How to Create Metadata in ArcGIS 10.0

Intermountain Region GIS Program

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Introduction

Metadata is a critical piece to GIS and data management. Metadata, or information about data, is essential to understanding a dataset's purpose, quality, attributes, and how and when it was created. Metadata ensures datasets can be used by more than just the creator.

Presidential Executive Order 12906 (1994) requires all federal agencies to create metadata for GIS datasets available to the public. This includes data collected by the park or data collected by a contractor, seasonal, or volunteer. Order 12906 created the Federal Geographic Data Committee (FDGC) and the Federal FGDC Content Standard for Digital Geospatial Metadata (CSDGM) standard.

This document is a starting point to make the process of creating and updating metadata easier. It is important to try to get your metadata FGDC-compliant, but this document will also highlight the basic amount of information you need to make your data understandable and useable. This document focuses on metadata creation using ArcCatalog 10.0 with Service Pack 3 (SP3). ESRI fixed many bugs in Service Pack 3 making creating and updating metadata a bit easier.

There are other sources for metadata training, including the ESRI on-line courses available to NPS free of charge as part of our enterprise license agreement. These include "Creating and Maintaining Metadata Using ArcGIS Desktop" and "Metadata Tips and Tricks." They are both written for ArcGIS 9.3 but much of the information is still current.

In this document you will learn how to:

- How to configure ArcGIS Catalog for FGDC metadata
- How to upgrade older metadata for ArcGIS 10.0 SP3
- How to import a premade metadata template for new data
- How to edit metadata and create a thumbnail

The appendices to this document incorporate reference notes and resources. The five appendices include:

- Appendix A: How to export FGDC-compliant metadata and create metadata in HTML format
- Appendix B: FGDC vs. ArcGIS metadata and upgrading metadata
- Appendix C: Descriptions of the three metadata standards: ArcGIS, Federal Geographic Data Committee (FGDC), and International Organization for Standardization (ISO)
- **Appendix D: FGDC-formatted table with the requirements necessary to publish FDGC metadata**
- **Appendix E: Illustrated guide of Appendix D's FGDC-formatted table guide**

The guidelines for editing your metadata can be used in conjunction with Appendix D & E.

Getting Started

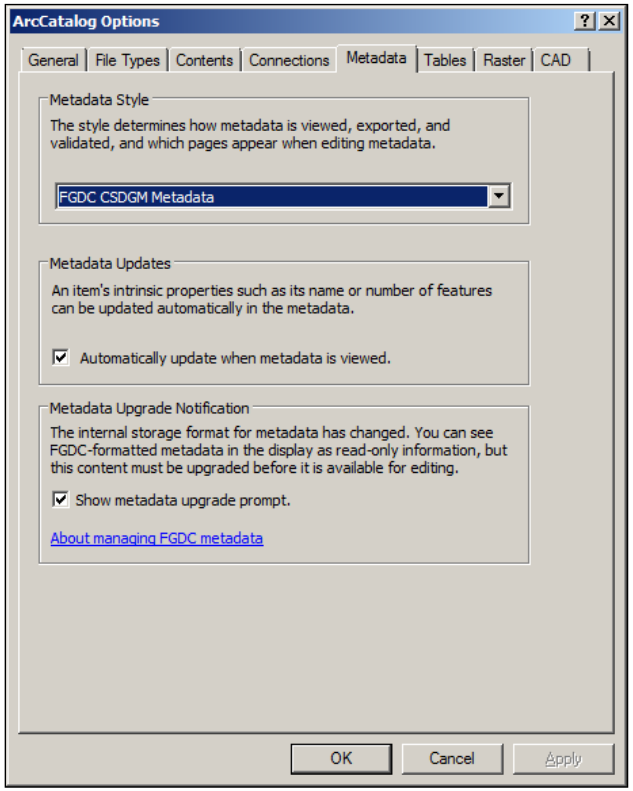
Software Requirements

In order to use this document, you must have ArcGIS 10.0 Service Pack 3 installed. To check your Service Pack status, open **ArcCatalog**, click the **Help** menu button and click **About ArcCatalog.** You will see your Service Pack version in the popup window.

Configure ArcGIS Desktop to View FGDC Metadata

Before you plan to work with metadata, you want to make sure you have configured your ArcGIS Desktop to view FGDC CSDGM metadata.

1. From your **ArcCatalog** menu bar click **Customize,** choose **ArcCatalog Options**.
2. When the ArcCatalog Options window opens, click the **Metadata** tab.
3. From the Metadata Style, pick **FGDC CSDGM Metadata**,
   i. Check the box next to **"**Automatically update when metadata is viewed".
   ii. Check the box next to "Show metadata upgrade prompt".
   iii. Hit **OK**.

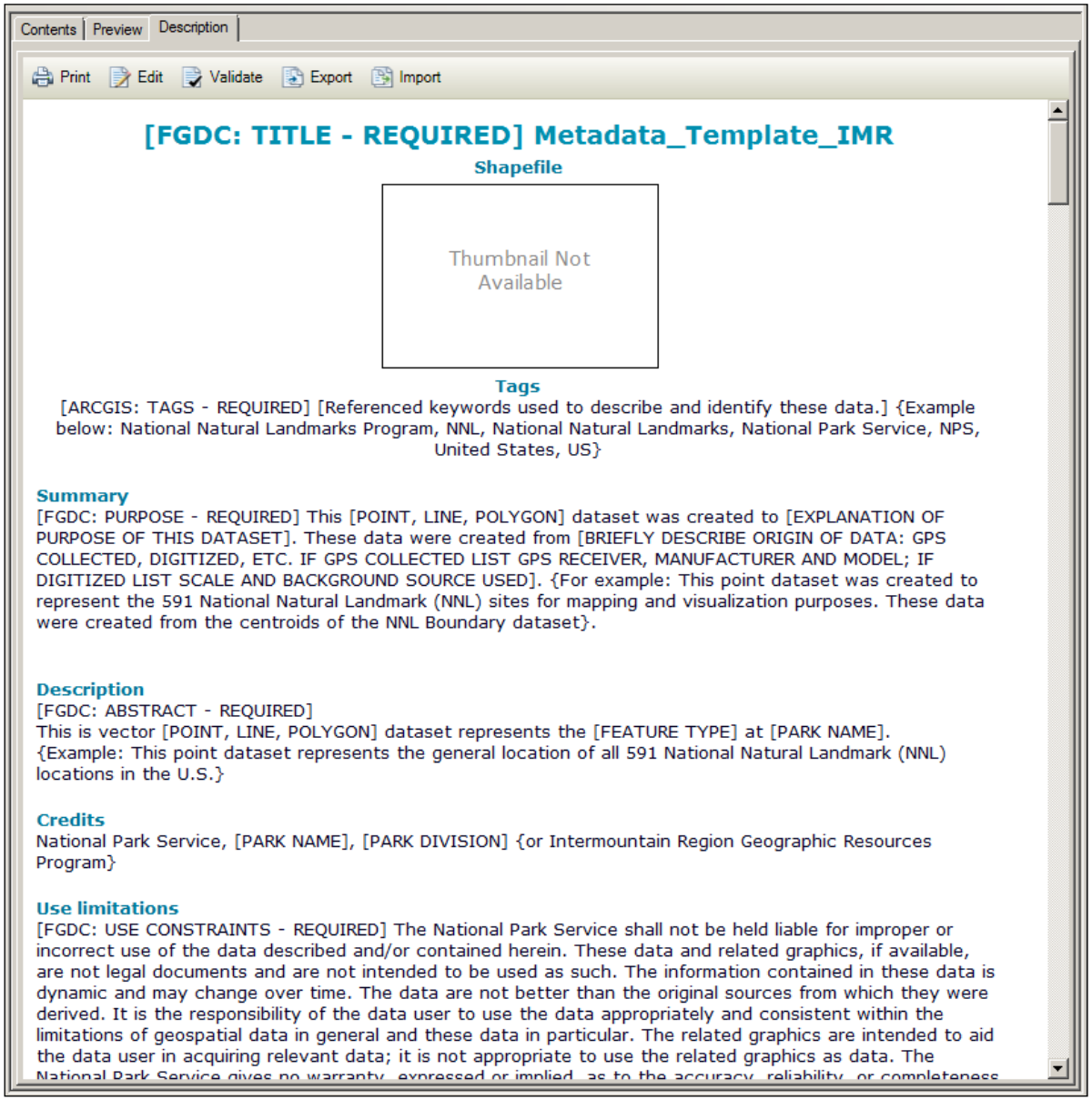


Other Thoughts

- If you don't have Service Pack 3, your FGDC Metadata will appear in dark blue font (without a read-only next to it) and it does not update when you edit the ArcGIS metadata.
- It's extremely important to upgrade your metadata to ArcGIS 10.0.
- For further explanation and reference links, refer to Appendix B.

Viewing Metadata

To view metadata in ArcCatalog, click on a dataset in the Catalog Tree. In the window to the right of the Catalog Tree, click the **Description Tab** and view the metadata of that feature.



Preparing the Metadata

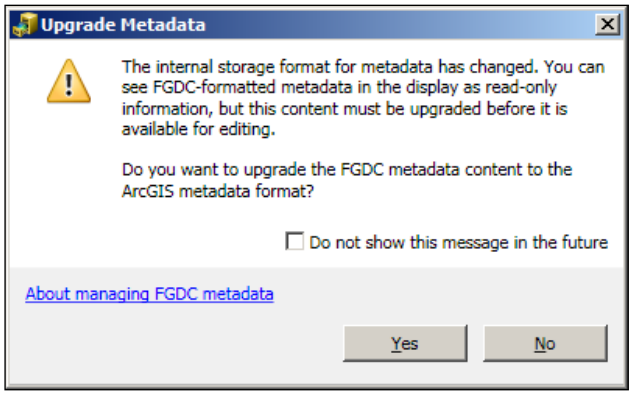
When starting a new editing session there initially needs to be an ArcGIS formatted file to edit. This means a new metadata template can be imported, old metadata can be upgraded and edited, or a blank metadata can be created for editing.

This section will cover the following:

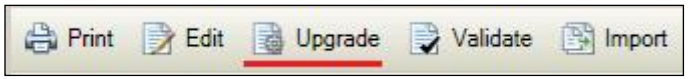
- How to upgrade metadata
- How to create a blank metadata record
- How to import a metadata template

1. Upgrading Metadata

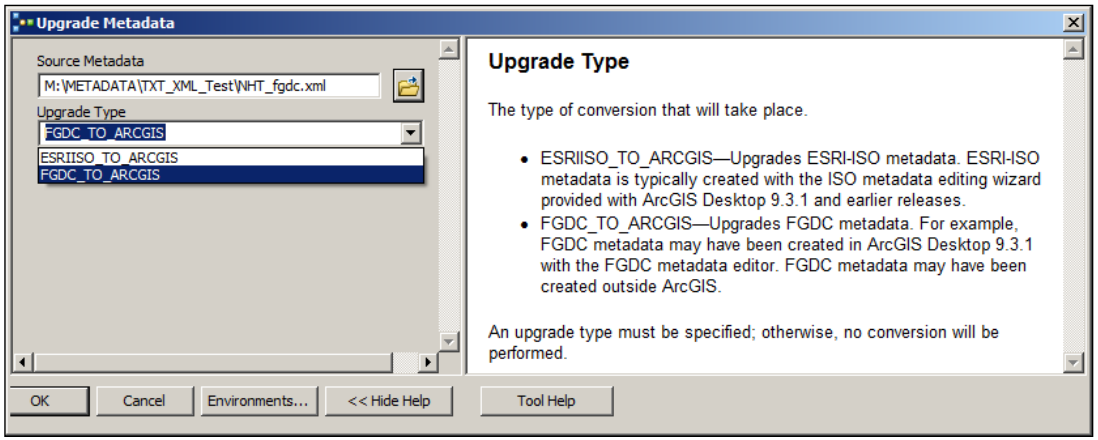
1.1. If you are using metadata that was created in an earlier version of ArcGIS, make sure it has been Upgraded. If a window pops up asking you if you want to upgrade your metadata, select **Yes**.



1.2. If you noticed an **Upgrade** button at the top of your **Description** tab, click it and upgrade your metadata.



If you have to upgrade, your **Upgrade Type** will be most likely be FGDC_TO_ARCGIS.



2. Starting with Blank Metadata

If you chose to start with blank metadata then proceed directly to **Updating or Editing Metadata** on page 7.

3. Import a Metadata Template

ArcCatalog allows you to import metadata from a template or another dataset in two ways. Using the **Import** button on the **Description** tab is not recommended, therefore the ArcToolbox **Import** tool steps are outlined below.

