

Fall 2009

Issue 58

# GIS/LIS NEWS

The Newsletter of the Minnesota GIS/LIS Consortium

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## **MN GIS/LIS Consortium**

### **From the Chair**

By Rebecca Foster, 2009 Chair

**MnGeo:** The Consortium was honored to support and speak at the *Point of Beginning* meeting on June 24 that wrapped up the Drive to Excellence "Enterprise GIS" project and introduced the new Minnesota Geospatial Information Office (MnGeo) by providing a grant for refreshments.

**Grant Money:** Are you looking for financial or advertising support for your GIS/LIS activity or event? Did you know that the MN GIS/LIS Consortium can provide funding (typically less than \$1000 per request since our funds are limited) for printing costs, mailing costs, meeting room rental fees, food services, speaker fees and advertisements for GIS/LIS activities or events in Minnesota? The request form and full instructions are available [here](#).

**2009 Fall Conference and Workshops:** Online registration is open and the excitement of returning to Duluth is approaching fast! All of you should have received a conference brochure describing this year's highlights for the 19<sup>th</sup> annual Fall Conference and Workshops on October 21-23. Visit our website for a full [Preliminary Program](#) with registration instructions. If you have any questions or comments, contact this year's Conference Chair, Jeff Storlie, at: [storliej@co.st-louis.mn.us](mailto:storliej@co.st-louis.mn.us).

**Salary Survey:** As part of its mission to support the GIS professional in Minnesota, the Consortium has historically conducted GIS skills/salary surveys. These surveys help develop a picture of current GIS salaries in Minnesota, with some ability to correlate that with job responsibilities and educational background. The results will help current professionals assess where they are and give people considering a career in the field a better idea what to expect. This will be useful both for job seekers and for employers. The results will be ready for the Fall Conference. The last salary survey was completed in 2002 and those results can be found [here](#).

**Consortium's Job Bank:** We have revised our [GIS Jobs link](#) that is on the lefthand side of our homepage. The site has been renamed "Job Bank". The Job Bank is hosted by the Consortium – anyone can post or search for a GIS/LIS job or internship within Minnesota and surrounding states (Iowa, North Dakota, South Dakota and Wisconsin). Positions may be full-time or part-time, paid or unpaid.

**Consortium's History:** How many of you know when the Consortium was formed or what its original name was? Check out our new [History link](#) on the lefthand side of our homepage to find out the answers.

In addition, we've scanned the earliest issues of MN GIS/LIS News, so now all past issues of our newsletter are [online](#) – see what the Minnesota GIS community was up to back through Fall 1988!

**Membership is Free:** The Consortium currently has 2500 members. Members include GIS/LIS professionals from local, state, and federal government agencies; business and industry; educational institutions; and nonprofits. Anyone can become a member by signing up at our website or, if you're already a member, please review your [member profile](#) and update if needed. I don't want you to miss out on an important training opportunity, E-announcement of current events, or the quarterly newsletter.

Looking forward to seeing all of you in Duluth!

### **Registration for the Annual Conference Is Open!**

By Jeff Storlie, 2009 MN GIS/LIS Conference Chair

It's time to register for the 19<sup>th</sup> annual Minnesota GIS/LIS Consortium Conference being held Oct 21<sup>st</sup> –Oct 23<sup>rd</sup> at the DECC in Duluth, MN.

**To register please visit our website at <http://www.mngislis.org>**

Review or download the [preliminary program](#) online. A final printed program will be included in your conference registration packet.

There will be full tracks of concurrent sessions, panel discussions, product demos, poster exhibition and a vendor reception. As always, there will be many great opportunities to network and socialize at all the entertainment events.

## **OVERVIEW**

### **Wednesday, October 21**

- Workshops (all at the DECC. Shared laptop policy - refer to registration)
- Welcome reception at the Duluth Curling Club

### **Thursday, October 22**

- Opening plenary: "The Geospatial Technology Revolution"
- Morning/afternoon concurrent sessions
- Awards luncheon
- Scholarship undergraduate and poster competitions
- Exhibit hall and vendor reception
- 5K fun run/walk
- Beer tasting

### **Friday, October 23**

- Morning concurrent sessions
- Scholarship graduate competition
- Brief annual member meeting during working lunch
- Closing lunch and plenary: "*Friendship Fires – Life in the Northwoods*"

- Member drawing with door prizes

## WEDNESDAY

**Workshops:** The event begins with workshops held in the DECC. Come to the Lobby to register, receive your program materials, and enjoy a continental breakfast. Or join us for lunch at 12:15 and attend an afternoon workshop. With a broad offering of hands-on and lecture-style workshops on a variety of topics, we hope that everyone will find something of interest.

**Welcome Reception:** That evening (5:00 – 10:00), be sure to stop by the Duluth Curling Club, located within the DECC complex. The Consortium will host an evening social hour with complimentary appetizers.

You will have a chance to sign up at 7:00 p.m. at the curling club (\$15.00 and please wear a clean pair of sneakers) to participate in a mini bonspiel (curling tournament). Please join us for a fun-filled event.

## THURSDAY

**Opening Plenary:** Conference registration begins at 7:30 a.m. and we lead things off with a great plenary session. Peter Batty will address the conference and speak about:

“The Geospatial Revolution”  
<http://geothought.blogspot.com/>

**Concurrent sessions** begin immediately following the keynote. Tracks of concurrent sessions run throughout the conference schedule, providing information on a vast array of GIS/LIS-related topics. Learn how others have implemented solutions to issues you might be having, find out about new technology advances, and listen to recent research in a field of interest.

**Awards Lunch:** The Thursday lunch program includes the presentation of the Consortium’s certificates to the scholarship winners from each school; its three Polaris mid-career awards and one Lifetime Achievement award; and a Governor’s Commendation to an outstanding GIS project.

**Student Competition:** Outstanding students from across the state will be competing for cash prizes in a special presentation competition. Watch for the competition entries among the student track presentations and in the poster gallery.

**5K Fun Run/Walk:** Get outside and get moving! Join us for a “5K” on Duluth’s Lake Superior walkway. The route winds along the Duluth harbor and around Canal Park. Timing devices will be provided or set your own pace. Changing facilities will be provided at the DECC. All participants registered will receive a T-shirt commemorating the run/walk event.

**Exhibit Hall, Vendor Reception:** The exhibit hall will be open throughout the conference, and vendors will be on hand to share their latest technologies and services. A new raffle will be held during the vendor reception, following the concurrent sessions. All proceeds from this event benefit the Consortium's scholarship program. You can sample the hors d'oeuvres during the reception as you make your way through the hall and poster gallery where you can meet and talk with the poster presenters and exhibitors.

**Beer Tasting:** Join us in the evening in the Ballroom at the Holiday Inn for the annual beer tasting. Home brewers are welcome to bring samples to share. Tickets can be purchased at the door for \$15 (or \$20 with a glass). All proceeds from this event support activities to foster and recognize exceptional up-and-coming GIS professionals through the Consortium's student awards program.

## **FRIDAY**

**Sessions and Closing Plenary:** The conference concludes with concurrent sessions in the morning followed by lunch and the closing plenary session. Our closing lunch will include an awards presentation to this year's student scholarship competition winners and a brief annual member meeting. Closing the conference will be Sam Cook, Duluth News Tribune Outdoor writer, presenting, "Friendship Fires – Life in the Northwoods". Door prizes will be drawn after the closing. Must be present to win!

It should be a great conference with quality workshops, engaging sessions, full exhibit hall, quality entertainment and an excellent opportunity to reconnect with friends and acquaintances. Please pass on the word about the conference to others who may not get our materials directly or may be interested in attending.

To register, visit our website at: <http://www.mngislis.org>. While there, you can learn more about the conference and make hotel reservations.

Thanks to each and every one of you who support the Consortium, and we hope to see **you all in Duluth!**

For more information, please contact Jeff Storlie at: [storliej@co.st-louis.mn.us](mailto:storliej@co.st-louis.mn.us) or 218-725-5022.

## **Past Newsletters Now Online**

All issues of MN GIS/LIS News are now [online](#) in PDF format, including Issues #1-20 which had been missing. Now it's easy to find out what the MN GIS community has been up to for the last 21 years.

From its beginning as *Natural Resources GIS News* in Fall 1988, the all-volunteer newsletter has covered hot issues, successes and challenges as technology and the community have evolved. Fifty-eight issues show how much things have changed, and yet, how much has stayed the same, especially the community's cooperative spirit.

