



# Annual Report Great Lakes Research Consortium

*Working Together for the Great Lakes Through Research and Education*

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Useful Information for  
New York's Great Lakes  
Research Community

2007-2008  
Volume 18



This year's conference featured our first ever auction, with auctioneer Greg Boyer. details on the conference, p. 6

## GLRC Funding Successes

Many of the Great Lakes Research Consortium members have found great success with funding this last two years. Below, we have highlighted some of the newer research grants that have been received by consortium members.

**The University at Buffalo's** Ecosystem Restoration through Interdisciplinary Exchange (ERIE) academic program received

funding for an exciting new doctoral curriculum funded by the National Science Foundation's Integrative Graduate Education and Research Traineeship (IGERT) program. ERIE's IGERT trainees pursue a doctoral degree from one of seven existing programs. There are additional requirements as well as opportunities for the stu-

## Seminar Series a Success for Participants

One often overlooked benefit for GLRC members is our seminar series. Each time one of our members travel to another member campus to provide a seminar, it opens up an exciting opportunity for collaboration by engaging students, researchers and professors in new and exciting research and provides opportunities for shared learning and discussion. For the exceptional seminar planner, other meetings and discussions are held on the same day as the seminar, making the trip that much more worthwhile. Besides, we do provide Fliers, advertising through our newsletter and travel support are provided for each seminar. Below are participants comments about their experiences.

*"Dr. Mark Noll, from SUNY Brockport, gave his presentation at Queen's University. It was really good! His presentation started with a really good introduction to internal phosphorus loading in temperate, seasonally-stratified lakes. He then used these principles to talk about nutrient loading issues in a major Lake Ontario embayment and management practices being used to mitigate the problem of excessive nutrients. About 25-30 people attended the seminar (which is a good turnout for our Limnology Seminar Series) .*

*Mark had a few minutes for brief introductions to some graduate students and a couple of faculty members. After his presentation, I treated him to lunch and then I introduced him to Dr. Shelley Arnott (limnologist) whom he had a chat with. Then, given that Mark is a geochemist, I thought he'd enjoy a tour of our Analytical Services Unit. We visited ASU and Dr. Allison Rutter gave us a great tour that lasted about an hour. Mark also met with someone who might be able*





## A Changing GLRC in a Changing Environment *Greg Boyer*

It's been several years since we published an Annual Report, but, as many of you may already know, the last year or so has been a time of great change for the Great Lakes Research Consortium. We have much to catch up on and I hope to produce a biennial report regularly in coming years.

I transitioned into the Director position beginning in the Fall of 2006 and officially became Director on January 1, 2007. Since that time, we have been working to increase the GLRC's visibility and activity at each of its 18 member campuses and on our 9 Canadian Affiliate campuses. I want to stress the importance of our organization to state and federal legislators and the SUNY Chancellor. As SUNY and State funding priorities have changed during the past 20 years, we have constantly evolved to ensure the

funding necessary to promote Great Lakes research has remained available. It hasn't been easy, but we are making progress.

Working together with the Board of Governors and the Campus Representatives we have implemented a new dues structure that will ensure the GLRC has the funding it needs to offer its core services, but will still be fair to its member campuses. Our seminar series continues to expand and I am pleased to see that interest in our annual conference and the small grants program funded through the New York Great Lakes Protection Fund remains strong.

The depth and breadth of research that the nearly 400 GLRC members provide is unparalleled. Over the past ten years, GLRC members have brought in more than \$17 million in sponsored research dollars through their affiliation with the consortium and our annual conference, seminar series, small grants program and annual report provide evidence of this exciting work. Let's not forget about our promising graduate students, whose work is vital to furthering research on the Great Lakes. Nearly 100 people attended this year's 18th Annual Student/Faculty Conference to see more than 40 students present the results of their work or provide updates on ongoing research. GLRC is committed to help students through our summer academic program, our new internship program, and by providing student travel awards so they can interact with the wider Great Lakes research community.

As always, we continue to administer the New York Great Lakes Protection Fund Grants, many of which are applied for and received by researchers at our member institutions.

Our office has undergone some changes as well. First, and most importantly, after 11 years of dedicated service, Chris Crysler decided to take a position as the secretary of the Department of Environmental Studies at ESF. Former graduate assistant, and recent graduate Khri Dodson has joined us as a staff assistant. Another change that many of you may not be aware of is our new office space. We are still located in 24 Bray Hall at SUNY ESF, but I guess you could say we got an Extreme Makeover. New carpets, a fresh coat of paint and the removal of an ugly and intrusive wall now provides us with a brighter, more open office space. Jack's old office has now been converted into a GLRC conference room which we hope to soon equip with video conferencing technology so we can more easily stay connected with our members.

