

Spring 2009

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THE COLLEGE AT BROCKPORT

Environmental Science and Biology

A Recession is Temporary but an Education is Permanent

Having a college degree increases lifetime earning potential by many hundreds of thousands of dollars. In light of budget cuts, a doom and gloom economy, and record job losses, students may fail to recognize that having a good education is the best bet for future economic prosperity. Almost every significant social problem has its roots in poverty, and the best way to fight poverty is to educate people (The Tampa Tribune, **Education is Best Bet for Our Prosperity**, May 28, 2008). In other words, education has long-term economic value, so stick with school during these hard times.

The US Department of Labor, Bureau of Labor Statistics Occupational Outlook Handbook states that the employment of environmental scientists is expected to increase by 25 percent between 2006 and 2016. A bachelor's degree in environmental science offers an interdisciplinary approach to the natural sciences, with an emphasis on biology, chemistry, and the earth sciences. Statistics show that the median annual income of environmental scientists was \$56,100 in May 2006. The middle 50 percent earned between \$42,840 and \$74,480.

President Obama has pledged **“to ensure that our nation’s environmental law and policies balance America’s need for a healthy, sustainable environment with economic growth”**. (Obama Biden, Blueprint for Change).

Thank you for considering these ideas, and please look forward to a future that holds great promise for employment in the environmental field.

BS/MS in Environmental Science and Biology Proposal and Major Revisions in the Environmental Chemistry Track

BS/MS Proposal

Final touches are being put on a combined BS/MS degree program in Environmental Science and Biology before sending it to Albany for approval by SUNY Administration and the State Education Department. The new 3 + 2 program is designed so that highly qualified (a 3.4 GPA is the baseline application criterion) and motivated students can complete two degrees and a research thesis project in five years. If approved, the new degree program likely would begin in the fall of 2010 or 2011.

ENV Chemistry Track

To improve the accessibility and marketability of the Environmental Chemistry track for our majors, the ESB Department has proposed a major revamping of the concentration. Students choosing the revised track, to be called **“Environmental Chemical Analysis,”** will take the standard 38-credit core curriculum for the Environmental Science majors plus 24 credits of required and five credits of elective courses. Required courses for the new con-

centration are Chemical Safety, Organic Chemistry I & II, Environmental Geochemistry, Biology of Pollution, Water Quality Analysis, and Aquatic Toxicology. Elective courses are Limnology, Limnology Lab, Biostatistics, Animal Ecophysiology, Environmental Impact Analysis, and Collaborative Research. If approved by the College Senate, students may enter the new concentration in the fall of 2009.

New Wetland Ecology Concentration in Environmental Science

Wetland ecology is an exciting and relatively new field of environmental science that intertwines disciplines such as plant ecology, wildlife biology, hydrology, geology, soil and water chemistry, paleoecology, and remote sensing in an effort to address conservation and management problems. Large areas of wetland, ranging from freshwater and salt marshes to forested swamps to peatland bogs and fens have been destroyed or impacted by human activities; laws enacted to protect remaining wetlands resulted in creation of many new career opportunities that cover a spectrum of interests. The time is ripe for students to take advantage of this opportunity. The Department of Environmental Science and Biology will be at the academic forefront by adding Wetland Ecology as a new concentration within the Environmental Science undergraduate major. This option is made possible by the recent addition of Dr. Douglas Wilcox to the faculty as the Empire Innovation Professor of Wetland Science. New courses that will support the concentration are Wetland Ecology, Restoration Ecology, and Northern Wetlands (covering peatlands and Great Lakes wetlands). General education and departmental core requirements will match those of other concentrations, but required courses and options for science electives will be tailored toward meeting the multi-disciplinary nature of wetland science. The required courses are Wetland Ecology, Northern Wetlands, Hydrology, Soil Science, and Plant Diversity. One of the following courses is also required: Wildlife Ecology, Aquatic Invertebrates, or Fishery Techniques & Fish Identification. Six to eight elective credits must also be selected. The foundation for this concentration was laid in a manuscript titled "Education and training of future wetland scientists and managers" that was published by Dr. Wilcox in the September 2008 issue of the journal *Wetlands*. That paper outlined the coursework requirements needed for development of the next generation of scientists and managers who will conserve our valuable wetland resources. Few universities offer a focused program in wetland science. This opportunity at Brockport could therefore make our graduating students attractive candidates for a variety of career positions and graduate programs (see <http://www.sws.org/jobs/> for examples). Dr. Wilcox will also create openings for MS students wishing to work in wetlands. His extensive contacts with wetland scientists across the country could also lead to opportunities for interested students to continue on into Ph.D. programs in a variety of wetland-related topics.

