From:	Hannan LaGarry
To:	Shea, Valois
Subject:	Dewy-Burdock
Date:	Monday, June 19, 2017 7:37:50 PM
Attachments:	EPA testimony 19 June 2017.pdf LaGarryCV 2017 current.pdf

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Please find attached a supplemental testimony and my CV to establish my credentials.

Dr. Hannan E. LaGarry
55 Whispering Pines
Chadron NE 69337

June 19, 2017

BY EMAIL
Valois Shea (shea.valois@epa.gov)
U.S. EPA Region 8
Mail Code: 8WP-SUI
1595 Wynkoop Street
Denver CO 80202-1129

Re: SUPPLEMENTAL WRITTEN TESTIMONY on the potential adverse effects of the proposed Powertech/Dewey-Burdock project.

Dear Sir or Madam:

The undersigned, Dr. Hannan E. LaGarry, an individual, residing at 55 Whispering Pines, Chadron NE 69337, hereby provide the following SUPPLEMENTAL WRITTEN TESTIMONY to the above-referenced draft permits and documents related to Powertech/Dewey-Burdock. These written comments are provided in addition to the written testimony provided at the original hearing in Hot Springs SD on 10 May 2017.

Introduction

I have served as an expert witness for uranium intervenors since 2008, and have provided numerous expert written expert testimonies for both the Crow Butte Resources (CAMECO) and Dewey-Burdock (POWERTECH/AZARGA) ISL uranium license interventions. I am a stratigrapher and geologic mapper with 30 years of experience working in the geology of SW South Dakota and adjacent NW Nebraska. A copy of my CV is attached at the end of this testimony to establish my credentials in this proceeding.

In my initial testimony I provided the data we recovered from our examination of Powertech's belatedly disclosed borehole data purchased from the Tennessee Valley Authority (TVA). Within this data we observed that the drillers of the TVA boreholes documented uncased holes, improperly plugged holes, artesian water, breccia pipes and caves, and faults. In my expert opinion, secondary porosities in the Dewey-Burdock area are such that loss of containment and the escape of pressurized fluids from underground waste injection are almost a certainty should either mining or injection be allowed. In this document, I will briefly outline my concerns with respect to this inevitable loss of containment: existing flow direction and water quality within the Minnelusa Aquifer.

Flow Direction in the Minnelusa Aquifer

During the hearings there was much discussion about whether or not groundwater within the Minnelusa Aquifer flowed west, east, or not at all. Based on groundwater flow mapping by the United States Geological Survey (Driscoll and others 2002), water in the vicinity of the Dewey-Burdock site flows S/SE along the southern edge of the Black Hills, and once into greater Fall River County, groundwater flow is due east (Figure 70 – black arrow showing dominant flow direction was added by me). This report makes no mention of a groundwater divide or other circumstance that would indicate isolation of groundwater within the Dewey-Burdock vicinity.

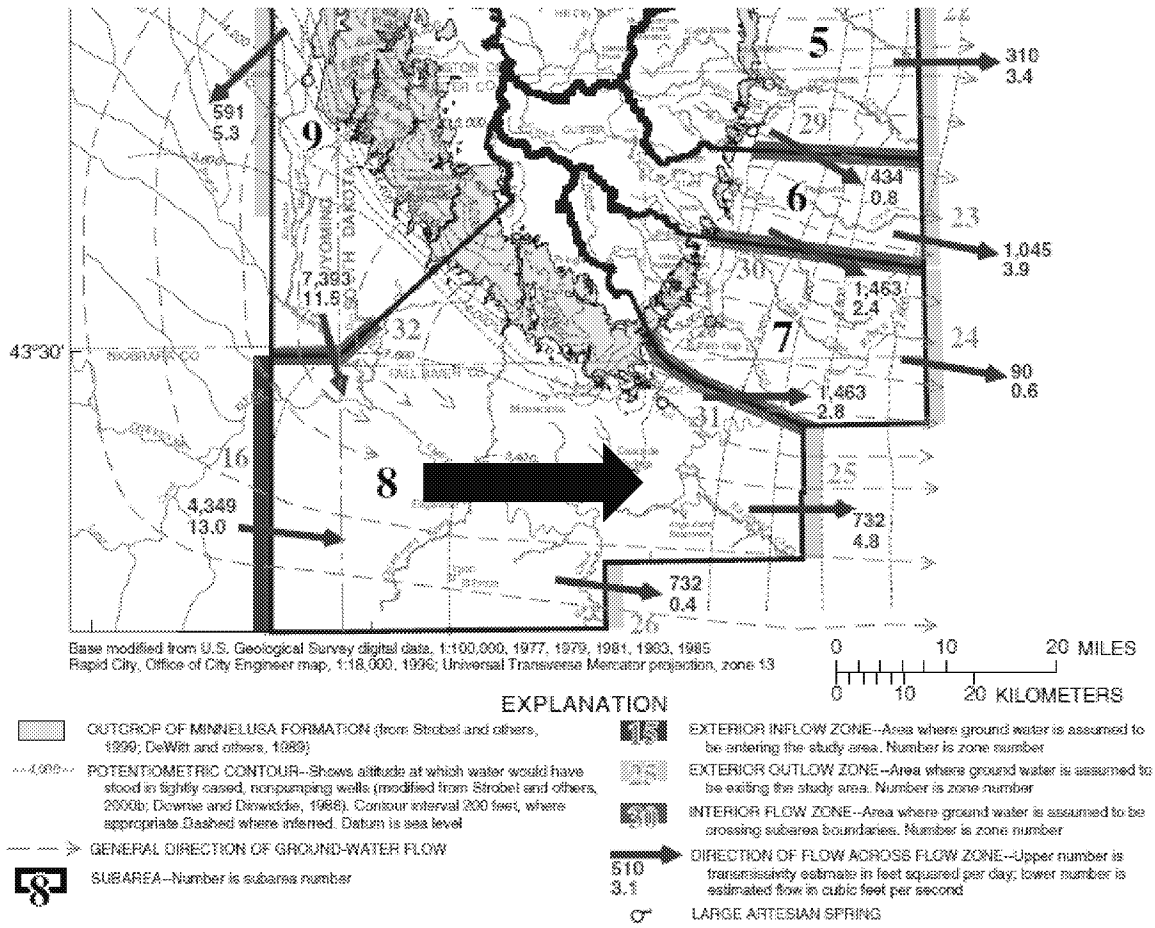

Figure 70. Subareas, generalized ground-water flow directions, and flow zones for the Minnelusa aquifer. Estimated transmissivities and flow components for flow zones also are shown (from Carter, Driscoll, Hamade, and Jarrell, 2001).

Figure 70 shows that while groundwater flow north of Dewey-Burdock may initially be to the SW into Wyoming, this flow path quickly corrects to southward and then eastward flow. The flow from north of Dewey-Burdock to the SW has been measured at 591 feet/day, but flow south of the site has been measured at 7,393 feet/day. Once eastward flow is established, its been measured at 4,349 feet/day to the east at the SD-WY state line, then 1,463 feet/day to the east in northern Fall River County and 732 feet/day to the east in central and southern Fall River County. On average, flow from Dewey-Burdock towards Edgemont, Hot Springs, Buffalo Gap,

Oelrichs, and the western border of the Pine Ridge Reservation is about 3,484 feet/day. The Pine Ridge Reservation (Oglala Lakota County) is 46 miles from the Dewy-Burdock site, which means contaminated water from Dewey-Burdock could travel to the Pine Ridge Reservation in 70 days. Edgemont would be affected in weeks, and Hot Springs would be reached in as little as 35 days.

Water Quality in the Minnelusa Aquifer

I've attached a recent groundwater test from Minnelusa Aquifer from the Hot Springs area (see following pages). Based on EPA's criteria for aquifer exemptions:

§146.4 Criteria for exempted aquifers.

An aquifer or a portion thereof which meets the criteria for an "underground source of drinking water" in §146.3 may be determined under §144.7 of this chapter to be an "exempted aquifer" for Class I-V wells if it meets the criteria in paragraphs (a) through (c) of this section. Class VI wells must meet the criteria under paragraph (d) of this section:

(a) It does not currently serve as a source of drinking water; and

(b) It cannot now and will not in the future serve as a source of drinking water because:

(1) It is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.

(2) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;

(3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or

(4) It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or

(c) The total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system.

(d) The areal extent of an aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery well may be expanded for the exclusive purpose of Class VI injection for geologic sequestration under §144.7(d) of this chapter if it meets the following criteria:

(1) It does not currently serve as a source of drinking water; and

(2) The total dissolved solids content of the ground water is more than 3,000 mg/l and less than 10,000 mg/l; and

(3) It is not reasonably expected to supply a public water system.

(Clean Water Act, Safe Drinking Water Act, Clean Air Act, Resource Conservation and Recovery Act: 42 U.S.C. 6905, 6912, 6925, 6927, 6974)

[45 FR 42500, June 24, 1980, as amended at 47 FR 4998, Feb. 3, 1982; 48 FR 14293, Apr. 1, 1983; 75 FR 77291, Dec. 10, 2010]

The attached water test shows TDS and U levels below the secondary maximum contaminant levels established by EPA for potable drinking water. Based on these standards, the Minnelusa Aquifer sampled in this case is a valid source of drinking water, and, given that the USGS document cited earlier does not recognized barriers to water flow within the aquifer, the Minnelusa Aquifer is ineligible for an aquifer exemption, and this residents potable water supply may be jeopardized by uncontained injected waste.

Concluding Remarks

If the injection permits are allowed to forward, its very likely that there will be leaks, and contaminants will adversely affect drinking water supplies in Fall River County

References

Driscoll, D. G., J. M. Carter, J. E. Williamson, and L. D. Putnam. 2002. Hydrology of the Black Hills Area, South Dakota. United States Geological Survey Water-Resources Report 02-4094, 150 pp.

Signature

The information contained herein is true and correct to the best of my knowledge at the time of this writing on 19 June 2017.

Dr. Hannan E. LaGarry
55 Whispering Pines
Chadron NE 69337

MIDCONTINENT TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 – www.thechemistrylab.com

Sample Site: Acter 605-745-6366
Project Name: Dewey Burdoc / Hot Springs
Sampled: 06/14/17 at 01:45 PM by Linsey McLean
Sample Matrix: Water

LINSEY MCLEAN
COUNCIL FOR RESPONSIBLE MINING
840 HUSKER PL
RAPID CITY, SD 57701

Lab ID#: 20170615207
Received: 06/15/17 at 08:00 AM by Dean Aurand
Account: 8766 - Council for Responsible Mining

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Total Dissolved Solids	223	mg/L	100ml	18.1	50.0	SM 2540 C	ELR	06/15/17
Non-Metallics								
Nitrogen, Nitrate (NO3)	0.471	mg/L	1	0.008	0.050	SM 4500-NO3 F	BLL	06/16/17
Sulfate (SO4)	31.4	mg/L	1	0.531	1.00	SM 4500-SO4 E	BLL	06/16/17
Metals - Total								
Antimony (Sb)	< 0.005	mg/L	10	0.00024	0.005	EPA 200.8	TNA	06/16/17
Arsenic (As)	0.014	mg/L	10	0.00047	0.005	EPA 200.8	TNA	06/16/17
Barium (Ba)	0.053	mg/L	10	0.00029	0.005	EPA 200.8	TNA	06/16/17
Beryllium (Be)	< 0.001	mg/L	10	0.00018	0.001	EPA 200.8	TNA	06/16/17
Cadmium (Cd)	< 0.001	mg/L	10	0.000025	0.001	EPA 200.8	TNA	06/16/17
Chromium (Cr)	0.001	mg/L	10	0.000025	0.001	EPA 200.8 DRC	TNA	06/16/17
Copper (Cu)	0.007	mg/L	10	0.00017	0.005	EPA 200.8	TNA	06/16/17
Lead (Pb)	< 0.001	mg/L	10	0.000024	0.001	EPA 200.8	TNA	06/16/17
Mercury (Hg)	< 0.0002	mg/L	1	0.000035	0.0002	EPA 245.1	TMS	06/16/17
Nickel (Ni)	< 0.005	mg/L	10	0.00007	0.005	EPA 200.8	TNA	06/16/17
Selenium (Se)	0.016	mg/L	10	0.001	0.005	EPA 200.8	TNA	06/16/17
Silver (Ag)	< 0.001	mg/L	10	0.00014	0.001	EPA 200.8	TNA	06/16/17
Thallium (Tl)	< 0.001	mg/L	10	0.00009	0.001	EPA 200.8	TNA	06/16/17
Uranium (U)	0.010	mg/L	10	0.000022	0.001	EPA 200.8	TNA	06/15/17
Zinc (Zn)	< 0.050	mg/L	10	0.002	0.050	EPA 200.8	TNA	06/16/17

Quality Control Data

Parameter	Result	Limits	DF	Method	Analyst	Date
Total Metals - Internal Std						
Bismuth (Bi)	81.5 %	(60.0 - 125.0) %	10	EPA 200.8	TNA	06/15/17
Bismuth (Bi)	91.2 %	(60.0 - 125.0) %	10	EPA 200.8	TNA	06/16/17
Germanium (Ge72)	93.2 %	(60.0 - 125.0) %	10	EPA 200.8	TNA	06/16/17
Germanium (Ge74)	94.5 %	(60.0 - 125.0) %	10	EPA 200.8 DRC	TNA	06/16/17
Indium (In)	93.9 %	(60.0 - 125.0) %	10	EPA 200.8	TNA	06/16/17
Lithium (Li)	97.5 %	(60.0 - 125.0) %	10	EPA 200.8	TNA	06/16/17
Scandium (Sc)	96.1 %	(60.0 - 125.0) %	10	EPA 200.8	TNA	06/16/17

Report Approved By:

Dean Aurand

Report Approved On: 6/16/2017 5:01:35 PM

Hannan E. LaGarry

CURRICULUM VITAE

updated 5 January, 2017

CONTACT INFORMATION

Office: Department of Math, Science, & Technology, Oglala Lakota College, PO Box 490, Kyle, SD 57752

E-mail: hlagarry@olc.edu

Home: 1002 1/2 East 3rd Street, Chadron NE 69337

EDUCATION

Regents' (Honors) Diploma, 1980. Norwood-Norfolk Central School, Norwood NY.

