

Digital Library Work Report August and September 2016

Prepared for the October 12, 2016 MSL Commission meeting
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Goal One—Content

1. MSL acquires and manages relevant quality content that meets the needs of Montana Library users.

The information management team will be working on several projects that will add to or otherwise enhance the existing MSL Collection.

1.1. Land Information staff have already begun a project to gather information needed to develop a revised version of the state boundary in Northeast Montana and correct townships currently impacted by the misrepresentation of this boundary. The final product of this process will be an updated CadNSDI dataset that includes these corrected features and that is scheduled for delivery in early 2016.

(Originally reported December 2015) In late September four GIS analysts visited three counties in Northeast Montana (Daniels, Sheridan, Roosevelt). To gather corner recordation survey documents. As a result of this trip and a July visit to Wibaux and Richland County, we are in the process of creating over 1,400 new ground control points that will be used to adjust approximately 200 townships in NE Montana.

(Originally reported February 2016) After completing the ~1,400 new ground control points based on the corner recordation survey documents, additional aerial imagery-based pseudo-control was added as needed for the adjustment process. QA/QC of the points is just finishing, with the actual township adjustments to follow. The process had been challenging due to software issues, but we have been working through that with both the software company and our project partner. We are in the process of extending the project end date from January 31, 2016 to March 31, 2016.

(Originally reported April 2016) From the work done in January, staff was able to perform an adjustment in early February making an extension to the project end date unnecessary. Project tasks outlined in the contract with Fairview Industries have been

completed. The Land Information group within the Digital Library is currently evaluating the success of this project to determine how to move forward with future CadNSDI adjustment projects and how to best leverage the ESRI parcel fabric tools.

(Originally reported June 2016) While the Northeast Montana CadNSDI adjustment was completed in February/March, as part of MSL's stewardship of the CadNSDI, the digital representation of the Public Land Survey System in Montana, MSL staff were invited to participate in a training on the Parcel Fabric with the BLM in Wyoming. Three members of the land information team will be in Cheyenne during the week of May 23-27 for this training opportunity. In addition to receiving training, MSL staff will meet with Wyoming BLM staff about a possible Montana/Wyoming CadNSDI border adjustment.

(Originally reported August 2016) Though not related to the NE Montana adjustment project, it is worth noting MSL has been working with Guy Dubois in Department of Revenue's Property Assessment Division for a couple of weeks on getting him set up and trained to perform adjustments to CadNSDI using the Parcel Fabric and DOR-obtained updated control. So far, network performance has been good enough to allow Guy, who is based in Shelby, to work directly in our databases. If successful, this pilot project could lead to the DOR being able to make adjustments to CadNSDI (the PLSS) in areas that they place a priority on for increasing the accuracy of the parcel layer in the Cadastral Framework.

(Update: October 2016) All cadastral parcels affected by the CadNSDI adjustments in FY16, including the NE Montana work, have been adjusted to vertically align with the current version of CadNSDI. Additionally, the Conservation Easement and Public Lands layers maintained by MSL have also been adjusted. Administrative boundaries in the affected areas will be updated soon.

Guy Dubois has been successfully adding new control and making adjustments to the CadNSDI using the Parcel Fabric. His work has focused on areas important to DOR for increased parcel spatial accuracy. Thus far, Guy has been working in Toole and Pondera counties. MSL staff will be traveling to Shelby to introduce Guy to some new tools and workflows that have recently become available.

1.2. The USDA Aerial Photography Field Office (APFO) is in the process of collecting 1m statewide imagery for Montana through the 2015 National Aerial Imagery Program (NAIP). MSL will work with the APFO to acquire a copy of this dataset, likely in late 2015. Digital library staff will develop a plan for adding this data to the MSL collection, identify what information products need to be developed to make this data accessible to users, and develop a communication plan to ensure stakeholders know that this dataset is available and how to access it. This will be the fifth year of statewide NAIP imagery data in the MSL collection which currently includes imagery from 2005, 2009, 2011, and 2013.

(Originally reported December 2015) The 2015 NAIP collection was significantly impacted by the amount of fire activity in western Montana that went well into the fall. Originally scheduled to be completed by mid-August, there are still areas in western Montana that had

not been flown as of November 20. The most current status is available on this status map maintained by the USDA - <http://arcg.is/1TbH2kk>. We are still hopeful that the remaining areas of the state will be collected and we are working with our partners to ensure we receive the data as quickly as possible once the full state is complete and available.

(Originally reported February 2016) Aerial photo collection as part of the 2015 NAIP has stopped for the year due to snow. As you can see from the link above, there are still substantial holes in the coverage over western Montana. We have received all of the available 2015 imagery from the USDA/APFO via the NRCS and we are currently working on a storage and distribution strategy. We are aware that the USDA/APFO is considering continuing data collection in the spring to complete statewide coverage.

(Originally reported April 2016) MSL has received a copy of the available NAIP 2015 data through our partnership with the NRCS. Also working in partnership we have been able to develop statewide compressed datasets in .sid format for distribution via the web - http://geoinfo.msl.mt.gov/data/Aerial_Photos/NAIP_2015. Patrons may request copies of the 2015 data through FTP (for small areas) or by sending in a hard drive (for a complete copy of the statewide dataset). We hope to have a 2015 NAIP web service available by the end of April, 2016. We are still waiting to hear from the USDA/APFO about any plans to fly any areas of the state that did not get completed in 2015.

(Originally reported June 2016) The most current, though unconfirmed, information we have received is that the USDA/APFO does plan to fill in the 2015 gaps during 2016 but we should not expect that data to be delivered until the "normal" 2016 product delivery window (likely in the October –December 2016 time-frame).

