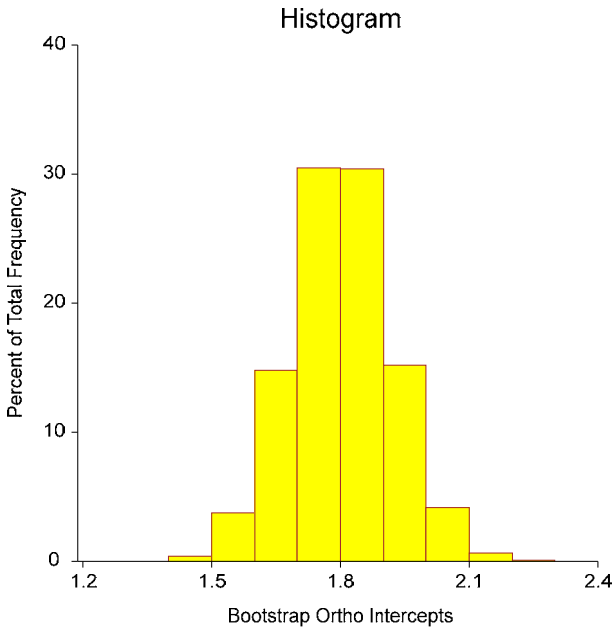


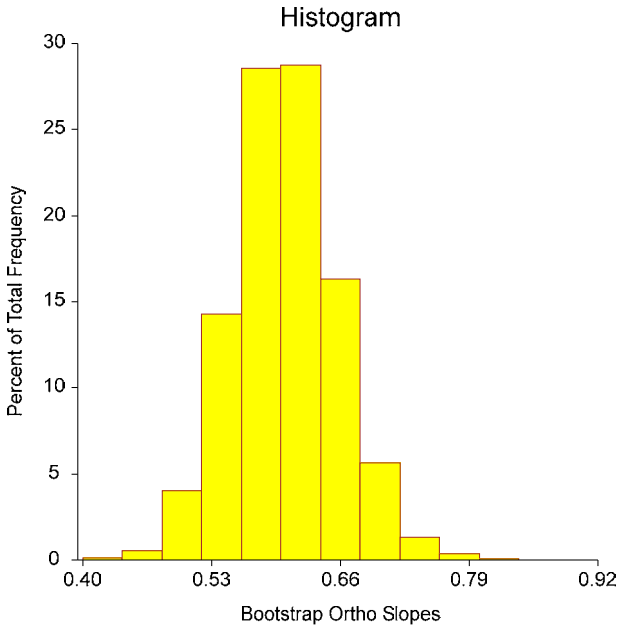


Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	0.8725	0.7613	0.8290
Lower 95% Conf. Limit (r dist'n)	0.7683		
Upper 95% Conf. Limit (r dist'n)	0.9286		
Lower 95% Conf. Limit (Fisher's z)	0.7722		0.6999
Upper 95% Conf. Limit (Fisher's z)	0.9304		0.9057
Adjusted (Rbar)		0.7552	
T-Value for H0: Rho = 0	11.1536	11.1536	9.2583
Prob Level for H0: Rho = 0	0.0000	0.0000	0.0000
Prob Level (Randomization Test N =1000)	0.0010		

Notes:
The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say r0, check to see if r0 is between the confidence limits. If it is, the null hypothesis that rho = r0 is not rejected. If r0 is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the orginal data with their ranks. This correlation is used when some of the assumptions may be invalid.

Analysis of Variance Section

Source	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1	192.5151	192.5151			
Slope	1	58.52184	58.52184	124.4023	0.0000	1.0000
Error	39	18.34654	0.4704242			
Lack of Fit	37	18.12719	0.4899239	4.4669	0.1995	
Pure Error	2	0.2193584	0.1096792			
Adj. Total	40	76.86839	1.92171			
Total	41	269.3835				

s = Square Root(0.4704242) = 0.6858748

Notes:
The above report shows the F-Ratio for testing whether the slope is zero, the degrees of freedom, and the mean square error. The mean square error, which estimates the variance of the residuals, is used extensively in the calculation of hypothesis tests and confidence intervals.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Summary Matrices

	X'X	X'X	X'Y	X'X Inverse	X'X Inverse
Index	**0**	**1**	**2**	**0**	**1**
0	41	24.53991	88.84322	0.02629657	-0.003184985
1	24.53991	202.6118	158.0454	-0.003184985	0.005321307
2 (Y'Y)			269.3835		
Determinant		7704.875			0.000129788

Variance - Covariance Matrix of Regression Coefficients

	VC(b)	VC(b)
Index	**0**	**1**
0	0.01237054	-0.001498294
1	-0.001498294	0.002503271

Tests of Assumptions Section

Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
Residuals follow Normal Distribution?			
Shapiro Wilk	0.9623	0.189822	No
Anderson Darling	0.4418	0.288827	Yes
D'Agostino Skewness	2.0614	0.039262	No
D'Agostino Kurtosis	1.6157	0.106165	No
D'Agostino Omnibus	6.8599	0.032389	No
Constant Residual Variance?			
Modified Levene Test	0.7878	0.380222	Yes
Relationship is a Straight Line?			
Lack of Linear Fit F(37, 2) Test	4.4669	0.199506	No

No Serial Correlation?
Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

Notes:
A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.
A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say N > 500) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

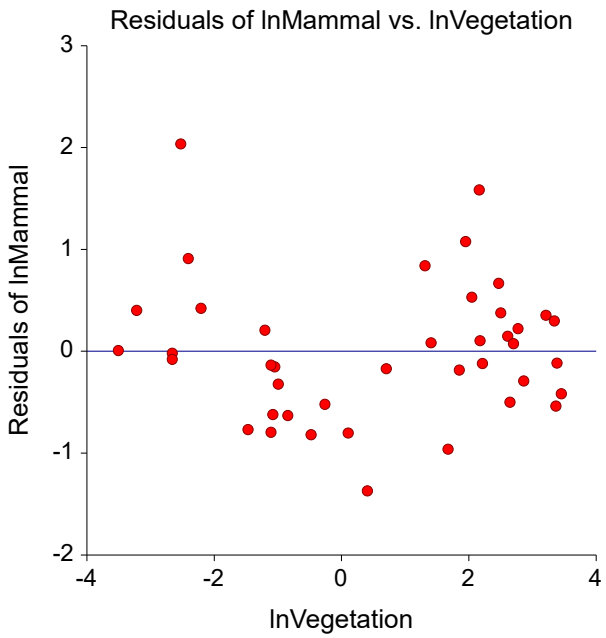
Normality and Constant Residual Variance:
Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

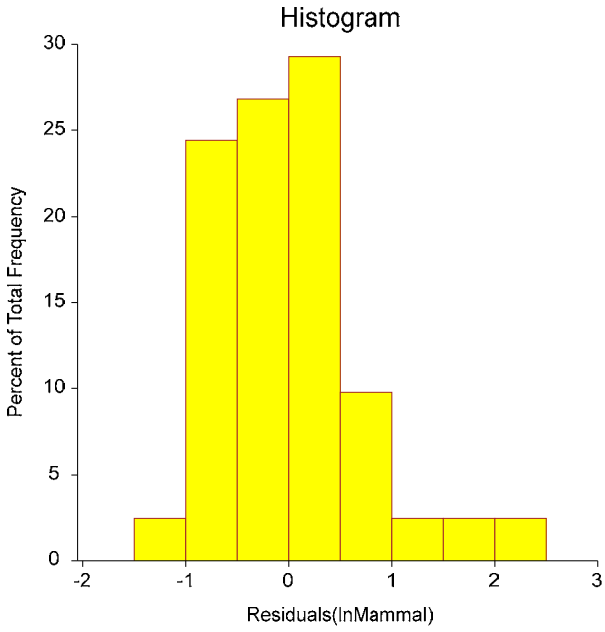
Straight-Line:
Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

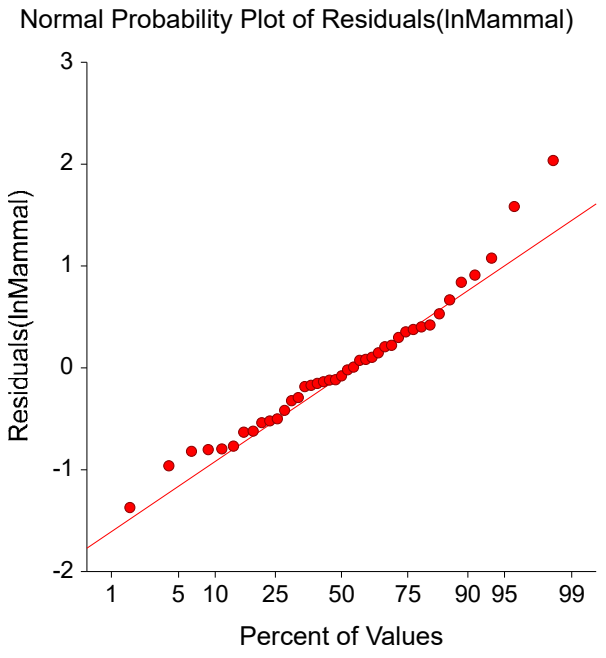
Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Residual Plots Section







Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Original Data Section

Row	lnVegetation (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual
10	3.4532	3.3429	3.7599	-0.4171
11	2.8622	3.1384	3.4301	-0.2917
13	1.4061	2.7007	2.6176	0.0831
14	2.6462	2.8094	3.3096	-0.5002
15	-0.9943	0.9555	1.2781	-0.3226
16	-2.5257	2.4592	0.4234	2.0357
17	-0.8440	0.7308	1.3619	-0.6312
18	-2.2073	1.0225	0.6011	0.4213
19	-0.4780	0.7467	1.5661	-0.8194
20	0.4055	0.6881	2.0592	-1.3710
21	-3.5066	-0.1165	-0.1239	0.0074
22	2.6101	3.4372	3.2894	0.1478
23	0.7031	2.0541	2.2253	-0.1711
24	2.5014	3.6055	3.2288	0.3767
25	2.7014	3.4144	3.3404	0.0741
26	3.3844	3.6055	3.7215	-0.1160
27	3.2108	3.9782	3.6247	0.3536
28	2.0464	3.5056	2.9749	0.5307
29	3.3429	3.9964	3.6984	0.2980
30	2.1759	3.1506	3.0471	0.1035
31	2.2138	2.9481	3.0683	-0.1202
32	1.6734	1.8050	2.7667	-0.9617
33	2.4681	3.8774	3.2102	0.6672
34	-2.4079	1.3995	0.4892	0.9104
35	-1.0498	1.0942	1.2471	-0.1529
36	-1.0788	0.6098	1.2309	-0.6211
37	0.1044	1.0886	1.8911	-0.8026
38	-0.2614	1.1663	1.6870	-0.5208
39	-1.1087	1.0784	1.2142	-0.1358
40	-1.1087	0.4187	1.2142	-0.7955
41	-2.6593	0.3293	0.3489	-0.0196
42	-1.2040	1.3678	1.1610	0.2068
43	-1.4697	0.2443	1.0128	-0.7685
44	-2.6593	0.2700	0.3489	-0.0789
45	-3.2189	0.4383	0.0366	0.4016
46	1.3110	3.4045	2.5645	0.8400
47	2.1633	4.6240	3.0401	1.5839
48	1.9488	3.9973	2.9204	1.0769
49	3.3673	3.1739	3.7120	-0.5381
50	1.8500	2.6810	2.8653	-0.1843
51	2.7726	3.6019	3.3801	0.2217

This report provides a data list that may be used to verify whether the correct variables were selected.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Predicted Values and Confidence Limits of Means

Row	lnVegetation (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Limit of Y Mean|X	Upper 95% Conf. Limit of Y Mean|X
10	3.4532	3.3429	3.7599	0.1785	3.3988	4.1210
11	2.8622	3.1384	3.4301	0.1559	3.1148	3.7454
13	1.4061	2.7007	2.6176	0.1145	2.3860	2.8491
14	2.6462	2.8094	3.3096	0.1482	3.0098	3.6094
15	-0.9943	0.9555	1.2781	0.1335	1.0080	1.5481
16	-2.5257	2.4592	0.4234	0.1895	0.0401	0.8067
17	-0.8440	0.7308	1.3619	0.1292	1.1007	1.6232
18	-2.2073	1.0225	0.6011	0.1766	0.2440	0.9583
19	-0.4780	0.7467	1.5661	0.1199	1.3236	1.8086
20	0.4055	0.6881	2.0592	0.1076	1.8416	2.2767
21	-3.5066	-0.1165	-0.1239	0.2316	-0.5925	0.3446
22	2.6101	3.4372	3.2894	0.1470	2.9921	3.5867
23	0.7031	2.0541	2.2253	0.1072	2.0083	2.4422
24	2.5014	3.6055	3.2288	0.1433	2.9389	3.5187
25	2.7014	3.4144	3.3404	0.1501	3.0367	3.6441
26	3.3844	3.6055	3.7215	0.1758	3.3660	4.0771
27	3.2108	3.9782	3.6247	0.1690	3.2829	3.9665
28	2.0464	3.5056	2.9749	0.1293	2.7133	3.2364
29	3.3429	3.9964	3.6984	0.1741	3.3461	4.0506
30	2.1759	3.1506	3.0471	0.1330	2.7780	3.3163
31	2.2138	2.9481	3.0683	0.1342	2.7969	3.3397
32	1.6734	1.8050	2.7667	0.1199	2.5243	3.0091
33	2.4681	3.8774	3.2102	0.1422	2.9226	3.4979
34	-2.4079	1.3995	0.4892	0.1847	0.1156	0.8627
35	-1.0498	1.0942	1.2471	0.1352	0.9736	1.5205
36	-1.0788	0.6098	1.2309	0.1361	0.9556	1.5061
37	0.1044	1.0886	1.8911	0.1099	1.6688	2.1135
38	-0.2614	1.1663	1.6870	0.1154	1.4536	1.9205
39	-1.1087	1.0784	1.2142	0.1370	0.9371	1.4913
40	-1.1087	0.4187	1.2142	0.1370	0.9371	1.4913
41	-2.6593	0.3293	0.3489	0.1950	-0.0456	0.7434
42	-1.2040	1.3678	1.1610	0.1400	0.8778	1.4443
43	-1.4697	0.2443	1.0128	0.1489	0.7115	1.3140
44	-2.6593	0.2700	0.3489	0.1950	-0.0456	0.7434
45	-3.2189	0.4383	0.0366	0.2190	-0.4063	0.4796
46	1.3110	3.4045	2.5645	0.1129	2.3362	2.7929
47	2.1633	4.6240	3.0401	0.1327	2.7718	3.3085
48	1.9488	3.9973	2.9204	0.1266	2.6642	3.1765
49	3.3673	3.1739	3.7120	0.1751	3.3578	4.0662
50	1.8500	2.6810	2.8653	0.1241	2.6143	3.1163
51	2.7726	3.6019	3.3801	0.1527	3.0713	3.6889

The confidence interval estimates the mean of the Y values in a large sample of individuals with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Predicted Values and Prediction Limits

Row	lnVegetation (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Prediction Limit of Y|X	Upper 95% Prediction Limit of Y|X
10	3.4532	3.3429	3.7599	0.7087	2.3264	5.1935
11	2.8622	3.1384	3.4301	0.7034	2.0074	4.8528
13	1.4061	2.7007	2.6176	0.6954	1.2111	4.0241
14	2.6462	2.8094	3.3096	0.7017	1.8902	4.7289
15	-0.9943	0.9555	1.2781	0.6987	-0.1353	2.6914
16	-2.5257	2.4592	0.4234	0.7116	-1.0159	1.8627
17	-0.8440	0.7308	1.3619	0.6979	-0.0498	2.7736
18	-2.2073	1.0225	0.6011	0.7082	-0.8314	2.0337
19	-0.4780	0.7467	1.5661	0.6963	0.1578	2.9745
20	0.4055	0.6881	2.0592	0.6943	0.6549	3.4634
21	-3.5066	-0.1165	-0.1239	0.7239	-1.5882	1.3404
22	2.6101	3.4372	3.2894	0.7014	1.8706	4.7082
23	0.7031	2.0541	2.2253	0.6942	0.8211	3.6294
24	2.5014	3.6055	3.2288	0.7007	1.8115	4.6461
25	2.7014	3.4144	3.3404	0.7021	1.9202	4.7605
26	3.3844	3.6055	3.7215	0.7080	2.2894	5.1537
27	3.2108	3.9782	3.6247	0.7064	2.1959	5.0535
28	2.0464	3.5056	2.9749	0.6980	1.5631	4.3866
29	3.3429	3.9964	3.6984	0.7076	2.2670	5.1297
30	2.1759	3.1506	3.0471	0.6987	1.6340	4.4603
31	2.2138	2.9481	3.0683	0.6989	1.6547	4.4819
32	1.6734	1.8050	2.7667	0.6963	1.3584	4.1750
33	2.4681	3.8774	3.2102	0.7005	1.7934	4.6270
34	-2.4079	1.3995	0.4892	0.7103	-0.9476	1.9259
35	-1.0498	1.0942	1.2471	0.6991	-0.1670	2.6611
36	-1.0788	0.6098	1.2309	0.6992	-0.1835	2.6452
37	0.1044	1.0886	1.8911	0.6946	0.4861	3.2962
38	-0.2614	1.1663	1.6870	0.6955	0.2802	3.0939
39	-1.1087	1.0784	1.2142	0.6994	-0.2005	2.6289
40	-1.1087	0.4187	1.2142	0.6994	-0.2005	2.6289
41	-2.6593	0.3293	0.3489	0.7131	-1.0934	1.7912
42	-1.2040	1.3678	1.1610	0.7000	-0.2549	2.5770
43	-1.4697	0.2443	1.0128	0.7019	-0.4069	2.4324
44	-2.6593	0.2700	0.3489	0.7131	-1.0934	1.7912
45	-3.2189	0.4383	0.0366	0.7200	-1.4197	1.4929
46	1.3110	3.4045	2.5645	0.6951	1.1585	3.9705
47	2.1633	4.6240	3.0401	0.6986	1.6271	4.4532
48	1.9488	3.9973	2.9204	0.6975	1.5096	4.3312
49	3.3673	3.1739	3.7120	0.7079	2.2802	5.1438
50	1.8500	2.6810	2.8653	0.6970	1.4555	4.2751
51	2.7726	3.6019	3.3801	0.7027	1.9589	4.8014