B. A. (Geology), 1985. State University of New York @ Potsdam NY (Advisor: W. Kirchgasser).

M. S. (Geology), 1988. Fort Hays State University, Hays KS (Advisor: R. J. Zakrzewski).

Ph. D. (Geology), 1997. University of Nebraska-Lincoln, Lincoln NE (Advisor: R. M. Hunt, Jr.).

CURRENT EMPLOYMENT

2013-present **CONSERVATION BIOLOGY INSTRUCTOR/RESEARCHER,** Department of Math, Science, & Technology, Oglala Lakota College, Kyle SD. Supervisor: Karla Witt, Chair (605-455-6124)

PAST WORK EXPERIENCE (see BIBLIOGRAPHY for list of publications)

1985 **PALEONTOLOGICAL FIELD ASSISTANT, Sternberg Memorial Museum**, Hays, Kansas (Supervisor: Dr. Richard J. Zakrzewski).

1985-1987 **GRADUATE TEACHING ASSISTANT, Geology Department,** Fort Hays State University, Hays, Kansas (Supervisor: Dr. Michael E. Nelson).

1986 **PROJECT PALEONTOLOGIST I, Illinois State Museum,** Springfield, Illinois (Supervisor: Dr. Russell W. Graham).

1987 **INSTRUCTOR OF GEOLOGY, Geology Department,** Fort Hays State University, Hays, Kansas (Supervisor: Dr. Kenneth R. Neuhauser).

1988 **ADJUNCT INSTRUCTOR, Division of Continuing Studies,** Barton County Community College, Great Bend, Kansas (Dean of Continuing Studies).

1988 **PROJECT PALEONTOLOGIST III, Illinois State Museum,** Springfield, Illinois (Supervisor: Dr. Russell W. Graham).

1988-1989 **GRADUATE TEACHING ASSISTANT, Department of Geosciences,** University of Nebraska-Lincoln (Supervisor: Dr. Samuel B. Treves).

1989-1990 **GRADUATE TECHNICAL ASSISTANT, Department of Geosciences,** University of Nebraska-Lincoln (Supervisor: Dr. Eric M. Durrance).

1991-1995 **RESEARCH TECHNICIAN III, University of Nebraska State Museum,** Lincoln, Nebraska (Supervisor: Dr. Robert M. Hunt, Jr.).

1991-1995 **PHYSICAL SCIENCE TECHNICIAN, National Soil Survey Center,** USDA Natural Resources Conservation Service (Supervisor: Dr. Carolyn G. Olson).

1996-1997 **RESEARCH ASSISTANT II, Nebraska Geological Survey,** University of Nebraska-Lincoln (Supervisor: Dr. Perry B. Wigley).

1997-1998	**RESEARCH GEOSCIENTIST, Nebraska Geological Survey,** University of Nebraska-Lincoln (Supervisor: Dr. Mark Kuzila).
1999-2006	**ASSISTANT GEOSCIENTIST, Department of Earth and Atmospheric Sciences,** University of Nebraska-Lincoln (Dr. Norman D. Smith).
2007-2008	**INTERPRETER, Hudson-Meng Bison Kill Site (USFS),** Crawford, Nebraska (Supervisor: Dr. Larry Agenbroad).
2008-2009	**CONSERVATION BIOLOGY INSTRUCTOR/RESEARCHER, Department of Math, Science, and Technology,** Oglala Lakota College (Supervisor: Dr. Gerald Giraud).
2009-2012	**CO-CHAIR, Department of Math, Science, and Technology,** Oglala Lakota College (Supervisor: Dr. Gerald Giraud).
2012-2013	**CHAIR, Department of Math, Science, and Technology,** Oglala Lakota College (Supervisor: Dr. Ursula Gaertner).

ADJUNCT & COURTESY APPOINTMENTS

1999-2006	**COURTESY FACULTY APPOINTMENT, Department of Earth & Atmospheric Sciences,** University of Nebraska-Lincoln.
2006-2008	**ADJUNCT PROFESSOR OF GEOSCIENCES, Department of Physical & Life Sciences,** Chadron State College, Nebraska.
2010-present	**ADJUNCT GRADUATE FACULTY, Department of Graduate Studies,** Oglala Lakota College, Kyle, South Dakota.
2011-present	**CURATOR, Oglala Lakota College Center for Science and Technology Collections & Oglala Sioux Tribe Specimen Repository,** Kyle, South Dakota.
2012-present	***EX-OFFICIO* MEMBER, Tribal Historical Preservation Advisory Committee,** OST Cultural Affairs and Historic Preservation Office, Kyle, South Dakota.
2015-present	**ADJUNCT SENIOR LECTURER, Department of Civil and Environmental Engineering (Atmospheric and Environmental Sciences Program),** South Dakota School of Mines and Technology, Rapid City, South Dakota.
2016-present	**RESEARCH ASSOCIATE, Department of Nuclear Engineering and Radiological Sciences,** University of Michigan-Ann Arbor, Ann Arbor, Michigan.
2016-present	**RESEARCH ASSOCIATE, Department of Chemistry and Biochemistry, South Dakota State University,** Brookings, South Dakota.

GRANTS & CONTRACTS (~ $11.6M to date)

1991 **CO-INVESTIGATOR (with R. M. Hunt, Jr.): Nebraska National Forest** Paleontological resource inventories of the Oglala National Grassland **($40,000).**

PRINCIPLE INVESTIGATOR: Nebraska Geological Society's Yatkola-Edwards Research Grant Vertebrate taphonomy and paleoecology in NW Nebraska **($250).**

1992 **CO-INVESTIGATOR (with R. M. Hunt, Jr.): Nebraska National Forest** Paleontological resource inventories of the Oglala National Grassland **($48,000).**

1993 **CO-INVESTIGATOR (with R. M. Hunt, Jr.): Nebraska National Forest** Paleontological resource inventories of the Oglala National Grassland **($42,000).**

1994 **CO-INVESTIGATOR (with R. M. Hunt, Jr.): Nebraska National Forest** Paleontological resource inventories of the Oglala National Grassland **($42,000).**

1995 **CO-INVESTIGATOR (with R. M. Hunt, Jr.): Nebraska National Forest** Paleontological resource inventories of the Oglala National Grassland **($60,000).**

1999 **CO-INVESTIGATOR (with J. B. Swinehart): US Geological Survey STATEMAP Program** Geologic Mapping in NW Nebraska **($178,000).**

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2000 **CO-INVESTIGATOR (with J. B. Swinehart & R. M. Hunt, Jr.): US Geological Survey STATEMAP Program** Geologic mapping in NW Nebraska **($192,000).**

2001 **CO-INVESTIGATOR (with J. B. Swinehart & B. E. Bailey): US Geological Survey STATEMAP Program** Geologic mapping in NW Nebraska **($196,000).**

2002 **CO-INVESTIGATOR (with J. B. Swinehart & B. E. Bailey): US Geological Survey STATEMAP Program** Geologic mapping in NW Nebraska **($200,000).**

2003 **CO-INVESTIGATOR (with J. B. Swinehart, B. E. Bailey, & R. M. Hunt, Jr.): US Geological Survey STATEMAP Program** Geologic mapping in northwestern Nebraska **($220,000).**

2004 **CO-INVESTIGATOR (with J. B. Swinehart, R. M. Joeckel, B. E. Bailey, R. M. Hunt, Jr., G. A. Liggett, & R. Lisichenko): US Geological Survey STATEMAP Program** Geologic mapping in northwestern and eastern Nebraska **($340,000).**

2005 **CO-INVESTIGATOR (with J. B. Swinehart, R. M. Joeckel, M. B. Leite, & R. Lisichenko): U. S. Geological Survey STATEMAP Program** Geologic mapping in northwestern and southeastern Nebraska **($196,000).**

2006 **CO-INVESTIGATOR (with L. A. LaGarry & M. B. Leite): US Forest Service Region 2 (Hudson-Meng Bison Kill Site)** Holocene geochronology in the vicinity of the Hudson-Meng Bison Kill Site **($11,200).**

2007 **CO-INVESTIGATOR (with R. Weedon, M. B. Leite, C. McAllister, S. Rolfsmeier, & L. Stewart-Phelps): Chadron State College VISION 2011 Strategic Planning Committee** Laying the groundwork for the second century of the CSC Natural History Museum **($37,790).**

CO-INVESTIGATOR (with M. B. Leite): Nebraska National Forest Photogrammetry and casting of the Toadstool Park Trackway Site, Oglala National Grassland, Nebraska **($15,400).**

2009 **CO-INVESTIGATOR (with G. Giraud): NSF Model Institutions for Excellence Phase III** Modular science, technology, engineering, and mathematics (STEM) course content for sharing among tribal colleges **($900,000).**

CO-INVESTIGATOR (with C. J. Tinant): NSF Tribal Colleges & Universities Program Phase III Faculty and curriculum development, scientific collections and library development, and student research support and dissemination **($2,500,000).**

CO-INVESTIGATOR (with G. Giraud): NSF (South Dakota) Experimental Program for Stimulating Competitive Research R2 T1 Undergraduate research, workforce development, and K-12 outreach **($875,000).**

2010 **PRINCIPAL INVESTIGATOR: USDA NIFA Tribal College Equity Program** Development of instruction and online curriculum in Agriculture & Natural Resources **($395,650)**

CO-INVESTIGATOR (with C. J. Tinant): NSF Academic Research Infrastructure/ ARRA "Yuowanca Okiya" laboratory renovations **($500,000).**

CO-INVESTIGATOR (with C. J. Tinant): National Science Foundation (TCUP), Pre Engineering Educational Collaborative Pre-engineering curriculum, service learning, and outreach **($1,250,000).**

2013 **PRINCIPAL INVESTIGATOR: Van Vlack Family Endowment** Digital petrographic microscope **($7,500).**

2014 **PRINCIPAL INVESTIGATOR: NSF (South Dakota) Experimental Program for Stimulating Competitive Research R2 T1** Cyber informatics, workforce development, and K-12 outreach **($857,000).**

PRINCIPAL INVESTIGATOR: USDA NIFA Tribal College Equity Program Development of constructivist curriculum and plant science research **($406,000).**

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2015 **PRINCIPAL INVESTIGATOR (SUPPLEMENT): NSF (South Dakota) Experimental Program for Stimulating Competitive Research R2 T1** Repair of benchtop XRF **($22,000).**

CO-INVESTIGATOR (with C. J. Tinant, A. Higa, D. Sandoval, M. Brave, & J. Sanovia): NSF Tribal Colleges & Universities Program Phase IV Faculty and curriculum development, scientific collections and library development, and student research support and dissemination **($2,489,200).**

2016 **PRINCIPAL INVESTIGATOR (SUPPLEMENT): NSF (South Dakota) Experimental Program for Stimulating Competitive Research R2 T1** K-12 outreach astronomy and aerospace engineering **($31,000).**

PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

1985-1988 **PALEONTOLOGICAL SOCIETY**

1985-2000 **SOCIETY OF VERTEBRATE PALEONTOLOGY**

1986-2000 **KANSAS ACADEMY OF SCIENCE**

1987-2000 **SIGMA XI**

1988-present **NEBRASKA ACADEMY OF SCIENCES**

2006-2007 **ASSOCIATION FOR WOMEN GEOSCIENTISTS**

2006-2010 **GEOLOGICAL SOCIETY OF AMERICA**

2014-present **GEOLOGICAL SOCIETY OF AMERICA**

2014-present **SOUTH DAKOTA ACADEMY OF SCIENCES**

SCHOLARSHIPS, HONORS, & AWARDS

1980 **National Honor Society**

Alumni Fund Scholarship (Norwood-Norfolk Central School Alumni: $150)

1985 **Earth Stewardship Award** (Earth Stewardship Council, Washington, DC: $150)

Graduate Teaching Assistantship (FHSU Department of Earth Sciences: $2,450)

1986 **Graduate Teaching Assistantship** (FHSU Department of Earth Sciences: $3,250)

1987 **Sigma Xi** (Hays, Kansas Chapter)

1988 **Distinguished Master's Thesis Award** (Midwestern Council of Graduate Schools)

Graduate Teaching Assistantship (UNL Department of Geology: $6,000)

1989 **Graduate Teaching Assistantship** (UNL Department of Geology: $7,000)

M. C. Green Fieldwork Scholarship (University of Nebraska State Museum: $1,000)

1990 **Curatorial Assistantship** (University of Nebraska State Museum: $7,000)

Student Seminar Award – 1st place (UNL Department of Geology: $100)

Eunice & T. Mylan Stout Student Paper Award (Nebraska Geological Society: $50)

M. C. Green Fieldwork Scholarship (University of Nebraska State Museum: $1,000)

1991 **Global Climate Change Internship** (USDA NRCS National Soil Survey laboratory)

Eunice & T. Mylan Stout Student Paper Award (Nebraska Geological Society: $50)

