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Newsletter Fall 2011

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Environmental Science and Biology

From the Chair's Desk— Dr. James Haynes



It is hard to believe the half-way mark of the fall semester is past. ESB's secretary, Deborah Dilker, put this newsletter on my desk for review a month ago but it has taken this long for it to rise to the top of my inbox given so many other pressing needs and demands.

The department is enjoying great success. Our undergraduate classes are fully enrolled by 130 majors, 34 graduate students are in various stages of MS thesis planning, research and writing, and the faculty and students

are involved in many research activities.

This newsletter highlights our newest track—Wetland Ecology. Led by Dr. Douglas Wilcox, Empire Innovation Professor of Wetland Science, undergraduate and graduate students are learning and researching about this critically important ecotone that separates aquatic and terrestrial ecosystems. Prospective students interested in environmental science and ecology are encouraged to take a hard look at Brockport,

which has unique capabilities in wetland, aquatic and terrestrial ecology.

Finally, last summer Dr. Norment and I taught Brockport's Biodiversity and Sustainability course in Australia, including work at the Great Barrier Reef, Daintree World Heritage Rain Forest, and Outback. Dr. Norment will teach the course in 2012, while I will teach Tropical Marine Ecology in remote Indonesia. Contact us for more information.

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Wetland Ecology/Biology Track: Career Opportunities

Wetland science emerged as a distinct discipline in the 1980s when new environmental laws and problems associated with loss of wetlands came to the forefront. Regulatory and management concerns relating to wetlands generated a need for specific training of environmental professionals with wetland backgrounds. In response to this need, courses addressing various aspects of wetland science and management were developed by universities, government agencies, and private firms. Professional certification of wetland scientists began in the mid-1990s to provide confirmation of the quality of education and experience of persons involved in regulatory, management, restoration/construction, and research involving wetland resources. The education requirements for certification and the need for persons with specific wet-

land training to fill an increasing number of wetland-related positions identified a critical need for more than single courses involving wetlands. Curriculum guidelines for an undergraduate wetland science major required basic science courses, upper-level specialized courses that address critical aspects of physical and biological sciences applicable to wetlands, and additional upper-level specialized courses that can be used to tailor a degree to students' interests. Where can you get such a degree? Few undergraduate programs offer even a single wetland course. The Department of Environmental Science and Biology at Brockport offers a curriculum geared specifically toward careers in wetland science

in the form of the Wetland Ecology Track. The track is modeled after the wetland science major proposed for Society of Wetland Scientists accreditation by ESB's own Dr. Douglas Wilcox in a paper published in the journal *Wetlands* in 2008. Students who complete the required coursework should fulfill most of the education requirements for professional wetland scientist certification and possess qualifications that make them attractive candidates for graduate school or entry-level positions in wetland science or management. Consider the few programs at other colleges and take advantage of the unique opportunity at Brockport to make yourself qualified for positions continually being advertised at <http://www.sws.org/jobs/>

Graduate and Undergraduate Student News

Nathan Grosse (BS '08, MS '12) Beginning in October 2010, and running through September 2011, I worked at Fort Drum, supported by the Oak Ridge Institute of Science and Education (ORISE). Fort Drum is a US Army base located in northern New York. I was hired to lead a research project focusing on the sandplain grassland habitat and the accompanying grassland birds found on the base. Sandplain grasslands are a rare ecosystem in NY, with much of the remaining habitat located on Fort Drum. Associated with these grasslands are several bird species of special concern (SSC), including the Vesper Sparrow (*Pooecetes gramineus*) and the Grasshopper Sparrow (*Ammodramus savannarum*), as well as a state threatened bird, the Upland Sandpiper (*Bartramia longicauda*). My task was to survey the sandplain grassland habitat intensively for both suitable vegetative habitat and birds. The overall product of my research is a management plan that the Fish and Wildlife program for Fort Drum can use to manage the areas for these bird species of concern. The aim is to restore the habitat that is being lost to succession, thus providing valuable breeding and nesting habitat for these vulnerable and declining grassland bird species. This project was a direct result of my masters' work at The College at Brockport, which also focuses on grassland habitat management for grassland bird species.



