



Fall 2008

# WyGISC Newsletter

A bi-annual newsletter of the Wyoming Geographic Information Science Center, University of Wyoming

### WyGISC Highlights

- Co-hosts southwest GIS users conference
- Launches Geospatial Technician certificate program
- Unveils My WyGISC, centralized website to obtain geospatial data
- Unveils Wyoming GeoLibrary linking data sources from numerous sources

## GIS Day 2008

November 19, 2008

(Details: page 5)

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## WyGISC co-hosts SWUG 2008

Every fall, the ESRI Southwest Users Group (SWUG) annual conference brings together GIS users from Arizona, Colorado, New Mexico, Utah, and Wyoming. This year WyGISC is proud to help in hosting this premier event in Laramie.

Jeff Hamerlinck, Director, WyGISC, considers SWUG 2008 to be an unique event since few other regional conferences bring together so many GIS users from federal, state, local government, and private sector.

GIS experts from various organizations will present their work in addition to the workshops organized by ESRI and other GIS organizations. Several GIS vendors and ESRI partners will showcase their latest enhancements to ESRI software as well

as new data products and services.

Mr. Hamerlinck believes that SWUG will provide a valuable networking opportunity for UW



students and staff with GIS experts throughout the region.

Jim Oakleaf, Program Chair is expecting this years' conference to not only be unique but also very informative for attendees. "This year, we have incorpo-

rated several workshops as part of the technical sessions. Participants can attend these workshops without having to register for workshops separately."

A rodeo night and BBQ has been organized at the University of Wyoming Hansen Arena, that will also include bluegrass music.

Organizing such events requires contributions from numerous individuals and organizations, and the local planning committee is thankful to the 20 plus sponsors for their valuable contributions.

Please visit [www.swug2008.org](http://www.swug2008.org) for information about the speakers, technical presentation and exhibits.

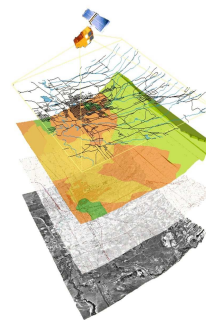
## NEW! Geospatial Technician Certificate Program

WyGISC is offering a new certificate program that will benefit professionals interested in enhancing their geospatial skills.

Anyone can earn the *Geospatial Technician Certificate* by completing certain required and elective short courses that are offered by WyGISC and ESRI.

UW students can obtain this non-credit certificate in addition to their UW diploma, and professionals can advance their career in GIS while advancing their skills with the current technology.

WyGISC has been offering short courses in GIS, GPS and remote sensing for more than 10 years.



WyGISC is also an ESRI Authorized Partner Education Center, which

demonstrates that WyGISC facilities and trainers' experience meet or exceed ESRI's stringent standards. Such certificate programs assist potential employers in assessing the geospatial skills and abilities of future employees.

Paul Caffrey, Education Coordinator at WyGISC, is hopeful that the technician certificate program will lead to advanced certificate programs in the near future. For further details visit <http://www.wygisce.uwyo.edu/education/certificate/>

## The New Face of Wyoming Geospatial Data Access

With ever increasing volume and type of geospatial data available for Wyoming it is a daunting task to stay current on new formats or know when new data become available. In order to streamline geospatial data searching and downloading, WyGISC has introduced My WyGISC. **My WyGISC** is a centralized web-based database, designed to serve Wyoming geospatial data and applications in an easy-to-use format. Users can choose to receive information about new data or short courses. **My WyGISC** also has links to various data providers and geospatial applications and user can search, browse and download data from a single location.

With the unveiling of this new product, current and new users are required to register on the *New User* page (shown to the right) to access various resources available through **My WyGISC**. The *Data Access* page provides links to the new *Wyoming GeoLibrary*, the *WyGISC Data Server*, *Wyoming View*, the *Energy Resources Information Clearinghouse*, and the *Wyoming Vertebrate Atlas*. Another new feature of My WyGISC, is the *Wyoming Data Viewer*, which serves as an easy-to-use map application for users to view features of Wyoming and related Wyoming data.

WyGISC Partner users can select from the **Partners** list and log in to the secure system to gain access to the products and applications available.