Great Jobs for ENV Alumni Despite a Weak Economy

Adam Goodine (BS 2004) - Adam is employed with ENVIRON in New Orleans, Louisiana as an Environmental Consultant. In order for reconstruction projects to receive grant money from the Federal Department of Housing and Urban Development, environmental reviews of each project must be conducted to ensure compliance with the National Environmental Policy Act. Adam ensures that this is done properly by conducting compliance reviews of environmental impact statements. According to Adam, **"The education I received at SUNY Brockport and the guidance I received from Dr. Norment have made me a competitive consultant in the southeast, and I'm grateful for that."**

Danielle Merry (BS 2005) - Danielle is employed with Devine Tarbell and Associates as an Associate Scientist. In the summer of 2008, Danielle was delineating wetlands on the Oswegatchie River, New York for licensing studies for a hydropower project. Danielle also traveled to Maine where she delineated wetlands for a wind project. Danielle enjoys not only her job but also the proximity and number of the moose that roam Maine. Danielle describes her experience in Maine as "Awesome!!!"

Sarah Davidson Hile (BS 2005) - Sarah is employed by NOAA (National Oceanic and Atmospheric Administration) in Maryland. She works on Caribbean coral reef ecosystem monitoring and assessments, with trips to St. John and St. Croix in 2008. Sarah also had two publications in 2008 and will be pursuing her graduate degree in Coastal Zone Management through the University of Ulster in January.



William Hershey (BS 2005) - Bill works for the Ontario County Soil and Water Conservation District as a Water Resource Technician. Bill's main function is Agricultural Environmental Management Representative for Ontario County, but he is also involved in stream restoration and related issues. Bill co-authored the Honeoye Lake Management Plan and Macrophyte Management Plan.

Renee Pszyk (BS 2007) - Renee works for the Prince William Aquaculture Corporation in Alaska where she assists the culturist with care and production of several species of Pacific salmon.



Mark Chalupnicki (BS 2003, MS 2006) - Mark works for the U.S. Geological Survey in Cortland, NY as a fishery biologist. A major focus of his work has been lake sturgeon restoration in the Genesee River, Finger Lakes, and St. Lawrence River regions of NY. Mark and his wife Kristina welcomed a daughter into their family in 2008.



Great Jobs for ENV Alumni (continued)

Meg Oles Janis (BS 2003) - Meg works at a variety of different state parks in western New York. Two of her major focuses are a biodiversity and deer impact assessment of Letchworth State Park and a shrubland management project at Joseph Davis State Park in Lewiston, New York. Both projects are geared to increasing diversity of vegetation and birds in the parks. These projects are part of New York State Parks' natural resource stewardship initiative.

Jon Guinn (BS 2004) - Jon is working at Johnson Engineering as an Environmental Scientist in Fort Myers, Florida. Jon works on water quality assessment of surface water, ground water, and coastal marine systems. Jon also assists the ecology division with assessments of wetlands for various federal, state, and private concerns.

Rachel Amon (BS 2007) - Rachel traveled to Prague after graduating with a minor in Environmental Studies and obtained a position with a teaching English at a company working with major firms in the Czech Republic, such as a major energy producer, a geological firm, and an energy transmission company. Rachel was able to keep learning about international environmental issues, the subject of her Honors Thesis at Brockport.

Gary Brown (BS 1990, MS 1993) - Gary works for the Monroe County Department of Environmental Services as Supervisor of the Organics and Metals laboratories.

Jennifer Tsarnas (BS 1996) - Jennifer is the Northeast Account Executive for B & D Natural Ingredients.

