Montana GIS News
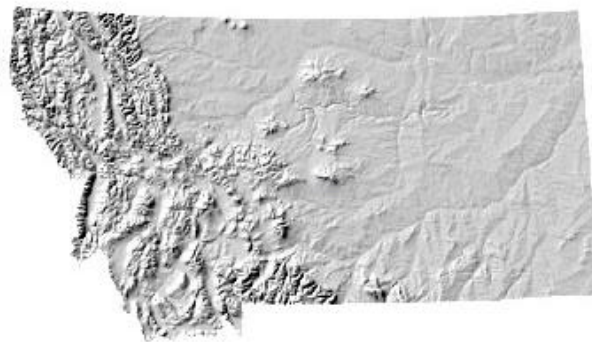
2003 Intermountain GIS Users' Conference Update

COLLABORATION IN COEUR D'ALENE

Coeur d'Alene, ID — The Northern Rockies Chapter of URISA (Urban-Regional Information Systems Association) and the Montana GIS Users Group, alternate the hosting each year of this joint annual conference. The conference focuses on GIS (Geographic Information Systems, i.e. computer mapping) applications, software, hardware etc., complete with keynote speakers and workshops.

GIS and geographic data have developed and grown substantially in scope and use over the past several years, in large part through technology and affordable computing power. There is also a growing public awareness and acceptance that this information and its analysis capabilities is used for decision making and supplying services in both the public and private sectors, from defense applications, utilities and facilities management, or locating businesses, to school bus routing and E911.

We are happy to announce our conference this year to be held at the Coeur d'Alene Resort, April 7-9, 2003. We have pre- and post-conference workshops available on Sunday, Monday morning and Thursday. Our keynote speakers on Monday afternoon are **Nancy Tosta**, former chair of the FGDC (Federal Geographic Data Committee) and currently working in the private sector; **Daniel Kemmis**, author and Director of the Center for the Rocky Mountain West and **Mike Domaratz**, USGS Homeland Security Liaison. They will open our conference by outlining our issues and exploring a col-

NORTHERN ROCKIES CHAPTER

laborative vision for GIS.

Women in GIS will host our Public Night on Monday, April 7th, which focuses on K-12 presentations, a Map Gallery and Poster Contest. Tuesday and Wednesday morning will include presentation sessions on GIS topics, with special interest and interstate group meetings on Wednesday afternoon.

We invite all those interested to attend as well as vendors who might like to share their product and services with an audience of 300 plus attendees. We still have open spots for both presenters and vendor booths! Please visit our website for more information: www.intermountaingis.org/conference.htm

There are online registration forms there as well as contact information to answer any questions you might have.

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Census 2000 Data Keeps On Coming...

by Pam Harris, Census and Economic Information Center (CEIC)

Although April 1, 2000, Census Day, is long over, data from the 2000 Decennial Census are still being released. The most recently completed release is that of Summary File (SF) 3 which consists of 813 detailed tables (484 population tables and 329 housing tables) of social, economic and housing characteristics compiled from a sample of approximately 19 million housing units (about 1 in 6 households) that received the Census 2000 long-form questionnaire. Fifty-one tables are repeated for nine major race and Hispanic or Latino groups. Summary File 3 presents data for the United States, the 50 states, the District of Columbia and Puerto Rico in a hierarchical sequence down to the **block group** for many tabulations, but only to the **census tract** level for others. Summaries are included for other geographic areas such as Zip Code Tabulation Areas (ZCTAs[TM]) and Congressional districts (106th Congress).

This huge file provides answers to such questions as:

- How many housing units are in a specific urban area?
- What is the employment status by gender and race on the reservations?
- What disabilities affect the working age population by county?
- What is the ratio of income to poverty level by age?
- How many structures are under/and or over 40 years of age?

And many more.

From Inkwell to Internet – Dissemination of the Data

Not long ago, the only access to Decennial Census data was by opening one of the many printed publications at your local library or maybe searching through microfiche for a data table. The dissemination of data has come a long way in the past decades and now, American FactFinder (AFF), http://factfinder.census.gov/servlet/BasicFactsServlet, is the Census Bureau's interactive database engine and the primary tool for retrieving reports, creating tables, and generating thematic maps from a variety of Census Bureau databases. This decade, the Census Bureau will publish only three printed reports with the majority of data available via the Internet or CD/DVD. AFF contains a full array of products for different needs and different levels of expertise in working with data. There are the very detailed sets of data tables contained in Summary Files, Demographic Profiles if you need just an overview of an area, Quick Tables (QT) for looking at sev-

eral key items for a single area, Geographic Comparison Tables (GCT) if you want to compare across geographic areas, Printed Reports, Maps (block, tract, city, urban areas, urban clusters, and thematic) and related geographic products.