**My WyGISC** also provides easy access to course listings and schedules for *Professional Short Courses*, *Virtual Campus Courses*, *Free Workshops*, and *Geospatial Forums*.

Questions or comments regarding **My WyGISC**? Contact: Phil Polzer (ppolzer@uwyo.edu)



Visit My WyGISC and register today! <http://alkali.wygisc.uwyo.edu/mynygisc/login.aspx>

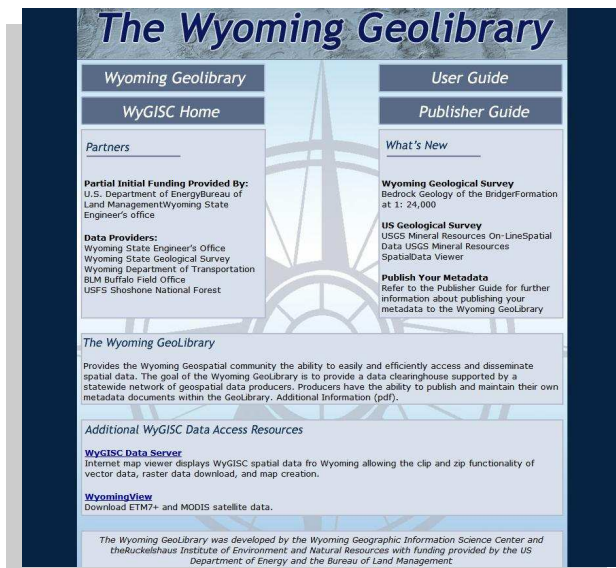
## Wyoming GeoLibrary

**Wyoming GeoLibrary** is an internet site that provides the ability to efficiently browse and access geospatial data from multiple sources. Users can compare data from different sources by reviewing the accompanying metadata, and download suitable data. Users, who have accessed data through the Wyoming Natural Resources Data Clearinghouse, will now use the **Wyoming GeoLibrary** to search and access Wyoming geospatial data.

The long-term goal of the **Wyoming GeoLibrary** is to create a data clearinghouse supported by a statewide network of Wyoming geospatial data producers. Data producers will have the ability to publish and maintain their own metadata documents within the **Wyoming GeoLibrary**, which offers data providers a method to disseminate their data with minimal hardware, software, and human resources while at the same time giving them full control of their contents within the GeoLibrary. This network is currently in the works and new data provider partners include the State Engineers Office, the Wyoming State Geological Survey, the Wyoming Department of Tourism, and the Wyoming BLM Buffalo Field Office, among others. Once the network is fully in place, it is anticipated that the **Wyoming GeoLibrary** will be an important asset to all parties interested in Wyoming geospatial data as it will provide the most current and accurate data for locations throughout the state.

Questions or comments regarding the Wyoming GeoLibrary? Email: [info@wygisc.uwyo.edu](mailto:info@wygisc.uwyo.edu)

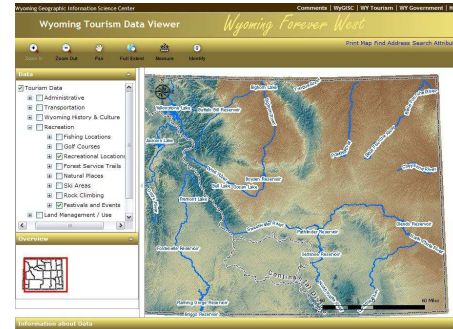
Want to become a Wyoming GeoLibrary data provider? [JOakleaf@uwyo.edu](mailto:JOakleaf@uwyo.edu) or [wycykoff@uwyo.edu](mailto:wycykoff@uwyo.edu)



## Wyoming Tourism Web Mapping

Wyoming Travel and Tourism is working to revamp the Wyoming tourism website. As part of this process, the Wyoming Geographic Information Science Center (WyGISC) has been contracted to assist in the development and support of a mapping component to the website which can aid tourists with their travel plans and itineraries. To date WyGISC has completed a data discovery and collection phase; which was then followed up with by undertaking the task of creating, modifying, and symbolizing data gathered in phase one. Additionally WYGISC has created an application for internal use by Wyoming Travel and Tourism personnel.

