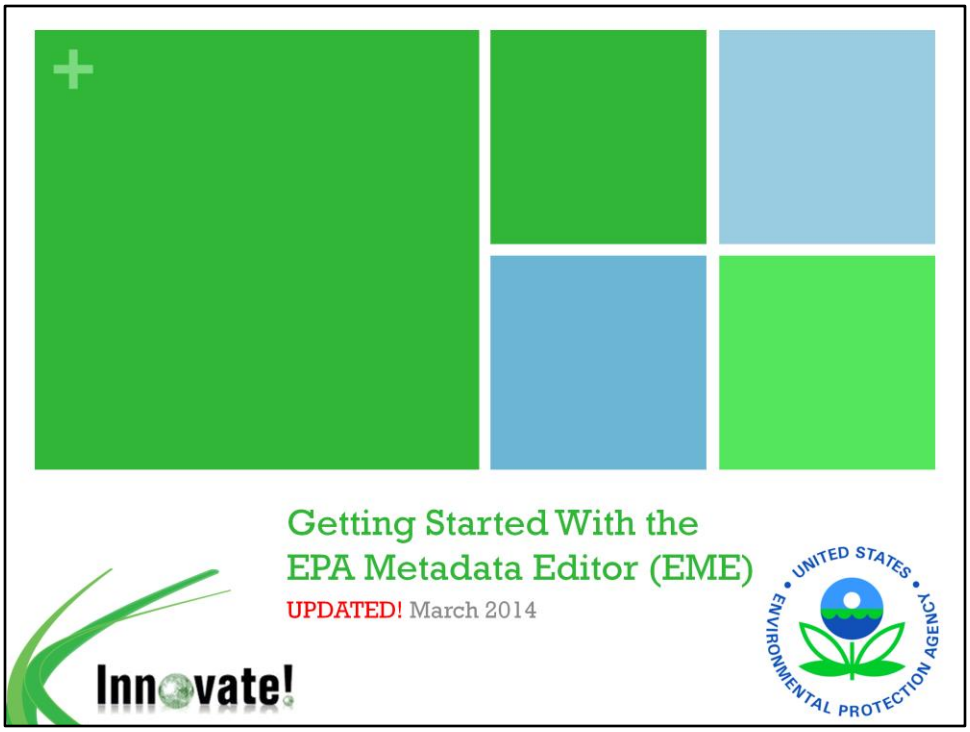


Welcome, everyone. I'm with Innovate's geospatial solutions group. and I'm pleased to meet all of you to present the EPA Metadata Editor.

Today's Agenda

- Introduction
- EME Demo
- Installation Requirements
- User Interface Basics +DEMO
- EME Database +DEMO
- Synchronization and Validation +DEMO
- Suggested Workflow
- Advanced Features & Topics
- Getting Help
- Questions/Discussion

Today is the first in a series of EME training sessions. In this first session we'll cover the EME basics. We will go over installation, introduce you to the EME's main features – including setting up the EME database and configuring synchronization and validation – and guide you through a suggested workflow. We'll touch on a few advanced features of EME, show you where to find additional information, and answer as many of your questions as possible.

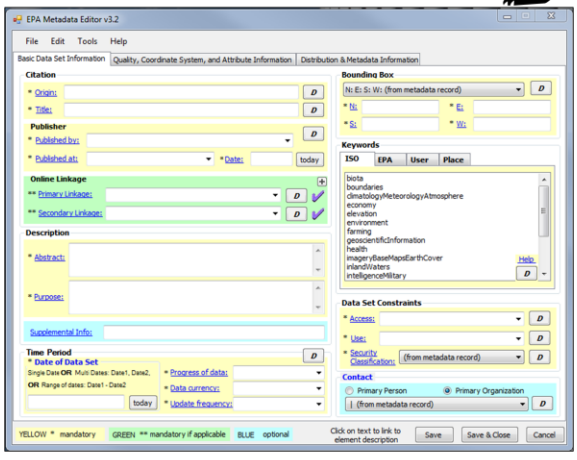
When I first started using the EME, I had a lot of experience with GIS but very little experience creating metadata. I know that the intricacies of creating and editing metadata aren't necessarily obvious just because you're a "GIS person." So this will be an introductory presentation, but hopefully it will also include useful information for our more experienced users.

Introduction

Gathering metadata for the winter

The EPA Metadata Editor (EME) In a Nutshell

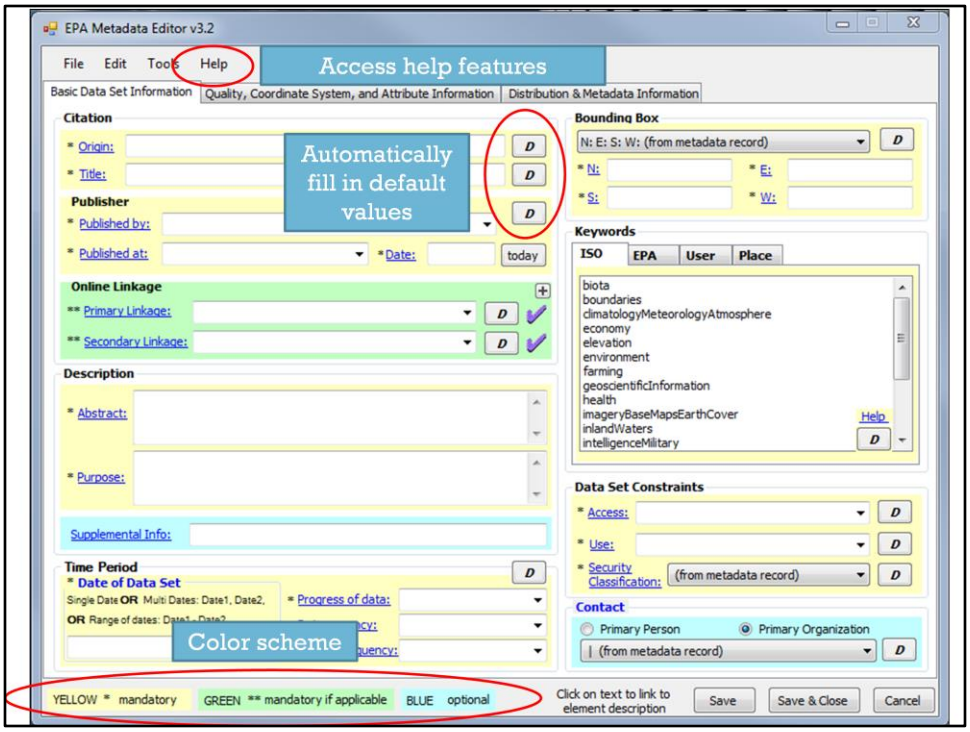
- Simple geospatial metadata editor
- Standalone application or ArcCatalog extension
- Compatible with ArcGIS 10.X



https://edg.epa.gov/EME/

The EME is a simple geospatial metadata editor that allows users to create and edit records that meet the EPA Geospatial Metadata Technical Specification and Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata requirements. The FGDC CSDGM, besides being a mouthful, is the current US Federal metadata standard. By using the EME, you can ensure that your records will meet these very detailed standards and save yourself some time and effort in the process.

