



Abstracts

2013 MAGIP Fall Technical Session and 2013 Montana Government IT Conference GIS Tract Presentations



Denotes Hands-On Lab or Workshop

-----Monday, December 9th----- 2013 MAGIP Fall Technical Session

Sharpen Your GIS Skills Seminar

Presenter(s): *Nathalie Smith (nsmith@esri.com) – ESRI Regional Manager, Olympia, WA & Scott Moore (smoore@esri.com) ESRI Solution Engineer, Olympia, WA*

It's an exciting time to be an ArcGIS user. The secret of what you, the GIS professional, can do is out, and more people rely on your expertise to help them make the best decisions. At the same time, the science and tools of GIS are improving rapidly and taking advantage of advancements in related technologies. Esri designed the Sharpen Your GIS Skills seminar to help you hone your abilities—or develop new ones—so you can realize all the benefits of the ArcGIS platform for your organization. Don't let your skills grow dull. Attend this session to

- Learn about the wealth of data, templates, and other resources available for your projects
- See examples of how and when to use basic to complex analysis tools to drive better decision making
- Get ideas for extracting more value and better information from your existing software and data
- Expand your knowledge of the latest GIS tools and how you can take advantage of them

ESRI Hands-On Learning Lab



Presenter(s): *ESRI Staff – Self-Paced Content*

Take Esri training at your own pace in the Hands-on Learning Lab. Each lesson includes a prerecorded presentation and exercises and is roughly 45 minutes in length. Esri staff will be on hand to answer your questions. Come in when you can—no advance registration is required.

Lesson topics include the following:

- Introduction to ArcGIS for Desktop
- Creating a Map in ArcGIS for Desktop
- Basics of the Geodatabase Model
- Editing with ArcGIS for Desktop
- Introduction to Versioned Editing
- Editing and Maintaining Parcel Data in a Parcel Fabric
- Geocoding with ArcGIS for Desktop
- Introduction to ArcGIS Network Analyst
- Introduction to Linear Referencing
- Using Geometric Networks for Utilities Applications
- Introduction to ArcGIS Spatial Analyst
- Introduction to ArcGIS for Server
- Designing Web Applications Using ArcGIS for Server
- Sharing Maps and Tools Using ArcGIS Online
- Sharing Data with the Community Maps Program
- Spatial Statistics for Public Health
- Working with CAD in ArcGIS for Desktop
- Introduction to Geoprocessing Using Python
- What's New in ArcGIS

What is Google Map Maker and Why Do I Need It



Presenter(s): Jenny Connelley (jenny.connelley@gallatin.mt.gov) – GIS Program Assistant, Gallatin County GIS, Bozeman, MT

Do you ever have conversations that start out like this? “Well, I looked on Google Maps and Google Maps says...” BUT, Google Maps doesn’t match your records at the local level? Google Map Maker allows you to add and update geographic information for millions of users to see in Google Maps and Google Earth. By sharing information about the places you know, like businesses in your town or places in your school campus, you can ensure that the map accurately reflects the world around you. Your updates will be reviewed and once approved, will appear online for people from all over the world to see. I’ve been editing Gallatin County roads with Google Map Maker for about a year and would like to share with you how you can correct your data. You are encouraged to Bring Your Own Device (BYOD) to this workshop to follow along.

GIS in the Cloud. Introduction to ArcGIS Online Through a Hands-On Workshop

Presenter(s): Ken Wall (kwall59801@yahoo.com) – Geodata Services, Inc, Missoula, MT



Bring your own device (BYOD), or come and share with someone else who did. All exercises are self guided so you can benefit from the workshop even if you can't bring a portable computer or tablet, since you can follow along with the instructor and take the exercise home to work through. Any

portable computer, PC or MAC with recent web browser software and ability to use wireless internet will work. You can also use an iPad with Safari. We will cover the basics of what ArcGIS Online is and how to use it with a public account or organizational subscription. This workshop is targeted at beginners. We will briefly cover how to administer ArcGIS Online, how to collaborate, publishing web maps and using web templates such as storymaps, how to maintain and administer an organizational subscription, and how to access ArcGIS Online using the Microsoft Excel and Powerpoint. The main focus, and all the exercises will be on working with GIS data and maps using the ArcGIS.com web viewer. You are encouraged to Bring Your Own Device (BYOD) to this workshop.

