



NSDI Cooperative Agreements Program  
Metadata Training & Outreach Project  
**FINAL Project Report**  
December 31, 2007

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**Project Name:** *Bringing Metadata Training to the Workplace*

**Clearinghouse**

**Hosting Metadata:** <http://geogateway.state.mn.us/z39.50s://lucy.lmic.state.mn.us:210/lmicdata> (registered node address)

**Federal**

**Agreement Number:** 03HQAG0138

**Minnesota State**

**Account Number:** G02 300 741 7376

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## *Narrative*

### **PROJECT DESCRIPTION**

Even after a decade-long effort on the part of the Land Management Information Center (LMIC) to instill metadata awareness, the task remains incomplete. Comments from newly trained metadata students suggest that the inclusion of metadata as a requisite step in routine GIS data-gathering processes is still not a generally acknowledged practice:

*“Thanks for educating me on this often ignored (but incredibly important) corner of the GIS world!”*

*“I wish it wasn’t necessary to push metadata as a “good and needed” thing. But, that’s just a sign of the times.”*

Despite the best intentions, only a few of those who take metadata training actually go on to develop metadata in the workplace. Formal, generic metadata training raises awareness and clarifies an understanding of the problems that well-formed metadata resolve. Training dispels myths about metadata’s complexity and helps instill the concept that its development is a shared effort. But, when it gets down to writing that first record, competing deadlines and lack of experience often doom the effort before it yields results.

While the need to continue to expose the uninitiated to metadata through awareness campaigns and training workshops is undeniable, a second wave strategy seems necessary to move the newly indoctrinated forward into the ranks of practicing experts. This project was designed to improve formal metadata training, offer direct proactive assistance to state, county and local government GIS programs beginning the documentation process, and reignite Minnesota’s metadata awareness campaign.

Over the project’s lifespan, the focus on providing hands-on training migrated to providing more sophisticated resources to help the job of the data documenter.

**GOALS** This project set the following goals:

#### **1. Expand metadata training**

- A. Continue to improve hands-on metadata training, including new developments such as: using ArcCatalog editors and style sheets; implementing XML; expanding online linkage to web mapping applications; and developing metadata management tools for OGC-compliant web data serving tools.
- B. Conduct at least four workshops during the grant period.

#### **2. Work with metadata developers**

- A. Work with state, county and local government GIS specialists who have been exposed to metadata training but who have not developed their own records, to create their own metadata records.
- B. Double the number of counties contributing to the Clearinghouse from 18 to 36.
- C. Increase the number of metadata records by 50.

#### **3. Extend a metadata marketing [communications] strategy**

- A. Develop a strategic plan that builds upon a successful statewide metadata awareness campaign to improve the promotion effort, taking metadata recognition to local government through professionally developed marketing materials.

**ACHIEVEMENTS** The following activities were conducted to satisfy the project plan:

## **1. Expand Metadata Training**

- A. **Improve metadata training.** During the course of this project, our efforts to improve metadata training and tools became channeled into five areas, some of which were not anticipated in our original proposal. They include: participating in ANSI NAP standard development, developing a tutorial that applies specifically to ArcCatalog metadata use, committing state efforts in support of GOS, addressing the challenges of applying NSGIC's RAMONA cataloging tool to Minnesota's internal metadata management system and participating in the EPA metadata catalog discovery project. Our progress in each of these initiatives is presented below.

### **ANSI North American Profile standard**

**Workshop participation:** Nancy Rader attended the December 5-6, 2006 meeting in Denver, coordinated by the FGDC, to begin to develop training materials for the North American Profile (NAP) of the ISO 19115 metadata standard. That event provided a valuable opportunity for us to begin learning the details of the standard. Rader has volunteered to help evaluate training materials that are currently being developed for the FGDC's webpage of online lessons (<http://www.fgdc.gov/training/nsdi-training-program/online-lessons>).

**NAP comments:** Building upon her exposure to NAP at the Denver meeting, Rader directed the Minnesota Governor's Council on Geographic Information's response to the draft during the public review period. Based primarily on her work, the Council's *Geospatial Architecture Committee* submitted 83 editorial, technical and general comments on the standard, most of which were accepted. The committee – since renamed the *Standards Committee* – has added items to its FY2008 workplan to continue to participate in the federal review of ISO metadata standards and to review the Minnesota Geographic Metadata Guidelines (MGMG) for possible updates once NAP is adopted by ANSI (<http://www.gis.state.mn.us/committe/stand/#workplan>).

**Implementation of service metadata (Appendix A):** LMIC has begun to implement several NAP fields developed to describe geospatial *services*. We had already developed a first-generation catalog of existing geospatial services using metadata fields created independent of a standard (<http://www.lmic.state.mn.us/GeoSpatialServices/>). As part of a project to enhance the catalog, LMIC worked to select essential fields from the existing catalog, create a crosswalk to the new NAP metadata fields, and implement the NAP tags in a pilot Phase 2 catalog.

This project's steering committee members unanimously agreed that developing metadata for services was critical and that the fields developed to do so must follow national standards. Since committee members are key personnel in the state's GIS community, their unequivocal acceptance of the need for metadata and standards demonstrates the progress made over time in disseminating the metadata message. The Phase 2 catalog is not yet publicly online, but is scheduled to be published in January 2008.

### **ArcCatalog MGMG metadata tutorial (Appendix B)**

In 2002, responding to demand from Minnesota ArcGIS software users, the Metropolitan Council of the Twin Cities adapted ArcCatalog's built-in FGDC metadata editor to create the MGMG Editor; users could now write, edit and display metadata using the Minnesota Geographic Metadata Guidelines. As this project ramped up, the tool existed, but a tutorial was needed to make the MGMG Editor easier to learn and to incorporate into metadata training.

In September 2003, Rader developed a step-by-step tutorial to walk metadata writers through the process of creating metadata in ArcCatalog using the MGMG Editor. The tutorial is free online and has been used in all of LMIC's subsequent metadata training workshops. It is included in the download installation file for the MGMG Editor:

<http://www.lmic.state.mn.us/chouse/arccatalog.html> .

Virtually every metadata workshop participant in Minnesota has chosen the MGMG Editor for ArcCatalog over other options, including the standalone DataLogr tool (for which we also provide a tutorial and free software download) and ESRI's FGDC and ISO editors, which come standard with ArcCatalog. Regardless of the complexity of the metadata being written, metadata creators like having a metadata authoring tool integrated into the software they regularly use for their GIS work. Nearly all prefer the simplicity of the MGMG Editor. Those using the FGDC Editor choose it to comply with requirements for federal funding or to have very specific fields that they need for their work. No one has chosen to work with the ISO Editor since it was a draft and likely would change as the standard developed.

### **Minnesota Metadata Harvesting through the GeoSpatial One Stop (GOS)**

The pilot implementation of GOS was launched on June 30, 2003. At that time, LMIC was interested in the GOS concept but was concerned about re-entering the state's metadata into the online GOS entry forms. LMIC's principal investigator in this initiative was Susanne Maeder.

In the fall of 2003 and winter and spring of 2004, Maeder actively worked with GOS staff, both at ESRI and the Bureau of Land Management, to prepare LMIC's metadata – already in XML format – for GOS harvesting. Some reformatting was required. Incomplete and untested metadata harvesting tools complicated the process. With guidance from GOS staff, LMIC altered its metadata and provided feedback on its harvesting results, which in turn assisted the federal GOS staff with troubleshooting. In May 2004, LMIC's metadata was successfully harvested into GOS 1.

Based on this success, LMIC registered all of the other metadata nodes hosted under the Minnesota Clearinghouse domain with GOS. LMIC also worked with state agencies that support stand-alone FGDC nodes (the Minnesota Department of Natural Resources and the Metropolitan Council) to streamline their harvesting process.

Unfortunately, FGDC-compliant metadata is not GOS-compliant; this inconsistency results in unanticipated and costly maintenance. GOS harvest tools do not always represent Minnesota's metadata as completely as we would expect. LMIC persisted to improve the interpretation of harvest software derived values so that no original content would be lost.

To meet harvesting requirements, LMIC improved all of its metadata records by applying minor modifications (such as adding an ISO Theme keyword into the Theme keyword category) over time. LMIC staff updated not only their own metadata but all of the metadata stored on nodes hosted at LMIC.

In fall of 2005, LMIC registered as a contributor to GOS 2, and again needed to make minor changes to the metadata records to make them harvestable under a new set of standards.

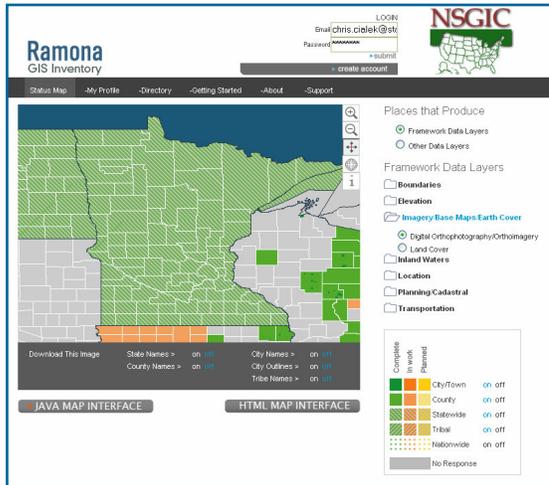
Through these efforts, all of the state's registered FGDC metadata is now searchable via the GeoSpatial One Stop.

In our experience, the GOS site has improved overall data search capabilities only marginally over the FGDC multi-node model. On the positive side, access is provided to more metadata without having to individually select multiple nodes. However, so much information is returned that it is often tricky to identify the data that are really important. Some automated harvesting

processes identify records that are not meaningful. By adhering to an ESRI metadata standard rather than that of the FGDC, harvesting has compromised any metadata that was not created and served up entirely within the ESRI toolset. Placing this burden on early adopters of the FGDC metadata standard is unfortunate.

## RAMONA

LMIC programmer, Brent Lund, has contributed to the development of NSGIC's RAMONA GIS Inventory tool by providing assistance in the application's map interface



(<http://wv.gisinventory.net/about.html>). Other LMIC staff members, along with GIS specialists from other state agencies, participated in two Webinar sessions (February 9, 2006 and February 27, 2007), designed to familiarize users with updates to the interface. Impressions of this application are favorable. Its presentation is appealing and the information access functions are intuitive and useful.

However, while the impetus driving NSGIC's RAMONA development team appears to be on creating and proactively supporting a web-based data catalog entry and display tool, it does not hold as a priority adherence to a metadata standard compatibility requirement. That throws

into question any efforts to achieve an efficient portability of existing metadata records from traditional clearinghouse environments (i.e. those complying with FGDC metadata standards).

LMIC is quite interested in contributing to this national geospatial data cataloging effort. We would encourage the RAMONA development team to consider implementing a cross-walk capability that could harvest existing Minnesota metadata into RAMONA.

