

# **THE MONTANA SPATIAL DATA INFRASTRUCTURE (MSDI)**

## **FY13 WORKPLAN**

*Produced by the Montana State Library in conjunction with the MSDI Theme Stewards and Leads*

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## **ACRONYMS USED IN THIS DOCUMENT**

1. BLM – U. S. Department of Interior’s Bureau of Land Management
2. BMSC – Base Map Service Center
3. GCDB – BLM’s Geographic Coordinate Data Base
4. MAGIP - Montana Association of Geographic Information Professionals
5. MBMG – Montana Bureau of Mines and Geology
6. MTNHP – Montana Natural Heritage Program
7. MSDI – Montana Spatial Data Infrastructure
8. MSL – Montana State Library
9. NRCS – U. S. Department of Agriculture’s Natural Resource Conservation Service
10. NRIS - Natural Resource Information System of MSL
11. USGS – U.S. Department of Interior’s United States Geologic Survey

## MSDI DATA WORK PLAN

The Montana State Library (MSL), working with Montana Spatial Data Infrastructure (MSDI) theme stewards and theme leads, has compiled maintenance plans and enhancement priorities for each MSDI theme. While there are differences in the nature of data content associated with each theme, there also are many similarities. In order to understand what types of tasks comprise MSDI stewardship, we made three broad categorizations of MSDI tasks:

1. MSDI education, outreach and coordination
2. MSDI maintenance
3. MSDI enhancement, research and development

For each theme an Excel worksheet captured the tasks and estimated hours to accomplish a base work level for categories one and two that would keep each theme at today's levels in terms of content and access. We also estimated hours to complete projects to improve content and access. Each theme worksheet was aggregated into a master worksheet to estimate the total MSDI workload for FY13. Each individual theme's worksheet is not included in this plan however examples are used throughout to explain the process used to compile this plan.

### MSDI EDUCATION, OUTREACH AND COORDINATION

MSDI education, outreach and coordination are required for each and every theme and goes beyond what a state GIS coordinator can accomplish. Each theme steward/lead must conduct some basic coordination and outreach tasks to meet user needs. Those basic functions or common outreach include things like work plan development, user outreach, technical support to users, and updating a theme's web presence. Additionally a theme might have some specific outreach identified. For example Administrative Boundaries identified local and tribal visits, coordination with the US Census Bureau's Boundary Annexation Program, and instruction on using the Montana Automated Boundary Application (MABA), as three areas needing special attention.

#### *Example of Administrative Boundaries Education, Outreach and Coordination Estimates:*

| TASK   | HOURS      |
|--|------------|
| <b>MSDI Education, Outreach and Coordination</b> | <b>300</b> |
| ANNUAL WORKPLAN DEVELOPMENT                      | 16         |
| MONTANA GIS USER OUTREACH                        | 16         |
| TECHNICAL SUPPORT                                | 24         |
| UPDATE WEB PRESENCE                              | 4          |
| SUB-COMMON OUTREACH                              | 60         |
| TRIBAL & LOCAL GOVERNMENT VISITS                 | 80         |
| BAS PROGRAM                                      | 40         |
| MABA PROMOTION & EDUCATION                       | 120        |
| SUB-THEME SPECIFIC OUTREACH                      | 240        |

In addition to theme specific education, outreach and coordination MSDI as a whole requires similar coordination from an updated web presence to consistent metadata and archival procedures. Some activities, for example an MSDI map gallery using ArcGIS Online, can be research oriented with the primary intent to explore new ways to expose MSDI. Note that some new projects, including a web update and some marketing efforts are included in this base outreach and are described under project priorities.

**Example of General MSDI Education, Outreach and Coordination Estimates for FY13:**

| <b>TASK</b>   | <b>HOURS</b> |
|---|--------------|
| MACO ANNUAL CONFERENCE                                | 32           |
| LEAGUE OF CITIES & TOWNS ANNUAL CONFERENCE            | 32           |
| LEGISLATURE/2013 LEGISLATIVE SESSION OUTREACH         | 40           |
| METADATA AND ARCHIVAL COORDINATION                    | 320          |
| MSDI MARKETING  | 40           |
| GENERAL MSDI OUTREACH (as a whole vs. theme specific) | 40           |
| MAP GALLERY - MONTANA GEOSPATIAL PLATFORM R&D         | 120          |
| UPDATE WEB PRESENCE                                   | 120          |
|   |              |
| <b>MSDI - GENERAL OUTREACH TOTALS</b>                 | <b>744</b>   |

The total estimated FY13 time for MSDI education, outreach and coordination, which includes MSDI general, theme general and theme specific, is **4990** hours.

