Introducing
Geospatial Metadata

A Two-day Workshop About Metadata

NSDI

Don't Duck Metadata

Instructor Guide

Contents

How to Use These Materials

This two-day workshop is designed to help you teach participants about geospatial metadata—what it is, why you need it, and how to write it properly and accurately. This course was designed to help everyone from graduate students to seasoned practitioners learn about the importance of metadata in their jobs.

The workshop is divided into 10 modules, each covering key topics that deal with metadata and each with its own set of instructor and participant materials. The modules have different lengths and varying degrees of detail, but they work together to help you lay a solid foundation for writing metadata.

The Federal Geographic Data Committee has sponsored these materials as a starting place to help you build a customized presentation that best suits your needs. We've given you an entire set of slides or overhead transparencies, an instructor guide, and participant materials to accompany your presentation. Feel free to add your own anecdotes and exercises so that you can better develop the skills of the individual participants in your workshop sessions.

We've given you the core materials for the workshop; the rest is up to you.

Here's what you have in this package:

❑ **Slides** in PowerPoint that you can project from a computer or use as overhead transparencies. You can print the transparencies in either color or in black and white (We recommend that you create color versions).

❑ **This instructor guide** that gives you exercise suggestions and miniature versions of the slides with accompanying teaching notes that you may use to guide your instruction.

❑ **A master for participant materials** for you to assemble. The package includes miniatures of the slides and space for taking notes, a cover page, and a set of labels for tabs to use in a three-ring binder, handouts, exercises, and more.

Workshop objectives

This workshop is designed to be a hands-on session where participants will work with their own data to learn how to write quality metadata. It's a practical session that will prepare them to:

❑ write quality metadata that they can share with others,

❑ learn how to help other people write quality metadata, and

❑ make sure that the data we all produce will be reliable, accurate, and long-standing.

Who should attend this workshop

This workshop is designed for anyone who uses geospatial data. Examples of the types of people who have already benefited from the course include:

- ❑ soil scientists
- ❑ geologists
- ❑ land use planners
- ❑ civil engineers
- ❑ urban planners
- ❑ emergency services directors
- ❑ planning directors
- ❑ GIS analysts
- ❑ GIS coordinators
- ❑ GIS data developers
- ❑ landscape architects
- ❑ and more.

Preparing for Your Training Session

We've supplied masters of the materials you will need to use to conduct your training session. However, before you can be ready to teach the course, you'll have to assemble the materials for your participants and personalize the lessons so that they will be most effective.

To teach the workshop, here's what you'll need:

❑ A computer lab, if possible, with a computer for each participant

❑ A computer that can project your images to a screen or an overhead projector (if you choose to create overhead transparencies)

❑ A screen

❑ Disks of the tool you'll demonstrate, if you choose to use one

❑ A flipchart or erasable board so that you can make notes during class

❑ A 2″ three-ring binder with plastic sleeve for each participant

❑ Avery 8-tab Index Maker #11419 to insert tabs into the binders

❑ Avery Laser Name Tag Kit #5383 to create name tags for participants, if you choose to make pre-printed ones before the workshop

❑ If you choose to use some devices to remind participants of the theme, *Don't Duck Metadata*, you'll have to find or order them ahead of time. Some instructors use plastic ducks, one for each participant, as incentives for filling out the evaluation form or as rewards for answering questions about practical uses of metadata. Others have used silly putty, asking participants to create their own ducks. And others have used duck whistles or duck pencils as give-aways.

Here are the materials you should have before you begin:

❑ A master of the preliminary survey, *Tell Me About Yourself,* to send to prospective participants in your workshop

❑ The *Sign-in Sheet* for the workshop

❑ The PowerPoint slides or overhead transparencies, whichever medium you prefer

❑ A master of the participant materials

❑ A master of all the exercises and handouts

❑ A master of the cover page for the binder

❑ A master of the name tags

❑ A master of the labels for the tabs

❑ Disks of the tool you'll demonstrate, if you choose to use one

❑ A master of the *Content Standard for Geospatial Metadata* (the *Green Book*)

❑ If you choose to have participants insert tabs in their *Green Books*, packs of self-adhesive tabs for each person

❑ A master of the *Certificate of Attendance*

❑ A master of *Please Evaluate the Workshop*

Here's what you'll need to do:

❑ If you prefer to mail a survey rather than calling participants ahead of time, send out the preliminary survey, *Tell Me About Yourself,* at least two weeks before your workshop session to ensure that participants have enough time to respond. Be sure to fill in your name, return address, and phone number in the space at the bottom of the form or affix a label with your information. You might also want to include a return envelope to ensure that participants return the survey.