I suspect we will continue to see changes in the GLRC as we move into fiscal year 2009. So, next time you're in Syracuse, drop by, say hello, check out our remodeled office space and let's talk about how we can help you move forward in this changing environment.

Sincerely,

**Board of Governors**

Lynn Videka University at Albany	Anne Baldwin SUNY Geneseo
Stephen A. Gilje Binghamton University	Jack Gelfand SUNY Oswego
Stuart Appelle SUNY Brockport	Kathleen Lavoie SUNY Plattsburgh
Lawrence G. Flood Buffalo State College	Galen K. Pletcher SUNY Potsdam
Thomas C. Young Clarkson University	Stefi Baum Rochester Institute of Technology
Stephen Kresovich Cornell University	Gina Lee-Glauser Syracuse University
Amy Henderson-Harr SUNY Cortland	Valerie Lehr St. Lawrence University
Bruce Bongarten SUNY ESF	Jorge V. Jose University at Buffalo
Marion Balyszak Hobart and William Smith Colleges	Dale Baker Timothy Murphy Harold Silverman
David Ewing SUNY Fredonia	

**Canadian Affiliates**

Brock University  
University of Guelph  
McMaster University  
University of Ottawa  
Queens University  
Ryerson University  
University of Toronto  
University of Waterloo  
University of Windsor

**Campus  
Representatives**

Ellen Braun-Howland University at Albany	Michael Milligan SUNY Fredonia
Burrell E. Montz Binghamton University	Robert David Simon SUNY Geneseo
Joseph C. Makarewicz SUNY Brockport	James J. Pagano SUNY Oswego
Alexander Y. Karatayev Buffalo State College	Timothy B. Mihuc SUNY Plattsburgh
Michael Twiss Clarkson University	Jason F. Schreer SUNY Potsdam
Edward Mills Cornell University	Anthony Vodacek Rochester Institute of Technology
John Lombardo SUNY Cortland	Lisa B. Cleckner Syracuse University
John P. Hassett SUNY ESF	Joseph Atkinson University at Buffalo
Bin Zhu Hobart and William Smith Colleges	Carolyn E. Johns St. Lawrence University

**The Great Lakes Research Consortium** is an organization of eighteen colleges and universities in New York, with nine affiliate campuses in Ontario, dedicated to collaborative research and education on the Great lakes. We have nearly 400 member faculty, who are conducting research in every facet of Great Lakes science.

Our mission is to improve the understanding of the Great Lakes ecosystem, including the physical, biological, and chemical processes that shape it, as well as the social and political forces that affect human impact on the lakes and their associated economic resources. We accomplish this through research, instruction, and public service.

*Funding Successes, continued from Page 1*

dents. All ERIE trainees take three new integrative courses in ecosystem restoration, field methods and Case Study teaching methods. During the second year of study, ERIE trainees complete an internship with one of over 10 participating organizations and participate in K-16 educational outreach. ERIE trainees conduct doctoral research under the guidance of an interdisciplinary faculty team, with numerous opportunities to link their dissertations with ongoing restoration projects.

Two **SUNY-College of Environmental Science of Forestry** professors, Karin Limburg and Giorgio Mountrakis, are investigating how urbanization and sprawl rank among the most serious threats to watershed ecosystems, water quality, and biotic integrity in much of the U.S. and elsewhere. They are building an integrated assessment tool that will link economics to “watershed health.” This award will enable them to enhance and strengthen existing tools with the addition of relevant abiotic data and through the development and incorporation of several models. Limburg and Mountrakis are planning to put this assessment tool into action by developing a decision support system for watershed managers, urban and regional planners, educators, as well as local research and business communities. This system will help incorporate environmental sustainability into the decision making process.

**Cornell University's** Biological Field Station (CBFS) at Shackleton Point is embarking on another stage of facility infrastructure improvements with the help of a recent award from New York Agriculture and Markets. CBFS plans to renovate and expand its current dormitory to accommodate a total of 46 people, and add living facilities, common areas and high speed internet. The new dormitory setting would be well insulated which would have the added benefit of greatly increasing year round housing capacity at CBFS and this facility would also provide handicap accessibility. At the completion of this project, CBFS looks forward to hosting visiting scientists, students and faculty as well as agency groups and educational and outreach activities.