## EPA Geospatial Metadata Catalog Discovery Project

This effort was initiated through the EPA Office of Environmental Information's EIEN (Environmental Information Exchange Network) program. LMIC became involved on behalf of Minnesota through its work on another related EPA grant.

EPA's Discovery Project involves designing a distributed system that initiates metadata searches through EPA's Central Data Exchange. The Central Data Exchange is the point of entry on the EIEN for environmental data submissions to the EPA. The search interface is similar to standard FGDC and GOS implementations. Users have an account on the Central Data Exchange in order to use the search interface. Search software simultaneously interrogates standard FGDC or GOS nodes (via XML) and EPA's internal Environmental Data Documentation site. The results provide access to both commonly available GIS metadata and to metadata for password-protected environmental databases within the EPA.

LMIC worked with EPA's project consultants between November 2006 and June 2007. LMIC was selected as one of the earlier new states to add to the search project because it already met the requirements of the project, most importantly, having a well-established network of Z39.50 metadata nodes and the expertise to run them. Participating in this project required little additional workload for LMIC because of our previous work with FGDC and GOS. This effort is

seen as another opportunity to leverage existing geospatial metadata by registering it with another type of search site. Due to delays out of our control we have not yet seen the final results of this project.

- B. **Conduct Metadata workshops.** LMIC's metadata team exceeded by one its commitment to conduct four workshops during the grant period (find workshop evaluations in Appendix C).

**1) University of Wisconsin; River Falls, WI; December 15, 2003.** This three-hour evening workshop was conducted by Nancy Rader and Chris Cialek in the Department of Geography's GIS laboratory. Eight students and two faculty members participated. The workshop was sponsored by the Department of Geography, although most student attendees were majors in other areas, predominantly Urban Planning.

**2) Clay County, MN; May 13, 2004.** This half-day workshop was scheduled to correspond with the monthly meeting of Minnesota's state GIS coordinating council, the Governor's Council on Geographic Information. It was requested by the Clay County GIS Director (a Council member) with support from the Fargo/Moorhead Council of Governments and the State of North Dakota GIS Coordinator. Twenty-three GIS specialists from Northwest Minnesota and Eastern North Dakota attended.

**3) Region 5 Development Commission, Staples, MN; August 24, 2004.** Ten GIS practitioners from rural north-central Minnesota attended this four-hour session held at the offices of the regional economic development commission.

**4) Southwest Minnesota State University; Marshall, MN; September 1, 2004.** Thirteen GIS specialists from rural southwest Minnesota attended this day-long session sponsored by SW MN State University and organized by Professor Charlie Kost. One attendee traveled from the EROS Data Center in Sioux Falls, SD to participate.

**5) MN Department of Agriculture; St. Paul, MN; March 22, 2006.** Six members of Agriculture's GIS Staff attended this ½-day session at their new computer lab facility.

## **2. Work with New Metadata Developers**

- A. **Work with GIS specialists to create their own metadata records.** This goal was implemented to increase expertise, retain resources already in use and build new capacity.

### **Minnesota Pollution Control Agency**

Nancy Rader and Susanne Maeder met with two of MPCA's key staff, Beth Brown and Linda Moon, to walk through the process of creating metadata. MPCA has a vast storehouse of data which, up to that point, was distributed to the public on an individual request basis. None of it had formal metadata, so could not be exposed online for others to download. Our session also uncovered a major impediment to posting data: MPCA did not allow zipped files to be put on the agency's FTP site, making it cumbersome to post datasets composed of many individual files, e.g., shapefiles. Our session gave the data management staff the impetus to resolve that problem with the MPCA IT staff.

Creating and maintaining metadata is now part of MPCA's normal business processes. MPCA currently has 12 datasets documented on their clearinghouse node, which is searchable through the Minnesota Geographic Data Clearinghouse and GOS. These data and metadata are also an integral part of a growing list of mapping and reporting websites that have made valuable data increasingly accessible to the general public:

- Environmental Data Access – Air Quality:  
<http://www.pca.state.mn.us/data/edaAir/index.cfm>
- Environmental Data Access – Water Quality:  
<http://www.pca.state.mn.us/data/edaWater/index.cfm>
- Environmental Data Access – Ground Water Data:  
<http://www.pca.state.mn.us/data/edaGWcatalog/>

### **Minnesota Department of Education**

The Minnesota Department of Education (MDE) maintains six widely used GIS layers that map the locations of school district and attendance boundaries, public, non-public and charter school programs and school district service centers. These layers were maintained by Scott Freburg at LMIC; in 2006 he became the GIS Administrator at MDE and brought his metadata training to his new agency. Freburg continues to maintain both the data and metadata, finding that the templates he created at LMIC greatly simplify the annual update task. We continue to work with him to refine how the metadata is written. The data and metadata are available via the MGDC and GOS.

### **True North: Mapping Minnesota's History project**

This project's new website is designed to link historical content with maps in order to help middle and high school teachers integrate geospatial data into lessons that meet Minnesota's Academic Standards in History and Social Studies<sup>1</sup>. Many of the GIS layers included were newly digitized from printed maps in the Minnesota Historical Society's (MHS) collection and needed metadata.

Rader met with two of the site's content developers, Lesley Kadish and Laura Kling, to walk through the metadata creation process. Based on their library backgrounds, they asked a number

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<sup>1</sup> [http://education.state.mn.us/MDE/Academic\\_Excellence/Academic\\_Standards/Social\\_Studies/index.html](http://education.state.mn.us/MDE/Academic_Excellence/Academic_Standards/Social_Studies/index.html)

of perceptive questions, especially about keywords and searching. They also were concerned that the GIS layers were “not of the same quality as LMIC usually provides” since their source maps were often generalized and of small-scale. They were concerned that others would rely on this data for inappropriately detailed uses and they felt that having metadata implied that the documented data was detailed and perfect.

We assured them that generalized data may be exactly what someone else needs, and that their data may be the best available for an historical time period. We worked through how to use the “Purpose” and “Lineage” fields to document uses for which the data is and is not appropriate. We are now in the process of evaluating the metadata they have created for their first layers which will smooth the way to finishing documenting these new datasets.

This effort not only documents a number of new historical map and GIS resources for the state, but it also further develops communication between the geospatial metadata and the library communities. Lesley Kadish, newly hired as MHS’s first **Curator of GIS**, is reaching out to the public to determine what historical map resources they most need (and thus need documented and made accessible), and also to the library community to discern how best to link GIS metadata to Dublin Core and other cataloging and searching systems. We expect this will continue to be a very fruitful partnership.

- True North website: <http://www.lmic.state.mn.us/ghol/>
- Mn GIS/LIS News article describing the True North site: <http://www.mngislis.org/displaycommon.cfm?an=1&subarticlenbr=272>

### **Rescue existing metadata programs in jeopardy**

During the project period, two existing and long-running metadata development and hosting programs suffered support setbacks that jeopardized their future existence. Project resources were invested to stabilize these initiatives and assure their continued viability.

- **Red River Basin Decision Information Network Clearinghouse node.** For several years the Red River Basin Decision Information Network (RRBDIN) <http://www.rrbdin.org/> had supported a metadata clearinghouse node that was registered to both the FGDC Clearinghouse and Minnesota GeoGateway Search sites. In October 2004, Houston Engineering, which had housed and supported the node for the coalition of agencies that make up the RRBDIN, notified LMIC and FGDC that their support of the node would be discontinued, citing insufficient interest and funds to keep it going. While the number of metadata records supported was small, the data they represented was significant. LMIC felt that it was important that they be maintained, so contacted RRBDIN staff at North Dakota State University and Houston Engineering staff, arranging to take over the maintenance of the RRBDIN node, housing it at LMIC where it could continue to be searched by national and state users.
- **Minnesota River Basin Data Center node.** In late 2003, staff from the Minnesota River Basin Data Center (MRBDC - <http://mrbdc.mnsu.edu/>) at the Water Resources Center at Minnesota State University (MSU), Mankato, approached LMIC about getting help to set up a clearinghouse node for their GIS data. Water Resources Center staff had been dedicated metadata developers before this time but lacked the resources to host their own node. LMIC staff helped them reformat their metadata and set up an MRBDC node at LMIC with the understanding that this node might eventually migrate to Mankato. In fact, it continues to be housed at LMIC.

In 2004, the Water Resources Center applied for and received a CAP grant to produce more metadata for their GIS data collection. This was particularly important as the original creators of these data sets were planning on moving to other positions, and without metadata, institutional memory would have been lost. Using internal funds, LMIC processed and housed metadata created through this separate CAP grant project on the MRBDC node and registered it with the FGDC and GOS. LMIC continues to administer the MRBDC node as a service to the Water Resources Center.

- B. Double the number of counties contributing to the Clearinghouse from 18 to 36.** This goal became quite fuzzy as the project moved forward. Before beginning this project, 19 counties had contributed to metadata records found in the Minnesota Geographic Data Clearinghouse. Our goal was to impact the amount of participation by other than state agencies over the span of this effort by increasing metadata contributions to 36 counties.

Six months into this project, LMIC applied for and received a second CAP award for a related project entitled: *Regional Development Organizations: Bridges linking state and local government to improve metadata coordination* (agreement number: 04HQAG0153). The major focus of that project was to provide seed money to Regional Development Organizations (RDO) to engage counties and local governments in their areas to build and register metadata records of their own.

What confused this goal was attempting to determine which entities actually authored the 67 new metadata records created as a result of the RDO project. Our count shows that new metadata records for 23 different counties are now discoverable through the Clearinghouse all attributed to the '04 CAP Award. Beyond that count, two new counties have been added. Strictly speaking, these are the only new county contributors directly related to this project (*Bringing Metadata Training to the Workplace*). Due to efforts attributed to both CAP awards, data representing 44 counties are now represented in the Clearinghouse.

- C. Increase the number of metadata records by 50 (Appendix D).** During the project period more than 140 metadata records were added to the Minnesota Geographic Data Clearinghouse. Sixty-seven of those were added as a direct result of the other FGDC CAP grant project described above (i.e. *RDOs*). For the project described in this report, 74 new metadata records were created and are listed by date and originating organization in Appendix D of this document.

### **3. Extend a metadata marketing strategy**

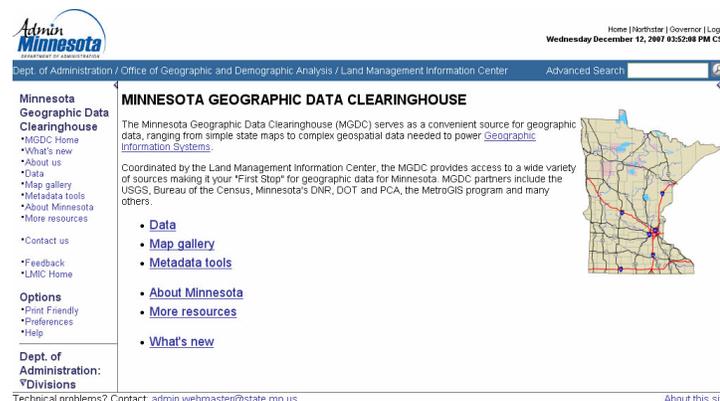
- A. **Develop a strategic plan.** In the past, LMIC teamed up with the Minnesota Historical Society to develop a broad-based metadata marketing strategy that provided demonstrable results. As originally devised, the intent of this project was to build on that effort: working again with MHS, to expand the marketing strategy by developing professional marketing materials to drive the message forward.