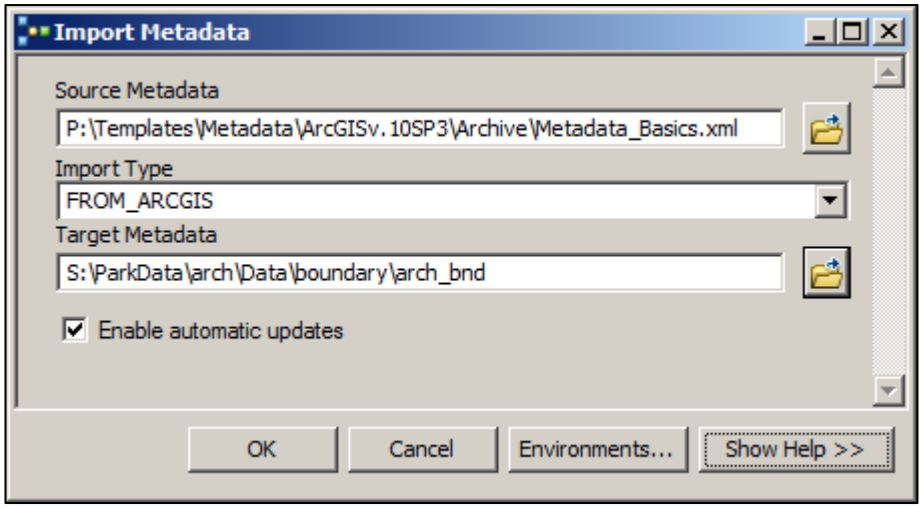
3.1. Open ArcCatalog and highlight the dataset in which you want to import metadata.

3.2. Open ArcCatalog Toolbox and navigate to **Conversion Tools**, **Metadata**, **Import Metadata**.

3.2.1. When the window opens, fill in the Source Metadata box using the browse button to navigate to your metadata template.

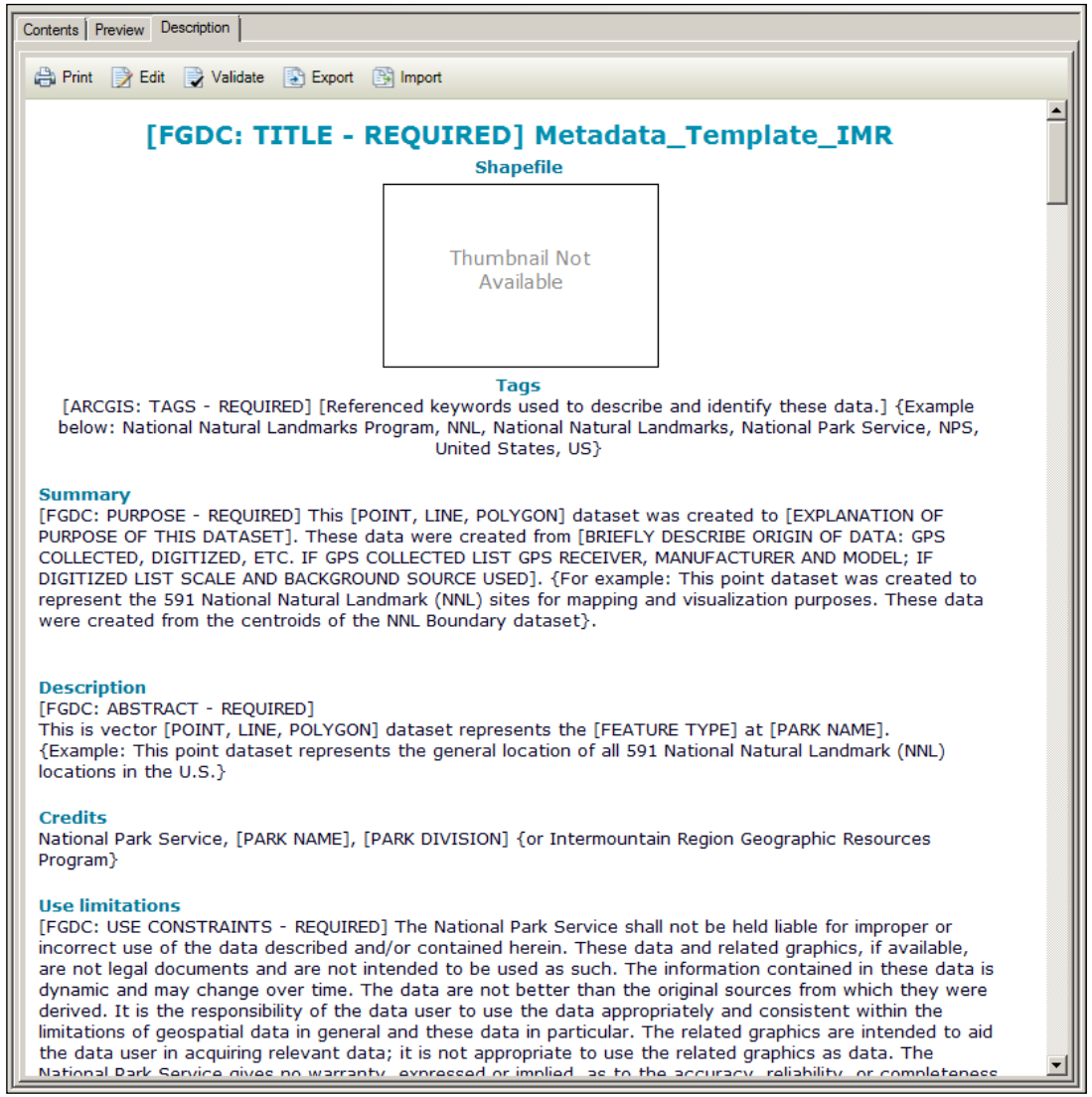
3.2.2. For the Import Type choose FROM _ARCGIS.

3.2.3. Your Target Metadata box should be filled in. If not, navigate to the dataset for which you want to import metadata. Check the box for **"Enable automatic updates"**. And click the **OK** button.



3.3. Close the process window when it's complete and check to make sure your template imported properly. The Description window should contain your metadata template.

3.4. If the import process didn't work, try refreshing your data, making sure you are on the correct file, and proceed with the import process again. If the import was successful continue on to the next section.



Updating or Editing Metadata

ArcCatalog has a built-in metadata editor which ties metadata to your shapefile or feature class. The metadata is maintained in an ESRI ArcGIS metadata format. The ArcGIS metadata format stores all the contents found in all metadata standards that are supported by ArcGIS Desktop. This includes the contents of FGDC and ISO metadata. Therefore you will be entering metadata content through the ArcGIS metadata format, but when the metadata is exported to FGDC format all the information will be included. You may not be able to *physically see* the entire FGDC contents in ArcCatalog because of the ArcGIS format, but you will see all the content once you export your metadata. Metadata can be exported into FGDC (or another standard) format through XML files. Those process steps are included in Appendix A.

This section will cover the following:

- How to edit metadata following the minimum FGDC requirements
  - Text in **GRAY BOLD** next to a heading is the FGDC equivalent name
  - The metadata items that are considered the very basic for metadata are highlighted with the icon
  - A table and illustrated guide of FGDC metdata is avialble in **Appendix D and Appendix E** for further clarification
- How to build a thumbnail for your metadata

Requirements – Minimum versus FGDC Compliance

This document outlines the *Basic Considerations* (minimum items that should be included) and *FGDC Requirements* (all items required to ensure metadata is FGDC-compliant) for each section of metadata. The icon will reside next to all the Basic Considerations sections, as a reminder of the minimum items that should be updated. They will appear at the beginning of each section or sub-section as follows:

Basic Consideration: Title, Tags, Summary, Description, Credits & Use Limitations

FGDC Requirements: Title, Tags, Summary, Description, Credits, Use Limitations, (Topic Categories), Theme Keywords, Thesaurus Citation, Publication Date & Citation Contacts.

Tools to Help – Appendix E & D

While reading the following pages on how to edit your metadata, the reader is encouraged to use Appendix D, a FGDC-formatted table and Appendix E, a FGDC-formatted illustrated guide. These are quick reference guides designed to help locate FGDC fields in ArcGIS metadata.

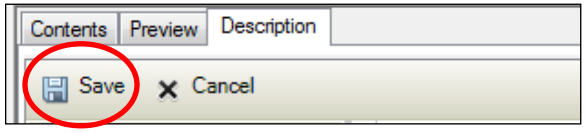
Empty Fields

While editing your metadata remember to delete all the FGDC reminders and examples. This includes sections you want to leave blank.

Do not use the term “None” in any fields, instead leave the space blank or use the word “Unknown”.

Save Your Work

It’s good practice to remember to save your work often. You can save your work by selecting the **‘Save’** symbol in the upper left hand corner of the metadata editing window. If you leave the Description tab before you saved your edits, they will be lost.

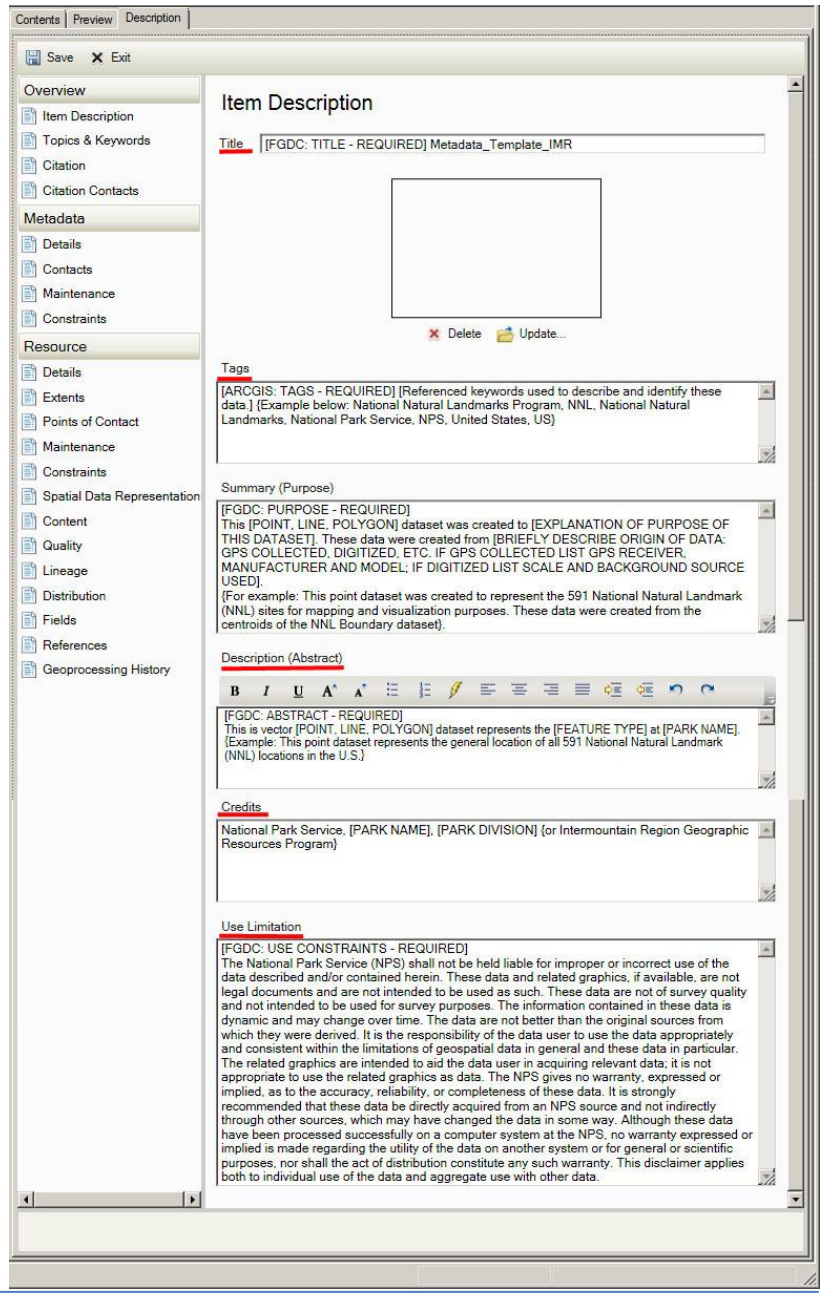


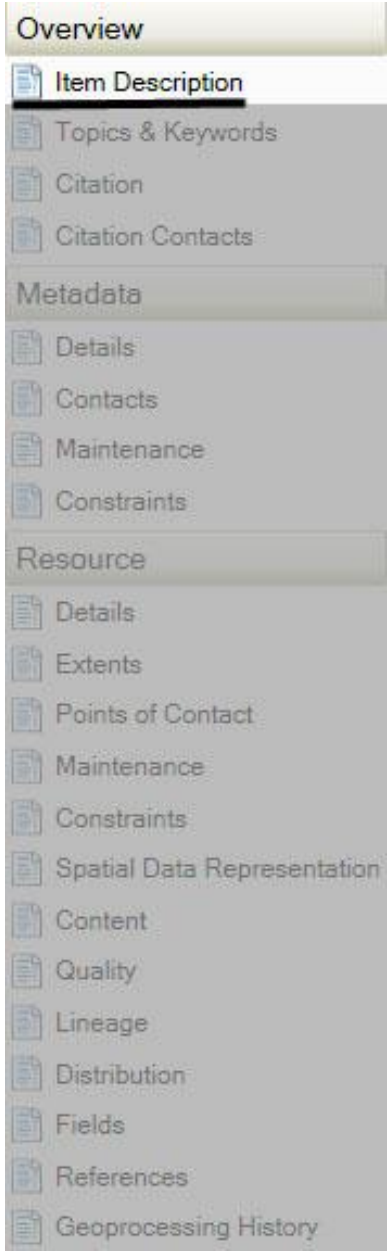
Start Editing

To view your metadata, navigate to your dataset and click the Description tab. To edit the metadata, click the **Edit** button found at the top of your Description screen.

