



Natural Resource Stewardship

The first program of 2010 in an ongoing luncheon series designed to highlight Western Carolina University's people and programs featured an advocate of environmentally sensitive forestry who has helped Western North Carolina towns manage their watersheds.

Western Carolina faculty member Peter Bates, associate professor of natural resource conservation and management, discussed his recent work during a Wednesday, Jan. 20, program showcasing WCU's College of Arts and Sciences as part of the Greater Asheville Luncheon Series.

Bates discussed how he and his students have assisted WNC municipal leaders with the long-term management of their towns' watersheds. Bates and his students have conducted inventories of forest resources in WNC watersheds to help officials determine if forest management activities within the watersheds could be ecologically and economically viable.

The Greater Asheville Luncheon Series is held at the new Hilton Asheville Biltmore Park on the third Wednesday of every month. Luncheon, which begin at

11:45 a.m. with a gathering and reception, followed at noon with a buffet lunch. Programs begin at 12:15 p.m. and adjourn at 12:45 p.m. Lunch cost is \$10.50. For more information, visit alumni.wcu.edu, or contact Marty Ramsey via e-mail at mramsey@wcu.edu.



Stream & Riparian

NRM 320 (Soil Conservation) students, led by NRCM faculty member Dr. Brian Kloeppe, engaged in a field tour of a stream and riparian restoration project near Franklin, NC. The project, coordinated by staff and volunteers of the Little Tennessee Watershed Association, utilized funds from a stimulus grant to replace a collapsing bridge, remove a former mill wall, and reshape the stream bank to greatly reduce soil erosion and sediment input to Watauga Creek, a tributary of the Little Tennessee River. The project was implemented on private land for an active farmer who utilized best management practices to increase the safety of his stream crossing as well as to improve the migration of

fish species upstream and to reduce sediment input. Students were offered the opportunity to assist in planting tree

seedlings in the restored riparian area to stabilize the soils and eventually provide shade to the stream.



Left to right: TJ Souther, Jeff White, Tyler Ross, Laura Moses, Ethan Henderson, Marcus Mentzer, Cory Sutton, Daniel Kincaid, Max Simmons, Jenny Sanders (Executive Director the Little Tennessee Watershed Association), and Kraig Metzger

NRCM Website <http://nrcm.wcu.edu>

T.J. Souther Wins Trout Unlimited Award

T.J. Souther is the first-ever recipient of the Stone Mountain Chapter of Trout Unlimited Award for 2010-11. This \$600 award was made possible by a generous contribution from the Stone Mountain Chapter of Trout Unlimited, based in Elkin, NC. The Chapter is committed to the conservation and protection of North Carolina's trout waters, and they created this award to support deserving NRCM students with career aspirations in this area.

Souther is honored to be the recipient of this award, remarking, "Growing up in the mountains of

Western North Carolina, I have been fortunate to live near some of the best trout habitat in the world. However, these waters are extremely sensitive to change, and today many of our trout streams are under threat. Sedimentation, introduction of non-native invasive species, and climate change are some of the factors degrading our trout waters. It is important that we continue to find ways to protect these streams, and I hope to do my part to insure that they

can be enjoyed for generations to come."

Pete Bates presenting TJ Souther (left) with the Stone Mountain Chapter of Trout Unlimited Award .



Forest Stewards Awards First Research Stipend

Mandi Miller, a senior in NRCM from Graham County, is the recipient of Forests Stewards' first undergraduate Research Stipend. Forest Stewards, a non-profit associated entity of WCU, was created to promote sustainable forest management in the southern Appalachians, and to provide paid internships and research opportunities for students majoring in Natural Resources and related disciplines. Forest Stewards is staffed by Executive Director Rob Lamb (MS Forestry, Yale University), and AmeriCorps volunteer Jon Shaffer (MS Forestry, Duke University), and is currently working with about 75 family and municipal landowners in the region. Research Stipends are funded

from charitable contributions made to Forest Stewards, and are used to support undergraduate students in the study of issues related to sustainable forestry. Miller is continuing work on a project designed to assess the effects of deer browsing on forest regeneration at the Biltmore

Estate in Asheville. This study was initiated in 2006, and Miller will participate in the collection of the final year's data and analysis of the results.

Left to Right: Forest Stewards Executive Director Rob Lamb, stipend recipient Mandi Miller, and AmeriCorps Volunteer Jon Shaffer



Community GIS & Remote Sensing

The consequence of technological changes in cartography have resulted in the democratization of mapping—mapping can now be done by anyone. Although it is hard to believe in the USA or with access to mapping resources such as Google Earth on the internet, in 2005 only 15% of the world's inhabited land area was mapped for such features as waterways, roads and infrastructure.

Community GIS and Remote Sensing groups have grown out of a need to have these resources mapped—especially in emergency situations. For example, “Citizen Cartographers” have volunteered to map pre- and post-infrastructure within days of disaster events such as the earthquakes in Haiti (January 2010) and Chile (February 2010). These map resources allowed emergency workers to navigate the changed landscape, to provide medical services, to identify hospitals and displacement camps, and to guide aid distribution. Examples of on-line cartographer volunteer communities include ‘google.com/mapmaker’ and ‘maker.geocommons.com’.