For reasons beyond our control, most notably a continuing struggle to assure funding continuity across biennial budget cycles, LMIC was unable to enter into formal interagency agreement with MHS, and therefore, needed to address a metadata promotion strategy that was not so tied to formal agreements and contractual commitments.

The purpose of a promotion strategy is to spread the word and develop interest in metadata and its development. In lieu of a formal arrangement with MHS, LMIC developed a two-pronged approach that: 1) focused on enhancing services and promotional materials on the web, and 2) promoted the state's metadata program in the community through informational presentations. Below is a brief description of a few of the most important examples of those efforts.

#### **Webpage redesign**

**Minnesota Geographic Data Clearinghouse (MGDC) redesign:** LMIC maintains the MGDC website (<http://www.lmic.state.mn.us/chouse/>) to provide a starting point for the public to look for Minnesota GIS data, maps and services. In addition to Google and GOS searches, this is a main way that people find Minnesota metadata. No data can be posted at MGDC unless it is documented according to either the Minnesota or federal metadata standards. At the beginning of



the grant project, the MGDC homepage had grown over time to become a long scrolling presentation packed with text. The burden was on the user to wade through the sections to find what they were looking for. Worse yet, the webpage's banner and left and right navigation bars were agency-mandated standard; they cluttered the page with a confusing array of unrelated options that steered searchers away from the page.

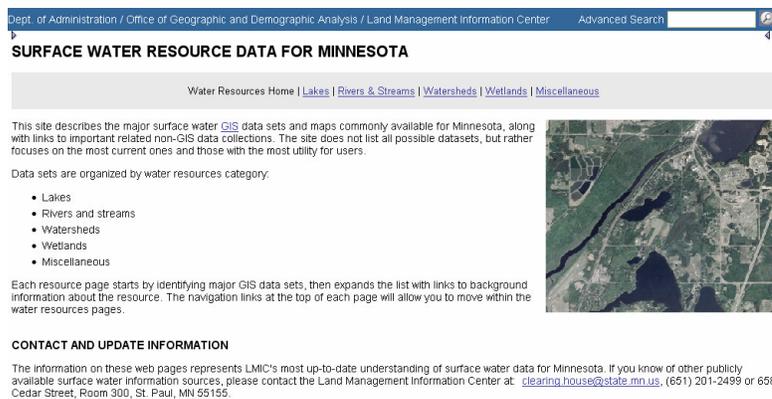
The MGDC team evaluated LMIC's web offerings, crafted a redesign and tested that new design through a series of modest usability tests. To streamline the process of finding information via the MGDC, we made the following changes:

- Pared the homepage to six choices that needed no descriptive text:
  - Data
  - Map Gallery
  - Metadata Tools
  - About Minnesota
  - More Resources
  - What's New

- Created a “Map Gallery” to provide access to important maps (both “finished” and “interactive online”) available for the state. The maps are arranged in sections according to ISO theme categories.
- Created the “About Minnesota” page to help people find answers to general questions about the state’s geography without having to use GIS data or maps.
- Customized the left navigation bar so that anywhere within the MGDC, choices were simple and applied only to MGDC content, and eliminated the right-hand navigation bar and most of the banner navigation.

**Additional “first-stop” information pages:** A critically important feature of the Minnesota Geographic Data Clearinghouse is the series of thematic “first-stop” webpages. Information on these pages provide an overview of GIS data, maps and statistics available for Minnesota. They help the public more quickly assess which resource(s) will best meet their needs – instead of having to locate and plow through all metadata records for a theme, people can read thumbnail descriptions and then link to the full metadata for those resources of greatest interest.

LMIC staff writes and maintains the pages based on their extensive experience helping people find this information; other experts in the topics review the pages for accuracy and completeness. The public is invited to let us know of any major resources we may have missed.



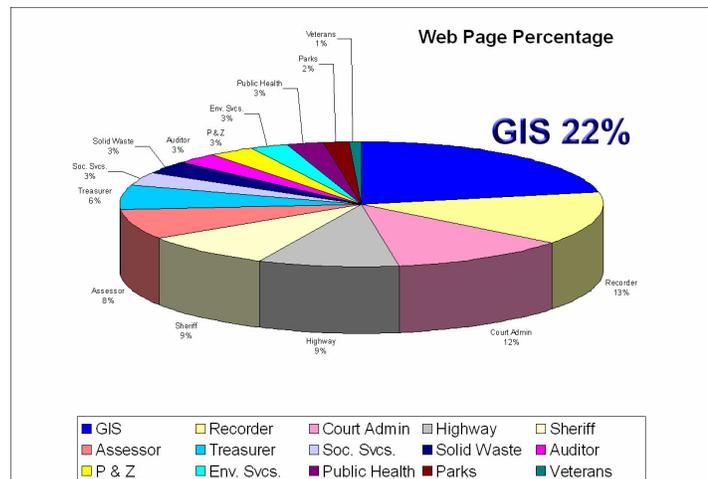
As part of this grant, we added two new topics to our “first-stop” section:

- **Surface Water Resources**  
<http://www.lmic.state.mn.us/chouse/water.html>  
 These pages summarize Susanne Maeder’s detailed knowledge of a vast array of water-related GIS data for the state, categorized into lakes, rivers and streams, watersheds, wetlands, and miscellaneous gaging and monitoring data.
- **Public Utilities and Telecommunications Infrastructure**  
[http://www.lmic.state.mn.us/chouse/utilities\\_telecommunication.html](http://www.lmic.state.mn.us/chouse/utilities_telecommunication.html)  
 These pages document Nancy Rader’s research into data and maps on electric power energy sources, transmission lines, substations, service areas, pipelines, water and sewer infrastructure, and telecommunications. This information is increasingly in demand as people research alternative energy sources and as the telecommunications industry evolves to meet changing markets and regulations.

**Outreach presentations.** In addition to providing formal metadata training workshops, project staff participated in four metadata informational presentations, all by invitation:

- **Pine-to-Prairie (Northwest Minnesota GIS Users Group); Fergus Falls, MN; December 3, 2003.** Cialek made a Clearinghouse presentation to this regional GIS users group (<http://www.pinetoprairie.org/>) at its quarterly meeting. About 50 people were in attendance.
- **Northern Minnesota GIS Users Group – Grand Rapids, MN; April 14, 2004.** Cialek gave a metadata presentation consisting of a condensed training workshop together with use statistics for the existing system. This session was part of a regional GIS users group meeting hosted by the DNR. About 25 people were in attendance.
- **ASPRS – Denver, CO; May 25, 2004.** Cialek was invited by the FGDC CAP Coordinator to give a presentation at this annual conference emphasizing metadata program development experiences in Minnesota. The talk, entitled *Eye on the Prize: Assessing the success of metadata CAP grants* attempted to apply basic principles of diffusion theory in an effort to anticipate stages of progress in a state metadata program. Slides from the presentation can be found at: <http://www.fgdc.gov/library/presentations/2004-presentations> . About 70 people were in attendance.
- **McLeod County Commissioners Meeting; Glencoe, MN; February 16, 2006.**

As an offshoot of relationships built during a metadata training event in the summer of 2005, McLeod County's GIS Manager requested that LMIC participate in a 1/2-day GIS highlight session to present to County Commissioners the status of ongoing efforts taking place in the county and how county/state cooperation is benefiting the region. Cialek made a presentation describing cooperative projects, data available at the state and some new partnership prospects. Neighboring Sibley County Commissioners were invited and many were in attendance. Later in the year, the McLeod County Commission approved data procurements for countywide high-resolution DOQ and LiDAR collections. Partners to this project, completed in 2007, included MN DOT and the USGS.

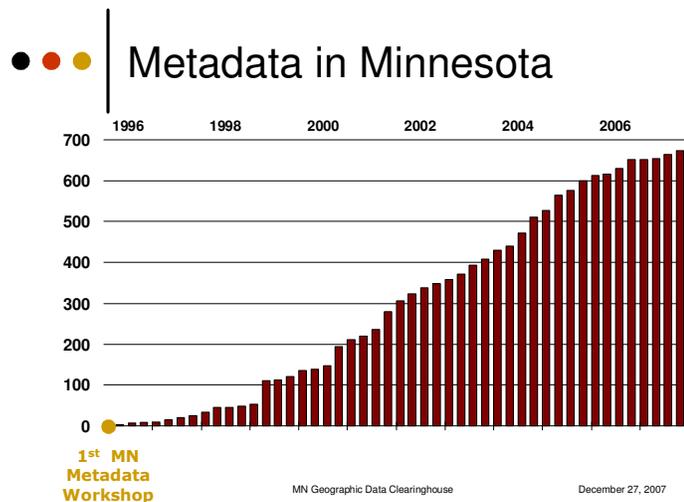


In 2006, maps and GIS were a significant destination for users of McLeod County's web site

## Feedback

### Challenges

- **Emerging new metadata standards:** Developing a strategy to transition from the CSDGM-based MINNESOTA GEOGRAPHIC METADATA GUIDELINES to the forthcoming NORTH AMERICAN PROFILE OF ISO19115:2003 requires a host of intelligent adaptation tactics. Coordination among GIS users in the state will need to be well-oiled to achieve a clean changeover. Important resources to help in the process include:
  - A convincing and broadly accepted transitional strategic plan
  - A fully functional and complete ESRI ArcCatalog template and style sheet option
  - A fully functional and complete standalone metadata authoring tool for those who are not ArcGIS users (less useful to this implementation challenge is for the FGDC to divert valuable resources away from a complete solution and instead commission studies that critique existing imperfect software tools and rate or grade them)
  - Availability of NAP training materials that clearly present the basics of the new standard in plain talk that busy technologists can efficiently interpret and use.
- **New cataloging systems that compete for limited resources:** Both GOS and RAMONA are good ideas that, unfortunately, require time-consuming metadata modification steps to implement. Although valuable, these tools impose additional burdens on lean Clearinghouse staff resources. LMIC's metadata staff describes those challenges on pages 7 and 8 of this report.
- **Metadata maintenance:** Day-to-day maintenance of metadata content (reviewing content periodically and responding to metadata users when they uncover outdated information) becomes an increasingly larger responsibility as metadata libraries grow. Our challenge will be to develop time-saving tools and techniques that keep the workload manageable.
- **Decreasing supply of low-hanging fruit:** The rate at which new metadata records are being added to the Clearinghouse is beginning to slow down. We attribute this trend to the fact that those most inclined to document GIS data have been trained or have already provided their contributions. A large number of undocumented data sets are being managed by data creators unaware or unconvinced of the benefits of writing fully compliant metadata. Our continuing challenge will be that of persuasion and assistance.
- **LMIC's threatened budget:** Over the period of this project, LMIC's budget had been threatened with dramatic reduction on two separate occasions. In both cases, a gubernatorial recommendation to cut was followed by Legislative hearings and eventual restoration. In the first case, the office suffered a 35% general fund reduction. In the second, the general fund allocation was modestly increased. The Clearinghouse role enjoys a high priority in the office mission and, therefore, decreased funding



has impacted our activities less than that of others. In any event, an environment of uncertainty regarding the long-term viability of the program impacts our ability to assure continuity of service.