**MSDI THEME MAINTENANCE**

MSDI theme maintenance consists of the day to day tasks a theme leads need to accomplish to keep the theme at present levels of accuracy, completeness and currency. Maintenance efforts are therefore subject to a theme’s maturity as the authoritative source of statewide data and vary significantly. Presently there is no definition of a minimum level of completeness in order to be classified as MSDI. This topic is more fully discussed in the FY2013 Project Priorities section of this document however for FY13 MSL has set the following goal:

MSL, with cooperation of MSDI Theme Stewards and Theme Leads, will establish a base level of completeness and availability for all MSDI themes. Data distribution, including metadata, will be consolidated at one primary access point.

Even if all themes were at a base level of completeness, maintenance levels would still vary based on the nature of the data. It is only logical that maintenance of the cadastral layer requires significantly

more work than that of imagery. Theme stewards and leads attempted to break out common maintenance tasks into the following categories:

1. Data maintenance & updates (actual manipulating existing features and adding new ones)
2. Database maintenance (compressions, reconciles and posts, versioning, schema changes, etc.)
3. Application administration and maintenance
4. Web services administration
5. Metadata updates
6. Data archival

An examination of maintenance tasks associated with the Cadastral and Imagery themes characterize the difference in required estimated maintenance between themes:

| TASK  | HOURS      |
|---|------------|
| <b>Cadastral Data Maintenance</b>                 | <b>744</b> |
| DATA MAINTENANCE & UPDATES                        | 320        |
| DATABASE MAINTENANCE                              | 160        |
| CADASTRAL APPLICATIONADMINISTRATION & MAINTENANCE | 160        |
| WEB SERVICES ADMINISTRATION                       | 80         |
| METADATA UPDATE                                   | 8          |
| DATA ARCHIVAL                                     | 16         |

| TASK  | HOURS     |
|---|-----------|
| <b>Imagery Data Maintenance (NAIP 2011)</b> | <b>52</b> |
| DATA MAINTENANCE & UPDATES                  | 0         |
| DATABASE MAINTENANCE                        | 0         |
| APPLICATION ADMINISTRATION & MAINTENANCE    | 0         |
| WEB SERVICES ADMINISTRATION                 | 40        |
| METADATA UPDATE                             | 4         |
| DATA ARCHIVAL                               | 8         |

Given that the NAIP 2011 photography has already been loaded and exposed, there is very little to do regarding maintenance or distribution of this theme. Cadastral data on the other hand requires considerably more hands on attention.

Based on estimates from MSDI theme stewards and leads, MSL estimates the total MSDI maintenance work load to be **7918** hours.

## **MSDI WORK PLAN – AVAILABLE RESOURCES**

Before attempting to prioritize FY13 projects that would enhance MSDI efforts beyond the status quo of basic maintenance and coordination efforts, some attempt must be made to quantify resources that can be applied towards MSDI enhancement projects. The administrative consolidation of the BMSC into MSL's Digital Library Division makes it easier to quantify available MSDI resources however basic MSDI maintenance would be impossible without additional resources beyond MSL staff. Estimates from the two preceding sections for base levels of coordination and maintenance total 12,908 hours. If staff were, in private sector terms 100% billable for the typical 2080 hour work year it would take a little over six FTE to accomplish base level stewardship for MSDI. Of course employees are not 100% billable, so with billable levels figured at 80% or 1664 hours per year, we need the equivalent of almost 8 FTE for base level MSDI stewardship.

To realistically compute MSL staff hours available for MSDI stewardship other factors need to be taken under consideration as well. The MTNHP, a program of the State Library operated by the University of Montana, provides stewardship for Land Cover, and (with MT DEQ) Wetlands. Education, Outreach and Coordination hours for federally stewarded themes (Elevation, Hydrologic Units and Soils) are covered by existing federal resources provided by NRCS and USGS. The MBMG provides stewardship for the Geology theme. After factoring in these additional resources we estimate that the Administrative Boundaries, Cadastral, Geodetic Control, Geographic Names, Hydrography, Imagery, Structures/Addressing and Transportation as the themes will require approximately 8,500 hours of base stewardship. Coincidentally (and conveniently) MSL is the steward and provides theme leadership for all these themes. The remaining piece of the equation is to estimate total MSL FY13 available resources, apply those to base stewardship requirements, and estimate available MSL resources for new projects in FY13.