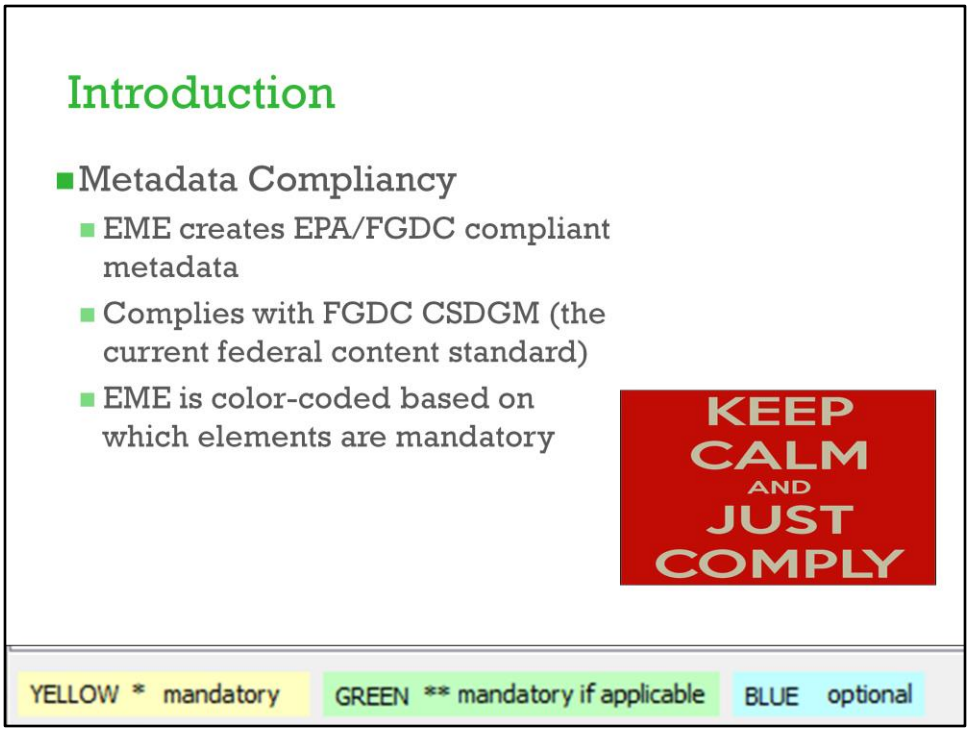
The EME comes with basic EPA defaults and an EPA metadata validation service. You can customize it to meet your needs, but right off the bat a lot of the work is already done for you. EME works as either a standalone application or as an ArcCatalog extension. EME 3.2 is compatible with ArcGIS 10.0 and higher, and it allows you to work around some of the eccentricities that Esri introduced when they changed the way metadata is handled in 10.0.



Here is the EME user interface. This is what you'll see when you open the program, either from ArcCatalog or as a standalone application. Each of these blank text boxes represents a metadata element. You'll notice that there are three tabs, each of which contains a set of metadata elements. The Help menu at the top is useful. EME comes with some very detailed Help documentation, so bear in mind that the Help is accessible from the user interface.

I want to point out these "D" buttons because they're one of the EME's most important features. By clicking the D button, the corresponding field is automatically populated with Default information. You can customize the Defaults to meet your needs – and we'll be going over how to do that. So for example, if you have a group of metadata records that all share the same Publisher information, you can set that information as the Default and only fill it in once.

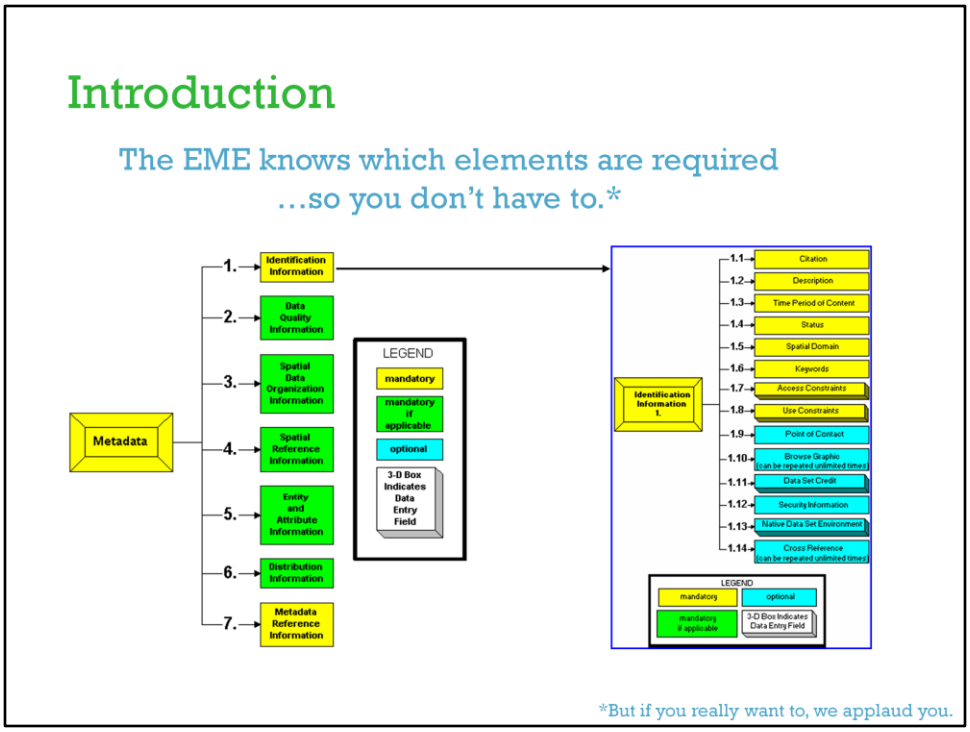
This color scheme key is also noteworthy. It distinguishes between fields that are mandatory, mandatory if applicable, and optional. By completing all of the mandatory and mandatory-if-applicable fields, you can be sure that your record will be compliant with EPA and FGDC standards.



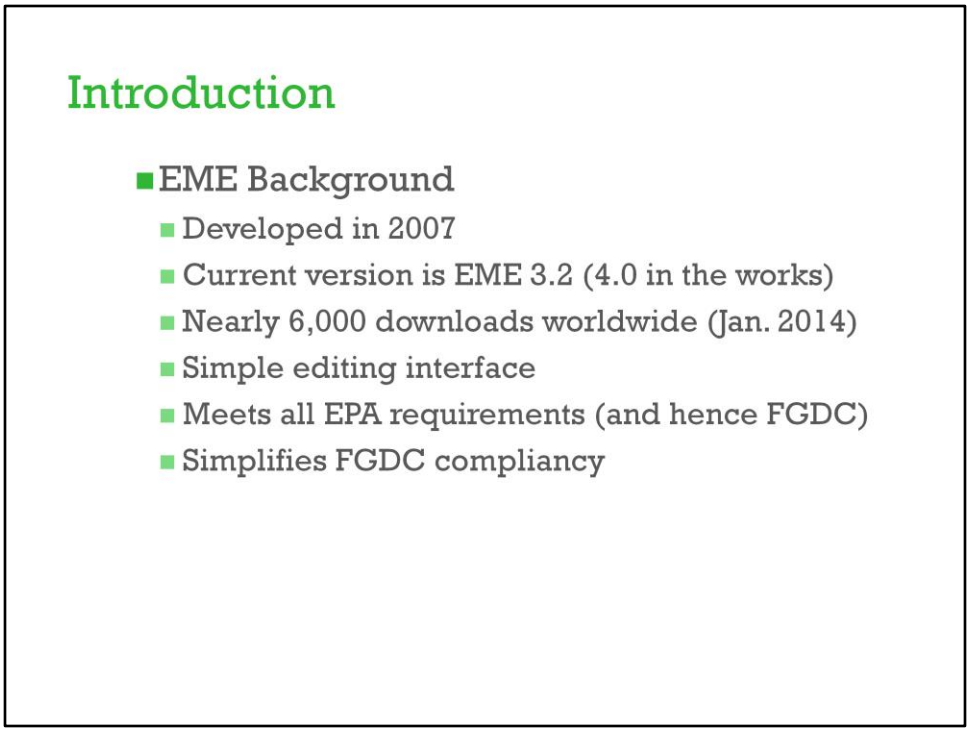
Let's spend a minute talking about metadata compliancy and why it matters.