❑ Print out your color slides (if you are creating overhead transparencies).

❑ Photocopy and hole-punch enough sets of participant materials for every participant.

❑ Affix the labels to the tabs.

❑ Assemble the binder materials and insert the tabs.

❑ Insert the cover page in the front sleeve of each binder.

❑ If you're going to demonstrate a tool, insert the disks in the inside front pocket of the binder.

❑ Type participants' names in the name tag master and assemble the name tags.

❑ Type participants' names in the *Certificates of Attendance* and print them if you wish to distribute them on the last day of the workshop. (Some instructors choose to mail them after the workshop, but note that doing so does cause an extra step and expense later.)

❏ Reproduce enough copies of *Please Evaluate the Workshop*. (You may choose to insert these forms in the back pocket of the binder or simply distribute them at the end of the last day of the workshop.)

Decisions you'll need to make before your session

❏ **Will you elicit information about participants and their needs before the workshop?** Some instructors call participants to find out how they use geospatial data on the job; others send out questionnaires about two weeks before the session to give participants time to respond. If you choose to mail a survey, we have provided a master for you. It's called *Tell Me About Yourself* and can be easily printed in Word. Use the information you collect to tailor your workshop to your participants and to sprinkle relevant examples throughout your lecture. Be sure to fill in your name, return address, and phone number in the space at the bottom of the form.

❏ **Do you want to use a formal or informal introduction technique at the beginning of the workshop?** If participants are unfamiliar with one another, they might find it easier to speak freely if they gradually get to know others in the class. You may want to pair participants at the beginning, use the pairings to facilitate introductions, then return to those pairings at different times throughout the workshop. For instance, you might want to have participants work in pairs to interpret the first few examples of metadata that you show them. Doing so will speed responses and may help those who are more confused.

❏ **Which sample metadata files will you use?** Your package includes several samples of metadata files; especially helpful are a raster sample, a vector sample, and a point sample, as well as several others. You need to decide which samples you will distribute (you could also consider using samples of your own), and then make sure you reproduce the samples and include them in your participant's package.

❏ **Will you demonstrate a tool and which tool will it be?** It's up to you to select the metadata tool that you're most comfortable with. Once you decide which tool to use, you'll have to take a number of steps to make sure that teaching it will be successful. For instance, you'll need to secure permission to copy and distribute the tool, secure permission to load the software and supporting files on laboratory computers, make enough copies for participants to use on their computers, install the software and test it on each computer before your session, and make sure that you tailor your exercises for that tool. If you don't have individual computers available for your session, you should still consider teaching a tool anyway. You can print the screens and slowly walk participants through the process so they'll know what to expect when they use the tool. You might want to stress that tools lighten the load of creating the metadata files, so participants should seriously consider using one.

❑ **Will you and how will you distribute a theme-related device during the session?** Using toy plastic ducks or candy as rewards for active participation can be a surefire way to elicit responses from reluctant participants. For example, instructors have found that chocolate is a big hit as an incentive in the classroom. Some instructors give out plastic yellow ducks whenever a participant cites a concrete example of how using metadata helps them on the job; others simply distribute them at the end of the workshop, along with a certificate, as a reminder of the session. Others give them out only when participants return a completed evaluation form. As some instructors have done, you can choose to be creative and find other ways to reinforce the duck theme: Some have distributed silly putty and asked participants to build their own ducks for a contest to be judged at the end of the course. Others have distributed other duck-related items, such as pencils or decorative items, to remind people of the theme when they return to their jobs. Any way you choose to use them, toy ducks serve as a light-hearted reminder of the theme, *Don't Duck Metadata*, and encourage participants to play an active role in the workshop. However, keep in mind that this is merely a suggestion. You don't have to use them.

❑ **When will you distribute the** *Certificates of Attendance* **and the evaluation form?** Your materials contain a master for you to create *Certificates of Attendance* for each workshop participant, as well as a master of an evaluation form called *Please Evaluate the Workshop*. You'll need to decide how and when you'd like to distribute both documents. For instance, you might simply prepare the certificates ahead of time and have them ready to distribute to everyone at the closing of your workshop, or you may offer them only to participants who return an evaluation form before they return home. Some instructors choose to follow up with participants after the workshop by sending the certificates about a month later, along with a cover letter or a personal note. (Your package also includes a master cover letter, if you take this option.) The choice is yours. However, please note that experience shows that if you delay giving the evaluation form to participants, you run the risk of not collecting it at all. Many people may simply misplace their mail or fail to take the time to fill the form out and return it.