A big thanks to Al Laumeyer, Goodhue County GIS Office, who volunteered to scan the paper copies, and Gerry Sjerven, Consortium webmaster, who posted the files. And thanks to all of you who have contributed articles and editing expertise which make the newsletter possible.



*Will Craig at first Consortium conference, 1991*

### **State**

#### **Minnesota Geospatial Information Office Created**

By David Arbeit and Fred Logman, MnGeo

The Minnesota Geospatial Information Office (MnGeo) was created during the 2009 Legislative session, officially recognizing for the first time the importance of geospatial technology by tasking MnGeo with broadly defined coordination responsibilities and authorities. With staff and resources from the Land Management Information Center, which was retired, the transition from LMIC to MnGeo began in earnest on June 24, when Department of Administration Commissioner Reger appointed David Arbeit the State's first Chief Geospatial Information Officer.



The appointment was announced at *Point of Beginning*, a community forum and celebration attended by more than 90 partners from federal, state, local and regional government, academia, private sector and non-profits who had participated in the Drive to Excellence process that resulted in MnGeo's creation. *Point of Beginning* was chosen as the name for this event as a reminder that creating the MGIO was not the end of a process, but the beginning of one dedicated to a shared vision where "Minnesota improves services statewide through coordinated, affordable, reliable and effective use of GIS." *Point of Beginning* slides are available [online](#).

Since the June 24 celebration, staff at MnGeo and its partners, especially a Transition Advisory Team (TAT) comprising of members of the Governor's Council on Geographic Information and its committees, have been laying the groundwork for introducing the MnGeo "brand" and MnGeo's advisory structure at the fall GIS/LIS conference in Duluth.

Two advisory councils will advise MnGeo, as specified in MnGeo's [authorizing legislation](#). One will focus on State government; the other on statewide issues. Applications for membership are being accepted via the State's open appointment process. Details are available at the [MnGeo Advisory Council](#) web page. The first meetings of the councils will occur in November. The Transition Advisory Team is advising MnGeo on the recruitment and appointment process. All community members are encouraged to consider applying.

For now, please continue to use the LMIC web address <http://www.lmic.state.mn.us> to access MnGeo services. A new website is being designed and will be announced when it is fully functional. Also, look for the new MnGeo logo on our communications. It is designed to communicate what we do: *Improving services statewide through the coordinated, affordable, reliable, and effective use of geospatial technology.*

To keep track of the transition, periodically check the [project website](#) for new and updated information or contact Fred Logman ([fred.logman@state.mn.us](mailto:fred.logman@state.mn.us), 651-201-2495) or David Arbeit ([david.arbeit@state.mn.us](mailto:david.arbeit@state.mn.us), 651-201-2460).

### **New Statewide City, Township, and Unorganized Territory (CTU) Data**

By Anna Brenes and Christopher Cialek, MnGeo

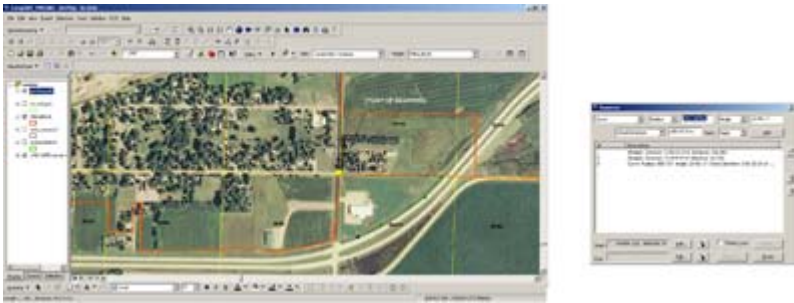
The Minnesota Geospatial Information Office (MnGeo), formerly the Land Management Information Center (LMIC), has created two new statewide data products containing updated information about cities, townships, and unorganized territories (CTU).

#### **CTU Boundaries**

A shapefile, called *MnCTU09*, includes updated statewide CTU boundaries obtained from annexation and detachment dockets approved by the Office of Administrative Hearings Municipal Boundary Adjustment Unit (MBAU) through April 2009.

The data set is a medium-scale (nominally 1:24,000) representation created as part of a legislatively mandated project to calculate a table of township acreage data for the Minnesota Department of Revenue. The basemap selected to create the MnCTU09 data set consists of Mn/DOT's internal municipal boundary file, which provided the most comprehensive coverage of annexation data through February 2008. MnGeo checked, updated and reformatted that file through the following processes:





**Figure 1. Example of boundary digitization using the Traverse COGO tool.**

- For annexations that included formal legal descriptions, applied ESRI's Traverse COGO tool in ArcMap 9.2 to insert new boundaries,
- For annexations that included georeferenced maps, digitized the boundaries using 2008 aerial photography and the Public Land Survey section line data.
- Remaining annexation boundaries, those without either formal legal descriptions or georeferenced maps, were digitized by "intent". Boundaries were digitized based on intent of the legal descriptions and interpreted using area measurements and relative positions of hand-drawn features. These areas may be less accurate than data entered using georeferenced maps or the Traverse tool.

After updating city, township, and unorganized territory boundaries and resolving gap and overlay issues, attribute information was refined to include acreage values, the Geographic Names Information System Feature Identifiers and other standard fields.

Access MnCTU09 data at: <http://www.lmic.state.mn.us/chouse/metadata/mnctu09.html>

### **CTU Identification Codes**

Working with its partners on the Governor's Council Standards Committee, MnGeo has published a database of current CTUs together with their formal GNIS Feature identification codes. These codes represent a state-recognized standard: *Codes for the Identification of Cities, Townships and Unorganized Territories (CTUs) in Minnesota*.

The Minnesota CTU Database is the official repository for names and unique identifiers for cities, townships and Census-defined unorganized territories in Minnesota. A unique identifier for each entry in the database complies with Minnesota's state CTU standard and with the national ANSI INCITS 446-2008 standard. At the Minnesota CTU Database web site, options to access the data include:

- Downloading the entire database
- Browsing via an interactive database search
- Following instructions for implementing a web service that can be integrated into remote applications without having to store the data locally

Visit the Minnesota CTU Database at: <http://www.lmic.state.mn.us/CTU/>

For more information, contact Chris Cialek at: [chris.cialek@state.mn.us](mailto:chris.cialek@state.mn.us) or 651-201-2481.

## **Minnesota High Resolution Elevation Dataset is Becoming a Reality!**

By Tim Loesch, Minnesota Department of Natural Resources

In June 2009, the Minnesota Legislature appropriated \$5.6 million towards the completion of a statewide, high-resolution elevation dataset derived using LiDAR technology. The money was funded from the Clean Water portion of the Minnesota Conservation Legacy Amendment passed by the citizens of the state in November 2008. The project was championed by the Governor's Council on Geographic Information Digital Elevation Committee and spearheaded by Les Everett from the University of Minnesota Water Resources Center.

The goal of this effort will be to publish a publicly available high-resolution/high-accuracy elevation dataset that covers the entire state.

Legislators were eager to support this project after being convinced that the availability of this data would support Clean Water projects over the course of the 25-year lifespan of the legacy amendment - predicted to be \$1.5 billion. In the Legislature, bills were introduced by Representative Rick Hanson and Senator Ellen Anderson and received bipartisan support in both the House and Senate. The funds were appropriated to the Department of Natural Resources with 2.5% to MnGeo for coordination and distribution purposes.

Now the hard work begins and there is much to do.

### **Project Planning**

Project planning is underway with a core working group from the Digital Elevation Committee consisting of Tim Loesch (MnDNR), Pete Jenkins (Mn/DOT), Chris Cialek (MnGeo) and Ron Wencil (USGS). Our first order of business is to put together a small working group of 8-10 interested parties to help steer the project specifications and deliverables, specify the project areas, generate a Request for Proposals (RFP), award a contract and oversee the project as it unfolds over the course of the next two to three years.

The project will start in the southwest part of state, focusing on the Minnesota River Watershed, proceeding northeast through the central part of the state and into the Arrowhead region. The initial data collection will start in Spring 2010 and, based on past experiences with LiDAR projects, data should start being delivered to the state roughly six months after the collect is complete. At a minimum, elevation points, two-foot contours and one-meter digital elevation models will be the data delivered. Edge-of-water breaklines are a desired product (depending on the cost). It is anticipated that approximately 44,000 square miles of data will be collected – a bit more than half the state – as part of this project.

