Working in WyGISC, UW Students Gain Valuable Geospatial Skills

UW Students gain valuable geospatial experience by working as interns or research assistants in WyGISC. Over the years, students from several academic departments have worked with WyGISC research scientists on projects of state, national and international scope. Through these projects, students apply the concepts they learned in their coursework in Geographic Information Science (GIS), Remote Sensing (RS) or advanced spatial analyses.

Travis Yeik (Geography major and Soil Science minor, 2010) started working for WyGISC as a field technician in summer 2008. He collected vegetation data and learned how to classify them and use those datasets in ecological research. He received an NSF EPSCoR fellowship to create a “sagebrush closure map” in the Pinedale Anticline. He worked with Eli Rodemaker, Remote Sensing Scientist at WyGISC on this project. “The experience I received was as equally great as my college education in the subject. It has prepared me for the upcoming years in graduate school as well as other career challenges I may face”. In fall 2010, Travis will start his graduate program at the University of Nebraska-Lincoln involving remote sensing for agriculture applications.

Melanie Mathews (Geography 2010) worked on projects that focused on natural resource management issues in Wyoming and Central Asia. These projects enabled her to gain “experience with geospatial technologies that was beyond the scope of related class work” and “insights into the wide array of local and global applications for GIS and RS technology.” Melanie has been accepted as a Masters student in the Department of Renewable Resources at UW. Her thesis work will involve using geospatial technologies for land management issues in Central America.

Matthew Hayes (Geography 2010) is working on various GIS projects at WyGISC involving university and government contracts. Experience gained at WyGISC is extremely useful because “one can only learn so much in a classroom about GIS and then it is only the technical side of the software. Working for WyGISC I have been able to learn, first hand, how GIS software is used on a daily basis and how jobs in the GIS world really work.” Thus WyGISC serves as an invaluable resource for students interested in gaining practical experience in the use of geospatial software and project management that is difficult to obtain in classrooms.

Over the years some students have had the opportunity to stay with WyGISC after graduating and work full time on projects to gain experience on all facets of project management. In addition to learning new data processing skills, students gain experience in designing and implementing projects.

Teal Wyckoff (Geography and Environment and Natural Resources - dual major, 2007), began working as a student tech in WyGISC in November 2006 and put her new GIS skills to the test. “If I had not begun working in GIS when I did, but only kept it as something I had learned in a class and moved on, I would not be where I am today. It has been my constant learning through development of job skills that has made my career possible. I enjoy my job thoroughly and found my career direction here at WyGISC. I meet new challenges every day, and am constantly learning new things.” Currently Teal serves as WyGISC’s Data Manager and Web Coordinator. Career possibilities in GIS are a growing national trend, as spatial technologies are developed and used for businesses and organizations around the world.
K-1 Students Learn Mapping

In February 2010 the UW Lab School’s combined kindergarten and first grade class came to WyGISC to learn about careers in geospatial sciences. The visit was part of a larger set of lessons that had the goal of making the children aware of a variety of career options and places of business in their community. Research Scientist Scott Lieske introduced the students to basic concepts in geography and mapping. The class discussed the question, “What is geography?” and talked about why geography is important and how geography is relevant to their lives. The students enjoyed a hands-on experience in communicating geographic information when they used colored pencils and paper to create a map showing their daily travel from home to school. Students had the opportunity to think about and experiment with landmarks, symbolization, and scale. After making their own maps the students were introduced to computer mapping and 3D visualization technologies. ArcGIS was used to demonstrate the “layer-cake” capability of GIS for analysis and showed some of the automated features of computer mapping. The kids enjoyed the 3D presentation and quickly identified that the technologies are often similar to video games they play. Overall, the students enjoyed their introduction to the world and tools of geography. According to Scott “if we could do this a few more times as they advance through grade school, they will have an informed basis for considering geography as a career choice.”

Laramie Junior High Students Learn About Remote Sensing

More than 115 8th grade students at Laramie Junior High School were introduced to remote sensing technology and applications as part of the Earth Observations (EO) Day activities. EO Day is an education and awareness effort of AmericaView. “EO Day resources--including imagery focused on surface land use/land cover, freshwater and marine ecosystems, and the atmosphere--will provide teachers with the data and geospatial interpretive tools needed for inquiry-based, Earth systems focused learning in the disciplines of Earth Science, Chemistry, Physics, Biology, Mathematics, and Geography.” Further information about EO Day can be found in the following website www.earthobservationday.org.

