

Fall, 2007

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## State University College at Brockport Department of Environmental Science and Biology

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### From the Department Chairperson, Dr. James Haynes

Welcome back for what we hope will be an exciting and productive academic year for students, faculty and staff. As you will read below, much happened during the summer. Renovation of South Lennon (large lecture hall, new basement labs) is underway, and the new greenhouse is expected to be finished for the spring semester. Dr. Jacques Rinchar joined your faculty. He is teaching Aquaculture I and Animal Ecophysiology this semester, and he will teach the new Biology of Organisms (ENV 204 for majors) course in the spring semester. He has already begun an active, externally-funded research program at the same time he is upgrading the Aquaculture Laboratory and Ponds facilities. Thanks to Dr. Makarewicz, the College received a SUNY Empire Innovation Grant that will fund a new, permanent Great Lakes research limnologist position in the department. In less than three years since program reviews of the ENV major and our proposed MS degree, our major goals have been achieved. A revised undergraduate major is in place for freshman and transfer students entering this semester, the first cohort of five students has entered our new MS program, we will have six full-time and three adjunct faculty teaching and researching in the fall of 2008, and beginning this semester we are offering the full set of courses envisioned for a two-year cycle.

Welcome back to a great academic program!

### Master's Degree in Environmental Science and Biology

The Fall 2007 semester at SUNY Brockport marks the start of the Masters program in Environmental Science and Biology

We are pleased and proud that the new MS program is being greeted by new students who are anxious to begin their studies this semester.

These students are now placed with ENV faculty who will oversee their individual progress in a chosen area (Terrestrial Ecology/Biology, Aquatic Ecology/Biology,

Environmental Chemistry or Earth Sciences.

Faculty members participating in the ESB MS program have trained more than 100 MS students. Graduates of the new MS program will be well rounded specialists with in-depth training in their chosen areas.

Upon completion of the MS degree, they will be prepared to enter a PhD program, teach at the K-12 or community college level (providing you hold NYS teaching certification), or

pursue a career with private industry, government or non-government organizations.

If you would like further information on the MS program in Environmental Science and Biology, please visit our website at

[www.brockport.edu/envsci/MS\\_program](http://www.brockport.edu/envsci/MS_program) or call 585-395-5975.



## Dr. Jacques Rinchard, PhD, Aquatic Ecology/Biology

The Department of Environmental Science and Biology is pleased to welcome Dr. Jacques Rinchard to the faculty.

Dr. Rinchard will be teaching two new courses in the fall semester:

### ENV 476/576, Ecophysiology

### ENV 495/595, Aquaculture

Dr. Rinchard brings to Brockport a wealth of experience in the fields of

aquaculture and fisheries.

Listed below are a few of the projects Dr. Rinchard is working on.

Identifying trophic pathways associated with thiamine deficiency complex in Great Lakes food webs (Great Lakes Fishery Commission)

Pelagic and benthic food web shifts affect availability of polyunsaturated fatty acids to lake trout: implications for early stages survival (Great Lakes Fishery Commission)

Effects of exotic species and human impacts on essential fatty acid availability on the Lake Michigan food web (Great Lakes Fishery Trust)

Also, look for two new courses Dr. Rinchard is developing:

### Biology of Organisms (2008)

### Multivariate Statistics (2009)

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*The research done by the faculty in the Department of Environmental Science and Biology is directly related to their teaching mission and sustaining a healthy environment*

## ENV Research – What we do and the benefits achieved

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 (e.g., toxic chemicals in fish, invasive species) and on watershed studies throughout central and western New York state (stressed stream analysis, water pollution, etc.). Dr. Norment's and Dr. Norris's students study grassland birds, amphibians, forest ecology, wetlands, soil ecology and much more in relation to environmental management issues. Dr. Haynes' students have researched fish and aquatic invertebrate ecology in Lake Ontario and regional streams, the ecological health and contaminant levels of vertebrate populations near Lake Ontario, and the status of coral and fish communities in the Bahamas. Virtually all of these faculty-student projects have contributed to solving specific environmental problems in the study systems. If doing real science and improving environmental health appeal to you, contact your professors to find out what opportunities are available during the academic year or summer.