*Seminar Series, continued from Page 1*

*to assist him with some analytical issues at SUNY - a lucky encounter. Then, Mark met with Dr. John Smol for a while. Thanks again for sponsoring Mark's travel to Kingston. We really learned alot from his presentation.”*

—Todd French, Queen's University

*“Back from Buffalo! It went well, and I enjoyed my visit there. I think I will put my name forth again as a possible speaker for the GLRC series next year.”*

—Linda Campbell, Queen's University

*“I gave a talk on mysids at SUNY Plattsburgh and it was attended by roughly 50 people, most of them students, but a few faculty. It was a lot of fun and I had interesting questions, but I ran over time. Too many exciting things to tell about mysids - do you believe that? Anyway, I did enjoy my visit and lunch afterwards. Tim Mihuc was an excellent host, and we discussed possibilities of collaborations on issues around zooplankton and their predators in Lake Champlain.”*

—Lars Rudstam, Cornell University

*“I must say I greatly enjoyed meeting and working with US faculty at Universities in the contiguous States, who I would not otherwise have met. I believe that we had truly interesting guest lecturers each semester for the 14 years that I was full-time. I also enjoyed giving seminars in various nearby up-State Universities.”*

—Bill James, University of Guelph

*“Last year I gave a talk at SUNY Brockport, where I have already collaborated with Joe Makarewicz. I really enjoyed talking with the graduate and undergraduate students there. In addition, I had a chance to talk with Joe more about future research, and to talk with Jim Haynes. I also met some non-aquatic faculty. After my talk I ate lunch with some of the students and we discussed their research. The whole experience was very enjoyable.”*

— Kim Schulz, SUNY ESF

## 17th & 18th Annual Student/ Faculty Conferences

Students and Faculty conducting research in and around the Great Lakes once again came together for the GLRC's annual conference held during the third week of March at SUNY-ESF in Syracuse. For the past two years we have had over 90 people in attendance with roughly 40 student presenters each year. Each year we begin the conference with a panel discussion, bringing in speakers from as far away as Texas. Last year's panel discussion was titled "Great Lakes Observing Systems" and this year our panel focused on the Great Lakes in a Changing Climate. Concurrent student presentation sessions in both years included such topics as Limnology, Fisheries, Environmental Engineering, Chemistry, Social Science and Policy. A poster session was held before Friday's banquet where students presented their work to conference attendees. Awards for each of the sessions are given at Saturday's lunch and a \$100 prize to each of six students receiving awards is made possible by New York Sea Grant. See you at next year's conference!



11 students presented their research at the 17th Annual Student/Faculty Conference in March, 2008..

### 17th Annual Conference Award Winners

**Pranesh Selvendiran**

Poster Presentation

Department of Civil & Environmental Engineering, Syracuse University  
*Dynamics of Hg in Forest Wetland Ecosystem in the Adirondack Region of New York, USA*

**Peter Krakowiak**

Limnology

Department of Biology, Buffalo State College  
*Seasonal Abundance and Diet Preference of Round Gobies (Apollonia melanostoma) in Lake Erie Tributary Streams*

**Jason Dittman**

Chemistry

Department of Civil and Environmental Engineering, Syracuse University  
*Response of Yellow Perch in Adirondack Lakes to Changes in Atmospheric Deposition of Mercury and Strong Acids*

**Leigh Holt**

Public Policy Analysis

Chemistry and Biology Department, Ryerson University  
*Ontario's Policy of Increased Land-Application of Municipal Biosolids, and the Need for Ecological Assessment in Determining Future Directions: An Example Using Nitrogen-Fixing Bacteria*

**Angela Au**

Engineering

Ryerson University  
*Environmental Applied Science and Management -A Planning Tool of Urban Greenroofs*

**Sougandh Kalluri**

Engineering

Civil, Structural and Environmental Engineering, University at Buffalo  
*Tracking Algal Blooms in the Great Lakes*

## 18th Annual Conference Award Winners

**Stacey Chmura**

University at Albany  
Wadsworth Center

*Evaluation of a TaqMan™ Based Quantitative Polymerase Chain Reaction Assay as a Rapid Method To Quantify Enterococcus in Recreational Water*

**Shannon M. Rupprecht**

Buffalo State College  
Department of Biology

*Assessing Barriers To Round Goby (Apollonia Melanostoma) Invasion Of Great Lakes Tributary Streams*

**Jason A. Dittman**

Syracuse University  
Civil & Environmental Engineering Department  
*Mercury In Adirondack Lakes And Fish*