Tom Hughes (MS 2002) - Tom serves as project coordinator for natural resource management, environmental stewardship, and education for the Central and Finger Lakes regions. Some of Tom's projects include invasive species control, water quality assessment, habitat restoration, fish and wildlife management, and environmental interpretation. New York State's parks are home to an incredible diversity of plants, animals, and ecosystems, many of which are rare or endangered. The Office of Parks, Recreation, and Historic Preservation (OPRHP) has launched the Natural Resource Stewardship and Interpretation Initiative. This program demonstrates its commitment to the



environment through habitat and wildlife management, lake and stream restoration, invasive species control, and public education; enhancing its natural resource interpretation and education programming by appointment of an Environmental Education and Interpretation Coordinator; and providing leadership for protecting and restoring important plant and animal habitats across the State Parks system.

Scott Wells (MS 2009) - Scott is a fisheries biologist with the NYS Department of Environmental Conservation in Stamford, NY.

Frederick Stoss (MS 1977) - Fred is the Associate Librarian for Biological and Environmental Sciences and Mathematics at the SUNY University at Buffalo. He is active in conducting environmental education workshops for agencies such as The Sierra Club, Environmental Education Committee at the LeConte Lodge, and Yosemite National Park. Fred trained under Al Gore and the Climate Project and was selected as one of the "1000 Climate Messengers." To see more of Fred's activities, please visit his website at lib-web.lib.buffalo.edu/staff/index.asp?ID=35.



Holley Schwingel (BS 2007) (above) banding a wolverine as a residential environmental education intern in the North Cascades Wilderness Area, Washington state, in 2008. Holly was the department scholar in 2006. In the fall of 2008, Hollee worked at Gallatin National Forest outside of Yellowstone National Park.

Environmental Science Undergraduate Activities

Natalie Pilakouta and Scott Williams (BS in progress) - Natalie and Scott will present results of their undergraduate research projects at NCUR (National Conference on Undergraduate Research). Natalie studied possible reasons for the decline of Harris's Sparrows at their wintering grounds on the Great Plains. Scott studied the reproductive behavior of several Central American tanagers, research conducted on captive birds last summer at the National Aquarium. Natalie and Scott worked with Dr. Norment.

Brian Zielinski (BS in progress) - Brian completed an internship with Sienna Environmental Technologies LLC in 2008 under advisement of Dr. Haynes. Prior to his internship, Brian completed a 40-hour Occupational Safety and Health Administration (OSHA) course that deals with toxins tested for compliance with NYS Department of Labor, NYS Department of Health, and OSHA rules. Brian was certified in NYS air monitoring after completion of this course. He learned to filter air and use phase contrast microscopy to test for the presence of asbestos. This toxin is a cancer-causing agent and is still marketed today. Ceiling tile, caulk,

wall board, roofing shingles, and other products containing asbestos are labeled "Chrysotile," the most common type of asbestos fiber. The next time you are in the local hardware store pick up a tube of caulk and see what is inside—you might be surprised!

Sarah Miloski (BS 2008) - Sarah is pursuing a MS in Ecology and Evolutionary Biology at West Virginia University. Please see her picture on the front page at Monogahela National Forest in Elkins, WV where she is doing research on federally threatened Cheat Mountain salamander.

Job Market Requires More than Merit Alone

Rosemary Fanelli - (BS 2004, MS 2007 in Watershed Hydrology at the SUNY College of Environmental Science and Forestry, pursuing PhD in Forest Hydrology at Oregon State University) - A family member in the political arena once described to me how one successfully navigates the political job market: "It's who you know that gets you in the door; it's what you know that keeps you there." At first, I shrugged off the importance of networking, thinking that it was only relevant in politics, and continued thinking that merit alone would suffice for landing a job in the environmental sciences. However, in the current economic climate, the best advice that I can give you is that you cannot rely on merit alone to find a position, and that it is incredibly advantageous for the agency, office, or company to be familiar with you before you apply. In that regard, there are many ways to introduce yourself to potential future employers during your undergraduate program. Many faculty members in the ESB Department actively participate in research projects that either collaborate with or are funded by local, state, or federal government agencies, non-profits, consulting firms, etc. You can conduct an independent study with a faculty member that will provide you with a taste of research, insight on how research projects are managed, and also a professional affiliation with the funding or collaborating agency. You may have opportunities to attend meetings or even present your work at a conference (which is a very important skill to hone as a scientist or resource manager). Some federal agencies, such as the NRCS or USGS, have undergraduate internship programs that help you get your foot in the door for a permanent position down the road. Volunteering for a non-profit, such as the Nature Conservancy, can also give you a significant edge when applying for a paid position with them. The key is to make your way into the agency or company so that you can move to another internal position when the opportunity arises.