(Originally reported August 2016) We still haven't received any updates from the USDA/APFO regarding filling the gaps in the 2015 NAIP coverage, but there has been some other activity related to NAIP imagery distribution worthy of reporting. First, we have updated each of the NAIP imagery distribution pages (there is a page for each of the 5 years of NAIP that exist for Montana) to include a link to a page with information about "Ordering Aerial Photos" - http://geoinfo.msl.mt.gov/data/Aerial_Photos/Ordering. This page provides users with important information about each year of NAIP data collection for quick reference when requesting aerial imagery from the MSL collection. Second, there seems to be growing interest in high resolution imagery acquisition (6" to 1' resolution compare to 1m resolution for NAIP) as well as some emerging opportunities for more efficient storage of NAIP data. We will be calling a meeting of the Imagery working group in the near future to discuss interest in these opportunities and begin planning how to move forward.

(Update: October 2016) We have received no further information about filling the holes in the 2015 NAIP imagery but we have been able to post the 2015 NAIP to our ESRI hosted managed services folder alongside other MSDI public access datasets. The 2015 NAIP Imagery Service can be found at –

https://gisservicemt.gov/arcgis/rest/services/MSDI_Framework/NAIP_2015/ImageServer

1.3. Water information staff are working on multiple projects to improve the quality of the data in the Montana Hydrography Dataset. The Department of Natural Resources and Conservation is working with the Water Information System to improve workflows for revising the Hydrography Dataset as well as to enhance it by integrating features in from the Water Rights database. Work is also underway through a grant from the USGS to develop bulk data loading procedures that will allow more efficient integration of data from existing sources such as the water rights database and the wetlands and riparian dataset managed by the Montana Natural Heritage Program. Both of these projects will run through the end of FY16.

(Originally reported December 2015) The USGS grant and DNRC contract are both in place. Preliminary work on the USGS grant started in July and we are currently ordering equipment – a desktop machine for hydro editing and processing tasks and a hard drive for data transfer – have been ordered and we expect delivery in the coming weeks. While not directly tied to these two projects, we have also received funding from the Army Corps of Engineers to continue work on the Yellowstone River Corridor Clearinghouse that has been developed with support from the Yellowstone River Conservation District Council for many years. The Yellowstone Clearinghouse is another potential data source for the Montana Hydrography Dataset if we can develop a manageable workflow for performing bulk data uploads through work with the USGS and DNRC.

(Originally reported February 2016) USGS grant work has been focused on reviewing edits received from Glacier National Park to make sure the edits are ready to be imported into the hydrography dataset using USGS geoconflation tools. Significant revisions were made to flowdirection and additional attention is needed to fix snapping issues. Progress was also made identifying workflow for deriving flowlines from LiDAR data in the Musselshell. The work tasks identified in the USGS grant and the DNRC agreement were presented to the Montana Hydrography Working Group, Dec. 17. There was good discussion and good support for the projects, particularly the effort with DNRC to develop a prototype demonstrating the value of the hydrography dataset and the long term vision for the water information system.

(Originally reported June 2016) MSL staff have successfully completed the first major objective of the USGS grant. The USGS Geoconflation Tools (USGS GCT) were used to import the North Fork edits from Glacier National Park into an NHD job. This job has been submitted back to the USGS for inclusion in the national production database. Staff are now working on integrating wetlands data and LiDAR data in the Upper Musselshell NHD and identifying how to best use USGS GCT and ESRI conflation tools to make bulk revisions. Work has begun on the DNRC agreement. Staff are preparing wetlands data for integration into the Middle Musselshell NHD and we expect to hire an intern next month to assist with the editing.

(Originally reported August 2016) MSL staff continue to work on preparing wetlands and LiDAR data for integration into the NHD in the Musselshell River subbasins. The data “prep” stage is approximately 80% complete. Once complete, staff will move on to using the USGS Geoconflation Tools and other ESRI conflation tools to bring the wetlands data into the NHD job, while preserving key attributes. We have also hired and trained an intern to edit the

NHD. The intern will be assisting with the USGS grant and the DNRC agreement approximately full time through December.

(Update: October 2016) The original end date for the USGS grant was September 10. We have spent available funds but have requested an extension to continue matching hours on the project. Staff are finishing up wetlands data "prep" in the Upper Musselshell subbasin and will begin the actual geoconflation process in early October. We anticipate finishing the project in November and submitting a final report to the USGS in December. An intern continues to work on editing the NHD in the Lower Musselshell as part of the DNRC agreement. This editing is now being done using standard ArcGIS tools, as opposed to the USGS NHD Update Toolbar, and will allow us to compare the two editing options and decide which is more efficient going forward.

1.4. MSL continues to partner with the NRCS to develop mutually beneficial data products. In the coming year the NRCS will be seeking additional support with the stewardship of the Watershed Boundary Dataset. The NRCS is also interested in expanding on the monthly water supply products that the library has assisted with the development of for more than 20 years. The current collection of water supply maps including monthly Surface Water Supply Index maps dating back to 1992 is available at:

http://mslapps.mt.gov/Geographic_Information/Maps/watersupply/Default.aspx

There are also a number of collection development projects that will be collaborative efforts between the user services and information management teams.

