



Collaborative Research in St. Joseph's Bay, Florida

Ron Davis (NRCM) and Susan Wood (Geology), along with NRCM major Matt Kerfonta, traveled to the St. Joseph Bay Aquatic Preserve in Florida in summer 2009 to continue their work mapping aquatic sediments in the bay.

The bay is a unique habitat because it is shallow and has very little freshwater input with large areas of salt marsh and seagrass which are critical feeding and breeding habitat for many species. The seagrass beds are essential for many fish species and scallops, but the bay is used by many animals including horseshoe crabs, sea turtles and even sharks. "Mapping the sediments will allow us to map habitat conditions for a number of aquatic animal and plant species and help the Preserve managed their resources" Davis

said. Mapping sediments is also very important for tracking the movement of pollutants through the bay.

According to Davis, "Most of our work so far has been GIS based sediment mapping but we were able to do some diving this summer to collect field data and we are planning to return in the summer to help the preserve personnel update their salt

marsh and seagrass maps." Currently Susan and Ron are seeking funding to hire undergraduate students to help with field data collection and to support possible student research projects in the bay. "This is a unique opportunity because the aquatic preserve wrestles with the typical issues we deal with here in NRCM but the landscape is aquatic instead of forested" Davis said.



Ron Davis, NRCM faculty, (St. Joseph's Bay, 2009).

Volunteer Experience Builds Resume



Andrew Lawson, Student Program Ambassador, WCU Open House (October 2009)

Andrew Lawson, NRCM Junior (Landscape Analysis concentration) volunteered as a Student Program Ambassador for WCU Open House on Saturday October 3rd, 2009 at the University Center.

If you would like to build your resume and participate in a volunteer experience such as the Student Program Ambassador for Open House, please contact Ron Davis. The next WCU open house is November 14th, 2009.

NRCM Website www.nrcm.wcu.edu

Alumni Profile: Kara Cassels (Class of 1999)

Western Carolina offered me a chance to be close to home, explore nature and enhance my environmental passion by choosing Natural Resources Management as my major in 1995. I understand now the degree is called Natural Resource Management and Conservation. This new version of NRM seems more appropriate because it caters to my profession with Natural Resources Conservation Service. NRCS is a division through the US Department of Agriculture and is a Federal agency geared towards helping private landowners install best management practices on their land for overall resource benefit. I've worked with several types of organizations throughout the years ranging from non-profits such as the Sierra Club, implemented educational programs for

corporations like Ford Motor Company and now have landed with public service with NRCS. Western's NRM program gave me a chance to learn field experience that I currently use on a daily basis. Classes and labs such as forest inventory, land surveying, soil testing, streambank stabilization and GIS all prepared me for the job I have now. NRCS has been a great agency for me to be apart of. I get to experience the fun in-field construction projects to the policy changes made in Washington DC. There are many opportunities to become what you want in this agency while protecting natural resources. NRCS is very unique in that we develop that strong partnership with the private landowners while providing a public service to the community. I encourage students to become familiar

with Soil and Water Conservation Districts and NRCS to further your environmental protection career. You won't be disappointed.



Kara M. Cassels, WCU 1995-1999, Natural Resources Management Degree, Forest Resources Concentration

Geospatial Data for Natural Resource Decision Making *Joni Storie*

This past year has been a busy one for my research projects that use geospatial data to make decisions for natural resource issues.

River Cane Habitat

The results of the river cane mapping project showed that there is 18 km² of potential river cane habitat in Jackson County based on GIS overlay analysis using Lidar-generated hydrology and elevation data as well as soils data. Remote sensing data (aerial photographs, Aster or Landsat) did not have adequate spatial or spectral resolutions to map existing river cane. The next stage of the project is to use polarimetric radar data to see if this data can discriminate river cane from other evergreen vegetation using structural biophysical characteristics.

Mapping Land-Cover in 3 Biomes

This past year also started three mapping projects using radar data in diverse environments: one is Cullowhee (mountainous, deciduous forest, semi-temperate), the second in Argentina (arid, vine land and olive groves) and

the third in Brazil (illegal soybean fields in a tropical rainforest). To date, two images have been acquired in both Cullowhee and Argentina, and four images have been acquired in Brazil.