Grassland habitat at Ft. Drum

Ben Sleeper (BS '12) Ben (next photo) helped aquatic ecologists from the Leetown Science Center, US Fish and Wildlife Service, collect water temperature and brook trout (*Salvelinus fontinalis*) distribution data for a genetic integrity study in the Delaware Water Gap National Recreation Area. The study modeled effects of water temperature on brook trout distributions and genetics in the watershed. Ben did backpack electrofishing to sample 71,150 sites. Pectoral fin clips were collected from the brook trout for later genetic analysis. Brook trout at three other sites were PIT tagged for movement studies.



Eric Long (BS '13) Helped graduate student **Coral Reina (BS '06, MS '12)** collect water and fish samples and measure aquatic and riparian habitat parameters in the west branch of Sandy Creek between Albion and Murray, NY. The purpose of Coral's thesis project, supervised by Dr. Haynes, is to see if statistical models will predict minnow distributions in relation to habitat parameters.

Matt Laine (BS '12) and **Laura Lanzafame** (transfer major from MCC in August) worked on a joint project among RIT, Brockport and MCC to characterize benthic macroinvertebrate communities as indicators of water quality in the Indian River Lakes watershed in the Adirondacks and in wetlands at the High Acres Natural Area south of Rochester.

Nick Vermuelen (BS '12), **Jenny Crane (BS '13)**, **Alex Navarro (BS '13)** and **Mandi Caldwell (BS '11)** all had internships with the NYS DEC last summer. Nick worked at the Montezuma National Wildlife Refuge and Jenny worked at the Iroquois NWF. Mandi and Alex worked on surveys of threatened freshwater mussel in western NY watersheds.

Editor's note: the above were all paid positions.

Graduate student **Alexander Healy (MS '12)** is working with advisor Dr. Doug Wilcox and in partnership with the NYSDEC to restore sedge/grass meadow on about 9 acres of agricultural land adjacent to West Creek at its confluence with Braddock Bay on Lake Ontario. To evaluate the effectiveness of restoring characteristic native meadow marsh species, field experiments consist of four interrelated com-

ponents: initial baseline survey of communities, seed bank study, experimental implementation of restoration procedures, and follow-up to determine what changes take place. Although analysis of results is ongoing, species typically associated with sedge/grass meadows in our area seem to have increased in the study area.

Danielle Barbiero (BS-SUNY Buffalo, MS '12) - Danielle (below), supervised by Dr. Haynes, is conducting thesis research at the Aquarium of Niagara Falls on the effects of environmental enrichment on learning a discrimination task by white-spotted bamboo sharks (*Chiloscyllium plygiosum*). For the month of July, Danielle studied in Fiji (upper left photo on p. 1) where she went SCUBA diving 16 times, 100 feet down, at a world-renowned marine reserve for shark conservation. She saw bull, nurse, gray reef, whitetip reef, and bluetip reef sharks. Danielle also completed a research project on the effectiveness of the marine reserve, did community service, and had a home-stay at a traditional Fijian village on the island of Beqa.



Alex Czayka (MS '12) Alex finished his thesis research this summer at Kents Creek, a drowned river mouth wetland on the eastern end of Lake Ontario. Under the direction of Dr. Wilcox, his research involved using multiple treatments to control cattail in a sedge/grass meadow wetland. Alex hopes he will find a successful treatment that could help restore hundreds of acres of cattail-invaded wetlands on Lake Ontario. Alex is in the process of starting his new job (fall 2011) as a wetland ecologist-research assistant for the U.S. Geological Survey at the Great Lakes Science Center in Ann Arbor, MI. The majority of his research will be conducted at Ottawa National Wildlife Refuge in western Lake Erie.

Environmental Science and Biology Job Updates

Kristin Burns (BS '11) - Environmental Scientist, Greystone Evolutions. Greystone provides sustainable and cost-effective environmental solutions to clients in order to meet their environmental management objectives. Kristin assists Senior Geologists in report writing for projects and various administrative duties.

Elizabeth McGuire (MS '11) - Oak Ridge Institute for Science and Education Internship in Atlanta, Georgia. Beth will be working with the EPA's Office of Wetlands, Oceans and Watersheds; mainly working on mining permits and nutrient loading issues in EPA Region 4. Students that are looking for internships please go to the following website:

<http://orise.orau.gov/science-education/internships-scholarships-fellowships/default.aspx>

Brian Zielinski (BS '09) - Pheasant Technician, New York State Department of Environmental Conservation, Region 8 Bureau of Wildlife,

Alex Kolody (BS '09) - Water purification unit, Ginna Nuclear Power Plant.

