

Spring 2010

585-395-5975



The College at Brockport

Environmental Science and Biology

So...how is the job market for Environmental Science majors?



Let's start out with a few statistics and then we'll show you how well our graduates are doing in this field.

Employment of environmental scientists and specialists is expected to increase by 28 percent between 2008 and 2018, much faster than the average for all occupations. Job growth should be strongest in private-sector consulting firms. Growth in employment will be spurred largely by the increasing demands placed on the environment by population growth and increasing awareness of the problems caused by environmental degradation. Further demand should result from the need to comply with complex environmental laws and regulations, particularly those regarding ground-water decontamination and clean air.

Much job growth will result from a continued need to monitor the quality of the environment, to interpret the impact of human actions on

terrestrial and aquatic ecosystems, and to develop strategies for restoring ecosystems. In addition, environmental scientists will be needed to help planners develop and construct buildings, transportation corridors, and utilities that protect water resources and reflect efficient and beneficial land use.

Many environmental scientists and specialists work in consulting. Consulting firms have hired these scientists to help businesses and government address issues related to underground tanks, land disposal areas, and other hazardous-waste-management facilities. Currently, environmental consulting is evolving from investigations to creating remediation and engineering solutions. At the same time, the regulatory climate is moving from a rigid structure to a more flexible, risk-based approach. These factors, coupled with new Federal and State initiatives that integrate environmental activities into

the business process itself, will result in a greater focus on waste minimization, resource recovery, pollution prevention, and the consideration of environmental effects during product development. This shift in focus to preventive management will provide many new opportunities for environmental scientists in consulting roles.

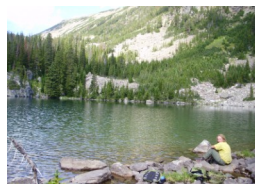
Job prospects. In addition to job openings due to growth, there will be additional demand for new environmental scientists to replace those who retire, advance to management positions, or change careers. Job prospects for environmental scientists will be good, particularly for jobs in State and local government.



How our graduates are doing in this job market

Hollie Schwingel (BS '07)

If these look like the kinds of environments you would like to work in, please investigate a major in Environmental Science and Biology at Brockport.



Hollie (upper left) is employed as an Interpretive Specialist at Sun Lakes/Dry Falls Washington State Park.

Nancy Kelly (BS '06) works for the Orleans County Department of Health as a Public Health Sanitarian inspecting and monitoring restaurants, public

swimming pools, children's camps and labor camps. Nancy says, "There are great job opportunities available if you are interested in serving the public."

Adam Goodine (BS '04)

Adam is employed with ENVIRON International Corporation in New Orleans, Louisiana as an Environmental Consultant. According to Adam, "Brockport's Environmental Science major allows students to determine their own focus areas in the vast arena of "environmental science." "...the College at Brockport gave me the tools I need to take just such opportunities and see them realized."

Michael Carpenter (BS '06)

Michael is employed with Bergman Associates in Rochester, NY as an Environmental Scientist. "Not every college offers you the quality of education you will get from the exceptional ES&B faculty."

Renee Pszyk (BS '07)

Renee works for the Prince William Sound Aquaculture Corporation as a fish culturist. PWSAC operates four remote salmon hatcheries on Prince William Sound and one on the Copper River.



Canoe Trip on Lake Ontario Wetland Sites

Dr. Douglas Wilcox will lead a group of environmental journalists on a canoe trip into one of his Lake Ontario wetland research sites and discuss the relations between Great Lakes water levels and wetlands, including the effects of water-level regulation. The journalists received competitive internships from the Institute for Journalism and Natural Resources and will complete a week-long circle tour of Lake Ontario as part of their training. The program is being led

by Peter Annin, the author of [Great Lakes Water Wars](#), a book that details interactions among interest groups regarding uses of Great Lakes water. Mr. Annin met Dr. Wilcox during interviews conducted while the book was being written.

If you would like to learn more about the concentration in Wetland Ecology/Biology in the Department to Environmental Science and Biology, contact Dr. Wilcox at

dwilcox@brockport.edu

Dr. Wilcox is a wetland ecologist and has been doing research on Great Lakes wetlands for over 30 years. He played a major role in the recent International Joint Commission study of Lake Ontario regulation and is now focusing his research on developing restoration methodologies for



Lake Ontario wetlands.

