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ENTERPRISE DATA WAREHOUSE (EDW)

Metadata User Manual

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OBJECTIVES

1. All Users should have a greater appreciation for EDW and its benefits to the USFS and the public.
2. All Users should have a basic understanding of metadata standards and know how to find detailed information about the dataset.
3. All Users should be able to find public data from Geospatial Data Discovery, Data.gov, and elsewhere.
4. USDA Users should be able to find internal data from the Forest Service ArcGIS Online Organizational Account, the data status list on SharePoint, ArcCatalog, and elsewhere.
5. All Users should be able to use metadata attributes (e.g. extent, accuracy, currency, refresh rate, source, etc.) to determine whether the data is suitable for their purpose.
6. All Users should be able to interpret and use various types of contact information to identify the correct point of contact for a specific question.
7. All Users should be comfortable using XML readers.

1 INTRODUCTION TO EDW

The U.S. Forest Service (USFS) is actively involved in improving its ability to manage and share authoritative agency data. The Enterprise Data Warehouse (EDW) is a USFS repository of geospatial and tabular data that is current (the data is refreshed regularly), trusted (the data is drawn from authoritative data sources, also known as systems of record), and standardized (the data has been approved as a USFS or generally-accepted data standard, e.g., reference datasets for State, County, and Congressional Districts). Data that meets certain criteria may be approved through the EDW Content Governance Board for inclusion in the EDW.

Functionally, the EDW is a technology platform that provides business intelligence tools for integrating data used for analysis and reporting, internal and external map services, and web services that make accessible, standard reference data that is consumed by agency applications. The EDW includes hundreds of datasets spanning dozens of dataset themes, as well as map services for authoritative agency data published and available to the public.

More information and access to EDW data can be found here: https://data.fs.usda.gov/geodata/edw/.

2 EDW PRIORITIES

1. Ensuring that the EDW content meets the priority information needs of agency programs
2. Ensuring that the EDW content includes the core set of data required for data integration to support management decisions
3. Fulfilling performance expectations with EDW tools
4. Meeting the needs of the user community by ensuring that the EDW program has sufficient resources

Link to Enterprise Data Warehouse (EDW) Factsheet: https://data.fs.usda.gov/geodata/edw/docs/EDW_Factsheet-External.pdf?version=2.0

3 HOW TO FIND EDW DATA

Before a dataset becomes part of the EDW, it must be approved by the EDW Content Governance Board (CGB). The EDW CGB may approve a dataset for external publication or for internal use only. For example, some sensitive information may not be appropriate for sharing with the public. The datasets that are part of the EDW are a subset of all the datasets that are created and maintained by the USFS. A major challenge in finding data that are not already part of the EDW is contacting the data stewards directly. This process, however, is outside of the scope of this user manual.

There are various avenues a user can take to find metadata information for EDW datasets. The methods described below are divided into two sections, the first of which describes the methods that can be employed by the public or those with USFS credentials, and the latter describes methods that are for USFS internally facing users only.

3.1 All Users (External and Internal to USFS)

The subsections here provide instructions for accessing EDW data for any user with internet access. This includes the public users and internal USFS users.

3.1.1 USDA FOREST SERVICE GEODATA CLEARINGHOUSE (FSGEODATA)

Link: https://data.fs.usda.gov/geodata/

An online collection of digital data related to forest resources. Includes a search for datasets related to forests and grassland spatial data.

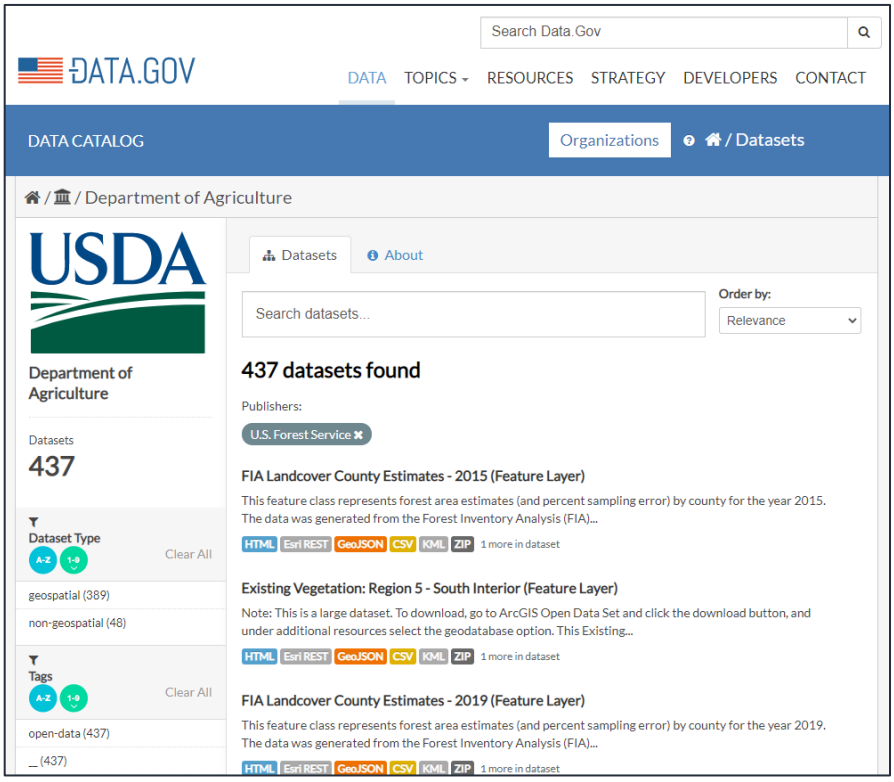
Figure 1: USDA Forest Service Geodata (FSGeodata) Front Page

3.1.2 USFS ON DATA.GOV

Link: https://catalog.data.gov/organization/4ae51f6c-467a-4f9d-b40a-2c52e83c326a?publisher=U.S.+Forest+Service

Figure 2: USFS Data on Data.gov Page

(Pictured on right)



(This link can also be reached by navigating to USDA data on Data.gov - ***Link:*** https://catalog.data.gov/organization/usda-gov - and filtering by publisher: ***U.S. Forest Service.*** Screenshot below)

This online repository holds data from government agencies including the USFS. Several search options are available for locating datasets of interest (e.g. search bar on the top right of the page, dataset search bar in the 'Datasets' tab in the middle of the page, and filtering options on the left). When using this repository, remember that not all datasets published by the USFS are part of the EDW. Check the dataset's metadata to see if it provides any clues. For example, metadata may include 'EDW' as a keyword or a have sentence stating that it is part of the EDW in the description tag's content. If you cannot confirm if a dataset is part of the EDW by examining the metadata, you may need to reach out to the data steward to make the determination.

3.1.3 MAP SERVICES

Link (External/Public): https://data.fs.usda.gov/geodata/edw/datasets.php

Link (USFS Internal): https://apps.fs.usda.gov/arcn/rest/services/EDW

Public data collected and managed by Forest Service programs is available in a map service and two downloadable file formats – in a shape file and an ESRI file geodatabase. Metadata is available that describes the content, source, and currency of the data.

Figure 3: USFS Site Page for Map Services and Data Downloads

3.1.4 USFS ARCGIS ONLINE

Link: https://usfs.maps.arcgis.com/home/index.html

From the website itself: *The USFS uses ArcGIS Online and Open Data to share maps, data, and applications for use by other federal agencies, partners, and the public.* This site provides links to data for viewing and download as well as links to training resources and to the FS Geospatial Data Discovery Tool page described in the next section.

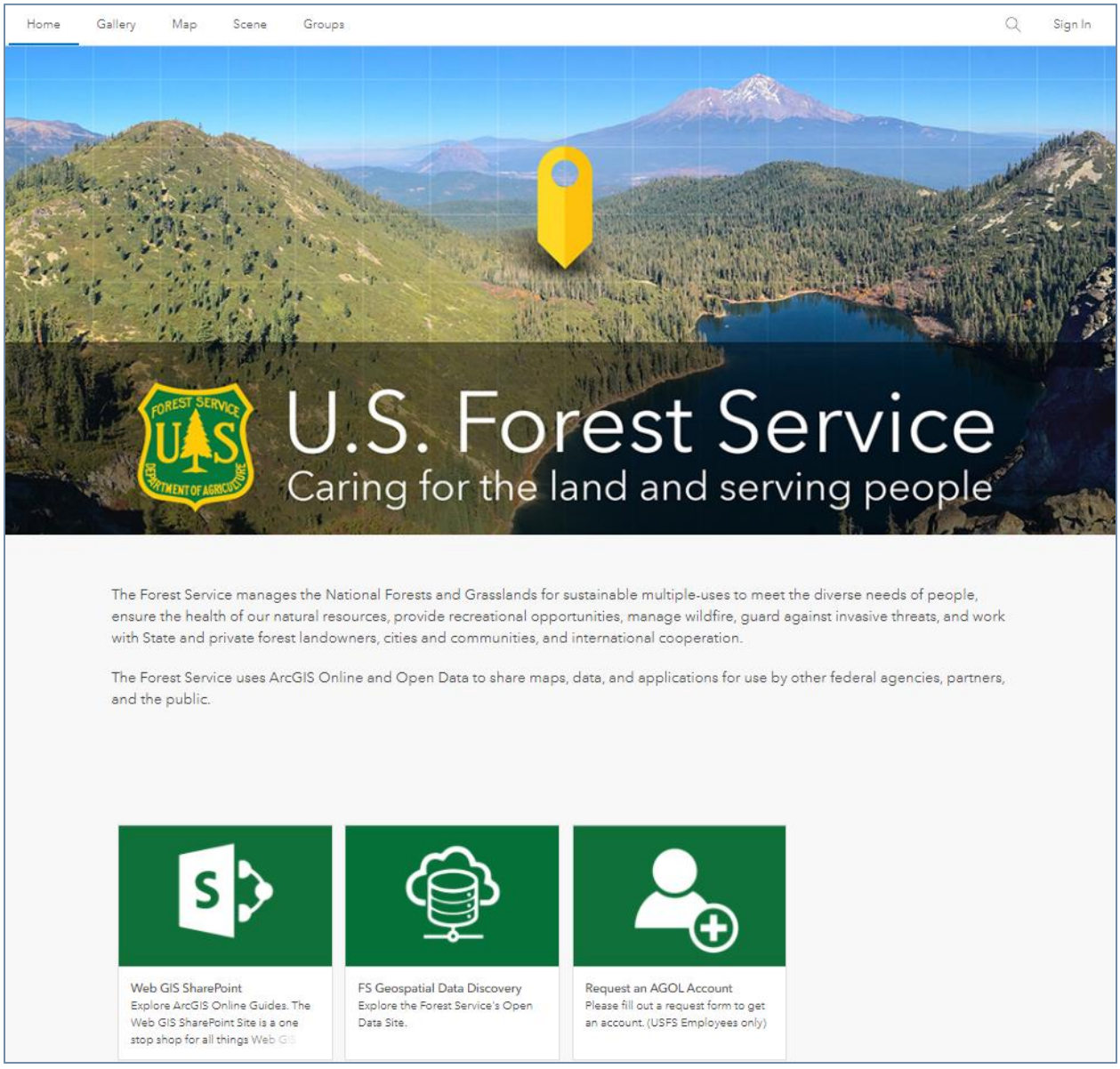


Figure 4: Site Page for USFS ArcGIS Online
By default, when you navigate to the site page for the USFS you will see the 'Home' page.

To view publicly available USFS datasets (and their metadata) using the USFS ArcGIS Online (AGOL) page, navigate to the 'Gallery' tab. You will see it on the menu at the top of the page.

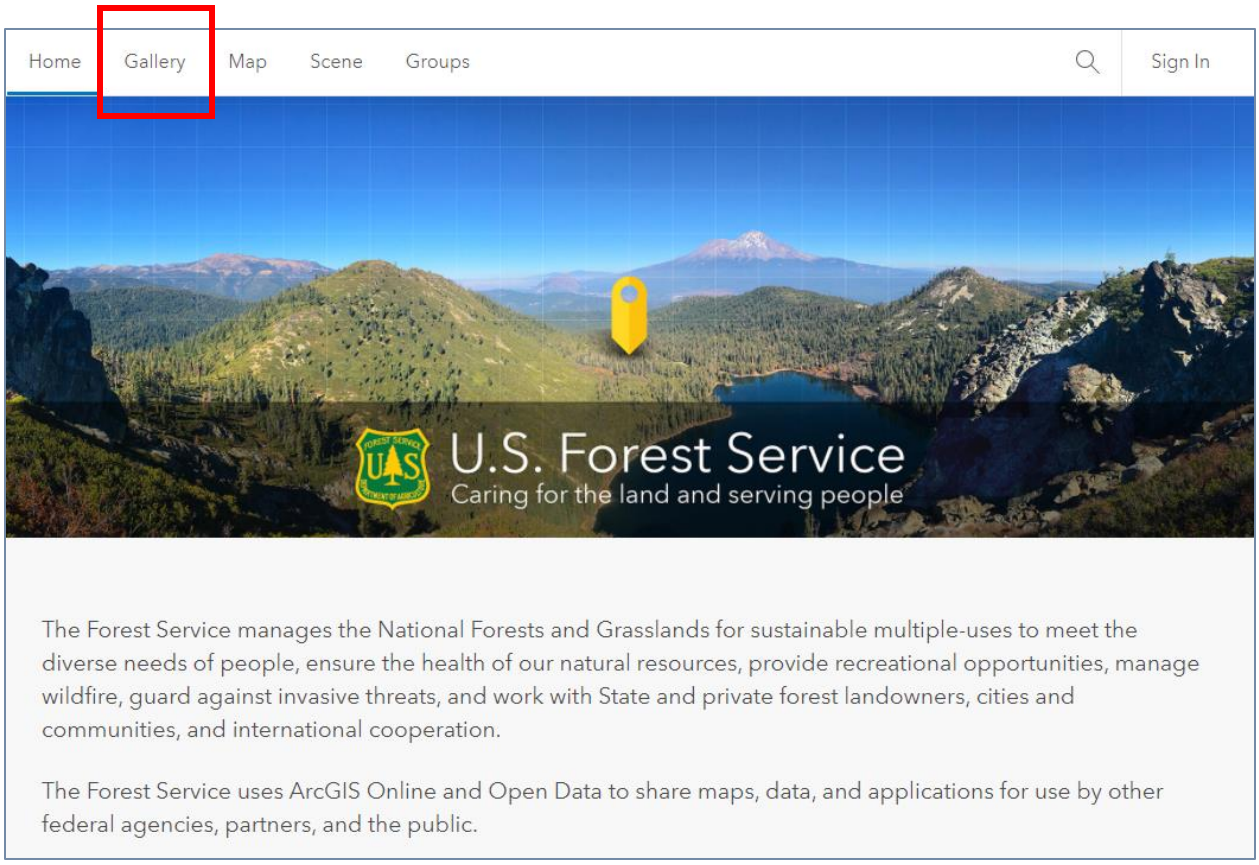


Figure 5: Navigating to Gallery page on USFS ArcGIS Online
The link to the 'Gallery' page on the USFS AGOL site is on the top menu.

On the USFS AGOL 'Gallery' page, you will be presented with a list of publicly available datasets which you can examine. Click on a dataset in the list to view it in the Map Viewer. Click the '…' for other options, such as 'View Item Details' which will present you with metadata information for the dataset. Some datasets may have more options available under the '…'.