The image on the right will appear. In ArcCatalog there are 3 main sections, Overview, Metadata, Resource, to ESRI metadata and can be navigated with the left navigation bar. The titles for each section/sub-section show on the right in the main metadata area and are underlined in red in the image to the right.

This is a preview of the focus areas you will be editing.





SECTION: Overview

Basic Consideration: Title, Tags, Summary, Description, Credits, and Use Limitations

FGDC Requirements: Title, Tags, Summary, Description, Credits, Use Limitations, (Topic Categories), Theme Keywords, Thesaurus Citation, Citation Date, and Citation Contacts.

REMEMBER: Delete all the FGDC reminders and examples. This includes sections you want to leave blank.

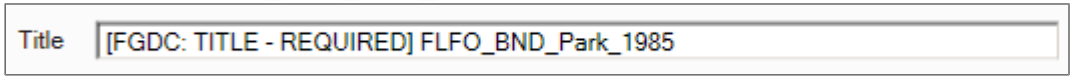
1. Item Description

This section focuses on the general information about the dataset. It is critical to any metadata record that the **'Title'**, **'Tags'**, **'Summary'**, **'Description'**, **'Credits'** and **'Use Limitations'** are completed.

NOTE: Do not use "None" in any fields, instead leave the space blank or use the word "Unknown".

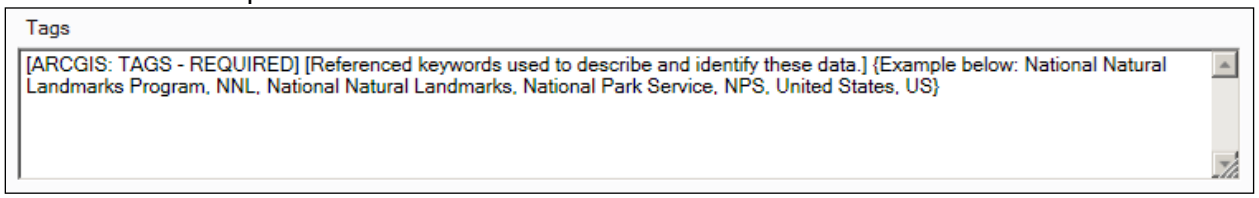
1.1. Title (Title)

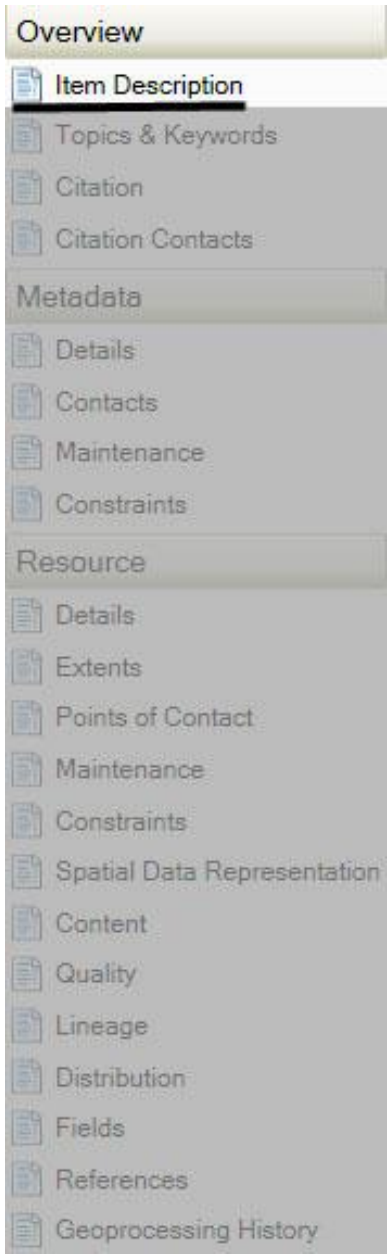
The default title will be the name of your feature class or shapefile. The title can be changed but it is not recommended.
For example: FLFO_BND_Park_1985



1.2. Tags (Tags)

A set of comma-separated terms that can be used to search for the dataset in ArcGIS.





1.3. **Summary** (Purpose)

A summary of the purpose for which the dataset was developed. This section can be confusing as it is called Summary but it is tied to the FGDC section Purpose. Therefore this section should cover more information about the dataset, how it was developed, and why.

Summary (Purpose)

[FGDC: PURPOSE - REQUIRED]
This [POINT, LINE, POLYGON] dataset was created to [EXPLANATION OF PURPOSE OF THIS DATASET]. These data were created from [BRIEFLY DESCRIBE ORIGIN OF DATA: GPS COLLECTED, DIGITIZED, ETC. IF GPS COLLECTED LIST GPS RECEIVER, MANUFACTURER AND MODEL; IF DIGITIZED LIST SCALE AND BACKGROUND SOURCE USED].
{For example: This point dataset was created to represent the 591 National Natural Landmark (NNL) sites for mapping and visualization purposes. These data were created from the centroids of the NNL Boundary dataset}.

1.4. **Description** (Abstract)

A brief abstract describing the dataset. This section can be confusing as it is called Description but it is tied to the FGDC section Abstract. Therefore this section should be the short statement or abstract about the dataset.

Description (Abstract)

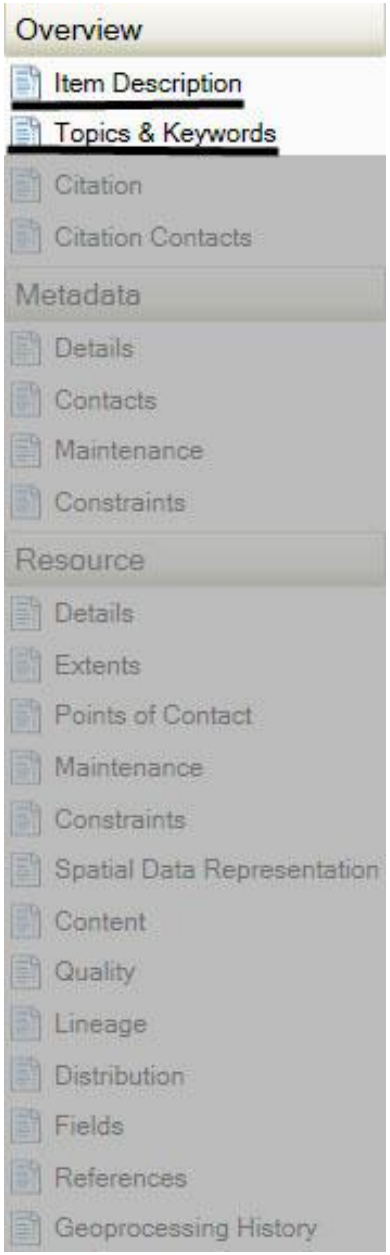
[FGDC: ABSTRACT - REQUIRED]
This is vector [POINT, LINE, POLYGON] dataset represents the [FEATURE TYPE] at [PARK NAME].
{Example: This point dataset represents the general location of all 591 National Natural Landmark (NNL) locations in the U.S.}

1.5. **Credits** (Credits)

Recognition of those who created or contributed to the dataset.
This information is copied in the **'Resource'**, **'Details'**, **'Credit'** section as well.

Credits

National Park Service, [PARK NAME], [PARK DIVISION] {or Intermountain Region Geographic Resource Program}



1.6. Use Limitation (Use Constraints)

Details about any limitations on how these data should or should not be used.

Use Limitation

[FGDC: USE CONSTRAINTS - REQUIRED]
The National Park Service shall not be held liable for improper or incorrect use of the data described and/or contained herein. These data and related graphics, if available, are not legal documents and are not intended to be used as such. The information contained in these data is dynamic and may change over time. The data are not better than the original sources from which they were derived. It is the responsibility of the data user to use the data appropriately and consistent within the limitations of geospatial data in general and these data in particular. The related graphics are intended to aid the data user in acquiring relevant data; it is not appropriate to use the related graphics as data. The National Park Service gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. It is strongly recommended that these data be directly acquired from an NPS source and not indirectly through other sources, which may have changed the data in some way. Although these data have been processed successfully on a computer system at the National Park Service, no warranty expressed or implied is made regarding the utility of the data on another system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data.

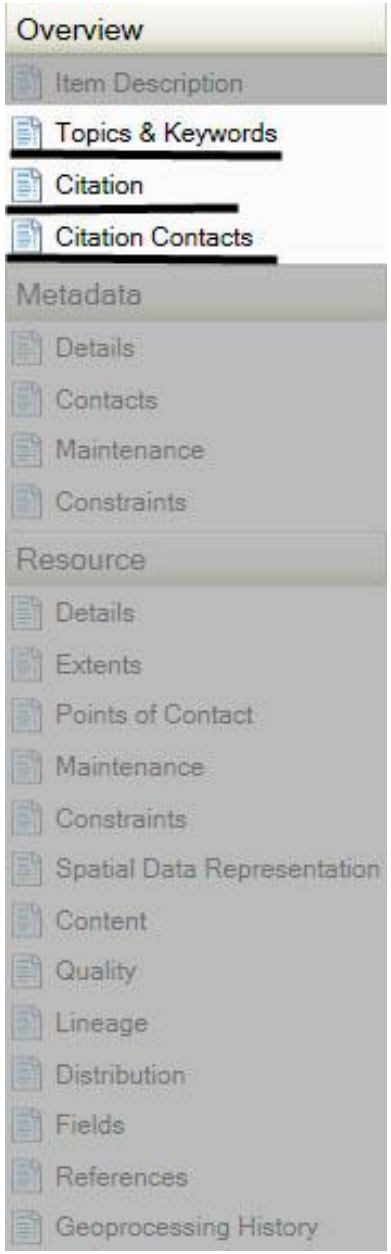
2. Topics & Keywords

2.1. Theme Keywords (Theme Keywords)

Click the drop down arrow next to the word '**Theme Keywords'** to expand the section and provide a list of keywords with each keyword on a separate line.

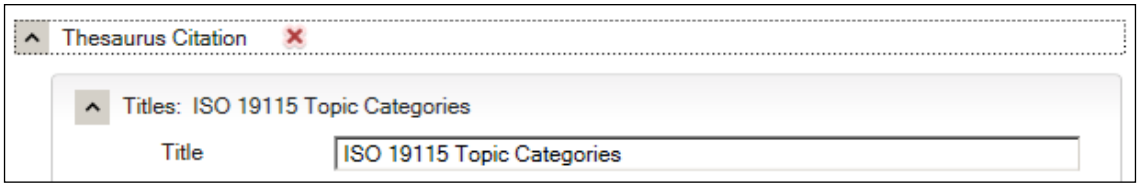
Theme Keywords

[FGDC: THEME KEYWORDS - REQUIRED] [Referenced keywords used to describe and identify these data. Each keyword is on a separate line.] {Example below:
National Natural Landmarks Program
NNL
NPS
National Park Service}



2.2. **Thesaurus Citation** (Theme Thesaurus)

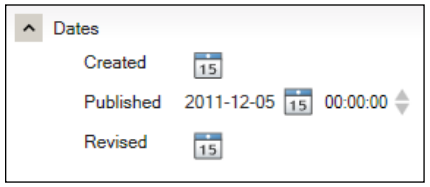
Below **'Theme Keywords'** click the drop down arrow next to **'Thesaurus Citation'**. Fill in the Citation **'Title'** with a reference to a formally registered thesaurus or a similar authoritative source of theme keywords. If unknown, choose a standard default, such as ISO 19115 Topic Categories ((http://gcmd.nasa.gov/User/difguide/iso_topics.html.)



3. Citation

3.1. **Dates** (Publication Date)

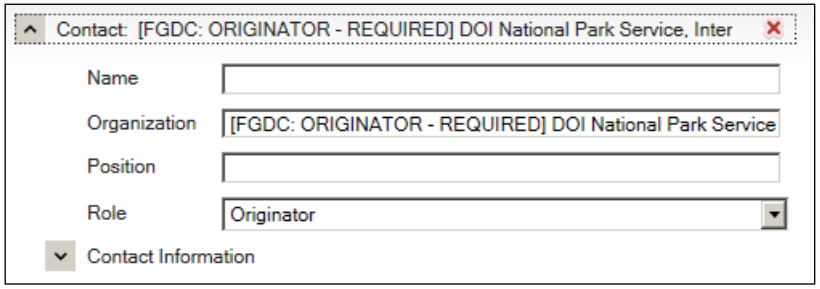
In the Overview section, select Citation. The **'Titles'** should already be filled in based on information under Item Description. Click the drop down arrow next to the word **'Dates'**. Click the calendar next to **'Published'** and choose a publication date pertaining to your dataset.

