

SIMPLY SPATIAL

RMMC'S RESEARCH AND SCIENCE NEWSLETTER

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From the Editors:

This issue focus' on the Geographic Analysis and Monitoring program (GAM). A lot of work was accomplished in spite of the fact that we missed a few days of work in March due to the famous Blizzard of 2003. Some areas had 5-6 feet of snow and it took several days for us to dig out. Our country has gone to war to protect us, and we are with the troops in spirit if not in body. At the same time, we have been helping out with disasters such as the Space Shuttle Recovery Effort, and gearing up for this year's fire season. It seems we have one challenge after another to keep us busy, but that's okay.

GEO WALL—ROCKY STYLE!

Visualization is an important component of science: the ability to illustrate scientific data in a meaningful way. A good example of



RockyWall

visualization is a shaded relief map showing elevation data in an area. The shaded relief map makes the elevation data meaningful to users. 3-D visualization is an extension of visualization from two to three dimensions – allowing the user to see depth in visualizations. This lets scientists and other users interact with their data in a new way.

There is a long history of 3-D visualization, starting with stereo opticons of the 19th Century, to ViewMasters, 3-D horror movies (The Creature from the Black Lagoon!), and stereoscopic viewing of aerial photography. There have

been computer 3-D visualization systems for several decades, but these systems required powerful, expensive hardware and software, and armies of technicians to run them. The GeoWall Consortium, an association of academic and government institutions, has made 3-D visualization much more affordable by developing free 3-D visualization software that runs on ordinary PC's and uses standard computer projectors (www.geowall.org). The Rocky Mountain Mapping Center, in cooperation with the USGS Central Region Director, has built and developed a GeoWall system for use by USGS scientists and other partners.

The first year goals for the RMMC GeoWall, named "RockyWall", were to (1) get the system to run using canned data available off the Internet, (2) develop 3-D visualizations using our own RMMC data, (3) begin to develop collaborations with other USGS scientists and sister DOI agencies to develop the use of the GeoWall for scientific applications. To date, we have been successful in completing the first two goals. The most spectacular use of RMMC data

has been the 3-D visualization of the Hayman IFSAR data – a high-resolution elevation data set derived from airborne synthetic aperture radar over the Hayman Fire area. The success of RockyWall has been due to the contributions of RMMC staff *Maria McCormick, Elissa Adams, John Kosovich, Mark Feller, Mike Tate, Gary Grande*, plus the help of Dan Steinwand and Brian Davis at the Eros Data Center, who pioneered the use of GeoWalls in USGS.



RockyWall Demo

Our ultimate goal is to develop a USGS Central Region 3-D Visualization facility that will allow USGS and DOI scientists and managers to create 3-D visualizations of their data, allowing them to interact with their data in a new way. To help accomplish that goal, we have demonstrated RockyWall to the Federal GIS Coordinating Group and the USGS Central Region Executive Leadership Team and are pursuing possible partnerships..

For more information, contact **Tom Owens** (tom_owens@usgs.gov) at 303-202-4071.



Federal GIS Users Group, April 8

EPA Emergency Response

The U.S. Geological Survey, Rocky Mountain Mapping Center and the EPA's Region VIII Oil Response Program have implemented web-based information and decision support applications for five emergency response action plan sub-areas in three western states.



Chemical Spill

The ArcIMS applications, developed by the USGS, will significantly improve mitigation of hazardous spills because the applications support expedient emergency response based on digital geo-referenced information. The USGS acquired digital



Cleanup in process

information from multiple GIS sources, in varied formats and integrated those data into a robust visual information tool, making them accessible to numerous responders and managers via the Internet and CD-ROM.

For more information, contact [Sherry Durst](mailto:Sherry.Durst@usgs.gov) (sldurst@usgs.gov).

NEW! NHD WEB SITE

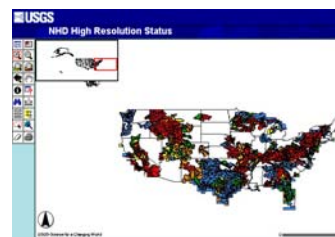
The web site of the National Hydrography Dataset (NHD) High Resolution data status is being developed. The NHD is being developed using the hydrography from 1:24,000-scale maps in what is known as High Resolution NHD.

This opens up entirely new markets for hydrography data because the NHD, specifically designed to support GIS, is now being produced at the scale used in most geographic research programs. As a result, most federal, state, and local agencies are turning to the NHD for the hydrography theme in their GIS. This has resulted in partnerships between the USGS and over 50 agencies that are converting half of the Nation's hydrography coverage into the NHD, with the other half to be completed by 2006.

The members of the partnership closely watch the

status of this conversion, and to help them get the latest information, a web site has been developed to allow a quick and useful status display.

Each of the 2,333 sub-basins that make up the NHD coverage of the country are



color-coded based on their status. The subbasins can also be queried to determine the expected due date, who is working on the conversion, the customer for the conversion, and who to contact for more information. It is also possible to build queries to locate subbasins meeting the desired criteria.

