

Spatial Data Metadata Update Workflow using ArcCatalog

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Scope

This document outlines the basic policies and procedures for updating existing metadata or creating new metadata that describe spatial vector and raster data using Esri ArcCatalog version 10.2.2.

This document provides instructions for metadata that describes datasets that will be ingested into the Alexandria Digital Research Library (ADRL). Sources of information used in developing these standards include the ISO 19115 standard, Open Geoportal Metadata Creation Guide (Metadata-Guide-2013_2_12.doc - converted to PDF and OGPMetadata-GeneralBestPracticesGuide-Draft.pdf) and Stanford University metadata creation workflow (MetadataCreationWorkflow.pdf).

[Metadata-Guide-2013_2_12.pdf](#)

[OGPMetadata-GeneralBestPracticesGuide-Draft.pdf](#) (January 22, 2015)

[MetadataCreationArcCatalog.pdf](#)

The Metadata Model from which this is based can be found in the following table:

[UCSB Library ADRL Metadata Model v1.xlsx](#)

ArcCatalog Checklist:

General Instructions

In general, do not remove any information provided by the original metadata creators.

Exceptions to this include:

- Change any spelling errors or formatting problems (such as mid-sentence breaks (returns)).
- Change any text that must conform to an authority (e.g. keywords that must use an authority such as Library of Congress Subject Headings).
- Change any information you know for sure to be incorrect.

Add missing information as necessary so that all required fields are filled out. Only add information that you know to be accurate. Do not guess if you are unsure. You may add information beyond what is required if you have that information and know it to be accurate.

Set ArcCatalog to use the ISO 19139 metadata schema

- ☐ Click the 'Customize' tab and select 'ArcCatalog Options'. In the dialog box, select the 'Metadata' tab. Select 'ISO 19139 Metadata Implementation Specification' from the drop-down menu if it is not already selected. Click 'OK'.

Update metadata auto-supplied fields if necessary

- ☐ **Upgrade metadata**
If ArcCatalog asks, upgrade the metadata to the current version.
- ☐ **Does a thumbnail exist?**
A thumbnail, or browse graphic, is optional at this point of metadata creation, but might be required when the data is deposited in ADRL. To create a thumbnail, follow one of these two steps:
 - ☐ A. A thumbnail can be created in ArcCatalog that will be viewable by future users of the data when using Esri's software. However, this thumbnail can only be exported by right-clicking it and saving it as a very-low-resolution image, which won't be very readable in ADRL.
 - ☐ To create an ArcCatalog thumbnail, click on the Preview tab, then click the 'Create Thumbnail' icon on the Geography toolbar.

- B. A thumbnail (or browse graphic) can be created in ArcMap using the symbology tools and then exporting a JPEG, TIFF, etc. The image file can then be uploaded to ArcCatalog using the 'Update...' button below the thumbnail.

- **Does an extent appear in the metadata?** (The extent should be listed under the fifth heading in the Description view.) If yes, skip to "Update the Overview section" below. If no:

This may mean that other auto-supplied information is not up-to-date as well. To update the auto-supplied information, follow these steps:

- A. Is there a title already given at the top of the metadata that is more than just the file name? If no, skip to step B. If yes:
 - The ArcToolbox tool used to update the metadata will overwrite any auto-supplied fields, including the title field. Click the 'Edit' button to begin editing the metadata: in the 'Overview - Citation' section of the editor, copy the title from the 'Title' field to the 'Alternate Title' field. Click 'Save' to save and exit Edit mode. Continue with step B.
- B. Update (synchronize) the metadata so that all auto-supplied fields are (re)populated. In the 'Geoprocessing' menu, click on 'Search for Tools'. Type in "synchronize metadata" in the text box. Select the 'Synchronize Metadata (Conversion)' tool from the results list. For 'Source Metadata', select the file that you are updating. For 'Synchronize Type', select NOT_CREATED. This will just update the metadata and nothing else (but will overwrite the Title field in the metadata with the file name). When it has finished running, the extents should appear in the metadata.

Review the Overview section

These instructions are written in the order that elements appear in ArcCatalog edit mode for ISO 19115. Elements not mentioned below are considered optional and have no requirements.

Click the 'Edit' button to begin editing the metadata. (These instructions are written with the assumption that the user is in Edit mode within a metadata record in ArcCatalog.)