Besides accessing data from AFF, the Census and Economic Information Center (CEIC) in the Montana Department of Commerce, provides a variety of data items specifically for Montana geography. Recently added to CEIC's web site http://ceic.commerce.state.mt.us/ are the following:

- Summary File (SF) 1 Detailed Profiles (34 pages of tables) for Montana, Counties, Cities, Reservations and Census Tracts in PDF format http://ceic.commerce.state.mt.us/ SF1detailedProfiles.html
- Summary File (SF) 3 Detailed Profiles (58 pages of tables) for Montana, Counties, Cities, Reservations and Census Tracts in PDF format http://ceic.commerce.state.mt.us/ SF3detailedProfiles.html
- Data Maps – Maps of county level data for such subjects as poverty rate, age, median household income, population density, etc. http://ceic.commerce.state.mt.us/ Data_Maps.html

CEIC's web site also has the one-page Demographic Profile available from Summary File 1 http://ceic.commerce.state.mt.us/ SF1demogProfiles.html and a three-page Demographic Profile File from Summary File 3 http:// ceic.commerce.state.mt.us/SF3demogProfiles. html available for all of the geography mentioned above.

CEIC staff are currently preparing a variety of Census Workshops to help people throughout the state learn how to access Census data via American FactFinder and CEIC's web site. AFF is a very powerful tool utilized to access a variety of data, but it is not necessarily intuitive to use. Assisted by Jerry O'Donnell, the Public Information Officer from the Denver Regional Office of the Census Bureau, CEIC staff have provided workshops on the use of AFF and GIS and Census data to clients in Helena and Billings. Most recently, Kris Larson, CEIC's GIS Programmer, offered a 4 hour, hands-on computer workshop at the MLGGC quarterly meeting in Bozeman on MSU's campus entitled "Incorporating Census Data into your GIS." CEIC staff are currently developing workshops for training small business owners to use census data and to help grant writers better use the statistics in their applications as well as more workshops geared toward GIS users and census data. In the near future, CEIC will update its web site to include information on where and when these workshops will be available. If your organization would like to sponsor a workshop (computer labs are a must), please contact CEIC staff at ceic@state. mt.us or (406) 841-2739. If you would like personal assistance with using FactFinder, CEIC staff would be happy to assist you in our office or over the phone. Contact CEIC for more information at (406) 841-2740.

More to come…

Upcoming in March, the Census Bureau will begin its release of detailed migration data including County to County Worker Flow and Gross Migration Summary which includes in- and out- migrants by geographic area. Also to be released starting this spring will be the last major summary file, Summary File (SF) 4, which has many of the tables from Summary File 3 cross tabulated by 132 race groups, 78 American Indian and Alaska Native tribe categories, 39 Hispanic or Latino groups, and 86 ancestry groups. Other special subject files yet to be released are the EEO (Equal Employment Opportunity) File in Fall of 2003; CTPP (Census Transportation Planning Package Profiles) basic county profiles are available now with more detailed data to come later in 2003; PUMS (Public-Use Microdata samples) in Spring 2003; and CHAS (Comprehensive Housing Affordability Study) in Fall 2003.
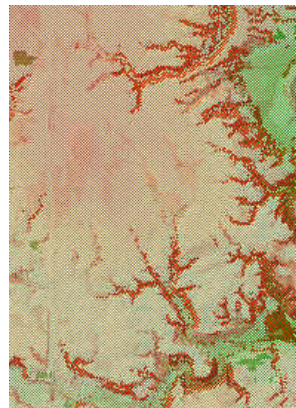
Collaboration Theme of GIS Conference

Prepared by Ken Wall, Geodata Services, Inc.
February 24, 2003

Collaboration and GIS are the focus of this year's Intermountain GIS conference. When many people think of "Collaboration and GIS" they envision public/private partnerships or multi-agency projects but GIS can also bring spatial tools directly to the collaborative process and can be very effective in group decision making regardless of the topic. This article will describe several examples of GIS in action in collaborative sessions. We'll cover tools and techniques to enhance meetings, GIS enabled conference calls, and Internet tools for individual and committee work between meetings. We use these techniques for local governments and in conservation based GIS services, primarily for state and federal agencies, wildlife conservation organizations and land trusts. We have used GIS in real time support for hundreds of meetings, and have developed tools and methods for groups to collaborate between meetings with GIS enabled conference calls and Internet tools. Geodata's customized ArcIMS-based commercial Internet map service provides collaborative tools for 24 land trusts and 22 national wildlife conservation groups and agencies such as the US Forest Service, US Fish and Wildlife Service and BLM. See http://www.geodata-mt.com for more detailed examples.