FGDC has established minimum requirements for metadata. Fulfillment of these requirements results in metadata compliancy. The rules are carried out by classifying sections as mandatory, mandatory if applicable and optional. This can become tricky with compound elements in a record – some of them have nested requirements, which can be confusing. Additionally, the information must be documented using the correct format for some data elements. There are not a lot of data format and content requirements in the FGDC CSDGM. Many fields are free text, but there are some requirements for fields that are supposed to contain particular types of information, such as numbers or dates.

The EME color coding makes it simple to sort through these requirements painlessly.

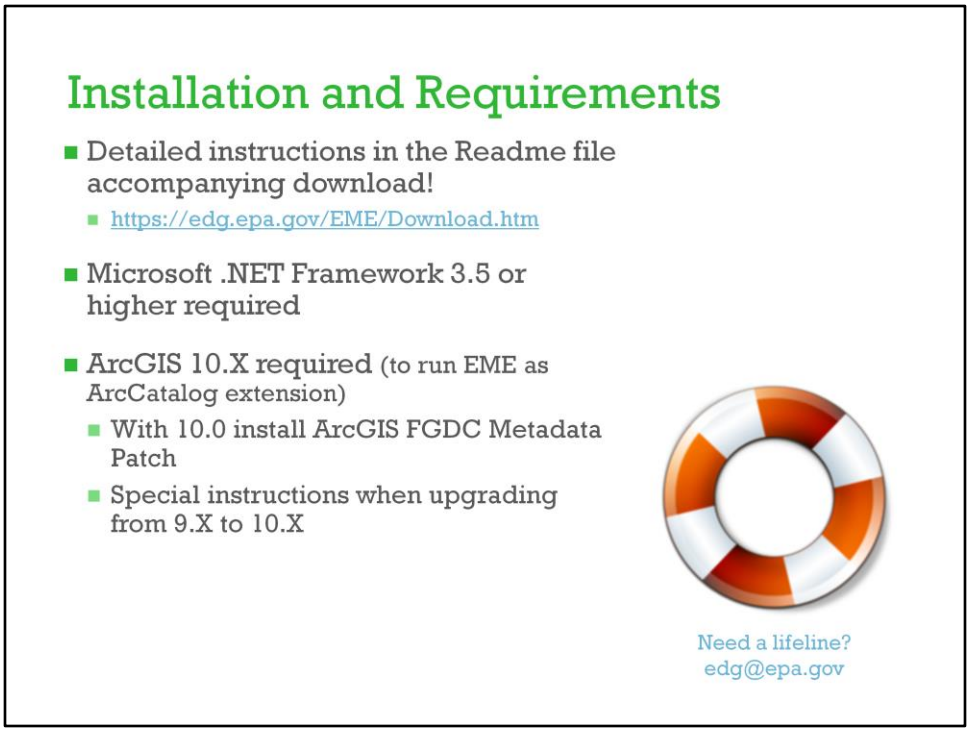


This is a diagram that I don't like to look at it, so we won't spend much time on it. It's a representation of which FGDC CSDGM elements are required and which are not. The EME tries to strike a balance between being complete and keeping the user interface simple, so it doesn't include all FGDC fields. The next version of EME will include some of these additional fields based on user feedback, but it's always a bit of a balancing act between simplicity and inclusiveness.



Creating metadata has been a challenge for agencies for many years, often due to a lack of tools that provide a simple editing interface that meets all requirements. To address this challenge, EPA developed the EME back in 2007. Since then it has been downloaded nearly 6,000 times by users around the world. It was one of the first FGDC metadata editors to be compatible with ArcGIS 10.

Its streamlined design, integrated help system, and use of defaults and drop-downs simplify the process of creating metadata that meets FGDC requirements. The current release of EME provides users with an FGDC metadata editor that is compatible with ArcGIS 10 and runs as a standalone tool. Additionally, EME for ArcGIS is deployed with a customizable synchronizer and EPA Validation tool.



If you haven't installed EME yet, but you want to, there are a couple of things to consider. These are all covered in the Readme file that accompanies the download.

First, you will need Microsoft .NET Framework 3.5 or higher in order to run the EME. Microsoft's .NET Framework is freely available and can be accessed from Microsoft's website. You can determine what version of the .NET Framework is on your machine by going to Start->Control Panel->Add or Remove Programs. You may see multiple versions of Microsoft .NET Framework (for example, versions 1, 2, and 3 may all be on your machine) which is fine—they can peacefully coexist. Just make sure that version 3.5 or higher is installed.

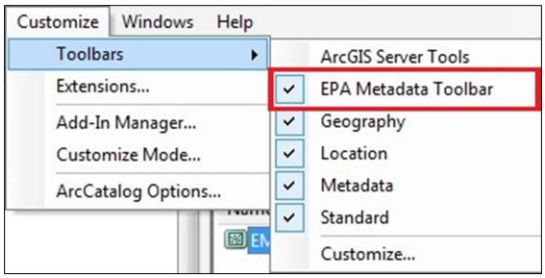
Second, you must be running ArcGIS 10.0 or higher if you want to run EME as an ArcCatalog extension. If you are running 10.1 or higher, the installation and operation of EME should work fine. However, with ArcGIS 10.0, you will need to install Esri's FGDC Metadata patch, which is available on the Esri website.

And for those folks who have been using EME with ArcGIS 9.X, there are special instructions to upgrade to 10.X included in the README file. Basically, it involves uninstalling your old EME before installing the new version. EPA has included a patch for this in the download, for those of you who need it.

You can always contact us for assistance at edg@epa.gov

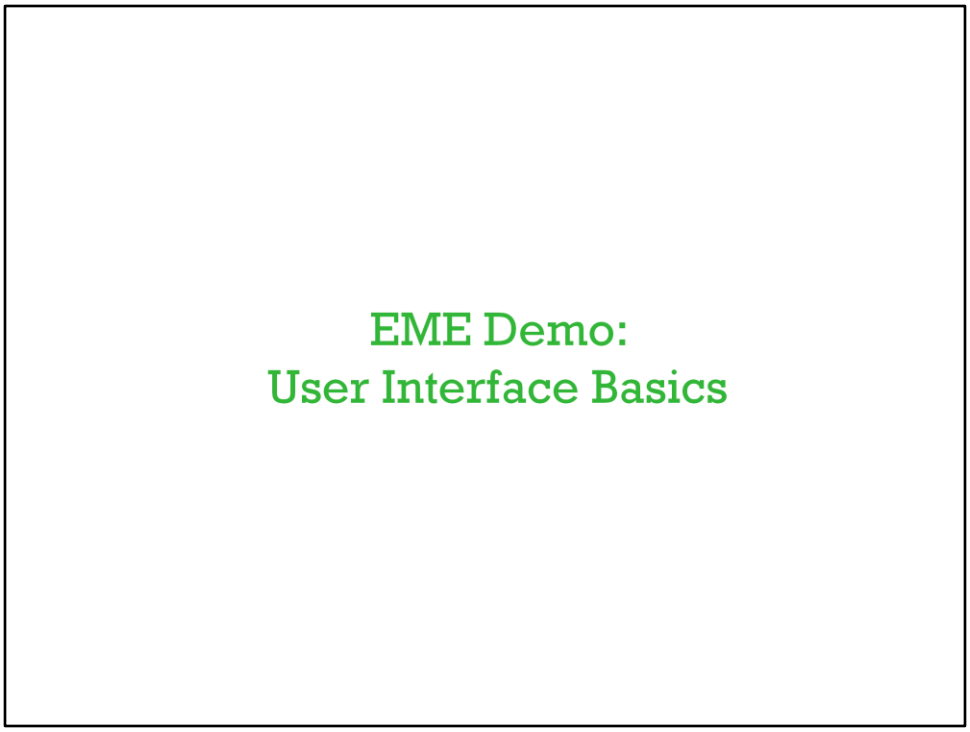
Installation and Requirements

- Installing the EME toolbar for ArcCatalog
  - Customize→ Toolbars→ Customize→ Commands→ Select "EPA Metadata Tools" from Categories menu
  - EPA Metadata Toolbar should appear in Toolbars menu