ENV Student Research Conducted in Monroe County Area

Justin Rogers (BS '05, MS in Progress; advised by Dr. Mark Norris)

The Washington Grove at Cobb's Hill Park
Rochester, NY

Fighting traffic during morning rush hour is not typical of every graduate student's ecological research. With mine, however, it is a more than likely occurrence. My research site is set within the city limits of Rochester, NY at the Washington Grove adjacent to Cobb's Hill Park. Although being within the city limits of Rochester, it is easy to imagine that you could be walking along a trail in the Adirondacks. The humbling reminder that you are not in the Adirondacks is the sound of interstate 490 just to the north. This site is unique and offers an interesting transition from urban living to old-growth forest.

There is concern, however, that this forest is progressing toward being dominated by non-native/invasive species. The most prolific invasive species that is raising the most concern is the Norway maple. My goal this past field season was to discover the magnitude of the invasive species presence. One study worked with various members of the Rochester Chapter of the Sierra Club to characterize the forest community. The Sierra Club posed this problem to our department initially, and their involvement with this project is much appreciated. We randomly sampled 472 trees that made up the canopy and sub-canopy of the forest. We also surveyed herbaceous cover, shrub cover, and seedling and sapling presence along four transects. In addition to this study, I have collected soil samples from the grove to perform a seed bank analysis to determine the species ready to germinate in the grove. Currently, from the soil collected, I am growing and identifying various grove species in Brockport's greenhouse. So far, I have had over 350 seeds germinate.

A seed rain analysis is also currently being conducted and began with the assistance of Bryan Payne (BS in progress). We constructed several seed traps within the grove to collect seed rain. Seed rain consists of any seed that is dropped from the canopy above. In addition to these analyses, I plan to survey available light, litter mass, and perform a comparative growth study of native versus non-native tree seedlings. After I collect and analyze these samples, my hope is to be able to understand the trajectory of this forest. Already from analysis of my forest characterization data, I have found the Norway maple to be the most dense and dominant tree species in the forest sub-canopy. It appears that after the current standing canopy dies off it may be replaced by exotic trees. Further interpretation of my data will help me better understand this system. Simply put, my project understanding will be built from the ground up, from the soil to top of the tallest tree.

NOTE: There are plenty of opportunities to conduct environmental research right in Monroe County and surrounding areas.



Environmental Science degree = employment = adventure = life at its best.

Pictures speak louder than words. Here are some pictures our students and alumni have sent us. **These are not just jobs they are getting, they are a life experience.**

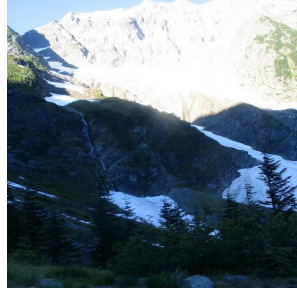
Renee Psyzk (BS 07)

Working in Alaska



Holley Schwingel (BS 07)

Working in Montana



John Bateman

Research in the Bergen Swamp



Erin Stocksclaeder (Bahamas course)



Brad Mudrzynski (BS ENV, MS in progress)



Amanda Alexander (MS in progress, fish & coral community response to lion fish invasion, Bahamas)



Environmental Science and Biology Faculty Research

Teaching and learning are much more than giving and listening to lectures and doing cookbook laboratories. In the ESB Department, laboratory and field courses are devoted to giving students hands-on practice with skills and methods that will prepare them well for employment or graduate work. However, students and faculty working together on real environmental research and management problems is the ultimate preparation for an environmental career or post-graduate study. The ESB faculty has a 30+ year record of involving students in real

projects. For example, dozens of Dr. Makarewicz's undergraduate and graduate students have worked on Great Lakes limnological studies and on watershed and water quality studies throughout central and western New York state. Dr. Norment's and Dr. Norris' students study grassland birds, amphibians, forest ecology, wetlands, and soil ecology. Dr. Haynes' students have researched fish and aquatic invertebrate ecology in the Bahamas, Lake Ontario and regional streams, as well as the ecological

health and contaminant levels of vertebrate populations near Lake Ontario. Dr. Rinchar's students are doing aquaculture and animal physiology projects, and Dr. Wilcox has four new graduate students working on wetlands projects.

If doing real science and solving environmental problems appeal to you, please consider applying to the MS program in Environmental Science and Biology. Contact Graduate Coordinator, Dr. Christopher Norment or the Office of Graduate Studies.

Terrestrial Ecology/Biology Graduate Student Research

Brad Mudrzynski recently finished his second field season of graduate research in the Environmental Science and Biology Department. The project that Dr. Norment and Brad set up was a study on the habitat use of songbirds during the fall migration. This is a unique study in that the research is performed during the fall semester rather than during summer. Brad and his field assistant, Pat Teora, spent September and the first half of October in various shrublands at Iroquois National Wildlife Refuge gathering data to determine the habitat use of these migratory birds.