This web site information system is yet another way the

web developers and GIS experts from the Rocky Mountain Mapping Center are building stronger connections between the USGS and its partners. OMB is said to be using this web site to monitor accomplishments within the USGS. To view the NHD Status web site, go to: <http://rockys9.cr.usgs.gov/nhdstatus/viewer.htm>

Melanie Hood-Lofthouse is the developer for this site and has written some

user guidelines to explain how to use the web site. The guidelines are located at the bottom of the web page as a link.

For additional information on the NHD, contact [Paul Wiese](mailto:Paul.Wiese@usgs.gov) (pmwiese@usgs.gov). For additional information on the web site, contact [Melanie Hood-Lofthouse](mailto:Melanie.Hood-Lofthouse@usgs.gov) (mkhood@usgs.gov).

STATISTICS FOR GEOGRAPHERS



RTA staff, in response to a need for statistical training for employees, has organized an introductory course in statistics for RMMC

employees. RTA employees *John McCammon*, *Ray Watts*, and *Karen Fritts* (from the Information Services Branch) have organized and are teaching the class. The class is held on Wednesday mornings from April 23 - May 28.

Over 20 RMMC employees are attending the class. Topics covered include introduction to statistics, regression, data

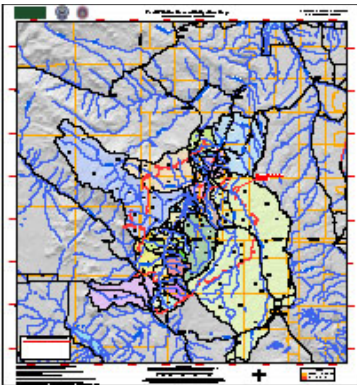
exploration, accuracy and precision, and spatial statistics. Future classes will use data contributed by the students to make the class relevant to their needs.

For more information, contact [John McCammon](mailto:John.McCammon@usgs.gov) (jhmccammon@usgs.gov).

POST WILDFIRE HAZARDS MITIGATION MAPS

Last summer, the USGS created Post Wildfire Reconnaissance Maps for 17 of Colorado's 2002 wildfire burn sites. The intent of the maps was to help FEMA, Colorado Water Conservation Board (CWCW), and local emergency managers assess potential risks to people and infrastructure from flood and debris flows resulting from the burn.

The Hayman, Coal Seam, and Missionary Ridge burn sites were identified as having the greatest potential impacts on public health and safety. John Elliott and Mark Smith from the USGS Colorado Water District, and Jason

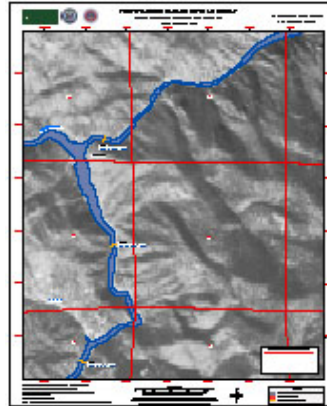


Wagner from the Bureau of Reclamation are conducting limited detail hydrologic & hydraulic analyses over these three areas. To aid local emergency managers in preparing for the spring runoff, *Alexis Ellis* and *Mark Bauer* from RMMC have prepared a set of Post Wildfire Hazards Mitigation Maps using the preliminary results of the analyses.

The geology and terrain over the Hayman site make flooding the primary hazard. The USGS collected cross section data along the South Platte River and used it to redefine the 100-year floodplain. A new floodplain was also defined for Mitchell Creek in the Coal Seam burn area, but the primary concern for this site and for the Missionary Ridge burn area is debris flows. Maps for these two sites show potential depositional areas along the drainage basins.

The Post Wildfire Hazards

Mitigation Maps will be distributed through the



CWCW. However, thumbnail sketches and plot files for the maps will be available on the USGS Colorado Wildfire Recovery web-mapping site as soon as it is completed. Final versions of the maps will also be prepared and distributed when the results of the analyses have been verified and accepted.

For more information contact: [Catherine Costello](mailto:Catherine.Costello@usgs.gov) (ccostello@usgs.gov).

WELCOME CLIFF!

Cliff Inbau is a GIS Consultant with the Environmental Systems Research Institute (ESRI) now working on-site for the USGS. *Cliff* is funded by the National Civil Applications Program (NCAP) to support NCAP related activities. He has over nine years of GIS experience, and more than 10 years of experience in water resources. *Cliff* recently joined ESRI and prior to that he worked in the GIS arena for a few consulting and software firms, as well as the City of Aurora Utilities Department.



Cliff is a Colorado native and received his Master of Engineering in GIS from the University of Colorado at Denver and a B.S. in Watershed Sciences from Colorado State University. Even though he attended both universities, he considers himself a Ram fan and has season football tickets. *Cliff* enjoys the outdoors, biking, Aikido, astronomy, books, music, and home brewing. He lives in Aurora with his wife and two sons (ages 7 and 4).