The prediction interval estimates the predicted value of Y for a single individual with this value of X. The interval is only accurate if all of the linear regression assumptions are valid.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Working-Hotelling Simultaneous Confidence Band

Row	lnVegetation (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Standard Error of Yhat	Lower 95% Conf. Band of Y Mean|X	Upper 95% Conf. Band of Y Mean|X
10	3.4532	3.3429	3.7599	0.1785	3.2511	4.2687
11	2.8622	3.1384	3.4301	0.1559	2.9859	3.8744
13	1.4061	2.7007	2.6176	0.1145	2.2913	2.9438
14	2.6462	2.8094	3.3096	0.1482	2.8872	3.7320
15	-0.9943	0.9555	1.2781	0.1335	0.8976	1.6585
16	-2.5257	2.4592	0.4234	0.1895	-0.1166	0.9635
17	-0.8440	0.7308	1.3619	0.1292	0.9938	1.7300
18	-2.2073	1.0225	0.6011	0.1766	0.0979	1.1044
19	-0.4780	0.7467	1.5661	0.1199	1.2244	1.9078
20	0.4055	0.6881	2.0592	0.1076	1.7527	2.3657
21	-3.5066	-0.1165	-0.1239	0.2316	-0.7841	0.5362
22	2.6101	3.4372	3.2894	0.1470	2.8706	3.7083
23	0.7031	2.0541	2.2253	0.1072	1.9196	2.5309
24	2.5014	3.6055	3.2288	0.1433	2.8204	3.6372
25	2.7014	3.4144	3.3404	0.1501	2.9125	3.7683
26	3.3844	3.6055	3.7215	0.1758	3.2206	4.2225
27	3.2108	3.9782	3.6247	0.1690	3.1431	4.1063
28	2.0464	3.5056	2.9749	0.1293	2.6064	3.3434
29	3.3429	3.9964	3.6984	0.1741	3.2021	4.1947
30	2.1759	3.1506	3.0471	0.1330	2.6680	3.4263
31	2.2138	2.9481	3.0683	0.1342	2.6859	3.4507
32	1.6734	1.8050	2.7667	0.1199	2.4251	3.1083
33	2.4681	3.8774	3.2102	0.1422	2.8049	3.6155
34	-2.4079	1.3995	0.4892	0.1847	-0.0371	1.0154
35	-1.0498	1.0942	1.2471	0.1352	0.8618	1.6323
36	-1.0788	0.6098	1.2309	0.1361	0.8431	1.6187
37	0.1044	1.0886	1.8911	0.1099	1.5778	2.2044
38	-0.2614	1.1663	1.6870	0.1154	1.3581	2.0160
39	-1.1087	1.0784	1.2142	0.1370	0.8238	1.6047
40	-1.1087	0.4187	1.2142	0.1370	0.8238	1.6047
41	-2.6593	0.3293	0.3489	0.1950	-0.2069	0.9048
42	-1.2040	1.3678	1.1610	0.1400	0.7620	1.5601
43	-1.4697	0.2443	1.0128	0.1489	0.5883	1.4372
44	-2.6593	0.2700	0.3489	0.1950	-0.2069	0.9048
45	-3.2189	0.4383	0.0366	0.2190	-0.5874	0.6607
46	1.3110	3.4045	2.5645	0.1129	2.2428	2.8862
47	2.1633	4.6240	3.0401	0.1327	2.6620	3.4182
48	1.9488	3.9973	2.9204	0.1266	2.5595	3.2813
49	3.3673	3.1739	3.7120	0.1751	3.2130	4.2110
50	1.8500	2.6810	2.8653	0.1241	2.5117	3.2189
51	2.7726	3.6019	3.3801	0.1527	2.9451	3.8152

This is a confidence band for the regression line for all possible values of X from -infinity to + infinity. The confidence coefficient is the proportion of time that this procedure yields a band the includes the true regression line when a large number of samples are taken using the same X values as in this sample.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Residual Section

Row	lnVegetation (X)	lnMammal (Y)	Predicted lnMammal (Yhat|X)	Residual	Standardized Residual	Percent Absolute Error
10	3.4532	3.3429	3.7599	-0.4171	-0.6298	12.4758
11	2.8622	3.1384	3.4301	-0.2917	-0.4368	9.2960
13	1.4061	2.7007	2.6176	0.0831	0.1229	3.0780
14	2.6462	2.8094	3.3096	-0.5002	-0.7469	17.8037
15	-0.9943	0.9555	1.2781	-0.3226	-0.4794	33.7570
16	-2.5257	2.4592	0.4234	2.0357	3.0883	82.7814
17	-0.8440	0.7308	1.3619	-0.6312	-0.9370	86.3703
18	-2.2073	1.0225	0.6011	0.4213	0.6357	41.2056
19	-0.4780	0.7467	1.5661	-0.8194	-1.2134	109.7442
20	0.4055	0.6881	2.0592	-1.3710	-2.0240	199.2389
21	-3.5066	-0.1165	-0.1239	0.0074	0.0114	6.3319
22	2.6101	3.4372	3.2894	0.1478	0.2206	4.2993
23	0.7031	2.0541	2.2253	-0.1711	-0.2526	8.3313
24	2.5014	3.6055	3.2288	0.3767	0.5616	10.4476
25	2.7014	3.4144	3.3404	0.0741	0.1107	2.1692
26	3.3844	3.6055	3.7215	-0.1160	-0.1750	3.2184
27	3.2108	3.9782	3.6247	0.3536	0.5319	8.8873
28	2.0464	3.5056	2.9749	0.5307	0.7879	15.1381
29	3.3429	3.9964	3.6984	0.2980	0.4492	7.4568
30	2.1759	3.1506	3.0471	0.1035	0.1538	3.2837
31	2.2138	2.9481	3.0683	-0.1202	-0.1786	4.0756
32	1.6734	1.8050	2.7667	-0.9617	-1.4241	53.2795
33	2.4681	3.8774	3.2102	0.6672	0.9944	17.2079
34	-2.4079	1.3995	0.4892	0.9104	1.3782	65.0484
35	-1.0498	1.0942	1.2471	-0.1529	-0.2274	13.9738
36	-1.0788	0.6098	1.2309	-0.6211	-0.9239	101.8606
37	0.1044	1.0886	1.8911	-0.8026	-1.1855	73.7280
38	-0.2614	1.1663	1.6870	-0.5208	-0.7703	44.6531
39	-1.1087	1.0784	1.2142	-0.1358	-0.2021	12.5934
40	-1.1087	0.4187	1.2142	-0.7955	-1.1837	189.9899
41	-2.6593	0.3293	0.3489	-0.0196	-0.0298	5.9558
42	-1.2040	1.3678	1.1610	0.2068	0.3079	15.1164
43	-1.4697	0.2443	1.0128	-0.7685	-1.1479	314.6350
44	-2.6593	0.2700	0.3489	-0.0789	-0.1200	29.2154
45	-3.2189	0.4383	0.0366	0.4016	0.6179	91.6426
46	1.3110	3.4045	2.5645	0.8400	1.2417	24.6734
47	2.1633	4.6240	3.0401	1.5839	2.3537	34.2532
48	1.9488	3.9973	2.9204	1.0769	1.5976	26.9405
49	3.3673	3.1739	3.7120	-0.5381	-0.8115	16.9546
50	1.8500	2.6810	2.8653	-0.1843	-0.2732	6.8733
51	2.7726	3.6019	3.3801	0.2217	0.3316	6.1563

The residual is the difference between the actual and the predicted Y values. The formula is Residual = Y - Yhat. The Percent Absolute Error is the 100 |Residual| / Y.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Residual Diagnostics Section