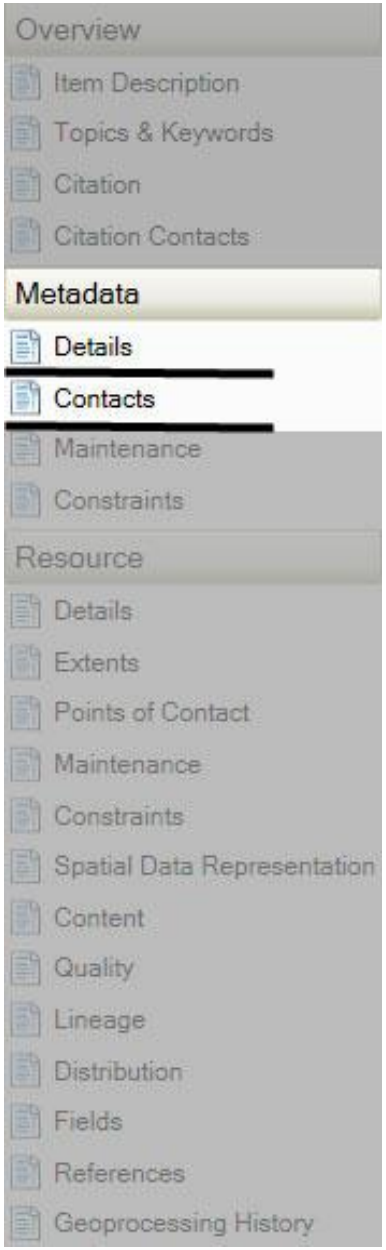


4. Citation Contacts

4.1. **Contact** (Originator)

This information is related to the originator or creator of the dataset. Click the **'+ New Contact'** button, if it isn't already open and then click the drop down arrow next to the word **'Contact'** to expand this section. Fill in **'Name'**, **'Organization'**, **'Position'** and **'Role'**.





SECTION: Metadata

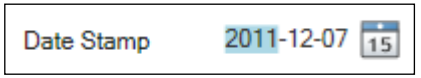
Basic Consideration: Contact and Contact Information
FGDC Requirements: Date Stamp, Contact, and Contact Information

This particular section focuses on the metadata record you are creating. It is critical to any metadata record that the **'Contact'** and **'Contact Information'** sections are completed.

5. Details

5.1. Date Stamp (Publication Date)

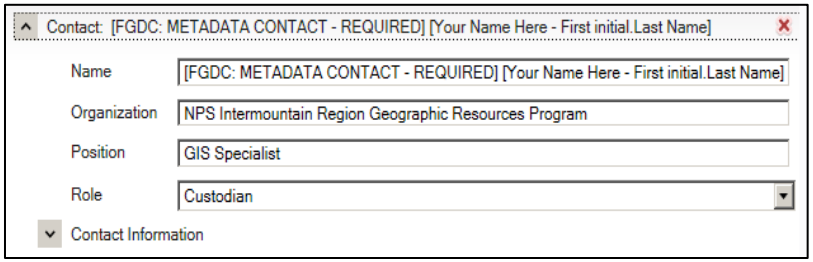
ArcGIS automatically updates the feature date stamp when features are edited but not when your metadata is edited. If you want to update your metadata date, click the calendar next to **'Date Stamp'** button and update the date.

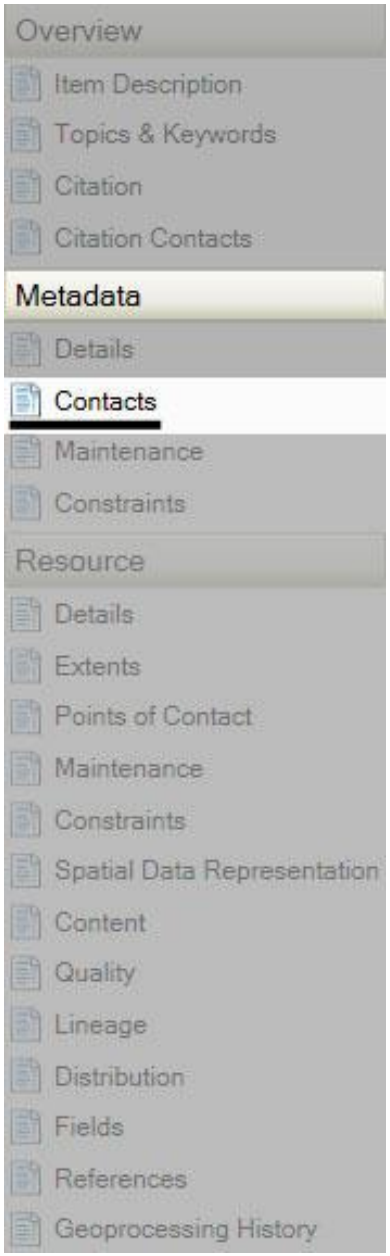


6. Contacts

6.1. Contact (Metadata Contact Name)

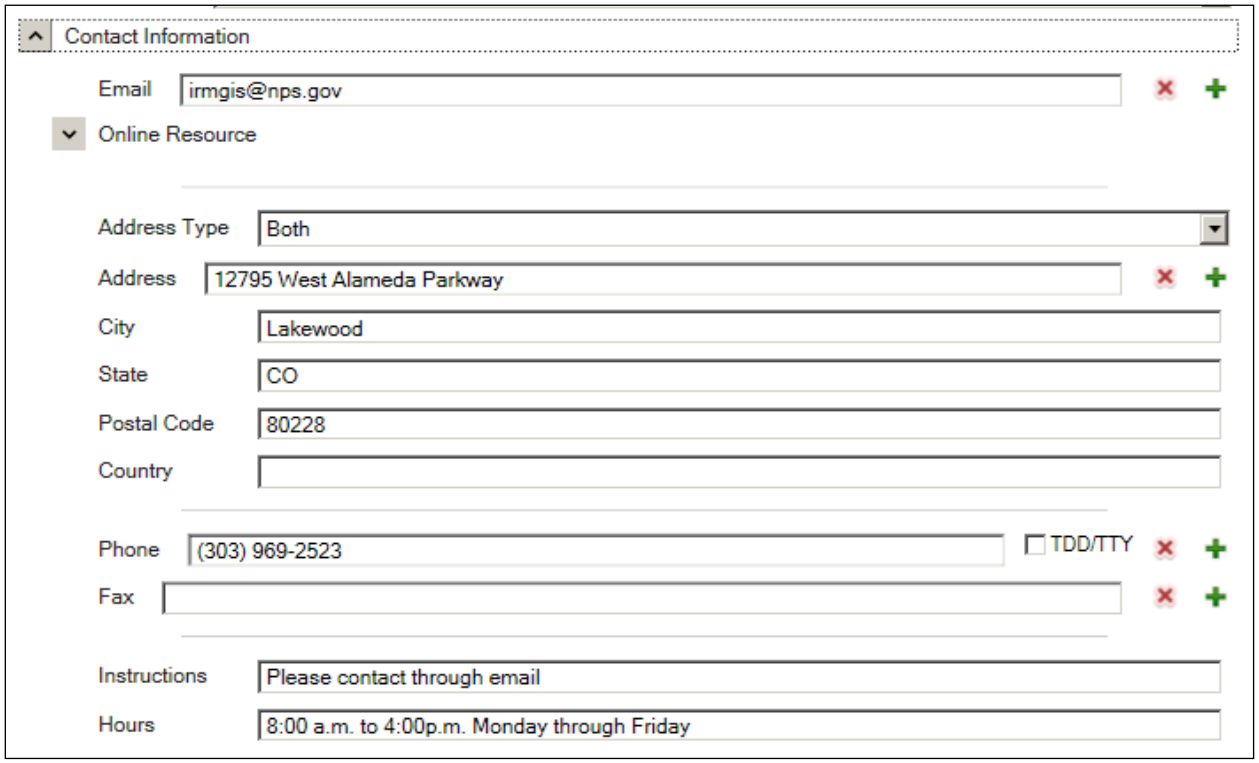
Under **Contacts**, click the **'+New Contact'** button or the **'Contact'** drop down arrow if applicable. Fill in **'Name'**, **'Organization'**, **'Position'** and **'Role'**.





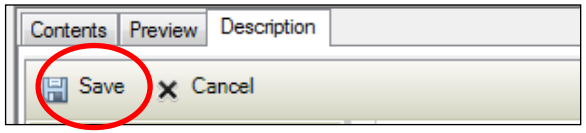
6.2. **Contact Information** (Metadata Contact Information)

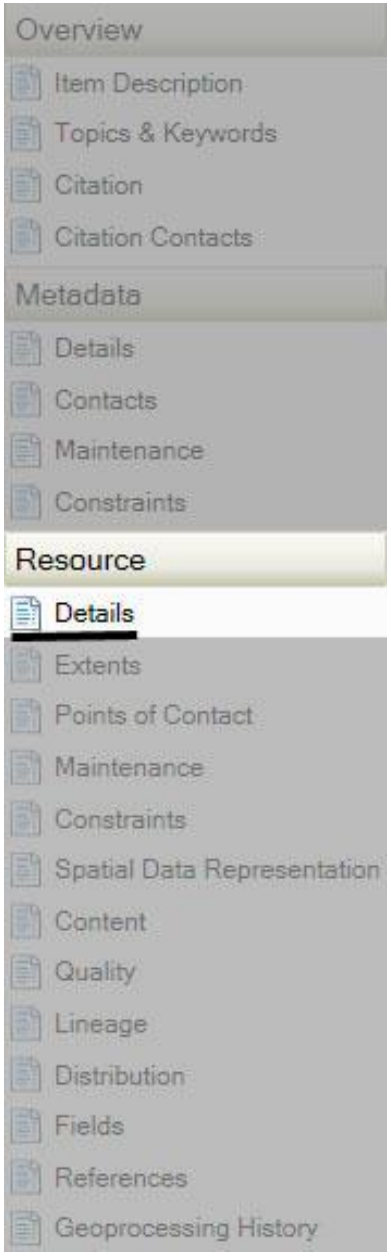
Click the drop down arrow next to Contact Information and fill out at a minimum: **'Address Type'**, **'Address', 'City'**, **'State'**, **'Postal Code'** and **'Phone'**.



SAVE YOUR WORK

Remember to save your work by selecting the **'Save'** symbol in the upper left hand corner of the metadata editing window. Start editing again by hitting the **Edit** button that will appear near the top of the Description tab.





SECTION: Resource

Basic Considerations: Points of Contact, Contact Information, Process Step (Description & Date), Distributor Contact, Details - Attribute: Type, Overview Description & Citation.

FGDC Requirements: Status, Extents, Contact & Contact Information, Online Resource, Update Frequency, Constraints, Quality Reports (Logical Consistency & Completeness), (if source data was used: Data Source, Medium Name, Title, Alternate Title, Published Date, Contact, Source Extent and Temporal Instant (or Period) Extent), Process Description & Date, Distributor Contact, Details - Attribute: X, Description, Overview Description & Citation.

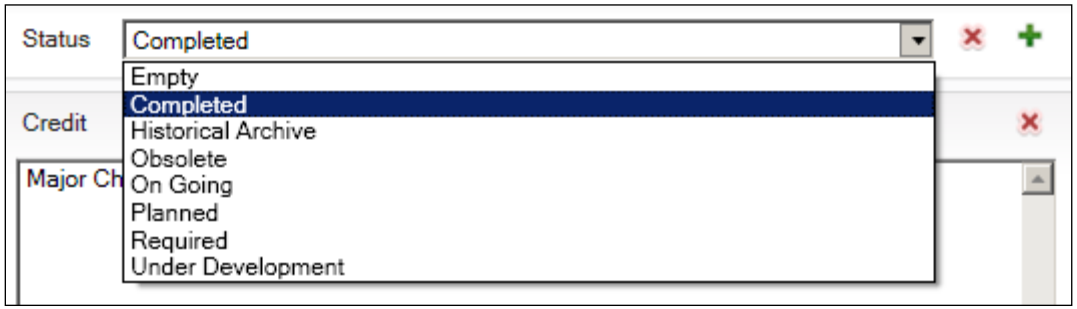
The Resource section focuses on the details of your particular data. It is critical to any metadata record that the **'Contact'**, **'Contact Information'**, **'Process Description'**, **'Date'**, **'Distributor Contact'** and **Description of your Fields** sections are completed.

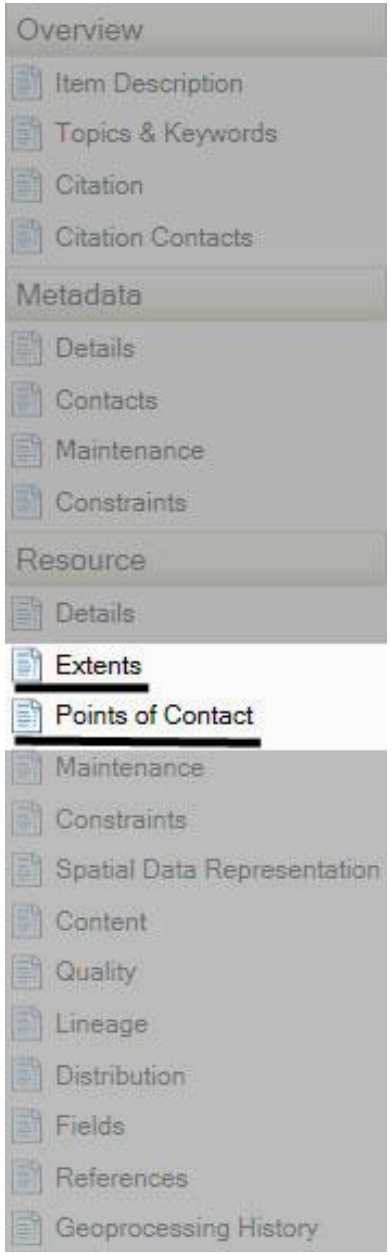
NOTE: Do not use "None" in any fields, instead leave the space blank or use the word "Unknown".