Aubrey Galusha - (BS '11) Ph.D. graduate assistantship, Environmental Health Science, SUNY at Albany.

Scott Wells (MS '09) - Aquatic Biologist, NYSDEC, Region 4.

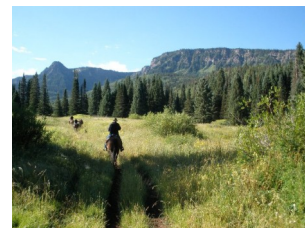
Christopher Titus - (BS '08, MS in progress) Independent Tortoise Subcontractor, California. One of Chris' study critters below.



Hollee Schwingel-McLean (BS '07) - Energy Lab Technician, Energy Northwest, Richland, Washington.

Kristina Klees-Daugherty (BS '05, MS '08)- GIS Analyst, Monroe County Department of Environmental Services, Rochester, New York.

Levi Atwater (BS, '07, MS in progress) - District Wildlife Manager I, Colorado Division of Wildlife, Denver.



Kaitlyn Wauhkonen (BS '11) - Crew Member, Montana Conservation Corps.



Levi's and Kaitlyn's work locations above.

Student Projects and Research

Edward Wesolowski (BS '11, MS in progress) Ed is currently investigating with Dr. Jacques Rinchar the effects that the invasive species, alewife and round goby, are having on native salmonids in the Great Lakes. He is conducting feeding experiments with lake trout and Atlantic salmon to evaluate how fatty acid signatures can provide time-integrated and energy-based depictions of food-web structure and to assess how changes in nutritional fatty acids can affect reproductive success (picture right).



Rob Cornish (BS '11, MS in progress) Rob is a Graduate Assistant on Dr. Wilcox's Great Lakes Coastal Wetland Monitoring Project. In the summer of 2011 he collected aquatic macroinvertebrates in Lake Ontario wetlands, and is now identifying them. Macroinvertebrate data will be combined with vegetation, bird, fish, and reptile and amphibian data to determine the health of coastal Lake Ontario wetlands. The project is a joint effort with many universities across the Great Lakes region, the USEPA, and Environment Canada.

Dr. Mark Norris, Terrestrial Ecology/Biology

Dr. Norris received his Ph.D. in Natural Resources Science and Management from the University of Minnesota where he studied the interactions between soil processes and the plant community in an oak savanna restored by prescribed burning. Dr. Norris continues his interest in terrestrial plant and ecosystem ecology by pursuing research in areas such as land use and land cover change, invasive species, and restoration ecology. Current students in his lab are involved with projects investigating the impacts of invasive plants and invasive pests in forest communities, soil carbon sequestration potential of restored wetlands, distribution patterns and consequences of non-

native earthworms, and shifts in community and ecosystem dynamics following the establishment of novel ecosystems.

Dr. Norris teaches key courses in the Department of Environmental Science and Biology: Ecology, Plant Diversity, Plant Ecology, Biostatistics, Experimental Design, and Terrestrial Ecosystem Ecology. Dr. Norris routinely takes students on field trips to locations such as Letchworth State Park, Mendon Ponds, Iroquois National Wildlife Refuge, and various other local locations. His Plant Ecology course also includes an overnight trip to Allegheny National Forest

in Pennsylvania where the class explores the goals and challenges of forest management in our region and then collects data to examine the long term consequences of natural or anthropogenic disturbances on forest composition and structure.

To learn more about Dr. Norris, please visit his website at: <http://www.itss.brockport.edu/~mnorris/>



[\\$1.2 Million Wetlands Grant Received by ESB Faculty Member](#)

Dr. Douglas Wilcox and colleagues in the Great Lakes Indicators Consortium received a \$10M EPA grant through the Great Lakes Restoration Initiative to monitor and assess the health of nearly all Great Lakes coastal wetlands. The GLIC includes collaborators from universities and governmental agencies from both the United States and Canada. Researchers will assess bird, amphibian, fish, aquatic macroinvertebrate, plant, and water quality components of each Great Lakes coastal wetland by the end of the five-year project.