Using the RMRS Raster Utility toolbar to design a study, sample predictive variables, build a predictive model, interpret results, and create a predictive surface



Presenter(s): John Hogland (jshogland@fs.fed.us) – US Forest Service Rocky Mountain Research Station, Missoula, MT & Nathaniel Anderson (nmanderson@fs.fed.us) – US Forest Service Rocky Mountain Research Station, Missoula, MT

The RMRS Raster Utility is a free, object oriented .NET library packaged as an ESRI add-in toolbar that simplifies data acquisition, raster sampling, and statistical and spatial modeling, while reducing the processing time and storage space associated with GIS analyses. In this workshop we will explore this innovative tool and learn how to: develop predictive surfaces, design a representative sampling scheme, extract information from new surfaces, build predictive models using statistical and machine learning algorithms such as general linear modeling and random forest, interpret the outputs of these models, and apply statistical models to new data. Though the workshop includes an easy to follow tutorial that will walk users through a classification and regression-type analysis, participants are also encouraged to work with familiar data, applying what they learn in the guided tutorial. So if you have spatial datasets that you would like to work with, please bring them to the workshop. For more information about the RMRS Raster Utility toolbar please visit our website at <http://www.fs.fed.us/rm/raster-utility/>.

Using CartoDB to Create Responsive and Beautiful Web Maps

Presenter(s): Josh Gage (josh@gagecartographics.com) – Gage Cartographics, Bozeman, MT

Are you interested in learning how to create responsive and beautiful web-maps without a steep learning curve? Do you have lots of data and need to visualize it on a map or in an interactive visualization? CartoDB is a web-based tool for creating interactive maps. It is open source and allows users to import spreadsheets or other data in seconds and create beautiful interactive map applications. It has been built to run quickly and efficiently without sacrificing aesthetics or ease of use. D3 is a JavaScript library for manipulating documents based on data. Responsive data driven graphics can be rendered quickly in the browser without excessive coding. I will touch on both CartoDB and D3, demonstrating the ease at which both platforms operate. To finish I will bring both technologies together to create a map based, data visualization. The presentation will be useful to both those that have never used CartoDB previously and to those that have already started using the platform but would like to learn more. Any GIS professionals, programmers or others interested in big-data and visualizations are encouraged to attend.

Data Collection with Android

Presenter(s): Miles Wacker (mwacker@mt.gov) – MDOT Geospatial Systems Analyst, Helena, MT

MDT The Montana Department of Transportation completed the Electronic Field Data Collection project in 2013 which resulted in an Android application built with the ArcGIS for Android SDK. This presentation will cover how requirements drove device selection, android application development and how the app fits into the ArcGIS stack, including future directions, challenges, and lessons learned.

GIS Technology for Military Munitions Remediation

Presenter(s): Meghan Burns (mburns@treccorp.com) – Montana Department of Military Affairs (DMA), Helena, MT

The Montana Army National Guard Unexploded Ordnance (UXO) Program is engaged in investigation and remediation activities at over forty Munitions Response Sites (MRS) in Montana. This presentation will demonstrate how Geographic Information Systems (GIS) technology plays a role in this complex process. The focus of this presentation will be on the largest remediation effort, located in the North Helena Valley, which is nearing completion.

Implementing a Montana PLSS Data Stewardship Program

Presenter(s): Stewart Kirkpatrick (skirkpatrick@mt.gov) – State GIS Coordinator, Montana State Library, Helena, MT

The Montana State Library Geographic Information Program is the Montana Spatial Data Infrastructure's theme steward for the cadastral theme as well as the closely related themes of Administrative Boundaries and Geodetic Control. The program considers the Public Land Survey System to be an integral part of the cadastral theme which is why it is distributed along with the tax parcels, conservation easements and other cadastral elements. In the past, maintenance and enhancement of the digital PLSS, known as the Geographic Coordinate Database (GCDB) or more recently CadNSDI, has been in the hands of the Bureau of Land Management. This arrangement is no longer meeting the needs of many users of PLSS data. The Geographic Information Program is currently working with the Esri Local/State Solutions Team, along with a several other stakeholders including Missoula County, the USFS, the Utah Automated Geographic Reference Center to explore alternatives to the GCDB tools and methodologies, using the Esri Parcel Fabric. The goal would be to responsibly move stewardship of CadNSDI (Montana) to the state to better meet stakeholder requirements. This presentation is intended for those interested in the future of the Montana Cadastral Database, a digital PLSS, and enhanced accuracy of associated cadastral features in general.

MAGIP Board of Directors Meeting

Presenter(s): MAGIP Board Members and Committee Members

The Montana Association of Geographic Information Professionals (MAGIP) Board of Directors will meet to discuss and adopt their 2013-2014 Work Plan. Budget Presentations from the various MAGIP Committees will be heard and discussed before the adoption of the 2014 budget. Everyone is welcome to attend and provide input to the organization.