GAM SCIENCE MEETING

The Rocky Mountain Mapping Center will be hosting the Geographic Analysis and Monitoring (GAM) Program Science meeting in Breckenridge, Colorado June 9-12. The meeting's purpose is to exchange information and ideas between NMD scientists working in the cost centers. The meeting will focus on programmatic, scientific, and technical issues, as well as the long-range plans of the Geographic Analysis and Monitoring Program. An outside

panel of geographic science experts will be invited as program advisors to the meeting.

The GAM Program is a new program (two years old) and has a program coordinator, Doug Muchoney, who has been with the program since September 2002. The Program is still developing its mission and goals, and this meeting will be critical for the future development of GAM activities. Attendees will include GAM scien-

tists, managers, and scientists and managers from other USGS programs. Significant portions of RTA branch activities are sponsored by GAM. For more information about GAM visit the website at <http://gam.usgs.gov/index.shtml>

For more information about the science meeting contact **Tom Owens** (tom_owens@usgs.gov) at 303-202-4071.

WORKSHOPS AND PRESENTATIONS

April 10: AAPG and RMAG will present "AAPG's First Distinguished Ethics Lecturer", John Gibson, CEO, Halliburton Energy Services, speaking on "The Ethics Storybook".

April 17: Denver Metro ArcGIS Users Group meeting at the City and County of Broomfield Municipal Building.

April 14-18: Safety and Health Awareness Week

Upcoming Events

May 20: NHD workshop, Denver, CO

May 26: Mark DeMulder visit, Denver, CO

May 28: Chip Groat and Bob Doyle visit, Denver, CO

June: GAM Science Meeting, Denver, CO

June 11-13: 24th Annual NRLC Conference—Water, Climate and Uncertainty, Boulder, CO

June 24-25: RMMC Program Review with Max Ethridge, Denver, CO

July 7-11: 23rd Annual ESRI User Conference, San Diego, CA

October 25-30: APSRS/MAPPS Fall 2003 conference, Charleston, SC

On-Going Events

Tuesdays at 10:00 a.m.: Remote Sensors Users Group, Denver, CO

Spring 2003 (Tuesdays): Sustainability of Practices and Land Uses, Colorado State University, Boulder, CO

Monthly: Federal GIS Coordination Group, Building 810, Denver, CO

GAM Program Coordinator Visits RMMC Forgets to Bring Snowboard!

Doug Muchoney, the new NMD GAM Program Coordinator spent the week of March



4-6 visiting RMMC and visiting with GAM scientists, managers, and other Center researchers. His visit gave RMMC scientists an opportunity to get acquainted with the new architect of the GAM Program and learn more about his plans and hopes for the future of the Geography Discipline. Doug's

enthusiasm for GAM and geographic science was evident and contagious. RMMC researchers eagerly responded with an array of project briefings outlining the work currently being conducted



with GAM project funds and outlined ideas for new initiatives. His visit left everyone feeling positive for the future of this program.

Although scheduled during the height of the Rocky Mountain ski season (and with outstanding conditions in place), Doug somehow forgot to bring his snowboard and repeatedly castigated himself about this error. He vowed that he would not make a similar mistake when he returns in June for the GAM Science Meeting in Breckenridge. (Hey, Doug, the snow will all be melted by then. Bring your fishing pole instead!)



Gunnison Gorge Integrated Science Project (Mancos Shale)



RTA researchers are contributing to the efforts by USGS scientists to assist the Bureau of Land Management (BLM) in determining the best land management practices on National Conservation Areas (NCA) in Colorado. The BLM Gunnison Gorge NCA encompasses 57,725 acres of public lands in Montrose and Delta counties. A portion of this land

is designated wilderness, but a majority of land is open to restricted or unrestricted public use. The adobe foothills of the Black Canyon of the Gunnison River are a favorite place for all-terrain and four-wheel drive recreation, collectively termed off-highway vehicle (OHV).

BLM's management plan for the Gunnison Gorge NCA must consider protection of endangered plants, animals, and the natural terrain while continuing to allow access to these public lands. USGS researchers are taking to the field this spring to gather soil chemistry, document soil/plant as-

sociations, and subbasin erosion.

The Geologic Discipline will be creating a 6-foot wide trench into a hillside in a remote location of the NCA to determine stratigraphic changes to the Mancos Shale and its derived soils. The Geography Discipline used the DLG Hypsography and Tagged Vector Contours to prepare field maps of subbasin and microwatershed delineation, and slope and azimuth (dip) maps for the field crew to reference and document locations and observations. For more information contact [Dave Catts](mailto:dcatts@usgs.gov) (dcatts@usgs.gov).

GAM! GAM! GAM!

The Geographic Analysis and Monitoring (GAM) Program is one of three Geography Discipline Programs. The GAM Program assesses the Nation's land surface at a variety of spatial and temporal scales to understand the rates, causes, and consequences of natural and human-induced

processes and their interactions that affect the landscape over time and provides this information to policy makers and land managers.