The Department of Environmental Science and Biology at the College at Brockport will monitor the US shore of lakes Erie and Ontario from Erie, Pennsylvania to Cape Vincent, New York. Dr. Wilcox is overseeing plant sampling and is being assisted by Dr. Jim Haynes, Dr. Chris Norment, and Gary Neuderfer for the fish, bird and amphibian, and aquatic macroinvertebrate components, respectively. **Brad Mudrzynski (BS '06, MS '10)** is the project/field crew leader responsible for much of the day-to-day activity on the project. He is working with graduate students **John Bateman (bird/amphibian, MS in progress)**, **Aaron Heminway (vegetation, BS/MS in progress)**, **Matt Piche (fish, BS-Keuka College, MS in progress)**, **Dave Sanderson-Kilchenstein (aquatic macroinvertebrates, BS-University of Maryland, MS in progress)**, and **Rob Cornish (aquatic macroinvertebrates, BS '11, MS in progress)**. **Greg Lawrence (BS '15 at RIT)** and **Cody Smeltzer (BS '11)** provided valuable assistance this past field season on the bird/amphibian and aquatic macroinvertebrate/fish crews, respectively.

Dr. Wilcox's team sampled 24 wetlands last summer, the inaugural field season for the project. Birds and amphibians were sampled in May and June using the Marsh Monitoring Protocol. Each site was sampled three times for amphibians and twice for birds using 15 minute surveys, noting species presence, abundance, location, and behavior. Fish sampling consisted of placing three fyke nets per wetland vegetation zone (e.g. submersed aquatic, bulrush, cattail) overnight. All fish and turtle species caught in the nets were identified, measured, and recorded as part of the assessment protocol. Aquatic macroinvertebrates were swept with D-frame nets near the fish nets in the same wetland vegetation zones. Once swept, 150 invertebrates were picked from pans at each sampling site and preserved for later identification. Water quality sampling was tied closely to both the fish and invertebrate sampling, with temperature, dissolved oxygen, pH, specific conductance, alkalinity, turbidity, soluble reactive phosphorus, nitrate, total nitrogen, total phosphorus, chlorophyll-a, turbidity, color, and chloride samples being taken at the same locations within each zone. Vegetation sampling was performed along three transects that spanned the typical vegetation zones of a coastal wetland: submersed, emergent, and meadow marsh. Each zone was sampled with five quadrats per transect with information such as total plant cover, individual species cover, water depth, and sediment depth recorded.

The goal of this project is to monitor and assess the health of both individual wetlands and wetlands as a whole in the Great Lakes. The health of these wetlands can be assessed using the species presence, species abundance, water quality, and physical habitat data collected. These data will be made available to resource managers and restoration practitioners throughout the Great Lakes to help improve Great Lakes coastal wetlands that fish, wildlife, invertebrates, and humans need.



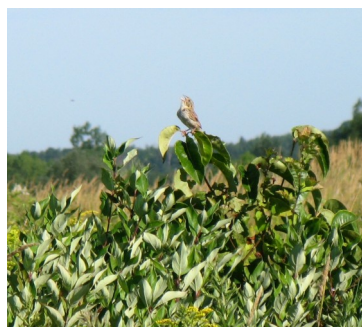
John Bateman (BS '10, MS in progress) This past summer, John began his thesis project, supervised by Dr. Chris Norment, on the use of stormwater ponds by calling amphibians, and also surveyed wetland birds and amphibians for Dr. Wilcox's Great Lakes Coastal Wetland Monitoring project. John's thesis work investigates whether stormwater ponds are suitable for sustaining amphibian communities, or if they are population sinks. By identifying environmental variables that affect amphibian presence, John's work will determine if stormwater ponds can be designed to either draw or deter amphibians, based on the presence or absence of suitable habitat in the surrounding area. John's work on the Great Lakes Coastal Wetland Monitoring project involves surveying birds and amphibians in coastal wetlands along the south and east shore of Lake Ontario. John and his assistant, Greg Lawrence (freshman at RIT), visited each site five times during the breeding season and recorded the presence of these animals and their breeding behavior. This work is part of a large-scale monitoring project that will allow land managers to understand the overall health of their wetlands.