Preliminary results of the Cullowhee study area show that there is only a weak relationship between forest stand types (defined by community) and radar decomposition products (entropy and dominant scattering mechanism) generated from polarimetric radar data. The next stage of the analysis will look at forest structural classifications to determine what biophysical characteristics can be extracted from the radar data in the southern Appalachians.



Dr. Joni Storie, Field Data Collection in Pocito department, San Juan province, Argentina (March 2009).

Results from the Brazil study site show that C-band radar data (5.4 cm) is better for detection of illegal soybean fields in the rain forest than L-band (23.5 cm) data.

La Crosse Virus from Mosquitoes

I am collaborating on a new project lead by Brian Byrd in Environmental Health Science program at WCU, to use geospatial sampling design to collect and analyze data. This investigation will study the spatial and temporal distribution of historical La Crosse encephalitis cases (1988-2008) in North Carolina residents using secondary data provided by the NC Division of Public Health.

GIS will be used to study local indicators of spatial association in order to identify hot spots of La Crosse virus transmission and to measure clustering. These data will be used to further understand the local transmission dynamics of La Crosse virus in Western North Carolina and to provide justification for future public health entomologic research and/or interventions, including mosquito control.

NRM210 Field Trip *by Winn Williams*

Winn Williams is an Environmental Science major from Athens, GA.

To explore career opportunities and various practices and used in contemporary Natural Resource Management, Drs. Pete Bates and Brian Kloepel led NRM 210 students on a three day field trip across the mountains of Western North Carolina and the piedmont of South Carolina. Students camped for 2 nights on the Broad River, and met with a number of professional resource managers.

Kara Cassels (NRM 1999, Forest Resources) is currently the District



NRCM students at their campsite on the Broad River in the Sumter National Forest in South Carolina

Conservationist with the Natural Resource Conservation Service for Haywood and Madison Counties. Kara guided students through conservation practices on private lands. Kara encourages private land owners to utilize best management practices (BMP's) to protect soil and water quality and sustain the lands ecological integrity. Some BMP's include: buffer installation, cattle grazing rotation, and stream restoration. NRCS uses cost sharing to subsidize portions of the cost associated with the implemented projects. Along with Kara, Patrick Ferrell (NRM 1994, Water Resources) demonstrated practices that private landowners employ for wildlife. Patrick is the Area

Wildlife Biologist for NRCS, and also utilizes cost sharing to encourage practices that restore and sustain productive wildlife habitat. Some of these practices include: stream and forest buffer creation, riparian restoration, and timber thinning.



NRCM District Conservationist Kara Cassels (NRCM 1999) describes how she is working with a local farmer to restore a channelized stream

The class toured Columbia Carolina's plywood mill in Old Fort. The tour was led by Jim Sitts, Columbia's Appalachian Timber Manager, and it gave students a chance to see a modern wood processing plant, and a potential final destination of harvested timber.



Jim Sitts, Appalachian Manager for Columbia Forest Products explains how plywood is made during a tour of their mill in Old Fort, NC

A full day was spent with several resource managers on the Sumter Na-

tional Forest in SC. Mary Yonce (NRM 2000, Water Resources) is the Assistant Timber Manager for the Sumter, and hosted our tour. We were able to see and discuss resource management practices and policies that are used on public lands. Some of these include: gully restoration, off-road vehicle recreation, native grass planting, and ecologically sustainable timber harvesting. Timber harvesting generates much of the money for these projects. We also toured a waterfowl management area that is funded by timber harvest receipts.

On our way back to Cullowhee we stopped at the Cradle of Forestry. While at the Cradle students gained an appreciation of the history behind modern timber management. The Cradle is considered the birthplace of forestry in America.



Mary Yonce (NRCM, 2000), US Forest Service Timber Management demonstrates the operation of a feller-buncher used to thin a loblolly pine stand in the Sumter National Forest

Overall, the trip was a successful hands-on interaction with natural resource managers as students gained information that can only be acquired in the field, not the classroom.



Black Rock Trail Maintenance

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*Back row from Left to Right—Chris Storie , Joni Bugden-Storie, Pete Bates, Ron Davis.
Front row: Ben Collette (left) and Brian Kloeppeel (right)*

Fall 2009 NRCM Kick-Off and Cook-Out

NRCM Students and Faculty at the annual fall kick-off event. This year the kick-off was held at the Picnic Shelter near the soft ball fields.