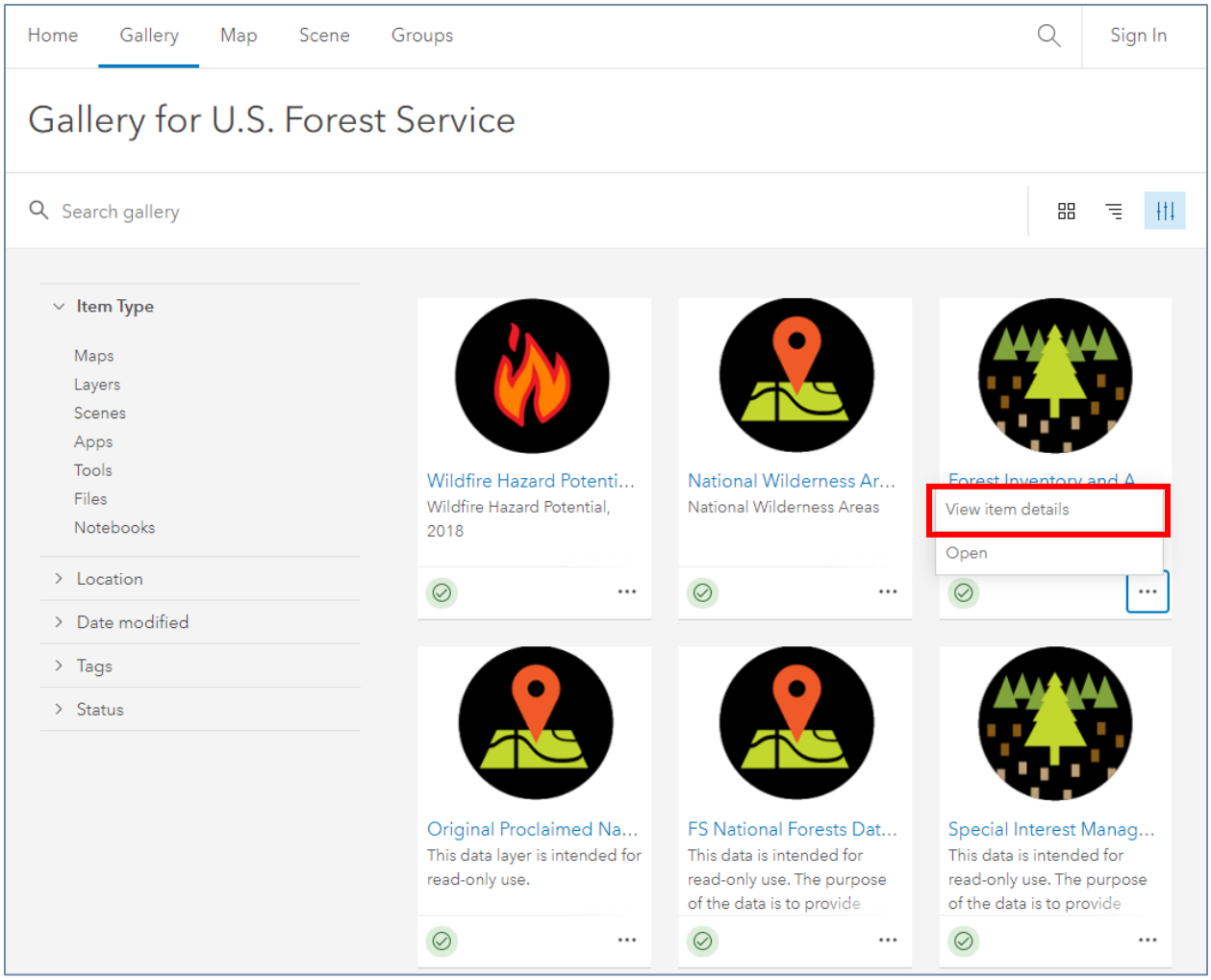


Figure 6: Gallery Page in USFS ArcGIS Online

USFS datasets are listed on this page. For more information on a dataset or to take another action on a dataset, such as downloading, click the '…' and select an option from the popup.

Using the methods described above, the viewer can locate USFS datasets- even those that are not a part of the EDW. In order to find EDW datasets, two methods can be used from the 'Gallery' page.

1. Filter the gallery page using the 'edw' tag.

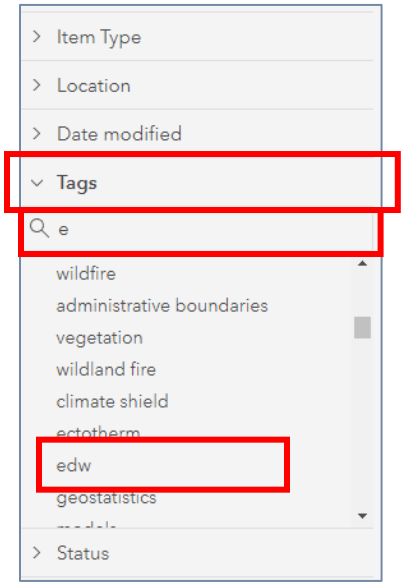


Figure 7: Filter Gallery Page in USFS ArcGIS Online with 'edw' Tag
On the left side of the 'Gallery' page there is a set of drop-down options for filtering the visible datasets. Click the **Tags** option to expand the selection and search for 'edw'. There is a search bar that appears under the **Tags** header that you can use to aid your search. In the example above, 'e' was used to help narrow down the choices.

2. Type 'EDW' in the search bar

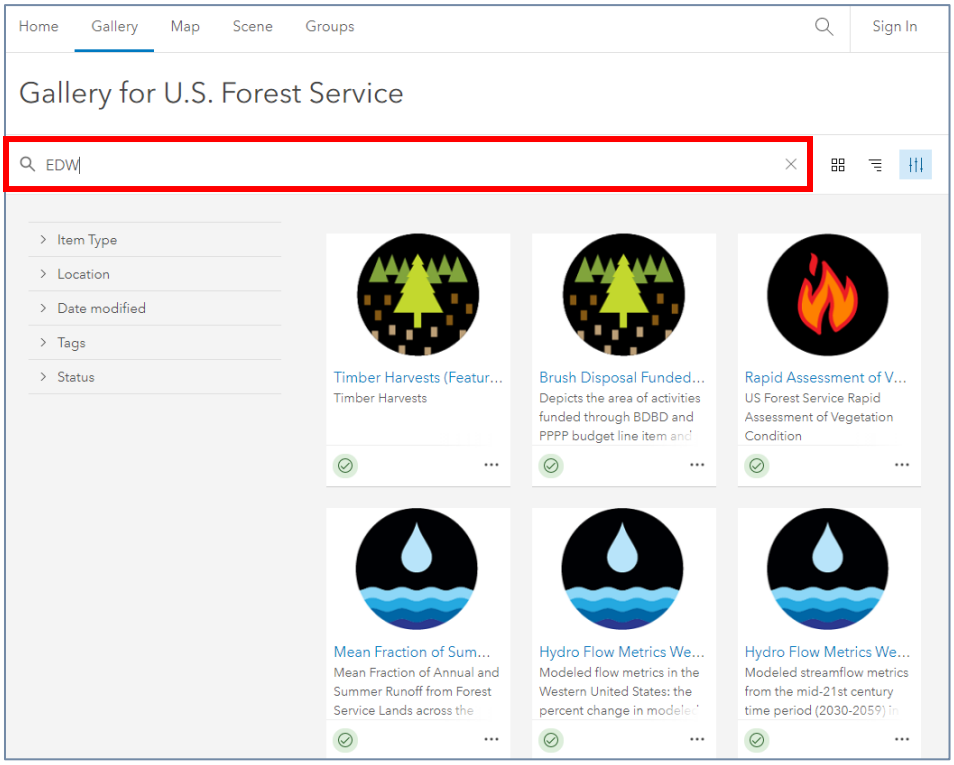


Figure 8: Using the Search Bar on the Gallery Page in USFS ArcGIS Online
USFS datasets can be filtered using the search bar. In this example, 'EDW' was entered into the search bar and the visible datasets refreshed accordingly.

A Note for External vs USFS Internal Users

The USFS AGOL platform will make available only datasets that are approved for external users if the viewer is either not logged into AGOL or is logged into an account that does not have the approved credentials to view internal USFS data. USFS users who do have the credentials to view internal USFS datasets can log into their AGOL account using the 'Sign In' option on the top right of the page, and in doing so they will be able to view both externally and internally facing datasets on the 'Gallery' page.

3.1.5 GEOSPATIAL DATA DISCOVERY TOOL

Link: https://data-usfs.hub.arcgis.com/

This tool can be used to search for and download data within a user specified area of interest, such as a national forest or grassland. Feature layer data can also be filtered. This data repository is only for externally published data, and the EDW datasets that it contains are only a subset of all of the available EDW datasets.

Figure 9: Geospatial Data Discovery Tool Page

The User Guide for the Geospatial Data Discovery Tool is available as a PDF here:

https://data.fs.usda.gov/geodata/includes/docs/Geospatial-Data-Discovery-Download_User-Guide.pdf

3.2 Internal USFS Users Only

The subsections here provide instructions for accessing EDW data using methods that are only available for users that have internal access to USFS accounts and drives.

3.2.1 ARCGIS ENTERPRISE GEODATABASE WITH ARCSDE

EDW data (feature classes, tables, and rasters) are accessible through an ArcSDE connection. Follow the instructions at this link (https://usfs.box.com/s/g7l9bxrlfzahonoeg8nzi0e65b40qnf4) to connect to the Enterprise Data Warehouse from Citrix. If for whatever reason this link does not work, this document can be found in the USFS Box account here: **All Files > DataWarehouse > Operations > StandardOperatingProcedures > Connect to the EDW from Citrix.pdf.**

Once logged in the ArcCatalog, you can set the Metadata Options to view metadata in many different formats.

You can view metadata on the Description tab views in ArcCatalog (see section 4.1.2). The metadata style presented on the Description tab is chosen from the Metadata tab on the **Options** dialog box. The style controls how you view metadata and the pages that appear when editing metadata. It identifies the metadata standard or profile to be followed, the XML schema defining the valid XML format for that standard, and how to export metadata from ArcGIS for Desktop to a stand-alone metadata XML file in that format.

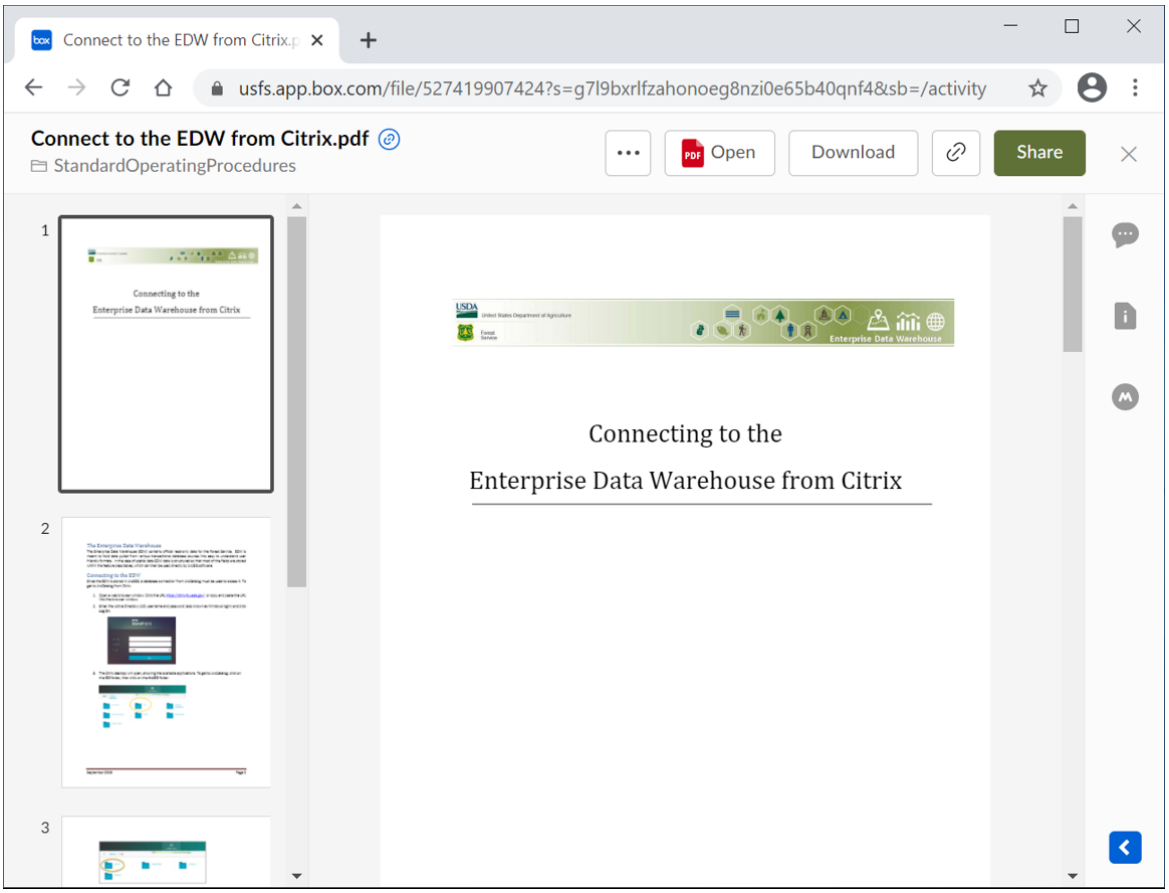


Figure 10: 'Connecting to the Enterprise Data Warehouse from Citrix' Guide for Internal USFS Users

3.2.2 T:\ DRIVE

Production versions of metadata for all EDW data can be found on the T:\ drive:

T:\FS\BusOps\CIO\Project\EDW\Metadata_Final

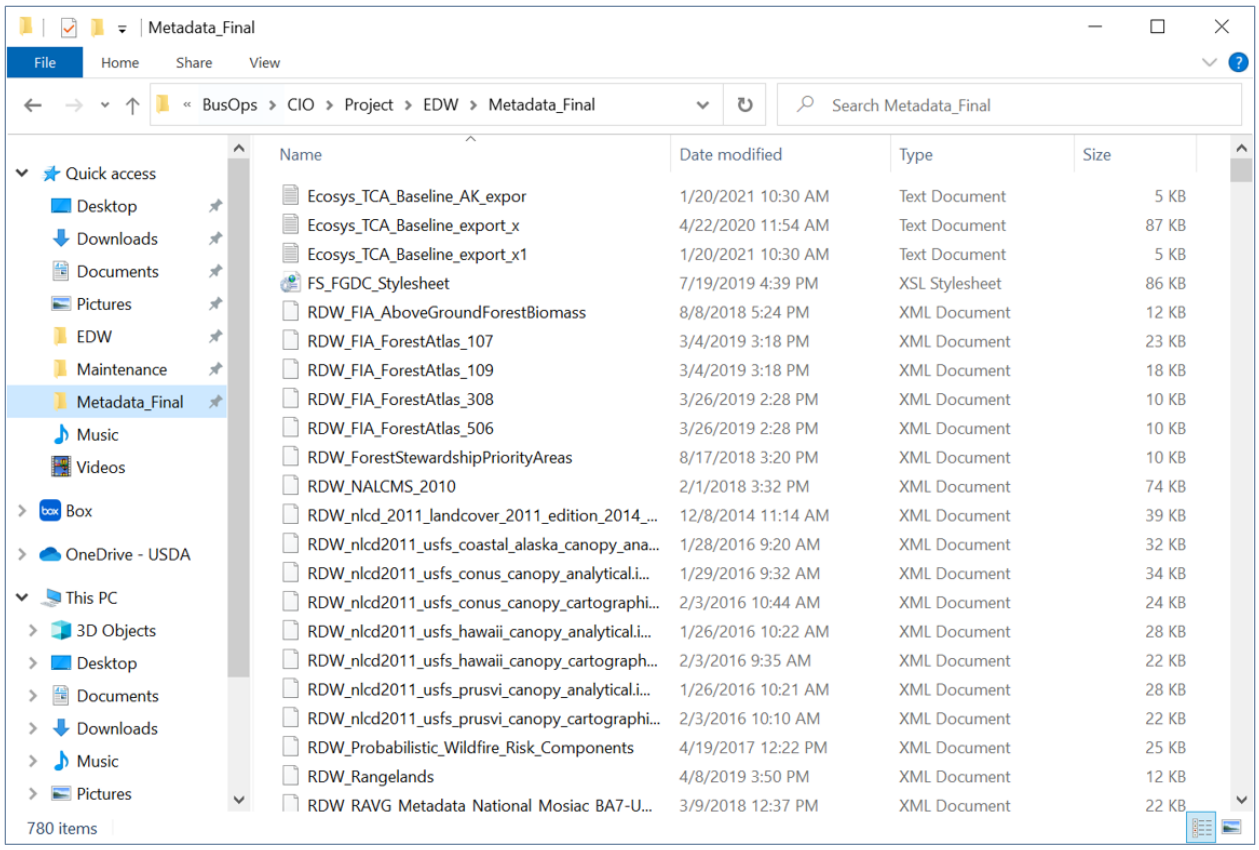


Figure 11: Screenshot of the T:\ Drive
This screenshot shows the location where production versions of metadata are stored.

4 INTRODUCTION TO METADATA

Metadata is information about data. It includes answers to the questions 'who', 'what', 'where', 'when', 'why', and 'how' related to a particular dataset. You may or may not have already encountered metadata designed for geospatial data, but you most certainly have encountered metadata in other areas of your life. A soup can is a fantastic example.

Imagine encountering a can of soup without its label. Determining the type of soup it contains or its ingredients would be impossible without opening the can. Still other information, such as brand, may not be possible to determine even after opening the can. That soup label is a fantastic example of metadata. It tells you all sorts of information about the contents of the can without the need to open the can itself.

Like a soup can, geospatial data comes with metadata that provide all sorts of valuable information that can be examined before the data are opened. Some common pieces of information in the geospatial metadata of the USFS EDW are contacts (e.g. names and contact information of the data creators and/or data stewards), an abstract or summary, use constraints on the data, date the data were created, and descriptions of each of the attributes in the data sets.

The major uses of metadata are to maintain an organization's internal investment in geospatial data, to provide information about an organization's data holdings to data catalogues, clearinghouses, and brokerages, and to provide information needed to process and interpret data from an external source.

Geospatial metadata are organized according to a standard. The remainder of this section will explore three metadata standards that a user of the EDW may encounter. These are the Federal Geographic Data Committee (FCDC) Content Standard for Digital Geospatial Metadata (CSDGM), ISO (International Organization Standardization) 19115-x, and ArcGIS.