(Originally reported December 2015) We have secured an extension to our current NRCS partnership agreement that provides an additional \$40,000 to perform GIS support tasks for the Montana NRCS through the end of September 2016. In a recent planning meeting with our NRCS liaison we began developing a work plan for the coming year which will include ongoing Ecological Site Development work, updated to the SSURGO Soils dataset, collaboration on Watershed Boundary Dataset updates and the continuation of our long term water supply mapping partnership. With the posting of the October 2015 water supply maps MSL and the NRCS have completed 23 years of Surface Water Supply Index (SWSI) maps. Originally created for the months of February through August, since 2002 these maps have been created each year for the months of January through October.

(Originally reported February 2016) In early January, MSL in partnership with the NRCS released the new Snow and Water Supply website:

http://mslapps.mt.gov/Geographic_Information/Maps/watersupply/Default

This new website provides improved maps compared to what was provided in past years and also adds new products, including precipitation and reservoir storage. Each month 49 maps will be updated and published to the website.

(Originally reported June 2016) May snow and water supply maps were completed and posted to the web the first of the month. Two new statewide map products (reservoir storage

and streamflow forecast) were created in April and we will be working with IT to create the new webpages for them. We are now producing 51 maps each month. Staff assisted with a Remote Sensing and Spatial Analysis training for NRCS personnel, including providing overview presentations of resources available at the State Library and assisting attendees with lab exercises. Updates have begun on the watershed boundary dataset. Edits along the International Boundary were completed for the Belly River and St. Marys hydrologic units. We will continue to coordinate with Canada to update shared watershed boundaries.

(Originally reported August 2016) Watershed Boundary Dataset (WBD) edits for the Belly and St. Marys hydrologic units were sent to Canada for “seaming” along the International Boundary and we received training from the USGS on coding WBD attributes. MSL staff reviewed approximately 300 new Watershed Boundary names proposed by the USGS. We continue to support the NRCS with various GIS projects, including: preparing data and writing a script to create geodatabases by HUC that contain all of the environmental spatial data that is important to NRCS field staff; organizing and preparing Northern Cheyenne GIS data for a training the NRCS is conducting for the BIA and tribal staff; and creating a web application that allows NRCS field staff to quickly compare frost-free days, Relative Effective Annual Precipitation, and soils data.

(Update: October 2016) Staff time on the NRCS agreement in August and September mostly went towards watershed boundary editing, specifically watersheds along the International Boundary. Monthly updates of the snow and water supply maps continue to go smoothly and now three staff are cross trained on the entire process. Staff also put together examples of the “HUC Environment Geodatabases” (data packaged for NRCS field staff) and are currently working on adding MSDI themes to the script that creates the geodatabases for each subbasin.

In mid-August we began work under a new 5-year, \$40,000/year, agreement with the NRCS. We are excited to continue the water supply mapping partnership that will now extend more than 25 years since it began in 1992 and we are also excited about the opportunity to be more engaged in the maintenance of the Montana Watershed Boundary dataset and the opportunities that should provide to improve the quality and usability of the Montana Hydrography Dataset.

1.5. State publications will work with user services to identify opportunities to make existing tools and resources more usable for patrons. An example from last year was the development of a web interface to submit a request for web sites to be archived. This received positive response from users and also improves our ability to capture and archive sites at critical moments that may otherwise be missed.

1.6. User services has identified a need to develop a process for the regular evaluation of electronic resources. This should include creating electronic resources workflow documents

that focus on ERMs (electronic resources management) particularly on the life cycle/renewal of an e-resource and the purchasing decision (acquisition) of a new e-resource

1.7. There are efforts underway to work with the Helena USGS office to consolidate and streamline their internal library through collaboration with the water information staff and engagement with our user services group. Possible outcomes may include the identification of materials to supplement the MSL collection and the development of a partnership with a key group of potential Water Information stakeholders.

(Originally reported December 2015) A group of staff made up of Library and GIS Professionals were able to visit the Helena USGS Office in October and get a tour of the existing library. Additional work on this project has been delayed by the ongoing Digital Library reorganization.

(Originally reported February 2016) MSL staff developed a spreadsheet to assist the USGS Water Center with the reduction of their library and met with the director and other staff. The USGS is now proceeding by having an MSU student intern organize the material. The intern has been focused on organizing the library room in the warehouse and has organized nearly all of the shelves and co-located similar publications. The intern will soon begin transferring the card catalog of USGS publications pertaining to Montana and adjacent states to a spreadsheet. MSL will review the inventory once complete in case there are materials to supplement the MSL collection.

(Originally reported June 2016) The USGS library reduction effort continues to move along. The USGS MT/WY Water Center is currently going through their topographic map collection and have decided to largely discard (give away to staff) the hardcopies (they are all available online). USGS has a good handle on the project now and MSL staff are minimally involved, but we are receiving updates in case there are materials we want for our collections.

1.8. The Montana Department of Health and Human Services (DPHHS) has approached MSL staff about opportunities to collaborate to make a number of their GIS data products more publicly accessible via the MSL Map Gallery (AGOL).

(Originally reported April 2016) While not specific to DPHHS GIS data products, several digital library staff members have been involved in a review of the use of ArcGIS Online (AGOL) at MSL and how we can better leverage this toolkit. In a March training event we were able to get some new ideas about how AGOL may be leveraged to simplify the process for providing access to different agency datasets such as those available from DPHHS.

(Originally reported June 2016) Staff met with DPHHS program staff to discuss how they could leverage ArcGIS online to make a map of fluoride levels in wells and public water supplies available to the public.

Finally, with the transition to a new organizational structure there is a need to develop workflows and processes for regular review of the MSL collection development policy and a process for evaluating new projects and the proposed products of those projects against the

existing collection development policy. A successful outcome would be the development of guidelines for regular evaluation of the collection development policy as well as some process for evaluating ongoing efforts to follow that policy.