Contact Shawn Lanning (sgl55@uwyo.edu or 766-6281)



Wyoming tourism web mapping application will provide give access to key spatial data and attributes to help with decision making, planning, and vendor interactions

## National Hydrography Dataset

In 2001, WyGISC initiated the effort to create the 1:24,000 scale dataset for Wyoming and in collaboration with funding and matching efforts from the Bureau of Land Management (BLM), United States Geological Survey (USGS), and the United States Forest Service (USFS), the high-resolution NHD for Wyoming was completed in March, 2007 and nationwide in July, 2007.

The National Hydrography Dataset (NHD) is the national standard in spatial hydrography. The high resolution NHD is a nationally seamless set of spatial data representing all surface water features that appear on USGS 7.5 minute topographic maps and the associated attribute information for as many as 52 hydrographic features. NHD surface water features such as lakes, ponds, streams, rivers, springs and wells can be easily linked with other water-related data. These linkages facilitate the analysis and display of these water-related data throughout the NHD water drainage network.

The NHD also serves as a framework for linking or indexing other water-related information spatially to the NHD, like the Department of Environmental Quality (DEQ) use-impaired waters, the BLM Proper Functioning Condition (PFC) riparian data, and the Game & Fish Department's fish habitat data without editing the underlying NHD coverage. There are numerous other applications of NHD, such as map making, up and down stream navigation and flow modeling. Many state and federal agencies have incorporated the NHD into various aspects of monitoring, oversight, and decision making.

The NHD is considered a living dataset. Future data maintenance and enhancements are supported within the NHD data structure. User requests for revisions and updates are increasing, and local level input will greatly improve these data over time. Many states have implemented stewardship programs to maintain and enhance the NHD. Contact Paul Caffrey (pcaffrey@uwyo.edu or 766-2770) for more information.

## WyomingView

WyomingView satellite data archive continues to provide imagery to a variety of users across the US and Canada. As of September 2008, users from 30 states and 2 Canadian provinces have requested and obtained satellite data for mapping Wyoming's land surface features, or monitor the changes. Students from several universities have obtained satellite data to use them as part of their thesis or dissertation work. WyomingView is pleased to see that the utility for Wyoming satellite data is steadily increasing.

WyomingView plans to add more than 100 Gigabytes of ASTER and Landsat data to its archive. Additionally discussions are underway with WisconsinView to obtain MODIS data on a daily basis for Wyoming. MODIS data would enable frequent monitoring of Wyoming's landscape. Starting this year, WyomingView data archive can be accessed through My WYGISC and users can use other GIS data while searching for images.

AmericaView, the national organization, recently signed an MOU with the US Department of Agriculture to obtain the Indian Remote Sensing (IRS) Satellite's—AWiFS data. USDA has been acquiring AWiFS data and WyomingView users have obtain these images for non-commercial applications.

Further information contact: Ramesh Sivanpillai (sivan@uwyo.edu)

AMERICA VIEW

WYOMING VIEW

USGS  
science for a changing world

UNIVERSITY OF WYOMING  
WyGISC

WyomingView is a consortium, headed by the Wyoming Geographic Information Science Center (WYGISC) and the University of Wyoming (UW), aimed at increasing opportunities for remote sensing through outreach, data distribution, education, training, and research activities in Wyoming.

WyomingView is part of the AmericaView (AV) program, funded by the US Geological Survey (USGS), and works with organizations, academic institutions and government agencies in WY.

For WyomingView publications [click here](#) ...

For current WyomingView events and news [click here](#) ...

For information about WyomingView scholarships [click here](#) ...