FGDC.GOV
FEDERAL GEOGRAPHIC DATA COMMITTEE

ISO

esri

4.1 FGDC's Content Standard for Digital Geospatial Metadata (CSDGM)

The Federal Geographic Data Committee (FGDC) is an organized structure of Federal geospatial professionals and constituents that provide executive, managerial, and advisory direction and oversight for geospatial decisions and initiatives across the Federal Government (https://www.fgdc.gov/organization). This committee is responsible for the geospatial metadata standard **Content Standard for Digital Geospatial Metadata (CSDGM,** https://www.fgdc.gov/metadata/csdgm-standard**)**.

The objectives of the standard are to provide a common set of terminology and definitions for the documentation of digital geospatial data. The standard establishes the names of data elements and compound elements (aka. groups of data elements) to be used for these purposes, the definitions of these compound elements and data elements, and information about the values that are to be provided for the data elements. The most up to date version of the CSDGM standard is version 2, or **FGDC-STD-001-1998** (https://www.fgdc.gov/standards/projects/metadata/base-metadata/index_html or https://www.fgdc.gov/standards/projects/metadata/base-metadata/v2_0698.pdf).

4.2 ISO 19115-x

The International Organization for Standardization (ISO) is an independent, non-governmental international organization with a membership of various national standards bodies (https://www.iso.org/about-us.html). The ISO is responsible for metadata standards **ISO 19115-x**, where the 'x' stands for the version (https://www.iso.org/ics/35.240.70/x/). Another ISO standard, **ISO 19139-x** provides the XML implementation schema for **ISO 19115-x**.

It is important to note that the **ISO 19115-x** standard has been much more recently updated than the FGDC's **CSDGM** standard. "Since the update of the CSDGM standard in 1998, geospatial data content, format, and supporting applications have evolved significantly. In addition, the Unified Modeling Language (UML) used to develop the ISO standard provides a more robust means of describing complex relationships between metadata elements, metadata standards, and data resource types. More specifically, ISO geospatial metadata standards support:

- documentation of a wide range of geospatial resources including: data, services, sensors/technologies, collection methods, QA/QC procedures, models, application schemas, ontologies, symbol sets, and more.
- documentation of the relationships between geospatial data and associated services, technologies, methods, models, etc.
- documentation of simple and complex geospatial data parent/child/sibling relations
- simplification of metadata compliance through the use of fewer mandatory metadata elements and XML attributes that allow for flexibility in meeting requirements, e.g. 'nilreason'
- standardization and discoverability of metadata content via standardized Topic Categories, a large percentage of fixed domains, and the use of identifiers to reference published information
- standardization and discoverability of metadata records across geopolitical boundaries and community-designated profiles

- standardization and simplification of documenting geographic coordinate systems and parameters through the use of Spatial Reference System identifiers, e.g. EPSG:5070"

(Information in quotes above from: https://www.fgdc.gov/metadata/benefits-of-iso.)

In fact, "several ISO metadata standards are now endorsed by the FGDC and federal agencies and NSDI Stakeholders are encouraged to make the transition to ISO metadata" (https://www.fgdc.gov/metadata/geospatial-metadata-standards). (NSDI stands for National Spatial Data Infrastructure. More information can be found here: https://www.fgdc.gov/nsdi/nsdi.html.)

4.3 ESRI ArcGIS Metadata Format

ArcGIS metadata is part of an ArcGIS item. When the item is copied, moved, or deleted, its metadata is also copied, moved or deleted (https://doc.arcgis.com/en/arcgis-online/manage-data/metadata.htm). When the item is imported into a geodatabase, its metadata is also imported. Metadata is stored in the same location as the item's data in a manner that is appropriate for its data type. For example, for shapefiles, metadata is stored in an XML file adjacent to the rest of the dataset's files. For geodatabase items, metadata is stored in the geodatabase system tables. If your data is stored in an enterprise geodatabase, see the topic that describes the geodatabase system tables for your DBMS to learn more. For example, with an Oracle database you would look in the topic System tables of a geodatabase stored in Oracle to learn more. Metadata is stored in the Documentation column in the GDB_Items table (https://desktop.arcgis.com/en/arcmap/latest/manage-data/metadata/the-arcgis-metadata-format.htm).

The ArcGIS metadata format contains elements that can store all content in all metadata standards supported by ArcGIS, including Federal Geographic Data Committee (FGDC) *Content Standard for Digital Geospatial Metadata (CSDGM)* metadata content, all ISO 19139 metadata content, all North American Profile metadata content, and all INSPIRE metadata content. ArcGIS metadata also includes ArcGIS-internal content such as thumbnails, which are useful for the ArcGIS platform, but not included in supported metadata standards.

In ArcGIS Online, an item's metadata is created, edited, and viewed on the item page. Item details include the title, type, and source, author, last modified date, thumbnail, and tags. It can also include additional information such as summary and description, how accurate and recent the item is, restrictions associated with using and sharing the item, credits, and so on. This information can help others discover and evaluate the usefulness of items.

For a more detailed understanding of the ESRI ArcGIS metadata format, it is recommended that the reader review the information in the following links (much of the content above comes from these links as well).

For ArcGIS Desktop: https://desktop.arcgis.com/en/arcmap/latest/manage-data/metadata/the-arcgis-metadata-format.htm

For ArcGIS Online: https://doc.arcgis.com/en/arcgis-online/manage-data/metadata.htm

5 READING METADATA

The method used to read metadata varies depending on which of the previously mentioned standards are being adhered to (FGDC, ISO, or ESRI) and the metadata's file format. The metadata file formats that may be encountered on the EDW project are Extensible Markup Language (XMLs), those that are part of a geodatabase, and those that are part of an ArcGIS Online (AGOL) item.

The table below lists the suggested software packages for reading metadata based on its file format. It should be noted that this is not a complete list of all software packages that can be used to read these file formats.

Metadata File Format	**Suggested Software Packages**
XML	Notepad++ (https://notepad-plus-plus.org/downloads/) ArcCatalog Google Chrome, Internet Explorer, or other web browsers
Geodatabase	ArcCatalog ArcMap
AGOL	AGOL

Methodologies for using the software packages listed above for reading each file format are listed below.

5.1 Reading XML Files

To read XML metadata using Notepad++ or a web browser, right click the file in windows explorer and select the appropriate software package. For example:

Right click > ***Edit with Notepad++***

or

Right click > ***Open with*** > ***Google Chrome*** *(or other web browser)*

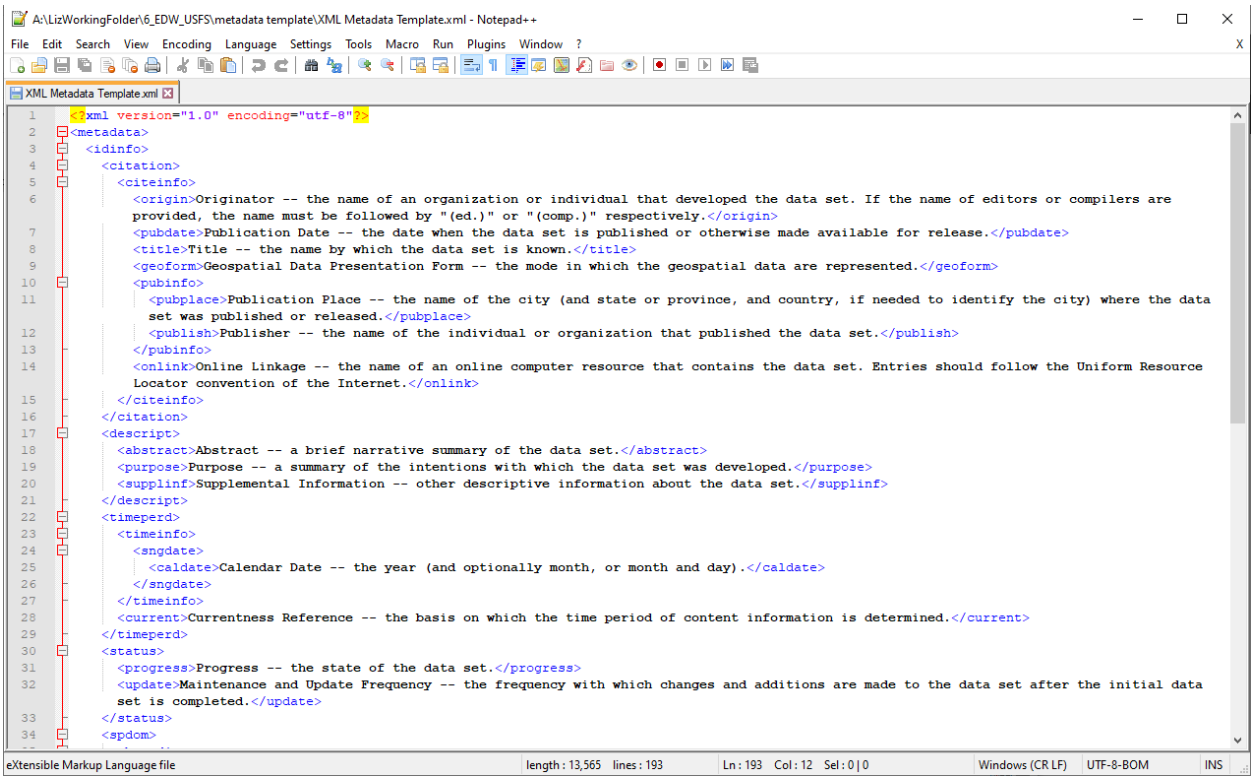


Figure 12: XML Document in Notepad++

Screenshot of an XML document as viewed in Notepad++. This XML document is a template that contains text prompts between tags to help the user fill in the appropriate data for a project. Tags in an XML document are denoted with the symbols '<>' and '</>', where the information applicable to that tag falls between the two symbols. Notepad++ can also be used to edit XML files, so be careful not to delete any information if your intent is viewing the metadata only.

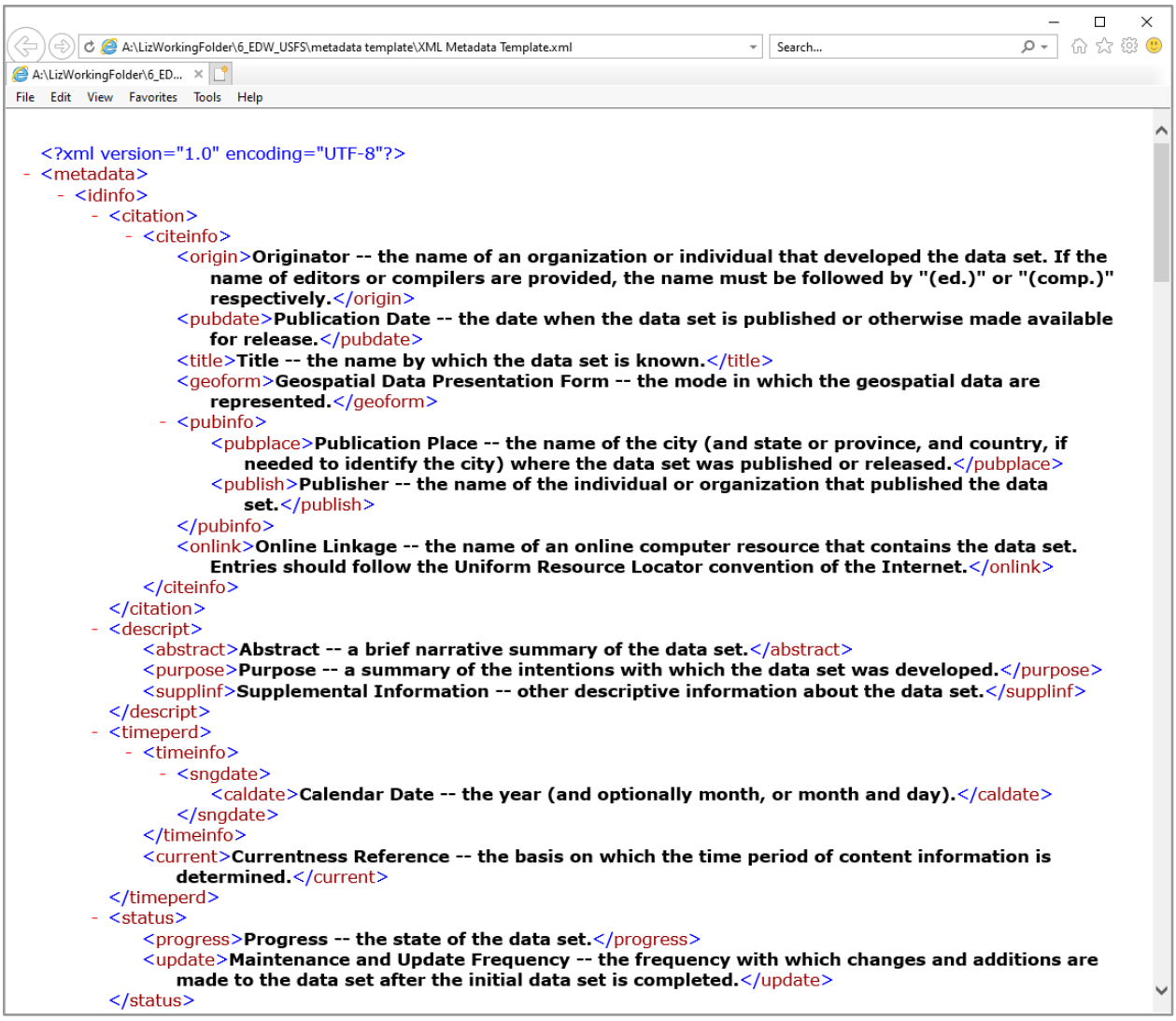


Figure 13: XML Document in Web Browser

Screenshot of an XML document as viewed in Internet Explorer. XML files cannot be edited when viewing them in a web browser, so you may elect to view metadata this way if you need to read metadata but not edit. This is the same XML document pictured in Figure 1.

5.1.1 EDW METADATA TEMPLATE EXAMPLE XML REFERENCE DOCUMENT

The template XML document used to create metadata and which accompanies this Metadata User Manual is titled 'EDW_Metadata_Template_User_Guide_Example.xml'. This XML document has been copied/pasted and included in Appendix A of this document for quick reference.

It is recommended that all readers acquaint themselves with this document. Comments have been added throughout that explain the information that can be found in each tag. This information includes, but is not limited to, detailed information about the extent, accuracy, currency, refresh rate, source, contact info, and use restrictions of the data.

5.2 Reading Metadata in ArcCatalog

ArcCatalog can be used to view metadata as an XML or as part of a geodatabase, and formatted as **ESRI**, FGDC's **CSDGM**, or **ISO 19115-x**.

To read metadata in ArcCatalog, open ArcCatalog, open the **Catalog Tree**  , navigate to and select the XML file you wish to view, then navigate to the **Description** tab on the main window.

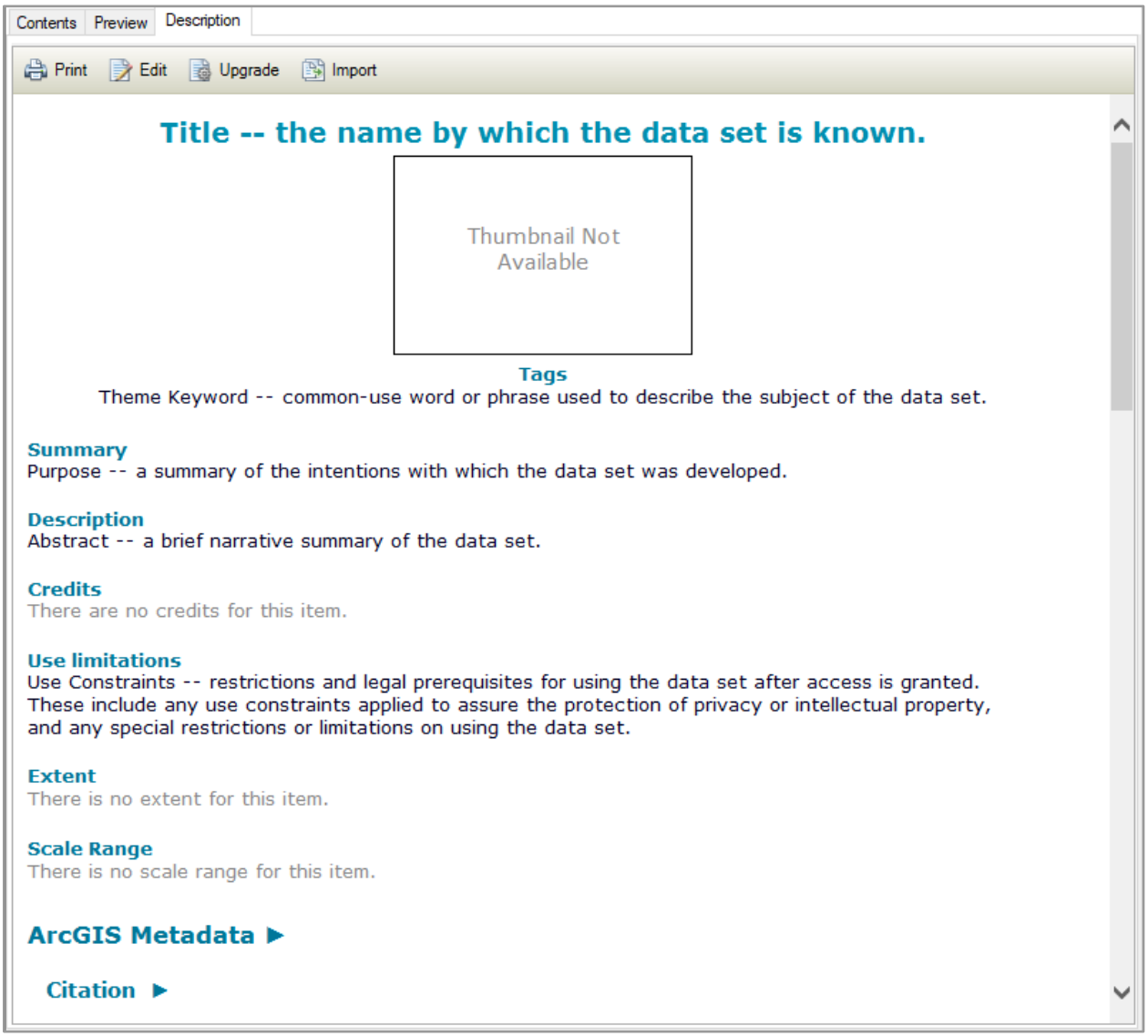


Figure 14: XML Document in ArcCatalog
Screenshot of an XML document as viewed in the Description tab of ArcCatalog. This is the same file as was shown in Figures 1 and 2. Notice that in ArcCatalog, you will not see the '<>' and '</>' symbols to signify XML tags, rather, these tags will be formatted as headings (pictured in blue here).