(Originally reported June 2016) Not included in the original work plan was MSL involvement in the US Census Boundary Annexation Survey (BAS). As the Census Bureau's BAS contact in Montana, the Administrative Boundaries theme lead participated in the 2016 BAS program by contacting local governments that had not already submitted a response to the Census Bureau. MSL also had several meetings with visiting Census Bureau staff about existing Census programs that MSL has participated in (School District Review Program, Boundary Quality Assessment and Reconciliation Project, Geographic Support System), as well as new programs and efforts leading up to the 2020 census.

(Originally reported June 2016) Not included in the original work plan was work to develop the Statewide Address point dataset. The recent addition of address points for Wheatland and Golden Valley counties means the Structures/Addresses Framework is now a statewide dataset, with addresses being provided by all 56 counties, as well as a number of city and tribal governments that manage their own addresses. These addresses will further enhance the MSDI Structures/Addresses Framework and MSL's geocoding web service.

(Update: October 2016) The Federal Geographic Data Committee (FGDC) recently announced the establishment of a new National Geospatial Data Asset (NGDA) Address Theme. The Department of Transportation and the Department of Commerce, U.S. Census Bureau were named as the lead agencies of the Address Theme and will support the ongoing work to develop a National Address Database. MSL is currently working with the Department of Transportation to submit Montana address points to version 1 of the National Address Database.

Goal Two—Access

2. MSL provides libraries, agencies, and its partners and patrons with convenient, high quality, and cost-effective access to library content and services.

2.1. With the recent changes in the Digital Library there is a need to work with the MSL Marketing Coordinator to develop a plan for communicating these changes with our partners and patrons. Part of this effort will be exploring existing branding that we may or may not want to continue to promote as well as developing a strategy for the structure and organization of Digital Library web pages. Specifically identified needs include the development of a plan for promoting the recently updated Digital Atlas as well as a need to evaluate potential enhancements to research.msl.mt.gov.

2.2. Cross training for the new user services group is needed to ensure they are prepared to handle requests for information from across the different library program areas. A plan for cross training staff and the development of a coverage calendar will allow for the different support phone numbers and email addresses to be redirected to the User Services group. There is also a need for broader cross training across the Digital Library to help staff be more comfortable and work more efficiently together.

(Originally reported December 2015) User services staff have begun a series of bi-weekly cross training sessions scheduled to run into the beginning of 2016. To date these have been primarily focused on providing the Library professionals with some basic GIS background and providing familiarity with the existing GIS data discovery tools.

(Originally reported February 2016) The last of the initial series of cross training sessions took place on January 18. In the coming weeks we will be identifying additional cross training needs in order to plan future trainings.

2.3. The information products team will identify or develop a new reference request management/tracking tool to replace the existing request tracker. From a management perspective it is critical that all digital library reference requests are tracked through a common system to allow for a better understanding of patron needs and to ensure we are making the most of our limited resources.

2.4. There is a library-wide need for more consistent collection of resource use information and tools that simplify the reporting of that information to encourage and feed a process of continuous improvement of the services we make available.

2.5. In an effort to make more of the existing collection accessible the state publications lead will be hiring a temporary cataloger to catalog the remaining historic print state publications needing MARC records. This will also provide an opportunity for evaluating the feasibility of relying on temporary staff to perform future cataloging needs.

(Originally reported February 2016) MSL conducted a limited solicitation of three bids and chose Backstage Library Works to do original cataloging of 200 state publications with the option of additional cataloging depending on resources and time once the initial project is completed.

(Originally reported June 2016) Backstage Library works has catalogued and returned the state publications. MSL staff is now loading new records into local catalog and preparing some items for digitization shipment offsite.

2.6. Work with OCLC to edit the tags of 22,000+ catalog records for print resources in order to derive 22,000+ new bibliographic catalog records for electronic content. Completion of this project will allow MSL. There is also a need to create, document, and implement procedures for providing non-MSC libraries with MARC files for digitized state publications.

2.7. The Montana Cadastral Application was developed by and is currently hosted at SITSD but there is a growing list of enhancement requests from our users. Efficient, ongoing support of this tool will likely require it to be re-written in the near future. Digital Library staff will plan a scoping process for a new Cadastral application and work with IT staff to get the development of a new application on the calendar for 2016.

(Originally reported February 2016) The information products team has put together a project proposal using the draft MSL project proposal template. This will be reviewed by the management team for guidance before moving forward. Additionally, we have recently become aware of a new cadastral application that the Department of Revenue has developed. We will be reviewing that application to determine if it will impact our application update plans.

(Originally reported April 2016) MSL met with Department of Revenue staff in March 2016 to discuss plans for updating the Montana Cadastral Application. The primary purpose of the meeting was to let DOR know we are planning an update in the near future and to solicit engagement from appropriate DOR staff and they seemed interested in being involved.

(Originally reported June 2016) Information Products staff met with the IT managers in April to identify initial project planning tasks that would put this project in a position to move forward when web development staff is prepared to take on new projects. A follow-up meeting is scheduled for early June.

(Originally reported August 2016) While still a high priority within the Digital Library, progress on this project has been delayed as a result of the fiscal year end and recruitment of several new positions as well as limited developer resources. Even so we hope to be in position to move forward with this important update in the coming months.