Three meetings are being scheduled in Marshall, Mankato and Worthington in September to meet with local officials and staff to gather local input, to communicate the plans of the project, and to let them know how they can help.

As Representative Hanson put it, “The legislature got you the dollars, now go out and show us what you can do!”

### **More Information**

For more information, contact Tim Loesch (651-259-5475; [tim.loesch@state.mn.us](mailto:tim.loesch@state.mn.us)) or visit the [Digital Elevation Committee website](#).

Also see related articles in this issue:

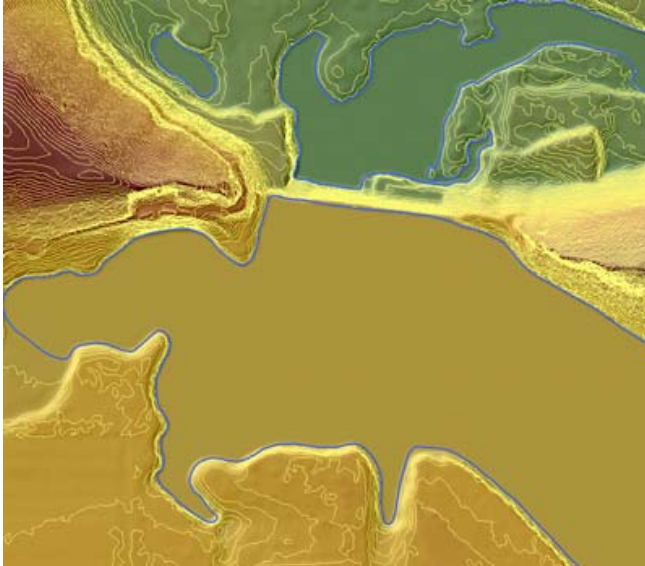
- [Southeast Minnesota LiDAR](#)
- [Conservation Applications of LiDAR](#)

### **Southeast Minnesota LiDAR Project Completed!**

By Tim Loesch, Minnesota Department of Natural Resources

In August 2007, a rainfall event dumped more than 10 inches of rain over a large swath of southeastern Minnesota. The flooding that ensued was responsible for damage estimated at \$67 million, affecting 4,200 homes and tragically resulting in seven deaths. Seven counties were declared disaster areas: Dodge, Fillmore, Houston, Olmsted, Steele, Wabasha and Winona – a total of approximately 4,100 square miles.

The Minnesota Legislature responded by appropriating monies to aid in the flood relief and to provide mitigation against future flood events. Acquisition of high-resolution elevation data using LiDAR technology was targeted as one of the outcomes of that mitigation and data collection was approved in April 2008. The project was coordinated by the Mn DNR and several partners including the U.S. Geological Survey, Mn/DOT and staff from affected counties. The project area grew to include Mower and Freeborn counties with \$75,000 from the USGS and \$122,000 from the two counties, and Turtle Creek, Shell Rock River and Cedar River Watershed Districts. This expanded the study area to 5,500 square miles.



A view of the Lake Zumbro Dam on the Zumbro River near Rochester.

A contract was awarded to Aerometric, Inc. and data collection was conducted in November 2008. Data started flowing in to the DNR for QA/QC starting in April 2009. Products delivered included one-meter resolution DEMs, two-foot contours, edge-of-water breaklines and LAS points. Required vertical accuracy was 18 centimeters (a bit more than 7 inches) as measured using methodologies outlined by the National Standard for Spatial Data Accuracy (NSSDA).

These data were independently validated using control points collected by county and contracted surveyors. In each county 100+ validation points were collected and used to verify the vertical accuracy of the LiDAR information. Accuracy assessments were completed by county and the following table shows the results (most are less than 6 inches).

County	RMSE (meters)
Dodge	0.129
Fillmore	0.155
Freeborn	0.144
Houston	0.134
Mower	0.170
Olmsted	0.117
Steele	0.125
Wabasha	0.106
Winona	0.161

Data was delivered in tiles that covered an area  $1/16^{\text{th}}$  of a 1:24,000-scale USGS quadrangle (approximately 3.25 square miles). As part of the processing, a one- and a three-meter county mosaic DEM was created and used for visual quality assessment.

- **County mosaics** are being distributed on the [DNR's ftp site](#) and are available by county. These data are being distributed as ESRI V9.3 file geodatabases and contains the breaklines, validation points, one- and three-meter DEMs and a shaded relief raster.
- **Individual tiles** of contours, points and DEMs will be available soon on the [DNR Data Deli](#).
- **Point cloud** in LAS format has been delivered to the USGS and will be available online at the [USGS Center for LiDAR Information, Coordination and Knowledge's website](#).

These datasets were delivered to each of the partner counties on an external hard-drive. A GIS contact was identified in each county and they acted as the focal point for distribution to other entities in the county. An ArcGIS toolbox was created to assist local GIS staff in data projection, conversion and surface creation. This toolbox continues to grow and evolve as new applications and needs arise (available at [ftp://ftp.dnr.state.mn.us/pub/gisftp/semn\\_lidar/semn\\_lidar\\_tools.zip](ftp://ftp.dnr.state.mn.us/pub/gisftp/semn_lidar/semn_lidar_tools.zip)).

For more information, contact Tim Loesch at [tim.loesch@state.mn.us](mailto:tim.loesch@state.mn.us) or 651-259-5475.



### **Conservation Applications of LiDAR: 2009 Conference**

Adapted from Water Resources Center webpage

On June 4, 2009, the University of Minnesota Water Resources Center hosted a conference in Rochester, Minnesota to exchange information on soil and water conservation applications of the newest LiDAR data that has just become available for [southeast Minnesota](#).

The conference was attended by technical staff from Soil and Water Conservation Districts, the Natural Resources Conservation Service, Watershed Districts, and county planning agencies. Presenters from Minnesota, Iowa, and North Dakota provided an overview of the range of applications now or soon to be available.

The conference agenda, presentations, and three training videos are [online](#). The 5-minute videos cover the following topics:

- **Terrain Attribute Applications**  
An example of how terrain attributes may guide conservation efforts.
- **Data Pre-processing**  
Creating a hydrologically corrected Digital Elevation Model (DEM) with LiDAR contours or spot elevations.

- **Terrain Attribute Calculation**

Calculating basic primary and secondary terrain attributes such as Stream Power Index with a DEM.

The videos were developed and narrated by Jake Galzki and Joel Nelson of the U of M Department of Soil, Water, and Climate, and produced by David Lindeman of the U of M OIT Video Solutions. Funding was from the Clean Water Legacy Act, through the Minnesota Department of Agriculture, under Project Managers Adam Birr and Barbara Weisman.

“LiDAR” stands for Light Detection and Ranging and provides high resolution digital elevation data. The [current map of LiDAR coverage in Minnesota](#) is available from the [Digital Elevation Committee](#) of the Minnesota Governor’s Council on Geographic Information.

For more information, contact: Les Everett, U of M Water Resources Center, [ever003@umn.edu](mailto:ever003@umn.edu) or 612-625-6751.



## **Geology and Ground Water Info Pages**

By Nancy Rader, MnGeo

Two new related topics, [geology](#) and [ground water](#), have joined MnGeo’s series of first-stop information webpages. These pages provide an overview of Minnesota GIS data, maps and related information available by theme.

### **Geology**

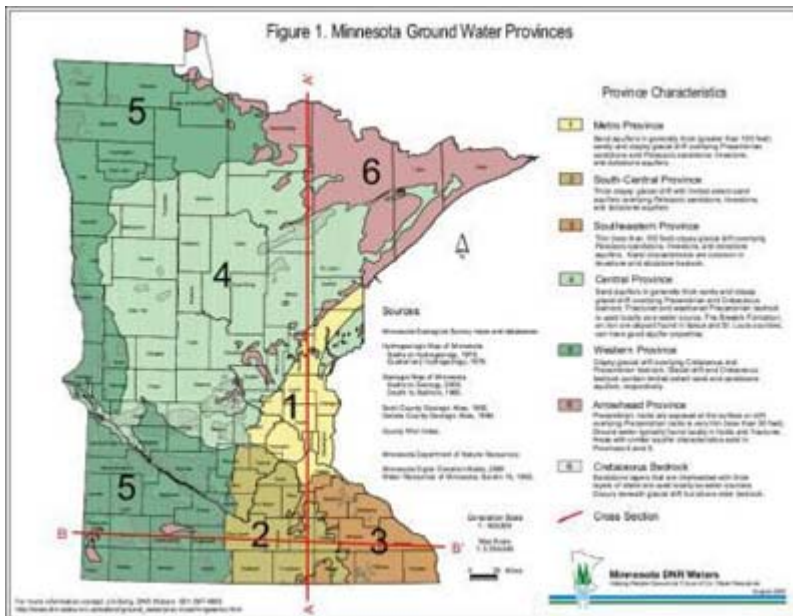
The Minnesota Geological Survey (MGS), the Minnesota Department of Natural Resources (DNR), and the U.S. Geological Survey (USGS) offer a wealth of geologic data for the state. The county geologic atlas and regional hydrogeologic atlas programs provide detailed maps and GIS data for many counties; other regional topics include aggregate resources, karst and peat.