Row	lnVegetation (X)	Residual	RStudent	Hat Diagonal	Cook's D	MSEi
10	3.4532	-0.4171	-0.6248	0.0678	0.0144	0.4779
11	2.8622	-0.2917	-0.4322	0.0517	0.0052	0.4804
13	1.4061	0.0831	0.1214	0.0279	0.0002	0.4826
14	2.6462	-0.5002	-0.7426	0.0467	0.0137	0.4759
15	-0.9943	-0.3226	-0.4747	0.0379	0.0045	0.4800
16	-2.5257	2.0357	*3.5073	0.0763	0.3941	0.3647
17	-0.8440	-0.6312	-0.9355	0.0355	0.0161	0.4719
18	-2.2073	0.4213	0.6308	0.0663	0.0143	0.4778
19	-0.4780	-0.8194	-1.2210	0.0306	0.0232	0.4646
20	0.4055	-1.3710	*-2.1119	0.0246	0.0516	0.4321
21	-3.5066	0.0074	*0.0113	0.1141	0.0000	0.4828
22	2.6101	0.1478	0.2179	0.0459	0.0012	0.4822
23	0.7031	-0.1711	-0.2496	0.0244	0.0008	0.4820
24	2.5014	0.3767	0.5566	0.0437	0.0072	0.4789
25	2.7014	0.0741	0.1093	0.0479	0.0003	0.4827
26	3.3844	-0.1160	-0.1728	0.0657	0.0011	0.4824
27	3.2108	0.3536	0.5269	0.0607	0.0091	0.4793
28	2.0464	0.5307	0.7839	0.0355	0.0114	0.4751
29	3.3429	0.2980	0.4446	0.0645	0.0070	0.4803
30	2.1759	0.1035	0.1518	0.0376	0.0005	0.4825
31	2.2138	-0.1202	-0.1764	0.0383	0.0006	0.4824
32	1.6734	-0.9617	-1.4437	0.0305	0.0319	0.4577
33	2.4681	0.6672	0.9943	0.0430	0.0222	0.4706
34	-2.4079	0.9104	1.3948	0.0725	0.0742	0.4593
35	-1.0498	-0.1529	-0.2246	0.0388	0.0010	0.4822
36	-1.0788	-0.6211	-0.9222	0.0394	0.0175	0.4722
37	0.1044	-0.8026	-1.1918	0.0257	0.0185	0.4654
38	-0.2614	-0.5208	-0.7662	0.0283	0.0086	0.4755
39	-1.1087	-0.1358	-0.1996	0.0399	0.0008	0.4823
40	-1.1087	-0.7955	-1.1900	0.0399	0.0291	0.4655
41	-2.6593	-0.0196	-0.0294	0.0809	0.0000	0.4828
42	-1.2040	0.2068	0.3043	0.0417	0.0021	0.4816
43	-1.4697	-0.7685	-1.1527	0.0472	0.0326	0.4665
44	-2.6593	-0.0789	-0.1184	0.0809	0.0006	0.4826
45	-3.2189	0.4016	*0.6129	0.1019	0.0217	0.4781
46	1.3110	0.8400	1.2506	0.0271	0.0215	0.4637
47	2.1633	1.5839	*2.5083	0.0374	0.1077	0.4142
48	1.9488	1.0769	1.6312	0.0341	0.0450	0.4512
49	3.3673	-0.5381	-0.8078	0.0652	0.0230	0.4747
50	1.8500	-0.1843	-0.2699	0.0327	0.0013	0.4819
51	2.7726	0.2217	0.3278	0.0495	0.0029	0.4814

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

MSEi is the value of the Mean Square Error (the average of the sum of squared residuals) calculated with each row omitted.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Leave One Row Out Section

Row	RStudent	DFFITS	Cook's D	CovRatio	DFBETAS(0)	DFBETAS(1)
10	-0.6248	-0.1684	0.0144	1.1070	-0.0610	-0.1348
11	-0.4322	-0.1009	0.0052	1.0999	-0.0470	-0.0733
13	0.1214	0.0205	0.0002	1.0827	0.0166	0.0073
14	-0.7426	-0.1644	0.0137	1.0735	-0.0838	-0.1136
15	-0.4747	-0.0942	0.0045	1.0819	-0.0879	0.0562
16	* 3.5073	1.0082	0.3941	0.6508	0.7728	-0.8317
17	-0.9355	-0.1794	0.0161	1.0434	-0.1703	0.1002
18	0.6308	0.1681	0.0143	1.1048	0.1342	-0.1336
19	-1.2210	-0.2168	0.0232	1.0060	-0.2127	0.0974
20	* -2.1119	-0.3353	0.0516	0.8649	-0.3297	0.0301
21	0.0113	0.0040	0.0000	* 1.1889	0.0028	-0.0036
22	0.2179	0.0478	0.0012	1.1013	0.0247	0.0327
23	-0.2496	-0.0395	0.0008	1.0762	-0.0375	-0.0019
24	0.5566	0.1189	0.0072	1.0837	0.0643	0.0790
25	0.1093	0.0245	0.0003	1.1056	0.0122	0.0172
26	-0.1728	-0.0458	0.0011	1.1256	-0.0171	-0.0363
27	0.5269	0.1340	0.0091	1.1052	0.0539	0.1036
28	0.7839	0.1505	0.0114	1.0577	0.0974	0.0843
29	0.4446	0.1167	0.0070	1.1143	0.0444	0.0920
30	0.1518	0.0300	0.0005	1.0932	0.0185	0.0178
31	-0.1764	-0.0352	0.0006	1.0935	-0.0213	-0.0212
32	-1.4437	-0.2562	0.0319	0.9764	-0.1896	-0.1150
33	0.9943	0.2107	0.0222	1.0455	0.1155	0.1386
34	1.3948	0.3899	0.0742	1.0277	0.3034	-0.3176
35	-0.2246	-0.0452	0.0010	1.0930	-0.0419	0.0275
36	-0.9222	-0.1867	0.0175	1.0490	-0.1725	0.1151
37	-1.1918	-0.1935	0.0185	1.0046	-0.1933	0.0435
38	-0.7662	-0.1308	0.0086	1.0513	-0.1300	0.0488
39	-0.1996	-0.0407	0.0008	1.0948	-0.0375	0.0254
40	-1.1900	-0.2426	0.0291	1.0197	-0.2234	0.1512
41	-0.0294	-0.0087	0.0000	1.1459	-0.0066	0.0073
42	0.3043	0.0635	0.0021	1.0938	0.0578	-0.0409
43	-1.1527	-0.2564	0.0326	1.0320	-0.2256	0.1782
44	-0.1184	-0.0351	0.0006	1.1452	-0.0265	0.0294
45	0.6129	0.2065	0.0217	* 1.1500	0.1458	-0.1801
46	1.2506	0.2087	0.0215	0.9987	0.1730	0.0659
47	* 2.5083	0.4946	0.1077	0.8055	0.3060	0.2918
48	1.6312	0.3065	0.0450	0.9524	0.2056	0.1635
49	-0.8078	-0.2133	0.0230	1.0890	-0.0802	-0.1688
50	-0.2699	-0.0496	0.0013	1.0848	-0.0345	-0.0251
51	0.3278	0.0748	0.0029	1.1020	0.0362	0.0533

Each column gives the impact on some aspect of the linear regression of omitting that row.

RStudent represents the size of the residual. DFFITS represents the change in the fitted value of a row. Cook's D summarizes the change in the fitted values of all rows. CovRatio represents the amount of change in the determinant of the covariance matrix. DFBETAS(0) and DFBETAS(1) give the amount of change in the intercept and slope.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Outlier Detection Chart