-----Tuesday, December 10th----- 2013 MAGIP Fall Technical Session

The ArcGIS-Online “Unconference”

Presenter(s): Nathalie Smith (nsmith@esri.com) – ESRI Regional Manager, Olympia, WA & Scott Moore (smoore@esri.com) ESRI Solution Engineer, Olympia, WA

This workshop is designed for attendees who have an ArcGIS Online subscription and who want to participate in discussions on best practices for:

- Managing an ArcGIS Online subscription
- Using ArcGIS Implementing an ArcGIS Online subscription
- Online to provide maps and apps for your customers
- Providing access to your GIS data on any device
- Enabling self-service mapping using your authoritative GIS data

The format will be an open schedule grid, which allows all attendees the opportunity to suggest session topics (related to ArcGIS Online) at the beginning of the workshop. Suggested topics can also be sent in advance. The topics to be covered will be voted on at the beginning of the workshop. Although the workshop will not be hands-on, we will make sure that, where appropriate, the selected topics are both discussed and demonstrated.

ESRI Hands-On Learning Lab



Presenter(s): ESRI Staff – Self-Paced Content

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New features of the RMRS Raster Utility Toolbar: A focus on Predictive Modeling

Presenter(s): John Hogland (jshogland@fs.fed.us) – US Forest Service Rocky Mountain Research Station, Missoula, MT & Nathaniel Anderson (nmanderson@fs.fed.us) – US Forest Service Rocky Mountain Research Station, Missoula, MT

The RMRS Raster Utility is a free, object oriented .NET library packaged as an ESRI add-in toolbar that simplifies data acquisition, sampling, and statistical and spatial modeling while reducing the processing time and storage space associated with GIS analysis. This talk will give an overview of some of the key aspects of the toolbar including installation, functionality, and background of the RMRS Raster Utility project. Specifically, we will highlight newly added statistical libraries that have been developed for the project, as well as some of the benefits associated with using these libraries and tools to perform complex testing and predictive modeling. For more information about the RMRS Raster Utility toolbar please visit our website at <http://www.fs.fed.us/rm/raster-utility/>.

High Level Overview of DEQ's Enterprise Geodatabase and its Evolving Architecture

Presenter(s): Chris Stump (cstump@mt.gov) – Montana Department of Environmental Quality, Helena, MT & Nat Carter (ncarter@mt.gov) – Montana Department of Environmental Quality, Helena, MT

Montana Department of Environmental Quality (DEQ) GIS workflows, analyses, and operational requirements are many and varied, and constantly change as a response to new technology, software upgrades, and overall business growth. To effectively manage and maintain current and evolving business processes, DEQ GIS staff has implemented data standards in conjunction with dependable, automated workflows and processes to ensure data-use consistency and reliability. This presentation is a high level overview of DEQ's Enterprise Geodatabase and its evolving architecture, focused on internal and external data distribution, software version distribution, data package creation, and web mapping service automation. We will also briefly showcase code and data management, web mapping products, and future field data collection workflows.

USGS Volunteer Geographic Information Web Editor for Structures

Presenter(s): Lance Clampitt (lsclampitt@usgs.gov) – US Geological Survey, Bozeman, MT & Michael Fashoway (mfashoway@mt.gov) – Montana State Library, Helena, MT

The U.S. Geological Survey (USGS) in cooperation with the Montana State Library is currently seeking volunteers to aid in collecting and verifying structures data for The National Map (TNM) and the Montana Structures & Addressing Data Framework. The USGS, National Map Corps aims to improve this topographic information via volunteered geographic information (VGI). The Montana

State Library and the USGS intend to work together to promote and manage the publically available on-line geospatial VGI web editor to gather and improve upon structures data. This presentation will describe the program and demonstrate a customized OpenStreetMap platform that enables users to edit this data and improve the state and national structures data holdings.

Working with a Large Amount of Climate Data in a Time Series

Presenter(s): Michael Sweet (michael.sweet@umontana.edu) – Montana Climate Office, Missoula, MT

The Montana Climate Office was recently designated as steward for Climate as Montana's 15th Montana Spatial Data Infrastructure (MSDI) layer. A brief overview will be presented on the Climate layer products and general outlook for 2014. The presentation will touch base on a few of the challenges of working with large amounts of dynamic GIS data in a time series, and delivering that information to the user community.

