MAGIP Spring Meeting 2015
Miles City, MT
Presentation Abstracts & Presenter Biographies

An Introduction to Location Intelligence
Bryant Ralston, Pitney Bowes

Nowadays it seems that the pervasive power of location is all around us. Our mobile phones know where they are and can even filter information by location. GPS, once only the domain of specialists and the United States military, is now ubiquitous and practically embedded in everything on our planet that moves. "Big Data" in motion is driving a good percentage of growth in the IT world and along with it the locationally-referenced "Internet of Things" seems to be emerging. No doubt, it's true: location is HOT! Location Intelligence (LI) is the capability to understand complex relationships between a location (of anything really) and information about it. This is done in order to drive better business decisions for the 21st century. Leveraging the power of Business Intelligence (BI) platforms, modern collaboration and communication tools and evolving location-based services, LI enables organizations to derive meaningful insight by harnessing "location, location, location." While organizations typically have their location data encoded in a wide variety of ways, formats and structures, LI solutions help them solve their toughest business problems, deliver compelling location-based services, manage their assets and help make the world more intelligent and efficient. Come to learn more about LI and how it is being applied by clients worldwide.

Database Efficiency, Polygon Size, and the Interpretation of Mapped Vegetation Characteristics
Robert Ahl, PhD, RedCastle Resources Inc/USFS Northern Region Geospatial Group

The USFS Northern Region Geospatial Group provides a wide range products and services to all Districts, Forest, and Regional Office specialists. One of those products is a constantly updated existing vegetation database called VMap. This database is produced for all national forests and grasslands in the Northern Region and is based on a regional vegetation classification system. An initial step in database production is converting the raster-based data into a vector dataset through a process known as image segmentation. The segmentation routine yields a set of image-objects, or polygons.

As the ability to segment imagery has advanced, users have requested increasingly finer delineations of vegetation patterns. While it is possible to achieve highly detailed delineations, the number of records in

resulting databases increases substantially and makes working with the product is computationally challenging. Addressing database efficiency has resulted in the production of larger and smoother delineations. While databases with larger and more generalized polygons are easier to work with, the fundamental depiction of vegetation patterns and characteristics is also affected. This is particularly evident in the depiction of tree size. Analyses on a test area in the Gallatin National Forest, using a gridded segmentation, clearly show an inverse relationship between polygon size and mean tree size estimates, and the percentage of forest that is mapped into the large tree size class. In very simple terms, increasing the size of polygons tends to reduce the overall estimate of tree size. Similarly, for every acre increase in polygon size, the amount of forest that is mapped into the large tree class decreases by roughly a quarter percent. Following this pattern, less than one percent of forest polygons are mapped as large trees when their size exceeds three acres. While this is partly an artifact of mapping process, it does point out that collections of large trees do not generally occur over large areas, and that one must carefully consider the attribute being mapped when selecting a minimum mapping unit.

Effective Use of Mapping in Growth Policy Development
David Corcoran, Montana Department of Commerce, Community Development Division

Growth Policies are one of the foundations of land use planning in Montana. These documents can easily be enhanced with data-driven analysis and mapping. This presentation will explore some of the ways in which GIS can be used to help make informed planning decisions.

Geoprocessing Procedures for Querying Wetland/Riparian Attributes and Importing Geometry into the National Hydrography Dataset (NHD)
Maya Daurio, Montana State Library Geographic Information

The National Hydrography Dataset (NHD) is provided in Montana as a high-resolution dataset and was originally based on 1:24,000-scale topographic mapping. There is an increasing need for local resolution NHD data among the Montana NHD user community. One way to address this need is to leverage already existing higher resolution datasets for integration into the NHD, such as National Wetlands Inventory (NWI) data produced by the Montana Natural Heritage Program (MTNHP). The NWI and the NHD are both surface water datasets that share many of the same features, and the NWI data can be imported into the NHD based on queries of wetland classifications that correspond to NHD Feature Types or Feature Codes. The geoprocessing procedures associated with querying and preparing the NWI data, deriving centerlines from 2D riverine features for use as NHD Flowlines, and importing the NWI data into the NHD will be presented.