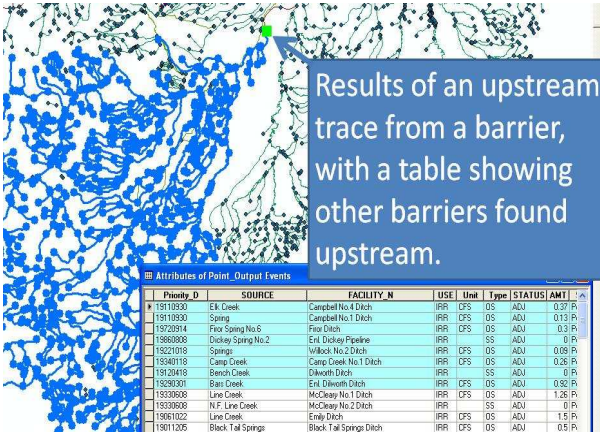
[About Us](#) [Consortium](#) [Resources](#) [Research](#) [Data](#) [Contact US](#)

WyomingView URL: <http://www.wygisic.uwyo.edu/wyview>

Updated by Ramesh Sivanpillai on November 26, 2007  
Please send your suggestions & comments to [sivan@uwyo.edu](mailto:sivan@uwyo.edu)



## Where do fish go?



It is a fundamental fact: fish need to move. All river fish migrate between feeding and spawning areas and make other seasonal movements to important habitats. Barriers such as culverts, dikes, water diversions, and dams prevent natural fish migrations, keeping them from important habitats. As a result, some populations of native fish are gone and others are on the brink of disappearing. The National Fish and Wildlife Service has been building a national database of barrier locations and how they affect fish passage, and the Wyoming Game and Fish Department (WGFD) is now expanding on this database for Wyoming. The WGFD has contracted with WyGISC to develop a GIS application for analyzing fish passage based on the barrier database. The GIS application connects the barrier locations to streams in the 1:24,000 National Hydrography Dataset, which was recently completed for Wyoming. Using upstream and downstream tracing, the application will be able to tell biologists all the barriers that fish encounter from a given starting point along a stream. The application will also create maps and reports showing how many barriers occur by county, watershed, or other unit. Expected completion of the application is December, 2008. For more information about this project, contact Margo Berendsen (meh@uwyo.edu).

## Ecological informatics

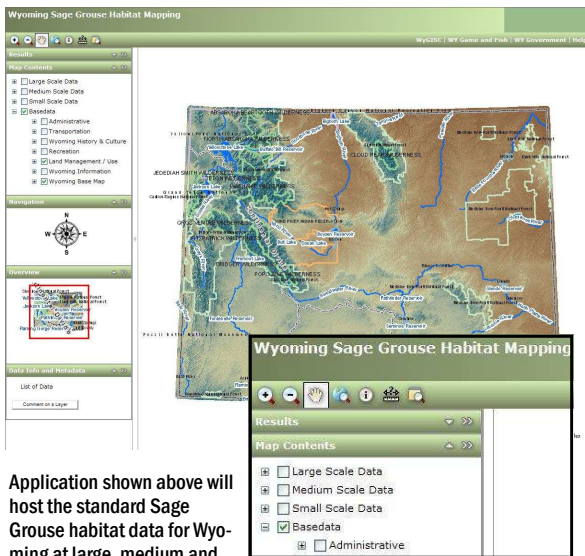
*WyGISC is developing an interdisciplinary program in Ecological Informatics in support of the UW Program in Ecology*

Dr. Zongbo Shang (766-6207, zshang1@uwyo.edu) is serving as the PI for developing an interdisciplinary program in Ecological informatics or Ecoinformatics. This program is a component of the University of Wyoming ecology initiative funded by the National Science Foundation. Specific goals are to foster integrative work in informatics and geographic informa-

tion science which will support ecological research tied to ecological topology and ecosystem response to global change. Research responsibility includes: 1) improving access to ecological data, information and computational services through data acquisition, data integration, and management activities; 2) developing and implementing spatial-temporal

data analysis and modeling techniques; and 3) participation in the development of collaborative initiatives and programs between WyGISC and the UW Program in Ecology (PIE). Currently, several studies are underway and complete details can be found at: <http://www.wygisc.uwyo.edu/ecoinformatics>

## Sage grouse habitat mapping



Application shown above will host the standard Sage Grouse habitat data for Wyoming at large, medium and small scale (insert) and form the basis for decision support among the federal, state and local government agencies.

The Wyoming Governor's Sage Grouse Conservation Implementation Team recommended that a current statewide map of sage grouse habitat is required in order for wildlife managers to accommodate human activities while minimizing the impact on sage grouse habitats. This map will be developed with satellite images and aerial photographs.