Lincoln Gem & Mineral Club Scholarship (Lincoln Gem & Mineral Club: $150)

Curatorial Assistantship (University of Nebraska State Museum: $7,000)

1992 **Student Seminar Award – 1st place** (UNL Department of Geology: $100)

Student Paper Award (North-Central Section, Geological Society of America: $50)

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Curatorial Assistantship (University of Nebraska State Museum: $7,000)

1993 **Curatorial Assistantship** (University of Nebraska State Museum: $7,000)

1994 **Student Presentation Travel Award** (UNL Department of Geology: $250)

1996 **Volunteer Service Recognition** (Nebraska National Forest)

Student Presentation Travel Award (UNL Department of Geology: $250)

1997 **Extra Effort Cash Award** (USDA NRCS National Soil Survey Center: $500)

2004 **Letter of Commendation** (USDA NRCS: CSD STATEMAP Research Program)

2009 **Special Invitation Travel Award** (NSF BIO Directorate, 2009 JAM: $1200)

2010 **Department Chair of the Year** (Oglala Lakota College)

Honoring for Reintroduction of the Swift Fox to the Pine Ridge Reservation (Oglala Sioux Parks & Recreation Authority)

2015 **Honoring for Service on the OST Tribal Historical Preservation Advisory Council** (Oglala Sioux Tribe Cultural Affairs & Historical Preservation Office)

COLLEGE & UNIVERSITY COURSES TAUGHT

FORT HAYS STATE UNIVERSITY, HAYS, KANSAS

1985-1986 **Historical Geology laboratory** (1 credit hour, 2 semesters)
1985-1986 **Invertebrate Paleontology laboratory** (1 credit hour, 2 semesters)
1987 **Field Methods** (3 credit hours, 1 semester)
1987 **Field Camp** (6 credit hours, 1 summer session)
1987 **Structural Geology** (3 credit hours, 1 semester)

BARTON COUNTY COMMUNITY COLLEGE, GREAT BEND, KANSAS

1988 **Life of the Past** (3 credit hours, 1 semester)

UNIVERSITY OF NEBRASKA-LINCOLN, LINCOLN, NEBRASKA

1988-1989 **Historical Geology laboratory** (1 credit hour, 2 semesters)
1990-1991 **Invertebrate Paleontology laboratory** (1 credit hour, 2 semesters)
1991-2002 **Independent Study in Geology** (3 credit hours, 3 semesters)
1992-1995 **Physical Geology laboratory** (1 credit hour, 4 semesters)
1995-1996 **Independent Study in Museum Studies** (3 credit hours, 2 semesters)
1998-2005 **Regional Field Geology** (1 credit hour, 8 semesters)

CHADRON STATE COLLEGE, CHADRON, NEBRASKA

2006 **Sedimentology & Stratigraphy** (3 credit hours, 1 semester)
2007-2008 **Earth Systems Science** (3 credit hours, 3 semesters)

OGLALA LAKOTA COLLEGE, KYLE, SOUTH DAKOTA

2008-2015 **Groundwater** (3 credit hours, 4 semesters)
2008-2009 **Introduction to Statistics** (3 credit hours, 3 semesters)
2009 **Renewable Energy** (3 credit hours, 1 semester)
2009 **Anatomy & Physiology I** (4 credit hours, 1 semester)
2009-2011 **Research Methods** (3 credit hours, 2 semesters)
2009-2011 **Senior Research** (3 credit hours, 2 semesters)
2010 **Anatomy & Physiology II** (4 credit hours, 1 semester)
2010-2014 **Physical Geology** (3 credit hours, 4 semesters)
2010-2016 **Soils I** (3 credit hours, 4 semesters)
2011-2015 **Historical Geology** (3 credit hours, 4 semesters)
2012-2016 **Paleontology** (3 credit hours, 1 summer, 1 semester)
2013-16 **Soils II** (3 credit hours, 3 semesters)
2013 **Evolution** (3 credit hours, 1 semester)

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2013	**Mammalogy** (3 credit hours, 1 semester)
2013-2014	**Human Biology** (3 credit hours, 3 semesters)
2014-2016	**Fluvial Morphology** (3 credit hours, 3 semesters)
2014	**Field Ecology** (3 credit hours, 1 semester)

RESEARCH INTERESTS

1984-1985	**Lake acidification, northern Adirondack Mountains, New York**
1984-1985	**Ordovician marine paleoecology, Trenton Group of northern New York**
1985-present	**Taphonomy & paleoecology of Neogene mammals, Nebraska**
1985-present	**Taxonomy & systematic description of Neogene mammals, Nebraska**
1988-present	**Biostratinomy of the Deer Creek Formation (Pennsylvanian), Nebraska**
1988-present	**Reptiles, amphibians, & lungfish, Eskridge Formation (Permian), Nebraska**
1988-present	**Taphonomy & paleoecology of Paleogene faunas, Nebraska**
1991-present	**Cenozoic paleosols of western Nebraska & southwestern South Dakota**
1993-present	**Cenozoic trace fossils of northwestern Nebraska**
1996-present	**Cenozoic lithostratigraphy of western Nebraska**
1998-present	**Cenozoic lithostratigraphy of north-central Nebraska**
2008-present	**Cenozoic lithostratigraphy of southwestern South Dakota**
2008-present	**Groundwater and mineral resources of the Pine Ridge Reservation**

FIELD EXPERIENCE

1981-1988	**Precambrian & early Paleozoic rocks, northern New York State**
1984-1985	**Limnology of acidified lakes, northern New York State**
1984-1985	**Early Paleozoic strata, northern New York State**
1985-1988	**Cretaceous & Neogene rocks & fossils of western Kansas**
1985-1988	**Late Paleozoic rocks & fossils of eastern Kansas**
1986-1987	**Paleozoic & Mesozoic strata, Utah & Colorado**
1988-1989	**Wisconsinan peat bogs, archeology, & vertebrates, northern Illinois**
1988-1995	**Late Paleozoic rocks & fossils of eastern Nebraska**
1989-1990	**Paleogene carnivores, Agate Fossil Beds National Monument**
1991-2002	**Vertebrate fossil resources of the Oglala National Grassland, Nebraska**
1996-present	**Cenozoic lithostratigraphy & vertebrate paleontology of NW Nebraska & SW South Dakota**
1998-present	**Cenozoic lithostratigraphy & vertebrate paleontology of north-central Nebraska**
1998-present	**Cenozoic paleosols & modern soils, northern Great Plains, USA**
2000-2005	**Pleistocene strata & paleosols of eastern Nebraska**
2006-present	**Archeology of NW Nebraska & SW South Dakota**
2008-present	**Groundwater and surface water of NW Nebraska & SW South Dakota**

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STUDENT RESEARCH SUPERVISED

UNIVERSITY OF NEBRASKA-LINCOLN

1989-1992 **Michael R. Myers, Department of Geology [independent study].** *"Mortality profiles of* Mammuthus imperator *(Leidy), Sheridan County, Nebraska."*

1989-1992 **W. Brantly Wells, Department of Geology [independent study].** "*Vertebrate trace fossils of the Toadstool Park Trackway Site, Oglala National Grassland, Nebraska."*

1991-1992 **Dennis W. Moser, Department of Geology [class project].** *"Biostratinomy of the Haynies limestone bed (Pennsylvanian), a compound distal tempestite from southeastern Nebraska"* **(1992 STUDENT PAPER AWARD, North-Central Section, Geological Society of America)**.

1991-1992 **Steven L. Holmes, Department of Geology [class project].** *"Biostratinomy of the Haynies limestone bed (Pennsylvanian), a compound distal tempestite from southeastern Nebraska"* **(1992 STUDENT PAPER AWARD, North-Central Section, Geological Society of America)**.

1996-1997 **April Whitten, Department of Anthropology [MS thesis: LuAnn Wandsnider, Advisor].** *"Late Holocene environments at the Arner Hearth Site, northwestern Nebraska."*

1996-1997 **Justin A. Kinsley, Department of Museum Studies [Independent Study].** *"A vertebrate coprocoenocis from the Orella Member of the Brule Formation (Oligocene), northwestern Nebraska."*

2000-2001 **Erin L. Richardson, Department of Anthropology [MS thesis: LuAnn Wandsnider, Advisor].** *"Holocene landscape reconstruction at the Sand Creek Hearth Site, Dawes County, Nebraska, USA."*

UNIVERSITY OF CALIFORNIA-BERKELEY

1999-2003 **Caroline A. E. Stromberg, Department of Evolutionary and Integrative Biology [Ph. D. dissertation: David A. Lindberg, Advisor].** "*Origin and spread of Tertiary grasslands in North America"* **(2003 ALFRED SHERWOOD ROMER PRIZE, Society of Vertebrate Paleontology)**.

TULANE UNIVERSITY

2001-2002 **Stephanie G. Thomas, Department of Geology [Independent Study]** "*Lithostratigraphic revision and redescription, White River and Arikaree groups"* **(UNDERGRADUATE FIELD MENTORSHIP PROGRAM, American Association of State Geologists).**

CHADRON STATE COLLEGE

2006-2007 **Jennifer L. Balmat, Department of Physical & Life Sciences [Undergraduate Capstone Thesis: Michael B. Leite, advisor]** *"Physical sedimentology of the Hudson-Meng Bison Kill Site, northwestern Nebraska."*

2006-2007 **Joshua W. Balmat, Department of Physical & Life Sciences [Undergraduate Capstone Thesis: Michael B. Leite, advisor]** *"Buried soils and ancient landscapes at the Hudson-Meng Bison Kill Site, northwestern Nebraska."*

OGLALA LAKOTA COLLEGE

2008-2009 **Helene Gaddie, Department of Math, Science, & Technology [Senior Research: Hannan E. LaGarry, advisor]** *"New lithostratigraphic correlations of the White River Group from northwestern Nebraska to southwestern South Dakota"*

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2009	**Dylan Brave, Department of Math, Science, & Technology [Junior Research: Hannan E. LaGarry, advisor]** *"New vertebrate trackway sites from the White River Group (Late Eocene) of southwestern South Dakota"*
2009-2013	**Curtis Belile, Department of Math, Science, & Technology [Junior Research: Hannan E. LaGarry, advisor]** *"Revised lithostratigraphic correlation of the Arikaree Group in southwestern South Dakota"*
2010-2013	**Elisha Yellow Thunder, Department of Math, Science, & Technology [Junior/Senior Research: Hannan LaGarry, advisor]** *"Stratigraphic and instrumental analysis of point-source and nonpoint-source radionuclide contamination on the Pine Ridge Reservation"* **(2011 NATIVE AMERICAN RESEARCH SCHOLAR, Native American Research Center for Health, Seattle WA).**
2012-2013	**Lilly Sanovia, Department of Math, Science, & Technology [Senior Research: Hannan E. LaGarry, advisor]** *"A paleontological resource inventory of selected outcrops along the White Clay Fault in southwestern South Dakota"* **(2013 GRADUATE RESEARCH FELLOWSHIP, National Science Foundation)**.
2014-present	**Patrisse M. Vasek, Department of Math, Science, & Technology [Junior/Senior Research: Hannan E. LaGarry, advisor]** *"XRF, XRD, and ICP ES analyses of uranium concentrations in the Late Eocene Chamberlain Pass Formation of northeastern Sioux County, Nebraska "* **(2014 NSF RESEARCH EXPERIENCE FOR UNDERGRADUATES, United Tribes Technical College).**
2014-present	**Patrisse M. Vasek, Department of Math, Science, & Technology [Junior/Senior Research: Hannan E. LaGarry, advisor]** *"XRF, XRD, and ICP ES analyses of uranium concentrations in the Late Eocene Chamberlain Pass Formation of northeastern Sioux County, Nebraska "* **(2014 NSF RESEARCH EXPERIENCE FOR UNDERGRADUATES, United Tribes Technical College).**
2015-present	**Joni K. Tobacco, Department of Math, Science, & Technology [Senior Research: Hannan E. LaGarry, advisor]** "Revised soil to sediment correlations, Fall River and Oglala Lakota counties, South Dakota" **(2015 SUMMER RESEARCH FELLOWSHIP, American Indian College Fund).**
2015-present	**Patrisse M. Vasek, Department of Math, Science, & Technology [Junior/Senior Research: Hannan E. LaGarry, advisor]** *"Remotely sensed geological lineaments as potential structural features and contaminant pathways for unconfined ISL lixiviant, Fall River and Custer counties, South Dakota."*
2016-present	**Patrisse M. Vasek, Department of Math, Science, & Technology [Junior/Senior Research: Hannan E. LaGarry, advisor]** *"Environmental assessment of toxic heavy metal contaminants in NW Nebraska and SW South Dakota."* **(2016 NSF RESEARCH EXPERIENCE FOR UNDERGRADUATES, Black Hills State University).**

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY

2015-present	**Ulrike Werner, Department of Civil and Environmental Engineering [MS Thesis: Hannan E. LaGarry, co-advisor with W. Capehart],** *"Atmospheric concentrations of toxic heavy metals, Pine Ridge Reservation, South Dakota."*

BLACK HILLS STATE UNIVERSITY

2016-present	**Camille Griffith, Department of Biology (Integrative Genomics) [MS Thesis: Graduate Committee Member]** *"Landscape ecology and genetics of the ornate box turtle (*Terrapene ornata*) from southwestern South Dakota."*