## Benefits

- **The value of investing:** Resources made available through this CAP award provide worth far beyond their monetary value. Support from federal agencies demonstrates to state and local government and their private sector partners that partnerships in adopting geospatial standards – most notably, metadata – are important and worthy of federal investment.
- **Partnering in-kind:** FGDC CAP funding fills a considerable need. LMIC considers Clearinghouse activities core to its mission and benefits considerably in fulfilling that mission with the augmentation that CAP grants represent. In turn, LMIC has been able to invest over 100% of this grant's value through in-kind investments to this project.
- **Broadening partner base:** This award allowed LMIC to strengthen its connection with the library community through collaborations with the Minnesota Historical Society.

## Lessons Learned

- Over the years a palpable change in attitudes toward metadata has slowly evolved. Rarely today do we encounter strong resistance to the principle of data documentation. In the geospatial analysis community it is accepted – in theory, at least – as a responsible and necessary part of doing business. A few recent developments in Minnesota bear this out:
  - The MetroGIS Services project steering committee, made up of key people in the state's GIS community, felt unequivocally that metadata was essential and that established and broadly accepted standards should be followed. There was no hesitation in arriving at this decision and no dissenting opinion (p. 6).
  - *True North* web site developers sought out LMIC's expertise for metadata training (p. 10).
  - At the Minnesota Department of Education, metadata maintenance is now a routine part of that agency's annual map and GIS data updates (p. 10).

With success, however, come new challenges. Many new supporters of the concept of metadata question the complexity and rigidity of established metadata standards. They argue for greater flexibility in deciding the appropriate amount of detail carried in metadata based on the purpose to which it will be put.

Beyond this grant, our challenge is to help guide metadata development so as to accommodate the desires of the geospatial data community in Minnesota while encouraging common, efficient and standards-driven content. To succeed with this delicate balance, the focus on metadata in Minnesota is likely to include:

1. Further refinement of *catalog metadata*, such as that developed for the Geospatial Services Inventory, for the purpose of data and shared services discovery. This effort should include looking at ways to implement NSGIC's call to populate RAMONA.
2. Designing and beginning to implement a full-fledged program to migrate Minnesota metadata guidelines to NAP.
3. Continued communication with GIS professionals on advancing systems and data management practices to increase a common documentation and discovery framework. Our first opportunity to advance this notion will come on January 24, 2008 when the MetroGIS will host **Meeting Shared Geospatial Needs Beyond Data**, a forum designed to address shared geospatial application needs of organizations that serve the Twin Cities Metropolitan Area.



## Appendix A.

### CROSSWALK BETWEEN MINNESOTA'S GEOSPATIAL SERVICES INVENTORY<sup>1</sup> METADATA AND ISO SERVICES METADATA<sup>2</sup>

*Prepared by LMIC for the MetroGIS Service Broker Project Steering Committee*

MN # / NAP #	FIELD NAME	FIELD TYPE	FIELD DESCRIPTION	REQUIRED ?
<b>1</b>	<b>Resource name</b>		<b>Name by which the cited resource is known</b>	
5.14.1	<i>title</i>	<i>free text</i>	<i>Name by which the cited resource is known</i>	<i>Mandatory</i>
5.14.4	<i>edition</i>	<i>free text</i>	<i>Version of the cited resource</i>	<i>Optional</i>
<b>2</b>	<b>Description</b>		<b>Briefly describe what this service or application does.</b>	
5.3.2.2	<i>abstract</i>	<i>free text</i>	<i>Brief narrative summary of service contents</i>	<i>Mandatory</i>
<b>3</b>	<b>Availability</b>		<b>When will this resource be available for use?</b>	
5.3.2.5	<i>status</i>	<i>code list</i>	<i>The development phase of the service.</i>	<i>Mandatory</i>
<b>4</b>	<b>Audience</b>		<b>For what type of users was this application or service designed?</b>	
5.3.2.3	<i>purpose</i>	<i>free text</i>	<i>Summary of the intentions for which the service was developed.</i>	<i>Optional</i>
<b>5</b>	<b>Resource Type</b>	checklist (closed)	<b>What type of resource is this?</b>	Mandatory
N/A			<i>(No NAP–Metadata counterpart)</i>	
<b>6</b>	<b>Conditions of use</b>		<b>Are there any restrictions or conditions of use placed on this resource?</b>	
5.4.2.3	<i>use Constraints</i>	<i>Code list</i>	<i>Restrictions or limitations or warnings to protect privacy, intellectual property or other special restrictions on the resource or the metadata</i>	<i>Optional</i>
<b>8</b>	<b>Geographic coverage</b>		<b>What geographic area is this resource designed to serve?</b>	
5.13.1	<i>description</i>	<i>free text (compiled from closed check lists)</i>	<i>Text which describes the spatial and temporal extent of the dataset.</i>	<i>Optional</i>

## Appendix A.

MN # / NAP #	FIELD NAME	FIELD TYPE	FIELD DESCRIPTION	REQUIRED ?
<b>15</b>	<b>Developer</b>		<b>Contact information for a representative from the organization that developed the resource</b>	
5.16.4	<i>contactInfo</i>	<i>CI_Contact</i>	<i>Information required enabling contact with the responsible person and/or organization</i>	<i>Mandatory</i>
<b>16</b>	<b>Distributor</b>		<b>Contact information for a representative from the organization that provides access to the resource</b>	
5.16.4	<i>contactInfo</i>	<i>CI_Contact</i>	<i>Information required enabling contact with the responsible person and/or organization</i>	<i>Mandatory</i>
<b>17</b>	<b>Link to resource</b>		<b>Identify the resource Web link</b>	
6.20.2	<i>protocol</i>	<i>Free text</i>	<i>The connection protocol to be used such as http, ftp, etc.</i>	<i>Mandatory</i>
6.19.2	<i>linkage</i>	<i>url</i>	<i>URL for additional metadata or other use information</i>	<i>Mandatory</i>
<b>20</b>	<b>Catalog Entry Author</b>		<b>Contact information for the author of this catalog entry</b>	
5.16.4	<i>contactInfo</i>	<i>CI_Contact</i>	<i>Information required enabling contact with the responsible person and/or organization</i>	<i>Mandatory</i>

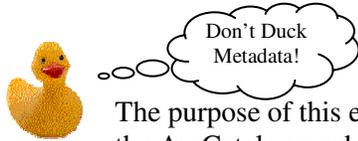
<sup>1</sup> **MN Geospatial Services Inventory Project.** This project was undertaken by LMIC in 2007, through a Metropolitan Council of the Twin Cities grant to determine the feasibility of a Geographic Information System (GIS) services broker. A GIS services broker consists of computer hardware and software along with human administrative functions to provide a means to list, query, search, discover, store, acquire and/or execute GIS computer programs. A GIS services broker could enable organizations to reduce their efforts in developing, maintaining, supporting and hosting GIS software and services as well as expanding the number and variety of GIS tools available to meet their business needs. The model of a services broker parallels past efforts to develop geospatial data discovery applications. More information at: (<http://www.lmic.state.mn.us/GeoServiceFinder/>)

<sup>2</sup> **North American Profile of ISO19115:2003 – Geographic information – Metadata.** More information at <http://www.fgdc.gov/standards/projects/incits-11-standards-projects/NAP-Metadata>

## Appendix B.

# Getting Started with the ArcCatalog Metadata Entry Tool

## Using the Minnesota Geographic Metadata Guidelines



The purpose of this exercise is to introduce you to viewing and creating metadata records using the ArcCatalog module of ESRI's ArcGIS software<sup>2</sup>, customized for the Minnesota Geographic Metadata Guidelines<sup>3</sup>.

### Part 1: Get started

Become familiar with the ArcCatalog's metadata viewing and editing screens

### Part 2: Edit a record

Make changes to an existing metadata record

### Part 3: Display metadata

Create an HTML version of your edited record (useful for printed reports or webpages)  
Compare different views of a record

### Part 4: Create a new record

Evaluate an automatically-created record  
Create your own metadata starter template

## Part 1: Get Started

Goals:

- Become familiar with the metadata toolbar
- Become familiar with the editing window
- Know how to find help

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### Step 1: Start ArcCatalog



- Open ArcCatalog, either by:
  1. using the Windows Start button: choose Programs; ESRI; ArcGIS; ArcCatalog, or
  2. double-clicking on c:\arcgis\arcexe81\bin\ArcCatalog.exe from Windows Explorer, or
  3. double-clicking a desktop shortcut you have created.
- Expand the window to fill your screen.

<sup>2</sup> ArcGIS and ArcCatalog © 1999-2002 ESRI Inc.

<sup>3</sup> MGMG Editor created by the Metropolitan Council of the Twin Cities; MGMG Stylesheet created by the Land Management Information Center at MN Planning.

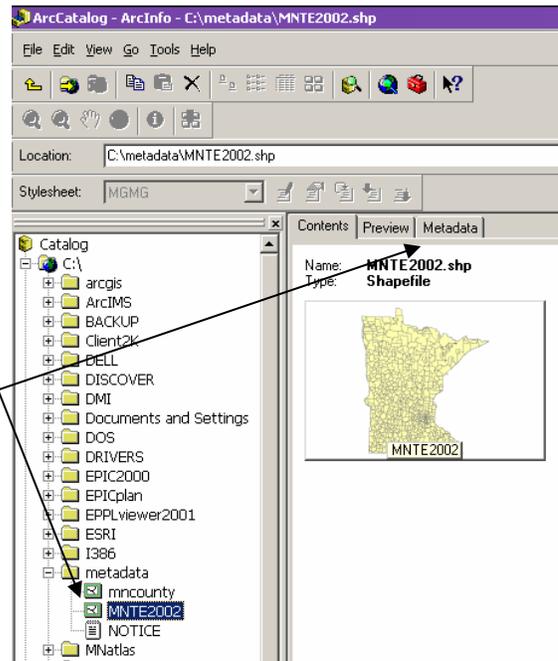
## Appendix B.

### Step 2: Navigate to the first exercise file

- Find the MNTE2002 shapefile, either by
  - typing “c:\metadata\MNTE2002.shp” in the **Location** box, or
  - navigating to the same location in the left column directory tree and clicking once on the filename to select (highlight) the file.