A List of Contributors

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Other Resources

General Metadata Education

FGDC metadata website: www.fgdc.gov/metadata/metadata.html

University of Wisconsin, NSGIC Online Metadata primer: A "How to" Guide on Metadata Implementation: rat.lic.wisc.edu/metadata/metaprim.htm

Louisiana Geographic Information Center Metadata Workbook Online: A Guide for Metadata Creation: lagic.lsu.edu/metadataworkbook

Content Standard for Geospatial Metadata

Image map of the CSDGM Version 2 by Susan Stitt, USGS-NBS: www.its.nbs.gov/fgdc.metadata/version2

CSDGM Workbook (*The Green Book*), Version 2: fgdc.gov/metadata/meta_workbook.html

Cliffy's Notes on the CSDGM (important, difficult, and misinterpreted elements): badger.state.wi.us/agencies/wlib/sco/metex/lowlite.htm

CSDGM Standard: www.fgdc.gov/metadata/contstan.html

Geospatial data converters

Mentor Software Freeware converter (deg/min/sec to decimal degrees): www.mntrsoft.com/freebie/free1198.ht

Chuck Taylor Freeware Toolbox (UTM to Lat/long converter and other GPS/GIS tools): home.hiwaay.net/~taylorc/toolbox/geography/geoutm.html

FGDC Clearinghouse

FGDC tutorial on setting up a clearinghouse node: fgdc.gov/clearinghouse/tutorials/howto.html

Search for Geographic Data, FGDC, National Geospatial Data Clearinghouse: 130.11.52.178/gateways.html

Metadata creation tools

USGS Metadata Editor (xtme is UNIX): geology.usgs.gov/tools/metadata/toolsdoc/xtme.html or
(tkme for Windows): http:/geology.usgs.gov/tools/metadata/tools/doc/tkme.html

Corpsmet 95 metadata creation freeware from USACE: corpsgeo1.usace.army.mil

National Biological Information Infrastructure (NBII) Metamaker tool for biological data: (Useful for documenting biological data, this is a standalone tool.): http://www.umesc.usgs.gov/metamaker/nbiimker.html

NOAA Coastal Services Center's ArcView® Metadata Collector Extension (Useful for those using ArcView GIS to create data sets, this tool is an ArcView extension): csc.noaa.gov/metadata/text/download.html

Tools for Creating and Reviewing Metadata: csc.noaa.gov/metadata/text/metatools.htm

DataTracker™ Commercial Metadata Software: www.theaxongroup.com/tracker.html

Spatial Metadata Manager Software (SMMS): www.rtsnetworksusa.com/html/smms3oh/smms.htm

Metadata validation software

USGS Metadata Parser (mp): geology.usgs.gov/tools/metadata/tools/doc/mp.html

USGS Metadata Pre-parser (Chew 'n Spit – CNS): geology.usgs.gov/tools/metadata/tools/doc/cns.html

Navy-developed online implementation of mp to perform CSDGM validation: www-mel.nrlmry.navy.mil/mel-bin/meta-val

Others

❑ **What Is Metadata?** www.csc.noaa.gov/metadata/text/whatismet.htm

❑ **The Value of Metadata:** www.csc.noaa.gov/metadata/text/metatools.htm

❑ **FGDC Metadata Brochure:** fgdc.er.usgs.gov/publications/documents/metadata/metabroc.html

❑ **What Metadata Is and Why It's Important:** badger.state.wi.us/agencies/wlib/sco/pages/qa-meta.htm

❑ **Frequently Asked Questions on FGDC Metadata:** geology.usgs.gov/tools/metadata/tools/doc/faq.html

❑ **Metadata in Plain Language:** geology.usgs.gov/tools/metadata/tools/doc/ctc/

Your Notes for the Workshop

A Quick Look at the Topics to Cover

Introductions and logistics – Introduce yourself and have participants introduce themselves. Make sure participants have all signed the *Sign-in Sheet* and that they have name tags. Review the layout of the facility — especially where the restrooms and phones are — and go over any rules of the classroom that you want them to follow.