7. Details

7.1. Status (Progress)

Click the **'+ New Status'** button and using the drop down menu choose the status of your data.



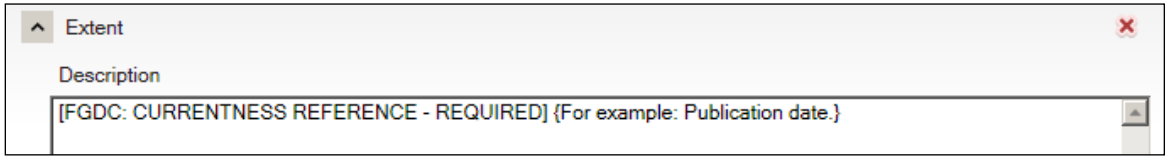


8. Extents

8.1. Description (Currentness Reference)

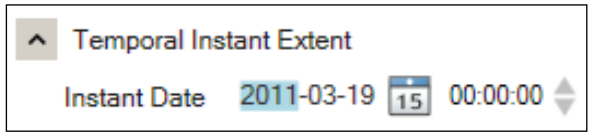
This section documents how "up-to-date" a dataset is. It is related to the ground condition or when the "real world" looked the way it is described in the dataset. Commonly, only the date/time the information was recorded or published is known.

Click the drop down arrow next to the word **'Extent'**. In the **'Description'** box enter the dataset's currentness date, usually the publication date.



8.2. Temporal Instant Extent (Time Period of Content)

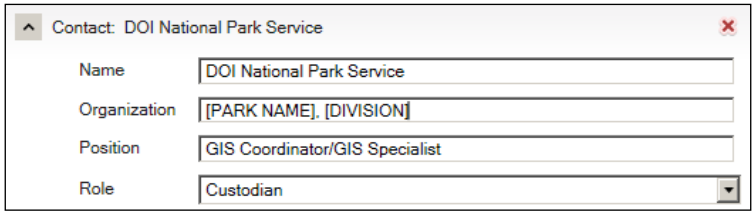
Within the **'Extent'** frame, click **'New Temporal Period Extent'** or **'New Temporal Instant Extent'**. Click the calendar and pick a date. This date refers to the ground condition (if the dataset was derived from another source) or when the information was recorded, published, etc.

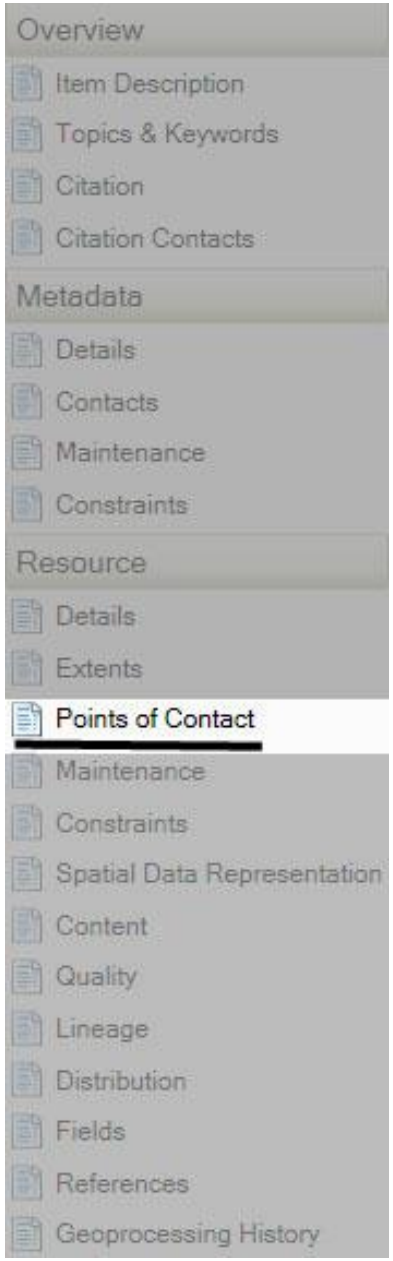


9. Points of Contact

9.1. Contact (Point Of Contact)

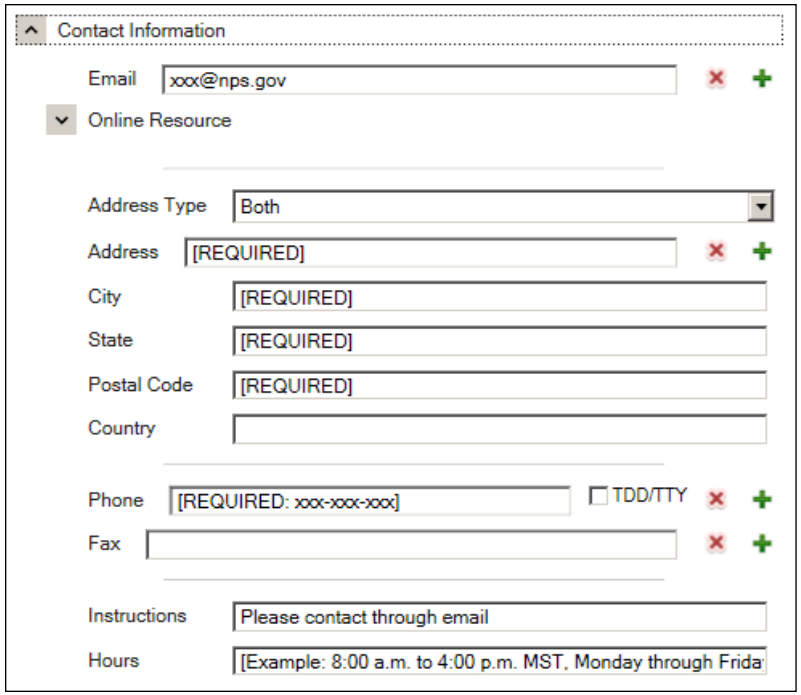
Click the **'+New Contact'** button or the **'Contact'** down arrow, if applicable. Fill in **'Name'**, **'Organization'**, **'Position'** and **'Role'**.





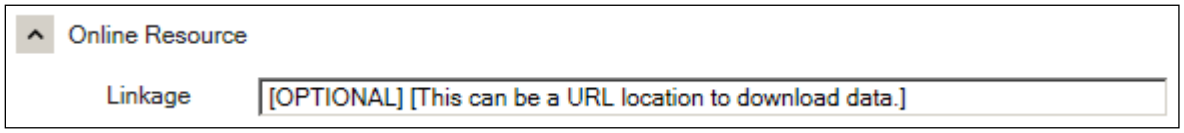
9.2. **Contact Information** (Contact Information)

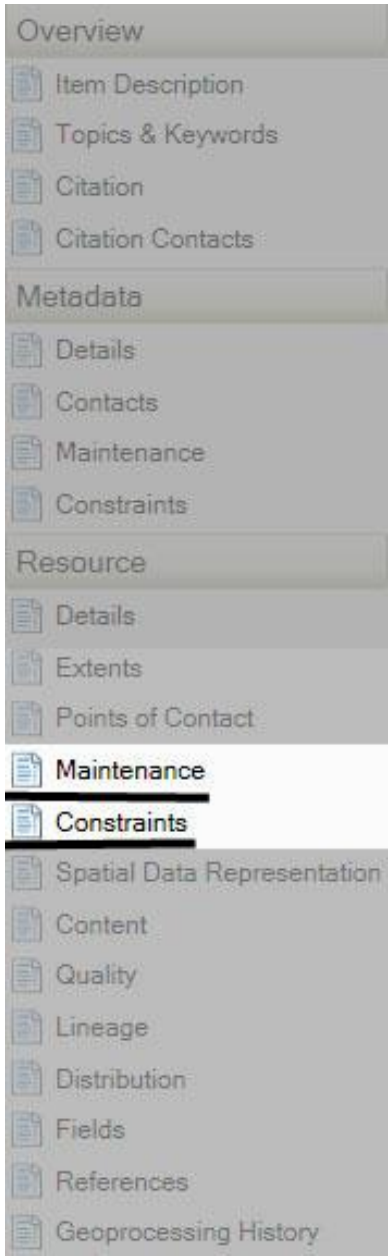
Click the drop down arrow next to **'Contact Information'** and fill out at a minimum: **'Address Type'**, **'Address'**, **'City'**, **'State'**, **'Postal Code'** and **'Phone'**.



9.3. **Online Resource** (Online Linkage)

Within the **'Contact Information'** frame click the drop down arrow by **'Online Resource'**. This information is optional.

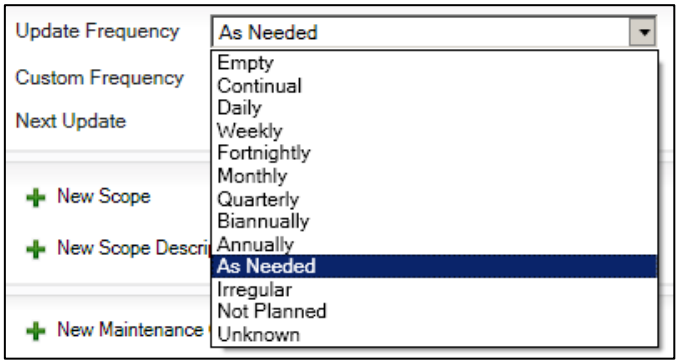




10. Maintenance

10.1. Update Frequency (Maintenance and Update Frequency)

Select the dataset's update frequency by clicking on the drop down arrow next to the word **'Update Frequency'** and selecting the appropriate option.



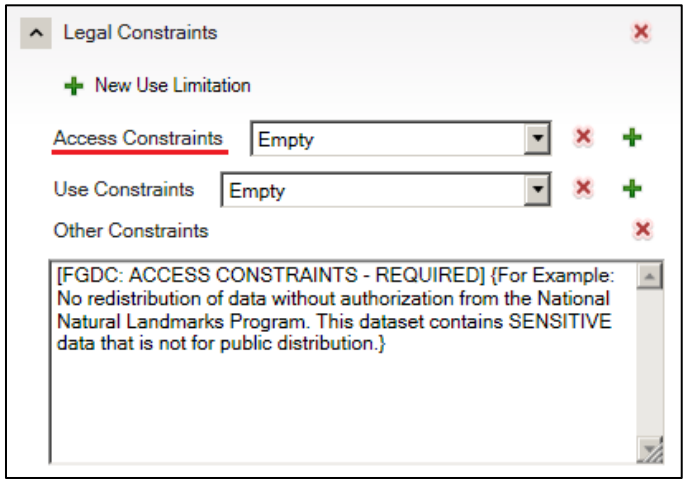
11. Constraints

11.1. General Constraints (Use Constraints)

If you click the drop down arrow next to **'General Constraints'**, you should see the '**Use Limitations'** already filled out from your earlier input under Item Description.

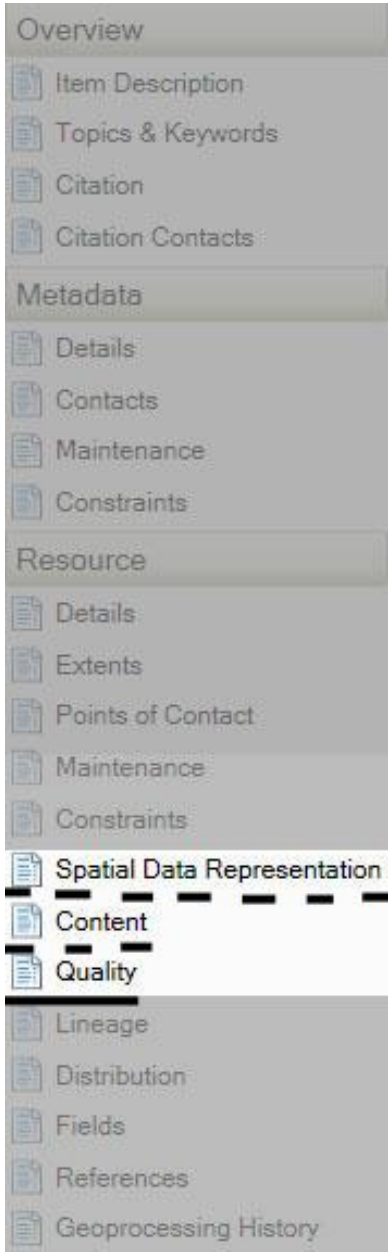
11.2. Legal Constraints (Access Constraints)

If you need to include any additional constraints, such as access restrictions or legal prerequisites for distributing the dataset, you can add a new constraint.



Either click the drop down arrow next to **'Legal Constraints'** or the plus sign next to **'+New Legal Constraints'**. Select an option from the drop down arrow next to **'Access Constraints'**. Then click the plus sign next to **'+New Other Constraints'** and put in a description in the **'Other Constraints'** box.

If you don't have any other constraints, you can select **'Empty'** for the **'Access Constraints'** and under '**Other Constraints'** type "No constraints at this time." or "See Use Limitation/Constraints."



12. Spatial Data Representation

This section will be filled out automatically by ArcGIS.

