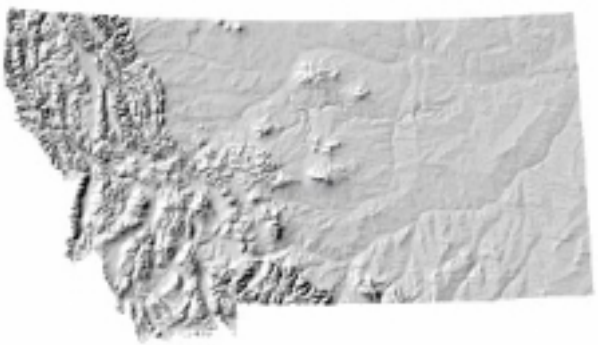
Montana GIS News



Winter Issue 2005

Welcome to the second edition of the Montana GIS News sponsored by the Montana Association of Geographic Information Professionals.

Our interim website is located at:
http:/www.mtgeo.org

Check here to download a copy of the MAGIP membership registration form, the applications for higher education scholarships and K-12 curriculum grants, and view workshop and training opportunities.
We will be using this location temporarily while our new website is being developed.

Our current mailing list has been prepared from the current MAGIP membership list, registration lists of the 2004 October Technical Session, Intermountain GIS conferences for 2002—2004, the ITWG list server, and the MLGGC list server .
To subscribe to the list send an email to: join magip@lists.state.mt.us
To unsubscribe from the list send an email to: leave-magip@lists.state.mt.us
To post a message to the list send an email to: magip@lists.state.mt.us
Rules and standards applying to authorized use of the list server can be view at: http://www.mtgeo.org

MAGIP is a volunteer organization and relies on its members to accomplish the goals of communication, education and outreach, and technical coordination in the Montana GIS community. Your participation is essential, so contact a committee chairperson and volunteer to share your expertise, ideas and energy.

In this Issue…

Montana Association of Geographic Information Professionals

October 2005 MAGIP Technical Session

The session, organized by Stewart Kirkpatrick of the Montana Department of Administration drew praise from attendees. One participant commented that the session offered a "good program – the best of any GIS technical meetings I've attended". Others noted that they were overwhelmed by the information and hoped that future sessions would limit the number of concurrent sessions so that participants were not forced to choose among so many excellent offerings.

Slightly less than a third of the attendees completed evaluation forms. Many of those responding indicated that they would like to see two technical working sessions offered every year that included more opportunities for introductions and networking. One participant noted that "it is very hard to get to know other GIS professionals. Maybe some activities to introduce and mix people up would be really helpful for networking." Participants were also asked about new audiences that MAGIP should try to reach. The most common answer to the question was to market MAGIP working sessions and conferences to educators and students.

A complete summary of the workshop evaluation forms can be found at the MAGIP web site http://www.mtgeo.org.

Janet Cornish—MAGIP Administrator

Mid-year Technical Working Session Draws Over 100 Participants

MAGIP's October, 2004 work session drew 116 participants to the Great Northern Hotel in Helena for a three day program featuring concurrent workshops as well as general technical and organizational sessions. Concurrent workshops included "Editing the ARCGIS Data Base", presented by Keith Blount and Eric Eidswick of the Montana Department of Administration, "Basic Geodata Design, presented by Jack Horton of the ESRI Olympia Office and "Basic Cartography", presented by Ed Madej of Tetra Tech EM Inc. of Helena. Plenary sessions included a session presented by Lloyd Queen of the University of Montana entitled "GIS meets the Fireline", a demonstration of IFSAR Technology by Intermap, a Colorado based company and a presentation by Visual Learning Systems demonstrating building foot print extraction from high resolution imagery.

Gerry Daumiller, MAGIP Secretary

MAGIP October 2005 Technical Session

Stewart Kirkpatrick, State of Montana
GIS Coordinator led the MAGIP Technical Committee in organizing the session.

Michael Sweet, University of Montana and MAGIP Technical Committee member encourages attendees to participate in the coordination efforts of MAGIP

Only those who didn't come weren't having a good time!

2005 Intermountain Conference Update

Advancing the Profession

The 2005 Intermountain GIS Users' Conference, sponsored by the Northern Rockies Chapter of URISA will be held April 18th- 22nd in Pocatello, Idaho.

