

Get a New Strategy

Five easy ways to streamline geospatial metadata production



By Jessica L. Zichichi and Caroline S. Roberts, Innovate!, Inc.

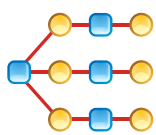
Is **metadata** something that your organization can just **never** seem to get to?

Is developing **metadata** for your resources **difficult** and time consuming?

Do you think **metadata** compliancy is just **too complicated**?

If so, you may want to rethink your metadata development strategy. Simply making a few changes in your metadata production process will not only reduce the time it takes to develop metadata but will also greatly improve the quality of your records. Use the five steps provided below and you will be creating high-quality, compliant metadata before you can say, “Federal Geographic Data Committee’s Content Standard for Digital Geospatial Metadata!”

This tutorial provides some basic recommendations for improving metadata production. It assumes the reader knows how to use ArcGIS ArcCatalog and has some familiarity with geospatial data and metadata topics in general. Although there are currently two standards available for documenting geospatial metadata in the United States—the Federal Geographic Data Committee’s (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM) and the North American Profile (NAP) of ISO 19115/19139—this tutorial focuses on implementing the FGDC CSDGM. Although focused specifically on the implementation of the FGDC CSDGM standard, the principles and techniques described are applicable to those implementing the NAP of ISO 19115/19139.



Step One

Create a Metadata Implementation for Your Organization

Developing a metadata implementation is an important but often overlooked step in metadata development. In fact, many people are not familiar with the concept of developing a metadata implementation. A metadata implementation defines how to interpret a metadata standard for a particular group or organization. Because many metadata standards are large and often include a number of free-text fields, it can be useful to review the standard with your organization’s objectives in mind and develop an organizational implementation specifying requirements that fit your needs. This will help standardize the way your group produces metadata.

Your organization may develop metadata for a number of inter-related reasons that can include providing a record of processing, serving as a legal document, or enabling resource sharing. The nature of your metadata needs will determine how your implementation is structured.

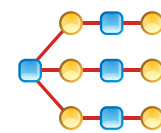
- If your concerns include FGDC minimum compliancy, you will need to include FGDC CSDGM sections one and seven (required for minimum compliancy).

- If data quality and processing steps are important, section two should be included.
- If your data includes attributes, then section five will be required.
- If you distribute your resources, you will want to review section six.

It can be useful to consider each section when creating your implementation, prioritizing those sections that are most critical to your needs.

Depending on the size of your organization and the number of metadata creators, the steps needed for developing an implementation may vary. For large organizations, it may be instructive to form a workgroup to review your chosen standard, define language for important fields, and identify the fields that you will require. Once these issues have been decided, you can develop a template (described in the fifth step in this article) along with descriptive documentation for your metadata developers. An example implementation developed by the United States Environmental Protection Agency (EPA) for geospatial metadata (called the EPA Geospatial Metadata Technical Specification Version 1.0) is available at EPA’s Web site (www.epa.gov/geospatial/policies.html).

Taking the time to develop an implementation as a first step in improving metadata production will greatly assist in making subsequent metadata development easier. You will improve consistency across your organization while saving time and ensuring that your records include the information you want. For additional background on metadata topics, visit the Innovate metadata training Web site. The training modules provided at this Web site can help familiarize you with the basics of the FGDC CSDGM, the NAP of ISO 19115/19139 standard, metadata catalogs, and contributing information to Geospatial One-Stop.



Step Two

Choose an Appropriate Metadata Editing Tool

Developing metadata can be especially challenging if you are not using the right tools to help streamline and automate the process. Making the right choice in editing tools will increase your productivity considerably. Some considerations for choosing a tool may include software availability (freeware, licensed, or purchased product), the editing environment (Web based or desktop), flexibility, ease of use, access to help, and support for full FGDC and/or ISO standards. In some cases, your organization may choose a combination of available

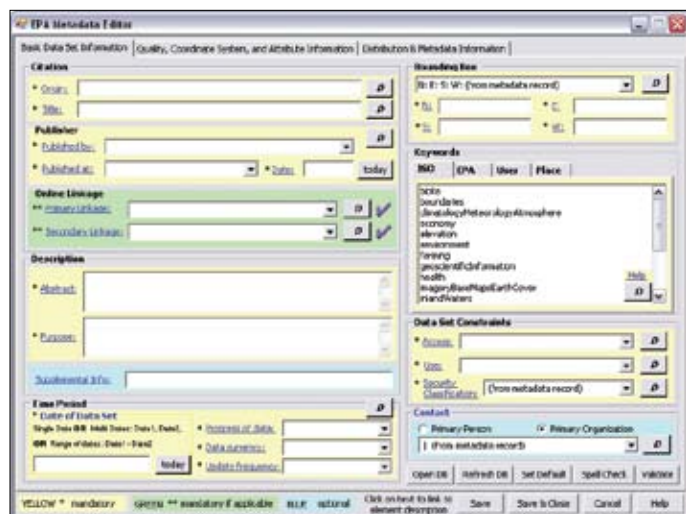
Make a few simple changes in metadata production and greatly improve the quality of your records.

tools to meet your needs. It is important to evaluate your needs against the features that particular tools offer when making a decision.

