



MAGERT

ALA MAP AND GEOGRAPHY ROUND TABLE

Map, GIS and Cataloging / Metadata Librarian Core Competencies

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GIS Librarian Core Competencies,
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Introduction

Over the past ten years libraries have seen an increase in the amount and types of cartographic materials requested and used. The Occupational Outlook Handbook states that employment in areas which use map and GIS resources, such as surveyors, cartographers, photogrammetrists, and urban and regional planners will increase faster than average between 2006 and 2016. “Increasing demand for fast, accurate, and complete geographic information will be the main source of growth for these occupations ... Also, the increased popularity of online mapping systems has created a higher demand for and awareness of geographic information among consumers.”(U.S. Dept. of Labor, 2008).

This growing demand calls for skilled professionals equipped with specialized knowledge of maps, geographic information systems (GIS) and all other cartographic resources, whether in hardcopy or digital form, and the cataloging of, or metadata creation for these same resources. Unfortunately, there is a noticeable absence of an authoritative resource detailing the skills required for this type of position. Thus, the MAGERT Education Committee has taken a leadership role in putting together documentation outlining core competencies in the map librarianship profession that previously did not exist. These Core Competencies outline and articulate the special skills needed to provide high-quality professional support to users of cartographic and geospatial materials. At the ALA Annual Conference in Washington, DC, in June 2007, three Subcommittees of the MAGERT Education Committee were formed to create a preliminary draft of Map, GIS and Cartographic Materials Cataloging Core Competencies.

The intention is that this competencies document will be distributed widely, and in many forms, to assist in the professional development life cycle: from student/faculty curriculum development to new professional to mid-career professionals or others who are new to the specialization, as well as administrators or personnel officers to assist in job descriptions and hiring in this area. Links and references at the end of this document will provide further support to all interested parties.

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Process

Subcommittees were created to address: 1) Map Librarianship, 2) GIS Librarianship, and 3) Map Cataloging and Metadata Creation. Each subcommittee describes their area of specialization, with the assumption that some overlap of duties between the three groups is expected as the tasks and responsibilities of each are at times interdependent. After preliminary drafts of core competencies were produced by each subcommittee, the chair and editors compiled and edited them into this document for review by a larger MAGERT audience.

Many core competency statements were reviewed to assist in the creation of this document, including the ALA Statement. These typically consisted of a general statement of concept or discipline, followed by the application of that concept. This core competencies document follows four key areas based loosely on those written by the Special Libraries Association: Organizational Management, Resource Management, Information Services, and Technological Applications. Each specialization contains statements on those four conceptual areas.

Core Competencies Summary

General Cartographic Competencies

Librarianship has changed over the years due to the advent of new information technologies. The world of map librarianship is no different. With the introduction of geographic information systems and associated datasets in libraries in the early 1990's, the skills required of the map librarian expanded to include digital cartographic resources. The core functions of traditional print map librarianship (i.e., identify, collect, organize, preserve and make available) can also be applied to digital geospatial resources (McEathron, 2001). It is assumed that certain map reading skills and cartographic knowledge will be obtained prior to or early in an individual's job assignment. That knowledge will include scale, projection, grids, and geographic coordinates. It is also helpful to know the basics of the history of cartography; as well as local, state, federal and international mapping agencies and private map publishers, map series and similar publication patterns, and gazetteers (print and online). These cartographic skills may be obtained by a degree in fields of study such as geography, anthropology, environmental sciences, urban planning and others. Job announcements often note a preference for job seekers who hold those, or similar degrees.

General Managerial Competencies

Most librarians find themselves serving as supervisor or manager, either officially or unofficially, or in a related leadership role as trainer or mentor. This assumes a basic understanding of typical human resources processes, such as hiring, evaluating, delegating, team building and motivating others. The librarian also needs an understanding of their role in the larger context of the organization, how to establish partnerships and develop services to meet needs. This document does not address those skills, but assumes that all librarians will possess and/or build their competencies in those areas also.

Levels of Competency

As individuals begin their career in map librarianship and continue along their career journey that they will gain new experiences and skills. In addition, they may also be required to, or volunteer to, take on new responsibilities due to an evolving organizational or technological infrastructure. Therefore, with change come new levels of competency in one or more areas of his/her position. With this in mind we have identified three Librarianship areas of competency in this document in order to further guide expectations along the continuum of experiences and skills needed to be successful in our profession. A specific individual or position may require competencies in one or more of the three areas.