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STUDENTS EMPLOYED

1989-1992	**Michael R. Myers (undergraduate in Geology), University of Nebraska-Lincoln.** Vertebrate fossil resource inventories of the Oglala National Grassland.
1989-1995	**W. Brantly Wells (undergraduate in Geology), University of Nebraska-Lincoln.** Vertebrate fossil resource inventories of the Oglala National Grassland.
1989-1995	**Chris E. Rudnick (graduate in Geology), University of Nebraska-Lincoln.** Vertebrate fossil resource inventories of the Oglala National Grassland.
1991-1992	**Daryl K. Pavey (undergraduate in Biology), University of Nebraska-Lincoln.** Vertebrate fossil resource inventories of the Oglala National Grassland.
1993-1994	**Michelle K. David (graduate in Geology), Fort Hays State University.** Vertebrate fossil resource inventories of the Oglala National Grassland.
1994-1995	**Carrie L. Herbel (graduate in Geology), University of Nebraska-Lincoln.** Vertebrate fossil resource inventories of the Oglala National Grassland.
1996-1997	**David L. Dyer (graduate in Museum Studies), University of Nebraska-Lincoln.** Curated White River Group vertebrate fossils from northwestern Nebraska.
1996-1997	**Justin A. Kinsley (undergraduate in Museum Studies), University of Nebraska-Lincoln.** Curated White River Group vertebrate fossils from northwestern Nebraska.
2002-2003	**Stephanie G. Thomas (undergraduate in Geology), Tulane University.** Geologic mapping (STATEMAP) in northwestern Nebraska.
2007	**Jennifer L. Balmat (undergraduate in Geology), Chadron State College.** Renovation of the Eleanor Barbour Cook Museum of Geology.
2007	**Joshua W. Balmat (undergraduate in Geology), Chadron State College.** Renovation of the Eleanor Barbour Cook Museum of Geology.
2008-2009	**Helene Gaddie (undergraduate in Natural Science), Oglala Lakota College.** Lithostratigraphy of the White River Group in SW South Dakota.
2009	**Dylan Brave (undergraduate in Natural Science), Oglala Lakota College.** Fossil mammal trackways of the White River Group, South Dakota.
2009-2013	**Elisha Yellow Thunder (undergraduate in Natural Science), Oglala Lakota College.** Uranium contamination in southwestern South Dakota.
2009-2012	**Curtis Belile (undergraduate in Natural Science), Oglala Lakota College.** Uranium contamination and lithostratigraphy in southwestern South Dakota.
2012	**Sheronne White (undergraduate in Natural Science), Oglala Lakota College,** Curation of vertebrate fossils of the Pine Ridge Reservation.
2013-2014	**Edwina Fills the Pipe (undergraduate in Life Sciences), Oglala Lakota College,** Curation of vertebrate fossils of the Pine Ridge Reservation.
2014	**Jacob Ferguson (undergraduate in Natural Science), Oglala Lakota College,** review of drillers' logs and notes in Oglala Sioux Tribe/Consolidated Intervenors *vs*. Powertech.
2014	**Camille Griffith (undergraduate in Natural Science), Oglala Lakota College,** review of drillers' logs and notes in Oglala Sioux tribe/Consolidated Intervenors *vs*. Powertech.
2014	**Patrisse Vasek (undergraduate in Natural Science), Oglala Lakota College,** review of drillers' logs and notes in Oglala Sioux tribe/Consolidated Intervenors *vs*. Powertech.

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2015-present **Patrisse M. Vasek (undergraduate in Natural Science), Oglala Lakota College,** SD EPSCoR blogger and student correspondent-at-large.

2015 **Michele LeBeau (undergraduate in Natural Science), Oglala Lakota College,** development of a uranium contamination literature database.

SERVICE TO PROFESSIONAL ORGANIZATIONS

1992 **TECHNICAL SESSION CONVENER:** 7th Annual Meeting of the Society for the Preservation of Natural History Collections, Lincoln, Nebraska.

EARTH SCIENCE SECTION CHAIR: 102nd Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

1995 **SYMPOSIUM CO-CONVENER (with D. O. Terry, Jr. & R. M. Hunt, Jr.):** *Depositional Environments, Lithostratigraphy, and Biostratigraphy of the White River and Arikaree Groups.* 29th Annual Meeting of the North & South-Central Sections, Geological Society of America, Lincoln, Nebraska.

FIELD TRIP CO-LEADER (with D. O. Terry, Jr.): *The White River Group Revisited: Vertebrate Trackways, Ecosystems, and Stratigraphic Revision, Redefinition, and Redescription.* 29th Annual Meeting of the North & South Central Sections of the Geological Society of America, Lincoln, Nebraska.

1996 **FIELD TRIP CO-LEADER (with D. O. Terry, Jr., R. Benton, & E. Evanoff):** *Hayden's Lakes Revisited: The Origin and New Stratigraphic interpretations of the White River Sequence, South Dakota, Nebraska, and Wyoming.* 1996 Annual Meeting of the Geological Society of America, Denver, Colorado.

1998 **FIELD TRIP CO-LEADER (with B. A. Beasley):** *Fossil Resource Management of the Oglala National Grassland and the Toadstool Park Trackway Site*. 5th Conference on Fossil Resources, Rapid City, South Dakota.

1999 **EARTH SCIENCE SECTION CO-CHAIR (with S. Tucker):** 109th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

DEHNER AWARD JUDGE (posters): 131st Annual Meeting of the Kansas Academy of Science, Manhattan, Kansas.

2000 **SYMPOSIUM CO-CONVENER (with E. L. Richardson):** *Nebraska Stratigraphy*, 110th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

EARTH SCIENCE SECTION CO-CHAIR (with A. Carter): 110th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

2002 **EUNICE & T. MYLAN STOUT STUDENT PAPER AWARD JUDGE (platform):** 112th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

DEHNER AWARD JUDGE (platform): 134th Annual Meeting of the Kansas Academy of Science, Hays, Kansas.

2003 **EUNICE & T. MYLAN STOUT STUDENT PAPER AWARD JUDGE (platform):** 113th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

2004 **NEBRASKA GEOLOGICAL SOCIETY STUDENT PAPER AWARD JUDGE (platform):** 114th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

2005 **NEBRASKA GEOLOGICAL SOCIETY STUDENT PAPER AWARD JUDGE (platform):** 115th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

2006 **NEBRASKA GEOLOGICAL SOCIETY STUDENT PAPER AWARD JUDGE (platform):** 116th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

2007 **EARTH SCIENCE SECTION CHAIR:** 117th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

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FIELD TRIP CO-LEADER (with L. A. LaGarry, M. P. Muniz, & L. D. Agenbroad): *Geoarcheology of the Hudson-Meng Bison Kill Site, Oglala National Grassland, Nebraska.* 65th Annual Meeting of the Plains Anthropological Society, Rapid City, South Dakota.

2008 **NEBRASKA GEOLOGICAL SOCIETY STUDENT PAPER AWARD JUDGE (platform):** 118th Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

2012 **NEBRASKA GEOLOGICAL SOCIETY STUDENT PAPER AWARD JUDGE (platform):** 122nd Annual Meeting of the Nebraska Academy of Sciences, Lincoln, Nebraska.

SERVICE TO FEDERAL, STATE, & TRIBAL AGENCIES

1992 **TRAINING CONTENT PROVIDER:** ***"Paleontological resources of the Oglala National Grassland,"*** US Forest Service (Region 2), US Forest Service Regional Team Leadership Meeting, Nebraska National Forest, Chadron, Nebraska.

1993-2004 **NORTH AMERICAN GEOLOGIC-MAP DATA MODEL SCIENCE-LANGUAGE TECHNICAL TEAM, Sedimentary & Surficial Deposits subgroups,** US Geological Survey National Geologic Mapping Working Group Steering Committee.

2004 **TRAINING CONTENT PROVIDER: Petrocalcic soils tour of the north-central Great Plains (with J. Wilson & P. Young).** NRCS National Soil Survey Laboratory, USDA Natural Resources Conservation Service, Lincoln, Nebraska.

2008 **TRAINING CONTENT PROVIDER:** ***"Uranium and water on the Pine Ridge Reservation,"*** Oglala Sioux Tribe/Tribal Agency Tech Team open meeting, OST Natural Resources Regulation Agency, Prairie Wind Casino, Oglala, South Dakota

2009 **TRIBAL COLLEGES & UNIVERSITIES INFORMATION AND PLANNING MEETING,** National Science Foundation BIO Directorate, Washington, DC.

RESEARCH EXPERIENCES FOR UNDERGRADUATES PROGRAM WORKSHOP FACILITATOR (with L. Patino), Tribal Colleges & Universities Program Leadership Conference, National Science Foundation, Albuquerque, New Mexico

2009-2010 **OGLALA SIOUX TRIBE'S TRIBAL NATIONAL PARK PLANNING AND STEERING COMMITTEE,** with participation from the Oglala Sioux Tribe, Oglala Lakota College, OST Natural Resources Regulation Agency, Oglala Sioux Parks & Recreation Authority, OST Tribal Historical Preservation Office, and Badlands National Park

2009-present ***AD HOC* GRANT PROPOSAL REVIEWER,** National Science Foundation, Arlington, Virginia.

2011 **TRAINING CONTENT PROVIDER:** ***"Paleontological Resources on the Pine Ridge Reservation,"*** Oglala Sioux Tribe/Regional Tribal Historical Preservation offices open meeting, OST Natural Resources Regulation Agency, Prairie Wind Casino, Oglala, South Dakota

2012 **TRAINING CONTENT PROVIDER:** ***"Paleontological Resources on the Pine Ridge Reservation,"*** Oglala Sioux Tribal Council/Oglala Sioux Parks & Recreation Authority, OST Transit Authority Conference Room, Pine Ridge, South Dakota

2012-present **PLANNING COMMITTEE FOR THE DEVELOPMENT OF A NATIVE AMERICAN CURRICULUM IN TRAVEL, TOURISM, AND INTERPRETATION,** Oglala Lakota College/Badlands National Park/Steven F. Austin University.

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2012-present **SOUTH DAKOTA EPSCoR REACH COMMITTEE,** National Science Foundation (South Dakota) EPSCoR Program (J. Rice, Director), South Dakota State University, Brookings, South Dakota.

2014 **PANEL PRESENTER*: "Is OSSPEEC accomplishing what it set out to do and meeting our expectations?"*** Engineering the future: NSF Pre-Engineering Educational Collaboratives (PEEC) Workshop, Minneapolis, Minnesota.

PANEL PRESENTER: *"OSPEEC"* Engineering the future: NSF Pre-Engineering Educational Collaboratives (PEEC) Workshop, Minneapolis, Minnesota.

2014-2016 **SOUTH DAKOTA EPSCoR STUDENT RESEARCH SYMPOSIUM STUDENT PAPER AWARD JUDGE (posters),** National Science Foundation (South Dakota) EPSCoR Program (J. Rice, Director), Pierre, South Dakota.

2015 **TRAINING CONTENT PROVIDER: *"Cultural resources on the Pine Ridge Reservation,"*** OST Cultural Affairs & Historical Preservation Office Cultural Resource Protection, NAGPRA, Historic Preservation Training, Prairie Wind Casino, Pine Ridge Reservation.

TRAINING CONTENT PROVIDER: *"Inventory and monitoring of the Oglala National Grassland,"* OST Cultural Affairs & Historical Preservation Office Cultural Resource Protection, NAGPRA, Historic Preservation Training, Prairie Wind Casino, Pine Ridge Reservation.

TRAINING CONTENT PROVIDER: *"Surface and subsurface distributions of uranium-bearing strata in NW Nebraska and SW South Dakota,"* OST Cultural Affairs & Historical Preservation Office Cultural Resource Protection, NAGPRA, Historic Preservation Training, Prairie Wind Casino, Pine Ridge Reservation.

PANEL REVIEWER: Presidential Awards for Excellence in Science, Math, and Engineering Mentorship, National Science Foundation, Arlington, Virginia.

PRESENTER: SD EPSCoR R2 T1 "2020 VISION" Reverse Site Visit, National Science Foundation, Arlington, Virginia.

SERVICE TO COLLEGES & UNIVERSITIES

2007-2008 **FACULTY MENTOR (with 6 others), *"People, Planet, & Prosperity"*** Environmental Protection Agency (student) Sustainability Design Competition, Chadron State College, Chadron, Nebraska.

2008 **MANUSCRIPT REVIEWER (with 3 others), *"Outside the Lines"*** student essay competition and published volume, Chadron State College, Chadron, Nebraska.

2008-2009 **INSTRUCTIONAL AFFAIRS COMMITTEE, Distance Learning Subcommittee,** Oglala Lakota College, Kyle, South Dakota.

2008-2009 **HIGHER LEARNING COMMISSION FOCUS VISIT TASK FORCE, faculty representative,** Oglala Lakota College, Kyle, South Dakota.

2008-2013 **INSTITUTIONAL (RESEARCH) REVIEW BOARD, Department of Math, Science, & representative,** Oglala Lakota College, Kyle, South Dakota.

2009 **GRADUATE STUDY ADVISORY GROUP,** Oglala Lakota College, Kyle, South Dakota.

SPOKESPERSON AND PRESENTER: *"Oglala Lakota College Department of Math, Science, & Technology: the year in review,"* Oglala Lakota College Annual Faculty Retreat, Rapid City, South Dakota.

SPOKESPERSON AND PRESENTER: *"Oglala Lakota College Department of Math, Science, & Technology: the year in review,"* Oglala Lakota College Board of Trustees Annual Retreat, Rapid City, South Dakota.

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ALL-FACULTY MEETING SPECIAL PRESENTATION: ***"Water and uranium on the Pine Ridge Reservation,"*** Piya Wiconi Administrative Campus, Oglala Lakota College, Kyle, South Dakota.