## A Synthetic Chemistry Breakthrough Receives a Presidential Green Chemistry Challenge Award

Ever felt ambivalent that on the one hand you don't like the pollution caused by the chemical industry, yet on the other hand you have to admit that we all rely on the many chemical products such as pharmaceuticals, gasoline, paints, cleaning agents, etc. The research group of Prof. Michael J. Krische from the University of Texas at Austin recently made a synthetic chemistry breakthrough that is likely to change the chemical industry for the better. One key goal of inorganic synthesis is the formation of carbon-carbon bonds so that larger and more complex molecules can be created. It is easy to break carbon-carbon bonds apart by oxidation reactions for example, but it is much harder to form them. Some of the synthetic tools thus far available to synthetic chemists include cyclo-addition reactions, the use of Grignard and Gilman reagents, or carbonyl addition reactions but most of these are environmentally

problematic. The group of Prof. Krische came up with an entirely new approach that is a great example of maximum atom economy, one of the 12 principles of Green Chemistry. Over the last couple of years they have published a whole series of papers that show the successful synthesis of a wide variety of complex molecules by reductive hydrogen mediated carbon-carbon coupling. In this type of reaction, essentially all atoms present in the reactants wind up in the product molecule, a 100% atom autonomic reaction, which thus inherently eliminates wastes and also circumvents unnecessary reaction synthesis steps. Before the work of the Krische group, reductive carbon-carbon coupling was only known to proceed for carbon monoxide as starting material such as in the Fisher-Tropsch reaction which is practiced today industrially on an enormous scale. It thus is fascinating that the principles of the

hydrogen mediated carbon-carbon coupling have been known for more than 70 years, but only now, through Prof Krische's work, it is evident how widely these can be exploited.

Since 1996 the Environmental Protection Agency has honored five individuals annually as part of their Presidential Green Chemistry Challenge Award Program for contributions to Green Chemistry. This year, Prof. Krische received the award for the academic category. To read more about Prof. Krische's research go to:

<http://research.cm.utexas.edu/mkrische/Reserch/index.htm#HYD>

or the EPA's website:  
<http://www.epa.gov/greenchemistry/pubs/programs.html>



This article was contributed by Dr. Markus Hoffmann (above), Associate Professor of Chemistry and advisor for the Environmental Chemistry track of the ENV major. Dr. Hoffmann is on sabbatical leave in Germany during the 2007-2008 academic year.

## Environmental Science and Biology Alumni News

**Michael Carpenter** (BS '06)—In the summer of 2006, after working on stormwater/GIS projects on the Brockport campus and in the Village of Hilton with Dr. James Zollweg, Mike was hired as an Environmental/GIS Specialist by Bergmann Associates in Rochester.

**Glenn Gerber** (MS '87)—Glenn is a Conservation Biologist at the San Diego Zoo working on reptiles, especially iguanas, throughout the Caribbean region and other parts of the world.

**Andrew Hasse** (BS '06)—Andy is working for ENSR/AECOM as a fisheries biologist in New Jersey. While continuing to work on impingement and entrainment sampling in the East River, he will also be in charge of report writing for an upcoming herring project. Andy's career is truly taking off. He was recently asked to be the lead biologist for a macro-invertebrate and electro-fishing project in Pennsylvania.

**Nancy Kelly** (BS '06)—Nancy works for the Orleans County Department of Health on various safety inspections. She is currently mapping the Public Water Districts in the county.

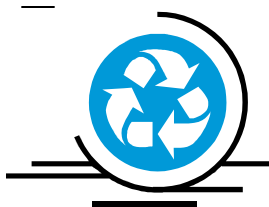
**Jeffrey Pierce** (BS ~'93)—Jeff is the North American Sales Manager for O. Mustad and Son. Jeff says, "My biology and fisheries background at Brockport has been a huge help. I use it often when designing new products, targeting a specific fishery, evaluating market potentials, and in my dealings with state regulatory agencies and NOAA".

**Craig Zaremba** (BS '94)—A biology teacher in Rochester, Craig spent the summer at Hamlin Beach State Park on Lake Ontario as a Naturalist working on various projects, including restoring the Yanty Creek Nature Trail first established by Professor Emeritus Ronald Dilcher in the 1970s.