Building an In-House Tablet Application for Field Appraisers

Presenter(s): Christian Hinderman (chinderman@mt.gov) – Montana Department of Revenue, Property Assessment Division, Helena, MT & Val Cannon (vcannon@mt.gov) – GIS Analyst, Montana Department of Revenue

The Department of Revenue needed a solution to provide our appraisers with parcel maps and property data in the field. We decided to try developing a solution in-house, choosing an ArcGIS Runtime WPF application for a Windows 8 tablet pc. Despite a lack of development experience, we concentrated on a simple interface and were able to design a design a lightweight application currently being field tested by 16 appraisers across the state.



R Language Workshop

Presenter(s): Cody Custis (ccustis@mt.gov) – Montana Department of Public Health and Human Services, Helena, MT

In recent years the R Language has become the working language of data intensive research. One of the outstanding strengths of the R language is the ease of programming extensions to automate the analysis and mining of almost any data type. R is a language and environment for statistical computing and graphics. R provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, and graphical techniques, and is highly extensible. R is available as Free Software. This workshop provides an overview of the basic knowledge for writing functions and programs in R. Participants are encouraged to bring their own laptops with R installed. Any needed libraries can be installed during the workshop.

Inexpensive representative sample selection methods using a multivariate two sample Kolmogorov-Smirnov test

Presenter(s): John Hogland (jshogland@fs.fed.usv) – US Forest Service Rocky Mountain Research Station, Missoula, MT & Nathaniel Anderson (nmanderson@fs.fed.usv) – US Forest Service Rocky Mountain Research Station, Missoula, MT & Rob Ahl, US Forest Service Rocky Mountain Research Station, Missoula, MT

Representative, unbiased training data are necessary to develop useful classification and predictive

models. Many people have described sampling strategies such as simple and stratified random sampling that help insure the collection of both a representative and an unbiased sample. However, in the field these approaches often present significant implementation challenges from both a logistical and economic standpoint, causing many analysts to adopt a “purposive” sampling scheme to increase accessibility and reduce costs. In this paper we present a methodology that can be used to minimize the logistical and economic impacts of probabilistic sampling while maintaining the desired attributes of being unbiased and representative. As a case study we present a biased sample derived from easily accessible locations and demonstrate how a multivariate Kolmogorov-Smirnov test can be used to determine if that sample is representative of the population. From the results of the Kolmogorov-Smirnov test, we demonstrate how sampling units of a biased sample can be subset and supplemented to match the distribution of the population for a given set of explanatory variables. We hypothesize that while a random sample derived from a subset of the population based on ease of access can result in an unrepresentative sample of the population, a purposely derived sample, randomly chosen from that subpopulation and supplemented with observations from outside the subset to match the distribution of predictor variables from the population is both unbiased and representative.

Montana Geographic Names

Presenter(s): Gerry Daumiller (gdaumiller@mt.gov) – GIS Analyst, Montana State Library, Helena, MT

The Montana State Library provides a Geographic Names layer that is based on, but different from, the Geographic Names Information System provided by the U.S. Geological Survey. I will present an overview of what improvements have been made to the layer. I will discuss the full design of the GNIS database at USGS, including alternate names and secondary points for features that are not currently available from MSL. I will talk about how to deal with errors you find in the GNIS. If time permits, I will also discuss the work of the Montana State Names Advisor and the process for adding or changing names of natural features in the GNIS. The State Names Advisor is responsible for providing the State's recommendation to USGS on all such proposed changes in Montana.

GIS Integration into Google Earth

Presenter(s): Ron Edwards (wsd363@3rivers.net) – Manager, Big Sky Water and Sewer District, Big Sky, MT

Practical How-To applications for using GIS data available from the Montana State Library and other local GIS providers and integrating that data into Google Earth. Big Sky is an unincorporated resort community that has 2,700 billable accounts. Ron has GPS mapped most of the water and sewer system infrastructure for the resort. BSWSD uses this information by converting it to Google Earth compatible files that operators use routinely to operate and manage the system. Primarily from a utility perspective, this presentation will demonstrate how to use GPS data and then convert this data to Google Earth KMZ files which are a user friendly format. This is done with a couple of very inexpensive software tools that small water and sewer system managers can afford.