Row	lnVegetation (X)	Residual		Standardized Residual		RStudent	
10	3.4532	-0.4171	|||.....	-0.6298	|||.....	-0.6248	||.....
11	2.8622	-0.2917	||.....	-0.4368	||.....	-0.4322	|.....
13	1.4061	0.0831	|.....	0.1229	|.....	0.1214	|.....
14	2.6462	-0.5002	|||.....	-0.7469	|||.....	-0.7426	|||.....
15	-0.9943	-0.3226	||.....	-0.4794	||.....	-0.4747	|.....
16	-2.5257	2.0357	||||||||||||||	3.0883	||||||||||||||	* 3.5073	||||||||||||||
17	-0.8440	-0.6312	||||.....	-0.9370	||||.....	-0.9355	|||.....
18	-2.2073	0.4213	|||.....	0.6357	|||.....	0.6308	||.....
19	-0.4780	-0.8194	||||||.....	-1.2134	|||||.....	-1.2210	|||||.....
20	0.4055	-1.3710	|||||||||.....	-2.0240	||||||||.....	* -2.1119	||||||||.....
21	-3.5066	0.0074	|.....	0.0114	|.....	0.0113	|.....
22	2.6101	0.1478	|.....	0.2206	|.....	0.2179	|.....
23	0.7031	-0.1711	|.....	-0.2526	|.....	-0.2496	|.....
24	2.5014	0.3767	||.....	0.5616	||.....	0.5566	||.....
25	2.7014	0.0741	|.....	0.1107	|.....	0.1093	|.....
26	3.3844	-0.1160	|.....	-0.1750	|.....	-0.1728	|.....
27	3.2108	0.3536	||.....	0.5319	||.....	0.5269	||.....
28	2.0464	0.5307	|||.....	0.7879	|||.....	0.7839	|||.....
29	3.3429	0.2980	||.....	0.4492	||.....	0.4446	|.....
30	2.1759	0.1035	|.....	0.1538	|.....	0.1518	|.....
31	2.2138	-0.1202	|.....	-0.1786	|.....	-0.1764	|.....
32	1.6734	-0.9617	||||||.....	-1.4241	|||||.....	-1.4437	|||||.....
33	2.4681	0.6672	||||.....	0.9944	||||.....	0.9943	||||.....
34	-2.4079	0.9104	|||||.....	1.3782	|||||.....	1.3948	||||.....
35	-1.0498	-0.1529	|.....	-0.2274	|.....	-0.2246	|.....
36	-1.0788	-0.6211	||||.....	-0.9239	||||.....	-0.9222	|||.....
37	0.1044	-0.8026	|||||.....	-1.1855	|||||.....	-1.1918	|||||.....
38	-0.2614	-0.5208	|||.....	-0.7703	|||.....	-0.7662	|||.....
39	-1.1087	-0.1358	|.....	-0.2021	|.....	-0.1996	|.....
40	-1.1087	-0.7955	|||||.....	-1.1837	|||||.....	-1.1900	|||||.....
41	-2.6593	-0.0196	|.....	-0.0298	|.....	-0.0294	|.....
42	-1.2040	0.2068	|.....	0.3079	|.....	0.3043	|.....
43	-1.4697	-0.7685	|||||.....	-1.1479	|||||.....	-1.1527	||||.....
44	-2.6593	-0.0789	|.....	-0.1200	|.....	-0.1184	|.....
45	-3.2189	0.4016	||.....	0.6179	||.....	0.6129	||.....
46	1.3110	0.8400	||||||.....	1.2417	|||||.....	1.2506	|||||.....
47	2.1633	1.5839	||||||||||....	2.3537	||||||||||....	* 2.5083	|||||||||.....
48	1.9488	1.0769	|||||||.....	1.5976	|||||||.....	1.6312	||||||.....
49	3.3673	-0.5381	|||.....	-0.8115	|||.....	-0.8078	|||.....
50	1.8500	-0.1843	|.....	-0.2732	|.....	-0.2699	|.....
51	2.7726	0.2217	|.....	0.3316	|.....	0.3278	|.....

Outliers are rows that are separated from the rest of the data. Since outliers can have dramatic effects on the results, corrective action, such as elimination, must be carefully considered. Outlying rows should not be automatically be removed unless a good reason for their removal can be given.

An outlier may be defined as a row in which |RStudent| > 2. Rows with this characteristic have been starred.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Influence Detection Chart

Row	lnVegetation (X)	DFFITS		Cook's D		DFBETAS(1)	
10	3.4532	-0.1684	||.....	0.0144	|.....	-0.1348	||.....
11	2.8622	-0.1009	|.....	0.0052	|.....	-0.0733	|.....
13	1.4061	0.0205	|.....	0.0002	|.....	0.0073	|.....
14	2.6462	-0.1644	||.....	0.0137	|.....	-0.1136	||.....
15	-0.9943	-0.0942	|.....	0.0045	|.....	0.0562	|.....
16	-2.5257	1.0082	||||||||||||||	0.3941	||||||||||||||	-0.8317	||||||||||||||
17	-0.8440	-0.1794	||.....	0.0161	|.....	0.1002	|.....
18	-2.2073	0.1681	||.....	0.0143	|.....	-0.1336	||.....
19	-0.4780	-0.2168	|||.....	0.0232	|.....	0.0974	|.....
20	0.4055	-0.3353	||||.....	0.0516	|.....	0.0301	|.....
21	-3.5066	0.0040	|.....	0.0000	|.....	-0.0036	|.....
22	2.6101	0.0478	|.....	0.0012	|.....	0.0327	|.....
23	0.7031	-0.0395	|.....	0.0008	|.....	-0.0019	|.....
24	2.5014	0.1189	|.....	0.0072	|.....	0.0790	|.....
25	2.7014	0.0245	|.....	0.0003	|.....	0.0172	|.....
26	3.3844	-0.0458	|.....	0.0011	|.....	-0.0363	|.....
27	3.2108	0.1340	|.....	0.0091	|.....	0.1036	|.....
28	2.0464	0.1505	||.....	0.0114	|.....	0.0843	|.....
29	3.3429	0.1167	|.....	0.0070	|.....	0.0920	|.....
30	2.1759	0.0300	|.....	0.0005	|.....	0.0178	|.....
31	2.2138	-0.0352	|.....	0.0006	|.....	-0.0212	|.....
32	1.6734	-0.2562	|||.....	0.0319	|.....	-0.1150	||.....
33	2.4681	0.2107	|||.....	0.0222	|.....	0.1386	||.....
34	-2.4079	0.3899	|||||.....	0.0742	||.....	-0.3176	|||||.....
35	-1.0498	-0.0452	|.....	0.0010	|.....	0.0275	|.....
36	-1.0788	-0.1867	||.....	0.0175	|.....	0.1151	||.....
37	0.1044	-0.1935	||.....	0.0185	|.....	0.0435	|.....
38	-0.2614	-0.1308	|.....	0.0086	|.....	0.0488	|.....
39	-1.1087	-0.0407	|.....	0.0008	|.....	0.0254	|.....
40	-1.1087	-0.2426	|||.....	0.0291	|.....	0.1512	||.....
41	-2.6593	-0.0087	|.....	0.0000	|.....	0.0073	|.....
42	-1.2040	0.0635	|.....	0.0021	|.....	-0.0409	|.....
43	-1.4697	-0.2564	|||.....	0.0326	|.....	0.1782	|||.....
44	-2.6593	-0.0351	|.....	0.0006	|.....	0.0294	|.....
45	-3.2189	0.2065	|||.....	0.0217	|.....	-0.1801	|||.....
46	1.3110	0.2087	|||.....	0.0215	|.....	0.0659	|.....
47	2.1633	0.4946	|||||||.....	0.1077	||||.....	0.2918	|||||.....
48	1.9488	0.3065	||||.....	0.0450	|.....	0.1635	||.....
49	3.3673	-0.2133	|||.....	0.0230	|.....	-0.1688	|||.....
50	1.8500	-0.0496	|.....	0.0013	|.....	-0.0251	|.....
51	2.7726	0.0748	|.....	0.0029	|.....	0.0533	|.....

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Influential rows are those whose omission results in a relatively large change in the results. They are not necessarily harmful. However, they will distort the results if they are also outliers. The impact of influential rows should be studied very carefully. Their accuracy should be double-checked.
DFFITS is the standardized change in Yhat when the row is omitted. A row is influential when DFFITS > 1 for small datasets (N < 30) or when DFFITS > 2*SQR(1/N) for medium to large datasets.

Cook's D gives the influence of each row on the Yhats of all the rows. Cook suggests investigating all rows having a Cook's D > 0.5. Rows in which Cook's D > 1.0 are very influential.

DFBETAS(1) is the standardized change in the slope when this row is omitted. DFBETAS(1) > 1 for small datasets (N < 30) and DFBETAS(1) > 2/SQR(N) for medium and large datasets are indicative of influential rows.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Outlier & Influence Chart