The call for papers has been announced and abstract submissions are due by Feb. 15. Final papers must be submitted no later than April 1, 2005. The requirements for papers can be viewed on the conference web site under Call for Papers. You can use the following web-link to access current information on the 2005 Conference sessions and workshops http://www.intermountaingis.org.

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The keynote address of upcoming 2005 Conference will be given by Jennifer Colosimo who will speak on "The 7 Habits of Highly Effective People" . The keynote address will be followed by a workshop on management skills.

The NASA/USGS "Earth as Art" exhibit, along with several tours will be available on the Idaho State campus during the Conference.

Geographic information professionals from Montana are encouraged to submit abstracts and participate in the 2005 Intermountain GIS Conference.

Update on the Montana Land Information Act

Montana Land Information Act Passes Senate

The Montana Land Information Act, Senate Bill 98, passed the Senate on January 17 by a vote of 44 to 6. SB98, sponsor by Senator Joe Tropila, Dem. – Great Falls, was well received in the Senate Natural Resource Committee earlier and passed from the committee with a unanimous vote. SB98 provides for a stable funding source to develop and maintain priority GIS data layers statewide. There were 17 proponents to the bill including representatives from both the private and public sector.

SB98 is now transmitted to the House of Representatives, and should heard in committee sometime after transmittal break in early March. More information is available at:http://laws.leg.state.mt.us/pls/laws05/LAW0210W$BSIV.ActionQuery?P_BILL_NO1=98&P_BLTP_BILL_TYP_CD=SB&Z_ACTION=Find

Montana Geographic Information Advisory Council (MGIC)

MGIC to Meet in March

The Montana Geographic Information Council will meet for its first quarterly meeting of the year at the Montana Association of Counties (MACO) building in Helena (near the airport) on March 3. Items that are currently planned for the agenda include:

Recommendations of the committee on strategic planning for GIS in Montana
Update on SB98 (MLIA)
Discussion of status of federal requests
Local Government communications team update
Update on the Geodetic Advisory Council
Update on the NAIP imagery acquisition

Members of the GIS community and the public at large are welcome to attend this and upcoming MGIC meetings.

Tony Herbert, MGIC Chair

MAGIP Education Committee Update

The MAGIP Education Committee has been busy in the past few months promoting our primary goal of providing a forum for outreach and education efforts across the state.

.A meeting of the Education Committee was held January 20, 2005 hosted by Margie Lubinski in Missoula. Participants included Ken Wall and Tim Miller of Geodata Services and Doug Beed of the EOS Education Project. Annette Cabrera called in from Billings, Cathy Maynard, Jane Horton, Kris Larson, Lee Weldon and Patrick Dougherty from Helena, Janet Cornish from Butte and Lindell Baker called in from Bozeman.

The agenda included a presentation from Doug Beed who provided the group with an update of the GIS4MT program. He discussed GIS training opportunities for educators with Introduction and Intermediate classes in ArcGIS to be held in Missoula, March 1, 2 and 8, 9 and in Billings, April 12-15. Teachers interested in taking these classes should contact Jody Bramel at EOS Education Project, jbramel@eoscenter.com, 406-243-5862.

Ken Wall then gave a demonstration of the utility of Web Services for providing geographic information capability to schools using the Internet. This information can be provided without the need for having software available locally, allowing access to technology for any classroom with an Internet connection. Kris Larson and Lee Weldon volunteered to work with Ken to see how MAGIP might be able to promote the use of this technology to help in the mission of educating students in GIS. Ken's presentation also included information on the varying capabilities, potential uses and comparison of the ESRI ArcGIS Server and ArcIMS software and how they can be used for different projects and levels of information needs. Please see a detailed article from Ken Wall on page nine describing this and other related activities.

Janet Cornish, MAGIP Administrator, will be contacting the Office of Public Instruction (OPI) to provide them with the K-12 grant information and she will establish contacts with universities and colleges throughout the state to get the word out about our educational training needs, opportunities and scholarships. The committee discussed the role of MAGIP in helping GIS professionals connect with educators who need training assistance. Janet will also develop a database of GIS professionals and educators that can be used in future MAGIP Education Committee efforts so if you are interested in helping with this and would like to be listed, please contact her at: JanAllyce@aol.com, 406-723-7993.

Margie Lubinski
Education Committee Chair

In other discussion, Kris Larson and Patrick Dougherty volunteered to work with Lee Weldon and the Townsend School District to provide on site ArcGIS training. Several topic suggestions were given for GIS Day (Nov), including "Weave a Story Through Mapping" and possibly using weed mapping as a way to use the Web Service approach in schools.