**Frank Pierce**

SUNY Oswego

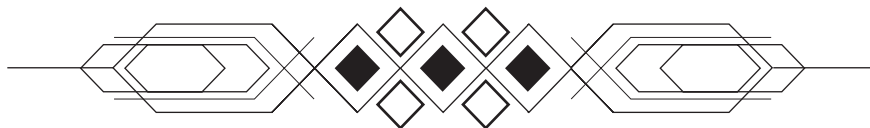
*Proteome analysis of toxic Microcystis aeruginosa by 2 dimensional gel and MALDI-ToF analysis*

**Joel Citulski**

University of Guelph  
Environmental Engineering

*Optimising the Performance of Immersed Ultrafiltration Membranes for Tertiary Wastewater Treatment and Reuse*

Panelists at the 18th Annual conference spoke about the future of the Great Lakes in the face of Climate Change. Panelist are (from L to R) Adam Burnett, Colgate University; Lee Tryhorn, Cornell University; Al Stamm, SUNY Oswego; and Jay Austin, University of Minnesota.



For more information on our current and future programs and activities please visit our website:

[www.esf.edu/glrc](http://www.esf.edu/glrc)

# New York Great Lakes Protection Fund Small Grants Program Awarded Projects 2006 Funding Cycle

## *Microbial Source Tracking of E. coli in Lake Erie*

Principle Investigator: W. Theodore Lee

Department of Biology; Chautauqua Erie Environmental Center, SUNY Fredonia

This research seeks to identify the sources of *E. coli* in two Lake Erie beaches in Dunkirk, NY. *E. coli* will be isolated from beach water and from streams that empty into the lake near the beaches. *E. coli* will also be isolated from fecal samples from different organisms (including humans, geese, cattle, dogs, and gulls). DNA isolated from these *E. coli* will be characterized using molecular analyses, specifically repetitive element polymerase chain reaction (Rep-PCR) and amplified fragment length polymorphism (AFLP) analysis. The data will be analyzed to compare the genetic profiles of bacteria isolated from the beaches and streams to known samples. This information will indicate which birds and mammals are most responsible for *E. coli* present in the beach waters. This information can then be used by the County Health Department to develop a plan to reduce the levels of coliform bacteria at the beach.



Rick Boheen, graduate student, Jon Sanford, undergraduate student and Suzanne Strakosh, research assistant are collecting a water sample from the Hyde Creek outlet into Lake Erie at Wright Beach in Dunkirk, NY.

## *Genetic Identification of Lake Erie Smallmouth Bass Tributary Stocks and Their Contribution to the Lake Population*

Principle Investigator: Timothy R. Strakosh

Department of Biology, SUNY Fredonia

This project will collect genetic information from both tributary and lake spawning smallmouth bass to investigate the genetic variability among sites and the contribution of each site to the local adult population. Genetic variability will be assessed using microsatellite loci to identify relationships between populations and individual fish. These data will be incorporated into an existing smallmouth bass genetic database. The research is a collaboration between SUNY Fredonia and NYS DEC Lake Erie Unit and will involve the supervising and training of a student intern.

## *Angler Survey: Analysis Of Angler Awareness Of Eighteenmile Creek Area Of Concern Fish Consumption Advisory*

Principal Investigator: Victor. F. DiGiacomo Jr.

Remedial Action Plan Coordinator, Niagara County Soil & Water Conservation District

This project proposes to design and carry out an angler survey that is intended to: analyze angler awareness of the Eighteenmile Creek fish consumption advisory; assess the need for fish consumption advisory signage; identify better pathways of communicating consumption advisories. A fish consumption advisory of, "Eat no amount of any species at any time," currently exists because of Polychlorinated Biphenyls (PCBs) and dioxins found in fish flesh. Due to the severity of the advisory and the popularity of Eighteenmile Creek's Fisherman's Park as a sport fishing destination, there is increasing



Anglers intensively fish the Eighteenmile Creek Area of Concern.



concern at the federal (the U.S. Environmental Protection Agency) and State (New York State Department of Health) level in regard to consumption advisory awareness of anglers and the need for advisory signage.

*Local and Regional Sources of Atmospheric Mercury in Rochester, NY: A Pilot Study*

Principal Investigator: Philip K. Hopke

Department of Chemical Engineering, Clarkson University

In this project dry deposition and high resolution speciated ambient mercury (Hg) concentrations in Rochester, New York will be measured. The use of these measurements, combined with ongoing particle size and gaseous pollutant measurements being made by NY DEC, will be used to determine the usefulness of these measurement techniques for determining dry deposition rates, sources and chemistry of atmospheric Hg. Analysis of correlations between various pollutants will be used to determine interactions among the pollutants being monitored. These data will be used to develop a more comprehensive proposal on determining the sources and importance of dry deposition of Hg to the Great Lakes.