Ramesh Sivanpillai provided an overview of remote sensing and its applications for monitoring earth resources such as forests, rangelands, vegetation and water. He also introduced students to various career options in remote sensing.
WyGISC and UW Geography Department jointly hosted the spring 2010 Brown Bag Speaker Series—All Things Geography. Speakers from human, cultural and physical geographies presented on the following topics:

1/22/10: Linking the Lewis and Clark National Historical Trail to the 21st Century, Dr. William Gribb, GEOGRAPHY


02/05/10: One School at a Time: Education in Rural Uganda. Dr. Kenneth Driese, BOTANY & WYGISC

02/12/10: The American Landscape through the Eyes of Two Cyclists. Mr. Arjun Dongre, GEOGRAPHY, & Ms. Melissa Thompson, WY GEOLOGIC SURVEY

02/19/10: Travels through Japan. Ms. Crystal Cooling, GEOGRAPHY

02/26/10: Learning from the past: Forests in space and time. Dr. Simon Brewer, BOTANY

03/05/10: Integrating Ecological and Visual Approaches to Land Management. Mr. Matthew Salava, GEOGRAPHY

03/26/10: Measurement and Mapping of Riverine Environments via Optical Remote Sensing. Dr. Carl Legleiter, GEOGRAPHY

04/09/10: Legends on the Landscape. Dr. John Harty, GEOGRAPHY

The WyGISC Geospatial Forum will resume in its regular Friday noon timeslot in September 2010.
The sun is setting, sending glowing arcs across the sky and plunging the cobalt waters of the Great Bahama Bank into deeper shades of blue. A black-capped night heron quietly stalks a bat along the edge of the path. All is calm and quiet on the island except for the incessant sound of... the diesel generator.

The switch to renewable energy is important worldwide, but especially in island nations such as the Bahamas. Case in point, the Perry Institute for Marine Science (PIMS), home to the Caribbean Marine Research Center (CMRC). The Center is located on Lee Stocking Island (LSI), Exuma, the Bahamas. Scientists and researchers at the CMRC focus on four key areas - building sustainable fisheries, maintaining healthy coastal ecosystems, predicting environmental change, and gaining new biological and economical value from the sea. The field research station houses a variety of research groups throughout the year on LSI – powered by two diesel generators on the island.

In January 2010, two WyGISC staffers, Jim Oakleaf and Teal Wyckoff accompanied by two volunteers, Erin Barnholdt and Chris Grosso, traveled to the PIMS facility on LSI to help with the first step towards switching to renewable energy: knowing what infrastructure is already there.

LSI is located in the Exuma chain in the Bahamas and approximately 6 miles north, northwest of Great Exuma, the largest island in the chain. It is bounded to the east by the Exuma Sound, a precipitous drop off dipping to 3000’ below sea level before opening to the Atlantic Ocean, and to the west by the Great Bahama Bank, shallow waters surrounding much of the Bahamian Islands. The PIMS research center was established in the late 1960s and provides researchers with rare ac-

WyGISC created a detailed geographic information system (GIS) database for Lee Stocking Island, Bahamas
WyGISC and PIMS collaborated to create a detailed geographic information system (GIS) database for LSI. Through direct input from the College of Bahamas’ (COB) Small Island Sustainability (SIS) program, the database has the opportunity to serve as a baseline spatial data infrastructure (SDI) for small island sustainability.

Aerial photographs, satellite imagery, and global positioning system (GPS) data served as the base data necessary for full database development. The spatial database included all the structures on LSI and the infrastructure necessary to be an operational research facility. The team mapped electric, water, sewer and gas utility lines as accurately as possible, relying on development plans, extensive maintenance personnel knowledge, and GPS locations. The team recorded building heights for future 3D rendering using a hypsometer and took high-resolution digital photographs of each side of all buildings.

While on Lee Stocking Island, the team met with both PIMS staff and the COB SIS Program to modify and develop the spatial database to address LSI’s sustainability needs. This provides a starting point for WyGISC, PIMS, and COB to collaborate on obtaining potential funding for the development of a full island sustainability SDI.

