# U.S. EPA Region 8
# GIS Deliverable Guidance

*Region 8 Ecosystems Protection and Remediation*

*Program Support*

*Data Systems Team*

*GIS*

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**Contacts**

| Name | Role/Org | Telephone | Email |
|---|---|---|---|
| John Wieber | GIS Lead | (303) 312-6118 | Wieber.John@epa.gov |
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# Purpose

The purpose of this document is to provide guidance to contractors, grantees, or others who provide GIS deliverables to EPA Region 8 programs, projects, or staff.

# Scope

This document covers the types of GIS deliverables anticipated in Region 8 and how the Region would like to receive these deliverables. Additionally, data standards, formats, and best management practices are identified.

# Responsibilities

The Region 8 GIS team is responsible for maintaining this document and providing it to those parties wishing to provide Region 8 with spatial data or products. It is the responsibility of those providing deliverables to the Region to adhere to the guidance provided in this document to the best of their abilities. The Region 8 GIS team relies on other EPA staff such as grant/contracting officers, RPMs, and inspectors to ensure data are getting submitted for long-term use at EPA.



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## Introduction

This document is intended to specify GIS file delivery formats for all geospatial materials developed in support of GIS related work within EPA Region 8. It is the intent of EPA Region 8 to acquire, catalog and manage all GIS files comprehensively across all projects to:

1) ensure future use and access to EPA,
2) provide an archive of work accomplished,
3) maintain and serve data that spatially represent features pertinent to on-going EPA efforts, and
4) provide a basis for future activities such as CERCLA Five Year Review.

## GIS Formatted Data Files

All final version spatially enabled files acquired or developed to support mapping and/or spatial analysis by a contractor or grantee are considered property of the EPA and are required to be submitted to EPA. Delivery schedules are negotiable, but should be annual at a minimum. This includes but is not limited to all GIS, CAD, and image formatted files used to develop maps for any scoping or decision document developed for EPA, as well as any spatial file used to inform a decision on site management or development. Only final versions of each layer are required for delivery to EPA, and must be in an approved format as specified in this document. In addition, all electronic geospatial data, whether vector or raster, must be projection defined (have a projection defined and embedded in or associated with the data file), and in the case of CAD data must NOT be in page space or a custom site-specific projection. All CAD data must be in known real world coordinate space, ideally conforming to the projection specifications outlined below. Should tabular data be appropriate to connect location information with attribute information, then documentation specifying the primary and foreign keys is required. Should coordinate information be provided in tabular format it should contain at minimum the following fields:

**ID** – a unique identifier given to each feature
**Latitude** – the Y coordinate in decimal degrees, 6 significant digits
**Longitude** – the X coordinate in decimal degrees, 6 significant digits
**Horizontal Datum** – the datum of the coordinates.

Additionally all static maps that appear in an EPA document should be in an electronic Adobe PDF format with fonts embedded and at a resolution of 300 dots per inch (dpi) or greater. Finally, any dynamic maps used in final map production, such as ESRI ArcMap documents (.mxd), may also required for delivery to EPA with accompanying data in a stand-alone directory structure. Such documents are recommended to be provided as ESRI map packages (.mpk).



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## Projection Requirements

All GIS files submitted to EPA must have spatial reference information that describes the projection, datum, and where applicable the collection methods. The EPA requests that all vector data be submitted in geographic coordinate system, decimal degree units, and NAD83 datum, as is required under the EPA National Geospatial Data Policy, 2008. Raster data, such as aerial photographs may be submitted in their native projection, and maps should be in the appropriate projection/coordinate system for the area depicted. EPA Region 8 GIS staff will be happy to consult and advise on projection, coordinate, and datum details for submission to EPA.

## Metadata Requirements

All GIS files developed for EPA are required by Executive Order 12906 to have associated metadata. EPA requires FGDC compliant metadata on all GIS files developed for site support. Region 8 also requires that all dynamic maps (ArcMap documents) have metadata completed. The Content Standard for Digital Geospatial Metadata can be found at www.fgdc.gov. Metadata, including information about the data's projection, can be developed using one of several built-in or add on tools within a GIS, and typically is associated with the geometry file as an XML file. EPA Region 8 GIS staff will be happy to consult and advise on development of required metadata.

## Organizational Requirements

If the project is complex, a directory structure and readme text file in the upper level directory that describes the structure is required. Because EPA will be managing data across many projects, it is important to make your submittals as understandable as possible. A recommended directory structure is as follows:

**<Project_Name>**

|_ **Docs** (reports, SOPs, correspondence, and other such documents)
|_ **Maps** (MXDs and PDFs. Map names should use the project name as a prefix)
|_ **Rasters** (aerial photos, satellite imagery, logos, DEMs, and other raster type data)
|_ **Source** (original unmodified data that may have been acquired from external/internal sources)
|_ **Tables** (MS-Access databases, spreadsheets, delimited text files, or other such tabular data not stored in a geodatabase)
|_ **Vectors** (geodatabases, shape files, and other approved vector data formats)

File naming conventions should be logical, consistent, and contain no spaces or special characters. An underscore may be used in lieu of a space.



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## Delivery Requirements

EPA will accept data delivered on CD-Rom, DVD, or external hard drive, as well as direct electronic submission via email or FTP site. Other delivery methods may be allowed if those requirements present a significant burden or as technology changes.

## EPA Acceptable Data Formats

The following file formats are considered acceptable and all maps and data must include an associated metadata document:

| DATA |
|---|
| **Vector** - **projected to geographic, decimal degrees, NAD83** |
| File Geodatabase (.gdb) *Preferred<br>Shape File (.shp, .shx, .dbf, .prj, .sbx, .sbn)<br>Personal Geodatabase (.mdb)<br>ESRI Map Package (.mpk) |
| **Raster** – **native projection acceptable** |
| TIFF image with world reference file or as a GeoTIFF (.tif, .tfw)<br>JPEG image with world reference file (.jpg, .jpw)<br>ERDAS Imagine image with pyramid file (.img, .rrd)<br>MrSid image (.sid)<br>ESRI Grid<br>DEM |
| **TINs** – **appropriate projection/coordinate system for the area depicted** |
| ESRI TIN |
| **CAD** - **projected to geographic, decimal degrees, NAD83** |
| DXF layer separates (.dxf) |
| **Tabular** – **primary keys should be clearly identified/documented** |
| MS-Access database (.mdb)<br>MS-Excel spreadsheet (.xlsx)<br>Delimited text file (.txt, .csv) |
| **MAPS** |
| **Static** |
| Adobe PDF at 300 dpi or better with embedded fonts (.pdf) |
| **Dynamic** |
| ESRI Map Package (.mpk) |

| FGDC Compliant METADATA |
|---|
| XML (.xml) |



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