Statewide information includes a State Map series, industrial mining, and aeromagnetic maps and data. National and international sources include the National Atlas and the National Geologic Map Database; educational information covers sources such as the *Minnesota At-a-Glance series*, *Geology of Minnesota: A Guide for Teachers*, and geologic mapping standards.

### **Ground Water**

Many of the geology sources also include information about Minnesota's ground water. The first-stop website describes GIS data, web applications, scientific reports, and general information. Web applications integrate a number of data sources about wells, drinking water protection, contamination susceptibility, and water appropriation permits. Some sources are statewide, some nationwide, and some are focused on regions such as the Twin Cities. The Minnesota Department of Health, DNR, MGS, Minnesota Pollution Control Agency, and USGS are the primary providers of this information.



## Other First-stop Topics

Other topics currently available in the series are:

- [Air photos](#)
- [Land ownership](#)
- [Land use/cover](#)
- [Soils](#)
- [Surface water](#)
- [Utilities/telecommunications](#)

The information on these webpages represents MnGeo's most up-to-date understanding of data for Minnesota. If you know of other publicly available information sources, or if you have other questions, please contact Nancy Rader at: [nancy.rader@state.mn.us](mailto:nancy.rader@state.mn.us) or 651-201-2489.



## **Governor's Council**

### **Minnesota Structures Data Grant Work is Underway**

By Steve Swazee, Co-Chair, Emergency Preparedness Committee, Minnesota Governor's Council on Geographic Information

In late summer 2008, the Minnesota Geospatial Information Office (MnGeo, formerly LMIC) and its project partners received a \$50,000 grant from the Federal Geographic Data Committee (FGDC) for the purposes of improving data availability of four types of structures in Minnesota:

- Schools (public and private)
- Hospitals
- Police stations
- Fire stations

Awarded under the National Spatial Data Infrastructure CAP program, the project's overall goal is to develop partnerships and the technical capacity for the statewide collection, publication and long-term, sustainable maintenance of these four data layers. The specific tasks for the *Minnesota Structures Collaborative – An Initiative to Support the National Map and NSDI* are outlined in an [earlier newsletter article](#).

A team made up of MnGeo staff and 12 volunteers from the Emergency Preparedness Committee has been using three interrelated approaches to execute these tasks: outreach, technical design, and web tool development:

**Outreach** includes upcoming formal presentations at the Association of Minnesota Emergency Managers Convention, Minnesota State Fire Chiefs Association Convention, and the GIS/LIS Consortium Conference, as well as one-on-one engagement with state and local emergency management and GIS personnel.

**Technical design work** has focused on understanding the current federal, state, local and discipline-related databases in order to determine the best approach for harvesting and maintaining each of the four layers for this project and in the future.

**Web tool development** is creating a prototype point and attribute editing tool that will facilitate entry of structure data at a local level; testing is expected to begin in mid-September. Issues related to various federal data collection models/software and symbology standardization for these layers are also being explored as time and resources allow.

Using the prototype editing tool, local volunteers will review and update the location and attributes of structures with which they are familiar. Based on the sample sets being locally reviewed, the project team will evaluate the web-based tool, the quality of the data acquired and the experiences of local partners validating the data. Project findings will be documented in a final report and used to enhance the processes and develop long-term partnerships.



Although November 30, 2009 is the deadline for completing the FGDC-funded part of the project, this effort is ultimately seen as *the start of a process* designed to create engagement, collaboration and technical capacity that will accurately maintain these four data layers on an ongoing basis. With that successful outcome, it is hoped important additional structures data can be brought into the program over time.

### **More Information**

If you are interested in participating in this effort, especially by helping to validate some local data, or would just like to learn more, please contact John Hoshal at [john.hoshal@state.mn.us](mailto:john.hoshal@state.mn.us); 651-201-2482, or Steve Swazee at [steve.swazee@state.mn.us](mailto:steve.swazee@state.mn.us); 612-239-6981.

### **Collaborative GIS in the Arrowhead**

The May meeting of the Governor's Council on Geographic Information was held in Duluth, Minnesota, and focused on an impressive variety of collaborative GIS efforts based in northeast Minnesota's Arrowhead region.

The [Natural Resources Research Institute](#) hosted the meeting, and Gerry Sjerven of NRRI arranged for five presentations:

- **NRRI's GIS Lab Projects**  
George Host, NRRI
- **Minnesota Coastal Program GIS Grants**  
Clint Little and Pat Collins, MN Department of Natural Resources
- **St. Louis County GIS Initiatives**  
Jeff Storlie and David Yapel, St. Louis County
- **Northern GIS Users Group and the U of M – Duluth GIS Lab projects**  
Stacey Stark, University of Minnesota – Duluth
- **Arrowhead Regional Development Commission and the Laurentian GIS Collaborative**  
Kara Kent, ARDC

The presentations are summarized in the [meeting minutes](#) which also link to the full presentation slides and handouts.

### **Local**

#### **Public GIS Web Application Saves a Trip to County Offices**

By Sarah Schrader, Goodhue County

Goodhue County developed a web application that allowed citizens to see how their property was affected by new FEMA flood maps. People whose properties were in or near the designated flood areas were mailed notices and invited to go to the site and zoom to their properties. The notices were mailed in anticipation of a public Planning Commission meeting on the topic and saved many citizens the trouble of attending that meeting.

To view the site, go [here](#) and click on "Interactive GIS Web Application".



County GIS staff created this basic ‘out-of-the-box’ application using ESRI’s ArcGIS Server 9.3 software. The site shows municipal boundaries, roads, parcels, imagery and updated FEMA floodway and flood zone information. Users can search for their property interactively or by entering their Property ID Number (PIN). There is an option to create a printable map and a link is also available to FEMA’s website for more information about the Flood Zone designations.

The Federal Emergency Management Agency (FEMA) recently completed the creation of the Digital Flood Insurance Rate Maps (DFIRM’s) for Goodhue County, Minnesota. During the update process, there were many opportunities for public feedback regarding the updated information and maps. Most recently, FEMA had set the effective date for the final maps and Goodhue County staff were required to adopt the maps and amend their zoning ordinance to incorporate the changes by the effective date.

Because the floodplain is an overlay district in Goodhue County’s Zoning Maps, county staff were required by ordinance to send notices to every property that contained floodplain and every property that was within ½ mile of the floodplain. By these standards, county staff had to send notification letters to over 4,000 property owners! The notices were broken up into different groups to try to ease confusion: those whose parcels intersect any part of the new Flood Zone or Floodway, those whose structures intersect any part of the new Flood Zone or Floodway, and those property owners within a ½ mile of any of the new Flood Zone or Floodway areas. County staff added this topic to the agenda for an upcoming Planning Commission meeting. With so many property owners being notified, staff needed a better way to handle feedback and questions from citizens so that 4,000 people did not show up at the public meeting!

Over a period of two weeks, the web application was accessed over 140 times. County staff also fielded over 200 phone calls regarding the updated flood data and web application. Because of the availability of this web application, many citizens saved a drive to county offices for the public meeting and their questions were answered quickly and more efficiently. The web application also saved staff time by not having to create and print hard copy maps of each individual property owner’s land and mail it to them.

This web application was set up temporarily until the new FEMA data has been adopted by Goodhue County. Once the data has been finalized and adopted by the county, the new flood data will be added to Goodhue County's general online GIS mapping site located [here](#).

