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Understanding, creating, and using metadata

**Exercise 1: Examine, search, and update
metadata**

Estimated time: 40 minutes

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One of the GIS analysts in your organization recently left to pursue her passion for urban beekeeping. You have been asked to complete one of her projects collecting relevant hydrology data for Florida's Miami-Dade County to present at an international conference. Your job is to search for and find the data of interest, copy it into the personal geodatabase that will be taken to the conference, and update the metadata as needed.

Some of the data is documented according to a formal metadata standard. Some contains simple item descriptions. Still other components are documented with external text files.

After completing this exercise, you will be able to:

- Explore various ArcGIS metadata styles
- Search for data using ArcGIS metadata
- Edit ArcGIS metadata
- Attach enclosures to ArcGIS metadata
- Export ArcGIS metadata to standard-compliant xml files

Step 1: Start ArcCatalog and explore the data

In this step, you will explore your former coworker's existing geodatabases and their feature classes. As you would for any GIS project, you will first familiarize yourself with the data structure and contents. You need to determine:

- Is all of the data pertinent to your project?
- Is all of the available hydrology data stored in the same geodatabase?
- Does all of the data have metadata?

Start ArcCatalog.

In the Catalog tree, expand your C:\Student\META folder connection.

Expand both the AGC and Geo personal geodatabases.

To get familiar with a geodatabase's contents, you would typically preview all its feature classes. However, for the purpose of this exercise, you will preview only one feature class from each geodatabase.

In the AGC geodatabase, click the Mjrivp feature class, then click the Contents tab.

The name of the feature class in this case is not immediately meaningful. Do you think you know what kind of features these are?

Click the Preview tab.

The preview of the features may provide some further information, but it's still not enough for you to confidently confirm what kind of features these polygons represent and whether they will be appropriate to your project.

In the Geo geodatabase, click the Ecoreg feature class, then click the Preview tab.

Once again, the name of the feature class isn't very descriptive, but by previewing the geography and table, you can conclude that these polygons don't represent hydrologic features.

You see that not all the datasets are of interest to you, and previewing the data did not provide all of the information you need to decide whether to include the data in your project. The META folder contains a variety of data, and there could be more datasets that are neither county-level nor related to hydrology. To understand the data, you need more information.

To get the information you need, you will examine the metadata.

Step 2: Examine the metadata

In the Catalog tree, click the Basins13 shapefile, then click the Description tab.

By default, the metadata style in ArcCatalog is set to Item Description. This style of metadata is very concise, yet it provides the kind of information that many GIS users are most interested in.

Read the information under the Description heading.

- According to the description, what kinds of geographic features do these polygons represent?
- Will this data be appropriate to include in a presentation on Florida hydrology?

Using the other information in the item description metadata, answer the following questions.

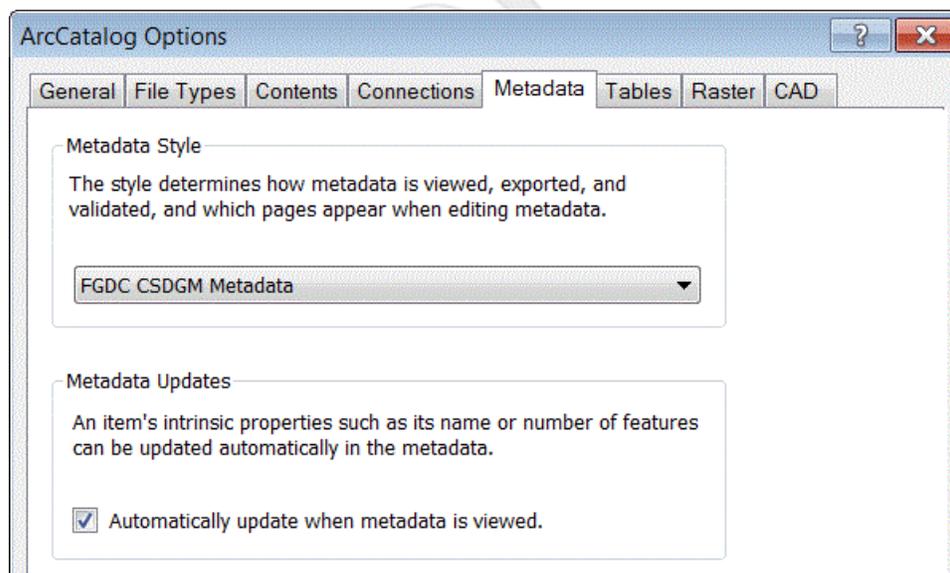
- Should this data be used to decide how much water a particular county or individual is entitled to?
- Who should be contacted regarding permissions to use this data?