Row	lnVegetation (X)	RStudent (Outlier)		Cooks D (Influence)		Hat Diagonal (Leverage)	
10	3.4532	-0.6248	||.....	0.0144	|.....	0.0678	|||||||.....
11	2.8622	-0.4322	|.....	0.0052	|.....	0.0517	||||.....
13	1.4061	0.1214	|.....	0.0002	|.....	0.0279	|.....
14	2.6462	-0.7426	|||.....	0.0137	|.....	0.0467	|||.....
15	-0.9943	-0.4747	|.....	0.0045	|.....	0.0379	||.....
16	-2.5257	* 3.5073	||||||||||||||	0.3941	||||||||||||||	0.0763	|||||||.....
17	-0.8440	-0.9355	|||.....	0.0161	|.....	0.0355	|.....
18	-2.2073	0.6308	||.....	0.0143	|.....	0.0663	|||||||.....
19	-0.4780	-1.2210	|||||.....	0.0232	|.....	0.0306	|.....
20	0.4055	* -2.1119	|||||||||.....	0.0516	|.....	0.0246	|.....
21	-3.5066	0.0113	|.....	0.0000	|.....	0.1141	||||||||||||||
22	2.6101	0.2179	|.....	0.0012	|.....	0.0459	|||.....
23	0.7031	-0.2496	|.....	0.0008	|.....	0.0244	|.....
24	2.5014	0.5566	||.....	0.0072	|.....	0.0437	|||.....
25	2.7014	0.1093	|.....	0.0003	|.....	0.0479	|||.....
26	3.3844	-0.1728	|.....	0.0011	|.....	0.0657	||||||.....
27	3.2108	0.5269	||.....	0.0091	|.....	0.0607	||||||.....
28	2.0464	0.7839	|||.....	0.0114	|.....	0.0355	|.....
29	3.3429	0.4446	|.....	0.0070	|.....	0.0645	||||||.....
30	2.1759	0.1518	|.....	0.0005	|.....	0.0376	||.....
31	2.2138	-0.1764	|.....	0.0006	|.....	0.0383	||.....
32	1.6734	-1.4437	||||||.....	0.0319	|.....	0.0305	|.....
33	2.4681	0.9943	||||.....	0.0222	|.....	0.0430	|||.....
34	-2.4079	1.3948	|||||.....	0.0742	||.....	0.0725	|||||||.....
35	-1.0498	-0.2246	|.....	0.0010	|.....	0.0388	||.....
36	-1.0788	-0.9222	|||.....	0.0175	|.....	0.0394	||.....
37	0.1044	-1.1918	|||||.....	0.0185	|.....	0.0257	|.....
38	-0.2614	-0.7662	|||.....	0.0086	|.....	0.0283	|.....
39	-1.1087	-0.1996	|.....	0.0008	|.....	0.0399	||.....
40	-1.1087	-1.1900	|||||.....	0.0291	|.....	0.0399	||.....
41	-2.6593	-0.0294	|.....	0.0000	|.....	0.0809	||||||||.....
42	-1.2040	0.3043	|.....	0.0021	|.....	0.0417	||.....
43	-1.4697	-1.1527	||||.....	0.0326	|.....	0.0472	|||.....
44	-2.6593	-0.1184	|.....	0.0006	|.....	0.0809	|||||||||.....
45	-3.2189	0.6129	||.....	0.0217	|.....	0.1019	||||||||||...
46	1.3110	1.2506	|||||.....	0.0215	|.....	0.0271	|.....
47	2.1633	* 2.5083	||||||||||.....	0.1077	||||.....	0.0374	||.....
48	1.9488	1.6312	||||||.....	0.0450	|.....	0.0341	|.....
49	3.3673	-0.8078	|||.....	0.0230	|.....	0.0652	||||||.....
50	1.8500	-0.2699	|.....	0.0013	|.....	0.0327	|.....
51	2.7726	0.3278	|.....	0.0029	|.....	0.0495	||||.....

Outliers are rows that are separated from the rest of the data. Influential rows are those whose omission results in a relatively large change in the results. This report lets you see both.

An outlier may be defined as a row in which |RStudent| > 2. A moderately influential row is one with a CooksD > 0.5. A heavily influential row is one with a CooksD > 1.

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Inverse Prediction of X Means

Row	lnMammal (Y)	lnVegetation (X)	Predicted lnVegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Conf. Limit of X Mean|Y	Upper 95% Conf. Limit of X Mean|Y
10	3.3429	3.4532	2.7058	0.7473	2.2189	3.3361
11	3.1384	2.8622	2.3394	0.5228	1.8863	2.9109
13	2.7007	1.4061	1.5551	-0.1490	1.1540	2.0212
14	2.8094	2.6462	1.7499	0.8963	1.3390	2.2390
15	0.9555	-0.9943	-1.5723	0.5780	-2.2131	-1.0790
16	2.4592	-2.5257	1.1222	-3.6480	0.7332	1.5469
17	0.7308	-0.8440	-1.9750	1.1310	-2.6860	-1.4390
18	1.0225	-2.2073	-1.4523	-0.7550	-2.0732	-0.9709
19	0.7467	-0.4780	-1.9465	1.4684	-2.6524	-1.4136
20	0.6881	0.4055	-2.0514	2.4569	-2.7762	-1.5069
21	-0.1165	-3.5066	-3.4933	-0.0132	-4.4954	-2.7696
22	3.4372	2.6101	2.8749	-0.2648	2.3709	3.5337
23	2.0541	0.7031	0.3964	0.3067	-0.0071	0.7862
24	3.6055	2.5014	3.1765	-0.6750	2.6400	3.8882
25	3.4144	2.7014	2.8341	-0.1327	2.3343	3.4860
26	3.6055	3.3844	3.1765	0.2079	2.6400	3.8882
27	3.9782	3.2108	3.8444	-0.6336	3.2293	4.6803
28	3.5056	2.0464	2.9974	-0.9510	2.4804	3.6774
29	3.9964	3.3429	3.8769	-0.5340	3.2578	4.7190
30	3.1506	2.1759	2.3613	-0.1854	1.9063	2.9361
31	2.9481	2.2138	1.9984	0.2153	1.5719	2.5201
32	1.8050	1.6734	-0.0500	1.7233	-0.4851	0.3411
33	3.8774	2.4681	3.6637	-1.1956	3.0707	4.4653
34	1.3995	-2.4079	-0.7766	-1.6314	-1.2949	-0.3518
35	1.0942	-1.0498	-1.3238	0.2740	-1.9238	-0.8546
36	0.6098	-1.0788	-2.1918	1.1130	-2.9422	-1.6312
37	1.0886	0.1044	-1.3338	1.4382	-1.9354	-0.8637
38	1.1663	-0.2614	-1.1946	0.9332	-1.7741	-0.7370
39	1.0784	-1.1087	-1.3520	0.2434	-1.9565	-0.8802
40	0.4187	-1.1087	-2.5342	1.4255	-3.3485	-1.9329
41	0.3293	-2.6593	-2.6944	0.0351	-3.5393	-2.0735
42	1.3678	-1.2040	-0.8335	-0.3705	-1.3596	-0.4047
43	0.2443	-1.4697	-2.8468	1.3771	-3.7211	-2.2068
44	0.2700	-2.6593	-2.8006	0.1414	-3.6660	-2.1665
45	0.4383	-3.2189	-2.4992	-0.7197	-3.3068	-1.9022
46	3.4045	1.3110	2.8163	-1.5053	2.3183	3.4652
47	4.6240	2.1633	5.0016	-2.8382	4.2361	6.0665
48	3.9973	1.9488	3.8785	-1.9298	3.2592	4.7209
49	3.1739	3.3673	2.4030	0.9643	1.9444	2.9843
50	2.6810	1.8500	1.5198	0.3302	1.1202	1.9821
51	3.6019	2.7726	3.1699	-0.3974	2.6342	3.8806

This confidence interval estimates the mean of X in a large sample of individuals with this value of Y.
This method of inverse prediction is also called 'calibration.'

Linear Regression Report

Dataset C:\Formation\Smoky Canyon\FS\PRG Calcs\AllSeEPC.NCSS
Filter Type = "UPL"
Y = lnMammal X = lnVegetation

Inverse Prediction of X Individuals

Row	lnMammal (Y)	lnVegetation (X)	Predicted lnVegetation (Xhat|Y)	X-Xhat|Y	Lower 95% Prediction Limit of X|Y	Upper 95% Prediction Limit of X|Y
10	3.3429	3.4532	2.7058	0.7473	0.1886	5.3664
11	3.1384	2.8622	2.3394	0.5228	-0.1807	4.9779
13	2.7007	1.4061	1.5551	-0.1490	-0.9773	4.1525
14	2.8094	2.6462	1.7499	0.8963	-0.7787	4.3567
15	0.9555	-0.9943	-1.5723	0.5780	-4.2368	0.9447
16	2.4592	-2.5257	1.1222	-3.6480	-1.4204	3.7005
17	0.7308	-0.8440	-1.9750	1.1310	-4.6662	0.5412
18	1.0225	-2.2073	-1.4523	-0.7550	-4.1094	1.0653
19	0.7467	-0.4780	-1.9465	1.4684	-4.6357	0.5697
20	0.6881	0.4055	-2.0514	2.4569	-4.7479	0.4649
21	-0.1165	-3.5066	-3.4933	-0.0132	-6.3036	-0.9613
22	3.4372	2.6101	2.8749	-0.2648	0.3583	5.5462
23	2.0541	0.7031	0.3964	0.3067	-2.1693	2.9484
24	3.6055	2.5014	3.1765	-0.6750	0.6603	5.8680
25	3.4144	2.7014	2.8341	-0.1327	0.3174	5.5028
26	3.6055	3.3844	3.1765	0.2079	0.6603	5.8680
27	3.9782	3.2108	3.8444	-0.6336	1.3248	6.5848
28	3.5056	2.0464	2.9974	-0.9510	0.4811	5.6768
29	3.9964	3.3429	3.8769	-0.5340	1.3570	6.6198
30	3.1506	2.1759	2.3613	-0.1854	-0.1586	5.0011
31	2.9481	2.2138	1.9984	0.2153	-0.5260	4.6181
32	1.8050	1.6734	-0.0500	1.7233	-2.6335	2.4894
33	3.8774	2.4681	3.6637	-1.1956	1.1456	6.3903
34	1.3995	-2.4079	-0.7766	-1.6314	-3.3949	1.7482
35	1.0942	-1.0498	-1.3238	0.2740	-3.9730	1.1947
36	0.6098	-1.0788	-2.1918	1.1130	-4.8983	0.3248
37	1.0886	0.1044	-1.3338	1.4382	-3.9837	1.1846
38	1.1663	-0.2614	-1.1946	0.9332	-3.8361	1.3250
39	1.0784	-1.1087	-1.3520	0.2434	-4.0030	1.1662
40	0.4187	-1.1087	-2.5342	1.4255	-5.2659	-0.0156
41	0.3293	-2.6593	-2.6944	0.0351	-5.4384	-0.1743
42	1.3678	-1.2040	-0.8335	-0.3705	-3.4548	1.6905
43	0.2443	-1.4697	-2.8468	1.3771	-5.6029	-0.3251
44	0.2700	-2.6593	-2.8006	0.1414	-5.5530	-0.2794
45	0.4383	-3.2189	-2.4992	-0.7197	-5.2282	0.0192
46	3.4045	1.3110	2.8163	-1.5053	0.2996	5.4839
47	4.6240	2.1633	5.0016	-2.8382	2.4628	7.8398
48	3.9973	1.9488	3.8785	-1.9298	1.3586	6.6215
49	3.1739	3.3673	2.4030	0.9643	-0.1165	5.0452
50	2.6810	1.8500	1.5198	0.3302	-1.0133	4.1156
51	3.6019	2.7726	3.1699	-0.3974	0.6538	5.8610