2009-2013 **RESERVATION-WIDE K-12 SCIENCE FAIR JUDGE,** Piya Wiconi Administrative Campus, Oglala Lakota College, Kyle, South Dakota.

2011-2012 **HIGHER LEARNING COMMISSION ACCREDITATION SELF-STUDY COMMITTEE, Research and Creative Activity,** Oglala Lakota College, Kyle, South Dakota

2013-2014 **CHAIR, INSTITUTIONAL (RESEARCH) REVIEW BOARD,** Oglala Lakota College, Kyle, South Dakota.

2014 **FACULTY DEVELOPMENT COMMITTEE,** Oglala Lakota College, Kyle, South Dakota.

2015-2016 **CHAIR, FACULTY DEVELOPMENT COMMITTEE,** Oglala Lakota College, Kyle, South Dakota.

SERVICE TO ACADEMIC DEPARTMENTS & STUDENT ORGANIZATIONS

1983 **SECRETARY, Students for Environmental Awareness,** State University of New York @ Potsdam, Potsdam, New York.

1984-1985 **VICE PRESIDENT, Students for Environmental Awareness,** State University of New York @ Potsdam, Potsdam, New York.

1984-1985 **GEOLOGY CLUB, Student Member,** Geology Department, State University of New York @ Potsdam, Potsdam, New York.

1985-1988 **STERNBERG GEOLOGY CLUB, Student Member,** FHSU Dept. of Earth Sciences.

1988-1993 **GEOLOGY CLUB, Student Member,** UN-L Department of Geosciences.

1993-1995 **STUDENT REPRESENTATIVE AT FACULTY MEETINGS,** Department of Geosciences, University of Nebraska-Lincoln.

2006-2007 **GEOLOGY CLUB, Faculty Member,** Chadron State College.

2009 **PANEL PRESENTER:** ***"Student participation in research at OLC's Department of Math, Science, & Technology,"*** Native Science Field Center Program National Leadership Conference, Rapid City, South Dakota.

2009-2013 **PANEL PRESENTER:** ***"Student research opportunities in the OLC Department of Math, Science, & Technology,"*** Department of Math, Science, & Technology Student Intern Meeting, Oglala Lakota College's Piya Wiconi Administrative Campus, Kyle, South Dakota.

2010-2013 **K-12 CONTENT PROVIDER: K-12 Science Exploratorium,** Department of Math, Science, & Technology, Lakota Nation Invitational Basketball Tournament, Civic Center, Rapid City, South Dakota.

2014 **FIELD TRIP CO-LEADER (with K. Costion & M. Englehart):** ***"Precolonial sacred sites and petroglyphs at Hell Canyon, Custer National Forest, South Dakota,"*** OLC Department of Math, Science, and Technology/Custer National Forest.

FIELD TRIP CO-LEADER (with K. Costion & M. Englehart): ***"Precolonial lithic scatters and sacred sites of Cascade Canyon, Custer National Forest, South Dakota,"*** OLC Department of Math, Science, and Technology/Custer National Forest.

2015 **FIELD TRIP CO-LEADER (with K. Costion & M. Englehart):** ***"Precolonial petroglyphs and pictographs at Craven Canyon, Custer National Forest,***

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South Dakota," OLC Department of Math, Science, and Technology/Custer National Forest.

CONTENT POVIDER: SD EPSCoR Little Shop of Physics, Department of Math, Science, & Technology, Lakota Nation Invitational Basketball Tournament, Civic Center, Rapid City, South Dakota.

2016 **MODERATOR (with Deig Sandoval): "Crying Earth, Rise Up!"** Special Film Presentation, UM-Ann Arbor Department of Nuclear Engineering and Radiological Sciences/Consortium for Verification Technology, Ann Arbor, Michigan.

SERVICE TO COMMUNITY & NONPROFIT ORGANIZATIONS

1993 **FIELD TRIP CO-LEADER (with L. A. LaGarry & D. A. Nixon), Nebraska Rocks!** Homestead Council, Girl Scouts of America.

2008 **EXPERT OPINION:** ***"Geological and hydrological implications of proposed Crow Butte Resources' North Trend Expansion of in-situ leach mining north of Crawford, Nebraska,"*** provided to Western Nebraska Resources Council, Owe Aku, and concerned residents http://savecrowbutte.org/files/Crow%20Butte%20LBP-08-06%20042908.pdf

PROGRAM CHAIR & MODERATOR: Our water, our future: a hard look at the dry facts, Town Hall Meeting, Chadron State College Student Center Ballroom, Chadron, Nebraska.

EXPERT OPINION: ***"Geology, groundwater resources, and implications of Crow Butte Resources' continued in-situ leach mining north of Crawford, Nebraska,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe http://plentyinternational.wordpress.com/2008/07/31/expert-opinion-regarding-isl-mining-in-dawes-county-nebraska/

2009 **PROGRAM CO-CHAIR (with Darwin Apple) & MODERATOR: Informational meeting between Oglala Lakota College and renewable energy development experts,** Oglala Lakota College MIE (Math & Science Department) Conference Room, Kyle, South Dakota

2010 **EXPERT OPINION:** ***"Expert opinion regarding the proposed Dewey-Burdock Project ISL mine near Edgemont, South Dakota,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe http://pbadupws.nrc.gov/docs/ML1006/ML100680016.pdf

2012 **EXPERT OPINION:** ***"Expert opinion on the environmental safety of in-situ leach mining of uranium near Marsland, Nebraska,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe http://pbadupws.nrc.gov/docs/ ML1302/ML13029A806.pdf

2014 **EXPERT ORAL TESTIMONY: Atomic Safety and Licensing Board**, provided on behalf of the Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Crow Butte Resources/Nuclear Regulatory Commission. http://www.powertechexposed.com/2014.08.21%20Transcript%20ASLB%20hearing_ML14238A184.pdf

EXPERT TESTIMONY: ***"Declaration of Dr. Hannan LaGarry,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Powertech/Nuclear Regulatory Commission before the Atomic Safety and Licensing Board. http://pbadupws.nrc.gov/docs/ML1428/ML14282A870.pdf

EXPERT TESTIMONY: ***"Supplemental declaration of Dr. Hannan LaGarry,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Powertech/Nuclear Regulatory Commission before the Atomic Safety and Licensing Board. http://pbadupws.nrc.gov/docs/ML1431/ML14311B006.pdf

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EXPERT TESTIMONY: ***"Written supplemental testimony of Dr. Hannan LaGarry,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Powertech/Nuclear Regulatory Commission before the Atomic Safety and Licensing Board. http://pbadupws.nrc.gov/docs/ML1432/ML14325A866.pdf

2015 **EXPERT OPINION:** ***"Supplemental expert opinion regarding the renewal of ISL uranium mining (Crow Butte Resources) near Crawford, Nebraska,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Crow Butte Resources/Nuclear Regulatory Commission before the Atomic Safety and Licensing Board. http://online.swc.tc/peec/wp-content/uploads/2015/03/LAGARRY-UPDATED-CBR-OPINION-2015.pdf

EXPERT TESTIMONY: ***"Additional testimony regarding lineaments, joints, and faults as contaminant pathways near Crawford, Nebraska (Crow Butte Resources ISL facility),"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Crow Butte Resources/Nuclear Regulatory Commission before the Atomic Safety and Licensing Board. http://pbadupws.nrc.gov/docs/ML1523/ML15239B098.pdf

EXPERT ORAL TESTIMONY: before the Atomic Safety and Licensing Board, provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Crow Butte Resources/Nuclear Regulatory Commission. http://pbadupws.nrc.gov/docs/ML1524/ML15240A397.pdf

SUPPLEMENTAL EXPERT TESTIMONY: ***"Supplemental testimony of Dr. Hannan LaGarry,"*** provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Crow Butte Resources/Nuclear Regulatory Commission before the Atomic Safety and Licensing Board.

SUPPLEMENTAL EXPERT ORAL TESTIMONY: before the Atomic Safety and Licensing Board, provided to Western Nebraska Resources Council, Owe Aku, concerned residents, and the Oglala Sioux Tribe vs. Crow Butte Resources/Nuclear Regulatory Commission.

GUEST SPEAKER: ***"Using scats and coprolites in natural history research,"*** Red Cloud Indian School after school programs, Dakota Horizons Council, Girl Scouts of America.

PROFESSIONAL CONFERENCES ATTENDED (dates)

American Association for the Advancement of Science (1988)

Cenozoic Vertebrate Tracks and Traces Conference (2007)

Conference on Fossil Resources (1992, 1994, 1998, 2011)

Digital Mapping Techniques Conference (2000)

First Americans Land Grant Consortium (2014)

Geological Society of America (1994, 1996, 1999, 2006-07, 2013)

Geological Society of America (Northeast Section) (1984)

Geological Society of America (North-Central Section) (1992, 1995, 2014)

Geological Society of America (Rocky Mountain Section) (1997, 2011)

Island in the Plains Historical & Archeological Symposium (2006-07)

Kansas Academy of Science (1987-88, 1991-92, 1994, 1999, 2001-02)

National Science Foundation Joint Annual Meeting (2009)

Nebraska Academy of Sciences (1989-93, 1995-2000, 2002-08, 2012)

North American Paleontological Convention (2001)

Northern Plains Governors' Conference (1992)

Plains Anthropological Society (2006-07)

SD EPSCoR All-Investigators Meeting (2014, 2016)

Society of Vertebrate Paleontology (1985, 1987, 1991-93)

Society for the Preservation of Natural History Collections (1992, 2013)

South Dakota Academy of Sciences (2014)

South Dakota EPSCoR Student Research Symposium (2014-16)

Western South Dakota Hydrology Conference (2009-10)

PROFESSIONAL DEVELOPMENT ACTIVITIES

1991 **LABORATORY EXERCISES IN PALEOPEDOLOGY (Instructor: G. Retallack),** University of Nebraska-Lincoln Department of Geology, Lincoln, Nebraska.

1999 **DIGITAL MAPPING METHODS: ACCURATE DIGITAL DATA CAPTURE AND ANALYSIS FOR THE FIELD GEOSCIENTIST,** Geological Society of America short course, Denver, Colorado.

2008 **QUALITY EDUCATION FOR MINORITIES NETWORK GRANT-WRITING WORKSHOP,** National Science Foundation (Research in Disabilities Education Program), Washington, D.C.

NATIONAL SCIENCE FOUNDATION TRIBAL COLLEGE WORKSHOP, NSF Office of Budget, Finance, & Award Management (Division of Institution & Award Support), Arlington, Virginia.

2009 **UNCFSP TRIBAL COLLEGE TECHNICAL ASSISTANCE TRAINING,** United Negro College Fund Special Projects unit, Albuquerque, New Mexico.

FUNDING OPPORTUNITIES (NSF BIO DIRECTORATE), National Science Foundation 2009 Joint Annual Meeting, Washington, DC.

SPECIAL NETWORKING SESSION (NSF BIO DIRECTORATE), National Science Foundation 2009 Joint Annual Meeting, Washington, DC.

TRIBAL COLLEGES & UNIVERSITIES PROGRAM LEADERSHIP CONFERENCE, National Science Foundation (Division of Education & Human Resources), Albuquerque, New Mexico.

INCORPORATING NATIVE CULTURE INTO THE STEM CURRICULUM, National Science Foundation (Tribal Colleges & Universities Program/Quality Education for Minorities Network), Albuquerque, New Mexico.

2013 **INSTITUTIONAL EFFECTIVENESS WORKSHOP,** Office of Institutional Research and Assessment, Oglala Lakota College, Kyle, South Dakota.

ACADEMIC COACHING SKILLS TRAINING, Office of Enrollment Management, Oglala Lakota College, Kyle, South Dakota.

2014 **ASSESSMENT DATA COLLECTION, ENTRY, AND REPORTING,** Offices of the Vice President for Instruction, Institutional Research and Assessment, and Enrollment Management, Oglala Lakota College, Kyle, South Dakota.

STRATEGIC PLANNING, Offices of the Vice President for Instruction, Institutional Research and Assessment, and Enrollment Management, Oglala Lakota College, Kyle, South Dakota.

INSTITUTIONAL EFFECTIVENESS AND ASSESSMENT PLANS, Offices of the Vice President for Instruction, Institutional Research and Assessment, and Enrollment Management, Oglala Lakota College, Kyle, South Dakota.

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PROGRAM LEARNING OUTCOMES & RUBRIC DEVELOPMENT (Instructors: J. Pease, G. Gagnon, & D. Frank), Institutional Research and Assessment, Oglala Lakota College, Kyle, South Dakota.

HIGHER LEARNING COMMISSION LIAISON VISIT (Presenter: A. Sweeney), Higher Learning Commission of the North Central Association of Colleges and Schools, Chicago, Illinois.

SUPERVISOR AND LEADERSHIP TRAINING (Facilitator: G. Kitsopoulos), Offices of the Vice President for Instruction, Institutional Research and Assessment, and Enrollment Management, Oglala Lakota College, Kyle, South Dakota.

2015 **CULTURAL RESOURCE PROTECTION, NAGPRA, AND HISTORIC PRESERVATION TRAINING:** ***"Protecting Our Identity in the Land,"*** Oglala Sioux Tribe Cultural Affairs & Historical Preservation Office, Prairie Wind Casino, Pine Ridge Reservation.

INVITED PUBLIC LECTURES

1994 ***"Mapping vertebrate fossil resources in northwestern Nebraska"*** Stout Lecture Series, Department of Geology, University of Nebraska-Lincoln, Lincoln, Nebraska.