[From Environmental Science Undergraduate to Environmental Science and Biology Graduate Student](#)

Levi Atwater (BS 2007, MS in progress) - "I have found that the training I received as an undergrad has greatly prepared me for my graduate career. I received solid background in topics such as identifying wildlife in the field, understanding the effects of invasive species on biotic communities, and understanding the delicate balance of nutrient cycles. Fieldwork was a very important aspect of my education. I have gained a wide variety of skills due to the field work I was able to participate in, from learning to identify potential productive salamander habitat, to aging white tailed deer, to collecting aquatic invertebrates to infer water quality. As a graduate student, I am required to design a research project and successfully implement my proposal. I know that with the combined knowledge and training I have received from The College at Brockport I will be well-prepared for a scientific career."

Sun, surf, sand... and an opportunity to study in the Bahamas

What better way in today's economy to have an opportunity to travel to the beautiful Bahamas, have the educational experience of a lifetime, and earn three credits toward your degree in Environmental Science than taking Marine Biology (ENV 457) or Marine Geology (ESC 457) in the Bahamas.

This is a 2-week, 3-credit field course in marine biology or geology in a tropical setting. Past and present marine environments are studied by snorkeling patch reef and associated shallow water habitats and by hiking beach, intertidal, and inland habitats. The course includes evening lectures, a detailed field notebook, and an independent research project.

The program is open to undergraduate and graduate students. No prior coursework is required to participate; however, one previous lab of field course in biology, geology, or marine science is helpful.

Comments by Student Participants in the Bahamas Experience

"The field experience at Sal Salvador was a complete 'hands on' educational journey from snorkeling and diving to the land hikes and caving".

"When people ask me about my trip to the Bahamas, I have to say, I had the time of my life".

"The personal contact and close relationships with professors were definitely a distinction of this program".

"Being able to observe various organisms in their natural habitat sure tops seeing pictures in a book".

Photo: 2009 Marine Biology/Geology class walking across the grass flat habitat from North Point to Cut Cay, San Salvador, Bahamas. See Dr. Haynes for information about the 2010 courses.



Graduate Student Thesis Projects in ESB

Christina Accardi - Christina is evaluating the impact of dietary fatty acids (important for cell membrane function and dietary fat storage/energy reserves) on reproductive success of yellow perch. She is feeding yellow perch two diets, alewife and round goby, which contain distinct fatty acid compositions. At the time of spawning, perch eggs will be collected and their quality evaluated. This research, funded by the Great Lakes Fishery Trust through a grant to Christina's advisor Dr. Jacques Rinchar, will improve understanding of how changes in nutritional fatty acids, linked to food-web changes, can affect reproductive success of yellow perch. The new MS program in Environmental Science and Biology and the new aquaculture classes being offered by the ESB department appealed to Christina who earned a BS in marine science at the University of South Carolina.



Rhonda Hudgins - Within the order Coleoptera, tiger beetles (Cicindelidae) are a distinct group of close to 2300 species worldwide that are found in a wide variety of habitats. Tiger beetles are often used as bioindicators, models for understanding, managing, and conserving biodiversity and ecosystems. In New York State, eight species of tiger beetles have been identified as "Species of Greatest Conservation Need" in New York State's Comprehensive Wildlife Conservation Strategy (CWCS) because these species are scarce and found only in small, localized areas and threats to their populations have been identified. The focal species of my study, the cobblestone tiger beetle (*Cicindela marginipennis* Dejean), has been observed along the Genesee River and Cattaraugus Creek in western New York. My objectives are 1) to identify environmental variables associated with suitable habitat; 2) to understand the dispersal dynamics of the adult cobblestone tiger beetles; and 3) to model dispersal, habitat selection, and patch occupancy by cobblestone tiger beetles. Support for these objectives will come from gathering data on the dispersal of marked and recaptured cobblestone tiger beetles, and repeating surveys of suitable habitat along the upper Genesee River. The information from my study will be shared with conservation managers responsible for managing cobblestone tiger beetle habitats in the state.