For more information about this project, contact Sarah Schrader, GISP – Goodhue County GIS

## Metro Area Consortium Helps Cities Keep Pace With GIS Technology

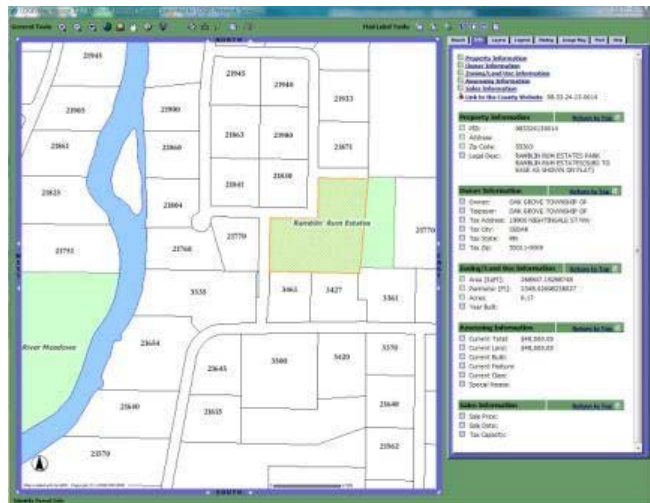
By Ben Verbick, LOGIS

A wealth of metro city data will soon be available to the public via browser-based mapping applications thanks to a collaborative effort between LOGIS GIS staff and its member cities. This effort builds upon previous work to create websites for in-house use and puts nearly all of a city's public interactive mapping in one application.

[LOGIS](#) (Local Government Information Systems Association) is a consortium of 44 Minnesota local government units that has been supporting its members' technology needs for more than 35 years. As one of many services to its members, LOGIS employs a small staff of GIS professionals to assist and support consortium member cities with GIS development, infrastructure, integration, data acquisition and maintenance, and training.

## In-house Sites

During the past several years, as the wave of browser-based GIS technology has rolled along, LOGIS members have looked to more browser-based GIS for casual and simple view/query needs, a direction and commitment that has saved the cities a great deal of money and effort by reducing desktop license fees, license management concerns, and installation/upgrade nuisances.



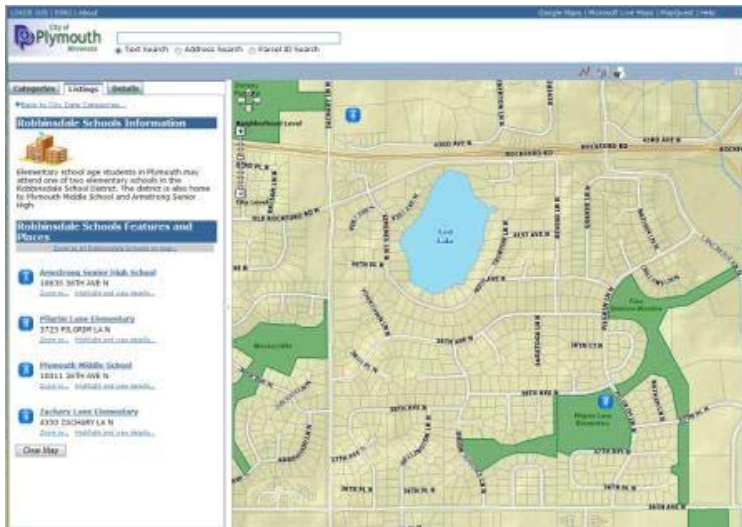
At LOGIS, the process started with ESRI's ArcIMS technology and the consortium's shared effort to develop an ArcIMS product for many of their common in-house geographic query needs. That product has been wildly successful, now boasting more than 500 end-users across the consortium. **LOGISmap** has been the "flagship" example of browser-based GIS for the consortium. It lightly integrates with the consortium's property data and permitting systems, as well as a variety of data tables and document imaging systems, allowing city staff to geographically acquire necessary business information, investigate spatial

relationships, produce simple map/report products, and compile mailings for city business.

## Public Sites

The popularity of simple browser-based GIS for city staff has matured to a logical next step: similar products for public use.

Many of the consortium's police agencies now share a simple mash-up over Bing maps to offer a geographic view of current crime data to the public. Most of these agencies share a common multi-jurisdictional law records management system which simplified the data management and development effort. As a group, the agencies and LOGIS GIS staff collaborate to preserve a common interface design and functionality as the product evolves.



Currently available in pre-release is an ArcGIS Server-based product for public consumption. This product, christened **gGov**, is essentially a public-facing version of LOGISmap, simplified and designed for public use. gGov is an interactive map tool that the consortium's cities plan to use to geographically expose municipal map layers, feature attributes, places of interest, public amenities, documents, photos and other images. Similar to MapQuest, Google Maps, etc., its interface is simple and intuitive. However, it offers the distinct ability for a city to directly use its own existing enterprise GIS data sets and to easily and quickly modify, add, or remove map features and attributes to meet the information demands of the public.

gGov replaces several older-generation internet mapping applications, putting nearly all of a city's publicly offered interactive mapping needs in one application. With gGov, cities plan to present access to park and recreation facilities and amenities, street and utility information, property data, places of interest, voter information and polling locations, school districts, busing zones, land use, zoning, construction sites and

information, event routes... virtually any geographic information and related data the city uses or produces.

### **The Development Process**

The gGov development process, like most LOGIS GIS development and integration projects, is a collaborative effort of the cities and LOGIS GIS staff. A steering committee of city staff assisted with interface design concepts and functionality. As development moved forward, the committee reviewed early releases for ease of use, functionality, integrity, and general design. They, and the consortium's GIS User Group, helped direct the LOGIS GIS development staff (with assistance from ESRI) toward a very simple-to-use yet information-rich and scalable geographic browser.

The ability for the LOGIS cities to offer their citizens such an information-rich product required a commitment by the consortium to migrate its shapefile datasets to an enterprise-wide SQL Server geodatabase. This geodatabase, accessible to all participating LOGIS cities, was initially designed and populated by LOGIS GIS staff. Through documented data management workflows, city staff can interact with the geodatabase, for tasks ranging from simple editing to building and managing their own geodatabases and replicating to master geodatabases at LOGIS.

The LOGIS consortium's service-oriented approach to the development of gGov leverages existing data sources, web pages, documents, maps and other services. A consortium-wide cached map service, updated regularly, serves as the basemap of gGov and other server applications. Instead of creating entirely new sources of information, gGov helps assemble multiple information sources through a single geographic solution.

### **Coming Soon...**

Watch for gGov deployments on LOGIS city websites later this summer. Brooklyn Center, Eagan, Eden Prairie, Edina, Golden Valley, Hutchinson, Maple Grove, Minnetonka, Oak Grove, Ramsey, Richfield, Plymouth, St. Louis Park, and Shakopee share GIS support and resources through the LOGIS consortium.

For more information, see the [LOGIS GIS website](#) or contact Ben Verbick at: [bverbick@logis.org](mailto:bverbick@logis.org) or 763-543-2638.

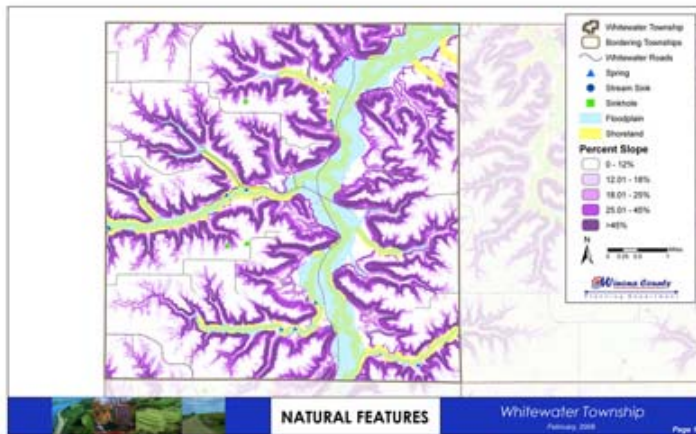
Specialist, at [sarah.schrader@co.goodhue.mn.us](mailto:sarah.schrader@co.goodhue.mn.us) or 651-385-3193.

### **Winona County Creates Township Atlas Series**

By Tom Hoffmann, Winona County Planning Department



In an effort to assist the township leaders in Winona County, Planning Director Brian Bender requested that the GIS division create a 10-page atlas for each township in the county. Nick Meyers and Todd Zielsdorf are working to create the atlases which will incorporate the most useful GIS data layers. This includes items such as: natural features, soils, slopes, roads, PLSS data, zoning, and water related features.