2.8. MSL is in the process of moving web map services off SITSD hosted services and on to ESRI cloud hosted hardware. This transition will be complete by November 2, 2015. Information products staff are actively working to identify updates that need to occur to ensure tools and applications do not break as a result of this change and a change management plan has been developed to make this transition as smooth as possible for our partners and patrons that use the MSDI web map services.

(Originally reported December 2015) Hosted managed services went into production in October and the old services at SITSD were taken offline on November 2. An exhaustive effort was made during the month of October to notify the various user communities of the planned changes and this seems to have been effective since we have had very few calls specific to the service changes. This changeover did result in a number of unanticipated issues with the cadastral application that GIS and IT staff have been working hard to resolve through the month of November. At this point we believe that we finally have a solid stable application in place pointing to the new managed services and we are primarily dealing with educating users in how to refresh their browsers to ensure cached data is not impacting their user experience.

(Originally reported February 2016) We have resolved a number of issues with the cadastral application that arose with the initial cutover to managed services and our users seem much happier. We are working with the ESRI Managed Services team to get regular, service based usage reporting that will allow us to compare the usage of our services now to the usage when they were hosted at SITSD.

(Originally reported April 2016) With the transition to ESRI Managed services complete, future updates on Managed Services will be reported under section 5.2.

2.9. MSL provides access to tiled aerial imagery and topographic map data via the Montana Geographic Information Clearinghouse website. Currently users discover and download image data by clicking on a series of image maps. DNRC has developed ArcGIS Online applications that make it easier to discover what data are available for a given area and download it (for example, all NAIP years are in one application). Their applications are currently pointing users at MSL data. We should make users aware of these tools and evaluate them to see if there are opportunities to improve the tools we make available.

(Originally reported April 2016) In building the distribution page for the 2015 NAIP, Information Products staff integrated an ArcGIS Online interface to allow users to access a dynamic map for finding and downloading the compressed imagery - http://geoinfo.msl.mt.gov/data/Aerial_Photos/NAIP_2015. This was successful, and the same model has since been applied to the distribution pages for all of the Montana NAIP imagery accessible from MSL - http://geoinfo.msl.mt.gov/data/aerial_photographs_of_montana

2.10. MSL would like to pilot a project to develop a Corner Recordation Application to provide better access to corner recordation surveys. This could be a simple ArcGIS Online application (similar to Ravalli County's) and use corner recordation documents obtained during the NE Montana adjustment project. Before the end of FY16 the information product team will initiate a scoping project to identify the needs of and opportunities offered by such a tool and what resources would be needed for its development.

(Originally reported June 2016) While we have not been able to pursue this project to date, we were very excited that the highest scoring MLIA Grant Application for FY2017 was a proposal from Lewis and Clark County to develop a similar Corner Recordation tool. We will be following their progress closely to see how this project may be leveraged to help with the development of a NE Montana Corner Record viewer.

2.11. There has been an enormous amount of climate data generated by the MSDI Climate theme steward. While accessible through web pages, this data isn't available through the bundler yet. We will work with the stewards to identify the best way to get this data into the bundler.

(Originally reported June 2016) We have not had success getting MSDI Climate theme data into the data bundler to date, but we have begun working with the Montana Natural Heritage program to identify opportunities to integrate data bundler functionality into the

MTNHP map viewer. It is possible this project may result in new bundler based tools that would be more usable by the MSDI climate theme (and others).

Goal Three—Training

3. MSL provides appropriate trainings and training resources so that the best use can be made of the resources offered.

3.1. Efforts to lead the development of ArcGIS Online training for state agencies started in FY15 and we need to continue to push for this training to happen in FY16.

(Originally reported February 2016) We are currently re-evaluating our use of ArcGIS online to determine what type of internal training is needed to administer and support the existing ArcGIS Online subscription. Once this process has been completed we will be in a better position to explore training options for other agencies.

(Originally reported April 2016) This work has continued through March 2016 and included an on-site training/consultation visit from an ESRI ArcGIS Online specialist. Current project tasks include identifying needed staff resources and getting them any training needed to be able to support our planned use of ArcGIS online within MSL. Once we have our plan in place we will be in a better position to understand how we can better assist other agencies.

(Originally reported August 2016) We are in a more comfortable place as far as support for ArcGIS Online is concerned, but efforts to plan for broader ArcGIS Online usage have been delayed as we recruit for key staff important to this project including the state GIS Coordinator, the Information Products lead and the Library User services lead. Once those positions have been filled we should be in a good position to move forward with broader plans for ArcGIS Online.

3.2. The Users Services team will continue to develop content for State of Montana new employee orientation but this effort will be broadened to include content from across the digital library.

3.3. User Services will lead the development of outreach priorities, an outreach calendar, and a process for adding or removing items from the outreach calendar through an annual review process that includes the MSL Marketing Specialist.

(Update: October 2016) State web developers group invited MSL staff to present at September 13th meeting on MT.GOV Connect, our library web archive of state agency websites dating from 1996 to the present. MSL staff gave overview of MT.GOV Connect with explanation of how it partially fulfills statutory mandate to provide permanent public access to state government information. MSL staff also encouraged meeting participants to consider adding Page History code to footer of their website as one way for agencies to abide by M.C.A. requirements to collaborate with MSL to provide access to their public information. MSL staff also showed attendees how to browse and do keyword searches within archive. One

participant was especially interested in MT.GOV Connect potential for archiving and providing access to public comment.