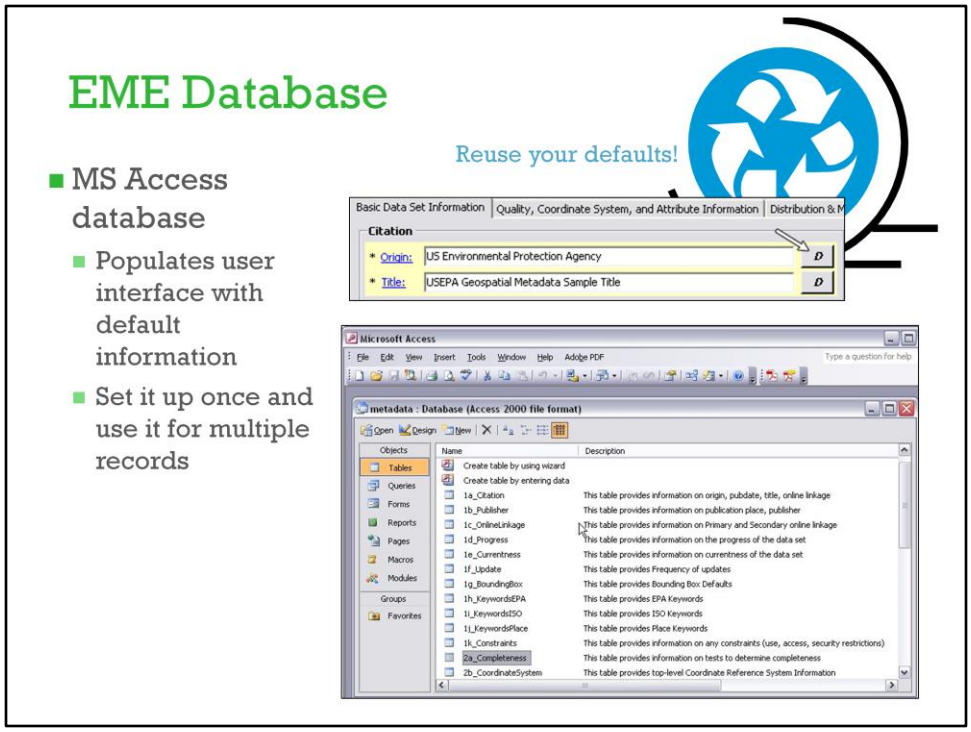


Once you have downloaded and installed the EME, you will need to open up ArcCatalog and install the EME toolbar. From ArcCatalog, you'll go to Customize→ Toolbars→ Customize→ Commands→ Select "EPA Metadata Tools" from Categories menu.

After you've completed those steps, the EPA Metadata Toolbar should appear in Toolbars menu.



Now we will give you a demonstration of the EME User Interface Basics.



Now we're going discuss a few of the EME's important features. We'll start with the EME Database.

The EME uses a Microsoft Access database to supply default information within the user interface. Information stored in this database can be modified by the user to include new data or to change defaults that are used by the 'Set Default' buttons.

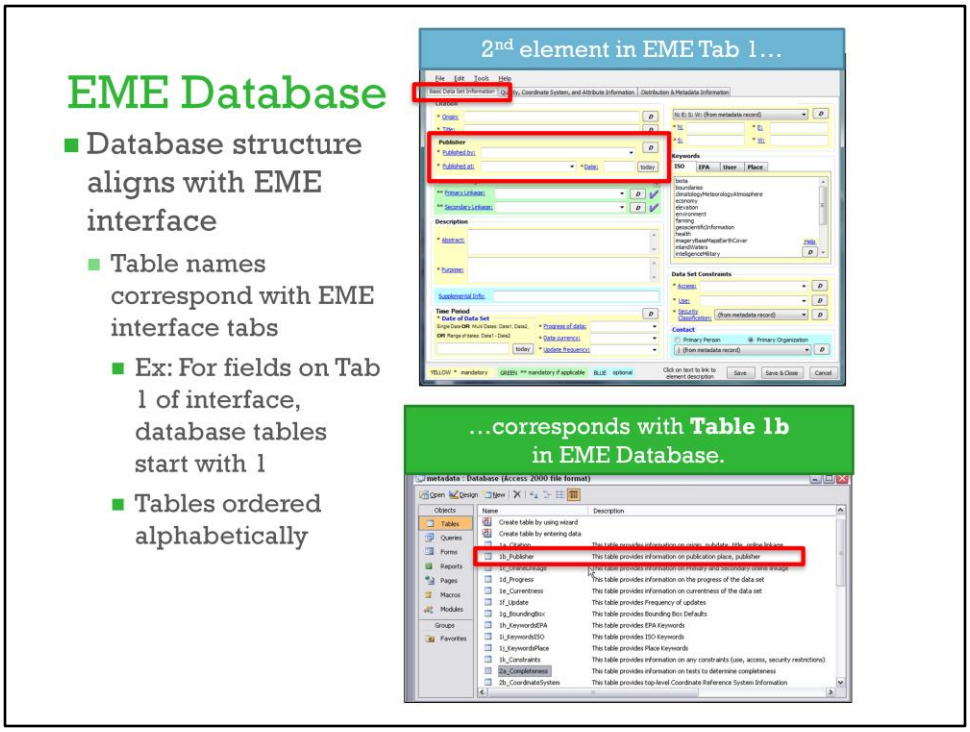
EME Database

- Save time and effort by customizing the database
  - EME will automatically enter default values common to your program or office, for example:
    - Contact info
    - Online linkages
    - Publisher
    - Projection
    - Data set access constraints
  - **Customizing requires MS Access**

Patty-Sue and Annie-Lou shared many common default values.

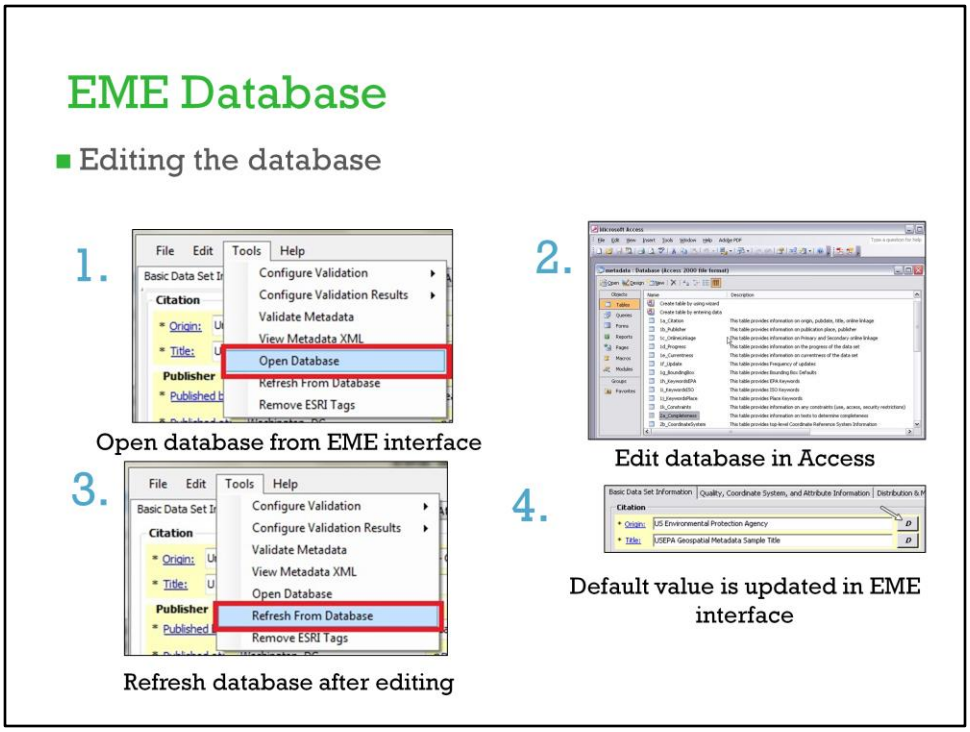
Like I mentioned earlier, you can customize the EME Database to automatically enter default values into the EME. This can save you a lot of time, especially if you are creating several metadata records. Some of the fields that can be automatically populated include contact information, online links, publisher information, projection, and data set access constraints.