The plan is that the hard copy maps will enable township officials to make more informed decisions on issues such as road maintenance. For those four townships that administer their own zoning regulations, it will provide a greater depth of understanding of the issues related to zoning administration.

The initial work involved creating templates for each of the 10 pages that will make up the atlases. Once the templates were created, work began to customize each page for each of the 19 townships. Each township map also includes a summary of the human settlement history of the townships, as well as an explanation of the varying land philosophies that reflect the unique qualities found in each township.

When the atlases are completed, which is dependent on the County Board's final approval of some changes in the County Zoning Ordinance, the atlases will be generated and several copies will be given to each township. If there is shown to be a wider interest among citizens, Winona County Planning Department may look at producing additional atlases that would be available for a nominal fee.

Beyond the immediate benefit of providing this information to the townships for their use, the Planning Director sees this as an opportunity to showcase GIS to a wider audience. Getting the townships to understand, appreciate, and ultimately rely on GIS could benefit all citizens with improved communications and understanding about issues that will face Winona County in the future.

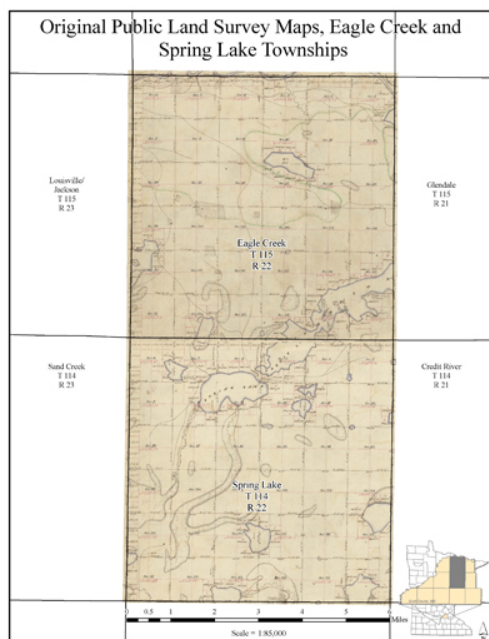
For more information, contact Tom Hoffmann at: [thoffmann@co.winona.mn.us](mailto:thoffmann@co.winona.mn.us) or 507-457-6335.

### **Mapping Pre-settlement Features Using Public Land Survey Records**

By Shawn Kelley, Shakopee Mdewakanton Sioux Community

In order to get a clearer picture of what the Shakopee Mdewakanton Sioux Community (SMSC) lands looked like prior to European settlement, I used GIS to map pre-settlement vegetation communities and other features like roads, trails, creeks, rivers, homesteads, and farm fields as recorded in the Public Land Survey (PLS) plat maps of 1854 and 1855. My primary data sources were the PLS plat images from the Land Management Information Center (LMIC), and bearing tree and PLS corners and vegetation type shapefiles from the Minnesota Department of Natural Resources.

I downloaded the PLS plats for Eagle Creek and Spring Lake Townships, in Scott County, Minnesota, where the SMSC owns land, and converted them from PDF to JPEG format. I then georeferenced the JPEGs to the Township-Range-Section shapefile for Scott County.



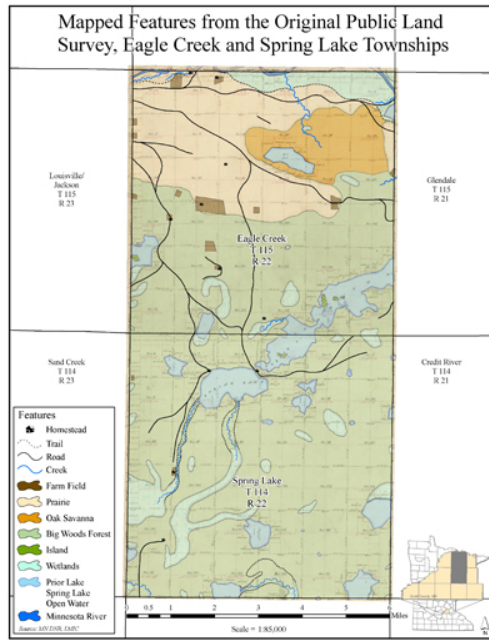
Next I exported the Eagle Creek and Spring Lake township boundaries to a separate shapefile which I could use as a base shapefile to map features on the plat images. I cut into the township polygons instead of digitizing individual polygons to represent the image features. This approach let me use the township polygons that already existed, and also avoided topological problems associated with creating new polygons by digitizing.

I used a scale of 1:10,000 to map the image features because, on the computer screen, it's close to the size of a section; that meant that all features could be digitized consistently at the same scale. I digitized wetlands, prairies, forests, lakes, oak savanna, the Minnesota River, and farm fields as polygons, based on the plat images. I added homesteads as points, and roads, trails, and creeks as polylines.

The original surveyors who mapped this area clearly identified lakes, wetlands, prairies, and forests but I needed more information to determine the oak savanna vegetation community. I checked the PLS corners and vegetation type shapefile and found a cluster

of points classified as "oak openings." Since the bearing tree data corroborated that all the tree species were oak (*Quercus*), I was fairly confident that this area was an oak savanna.

I finished the project by populating the attributes in the point, polyline, and polygon shapefiles to represent image features.



The project yielded good information. Calculating acreage for the mapped polygons showed roughly 8,000 acres of prairie on the northern end of Eagle Creek Township and about 30,000 acres of what was likely Big Woods forest for the southern half of Eagle Creek and all of Spring Lake townships. There were only 10 homesteads and about 350 acres of farm fields, so the townships were still relatively impact-free in 1854 and 1855.

### Data Sources and More Information

- [Public Land Survey Plat Map Retrieval System](#)
- [Original Land Survey Bearing Trees](#)
- [PLS Corners with Presettlement Vegetation Information](#)

For more information about the project, contact Shawn Kelley, GIS/Environmental Specialist, Land and Natural Resources Department, Shakopee Mdewakanton Sioux Community at: [shawn.kelley@shakopeedakota.org](mailto:shawn.kelley@shakopeedakota.org) or 952-496-6196.



## **Federal**

### **A New Generation of Maps**

Adapted from USGS website



The "[Digital Map – Beta](#)" is the first step toward a new generation of digital topographic maps delivered by the [U.S. Geological Survey](#). These maps are built from [The National Map](#) data, which are integrated from local, state, federal, and other sources.

The initial version of the "Digital Map – Beta" includes [orthoimagery](#) plus [roads](#) and [geographic names](#) in the traditional [7.5 minute quadrangle](#) format. "Digital Maps - Beta" are available free on the Web in GeoPDF format. File size is about 15 to 20 megabytes.

Tools are available free for [download](#). Users can turn data layers on and off, zoom in and out, and print the maps. As the "Digital Map - Beta" evolves, the USGS will add historical versions of the topographic maps and will incorporate other data layers including [hydrography](#) and [contours](#). Use of the term "Beta" signifies that these maps are initial versions that do not yet contain the full content of the traditional USGS topographic quadrangle maps.

#### **What Makes The USGS "Digital Map - Beta" Different From Other Electronic Maps?**

- Richer content....more than a street map
- Can be used on the computer or plotted and printed to scale
- Looks and feels like the legacy paper USGS topographic maps with user-selected layers
- Nationally consistent data; quality assured to standards
- Can be downloaded free from the USGS Store
- User interaction tools can be downloaded free
- Users can select from various reference systems: Latitude/Longitude, UTM (Universal Transverse Mercator), and MGRS (Military Grid Reference System)
- Direct "mash-up" capabilities with Google Maps®
- Will continue to evolve and incorporate additional data layers including contours



The USGS values your [comments and suggestions](#) about the new "Digital Map - Beta".

### **2009 FSA Air Photo Update**

By Jeff Bloomquist, USDA Farm Service Agency

New air photos of Minnesota are being flown during Summer 2009 as part of the Farm Service Agency's NAIP program. This results from a requirement in a recent U.S. Congressional appropriations bill calling for FSA to provide 1-meter imagery for 30

states in 2009 with the remainder of the states to be flown in 2010. This is a one-time exception for NAIP (National Agricultural Imagery Program) which typically operates on a three-year cycle.

As of August 14, nearly all of the state had been collected; for updates, see the [status map](#).