Eli Rodemaker (eli@uwyo.edu, 766-2794) is heading a statewide field data collection on sagebrush and other vegetation types. Eli and his team of more than 20 technicians and interns, have been collecting field data since late spring 2008 and expect to collect until fall 2008. Private consultants and state agency personnel have also donated their time for field data collection.

Data collected in the field along with other habitat information will be uploaded to a web-based GIS server in WyGISC. Authorized federal, state, and local government agencies will be able to access this database and update the stored information. Once completed this database will serve as a centralized location for storing and retrieving Sage Grouse habitat information. Federal and state land management agencies can coordinate their planning and permitting activities from a single database.

## \$500 GITA Scholarships

The Wyoming Geographic Information Science Center (WyGIS) is proud to offer this scholarship opportunity which has been generously provided the **Geospatial Information and Technology Association (GITA)** Rocky Mountain Chapter.

We will award two \$500 scholarships to the most qualified undergraduate and graduate students, respectively, whose degree programs focus on an aspect of GISci or make significant use of GIS technology.

The \$500 scholarships, offered for the Fall 2008 semester, will support one undergraduate and one graduate student whose degree program focuses on the use of GIS technology. WyGIS will award the scholarships based on the recommendation of a selection committee composed of faculty and research staff from UW and WyGIS.

Applicants must have full-time student status for the Fall 2008 and Spring 2009 semesters.

Preference will be given to students with a 3.5 GPA or better.

To apply, please request an application from the following location and return it by Friday, October 31, 2008.

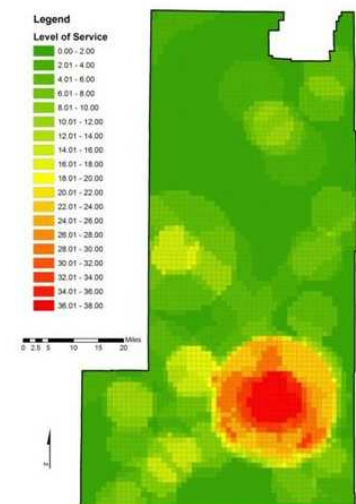
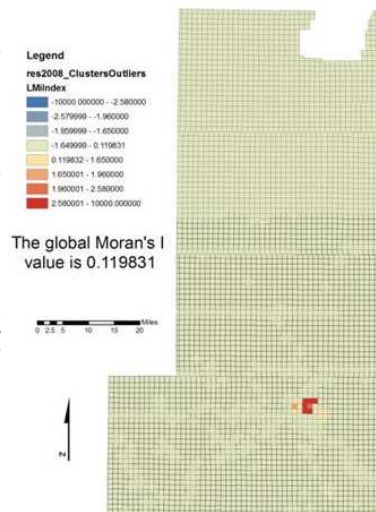
WyGIS  
Attn: Ken Driese/GITA  
Dept. 4008, 1000 E. University Ave  
Agriculture Building, Rm. 330  
Laramie, WY 82071  
(307) 766-3975  
kdriese@uwyo.edu

*Undergraduates or  
Graduates Using or  
Studying Geographic  
Information Science  
(GISci)*

*Application Deadline  
– Oct. 31, 2008*

## Fiscal Modeling with Spatial Econometric Techniques

Because the fiscal implications of different land uses and patterns are important considerations for local government financial health, Scott Lieske ([lieske@uwyo.edu](mailto:lieske@uwyo.edu), 766-3709) is researching straightforward and accurate ways to assess provision of public services using GIS and related tools. Two methods for assessing local government finances are spatially precise fiscal impact modeling and growth efficiency modeling. Spatially precise fiscal modeling uses spatial econometric techniques to develop revenue and expenditure ratios based on land use and location. In contrast, growth efficiency modeling incorporates public preference surveys with locations for centers of service provision in a multi-criteria analysis framework to determine efficient locations for future growth. Spatially precise fiscal modeling is based on a large body of research and so carries with it a substantial likelihood that model outputs, when developed, will in fact be what modelers believe them to be. Drawbacks are that spatially precise fiscal modeling is very data and process intensive. The data demands of growth efficiency modeling are relatively light and the model has the added benefit of incorporating public opinion data. The methods and outputs of the two models may be contrasted in order to evaluate the best way to include fiscal concerns in land planning and produce actionable information for planners and decision makers. Support for this research comes from several branches of the University of Wyoming including the Agricultural Experiment Station, the International Programs Office, and the Agricultural College's Global Perspectives program as well as the Faculty of Science Health and Education at the University of the Sunshine Coast, Queensland, Australia.