After analyzing FY12 resource allocations MSL estimates it will expend approximately 9500 hours on MSDI stewardship. If based on FY12 resource expenditures we would estimate approximately 1000 hours in FY 13 to spend on MSDI enhancement beyond base stewardship levels. However, the administrative merger of the BMSC into MSL has resulted in both efficiencies as well as access to additional resources. Existing NRIS staff, the MSL web programmer, the MSL Marketing Coordinator and Administrative Assistants can all be counted on to provide additional MSDI resources. After careful assessment MSL believes that we can expect approximately 1500 hours of staff time to devote to the prioritized projects summarized in the next section.

## **FY 2013 PROJECT PRIORITIES**

During the planning process MSDI theme stewards and leads assembled a list of potential MSDI projects that could be undertaken in FY13 (Appendix A). MSL also solicited MAGIP member input for additional potential projects. Based on the MAGIP Technical Committee's evaluation (Appendix B) of MSDI availability status some projects proposed by the stewards and leads correlate nicely. For example for statewide accessibility soils and geology databases will require some work. Some additional map

services for Geographic Names and Hydrography will need to be created. MSL also based project prioritization for theme enhancement projects that would benefit multiple MSDI themes. For example aligning bridges in the transportation theme with photo-identifiable bridges in 2011 NAIP photography makes for more pleasing cartography when using both frameworks together. MSL believes resources are available to successfully complete the following prioritized projects in FY13.

**1. Reengineer the MSDI Web Presence**

Currently through existing BMSC and NRIS web pages, there are several ways to access MSDI data and services. The MAGIP Technical Committee believes that data users would benefit from a consolidated approach. This fits well into the MSL plan to consolidate geographic information, both data holdings as well as information about data, services, and GIS coordination in a more cohesive manner. MSL estimates the level of effort required to reengineer the MSDI portion at approximately 120 hours and is built in to base level MSDI maintenance. Implementation will be accomplished under base MSDI maintenance for most themes.

**2. MSDI Marketing**

In the base education outreach and coordination hours we allotted approximately 140 hours for developing MSDI marketing materials and showcasing them at events such as the annual MACO League of Cities and Towns conferences as well as to the 2013 Legislature, MAGIP events and GIS day.

**3. Cadastral and Administrative Boundary Theme adjustments to a new GCDB**

There was a good deal of internal discussion of whether this shouldn't be included with base maintenance. Normal y small adjustments would be, however the FY13 adjustment will be such a major time consumer we list it as an enhancement project. The BLM collected points in almost 300 townships in 2010 and 2011 using ARRA funds. This will result in a major GCDB readjustment that will be known as CadNSDI 2.0. The taxparcel feature class in the cadastral framework, the public lands feature class supplied to MTNHP for the land stewardship databases, conservation easements, along with all state wide boundary themes will all require adjustment. We are estimating a third of the state will be impacted and will take approximately 700 hours to accomplish.

**4. Soils – Build Statewide Standard Interpretations and Services**

Probably the most common statewide soils map in use today is not MSDI framework but the ArcGIS Online soil survey map

<http://blogs.esri.com/Support/blogs/arcgisonline/archive/2010/12/14/arcgis-online-soil-survey-map-available.aspx>

We believe a cooperative effort between MSL and NRCS soil scientists, developing sophisticated database queries that standardized results between disparate soil surveys, could produce other statewide soils interpretations. The data could be distributed, and services built, so soils data

could be accessed in the same manner as other MSDI Frameworks. The level of effort to accomplish this is 400 hours.

**5. Hydrography – Build Custom Web Services and Develop a Plan for Long Term Maintenance**

NHD, in its “raw” form can be cumbersome to use for cartographic purposes. One or more interpretations of NHD will be developed and published as web services. Additionally MSL, along with NHD Stakeholders, will develop a plan for long term maintenance of NHD. The level of effort to accomplish both projects is estimated at 180 hours.

**6. Geology – Statewide Geodatabase and Services**

MBMG will release a statewide seamless 1:500,000 geology layer. Map services will be built internally. MSL will link to MBMG services and data through a unified MSDI web presence. Work will start on moving the 1:100,000 maps to an integrated (not seamless) geodatabase format however that product is not expected to be completed in FY13. A 1:100,000 scale layer will include some 1:250,000 scale data till these areas are mapped at the 1:100,000 scale by MBMG staff.