The Research Technology and Applications Branch of the Rocky Mountain Mapping Center has initiated several significant GAM projects that are researching vari-

ous aspects of landscape change in the Rocky Mountain West. Here are brief updates on the accomplishments of these GAM projects to date.

For more information on this program, contact [Tom Owens](mailto:tom_owens@usgs.gov) (tom_owens@usgs.gov).

STRIDES!

STakeholder-driven Research and Involvement in DEcision Support Project

In an effort to improve the linkage between science and decision maker needs, we are exploring decision support approaches and how land-use decision makers can use USGS science more effectively.

We are currently working with the BLM on the Colorado Plateau to collaboratively formulate integrated science questions that would address resource management issues in this region. The integrated science questions will be framed for modular modeling efforts currently underway on the Colorado Plateau.

Our goal is to provide the interface between the decision makers and the scientists who will address the issues. The advantage to using the modular modeling approach is that both empirical data and process modeling approaches can be applied to permit integration across disciplines, and thus permits a more integrated approach to addressing the science requirements identified.

We are also exploring simpler user interfaces for accessibility to broader audiences, which retain the ability to access detailed supporting scientific data when desired.

For additional information contact [Richard Zirbes](mailto:rjzirbes@usgs.gov) (rjzirbes@usgs.gov).

GAM NODE DEVELOPMENT

GAM Node represents a set of tasks that provide comprehensive and coordinated information and data management for the GAM program. Specific activities include continued development and support of the GAM web site <http://gam.usgs.gov/>, increased web enabling of project specific data and information <http://rockys20.cr.usgs.gov/>, and development of a data set registry <http://rockys20.cr.usgs.gov/sds/>.

Support of the GAM web site involves both hosting

and maintenance activities. Project specific sites have been developed for a variety of projects, including sites currently under development for the Powder River Basin and the Land Cover

Trends project. And finally the Science Data Store (SDS) system is available for web based registration and storage of data.

All of these activities are aimed at helping to address the goal to provide pertinent access to data, information, and tools that are key to the GAM program.

For more information contact [Jill Cress](mailto:jjcress@usgs.gov) (jjcress@usgs.gov) or 303-202-4275.



South Platte Landscape Change

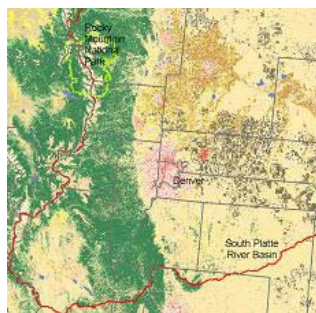
This is a new project that looks at where, why, and how landscape change occurs. This type of information is critical for managing our expanding influence on the land surface, yet scientific understanding of land use change and its causes is generally lacking. Landscape change is a dynamic process with complex interactions between human activities and environment. Biophysical factors such as elevation, soils, vegetation type, and water resources provide a potential for many land use types in the South Platte region. However, economic potential and other human factors

such as land ownership also shape the landscape.

In this study, the spatial processes and dynamics of land use change are being investigated. Some of the nation's most rapid urban growth is occurring in the basin. But the region is also an important agricultural and recreational area. Competition for water, suburban growth, and national trends in agriculture may be important human causes of regional change. The effects of large natural disturbances, such as fire, on land use patterns may also be important. National Land Cover Data from the early 1990s is one important component for

determining the dynamics of change.

For more information contact [Mark Drummond](mailto:mark_drummond@usgs.gov) (mark_drummond@usgs.gov) or 970-226-9374.



South Platte

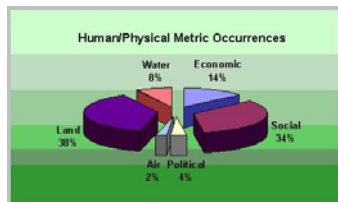
SLAM

Systems-approach to Landscape Analysis and Monitoring

The goal of the SLAM project is to develop a set of standardized metrics to analyze rates, trends of landscape change and the underlying causal forces behind the changes. Hypothetically there are many parameters/metrics to monitor landscape change, standardized key metrics can be identified and developed for quantifying not only local changes but regional and national changes as well. These metrics will allow for a uniform synthesis of landscape change for the various projects under the GAM program for its Status and Trends Report.

After an extensive literature review of studies, reports, websites, and journal articles an access database was developed to track the various physical and human metrics used by researchers. To date, 150 entries have been entered into the database. The metrics have been categorized according to metric class, type, and subtype.

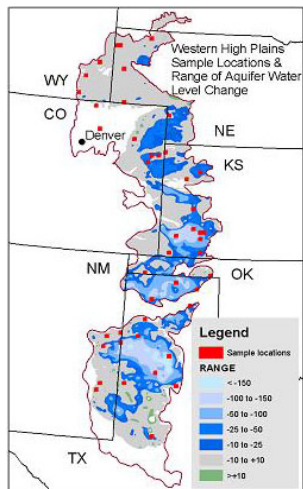
By analyzing what metrics various groups are already using, we plan on identifying a set of key metrics. Candidates for further testing will be those metrics that are used multiple times (indicating their importance as a measurement) and those that can be easily derived nationally. Regression analysis will be used to test the importance of the metrics in measuring landscape change and the forces behind it. Data along the Colorado Front Range will be used to prototype the metrics.