They used both visual/auditory transects and mist nets to determine the relative abundances of the migratory songbirds in each field. They also characterized each shrubland by estimating shrub cover, shrub species presence, and fruit available for consumption, along with a number of other parameters. Now that both field seasons are done, the real fun is about to start in the form of data entry and statistics to determine what habitat characteristics are preferred by these migratory songbirds. Brad is looking forward to analyzing his

results, writing his thesis, and getting it published in a journal.



Matt Jasikoff (BS candidate)

Spring and Summer 2009: Ducks Unlimited Inc. and U.S. Fish and Wildlife Service

Matt was employed as a Biological Technician for Ducks Unlimited in a cooperative partnership with the U.S. Fish and Wildlife Service at the St. Lawrence Wetland and Grassland Management District, Richville, NY. Matt assisted Ducks Unlimited and U.S. Fish and Wildlife personnel to accomplish habitat restoration projects on state, federal, and private lands. With assistance from staff, Matt helped design, construct, and install ditch plugs, low level earthen dikes, spillways, and water-control structures to restore the hydrology of several drained wetlands and potholes. Matt accomplished these tasks by surveying landscapes with the use of laser level surveying equipment and installing benchmarks and field grade stakes to determine wetland boundaries. Furthermore, he operated a John Deere crawler bulldozer to accomplish wetland restorations and visited with private landowners to assess their property for eligibility into the Partners for Fish and Wildlife Program. Matt helped to accomplish grassland restoration work by preparing fields using a brush hog to eliminate old field habitat and then planting warm and cool season grasses for grassland bird nesting habitat using an agricultural tractor and no-till seeder. Finally, Matt helped to evaluate vegetation types to select possible restoration sites and analyze the success of grassland restorations from subsequent years to determine if they are providing adequate nesting habitat or if they need to be re-worked.



John Bateman (BS candidate)

This spring, working with Dr. Norment, John will be investigating the use of PIT (Passive Integrated Transponder) tags in red-backed salamanders (*Plethodon cinereus*) in the Brockport woods. This will involve performing a small procedure where the individual is anesthetized and the monitoring device is surgically implanted under their skin. Since there are a few studies that have involved tagging species of a similar size, monitoring of a few tagged individuals will be done before tagging the two populations. If successful, John will be able to determine the size of the two populations more accurately through a mark-recapture model and also see if there is movement between the two populations.



Michael Lyzwa (BS candidate)

Michael has been performing research on sediment and phosphorus fluxes in Oatka Creek and Oak Orchard Watershed in Dr. Makarewicz's lab. This project was funded by the U.S. Army Corps of Engineers.

San Salvador, Bahamas: A Place to Remember...

By Erin Stocksclaeder

There was no place I would rather be for almost three weeks of my inter-semester break than on a tropical Bahamian island. My trip to San Salvador was part of a Marine Biology/Geology class during the fall semester that was taught by Dr. Haynes. During this class, we learned about many of the different species that we would see during our trip, but nothing prepared us for the huge amount of diversity that we would experience firsthand during our almost daily snorkeling expeditions. Through this class, I had the opportunity to witness many rare and beautiful aquatic species that many people only dream of seeing. I also

learned about and saw many geologic structures, including blue holes, fossil coral reefs, and caves. Swimming through an underground cave in the pitch dark was an experience none of us will ever forget! Some of the other highlights of this trip included feeding wild iguanas, seeing sea turtles, holding a donkey dung sea cucumber, and taking in the beautiful scenery. At times, I felt like I was living in a tropical aquarium. I highly recommend this class for anyone who seeks adventure and wants valuable field experience. This class is not a vacation—we had to keep a detailed field journal, take a "critter quiz," complete a habitat exercise, develop and conduct a research project, do



data analyses, and write a scientific report. Interested: please email: jhaynes@brockport.edu

NOTE: To get the lowest cost for the Jan 2011 course, it is important to register for ENV 457/699 or ESC 457/557 during preregistration this spring. See Dr. Haynes soon if interested.

Environmental Science and Biology Faculty and Staff

We invite visitors to tour our state-of-the-art facilities in Lennon Hall to see our teaching and research labs, to speak with our professors, and to view our bulletin boards, which feature undergraduates, graduate students, and alumni of the Department.

If you would like additional information about our programs (major in Environmental Science; minors in Environmental Science and Environmental Studies; MS program), please send an email to Deborah Dilker at ddilker@brockport.edu.

Dr. James Haynes, Professor and Chairman
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Fisheries Techniques & Fish Identification

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