*Beneficial Use Impairment Identification and Analysis: St. Lawrence River AOC at Massena, NY*

Principal Investigator: Michael R. Twiss,

Director Great Rivers Center, Clarkson University

The St. Lawrence River area of concern (AOC) at Massena requires an investment to advance the status of Beneficial Use Impairments. Phytoplankton community composition and health is difficult and expensive to determine using traditional techniques. Using advanced instrumentation capable of collecting high resolution relevant data, the Great Rivers Center at Clarkson University will lead a study of the phytoplankton population status in the Massena AOC. The work will involve a student intern and will collaborate with the Massena AOC Remedial Action Committee. This study will advance several needs of the NY GLPF, provide information needed to advance the AOC towards delisting, and advance limnological research on the St. Lawrence River with the ultimate goal of establishing a node of the NOAA Great Lakes Observing Systems.



Stephanie Kring, a McNair Scholar at Clarkson University (left) and Carmen Ulrich, a NSF-REU fellow visiting from The University of Texas at Austin (right) in the field on the Great Rivers Center's research vessel, Lavinia. They are sampling the St Lawrence River from Massena to offshore Lake Ontario as part of a study to determine how plankton community composition and health changes as water moves downstream through the International Section of the St Lawrence River. The research is in support of the Plankton Health Beneficial Use Impairment identified as requiring analysis in the St. Lawrence River in the Massena Area of Concern at Massena, New York.

# New York Great Lakes Protection Fund Small Grants Program Awarded Projects 2007 Funding Cycle

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## *LiDAR Acquisition for Regional Water Management*

Principal Investigator: Martin Weiss, Associate Planner


Oswego County Department of Community Development, Tourism & Planning

Oswego County has received Finger Lakes-Lake Ontario Water Protection Alliance (FL-LOWPA) funding to acquire LiDAR data for portions of Oswego County to demonstrate its use for watershed mapping, estimating shoreline erosion rates, and assessing the accuracy of flood hazard maps. LiDAR (Light Detection and Ranging) is a site characterization tool used to create digital elevation models or detailed, shaded relief images. The County has contracted with Pictometry International Corp., Rochester, NY to fly an aircraft over Oswego County acquiring LiDAR data. The County will purchase LiDAR data for the area including the Lake Ontario, Oneida Lake and Oswego River shoreline communities as well as the communities adjacent to the Tug Hill Aquifer. At the regional, watershed, or community scale, LiDAR has many applications, including forest management, floodplain management, community planning and hazard assessment. LiDAR is becoming an increasingly common and cost effective tool for use in environmental and community planning and for problem solving.

## *Predicting the invasion process of European frogbit (*Hydrocharis morsus-ranae*) and a survey of possible biological control organisms in the Great Lakes region*

Principal Investigator: Bin Zhu, Ph.D.

Finger Lakes Institute, Hobart and William Smith Colleges

10  European frogbit (*Hydrocharis morsus-ranae*), an invasive floating plant, has been spreading rapidly from Canada to the Great Lakes region in the United States. It may be an imminent threat to further areas of the Great Lakes Basin, including areas in New York State, and likely to have major impacts on these surrounding natural ecosystems. Knowledge of its invasive ability will be crucial to predict the potential extent of future distributions and by extension the resulting ecosystem disruption and economic loss. Dr. Bin Zhu, at the Finger Lakes Institute, Hobart and William Smith Colleges, and Dr. Lars Rudstam at Cornell University will collaborate to investigate the major environmental factors contributing to the rapid expansion of this plant, and explore possible biological control agents to manage its current population. To achieve these goals, they will conduct a literature review of ecological and economic impacts of European frogbit, investigate the environmental factors contributing to the success of this species by contrasting the environmental variables in areas where the species has been established and where it has not, and examine possible biological control agents by researching a wide range of lakes in New York State and conducting an experiment with snails as the agent.