The simple item description is one style of metadata that will suit many GIS users, but some organizations require more extensive documentation. They often adhere to an accepted standard for metadata, such as ISO or FGDC. ArcCatalog can display and edit these metadata styles as well. The feature classes in the geodatabase that you previewed in Step 1 were originally documented in a previous release of ArcGIS using the FGDC standard. In ArcGIS Desktop 10, the metadata data has been upgraded to ArcGIS metadata.

- In the Catalog tree, click the Mjripv feature class in the AGC geodatabase.
- Click the Description tab.

Since the metadata style is still set to Item Description, the Description tab displays only the portion of the metadata that matches with the Item Description categories. This is adequate for most purposes, but if you want to display the entire metadata, you need to change the metadata style.

- On the main toolbar, click Customize > ArcCatalog Options and click the Metadata tab.
- For Metadata styles choose FGDC CSDGM Metadata from the drop-down list.



Click OK.

Note: You will probably have to refresh your display to see the results of the change, so click View > Refresh or press F5 on your keyboard.

The difference in the metadata style may not be immediately apparent, but scroll down to the bottom of the Description tab and you will see two new headings: ArcGIS Metadata and FGDC Metadata.

In ArcGIS 10, metadata is stored according to an ArcGIS metadata format. Many of the elements in this format coincide with elements in the ISO and FGDC standards, while other elements are ArcGIS specific. When displaying the Description tab for an item that has existing FGDC or ISO metadata, elements that are common to both the ArcGIS and standard format will be displayed in the ArcGIS metadata. Any standard-specific or ArcGIS-specific elements will be displayed only in their respective categories.

Click ArcGIS Metadata > Resource Identification.

Notice that the Abstract in this metadata is the same as the Description from the simple Item Description style. When complete metadata exists, the Item Description style simply displays an appropriate subset.

- Based on the Abstract (Description), is this feature class a likely candidate for inclusion in your project about hydrology for only Miami-Dade county?

Notice also that many of the entries are in blue, while others are in green. Blue elements are those that are common to both the ArcGIS metadata format and the existing standard (FGDC in this case). The green elements are those that are specific to ArcGIS metadata only.

If necessary, scroll down to the Processing Environment.

Notice that this and several other entries have an asterisk (*) next to them. The * connotes that the element is automatically maintained by ArcGIS. There is no reason to edit these items manually.

If you like, you can explore some of the other categories in both the ArcGIS and FGDC metadata headings. When you're finished, collapse both metadata headings.

Step 3: Edit an item description

So far you have explored feature classes that have either simple item descriptions, or complete standardized metadata. Now you'll explore a shapefile that doesn't have either yet. Instead, it's documented with a stand-alone text file.

- In the Catalog tree, click the Fnaica01 shapefile, then click the Description tab.

The Item Description for this shapefile is empty. If you investigate the ArcGIS metadata, you will notice that the ArcGIS-controlled items are populated, but the other items are not.

- In the Catalog tree, notice that there's another file named Fnaica01. This is the text file that contains the documentation for the Fnaica01 shapefile.

- Double-click the Fnaica01 text file to open it in a text editor.

Though limited, this text file does have information that is useful and can easily be transferred to the item description. First, however, you will change the metadata display style back to Item Description.

- Leave the Fnaica01 text file open in the text editor.
- On the main toolbar, click Customize > ArcCatalog Options and click the Metadata tab.
- Click Item Description from the Metadata Styles drop-down list.

- In the Catalog tree, click the Fnaica01 shapefile, then click the Description tab.

- At the top of the Description tab, click the Edit button.

- In the Tags field, type the following text:

Conservation, Natural Areas, Environment, Central Florida

- Copy the following text from the Fnaica01 text file and paste it into the Summary field in the item description:

The data are intended for educational purposes only.

- Copy the following text from the Fnaica01 text file and paste it into the Description field in the item description:

This dataset illustrates areas of conservation interest as categorized by the Florida Natural Areas Inventory (FNAI).