For more information contact [Carol Mladinich \(csmadinich@usgs.gov\)](mailto:Carol.Mladinich@usgs.gov) or 303-202-4313.

Land Cover Trends in the Central U.S.

RTA is also involved with regional analyses in the Land Cover Trends Program. Regional analyses are an important intermediate



level of study for understanding the human and ecological dynamics of

change. This project synthesizes and analyzes basic regional data on socioeconomic conditions, land use, and natural resources to identify and model the processes of change. These types of analyses contribute to understanding the status and trends of the nation. Current work in the Western High Plains examines how land use change relates to water resource dynamics. The region is one of the nation's most important agricultural areas, due in large part to a ready supply of water for irrigation. However, the High Plains (Ogallala) Aquifer is being depleted in many areas because of heavy use. The dynamics of regional agriculture and aquifer decline are

causing significant changes on the land surface. At present, 45 locations are being sampled at a fine scale to analyze land use and land cover change from 1973 to 2000. Spatial analysis of the relationships between land use change and aquifer resources will be used to understand regional scale processes that influence human activities and the environment. Upcoming studies will focus on the processes of change in Rocky Mountain forests, desert regions, and the Gulf Coast.

For more information contact [Mark Drummond \(mark.drummond@usgs.gov\)](mailto:mark.drummond@usgs.gov) or 970-226-9374.

Land Cover Trends – National Support

RTA is providing national support the Land Cover Trends Program. We assist other centers in getting organized and running LCT projects. It's that time of year again for Trenders to get out in the field—especially in areas that have a tendency to heat up early. Keith Landgraf joined Alisa Gallant (EDC), Darrell Naptopn (EDC/South Dakota State University), and Brook Kintz (Texas Mapping Partnership Office) to conduct fieldwork in the Edwards Plateau ecoregion from March 30 to April 4. *Bev Friesen* hit the Mojave ecoregion from April 11-18 with Ben Sleeter and Christian Raumann (Western Region Office, Menlo Park, California) and John Vogel and Leila Gass (Southwest Science Center in Tucson, Arizona). Additional field trips

may be scheduled to other ecoregions this summer. Field teams are ideally comprised of people from at least two other USGS centers to leverage regional expertise and provide a forum for collaboration and communication between centers. Although satellite imagery and aerial photography are primary sources of information for mapping change over the past 30 years, time in the field helps document the relationship between land cover and land use, and provides subtle hints of the driving forces of that change.

Our goal is to visit as many as 90% of our 10-x 10-km sample blocks. That means a lot time behind the wheel. Every trip is different, but most

cover about 300 miles per day when access is available and roads are in good condition. More ground was covered in the Western High Plains trip in the 2002 field season than in some of the other ecoregions. The Mojave team logged over 2000 miles in six days in the field in April!

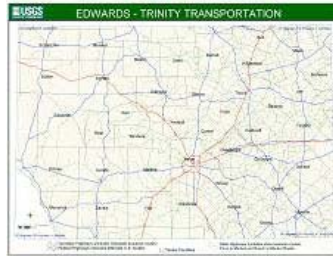


For more information contact [Bev Friesen \(bafriesen@usgs.gov\)](mailto:Bev.Friesen@usgs.gov) or 303-202-4179.

LAND USE DYNAMICS IN THE EDWARDS-TRINITY AQUIFER

The Austin-San Antonio urban corridor is home to more than 2.5 million inhabitants, and depends on the Edwards-Trinity Aquifer system as the major source of water. Population projections indicate that by 2040, approximately 4.8 million people will be living in the area, placing a greater burden on the aquifer system. In collaboration with the University of Texas-Austin, the Greater Austin-San Antonio Corridor Council, USGS' Rocky Mountain Mapping Center (RMMC), the Texas Mapping Partnership Office (MPO), and the EROS Data Center (EDC), are reconstructing and visualizing the process of land use change for the Austin-San Antonio urban corridor and adjacent Texas Hill Cemetery.

A case study, consisting of 16 1:24,000-scale quadrangles within the urban corridor, will be used to analyze and model Austin's land use development. Land surface characterization metrics, such as composition of urban or developed lands, will be used to quantify the impact humans



have had on the landscape. In collaboration with the EROS Data Center, the Edwards-Trinity Aquifer Project is monitoring the land use and land

cover transitions in the Edwards Plateau ecoregion. National Elevation Dataset and National Land Cover Data are being used to construct a temporal land use dynamics database for analysis, model, and visualization.

The transformation of undeveloped land into a specific land use is often dependent on how accessible that area is to the present mode of travel. The closer a parcel on the landscape is to an existing transportation feature, the greater the likelihood the parcel will undergo landscape change.