Level 1 - everyone needs to know, and at the entry level needs to master in their first 1-2 years

Level 2 - most will need to know, but may depend on local circumstances

Level 3 - advanced level of specialization: very dependent on local user needs, departmental staff and organizational structure

Please note that the specific necessary skills listed in the following three Librarianship sections below are weighted according to the Levels above based on the definition provided for each. A Level designation is provided at the end of each bulleted skill/experience item.

Section I. Core Competencies for Map Librarianship

“Evidently, map librarians, and those with a controlling influence on map libraries, need to rethink their role in the changing context of new technology, new media, and of new political and economic perspectives.”

--Parry and Perkins, 2001, “Introduction”

The role of the map librarian is changing and that new role requires adaptability, knowledge, and initiative to keep map collections dynamic and useful. Map librarians must navigate the world of both print and digital cartographic resources as well as oversee all aspects of the map library, its collections, and services. Beyond that, they must have an awareness of the scope and projects of other map collections, particularly as they inform areas of overlap with the librarian's own collection as this may affect collection development decisions, reference referrals, and digitization decisions. The skills needed by the map librarian are extremely varied and overlap in many areas with both the GIS librarian and the map cataloger but this is inescapable given the requirement of the map librarian to be involved in all aspects of the collection, which includes the GIS/digital resources and services, as well as the organization and classification of the materials.

I.A. Organizational Management

I.A.1. Management

❖ Strategic Planning

- Development of short term and long term goals **[Level 2]**
- Ability to evaluate the outcomes of programs and projects to better plan for the future **[Level 3]**

❖ Project Management

- Ability to prioritize and decide what needs to be done, when, and by whom **[Level 1]**
- Ability to see a large project through from start to finish (such as large scale digitization projects of map library materials and overseeing the cataloging of a large uncataloged backlog according to a certain set of priorities) **[Level 2]**

❖ Fiscal Management

- Ability to manage multiple budgets such as those for collections, staffing, and supplies. **[Level 2]**

❖ Fundraising

- Participation in fundraising activities **[Level 2]**
- Ability to apply for appropriate grants that would fund projects relevant to the discipline's ongoing work **[Level 3]**

I.A.2. Marketing and Outreach

❖ Intra-institutional marketing and inter-institutional marketing: ('Intra'- is marketing within your institution, while 'inter' is marketing outside of your institution or between libraries and other organizations.)

- Ability to act as an advocate for the map library collections and programs **[Level 1]**
- Knowledge of marketing strategies, in particular to different user groups **[Level 2]**
- Development of innovative ideas to market map library collections and services **[Level 2]**
- Development of exhibits and programs **[Level 2]**
- Development of relationships with other organizations to work to increase visibility of the map library outside of the institution (ability to form partnerships or work collaboratively with colleagues within one's institution and nationally or locally at other institutions) **[Level 3]**

❖ Webpage Development

- Knowledge of current web trends in spatial data **[Level 1]**
- Oversees the development of a webpage for the collection **[Level 2]**

I.B. Resource Management

I.B.1. Collection Development

❖ Acquisitions

- Knowledge of the strategies used to obtain different types of maps, imagery, and spatial data; including an understanding of the kinds of resources available from commercial and nonprofit publishers, their avenues of distribution, and new trends in the production and delivery of spatial data **[Level 1]**
- Understanding of federal, state, and other governmental information, its sources, and they way it is distributed, particularly if the institution in question is part of the Federal Depository Library Program **[Level 2]**
- Understanding copyright considerations and the ability to negotiate licensing agreements for databases and collections of spatial information with regard to use of the collection **[Level 2]**

❖ Management (Selection and De-selection of Materials and Resources)