In order to customize the EME Database, you must have Microsoft Access installed locally on your machine.



The database is structured to align closely with the flow of the user interface. All tables in the database are named according to the location in which their information resides in the EME user interface. For example, all tables that have information located on Tab 1 of the user interface begin with a 1. All tables that store information located on Tab 2 of the user interface begin with a 2. All tables that store information located on Tab 3 of the database begin with a 3. The tables are also ordered sequentially by letter. When sorted by name, the tables generally flow with the order of the elements as they are located in the user interface, starting with the top left.

Each table has a column in it called 'default'. This column controls what is selected in the EME when the user clicks on the 'Set Default' or 'D' buttons. Users may change the defaults used by the EME by selecting the checkbox next to the entry of their choice. Note that you will need to uncheck the currently selected default when selecting a new default.



Editing the Database

To modify the EME database, follow these steps:

1. Navigate to Tools --> Open Database.
2. Locate and open a table of interest (e.g., "1b_Publisher").
    a. Change the default by selecting a new default entry and deselecting the existing default entry.
    b. Add new information by adding a new row to the table and entering your own data.
    c. If you don't want anything to be selected as default for a particular field, deselect all checkboxes in the user interface.
    d. Close the database.
3. Click on the 'Refresh From Database' item in the Tools menu in the EME interface to update the user interface with the new database settings. You will need to click 'Refresh From Database' for each tab where changes should be reflected.
4. Your interface now populates the metadata element with the new default value when the D button is pressed.

EME Database

- Advanced features
  - Spell-check behavior
  - Compound element behavior
  - Theme keyword thesaurus
  - Change the database location

See EME Help for more details. Also, look for the EME Advanced Topics training session at https://edg.epa.gov/EME/resources.html

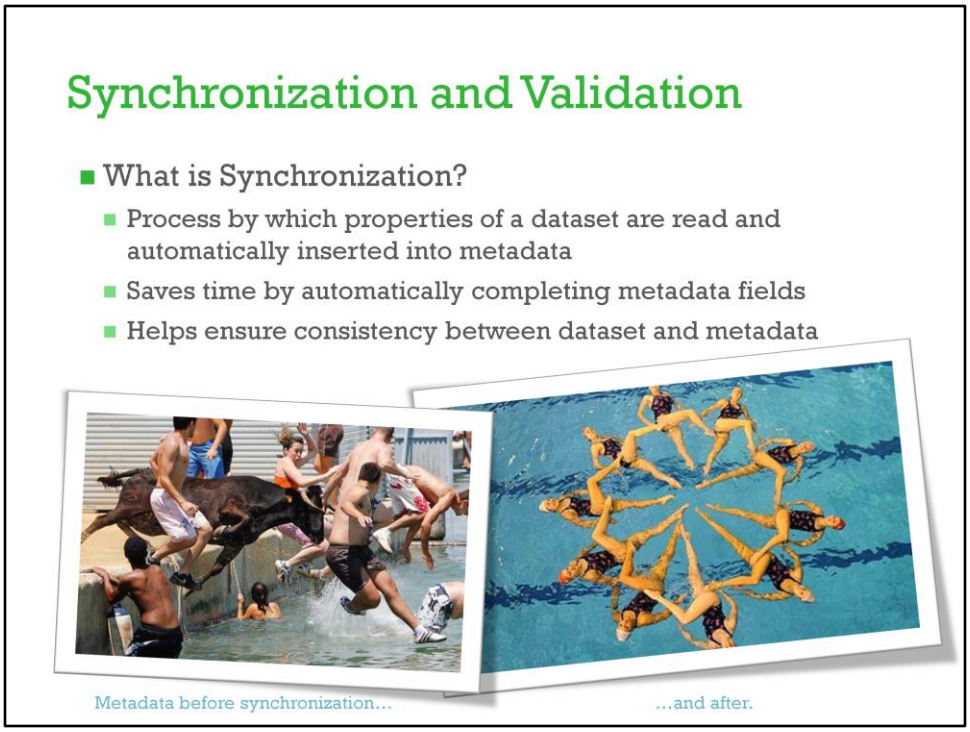
Volumes could be written about the EME Database…

…or at least a few more slides.

The database also has some advanced features, including spell-check behavior, compound element behavior, a theme keyword thesaurus, and the ability to change the database location. Those topics are covered in the Advanced Features training session. You can also check the EME Help for more details.

EME Demo:
EME Database Editing

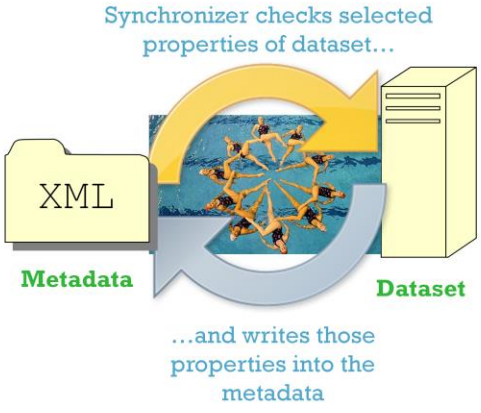
Now we will give you a demonstration on how to edit the EME Database.



Synchronization is the process by which properties of a data set are read from the data and written into its metadata (for example, bounding coordinates, spatial reference information, attributes, etc.). Synchronizers are immensely useful because they remove the burden of manually documenting some portions of your metadata record by automatically inserting information into your record. They also ensure consistency with the data set, so that changes to the data are applied to the metadata.

Synchronization and Validation

- What is Synchronization? (cont.)
  - Commonly synchronized fields:
    - Bounding coordinates
    - Spatial reference information
    - Attributes
  - ArcCatalog currently uses synchronizers to insert information
  - **But some of that information may not be FGDC compliant!**



This slide lists a few of the most commonly synchronized fields.

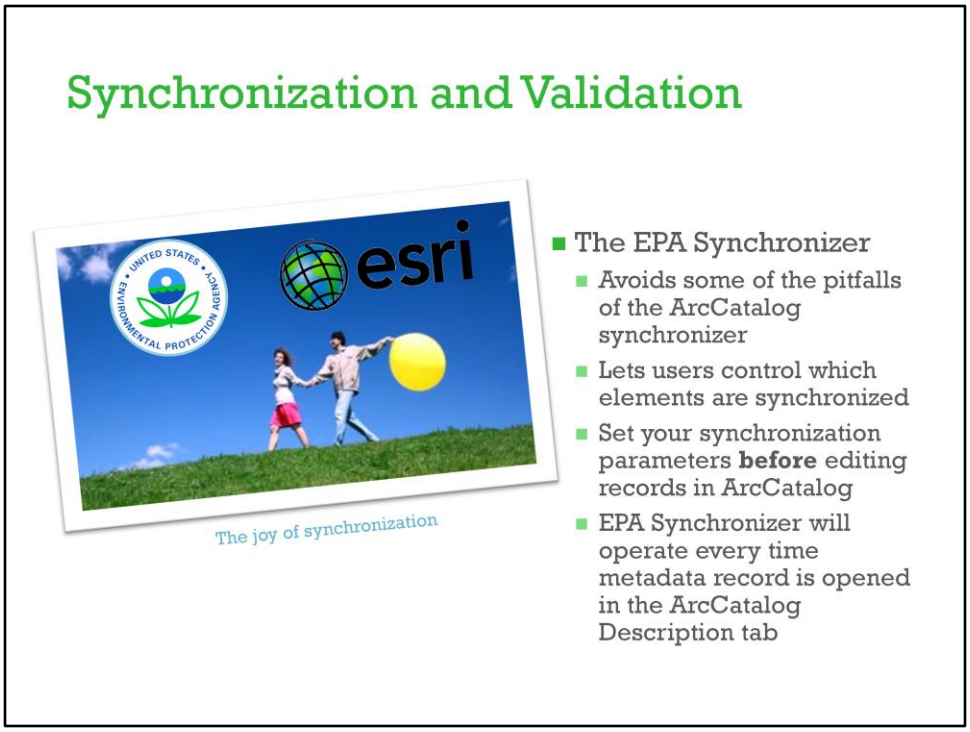
ArcCatalog uses synchronizers to insert information into your metadata. The problem with the default synchronizers in ArcCatalog is that they may insert information into your record that is not compliant with FGDC standards.