Modeling outputs showing preliminary results in spatially precise fiscal modeling (left) and growth efficiency modeling (right) for Albany County, Wyoming.

## Extramural funding @ WyGISC

*WyGISC received  
1.32 million  
dollar in new  
extramural funding  
during the 2008  
fiscal year*

WyGISC received 26 external grants and contracts from agencies, non-profits and private companies totaling 1.32 million dollars for the 2008 state fiscal year.

Awards from federal and state land management agencies constituted a major portion of the total award for developing new applications to generate and disseminate geospatial data for planning and decision support.

Research scientists at WyGISC are actively involved in the Governor's Sage Grouse habitat

mapping project (page 4) and has obtained funding from Wyoming Game & Fish Department for developing a new statewide, Sage Grouse habitat map.

WyGISC received new awards from the US Geological Survey for developing hydrology datasets for California. WyGISC personnel have developed hydrology datasets for several other western states as well.

Several awards were received from county governments and non-profit for developing new geospatial datasets through remote sensing technology or

streamlining existing datasets for planning and decision support.

Last fiscal year also saw an increase in the collaboration between WyGISC research scientists and researchers in other units both on- and off-campus. WyGISC expects to see an increase in both the number and award of grants and contracts for the current fiscal year.

For additional details about the research activities at WyGISC please visit: <http://www.wygis.c.uwyo.edu/research.htm>

## Campus Enterprise GIS Update - MyWyGISC Tools Provide Secure Access to Data

Collaborative work continues between WyGISC, Real Estate Operations (REO) and other Administration departments on campus toward increasing the breadth and depth of the Campus Enterprise GIS. Recent developments include streamlined data access through MyWyGISC, automated lease notification and the implementation of archiving capabilities. These advancements are facilitated through the use of Spatial Data Engine (SDE) technology which allows multiple users and applications to access the data at one time.

WyGISC has developed several applications that can be accessed by both UW employees and contractors via our new web portal, MyWyGISC. These secure applications include a Campus Control Network application to access detailed information about UW's survey location points as well as an updated Electrical Data Viewer that allows for viewing of Physical Plant's electrical conductor data and images.

Archiving has now been enabled in the Enterprise GIS allowing users to view and query the geodatabase through its history. Another advancement is the generation of lease expiration e-mails. These are generated based on the data in SDE and include links to lease documents and other related data.

GIS standards are currently being developed for use in guiding the creation of new GIS datasets for use in the Campus Enterprise GIS. Standards will streamline the integration of data into the Enterprise system, reduce data redundancy, and increase the return on investment for dollars spent on development of new data.

Contact Wendy Berelson at 766-6649 or [berelson@uwyo.edu](mailto:berelson@uwyo.edu)

**Users can retrieve information about campus infrastructure through a centralized data gateway—MyWyGISC. Future development will include data updates via MyWyGISC. Authorized users can view detailed information about UW's survey control points.**



