EPA | **INFORMATION DIRECTIVE**
PROCEDURE

Issued by the EPA Geospatial Advisory Committee (EGAC), 9/15/2020

National Geospatial Deliverable Standard

1 **1.   PURPOSE**
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3   This document is intended to establish a uniform method for submitting geospatial data
4   and related products to the US EPA. It provides guidance for contracts, grantees,
5   potentially responsible parties, Agency staff, and any others who provide geospatial data
6   and products to US EPA programs, projects, or staff. The Geospatial Data Act of 2018
7   requires agencies to collect, maintain, disseminate, and preserve geospatial data such
8   that resulting data, information, or products can be shared.
9
10   This document specifies geospatial file delivery formats for all geospatial materials
11   developed in support of geospatial-related work for and within US EPA to ensure locational
12   data consistency and integrity. It is the intent of US EPA to acquire, catalog and manage
13   all geospatial files comprehensively across all projects to:
14   ▪   ensure future use and access by EPA;
15   ▪   provide an archive of work accomplished;
16   ▪   apply appropriate data standards and formats;
17   ▪   maintain and serve data that spatially represent features pertinent to on-going EPA
18   efforts;
19   ▪   provide a geospatially consistent basis for future activities;
20   ▪   facilitate free and open access for the public to geospatial data
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23 **2.   SCOPE**
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25   This document provides guidance on recommended formats and associated
26   documentation for delivering geospatial data and products to the EPA. This document is
27   intended as general guidance, whereas individual project requirements may require
28   modifications or enhancements.
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31 **3.   AUDIENCE**
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33   This document is written for all entities collecting or producing geospatial data and
34   products, either directly or indirectly (e.g. through grants, partnerships, or contracts) on
35   behalf of the EPA and partnering Federal agencies.
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38 **4.   BACKGROUND**
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40   Geospatial data should be created using industry best practices, following EPA National
41   Geospatial Data policy and be properly documented as specified in the national GIS
42   metadata policies. Each geospatial deliverable should minimally adhere to the following:
43   ▪   All data files must be in an approved format as specified in this document.

44   ▪   All geospatial files submitted to EPA must have spatial reference information that
45   describes the projection/coordinate system, datum, and units of measure.
46   ▪   All geospatial files developed for EPA are required by the EPA National Geospatial
47   Data Policy to have associated metadata.
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5. EPA AND NATIONAL AUTHORITY DOCUMENTS

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52   The EPA Geospatial Policies and Standards web page contains updated links to EPA policies
53   and standards. National policies and standards include:
54
55   1) Geospatial Data Act
56   2) Evidence-Based Policymaking Act
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6. RECOMMENDED GEOSPATIAL FORMATTED DATA FILES

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61   Data files must be in an approved format as specified in this document. Please see
62   Attachment A for a list of additional acceptable formats. The following formats are
63   **recommended:**
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Tabular Data

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67   ▪   Microsoft Excel (.xlsx)
68   ▪   Tab or comma-delimited text files (.txt, .csv)
69   ▪   Database files (.accdb)
70   ▪   Extensible Markup Language (.xml)
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Map Deliverable

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74   ▪   Esri ArcGIS Pro Project (.aprx)
75   ▪   Esri ArcMap Map (.mxd)
76   ▪   Map/Project Package (.mpk, .ppkx)
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Vector Geospatial Data

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80   ▪   Esri File Geodatabase (.gdb)
81   ▪   Shapefile (.shp)
82   ▪   GeoJSON
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Raster/Aerial Imagery

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86   ▪   TIFF image with world reference file or as a GeoTIFF (.tif, .tfw)
87   ▪   JPEG image with world reference file (.jpg, .jpw)
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89   Other data formats may be acceptable under specific circumstances. Please check
90   whether the recipient at EPA can accept other data formats.

All electronic geospatial data, whether vector or raster, must have a projection defined and embedded in, or associated with, the data file. In the case of CAD data, the projection must be a commonly used regional or national projection and must NOT be in page space or a custom site-specific projection.