## **Specifications**

The 2009 Minnesota photos will be one-meter resolution in natural color (3 bands) using absolute control; a seamline shapefile, rather than a quarter-quadrangle boundary shapefile, will provide the basis for an index for referencing metadata. The seamline identifies the actual area of each photo used in the orthoimagery – it usually matches closely with the quarter-quadrangle boundary but it is not identical.

This product will be film-based, therefore a color infrared or "4-band" product will not be available.

The 2009 specifications were assembled based on the 2008 NAIP contract – the major difference was that this flight was funded without local partners. Based on the timing of this flight and budget deadlines, it was not possible for FSA's APFO (Aerial Photography Field Office) to obtain partner commitments this year in Minnesota.

## **Distribution Plans**

Decisions are still being made on how the public will have access to this imagery but all signs point to the county files (county compressed mosaics, or "CCMs") being available for download from the Natural Resources Conservation Service's [Geospatial Data Gateway](#) and also from the Minnesota Geospatial Information Office's [website](#).

**Future Years**For Minnesota, the next NAIP 1-meter flight is scheduled for the summer of 2011 and the FSA will again seek local partner participation to ensure full state coverage and to fund a 4-band (natural color and color-infrared) deliverable.

**More Information**More details on the 2009 flight will follow as the information is received. Questions should be directed to Jeff Bloomquist at: [jeff.bloomquist@mn.usda.gov](mailto:jeff.bloomquist@mn.usda.gov) or 651-602-7728.

For information on earlier years of Minnesota's FSA NAIP air photos, click [here](#).

## **Congress Looks at GIS Governance**

Will Craig, University of Minnesota



Recent activity in Congress shows a new interest in GIS. Two new reports from the Congressional Research Service provide background information to members of Congress; these are usually produced only on request, so someone cares. Also, a recent “oversight hearing” was held on federal GIS data management; up to now Congress has let the Executive branch worry about this. All this material is available online.

### **Reports**

Two reports from the Congressional Research Service touch on critical issues. Both are in PDF format:

- [Geospatial Information and Geographic Information Systems \(GIS\): Current Issues and Future Challenges](#), June 8, 2009, 30 pages.
- [Issues Regarding a National Land Parcel Database](#), July 22, 2009, 15 pages.

### **Hearing – Video and Written Testimony**

On July 23, 2009, the House Natural Resources Committee, Subcommittee on Energy and Mineral Resources, led by Rep. Jim Costa (D-CA), held an oversight hearing on "Federal Geospatial Data Management." The hearing was webcast and recorded. The video (1 hour 31 minutes) along with written testimony is on the [committee website](#).

### **AirNOW: Multi-agency Effort Maps Air Quality Nationally**

Adapted from AirNOW website

The [AIRNow Web site](#) provides the public with easy access to national air quality information. The website offers daily AQI forecasts as well as real-time AQI conditions for over 300 cities across the U.S., and provides links to more detailed state and local air quality websites. The site was developed by the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the National Park Service, tribal, state, and local agencies.

#### [Air Quality Forecasts](#)

Nationwide daily air quality forecasts provided by state and local air agencies for over 300 major U.S. cities.

#### [Air Quality Conditions](#)

Nationwide and regional real-time ozone air quality maps, updated every hour, covering 46 U.S. states and parts of Canada.



## The Air Quality Index

The Air Quality Index (AQI) is an index for reporting daily air quality. It tells you how clean or polluted your outdoor air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air.

EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health.

## About the Data

The air quality data used in these maps and to generate forecasts are collected using either federal reference or equivalent monitoring techniques or techniques approved by the state, local or tribal monitoring agencies. Since the information needed to make maps must be as "real-time" as possible, the data are displayed as soon as practical after the end of each hour.

Although some preliminary data quality assessments are performed, the data as such are not fully verified and validated through the quality assurance procedures monitoring organizations use to officially submit and certify data on the EPA AQS (Air Quality System). Therefore, data are used on the AIRNow website only for the purpose of reporting the AQI. Information on the AIRNow website is not used to formulate or support regulation, guidance or any other agency decision or position.

## Presidential Elections Map 1789-2008

Adapted from USGS press release

The newest version of the National Atlas Presidential Elections map details election results from 1789 to 2008. The evolution of America's political parties and its election laws and procedures is illustrated on this map which measures approximately 29 x 41

inches. This is a great wall map which can help to spark further reading and lead to the discovery of the many interesting stories behind the elections.

Prepared by the U.S. Geological Survey (USGS) as part of the National Atlas of the United States series, this map shows the electoral votes by political party and State for all of the Presidential elections from George Washington in 1789 to Barack Obama in 2008. In addition to a small electoral votes map, the 2008 election is illustrated with a larger, more detailed map that shows the popular vote results at the county level.

Published in 2009, this map is available for purchase from the U.S. Geological Survey.

- Map # 09-07
- Stock #112283
- Price: \$9.00 for the map plus \$5.00 handling

For more information on this or other USGS products, contact the USGS Science Information and Library Services (SILS) at 1-888-ASK-USGS, or online through the USGS store at: <http://store.usgs.gov>



### **Higher Education**

#### **UWRF GIS Program Update**

By Dr. Charles Rader, University of Wisconsin – River Falls

UWRF is one of the other “state” schools in the Twin Cities Metropolitan Area. The Geography and Mapping Sciences Department offers a comprehensive major in Geography. The major consists of coursework in physical, human, regional, and geographic techniques. In 1982, the department established a minor in Cartography and in 1993, the minor was revised to be a GIS and Cartography minor.



#### **GIS and Cartography Minor**

This minor is open to all majors at UWRF and we have had numerous students combine it with their majors in geography, biology, geology, conservation, landuse planning,



agriculture, environmental science, and computer science. The minor consists of 21 credits of coursework. The courses emphasize both the theory and methods of GIS and Cartography and consist of eight dedicated courses taught in an up-to-date GIS laboratory using ESRI ArcGIS, Idrisi, and Adobe software. Courses cover GIS analysis, map design, interactive and animated mapping, digital image processing and GPS field methods. Flexibility is offered through additional courses in Computer Science and Environmental Science. Courses offered are:

- Introduction to Cartography and GIS (GEOG 250)
- Map Design (GEOG 351)
- GIS: Theory and Methods (GEOG 360/560)
- Field Methods and GPS (GEOG 366/566)
- Quantitative Techniques (GEOG 365)
- Digital Image Processing (GEOG 368/568)
- Animated and Interactive Map Design (GEOG 455)
- GIS: Analysis and Modeling (GEOG 460/660)

### **Faculty**

Three faculty contribute expertise to the GIS and Cartography program at UWRF. Dr. Charles Rader (Ph.D. Michigan State University) has directed the development of the program since 1993 and has specializations in GIS modeling and analysis, analytical cartography, and map design. Dr. Mathew Dooley (Ph.D. University of Nebraska – Lincoln) has specializations in GIS, map design, interactive and animated mapping, data analysis and visualization, and field methods. Most recently, Ian Muehlenhaus (M.A. Pennsylvania State University) serves as the GIS Lab Manager and has specializations in map design, interactive and animated mapping, web design, and GIS.

### **More Information**

For more information, see the following UWRF webpages:

- [Geography Department](#)
- [GIS/Cartography Minor](#)

or contact Dr. Charles Rader, Department of Geography and Mapping Sciences, University of Wisconsin – River Falls: [charles.p.rader@uwrf.edu](mailto:charles.p.rader@uwrf.edu) or 715-425-3264.

### **Mark Monmonier to Lecture at U of M**

This year's John Borchert Lecture speaker at the University of Minnesota will be Dr. Mark Monmonier, Distinguished Professor of Geography at Syracuse University.

His presentation, "Coastlines, Boundary Lines, and the Cartographies of Protection and Control" will be on Friday, November 20, 2009 at 1:30 p.m. in Cowles Auditorium in the



[Humphrey Center](#) on the West Bank campus. A reception will follow from 2:30-3:30 p.m. Click [here](#) for directions.

For more information on Dr. Monmonier and his publications, please visit <http://www.markmonmonier.com>.

### **Private**

## **Prioritizing Natural Resources in Community Land Use Planning Processes: City of Scandia**

By Jean Coleman and Mark Ellis, CR Planning

Most communities consider natural resource protection an important part of their land use planning decisions, as shown in their visions and comprehensive planning goals. Protecting natural resources does not preclude development or other land use activities. Understanding the location and importance of natural features, resources, or systems can help a community shape the way that development occurs while minimizing risks to natural resources.