- Copy the following text from the Fnaica01 text file and paste it into the Credits field in the item description:

The data used in this course is courtesy of the University of Florida GeoPlan Center. The data is from the Florida Geographic Data Library, a product of the

University of Florida GeoPlan Center with support from the Florida Department of Transportation and the Florida Department of Environmental Protection.

- Copy the following text from the Fnaica01 text file and paste it into the Use Limitation field in the item description:

The FGDL data are copyrighted by the University of Florida GeoPlan Center for the FGDL contributing agencies and organizations and cannot be resold.

- Click the Save button at the top of the Description tab.

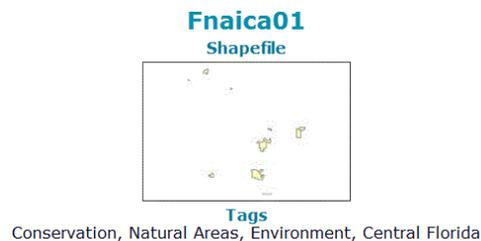
The only thing lacking in the item description now is a thumbnail. Even though this is optional, it can be very helpful when browsing data, plus it's easy to create.

- Click the Preview tab.

- On the Geography toolbar, click the Create Thumbnail button .

- Click the Description tab again. You should now see the thumbnail updated in the item description.

When you are finished, your Description tab should look like this:



Summary

The data are intended for educational purposes only.

Description

This dataset illustrates areas of conservation interest as categorized by the Florida Natural Areas Inventory (FNAI).

Credits

The data used in this course is courtesy of the University of Florida GeoPlan Center. The data is from the Florida Geographic Data Library, a product of the University of Florida GeoPlan Center with support from the Florida Department of Transportation and the Florida Department of Environmental Protection.

Access and use limitations

The FGDL data are copyrighted by the University of Florida GeoPlan Center for the FGDL contributing agencies and organizations and cannot be resold.

You now have all of the information from the text file in the Fnaica01 item description. But for historical purposes, it's a good idea to retain the original text file. ArcGIS

metadata allows you to include any type of enclosure as part of the metadata properties. To add an enclosure, you use the Metadata toolbar.

- On the main ArcCatalog toolbar, click **Customize > Toolbars > Metadata**.
- Verify that you have the Fnaica01 shapefile selected in the Catalog tree.
- On the Metadata toolbar, click the Metadata Properties button .
- In the Metadata Properties dialog box, click **Add**.
- For **Path**, click the **Browse** button, navigate to the META\Fnaica01.txt file, and click **Open**.
- For **Description**, type **Original text documentation**.
- Click **OK**.

The text file is now included with the metadata as an enclosure.

Now that you have explored and edited various types of metadata for the feature classes in the META folder, you will use it to search for data that meets the needs of your project.

Step 4: Search metadata

For convenience, in this exercise you'll assume that all the datasets are now documented with at least an item description. This means that all of the data's information (like tags) has been indexed and is available for quick searching in ArcGIS Desktop.

So far, from your examination of the data structure and metadata, you can draw these conclusions:

- The data is stored in various locations.
- County-level and state-level data related to various themes may be stored in the same location.
- The data is in various formats (geodatabase feature classes, shapefiles).
- The metadata for all the datasets has both theme and place tags.

Based on what you have discovered about this data, you'll use the ArcGIS Desktop Search Window to find the data you need, using the following search criteria:

- The place keyword includes the words "Miami-Dade."
- The theme keyword is the word "hydrology."

- On the Standard toolbar, click the Search Window button .
- Click the Data link to constrain the search to just datasets.
- In the lower portion of the window, notice that you can filter the search results even further by data type. In this case you will keep the default of searching for all data types.
- In the Search window, type **hydrology** in the text box and click the Search button.

How many results does the search return? Since you only searched using one of the keywords, your results include data you most likely do not need.

- In the Search window, point to, but do not click, the Watershed_CSI result.

Notice that a pop-up appears with information from the item description.

From the tags in the pop-up window, you can probably determine why this particular shapefile is not relevant to your project. It contains data for the entire state of Florida, not just Miami-Dade county.

The Search window allows you to search by multiple keywords. When multiple keywords are used, the expression operator is assumed to be AND, meaning that the tool will search for data that meets both criteria. If you want to use other operators, such as OR, you need to add them manually.

- In the Search window, type **Miami-Dade hydrology** in the text box and click the Search button.