When using ArcCatalog, by default the **Description** tab will show metadata in the ESRI ArcGIS format, though you may choose to view metadata in another *style*. Metadata styles in ArcCatalog are like filters. In other words, when

using a metadata style, the underlying metadata format will remain the same, but how it is presented by the software will be modified.

To use a metadata style in ArcCatalog, click **Customize > ArcCatalog Options**, then click the **Metadata** tab (https://desktop.arcgis.com/en/arcmap/latest/manage-data/metadata/choosing-a-metadata-style.htm).

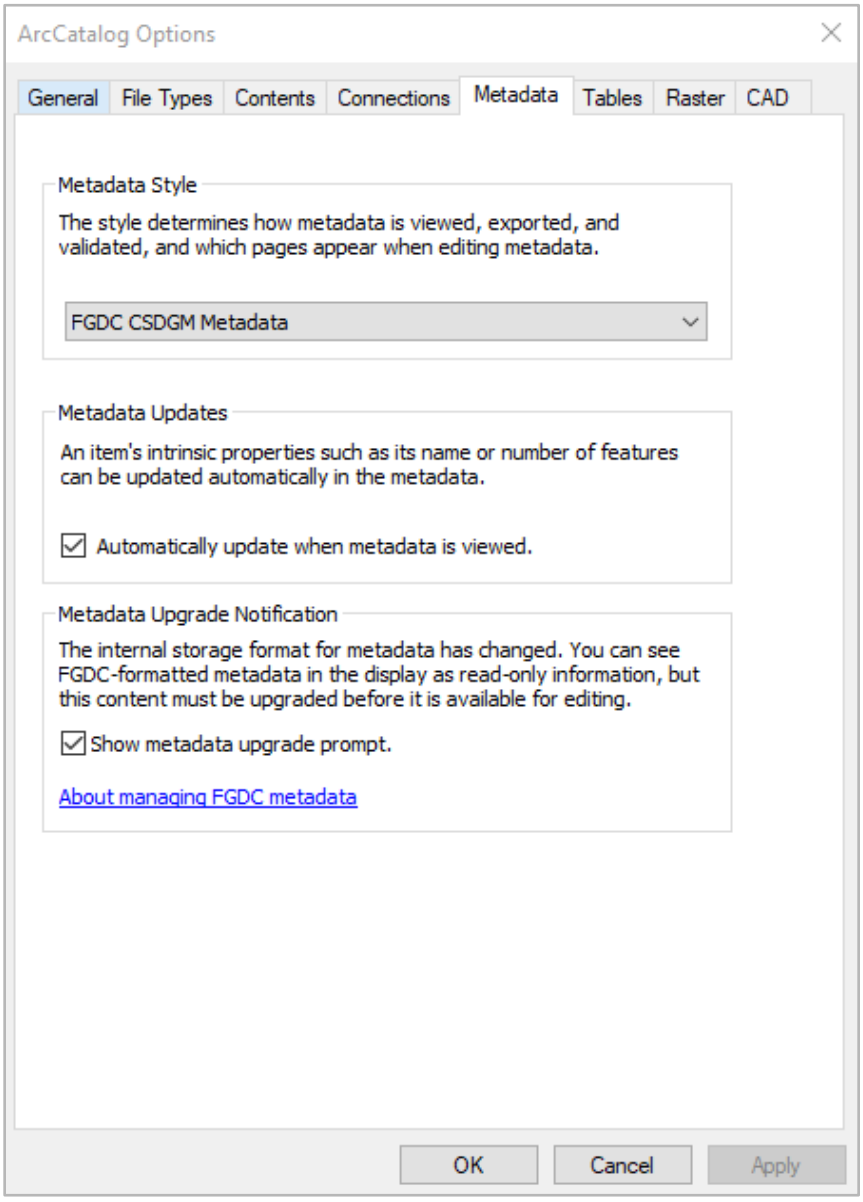
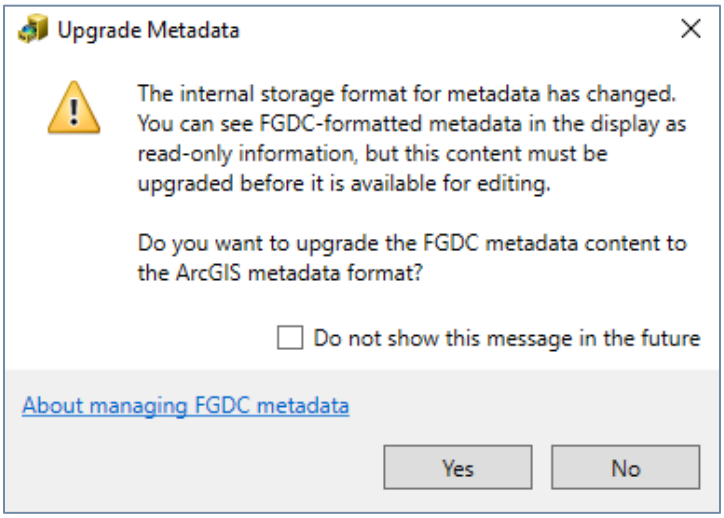


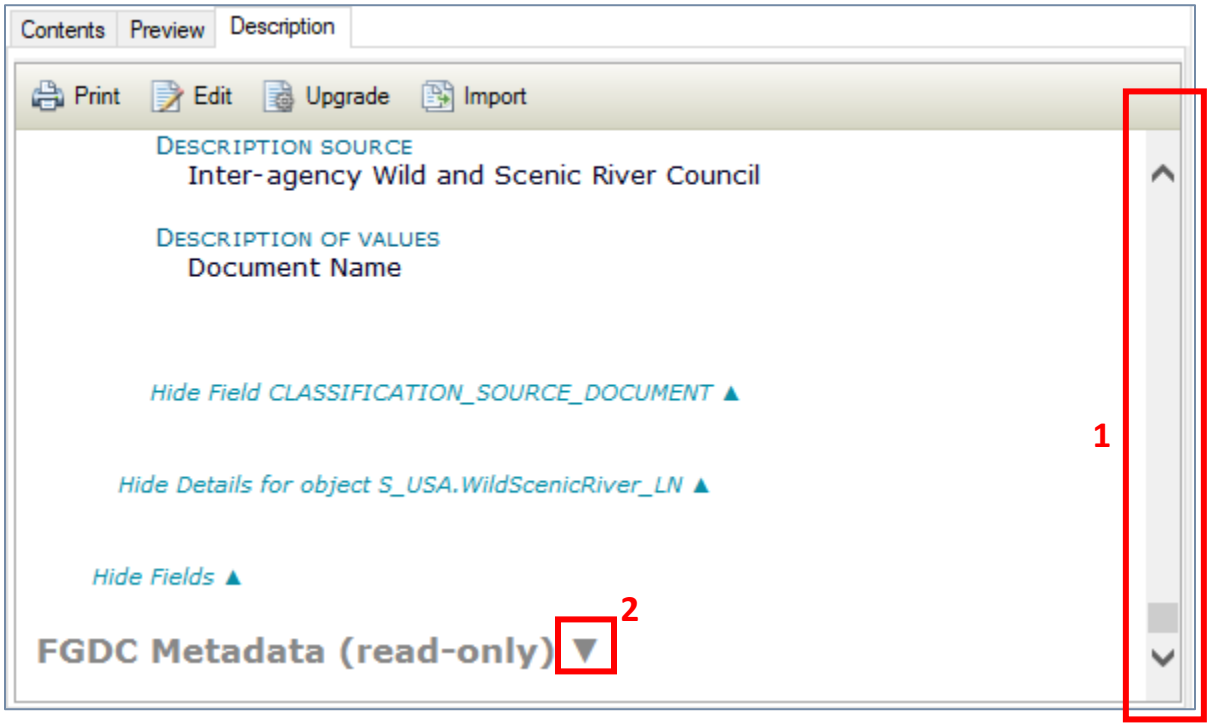
Figure 15: Changing Metadata Style in ArcCatalog
Screenshot of the **Metadata** tab of the **ArcCatalog Options** window in ArcCatalog. The metadata style can be changed in the dropdown on this tab.

Depending on ArcCatalog's settings and the format of the metadata file you are attempting to view, you may be presented with the 'Upgrade Metadata' popup as pictured below:

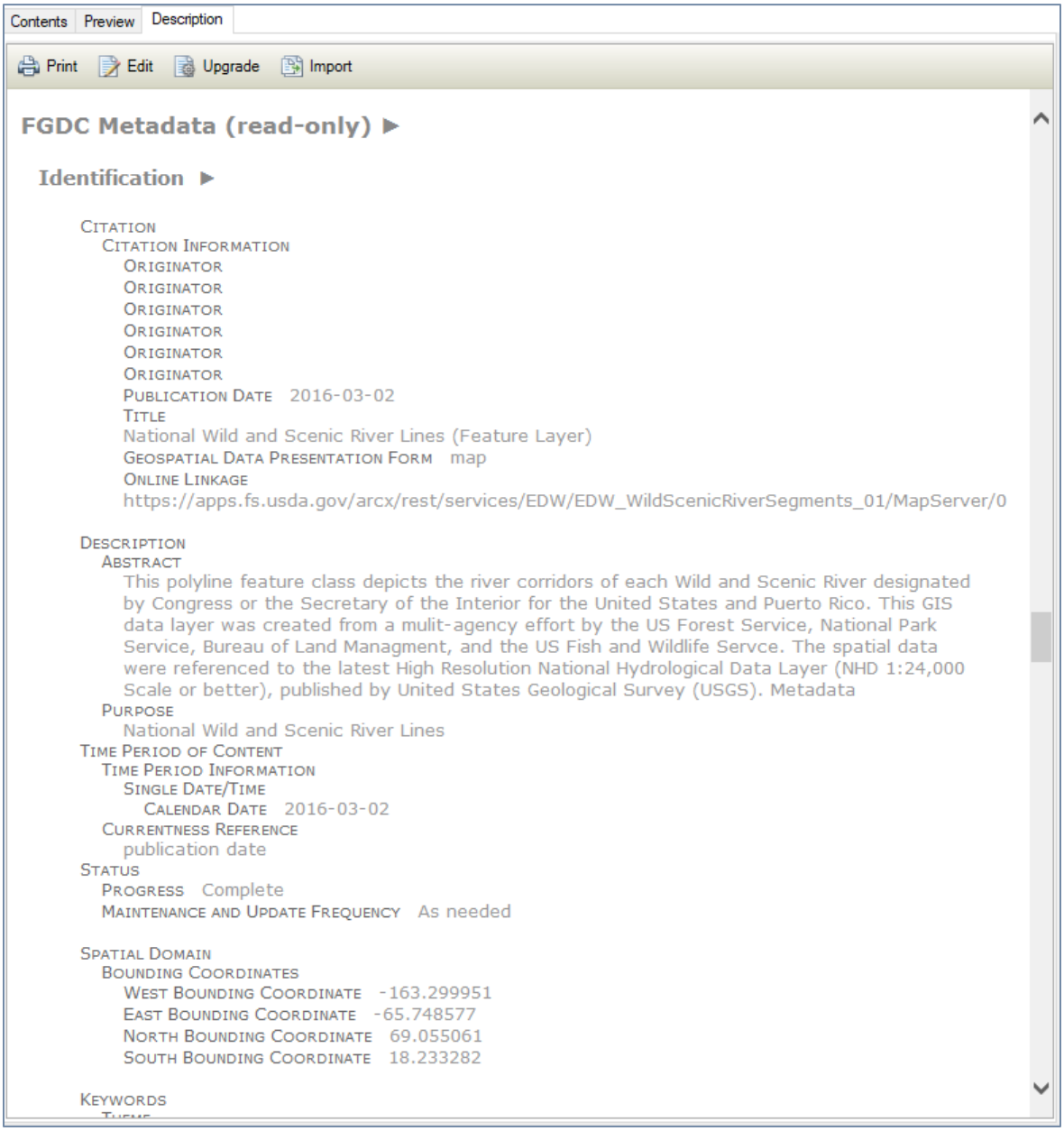


For the purpose of viewing metadata, it is recommended that you click 'No' in this popup and complete the following procedure:

1. scroll to the bottom of the **Description** tab in ArcCatalog
2. click the arrow next to the gray heading text 'FGDC Metadata (read-only)' to expand its contents.



Below is an example of what the contents of the 'FGDC Metadata (read-only)' look like:



5.3 Reading Metadata in ArcMap

To view metadata in ArcMap, open the **Catalog** window  , navigate to the dataset for which you'd like to see the metadata (e.g. XML file, feature class, shapefile), right click and select **Item Description…**

Like what was explained about viewing metadata in **ArcCatalog** above, you may elect to view metadata using different *styles* in ArcMap. To do so, in ArcMap, click **Customize > ArcMap Options**, then click the **Metadata** tab (https://desktop.arcgis.com/en/arcmap/latest/manage-data/metadata/choosing-a-metadata-style.htm).

5.4 Reading Metadata on ArcGIS Online

To view metadata in ArcGIS Online, you will need to locate the option **View item details**. The exact location of this option may shift based on which page you are on within ArcGIS Online (e.g. Living Atlas, My Content, Groups). A screenshot of the location of this option on the **Living Atlas** page is shown in Figure 5.

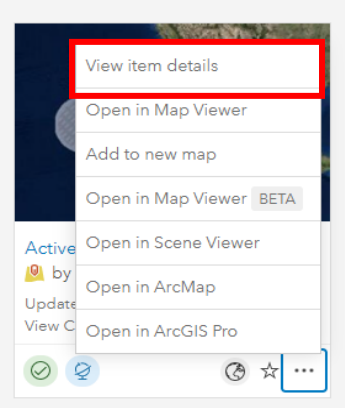


Figure 16: Finding the Item Details in ArcGIS Online
(Image on right) On the **Living Atlas** page of ArcGIS Online, to locate the metadata, click the '...' button and select **View item details**.