## **ECOS Environmentally Conscious Organization for Society**

From Hilary Richardson, ECOS advisor and green campus advocate

The environmental club ECOS invites you to join us in promoting environmentally conscious activities on campus and across our communities. We are looking for a new president of the club, as spring president Jesse Batz has graduated. Good luck Jesse! We nominate people to take on roles of president, vice president, treasurer, secretary, and promotions person. This year we would love to have you as one of our officers. Meetings are usually once a week for approximately half an hour. Meetings are announced on our website (<http://www.itss.brockport.edu/~ecos>).



This past year ECOS held several successful events. During the fall semester, under the presidency of Amanda Alexander, ECOS hosted the 20<sup>th</sup> annual International Coastal Cleanup at Hamlin Beach State Park. Over 30 people came out to help clean up the park and enjoy some coffee and scones provided by Java Junction and a grant from Student Services. After the cleanup, volunteers enjoyed pizza donated by Mark's Pizzeria in Brockport. America Recycles Day hosted Monroe County, Nike sneaker recycling and Waste Management Corp. to educate the campus about recycling. ECOS also hosted a clothing drive for the Volunteers of America. Over 25 bags of clothing were collected. ECOS supported the Seneca Park Zoo during a fall foliage cleanup. The Zoo showed its gratitude by giving a behind the scenes tour of the rhinoceros cage during a feeding. This fall we hope to have the similar activities.

The spring offered more opportunities for ECOS to promote green issues. The club sponsored the second annual campus celebration of Darwin Day with the showing of 'Flock of the Dodos: the Evolution-Intelligent Design Circus'. Many campus clubs and classes attended. The first annual campus cleanup was in April, and several campus groups came out to help. Earth Day was also a huge success with the Wegman's zoomobile along with Monroe County and others on hand to showcase their green ways. This was the first year that ECOS was involved with Walk! Bike! Brockport, an event designed to get people out of their cars and walking. The event was open to the campus and Brockport community and culminated with an awards ceremony and tree planting for Arbor Day. ECOS manned tables and donated water bottles for the event that attracted over 100 people.

Overall, the students involved in ECOS last year were enthusiastic and dedicated to making the campus a cleaner, greener place to reside and work. Thank you for all your hard work! We look forward to working with new and past members again this next year!

## **Faculty Research and Scholarship Notes**

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*Our productive faculty achieved Brockport's institutional objective for more external funding (and publications) during the 2006-07 academic year, Goal One of President Halstead's Vision Statement.*

### **James Haynes –**

Published: "Rock bass learn to associate food with a visual cue and remember the association when food is absent;" "Fish and coral communities are related on shallow water patch reefs near San Salvador, Bahamas;" and "Failure of walleye recruitment in a lake with little suitable spawning habitat is probably exacerbated by restricted home ranges."

### **Joseph Makarewicz –**

Funded: Experimental manipulation of entire watersheds through BMP'S," NOAA MERHAB, \$634,000 "Assessment of the extent of coastal nutrient pollution and basic research," USEPA, \$145,100; "Tributary sampling of Honeoye Lake," \$16,300; "Stressed stream analysis of Otter Creek," \$10,000; proposal to build the Lake Ontario Natural Resource Center in the Port of Rochester; and much more.

### **Christopher Norment –**

Funded: "Shrubland and early successional forest bird habitat study of alternative mowing plans," U.S. Fish and Wildlife Service, \$15,036.

### **Mark Norris –**

Published: "Altered ecosystem processes as a consequence of *Juniperus virginiana* L. encroachment into North American tallgrass prairie.

### **Jacques Rinchar –**

Funded "Use of fatty acid signatures to assess food web dysfunction," Great Lakes Fishery Trust, \$326,524.

## La Hesperia Nature Reserve, Ecuador

From Hilary Richardson  
Instructional Support Technician



With the financial support of two grants in hand, I had the pleasure of spending two and a half weeks in Ecuador, doing environmental conservation work at the La Hesperia Nature Reserve, a biological hotspot located in the cloud forest approximately 2 hours south of Quito, Ecuador. La Hesperia, the name of the local community of ~10 families, is 814 hectares of biological reserve in the western Andes at an altitude between 1100-2040 meters above sea level. The reserve is in the heart of the protected 'Toachi-Pilaton' forest and contains two important bioregions of the world: the Tropical Andes and the Choco-Darien-Western Ecuador which are considered to be two the top five biodiversity hotspots on earth. This area is extremely important for conservation of biodiversity and the protection of local watersheds. Deforestation still threatens primary forests in the area; however, reserve staff and volunteers are working to combat this by planting new seedlings and seeds from existing trees.

