



The Vector

Newsletter of the Montana Association of Geographic Information Professionals

April 2009

The Corner

Kris Larson, MAGIP President

Robin Trenbeath, State Geographic Information Officer

MAGIP will soon have several new Board members. Besides the appointed positions for committee chairs, up for election were two at-large and the Vice President position. Elections just closed and announcement will be made within the week.

In the last issue of the Vector, there was an article on Best Practices. Those guidelines have been adopted by MAGIP and will likely be approved by MLIAC at their June 4th meeting. Once adopted, they'll be posted on the websites. If you have questions, comments or concerns, talk to Michael Fashoway --- Mfashoway@mt.gov.

MAGIP has endorsed the GISP (GIS Professional) certification through the GIS Certification Institute. GISP endorsement will be on MLIAC's agenda at the next meeting. See the related article in this issue of the Vector.

Statewide aerial Orthoimagery is one of Montana's most critical data infrastructure layers. The National Aerial Imagery Program (NAIP) flew the last update to statewide imagery in 2005. This product sits behind many web-based applications like the Montana Cadastral (parcel) website, the State Library's Digital Atlas, and many other organizational business processes. By the time the state can be re-flown and the imagery processed, the existing information will be at least five years old. In terms of changes to communities and the landscape, a lot has happened during those intervening years.

Assuming we can raise the remaining funds, it is our intent to enter into a contract with the US Department of Agriculture/APFO to re-fly the state this summer; processing completed by early 2010. The local consortium of Federal State Offices, State agencies, local governments, tribes, non-profits and private sector partners has raised over \$400,000 of the approximately \$550,000 necessary to match the national-level investment of \$2,340,000. However, this still leaves us somewhat short of our goal. If your office can help or if you have ideas about other entities that may be interested in contributing, contact Robin Trenbeath at rtrenbeath@mt.gov or (406) 444-2440.

Finally, a MSDI Theme Review Committee under the guidance of MAGIP and the MLIAC has initiated a process that will formalize current stewards and establish additional theme stewards where vacuums exist. The committee has prepared a questionnaire and started the process of gathering information.

Stay involved, spread the word, keep in touch. Help create the kind of geographic community that you'd like to see.

Let's Hear from the Board of Directors

What is the most difficult GIS project you've worked on?



Kris Larson, President

It was probably back in 1989 when we didn't have any DATA!! My job, as a lowly intern at NRIS, was to actually create a ~DEM (a Kris-DEM!) from scratch. I had to lay a piece of mylar with a grid drawn on it over the top of a 24k quad, digitize all the points on the grid, and then interpolate the elevations. It was painful!

But in the end, we came up with a good demonstration project for siting a potential power line.

Lee Macholz, Secretary

I can't pinpoint any one project that has been the 'most difficult.' However, there is one task that seems to be one of the most challenging in every project I do. That is the task of determining user requirements. What is it that the person I am working with/for is REALLY after. What question do they REALLY want to ask of the GIS. What do they REALLY want to see or do in the final application? What can I provide them that will REALLY help them in making a good decision about wildland fire? Good communication can be difficult, but oh so important!



Tony Thatcher, Treasurer

All GIS projects have their challenges, so it is difficult to choose a single project. One that had a variety of hurdles was a recent project with the Montana Department of Revenue developing a set of tools to value agricultural lands. Montana has about 50 million acres of privately owned land in agricultural production. With over 250,000 individual parcels in agricultural production, the DOR needed a consistent and equitable system for determining the taxable value of a parcel. To support this effort, the DOR contracted my company, DTM Consulting, Inc., to help develop a suite of GIS and database tools for analyzing and reporting land use and productivity values for every agricultural parcel in the state. The tools integrate both GIS and database technologies to generate productivity values for all agricultural lands. Information from cadastral, agriculture and forest land use, SSURGO soils and NASIS datasets are merged to calculate a productivity value for each parcel/land use/soil combination. These records output to an external database where queries adjust and summarize the data according to a defined set of rules. The biggest challenge was dealing with inconsistencies in each of the data sets. Parcel boundaries do not line up with land use boundaries. The NASIS soils database lacks productivity data for all soil units. The SSURGO data sets have areas that have not been mapped. Each of these challenges required developing a set of tools, rules, or processing techniques to allow productivity values to be calculated for each parcel. In the end, over 250,000 individual maps were produced and mailed for landowner review.



Erin Geraghty, Vice President

...when I was a GIS "Newbie," at the North-western Water & Sewer District in Ohio. The project was to convert the entire water & sewer infrastructure into a GIS Database; first a pilot project and if that was successful a full conversion. I was the only one who knew about GIS in the organization and when the project started I was still an undergraduate at Bowling Green State University working as a quasi-project manager at intern job status! We hired a GIS Contractor that used prison labor to do the digitizing and I actually visited the prison twice: I had an inmate tell me he would cut someone for a Big Mac. The hard part of the project was working with the GIS contractor for several reasons: things were not communicated well; honesty was not their best quality; the blame game was used often, etc. Before the project ended the company went belly-up for some sort of tax problems and there were rumors that the owner was on the run from the Feds. I never did find out if that inmate was able to safely get a Big Mac...needless to say it was a learning experience of a lifetime!