## *Phosphorus and nitrogen monitoring and modeling in the Cattaraugus Creek Watershed, a major tributary to Lake Erie*

Principal Investigator: Sheila F. Christopher

Buffalo State College, Great Lakes Center

Symptoms of eutrophication have returned to Lake Erie in recent years. Unfortunately, largescale monitoring of nutrients, particularly phosphorus (P), in Lake Erie, ceased after 2002 and little information is available even for nitrogen (N) loading in Lake Erie. Several regional and national groups are advocating stronger management with respect to nutrient loads. They realize that baseline monitoring of tributaries (non-point sources) to Lake Erie is needed to understand the relative importance of nutrient sources and to develop lake-wide and watershed models. This project will provide baseline monitoring of P and N

loading in the Cattaraugus Creek Watershed, a major tributary to Lake Erie, in order to calibrate and validate a nutrient loading model (Soil Water Assessment Tool (SWAT) Model). Monitoring and modeling data can then be used as an input to a lake-wide model. This project also will assess how land-use change, especially urbanization, will affect P and N loading, via SWAT model predictions. The results can then be used to seek additional funds for a more comprehensive sampling protocol and rigorous model calibration through a larger-scale grant. The model developed from this project also will provide a desired tool for regional and national entities such as the United States Environmental Protection Fund (EPA) that make decisions regarding nutrient and eutrophication management.

*Data Rescue of Historical Aquatic Studies from Lake Ontario at Sterling, NY*

Principal Investigator: Paul M. Sawyko  
The Water Education Collaborative

This project will continue a data rescue effort which developed a process to recover historical environmental data and ensures that quality information is made available for researchers and the general public. Collaborators will provide access to the historical information and labor for scanning and proof-reading (SUNY Brockport). The recovered information will be placed upon CDs for ultimate disposition on the internet, thus being made available for use by academic institutions and research organizations, and as a resource for understanding of the population trends and threats to key aquatic populations and their health, within Lake Ontario.

*Building Capacity for SLAM RAP: St. Lawrence River at Massena Remedial Action Plan*

Principal Investigator: Michael R. Twiss  
Director Great Rivers Center, Clarkson University

The St. Lawrence River at Massena Area of Concern is currently at Stage Two (of three) of its Remedial Action Plan. The St. Lawrence River at Massena Area of Concern has never had a local coordinator and thus, this AOC has languished. The goal of the St. Lawrence River at Massena Remedial Action Plan (SLAM RAP) is to restore, protect and maintain the chemical, physical and biological integrity, as well as protect the aquatic ecosystem of the St. Lawrence River at Massena, Awkesasne, and downstream areas in Lake St. Francis in accordance with the Great Lakes Water Quality Agreement and a goal of the NYGLPF. This proposal seeks to advance that goal by progress forward by scientifically assessing the Beneficial Use Impairments (BUIs) and beginning the task of capacity building for the SLAM RAP. Funds from NYGLPF will support a graduate student intern who will work to advance BUI assessment and accelerate the existing collaboration among members of the Public Advisory Committee in this AOC.





## University at Albany

Researchers at the University at Albany have recently developed a method for discriminating toxic and non-toxic *Microcystis aeruginosa* in environmental samples. The technique is based on antibody-specific labeling of the toxin, microcystin, within cyanobacterial cells. Toxin-containing cells are visualized microscopically on the basis of antibody-conferred immunofluorescence within hours of sample collection. The rapid identification of toxic colonies on a per-cell basis will facilitate ecological studies, including those designed to identify environmental triggers impacting toxin production in *Microcystis*.

*Microcystis aeruginosa* is among several cyanobacterial genera that are capable of producing one or more potent cyanotoxins, including microcystins. The most commonly detected of all microcystin-producing organisms, blooms of *Microcystis spp.* have been demonstrated in both drinking water sources and recreational waters in the United States and elsewhere. In spite of their ubiquity in nature and the documented health effects of cyanotoxins, little is known about the distribution and ecology of these toxin-producing cyanobacteria. Progress has been hampered by the fact that toxin-producing strains can not be morphometrically differentiated from their non-toxic counterparts, with which they co-exist in the natural environment (Kurmayer et al., 2002; Rinta-Kanto et al., 2005).

—Submitted by Ellen Braun-Howland

## Binghamton University

We are putting together a special issue of the *Journal of Contemporary Water Research and Education* (published by the Universities Council on Water Resources) based on the workshop we had in May called "The role of Science in Watershed Management." The articles relate to the Susquehanna Basin and may be of interest to GLRC members. —Submitted by Burrell Montz

## SUNY Brockport

**Dr. Jacques Rinchar**d's research focuses on the reproductive physiology of fish. This new assistant professor works on fatty acids in the food web and the impact on fish reproduction, new techniques to increase the reproductive efficiency of fish and hormonal, genetic and environmental treatments to manipulate sex ratios of fish populations. He received his Ph.D. from the Facultés Universitaires Notre-Dame de la Paix, Namur (Belgium) in 1996. Until 2006 he worked in the Laboratory of Freshwater Ecology as a Research Investigator at the University of Michigan (School of Natural Resources and Environment) and USGS Great Lakes Research Center.