Item Description

— Title - mandatory

- If a title already exists that is more than just the file name, copy it to the 'Citation' section: 'Alternate Title'. If you synchronized the metadata in Section while updating the metadata auto-supplied fields in the instructions above, this should have already been done.
- Add or update the title to follow this convention:

Feature Type/Data Theme, Geographic Coverage, Ground Condition Date

Follow these conventions:

- The title should describe the data's theme, geography, and ground condition/situational date in a human readable form.
- The filename is not an appropriate title.
- Include punctuation (commas) between the concepts in the title.
- Don't use abbreviations. Spell everything out.
- Geographic coverage:
 - The geographic coverage should be equivalent to the geographic extent of the data, and include the higher administrative geography where appropriate.
 - Include higher administrative geography where appropriate
 - For US and Canada include name of State/Province but not country; for non US/Canada geographies include name of country.
 - For global datasets, use "World" to describe the geographic extent.
 - For historical data, use current form of place names.
 - Spell out administrative geographies. Do not use two-letter abbreviations for states - spell them out.
- Date:
 - If no year is known, leave it blank.
 - If the ground condition date is unknown but the publication date is known, use the publication date if it is estimated to be relatively close to the ground condition date.
 - Approximate or estimated dates use "ca." ahead of the date
- Multi-sheet map images include "(Image 1 of 2)" at the end of the title.

Examples
<ul style="list-style-type: none"> • Rivers, Maya Forest, Guatemala, 2000 • Building Footprints, University of California Santa Barbara, 1990 • Soils, Santa Barbara County, California • Cities, China, 2003 • Building Footprints, San Francisco, California, 2007 • Streets, Medford, Massachusetts, 1990-1999 • Prague, Czech Republic, ca. 1910 • Paris, France, 1856 (Image 2 of 6)

Summary or Purpose - optional

If text already exists in the description box, remove any strange page breaks in the paragraph text that might appear.

Description or Abstract - mandatory

The metadata must include an abstract. If one is not provided, write a brief description of the data, such as what the features represent. Things to include:

- subject of the dataset and what the features represent
- geographic extent
- form of the dataset (examples: polygon shapefile, point feature class, raster, geoTIFF image)
- time period represented by the features
- other relevant information

Example
The points in this shapefile represent the locations of soil samples, and were created using a GPS device. The locations are within the Sierra National Forest, California, collected between June 2011 and August 2012.

If text already exists in the description box, remove any strange page breaks in the paragraph text that might appear.


Bounding Box - mandatory

If the dataset has geospatial coordinates, the extents of the dataset should be automatically shown here. If they are not, see the "Update metadata auto-supplied fields if necessary" section above.

Topics and Keywords

Keywords should come from an authoritative list. If keywords were already added by the original metadata creator, but do not conform to a standard, they should be re-entered as described below.

When using a thesaurus for authoritative terms, copy and paste the terms from the thesaurus into ArcCatalog. This will minimize spelling errors.

-  **Record the theme and place keywords in a project spreadsheet** that lists the authorized keyword or location, authority name or code, and URI. This will be used to keep track of all values for future data linking. If you are entering a geographic name, you can include multiple authorities for the same location. Include all authorities for the same location on the same row. In the example below, the city of Tezpur, India is listed with both the LC Name Authority File authority (Term1, Authority1, Link1) and the Geonames authority (Term2, Authority2, Link2).

Example:

Term1	Authority1	Link1	Term2	Authority2	Link2
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Tezpur (India)	naf	http://id.loc.gov/authorities/names/n89110553	Tezpur	geonames	http://www.geonames.org/1254710
Assam (India)	naf	http://id.loc.gov/authorities/names/n79090160	State of Assam	geonames	http://www.geonames.org/1278253
Villages	lcsh	http://id.loc.gov/authorities/subjects/sh85143356			

Topic Categories - mandatory

Click the boxes next to the appropriate keyword(s). See the ISO 19115 documentation and [local notes](#) for definitions of terms.

Theme Keywords - mandatory

Add subject keywords using an appropriate authority. For materials being ingested into ADRL, this will be the *Library of Congress Subject Headings* (LCSH) authority.

If entering multiple terms into the text box, type each term on a different line, separating the terms by hitting the "enter" key. Do not use punctuation and/or spaces to separate terms.