Additionally, the Montana State Library Geographic Information Program (GeoInfo) recently developed a Montana Hydrography Edit Request Viewer to allow NHD users to interactively submit NHD revisions to GeoInfo staff. This not only provides an easy way for NHD users to submit edits but also takes advantage of the on-the-ground, local knowledge of many of Montana's NHD users in improving the accuracy of the data. A brief overview of this application will be provided.

GISP Update

Leslie Zolman, Montana Department of Commerce, Census & Economic Information Center

Learn more about what a GISP is and about the changes in the application process due to the new test requirements.

High Accuracy GNSS alongside iOS and Android devices for GIS Data Collection

Jackson Beighle, Electronic Data Solutions

Smart devices such as iPads and Android tablets are becoming more and more popular for collecting GIS data in the field. They are affordable, readily available, and powerful and offer benefits that GIS folks like such as a larger view for displaying imagery and completing an attribute form. The "tablet craze" as you might call it will continue to grow for GIS professionals as users migrate to cloud-based applications like Esri Collector and Trimble TerraFlex. Further adding to the use of smartphones and tablets in GIS are Bluetooth GNSS receivers that offer submeter or better accuracy. In some cases, GIS data collection requirements are in the centimeter range especially in applications like water and wastewater where high accuracy vertical data is important.

Attend this presentation and see how your organization can be more productive in the field by combining smart devices and high-accuracy GNSS for a complete solution.

Humanitarian GIS and the Ebola Outbreak

Leslie Zolman, Montana Department of Commerce, Census & Economic Information Center

How can GIS skills be used to support humanitarian needs? This presentation will provide an overview of how you can get involved doing volunteer humanitarian work from your home or volunteer for volunteer mission deployment. Highlights will include my work with the World Health Organization and the UN on the Ebola outbreak last January and remote missions I assisted OpenStreetMap with from Montana. I will also provide a peak into the collecting of Ebola data and creating of the WHO Ebola story map.

It's Time to Start Planning for NextGen 9-1-1 in Montana

Michael Fashoway, Lisa Kelly, Jason Horning and Annette Cabrera

You've seen the national headlines such as this one: "911's deadly flaw: Lack of location data A technology shortfall can lead to tragic results, a national investigation shows. John Kelly and Brendan Keefe , USA TODAY". From that article comes this quote which sums up the problem: "It is now easier than ever for victims to reach 911, but harder than ever for responders to reach them".

Current 911 infrastructure is not designed to handle today's technology. Accurate, current location data is critical for prompt emergency response. Coordination between all sectors of public safety personnel,

telecommunications providers, Information Technology and GIS professionals will be required to implement a successful NG911. This session will provide an overview of NG911, where we stand in Montana with regard to GIS data and telecommunications and how North Dakota is moving forward.

Next Generation 9-1-1 and Local Government GIS
Michael Fashoway, Montana State Library Geographic Information

E9-1-1 has long been a primary driver for GIS at the local government level. Road centerlines, address points, Public Safety Answering Point (PSAP) boundaries and other GIS datasets were developed to aid 9-1-1 call takers in locating an emergency and helping to guide emergency responders to the correct location. With Next Generation 9-1-1 (NG9-1-1), GIS becomes the mechanism by which 9-1-1 call are located and routed to the correct 9-1-1 call center. The transition to NG9-1-1 will have profound impacts on how GIS data are managed and used at the local level. This presentation will provide background on NG9-1-1, the GIS data needs for NG9-1-1, standards associated with NG9-1-1 GIS data, and steps for preparing datasets for NG9-1-1.

Montana 9-1-1 Network & NG Prep
Lisa Kelly, Century Link

This presentation will focus on how the 9-1-1 Network and database will use geo-spatial data for routing calls in Next-Gen 9-1-1. We will touch on a high level the Network components involved when transitioning from the legacy MSAG type routing to Next Gen routing.