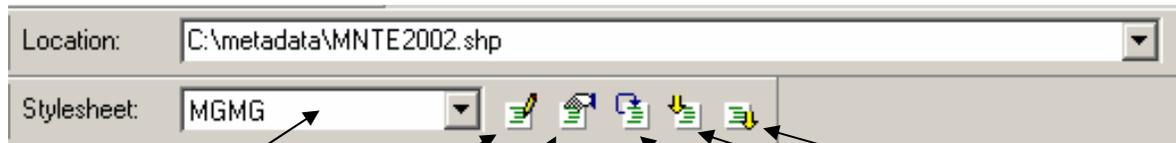
- By default, the **Contents** tab is chosen and you will see the filename, file type and a thumbnail image (if available) in the main window. Click on the **Metadata** tab to bring up an existing metadata record and to activate the metadata toolbar.

Note: The MNTE2002 data set shows the 2002 boundaries of Minnesota’s telephone exchange service areas.



### Step 3: Become familiar with ArcCatalog’s metadata toolbar

- Look at the options on the ArcCatalog metadata toolbar:



**Stylesheet dropdown menu**   **Edit**   **Properties**   **Create/Update**   **Import**   **Export**

**Stylesheet dropdown menu:** gives you several options to change the appearance of the metadata.

**Edit:** starts the metadata editor so you can edit the metadata for the selected item.

**Properties:** allows you to choose whether or not you want the metadata record to be automatically updated

**Create/Update:** Creates a metadata record if one doesn't exist (note, however, that most fields remain blank); updates several fields if a record does exist.

**Import:** Imports existing metadata into ArcCatalog and associates the record with a particular data set.

**Export:** Exports metadata from ArcCatalog.

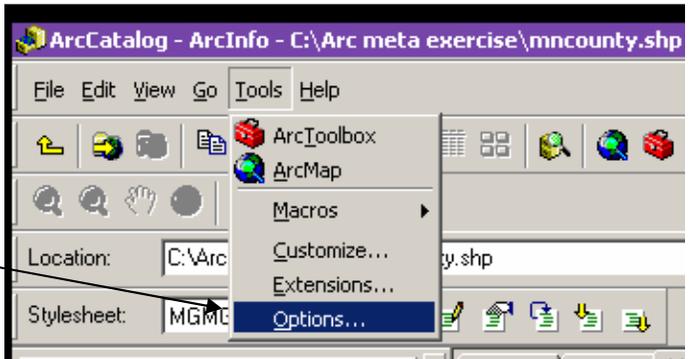
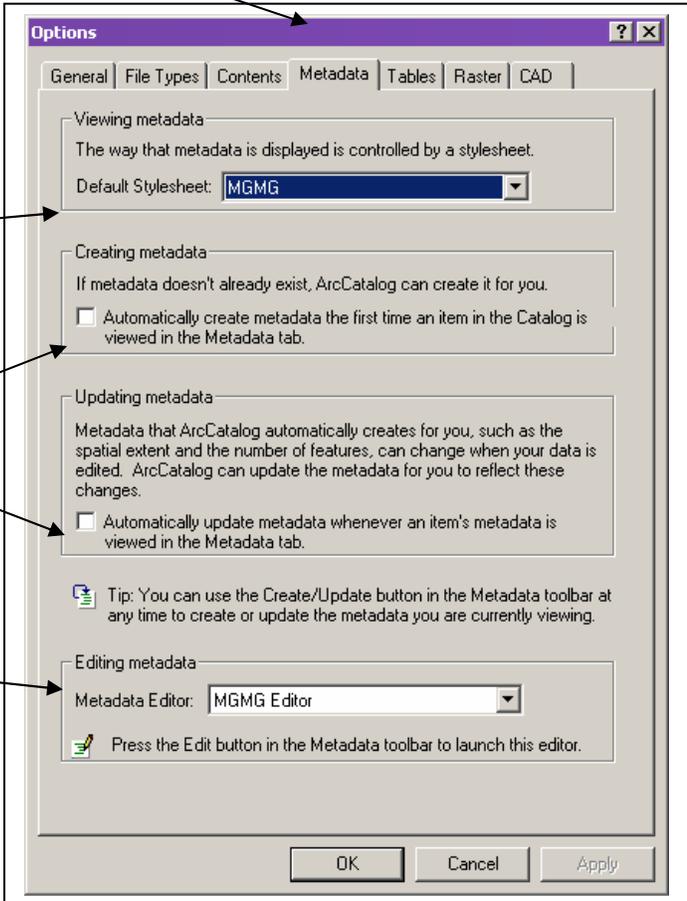
*Hint: if you forget which button does what, put your mouse arrow over the button and read the “tool tip” popup.*

Note: when using the Minnesota Geographic Metadata Guidelines (MGMG) editor, the **Edit** button is the only one that's really useful. More on this in Part 4...

## Appendix B.

### Step 4: Choose a default editor and stylesheet

For this exercise, we will be using the Minnesota Geographic Metadata Guidelines editor (MGMG Editor).

- To make sure that it is selected, click on the **Tools** menu, choose **Options** and then select the **Metadata** tab.A screenshot of the ArcCatalog application window. The 'Tools' menu is open, and 'Options...' is highlighted. The 'Stylesheet' field in the background shows 'MGMG'.
- The first dropdown menu lets you choose a default stylesheet. Make sure **MGMG** is chosen.A screenshot of the 'Options' dialog box with the 'Metadata' tab selected. The 'Default Stylesheet' dropdown menu is set to 'MGMG'. The 'Automatically create metadata' and 'Automatically update metadata' checkboxes are unchecked. The 'Metadata Editor' dropdown menu is set to 'MGMG Editor'.
  - Leave the boxes unchecked under Creating Metadata and Updating Metadata.
  - In the dropdown menu under Editing Metadata, make sure the **MGMG Editor** is chosen. Click **OK** to close the box.

## Appendix B.

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### Step 4: Start the MGMG Editor

- Click on the **Edit Metadata** button on the metadata toolbar to open the MGMG Editor window to view and edit the MNTE2002 record.
- Note the seven tabs on top of the window, one for each section of the metadata. By default, Section 1 (**Identification Information**) is on top. Click on the **Data Quality** tab to bring the window for Section 2 to the top. Click on each of the remaining tabs to see what the other sections look like. End by bringing **Identification Information** back to the top.



- Note the buttons at the bottom of the window.



**Help & About:** Provides links to more help available within the MGMG Editor, help within ArcGIS, and further resources on the internet.

*Note that you can get help for any field by pressing the **F1** key (along the top of your keyboard) while the cursor is in the field.*

**Cancel:** does NOT save changes and closes the editor window.

**Save:** saves your changes and keeps the editor window open.

**Save and Exit:** saves your changes and closes the editor window.

## Part 2: Edit a record

Goals:

- Become familiar with the four different field types
- Know how to edit metadata content including cutting-and-pasting an existing document into the record
- Understand how the ONLINE LINKAGE field changes

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### Step 1: See and edit different field types

The steps below will show you the four different field types:

**Single-line text:** allows only one line of text

**Multi-line text:** allows many lines of text

**Closed Picklist:** provides a menu of fixed choices; does not allow you to add your own text

**Open Picklist:** provides a menu of choices and also allows you to add your own text

## Appendix B.

- Look at and edit examples of the different field types

1. **Single-line text:** Look at the first field in the record, at the upper left, ORIGINATOR. Notice that the text entry box has a white background and is sized to hold one line of text (up to 254 characters). Click anywhere in the text; you can use the right and left arrow keys and the **Home** and **End** keys to move around the text entry box.

Now click in the TIME PERIOD field. Try typing in October 31, 2003 (it won't let you finish the whole date).

**Question 1:** What are two ways you could type this date in this field?

\_\_\_\_\_

*Hint: Either hit the F1 key to get help or click anywhere else in the screen and get an error message about the Time Period field.*

2. **Multi-line text:** Now look at the ABSTRACT field. Note that the box has a green background, indicating that you can type lots of text in this field. Double-click in the box to open a new larger window – this helps you see what you're typing.

Let's say that you want to make sure that people realize that a printed map has been made from this data set. At the end of the text that's already in the Abstract, type in:

"In addition to the digital data, printed maps are also available; see Ordering Instructions."

Now close the window.

3. **Closed picklist:** Look down to the middle left side of the window to find the field, PROGRESS. Note that there are only three choices to fill in this field. You cannot add any other text. To select a choice, click on it. To clear the selection, right-click anywhere in the box.

4. **Open picklist:** Move down to the next field, MAINTENANCE AND UPDATE FREQUENCY. See the options given. Delete "Irregular" and type in some free text of your choice, for example:

"When updates are received from the Department of Commerce"

or

"Whenever we get around to it."

## Appendix B.

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### Step 2: Cut and paste from another document

Let us assume that your organization has already established a standard distribution liability statement, contained in a file called NOTICE.TXT. There's no need to retype it every time you create a metadata record.

- Open Windows Explorer (from the Start menu: choose Programs\Accessories\Windows Explorer).  
Navigate to the c:\metadata folder.  
Double-click on NOTICE.TXT to view the liability statement in Notepad.
- Highlight all the text with your mouse.  
Right click your mouse.  
Choose **Copy** from the popup menu.  
Close the window.
- Click on the ArcCatalog window to make it active again.  
Click on the **Distribution** tab to bring up Section 6 and click within the DISTRIBUTION LIABILITY field (the green box on the right hand side of the window).  
Right click your mouse.  
Choose **Paste** from the popup menu.

You should now see the distribution liability text in the window.

---

### Step 3: See how “Online Linkage” text changes

- In the same **Distribution** section, look at the field at the bottom of the screen, ONLINE LINKAGE.

**Question 2:** What text is typed in here? \_\_\_\_\_

(Hint: it starts with “ftp://”) This is the internet site where you could download this data.

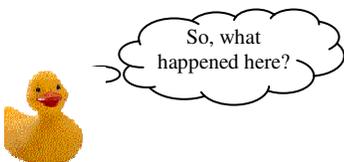
- Click the **Save and Exit** button. Your edited file will be saved as “MNTE2002.shp.xml” since it's in XML format and is associated with the MNTE2002 shapefile. It will be saved in the same directory as the shapefile.
- In the part of the window that displays the record, scroll down to ONLINE LINKAGE, the last field in both the Metadata Summary and in Section 6 (*not the METADATA ONLINE LINKAGE field in Section 7*).

**Question 3:** What text is displayed the ONLINE LINKAGE field?

\_\_\_\_\_

\_\_\_\_\_

- Click on the “[Click Here](#)” link in the ONLINE LINKAGE field to confirm that the link goes to the FTP address that you saw in the editing screen (the answer to Question 2). *Note: don't take time to actually download the files — you don't need them for this exercise.*
- Close the internet browser window.



This is the one place where the MGMG stylesheet changes the text you type in to something else. Since many people download data first, without reading the metadata, this changed wording tries to ensure that people are made aware of the Ordering Instructions and Distribution Liability fields.