- Ability to formulate and write a collection development and de-selection policy **[Level 1]**
 - Understands the needs of patrons so the policy directly correlates their needs to the development of the collection
 - Understands the strengths and specialties in the collection to be able to build on those strengths
- Knowledge of the rules governing the selection/de-selection of federal and state government documents **[Level 1]**
- Knowledge of avenues to utilize when withdrawing cartographic materials (i.e., offering government documents to other depository libraries, sending lists of discarded materials out to other map librarians on list-serves, offering maps to local schools to serve as teaching aids, etc) **[Level 2]**
- Understanding where gaps exist in the collection, through analysis, so that a strategic selection plan can be developed. **[Level 2]**
- Manage ongoing changes to collection development and de-selection policy(ies) **[Level 2]**

I.B.2. Collection Maintenance and Organization

❖ Facilities and Equipment

- Basic knowledge of map library equipment such as map storage cabinets and drawers **[Level 1]**
- Knowledge of ADA and local fire codes and laws to keep traffic areas free in support of physical safety and collection accessibility, including a written disaster plan **[Level 1]**

❖ Preservation of resources (print and digital)

- Knowledge of proper materials handling, especially for rare and fragile materials **[Level 1]**
- Knowledge of preservation methods, such as encapsulation **[Level 1]**
- Knowledge of digitization and scanning standards and copyright limitations related to them **[Level 2]**
- Knowledge and ability to manage preservation projects **[Level 3]**

❖ Collection Access and Maintenance

- Basic understanding of different classification/organization systems used in map collections **[Level 1]**
- Understanding of the special considerations that need to be taken into account with cataloging cartographic materials (e.g., decisions about describing map sets as a whole as compared to cataloging them at the sheet level, or, the impact of classification decisions on the physical organization of the collection) **[Level 1]**

- Ability to create a variety of finding aids for cartographic materials, including indexes **[Level 1]**
- Familiarity with the application of a variety of metadata schema for spatial data **[Level 2]**
- Participation in the selection and testing of a new ILS **[Level 2]**

❖ Security of the Collection

- Knowledge of map security issues **[Level 1]**
- Ability to protect library materials from theft using available methods and resources **[Level 1]**

I.C. Information Services

I.C.1. Reference and Instruction

❖ Reference

- Understanding of how to conduct an effective reference interview within the specialized environment of the map library **[Level 1]**
- Ability to effectively communicate in person, on the phone, through email, and in a virtual environment **[Level 1]**
- Knowledge of how to use catalogs, indexes, finding aids and electronic reference tools **[Level 1]**
- Knowledge of geographic and cartographic principles, including important details such as projections, coordinate systems and history **[Level 1]**
- Knowledge of the creation and distribution systems for cartographic resources
 - Understand map production and reproduction processes and types **[Level 1]**
 - Understand the roles of map publishers, distributors, cartographers and other contributors, both as individuals and corporate bodies **[Level 1]**
- Ability to effectively communicate with and work with other reference staff within the institution to better facilitate referrals to and from the map collection **[Level 1]**
- Knowledge of strategies to discover digital spatial data for use in GIS **[Level 2]**
- Knowledge of how to use aerial photography and indexes as well as satellite imagery **[Level 2]**

❖ Bibliographic/Cartographic Instruction

- Knowledge of classroom instructional techniques **[Level 1]**
- Development of instructional sessions **[Level 1]**
- Development of formalized curricula for use in an extended classroom situation or workshop **[Level 3]**

I.D. Technological Applications

I.D.1. Map Library Computer Resources

- ❖ Computer Lab Maintenance
 - Ability to provide basic maintenance and upkeep for computer workstation hardware and software **[Level 1]**
 - Knowledge of digital mapping (GIS) and scanning software and standards **[Level 2]**
- ❖ Spatial Data Collections
 - Development of infrastructure to store, preserve, and access spatial data **[Level 3]**

Section II. Core Competencies for GIS Librarianship

“... staff need to understand, and be proficient in, several areas. Training implies learning to use GIS software, but it is important to have a conceptual understanding and knowledge of real GIS applications in order to make training useful. Staff must know more than how to operate the GIS software; they need instruction in the issues of GIS theory, GIS databases, and GIS applications in a discipline. This instruction is necessary because the ability to add, manipulate, and analyze data in a GIS intelligently requires understanding; the inputs and processes needed to yield a meaningful result are a function of employing a GIS in an intellectually appropriate way.”