We will begin work soon on a strategic plan that the committee can use to continue meeting the goals of MAGIP and the needs of its members in the coming years. Ongoing efforts include our Grants and Scholarship Program, Geospatial Trunks, Community Outreach and training for teachers. The committee also felt it very important to include Professional Development. If you are interested in taking part and becoming involved in GIS education throughout the state, please contact Margie Lubinski at: mlubinski@fs.fed.us, 406-329-3743.

Announcements:

The **K-12 Grants** and **Higher Education Scholarships** are once again being advertised for this year and revised forms are available for download from the MAGIP website at: http://www.mtgeo.org Please note that the application dates for both awards are March 15, 2005 so please be sure to submit your information before the closing date.

Professional Development Corner

An important issue that was raised at the January Education Committee meeting was the need for MAGIP to provide leadership in developing avenues to promote the professional development of its members. It was agreed that this is an important focus item for the Education and Training Committee that needs the benefit of serious attention and the participation of members to develop an action plan and recommendations to the MAGIP Board on how best to promote professional training opportunities for GIS professionals around the State.

If you would like to be involved in proposing and developing solutions, please contact Bob Holliday at: rholliday@mt.gov

GIS Training Made Accessible

As part of our service mission to the citizens of Montana, The College of Forestry and Conservation at The University of Montana promotes the advancement of professional training. GIS training became more accessible to Montanans when The University of Montana signed an agreement in August 2005 with Environmental Systems Research Institute (ESRI) to establish the Missoula campus as the official ESRI training site for Montana. There is also an option within this agreement to hold training at other University System college campuses, provided adequate arrangements are made. While all training needs will not be met through this agreement, it does provide a lower-cost alternative to out-of-state travel; especially for the more popular classes. It is our intent to survey the GIS community through MAGIP about every six months to determine which courses are of greatest interest to the Montana GIS community. Entities interested in GIS training and training issues are encouraged to participate in MAGIP.

Training was held on the Missoula campus in October 2005 for ArcSDE SQL Administration and in January 2005 for ArcGIS I and II. Upcoming classes include, Building Geodatabases I (May 23-25), Building Geodatabases II (May 26-27), Geodatabase Design Concepts (June 27-28), and Geoprocessing Scripts Using Python (June 29-30). .

There are alternatives if for some reason your group does not find these dates and or courses acceptable. If you are training a large number of employees and want to maximize training funds, it is possible to contract with ESRI for a client-side class. An instructor-led course can be scheduled just about any time there is a minimum of eight interested individuals, and the training facilities and an ESRI instructor are available

As has been true in the past, the College of Forestry and Conservation at The University of Montana will continue its support of other training opportunities as well. Computer lab facilities at the College have supported training for employees from the Montana Department of Fish, Wildlife, and Parks; and from the Montana Department of Natural Resources and Conservation. Visual Learning Systems of Missoula has hosted training for their Feature Analyst software. It is in our collective interest to continue to promote access to training in Montana. If you should have questions about our facility or sponsored courses, please contact Mike Sweet or Gary Decker via support@forestry.umt.edu.

Michael Sweet and Gary Decker
The University of Montana
College of Forestry and Conservation

MAGIP Education Committee
General Information

The purpose of the Education Committee is to provide a forum for outreach and education efforts of the Montana Association of Geographic Information Professionals (MAGIP). Membership in the Association and its Education Committee is open to anyone with an interest in geospatial technologies and a willingness to share their knowledge. The Education Committee of the Association sponsors the following activities:

Geospatial Trunks: The Education Committee is responsible for the maintenance of the Geospatial Education Trunks, which contain lesson plans and equipment for a K-5 and 6-12 classroom. The trunks are designed to provide GIS project-oriented curriculum for teachers to incorporate into their existing curriculum. Items in the trunks include GIS workbooks, tutorial CDs, games, mapping materials, GIS data, Global Positioning Systems (GPS) units, and much, much more! The Geospatial Education Trunks are distributed to schools through the Montana Natural History Center (MNHC) in Missoula. To reserve either of the Geospatial Trunks, contact the Center at 406-327-0405 or email at mnhc@montana.com. For more information, their website is www.thenaturecenter.org.