How is the number of returned matches different this time? These results meet the criteria of having both the words "Miami-Dade" and "hydrology" in the item description.

Now you have found the data that matches your criteria, but can you use it in the way that you want to? Remember, the data will be presented to the public during a conference, but sometimes data has restrictions placed on its use and distribution. You need to examine the metadata to see if you have permission to make the data public.

- In the Search window, point to, but do not click, the Wtrwpc13 result.

The pop-up window displays some of the item description information, but the information on use limitations is not included.

- In the pop-up, click the Item Description link.

- Examine the Use Limitation to see if this dataset is can be made public.

As with most of the data in the Search results, it's permitted to use the Wtrwpc13 feature class as long as it's not resold.

- Examine the description for the Rrnstn2 search result.
 - Can this dataset be made public?
 - Why or why not?

Step 5: Move the data to a geodatabase

To take your data to the conference, you will store it in a personal geodatabase.

- Close the Search window.
- Right-click the META folder and click New > Personal geodatabase.
- Name the new geodatabase Share.

The datasets that you need to move are:

- Wtrwpc13 feature class
 - Basins13 shapefile
 - Hy100p13 shapefile
- Navigate to the Wtrwpc13 feature class in the AGC geodatabase.
 - Right-click the Wtrwpc13 feature class and choose Copy.
 - Right-click Share.mdb and choose Paste. Click OK in the Data Transfer window.

Note: If you don't see Share.mdb in the Data folder, right-click the Data folder and choose Refresh.

Next, you'll add the data from the two shapefiles to Share.mdb.

- In the META folder, right-click Basins13.shp and choose Export > To Geodatabase (multiple).
- Click Hy100p13.shp and drag it into the Input Features box inside the Feature Class to Geodatabase (multiple) dialog box.
- For Output Geodatabase, browse to the META folder and click Share.mdb.
- Click Add.

- Click OK.
- Close the progress window when the export process completes.
- Expand the Share geodatabase.

The data you want to present at the conference is now located where you want it, in the Share geodatabase. Now you have one final task to perform—exporting the ArcGIS metadata to the more internationally recognized ISO standard.

Step 6: Export the metadata

As we discovered in a previous step, the metadata for these feature classes was originally created using the FGDC standard (which is specific to the United States) and then upgraded to the ArcGIS metadata style. Since this data will be presented at an international conference, it may be appropriate to export the metadata to a standard that will be more recognized by the audience.

The ArcGIS metadata tools allow you to export stand-alone xml files of your metadata in a standards-compliant format. To demonstrate this, you will export the metadata for one of your feature classes in the Share geodatabase to an ISO 19139 xml file.

- In the Catalog tree, click the HY100p13 feature class in the Share geodatabase.

Now you will change the metadata style to ISO 19139.

- Click Customize > ArcCatalog Options > Metadata tab.
- Choose ISO19139 Metadata Implementation Specification from the Metadata Style drop-down and click OK.
- If necessary, click the Description tab.
- On the Description tab, click the Export button.
- In the Export Metadata tool, the Source Metadata field should already be populated with the HY100p13 feature class.
- Verify that the translator is ESRI_ISO2ISO19139.xml. If it isn't, navigate to the ArcGIS install folder, then to Desktop10.0\Metadata\Translator to find it.

For Output file, navigate to your META folder and name the output file **HY100p13_ISO.xml**.

Click OK.

In the Catalog tree, click your META folder, then click View > Refresh.

The new HY100p13_ISO.xml should appear in your META folder.

Double-click the HY100p13_ISO.xml file to open it in your web browser.

Scroll down the page just a little until you find the `<metadataStandardName>` tag.

Note: You can also press Ctrl+F on your keyboard to bring up the text search tool in your web browser and search for the `<metadataStandardName>` tag that way.

- What metadata standard is used in this xml file?

Now that you have this stand-alone metadata xml file, you could include it with your data if you distribute it to any participants at the international conference.

Your data is now ready to go to the conference.

Close ArcCatalog.

Conclusion

In this exercise, you examined various styles of metadata. You also looked for and found spatial data when you searched for metadata. The ArcCatalog Search window simplified your task and made the data search considerably faster than examining datasets one at a time in the Catalog tree.

Because the data was going to be shared internationally, you also used the Export Metadata tool to export your ArcGIS metadata to a stand-alone xml file that complies with the ISO standard.