--Longstreth,1995

Geographic information systems (GIS) offer a compelling and powerful approach to exploring our world. Applicable across a vast range of disciplines and in a variety of institutional settings, GIS simultaneously serves as an information management system, analysis tool, and visualization technique. It does so by utilizing the spatial aspects of information - “the where” component of information – and by doing so allows a user to ask and answer questions in an entirely new way.

Given that GIS as a tool is applicable in such a breadth of topics and scenarios, it follows that the core competencies of the GIS Librarian are equally broad and span the theoretical, technical and social. Explanation and instruction of GIS calls for a solid theoretical understanding of spatial information and databases, as well as the vision and imagination to apply GIS to a variety of disciplines. A minimum level of proficiency in the use of specialized GIS software and the ability to locate and manipulate GIS data is necessary to respond to patron inquiries. Since GIS is inherently technology based, the GIS Librarian is required to have the technical skills to work with information technology (IT) systems directly, or possess the communication skills required to be respected by and work effectively with IT staff. Despite the fact that GIS has existed since the 1960s, it is perceived as relatively new and thus the GIS Librarian should be comfortable and capable with planning and implementing outreach and advocacy of the tool. Outreach and advocacy for the GIS Librarian may well extend beyond the boundaries of any given institution; GIS Librarians have a collaborative role (not currently being fully realized) to ensure that the principles and expertise of library science be present in the fast-evolving geoinformatics and spatial literacy movements.

II.A. Organizational Management

II.A.1. Management

- ❖ Strategic Planning
 - Ability to develop short term and long term goals for GIS services using outcome evaluation as a development tool **[Level 2]**
 - Sufficient GIS knowledge to evaluate emerging GIS technologies and integrate same into current and future services **[Level 3]**
- ❖ Project Management

- Serve as project manager (for example, building a spatial data repository, or leading a map scanning project) **[Level 2]**
- Ability to prioritize and decide what needs to be done, when, and by whom **[Level 2]**
- Ability to evaluate other GIS projects/services provided in the organization to prevent duplication of services **[Level 2]**

❖ Fiscal Management

- Ability to manage multiple GIS related budgets, such as those for hardware, software, data, staffing and supplies **[Level 2]**

❖ Fundraising

- Participation in fundraising activities **[Level 2]**
- Ability to apply for appropriate grants that would fund projects relevant to the discipline's ongoing work **[Level 3]**

II.A.2. Marketing and Outreach

❖ Communications and Event Planning

- Ability to plan and organize events such as GIS days, open house, etc. **[Level 1]**
- Presentation skills for demonstrations of GIS **[Level 1]**
- Web development skills for promotion of GIS services, GIS newsletters, etc. **[Level 1]**
- Assessment skills to identify current and potential GIS users and partners **[Level 2]**
- Collaboration skills for identifying potential internal and external partners **[Level 2]**

II.B. Resource Management

II.B.1. Data Acquisition

❖ Broad knowledge of spatial data resources

- Government resources, including local, state/provincial, national and international **[Level 1]**
- Commercial resources **[Level 1]**
 - Vendors: local, regional, global
- Research and other user-generated resources **[Level 1]**
 - Consortia such as ICPSR
 - Research projects that generate data appropriate to the organization

- Knowledge of licensing issues and acquisition details peculiar to data **[Level 2]**
- Broad knowledge of data quality, data types, data storage requirements **[Level 2]**
- Knowledge of map scanning and digitization processes for use in GIS **[Level 2]**
- Knowledge of collection assessment techniques for data collections **[Level 2]**
 - Knowledge of collection development/selection principles
 - Knowledge of use statistics collection

II.B.2. Data Discovery

- ❖ Knowledge of spatial metadata standards and issues
 - Ability to promote metadata standards and educate users regarding metadata **[Level 1]**
 - In-depth knowledge of data discovery tools and data repositories, including The Web, academic/ research community, and offline data resources **[Level 1]**
 - Ability to implement metadata standards in typical discovery tools such as the OPAC **[Level 2]**
 - GIS metadata and data portals
- ❖ Competence in data reformatting, manipulation, etc. **[Level 1]**
- ❖ Competence in building spatial data discovery tools (clearinghouse, etc.) appropriate to the organization **[Level 3]**