Tools: The following tools can be used to search for LCSH terms:

- Library of Congress Linked Data Service: <http://id.loc.gov/>
 - Library of Congress Authorities: <http://authorities.loc.gov>
- Note:
- The 1XX field indicates the proper form. Copy this text.
 - The 4XX and 5XX fields indicate "see from" and "see also from" forms. Do not use these forms. These terms are redirected to the term shown in 1XX.
 - The LC control no. starts with "sh" for subjects (LCSH) and with "n" for names (LCNAF).
 - Classification Web: <http://classificationweb.net/Menu/index.html> (requires username/password)

Complex subjects: LCSH complex subjects can be used as long as they have a URI. (Example: Precipitation (Meteorology)--Measurement = <http://id.loc.gov/authorities/subjects/sh85106219>) *Current policy:* If a subject can be subdivided geographically, use the subject without the geographic subdivision and enter the geographic location as a place keyword using LCNAF, even if the geographically subdivided subject has its own URI. (Example: Earthquakes--California = <http://id.loc.gov/authorities/subjects/sh2003005933> should be entered as Earthquakes = <http://id.loc.gov/authorities/subjects/sh85040496> as a theme keyword and California = <http://id.loc.gov/authorities/names/n79041717> as a place keyword.)

Theme Keywords Thesaurus Citation - mandatory

Add the appropriate thesaurus code according to the *Library of Congress Subject Heading and Term Source Codes*: <http://www.loc.gov/standards/sourcelist/subject.html>

Typical code:

- lcsh (for LC Subject Headings)

If the thesaurus you are using is not on this list, type out the name of the thesaurus in lower case letters.

- Although the created, published, or revised date for the thesaurus is mandatory within the ArcCatalog editor, this information is not mandatory in ISO 19115 nor in local policy. Optionally, the revised date can be added to the Dates subsection of the Thesaurus Citation.

Place Keywords - mandatory

Add location keywords using an appropriate authority. OGP Best Practices are to also include the hemisphere or continent using LCSH terms.

If using the *Library of Congress Subject Headings* (LCSH) or *Name Authority File* (LCNAF), use any of the first three links listed below. Possible authorities include:

- Library of Congress Linked Data Service: <http://id.loc.gov/>
- Library of Congress Authorities: <http://authorities.loc.gov>

Note:

- The 1XX field indicates the proper form. Copy this text.
- The 4XX and 5XX fields indicate "see from" and "see also from" forms. Do not use these forms. These terms are redirected to the term shown in 1XX.
- The LC control no. starts with "sh" for subjects (LCSH) and with "n" for names (LCNAF).
- Classification Web: <http://classificationweb.net/Menu/index.html> (requires username/password)
- GeoNames: <http://www.geonames.org/>
- Getty Thesaurus of Geographic Names (TGN): <http://www.getty.edu/research/tools/vocabularies/tgn/>
- Geographic Names Information System (GNIS) - for locations within the USA: <http://geonames.usgs.gov/>
- NGA GEOnet Names Server (GNS) - for locations outside the USA: <http://geonames.nga.mil/namesgaz/>

If using GNS, use the following priority to choose a name:

1. Conventional
2. Approved
3. (Do not use names with any other name type)

Place Keywords Thesaurus Citation - mandatory

Add the appropriate thesaurus code according to the Library of Congress Name and Title Authority Source Codes: <http://www.loc.gov/standards/sourcelist/name-title.html>

Typical code:

- lcsh (for LC Subject Headings)
- naf (for LC Name Authority File or NACO Authority File)

if the thesaurus you are using is not on this list, type out the name of the thesaurus in lower case letters. For example, for GeoNames, type "geonames".

- Although the created, published, or revised date for the thesaurus is mandatory within the ArcCatalog editor, this information is not mandatory in ISO 19115 nor in local policy. Optionally, the revised date can be added to the Dates subsection of the Thesaurus Citation.

Citation

Title - mandatory

The title should automatically be populated from the Item Description section

Alternative Title - mandatory if applicable

This field is used to record the original title given to the file when it does not conform to the standards outlined under "Title" above. This field should have been populated for this purpose during the "Title" step above. This field can optionally be used for any other alternative title as needed. (If the original title given to the file was just the file name, the title does not need to be copied into the Alternative Title text box.)

Collective Title - recommended if applicable

Enter a name of the entire collection of data (such as Maya Forest GIS). Ensure that the same form of the name is entered in each dataset's metadata.

Presentation Form - mandatory

Select from the dropdown list. (This is new with updated OGP Metadata Best Practices Guide.)

Identifier - Code - mandatory

This will be assigned during ingest into ADRI, so this does not need to be entered here.

Dates - mandatory

Publication date is required. Created and revised dates are optional. (This has changed with the updated OGP Metadata Best Practices Guide.)

Publication date is the date when the data set is published or otherwise made available for release.

If the month and/or day are unknown, enter 01. However, if the date is unknown, there is no way to specify that here.

Examples:

October 10, 1995 = 1995-10-10

May, 2010 = 2010-05-01

2013 = 2013-01-01

Unknown - leave blank in ArcCatalog

Edition - recommended if applicable

Enter any relevant edition information.