Bryant Ralston

...was utilizing PC ArcInfo and ArcView 2.1 to spatially and temporally (that's the tough part) assess bison grazing patterns on a LTER (Long Term Ecological Research) site called Konza Prairie affiliated with Kansas State University near Manhattan, Kansas. This project required PC ArcInfo SML (Simple Macro Language versus Arc Macro Language) custom code to summarize the GIS data by different time slices. Some GIS Researchers have written about time being the fourth dimension of GIS (x, y, z, t) and I surveyed the GIS literature for handling time circa mid 1990s. Even though I wanted to at the time (it didn't exist yet) I would have liked to utilize the animation functionality of ArcGIS to show researchers how the bison grazing patterns changed throughout the year and quantify how other variables were influencing their patterns (water, temp, burning frequency, biomass, etc).

Michael Fashoway, Technical Committee

I've found that while the technical aspects of a GIS project can be challenging, the most difficult projects are those that require coordinating with multiple stakeholders, whether that is within a single organization or across a state. So, in that way, pretty much any project I've been involved with since moving to Montana could be considered my most difficult project.



Van Shelhamer, Education Committee

Most challenging project at present is mapping and building a database for Irrigation Canal Management.



A Federal Agency Perspective GIS In The Natural Resources Conservation Service

- Catherine Maynard

GIS In the Agency

From a remote field office in Wibaux, to our State headquarters in Bozeman, NRCS employees in Montana use GIS, GPS, and remote sensing data on a daily basis. The basic computer in every NRCS field office has the full suite of ESRI GIS software, along with custom ArcGIS applications known as the 'Customer Service Toolkit'. The Toolkit uses consistent data sets and templates to create conservation planning maps that display orthoimagery, soils, cadastral, roads, hydrography and other GIS data for farms, ranches, and other planning units. Whether the information need is driven by rangeland management, implementing precision agriculture, conserving habitat for native plant and animal species, or countless other resource conservation efforts, GIS is used as a planning tool.

The USDA has long been at the forefront of federal agency adoption of geographic systems technology. Over ten years ago the NRCS began instituting the mandatory use of GIS for all their conservation planning and soil mapping efforts. Today, throughout the U.S. and in every state, GIS data stored on USDA servers is managed with a consistent structure of data organization and naming conventions. This allows NRCS employees to move freely between offices or even states and readily perform the basic mapping tasks that support efficient conservation planning. Accomplishing this successful example of 'enterprise-wide' GIS adoption required years of planning and input from hundreds of specialists. Planning documents dating back to 1998 reflect the careful strategic approach applied to this monumental effort. As state agencies, counties, tribes, and businesses in Montana grapple with incorporating GIS into their core enterprise activities, the NRCS example is well worth a close look.

NRCS Data in Montana

Most GIS users in Montana have come to rely on the high resolution digital aerial imagery (NAIP) as an important background theme. But few realize that the NRCS, in partnership with the Farm Services Agency (FSA), has been working for decades collecting aerial photography, developing image data standards, and staying on the cutting edge of implementing remote sensing technology. That innovative drive, along with the USDA program that promotes state partnerships in the NAIP program, will result in a 2009 state-wide acquisition of 1-meter resolution, 4-band orthoimagery for Montana. What this means to the GIS community is that a single digital image product will contain the information we now have separately in the natural color NAIP and the color infrared (CIR) imagery that was collected in 2005.

At both the national and state levels, the NRCS provides stewardship for the soils data and the hydrologic units. These core Montana Spatial Data Infrastructure (MSDI) themes are readily available to all Montanans via the Montana State Library (MSL) Natural Resource Information System (NRIS) website. Also available through NRIS are the Relative Effective Annual Precipitation (REAP) data that have been developed by NRCS soil scientists. Each countywide REAP grid represents 30-year averages of precipitation that have been adjusted using 10-meter Digital Elevation Models (DEMs) to account for the effects of slope, aspect, and soil properties that influence plant available moisture. The NRCS is also responsible for measuring and reporting water supply forecasts, stream flow, and snowpack information which are updated monthly and available on the NRIS water information webpage.

What I have reported on here represent just a small sampling of the geographic information that is constantly being developed by the NRCS at the national and state levels. Although it is a relatively small agency, the integration of GIS into nearly every business function allows the NRCS to better serve the public and accomplish our mission ... "Helping People Help the Land".

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MAGIP Endorses GIS Professional Certification

As a grassroots organization of Montana based geographic information professionals, MAGIP recognizes the value of continual professional development for the membership in such a dynamic profession. To this end, the MAGIP board of directors has voted to endorse the GISP certification and has future plans to fully support MAGIP members with the appropriate content, documentation, information, and guidance to obtain this important certification if so desired.

The following Montanans are already certified GIS Professionals:

Allen Armstrong
Lydia Bailey
Keith Blount
Ted Chase
Lance Clampitt
Gregory Dillon
Joshua Dorris
Guy Dubois
Michael Fashoway
Ronald Frisbie
Jon Henderson
Carrie Higinbotham
Robert Holliday
Ricki Ann Ketterling
Stewart Kirkpatrick
Thomas Kohley
Kris Larson
Catherine Love
Duane Lund
Catherine Maynard
Tony Thatcher
Thomas Tully
Bill Ware
Jack Yates

For more information, go to <http://www.gisci.org/>