North Dakota GIS Efforts in Support of Next Generation 9-1-1
Jason Horning, North Dakota Associations of Counties

Next Generation 9-1-1 at its core is dependent upon timely, authoritative and seamless GIS information for 9-1-1 call delivery to a Public Safety Answering Point. The process of building and maintaining 911 GIS data primarily for local or small regional use will be replaced with agreements and new processes for aggregating datasets for large regions or an entire state.

Hear how North Dakota has gone about tracking this challenge including its current tools, processes, and methodology for migrating from Enhanced 9-1-1 to Next Generation 9-1-1.

Leveraging Multi-sensor Precipitation Data for Environmental Monitoring in Remote Areas of Eastern Montana and Wyoming
Bryan Swindell, SWCA Environmental Consultants

Extreme precipitation events are common in the Plains of eastern Montana and Wyoming. Development projects that disturb the topsoil require close monitoring to prevent erosion into streams and wetlands. However, monitoring is made more difficult by the remote, sparsely-populated nature of these areas. Extensive areas of the Plains are not covered by the National Weather Service Doppler NEXRAD

network, and instrumented weather stations are widely-spaced. The Weather Service has developed a multi-sensor approach to estimating precipitation across the CONUS that addresses the shortage of ground-based data in remote areas. Nationwide precipitation datasets are published daily and are accessible online in a geospatial format. This presentation will introduce the data, show how it can be processed with Python scripting for use in a GIS, and demonstrate its application in an environmental monitoring framework.

MAGIP Board Update
Meghan Burns, MAGIP President

The mission of the Montana Association of Geographic Information Professionals (MAGIP) is to stimulate, encourage, and provide for the advancement of an interdisciplinary approach to the use of geographic information. We accomplish this through our committees: Professional Development, Education, Technical, and Operations & Business. This presentation will highlight MAGIP's accomplishments through the June 2014 – May 2015 Board term.

Managing the PLSS CadNSDI and Associated Data in a Parcel Fabric
Maya Daurio, Montana State Library Geographic Information

The PLSS CadNSDI is the Public Land Survey System (PLSS) cadastral reference components of the Cadastral data of the National Spatial Data Infrastructure (CadNSDI), which complies with FGDC standards and guidelines. The Montana State Library Geographic Information Program undertook an effort over a year ago to migrate the PLSS CadNSDI into a parcel fabric in order to manage the data, implement accuracy adjustments based on the availability of geodetic control throughout the state, and publish updates to the data on a regular, quarterly basis. Parcel fabrics represent a continuous surface of connected polygons, lines, and point features. A fabric least-squares adjustment is performed to improve the accuracy of this network by deriving more accurate coordinates for parcel corners using control points. Parcel fabrics are used primarily by local governments, and Montana was the first to utilize the fabric to manage a statewide dataset and specifically, the PLSS CadNSDI. Other western states are following suit and taking advantage of our experiences and documentation to implement their projects. This presentation will go over the processes, workflows, and lessons learned involved in migrating data to a parcel fabric, managing and improving data within the fabric, and managing associated data aligned to the PLSS.

Status of the Montana Geographic Names Framework
Gerry Daumiller, Montana State Library Geographic Information

The Montana Geographic Names Framework (MGNF) is based on, but different from, the Geographic Names Information System (GNIS) provided by the U.S. Geological Survey. The presentation will explain the data available in the MGNF and the GNIS and give examples of the edits that have been made to the MGNF that are not available in the GNIS. Attendees will learn how to report errors in the database(s) and get them corrected. If time permits, the role of the U.S. Board on Geographic Names will be

discussed, including the rules for changing official names and the state's advisory role in the name change process.