Other groups encourage ease of use, more accessible technology, and the ability to be deployable worldwide—groups such as Ushahidi (Swahili for testimony or witness) at www.ushahidi.com. This allows local people to contribute and tell their own story by text messages and

video from cell phones or posting on-line reports. This effort has provided direction for relief efforts during droughts; monitored of unrest, violence or elections; or mapped H1N1 (‘swine flu’) around the world.

Closer to home, in the Geosciences department, faculty and students are volunteering expertise and resources to help local communities. On the first day of spring in 2010, the Geog321 GIS class mapped trails in the core area of the NC Arboretum using GPS units. The trail files were converted into GPX format and will be passed along to Angela Brown, Coordinator of Technology-based Programs (and NRCM alumni). Angela will post these GPX trail files on the trails page of the NC Arboretum

website which will be available for visitors to download for use as a navigation tool on the Arboretum property. In addition Angela says that the Arboretum Public Safety officers are also excited about using

Beyond data collection, Bill Donaldson, a NRCM Senior in the NRM444 Applied GIS class, is building a geo-database for the Arboretum. In addition to the trails, this database will include roads, land-cover, aerial photographs, soil, and basemaps. Angela Brown is solely responsible for developing and updating the geographic information at the Arboretum so any help she can get from WCU is greatly appreciated.



Geog321 (GIS) Class @ NC Arboretum

Other students in the NRM444 class are also developing geo-databases for more community organizations in the region.

Trail Mapping @ NC Arboretum *Becky Howard*

Becky Howard is a NRCM Junior (Landscape Analysis) from Clay County, NC.

I loved hiking at the North Carolina Arboretum in Asheville North Carolina, it was a great experience. The day was a beautiful warm and sunny with flowers popping up all over; it definitely proved to be a great way to kick off the first day of spring.

My group included Kelly Zehrung (Parks & Recreation alumni) and Kendal

Hemker (Environmental Studies, Junior). We hiked the “Old Mill Trail”, “The Wesley Branch Trail” and the “Natural Garden Trail” which is a total of about 2 miles of the more than 10 miles of trails in the managed portion of the NC Arboretum.

While we hiked the trails we recorded the trail locations on GPS devices so others could later download the GPX files off the NC Arboretum website onto their own GPS devices. The visitors to the Arboretum could then go hiking or biking and enjoy the scen-

We also enjoyed some of the other exhibits after hiking like the bonsai garden and the garden at the head of the “Natural Garden Trail.” I cannot wait to go hiking again!



Kurt Remington (Geology, Senior) and Ben Williams (Sociology, Sophomore) at the beginning of the Azalea Trail.



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Grouse Habitat Monitoring

NRCM Junior Kyle Underwood (Forest Resources concentration) wrote a proposal and received a \$500.00 grant from the WCU Honors College to evaluate habitat quality for Grouse at the Balsam Mountain Preserve.

The project is an extension of a research Kyle developed in the Wildlife Ecology class (NRM330) and will prove a valuable contribution to management of conservation lands at the Preserve. The non-profit Balsam Mountain Trust has supported WCU faculty and student research for several years. However, with only three naturalists and a very limited budget, the trust has some basic research needs that cannot be met.

Kyle has dedicated much of his own time in meeting with the Preserve naturalists to develop a research plan

which supports their land conservation mission and the work outlined in the proposal reflects the conservation priority of the trust. The results of this study will directly affect habitat conservation efforts on trust lands as well.

Kyle will present the results of this work to the BMP land management board in the Fall 2010 in order to make specific recommendations for habitat management and conservation. This work will also be presented at SAF in New Mexico (2011).

*Kyle Underwood
Author of a successful grant proposal to
monitor grouse habitat in Balsam Mountain
Preserve*



NRCM Students conduct “Energizing Science” @ Cullowhee Valley School (April 30th, 2010)

NRCM Students in Geog150 (Environmental Geography) as well as students completing honor’s contracts in NRM140 or Geog300 (Weather and Climate) are participating in Cullowhee Valley School’s Science Day initiative. This year’s theme is “Energizing Science”.

Projects include Hurricanes (J. McKibben and D. Miller), Food Web in Arizona (H. Nichols, T. Clay, J. Shaak, M. Metzger), Wolf-Elk Predator-Prey Rela-

tionship in Yellowstone National Park (S. Brown, G. Stanley, M. Dry, D. Cutsall), Change in Ecosystem Function due to Wildfires in Southern Appalachians (F. Koontz, M Simmons, S. Leatherwood, P. Pittman), Biomass as Fuel in WNC (W. Johnston, M. Ledger, C. Dunevant, B. Hysong), Producers & Decomposers in the Rainforest (L. Butner, B. Howard, P. Helm, J. Demos), Renewable and Non-Renewable Resources in West Virginia (E. Henderson, M. Hyatt, E. Smith, C.

Holleman), Futuristic Fuels-Algae Farms in Gulf Coast (K. Metzger, B. Thomas, K. Robinson, K. Watkins), Carbon Cycle in the Pacific Ocean (J. Brown, Z. Skipper, M. Miller, L. Barger), Biological Fixation in the Piedmont of North Carolina (B. Collette, T. Dean, T. Gray, B. Wilson).

The NRCM students are developing information materials, activities and games that emphasize key concepts and are appropriate for Grade 7 & 8 students at Cullowhee Valley School.