Synchronization and Validation

- Confusion: "Synchronization" in ArcGIS 10
  - Two different uses of term "synchronization"
    - **Traditional Synchronization:** FGDC Metadata → Dataset
      - FGDC Metadata synced with the dataset
      - Dataset parameters written to FGDC Metadata
    - **ArcGIS "Synchronization":** FGDC Metadata → ArcGIS Metadata
      - FGDC Metadata synced with ArcGIS Metadata
      - ArcGIS Metadata synced with the dataset
      - But ArcGIS Metadata includes non-FGDC-compliant items!
      - Avoid this by using EPA Synchronizer in EME

This can be confusing, so let's spend a moment on this topic. ArcCatalog synchronization was new in ArcGIS 10. When this was introduced in ArcGIS 10, Esri sort of repurposed the term "synchronization," and this has led to a lot of confusion.

For EME purposes, we like to use the term "synchronization" in the traditional sense, which is the process of synching FGDC metadata with a dataset. But in Esri-speak, with ArcGIS 10, "synchronization" means synching FGDC metadata with ArcGIS metadata. This is an issue that is addressed in greater detail in the Advanced Features training session, but I wanted to mention it very briefly now, because the ArcGIS synchronization may introduce some items into your metadata that are not FGDC compliant.

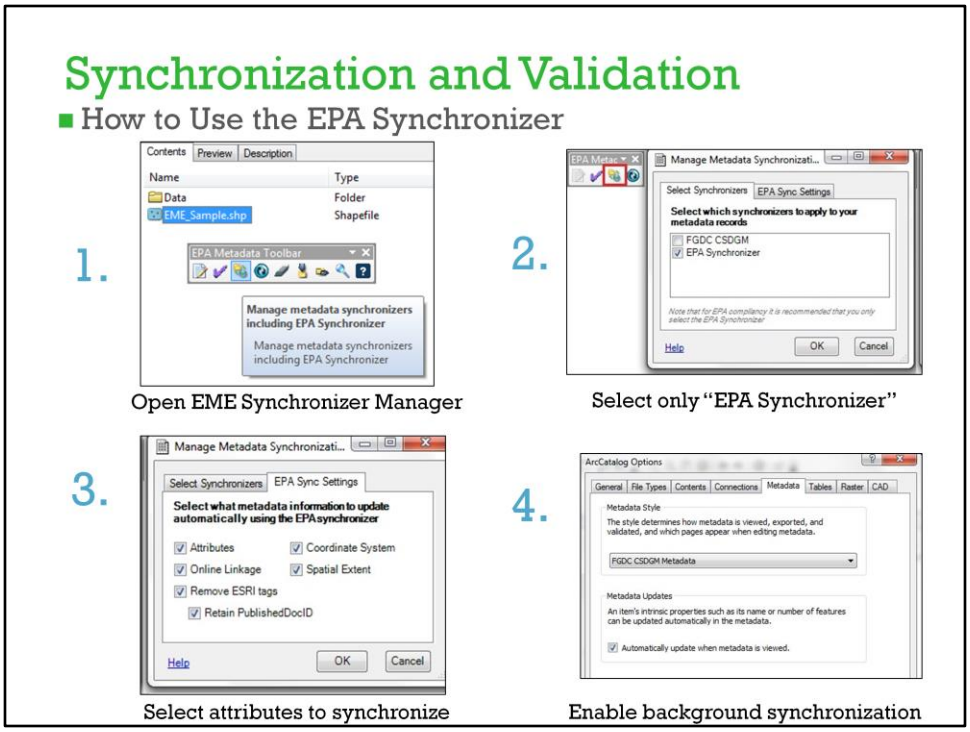


The way to avoid some of these pitfalls is to use the EPA Synchronizer in EME.

The EPA Synchronizer helps users find a middle ground by providing users with the capability to control which elements are synchronized with the data set. This allows users to retain information for important elements, but also avoids inserting unnecessary information into the metadata record. The EPA Synchronizer is accessed from the EPA metadata toolbar. Clicking the EPA Synchronizer button from the toolbar will open the EPA Synchronizer interface. Users can select which synchronizers to use and which elements to synchronize.

Note that the EPA Synchronizer cannot be used to modify synchronization that has already been applied to a record. The synchronization parameters should be set **before** editing records in ArcCatalog. If you have a metadata record that was already modified using the ArcCatalog synchronizer, you can remove the Esri elements that were inserted into your record by ArcCatalog by selecting the "Remove ESRI Elements" checkbox, which you will see in the next slide.

The EPA Synchronizer will continue to operate on your metadata record every time the information is viewed in ArcCatalog. This will override any information in your metadata record for the fields you have selected to synchronize (for example, coordinate system information). If you would like to disable synchronization, simply uncheck the metadata synchronizer checkbox.



Setting Up Synchronization

To set up the EPA Synchronizer, follow these steps:

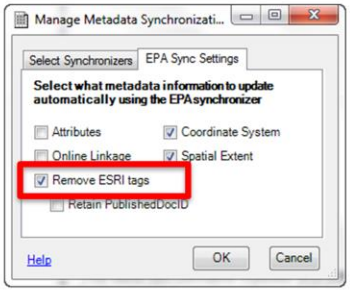
1. Open the Synchronizer Manager by clicking on the "Manage Metadata Synchronizers" button from the Metadata Toolbar.
2. Enable the EPA Synchronizer by selecting the "Select Synchronizers" tab from the Manage Metadata Synchronization interface.
    a. Select the EPA Synchronizer and deselect all other available synchronizers.
3. Select which attributes to synchronize by selecting the "EPA Sync Settings" tab from the Manage Metadata Synchronization interface.
    a. Choose which elements to synchronize with your data set. Click OK.
4. Synchronization can either be applied manually or it may be enabled as a background process. To enable background synchronization, navigate to Customize->ArcCatalog Options and select the Metadata tab. Enable the checkbox for "Automatically update when metadata is viewed."

Background synchronization applies a synchronization of the metadata to the dataset every time the dataset is viewed in the ArcCatalog description tab.