Tools and techniques to enhance meetings

Specialists can display GIS layers prepared in advance and work with the group to select areas and interact with the data layers. Many of our experiences have involved strategic planning at the watershed level for states or multi-state regions. Many layers of resource data are usually generalized to the watershed-level using rule based models or expert system assignment of high, medium and low categories. This can be done interactively with a group that has expert knowledge of certain geographic areas or
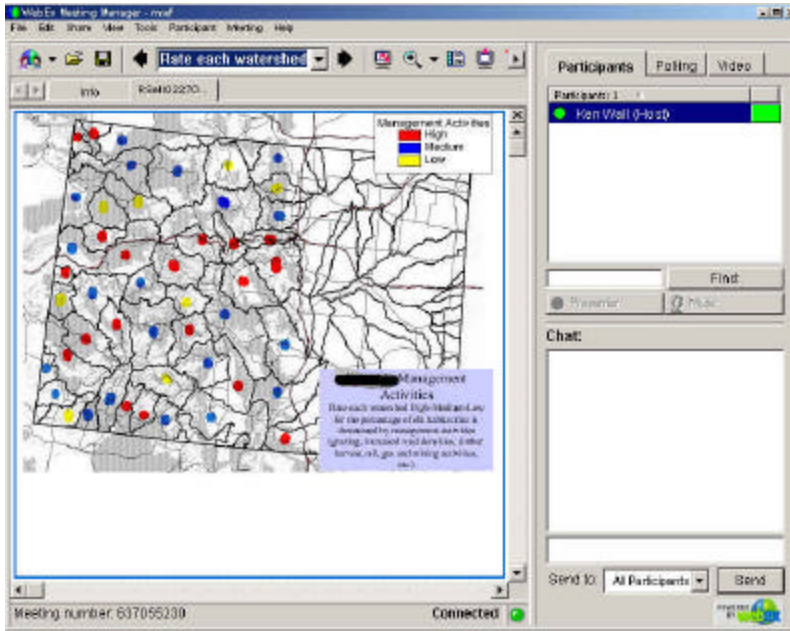
specific resources. Biologists are usually reluctant to run the GIS or even touch the mouse in front of a group, but will point out areas with a laser pen or markup areas projected on a whiteboard. It takes practice, but a competent technician can keep up with a group of reasonable size. Laser pens are inexpensive and work well for selecting or identifying features, and can be easily passed around the group. Computer images projected on a whiteboard are effective for drawing free form areas such as irregular boundaries. Groups are sometimes more comfortable drawing on a map on the wall and this emulates that process well. The GIS technician follows along digitizing the results in real time. We also still use paper maps and worksheets for some larger groups or projects requiring a great deal of original input. This technique also works with wall maps and input matrix. For instance, groups can determine geographic priorities for funding allocations by using stickers, representing expenditures, placed on a wall map. Paper data input can be processed during a break or overnight for subsequent sessions.

Complex models or elaborate GIS modeling are often not practical to develop for interactive meetings, so they are usually prepared ahead of time. One software package we have used allows complex models to be used in interactive sessions. CommunityViz, a product of the non-profit Orton Family Foundation, is one of the leading GIS extensions for community planning. One of the program modules, Scenario Constructor, excels at bringing more complex mod-

eling into a group collaborative session. Overlays, spatial lookups, map layer interaction and other spatial analysis can be built into interactive models with run times quick enough for groups to analyze multiple scenarios and ask "what if" questions in single sessions. The program is also effective at capturing group values for a list of alternatives, such as land use practices or project proposals. Steve Mullen, a planner with CommunityViz, developed and applied this technique with several local government planning processes in Colorado and Utah. A group can quickly weight a list of alternatives or underlying issues, using an ordinal scale (high to low,or least sensitive to most sensitive, etc.) and see the results mapped in real time (see figure 1). The group can then compare different weightings and immediately see the results. The maps become more than a two dimensional representation of the geography or static thematic view of the data, they become an interactive model and more valuable to the process for the group.

One of the newest technologies in computing introduced this year was Tablet PC computers. These devices will take collaborative GIS in meetings to a new level. Many non-GIS users are not comfortable using a computer in an interactive session. Tablet PCs are unobtrusive, lie flat on the table and are drawn on with a pen device, and users interact with the map in a more natural way. The PC does not place a large piece of equipment like a monitor between people and inhibit group interaction. Linked together with groupware over a wireless network, collaborative mapping, along with other group processes are possible without disrupting the meeting dynamics.