II.B.3. Information Technology

- ❖ Current knowledge of system requirements for GIS
 - Solid communication techniques and an understanding of the computing environment **[Level 1]**
 - Knowledge of facility requirements for software and hardware **[Level 1]**
 - Competence in continually upgrading software and hardware/technology **[Level 1]**
 - Knowledge of desktop and web technologies (client/server and networks) **[Level 1]**

II.B.4. Technological Infrastructure/Facilities

- ❖ Management
 - Competence in fiscal management and planning for needed space, hardware and related technological equipment, etc. **[Level 2]**
 - Ability to manage GIS laboratory facilities **[Level 3]**

Hardware

- Ability to perform basic hardware maintenance **[Level 1]**
- Evaluate/provide access to GIS-related tools such as GPS units **[Level 2]**
- Replacement and upgrades of hardware **[Level 2]**
- Plan server replacement and upgrades **[Level 3]**

Software

- Ability to perform initial troubleshooting for software issues **[Level 1]**
- Ability to recommend upgrades to GIS software **[Level 1]**
- Evaluate/install supporting software tools for GIS use, i.e., FME, Google Earth, unzipping utilities **[Level 1]**
- Manage GIS-related campus wide licenses such as ESRI or ERDAS **[Level 3]**

Policy

- Implement/oversee policy changes as appropriate **[Level 1]**
- Develop/maintain GIS reference materials/tutorials **[Level 1]**
- Ability to develop GIS laboratory facilities **[Level 3]**

II.B.5. Related Technologies

- Knowledge of GPS (global positioning systems) technologies **[Level 1]**
- Ability to assist patrons in downloading and utilizing GPS data in a GIS **[Level 1]**
- Knowledge of computer programming and web services related to GIS **[Level 1]**
- Creation of scripts for batch processing, data ingestion, web services, digital library creation and integration, and other geo-processing applications **[Level 3]**

II.C. Information Services

II.C.1. Reference

- Knowledge of key GIS resources for data and software support **[Level 1]**
- Knowledge of GIS tutorials & training courses specific to patron needs **[Level 1]**
- Ability to perform basic spatial and geo-processing activities **[Level 1]**
- Working knowledge of GIS products and companies, i.e., in-depth knowledge of appropriate web resources such as company web sites (e.g., ESRI, Map Info, Idrisi) **[Level 1]**
- Knowledge of GIS applications specific to an industry or discipline **[Level 2]**

II.C.2. Instruction

- Ability to develop and deliver formal introductory GIS instruction sessions and/or workshops **[Level 1]**
- Ability to conduct one-on-one consultations **[Level 1]**
- Knowledge of instruction options and ability to manage/facilitate access to commercial options for instruction (e.g., ESRI Virtual Campus course access codes) **[Level 1]**

II.C.3. Research Consultation

- Working knowledge of GIS software - preferably more than one GIS **[Level 1]**
- Broad knowledge of data resources and discovery tools **[Level 1]**
- Working knowledge regarding data organization and data manipulation **[Level 1]**
- Working knowledge of presentation techniques **[Level 1]**
- Working knowledge of reference techniques **[Level 1]**
- Working knowledge of GIS project planning and implementation **[Level 1]**

Section III. Core Competencies for Map Cataloging and Metadata Creation

“The purpose of cataloging spatial data, like that of book cataloging, is to make items available for use in an efficient, effective way. It is done by creating a surrogate for the actual item, describing that item, distinguishing it from all others, and making a single, complete record of it, in the form of a unit record, nowadays with very few exceptions in a digital catalog database. In ensuring that the resources of the collection are cataloged, several tasks are accomplished. First and most importantly, cataloging enables the user (who is, after all, the reason for our contortions) to discover that the item exists and by what collection it is held.”

--Larsgaard, 1998

The chief role and function of a map cataloging librarian is to create and maintain bibliographic access to all cartographic resources, hardcopy and digital, of the collection(s) he/she works with. Activities include descriptive cataloging, classification of items, ensuring appropriate subject access, maintaining authorized headings, and keeping abreast of ever-changing national and international standards. These national and international standards include metadata standards when required. In addition, depending on his/her local institution, activities may include participation in relevant cooperative cataloging programs such as OCLC's Enhance Program for the maps format, and one or all of the Library of Congress' Program for Cooperative Cataloging programs (NACO, SACO and/or BIBCO).