Ancillary tabular data may be appropriate to connect location information with attribute information. If provided, documentation specifying the primary and foreign keys to create the data connection is required. Also, coordinate information provided in tabular format 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

7. MAP DOCUMENTION REQUIREMENTS

Esri ArcMap documents (.mxd) or ArcGIS Pro projects (.aprx) are required for delivery with accompanying data in a stand-alone directory structure. Map formats also need to be configured to use relative paths and not be set to use a printer-specific paper setting. Such documents are recommended to be provided as Esri map/project packages (.mpk, .ppkx). A PDF version of a map should accompany a delivery as a reference document, but they are not considered geospatial data deliverables.

8. PROJECTION REQUIREMENTS

All geospatial and CAD files submitted to EPA must contain spatial reference information describing the projection, datum, and units of measure.
- Vector data is recommended to be submitted in geographic coordinate system, decimal degree units, and WGS84 datum. Other projections may be used if related to web-based applications or as requested for a project.
- 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.

9. METADATA REQUIREMENTS

All geospatial data collected for or produced by federal agencies are required to meet all relevant standards established by the FGDC. EPA requires fully compliant metadata on all GIS files developed for deliverables. The Geospatial Metadata Standards and Guidelines can be found at http://www.fgdc.gov/metadata. Metadata can be developed using one of several built-in or add on tools within a GIS and is typically in the form of an XML file associated with the spatial file. EPA has created the EPA Metadata Editor (EME),

138 which is available for free download and can be used to help create FGDC compliant
139 metadata.
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10. DATA ORGANIZATION RECOMMENDATIONS

144 A directory structure and readme text file in the upper level directory that describes the
145 structure are required. A recommended directory structure is as follows:

147 <PROJECT_NAME>
148   - ReadMe Text File
149   - GIS Data Submission Form (Attachment C)
150 📂 Documents (reports, PDFs, SOPs, correspondence, and other such documents)
151 📂 Imagery (aerial photos, satellite imagery, DEMs, and other raster type data)
152 📂 Maps (.mxd, .aprx,)
153 📂 Geospatial Data (geodatabases, shapefiles, other approved vector data formats)
154 📂 Source (original unmodified data that may have been acquired from
155   external/internal sources)
156 📂 Tables (Microsoft Access databases, spreadsheets, delimited text files, or other
157   such tabular data not stored in a geodatabase)

159 File names must be unique, complete, and interpretable outside of the file structure. File
160 naming conventions should be logical, consistent, and contain no spaces or special
161 characters. The options below are examples of acceptable standards for naming
162 electronic files including GIS, CAD, Global Positioning System (GPS) data, tabular data,
163 digital images, reports, and reference materials.

165 Use the following conventions as guidance:
166   ▪ A ReadMe text file outlines the contents of the deliverable, including a description
167   of each file.
168   ▪ File name shall be succinct and descriptive. (Note: long file and path names of
169   more than 128 characters may not allow backup onto CD's or external hard drives).
170   ▪ Use underscores as delimiters. Do NOT use blank spaces or periods.
171   ▪ Do NOT use special characters in file or folder names (- % ( ) # @ . , * & [ ] / \).
172   ▪ Use the date for document version control. Embed the version date at the end of
173   the file name. Date shall be in yyyymmdd format at the end of the file name
174   preceded by an underscore (e.g., FileName_yyyymmdd.pdf).
175   ▪ For vector data, if file names of different feature types are identical, use a two-letter
176   abbreviation for point (pt), line (ln), and polygon (py).
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11. GENERAL DELIVERY BEST PRACTICES

180 **Submission**
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182 To submit your Geospatial data to EPA, complete the GIS Data Submission form and
183 include it in the main directory of the submission (see section 10). EPA will not accept any
184 data that does not have this form completed and accompanying the submission.