(Update: October 2016) MSL hosted for Montana librarians a half-day in person and online training by two Government Publishing Office (GPO) librarians. These Washington, D.C. based librarians presented on how to provide reference service to federal information with a special focus on Montana resources. Afterwards the GPO librarians presented a plaque to Montana State Library in recognition of our 50 years of commitment to providing public access to government information as a Federal Depository Library, 1966-2016

Goal Four—Consultation and Leadership

4. MSL provides consultation and leadership to enable users to set and reach their goals.

4.1. With an increasing recognition of the importance of GIS data in the development and implementation of Next Generation 9-1-1 we have been pushing for MSL to be included on the state 9-1-1 advisory council. We will continue to push for that to happen and if we are successful Digital Library staff will be available to support the State Librarian in that role. Outside of the 9-1-1 Advisory Council, MSL has been raising awareness of NG9-1-1 in the GIS community and reaching out to the 9-1-1 community in Montana by distributing information on GIS and NG9-1-1 to PSAP managers. MSL has also been working with some local governments to begin the process of planning for NG 9-1-1.

(Originally reported December 2015) The GIS Coordinator and the Land Information lead were invited to present at the first meeting of the Energy and Telecommunication Interim Committee. They presented information about the role of GIS in NG 9-1-1 and provided additional information on the basic workflow for NG 9-1-1 GIS data development as well as information about NG 9-1-1 planning efforts in other states. Since that time MSL has participate in two additional meetings of a NG 9-1-1 working group tasked with developing a NG 9-1-1 implementation plan to present to the interim committee at their March 2016 meeting.

(Originally reported February 2016) - MSL staff have been participants in an NG9-1-1 Working Group, created by MACo to provide recommendations to the Energy and Telecommunications Interim Committee (ETIC). In the January working group meeting MSL presented information about the role of GIS in NG9-1-1. MSL has also been given a seat on the 9-1-1 Advisory Council and has participated in their meetings since October 2015.

(Originally reported April 2016) Thanks in part to MSL involvement on the ETIC Working group and the 9-1-1 Advisory Council we are happy to report that the working group recommendations to ETIC included a request for \$80,000 to fund a statewide NG9-1-1 GIS data assessment. While it is still early, ETIC did take action to draft a NG9-1-1 bill that includes the GIS assessment funding recommendation.

(Originally reported August 2016) The ETIC has endorsed the proposed draft 9-1-1 legislation coming out of the ETIC NG9-1-1 Working Group and the 9-1-1 Advisory Council, which includes \$80,000 to fund a statewide NG9-1-1 GIS data assessment that MSL would coordinate. The draft bill is currently in a second public comment period. A link to that bill draft and the NG 9-1-1 report to ETIC can be found at - <http://leg.mt.gov/content/Committees/Interim/2015-2016/Energy-and-Telecommunications/>

4.2. User services needs to provide the Land Information Advisory Council with a recommendation for how to proceed with the MSDI Elevation Theme. Elevation has been without a steward for many years and with the recent loss of our long term USGS contact there seems to be little ongoing interest from the USGS is continuing to support that theme. **(Originally reported June 2016)** Steve Shivers, the USGS National Map Liaison to Montana, indicated during the Intermountain GIS conference that he may be willing to serve in the role of MSDI Elevation theme lead. We will follow up with him to determine the extent that he will be able to support this critical theme.

4.3. With SITSD retracting from involvement in GIS, User Services and Information Products staff will need to develop a model for supporting agencies needing ELA and ArcGIS Online support. The State Librarian and the Digital Library Administrator will begin discussing a 2017 ELA renewal with ESRI in the coming months.

(Originally reported February 2016) An initial ESRI Enterprise License Agreement (ELA) renewal meeting took place in early in December which included the State Librarian and the Digital Library Administrator as well as the DNRC CIO and the primary ELA contact for ESRI, Nathalie Smith. The meeting was generally focused on what the different parties need to begin the process. ESRI needs updates software deployment information that is currently being gathered by SITSD. The state needs to determine what type of procurement process needs to take place and we are pursuing the as a sole source procurement and are currently in the process of completing the justification forms needed for that.

(Originally reported April 2016) MSL has compiled the documentation needed for a sole source procurement. SITSD has provided ESRI with a software deployment report though it may need a few updates. The GIS Managers have an initial ELA discussion on the calendar for late March.

(Originally reported June 2016) MSL coordinated an ESRI site visit in early May. The State Librarian and the Digital Library Administrator as well as the DNRC CIO were able to meet with Nathalie Smith and other ESRI representatives early in the week and again at the end of the week. ESRI met with agency GIS managers as a group and also had one on one meetings with several agencies over the course of the week to understand program needs. By the end of the week we were comfortable that we had a basic understanding of the framework for a new agreement – a two-year extension to the current agreement that will run from July 1, 2017 – June 30, 2019. It will include the same modules as the current ELA with an

additional Managed Services module that will mimic the exiting two year managed services we currently have with ESRI (outside of the ELA).

(Originally reported August 2016) In late July, ESRI provided an initial proposal for an extension to the existing ELA to cover FY17/18. We are currently doing research to develop an analysis of the proposal to determine how to proceed.

(Update: October 2016) We have negotiated a new enterprise license agreement with ESRI to provide software, training, ArcGIS Online, and managed services to the state for the FY18/19 biennium. We are working to get the final agreement signed but as it stands the cost for these services will be more than \$150,000 per year less than what the state budgeted in the FY16/17 biennium.

Goal Five—Collaboration

5. MSL promotes partnerships and encourages collaboration among its users

5.1. As the user services team works on the next MSDI Work Plan consideration should be given to how the MSDI work plan integrate with Land Plan and MSDL Work Plan.