This prediction interval estimates the predicted value of X for a single individual with this value of Y.
This method of inverse prediction is also called 'calibration.'

Attachment 3 – Detailed Statistical Results
Comparison of NOAEL and LOAEL Bird vs. Mammal TRVs
ANOVA

One-Way Analysis of Variance Report

Dataset Untitled
Response NOAEL

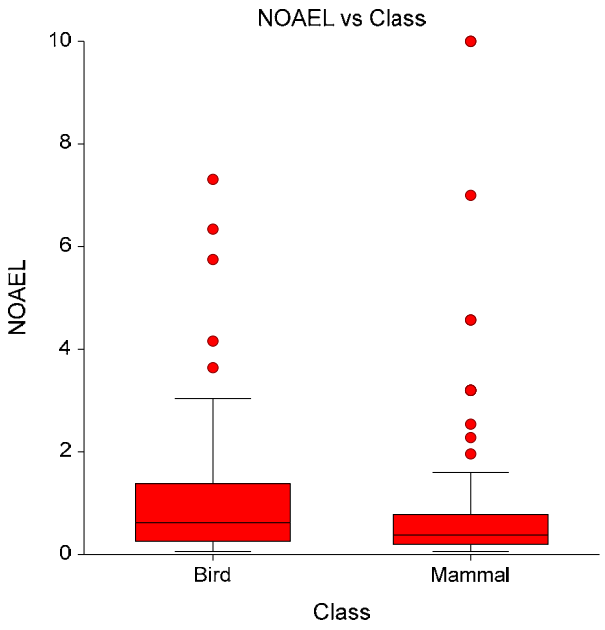
Tests of the Normality of Residuals Assumption

Normality Attributes	Test Value	Prob Level	Reject Normality? (α=0.20)
Skewness	9.3001	0.00000	Yes
Kurtosis	6.5559	0.00000	Yes
Skewness and Kurtosis (Omnibus)	129.4715	0.00000	Yes

Tests of the Equality of Group Variances Assumption

Test Name	Test Value	Prob Level	Reject Equal Variances? (α=0.20)
Brown-Forsythe (Data - Medians)	0.7742	0.38040	No
Levene (Data - Means)	0.5485	0.46013	No
Conover (Ranks of Deviations)	11.5724	0.00067	Yes
Bartlett (Likelihood Ratio)	0.0004	0.98471	No

Box Plot Section



Expected Mean Squares Table

Model Term	DF	Term Fixed?	Denominator Term	Expected Mean Square
A: Class	1	Yes	σ^2	$\sigma^2 + sA$
Error	144	No		σ^2

Note: Expected Mean Squares are for the balanced cell-frequency case.

One-Way Analysis of Variance Report

Dataset Untitled
Response NOAEL

Analysis of Variance Table and F-Test

Model Term	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Reject Equal Means? (α=0.05)	Power (α=0.05)
Between (Class)	1	2.715083	2.715083	0.9496	0.33145	No	0.16231
Within (Error)	144	411.7075	2.85908				
Adjusted Total	145	414.4226					
Total	146						

Welch's Test of Means Allowing for Unequal Variances

Model Term	Numerator DF	Denominator DF	F-Ratio	Prob Level	Reject Equal Means? (α=0.05)
Between Groups	1	84.75	0.9514	0.33213	No

Kruskal-Wallis One-Way ANOVA on Ranks

Hypotheses
H0: All medians are equal.
H1: At least two medians are different.

Test Results

Method	DF	Chi-Squared (H)	Prob Level	Reject H0? (α=0.05)
Not Corrected for Ties	1	2.7389	0.09793	No
Corrected for Ties	1	2.7391	0.09792	No

Number Sets of Ties	20
Multiplicity Factor	228

Group Detail

Group	Count	Sum of Ranks	Mean Rank	Z-Value	Median
Bird	45	3698.00	82.18	1.6550	0.617
Mammal	101	7033.00	69.63	-1.6550	0.384

Normal Scores Tests

Hypotheses
H0: All group data distributions are the same.
H1: At least one group has observations that tend to be greater than those of the other groups.

Results

Test	DF	Chi-Squared (H)	Prob Level	Reject H0? (α=0.20)
Terry-Hoeffding - Expected Normal Scores	1	2.2292	0.13543	No
Van der Waerden - Normal Quantiles	1	2.2885	0.13033	No

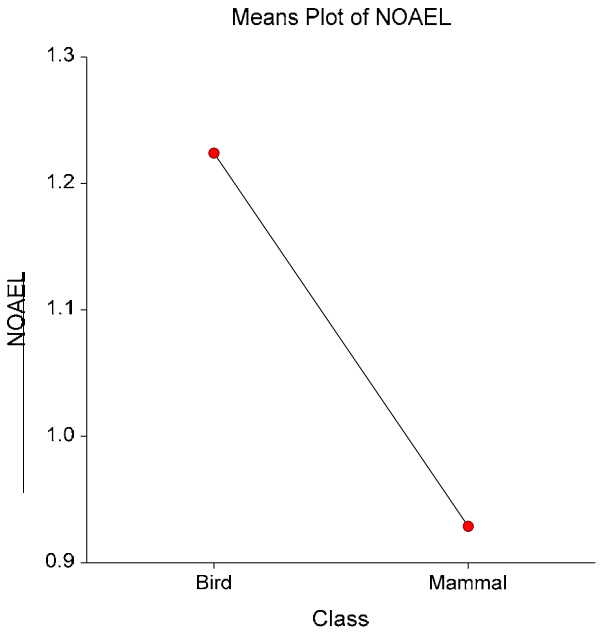
One-Way Analysis of Variance Report

Dataset Untitled
Response NOAEL

Descriptive Statistics

Group	Count (ni)	Mean	Effect	Median	Standard Deviation	Standard Error √(MSE/ni)
All	146	1.019658	1.076295			
A: Class						
Bird	45	1.223958	0.1476628	0.617	1.68799	0.2520617
Mammal	101	0.9286327	-0.1476628	0.384	1.692152	0.168249

Plots of Means Section



Bonferroni (All-Pairwise) Multiple Comparison Test

Response: NOAEL
Term A: Class

Alpha=0.050 Error Term=S(A) DF=144 MSE=2.85908 Critical Value=1.9766

Group	Count	Mean	Different From Groups
Bird	45	1.223958	
Mammal	101	0.9286327	

Notes:
This section presents the results of all paired comparisons among the means. Since this procedure uses the Bonferroni inequality, it is not as accurate as the Tukey-Kramer's method.

One-Way Analysis of Variance Report

Dataset Untitled
Response NOAEL

Tukey-Kramer Multiple-Comparison Test

Response: NOAEL
Term A: Class

Alpha=0.050 Error Term=S(A) DF=144 MSE=2.85908 Critical Value=2.8035

Group	Count	Mean	Different From Groups
Bird	45	1.223958	
Mammal	101	0.9286327	

Notes:
This report provides multiple comparison tests for all pairwise differences between the means.