The Park County Atlas: A Transition from Static to Interactive Geospatial Data
Henry Hansen, Park County

The Park County Atlas is a combined source of maps, figures, photos, and text that concentrates on Park County's economic, demographic, and historical data. The scope of this presentation will encompass our development process for an interactive, web based atlas from a static paper atlas. More specifically, the presentation will cover: choosing between Esri web applications (storymaps), recognizing and overcoming obstacles throughout the development process, and capitalizing on our local IT setup. This presentation is geared toward individuals that have beginner/introductory knowledge of story maps.

The Survey Grade Accuracy World meets GIS and LiDAR (A Planning, Right of Way and Design Tool)
Wallace Gladstone, Northern Engineering & Consulting, Inc. and Hunter Simpkins, Robert Peccia & Associates Inc.

The benefits of merging the survey grade accuracy world with the GIS world. Imagine a world that allows anyone doing surveying, engineering and GIS development to coordinate and associate all projects onto one simple mathematical base. A world where the DOT, Land Departments, Irrigation, subdivision designs (water, sewer, and plats), DNR, Forestry, Utilities and all others involved with development and mapping will be able to put all data onto one common survey grade base map. The Blackfeet Nation, Crow Nation, Fort Belknap Indian Community, Fort Peck, and Wind River Reservations were awarded the ACEC Engineering Excellence Award in 2013 and 2015 for such a project.

What You Need to Know about Map Projections
Gerry Daumiller, Montana State Library Geographic Information

This presentation provides a quick refresher on what map projections are and why they are necessary. The concepts of map datums and coordinate systems will also be explained.

The main focus of the talk is to make you aware of the effect that these things have on the accuracy of measurements you make when you are using GIS. You should come out of the talk being able to recognize situations where your GIS software or a web mapping application can give you wildly inaccurate numbers for distances and areas, and have an idea of what to do to make them better.

Working with Attachments from ArcGIS Collector
Hunter Simpkins, Robert Peccia & Associates Inc.

The ArcGIS Collector app is a great way to collect data in the field. The app makes it easy to take pictures and collect attributes and sync those data back to the ArcGIS Online platform. But what if you need to download those data to use in your desktop workflows or provide the data and photos to someone who

doesn't know GIS? With some simple Python scripting, you can batch export the photos to folders of your choosing, rename the photos however you want them to appear, and write the output path of the photos to the attribute table. This presentation will demonstrate some techniques to automate your data collection and photo downloads.

<u>**Hands-on Workshops**</u>

Esri ArcGIS Pro: An Introduction
TJ Abbenhaus, Esri

The 10.3 release of ArcGIS for Desktop includes ArcGIS Pro. This is a new desktop application for 2D/3D mapping, editing, visualization, and spatial analysis. This workshop will introduce functionality in this new and exciting desktop application. The workshop will consist of a combination of presentation, demonstration, and hands-on exercises using the computer lab at Miles Community College.

> **Prerequisites:** ArcGIS Pro requires an ArcGIS Online organizational account. Participants are encouraged to use their existing accounts. If you do not have an account a temporary one will be provided for you.

Extend ArcGIS to your Mobile Workforce
TJ Abbenhaus, Esri

Learn to put your Collector for ArcGIS application to use quickly and effectively. This app is included with all ArcGIS Online organization subscriptions. Esri staff will step through mobile GIS workflows supported by this app.

- Capture, update, and report spatial and tabular information directly from your Android or Apple device
- Plan routes and get directions
- Improve your data quality with data-driven forms
- Capture photos and video
- Integrate information into your organization's GIS
- Configure the app to fit your organization's workflow

Collector for ArcGIS improves your productivity with intuitive data collection whether your device is connected to the internet or not. We will touch on other available applications and tools available through ArcGIS Online.

> **Prerequisites:** The Collector for ArcGIS application requires an ArcGIS Online organizational account. Participants are encouraged to use their existing accounts. If you do not have an account a temporary one will be provided for you.

> **NOTE:** Participants must bring their own Android OS or iOS devices for this workshop. The Collector for ArcGIS application should be installed on your device prior to coming to the workshop.