

**National Spatial Data Infrastructure Category 1 Proposal:
GIS Metadata for Environmental Science and Management on the Colorado
Plateau**

**Agreement Number: 03HQAG0166
Final Report**

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OVERVIEW

The Merriam-Powell Center for Environmental Research made a commitment to produce the following five deliverables for USGS Metadata Phase I funding:

- 1) Obtain professional training in metadata collection for Merriam-Powell Center for Environmental Research (MPCER) staff.
- 2) Provide training to three additional Merriam-Powell staff.
- 3) Create metadata for 30 existing MPCER environmental datasets.
- 4) Provide web-based resources and an in-person workshop to train additional researchers, students, and agency personnel in metadata collection.
(Approximately 12 people)
- 5) Serve as a metadata node for the metadata we create.
- 6) Assurance of long-term project support

Metadata Training

Through the CAP I funding award we were able to send Jill Rundall and Paul Heinrich to complimentary metadata training events. These events provided training and training techniques in the Content Standard for Digital Geospatial Metadata (CSDGM) to produce Federal Geographic Data Committee (FGCD) compliant spatial metadata with the Biological Data Profile (BDP). Jill Rundall, GIS Research Specialist, attended a two day introductory metadata creation training workshop February 2004 in Arlington, VA. This workshop, hosted by NatureServe and National Biological Information Infrastructure (NBII), provided Jill with a better understanding of metadata structure, semantics and tools to implement metadata at MPCER. Paul Heinrich, IT Specialist, attended the Train the Trainer Workshop, August 2004 in Denver, CO. This workshop, hosted by the Federal Geographic Data Committee, provided Paul training tips, techniques and tools to apply in metadata training. Together these are a strong basis for our metadata development and training site.

MPCER Metadata Workshops

The training and resources we obtained have allowed us to lead metadata training for the staff of Merriam-Powell Center for Environmental Research (MPCER). We conducted one full day workshop and two mini-metadata training workshops. To accommodate the

range of attendees' expertise and interest, we covered broad and detailed areas of metadata. Topics covered included defining metadata, benefits of metadata for managers and data users, the mandatory, optional and mandatory if applicable elements of CDSGM metadata, using the 'Greenbook' and color coded graphical representation of elements, transition to ISO and hands-on metadata creation and validation.

Training resulted in five individuals trained to create metadata integrating several software packages. Attendees were introduced to metadata creation, validation, management and publishing through ESRI's ArcCatalog, ArcIMS Metadata Explorer, Intergraph's Spatial Metadata Management System, and Metadata Parser (MP).

We found flexibility in the training environment very helpful in accommodating time constraints and varying levels of expertise. While our goal was to provide as much technical metadata training as possible, we were also aware that simply exposing research and faculty to the ideas of metadata development and integration in project management is a key component to advancing the metadata movement.

Colorado Plateau Metadata Web Resources

The [CP Metadata Resources](#) website provides information for both managers and staff about the costs and benefits of metadata development. It will focus on metadata integration in projects and agency-level spatial data efforts. The website provides a forum for synthesizing strategies and best practices discussed in the metadata training workshop, researched data and personal knowledge.

Development of Metadata for Environmental Research

To assist in organization-level metadata development MPCER developed an organizational metadata template including ISO recommendations for keyword fields. After metadata training, the MPCER staff produced thirty new FGDC CSDGM metadata records. Current metadata developed include the datasets outlined in the table (Appendix 1) and are available on our CP Metadata Clearinghouse (<http://mprlsrvr1.bio.nau.edu/metadataexplorer>).

Colorado Plateau Metadata Clearinghouse Node

We have created a Colorado Plateau metadata clearinghouse to aid in receiving and serving metadata for GIS data <http://mprlsrvr1.bio.nau.edu/metadataexplorer>. The CP Metadata Clearinghouse is primarily intended to house environmental spatial data related to the Colorado Plateau and the larger southwestern ecoregion.

The CP Metadata Clearinghouse utilizes ESRI's Metadata Explorer, ArcIMS 9, ArcSDE 9 and MicroSoft SQL Server 2000. It can be accessed either through the WWW, by Z39.50 clients through the FGDC Clearinghouse Registry, or by direct connection to the ArcIMS metadata service using ArcCatalog. All publishing to the site is through ArcCatalog and requires a valid password. We have completed testing of the CP Metadata Clearinghouse and are populating it with Merriam-Powell Center for Environmental Research metadata. Currently, we have placed our initial set of metadata sets on the site, but will continue populating the site with additional internal and acquired

data sets. We have registered the clearinghouse with FGDC and begun to solicit contributions from other entities.

Ensuring Long-Term Support for Metadata

We will continue our metadata work beyond the performance period through several processes. First, we are establishing the Geospatial Research and Information Laboratory (GRAIL) at NAU that will have a strong GIS metadata creation emphasis. In conjunction with this effort we have created a GIS working group that will be housed in the GRAIL. The GIS working group will be responsible for obtaining the necessary resources for metadata training and development. We will serve as a metadata node for the metadata we create and for future environmental data sets from the Colorado Plateau. Second, we will support metadata activities through a partnership with the USFS. This three-year partnership has resulted in the development of the NAU Environmental Research Database, which will provide support for metadata creation for research projects conducted on USFS lands. Third, we have received funding for DireNET. This project will coordinate research efforts on effects of drought on pinyon-juniper woodlands. An integral part of coordination will be assisting agencies and researchers to provide CDGSM metadata. Fourth, we have successfully received funding from USGS for a Metadata Phase II project. This funding will allow us to conduct numerous workshops and focus on Native American involvement.

In collaboration with Julie Pryor-Magee and Leanne Hansen at the USGS Southwest Information Node (SWIN) we will extend our ongoing outreach efforts to establish collaborations with other institutions developing environmental GIS data.

Measurable Project Results:

The number of individuals capable of creating metadata

5

The number of metadata files or datasets documented

32

Describe metadata service

Indicate how metadata is served or posted

Metadata is served through an ArcIMS Metadata Explorer on the CP Metadata Clearinghouse

Indicate how many metadata entries were created

31

Indicate if you need assistance in providing for metadata service

No

Feedback on Cooperative Agreements Program:

What are the program strengths and weaknesses? Where does the program make a difference? Was the assistance you received sufficient or effective?

Strengths of the CAP program are the contact and support from the funding agency with the recipients. We found the program manager and metadata manager responsive to our questions and concerns during the grant.

Are there program management concerns that need to be addressed? Time frame?

Several of the CAP Categories require collaborations. Increased time between CAP request for proposals and proposal due date would help collaborations and cooperative grant writing efforts.

If you were to do this again, what would you do differently?

Metadata workshops are most effective if they can address people of similar expertise levels. Individual workshops aimed specifically at managers versus more technical hands-on workshops could be conducted separately.

More time could be allotted to learning the metadata software packages that are non-proprietary. These will be in greater demand with smaller environmental and university laboratories with limited budgets.

Additional time would be allotted for documenting legacy spatial data with FGDC metadata.

Quarterly updates via email to the Metadata Ad Hoc Work Group and metadata trainers from CAP and / or Metadata manager.