Kruskal-Wallis Multiple-Comparison Z-Value Test (Dunn's Test)

NOAEL	Bird	Mammal
Bird	0.0000	1.6550
Mammal	1.6550	0.0000

Regular Test: Medians significantly different if z-value > 1.9600
Bonferroni Test: Medians significantly different if z-value > 1.9600

One-Way Analysis of Variance Report

Dataset Untitled
Response LOAEL

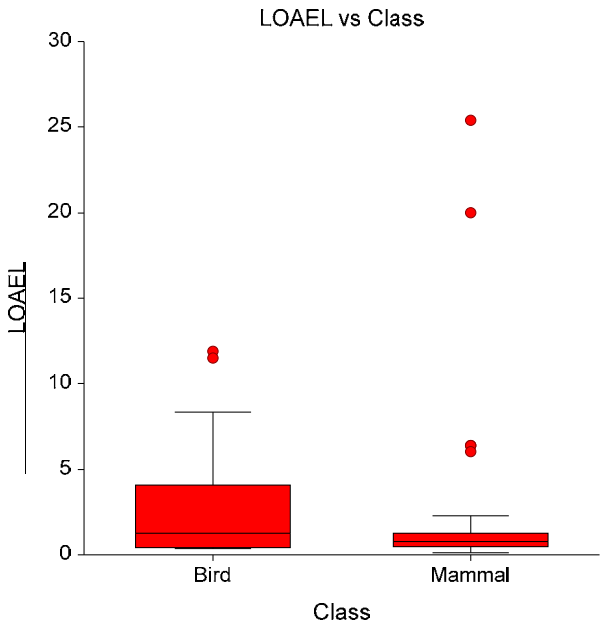
Tests of the Normality of Residuals Assumption

Normality Attributes	Test Value	Prob Level	Reject Normality? (α=0.20)
Skewness	7.7105	0.00000	Yes
Kurtosis	5.8351	0.00000	Yes
Skewness and Kurtosis (Omnibus)	93.5004	0.00000	Yes

Tests of the Equality of Group Variances Assumption

Test Name	Test Value	Prob Level	Reject Equal Variances? (α=0.20)
Brown-Forsythe (Data - Medians)	0.4977	0.48273	No
Levene (Data - Means)	0.2080	0.64964	No
Conover (Ranks of Deviations)	13.1874	0.00028	Yes
Bartlett (Likelihood Ratio)	2.0728	0.14994	Yes

Box Plot Section



Expected Mean Squares Table

Model Term	DF	Term Fixed?	Denominator Term	Expected Mean Square
A: Class	1	Yes	σ^2	$\sigma^2 + sA$
Error	74	No		σ^2

Note: Expected Mean Squares are for the balanced cell-frequency case.

One-Way Analysis of Variance Report

Dataset Untitled
Response LOAEL

Analysis of Variance Table and F-Test

Model Term	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Reject Equal Means? (α=0.05)	Power (α=0.05)
Between (Class)	1	10.22658	10.22658	0.5948	0.44301	No	0.11858
Within (Error)	74	1272.224	17.19222				
Adjusted Total	75	1282.451					
Total	76						

Welch's Test of Means Allowing for Unequal Variances

Model Term	Numerator DF	Denominator DF	F-Ratio	Prob Level	Reject Equal Means? (α=0.05)
Between Groups	1	57.46	0.7234	0.39856	No

Kruskal-Wallis One-Way ANOVA on Ranks

Hypotheses
H0: All medians are equal.
H1: At least two medians are different.

Test Results

Method	DF	Chi-Squared (H)	Prob Level	Reject H0? (α=0.05)
Not Corrected for Ties	1	1.9046	0.16756	No
Corrected for Ties	1	1.9050	0.16751	No

Number Sets of Ties	10
Multiplicity Factor	96

Group Detail

Group	Count	Sum of Ranks	Mean Rank	Z-Value	Median
Bird	24	1047.50	43.65	1.3801	1.26
Mammal	52	1878.50	36.13	-1.3801	0.763

Normal Scores Tests

Hypotheses
H0: All group data distributions are the same.
H1: At least one group has observations that tend to be greater than those of the other groups.

Results

Test	DF	Chi-Squared (H)	Prob Level	Reject H0? (α=0.20)
Terry-Hoeffding - Expected Normal Scores	1	2.2234	0.13593	No
Van der Waerden - Normal Quantiles	1	2.2395	0.13453	No

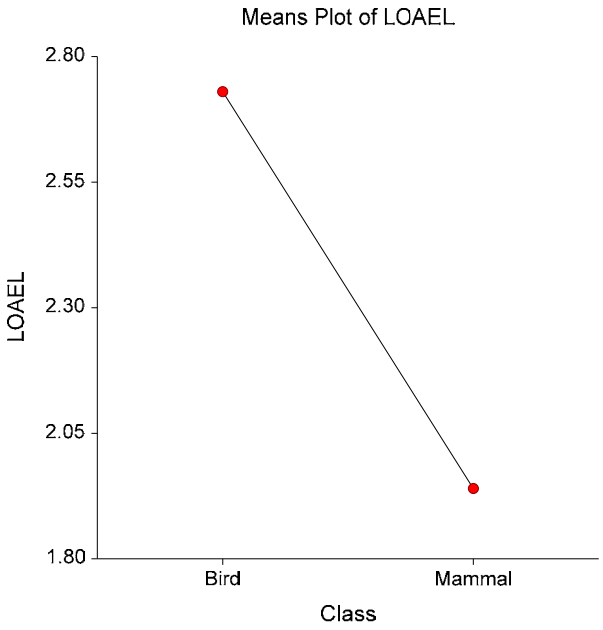
One-Way Analysis of Variance Report

Dataset Untitled
Response LOAEL

Descriptive Statistics

Group	Count (ni)	Mean	Effect	Median	Standard Deviation	Standard Error √(MSE/ni)
All	76	2.189093	2.334464			
A: Class						
Bird	24	2.729044	0.3945798	1.26	3.398949	0.8463701
Mammal	52	1.939885	-0.3945798	0.763	4.442461	0.5749953

Plots of Means Section



Bonferroni (All-Pairwise) Multiple Comparison Test

Response: LOAEL
Term A: Class

Alpha=0.050 Error Term=S(A) DF=74 MSE=17.19222 Critical Value=1.9925

Group	Count	Mean	Different From Groups
Bird	24	2.729044	
Mammal	52	1.939885	

Notes:
This section presents the results of all paired comparisons among the means. Since this procedure uses the Bonferroni inequality, it is not as accurate as the Tukey-Kramer's method.

One-Way Analysis of Variance Report

Dataset Untitled
Response LOAEL

Tukey-Kramer Multiple-Comparison Test

Response: LOAEL
Term A: Class

Alpha=0.050 Error Term=S(A) DF=74 MSE=17.19222 Critical Value=2.8261

Group	Count	Mean	Different From Groups
Bird	24	2.729044	
Mammal	52	1.939885	

Notes:
This report provides multiple comparison tests for all pairwise differences between the means.

Kruskal-Wallis Multiple-Comparison Z-Value Test (Dunn's Test)

LOAEL	Bird	Mammal
Bird	0.0000	1.3802
Mammal	1.3802	0.0000

Regular Test: Medians significantly different if z-value > 1.9600
Bonferroni Test: Medians significantly different if z-value > 1.9600

Procedure Input Settings

Autosave Inactive

Variables Tab

Input Type:	Response Variable(s) and a Factor (Grouping) Variable
-- Variables ----------	
Response Variable(s):	NOAEL, LOAEL
Factor Variable:	Class
-- Comparisons ----------	
Planned Comparisons:	None

Reports Tab

-- Select Reports ----------	
Assumptions (Normality and Equal Variance) Reports	Checked
EMS Report	Checked
ANOVA Report	Checked
Welch's Test	Checked
Kruskal-Wallis / Van der Waerden / Terry-Hoeffding Tests	Checked
Means Report	Checked
·· Alpha ·····	
Test Alpha:	0.05
Assumption Alpha:	0.20

One-Way Analysis of Variance Report

Dataset Untitled
Response LOAEL

Procedure Input Settings (Continued)

Reports Tab (Continued)

-- Multiple Comparison Tests ----------

Bonferroni Test (All Pairs)	Checked
Bonferroni Test (Versus Control)	Unchecked
Dwass-Steel-Critchlow-Fligner Test	Unchecked
Duncan's Test	Unchecked
Dunnett's 2-Sided (Versus Control)	Unchecked
Dunnett's Lower 1-Sided (Versus Control)	Unchecked
Dunnett's Upper 1-Sided (Versus Control)	Unchecked
Dunnett's Confidence Intervals	Unchecked
Fisher's LSD Test	Unchecked
Hsu's M.C. with Best	Unchecked
Kruskal-Wallis Z Test (Dunn's Test)	Checked
Newman-Keuls Test	Unchecked
Scheffe's Test	Unchecked
Tukey-Kramer Test	Checked
Tukey-Kramer Confidence Intervals and P-Values	Unchecked

·· Multiple Comparison Alpha and Decimals ·····

MC Alpha:	0.05
MC Decimals:	All

Report Options Tab

-- Report Options ----------

Variable Names:	Names
Value Labels:	Data Values

-- Decimal Places ----------

Means and C.I. Limits:	Auto (Up to 7)
Std Deviations and Std Errors:	Auto (Up to 7)
P-Values:	5
Test Statistics:	4
Rank Statistics:	2
Fractional DF:	2
α in Titles:	2

Plots Tab

-- Select Plots ----------

Means Plot	Checked
Box Plot	Checked

Storage Tab

-- Data Storage Options ----------

Storage Option:	Do not store data