Higher Education GIS Scholarships: MAGIP has established scholarships for undergraduate seniors or first year graduate students at Montana colleges and universities. To be eligible, the recipient may be from any discipline but must be working on projects that use GIS as part of their research or thesis. Students are awarded a one time $1000.00 scholarship and are encouraged to present their work at the annual Intermountain GIS conference. The scholarships are awarded each March for the following summer, fall and/or spring semester. Current grant application information can be found at: http://www.mtgeo.org

K-12 Competitive Grant Program: Each year the Education Committee awards competitive grants to develop K-12 Geospatial curriculum that helps bring GIS, GPS, remote sensing and mapping technologies into the classroom. Curriculums developed are then made available in the Geospatial Trunks.
Current grant information can be found at: http://mtgeo.org/

Education Awards and Scholarships: The committee has provided one time awards up to $1000.00 to educators who have previously developed Geospatial curriculums and are willing to provide them to the Geospatial Trunks. They have also provided teachers with scholarships to attend training, conferences, etc.

Intermountain Conference Public Night: The Committee helps to organize Public Night which is held at the Intermountain GIS Conference in Montana. This is an opportunity to demonstrate geospatial tools and activities to the public. Communities are invited to participate in hands on activities relating to GIS, GPS, remote sensing and mapping. Students can showcase projects that they have been working on during the school year and the MAGIP Geospatial Trunks are on display.

SIGN UP TODAY! If you are interested in furthering Geospatial education in your area and would like to be a part of this committee, please email Margie Lubinski, mlubinski@fs.fed.us and volunteer to get involved in your community and help benefit GIS education throughout Montana!

2006 Conference Planning Activities

Realizing Our Collective Potential

2006 Intermountain GIS Conference

Planning is actively under way for the 2006 Intermountain GIS Conference to be held in Helena, MT April 3-7, 2006. The conference theme "Realizing Our Collective Potential" reflects our desire to grow and expand MAGIP through strengthening the skills and knowledge base of our individual members. Conference tracks will include a variety of Technical Sessions, Tools for Analysis, Education and Professional Development, Data Development and Management, and Vendor Demonstrations. We have selected Mark Monmonier, University of Syracuse professor and author of How to Lie With Maps, to be our keynote speaker.

One of our goals for the 2006 Conference is to showcase projects that demonstrate how cooperation, coordination, planning and execution can provide mutually beneficial results for a wide variety of site specific, Statewide, and regional projects and their information needs. We are relying on your help to share the results of your work and show us how you have used these methods to create the data we all need to move forward with land use planning, natural resource conservation, addressing social problems such as health and human services, and the countless other applications of geographic information is being used to solve common problems at the local, State and regional level

The Conference Committee encourages each of you to be planning ahead to participate. Please share with us your ideas and suggestions or session topics, presenters and workshops.

We hope you will mark your calendar and join us for the conference at the Great Northern Hotel in downtown Helena, Montana.

Catherine Love, Conference Committee Chair

MONTANA GIS NEWS CALL FOR ARTICLES

As you can see we have plenty of room in the next newsletter for an update or in-depth article of you geographic information activities around the State. Send your newsletter submission to:
Janet Cornish at:
JanAllyce@aol.com

The title of your article, the authors' name, and the date it is received will be recorded in our database and, once reviewed by the Communications Committee, will be added to the on-line newsletter on a first-come basis using the database entry for the submission date of your article.

Thank you for your support to MAGIP and good luck in all your geographic information development and applications activities.

We would also like to start collecting a library of photos that can be used to enhance newsletter articles and web pages. Pictures of GIS professionals at work or at play in our beautiful Montana scenery will be welcomed.

View from the Skytop in Billings, MT
Site of the 2004 Intermountain GIS Conference

Census Data Update

An Opportunity to Improve the Census Geographic Database Presents Itself

The dust is just settling from the 2004 election cycle that used the new legislative districts based on the last round of redistricting, which was based on Census 2000. At the same time, the Census Bureau is busily planning for Census 2010. Redistricting is the main reason I pay attention to the Census, as should anyone who may be affected by redistricting. The problem is, you may not realize that you should be paying attention until it=s too late. As many of the GIS departments in county government found out in the last year or so, this may mean that you are trying to use the new legislative districts in your GIS system to create precinct boundaries with lines that don't match. Something can be done about that.