1996 ***"The geology of Nebraska north of the Pine Ridge"*** CHAUTAUQUA '96, Chadron/ Dawes County Chamber of Commerce, Chadron, Nebraska.

1999 ***"New stratigraphic classification of the 'basal Chadron Formation' of northwestern Nebraska"*** Crawford Rock Club Annual Rock & Fossil Swap, Crawford, Nebraska.

2002 ***"Late Cretaceous and early Tertiary stratigraphy of the French Creek agate locality near Fairburn, South Dakota"*** **(with L. A. LaGarry)** 54th Annual Lincoln Gem & Mineral Show, Lincoln, Nebraska.

2003 ***"Diet and behavior in fossil carnivores"*** Friends of the Prehistoric Prairies Discovery Center Annual Meeting, Crawford, Nebraska.

2004 ***"Recent advances in the Tertiary stratigraphy of Nebraska"*** Water Center Seminar Series, School of Natural Resources, University of Nebraska-Lincoln, Lincoln, Nebraska.

"Tracks and trails from the Tertiary of Nebraska" **(with W. B. Wells)** Nebraska Geological Society, Omaha, Nebraska.

2005 ***"Recent research at Agate Fossil Beds National Monument"*** 40th Anniversary Celebration Program, Agate Fossil Beds National Monument, Nebraska.

2006 ***"Geological survey (1996-2006) in northwestern Nebraska"*** 2nd Annual Earth Day Celebration, Chadron State College, Chadron, Nebraska.

2008 ***"Introduction and agenda - Our Water, Our Future: A Hard Look at the Dry Facts"*** Town Hall Meeting, Chadron State College Student Center Ballroom, Chadron, Nebraska.

"Geology and groundwater resources of northwestern Nebraska and southwestern South Dakota" **(with L. A. LaGarry)** Oglala Sioux Tribe Natural Resources Regulatory Agency meeting, Pine Ridge, South Dakota.

"Oglala Lakota College's potential role in managing the vertebrate fossil resources of the Pine Ridge Reservation" Oglala Sioux Parks & Recreation Authority public information meetings in Red Shirt and Kyle, South Dakota.

2009 ***"Uranium and uranium mining in southwestern South Dakota"*** DNERS Colloquium, Department of Nuclear Engineering and Radiological Sciences, University of Michigan-Ann Arbor, Ann Arbor, Michigan.

"The local uranium mining scene" Western Mining Action Network Annual Meeting (Defenders of the Black Hills), Rapid City, South Dakota.

2012 ***"Uranium and groundwater on the Pine Ridge Reservation"*** American Indian Science and Engineering Society, Black Hills State University, Spearfish, South Dakota.

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2013 ***"Uranium mining in western South Dakota"*** Dakota Rural Action Network Teach-in 2, Spearfish, South Dakota.

2014 ***"Recent advances in environmental science research at Oglala Lakota College"*** American Indian Awareness Week Speaker Series, Black Hills State University Native American Awareness Week, Spearfish, South Dakota.

2016 ***"The Crow Butte in situ leach uranium mine: environmental implications"*** **(with Patrisse Vasek and Jordon Cano)** Special Presentation, Department of Nuclear Engineering and Radiological Sciences/Consortium for Verification Technology/Health Physics Society Student Branch, University of Michigan-Ann Arbor, Ann Arbor, Michigan.

"Undergraduate research on radiation and radionuclides at Oglala Lakota College from 2008-2016" DNERS Colloquium, Department of Nuclear Engineering and Radiological Sciences/Consortium for Verification Technology, University of Michigan-Ann Arbor, Ann Arbor, Michigan.

PERMITS & AUTHORIZATIONS

1990 **SPECIAL-USE PERMIT (3 years, User Number 2033)** Nebraska National Forest, Chadron, Nebraska. Permission to excavate federally owned and protected vertebrate fossils from the Oglala National Grassland during dissertation fieldwork and paleontological resource inventories.

1991-1995 **ARCHEOLOGICAL SITE EVALUATION CLEARANCE** Nebraska National Forest, Chadron, Nebraska. Clearance to assess potential archeological sites during dissertation fieldwork and paleontological resource inventories of the Oglala National Grassland.

1993 **SPECIAL-USE PERMIT RENEWAL (User Number 2033-4)** Nebraska National Forest, Chadron, Nebraska. Permission to excavate federally owned and protected vertebrate fossils from the Oglala National Grassland during dissertation fieldwork and paleontological resource inventories.

1994-1995 **SPECIAL-USE PERMIT (3 years, User Number 2033-4)** Nebraska National Forest, Chadron, Nebraska. Permission to excavate federally owned and protected vertebrate fossils from the Oglala National Grassland during dissertation fieldwork and paleontological resource inventories.

1998-2000 **ARCHEOLOGICAL SITE EVALUATION CLEARANCE** Nebraska National Forest, Chadron, Nebraska. Clearance to assess potential archeological sites during STATEMAP fieldwork in the Pine Ridge Ranger District, Dawes County, Nebraska.

1998-2000 **SPECIAL-USE PERMIT (3 years, User Number 2033-4)** Nebraska National Forest, Chadron, Nebraska. Permission to excavate federally owned and protected vertebrate fossils from the Pine Ridge Ranger District, Dawes County, Nebraska, during STATEMAP fieldwork.

1998-2000 **SPECIAL-USE PERMIT (3 years, User Number 2033-4)** Nebraska National Forest, Chadron, Nebraska. Permission to trench covered or weathered exposures and collect rock and volcanic ash samples from the Pine Ridge Ranger District, Dawes County, Nebraska, during STATEMAP fieldwork.

MISCELLANEOUS

DOCUMENTARY FILM APPEARANCES

2015 **CRYING EARTH RISE UP! (science documentary: 57 min.)** Suree Towfignia, Producer. Prairies Dust Films **(with D. White Plume, E. Yellow Thunder, T. Cardinal, & others).** www.cryingearthriseup.com/

2016 **HOT WATER: The Uranium Industry's Dirty Little Secret (science documentary: 80 mins.)** Lizabeth Rogers and Elizabeth Kucinich, Producers. Rogers Entertainment Group/Indican Pictures **(with C. White Face, H. Caldicott, A. Gunderson, K. Kearfott, J. Stone, & D. Kucinich).** www.zero**hotwater**.com/

TELEVISION APPEARANCES

1996 **RESTLESS PRAIRIE (science documentary: 60 min.)** Joe Turco, Producer. Science, Outreach, & Specials Unit, University of Nebraska-Lincoln Television. Broadcast on Nebraska Educational Television (NETV) Network. *12 min segment: Toadstool Park Trackway site and Fossil Conservation on the Oglala National Grassland* **(with W. B. Wells & D. A. Nixon).**

RADIO APPEARANCES

2008 **SOUND OFF (KCSR Radio, Chadron, Nebraska: 30 min.)** *"Our Water, Our Future: A Hard Look at the Dry Facts"* (with Mr. Glen Price, landowner).

COMMUNITY FOCUS (KCSR Radio, Chadron, Nebraska: 15 min.) *"Our Water, Our Future: A Hard Look at the Dry Facts"*

2011 ***"Company wants to expand uranium mine in Nebraska panhandle"*** **(NET Radio, Lincoln, Nebraska: 2 min.)** Featured program discussing benefits and concerns regarding ISL uranium mining in northwestern Nebraska http://www.netnebraska.org/article/news/company-wants-expand-uranium-mine-nebraska-panhandle

FIELD HANDBOOK DATA SHEETS

1998 Schoeneberger, P. J., D. A. Wysocki, E. C. Benham, & **H. E. LaGarry.** ***Miscellaneous,*** pp. 7-1 to 7-14 *in* (P. J. Schoeneberger, D. A. Wysocki, E. C. Benham, & W. D. Broderson, compilers) *Field Book for Describing and Sampling Soils (Ver. 1.1).* USDA Natural Resources Conservation Service, National Soil Survey Center, Lincoln NE.

2002 Schoeneberger, P. J., D. A. Wysocki, E. C. Benham, & **H. E. LaGarry.** ***Miscellaneous,*** pp. 7-1 to 7-14 *in* (P. J. Schoeneberger, D. A. Wysocki, E. C. Benham, & W. D. Broderson, compilers) *Field Book for Describing and Sampling Soils (Ver. 2.1).* USDA Natural Resources Conservation Service, National Soil Survey Center, Lincoln NE.

ILLUSTRATION CREDITS

1985 ***"Artist's conception of a middle Ordovician life scene during Trenton (limestone) time. The orthocone cephalopod is similar to those found at the Clairmont Quarry."*** p. 297 *in* Van Diver, B. B. 1985. *Roadside Geology of New York.* Missoula, Montana, Mountain Press Publishing Company.

1996 ***"USGS quadrangles (solid lines) examined in the CSD open-file report by LaGarry and LaGarry, adjacent quadrangles also mapped, and federal lands of the Oglala National Grassland."*** p. 35 *in* Flowerday, C. A. 1996. *Fossil inventories yield geologic mapping, revision of the White River Group.* Resource Notes, 10:33-35.

PHOTOGRAPH CREDITS

1988 ***"Below: Each biological specimen found during the excavation was isolated from the majority of the surrounding sediment and was subsequently wrapped for removal to the laboratory. A portion of the pelvis of the stag-moose is seen in the center of the photo, and spruce logs in the foreground,"*** p. 41 *in* Warren, R. E. & R. W. Graham. 1988. Cervalces*: an Ice Age discovery.* The Living Museum, 50(3):38-41.

1996 ***"A field party made up of CSD, UNL Geology, and UN State Museum geologists examine the Chamberlain Pass Formation near Toadstool Park in northern Sioux County. Observers are (from left) Leigh Anne LaGarry, CSD; Dennis Terry, UNL Geology; Dave Loope, UNL Geology; Dave Nixon, UN State Museum; Brant Wells, UNL Geology; and Jim Swinehart, CSD."*** p. 33 *in* Flowerday, C. A. 1996. *Fossil inventories yield geologic mapping, revision of the White River Group.* Resource Notes, 10:33-35.

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2004 ***"The petrocalcic field tour led by SNR geoscientist Hannan LaGarry stops to look at the Box Butte Formation on the highway south of Marsland in the upper Niobrara River valley. Co-leader and former SNR soil scientist Phil Young (far right, crouching) talks to the group, which includes scientists from various Great Plains offices of the U. S. Natural Resources Conservation Service and from the NRCS National Soil Survey Center in Lincoln. SNR soil scientist Francis Belohlavy sits in the cab of the white pickup."*** p. 6 *in* Flowerday, C. A. 2004. SNR tour helps federal scientists solve soil classification riddle, saves money. Natural Resource Links, 4(4):1-12.

"An example of a calcic, not a petrocalcic, horizon near Marsland. White concretions show carbonate buildup. Marks on tape measure are every 10 centimeters." p. 6 *in* Flowerday, C. A. 2004. SNR tour helps federal scientists soil classification riddle, saves money. Natural Resource Links, 4(4):1-12.

BOOK COVERS

1998 ***"Fine-grained volcaniclastic rocks of the White River Group initially studied by N. H. Darton (1899) at the Pine Ridge escarpment in northwestern Nebraska."*** Terry, D. O., Jr., H. E. LaGarry, & R. M. Hunt, Jr. (eds.). 1998. Depositional Environments, Lithostratigraphy, and Biostratigraphy of the White River and Arikaree Groups (Late Eocene to Early Miocene, North America). Geological Society of America Special Paper 325, 216 pp.

NEWSPAPER ARTICLES

2006 ***"Earth Day celebration to focus on water in the High Plains"*** **(with L. A. LaGarry)** p. 4A *in* The Chadron Record, Wednesday, April 12, 2006 (www.thechadronnews.com).

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BIBLIOGRAPHY

BOOKS AND MONOGRAPHS

1998 Terry, D. O. Jr., **H. E. LaGarry,** & R. M. Hunt, Jr. (eds.). ***Depositional environments, lithostratigraphy, and biostratigraphy of the White River and Arikaree Groups (Late Eocene to Early Miocene, North America).*** Geological Society of America Special Paper 325, 216 p.

2004 **LaGarry, H. E.** ***Taphonomic evidence of bone processing from the Oligocene of northwestern Nebraska***. University of Nebraska-Lincoln School of Natural Resources Professional Paper 2, 35 p.

INVITED BOOK CHAPTERS

1998 Terry, D. O., Jr. & **H. E. LaGarry.** ***The Big Cottonwood Creek Member: a new member of the Chadron Formation of northwestern Nebraska,*** pp. 117-142 *in* (D. O. Terry, Jr., H. E. LaGarry, & R. M. Hunt, Jr., eds.) Depositional environments, lithostratigraphy, and biostratigraphy of the White River and Arikaree Groups (Late Eocene to Early Miocene, North America). Geological Society of America Special Paper 325, 216 p.

LaGarry, H. E. ***Lithostratigraphic revision and redescription of the Brule Formation (White River Group), northwestern Nebraska,*** pp. 63-92 *in* (D. O. Terry, Jr., H. E. LaGarry, & R. M. Hunt, Jr., eds.) Depositional environments, lithostratigraphy, and biostratigraphy of the White River and Arikaree Groups (Late Eocene to Early Miocene, North America). Geological Society of America Special Paper 325, 216 p.

2000 Wysocki, D. A., P. J. Schoeneberger, & **H. E. LaGarry.** ***Geomorphology of soil landscapes,*** pp. E5-E39 *in* (M. E. Sumner, editor-in-chief) Handbook of Soil Sciences: Properties and Processes. Chemical Rubber Company Press, New York, New York.