13. Content

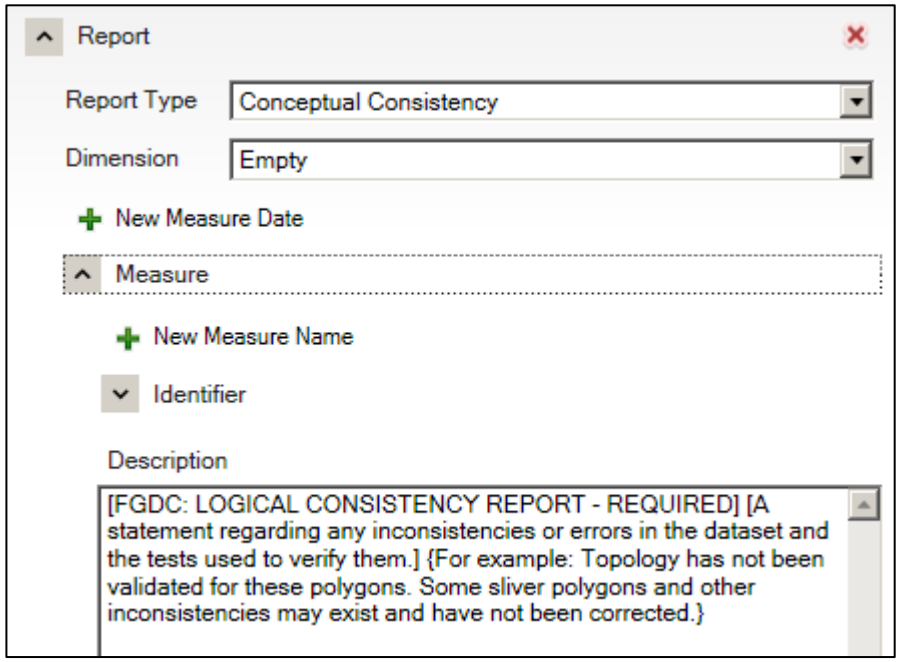
This section allows the user to describe the content of the dataset. This section is not required and similar information is already filled out in other sections.

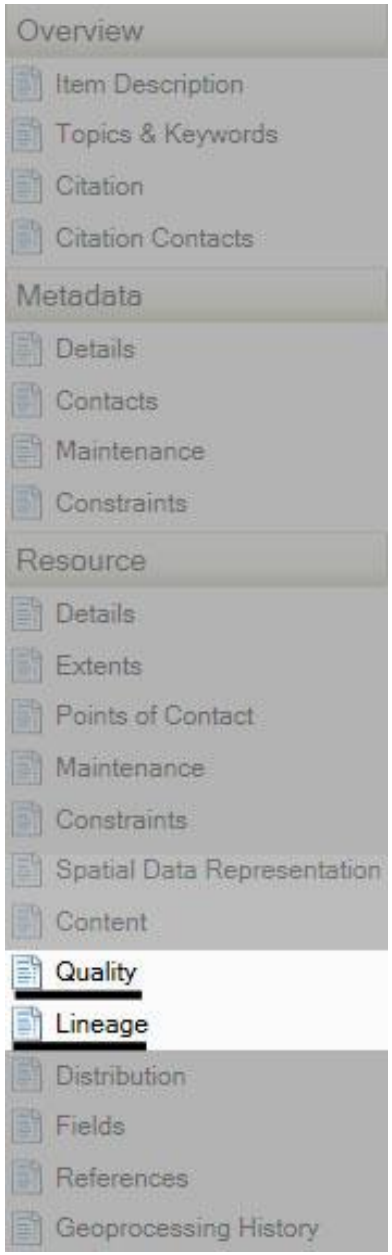
14. Quality

This section requires that two types of reports be filled out for FGDC-compliance. A logical consistency report and a completeness report.

14.1. Report (Logical Consistency Report)

This report is a statement regarding any inconsistencies or errors in the dataset and the tests used to verify them. Click **'+New Report'** and using the drop down arrow next to **'Report Type'**, choose **'Conceptual Consistency'**. Below the **'Report Type'** click the drop down arrow next to **'Measure'** and fill in the box under **'Description'**.



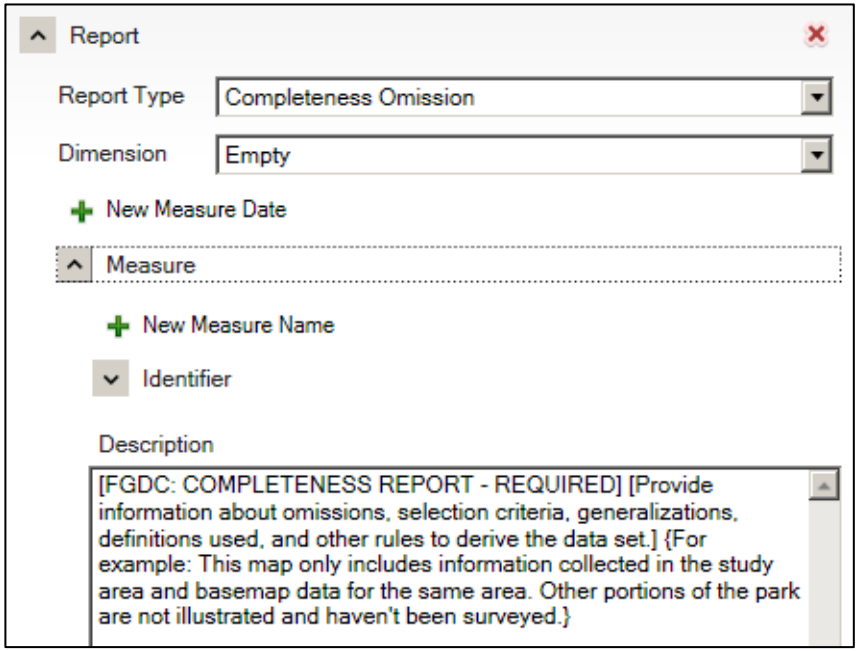


14.2. Report (Completeness Report)

The completeness report is information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set.

To add the second report, click **'+New Report'**. Select **'Completeness Omission'** for the **'Report Type'**.

Below the **'Report Type'** click the drop down arrow next to **'Measure'** and fill in the box under **'Description'**.

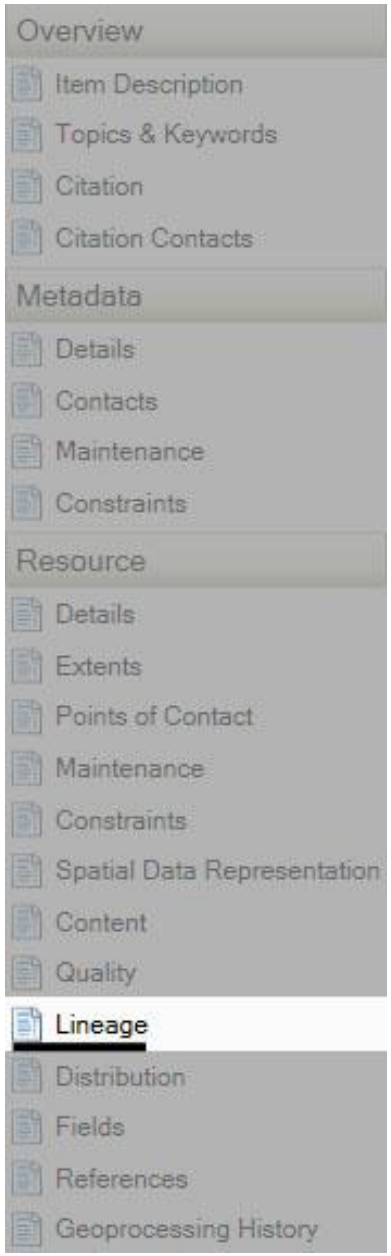


15. Lineage

IF SOURCE DATA WAS USED:

If your dataset was created from another source, such as aerial photography, elevation models, USGS Topographic maps, by FGDC standards you must fill out the following sections: **'Data Source'**, **'Medium Name'**, **'Title'**, **'Alternate Title'**, **'Published Date'**, **'Contact'**, **'Source Extent'** and **'Temporal Instant (or Period) Extent'**.

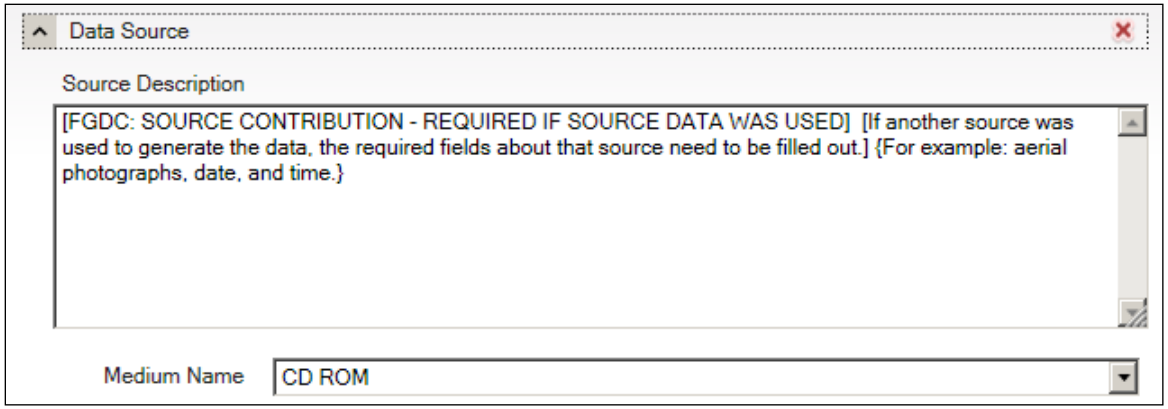
IF SOURCE DATA WAS NOT USED: Skip to Process Step 15.7.



15.1. **Data Source** (Source Contribution & Type of Source Media)

Click the drop down arrow next to **'Data Source'** and under the '**Source Description'** box put in a short description of the source. For example if the dataset was created from aerial photographs, the dataset source would include photo dates and type collected.

Choose a type of media for the **'Medium Name'.**

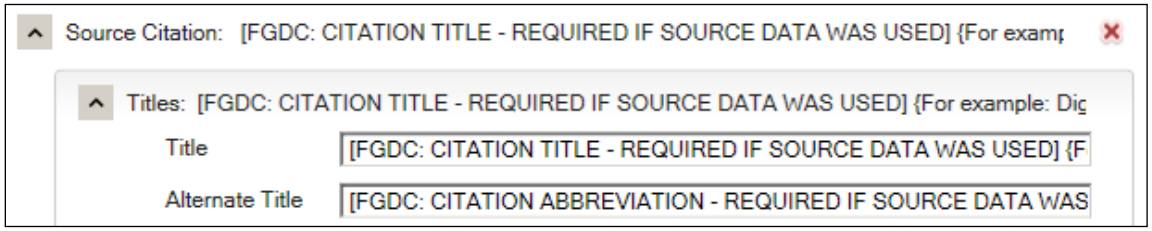


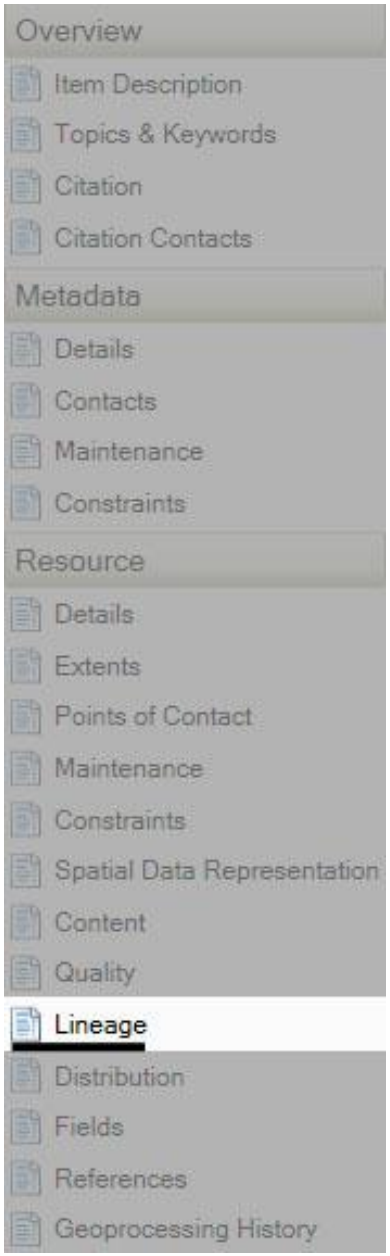
15.2. **Source Citation**

Within the '**Data Source'** subsection, click on **'+ New Source Citation'** or the drop down arrow next to **'Source Citation'** to show the properties for the citation.
The **Source Citation** will fill in once you fill out the '**Title'** and **'Alternate Tile'** below **'Tiles'**.

Title & Alternate Tile (Source Title & Source Citation Abbreviation)

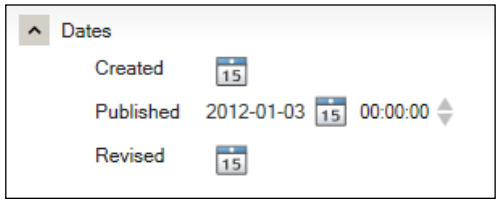
Under **'Tiles',** fill out **'Title'** and **'Alternate Title'** (the Citation Abbreviation.) For example: Title would be "Digital Orthophotos of New Mexico" and the Alternate Title would be "1992 Color IR Orthophotography."