If you would like more information about tools or considerations for choosing one, a number of resources are available. The FGDC Web site includes information on metadata tools and choosing the appropriate tools for your needs. This information covers tools for both FGDC CSDGM and ISO 19115/19139 editing.

In addition, the Innovate metadata training Web site provides information about popular tools and considerations for using them. A metadata tools comparison spreadsheet (located with the sample data) is available with Microsoft PowerPoint training modules that contain information about considerations for choosing tools (introductory slides, module 3).

One popular choice is the EPA Metadata Editor (EME) version 3.0. EME is a freely available ArcCatalog extension that provides a number of key features including clearly identifiable requirements, buttons that autopopulate a record with your default information, use of a configurable Microsoft Access database to allow you to specify defaults, and an integrated help system. To access the EME and related resources (e.g., training videos, frequently asked questions, or source code) go to the EME Web site.

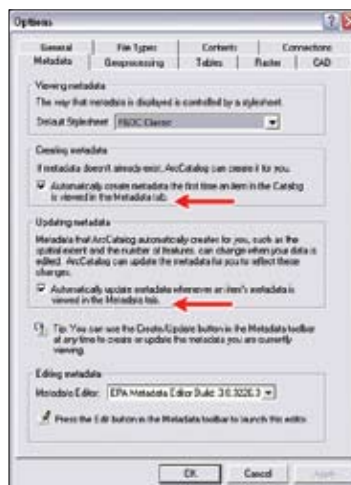


The EPA Metadata Editor (EME) interface

Synchronization is the process of inserting information about your dataset into your metadata, which may include attribute information, spatial extent, coordinate system information, or other details. Enabling synchronization causes ArcCatalog to insert these details into your metadata whenever you click on a dataset in ArcCatalog. This is beneficial because it automates the process of documenting these details and helps ensure metadata integrity.

However, the process may have some unintended side effects such as inserting information you do not want in your records, simultaneously inserting both FGDC and ISO elements, or inserting noncompliant information. To control this, you should configure your synchronizers.

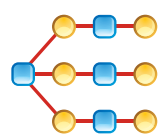
ArcCatalog allows you to enable and disable your synchronizers and select which synchronizers to use. Turning synchronization on or off is performed within the Metadata tab of the ArcCatalog settings interface by choosing Tools > Options and selecting the Metadata tab. In this interface, you can enable or disable the synchronization process and select which synchronizers to use by adding the Set Working Synchronizers button to an ArcCatalog toolbar. This button allows you to select which default synchronizer to use (FGDC, ISO, or Geography Network). The drawback to this approach is that it results in an all-or-nothing approach. Synchronization is either entirely enabled or entirely disabled. Some users may want additional flexibility.



Turning synchronizers on or off in ArcCatalog



Set working synchronizers in ArcCatalog



Step Three

Configure Your Metadata Synchronizers

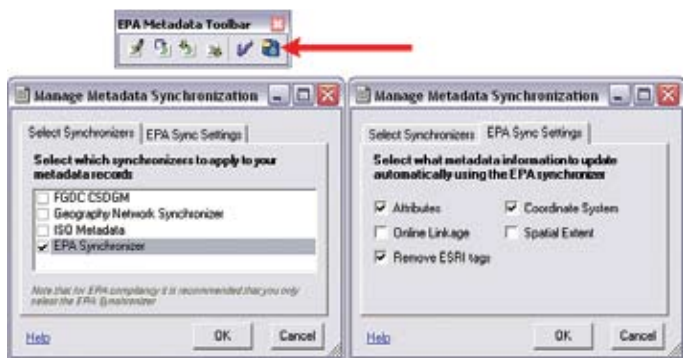
Many people who create metadata are not aware of metadata synchronizers. In fact, many metadata developers are using synchronizers without knowing it. This is because synchronization is an automated process in ArcCatalog that is enabled by default during installation.

An alternative to the all-or-nothing approach just described is to use the EPA Synchronizer that comes with EME version 3.0. The EPA Synchronizer allows you to specify which elements to synchronize with the dataset. That way, your organization can choose which elements to update as part of the synchronization process. You can also specify which synchronizers to use within the EPA Synchronizer interface. Access the EPA Synchronizer from a button on the EME toolbar. For more information, visit the EPA EME Web site and access the EPA Synchronizer training video in module 2. For additional, more general information about how synchronizers work, visit the Innovate metadata training Web site and access the introductory training modules (module 2).