**7. Geographic Names**

All the tasks listed in Appendix A will be completed. Level of effort is anticipated to be approximately 300 hours. Additionally, working under a USGS grant MSL will review the locations of 24,000 physiographic features in the GNIS and make corrections where necessary. MSL will also remove some duplicate, incorrectly classified and un-named features. Some of the data transfer issues listed in Appendix A should be resolved as MSL meets the data delivery requirements of the grant.

**8. Transportation – Vertically Integrate Bridges to NHD and NAIP 2011**

The bridge feature class will be aligned to a best fit with NHD and NAIP. Level of effort is anticipated to be 120 hours.

**9. Land Cover**

MTNHP will embark on an effort to update forest classifications to reflect insect and disease loss, and revise, as necessary, the classification of permanent snow and ice cover classes.

**10. Wetlands**

We estimate that resources are available to ensure approximately 30 new wetland quadrangles could be completed by MTNHP.

**11. Elevation – Scope and Pilot a Lidar Catalogue**

There are at least fifty known Lidar projects that have taken place over Montana. Several additional projects are being proposed for 2012. The raw data, data products such as DEM and

DSM, as well as the metadata that accompany the projects are all difficult to discover. This project will bring together stakeholders to research the requirements to establish a Lidar Catalogue/Clearinghouse for Montana. This scoping effort is estimated to take 80 hours.

Should additional staff time and/or resources be available after these projects are completed the MSDI theme stewards and leads will solicit input and discuss other priority projects that can be undertaken in FY13.

## APPENDIX A – FY13 STEWARD/LEAD PROPOSED PROJECTS

| Theme            | FY13 Proposed Project  | Hours |
|------------------|--|-------|
| General MSDI     |  |       |
|                  | MEDIUM SCALE ESRI COMMUNITY MAPS PROGRAM (ALL)   | 160   |
|                  | PROMOTION OF ESRI COMMUNITY BASEMAP PROGRAM (ALL)  | 80    |
|                  | MSDI WEB PRESENCE - REENGINEER   | 160   |
|                  | MAP GALLERY - MT GEOSPATIAL PLATFORM USING ARCGIS ONLINE                                     | 160   |
|                  | THEME WORKFLOW DOCUMENTATION/PUBLICATION   | 160   |
| Admin Boundaries |  |       |
|                  | WATER & SEWER DISTRICTS - 10 MORE COUNTIES   | 160   |
|                  | ADJUST BND THEMES TO NEW GCDB  | 200   |
|                  | STATE/BIA RESERVATION BND AGREEMENT  | 40    |
| Cadastral        |  |       |
|                  | ADJUST CADASTRAL & PUBLIC LANDS TO NEW GCDB  | 500   |
|                  | MOVE TO NEW EDITING ENVIRONMENT  | 200   |
|                  | DEVELOP SQL VIEWS FOR CAMA   | 120   |
| Elevation        |  |       |
|                  | LIDAR PROJECTS - MSL CATALOG & POST PROCESS -48 OLD,3 NEW                                    | 600   |
| Geographic Names |  |       |
|                  | EVALUATE DATA MODELS, DECIDE ON DATA AND DISTRIBUTION MODELS, DETERMINE HOW TO APPLY UPDATES | 90    |
|                  | CREATE WEB SERVICE   | 20    |
|                  | SUBMIT FWP CORRECTIONS TO USGS   | 40    |
|                  | CREATE FRAMEWORK AND DISTRIBUTION DATA & SERVICES  | 40    |
|                  | RESEARCH WFS-G AND DETERMINE IF WE CAN USE IT  | 80    |
|                  | IF WFS-G IS USABLE ESTABLISH SERVICE AND/OR CLIENT   | 40    |
| Geology          |  |       |
|                  | DEVELOPMENT & PRODUCTION OF NEW DATA   | 1000  |
|                  | DEVELOP GEOLOGY DATA SERVICE AND MAINTAIN FOR FIRST YEAR                                     | 500   |
| Hydrography      |  |       |
|                  | RESEACH AUTOMATED UPDATE/MT STABLE VERSION   | 160   |
|                  | BUILD CUSTOM WEB SERVICES  | 80    |
|                  | PILOT/TEST WEB EDITING TOOL  | 20    |
|                  | NHD SCRUB INITIAL - ALIGHN NHD/NWI AND OTHER MSDI  | 1000  |
|                  | INDEX POINTS OF DIVERSION  | 40    |
|                  | NATIONAL INVENTORY OF DAMS   | 40    |
| Land Cover       |  |       |