WyGISC involvement in this project was the result of Jim Oakleaf traveling to LSI for three days in January 2009. This trip was in support of the UW Haub School of Environment and Natural Resources (ENR) capstone class, which performed an alternative assessment on the consequences of ocean acidification and warming on coral reef ecosystems of The Bahamas. Through PIMS contacts made during this trip, PIMS recruited WyGISC to perform their mapping project the following year. Funding for this project was provided as a travel grant by the UW International Program office and PIMS provided room and board for the 10 day project. WyGISC is looking at alternative ways in which to give PIMS the ability to use the LSI database. Current efforts are directed at incorporating the entire database into Google Earth, providing not only a method of viewing the database but also allowing three-dimensional rendering techniques to be applied to these data. WyGISC will be exploring methodologies of moving these data to a web-mapping environment in order to help PIMS recruit other academic institutions in coming to LSI by giving them a full understanding of the research and housing capabilities at the Island, as well as allow PIMS to plan future energy infrastructure based on existing resources.

This project gave WyGISC and UW more opportunities to continue work with an outstanding and world-renowned research institute such as PIMS. The partnership will only continue to grow and develop in the future as this journey in support of sustainability, research, and education continues.
WyomingView and UMAC Interns present at 2010 Wyoming Undergraduate Day

WyomingView interns Karley Shepperson (Rangeland Ecology and Watershed Management) and Paul Ardent (Geography), and UMAC intern Mathew Jolivet (Agroecology) presented their research during the 2010 Wyoming Undergraduate Research Day activities on April 24, 2010.

Ms. Shepperson tested the utility of Landsat data for identifying cheatgrass infested areas on a ranch near Casper, Wyoming. Using Landsat data Mr. Ardent assessed bark beetle impacted lodgepole pine stands in the Medicine Bow National Forest in Wyoming. WyomingView is a USGS/AmericaView funded program aimed at promoting remote sensing education and applied research.

Upper Midwest Aerospace Consortium (UMAC) intern Mr. Jolivet mapped decadal changes in the Aral Sea from 1989 to 2009 with Landsat images. His research was supported by the UMAC internship program. UMAC is a NASA funded program which is also aimed at promoting remote sensing technology for earth observations research. WyomingView and UMAC encourages undergraduate student research in remote sensing. The number of interns from these programs presenting in this annual event has steadily increased since 2008. Through these projects, WyGISC will continue to support undergraduate research at UW.

GITA Scholarship Winners Announced

Kerry Cutler and Brandon Zook won the spring 2010 Rocky Mountain Chapter of the Geospatial Information and Technology Association (GITA) scholarships of $500 each. Several students applied for these scholarships and winners were selected by a panel of research scientists.

Brandon (left) is an undergraduate student majoring in Geography. His interest is in GIS, GPS and remote sensing, and has completed research projects involving Geographic Information Science and Systems. He has been accepted to the Masters program in Geography starting fall 2010.

Kerry (above right) is a graduate student in the Department of Zoology and Physiology. Her research focuses on studying lichen distributions in Wyoming using GIS, GPS and remote sensing in the context of the elk die-off several years ago believed to have been caused by ingestion of toxic lichen. Ken Driese, Remote Sensing Scientist at WyGISC coordinates these annual awards for UW.
Education & Outreach

Our mission is to advance the use of geographic information science (GISci) at the University of Wyoming by furthering GISci education and training at all academic levels, by pursuing basic and applied research in GISci, and by using GISci technologies for problem-solving within the University and throughout the State and region. WyGISC has been providing GISci professionals with flexible and comprehensive training for over ten years. We are proud to be an ESRI Authorized Partner Education Center. This designation means that WyGISC meets ESRI standards for quality and content and we are approved to offer ESRI courses. For further information about short courses, GIS certificate, or our upcoming course schedule contact:

Phone: 307-766-2770
Email: wygisc-education@uwyo.edu
Web: http://www.uwyo.edu/wygisc/

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For further details about Virtual Campus courses call (307) 766-2770, email wygisc-education@uwyo.edu or visit the Education & Outreach section in http://www.uwyo.edu/wygisc/
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 wygisc@uwyo.edu. You can also make a contribution online through the UW Foundation at https://uwsecureweb.uwyo.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.

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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.