2008 **LaGarry, H. E.** ***Taphonomic evidence of predation and scavenging from the Minium Quarry Local Biota (late Miocene) of north-central Kansas, USA,*** pp. 61-76 *in* (G. H. Farley & J. R. Choate, eds.) Unlocking the Unknown: Papers Honoring Dr. Richard J. Zakrzewski. Fort Hays Studies Special Issue 2, 153 p.

2011 Wysocki, D.A., P.J. Schoeneberger, D.R. Hirmas, & **H.E. LaGarry.** ***Geomorphology of soil landscapes,*** pp. 29.1-29.26 *in* (P.M. Huang, Y. Li, and M.E. Sumner, eds.) Handbook of Soil Sciences: Properties and Processes (2nd edition). Chemical Rubber Company Press, Boca Raton, Florida.

2016 Benning, J., **H. LaGarry**, & C. J. Tinant. ***Joining forces with unexpected PEEC-enhancing projects along the way: Unforeseen alliances in South Dakota***, pp. 186-190 *in* (S.R. Burckhard and J. M. Kant, eds.) The PEEC Experiment: Native Hawaiian and Native American Engineering Education. The Jerome J. Lohr College of Engineering, South Dakota State University, Brookings SD, 298 pp.

LaGarry, H. ***Discovering what works: STEM pedagogy and curriculum development for Native Americans***, pp. 46-53 *in* (S.R. Burckhard and J. M. Kant, eds.) The PEEC Experiment: Native Hawaiian and Native American Engineering Education. The Jerome J. Lohr College of Engineering, South Dakota State University, Brookings SD, 298 pp.

Padmanabhan, G., **H. LaGarry**, C. Davis, F. McCoy, L. Azure, M. Hoffman, & C. J. Tinant. ***Establishing who leads: Hawaiian-serving community colleges or tribal colleges as leaders***, pp. 88-112 *in* (S.R. Burckhard and J. M. Kant, eds.) The PEEC

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Experiment: Native Hawaiian and Native American Engineering Education. The Jerome J. Lohr College of Engineering, South Dakota State University, Brookings SD, 298 pp.

Padmanabhan, G., **H. LaGarry**, R. Franco, L. Azure, L. Alfson, & C. Davis. ***Assembling interconnected networks for advancement in engineering: Champions and community***, pp. 120-140 *in* (S.R. Burckhard and J. M. Kant, eds.) The PEEC Experiment: Native Hawaiian and Native American Engineering Education. The Jerome J. Lohr College of Engineering, South Dakota State University, Brookings SD, 298 pp.

Pieri, R., H. Aldridge, M. Brave, **H. LaGarry**, G. Padmanabhan, & L. Azure. ***Outreaching to K-12 and tribal schools in PEEC***, pp. 78-86 *in* (S.R. Burckhard and J. M. Kant, eds.) The PEEC Experiment: Native Hawaiian and Native American Engineering Education. The Jerome J. Lohr College of Engineering, South Dakota State University, Brookings SD, 298 pp.

PEER-REVIEWED JOURNAL PAPERS

1990 Thomasson, J. R., R. J. Zakrzewski, **H. E. LaGarry,** & D. E. Mergen. ***A late Miocene (Late Early Hemphillian) biota from northwestern Kansas.*** National Geographic Research, 6(2):231-244.

1993 **LaGarry, H. E.** & M. R. Myers. ***Mortality profiles of* Mammuthus imperator *(Leidy), Sheridan County, Nebraska.*** Transactions of the Kansas Academy of Science, 96(3-4):196-203.

2005 Wysocki, D. A., P. J. Schoeneberger, & **H. E. LaGarry.** ***Soil surveys: a window to the subsurface.*** Geoderma 126:167-180.

2007 Fielding, C. R., **H. E. LaGarry,** L. A. LaGarry, B. E. Bailey, & J. B. Swinehart. ***Sedimentology of the Whiteclay gravel beds in northwestern Nebraska, USA: structurally controlled drainage promoted by early Miocene uplift of the Black Hills Dome.*** Sedimentary Geology 202:58-71.

GEOLOGIC MAPS

2008 Diffendal, R. F., M. R. Voorhies, E. J. Voorhies, **H. E. LaGarry,** C. L. Timperley, & M. E. Perkins. ***Geologic Map of the O'Neill 1° x 2° Quadrangle, Nebraska, with Configuration Maps of Surfaces of Formations (1:250,000).*** University of Nebraska-Lincoln School of Natural Resources (Conservation & Survey Division) map GMC-34 (25" x 36" map w/ 29 p. explanation booklet and accompanying digital versions on CD ROM).

CONFERENCE PROCEEDINGS

1994 **LaGarry, H. E.** ***Results & recommendations of the 1991 paleontological resource survey of the Oglala National Grassland,*** pp. 69-72 *in* (R. Benton & A. Elder, eds.) Proceedings of the 3rd Conference on Fossil Resources. Natural Resources Report NPS/NRFOBU/NRR-94-14, 98 p.

1997 **LaGarry, H. E.** ***Paleontological resource inventories of the Oglala National Grassland: a model for generating paleontological and geological research on public lands,*** pp. 108-113 *in* (M. Johnson & J. McChristal, eds.) Proceedings of the 4th Conference on Fossil Resources. Natural Resources Report NPS/NRFLFO/NRR-97/01, 239 p.

1998 **LaGarry, H. E.,** W. B. Wells, D. O. Terry, Jr., & D. A. Nixon. ***The Toadstool Park Trackway Site, Oglala National Grassland, Nebraska,*** pp. 92-107 *in* (J. Martin & R. Benton, eds.) Proceedings of the 5th Conference on Fossil Resources. Dakoterra 5, 143 p.

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2011 Catches Enemy, M., W. Mesteth, & **H. E. LaGarry.** ***Paleontological Resource Management and the Oglala Sioux Tribe's Historic Preservation Office,*** pp. 40-42 *in* (T. Olstad & A. K. Aase, eds.) Proceedings of the 9th Conference on Fossil Resources. Brigham Young University Geology Studies 49(A).

2014 Tinant, C. J., J. M. Kant, **H. E. LaGarry**, J. J. Sanovia, and S. R. Burckhard. ***Building Trust, Experiential Learning, and the Importance of Sovereignty: Capacity Building in Pre-Engineering Education – a Tribal College Perspective.*** Proceedings of the 2014 ASEE North Midwest Section Conference, 17 p.

FIELD GUIDES

1995 Terry, D. O., Jr., **H. E. LaGarry,** & W. B. Wells. ***The White River Group revisited: vertebrate trackways, ecosystems, and lithostratigraphic revision, redefinition, and redescription,*** pp. 43-57 *in* (C. Flowerday, ed.) Geologic field trips in Nebraska and adjacent parts of Kansas and South Dakota. University of Nebraska-Lincoln Conservation and Survey Division Guidebook 10, 136 p.

1997 **LaGarry, H. E.** & D. O. Terry, Jr. ***Regional distribution of lithotopes within the Chadron Formation of northwestern Nebraska,*** pp. 9-22 *in* (R. Hunter, ed.) Geology and paleontology of the White River Formation. Tate Geological Museum Guidebook 2, 139 p.

ABSTRACTS

1987 **LaGarry, H. E.** ***Camelidae (Mammalia: Artiodactyla) from the Minium Quarry local biota (Early Hemphillian), Graham County, Kansas.*** Kansas Academy of Science Abstracts, 6:29.

1988 **LaGarry, H. E.** ***Notes on the taphonomy of the Early Hemphillian-aged Minium Quarry local biota, Graham County, Kansas.*** Kansas Academy of Science Abstracts, 7:22.

1989 **LaGarry, H. E.,** C. E. Rudnick, & J. I. Kirkland. ***Biostratinomy, paleoecology, and storm wave disturbance in the Pennsylvanian-aged "Haynies limestone" bed (Deer Creek Fm.) of Cass County, Nebraska.*** Proceedings of the 99th Annual Meeting of the Nebraska Academy of Sciences, pp. 58-59.

Bailey, B. E., C. L. Herbel, **H. E. LaGarry,** C. E. Rudnick, & M. R. Voorhies. ***Population dynamics of Pleistocene* Equus *from the "Equus beds:" age profiles of fossil horse dentitions from Gordon Quarry, Late Irvingtonian, Sheridan County, Nebraska.*** Proceedings of the 99th Annual Meeting of the Nebraska Academy of Sciences, p. 49.

1990 **LaGarry, H. E.** & C. Wellstead. ***New Permian vertebrate localities in the Eskridge Fm., Richardson County, Nebraska.*** Proceedings of the 100th Annual Meeting of the Nebraska Academy of Sciences, pp. 61.

Myers, M. R. & **H. E. LaGarry.** ***Mortality profiles of Mammuthus imperator (Leidy) from the Rushville and Gordon Quarries (Irvingtonian) of Sheridan County, Nebraska.*** Proceedings of the 103rd Annual Meeting of the Nebraska Academy of Sciences, pp. 61-62.

1991 **LaGarry, H. E.** ***Carnivore-induced bone modification patterns in large ungulates of the Minium Quarry local biota (Late Miocene) of north-central Kansas.*** Kansas Academy of Science Abstracts, 10:16.

LaGarry, H. E. ***Taphonomic evidence of predation and scavenging in the Minium Quarry local biota (Early Hemphillian) of northwestern Kansas.*** Journal of Vertebrate Paleontology-Abstracts, 11(3):41A.

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LaGarry, H. E. ***Stratigraphy and sedimentology of the upper Trenton Group (Middle Ordovician), Kellogg Hill, New York.*** Proceedings of the 101st Annual Meeting of the Nebraska Academy of Sciences, pp. 58-59.

LaGarry, H. E. ***Community paleoecology and biofacies analysis of the upper Trenton Group (Middle Ordovician), Kellogg Hill, New York.*** Proceedings of the 101st Annual Meeting of the Nebraska Academy of Sciences, p. 59.

1992 **LaGarry, H. E.** ***1991 paleontological resource survey of the Oglala National Grassland (Roundtop 7.5' Quadrangle), Sioux County, Nebraska.*** Kansas Academy of Science Abstracts, 11:22.

LaGarry, H. E., C. E. Rudnick, D. W. Moser, & S. L. Holmes. ***Taphonomy of the Haynies limestone bed (Pennsylvanian), a compound distal tempestite from southeastern Nebraska.*** Geological Society of America Abstracts with Programs, 24(4):7.

LaGarry, H. E. ***Cladistic reanalysis of the Camelidae (Mammalia: Tylopoda).*** Proceedings of the 102nd Annual Meeting of the Nebraska Academy of Sciences, pp. 68-69.

LaGarry, H. E. ***The impact of unauthorized collecting of vertebrate fossils on the Oglala National Grassland (Roundtop 7.5' Quadrangle), Sioux County, Nebraska.*** Proceedings of the 102nd Annual Meeting of the Nebraska Academy of Sciences, p. 69.

LaGarry, H. E. ***Unauthorized collecting of fossil vertebrates on federal lands in northwest Nebraska: a case study.*** Seventh Annual Meeting of the Society for the Preservation of Natural History Collections Program and Abstracts, p. 17.

1993 Nixon, D. A. & **H. E. LaGarry.** ***Oligocene trackways in the White River Group type section at Toadstool Park, Sioux County, Nebraska.*** Proceedings of the 103rd Annual Meeting of the Nebraska Academy of Sciences, pp. 64-65.

LaGarry, H. E., D. A. Nixon, & W. B. Wells. ***1992 USDA Forest service survey and assessment of Toadstool Park as a sensitive site.*** Proceedings of the 103rd Annual Meeting of the Nebraska Academy of Sciences, pp. 61-62.

Nixon, D. A. & **H. E. LaGarry.** ***New trackway site in the White River Group type section at Toadstool Park, Nebraska; paleoecology of an Oligocene braided stream, riparian woodland, and adjacent grassland.*** Journal of Vertebrate Paleontology – Abstracts, 13(3):51A.

LaGarry, H. E. ***Survey of paleontological resources on U.S. Forest Service lands (Oglala National Grassland) in NW Nebraska.*** Journal of Vertebrate Paleontology-Abstracts, 13(3):45A.

1994 Terry, D. O., Jr. & **H. E. LaGarry.** ***Lithostratigraphic correlation and provisional redefinition of the Eocene-Oligocene White River Group, Nebraska and South Dakota.*** Geological Society of America Abstracts with Programs, 26(7):249.

LaGarry, H. E., D. A. Nixon, W. B. Wells, & B. A. Beasley. ***1993 paleontological resource survey of the Oglala National Grassland, Nebraska.*** Kansas Academy of Science Abstracts, 13:24.

LaGarry, H. E. ***Results and recommendations of the 1991 paleontological resource survey of the Oglala National Grassland,*** p. 25 *in* (R. Benton & A. Elder, eds.) Proceedings of the Third Conference on Fossil Resources in the National Park Service (Natural Resources Report NPS/NRFOBU/NRR-94/14).

1995 **LaGarry, H. E.** ***Provisional revision of lithostratigraphic boundaries of the Brule Formation in northwestern Nebraska.*** Geological Society of America Abstracts with Programs, 27(3):66-67.

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Terry, D. O., Jr. & **H. E. LaGarry.** ***Provisional redescription and redefinition of the upper part of the Chadron Formation in northwestern Nebraska.*** Geological Society of America Abstracts with Programs, 27(3):89.

Wells W. B., D. O. Terry, Jr., & **H. E. LaGarry**. ***Stratigraphic implications of a fluvial origin for the "nodular zones," Brule Formation (Orella Member), northwestern Nebraska.*** Geological Society of America Abstracts with Programs, 27(3):95.