(Originally reported April 2016) Better integration of the MSDL Work Plan and the Land Plan was a key consideration in the development of the new MLIA Land Plan timeline - http://docs.msl.mt.gov/Central_Services/Commission_Councils/Montana_Land_Information_Advisory_Council/Archive/2016/03/land_plan_timeline.pdf - that was proposed to the council at their March 2016 meeting. This generated some good discussion among council members and we will be updating the timeline in anticipation that the council will take action in their May meeting. We have also asked council members to provide feedback on the MSDI work plan and its integration into the MSDI framework pages as we begin the process of updating the plan and pages for the coming year.

5.2. As we transition to ESRI managed services as a replacement for SITSD hosting of web map services there is a need to work with existing and prospective state agency users to develop ESRI Managed Services Partnership that identifies how available service "slots" will be allocated and also addresses any future enhancements to the platform will be paid for.

(Originally reported December 2015) We have had a managed services kick off meeting with other partner agencies. This meeting was led by information products staff and focused on getting other agency administrators information about how to update their hosted managed services. We also used this meeting to identify agency needs for the remaining service slots available through the managed services contract. Knowing that there are several available slots, we have been able to significantly expand our service offerings including the addition of both State Plane and Web Mercator versions of most of our MSDI Framework Services. Information Products staff are currently working on setting up a number of

additional support services including USGS Topo Maps, Elevation and Hillshade, 1990s Digital Orthophoto Quarter Quadrangles, and possibly a Montana Highway Map service similar to what we have made available through the Montana Place Names application.

(Originally reported February 2016) Information Products staff have been working with ESRI to understand the proper procedures for making updates to web services. We are currently coordinating with agencies to ensure they understand these procedures to ensure monthly updates occur regularly, on schedule, and without issues. New services described previously are not in production yet due to some data transfer issues, but we still hope to have those up in the coming months.

We are evaluating the possibility of making all production MSDI web services available via the Open GIS Consortium (OGC) Web Map Service (WMS) protocol. This has always been an option but we have resisted in the past because of uncertainty about the consequences of enabling this format. We have heard from some users of older or different GIS tools recently that they are unable to access some of our web services, and it appears that they can access them if we enable OGC WMS support.

(Originally reported April 2016) We have been working with the ESRI managed services team to resolve some performance issues that were initially observed in late January. The ESRI response to date has been disappointingly slow and disorganized. They have put into place some temporary measures to resolve performance issues and provided a somewhat helpful after incident report. We are currently working to identify a sustainable long term solution to the performance issues. While existing services continue to be available as we work through this, it has delayed several new services from going into production for a couple of months now.

(Originally reported June 2016) We continue to struggle to find satisfactory resolution to the performance issues that we experienced in January. We have a work around in place and existing services are performing to our expectations, but there continue to be delays in getting new services up and running. We will be working with ESRI to resolve these issues before fiscal year end.

(Update: October 2016) We worked with ESRI through the summer and have just signed an updated task order for ESRI Managed Services which resolves lingering issues with performance and data storage. At no additional cost over our original agreement, ESRI has agreed to increase the number of processors and the amount of memory available to our hosted cloud servers. They have also updated the storage language to clarify that we would be able to store 20TB of data, not use 20TB of disk space (as the previous agreement had been interpreted). These changes provide us with the robust platform we need to support Enterprise Web Map Services and we are confident that we will be able to scale these servers as needed to support future demand without seeing an unmanageable increase in costs.

5.3. The NRIS Advisory committee needs to be re-formed (many members are currently vacant) and a meeting will be scheduled before the end of 2015. Agenda items for that meeting will include an update on the MSDL organization changes, discussion of the ongoing role of the NRIS Advisory Committee, and updates to the Data Partner MOUs.

(Originally reported April 2016) – We are behind schedule in getting this group together. I still hope that we can get a meeting on the schedule before the end of the fiscal year, but I want to try to include the new GIS Coordinator in this process if possible since that position will have a big role in NRIS moving forward. In the interim, I will be working with our partner agencies to extend the FY14/15 Data Partner MOU through the FY16/17 biennium. The primary focus of the NRIS Advisory during the current (FY16/17) biennium will be to develop an updated Data Partner MOU that will go into effect in the FY18/19 biennium.

(Originally reported June 2016) Proposed Core Funding MOU extensions have been sent out to partner agencies for review.

(Update: October 2016) One agency has agreed to the MOU extension while another has requested a new MOU. We are preparing an updated MOU for that agency.

5.4. The State Water Plan identified a number of recommendations specific to making water information available through the MSL Water Information System. We need to engage DNRC to identify how we can help ensure these recommendations are implemented effectively.

(Originally reported February 2016) DNRC engages with the MSL about hydrography dataset needs and the water information system through the Hydrography Working Group. A review of the Water Information System was presented to the Water Policy Interim Committee on January 11 -

http://montanalegislature.granicus.com/MediaPlayer.php?view_id=67&clip_id=18597&meta_id=139266

(Originally reported June 2016) The Water Information Manager met with DNRC to discuss infographics, ArcGIS online, story maps, and other approaches to making State Water Plan and other water information attractive and available to the public. The Water Information Manager has also been in discussions with DNRC Water Planners and the EPA regarding the Upper Missouri River Drought Resiliency demonstration project. Due to key DNRC and NOAA staff retirements, monthly drought maps have been on hold since January. In later April, we began working with the new DNRC Drought Planner and we expect to have all the drought maps caught up for 2016 by early June.

(Originally reported August 2016) MSL staff worked closely with the DNRC Drought Planner to get the monthly drought maps back on track. Drought maps for January through June were completed and posted to the web, and we will continue to produce a new map each month in partnership with the Governor's Drought Advisory Committee.