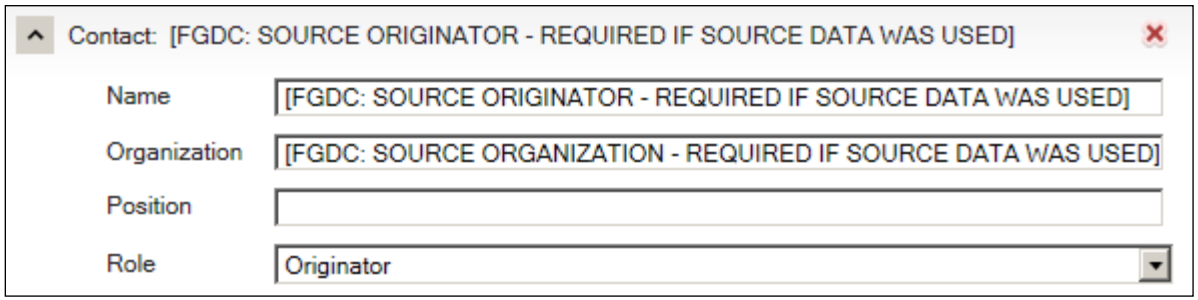
15.3. **Dates** (Source Publication Date)

Under **'Source Citation'**, click on **'Dates'.** Click the calendar next to **'Published'** and choose the publication date of the source data.



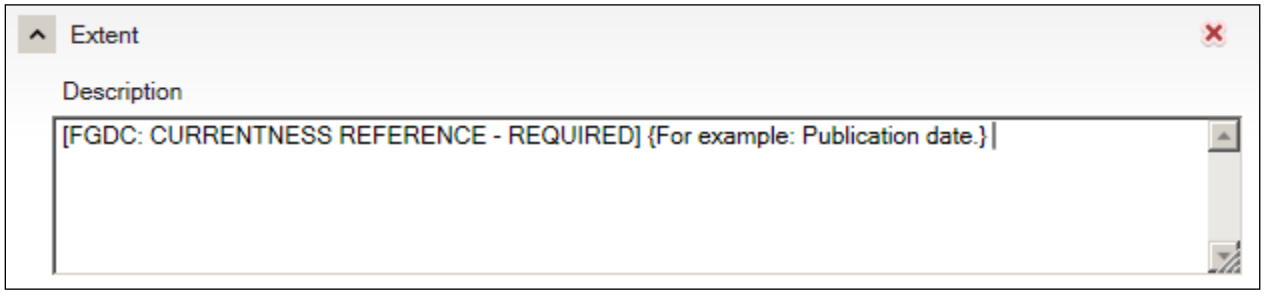
15.4. **Contact** (Source Originator)

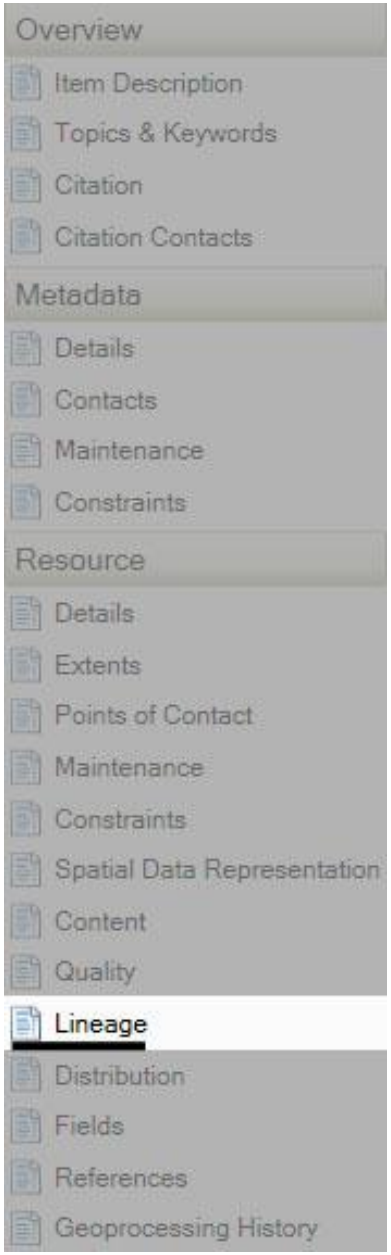
Under **'Source Citation'**, click the drop down arrow next to **'Contact'** or **'+ New Contact'**. Fill in **'Name'**, **'Organization'**, and **'Position'** of the data source.



15.5. **Source Extent** (Source Currentness Reference)

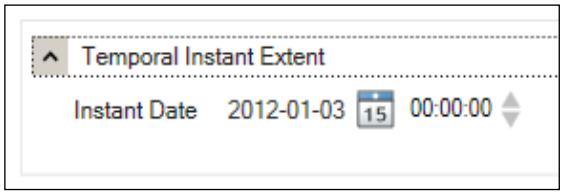
Under **'Data Source'**, click **'+ New Source Extent'** or click **'Source Extent'** and then provide the appropriate dates and times associated with the source data.





15.6. Temporal **Instant (Period) Extent** (Source Time Period of Content)

Under **'Data Source', 'Source Extent'**, **click '+ New Temporal Period Extent'** or **'+New Temporal Instant Extent'** and then provide the appropriate dates and times associated with the source data.



15.7. **Process Step** (Process Description & Date)

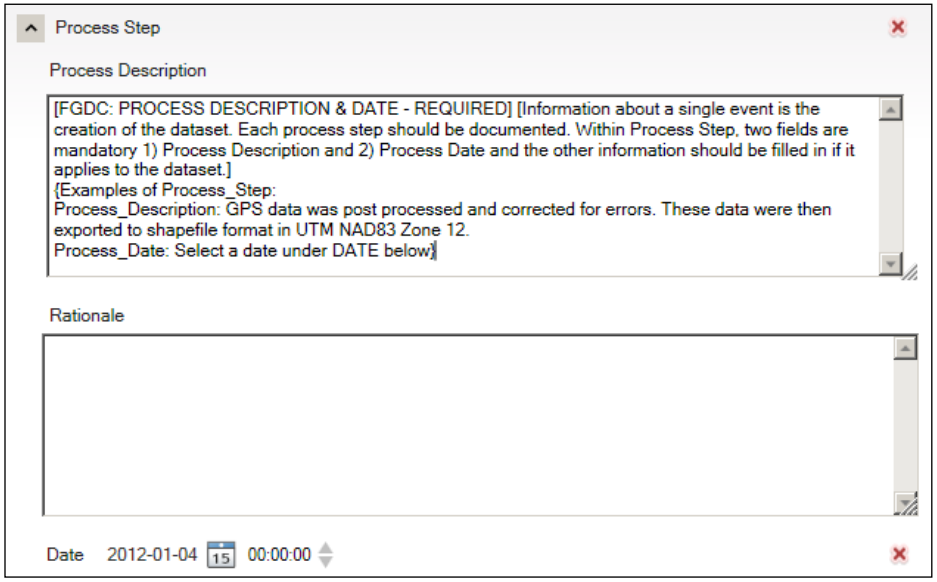
It is important for any metadata record that **'Process Step'** and **'Date'** be filled out. This section is important to help the user understand what has been done to the dataset and how it was created. Each significant process step should be documented.

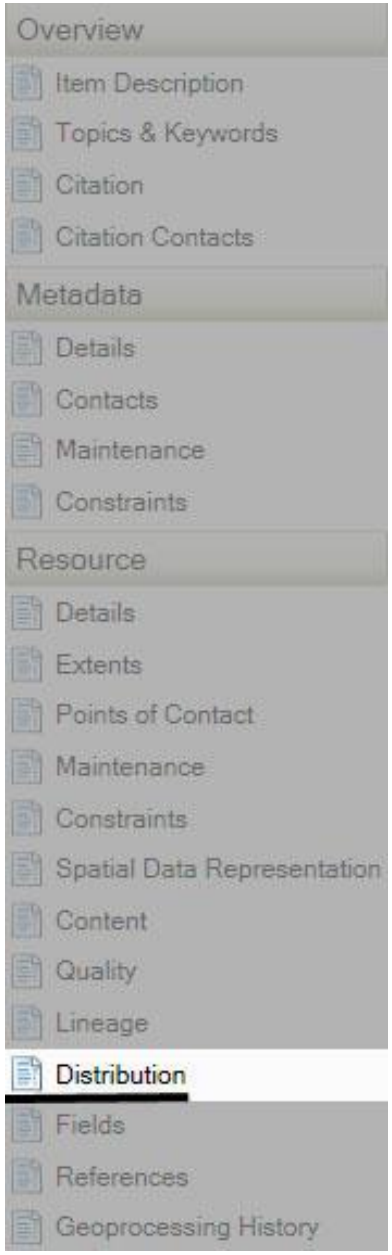
Click **'+New Process Step'** or click the drop down arrow next to **'Process Step'** if applicable.

Describe how the dataset was put together under the **'Process Description'** box.

Click the calendar next to **Date** to pick a process date.

Keep adding process steps to document each significant step in the development of the dataset.





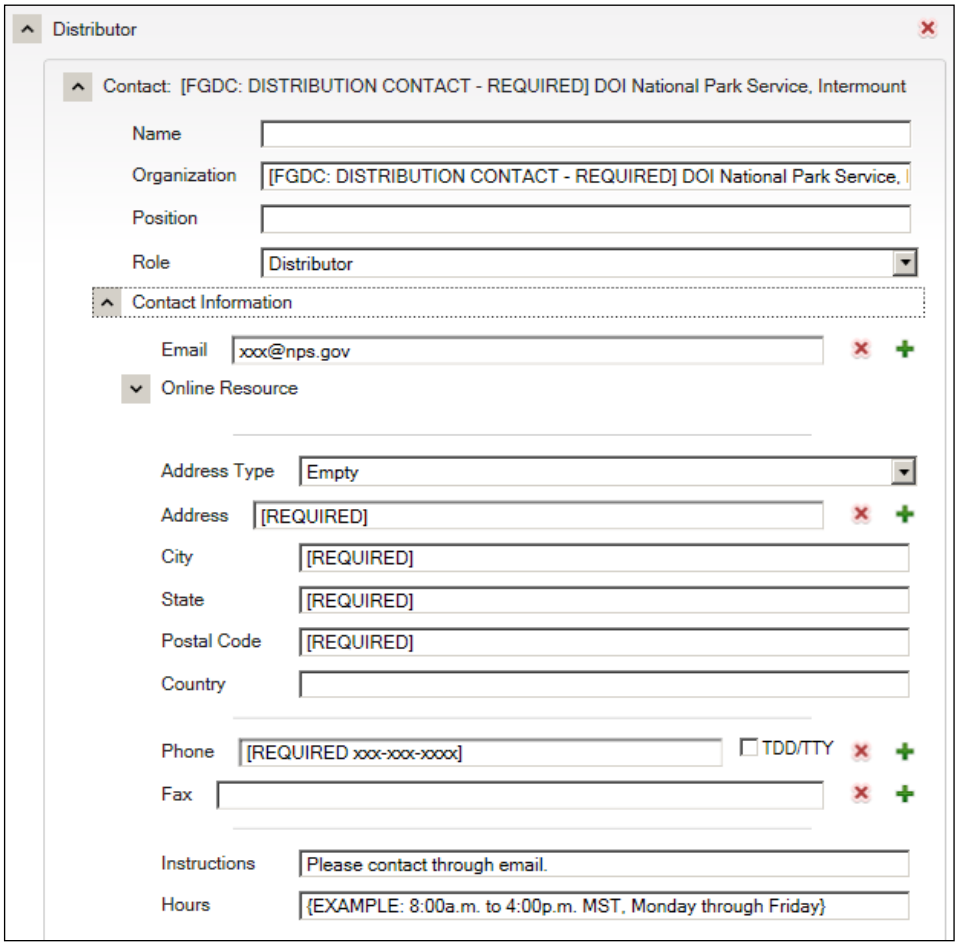
16. Distribution

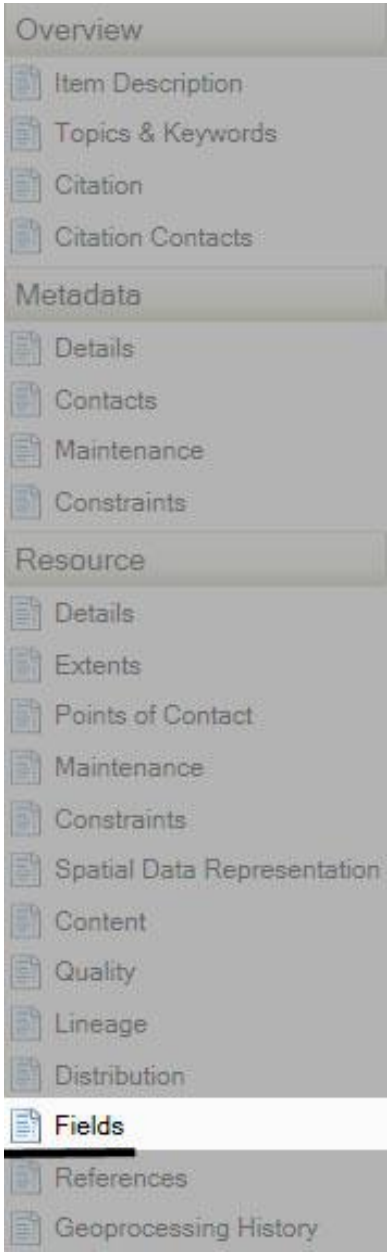
It is important that the Distributor 'Contact' and 'Contact Information' be filled out.