-----**Wednesday, December 11th**-----
2013 Montana Government IT Conference
GIS Tract Presentations

MAGIP Benefits for the GIS and IT Community in Montana

Presenter(s): Allen Armstrong (allen.armstrong@gallatin.mt.gov) – MAGIP President, Bozeman, MT & Meghan Burns (mburns@treccorp.com) – MAGIP Vice-President, Helena, MT

The Montana Association of Geographic Information Professionals (MAGIP), provides training and professional development to GIS and IT professionals throughout Montana. MAGIP also is an influential group that can impact many state and local government actions through special interest groups, best practices, guidelines and policy decisions. MAGIP will present their most current work plan for the upcoming year and gather input from participants for additional future consideration by the Board of Directors.

Location Analytics in State Government

Presenter(s): Nathalie Smith (nsmith@esri.com) – ESRI Regional Manager, Olympia, WA

Location is fundamental to all aspects of business and is critical for State Government. Location Analytics is the integration of maps and geographic context to existing business systems and processes to produce greater analytic insight, better decisions, and improved outcomes. Location Analytics is how the State can leverage its IT investments and achieve better understanding of State run programs with discovering new patterns in the data, achieving greater insights, improving decision-making and ultimately achieving better outcomes. This presentation will highlight how location analytics takes advantage of the State's investment in GIS to increase the value of other data currently held in various Business Intelligence, ERP, or CRM systems via an enterprise-wide accessible and scalable platform.

Administering ArcGIS Server 10.2 using the Administrator API: Simple Scripts That Can Make Your Life Easier

Presenter(s): Scott Story (ssstory@mt.gov) – GIS Database Administrator, Montana State Library, Helena, MT

The Montana State Library will present their experience with the 10.2 full release of the ArcGIS platform and how it includes enhanced functionality, stability improvements, and better support for connectivity, security, and enterprise readiness. With the introduction of new extensions to ArcGIS for Server there is now an increased set of scripts and tools for supporting ArcGIS clients.

-----Thursday, December 12th----- 2013 Montana Government IT Conference GIS Tract Presentations

K-12 GIS Opportunities for Teachers and Students

Presenter(s): Allen Armstrong (allen.armstrong@gallatin.mt.gov) – Gallatin County GIS, Bozeman, MT & Carrie Shockley (cshockley@bozeman.net) – Bozeman Water/Sewer GIS Specialist, Bozeman, MT

The Montana Association of Geographic Information Professionals (MAGIP), provides an avenue to connect highly trained GIS, IT and Development professionals with interested K-8 educators, High School classrooms, 4-H student projects, FFA young adults, and University Service Learning Programs to train and offer real-world project experience for future professionals in this industry. If you believe that working with K-12 students will confine your mapping some of the most mundane features on the earth, you will be surprised. The projects these students can come up with will truly surprise the seasoned professional. Probably some of the best mobile application users out there are our K-12 students. MAGIP is now offering teacher Renewal Units for conferences/workshops attendance to train educators on web-based mapping, mobile applications and geographic science. MAGIP provides educational trunks to equip classes with field-ready GPS units for navigation, mapping and building GIS layers. Successful projects and lessons learned from K-12 projects will be discussed in this presentation.

Mobile Application Development at the State Level

Presenter(s): Miles Wacker (mwacker@mt.gov) – MDOT Geospatial Systems Analyst, Helena, MT

Montana's Department of Transportation has built a successful cross platform application, MDT Travel Info, that provides traveler information focused on the State of Montana. For agencies looking to develop similar applications for their customers, the presentation will include a high-level overview of the application, the technology used and lessons learned from developing and publishing mobile apps. Governments are changing to meet the needs of their customers and provide a level of information access the public is becoming accustomed to.

Tapping Into the Power of ArcGIS Online Through the State's Enterprise Subscription

Presenter(s): Erin Fashoway (efashoway@mt.gov) – GIS Analyst, Montana State Library, Helena, MT

The ArcGIS Online Community is growing rapidly. Access to online web mapping is becoming easier every day. This presentation will focus on how the use of ArcGIS Online has evolved at the Montana State Library. We will discuss how we manage and maintain our accounts; how to use existing services; how to create new services; how to create new services within ArcGIS Online; and how to leverage the investment in Montana's Enterprise Subscription for web mapping applications.

Python Special Interest Group Meeting

Presenter(s): Members and Interested Members of Special Interest Group

If you are user of Python or connected with a group supporting users of Python, we encourage you to attend this MAGIP-Supported new Special Interest Group that is developing around the use and development of the Python language. MAGIP offers a forum for SIG members to share ideas, collaborate on projects, exchange technology and develop standards and procedures among their

special interest. A dedicated place and presence under the MAGIP web site for posting news and events as well as membership contact for all members to collaborate will be established. MAGIP SIGs have access to the MAGIP board in an advisory capacity that may affect policy, standards, work plans, etc.