What's in your notebook? – Run through the tabbed sections so participants know what's there.

- ❏ Agenda
- ❏ List of participants so that you can contact them if you have a problem on the job
- ❏ Copies of the slides with space to take notes
- ❏ Handouts
- ❏ Exercises
- ❏ Disks of the tool you'll demonstrate, if you choose to use one
- ❏ *The Green Book*
- ❏ *Please Evaluate the Workshop*

What's metadata? – Give an overview that covers what metadata is, why you need it, who uses it, what its purpose is, what the benefits of good metadata are, and the downside of having poor quality metadata.

What does good metadata look like? – Show a really good example (maybe a really bad one, too), coupled with a handout where participants try to interpret a metadata file that they've never seen, possibly one that is outside of their field. Doing so will give participants a feel for the "big picture" before they see the details.

The importance of sharing your good metadata – Explain why people want to share their metadata, the purpose of the Clearinghouse, and how to search to look for a metadata file of interest (using a brief exercise to search for sample metadata files so that participants slowly get the feel for looking at metadata files). (At the end of the workshop, you'll have a handout that explains more about the Clearinghouse, how to set up a clearinghouse node).

What you need to know about the FGDC Metadata Standard – Briefly explain why a standard exists and the history of the standard.

All about the *Green Book* – Cover the details of how to understand the *Bible* of Metadata, what the sections are, the elements, definitions, types of information, domains, the structure of the information (dates), entities, attributes. Walk through all the sections, element by element, so that participants learn what's included in each section.

How do you write good metadata? Review the details of "thinking outside of the box" or putting yourself in someone else's shoes when you look at your data. Cover what you need to know to write any kind of metadata and that you can meet the requirement and you still may not have useful records. You have to think of the uses of metadata and be sure to define your terminology (using the quickie worksheets for titles, acronyms, keywords).

Tools that will help you write good metadata – Discuss the types of tools that you can use, where to find them, how to use them. Depending on whether you've chosen to teach participants a specific tool or not, you'll have to expand this section to accommodate your tool. You'll have to provide the disks so that participants can follow along on their computers, or you'll have to print out screens to walk them the important features of the tool.

Using the clearinghouse – Cover the importance of using the clearinghouse, giving an overview of current participants. Introduce participants to *mp* and *cns* and the concept of setting up a node to participate in the clearinghouse.

Where do you go from here? Wrap up the session. Now that you know what it's all about, go back and build your own data community. Point out where to find help, where to go to develop profiles and extensions that fit participants' own data, training opportunities, and web resources. Remind participants that several of the handouts and exercises will be useful as reference sheets on the job.

Exercise suggestions

❑ **What Does Good Metadata Look Like?** Before you discuss any details of the sections of metadata, you should show the class a full record of good metadata. That way participants see what the target is before they get tied down with the details.

— You could distribute handouts that show the complete file, either have them work in pairs or as the entire group. Ask them to interpret what they see, what they can decipher without any guidance at all. It would be best to use a metadata file that the participants would be entirely unfamiliar with. That way, they'd work with data that they'd have to spend a few minutes to figure out.

— As an alternative, you could ask participants what information they need when they borrow or inherit a data set from someone else. List their examples and use them as questions to interpret the sample.

— This exercise would give them first-hand experience with good records, to see how easy it is to interpret when it's done well. On the other hand, if you have wonderful examples of truly bad metadata, you could follow with a handout of that and let participants walk through trying to figure out the information with an obviously flawed record. Remember, if you do find an example of a "bad" metadata record that you would like to use, you might want to remove the name and other identifiers from the actual record to avoid insult. You could also consider creating a bogus record to illustrate the points you want to make; however, if you do this, make sure that your example seems realistic and is not too far-fetched.

❑ **Guess the Acronym.** Use this simple worksheet with a list of undefined acronyms to illustrate the importance of defining your acronyms when you write your metadata files. For example, PC = personal computer or politically correct. CA = California or Canada.