|                |  |       |
|----------------|--|-------|
|                | REVISE AS NECESSARY THE CLASSIFICATION OF PERMANENT SNOW AND ICE COVER CLASSES | 400   |
|                | UPDATE FOREST CLASSIFICATIONS TO REFLECT INSECT AND DISEASE LOSS               | 300   |
| Imagery        |  |       |
|                | STATE IMAGERY TO ESRI COMMUNITY BASE MAPS                                      | 40    |
| Soils          |  |       |
|                | STANDARD INTERPRETATIONS - SERVICES  | 400   |
| Structures     |  |       |
|                | NEW DATA AND ETL ROUTINES TO FRAMEWORK   | 640   |
| Transportation |  |       |
|                | ALIGN BRIDGES USING HYDRO AND NAIP   | 160   |
| Wetlands       |  |       |
|                | NEW WETLANDS QUAD MAPPING 25 QUADS (JAN - JUNE 2013) mlia                      | 1000  |
|                | PARTNER CONTRACTED MAPPING - 300 QUADS   | 12000 |

## APPENDIX B – MAGIP EVALUATION OF MSDI AVAILABILITY

| Layer Name                 | Opensource format | Current ArcGIS Version | Current ArcGIS Version - 1 | Metadata | Statewide Format |
|----------------------------|-------------------|------------------------|----------------------------|----------|------------------|
| Boundaries_Counties        | Yes               | No                     | No                         | Yes      | Yes              |
| Boundaries_State           | No                | No                     | No                         | Yes      | Yes              |
| Boundaries_FireDistricts   | Yes               | No                     | Yes                        | Yes      | Yes              |
| Boundaries_Reservations    | Yes               | No                     | No                         | Yes      | Yes              |
| Boundaries_Cities&Towns    | Yes               | No                     | Yes                        | Yes      | Yes              |
| Boundaries_TIFD            | Yes               | No                     | Yes                        | Yes      | Yes              |
| Boundaries_SchoolDistricts | Yes               | Yes                    | No                         | Yes      | Yes              |
| Cadastral                  | Yes               | No                     | Yes                        | Yes      | Yes              |
| Elevation                  | NA                | NA                     | NA                         | Yes      | No               |
| Geodetic Control           | No                | No                     | No                         | Yes      | Yes              |
| Geographic Names           | Yes               | No                     | No                         | Yes      | Yes              |
| Geology                    | No                | No                     | No                         | No       | No               |
| Hydrography                | No                | No                     | No                         | Yes      | Yes              |
| Hydrologic Units           | No                | No                     | No                         | Yes      | Yes              |
| Land Use/Land Cover        | NA                | No                     | Yes                        | Yes      | Yes              |
| Orthoimagery               | NA                | NA                     | NA                         | Yes      | No               |
| Soils                      | Yes               | No                     | No                         | No       | No               |
| Structures                 | No                | Yes                    | No                         | Yes      | Yes              |
| Transportation             | No                | Yes                    | Yes                        | No       | Yes              |
| Wetlands                   | Yes               | No                     | No                         | Yes      | Yes              |

| Layer Name                 | Service Available? | Service Metadata Available? | Defined Symbology? | Symbology Available w/Download? |
|----------------------------|--------------------|-----------------------------|--------------------|---------------------------------|
| Boundaries_Counties        | Yes                | No                          | Yes                | No                              |
| Boundaries_State           | Yes                | No                          | Yes                | No                              |
| Boundaries_FireDistricts   | Yes                | No                          | Yes                | No                              |
| Boundaries_Reservations    | Yes                | No                          | Yes                | No                              |
| Boundaries_Cities&Towns    | Yes                | No                          | Yes                | No                              |
| Boundaries_TIFD            | Yes                | No                          | Yes                | No                              |
| Boundaries_SchoolDistricts | Yes                | No                          | Yes                | No                              |
| Cadastral                  | Yes                | No                          | Yes                | No                              |
| Elevation                  | No                 | No                          | NA                 | No                              |
| Geodetic Control           | Yes                | No                          | Yes                | No                              |
| Geographic Names           | No                 | No                          | No                 | No                              |

|                     |     |     |     |     |
|---------------------|-----|-----|-----|-----|
| Geology             | No  | No  | No  | No  |
| Hydrography         | Yes | No  | Yes | No  |
| Hydrologic Units    | Yes | No  | Yes | No  |
| Land Use/Land Cover | Yes | No  | Yes | Yes |
| Orthoimagery        | Yes | No  | Yes | No  |
| Soils               | No  | No  | Yes | No  |
| Structures          | Yes | Yes | Yes | No  |
| Transportation      | Yes | No  | Yes | No  |
| Wetlands            | No  | No  | No  | No  |