My volunteer experience dealt with environmental conservation issues, specifically primary forest restoration, and was enriched by working with volunteers from all over the world, including Australia, New Zealand, Switzerland and Wales. I spent just under two weeks on the reserve where daily life included a breakfast of oats, hand processed coffee, fresh warm milk and homemade breads made from ingredients grown on-site. Morning work sessions were three and a half hours of hot, humid conservation work in the form of hacking brush with a machete (see photo above), transplanting tree seedlings, organic gardening, sustainable agriculture and primary forest census, plus keeping an eye out for the 320 bird species that have been identified in the reserve. Lunch was an oasis of heavenly homemade soup followed by beans and rice, pasta or a vegetable dish. The afternoon session was another three and half hours of activities similar to the morning session. Before dinner a lecture on the local habitat, culture or politics of the region was given or the reserve would host a local 'futbol' game: volunteers against the workers. I hadn't realized soccer scores could reach such high numbers until the Ecuadorians beat us 20-2 in one unfortunate game!

Weekly lectures were given by the owners, Juan Pablo and Alexandre, who purchased the reserve from a family friend who wanted to keep the property as primary forest rather than to sell it the primary business in Ecuador: logging. They have partnered with Fundacion Jatun Sacha, a non-profit organization with the goal of promoting conservation in Ecuador. The cloud forest region in Ecuador has traditionally received little study by scientists given its steep slopes and propensity for mud slides. For this reason, La Hesperia offers scientists and the conservation minded the opportunity to come and study the cloud forest ecosystem and to take part in restoring the primary forest of one of the world's most diverse communities. The reserve hosts several universities and high school groups from the US and around the world each year in addition to up to 20 volunteers.

To learn more, visit [www.la-hesperia.com](http://www.la-hesperia.com). La Hesperia offers internship and volunteer possibilities for all ages and skill levels.

See pictures of my adventure below!



Evidence of deforestation in the neighboring plantation.

## Environmental Science and Biology Student News

**Sarah Miloski** (BS '08) interned at Brookhaven National Laboratory through FERN (Foundation for Ecological Research in the Northeast). Sarah worked on protocols to enable monitoring of the health of Long Island's Central Pine Barrens.

**Amanda Alexander** (BS '06, MS in progress) and **Renee Pszyk** (BS '07), working with Dr. Haynes, were in the Bahamas in June to study a recent invader, the red lionfish *Pterois volitans*, into the waters surrounding Sal Salvador. They spent five weeks surveying three shallow patch reef habitats for fish and coral abundance and diversity.

**Stephanie Figary** (BS '08) worked on a project in Dr. Makarewicz's lab to review and analyze deep chlorophyll in Lake Ontario in comparison to Lake Michigan.

**Brad Mudrzynski** (BS '08) spent the summer working as a wetland delineation technician at Fort Drum for a civilian contractor, Colorado State University. He learned wetland mapping and legal details pertaining to wetlands, mapped existing wetlands, and improved his plant ID and GIS skills and knowledge of wetlands functions and soils.

## Student Research in Terrestrial Ecology in the Summer of 2007

From Dr. Christopher Norment

**Kristie Klees** (M.S. candidate) completed her second summer of field work on habitat selection by shrubland birds in the Lake Ontario plain. Her research sites were located at Iroquois National Wildlife Refuge, Bergen Swamp, Cicero Swamp, and the Chaumont Barrens in Jefferson County. Kristie was ably assisted by **Tuneeshaw Hudson** (B.S. candidate) and **Levi Atwater** (B.S. '07). Levi is also a member of the first cohort of students pursuing the M.S. degree in Environmental Science and Biology. Kristie's research has been supported by funding from the U.S. Fish and Wildlife Service and New York State Biodiversity Institute. In early August, Kristie traveled to Colorado State University to attend a workshop on the program DISTANCE, which is used to estimate animal populations surveyed with transects or point counts.

**Sabrina Isaacs** (B.S. '08) studied the effects of different habitat management practices on grassland bird populations at the John White Wildlife Management Area. Sabrina's research was funded by the New York State Department of Environmental Conservation. Sabrina presented the results of her work at the recent Merck/AAS poster session on undergraduate research.