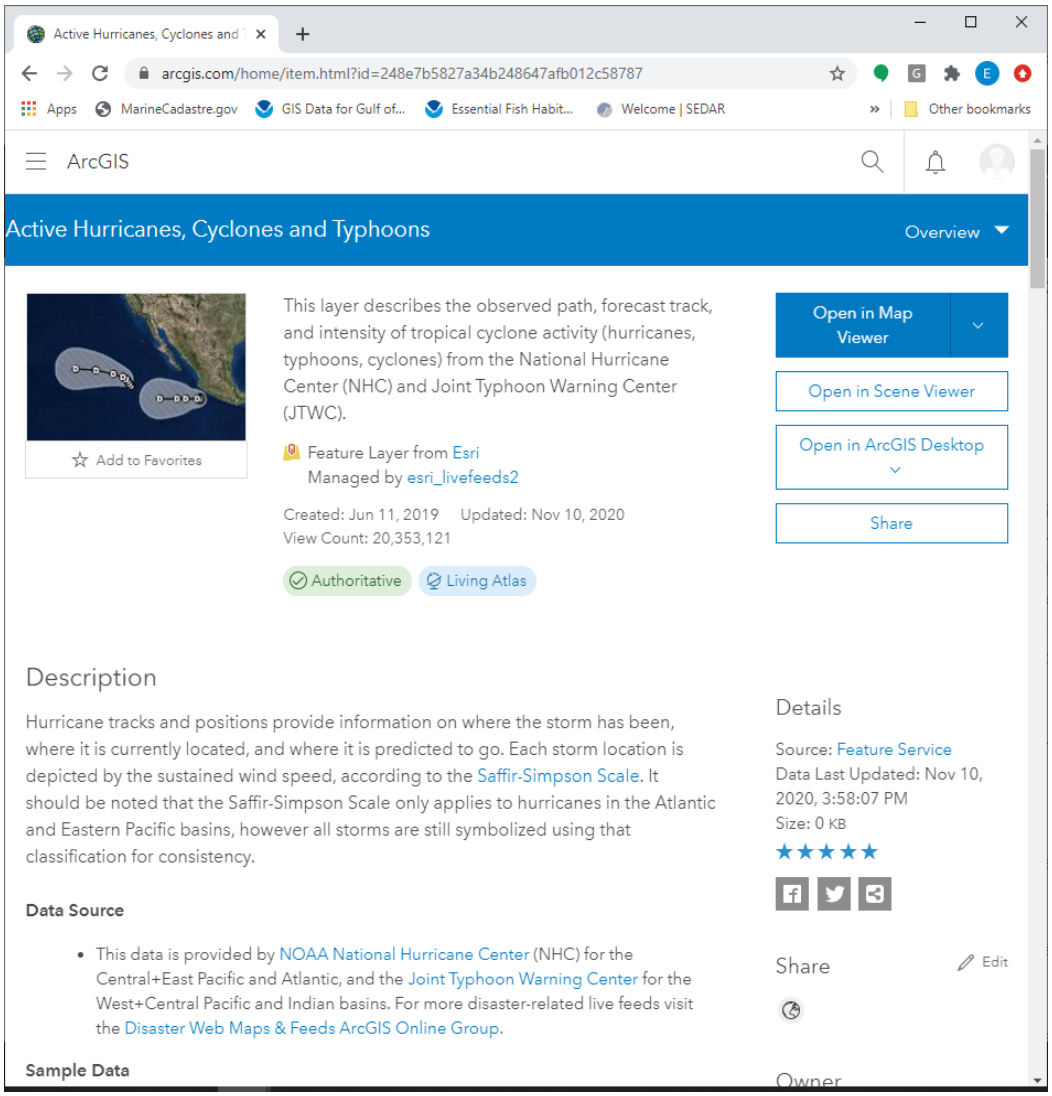


Figure 17: Viewing the Item Details Page on ArcGIS Online
The **Item Details** page of any given layer will look like this screenshot. Scroll down this page to view all the metadata associated with an item.

6 COMMONLY REFERENCED EDW METADATA TEMPLATE SECTIONS

The intent of this section is to help users find commonly sought-after information in metadata which is formatted like the EDW Metadata Template (Appendix A). The EDW Metadata Template itself contains content prompts within tags and can therefore be used as a quick reference, however, this section of the user manual expands on that information with lengthier descriptions and examples from EDW datasets with screenshots. The EDW Metadata Template is based on the **CSDGM** standard created by the FGDC. Further information on this standard can be found here: https://www.fgdc.gov/metadata/csdgm-standard.

Many software packages can be used to view metadata, though each may display and format information differently. Screenshots in the following sections will show examples of metadata viewed using the following software packages: ArcGIS software (ArcCatalog or ArcMap) and Notepad++. It is assumed that the reader has access to one or both of these programs. (Notepad++ can be downloaded for free here: https://notepad-plus-plus.org/downloads/.)

A secondary goal of this section is to provide brief descriptions of commonly sought-after information in metadata formatted using the ISO standard. These descriptions are included in case the reader is viewing a dataset formatted using this standard. Since the ISO standard may be updated in the future (unlike the **CSDGM** standard), details on locating commonly sought-after information in metadata in this section are purposefully kept brief. It is also the case that at the time of writing of this document, the EDW program has not yet adopted the ISO standard for its metadata. To gain full appreciation of how information is stored in metadata formatted using the ISO standard, it is recommended that the reader review the applicable standard(s): https://www.iso.org/ics/35.240.70/x/.

It is also important to note here that throughout the following user manual sections, the term ‘tag’ will be used when referring to the location of information in ISO formatted metadata. This may be in contrast to the more specific terms such as ‘element’, ‘attribute’, ‘packages’, or ‘namespaces’ that are used in the ISO standard itself. This is intentional to minimize the length of this document. Therefore, ‘tag’ in the sections below refers to items held in ‘<>’ and ‘</>’ symbols when viewed in Notepad++.

Lastly, the sections below explain how to view **CSDGM** and **ISO** formatted metadata. **ESRI ArcGIS** formatted metadata can be viewed in ArcGIS software in the **Description** tab. It will resemble the screenshots with blue headers in the screenshots below.

A Note on Referencing Metadata in ArcGIS Online (AGOL)

The location of commonly sought-after information in the metadata in AGOL is not specifically referenced in the sections that follow, however, AGOL metadata typically loosely resembles the **Description** tab in ArcGIS due to the fact that the main body of information on the 'View Item Details' page is separated into sections with headers (See section 4.1.4 for instructions on how to navigate to this page in AGOL.) Viewers of metadata in AGOL should also pay attention to the information at the top of the page (above the **Description** header), the information on the right of the page, and the comments.

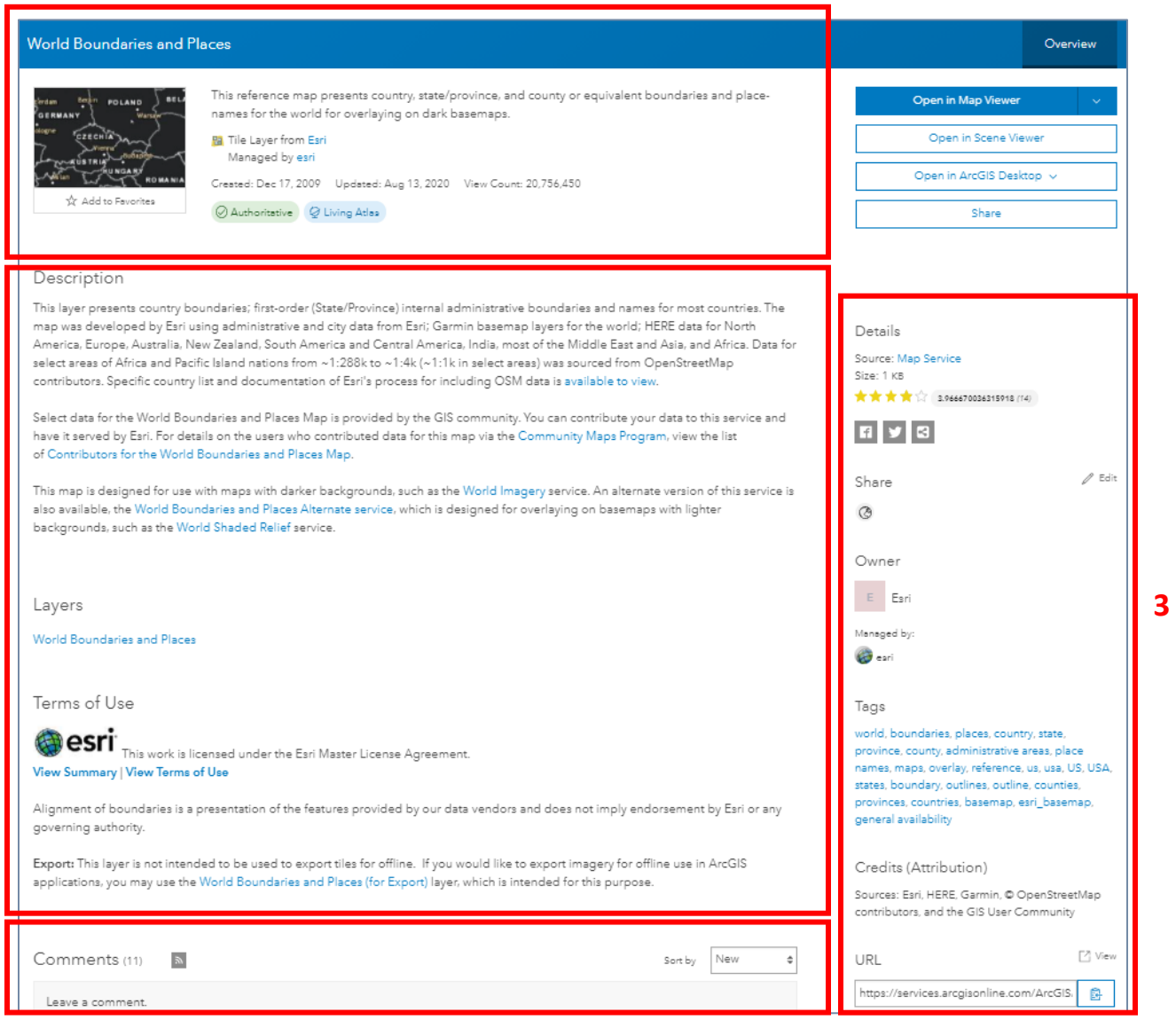


Figure 18: Example of Metadata in ArcGIS Online (AGOL)

The above is an example of metadata as viewed on the 'View Item Details' page on AGOL. Viewers should pay attention to the information at the top of the page (1), main body (2), and right side of the page (3). Unlike any other method of viewing metadata mentioned in this user manual, the 'View Item Details' page in AGOL has a 'Comments' section (4). If any are present, the comments may contain valuable information from data users related to missing data and/or errors that the data provider has yet to resolve.

6.1 Abstract and Summary Information

Summary information about the dataset can be found in the following tags in the EDW Metadata Template:

abstract: A brief narrative summary of the data set.
purpose: A summary of the intentions with which the data set was developed.
supplinf: Other descriptive information about the dataset (optional).

These tags are nested in the tags **metadata > idinfo > descript**.

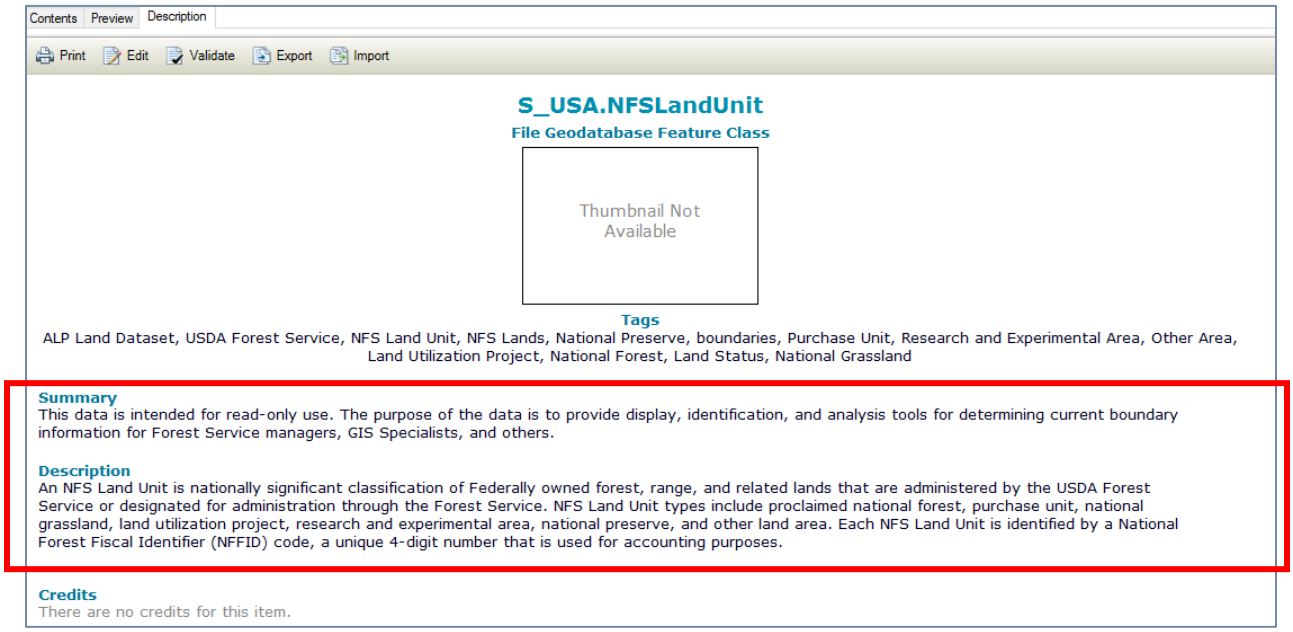


Figure 19: Sample Metadata Abstract and Summary Information in ArcGIS

The **Description** tab will show abstract and summary information as pictured above. It is important to note that ArcGIS will display the **abstract** tag information under the **Description** heading and the **purpose** tag information under the **Summary** header. This sample EDW dataset is the National Forest System Land Units dataset ('S_USA.NFSLandUnit.gdb' file geodatabase, 'NFSLandUnit' feature class). This example dataset does not have any information in the **supplinf** tag.

```
<abstract>
  An NFS Land Unit is nationally significant classification of Federally owned
  forest, range, and related lands that are administered by the USDA Forest Service
  or designated for administration through the Forest Service. NFS Land Unit types
  include proclaimed national forest, purchase unit, national grassland, land
  utilization project, research and experimental area, national preserve, and other
  land area. Each NFS Land Unit is identified by a National Forest Fiscal Identifier
  (NFFID) code, a unique 4-digit number that is used for accounting purposes.
</abstract>
<purpose>
  This data is intended for read-only use. The purpose of the data is to provide
  display, identification, and analysis tools for determining current boundary
  information for Forest Service managers, GIS Specialists, and others.
</purpose>
```

Figure 20: Sample Metadata Abstract and Summary Information in Notepad++

This sample comes from the same dataset as pictured in Figure 8. Notice that Notepad++ will display the tag names in blue text and the tag content in black text.

For ISO formatted metadata, abstract and summary information are found in the **abstract, purpose,** and **supplementalInformation** tags.

```
<abstract>
  <gco:CharacterString>A boundary depicting an area that has been designated
  as a National Wilderness in the National Wilderness Preservation System.
  </gco:CharacterString>
</abstract>
<purpose>
  <gco:CharacterString>This data is intended for read-only use. Wilderness is
  a commonly used base layer used in a wide range of Forest Service business
  functions as well as those of other entities.</gco:CharacterString>
</purpose>
```

Figure 21: Sample Metadata Abstract and Summary Information in ISO Format in Notepad++
This sample comes from the National Wilderness Areas dataset ('S_USA.Wilderness.gdb' file geodatabase, 'Wilderness' feature class). Notice that when viewed in Notepad++, metadata formatted using the ISO standard may appear to contain tags with prefixes such as 'gco:' (which stands for 'Geographic Common extensible markup language') like the one pictured above. These items are known as namespaces and for the purpose of locating and viewing metadata content in this user manual, can be largely ignored. More information on namespaces can be found in the ISO standards: https://www.iso.org/ics/35.240.70/x/.

6.2 Contact Information

Contact information for the dataset includes the identity of and means to communicate with person(s) and/or organization(s) associated with the dataset. This information can be found in the following tags in the EDW Metadata Template:

cntorg: Contact Organization – the name of the organization to which the contact type applies
cntper: Contact Person – the name of the individual to which the contact type applies
addrtype: Address Type – the information provided by the address.
address: an address, not including the items listed separately below.
city: city of the address.
state: the state or province of the address.
postal: Postal Code – the ZIP or other postal code of the address.
country: the country of the address.
cntvoice: Contact Voice Telephone – the telephone number by which individuals can speak to the organization or individual
cntemail: Contact Electronic Mail Address – the address of the electronic mailbox of the organization or individual.
hours: Hours of Service – time period when individuals can speak to the organization or individual.
cntinst: Contact Instructions – supplemental instructions on how or when to contact the individual or organization.

All these tags are nested in the tags **metadata > metainfo > metc > cntinfo**. The **cntorg** and **cntper** tags are further nested in the **cntorgp** tag and the **addrtype, address, city, state, postal,** and **country** tags are further nested in the **cntaddr** tag.

Figure 22: Sample Contact Information in the Metadata in ArcGIS

This example comes from the 'National Wild and Scenic River Lines' dataset ('National_Wild_and_Scenic_River_Lines__Feature_Layer.shp' shapefile). The metadata for this shapefile was not formatted as ArcGIS metadata and did not show up automatically in the upper portion of the **Description** tab. In cases like these, the user should scroll to the bottom of the **Description** tab and expand the gray header that reads 'FGDC Metadata (read-only)' to find this information (reference section 4.1.2 for more details).

```
<metainfo>
    <metd>20170116</metd>
    <metc>
        <cntinfo>
            <cntorgp>
                <cntorg>USFS Chief Information Office, Enterprise Data Warehouse</cntorg>
            </cntorgp>
            <cntaddr>
                <addrtype>physical</addrtype>
                <city>Washington</city>
                <state>DC</state>
                <postal>20250</postal>
            </cntaddr>
            <cntvoice>Please send an e-mail to the address below.</cntvoice>
            <cntemail>data@fs.fed.us</cntemail>
        </cntinfo>
    </metc>
    <metstdn>FGDC Content Standard for Digital Geospatial Metadata</metstdn>
    <metstdv>FGDC-STD-001-1998</metstdv>
    <mettc>local time</mettc>
</metainfo>
```

Figure 23: Sample Contact Information in the Metadata in Notepad++

The figure above shows the same information as shown in Figure 11 but as viewed in Notepad++.

In the case that the reader is viewing an older set of metadata where the format does not align with the EDW Metadata Template, it is useful to explain here that there are a few other sections of the **CSGDM** metadata standard where contact information may be held. Each of these other locations has a different purpose.