GIS information on natural resources is abundant and readily available through individual data layers or integrated natural resource inventories such as the Minnesota Land Cover Classification System (MLCCS). But how can a community use this information to prioritize natural resources in the land use planning process?

Several communities across the state have used a GIS-based mapping analysis process to help them prioritize. The City of Scandia created a Natural Resources Priority Overlay map for their recent comprehensive plan update. As shown on the composite map, natural features are present in most of the city. Some areas, however, have multiple natural features or particularly high quality features and show a higher priority level. The overlay shows a gradient of priorities for natural features ranging from a score of 4 to a score of 41. The method for computing the score is described below.

**Step 1** A steering committee identified eight categories of natural features that they felt should shape the way that land is used or developed:

1. Rivers and streams
2. Lakes
3. Wetlands
4. Groundwater
5. Significant natural areas/habitat
6. Existing and potential corridors
7. Steep slopes
8. Soils

**Step 2** Key measurable characteristics for each natural feature were identified based on input from public meetings, focus groups, and Comprehensive Plan Committee discussions. *Example:* Four characteristics of lakes were identified: water quality, potential benefit of restoration, shoreland area, and slopes and bluffs near lakes.

**Step 3** A point system was used to identify high priority areas. Points were assigned to each measurable feature. *Example:* Lakes with higher water quality received more points than those with average or low water quality.

**Step 4** A map was created for each natural feature showing high priority areas (more points) and lower priority areas (fewer points) – see [Figure 1](#).

**Step 5** All the maps were layered on top of one another. A composite point score was calculated for each location by adding up the scores for each natural resource present – see [Figure 2](#). In this way, the steering committee determined which places have the highest priority for natural resource protection overall. *Example:* A location that is near a high quality lake, in a wetland and that offers high quality wildlife habitat combines all the points from each natural feature and is rated higher than an area that is near a lake but is not a wetland or a habitat area.

The City of Scandia can now use this natural resource priority information to help make important land use decisions such as:

- Defining where to encourage resource protection
- Defining where to encourage development
- Defining where natural systems can work with development (e.g. stormwater management)
- Defining how natural resources can be protected within development areas

#### **Additional Resources**

- A detailed description of the process, list of data sources, assumptions, and maps of all resource layers for the Scandia process is found in Appendix A of the adopted comprehensive plan at <http://www.ci.scandia.mn.us>.
- For a detailed description of how to combine GIS and community values to define protection and development areas, see *Environmentally Based Regional Smart Growth Planning and Design* at [CR Planning's website](#).
- MLCCS - The Minnesota Department of Natural Resources Central Region developed the [Minnesota Land Cover Classification System](#) (MLCCS) in cooperation with other state, federal and local agencies.

For more information, contact Jean Coleman, [jcoleman@crplanning.com](mailto:jcoleman@crplanning.com), 612-588-4904, 2634 Vincent Ave. North, Minneapolis, MN 55411.

#### **Non-Profits**

##### **Goodhue County Land Use Model**

By Alison Slaats, 1000 Friends of Minnesota

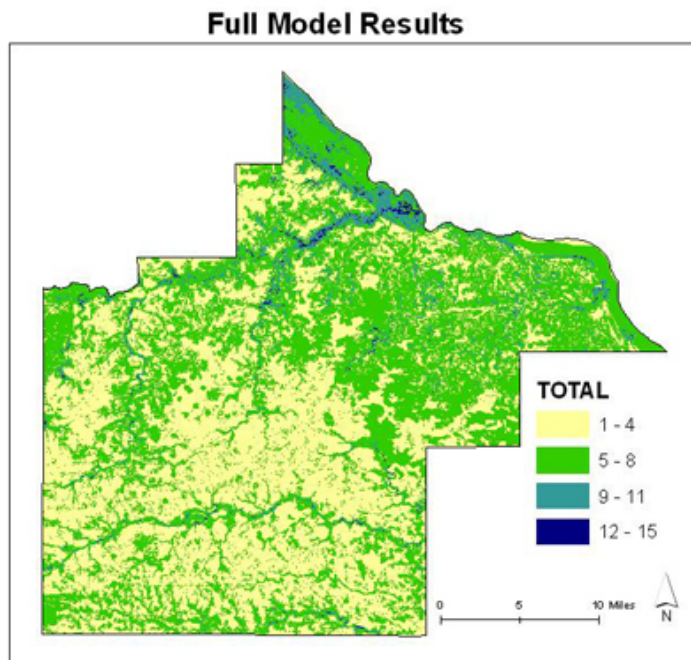
Recently, [1000 Friends of Minnesota](#) completed a GIS land use suitability model for Goodhue County. The project was funded through a community assistance grant from the Minnesota Department of Natural Resources.

Goodhue County is situated between expanding urban centers of Rochester and the Twin Cities. County decision-makers have the challenge *and* opportunity of managing growth and doing so in a manner appropriate for Goodhue County's environmentally sensitive



and aesthetically beautiful landscape. The land use suitability model was created to provide an easier way for decision-makers to digest the rich GIS data available in Goodhue County.

The land use model was created in ArcGIS ModelBuilder and includes 21 vector data layers representing landscape features that are key in making land use decisions. The layers were grouped into 3 submodels: Natural Resources; Regulatory Factors; and Additional Considerations. Input layers were scored and so in the results layers, each polygon has a combined score indicating how many inputs are present. The results scores can be examined and interpreted for land use decisions. For example, the natural resource model results can be viewed to ascertain where high value ecological areas are in Goodhue County.



*This graphic shows the combined model results with the total number of factors that may impact land use decisions. Geographic features such as bluffs and riparian areas are most evident because so there are several regulatory and natural factors present in those areas.*

The land use model results will be used to inform the Goodhue County 2009 Comprehensive Plan Update and help identify areas of rich ecological value to support the county's stated goal of natural resource preservation. Additionally, the model is helpful to refine municipal growth boundaries while considering significant natural resources and land use at a sub-parcel scale.

By providing a more complete picture, the land use model helps to inform critical choices that balance growth and change with preservation of rural character and natural resources in Goodhue County.

#### **Contacts:**

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## **People**

### **Bob Marx, GIS Pioneer at the U.S. Census, Has Passed Away**

Robert W. Marx, former Chief of the Geography Division of the U.S. Census Bureau, succumbed to an illness on September 7, 2009.

Bob had roots in Minnesota and was honored with a MN GIS/LIS [Lifetime Achievement Award](#).

Bob served as Chief of the Geography Division from 1983 to 2003 (interrupted by a 3-year period as Associate Director in the 1990s to prepare for Census 2000). He was the architect of the Census Bureau's TIGER System which began in the early 1980s as a collaborative effort with the U.S. Geological Survey. Bob was a visionary who sought ways to advance the importance of census geography through new technological developments that were made practical through useful applications. By making spatial data for the nation available, the TIGER effort opened the way for GIS development and created an entire new industry which continues to grow. Bob was a friend to all and will be sadly missed by his colleagues.

During his more than 36-year career at the Census Bureau, he received several awards for exceptional performance, including the Department of Commerce's Gold and Silver Medals, and the Meritorious Presidential Rank Award.

Bob Marx is survived by his wife of 44 years, Jan. They have two grown sons and eight grandchildren.

## **Other Places**



### **ASPRS 2011 National Conference**

By Brian Huberty, President, ASPRS Western Great Lakes Region

This is an early heads-up for a once-in-a-lifetime, national geospatial and remote sensing conference. The American Society for Photogrammetry and Remote Sensing (ASPRS) will be hosting their annual spring conference May 1-5, 2011 at the Midwest Center in Milwaukee, WI. The annual spring national conference has never been held in the Upper Midwest.

This will be your chance to attend the latest remote sensing and photogrammetry workshops and technical sessions. The theme for this conference has not been set, but chances are it will involve baseball, Great Lakes, motorcycles and beer in some form or manner.



If you wish more information, would like to co-sponsor the event or help support developing and running the conference, please contact either conference co-chair:

- Brian Huberty: [brian\\_huberty@fws.gov](mailto:brian_huberty@fws.gov) or 612-713-5332.
- Miles Strain: [mstrain@aerometric-mn.com](mailto:mstrain@aerometric-mn.com) or 763-420-9606 x34.

The websites to watch are:

- <http://www.asprs.org>
- <http://www.asprs.org/wgl/>