185   Compress all files into a zip file (.zip). The Delivery Checklist (Attachment B) document
186   should be included along with the zip file.
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188   **Data Delivery Methods**
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190   The final submission may be attached to an email sent directly to the EPA responsible
191   party or shared in OneDrive. If the zip file is larger than 15 MB, the EPA responsible party
192   should prepare an external request for a large file transfer using GoAnywhere SecureMail.
193   The size limit for individual files is 10 GB. EPA cannot accept unsecure File Transfer
194   solutions. Digital media (physical disk) should be used if digital transfer is not feasible.
195
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12. **ATTACHMENT A**

EPA Accepted Data Formats
The following file formats are considered acceptable and all maps and data must include associated metadata. If files do not support metadata, please provide relevant information in the readme document included in the data delivery.

DATA
ArcGIS Supported Data Formats
Vector – Projected to geographic, decimal degrees, WGS84

File Geodatabase (.gdb)
    Shapefile (.shp, .shx, .dbf, .prj, .sbx, .sbn)
    GeoPackage (.gpkg)
    GeoJSON
    Personal Geodatabase (.mdb)
    XML Workspace Document with dependencies clearly documented (.xml)
    Google KML (.kml, .kmz)

Raster – Native projection

Esri ArcGIS supported file formats (see full list)
    Examples include:
         TIFF image with world reference file or as a GeoTIFF (.tif, .tfw)
         JPEG image with world reference file (.jpg, .jpw)

CAD – Projected to geographic, decimal degrees, WGS84
AutoCAD Drawing Files (.dwg, .dxf)
Tabular – Primary keys should be clearly identified/documented

Microsoft Excel spreadsheet (.xlsx)
    Tab or comma-delimited text file (.txt, .csv)
    Microsoft Access database (.accdb, .mdb)
    Database file (.dbf)
    Extensible Markup Language (.xml)

MAPS
Static (for reference only)
Adobe PDF at 300 dpi or better with embedded fonts (.pdf)
Dynamic

ArcGIS Pro project (.aprx)
    ArcMap document (.mxd)
    Esri Map/Project Package (.mpk, .ppkx)
    QGIS Project (.qpj)

FGDC COMPLIANT METADATA

XML (.xml)
    SGML (.sgml)
    TXT (.txt)

206 **13.   ATTACHMENT B**

207   **Delivery Checklist**
208   This checklist should be used by the data provider to ensure that the deliverable is
209   complete and meets the guidance in this document.
210   EPA ID:
211   Site Name:
212   Report Name:
213

DATA	Yes	Does Not Apply	Comments
Is each vector file (including CAD) in geographic, decimal degrees, WGS84?	☐	☐	
Is each raster file in its native projection?	☐	☐	
Is each data file in an EPA acceptable format?	☐	☐	
Are data files following the suggested file name structure as outlined in Section 10 above?	☐	☐	
Does each data file have fully compliant metadata?	☐	☐	
Are the primary and foreign keys documented for tabular data?	☐	☐	
Is a ReadMe text file included outlining the contents of the deliverable, including a description of each file?	☐	☐	
MAPS			
Are map names following the suggested file name structure as outlined in Section 10 above?	☐	☐	
Are map documents accompanied with ALL their relevant data in a stand-alone directory structure? If an ArcMap document, relative paths are used.	☐	☐	
If the deliverable contains a PDF, is each static map provided in an electronic format at a resolution of 300 dpi or higher?	☐	☐	

If the deliverable contains a PDF, does each static map have fonts embedded?	☐	☐	

214 **14.** **ATTACHMENT C**

215 **Data Submission Form**

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217 This form must accompany any delivery of geospatial data to the EPA.

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Submission Date	
Submission Title	
Site EPA ID	
Site Name	
Contractor/Data Provider Name	
Contractor/Data Provider Company Name	
Contractor/Data Provider Email	
EPA Project Manager Name	
EPA Project Manager Phone	
EPA Project Manager Email	
Submission File Name	
Submission File Size	
Submission Notes	