III.A. Organizational Management

❖ Administrative awareness

- Determine how the cataloging/metadata department fits into the larger organizational structure and priorities **[Level 1]**

❖ Communication and workflow issues

- Communicate with upper management and other units to best support the flow of cartographic materials from acquisitions to the public **[Level 1]**
- Develop appropriate workflow(s) **[Level 1]**
- Monitor workflow(s), and adapt as necessary workflow changes **[Level 1]**
- Communicate with upper management, other units, and head map librarian or curator to apply priorities and best support the flow of cartographic materials

❖ Training and documentation

- Support unit procedures by training others where needed and appropriate **[Level 1]**
- Create, review and update local documents for cartographic materials cataloging policies and procedures **[Level 1]**

III.B. Resource Management

- ❖ Cataloging standards
 - Stay abreast of national/international standards and apply them consistently **[Level 1]**
 - Develop local practices and be able to adjust to locally-needed changes or situations **[Level 2]**
- ❖ Cataloging Resources
 - Learn, understand, and appropriately apply cataloging rules, rule interpretations and subject analysis techniques **[Level 1]**
 - Identify and use appropriate hardcopy resources for cartographic materials cataloging in all formats **[Level 1]**
 - Identify and use appropriate online resources for cartographic materials cataloging in all formats **[Level 1]**
 - Apply classification schedules/schemes and create call numbers **[Level 1]**
 - Apply accurate subject headings using LCSH and/or other thesauri
 - Create, where needed, appropriate local cartographic materials cataloging guides, project-level documents, etc. to document local practices **[Level 2]**
- ❖ Knowledge of the creation and distribution systems for cartographic resources
 - Understand map production and reproduction processes and types **[Level 1]**
 - Understand the roles of map publishers, distributors, cartographers and other contributors, both as individuals and corporate bodies **[Level 1]**
- ❖ Cataloging with existing records (“copy cataloging”)
 - Search for and identify matching existing bibliographic record(s) from external databases, download/import record(s), edit record(s) for local use **[Level 1]**
 - Search for and identify matching existing bibliographic records from internal databases and edit/update for completeness and accuracy **[Level 1]**
- ❖ Bibliographic record creation (“original cataloging”)
 - Understand theory and practice of descriptive cataloging as it applies to cartographic materials **[Level 1]**
 - Correctly identify the title proper when more than one title exists or when a single title can be read in multiple ways **[Level 1]**
 - Correctly provide for second or alternative titles in the record **[Level 1]**
 - Understand scale and how it functions, know the different methods of communicating scale and calculating scale when necessary, and supply scale statements in the correct format(s) **[Level 1]**

- Understand map projections and correctly apply projection information when needed **[Level 1]**
- Understand the coordinate system and apply correct latitude/longitude values and formats when given on the map **[Level 1]**
- Understand the coordinate system and apply correct latitude/longitude values and formats when supplying coordinates **[Level 2]**
- Interpret and then provide correct information about the physical characteristics of cartographic items **[Level 1]**
- Know and apply the correct techniques for measuring and correctly provide measurements in the bibliographic record **[Level 1]**
- Determine the correct form of heading for personal and corporate names and/or uniform titles and create correct forms of headings when needed **[Level 1]**
- Train for, and actively participate in, Cooperative Cataloging Programs as a means of "contributing to the greater good" and maintaining one's skills **[Level 3]**

❖ Metadata creation

- Understand the theory and practice of metadata schemes (chiefly U.S. Federal Geographic Data Committee (FGDC) and Dublin Core (DC)) **[Level 2]**
- Create GIS and other metadata **[Level 2]**
- Provide metadata for institutional repositories and digital libraries **[Level 2]**

III.C. Information Services

❖ Internal cataloging/metadata information needs

- Measure quality and quantity of cataloging output **[Level 1]**
- Produce reports and recommendations to support organizational needs **[Level 1]**

III.D. Technological Applications

❖ Cataloging-specific technologies

- Learn and apply supportive technologies including macros and similar time-saving techniques, local integrated library system (ILS) cataloging features and functions, and other special technologies as needed **[Level 1]**
- Participate in the selection and testing of new ILS **[Level 1]**