For more information, contact [David J. Hester](mailto:djhester@usgs.gov) (djhester@usgs.gov) or 303-202-4318.

Status and Trends of the Transportation Network



Scientists from RTA have developed a number of innovative descriptors for the status of the transportation system, and have been refining them for analyses in biogeography and ecosystem science. One of the simplest indicators is illustrated (above), which depicts distance-to-road in the S. Platter River basin of Colorado, Wyoming, and Nebraska as pseudo topography (places far from roads appear to be hills or mountains). Denver, Boulder, and other Front-Range communities appear as prominent blue patches. There are surprisingly unroaded areas on the plains southeast of Greeley, Colorado. More sophisticated indicators are under development. One of these estimates of human remoteness, which is the travel time required to reach each point on the landscape; calculations are based on terrain, land cover, and estimated road speeds. A pilot application of the remoteness model in the Uinta Basin of Utah and Colorado helped BLM managers identify areas that are least accessible and therefore most vulnerable to significant ecological change in the event of energy exploration or development. Additional work provides transportation parameters for the sample tiles of the Land Cover Trends (LCT) project, enabling LCT to statistically analyze relationships between roads and trends in land cover change.

For more information contact [Ray Watts](mailto:rwatts@usgs.gov) (rwatts@usgs.gov) or 970-226-9378.

YELLOWSTONE PLACE-BASED STUDY

Scientists from the Geography and Biology Disciplines are cooperating in studies of the effects of human activities on wildlife in the Greater Yellowstone Ecosystem. Roads, traffic, and general human accessibility are proposed as factors that degrade the quality of wildlife habitat. In four years of effort, RTA researchers have photo-interpreted road occurrences in more than half the perimeter around Yellowstone National Park and adjacent Wilderness Areas (Fig. 1). Fieldwork following photo interpretation has provided corrections and attributes for mapped roads. Compared to off-the-shelf road data sets, the new products show increases in road lengths ranging from 20% to 100% in different parts of the ecosystem. The new maps combine with traffic data, elevation data, and land cover data to provide estimates of the remoteness of any point on the landscape; this remoteness model

is in early stages of development and has been applied only to a small part of the ecosystem. Global Positioning System locations of grizzly bears have been compared to output from the human remoteness model, and preliminary analysis indicates that bears prefer to inhabit areas that are difficult for humans to access. Work continues in development of traffic models, human remoteness models, and assessment of impacts on grizzly bears.

For more information contact [Ray Watts](mailto:rwatts@usgs.gov) (rwatts@usgs.gov) or 970-226-9378.

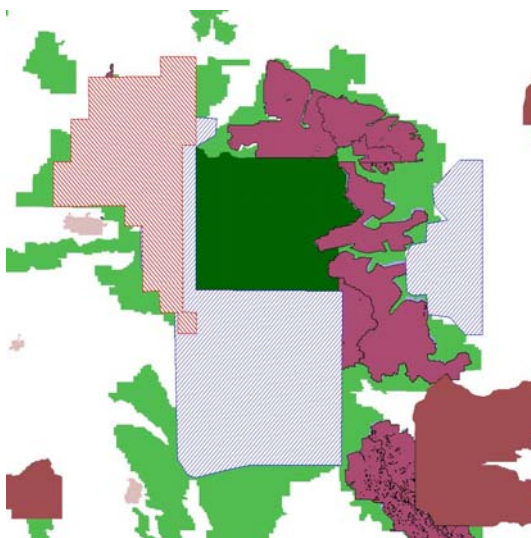


Figure 1. Map showing Yellowstone National Park (dark green), surrounding Wilderness Areas (purple), National Forests (green), and other federally managed lands (brown). Pink areas have been specially mapped for this integrated place-based study in FY2003; blue areas have been both mapped and field validated in earlier years.

GOOD-BYE ELDON

After 30 years of federal service, *Eldon Jessen* has retired. *Eldon* began his career in Reston, Virginia in 1973, joining the USGS as a geographer. He worked for the Geographic Applications Program. *Eldon* moved to Denver in 1975, and was assigned to the Land Use Mapping Program as a Liaison Officer doing Quality Control. In the 1980-81 timeframe, *Eldon* was reassigned to the Research Branch doing geographic research, and became a Physical Scientist.

Eldon has numerous projects to his credit: WAsATCH Utah Earthquake Hazards Program, Hydro Carbon Micro Seepage in the Outer River Basin, and test pilot projects for Land Use Programs. He was involved in the monoscopic revision of USGS maps, which lead to the RevPG program in the early 1990's. RevPG spawned the FTI Program, and *Eldon* continued doing software development for both RevPG and FTI throughout the 90's. The past three years, he has worked on the GeoMAC and Fire Science web site development. His hard work and dedication will be missed.

Eldon plans to enjoy his retirement by doing genealogy research on his family, gardening, drawing, and some traveling. He has a lovely wife, seven children, and fifteen grand-children. With his family and projects, he will stay busy.