1. **idinfo > ptcontac** (general contact information)
    - idinfo = Identification Information – basic information about the data set.
    - ptcontac = Point of Contact – contact information for an individual or organization that is knowledgeable about the dataset.
2. **dataqual > lineage > procstep > proccont** (contact information for a party knowledgeable about a particular processing step)
    - dataqual = Data Quality Information – a general assessment of the quality of the data set.
    - lineage = Lineage -- information about the events, parameters, and source data which constructed the data set, and information about the responsible parties.
    - procstep = Process Step – information about a single event.
    - proccont = Process Contact -- the party responsible for the processing step information.
3. **distinfo > distrib** (information about the party responsible for data distribution)
    - distinfo = Distribution Information -- information about the distributor of and options for obtaining the data set.
    - distrib = Distributor -- the party from whom the data set may be obtained.
4. **distinfo > stdorder > digform > digtopt > onlinopt > computer** (instructions for establishing communications with the distribution computer)
    - distinfo = Distribution Information -- information about the distributor of and options for obtaining the data set.
    - stdorder = Standard Order Process -- the common ways in which the data set may be obtained or received, and related instructions and fee information
    - digform = Digital Form -- the description of options for obtaining the data set on computer-compatible media.
    - digtopt = Digital Transfer Option -- the means and media by which a data set is obtained from the distributor
    - onlinopt = Online Option -- information required to directly obtain the data set electronically.
    - computer = Computer Contact Information -- instructions for establishing communications with the distribution computer.

For ISO formatted metadata, look for contact information in the **CI_ResponsibleParty** tag:

```
<contact>
  <CI_ResponsibleParty>
    <organisationName>
      <gco:CharacterString>USFS Chief Information Office, Enterprise Data Warehouse
      </gco:CharacterString>
    </organisationName>
    <contactInfo>
      <CI_Contact>
        <phone>
          <CI_Telephone>
            <voice>
              <gco:CharacterString>Please send an e-mail to the address below.</gco:CharacterString>
            </voice>
          </CI_Telephone>
        </phone>
        <address>
          <CI_Address>
            <city>
              <gco:CharacterString>Washington</gco:CharacterString>
            </city>
            <administrativeArea>
              <gco:CharacterString>DC</gco:CharacterString>
            </administrativeArea>
            <postalCode>
              <gco:CharacterString>20250</gco:CharacterString>
            </postalCode>
            <electronicMailAddress>
              <gco:CharacterString>data@fs.fed.us</gco:CharacterString>
            </electronicMailAddress>
          </CI_Address>
        </address>
      </CI_Contact>
    </contactInfo>
    <role>
      <CI_RoleCode codeList=
      "http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_RoleCode" codeListValue=
      "pointOfContact" codeSpace="ISOTC211/19115">pointOfContact</CI_RoleCode>
    </role>
  </CI_ResponsibleParty>
</contact>
```

Figure 24: Sample Contact Information in ISO Formatted Metadata in Notepad++
This example comes from 'National Forest System Land Units' dataset ('S_USA.NFSLandUnit.gdb' file geodatabase, 'NFSLandUnit' feature class).

6.3 Lineage and Process Steps

The **lineage** tag in the EDW Metadata Template holds information about the events, parameters, and source data which constructed the dataset, and information about the responsible parties. This includes information about each source in the **srcinfo** tag and processing steps in the **procstep** tag. The **srcinfo** tag is compound and contains the following tags (indented here to indicate their hierarchy):

srccite: Source Citation -- reference information for a source data set.
citeinfo: Citation Information – reference information for a source data set.
origin: Source Citation Originator – the name of an organization or individual that developed the source data set. If the name of editors or compilers are provided, the name must be followed by "(ed.)" or "(comp.)" respectively.

pubdate: Source Citation Publication Date – the date when the source data set is published or otherwise made available for release.
title: Source Citation Title – the name by which the source data set is known.
geoform: Source Citation Geospatial Data Presentation Form – the mode in which the source geospatial data are represented (e.g. “atlas”, “spreadsheet”, “remote sensing image”, “raster digital data”, or free text).
typesrc: Type of Source Media – medium of the source data set (e.g. “disc”, “paper”, “online”, “CD-ROM”, or free text)
srctime: Source Time Period of Content – time period(s) for which the source data set corresponds to the ground.
timeinfo: Time Period Information – information about the date and time of an event.
rngdates: Range of Dates/Times – means of encoding a range of dates and times.
begdate: Beginning Date – the first year (and optionally month, or month and day) of the event.
enddate: Ending Date – the last year (and optionally month, or month and day) of the event.
srccurr: Source Currentness Reference – the basis on which the source time period of content information is determined.
srccitea: Source Citation Abbreviation – short-form alias for the source citation.
srccontr: Source Contribution – brief statement identifying the information contributed by the source to the data set.

The **procstep** tag is compound as well, but contains just a couple of tags:

procdesc: Process Description – an explanation of the event and related parameters or tolerances.
procdate: Process date – the date when the event was completed.

The information in the **procstep** tag may provide an overview of the processing that was performed to create the dataset, or it may be broken down further into a series of steps. In some cases, this may be quite an extensive list of steps. Settings in the ArcGIS software can be enabled to add an entry to the metadata each time a geoprocessing tool is run on a dataset (some examples of geoprocessing tools are ‘Clip’, ‘Buffer’, and ‘Union’).

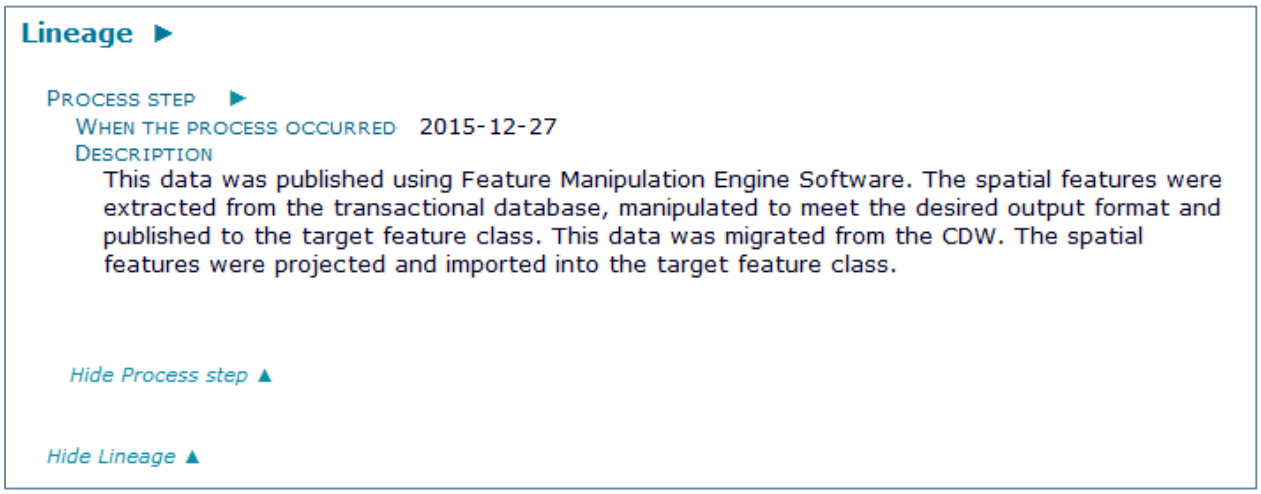


Figure 25: Sample Process Step Information in Metadata in ArcGIS
This example comes from the ‘National Wilderness Areas’ dataset (‘S_USA.Wilderness.gdb’ file geodatabase, ‘Wilderness’ feature class). This dataset has a single ‘Process Step’ entry. Notice that in this example, the **lineage** tag contains information on processing steps, but nothing related to the Source Citation (**srccite** tag). This may be the case for some datasets.

```
<lineage>
    <procstep>
        <procdesc>This data was published using Feature Manipulation Engine
        Software. The spatial features were extracted from the
        transactional database, manipulated to meet the desired output
        format and published to the target feature class. This data was
        migrated from the CDW. The spatial features were projected and
        imported into the target feature class.</procdesc>
        <procdate>20160302</procdate>
    </procstep>
</lineage>
```

Figure 26: Sample Process Step Information in Metadata in Notepad++
This example comes from the 'National Wild and Scenic River Lines (Feature Layer)' dataset ('National_Wild_and_Scenic_River_Lines__Feature_Layer.shp' shapefile).

When viewing metadata formatted using the ISO standard, you may also search for a **lineage** tag to find information on the events and source data used to construct the dataset. This includes processing steps in the **LI_ProcessStep** tag and **LI_Source** tag for information on the sources used in the development of the dataset.

```
<lineage>
  <LI_Lineage>
    <processStep>
      <LI_ProcessStep>
        <description>
          <gco:CharacterString>This data was published using Feature Manipulation Engine Software.
          The spatial features were extracted from the transactional database, manipulated to meet
          the desired output format and published to the target feature class. This data was migrated
          from the CDW. The spatial features were projected and imported into the target feature
          class.</gco:CharacterString>
        </description>
        <dateTime>
          <gco:DateTime>2015-12-27T00:00:00</gco:DateTime>
        </dateTime>
      </LI_ProcessStep>
    </processStep>
  </LI_Lineage>
</lineage>
```

Figure 27: Sample Lineage Information in ISO Formatted Metadata in Notepad++
This example comes from the 'National Wilderness Areas' dataset ('S_USA.Wilderness.gdb' file geodatabase, 'Wilderness' feature class).

6.4 Coordinate System

Information on the coordinate system of the dataset can be found in the **geodetic** tag in the EDW Metadata Template which is nested in **spref > horizsys**. Several tags are nested in the **geodetic** tag:

horizdn: Horizontal Datum Name -- the identification given to the reference system used for defining the coordinates of points.
ellips: Ellipsoid Name -- identification given to established representations of the Earth's shape.
semiaxis: Semi-major Axis -- radius of the equatorial axis of the ellipsoid.
denflat: Denominator of Flattening Ratio -- the denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when the numerator is set to 1.

Like other tags in the EDW Metadata Template, information will only be available in the **geodetic** tag if it has been filled in. However, regardless of the contents- or presence- of this tag in the metadata, information on a dataset's coordinate system is automatically populated upon its import to ArcGIS software. You can find this automatically generated information under the **Spatial Reference** header in the **Description** tab.

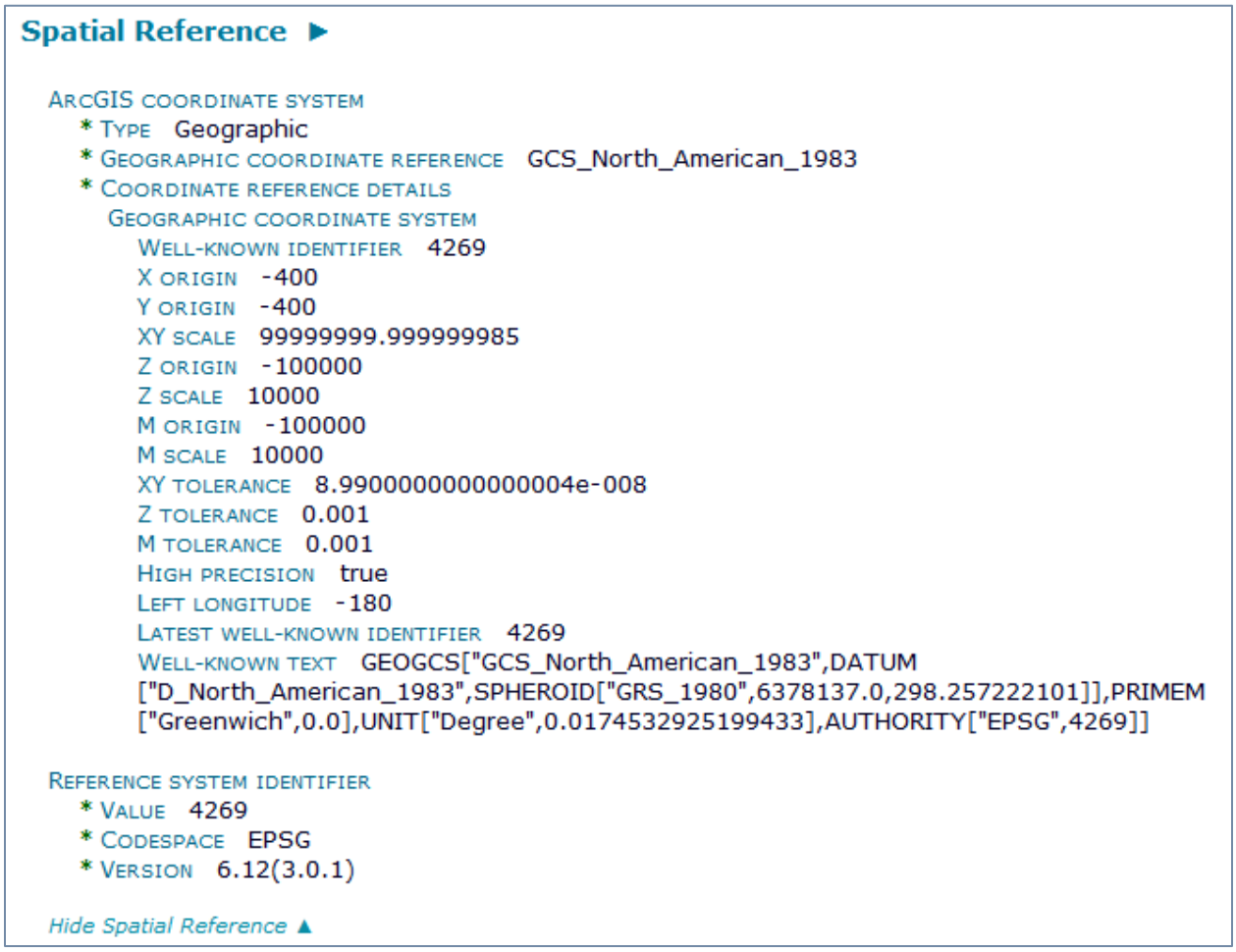


Figure 28: Sample Coordinate System Information in Metadata in ArcGIS
This is an example of the automatically generated coordinate system information that ArcGIS software will create upon a dataset's import. This example comes from the 'National Wilderness Areas' dataset ('S_USA.Wilderness.gdb' file geodatabase, 'Wilderness' feature class).

If you are viewing ISO formatted metadata, look for the **referenceSystemInfo** tag:

```
<referenceSystemInfo>
  <MD_ReferenceSystem>
    <referenceSystemIdentifier>
      <RS_Identifier>
        <code>
          <gco:CharacterString>4269</gco:CharacterString>
        </code>
        <codeSpace>
          <gco:CharacterString>EPSG</gco:CharacterString>
        </codeSpace>
        <version>
          <gco:CharacterString>6.12(3.0.1)</gco:CharacterString>
        </version>
      </RS_Identifier>
    </referenceSystemIdentifier>
  </MD_ReferenceSystem>
</referenceSystemInfo>
```

Figure 29: Sample Coordinate System Information in ISO Formatted Metadata in Notepad++
This example comes from the 'National Wilderness Areas' dataset ('S_USA.Wilderness.gdb' file geodatabase, 'Wilderness' feature class).

6.5 Extent

Information on the spatial extent of a dataset can be found in the **bounding** tag in the EDW Metadata Template which is nested in the **metadata > idinfo > spdom** tags. The **bounding** tag contains four tags that indicate the bounding coordinates of the dataset:

westbc: West Bounding Coordinate -- western-most coordinate of the limit of coverage expressed in longitude.
eastbc: East Bounding Coordinate -- eastern-most coordinate of the limit of coverage expressed in longitude.
northbc: North Bounding Coordinate -- northern-most coordinate of the limit of coverage expressed in latitude.
southbc: South Bounding Coordinate -- southern-most coordinate of the limit of coverage expressed in latitude.

```
Spatial Domain
  Bounding Coordinates
    West Bounding Coordinate   -163.299951
    East Bounding Coordinate   -65.748577
    North Bounding Coordinate   69.055061
    South Bounding Coordinate   18.233282
```

Figure 30: Sample Extent Information Metadata in ArcCatalog
Example bounding coordinates as displayed in the **Description** tab in ArcCatalog.

```
<spdom>
    <bounding>
        <westbc>-163.299951</westbc>
        <eastbc>-65.748577</eastbc>
        <northbc>69.055061</northbc>
        <southbc>18.233282</southbc>
    </bounding>
</spdom>
```

Figure 31: Sample Extent Information Metadata in Notepad++
Example is from the same dataset as Figure 19.

If you are viewing ISO formatted metadata, look for the **geographicElement** tag in the **extent > EX_Extent** tags:

```
<extent>
  <EX_Extent>
    <geographicElement>
      <EX_GeographicBoundingBox>
        <westBoundLongitude>
          <gco:Decimal>-150.007671</gco:Decimal>
        </westBoundLongitude>
        <eastBoundLongitude>
          <gco:Decimal>-64.734329</gco:Decimal>
        </eastBoundLongitude>
        <southBoundLatitude>
          <gco:Decimal>17.738983</gco:Decimal>
        </southBoundLatitude>
        <northBoundLatitude>
          <gco:Decimal>61.51899</gco:Decimal>
        </northBoundLatitude>
      </EX_GeographicBoundingBox>
    </geographicElement>
  </EX_Extent>
</extent>
```

Figure 32: Sample Extent Information in ISO Formatted Metadata in Notepad++
In ISO formatted metadata, you will find bounding coordinates for the dataset listed out similarly to the EDW Metadata Template format, though with slightly different tag names. In ISO data, you may also see an **extentTypeCode** tag which is an indication of whether the bounding polygon encompasses an area covered by the data or an area where data is not present (not pictured above).