In May 2007, at the International Association of Great Lakes Research Annual meeting, an entire session titled "Experimental Manipulation of Entire Watersheds through BMPs: Nutrient Fluxes, Fate, Transport and Biotic Responses" explored the findings of a six-year project funded by the USDA CREES program. Many presentations were from members of the Great Lakes Research Consortium including **Bob Simon** and **Sid Bosch** from SUNY Geneseo, **Nate Herendeen** of Cornell Cooperative Extension, **Mark Noll, Jim Zollweg, Erin Magee, Paul Richards, Ted Lewis** and **Joe Makarewicz** from SUNY Brockport and **Tony Vodacek** from the Rochester Institute of Technology.

The Lake Ontario Intensive field year began in the summer of 2008. Faculty from Clarkson (**M. Twiss**), Buffalo State (**G. Fraser**), University at Buffalo (**J. Atkinson**), Cornell University (**E. Mills**), SUNY Brockport (**J. Makarewicz**) and SUNY-ESF (**G. Boyer**) have been engaged with their Canadian counterparts to develop a sampling design and proposal for funding to focus efforts on the coastal zone of Lake Ontario. The co-leads of this project (Lake Ontario Nearshore Nutrient Transport Study) are T. Howell (Ministry of the Environment) and J. Makarewicz (SUNY Brockport). Funding for this project is anticipated shortly.

Brockport continued...

One of the goals of the Empire Innovation program in SUNY is to attract new researchers to assist the State of New York to be a leader in various fields. To this end, Brockport has received funding from the Empire Innovation Program to hire Dr. Douglas Wilcox, a mid-career limnologist to develop collaborative proposals with SUNY Brockport faculty and members of the GLRC.

—Submitted by Joe Makarewicz

## Clarkson University

**Dr. James S. Bonner** is the new Director of the Center for the Environment. Jim was the former founding director of the Shoreline Environmental Research Facility (SERF) of Texas A&M University. Jim's primary research interests are in the field of coastal processes and observations, oil spill remediation and various defenses used to exterminate the consequential toxins. Also joining the Center for the Environment is Research Associate **Dr. Temitope Ojo**, also from the SERF, and **Dr. Shane Rogers**, a new assistant professor in the Department of Civil and Environmental Engineering with expertise in genome-enabled molecular technologies as tools to identify and trace the origin and fate of pollutants in natural and engineered systems.

Clarkson University's Great Rivers Center will co-host with St. Lawrence River Institute for Environmental Sciences (Cornwall, ON) the 15th Annual International Conference on the St. Lawrence River/Great Lakes Ecosystem at Cornwall in 2008 and 2009. This year's theme is "Managing Ecosystems Regulated Rivers and Watersheds" since 2008 is the 50th anniversary of the construction of the power dam project. In 2009 the conference will commemorate the construction of the St. Lawrence Seaway.

—Submitted by Michael Twiss

## Cornell University

A regional Institute for Invasive Species Research (IISR) will be housed in the Department of Natural Resources at Cornell University and will serve both New York State and the Northeast region. A coordinator will be hired to ensure that the IISR collaborates closely with colleges and universities,

the New York State Invasive Species Council, state and federal agencies, and regional entities to coordinate and prioritize needs and funding of invasive species research. An advisory committee made up of researchers, outreach specialists, regulatory specialists and others with invasive species expertise will guide the IISR.

The Cornell University Biological Field Station recently received funding from EPA's Great Lakes National Program Office focusing on disease pathogens as a primary factor leading to the decline of the native amphipod *Diporeia* in the Great Lakes. In addition, the Station is involved in planning for the Intensive Lake Ontario lower food web assessment or LOLA II in 2008. LOLA II will be a multi-agency effort and will involve several university/college and Great Lakes Research Consortium partners.

The Department of Natural Resources (DNR) at Cornell University recently hired four new faculty in 2007 whose research interests include conservation genetics, human dimensions of natural resources, and Native communities. DNR is very pleased to have **Drs. Matt Hare, Richard Stedman, Shorna Broussard**, and **Karim-Aly Kassam** join its program and the wealth of experience they bring to Cornell.

**Matt Hare's** research spans from conservation genetics to evolutionary genomics with a focus on marine and estuarine biota. Most of his research utilizes genetic markers to measure processes such as selection and gene flow in natural populations to address basic and applied questions.