Association of American Geographers Convention

As I stepped off the plane in New Orleans I knew I was no longer in Colorado. It was humid, humid, humid. The locals said if I thought this was humid I should come back in July and August! These were *Carol Mladinich's* first reactions when attending the 99th annual convention of the Association of American Geographers held on March 5-8. RMMC staff members who attended the Convention with *Carol* included *Stacy Welding*, *Beverly Friesen*, *Mark Drummond*, *Joseph Ker-ski*, *Monica Ruiz-Bustos*.

Climate and fun aside, attending scientific meetings is an important component of a researcher's work. The researcher is able to learn about what his/her peers are doing by attending presentations and through personal contacts. The research also presents his/her work for critical review by peers. The few days that are spent at meetings such as this are very intense and very rewarding for the researcher. The

AAG convention is an important one for our researchers to attend because many of the leading geographers are there to generate a stimulating exchange of ideas.

This year's annual meeting was once again jam-packed with many more sessions than an individual could hope to see over the wide breadth of the geography discipline. There were three time blocks in both the morning and afternoon with up to 40 sessions in each time block and four papers in each session. An employee at the hotel, upon seeing the morning's scheduled meetings, said he had never seen so many talks being held at one time.

Presentations by RTA staffers included *Carol Mladinich* and *Stacy Welding* who presented a poster entitled "Evolving Landscapes along the Colorado Front Range". It was well received and there was interest in the research they are doing in

the SLAM project to develop a set of standardized metrics. A session on Land Cover Land Use Dynamics in the U.S. was organized and facilitated by Dr. Napton from South Dakota State University and the EROS Data Center. Five team members presented results of their research, including two from RMMC and three



from EDC. *Bev Friesen* summed up work on the Ridge & Valley Ecoregion while *Mark Drummond* explored the topic of land use and water resource dynamics of land cover change in the Western High Plains.



DYNAMIC WEB ATLAS

The Dynamic Atlas activity involves research into leading-edge technologies to support the web-enabled dissemination of the information contained in the Land Status & Trends reports. The goal of this project is

to provide web available access to both the Land

Status & Trends reports, and their underlying data and information.

For more information contact [Jill Cress](mailto:jjcress@usgs.gov) (jjcress@usgs.gov) or 303-202-4275.

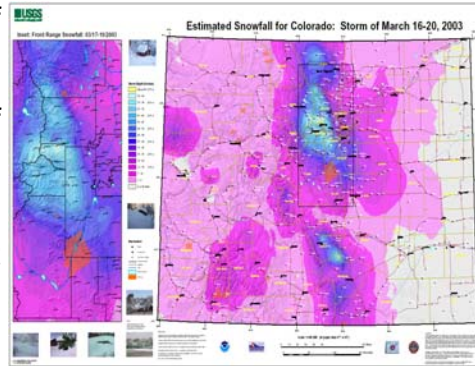


COLORADO SNOW!

A record-breaking snowstorm on March 16-20, 2003 followed a record-breaking 2002 wildfire season for the state of Colorado. The Front Range and other eastern slope areas received several feet of snow, with many locations reporting 5-6 feet. As a result of this one storm, March 2003 is the snowiest March, and is the third snowiest month ever, in Denver's recorded history.

average after the storm.

The Rocky Mountain Mapping Center has created a map of estimated snowfall totals for Colorado based on



laid on updated Colorado state base GIS data layers. Also shown on the map are last summer's wildfires. The heaviest snowfall occurred to the north of the area burned by the 137,000-acre Hayman fire; however, concerns of flooding and reservoir contamination due to rapid spring meltoff still exist. No accuracy is implied for the indicated snowfall depths, as the NWS data locations were fairly

A streak of 19 consecutive months of below-normal precipitation was finally broken by this storm. Snowpack for the South Platte River watershed jumped from approximately 85% before the storm to over 100% of

the accumulations reported by NOAA/National Weather Service (NWS) for this single storm. Snow depths at specific locations were obtained from NWS web sites, interpolated into a depth surface, and then over-

dense along the Front Range, but were sparse for the rest of the state. Visit <http://rockyweb.cr.usgs.gov/html/graphics/>

For more information contact [John Kosovich \(jjkosovich@usgs.gov\)](mailto:jjkosovich@usgs.gov).

FEMA Detail Concludes

In April, Catherine Costello completed her four-month assignment as the USGS liaison to FEMA Region 8. The liaison position was the result of the joint USGS-FEMA efforts last summer in the post wildfire mitigation activities. To strengthen relations and identify other areas where the two agencies could work together, Catherine was assigned to Region 8's GIS group. It was an interesting time to be at FEMA, since the agency was in the process of being absorbed into the newly established Department of Homeland Security (DHS). Catherine learned a great deal about FEMA and identified several programs for potential USGS-FEMA cooperation, including FEMA's Flood Insurance Rate Map (FIRM) Modernization program and the Hazards U.S. (HAZUS) disaster planning application. Though her assignment has ended, Catherine will continue her relationship with FEMA by working on the post wildfire recovery activities as well as several of the projects she identified during her detail. RMMC plans to continue the liaison position with another temporary assignment.