## Appendix B.

### Part 3: Display metadata

#### Goals:

- Learn to run the MGMG Converter to convert XML to HTML
- See different views of the same metadata record

When using the MGMG Editor, it's recommended to use the MGMG Converter (a free standalone utility from LMIC) to produce HTML, rather than ArcCatalog's **Export** button, since the MGMG Converter automatically creates hotlinks for web addresses (specifically, from any text beginning with http:// or ftp://).

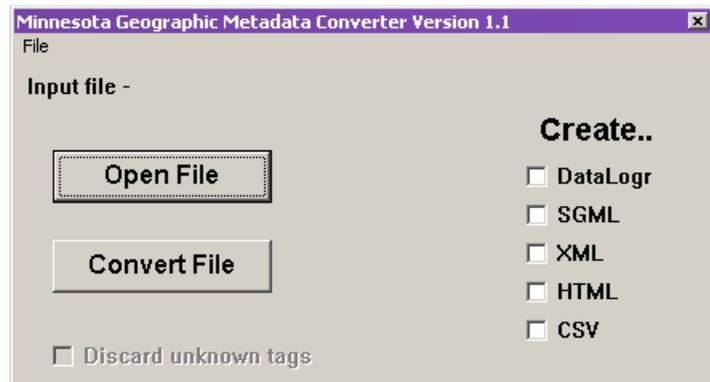
(If you use the FGDC Editor, then use ArcCatalog's **Export** button, choosing from several available formats.)

#### Step 1: Start the converter program

- Open the converter by double-clicking on c:\metadata\wmeta32.exe from Windows Explorer.

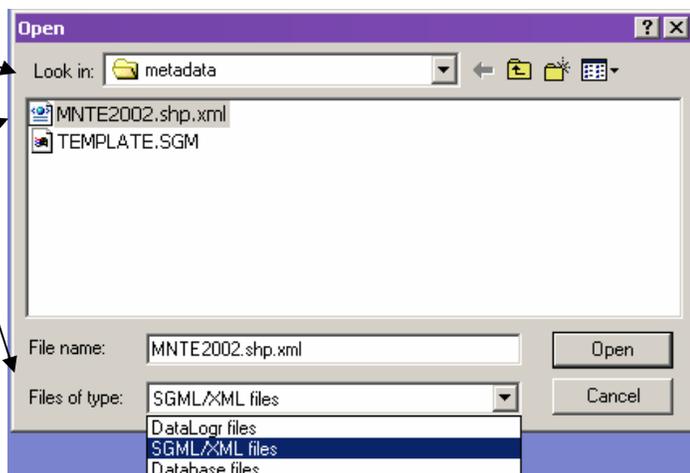
You will then see the converter window:

- Click the **Open File** button



#### Step 2: Convert an XML file to HTML format

- Navigate to c:\metadata
- For **Files of type**, choose **SGML/XML files**
- Choose **MNTE2002.shp.xml** from the list.
- Click **Open** to return to the converter window.

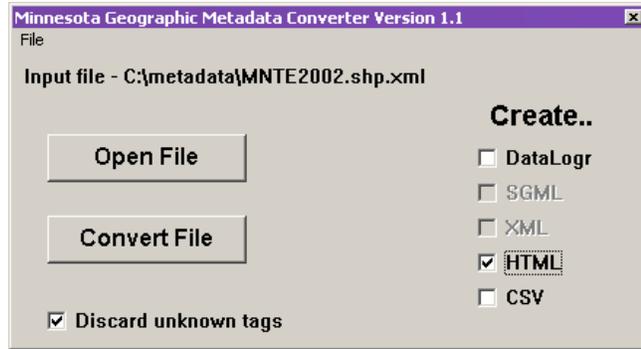


## Appendix B.

Check the **HTML** box.

- Click the **Convert File** button.
- Click **OK** on the “Conversion Successful” window.

Note: the converter has other format options:  
DataLogr format is used with DataLogr metadata entry software;  
CSV is for used with a variety of database software;  
SGML is essentially XML and is used as a generic format for exchanging metadata files.



- Close the converter window.

---

### Step 3: Display the HTML file

- Find the completed HTML file using Windows Explorer (c:\metadata\MNTE2002.shp.htm).
- Double-click on the MNTE2002.htm file to view it with an internet browser. Note that hotlinks were automatically created in the ORDERING INSTRUCTIONS and ASSOCIATED DATA SETS fields. You could now print this report to give to someone or to file, or you could post this HTML page on a website.
- Close the browser window and go back to the ArcCatalog window.

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### Step 4: Change the way a metadata record looks on your screen

In ArcCatalog, the same metadata record can be displayed with different appearances by using different *stylesheets*.

- **MGMG**: Make sure you are looking at the Minnesota Geographic Metadata Guidelines stylesheet by choosing **MGMG** from the Stylesheet dropdown menu.



Location: C:\metadata\MNTE2002.shp

Stylesheet: MGMG

Full Metadata View Attributes View Sample Get Data

### Telephone Exchange Service Area Boundaries for Minnesota, 2002

This page last updated: 07/19/2002  
Metadata created using [Minnesota Geographic Metadata Guidelines](#)

#### Metadata Summary

**Originator** Minnesota Land Management Information Center

**Abstract** This data set provides a statewide view of telephone exchange service areas. It includes five separate layers:

1. Boundaries of more than 700 telephone exchange service areas

## Appendix B.

Some features of the MGMG stylesheet include “quick links” along the top, a metadata summary followed by a full record of all the metadata fields, all field names in bold italic along the left margin, etc.

- **FGDC Classic:** Look at the original FGDC format by choosing **FGDC Classic** from the stylesheet menu.

Notice that there are no quick links or metadata summary, the field names are different (and there are more of them) and they are indented in a hierarchy.

- **FGDC:** Now look at how ESRI spiffed up the FGDC stylesheet by choosing **FGDC** from the stylesheet menu.

**Question 4:** What four fields are in the green box at the top?

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- **FGDC FAQ:** This “frequently-asked questions” format is an interesting one, phrased in terms of the way people usually ask questions about data. Choose **FGDC FAQ** from the drop down menu.

Click on “Why was this data set created?” (third bulleted question). This is the text from the PURPOSE field.

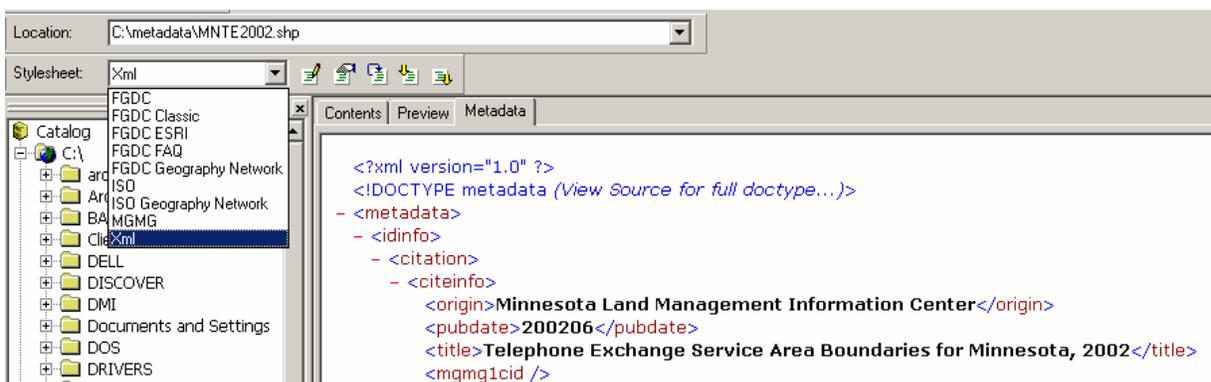
**Question 5:** Should you use this data for detailed site analysis or for a legal document? Yes / No

- **ESRI:** Choose **FGDC ESRI** from the menu. This style uses three tabs at the top (**Description**, **Spatial** and **Attributes**). Click on each of them to see what the screens look like. Click on any green text to see how you can show and hide detail.

So... what’s going on here? Are all these different styles stored as separate files?

No. There is only one file, stored in XML (eXtensible Markup Language) format. The XML file only stores the content of the fields; it doesn’t contain any of the nicely formatted styles.

- **XML:** Each field in an ArcCatalog metadata record is enclosed by two tags (code words inside bracket symbols) that define what the field is. To see what this looks like, choose **Xml** from the Stylesheet dropdown menu



- Find the XML tags

## Appendix B.

See the text **Telephone Exchange Service Area Boundaries for Minnesota, 2002**. Preceding that text is a tag `<title>`; this tells the computer that the following text is a title. The computer knows it's reached the end of the title when it sees the "end tag", or `</title>`.

For the computer, XML is easy to read – for people (and duckies) it's not! That's why there are stylesheets. Stylesheets tell ArcCatalog what fields to display, in what order, and how to format them (bold, italic, colors...). Stylesheets are written in XSL (eXtensible Stylesheet Language). If you are familiar with XSL, you could write your own stylesheet — but not for this exercise...

- Go back to the MGMT stylesheet.

### Part 4: Create a new record

Goals:

- Review the metadata ArcCatalog automatically creates
- Create your own starter template



Some information in a metadata record will likely be the same for every, or almost every, metadata record you create. For example, your name and contact information in Section 7 won't change. Why type it over and over? Instead, create a "starter template" with the unchanging information. When it's time to create a new metadata record, save a copy of this file with a new name, then add the information that is specific to the particular data set, for example, the title and abstract.

But wait a minute, isn't ArcCatalog supposed to create metadata records for you? Let's see what it fills automatically...

#### Step 1: Use ArcCatalog to automatically create and fill in a record

- Choose the mncounty file (a file that shows the outlines of Minnesota's 87 counties).
- When the metadata tab is selected, the message should read, "Metadata has not been created for the selected item."
- Click on the **Create/update metadata** button

#### Step 2: Evaluate the automatically-created record

**Question 6:** What is the title of the data set? \_\_\_\_\_

**Question 7:** What would be a better title? \_\_\_\_\_

**Question 8:** Check "Native Data set Environment" (Section 3).

Do you think this data set was really created with either Windows or ArcCatalog? Yes / No

## Appendix B.

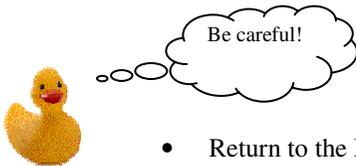
Check Section 4 (there's nothing filled in). But, doesn't ArcGIS "know" your data set's projection, datum and horizontal units? Not if there's no projection file accompanying the data set (a projection file is a text file ending with .prj ; it is stored in the same directory as the data file). It is VERY important to create projection files for your data; however, this is beyond the scope of this exercise. If you need more information about the topic, see "projection files" in ArcGIS's Help Menu.