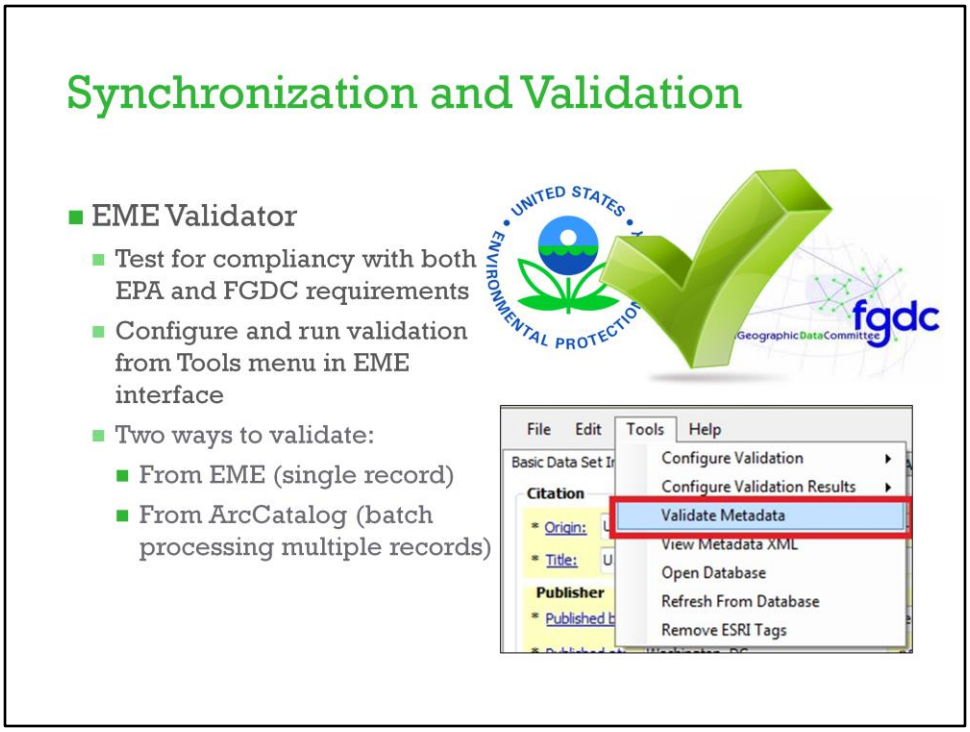
If you wish to disable background synchronization and manually synchronize metadata, first uncheck the "Automatically update when metadata is viewed" checkbox. Then to manually synchronize, select the data set in the contents window, and click the "Synchronize Metadata" button in the EPA Metadata Toolbar. This will force synchronization for your data set and metadata record, using the settings you have specified in the Manage Metadata Synchronization interface.

Synchronization and Validation

- Tips for successful synchronization:
  - Remove Esri tags
  - Use EME stylesheets
  - Use ArcGIS 10.1 or higher, or upgrade to 10.0 Service Pack 3

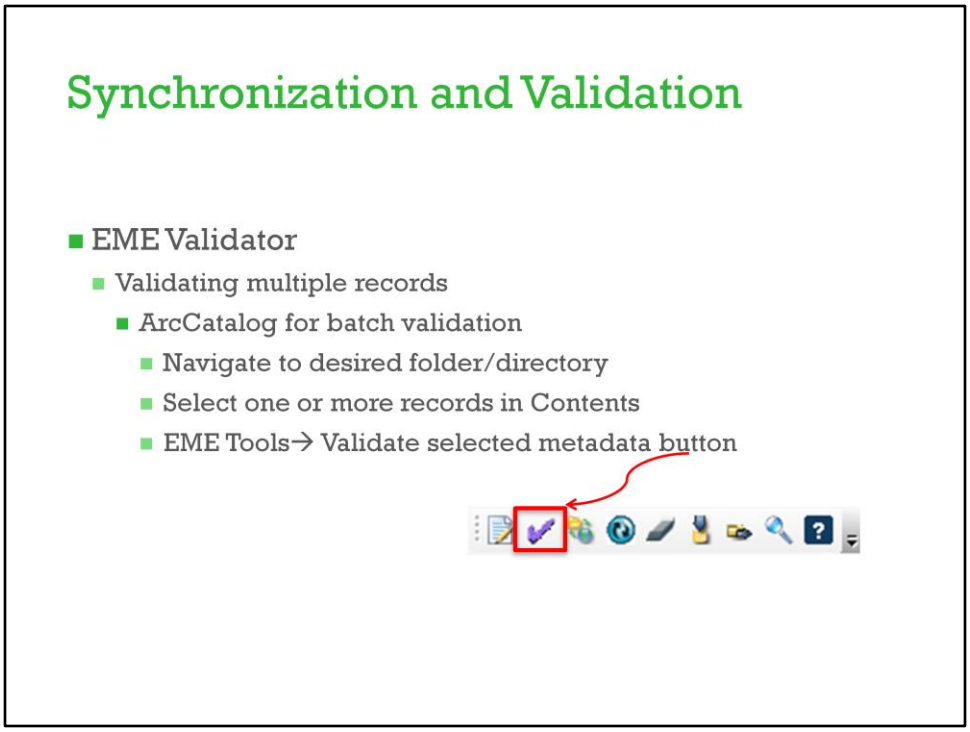


Here are a few quick tips for successful synchronization:
•Remove ESRI tags to avoid introducing non-compliant information by accident
•Use the EME stylesheets (this is something that is covered in more detail in the Advanced Features session)
•Upgrade to ArcGIS 10.1 or higher, or, if at ArcGIS 10.0, make sure Service Pack 3 is installed. This upgrade sorts out some of the ArcGIS 10 metadata glitches.



After metadata has been synced and the fields filled in, it is important to check the entries to make sure the edited record meets compliancy requirements. This may be done within EME using the EME Validator. The validator allows a user to validate records according to EPA's Geospatial Metadata Technical Specification Version 1.0, which satisfies both FGDC requirements and EPA requirements. And just to clarify, all EPA-compliant records are also FGDC-compliant. This service can be invoked for a single metadata record from the EME user interface or it can be invoked in batch-processing mode for a set of files from ArcCatalog.

You can access the validation service from the EME Toolbar or through the EME Tools menu.



If you'd like to validate multiple records simultaneously, you can use the batch validation feature of the EME. This is done in ArcCatalog outside of the EME interface. To batch validate a set of records, take the following steps:

1. Navigate to a directory or folder of interest in ArcCatalog and click on the "Contents" tab.
2. Select one or more datasets or metadata records in the Contents interface.
3. In the EME Toolbar, click on the "Validate selected metadata..." button.

Each metadata record selected will be displayed in a separate web page in your browser. The title of the selected record will be displayed in the title of the web page.

Troubleshooting Viewing the Validation Results in your Web Browser

If the EPA Validator results don't appear to be formatted correctly within your web browser, take the following steps:

1. Open Windows Explorer.
2. In the "Tools" menu, go to "Folder Options."
3. Click on the "File Types" tab.
4. Pick "XML Document" in the list then click "Edit..."
5. The "Content Type (MIME)" should be text/xml and "Default Extension for Content Type" should be ".xml".

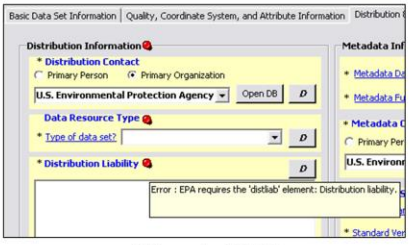
Note: if XML is not in your list, click "New", then enter "xml" for the extension and

"XML document" from the drop down list for the file type.]

Synchronization and Validation

- EME Validator
  - Tools→ Configure Validation Results
  - "View in browser window"
    - Errors/warnings displayed in browser
  - "View in User Interface"
    - Errors/warning highlighted with red dots in EME

View in Browser Window



View in EME

Depending on the settings you've configured for viewing the results, you will be presented with the results of validation within a web browser or within the EME user interface. You may choose to view results using either or both of these options.

The 'View in browser window' option will open a web page and will list the errors and/or warnings found during validation (if any) along with information about the specific line(s) where errors and/or warnings were reported. It also displays the total number of errors and warnings found in the record. You may scroll through the record to view the element(s) that caused the error. Errors are highlighted in red and warnings are highlighted in yellow.