Series - recommended if applicable

Name and issue are mandatory if applicable. Enter any relevant series information. This should be a unique name that is consistent across all metadata records belonging to the same collection/series.

Citation Contacts

The **originator** and **publisher** are **mandatory if applicable**. If either are unknown, enter "Unknown" in the Organization text field.

Name or Organization - mandatory

The personal name and/or organization name should be entered in the appropriate field using the *LC Name Authority File* format, if available. If not, it should be entered in the form by which it would be listed in a name authority file. The name should also be added to the project's spreadsheet of controlled vocabularies, indicating that no authority was used.

Role - mandatory

Choose from the drop-down list.

Contact information - optional

This information can optionally be added to the contact.

Citation Contact - recommended local entry

University of California, Santa Barbara. Map and Imagery Laboratory may be added as a *custodian*. Use the LCNAF format for the Organization name, but use the mailing address format for the contact information:

Organization: University of California, Santa Barbara. Map and Imagery Laboratory

Role: Custodian

Contact information:

Address type: Both

Address: UCSB Library
Address: Map & Imagery Laboratory
City: Santa Barbara
State: CA
Postal Code: 93106-9010
Country: UNITED STATES

- Because the Citation Contacts also use authorized headings similar to theme and place keywords, enter citation contacts in the project spreadsheet in a similar manner to the keywords.

Example:

Term1	Authority1	Link1
University of California, Santa Barbara. Map and Imagery Laboratory	naf	http://id.loc.gov/authorities/names/no98110092
Consejo Nacional de Áreas Protegidas (Guatemala)	naf	http://id.loc.gov/authorities/names/no98043408

Review the Metadata section

Details

- File Identifier - mandatory**

This identifier may change as URIs are assigned during the ingest process, but for now, click "Create" following the file identifier text box to generate a unique ID.

- Parent Identifier - mandatory if applicable**

Enter any relevant unique code that identifies the parent metadata record. This may not be available until the dataset is ingested into ADRL, so can be left blank at this time.

- Dataset URI - mandatory**

Enter the online reference (or offline location) to the data for which this metadata describes. This information may not be available until the dataset is ingested into ADRL, so can be left blank at this time.

- Date Stamp - mandatory**

The date should have been generated automatically.

- Language - mandatory**

The default language from the drop down list should be English. (This is the language of the metadata, not the data.)

- Character set - mandatory**

The character set should be utf8.

Contacts

- Metadata contact - mandatory**

One metadata contact organization (or person) and role are required.

- The original metadata creator should be entered as the *Originator*.
- If MIL only updated metadata originally created by another organization, MIL should be entered as a *Processor*. See Citation Contacts above for method of entering MIL information.
- **Name or Organization - mandatory**
As metadata contacts are not search parameters, the names and organizations do not need to conform to an authority. However, they should be consistent with contact information elsewhere in this and other related metadata records.
- **Role - mandatory**
Choose from the drop-down list.
- **Contact information - optional**
This information can optionally be added to the contact.

Maintenance

— Update frequency - optional

ArcCatalog shows this as a mandatory element, although it appears to be optional in ISO 19115. One suggestion is to use "as needed".

Metadata Constraints

- Legal Constraints - optional
- General Constraints - optional
- Security Constraints - optional

Review the Resource section

Resource Details

— Status - recommended

If this has not already been created, create a new status and select the appropriate status category. This is the status of the original resource, not the copy in hand.

— Language - mandatory

This is the language used within the resource. For example, if the attribute table is in Spanish, this should be set to "Spanish; Castilian".

— Character set - mandatory

This should be set to utf8.

— Spatial representation type - mandatory

This should be set by ArcCatalog to the appropriate format, such as Vector.

Resource Extents

— Bounding Box - mandatory

An extent that includes the bounding box should have been automatically created.

Points of Contact

Contact - recommended

A point of contact (organization and role) is recommended. This is the "... identification of, and means of communicating with, person(s) and organization(s) who have knowledge about the resource." This would most likely NOT be MIL unless the library has direct knowledge about the creation and/or publication of the dataset.

Name or Organization - recommended

As points of contact are not search parameters, the names and organizations do not need to conform to an authority. However, they should be consistent with contact information elsewhere in this and other related metadata records.

Role - recommended

Choose from the drop-down list. This is mandatory if a Name or Organization is entered.

Contact information - optional

This information can optionally be added to the contact.