LaGarry, H. E. ***Bone processing behaviors of extinct mammals from the Eocene-Oligocene White River Group of northwestern Nebraska.*** Geological Society of America Abstracts with Programs, 27(3):67.

LaGarry, H. E., W. B. Wells, D. A. Nixon, & B. A. Beasley. ***1994 paleontological resource survey of the Oglala National Grassland, Nebraska.*** Proceedings of the 105th Annual Meeting of the Nebraska Academy of Sciences, pp. 55-56.

LaGarry, H. E. ***Geology of the "Old Floyd Hall Place" (UNSM localities Sx-6 and Sx-7), Sioux County, Nebraska.*** Proceedings of the 105th Annual Meeting of the Nebraska Academy of Sciences, p. 55.

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NEBRASKA GEOLOGICAL SURVEY OPEN-FILE MAPS

Table 1. Open-file (OFM) and open-file digital (OFDM) maps from the Alliance 1:250,000 Quadrangle available from the Nebraska Geological Survey (University of Nebraska-Lincoln Conservation & Survey Division, School of Natural Resources). Digital maps were produced by the Department of Geosciences at Fort Hays State University, supervised by R. Lisichenko, J. Heinrichs, G. Liggett, and K. R Neuhauser. All maps are Nebraska quadrangles except as noted.

Map Name[1]	Date[2]	Map No.[3]	Authors
Sherrill Hills (WY-NE)	1997	53	LaGarry & LaGarry
Story	1997	54	LaGarry & LaGarry
(digital version 1.1)	2001	54D	LaGarry, LaGarry, & Swinehart
Story NE	1997	55	LaGarry & LaGarry
(digital ver. 1.1)	2001	55D	LaGarry, LaGarry, & Swinehart
Lone Tree Ranch	1997	56	LaGarry & LaGarry
(digital ver. 1.1)	2001	56D	LaGarry, LaGarry, & Swinehart
Wayside	1997	57	LaGarry & LaGarry
(digital ver. 1.1)	2001	57D	LaGarry, LaGarry, & Swinehart
Bohemian Creek	1997	58	LaGarry & LaGarry
(digital ver. 1.1)	2001	58D	LaGarry, LaGarry, & Swinehart
Kirtley (WY-NE)	1997	59	LaGarry & LaGarry
Warbonnet Ranch	1997	60	LaGarry & LaGarry
(digital ver. 1.1)	2001	60D	LaGarry, LaGarry, & Swinehart
Bodarc	1997	61	LaGarry & LaGarry
(digital ver. 1.1)	2001	61D	LaGarry, LaGarry, & Swinehart
Five Points	1997	62	LaGarry & LaGarry
(digital ver. 1.1)	2001	62D	LaGarry, LaGarry, & Swinehart
Whitney	1997	63	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2001	63D	LaGarry, LaGarry, & Swinehart
Trunk Butte	1997	64	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2001	64D	LaGarry, LaGarry, & Swinehart
Chadron West	1997	65	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2001	65D	LaGarry, LaGarry, & Swinehart
Crawford	1998	66	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	66D	LaGarry, LaGarry, & Swinehart
Crow Butte	1998	67	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	67D	LaGarry, LaGarry, & Swinehart
Chimney Butte	1998	68	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	68D	LaGarry, LaGarry, & Swinehart
Coffee Mill Butte	1998	69	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	69D	LaGarry, LaGarry, & Swinehart
Dead Mans Creek	1998	70	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	70D	LaGarry, LaGarry, & Swinehart
Belmont	1998	71	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	71D	LaGarry, LaGarry, & Swinehart
Coffee Mill Butte SW	1998	72	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	72D	LaGarry, LaGarry, & Swinehart
Coffee Mill Butte SE	1998	73	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2002	73D	LaGarry, LaGarry, & Swinehart
Van Tassell (WY-NE)	1999	74	LaGarry, LaGarry, & Swinehart

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Table 1 (continued).

Map Name[1]	Date[2]	Map No.[3]	Authors
Harrison West	1999	75	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	75D	LaGarry, LaGarry, & Swinehart
Harrison East	1999	76	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	76D	LaGarry, LaGarry, & Swinehart
Andrews	1999	77	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	77D	LaGarry, LaGarry, & Swinehart
Smiley Canyon	1999	78	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	78D	LaGarry, LaGarry, & Swinehart
Van Tassell SE (WY-NE)	1999	79	LaGarry, LaGarry, & Swinehart
Harrison SW	1999	80	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	80D	LaGarry, LaGarry, & Swinehart
Harrison SW	1999	81	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	81D	LaGarry, LaGarry, & Swinehart
Kyle Creek	1999	82	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	82D	LaGarry, LaGarry, & Swinehart
Glen	1999	83	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2002	83D	LaGarry, LaGarry, & Swinehart
Isinglass Buttes	2000	84	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2003	84D	LaGarry, LaGarry, & Swinehart
Chadron NE	2000	85	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2003	85D	LaGarry, LaGarry, & Swinehart
Chadron East	2000	86	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2003	86D	LaGarry, LaGarry, & Swinehart
Bordeaux	2000	87	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2003	87D	LaGarry, LaGarry, & Swinehart
Kings Canyon/Chadron 3 NW	2000	88	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2003	88D	LaGarry, LaGarry, & Swinehart
Hay Springs Creek/Chadron 3 NE	2000	89	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2003	89D	LaGarry, LaGarry, & Swinehart
Sand Canyon West/Chadron 3 SW	2000	90	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2003	90D	LaGarry, LaGarry, & Swinehart
Sand Canyon East/Chadron 3 SE	2000	91	LaGarry, Swinehart, & LaGarry
Beaver Wall	2001	92	LaGarry, Swinehart, & LaGarry
Whiteclay	2001	93	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2005	93D	LaGarry, LaGarry, & Swinehart
Whiteclay SW	2001	94	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2004	94D	LaGarry, LaGarry, & Swinehart
Whiteclay SE	2001	95	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2005	95D	LaGarry, LaGarry, & Swinehart
Hay Springs	2001	96	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2004	96D	LaGarry, LaGarry, & Swinehart
Hay Springs NE	2001	97	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2005	97D	LaGarry, LaGarry, & Swinehart

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Table 1 (continued).

Map Name[1]	Date[2]	Map No.[3]	Authors
Hay Springs SW	2001	98	LaGarry, Swinehart, & LaGarry
(digital version 1.1)	2004	108D	LaGarry, LaGarry, & Swinehart Hay
Springs SE	2001	99	LaGarry, Swinehart, & LaGarry
Montrose	2001	108	LaGarry & LaGarry
(digital version 1.1)	2001	108D	LaGarry, LaGarry, & Swinehart
Orella	2001	109	LaGarry & LaGarry
(digital version 1.1)	2001	109D	LaGarry, LaGarry, & Swinehart
Wolf Butte	2001	110	LaGarry & LaGarry
(digital version 1.1)	2001	110D	LaGarry, LaGarry, & Swinehart
Roundtop	2001	111	LaGarry, LaGarry, & Swinehart
(digital version 1.1)	2001	111D	LaGarry, LaGarry, & Swinehart
Horn	2001	112	LaGarry & LaGarry
(digital version 1.1)	2001	112D	LaGarry, LaGarry, & Swinehart
Clinton NW	2002	113	LaGarry, Swinehart, & LaGarry
Clinton NE	2002	114	LaGarry, Swinehart, & LaGarry
Clinton SW	2002	115	LaGarry, Swinehart, & LaGarry
Clinton	2002	116	LaGarry, Swinehart, & LaGarry
Rushville SE	2002	117	LaGarry, Swinehart, & LaGarry
Rushville SW	2002	118	LaGarry, Swinehart, & LaGarry
Rushville NE	2002	119	LaGarry, Swinehart, & LaGarry
Rushville	2002	120	LaGarry, Swinehart, & LaGarry
Gordon NW	2003	121	LaGarry, Swinehart, & LaGarry
Hog Island	2003	122	LaGarry, Swinehart, & LaGarry
Gordon	2003	123	LaGarry, Swinehart, & LaGarry
Gordon SE	2003	124	LaGarry, Swinehart, & LaGarry
South of Gordon	2003	125	LaGarry, Swinehart, & LaGarry
Coburn Canyon	2003	126	LaGarry, Swinehart, & LaGarry
Bovee Valley West/Rushville 3 SW	2003	127	LaGarry, Swinehart, & LaGarry
Bovee Valley East/Rushville 3 SE	2003	128	LaGarry, Swinehart, & LaGarry
Whistle Creek NW	2004	129	LaGarry, Swinehart, & LaGarry
Whistle Creek NE	2004	130	LaGarry, Swinehart, & LaGarry
Marsland NW	2004	131	LaGarry, Swinehart, & LaGarry
Marsland	2004	132	LaGarry, Swinehart, & LaGarry
Box Butte Reservoir West	2004	133	LaGarry, Swinehart, & LaGarry
Box Butte Reservoir East	2004	134	LaGarry, Swinehart, & LaGarry
Box Butte NW	2005	137	LaGarry, Swinehart, & LaGarry
Box Butte NE	2005	138	LaGarry, Swinehart, & LaGarry
Skunk Lake NW	2005	139	LaGarry, Swinehart, & LaGarry
Skunk Lake NE	2005	140	LaGarry, Swinehart, & LaGarry
Smith Lake	2005	141	LaGarry, Swinehart, & LaGarry

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Table 1 (continued).

Map Name[1]	Date[2]	Map No.[3]	Authors
Twin Lakes NE	2005	142	LaGarry, Swinehart, & LaGarry
Dolly Warden Lake	2005	143	LaGarry, Swinehart, & LaGarry
Billys Lake	2005	144	LaGarry, Swinehart, & LaGarry

Notes for Table 1:
1. **Where two names are given, the former name is listed first, and the current name second**
2. **Date indicates when map went on open file.**
3. **Numbers were assigned by the Conservation & Survey Division, and "D" denotes a digital version**

Table 2. Open-file (OFM) maps from the O'Neill 1:250,000 Quadrangle available from the Nebraska Geological Survey (University of Nebraska-Lincoln Conservation & Survey Division, School of Natural Resources). All maps are Nebraska quadrangles except as noted.

Map Name	Date	Map No.	Authors
Meadville NW	in review	pending	LaGarry, LaGarry, & Diffendal
Meadville NE	in review	pending	LaGarry, Diffendal, & LaGarry
Springview NW	in review	pending	LaGarry, Diffendal, & LaGarry
Burton	in review	pending	LaGarry, Diffendal, & LaGarry
Mills	in review	pending	LaGarry, Diffendal, & LaGarry
Jamison	in review	pending	LaGarry, Diffendal, & LaGarry
Meadville	in review	pending	LaGarry, Diffendal, & LaGarry
Huddle Table	in review	pending	LaGarry, Diffendal, & LaGarry
Springview	in review	pending	LaGarry, Diffendal, & LaGarry
Springview SE	in review	pending	LaGarry, Diffendal, & LaGarry
Jamison SW	in review	pending	LaGarry, Diffendal, & LaGarry
Mariaville	in review	pending	LaGarry, Diffendal, & LaGarry
Ainsworth NW	in review	pending	LaGarry, Diffendal, & LaGarry
Dutch Creek	in review	pending	LaGarry, Diffendal, & LaGarry
Bassett NW	in review	pending	LaGarry, Diffendal, & LaGarry
Riverview	in review	pending	LaGarry, Diffendal, & LaGarry
Carns	in review	pending	LaGarry, Diffendal, & LaGarry
Newport NE	in review	pending	LaGarry, Diffendal, & LaGarry

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ARCHIVED FIELD NOTES

Table 3. Field notes archived at the Conservation & Survey Division of the University of Nebraska-Lincoln. All compilations are color .jpg files on CDROM. Copies of these notes also reside with the author(s).

Author(s)	Date[1]	Vol.[2]	Pages	Compiler (date)
LaGarry, H. E.	1985-1986	1	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1986-1987	2	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1987-1988	3	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1987-1988	3B	45[3]	R. W. Vasek (2003)
LaGarry, H. E.	1987-1988	4	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1988-1989	5	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1988-1989	6	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1989-1992	7	117[3]	R. W. Vasek (2003)
LaGarry, H. E.	1992-1993	8	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E.	1993-1994	9	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E.	1994-1995	10	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E.	1994-1995	11	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E.	1994-1995	12	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. Armantrout	1994-1995	12B	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1994-1995	13	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1995-1996	14	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1996-1997	15	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1996-1997	16	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1998-1999	17	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1998-1999	18	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1998-1999	18B	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1998-1999	19	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1998-1999	20	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1998-1999	21	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1999-2000	22	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1999-2000	23	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1999-2000	24	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1999-2000	25	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1999-2000	26	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	1999-2000	27	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2000-2001	28	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2000-2001	29	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2000-2001	30	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2000-2001	31	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2000-2001	32	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2000-2001	34	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2001-2002	38	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2001-2002	40	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2001-2002	42	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2001-2002	44	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2002-2003	45	167[3,4]	R. W. Vasek (2003)
LaGarry, H. E. & L. A. LaGarry	2002-2003	46	167[3,4]	R. W. Vasek (2003)

Notes for Table 3:

1. **Includes notes archived for the Nebraska National Forest (1991-1995) and the U. S. Geological Survey STATEMAP Program (1996-2006).**
2. **Volume numbers were assigned by the authors.**
3. **Includes inserts (typically other peoples' published work used as reference material).**
4. **Includes maps (original field maps and compilations of original maps at various scales).**

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