POWDER RIVER INFORMATION SCIENCE ACCESS SITE (PRISAS)

PRISAS is a web-enabled, spatially referenced, decision support and information dissemination system encompassing the Powder River Basin in Montana and Wyoming.

This site will support the multidisciplinary, integrative needs of state and federal resource managers, private industry, and the public. It will also be available as a primary

geographic analysis tool for Coalbed Methane (CBM) prospecting and environmental monitoring activities.

PRISAS will offer a valuable impartial scientific resource to help answer many questions, including: What areas on the landscape are vulnerable to potential impacts from CBM development? How will surface soils react with chemical makeup of

discharge water? What are the effects of CBM development on existing mainstream wetlands?

The website can be found at <http://rockys20.cr.usgs.gov/prisas>

For more information contact [Susan Harrison \(sjharrison@usgs.gov\)](mailto:sjharrison@usgs.gov) or 303-202-4291.

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We're on the Web!

<http://rockys20.cr.usgs.gov/newsletter>

Letters to the Editors

"Especially enjoyed the biography on Mike Hutt. Thanks for the interesting issue!"
- Ed McNamara

January/February Addendum

The cover article in the last issue of *Simply Spatial* dealt with the creation and launch of the Sentinel Hotspots, a wildfire mapping resource system for Australia. The system was developed under the direction of Peter Dyce, CSIRO (Commonwealth Scientific & Industrial Research Organisation), project lead for Sentinel Hotspots, was instrumental in the development and implementation of this system. John Guthrie worked with Peter during the initial kickoff of the system and his name was inadvertently left out of the article. Peter reported that Sentinel Hotspots had over 100,000 hits on the very first day of operation, and he provided the pictures of the fires. Our thanks for the information and pictures, and our apologies to Peter for not mentioning him by name in the original article.

IN THE SPOTLIGHT...

Carol is the Principal Investigator for the Systems approach to Landscape Analysis and Modeling (SLAM), which is using socio-economic factors and the physical landscape to explain and predict landscape change in the Colorado Front Range. Carol has been with the Rocky Mountain Mapping Center since 1984, when she came to Denver from Menlo Park, California.



Carol received her Bachelor's degree from Fresno State and Master's degree from San Jose State Universities. Both degrees were in geography. Carol was attracted to geography when she took an introduction to geography course in the summer after her sophomore year in college. The instructor's description of geography as an integrative science that could explain why people did what they did on the landscape inspired Carol to become a geographer.

Carol was first introduced to USGS as a graduate student at San Jose State when she was appointed to the Q program, in which students could intern at USGS. Her first job was at the Menlo Park mapping facility keypunching orders for original material boxes. During this time, she sat through an earthquake because the vibrations at the keypunch machine were so strong that she did not feel the earthquake.

Carol's first job out of graduate school was with TGS at the NASA Ames facility. She worked on a joint USGS-NASA project with Len Gaydos and Gail Thelin to map irrigated lands on the High Plains Aquifer using LandSat 2 and 3 data. Carol developed very strong arms in this job because she had to carry 9-track tapes from building to building. She also became very good at blind digitizing because the technology of the times did not allow the digitizer to see what he/she was digitizing.

Carol was in the WEL (Women's Executive Leadership) Program in 1993. She had two details to the then National Biological Survey (now USGS Biological Resources Discipline). She was instrumental in locating the NBS office in Building 810.

When Carol started in geographic research at RMMC, the work was primarily to develop spatial databases to do analysis. She started working on the Front Range Infrastructure Resources (FRIR) project in 1997, which was a USGS integrated science project investigating the availability of resources (water and aggregate) in the Colorado Front Range. The FRIR project ended in 2001. In 2002, the SLAM project was begun under Carol's leadership. In this project, Carol and her colleagues are taking the spatial data developed by FRIR and doing geographic analysis and prediction.

At this stage in her career, she is still motivated by the interests that first drew her to geography – understanding why people do what they do on the landscape. The motivation is the same but “the tools are a lot better now!” Carol says. She is instrumental in organizing the RMMC remote sensing discussion group, an informal group of people involved with remote sensing, and has taken the lead in installing and maintaining Reference Manager at RMMC, a reference management database program, an important tool for scientific research.

Carol is married to Matt, also an RMMC employee. They have two children: Katie, 15, a freshman at Lakewood High School, and Peter, 12, in 7th grade at Creighton Middle School. Carol spends her spare time gardening, singing in the church choir, and carting everyone everywhere.

An interesting fact about Carol is that her grandfather homesteaded south of Hayden, Colorado, and had a country store and a sheep ranch. Her mother grew up on the ranch, which is still there. Her relatives are adding an indoor bathroom to the old ranch house this year!