❑ **Searching for Metadata**. Early in the session, give participants some key elements to search for so that they can become familiar with how easy it is to search for metadata once it is catalogued in a clearinghouse. Using an online search engine and the worksheet called, *Searching for Metadata*, have participants find two different metadata records for each of the key words on the worksheet. Ask them to write the entire title under the word and think about these questions: What types of records did they find? How different are the types of records? How could they have narrowed the search to find those particular records? What other key words would they recommend using for those records? This exercise will help participants see how easy it is to find other people's metadata records and will help them begin to become familiar with the importance of writing well-defined key words and of using a variety of descriptive key words. Underscore the fact that it is important to share metadata and to write it in such a way that it is easy for other people to

find. (*Note:* Some instructors have experienced difficulty accessing clearinghouses during class time. If that occurs to you, you can simply use the examples on the instructor version of the worksheet and ask participants what key words they would use with the given titles. Tell them the different titles that were found using the same key words and ask them to analyze the findings.)

❑ **Use Key Words Effectively.** Key words can be misleading. For example, *plasma*, *waves*, and *flares* are all useful words, but they mean different things to people in different fields or under different circumstances. Are *waves* mentioned in your metadata sound waves? Waves that result from earthquakes? Coastal waves? Are *flares* solar flares? Automotive flares? Kuwaiti oil fire flares? Use this exercise to help participants develop useful key words for their data sets and to get a feel for what someone else would have to go through to find their data set. You could use this exercise in two ways: First, you might consider having them work alone on their own data set to devise the list or you could have them work in pairs, first listing their own key words, then having their partners develop a list for them. They would then compare the two sheets, seeing if the other person filled any gaps that they did not consider at first.

❑ **Giving Metadata Files a Title.** Titles can be helpful or misleading. When you write your metadata, you need to use a title that helps readers interpret your file quickly. You need to avoid ambiguity, consider all the possible misreadings of your word choices, include as many details as you can so that readers can surmise what's in your data before they go further. This 30-minute exercise that will help participants see first-hand the difference between a helpful, well-written title and an incomplete one. Using the real titles on the worksheet, point out how some titles are written for creators and others are written with everyone else in mind. Have participants look at the titles on the worksheet. Ask them to write down everything they learned about the data set from the title. Have them jot down any remaining questions they might have about the data set. Compare their results and note recurring questions or holes (perhaps by recording them on a flipchart or chalk board). Make sure participants fill those same holes later in the session when they write their own titles.

❑ **Looking at the *Green Book*.** To help participants become familiar with using the *Green Book*, some instructors have participants create tabs for their copies of the book when they are first introduced to the materials of the course. Doing so helps participants see all the features of the book before they have to use them in depth. Simply distribute packs of self-adhesive tabs to each person and have them write the titles on them and insert them on the appropriate pages. You might want to point out the major features of each section as you go. However, be sure to note that this exercise is for preliminary purposes only; you will deal with the book in more detail later in the session. So that participants can gain a more detailed look at the book, consider distributing the

worksheet, *Using the Green Book*. This exercise asks participants to use the book to find answers to a list of questions, reinforcing the contents of the book.

❏ **A Guide to the Data Elements.** This exercise is designed to be used at various points in the workshop. You can use it as a guideline to lead your discussion about the Green Book and the definitions of the data elements. You can also have participants follow it when they write their own metadata files. (They can use it as a critique sheet if they work in pairs to evaluate a partner's record, or they can use it as an individual worksheet to guide their self-evaluation of their own records.) Note that it can be a valuable tool during the workshop and on the job as well.

❏ **The Top Ten Errors Made When Writing Metadata.** Experts (or *metamasters*) from across the country have joined together to create a list of the most common errors that people tend to make when they create metadata records. The purpose of this handout is to help participants become aware of the most common pitfalls so that they might learn from the mistakes of others. This handout is designed to be fun and flexible in its use. You may decide to use it as a closing exercise to remind participants of the potential problems and to leave the solutions fresh in their minds when they return to their jobs. You may chose to use it as a working tool in the exercise of writing their own metadata records. You could have participants work in pairs to review their partner's metadata files, using the list as a guideline for what to look for. The handout is intended to take a fun approach to the things we often overlook and can be a valuable asset during the workshop; however, you should also stress that participants could post this list at their worksite so that they can review it on the job when they're actually creating their files. It could serve a handy reminder for them and their co-workers.

❏ **Reviewing Your Metadata**. At the end of the second day, after participants have written their own metadata files, distribute the checklist. You might want to use this worksheet as a final exercise, or you may want to simply tell participants to use it on the job. The purpose of the checklist is to have participants review their files after they've created them, looking at them for completeness, accuracy, and clarity. You might also consider making this a paired exercise, where partners would use the checklist to double-check each other's files. Doing this would also underscore the importance of having an outside reviewer look over the files before they are considered complete.