The automatic option does fill in a few elements not in the Minnesota Guidelines:

- Change to the FGDC ESRI stylesheet
- Click the **Attributes** tab

**Question 9:** What is the number of records? \_\_\_\_\_

**Question 10:** Can you tell what all of the attribute codes mean? Yes / No



Presumably, ArcCatalog's automatic features will improve with time, but it will never write the whole record for you. And always make sure that what's automatically filled in is what you really wanted!

- Return to the MGMG stylesheet

---

### Step 2: Create a starter template file

Modify the almost-blank record that ArcCatalog created for mncounty to be your starter template.

- Start the MGMG Editor.
- Fill in the fields that usually stay the same for all metadata records you create (for example, ORIGINATOR; contact information; bounding box coordinates; projection information; all of Section 7...)

*Hint: to find latitude/longitude bounding box coordinates for each Minnesota county and for the state, see: <http://www.lmic.state.mn.us/chouse/coordinates.html>*

- Delete any information that ArcCatalog inserted that would not stay the same for all metadata records you create (for example, TITLE and METADATA DATE).
- **Save** your edits.
- Go to Windows Explorer, navigate to c:\Metadata\mncounty.shp.xml and rename the file to some other name, such as mystart.xml.
- Now, whenever you start documenting a new data set, make a copy of mystart.xml, rename it to a filename appropriate for your data set, and edit that xml file using the MGMG Editor.

## Exercise Answers

Question 1: 10/31/2003 or 20031031

Question 2: ftp://ftp.lmic.state.mn.us/pub/data/trans\_util/mnte2002.exe

Question 3: [Click here](#) to download data. (See Ordering Instructions above for details.) By clicking here, you agree to the notice in "Distribution Liability" above.

Question 4: Title; Coordinate System; Theme Keywords; Abstract

Question 5: No

Question 6: mncounty

Question 7: Minnesota County Boundaries

Question 8: No

Question 9: 87

Question 10: No

## Appendix B.

### Easy Multiple Choice Questions

Real life examples!  
(except Tahiti)

Metadata is useful for:

- protecting your expensive investment in data development
- reducing time spent answering routine questions
- figuring out whether data will be useful for your project
- limiting your liability
- all of the above



When is it easiest to write metadata?

- when it's fresh in mind
- after the data creator has renounced technology and moved to Tahiti
- when there are a pile of CDs labeled:
  - C: Drive Backup
  - Miscellaneous
  - County Data
  - Important Stuff
- when you're on the phone with a [citizen/supervisor/legislator] who needs an answer about your data RIGHT NOW

When is it easiest to ask for metadata?

- when you're requesting a data set or contracting for someone to create it
- after you've downloaded data from the internet and forgotten which site you downloaded it from
- three months after you've downloaded the data
- when your project that relies on the data is due at noon today

Answers to Easy Multiple Choice Questions: e; a; a

---

*The End*

---

This exercise was created by the Land Management Information Center at Minnesota Planning as part of the Federal Geographic Data Committee's "Don't Duck Metadata" initiative, 3/29/03.

## Appendix C.

Minnesota Geographic Metadata Guidelines  
**University of Wisconsin; River Falls Workshop Evaluation Responses**  
December 15, 2003

Ten workshop attendees, eight students and two faculty from the University of Wisconsin at River Falls. The workshop was sponsored by the Department of Geography, although most student attendees were majors in other areas, predominantly Urban Planning. The workshop was held on Monday evening, 6:00 pm to 9:00 pm. Chris Cialek & Nancy Rader: instructors.

### 1. How useful was this workshop to you? (circle one)

very useful	useful	not very useful	not at all useful
8	1	0	0

### 2. Were the presentations clear and effective? (circle one)

very clear	clear	not very clear	not at all clear
7	2	0	0

### 3. How would you rate the quality of the handouts and other presentation materials? (circle one)

very useful	useful	not very useful	not at all useful
8	1	0	0

### 4. What other information do you need to know about creating or using metadata?

- 
- *Can I train the duck to do it for me?*
  - *Not yet, but probably in the future.*
  - *Differences? Is one [standard] better or should I be focused on more, or is it dependant on employer/agency?*
  - *I don't know right now, but as I get into it I'm sure I'll need something.*
  - *Just experience.*
- 

### 5. Do you have any other comments about this workshop?

- 
- *Good to include ISO as something to watch. Good to stress documentation as you go. . .*
  - *In the exercise – don't say "play around" use an active verb such as "explore" or "work with" etc.*
  - *Great help, thanks; lots of good advice on how to get it done. Love the duckie*
  - *Lots of fun. Thanks.*
  - *You did a good job touching on several useful aspects – copying data by templates, search engines, etc.*
  - *Very good workshop – provided an excellent jumping off point for metadata rookies. Thank you!*
  - *Thank you for coming out on a Monday night. The presentation was excellent and the time frame was appropriate.*
-

## Appendix C.

Minnesota Geographic Metadata Guidelines  
**Clay County GIS Office Metadata Workshop Evaluation**  
Moorhead, MN  
May 13, 2004

### 20 evaluations received from 23 workshop attendees

#### 1. How useful was this workshop to you? (circle one)

very useful	useful	uncertain	not very useful	not at all useful
7	13	0	0	0

#### 2. Were the presentations clear and effective? (circle one)

very clear	clear	uncertain	not very clear	not at all clear
10	10	0	0	0

#### 3. How would you rate the quality of the handouts and other presentation materials? (circle one)

very useful	useful	uncertain	not very useful	not at all useful
10	10	0	0	0

#### 4. What other information do you need to know about creating or using metadata?

- *Need to use it to become more knowledgeable before requesting more information.*
- *It gave very good info – now we just need to get started!*
- *Unsure at this time.*
- *Nope.*
- *What standard to use when dealing with MN and ND data together? (FGDC) standard [?]*
- *Are there metadata editors built into other GIS software programs?*
- *I can't think of anything else at this time.*
- *When applicable, conversion to ISO standards: how done, required tools, etc. [?]*
- *Especially for raster data, the total number of bytes (rows & columns) for easier importation of data into various formats (ERDAS IMAGINE, e.g.).*

#### 5. Do you have any other comments about this workshop?

- *Good job, Chris & Nancy!*
- *Nicely presented. Thanks for the ducky.*
- *Very much liked the hands-on portion – viewing, editing, and learning about the MGMG editing tools/formats. This portion of the workshop was very helpful!*
- *Good presentation about an often overlooked topic.*
- *Excellent workshop.*
- *Thank you.*
- *Good location. I didn't have to travel to the twin cities.*

## Appendix C.

- *Wonderful workshop! The presenters were great.*
- *Good informative workshop. Nice hands on portion.*
- *Very informative about the standards that cleared up many questions for me.*
- *Very well done, much appreciated. Good facilities. Right amount of time.*

*Thanks!*

**Metadata Workshop Attendees  
May 13, 2004  
Clay County GIS Office; Moorhead, Minnesota Planning**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Anderson, Brad	GIS Coordinator	City of Fargo
Blakeway, Kay	GIS Coordinator	Cass County, ND
Borgen, Donald	AutoCAD–GIS Instrctr	North Dakota State University
Corshbough, Wayne		City of Fargo
Coziahr, Chad		Fargo-Moorhead COG
Geraci, Charles	Graduate Student	University of North Dakota
Graham, Marshall		Beltrami County Environmental Services
Hanson, Clair		City of Moorhead
Harper, Tom		MN DOT; Detroit Lakes, MN
Larson, Philip		Douglas County Land & Resource Mgmt
Masten, Daryl		City of Fargo; Engineering
Mayer, Tony	Technical Planner	Headwater Regional Development Commission; Bemidji
Mita, Dath		North Dakota State University; Agriculture & Biosystem Engineering
Nielson, Stephanie		University of North Dakota Energy & Environmental Research Center
Nutsch, Bob	State GIS Coordinator	State of North Dakota
Peck, Wes		University of North Dakota Energy & Environmental Research Center
Qualley, Chad	GIS & CAD Specialist	Houston Engineering, Inc.
Schoon, Ed		Lake Region Electric Coop; Pelican Rapids, MN
Sloan, Mark	GIS Director	Clay County, MN
Reed, Timothy	Research Archeologist	ND State Historical Society; Bismarck
Wail, Shannon		MN DOT
Wickerheiser, Carol	GIS Technician	Clay County, MN
Zahler, Ryan		Xcel Energy

**Appendix C.**

Minnesota Geographic Metadata Guidelines  
**Region 5 Development Commission Metadata Workshop Evaluation**  
Staples, MN  
August 24, 2004

**8 evaluations received from 10 workshop attendees**

**1. How useful was this workshop to you? (circle one)**

very useful	useful	uncertain	not very useful	not at all useful
<b>5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>

**2. Were the presentations clear and effective? (circle one)**

very clear	clear	uncertain	not very clear	not at all clear
<b>6</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

*[one comment: Great job!]*

**3. How would you rate the quality of the handouts and other presentation materials? (circle one)**

very useful	useful	uncertain	not very useful	not at all useful
<b>6</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>

*[one comment: Very precise and easy to understand]*

**4. What other information do you need to know about creating or using metadata?**

- *Any updates on automation through HTML forms or PHP/ASP driven web interfaces, networkable Datalogr, etc....*
- *I am very interested in naming conventions. Having data in our office, how do I let staff know that this metadata file is attached to this data. It is easy to go from Metadata to Data, but from Data to Metadata*

**5. Do you have any other comments about this workshop?**

- *Thank you.*
- *Hands on and the hand outs are great!!*
- *Well done... this is a dry subject and tough to arouse enthusiasm. You guys did a good job.*
- *You've made metadata seem relatively easy. The key advantage I noticed to DataLogr is that there were no required fields; you can fill them in as needed. In the past, I needed to use a metadata tool that required all fields to be filled in before continuing on to the next field.*
- *The information was very useful and it made me think about the data I create. Thanks!*

## Appendix C.

- *Have participants bring in an example of data that they need metadata for – then work on that during the workshop. Of course, people would have to have some details about the data!*
- *I think the suggestion of creating your data (meta) as you are creating your data is very important.*

### **Metadata Workshop Attendees August 24, 2004 Region 5 Development Commission; Staples, Minnesota**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Anderson, Brant		Mud Labs ( <i>GIS programming services</i> )
Bartels, Doug	Engineering Technician	Richland County Highway Dept. (ND)
Brekke, Lee		Wadena County Assessors Office
Foster, Bonnie		Todd County GIS & Land Services
Harris, Mary	GIS Coordinator	Region Five Development Commission
Juvrud, Mike		Mud Labs ( <i>GIS programming services</i> )
Moore, Rick	GIS Planner	Mid-Minnesota Regional Development Commission
Morton, Sarah	GIS Planner	East Central Regional Development Commission
Oldakowski, Anne		Wadena SWCD
Stevenson, Gloria	GIS Coordinator	Todd County GIS & Land Services

## Appendix C.

Minnesota Geographic Metadata Guidelines  
***Southwest Minnesota State University Metadata Workshop Evaluation***  
Marshall, MN  
September 1, 2004

### 13 evaluations received from 13 workshop attendees

#### 1. How useful was this workshop to you? (circle one)

very useful	useful	uncertain	not very useful	not at all useful
<b>9</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### 2. Were the presentations clear and effective? (circle one)

very clear	clear	uncertain	not very clear	not at all clear
<b>10</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### 3. How would you rate the quality of the handouts and other presentation materials?

very useful	useful	uncertain	not very useful	not at all useful
<b>9</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### 4. What other information do you need to know about creating or using metadata?