6.6 Accuracy

The EDW Metadata Template contains information on the dataset's horizontal and vertical accuracy as well as attribute accuracy. To find this information, look for the following tags:

attraccr: Attribute Accuracy Report -- an explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used.

horizpar: Horizontal Positional Accuracy Report -- an explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used.

vertacc: Vertical Positional Accuracy Report -- an explanation of the accuracy of the vertical coordinate measurements and a description of the tests used.

The tags listed above are nested in the **metadata > dataqual** tags. The **horizpar** and **vertacc** tags are further nested in the **posacc** tag.

Figure 33: Sample Accuracy Information Metadata in ArcCatalog

Example accuracy information as displayed in the **Description** tab in ArcCatalog. This example comes from the 'Mineral Rights' feature layer ('Mineral_Rights__Feature_Layer.shp'). This dataset's metadata does not have any information on vertical accuracy.

```
<dataqual>
    <attracc>
        <attraccr>The Regional Land Status personnel are responsible for their
        local data stewardship and maintenance. The overall collection
        nationwide consists of 100% attribute accuracy based on currentness and
        completeness.</attraccr>
    </attracc>
    <logic>Topology was created using ESRI Arc/Info software and checked for
    gaps, slivers, intersect errors and invalid dangling nodes. Data was
    confirmed complete. Standard collection procedures included edgematching
    between township coverage tiles. Any errors were corrected using USDA
    Forest Service standards and guidelines for Quality Control (QC). Region
    datasets followed the Washington Office standards and processes. The data
    was collected following FGDC standards. Quality control measures taken:
    this feature class is populated by an automated translation process from
    the source feature class that is edited and maintained by the data
    stewards. Only stewards with the proper role grants can edit the data. The
    application used for editing has built in controls to only allow valid
    geometry and domains to control attribute integrity.</logic>
    <complete>This theme is current to date of publication. Other themes may
    not contain current information.</complete>
    <posacc>
        <horizpa>
            <horizpar>Generally the source information used to record spatial
            locations are from: 1) on-screen digitizing with a georeferenced
            topographic or image background; or 2) GPS field collected
            positions.</horizpar>
        </horizpa>
    </posacc>
    <lineage>
        <procstep>
            <procdesc>This data was published using Feature Manipulation Engine
            Software. The spatial features were extracted from the
            transactional database, manipulated to meet the desired output
            format and published to the target feature class.</procdesc>
            <procdate>20160101</procdate>
        </procstep>
    </lineage>
</dataqual>
```

Figure 34: Sample Accuracy Information Metadata in Notepad++
The same information as in Figure 22 but displayed in Notepad++.

If you are viewing ISO formatted metadata, look for the **report** tag, which may contain the following tags:

DQ_CompletenessCommission
DQ_CompletenessOmission
DQ_ConceptualConsistency
DQ_DomainConsistency
DQ_FormatConsistency
DQ_TopologicalConsistency
DQ_AbsoluteExternalPositionalAccuracy
DQ_GriddedDataPositionalAccuracy
DQ_RelativeInternalPositionalAccuracy
DQ_ThematicClassificationCorrectness
DQ_NonQuantitativeAttributeAccuracy
DQ_QuantitativeAttributeAccuracy
DQ_AccuracyOfATimeMeasurement
DQ_TemporalConsistency

```
<report>
  <DQ_DomainConsistency>
    <evaluationMethodDescription>
      <gco:CharacterString>Quality control measures taken: this feature class
      is populated by an automated translation process from the source
      feature class that is edited and maintained by the data stewards. Only
      stewards with the proper role grants can edit the data. The application
      used for editing has built in controls to only allow valid geometry and
      domains to control attribute integrity.</gco:CharacterString>
    </evaluationMethodDescription>
    <result gco:nilReason="missing" />
  </DQ_DomainConsistency>
</report>
<report>
  <DQ_ConceptualConsistency>
    <measureDescription>
      <gco:CharacterString>Quality control measures taken: this feature class
      is populated by an automated translation process from the source
      feature class that is edited and maintained by the data stewards. Only
      stewards with the proper role grants can edit the data. The application
      used for editing has built in controls to only allow valid geometry and
      domains to control attribute integrity.</gco:CharacterString>
    </measureDescription>
    <result gco:nilReason="missing" />
  </DQ_ConceptualConsistency>
</report>
<report>
  <DQ_CompletenessOmission>
    <measureDescription>
      <gco:CharacterString>This theme is current to date of publication.
      </gco:CharacterString>
    </measureDescription>
    <result gco:nilReason="missing" />
  </DQ_CompletenessOmission>
</report>
<report>
  <DQ_AbsoluteExternalPositionalAccuracy>
    <measureDescription>
      <gco:CharacterString>Generally the source information used to record
      spatial locations are from: 1) on-screen digitizing with a
      georeferenced topographic or image background; or 2) GPS field
      collected positions.</gco:CharacterString>
    </measureDescription>
    <result gco:nilReason="missing" />
  </DQ_AbsoluteExternalPositionalAccuracy>
</report>
```

Figure 35: Sample Accuracy Information in ISO Formatted Metadata in Notepad++

In ISO formatted metadata, you will find accuracy information within the **report** tag. There may be several **report** tags, as in the example above. This example comes from the National Forest System Land Units' dataset ('S_USA.NFSLandUnit.gdb' file geodatabase, 'NFSLandUnit' feature class).

6.7 Currency

Information on the currency of a dataset are found in the **timeperd** tag in the EDW Metadata Template. The following tags of interest are nested in that tag:

caldate: Calendar Date -- the year (and optionally month, or month and day).
current: Currentness Reference -- the basis on which the time period of content information is determined.

The **caldate** tag is nested in the **timeinfo > sngdate** tags.

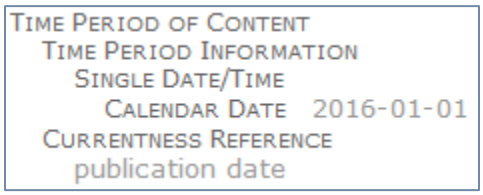


Figure 36: Sample Currency Information Metadata in ArcCatalog
Example data currency information as displayed in the **Description** tab in ArcCatalog.

```
<timeperd>
    <timeinfo>
        <sngdate>
            <caldate>20160101</caldate>
        </sngdate>
    </timeinfo>
    <current>publication date</current>
</timeperd>
```

Figure 37: Sample Currency Information Metadata in Notepad++
Example data currency information as displayed in Notepad++.

If you are viewing ISO formatted metadata, look for the **EX_TemporalExtent** tag (in the **extent** tag):

```
<extent>
  <EX_Extent>
    <description>
      <gco:CharacterString>Publication Date</gco:CharacterString>
    </description>
    <temporalElement>
      <EX_TemporalExtent>
        <extent>
          <gml:TimeInstant gml:id="ID0EZEAE">
            <gml:timePosition>2015-12-27</gml:timePosition>
          </gml:TimeInstant>
        </extent>
      </EX_TemporalExtent>
    </temporalElement>
  </EX_Extent>
</extent>
```

Figure 38: Sample Currency Information in ISO Formatted Metadata in Notepad++
In ISO formatted metadata, you will find data currency information within the **report** tag. There may be several **extent** tags in a single metadata file (see section 4.2.4 for another example).

6.8 Refresh Rate

The refresh rate, or update frequency, of a dataset is found in the **status** tag of the EDW Metadata Template. The following two tags are nested in this tag:

progress: Progress -- the state of the data set.
update: Maintenance and Update Frequency -- the frequency with which changes and additions are made to the data set after the initial data set is completed.

Figure 39: Sample Refresh Rate Information Metadata in ArcCatalog
Example data refresh rate information as displayed in the **Description** tab in ArcCatalog.

```
<status>
    <progress>Complete</progress>
    <update>As needed</update>
</status>
```

Figure 40: Sample Refresh Rate Information Metadata in Notepad++
Example data refresh rate information as displayed in Notepad++.

For ISO, look for the **resourceMaintenance** tag:

```
<resourceMaintenance>
  <MD_MaintenanceInformation>
    <maintenanceAndUpdateFrequency>
      <MD_MaintenanceFrequencyCode codeList=
      "http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#MD_Main
      tenanceFrequencyCode" codeListValue="weekly" codeSpace="ISOTC211/19115">
      weekly</MD_MaintenanceFrequencyCode>
    </maintenanceAndUpdateFrequency>
  </MD_MaintenanceInformation>
</resourceMaintenance>
```

Figure 41: Sample Refresh Rate Information in ISO Formatted Metadata in Notepad++
In ISO formatted metadata, look for refresh rate information in the **resourceMaintenance** tag. In the example above, a code was used to fill in this information (**MD_MaintenanceFrequencyCode**). You may see codes such as this in ISO formatted metadata.

6.9 Attribute Values

Several tags within the **eainfo** (Entity and Attribute Information) **> detailed** tags in the EDW Metadata Template describe attribute values for the dataset. Of particular interested are:

attrlabl: Attribute Label -- the name of the attribute.
attrdef: Attribute Definition -- the description of the attribute.
attrdefs: Attribute Definition Source -- the authority of the definition.

These tags are nested within the **attr** tag and it is very likely for there to be more than one **attr** entry in a metadata file.

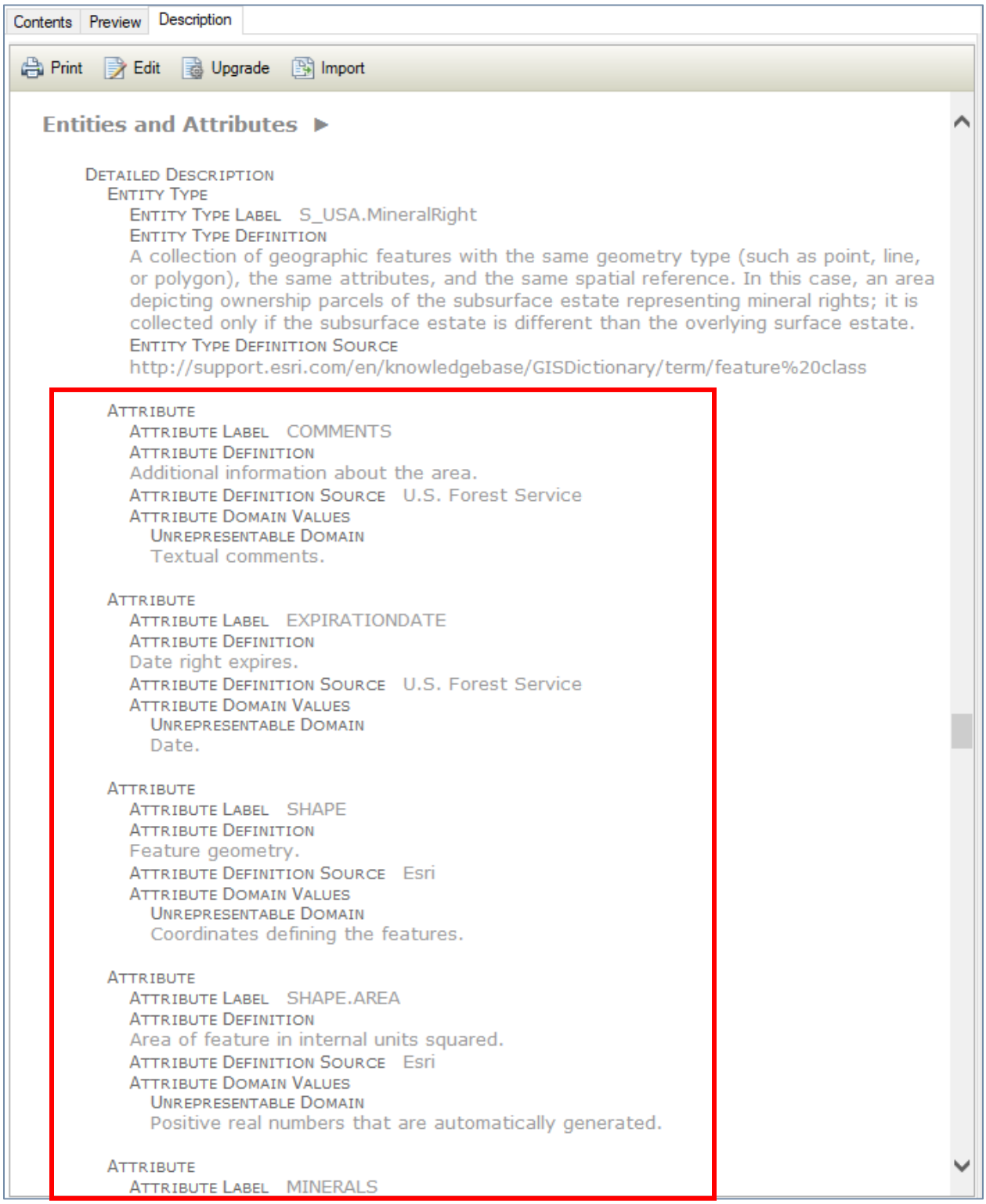


Figure 42: Sample Attribute Values Information Metadata in ArcCatalog

Example attribute values information as displayed in the **Description** tab in ArcCatalog. Notice in this dataset that there are many 'Attribute' entries- one for each attribute in the dataset.

```
<eainfo>
    <detailed>
        <enttyp>
            <enttypl>S_USA.MineralRight</enttypl>
            <enttypd>A collection of geographic features with the same geometry
            type (such as point, line, or polygon), the same attributes, and
            the same spatial reference. In this case, an area depicting
            ownership parcels of the subsurface estate representing mineral
            rights; it is collected only if the subsurface estate is different
            than the overlying surface estate.</enttypd>
            <enttypds>
            http://support.esri.com/en/knowledgebase/GISDictionary/term/feature%2
            0class</enttypds>
        </enttyp>
        <attr>
            <attrlabl>COMMENTS</attrlabl>
            <attrdef>Additional information about the area.</attrdef>
            <attrdefs>U.S. Forest Service</attrdefs>
            <attrdomv>

                <udom>Textual comments.</udom>

            </attrdomv>
        </attr>
        <attr>
            <attrlabl>EXPIRATIONDATE</attrlabl>
            <attrdef>Date right expires.</attrdef>
            <attrdefs>U.S. Forest Service</attrdefs>
            <attrdomv>

                <udom>Date.</udom>

            </attrdomv>
        </attr>
        <attr>
            <attrlabl>SHAPE</attrlabl>
            <attrdef>Feature geometry.</attrdef>
            <attrdefs>Esri</attrdefs>
            <attrdomv>

                <udom>Coordinates defining the features.</udom>
```

Figure 43: Sample Attribute Value Information Metadata in Notepad++

Example attribute value information as displayed in Notepad++. This is the same dataset as in Figure 31.

Additional information about attribute values may be gleaned from the contents of the **overview** tag which is also nested within **eainfo**. The **overview** tag contains the following:

eaover: Entity and Attribute Overview -- detailed summary of the information contained in a data set.
eadetcit: Entity and Attribute Detail Citation -- reference to the complete description of the entity types, attributes, and attribute values for the data set.

For ISO, look for the **FC_FeatureCatalog** tag (if it exists) and the tags nested within. Regardless of the presence of these tags, if viewed using ArcGIS, information about the dataset attribute fields will be displayed under the **Fields** header in the **Description** tab.