(Update: October 2016) The Water Information System Manager has been assisting the DNRC Drought Planner with revising the Governor's Drought Website <http://drought.mt.gov>.

We are also coordinating to feature a webpage through the Water Information System that provides a “one-stop shop” for maps/graphs/tables of current water conditions. This page will assist the Drought and Water Supply Committee by providing, in one place, the majority of the resources that need to be reviewed each month when they update the county-based drought map <http://nris.mt.gov/drought>. We also think this will be a useful page for anyone interested in the current conditions of Montana’s water supply— currently one has to search many different sites to get the full picture of precipitation, evapotranspiration, soil moisture, snow pack, streamflow, and etc.

Goal Six—Sustainable Success

6. MSL is efficient and effective (measured against partner and patron outcomes) and is engaged in fulfilling its mission.

6.1. Digital Library staff will use the information gathered through the Patron Survey to develop an action plan for improving the services we make available through the Digital Library.

6.2. Through our User Services team, we need to continue to expand the use of social media to engage patrons. In the coming year we need to expand this effort across the digital library.

6.3. The Digital Library Administrator will continue to work with the leads to identify and work through issues that come up during the transition to the new organization structure. **(Originally reported December 2015)** Since early October we have been able to schedule at least one meeting of each of the full working groups and we have also had multiple leads meetings. Weekly “stand-up” meetings with the Information Products team and the Information Management leads are now on the calendar and something similar for user services will be scheduled soon.

(Originally reported August 2016) As we fill the remaining Digital Library lead positions I will be working with the new leads to help them with any issues that may come up with the new organizational structure. Particularly in the User Services group where there has been turnover in both lead roles and much of the transition of the reorganization has been delayed. Additionally, with all of the lead positions filled we will begin having regular leads meeting with an eye towards higher level, more holistic planning for the Digital Library Division.

(Update: October 2016) I am happy to announce that we have filled all of the remaining Digital Library lead positions and when our new User Services lead and Information Products lead start on October 3 the digital library will be fully staffed. There are a number of changes associated with last year’s reorganization that have been delayed while these positions were

open. I will be meeting with the full team of Digital Library leads later in October to begin planning for how to move forward.

6.4. The User Services team needs to begin planning for the retirement of the State GIS Coordinator with the understanding that this position will likely be open for several months before it is filled

(Originally reported December 2015) With Stu retiring ahead of schedule we are still trying to get caught up on this. Fortunately, Stu did a great deal of work to prepare his staff to take on some of his regular tasks and he left thorough documentation behind to assist with this. Several staff have stepped up to help out in his absence. On the MLIAC side, the land plan subcommittee went out of their way to produce a land plan on schedule to ensure we would not have to delay the MLIAC granting cycle.

(Originally reported February 2016) We were able to get the 2017 Land Information Plan approved by the MSL Commission on schedule in December and the Montana Land Information Act Grant application package was posted and announced on January 15, also on schedule. Over the coming weeks we will be working to spread awareness of this grant opportunity in hopes of encouraging a large number of applications.

(Originally reported April 2016) The FY17 grant application process was a huge success. We received 26 grant applications requesting more than \$850,000 in funding. We are working with MLIAC to form an application review subcommittee to score grants and provide recommendations for funding at the May 2016 MLIAC meeting.

We hope to have the GIS Coordinator position posted by the end of March with the goal of filling it within four to six weeks of posting.

(Originally reported June 2016) The MLIA Grant Review subcommittee recommended 12 grant proposals for funding at the May 18 MLIA Council meeting. The full MLIA Council approved this recommendation. The recommendation was presented to the MSL Commission at their May 25 meeting where it was approved. We will begin working with the 12 successful applicants to develop statements of work so that they will be in a position to begin work on these projects at the beginning of FY17.

The GIS Coordinator position has been advertised since early May. The first round of screening began during the week of May 23 and 42 applications were reviewed. We are very optimistic that we can have a well-qualified candidate in this position before the end of the fiscal year.

(Originally reported August 2016) Erin Fashoway was hired as the new State GIS Coordinator and she started in that position on July 11. In addition to being a former MSL employee (as a GIS Analyst supporting the MSDI Administrative Boundaries theme), Erin also served as the Montana Association of GIS Professionals (MAGIP) president. More recently she has worked with the Montana Department of Transportation as a GIS Analyst/Transportation Planner. We are very excited to be able to bring in a new coordinator with the experience engaging the Montana GIS community that Erin has.

6.5. MSDL Leads will need to work together to identify training priorities and plan for the use of the MSDL training budget.

(Originally reported April 2016) MSDL Leads had an initial discussion of training planning in January. The reorganization has presented some challenges both on a funding and staffing front for the current fiscal year, but we will meet again in late March or early April to plan for the final quarter of FY16 as well as to ensure we are in a good position planning-wise heading into FY17.

6.6. We need a process for identifying, documenting, and evaluating emerging opportunities to improve our collection, access tools, trainings, and other outreach and engagement. The need here is to ensure we are making active decisions about what we provide and how we provide it rather than simply acting on what we can in the moment without considering broader needs and goals. If done properly, this should improve the process for developing this work plan in the future.

6.7. We need a process for the ongoing evaluation of our access tools to ensure that they continue to serve the needs of our users. The need here is to avoid situations like we had with the Digital Atlas and Topofinder where we were forced to act quickly and in a manner that was disruptive to our users because these tools had not been updated in the past to keep up with current technology.