Resource Maintenance

Update frequency - mandatory

Use the drop down list to set the frequency with which changes and additions are made to the resource after the initial resource is completed. If unknown, select "unknown". Do not leave it as "Empty". (This is referring to updates to the original resource, not this particular copy of the resource.)

Resource Constraints

Legal Constraints - Use Limitations - mandatory if applicable

Click the green plus next to 'New Use Limitation' to add a text box. Enter text describing any access and/or use constraints that are identified by the drop down boxes below. Access and use constraints can be combined in the same text box. For now, if there are none, do not add a text box. In the future, OGP may implement a best practice to require some text, such as "unknown" or "none".

Legal Constraints - Access Constraints - mandatory if applicable

This indicates whether the dataset is publicly available or restricted by license. Use the drop-down list to select the appropriate constraint. If "unknown" or "none", select "Empty".

Legal Constraints - Use Constraints - recommended

These are specific rules regarding how the data can be used, such as regarding derivative works or re-publication. Use the drop-down list to select the appropriate constraint. If "unknown" or "none", select "Empty".

General Constraints - optional

Security Constraints - optional

Spatial Reference

Spatial Reference System - mandatory for geospatial datasets

This should be auto-supplied by ArcCatalog.

Spatial Data Representation

All elements are optional.

Content

All elements are optional.

Quality

All elements are optional.

Lineage

All elements are optional.

Distribution

Format name - mandatory

This should be auto-supplied by ArcCatalog. An example is "Shapefile".

Format version - optional

Although ArcCatalog requires a format version, it is not required by ISO 19115 standards.

Distributor Contact - mandatory

The host institution is mandatory. Add any other known distributors.

UCSB would be entered here as the host institution. This can be done by listing MIL as the organization and *custodian* as the role. See Citation Contacts above for method of entering MIL information.

Name or Organization - mandatory

As distributors are not search parameters, the names and organizations do not need to conform to an authority.

However, they should be consistent with contact information elsewhere in this and other related metadata records.

Role - mandatory

Choose from the drop-down list.

Contact information - optional

This information can optionally be added to the contact.

Fields

The entity and attribute information should be filled out as best as possible.

Label - mandatory

This should be the file name without the extension (i.e. lakes, not lakes.shp). Each time the metadata is refreshed by ArcCatalog (for example when using the "Synchronize Metadata" tool, but not when just saving after edits), this field is replaced with the current file name.



- ☐ Entity type:
 - ☐ **Object**
This should be automatically entered by ArcCatalog.
 - ☐ **Definition - mandatory**
This defines the entity. (Examples: "Lakes and rivers wide enough to be represented as polygons in the Maya Biosphere Reserve"; "Roads of California") **Check ISO 19110. There is some difference in opinion as to how this is supposed to define the entity.**
 - ☐ **Definition source - optional**
Note whether the definition was written by MIL or some other organization.
- ☐ **Attribute labels and definitions - mandatory if applicable**
The labels should be provided by ArcCatalog, but the definitions should come from the source. If there is no information here, you can add whatever information you know. If you don't know the information, leave it blank.

References

- ☐ **Aggregate Information-Dataset Citation-Title - optional**

If this dataset belongs to a larger collection, click on "New Aggregate Information", then click on "New Citation". Add the name of the collection as the title.
- ☐ **Identifier Code - optional**
This will be assigned during ingest into ADRI, so this does not need to be entered here.
- ☐ **Association Type - optional**
Select "Larger Work Citation" from the drop down list if applicable.

Validate Metadata and Generate ISO 19139 XML file

The values listed below apply to ArcCatalog version 10.2.2 only.

- ☐ Click the Validate button (next to the Edit button on the Description tab in ArcCatalog).
 - ☐ Source metadata should be the file (shapefile) you are validating
 - ☐ Translator should be C:\Program Files (x86)\ArcGIS\Desktop10.2\Metadata\Translator\ArcGIS2ISO19139.xml
 - ☐ Schema URL should be <http://www.isotc211.org/schemas/2005/gmd/metadataEntity.xsd>
 - ☐ Namespace URI should be <http://www.isotc211.org/2005/gmd>
 - ☐ **Output File** should be ...\<<file_name>-iso19139.xml. **This is the ISO 19139 formatted XML file that will be used going forward, and is different from the Arc-Catalog formatted <filename>.shp.xml file.**
- ☐ Check the Geoprocessing Results for any errors (Geoprocessing > Results > Current Session (open the ValidateMetadata report and check the messages).
 - ☐ If there are problems reported, fix the metadata and re-run the validation. Keep in mind that this is not validating the content of the elements, only the validity of the schema.