16.1. Contact (Distributor Contact)

Click the **'+ New Distributor'** button or click the drop down arrow next to the word **'Distributor'** to expand this section. Click the drop down arrow next to **'Contact'** to fill in **'Name'**, **'Organization'**, **'Position'** and **'Role'**. Choose **'Distributor'** as the role.

Click the drop down arrow next to **'Contact Information'** and fill out at a minimum: **'Address Type', 'Address', 'City'**, **'State'**, **'Postal Code'** and **'Phone'**.





17. Fields

It is important to understanding a dataset's attribute table that the attribute information is filled out.

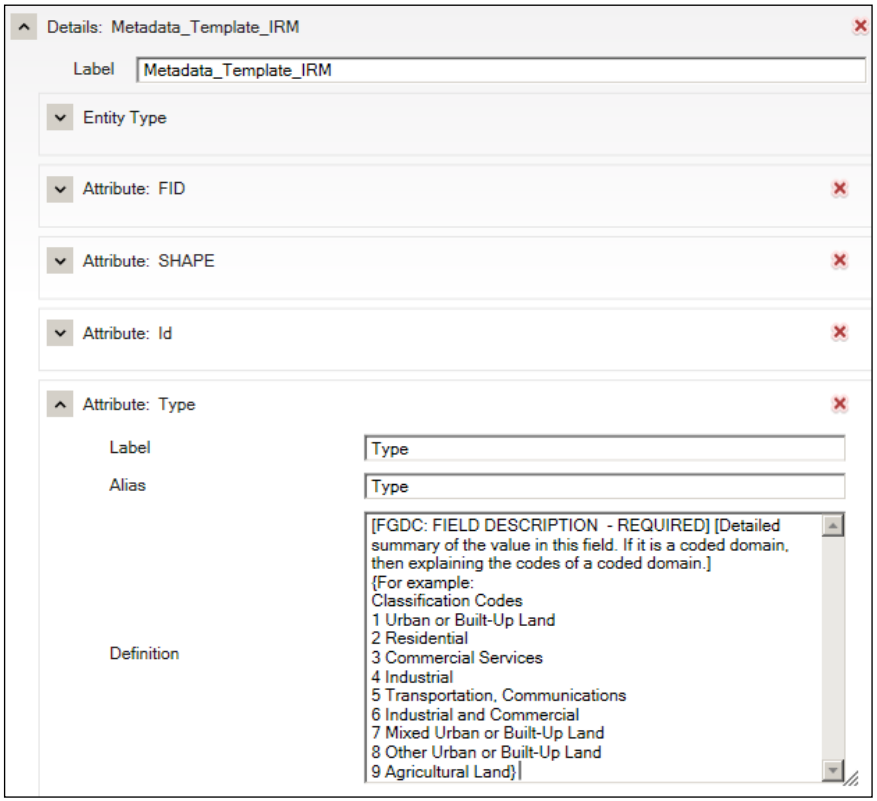
Do not add a New Attribute in the metadata. It will be deleted when you exit the metadata. It does not save your additions.

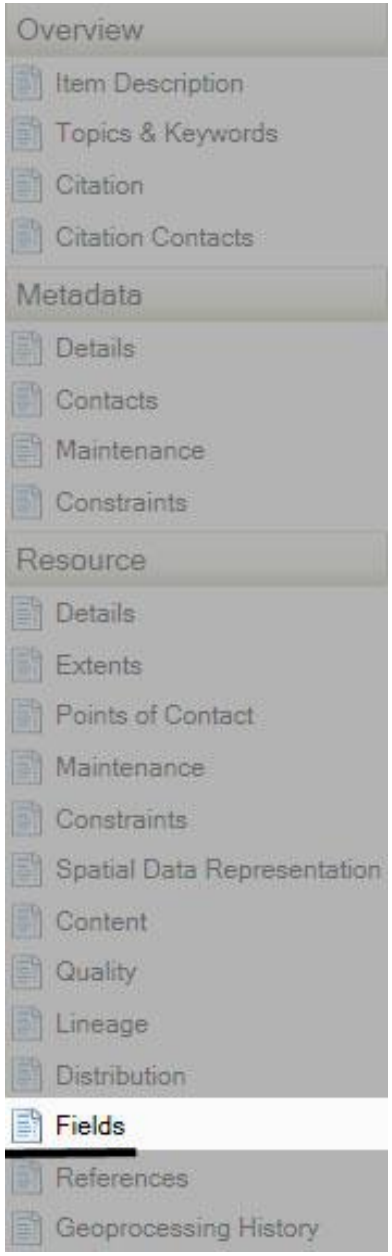
17.1. Details - Attribute: Type (Field Description)

ArcGIS automatically maintains information about the item's attributes through the synchronization process. Attributes are added to the metadata as they are created.

Each field in the attribute table needs to be given a description so the user understands the values in the field. A description is essential if the field is an abbreviation or contains a coded domain. A coded domain specifies a valid set of values used for an attribute. For example, vegetation classes are often assigned a number and the list of numbers with the vegetation class name is provided in the metadata.

Click the drop down arrow next to **'Details'**. Then click the drop down arrow next to an attribute you created and enter in a description in the **'Definition'** box.



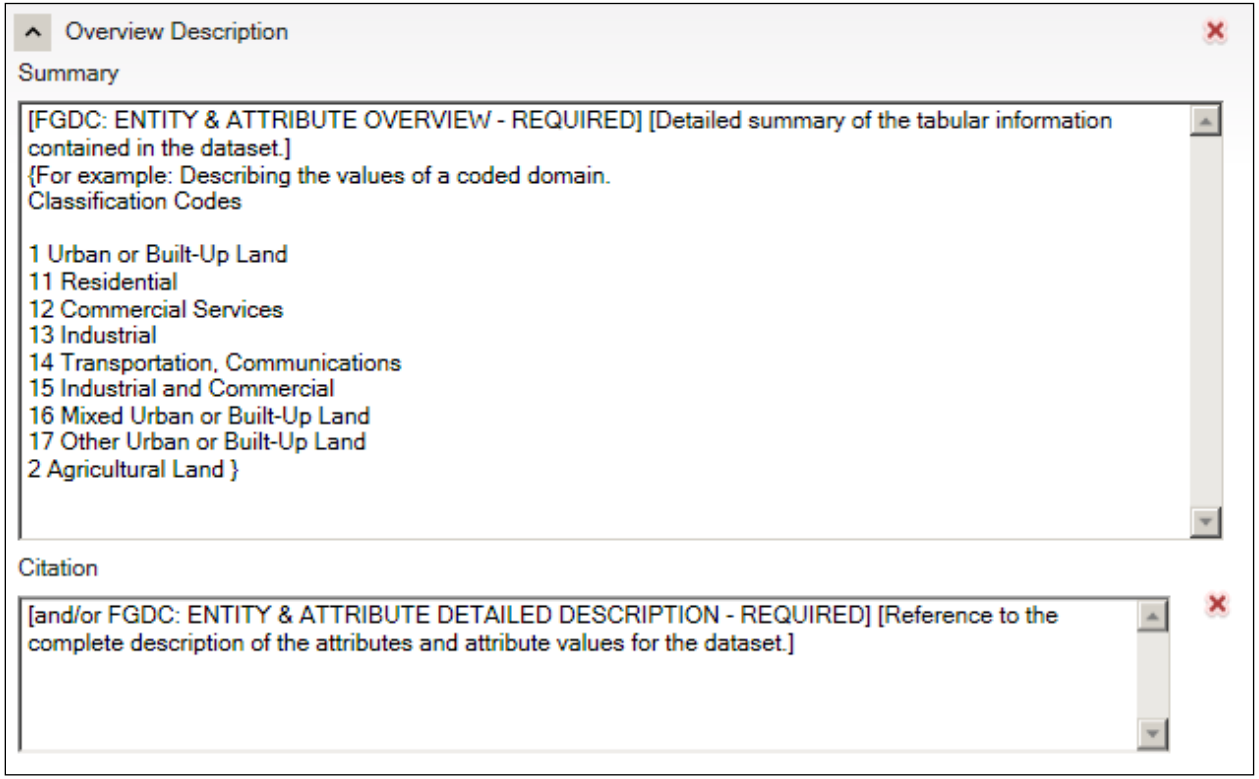


17.2. Overview Description & Citation

(Entity & Attribute Description & Overview)

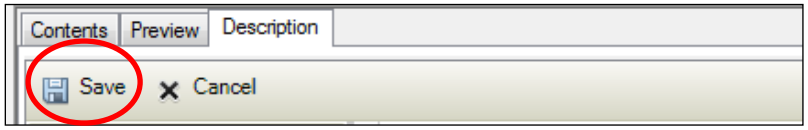
Click the drop down arrow next to **'Overview Description'** or click the plus sign next to **'+New Overview'**. Fill in the **'Summary'** section with an overview of your entities & attributes.

Under **'Citation'** fill in a detailed description of your entities & attributes.

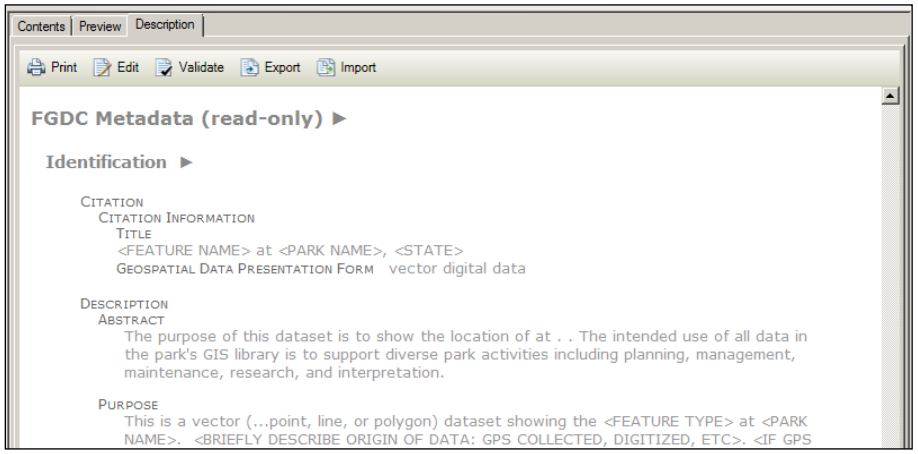


Save and Review Your Work

1. Save your work by selecting the **'Save'** symbol in the upper left hand corner of the metadata editing window.



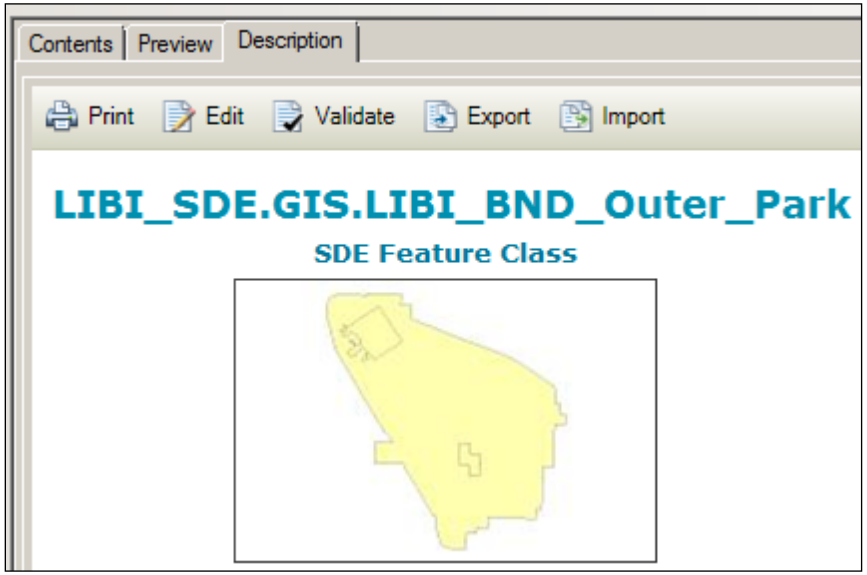
2. In the FGDC Metadata (read-only) section at the bottom of the Description tab, click the down arrows expanding each section and review for any errors or missing information. You will not see <u>all</u> your FGDC- compliant edits, but you can expand each section to review your edits.



Producing a Thumbnail

A thumbnail is a snapshot of the dataset that can be included in your metadata. It is helpful when viewing metadata to have a graphic representation of the data.

1. In ArcCatalog, make sure you have the Geography menu toolbar visible. If you don't have the tools below, right-click in any blank area in to the right of the menus and select Geography in the toolbar list.

2. Click on the **Preview** tab and click the **Create Thumbnail** button on the Geography toolbar.

3. To see the thumbnail, click on the dataset's **Description** tab and a thumbnail of your data should appear.