**Chris Titus** (B.S. '08) conducted a survey for the state-listed Blanding's turtle, *Emydoidea blandingii*, in western New York in cooperation with the NYS Department of Environmental Conservation. The surveys were unsuccessful in finding this elusive species. However, 61 snapping turtles and 53 painted turtles were caught at four study sites. Chris presented the results of his work at the recent Merck/AAS poster session on undergraduate research.

## Nitrogen Conservation Via Resorption Across Two Fertility Gradients

From Dr. Mark Norris (presented at Ecological Society of America 2007 annual meeting)

Nutrient resorption (or retranslocation) in plants is the breakdown and transfer of nutrients from senescing leaves to storage in perennial tissue. This process is visible during fall color changes in deciduous trees as photosynthetic compounds are broken down and removed from the leaves to be used in the future. If plants can reuse nutrients from last year's leaves, they do not have to expend energy to take up nutrients from the soil to build this year's leaf crop. Resorption is often hypothesized to provide greater nutrient conservation in infertile than fertile habitats because of the presumed advantage when nutrients are scarce. My study addressed intraspecific patterns of nutrient resorption for eight species across two soil nitrogen availability gradients on similar soils in an oak savanna ecosystem, a long-term fire frequency gradient with a negatively correlated N fertility gradient, and a long-term N fertilization gradient. In short, I found that plants within the same species do alter rates of nutrient resorption—plants in infertile habitats conserve nutrients through greater resorption of nutrients from senescing leaves compared to plants in more fertile habitats. What makes this finding particularly interesting is that few studies have directly addressed the issue of resorption variation on clearly defined soil fertility gradients, and results to date have been inconclusive.

The Ecological Society of America holds its annual meeting in August and hosts over 5,000 ecologists from around the globe. It is a wonderful opportunity to network and hear about the latest ecological research. To visit the ESA website, go to: [www.esa.org](http://www.esa.org).

## SUNY Brockport

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and

[www.brockport.edu/envsci/  
MS\\_program](http://www.brockport.edu/envsci/MS_program)

## Fisheries Experience and Opportunities at SUNY Brockport

From Ross Abbett, BS '05, MS in progress

In my three and half years at SUNY Brockport, I have had many opportunities to gain valuable field experience and make contacts with professionals working in fisheries. As an undergraduate, I assisted on two of Dr. Haynes' research projects. Working with MS candidate Scott Wells and funding from the NYS Department of Environmental Conservation, over two summers I conducted habitat and fish surveys in the Johnson and Tonawanda Creek watersheds of western New York. With funding from the U.S. Fish and Wildlife Service, I also surveyed potential host fishes for endangered and threatened freshwater mussels in Muddy Creek in the Erie National Wildlife Refuge in Pennsylvania. Working with the USFWS provided a great opportunity to see different fish species than encountered in New York State and to work in a nearly pristine setting.

SUNY Brockport also has a large role in monitoring the fish communities in Waneta and Lamoka Lakes where chemical treatment for a nuisance aquatic weed, Eurasian watermilfoil, took place in 2003. Now that I am a graduate student, I am leading electro-shocking sampling trips to the lakes (electro-shocking is putting an electric current in the water that attracts fish to electrodes and stuns them so they can be netted for research and released unharmed). This provided a great opportunity to work in the field with fisheries biologists from the DEC.

Another gratifying part of my involvement with fisheries at SUNY Brockport was working with the endangered lake sturgeon by assisting fellow graduate student Mananjo Jonahson who surgically implanted transmitters in juvenile lake sturgeon. Subsequently, the fish were monitored with a telemetry receiver. I have also worked with the U.S. Geological Survey each summer as they monitored the health of the juvenile sturgeon population in the lower Genesee River by gill netting. Another set of important contacts!

I could go on and on about the wealth of information, experience and contacts I have made through my experiences at SUNY Brockport. If you would like more information, please email [ddilker@brockport.edu](mailto:ddilker@brockport.edu) with your questions or comments, and I will get back to you.

## Spring 2008 Course Schedule

Environmental Science  
Fish Ecology  
Water Quality Analysis  
Aquatic Toxicology  
Ecology  
Research Thesis

Environmental Laws & Regulations  
Biology of Organisms  
Terrestrial Ecosystem Ecology  
Ornithology  
Research Seminar

## ES&B Faculty and Staff

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