Bit By The Science Bug In The Great Dismal Swamp

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DURHAM, N.H. -- Throughout high school, University of New Hampshire sophomore Allie Collopy suffered through her required science courses and planned to do pretty much the same during her college career.

"I've never had a real aptitude for science," the UNH Spanish and linguistics major from Durham says matter-of-factly.

But much to her surprise, after recently spending two weeks tromping through the Great Dismal Swamp and environs in North Carolina as part of UNH's Watershed Watch program, Collopy now plans to challenge herself with some rigorous science by minoring in an area of environmental conservation.

Collopy, whose Watershed Watch project dealt with the effects of urbanization on water quality within the Pasquotank River watershed (which has its headwaters in the Great Dismal Swamp), hopes to gain some skills with her newfound aptitude for environmental science and eventually help people in third-world countries as a member of the Peace Corps.

"I always planned to go into the Peace Corps just to teach English, but I feel I have more options now," says Collopy who wants to launch a life for herself in South America where, she imagines, she might be able to help people grapple with water-related problems.

Collopy's Watershed Watch experience is emblematic of the program created specifically to increase both the recruitment and retention of students into science, technology, engineering, and mathematics.

Now in its second year, the National Science Foundation-funded Watershed Watch program is run out of the UNH Joan and James Leitzel Center and is a collaborative effort with Elizabeth City State University (ECSU) – a historically black university in North Carolina. Also participating are two-year colleges – the New Hampshire Community Technical College and North Carolina's College of the Albemarle.

Students participating in Watershed Watch focus their studies in alternating years on the Merrimack River in New Hampshire and the Pasquotank River in North Carolina, studying terrestrial and aquatic aspects of the two watersheds. The interdisciplinary approach helps students understand what a watershed is and how it functions, why it's important and what the benefits of it are to the land and its people, and how various types of pollution impact the watershed.

The program relies heavily on a variety of scientific methods and technologies. Students use standard equipment and protocols for measuring the forest's characteristics and age, and how

these values influence the observed measurements of water quality in the river that receives the precipitation runoff from the land. "Remotely sensed" satellite imagery, global positioning system (GIS), and computer mapping systems are also used to get a bird's-eye-view of the landscape, including the placement of agricultural and developed human impacted areas.

UNH has a strong graduate-level remote sensing-GIS research program while Elizabeth City has a focused undergraduate curriculum in the same area. One goal of Watershed Watch is to create a "pipeline" of minority students from ECSU coming to UNH as graduate students.

"UNH and ECSU have been developing a partnership over the last several years and have submitted a number of collaborative proposals to a variety of federal agencies," says professor Karen Graham, director of the Leitzel Center and co-principle investigator on the project. Graham adds, "Watershed Watch is one of our first success stories and in many ways symbolizes the UNH-ECSU partnership model since it builds on the research and educational strengths of both institutions."

Professor Barry Rock, the principle investigator for the NSF Watershed Watch grant, is one of six faculty and staff members who worked with students during two intense weeks of study in the Great Dismal Swamp. Rock, of the UNH Institute for the Study of Earth, Oceans, and Space and the Department of Natural Resources, notes that Watershed Watch seeks to entice students, many of whom have yet to declare a major, into the "STEM disciplines" – science, technology, engineering, and mathematics – by means of "hands-on, inquiry-based" studies tailored to individual student's interest.

Indeed, notes Collopy, after being schooled in the basic science they would need for their aquatic and terrestrial research at Great Dismal Swamp, she and others were set loose to come up with their own research questions and pursue their own particular passions within the broad context of the program.

"They did a really good job giving us the basic tools so we could direct ourselves," Collopy says.

Providing students with the fundamental research tools and then letting them generate their own scientific questions is a recipe for success, asserts Stephen Hale of the UNH Leitzel Center and one of the six faculty and staff on the recent excursion.

"I am continually amazed at how students, when put in charge of their own learning, rally to the task. Many students were putting in 10- to 14-hour days collecting and analyzing data," says Hale. All that effort culminated in a scientific poster explaining their project, which, Hale notes, "accounts for a great deal of their learning as they organize their thoughts and findings into a relatable story that ultimately produces an answer to their question."

Another dimension complementing the program's student-centric approach is that, by design, cultural history of the region is blended with the science of the landscape, including, in this case, discussion on the Great Dismal Swamp being a noted stopping point for slaves seeking freedom by means of the Underground Railroad.

One New Hampshire Technical Community College student took this blending of science and culture to interesting creative heights for his research project by using remote sensing tools and data to investigate the local Native American legend of a "healing pond" somewhere in the Great Dismal Swamp. According to the legend, which the student uncovered during the two-week project, the healing pond was a place where animals, wounded by hunters or injured in some way, would bathe and be healed.

Says Rock, "The student, Richard Harris, used Landsat data to analyze the landscape. He brought in his interests in literature and linguistics but used the technology and science and some knowledge of topography and tree types to come up with a possible location for the healing pond."

While the students themselves could be clever and self-motivated in their research, Collopy stresses that a key to student success was the enthusiasm of the faculty.

"Throughout high school, I'd never get excited about science, but just the passion the Watershed Watch faculty and staff showed for the subjects, the way they presented things, really changed my perspective," she says. Likewise, several of the students who tromped through the Great Dismal Swamp were similarly bit by the science bug and will now continue along that path in their educational careers.

A photograph is available to download here:

http://www.unh.edu/news/img/swamp0607.jpg

Caption: UNH student Allie Collopy (center) works on water samples with
UNH professor Jeff Schloss.
Photo courtesy of Jeff Schloss.