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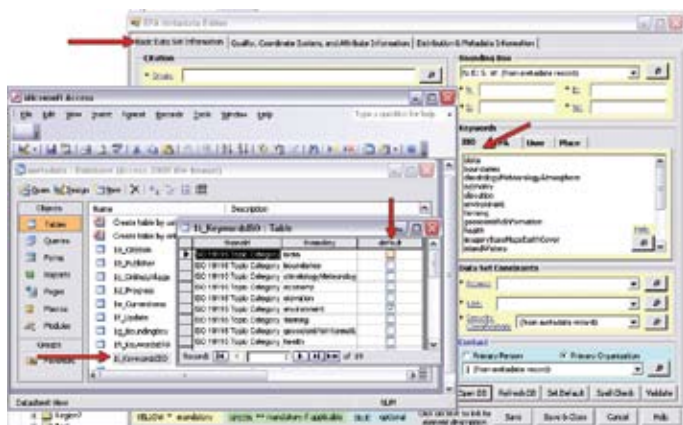


Using the EPA Synchronizer

Step Four Customize and Share Your EME Database

One of the biggest benefits of EME is the ability to customize it by changing information in the EME database. EME utilizes a simple Microsoft Access database to populate the drop-down lists and defaults within the user interface (UI). You can modify the contents of the database to reflect your defaults using Microsoft Access, then use that information in the EME UI.

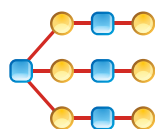
To do this, click the Open DB button in the EME UI. When the database opens, you will see a list of tables that are available for editing. The table names reflect their location within the EME UI. For example, table 1b_Publisher contains information found on tab 1 of the EME UI. Similarly, table 2a_Completeness contains information found on tab 2 of the EME UI. This design simulates the flow of elements as shown in the EME UI so that it is easy for users to identify which tables they would like to edit. You can add information to your table of choice to suit your metadata needs. To make your information the default within EME, select the check box for your entry in the default column within the table. If you select a new default for your information, make sure to deselect the currently existing default.



The EME database structure

For more information, see *Creating and Maintaining Metadata Using ArcGIS Desktop, a Web course, and Metadata: Tips and Tricks, a free Web training seminar. Both are available at www.esri.com/training.*

The EME database is located in the EME installation directory. By default, it's called metadata.mdb and is installed in C:\Program Files\Innovate! Inc\EPA Metadata Editor. However, you can change the location of the EME database and specify that EME point to this new location. This can allow your organization to share the EME database across multiple parties. To change the location of the EME database, access the "Setting up the EME Database" section of the EME help file.



Step Five Create Metadata Templates

Once you have a standard approach for developing metadata, you may want to consider creating metadata templates. Using templates can provide even greater consistency and automation within your metadata creation practices. As the name implies, metadata templates are used as a basis for developing metadata by providing default information. You can create a template by starting from scratch or by using a pre-existing metadata record. If you already have a record that contains information that your organization can reuse, export it to XML format (FGDC CSDGM specifically) and save the file on your machine. Then you can import that file and use it as a basis for other resources. Be careful when importing metadata templates, as they overwrite all pre-existing metadata. More information on creating templates is available in the introductory section of module 3 at the Innovate metadata training Web site.

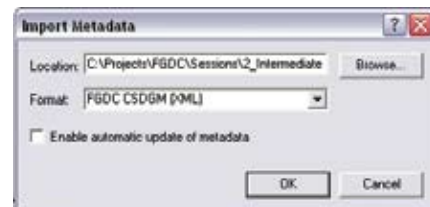
Depending on the nature of your data, it may be useful to create a series of templates organized around different topics. For example, you may consider creating templates that reflect the different types of geospatial assets used by your organization (e.g., downloadable data, live data and maps, or applications), or it may make more sense to create a series of templates that reflect the types of data maintained by your organization.

While going through all the steps listed in this article is recommended for improving metadata creation, it can be beneficial to start by incorporating just one or a combination of these suggestions. Whatever your needs, taking a little time to initiate some better metadata practices will be well worth your investment and will increase the value of your resources in the long run.



Exporting a metadata record

Importing a metadata record





Site	URL	Resources available
EPA Metadata Editor (EME) Version 3.0	www.epa.gov/geospatial/eme.html	Freely available ArcCatalog metadata extension
Federal Geographic Data Committee	www.fgdc.gov/metadata/geospatial-metadata-tools	Information on metadata tools and choosing the appropriate tools for both FGDC CSDGM and ISO 19115/19139 editing
Innovate!, Inc.	innovateteam.com/projects/epa-and-partners-geospatial-metadata-training/	Training modules on metadata topics and the basics of the FGDC CSDGM, the NAP of ISO 19115/19139 standard, metadata catalogs, and contributing information to Geospatial One-Stop
U.S. Environmental Protection Agency	www.epa.gov/geospatial/policies.html	EPA Geospatial Metadata Technical Specification Version 1.0

Resources

For more information, contact

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Caroline S. Roberts, GISP, has been working in the field of GIS for more than 10 years. She holds a master's degree in marine science and bachelor's degree in natural resources. Her current projects include utilizing GIS for marine environmental remediation activities, aeronautical surface mapping for obstruction analysis, and geospatial metadata training. Roberts has recently finished leading a free, comprehensive metadata training program through an FGDC-sponsored Cooperative Agreements Program grant.

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