The Census Bureau last May announced establishment of the 2010 Census Redistricting Data Program. The Redistricting Data Program provides states the opportunity to specify the small geographic areas for receiving decennial population totals. You may not be too concerned with the population at first. Population totals are easy enough to generate. However, the key is each boundary that defines a "small geographic area." For redistricting, those small geographic area boundaries can be voting districts, or precincts and legislative districts. These areas provide additional information for the government unit data layer to complement city, county, and reservation boundaries.

Last fall, after some strong encouragement from a political party, many counties found out the importance of the census boundaries of those small geographic areas. When a dozen counties tried to adjust precinct boundaries to match their databases because the census boundaries did not coincide, potential problems were noted right before the election setting up a Hobson's choice of changing precinct boundaries outside of the legal timelimes or potentially having litigation following a close election. And now we have yet more examples of what a close election means. If state and local governments fully participate in Census Bureau programs, we will benefit from more accurate geographic boundaries, which in turn has the potential to assist us in drawing new legislative district and precinct boundaries. The input will be used for the update and improvement of the TIGER/Line file geographic features that delineate where we are counted for the decennial census.

In Montana, we have such a sophisticated GIS community that many may not fully appreciate the importance of TIGER/Line files because of its problems of spatial accuracy. It is local officials who have an awareness of unusual features and of the accuracy of the visible boundaries that the TIGER/Line files are based upon. In the case of voting precincts, many voters found themselves separated from their polling place by hills, mountains, and lakes that forced them to travel through other districts and past previous polling places to be able to vote. Election administrators choices were bound by the districts drawn using the TIGER/Line data. If the state is proactive, we can participate in Phases 1 and 2 and work together to provide accurate input to the Census Bureau to improve the TIGER/Line files for the next round of redistricting and for many other purposes. If county precincts are submitted to the Census Bureau and accurately represented, it will provide an important resource to counties for receiving census data by precinct and by legislative district. Montana is one of the few states in the nation that doesn=t participate in the Redistricting Data Program. Hence, we are currently unable to access this wealth of demographic information by precinct or legislative district.

If we actively take advantage of this Redistricting Data Program and other census programs such as the Boundary and Annexation Survey, Local Update of County Addresses, and the Statistical Areas Program, it will benefit redistricting, but will also benefit counties as we improve the accuracy of the TIGER/Line files that provide a geographic link to a gold mine of social, economic, and political data. Legislators, county commissioners, clerk and recorders, and county planners need to be educated about the importance of this program and encouraged to provide direction and resources to this end. That will require a concerted effort by the GIS community at the local and state levels and legislative staff to bring a proposal to the policymakers for approval.

Catherine McCully, of the U.S. Census Bureau, has promised to visit each state to discuss the Redistricting Data Program, and is scheduled to visit Montana later this year. It is imperative that Montanans participate in this process if we want to improve the accuracy of the TIGER/Line data and make critical information available to our constituents.

If you would like more information about the Redistricting Data Program, check out the website at http://www.census.gov/rdo/www/. And if you are interested in working on a proposal to participate in Phase 2 with legislative staff, please contact Susan Fox at sfox@mt.gov.

Susan Fox, U.S. Census Bureau

Coordinating GIS at DEQ

To address the growing need for accurate and timely geographic information the State of Montana's DEQ recently created a GIS Coordinator position and selected Catherine Love to help manage and improve the quality and usefulness of its geo-spatially referenced data.

Almost all of the data collected by the Department of Environmental Quality (DEQ) has a geographic component. However, the agencies' data has not been easily accessible in a geospatial format to in-house or other users. As a regulatory agency, efficient and accurate work by DEQ depends in part on what is located near the site that is being permitted or inspected. As the first GIS Coordinator for DEQ, my job is two-fold. I provide the initial technical support and training for both GIS and GPS users within our agency and also am responsible for coordination and guidance of spatial data management. Theses two tasks support the ultimate goal of the GIS section, which is to improve access to information for our internal employees and to the public.

This position is located with DEQ's Office of Information Technology and supports over fifty GIS users that work with either ArcView or ArcInfo software. As part of the Customer Support Bureau, I manage licenses, upgrade and install software, provide technical support, and research new potential software. I am also creating an in-house training program to help DEQ employees learn GIS skills that are specific to each of their jobs. We plan to have the materials from each of our training sessions available on our internal website.