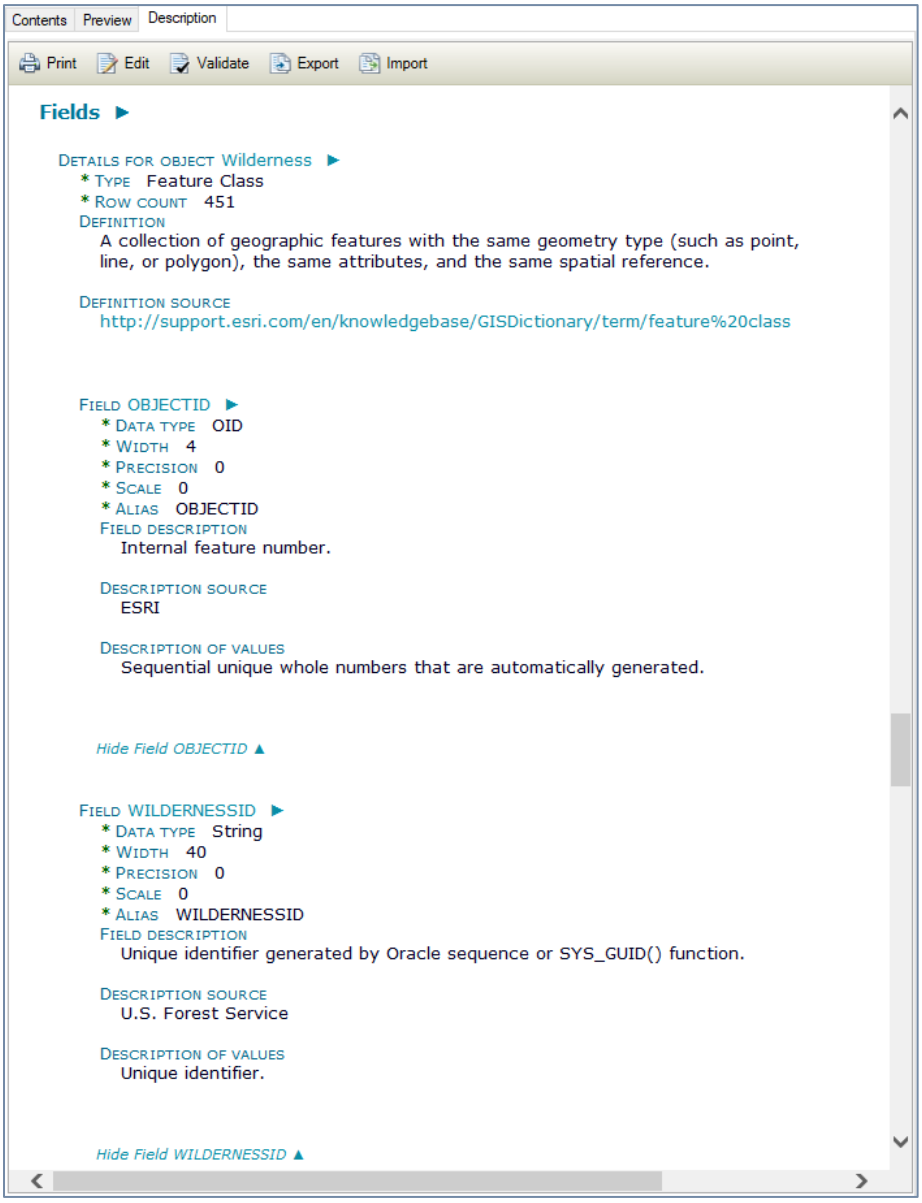


Figure 44: Sample Attribute Value Information in ISO Formatted Metadata in ArcGIS
Regardless of whether the ISO metadata itself contains information on a dataset's attribution, ArcGIS will display information such as this in the upper portion of the **Description** tab. Look for the **Fields** header. This sample comes from the 'National Wilderness Areas' dataset ('S_USA.Wilderness.gdb' file geodatabase, 'Wilderness' feature class).

6.10 Accepted Domain Values for Attribution

Several tags within the **eainfo** (Entity and Attribute Information) **> detailed** tags in the EDW Metadata Template describe accepted domain values for attributes in the dataset. Of particular interest are (and indented here to indicate their hierarchy):

attrdomv: Attribute Domain Values -- the valid values that can be assigned for an attribute.
udom: Unrepresentable Domain -- description of the values and reasons why they cannot be represented.
edom: Enumerated Domain -- the members of an established set of valid values.
edomv: Enumerated Domain Value -- the name or label of a member of the set.
edomvd: Enumerated Domain Value Definition -- the description of the value.
edomvds: Enumerated Domain Value Definition Source -- the authority of the definition.

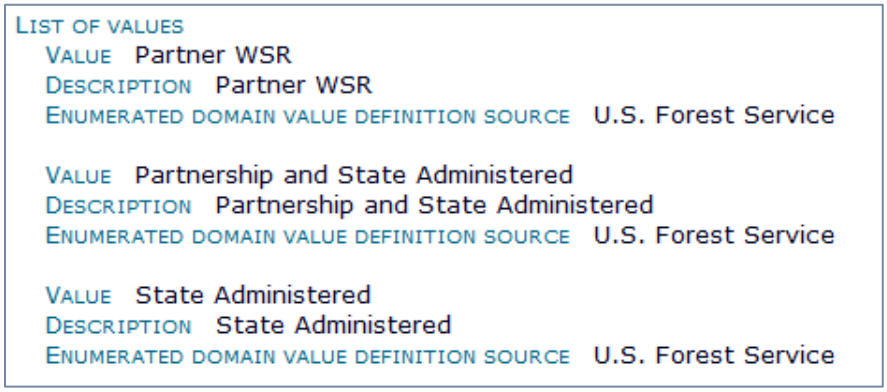


Figure 45: Sample Accepted Domain Values for Attribution in Metadata in ArcCatalog (top)
Example accepted domain values for attribution as displayed in the top portion of the **Description** tab in ArcCatalog.

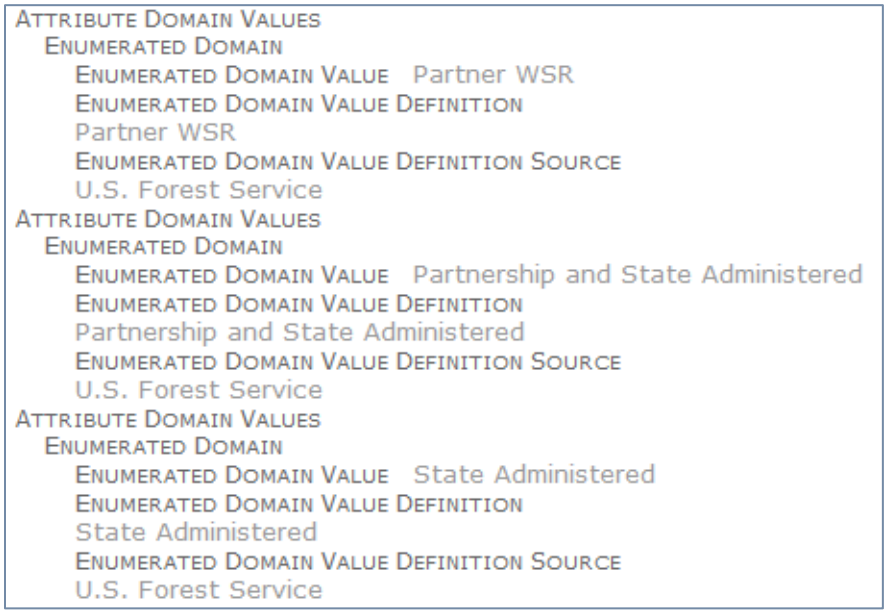


Figure 46: Sample Accepted Domain Values for Attribution in Metadata in ArcCatalog (bottom)
Example accepted domain values for attribution as displayed in the bottom portion of the **Description** tab in ArcCatalog (the bottom portion here refers to below the gray 'FGDC Metadata (read-only)' header).

```
<attrdomv>
    <edom>
        <edomv>Partner WSR</edomv>
        <edomvd>Partner WSR</edomvd>
        <edomvds>U.S. Forest Service</edomvds>
    </edom>
</attrdomv>
<attrdomv>
    <edom>
        <edomv>Partnership and State Administered</edomv>
        <edomvd>Partnership and State Administered</edomvd>
        <edomvds>U.S. Forest Service</edomvds>
    </edom>
</attrdomv>
<attrdomv>
    <edom>
        <edomv>State Administered</edomv>
        <edomvd>State Administered</edomvd>
        <edomvds>U.S. Forest Service</edomvds>
    </edom>
</attrdomv>
```

Figure 47: Sample Accepted Domain Values for Attribution in Metadata in Notepad++
Example accepted domain values for attribution as displayed in Notepad++.

Additional information about attribute values may be gleaned from the contents of the **overview** tag which is also nested within **eainfo**. The **overview** tag contains the following:

eaover: Entity and Attribute Overview -- detailed summary of the information contained in a data set.
eadetcit: Entity and Attribute Detail Citation -- reference to the complete description of the entity types, attributes, and attribute values for the data set.

For ISO, look for the **FC_FeatureCatalog** tag and the tags nested within. Regardless of the presence of these tags, if viewed using ArcGIS, information about any domains for the dataset attribute fields will be displayed under the **Fields** header in the **Description** tab.

Figure 48: Sample Accepted Domain Values for Attribution in ISO Formatted Metadata in ArcGIS
Regardless of whether the ISO metadata itself contains information on a dataset's attribution, ArcGIS will display information such as this in the upper portion of the **Description** tab. Look for the **Fields** header. This sample comes from the 'National Wilderness Areas' dataset ('S_USA.Wilderness.gdb' file geodatabase, 'Wilderness' feature class).

APPENDIX A: EDW METADATA TEMPLATE

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE metadata SYSTEM "http://fgdc.gov/metadata/fgdc-std-001-1998.dtd">
<metadata>
  <idinfo>
    <citation>
      <citeinfo>
        <origin><!--(Default) USDA Forest Service--></origin>
        <pubdate><!--Date published--></pubdate>
        <title><!--Name of dataset (ok to use spaces)--></title>
        <geoform><!--vector, raster, or table --></geoform>
        <onlink><!--For PUBLIC datasets use http://data.fs.usda.gov/geodata/edw/datasets.php. For INTERNAL data sets in the dashboard, use https://usfs.maps.arcgis.com/apps/webappviewer/index.html?id=da0bbc54ab834beaae20c2b5b35d28bc. Any other URL relevant to the dataset can also be used here. Tag can be repeated.--></onlink>
      </citeinfo>
    </citation>
    <descript>
      <abstract><!--A brief narrative summary of the data set--></abstract>
      <purpose><!--A summary of the intentions with which the data set was developed.--></purpose>
      <supplinf><!--Other descriptive information about the dataset (Optional)--></supplinf>
    </descript>
    <timeperd>
      <timeinfo>
        <sngdate>
          <caldate><!--Time period: The year that the data itself represents. For example, if it was digitized from base imagery, this would be the year the imagery was taken. Otherwise, if it is data collected in the field then it would be the range of dates that the data was collected. If using a range of dates, the tags would need to be changed from <sngdate> to <rngdates>.--></caldate>
        </sngdate>
      </timeinfo>
      <current><!--Currentness reference of the time period (above). Common examples include:
'Ground Condition' (if dataset was created using aerial photography as a reference),
```

'Recorded' (if the data was officially recorded as an observation in the field),

'Publication Date' (if the dataset was created from a source like a historical USGS Topo map)--></current>

</timeperd>

<status>

<progress><!--Complete, In work, or Planned--></progress>

<update><!--None planned, As needed, Weekly, Monthly, Annually--></update>

</status>

<spdom>

<bounding>

<!--autopopulated by esri-->

<westbc/>

<eastbc/>

<northbc/>

<southbc/>

</bounding>

</spdom>

<keywords>

<theme>

<themekt><!--(Default) ISO 19115 Topic Categories--></themekt>

<themekey><!--Use keywords from https://geo-ide.noaa.gov/wiki/index.php?title=ISO_Topic_Categories--></themekey>

</theme>

</keywords>

<accconst><!--(Default) Access Constraints:

'None' (if data set is accessible to the public as well as internal Forest Service users);

'Internal Only' (if data set accessible to Forest Service users with an Active Directory account);

'Restricted' (if data set accessible to a specified set of Forest Service users due to data sensitivity)-->

</accconst>

<useconst><!--(Default) The USDA Forest Service makes no warranty, expressed or implied, including the

warranties of merchantability and fitness for a particular purpose, nor assumes any

legal liability or responsibility for the accuracy, reliability, completeness or utility

of these geospatial data, or for the improper or incorrect use of these geospatial data.

```
These geospatial data and related maps or graphics are not legal documents and are not
intended to be used as such. The data and maps may not be used to determine title,
ownership, legal descriptions or boundaries, legal jurisdiction, or restrictions that
may be in place on either public or private land. Natural hazards may or may not be
depicted on the data and maps, and users should exercise due caution. The data are
dynamic and may change over time. The user is responsible to verify the limitations of
the geospatial data and to use the data accordingly.--></useconst>
  <ptcontac>
    <cntinfo>
      <cntorgp>
        <cntorg><!--(Default) USFS Chief Information Office, Enterprise Data Warehouse--></cntorg>
      </cntorgp>
      <cntaddr>
        <addrtype><!--(Defualt) physical--></addrtype>
        <city><!--(Default) Washington--></city>
        <state><!--(Default) DC--></state>
        <postal><!--(Default) 20250--></postal>
        <country><!--(Default) US--></country>
      </cntaddr>
      <cntvoice><!--(Default) Please send an e-mail to the address below.--></cntvoice>
      <cntemail><!--(Default) SM.FS.data@usda.gov--></cntemail>
    </cntinfo>
  </ptcontac>
  <datacred><!--Recognition of those who contributed to the data set (optional)--></datacred>
  <native> <!--(Default) Version 6.2 (Build 9200) ; Esri ArcGIS 10.5.1.7333--></native>
</idinfo>
<dataqual>
  <logic><!--Quality checks on the data or measures of accuracy--></logic>
  <complete><!--(Default) Data is complete as of publication.--></complete>
  <posacc>
    <horizpa>
```

<horizpar><!--Explanation of horizontal accuracy. Example: Generally the source information used to record spatial locations are from: 1) on-screen digitizing with a georeferenced topographic or image background; or 2) GPS field collected positions. Horizontal accuracy is variable.--></horizpar>

</horizpa>

</posacc>

<lineage>

<procstep>

<procdesc><!--Description of how the data set was produced or derived from the original source--></procdesc>

<procdate><!--The date that this happened.--></procdate>

</procstep>

</lineage>

</dataqual>

<spdoinfo>

<!--This section auto populated by esri upon import-->

<direct></direct>

<ptvctinf>

<sdtsterm>

<sdtstype/>

<ptvctcnt/>

</sdtsterm>

</ptvctinf>

</spdoinfo>

<spref>

<!--This section auto populated by esri upon import-->

<horizsys>

<geograph>

<latres/>

<longres/>

<geogunit/>

</geograph>

<geodetic>

```
        <horizdn/>
        <ellips/>
        <semiaxis/>
        <denflat/>
      </geodetic>
    </horizsys>
  </spref>
  <eainfo>
    <detailed>
      <enttyp>
        <enttypl><!--autopopulated filename--></enttypl>
        <enttypd><!--(Default) Feature class: A collection of geographic features with the same geometry
          type (such as point, line, or polygon), the same attributes, and the same
          spatial reference.--></enttypd>
        <enttypds><!--(Default) ESRI GIS Dictionary--></enttypds>
      </enttyp>
      <attr>
        <!--This section is needed for every attribute field-->
        <attrlabl><!--Field name--></attrlabl>
        <attrdef><!--Definition--></attrdef>
        <attrdefs><!--Source of the definition (e.g. U.S. Forest Service)--></attrdefs>
        <attrdomv>
          <!--List of possible values and their definitions-->
          <edom>
            <!--edom is used when there is a specific list of domain values. Repeat for every possible value.
          If there is a link to a list of values then use the <codesetd> tag instead.
          If the value could be any text or number then use the <udom> tag instead.
          If the values fall within a specific range of numbers then use the <rdom> tag instead.-->
            <edomv><!--Value--></edomv>
            <edomvd><!--Definition--></edomvd>
            <edomvds><!--Source of definition (e.g. USFS)--></edomvds>
```

```
            </edom>
          </attrdomv>
        </attr>
      </detailed>
    </eainfo>
    <distinfo>
      <distrib>
        <cntinfo>
          <cntorgp>
            <cntorg><!--(Default) USFS Chief Information Office, Enterprise Data Warehouse--></cntorg>
          </cntorgp>
          <cntaddr>
            <addrtype><!--(Default) physical--></addrtype>
            <city><!--(Default) Washington--></city>
            <state><!--(Default) DC--></state>
            <postal><!--(Default) 20250--></postal>
          </cntaddr>
          <cntvoice><!--(Default) Please send an e-mail to the address below.--></cntvoice>
          <cntemail><!--(Default) SM.FS.data@usda.gov--></cntemail>
        </cntinfo>
      </distrib>
      <distliab><!--(Default) The U.S. Forest Service makes no warranty, express or implied, nor assumes any
        liability or responsibility for the accuracy, reliability, completeness, or utility of
        these geospatial data or for the improper or incorrect use of those data. The data are
        dynamic and may change over time. The user is responsible for verifying the limitations
        of the geospatial data and for using the data accordingly.--></distliab>
    </distinfo>
    <metainfo>
      <metd><!--Date that this metadata XML was last updated--></metd>
      <metc>
        <cntinfo>
```

```
            <cntorgp>
              <cntorg><!--(Default) USFS Chief Information Office, Enterprise Data Warehouse--></cntorg>
            </cntorgp>
            <cntaddr>
              <addrtype><!--(Default) physical--></addrtype>
              <city><!--(Default) Washington--></city>
              <state><!--(Default) DC--></state>
              <postal><!--(Default) 20250--></postal>
            </cntaddr>
            <cntvoice><!--(Default) Please send an e-mail to the address below.--></cntvoice>
            <cntemail><!--(Default) SM.FS.data@usda.gov--></cntemail>
          </cntinfo>
        </metc>
        <metstdn><!--(Default) FGDC Content Standard for Digital Geospatial Metadata--></metstdn>
        <metstdv><!--(Default) FGDC-STD-001-1998--></metstdv>
    </metainfo>
</metadata>
```