Blake Snyder - In November 2008, the Aquaculture II class by Dr. Jacques Rinchar traveled to the Adirondack Fish Hatchery located in Saranac Lake, NY. The hatchery is owned and operated by the NYS Department of Environmental Conservation to spawn and raise Atlantic Salmon for stocking in surrounding waters. The hatchery contains many indoor tanks that contain broodstock salmon, but also utilizes a wide supply located in neighboring Little Clear Pond. If egg quality differs among broodstocks (NYSDEC and wild), changes in diet can be made to hopefully improve survival rates of the NYSDEC Atlantic salmon.



Christopher Titus (BS 2008) - Chris has been conducting research on the Northern Coal Skink as part of a State Wildlife Grant through the Nature Conservancy, the Natural Heritage program, and the NYS Department of Environmental Conservation. The primary focus of this study is to examine habitat use and population dynamics of the species in Western New York.

Brad Mudrzynski (BS 2007) - Brad is working on a U.S. Fish and Wildlife Service-funded project studying how fall migrant songbirds use early-successional habitats at Iroquois National Wildlife Refuge. Results from his study will be used to make management recommendations that will benefit migrant songbirds on the refuge.

Levi Atwater (BS 2008) - Levi is working on a project examining how the NYS Department of Environmental Conservation's Landowner Incentive Program (LIP) is doing at selecting applicant properties for inclusion in the program based on their value as grassland bird breeding habitat. Levi's work on this project is supported by the NYS DEC and New York Audubon. He has completed one season of field work with a second to follow in 2009.



ChristiAnn Severson - Christi's research focuses on predatory zooplankton in Lake Ontario: *Cercopagis pengoi*, *Bythotrephes cederstroemi*, and *Leptodora kindtii*. Two of three species, *Cercopagis* and *Bythotrephes*, are exotic invasive species introduced to Lake Ontario in recent decades, and their full impact on the local food web is not completely understood. Christi's thesis work is looking at fatty acid profiles of these predators to help elucidate their location in the food web and examine the trophic energy transfer associated with these organisms.

Justin Rogers - With support of the Rochester Chapter of the Sierra Club, Justin will collect preliminary data that may lead to an urban forest restoration project. The urban forest site is the Washington Grove within the boundary of Cobb's Hill Park in Rochester, NY. This area was originally dominated by oak and other native tree species but introduced Norway maple may be establishing ecosystem dominance. The initial project design has three components: 1 - Forest characterization, 2 - Propagule (reproductive) pressure of native and non-native species, and 3 - Native and non-native tree regeneration.

In Memoriam

Dr. Ronald C. Dilcher (1930-2009) - Dr. Dilcher taught Ecology, Ornithology, Environmental Impact Analysis, and many other subjects during his long career at Brockport (1957-1995). A consummate naturalist, he could identify most plants and animals in terrestrial and aquatic systems, including their Latin names, in the field. Generations of students and colleagues will remember his dedication to science education, work to protect and preserve the local environment, gentle nature, and dry wit.

Fall 2009 Course Offerings

ENV 201/202	Environmental Science	1:15-2:15 Monday/Wednesday/Friday
ENV 405/505	Plant Ecology	4:00-5:30 Tuesday/Thursday
	Lab	1:15-5:00 Wednesday
ENV 419/519	Limnology	6:00—9:15 Tuesday
ENV 421/521	Limnology Laboratory	12:00—5:00 Thursday
ENV 437	Biostatistics	8:00-9:30 Tuesday/Thursday
ENV 446/546	Wetland Ecology	6:00-9:15 Thursday
	Lab	1:15-5:00 Thursday
ENV 452/552	Environmental Laws and Regulations	5:30-7:00 Monday/Wednesday
ENV 457	Marine Biology Bahamas	3:45-5:15 Monday/Wednesday
ENV 459/559	Mammalogy	9:45-11:15 Tuesday/Thursday
	Lab	1:15-5:00 Friday
ENV 464/564	Aquaculture I	9:45-11:15 Tuesday/Thursday
	Lab	1:15-4:15 Monday
ENV 469/569	Environmental Literature	11:30-1:00 Tuesday/Thursday
ENV 476/576	Ecophysiology	7:45-9:15 Monday/Wednesday
ENV 490/590	Fishery Techniques/Fish ID	12:00-5:00 Tuesday
ENV 614	Experimental Design	8:00-9:30 Tuesday/Thursday

ES&B Faculty and Staff Directory and Expertise

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