In addition to working with user with GIS users, this position also supports the DEQ employees who collect data with GPS units. Many of these employees use ExpertGPS software. ExpertGPS allows users to download data from a GPS unit and view the data represented on an aerial photo or topographic map. This simple to use and inexpensive software is particularly useful to employees who are required to collect and report a location but do not need higher level analysis capabilities. DEQ has over a hundred ExpertGPS users who also require technical support and training.

To help with a training plan and other coordination activities, I've started a Spatial Data Policy committee. The purpose of the committee is make policy recommendations on issues concerning spatial data within DEQ.

The first topic we're focusing on is data collection standards. DEQ collects data in as many as seven different coordinate systems and currently we have no metadata standards. We believe that standards, procedures and metadata for data collection will improve both the quality of the data and our ability to share the data with others.

Another project we have undertaken is to improve data management through the use of ArcSDE and Oracle. Last October, Michael Fashoway was hired to be the SDE Administrator for DEQ. Michael will be bringing some of the larger datasets that are shared across the agency into SDE. The first dataset we are working with is our facilities information. In DEQ terms, `facilities' are places where environmental regulatory activities of interest to the State are occurring. The permit identification number, inspection type and date, and date and type of complaints are all attributes associated with a facility. Using the Spatial Data Environment (SDE), this information about monitored facilities will be made available on their desktops to DEQ GIS users and will eventually be made available to the public through the use of the ESRI ™ Internet Mapping Services (ArcIMS TM).

Our goal is to utilize the data display and analysis capabilities of geographic information systems to assist DEQ in accomplishing its mission. As an environmental regulatory agency, DEQ's success relies on its ability to collect, analyze and share information about a given location or area and the activities at that site within divisions of the agency and with other partners throughout the State .For example, the information collected about a facility in the Permitting Division needs to be made available to our Enforcement division staff when a violation is reported. To develop permitting information we need to be able to display to the public where a proposed facility is and what it is located nearby. To provide these services to the public coordinating GIS technical support, training, standards and data managements activities within our agencies are essential.

If you have an interest in the data sets we manage or would like to offer input to DEQ's GIS coordination activities please contact: calove@mt.gov

Catherine Love, Montana DEQ

WEB MAPPING TOOLS: SUPPORTING WILDLIFE HABITAT PROJECTS

Ken Wall
Geodata Services, Inc.
104 South Ave E.
Missoula, MT 59801

Wildlife conservation increasingly involves public/private partnerships, multi-agency projects, and collaborative efforts. On January 28 thirty people attending Missoula the monthly Missoula GIS coffee talk were joined by wildlife biologists from coast to coast in a web broadcast from the Rocky Mountain Elk Foundation headquarters. Ken Wall gave live demonstrations of the collaborative tools developed by Geodata Services that are used by wildlife biologists in the Forest Service, BLM and US Fish and Wildlife Service, tribal biologists, 14 state wildlife agencies, and 24 non-governmental organizations for collaboration on wildlife habitat projects. He also presented details on the custom web mapping tools, developed on open source and commercial web mapping software. This article summarizes the content of the coffee talk.

Wildlife and their habitats are complex systems. Even the best computer models are simply tools for biologists to make more informed decisions. Many planning efforts leverage modeling efforts with expert opinion. Traditionally, this entailed sending paper maps to experts for mark-up. Maps were then digitized into GIS. Today many additional means exist for collecting expert opinion. In this example, web technology was an alternative to sending out paper maps, and allowed low cost dynamic interactive mapping with rich content. Techniques for participatory GIS are becoming an important tool for same time/ different time and same place/different place communication settings. Common sense suggests that maps are among the most effective methods of communicating resource alternatives and decisions. Tables and charts communicate quantitative detail but limit comprehension of complex issues, and photos are visually powerful, but are mainly effective in communicating general ideas.

The collaborative web tools Geodata has developed and adapted for planning meetings, map enabled conference calls and interactive web mapping included a complex set of GIS techniques applied to group decision making. This application of GIS tools has been defined as "participatory spatial decision support." (Jankowski and Neyerges, 2002) and the theoretical and conceptual framework for GIS in decision support they laid out has been adapted by Geodata to aid partnerships in wildlife conservation.

In this application ArcIMS and ArcGIS Server, commercial software from ESRI™ were used to provide more complex mapping and modeling tasks via the Internet yet many of the associated basic map services were based on free, open source software. Recent advances in geospatial technology, built into powerful relational database programs such as My SQL and PostgreSQL, combined with broadcast web services such as The National Map from USGS, the Montana State Library's NRIS map servers, the Geography Network and ESRI's commercial web services, provide an affordable base for almost any organization, including non-profit organizations. Both MySQL and PostgreSQL/PostGIS support Open GIS Consortium (OGC) http://www.opengeospatial.org/ standards.