## Geospatial forum - Fall 2008

- 9/5/2008: *Biogeography: what is it, where did it come from, and where is it going?* - Dr. Steve Jackson, BOTANY
- 9/12/2008: *A Tale of Two Ecotones: Patterns and Processes of Climate-Induced Change along Grassland-Forest Borders in Central North America over the Past 2000 Years* - Dr. Bryan Shuman, GEOLOGY AND GEOPHYSICS
- 9/19/2008: *Vegetation history of Southeast Wyoming* - Dr. Tom Minckley, BOTANY
- 9/26/2008: *Reconstructing Wyoming's Ancient Ecosystems: Paleontological and Geochemical Evidence of Ecosystem Change over the Last 65 Million Years* - Dr. Mark Clementz, GEOLOGY AND GEOPHYSICS
- 10/03/2008: *GIS in weather, climate and impacts* - Olga Wilhelmi, Scientist, National Center for Atmospheric Research (NCAR), Boulder, CO.
- 10/10/2008: *Biogeography of Fungi--examples at different scales* - Dr. Steve Miller, BOTANY
- 10/17/2008: *Global spatio-temporal patterning in proboscidean (elephants, mammoths, and mastodons) exploitation and extinctions* - Dr. Todd Surovell, ANTHROPOLOGY
- 10/31/2008: *Wyoming's Modern Vegetation Types and the Influence of Climate and Geologic Substrate in Controlling Their Distribution* - Dr. George Jones, Wyoming Natural Diversity Database (WNDD)
- 11/7/2008: *Spatial Genetics: Using genetics to assess population structure and growth in a geographic context* - Mr. Mark Lesser, BOTANY
- 11/14/2008: *Wyoming's Current Wildlife Distributions: Biological Mechanisms and Methods of Study* - Mr. Doug Keinath, Wyoming Natural Diversity Database (WNDD)

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## Professional short course schedule

- 10/9/08: Introduction to GPS I (2 days)
- 10/20/08: ArcGIS for natural resource applications (2 days)
- 10/20/08: Using ArcMap functionality for remote sensing analysis (2 days)
- 11/5/08: Introduction to programming ArcObjects with VBA (3 days)
- 11/12/08: ABCs of Remote Sensing (1 day)
- 11/17/08: ArcGIS Desktop I: Getting started with GIS (2 days)
- 11/19/08: ArcGIS Desktop II: Tools and functionality (2 days)
- 12/02/08: ArcGIS Desktop III: GIS workflows and analysis (2 days)
- 12/04/08: Introduction to metadata for GIS users (1/2 day)
- 12/09/08: ArcGIS for natural resource applications (2 days)

For additional information about WyGISC short courses please contact Mr. Paul Caffrey at 766-2770 or [caffrey@uwyo.edu](mailto:caffrey@uwyo.edu).

## GIS DAY 2008

November 19, 2008

KEYNOTE SPEAKER

**Dr. Carl Reed**

Chief Technical Officer

Open Geospatial Consortium

## New faces

Fawn Sprague has taken over as the WyGISC Accountant as of August 2008. Ms. Sprague, a Pennsylvania native earned her Bachelor's degree from Bloomsburg University in 1999. In 2003, she began working for the University of Wyoming in the Chemistry Department. Over the years, she became involved in grant bookkeeping and took on higher levels of responsibilities in grant accounting. Ms. Sprague is looking forward to working with the WyGISC collaborators and contractors.

Kati Baringer was hired as a Research Associate I in October 2008. Katie graduated from UW with a Bachelor's degree in Agriculture Business as a major and a minor in Environment and Natural Resources.

Jared Jensen, majoring in Business Administration (Junior) was hired as the PC/Web Assistant Technician in September 2008.

Emily Strait was hired in October 2008 as the new office associate. She is a sophomore majoring in communication.



## WyGISC Mission

WyGISC's mission is to advance geographic information science (GISci) at the University of Wyoming and its application across the State of Wyoming, Rocky Mountain Region and beyond. We accomplish this through research and application development in place-based decision-making and Web-based access to geospatial data and mapping applications. The Center's education, training, and information and technology transfer activities support the adoption and use of geospatial data and information technologies among a variety of users in academia, government, business, and our local communities.

## Giving to WyGISC

Gifts to WyGISC enhance our programs by providing support for outreach and educational materials, scholarships, and student and academic staff development. If interested, please contact us at, [info@wygisc.uwo.edu](mailto:info@wygisc.uwo.edu). You can also make a contribution online through the UW Foundation at <https://uwsecureweb.uwo.edu/GIVEONLINE/>.

Be sure to indicate that your gift is to be made to the Wyoming Geographic Information Science Center under **further instructions about your gift of giving online** form. Thank you for your valuable support.



*University of Wyoming*

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<http://www.wygisc.uwo.edu>

WyGISC is located on the third floor of the "Agriculture C" Building on the main campus of the University of Wyoming in Laramie, WY. Our main office is located in room 337. For those familiar with campus, the building is the south (and original) wing of the building facing Prexy's pasture.