❖ Metadata-specific technologies

- Stay abreast of metadata applications and uses **[Level 1]**
- Understand the relationship of interoperability or crosswalks between metadata standards **[Level 2]**

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Web Pages of Interest

General Sites:

- Map and Geography Round Table (MAGERT) of the American Library Association / webmaster: Colleen Cahill. <http://www.ala.org/ala/magert/magert.htm>
- Western Association of Map Libraries' Map Librarian's Toolbox / Linda Zellmer. <http://www.waml.org/maptools.html>
- MAGERT Electronic Publication No. 1: Helpful Hints for Small Map Collections. <http://www.ala.org/ala/magert/publicationsab/larsg.htm>
- USGS. Maps, Imagery, and Publications <http://www.usgs.gov/pubprod/>
- Federal Depository Library Manual. http://www.access.gpo.gov/su_docs/fdlp/pubs/fdlm/
- A Guide to the Cartographic Products of the Federal Depository Library Program (FDLP) <http://www.ala.org/ala/magert/publicationsab/fdlpguide.cfm>.
- Map Imaging Service Providers. <http://www.ala.org/ala/magert/publicationsab/service.cfm>.
- Helpful Hints for the Paperless Map Librarian. <http://www.ala.org/ala/magert/publicationsab/allen.cfm>.

Map Cataloging Sites:

- Cataloguer's Toolbox <http://staff.library.mun.ca/staff/toolbox/index.html>
- Cataloging Tools by David Bertucca, 2003 http://ublib.buffalo.edu/libraries/asl/maps/cat/map_cat_tools.html Initially for map cataloging workshops but includes a comprehensive list of tools, reference sites, webpages, and a bibliography useful for map reference and collection building.
- Map Cataloging Manual / content by the Library of Congress; hosted by The Library Corporation. [Also in LC's *Catalogers Desktop*] <http://www.itsmarc.com/crs/map0001.htm>
- Mathematical data for bibliographic descriptions of cartographic material and spatial data / Jan Smits. <http://www.kb.nl/skd/mathemat.html>.
- Library of Congress, Program for Cooperative Cataloging. "Cartographic Materials: BIBCO Core Record Standards." <http://www.loc.gov/catdir/pcc/bibco/coremaps.html>
- Oregon State University Map Cataloging and Reference Tools / Terry Reese. <http://oregonstate.edu/~reese/html/tools.html>.
- Rare Books and Manuscripts Section. Bibliographic Standards Committee. Directory of Web Resources for the Rare Materials Cataloger. <http://lib.nmsu.edu/rarecat/>

Official Online Gazetteers:

- United States Geological Survey Geographic Names Information Service (the primary source for U.S. and Antarctic place names) <http://geonames.usgs.gov/pls/gnispublic>
- National Imagery and Mapping Agency GEOnet Names Server (the primary source for international place names) <http://earth-info.nga.mil/gns/html/index.html>

GIS and Related Sites:

- Current Literature on Geographic Information Systems and Libraries, provided by McMaster University. http://library.mcmaster.ca/maps/gis_libr.htm.
- Metadata Primer for Map Librarians. <http://www.ala.org/ala/magert/publicationsab/metaprime.cfm>.
- GIS.com : the Guide to Geographic Information Systems. www.gis.com
- USGS. Geographic Information Systems (poster). http://egsc.usgs.gov/isb/pubs/gis_poster/

Map and Geospatial Professional Organizations

- American Library Association, Map and Geography Round Table (MAGERT) <http://www.ala.org/ala/magert/magert.cfm>
- Association of Canadian Map Libraries and Archives (ACMLA) <http://www.ssc.uwo.ca/assoc/acml/acmla.html>
- North American Cartographic Information Society (NACIS) <http://www.nacis.org/>
- North East Map Organization (NEMO) <http://ublib.buffalo.edu/libraries/asl/maps/nemo.html>
- Special Libraries Association, Geography & Map Section (SLA G&M) <http://units.sla.org/division/dgm/index.htm>
- Western Association of Map Libraries (WAML) <http://www.waml.org/index.html>
- WAML Map Library Organizations <http://www.waml.org/maporg.html>