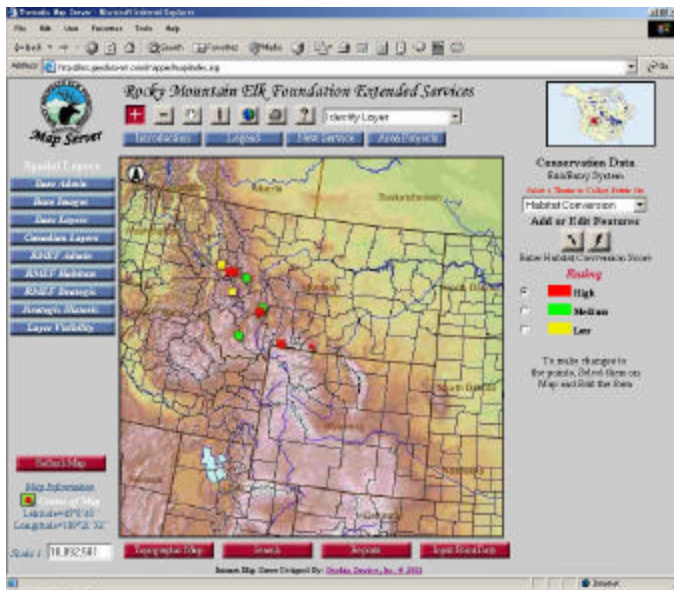### GIS enabled conference calls

WebEx is a commercial service we use for working sessions between meetings and remote collaboration supplementing conference calls. WebEx uses the Internet for groupware to supplement a conference call. Similar to Microsoft's NetMeeting software, WebEx provides a group whiteboard for all participants to review documents or maps, mark them up and provide comments. The service goes well beyond NetMeeting in functionality and ease of use. This service installs an add-on to Internet Explorer, Netscape or other browser software and works with Microsoft Windows, MacIntosh and Unix operating systems. In addition to sharing a group whiteboard, user polls can be set up for group surveys or straw polls, a chat mode allows free form text input and public or private sideline conversations among participants, and presenters can take the group on a web tour or demonstrate applications running on their own computer. For instance, an ArcView project can be shown and the mouse turned over to a participant temporarily to point out a feature or interact with the program. We often use this service for pre and post meeting working sessions. Often our clients are on dial-up Internet connections at speeds of 28k to 56k and the desktop sharing is not as effective (it works best when all participants are on cable, DSL or Lan connections). When we have users on dial-up connections, the native WebEx document sharing mode is preferable, since everyone can keep up. We typically prepare a series of PowerPoint slide shows of the maps to be reviewed in the ses-

sion. These are then loaded into individual whiteboards providing a set of worksheets for each participant (figure 2). Working through the slides in each worksheet, participants mark the maps up collectively. If someone needs a supplemental map, or a larger scale view, they circle the area of interest on the screen and the host switches to ArcView behind the scenes and grabs the screen image they need and pastes it onto the whiteboard. Participants can also provide individual comments. All annotations made

during the meeting are stored for offline review and digitizing. A project review that formerly took days or weeks to accomplish (sending out maps for review, recollecting them, and digitizing the results) can be condensed to a single conference call. The process works because the procedures are similar to traditional map mark up and don't require any training or special software skills. It is particularly effective in pre-meeting sessions. Working committees or the entire group can get together a day or two prior to the meeting and get preliminary work done while sitting at their desk, without travel time and expense. The session can also be recorded, allowing instant documentation or meeting minutes, and made available for review by those unable to attend the session. The built in file transfer provides an easy method to share documents or files between participants for handouts or supporting documents.

Internet tools for individual and committee work between meetings

GeoData customized ArcIMS software to make it adaptable for individual clients. We run it as an "image map" service for simplicity, requiring no add on software or extra licensing, so it works through firewalls and can be accessed from home, a library or an agency office. The Airzip compression software running on our map server allows our users on slower dial up connections to access maps with reasonable speed. Designed for use by those who can read maps but are not fluent with GIS, the interface or graphical user interface is purposefully kept simple and intuitive (figure 3). In addition to the common tools for changing scale, panning and querying data, we added a collaborative feature. Each user has one or more virtual overlays they can use to provide input to the system. When they enter point or polygon information and annotation, their comments are tagged with their name, date, spatial location, and topic (added automatically based on their log in) and supplemental comments. These are stored in a relational database and available instantly in a digital GIS format. This process captures user input like WebEx, but it does not require any additional Internet browser add-ons, and it is available to registered users at any time, not just during scheduled sessions. The ArcIMS based collaboration is slightly more complicated than WebEx because users must perform some basic GIS routines like making a map layer visible and selecting layers from a pull down list. This is more practical for detailed work since users can change scales, zoom in for more detail, look at different map reference layers, and query tables behind the map features.