In this case, complex map interfaces were ruled out in favor of simple tools, with many decisions made automatically for the users. The system was designed for field biologists who can read maps but are not fluent with GIS, the graphical user interface was intentionally simple, minimizing training and procedure recall. In addition to common tools for spatial searches and changing scale, collaborative features were added. Each user had one or more virtual overlays to provide input. When a user entered point or polygon information and annotation, comments were tagged with their name, reference information, date, spatial location, and topic and supplemental comments. The software was developed to do the work on the server, and require no additional software on the clients machines except common Internet browser software, working through firewalls and other security, and requiring no technical support.

The National Wildlife Habitat Project Registry is one of the tools available to all wildlife biologists in the US. It was sponsored by 24 national wildlife organizations and hosted by Geodata Services, Inc., the Rocky Mountain Elk Foundation, and the Wildlife Management Institute, and funded though a grant from the National Fish and Wildlife Foundation (http://www.geodata-mt.com). The Registry allows biologists to enter on-the-ground habitat projects such as prescribed burns, weed treatments, water projects, and other habitat enhancements onto a map visible to all. They can draw a box on the screen to locate projects geographically, and to identify other partners and obtain names, email and phone numbers of potential partners in any area ranging from a multi-state area to an individual watershed.

WEB MAPPING TOOLS SUPPORTING WILDLIFE HABIAT PROJECTS (continued)

With so many partners, we wanted to implement a low cost system that could be perpetually maintained as a common initiative. The geospatial operations necessary for these operations did not require advanced commercial software capability, free, open source software and web services were adequate to meet the task. With these constraints we chose a standard Microsoft Windows server, developed the map service with a Microsoft .Net application programmers interface (API) based on MySQL Connector/Net. We programmed a custom wizard-based MySQL Data Converter, a wizard-like application, created in .Net C#, that creates, imports, converts, and appends tabular and spatial data supported by ESRI ArcGIS.

Web services supply the map content. For this application, biologists needed typical small scale maps to locate their projects, and topographic maps for mapping project boundaries. The task of collecting this data for the entire country would be daunting without web services. Gathering 1:100,000 to 1:20,000 scale base layers such as roads, places, land cover, shaded relief was necessary, as well as clipping, projecting and mosaicing the nearly 100,000 7.5 minute USGS topo maps in the US. Linking GIS web services such as the USGS National Map (free service) and ESRI web services, in this case the National Geographic topo map series (commercial service with a minimal fee of 1.25 cents per map view) to the MySQL database with some custom .Net and C## functions allowed the user rich map content, fitting the mapping task at all scales. This allowed us to serve the web maps without storing any GIS layers or imagery locally on the hosting server.

Other collaborative tools use a similar strategy, but combine a remote web service with Geodata's ArcIMS commercial software, blending the images before delivery to the client browser allowing local GIS layers to be shown over terrabytes of remote data and images.
The implications of this unique strategy are exciting. Non profit organizations, community organizations, teachers, and small rural local governments can now take advantage of high quality, low cost interactive web mapping, without elaborate infrastructure costs for hardware and software. Organizations can tap into volunteer efforts to gather and validate spatial data, and community mapping can be built on a broader base, involving people who would not be interested in using traditional GIS software.

The process is very similar to a n concept to a geographic "Wiki". This is a Hawaiian term for "quick", and is used generically for web software designed specifically for users to collectively maintain a web site. A geo-wiki is a map that is built and maintained collectively by a group of users. You can learn more about geo-wikis by visiting a public Wiki set up by Geodata to complement the national Wildlife Habitat Registry (http://wildlife.editme.com).

For further information:
National Wildlife Habitat Registry
http://www.geodata-mt.com

Wildlife Habitat Wiki http://wildlife.editme.com

Simple Features Specification For SQL http://www.opengeospatial.org/docs/99-049.pdf

The two primary open source databases:
MySQL http://www.mysql.com/
PostgreSQL with PostGIS http://www.postgresql.org/ and http://www.postgis.org/

LITERATURE CITED

Jankowski, P and T.L. Nyerges. 2001. Geographic information systems for group decision making, Taylor & Francis, London, England.