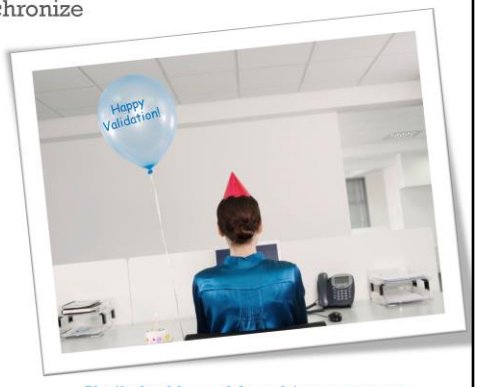
The 'View in EME' option will highlight errors in the user interface using a red balloon. Red balloons are displayed at each location within the EME user interface where errors were found in the metadata record. Users can hover over the balloon to understand what the nature of the error was and then fix the error(s) accordingly.

EME Demo:
Synchronization and Validation

Now we will give you a demonstration of synchronization and validation, working through the steps that we just discussed.

Suggested Workflow

- Customize EME database based on your program or office's desired default values
- Configure EPA Synchronizer and synchronize
- Manually complete EME fields that have not been filled in automatically
- Configure and run the EME Validator
- Correct any errors identified during validation
- Rejoice in your EPA compliancy!

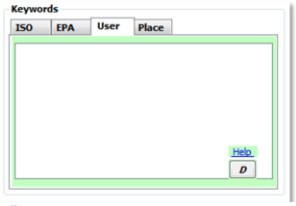


Sheila had hoped for a bigger turnout at her metadata validation party.

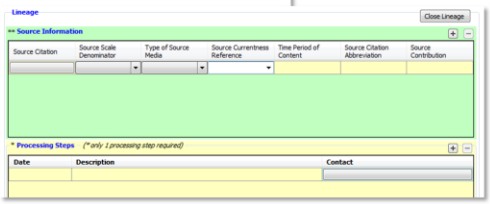
We've covered a lot today, so I want to give you a quick overview of a suggested workflow.
First you will customize the EME database based on your individual needs.
Next you will configure the EPA synchronizer to avoid introducing non-compliant fields into your records.
Third you will manually complete the EME fields that were not filled in automatically when you synchronized. Use the Default buttons, the dropdown menus, or add your own text based on the requirements of the field.
Fourth, you'll configure and run the EME Validator.
Finally, you will correct any errors found during validation and validate again. Only when you are error free may you hold your compliancy party.

Additional EME 3.2 Features

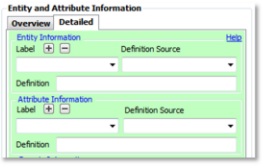
- Customizable User Keywords



- Lineage
  - Source Information: Citations, References
  - Processing Step Contacts



- Attributes – Overview vs. Detailed



Even with everything we covered, there's still more to learn!

You can customize your own keywords in the EME Database. This may be particularly useful if you have a project with its own set of keywords that don't appear in the other keyword thesauruses.

You can add very specific information in the lineage section. If a new dataset is a combination of two source datasets, you can capture information about those sources in this section. Additionally, you may capture contact information for individual processing steps, which may be useful if multiple individuals are involved in dataset assembly.

Finally, Attribute information requirements may be satisfied by including a descriptive overview rather than detail about individual field items. This is helpful when your metadata describes a resource that doesn't contain a table of fields—for example, web services or data download packages.

What's Next for EME

- Coming soon: EME v4
  - Support for OMB's Open Data Policy (Common Core Metadata/DCAT)
  - Updates to User Interface
  - Remove Dependency on MS Access (Move to XML-Based)
  - Utilize Enhanced Capabilities of ISO 19115

EME developers add new fields to the user interface.

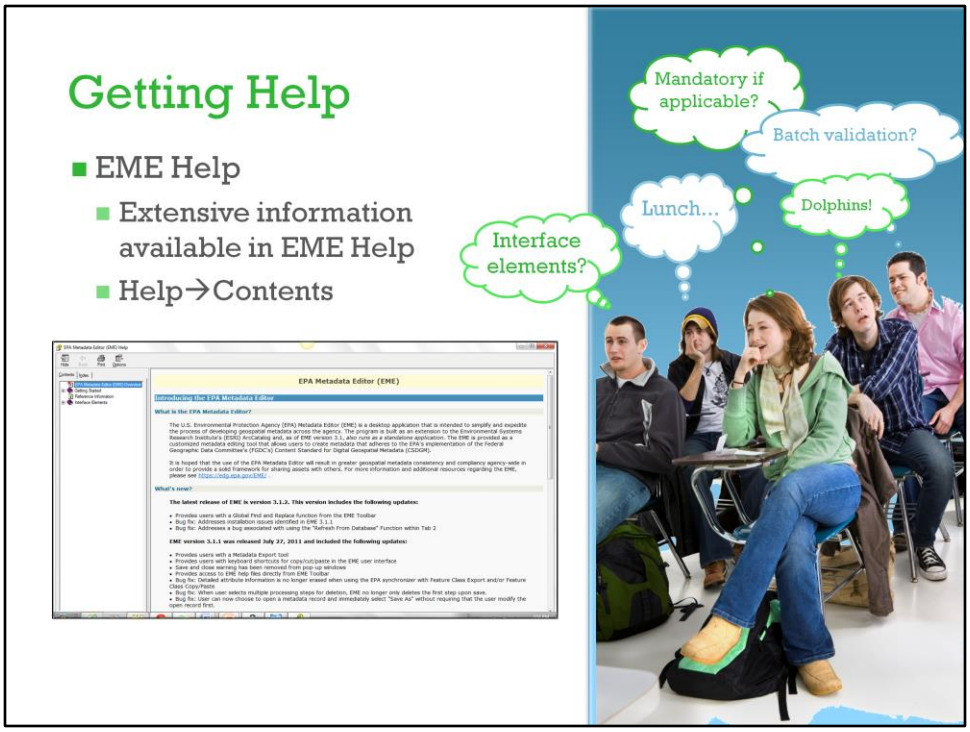
This year we will be releasing EME Version 4. It will include several updates, including support for OMB's Open Data Policy, a new database design that no longer relies on Microsoft Access and utilization of ISO capabilities. More details on the new version will be released later this year.

EME Advanced Topics

- Advanced EME Database Customization
  - Changing the default location and name
  - Compound elements
  - Keywords
- Synchronization Tips and Tricks
- Troubleshooting Validation Errors
- Working with Stylesheets

EME is not THIS advanced.

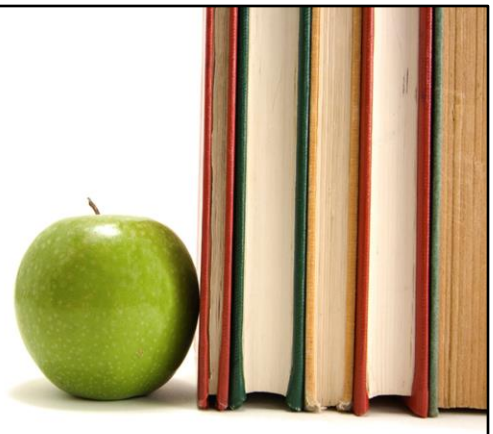
The Advanced Topics training session covers Database customization, Synchronization, Validation, and Stylesheets in much more detail.



I mentioned EME Help at the beginning of the presentation, but it's worth repeating that a lot of information is available to you in the Help documentation. We've sped through a lot of content today. All of what we've talked about is included in the Help documentation, which you can access from the EME interface.

Getting Help

- EME web resources
  - Fact sheets
  - FAQs
  - Training presentations
  - Helpful links



https://edg.epa.gov/EME/resources.html

There are also some useful resources available on the EME website, including fact sheets, training presentations, and links to other metadata resources.

Getting Help

edg@epa.gov

If you'd like to get in touch, feel free to contact the EME team. We always appreciate questions and feedback from EME users.

Questions and Discussion

Question: Is this some type of cake? Please discuss.

At this point I'd like to open it up for questions and discussions.