Josh Cronlund (BS-University of Vermont, MS in progress) is in the second semester of his Masters program where he plans to study habitat preferences by the hoary bat (*Lasiurus cinereus*) in New York State. Obtaining a Bachelor's Degree in 2004 in Wildlife Biology, he has three diverse field seasons under his belt. He has mist-netted migratory birds in Colima, Mexico (not Mexico, NY!), trapped and tagged Utah prairie dogs in southern Utah, and monitored Indiana bats with radio telemetry in the Lake Champlain region of New York and Vermont. Since graduating and working on field crews as a field tech, Josh worked as a Pollution Control Inspector for Miami-Dade County's Department of Environmental Resources Management (DERM), where he inspected permitted and non-permitted facilities as well as responded to citizen complaints, which fell under the jurisdiction of the environmental code of Miami-Dade's ordinances. After living in Miami, FL for three years, Josh will gladly tell you that it is a nice place to visit. Josh's wife Leah is also a full time student. They have a daughter, Sofia, who says "Hi," to any and all passersby on a walk, and a dog named Tope (Mexican Spanish for "speedbump"), who can do a trick called "the Superman."



Ariel Kirk (BS- St. John Fisher College, MS in progress) Ariel just completed her first field season as a graduate student with Dr. Chris Norment. She is developing a management plan for the Henslow's Sparrow, a NYS threatened grassland bird. Ariel collected her data at Fort Drum, New York in Watertown with her two awesome field technicians, **Dave Greer (MS in progress)** and **Kristine Carlson (BS in progress)**. It was a long, hot summer, but having a great team to work with made the harder days fly by. Ariel will return to Watertown next summer for her second field season and finish writing her thesis the following semester.



David Greer (BS-Roberts Wesleyan College, MS in progress) This summer I worked at Fort Drum, NY along with Ariel Kirk and Kristine Carlson. We studied the habitat preferences of Sedge Wrens, Henslow's Sparrows, and grassland birds in general. It was a great summer and lots of work. We learned a lot from some of the biologists at Fort Drum and even more by trial and error. Along with getting to see some bird's that are very rare in New York we also saw coyotes, snapping turtles, black bears, and American Mink.



Will Smith (BS '11) To improve water quality in Lake Ontario, numerous agencies, universities and conservation groups in both the U.S. and Canada are conducting research to better comprehend lake dynamics and to enhance management practices. Understanding the role of the lake's many tributaries, and their respective effects on its ecology, is a crucial component of this work. Sponsored by a grant from the Brockport Foundation, this past summer I worked with Dr. Makarewicz in the Water Quality Laboratory. Current work in the lab centers on a comprehensive assessment of the Genesee River watershed, an ongoing research effort sponsored by a grant to Dr. Makarewicz from the U.S. Department of Agriculture. In my research I investigated two sections of the upper Genesee River where during prior monitoring total suspended solids and total phosphorus were shown to generally increase. My task was to identify areas of streambank soil loss and nutrient runoff, with the overriding goal of making recommendations for future management and restoration projects. Over the course of ten weeks I analyzed both sections of the river (and their tributaries) by way of water quality analysis, an erosion survey, and GIS.

As part of the same comprehensive water quality assessment of the Genesee River watershed funded by the USDA and directed by Dr. Joe Makarewicz, graduate students **Dale Pettenski, BS-Paul Smith's College** (Oatka Creek subwatershed), **Evan Rea, BS-Paul Smith's College** (Canaseraga Creek subwatershed), and **Mellissa Winslow, BS-Clarkson University** (Black Creek subwatershed) are doing routine weekly and "rain event" sampling to fully describe the hydrology and water quality of these subwatersheds and to calibrate and validate SWAT (Soil Water Assessment Tool) models. SWAT simulations allow resource managers to predict water quality based on land use and to "test" Best Management Practice scenarios. The objectives of Dr. Makarewicz's overall study are to identify the sources and causes of nutrient pollution in the Genesee River watershed with the overall goal of improving water quality in the nearshore of Lake Ontario. New graduate student **Lindsay Dressel** has joined Dr. Makarewicz's research group and will soon choose her own subwatershed study.

Also working on the Genesee River project, Aubrey Galusha (**BS '11**) did a Collaborative Research (ENV 498) project with Dr. Makarewicz on "*The Impact of a Rock Quarry on Black Creek Water Chemistry.*" For this project, Aubrey was a co-recipient of the 2011 Kenneth A. Damann Award for Research in Aquatic Ecology (Ed Wesolowski, working with Dr. Richard was the other co-recipient). Her research project undoubtedly played an important role in Aubrey's receipt of a full PH.D graduate assistantship at SUNY Albany.