- *When a file should be “metadated” or just used personally for “in house” or even for one project.*
- *No.*
- *Nothing – you covered a lot of points well.*
- *Details about xml and dtd. Info about how to create/join node.*
- *Very complete presentation.*
- *The presentation was very thorough/complete – all questions answered in presentation or quickly asked and answered by students/instructor.*

#### 5. Do you have any other comments about this workshop?

- *Very helpful and complete.*
- *Very useful, good information, helpful.*
- *I would have liked to see a “real world” example from beginning to end. Perhaps a member of the group could have brought in a shapefile and as a group we could have generated a new metadata file.*
- *Very informative and very well presented. Thank you!*
- *For an introductory training, it was just the right length in time and covered very useful information. The contacts and links that were provided to us will be very useful.*
- *None.*

## Appendix C.

- *Very interesting (and energetic) considering the subject matter. Well done.*
- *Just “Ducky.”*
- *Thank you for visiting SW MN.*
- *Well done – thank you!*
- *Every GIS person in the state of MN should sit through this workshop. It is a great starting point for all of us to get started producing metadata.*
- *I appreciate Nancy and Chris coming to southwest Minnesota to conduct this workshop.*
- *Good analogy – unmarked cans. Well put together, presented. Vital information, particularly when some GIS professionals in rural areas are not GIS trained. Thank you.*

### **Metadata Workshop Attendees September 1, 2004 Southwest Minnesota State University; Marshall, Minnesota**

Name	Affiliation
Christoffels, Jean	Murray County Environmental Services
Collins, Beth	NRCS
Cunfer, Geoff	Southwest Minnesota State University
Gehrke, Arlyn	Rock County Land Management Office
Green, Brian	Redwood County Environmental Services
Johnson, Annie	SGT, Inc for SAIC at USGS/EROS Data Center
Justice-Kamp, B.J.	Independent GIS consultant
Kost, Charles	Southwest Minnesota State University
Kresko, Tom	BWSR
Kristoff, Joseph	NRCS
Sires, Clint	Nobles County, Emergency Management Director
Strong, Shawn	Lyon County
Wohnoutka, Shawn	Redwood-Cottonwood Rivers Control Area

## Appendix C.

Minnesota Geographic Metadata Guidelines  
**Department of Agriculture Metadata Workshop Evaluation**  
St. Paul, MN  
March 22, 2006

**1. How useful was this session to you? (circle one)**

very useful      useful      uncertain      not very useful      not at all useful

**3                      3**

**2. Was the material presented clearly? (circle one)**

very clear      clear      uncertain      not very clear      not at all clear

**6**

**3. How would you rate the quality of the handouts and presentation materials? (circle one)**

very useful      useful      uncertain      not very useful      not at all useful

**3                      3**

**4. What other information do you need to know about creating or using metadata?**

- *None that I can think of now! Great job – Thx!*
- *More info on searching for data sets – What fields to check in metadata.*
- *For now, I need to get started entering metadata so project Shapefiles can be served on the web. The training session got me started on that.*

**5. Do you have any other comments about this session?**

- *Thanks for demystifying metadata creation. The online Clearinghouse node search tool is great! I've never known about it – Thanks!*
- *This session was very informative and provided some great examples of how to create and maintain metadata for GIS databases. This practice is critical for daily business processes and in the event of sharing info during an emergency response scenario.*
- *I suggest covering less history of metadata and more on the mechanics and use of metadata.*
- *Instructors are very good teachers.*
- *This was very useful – I'm glad I attended . . .*
- *The handout of the slideshow had some print that was unreadably small.*

## Appendix C.

<b>Name</b>	<b>Email</b>
Monika Chaneller	<i>monika.chaneller@state.mn.us</i>
Ben Miller	<i>benjamin.miller@state.mn.us</i>
Mark Abrahamson	<i>mark.abrahamson@state.mn.us</i>
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Becky Vick	<i>becky.vick@state.mn.us</i>
Gary Elsner	<i>gary.elsner@state.mn.us</i>
Mike Dolbow	<i>mike.dolbow@state.mn.us</i>

## Appendix C.

**Appendix D.**

**Metadata Created by Date  
FGDC grant period: 10/1/2003 – 9/30/2007**

<b>Date Posted</b>	<b>Dataset Name</b>	<b>Originating Agency/ Metadata Agency</b>
9/5/2003	Correctional Facilities, MN, 2003	MN Dept of Corrections/LMIC
10/8/2003	MnDOT County Hwy Maps - Georeferenced Images	MnDOT/LMIC
10/31/2003	TCMA Impervious Surface Area, 2000	Manitoba Remote Sensing Center
10/31/2003	TCMA Landsat Land Cover – Level 1	Manitoba Remote Sensing Center
10/31/2003	TCMA Landsat Land Cover – Level 2	Manitoba Remote Sensing Center
10/31/2003	TCMA Land Cover 2000 Etc- EPPL Version	Manitoba Remote Sensing Center/LMIC
11/13/2003	Quarter-Quad Index Map	DNR
12/23/2003	MnDOT County Hwy Maps - .pdf version	MnDOT/LMIC
12/31/2003	AM Radio Tower Locations	FCC/LMIC
12/31/2003	Antenna Structure Registration (ASR)	FCC/LMIC
12/31/2003	Cellular Tower Locations	FCC/LMIC
12/31/2003	FM Radio Tower Locations	FCC/LMIC
12/31/2003	Land Mobile Stations - Commercial	FCC/LMIC
12/31/2003	Land Mobile Stations - Private	FCC/LMIC
12/31/2003	Microwave Tower Locations	FCC/LMIC
12/31/2003	Pager Tower Locations	FCC/LMIC
12/31/2003	TV Transmission Towers	FCC/LMIC
1/6/2004	Telephone Exchange Boundaries 2003	LMIC
1/7/2004	NAIP Orthorectified Images – 2003 Final	USDA-FSA/LMIC
1/26/2004	Mower County Geologic Atlas – Part B	DNR
1/26/2004	Goodhue County Geologic Atlas – Part B	DNR
1/26/2004	Regional Hydrogeologic Assessment - Part B Otter Tail Study Area	DNR
2/5/2004	Renville County Aggregate Mapping	DNR Minerals
2/11/2004	National Pipeline Mapping System	USDOT – OPS/ LMIC
2/17/2004	Regionally Significant Ecological Areas	DNR
2/25/2004	Minor Civil Divisions 2003	LMIC
3/19/2004	Public School Locations SY 2002-2003	LMIC
3/19/2004	MN School Dist Attendance Areas SY 2002-2003	LMIC
3/30/2004	Sherburne County Aggregate Potential	DNR Minerals
4/26/2004	Public School Locations SY 2003-2004	LMIC
8/2/2004	Minnesota Boundaries Map Service	LMIC
8/2/2004	Minnesota Geology Map Service	LMIC
8/2/2004	Minnesota Health Services Map Service	LMIC
8/2/2004	Minnesota Hydrography Map Service	LMIC
8/2/2004	Minnesota Social Services Map Service	LMIC

## Appendix D.

Date Posted	Dataset Name	Originating Agency/ Metadata Agency
8/5/2004	Minnesota Soil Atlas	U of MN Soils/LMIC
8/17/2004	Pine County Geologic Atlas – Part B	DNR Waters
8/17/2004	Crow Wing County Geologic Atlas – Part A	MN Geol Survey
8/18/2004	School District Boundaries SY 2003-2004	LMIC
8/18/2004	School Dist Attendance Areas SY 2003-2004	LMIC
9/3/2004	Statewide Parcel Mapping Inventory 2004	MnDOT/LMIC
10/21/2004	Original Land Survey Maps (GLO) Images	LMIC
11/1/2004	NAIP images 2004 Interim	USDA-FSA/LMIC
12/1/2004	Electric Transmission Lines and Substations	EQB/LMIC
12/29/2004	Minnesota State-Owned Facilities Database ( <i>note: at the request of HSEM, this record was later purged from the system</i> )	DPS-HSEM & MDA/ LMIC
12/29/2004	State Soil Geographic DB - STATSGO	NRCS/LMIC
12/30/2004	School District Boundaries SY 2004-2005	LMIC
12/30/2004	School Dist Attendance Areas – SY 2004-2005	LMIC
1/27/2005	Public School Locations SY 2004-2005	LMIC
2/7/2005	Minnesota Navigator Land Use (derived from NLCD)	USGS & LMIC/ LMIC
2/7/2005	NAIP 2003 Final - 8-bit B&W GeoTIFF	LMIC & USDA- FSA/LMIC
10/12/2005	Wabasha County Geologic Atlas – Part B	DNR
10/14/2005	Public School Locations SY 2005-2006	LMIC
10/14/2005	School District Boundaries SY 2005-2006	LMIC
10/14/2005	School District Attendance Areas SY 2005-2006	LMIC
1/5/2006	NAIP images 2003-2004	LMIC & USDA-FSA /LMIC
10/12/2006	Ground Water Contamination Susceptibility	MPCA & LMIC/ LMIC
2/9/2007	Pope County Geologic Atlas – Part B	DNR
3/9/2007	NAIP Images 2005 Interim	USDA-FSA/LMIC
3/9/2007	NAIP Images 2006 Interim	USDA-FSA/LMIC
5/9/2007	Scott County Geologic Atlas	MGSL/LMIC
8/6/2007	Peat Inventory Maps and Reports (Historic)	DNR Minerals
11/13/2007*	Charter School Locations SY 2006-2007	Education
11/13/2007*	Charter School Locations SY 2007-2008	Education
11/13/2007*	Pub School Dist Ctr Locations SY 2006-2007	Education
11/13/2007*	Pub School Dist Ctr Locations SY 2006-2007	Education
11/13/2007*	Non-Public School Locations SY 2006-2007	Education
11/13/2007*	Non-Public School Locations SY 2007-2008	Education
11/13/2007*	Public School Locations SY 2006-2007	Education
11/13/2007*	Public School Locations SY 2007-2008	Education
11/13/2007*	School District Boundaries SY 2006-2007	Education
11/13/2007*	School District Boundaries SY 2007-2008	Education
11/13/2007*	SD & Attendance Area Education Boundaries SY 06-07	Education
11/13/2007*	SD & Attendance Area Education Boundaries SY 07-08	Education

\* Metadata records received by LMIC before the project deadline but not posted until afterward