GIS and Public Participation

Our experience with collaborative GIS has primarily been in expert workshops, but the techniques have also proven effective in public meetings. Capturing individual and collective values at a public meeting can provide valuable perspective for participants and often focus the group. For example, an open space committee

recently met to evaluate the sensitivity of land use constraints. During the meeting everyone was asked to place a dot on a chart for a quick survey (see figure 1). The process is simple for participants, but behind the map a lot is going on. The modeling software converts the dots to weightings reflecting the group's concerns, multiplies the weightings on-the-fly to match a union of all underlying resource layers, and in a few minutes returns a thematic map of the area reflecting the group's values. This technique often helps to define the areas of agreement and the areas where individuals or groups agree to disagree, and makes land use discussions less abstract, setting up an atmosphere of collaboration instead of conflict. The Townbuilder module of CommunityViz is also a useful tool in public meetings, translating abstract maps into instant 3D models for visualizing the results. As technology advances and today's PDAs and tablet PCs evolve into digital paper and more natural ways to handle geographic data, and as the data and models become more complex and more closely represent realistic alternative scenarios, non-traditional GIS users (biologists, mid-level managers, politicians, and individual citizens) will make more use of GIS in collaborative settings without realizing they are doing GIS. In the meantime, don't wait - GIS is already playing an important role in collaboration.

Ken Wall *will be presenting on this topic at the conference and will be available for demonstrations with a booth in the exhibitors section.*

NRIS 2002 GIS DAY ACTIVITIES SUCCESSFUL

On November 20, Montana's Natural Resource and Information System (NRIS) hosted a variety of GIS Day events that were fun, informative, and successful.

The afternoon began when 40 fifth-grade students from Smith Elementary School in Helena were treated to interactive presentations by GIS professionals from NRIS; the Montana Census and Economic Information Center; and Montana Fish, Wildlife, and Parks. Each student was given a personalized certificate of participation, maps, and flyer listing several links to geography-themed Web sites to facilitate extra curricular learning.

A seminar for natural resource professionals and the public was next on the agenda. Presented by professionals from NRIS and the Montana Dept. of Natural Resources and Conservation, the seminar included an overview and demonstration of Internet-accessible water rights data.

The afternoon concluded with an open house for our partners in the GIS community, government, and the public. Guests enjoyed viewing a map gallery, participating in hands-on demonstrations covering a variety of Web applications, and refreshments.

The activities received excellent electronic and print media coverage, including two TV news stories and coverage in Helena's local newspaper. All events took place at the Montana State Library in Helena. NRIS has been a part of the State Library since 1985.

Montana NRIS hosted a fifth-grade class from Helena during our GIS Day activities. NRIS received thank you letters from these students. Here are some excerpts, with original spelling:

"...I liked seeing the airial photos. They were really cool! I think that I'm going to map my way home tonight."
> Thanks,
> Taylor

"...Thanks for inventing us today. I especially liked the computer lesson and I learned that women live longer then men."
Thanks for everything,
> Adam
> P.S. About the women living longer then men that is a big bummer.

"...Thank you for letting us come and use your gadjets. I really learned a lot. If I get lost I can remember where the latitude and longtitude lines are."
> Thanks again!
> Lauren

Montana Fish, Wildlife & Parks (FWP) GIS Data Now Available on the Web

Getting FWP's GIS data just got a lot easier. Thanks to the good work of FWP's Information Management and Web staff, you can now download over 30 FWP GIS layers in either ArcView shapefile format or ArcInfo e00 format. You can also see a quick image of a data layer by clicking on the layer's map image button. From hunting districts to bighorn sheep distribution, from westslope cutthroat trout conservation areas to routed stream hydrography, these data are now available. Also on the site, is a "who to call" link and a link to data layers under development. Clicking on any of the major headings on the main GIS page will jump you to a more detailed list of related information where you can download the data, view the metadata, and view the map images of the data.

To find out more about any of FWP's GIS layers or download the layers go to http://fwp.state.mt.us/insidefwp/fwplibrary/gis/. To insure your web browser is displaying the most recent list of layers press F5 on your keyboard while on the site. This will refresh the site as layers are added and changes are made.

Another feature available on FWP's website is the Interactive Hunt Planner. The hunt planner allows prospective hunters to view a species' distribution within a specific area or hunting district with a choice of three different backgrounds (public land ownership, topographic, or the Montana state highway map). The Interactive Hunt Planner is located at http://fwp.state.mt.us/hunting/plan/chooseRegion.asp.