**Richard Stedman** is a natural resource/environmental sociologist. He joined Cornell University in 2007, following six years as a faculty member in the Department of Agricultural Economics and Rural Sociology at Penn State University. His research and teaching interests lie at the interface of coupled human and ecological systems, and how the conditions and well-being of each system influences the other. **Shorna R. Broussard's** research program blends human factors and natural sciences to improve resource management and conservation. The goal of her research program is to develop a fundamental understanding of human behavior for the purposes of improving resource conservation and management. An understanding of human social, political, and psychological processes will enhance our ability to conserve and manage our natural resources and encourage an open and informed

exchange of ideas. Finally, **Karim-Aly Kassam** works in partnership with Native communities in the Alaskan, Canadian and Russian Arctic and Sub-Arctic; the Pamir Mountains in Afghanistan and Tajikistan; and the rainforest in the south of India. Dr. Kassam focuses his applied research on the complex connectivity of human and environmental relations addressing issues such as indigenous ways of knowing, sustainable livelihoods, gender relations, and socio-cultural change. —Submitted by Ed Mills

## University of Guelph

The University of Guelph has designated water one of its priority areas for research and teaching. Of course water was always a major area of interest here given the institutional roots in agriculture. More recently it has taken on added importance as the population of south western Ontario grows. A large proportion of this population obtains its water from groundwater sources and the issues of quantity and quality are becoming more pressing. One alternative, of course, is to use the Great Lakes, but that does not resonate well in this area from both the point of view of needed infrastructure and general sustainability of the Great Lakes system itself.

Of interest this year has been a large increase in the number of undergraduate students enrolled in environmental engineering or water resource engineering. Guelph currently supplies about 40% of the environmental engineering graduates in Canada. We fully expect this number to increase as issues of sustainability take on added importance in the private and public sectors.

—Submitted by John Gruzleski

## Hobart and William Smith Colleges

A third year of investigations on water quality indicators from the seven central Finger Lakes, Honeoye, Canandaigua, Keuka, Seneca, Cayuga, Owasco, and Skaneateles Lakes was conducted in 2007. Water quality samples were routinely collected from surface and deep water at two deep water sites in Honeoye, Canandaigua, Keuka, Seneca, Cayuga, Owasco, and Skaneateles Lakes. At each site, surface and bottom water samples were collected for bacteria, nutrient and chlorophyll assays. In addition, secchi disk depth and water column CTD profile were collected from each site. Water samples were analyzed for dissolved nutrient

(phosphate, nitrate and silica), chlorophyll-a, and total suspended solids analyses back in the laboratory. A comprehensive report of 2007 findings is underway and will be released in early 2008.

Owasco Lake research continued at the 11 sites utilized in 2006, one additional site located offshore of Dutch Hollow Creek and four additional sites clustered at the southern end of the lake just offshore of Owasco Inlet by **Dr. John Halfman**.

Dr. Halfman also conducted expanded tributary research in the Owasco Watershed. Tributary water quality samples were expanded from the seven sites utilized in 2006, which included Dutch Hollow Creek and 6 sites along Owasco Inlet, to include a site on Sucker Brook, Vaness Brook and Fillmore Glen, taken within one day of the lake samples. The selected diversity provides a means to assess the relative difference in the delivery of nutrients, soil particles, herbicides and pesticides to Owasco Lake.

Ten additional researchers from the Finger Lakes Institute, Hobart and William Smith Colleges (HWS) and neighboring institutions and their students investigated other critical parts of Owasco Lake's ecosystem in 2007 along with water quality protection legislation in Owasco and neighboring Finger Lakes watersheds. They included:

**Dr. Meghan Brown**, aquatic biologist, HWS, investigated the plankton within the lake, focusing on the zooplankton in the water column, through the analysis of bi-monthly samples at selected lake sites and to assess the zooplankton egg relative abundances preserved in the recent sediments to gain a historical picture of the zooplankton ecology.

**Dr. Tim Sellers**, aquatic biologist, Keuka College, undertook nutrient and light limitation studies through the collection and analysis of bi-monthly samples at selected lake sites, and algal growth limitation analyses in the laboratory.

**Dr. Bruce Gilman**, aquatic biologist, Finger Lakes Community College & Dr Bin Zhu, FLI Research Scientist, investigated the macrophyte distribution in the lake.

**Dr. Dawn Dittman**, Research Scientist, USGS, Cortland & Jim Watkins, Cornell grad student, both benthic ecologists, investigated the profundal benthic ecology, and the impact of dreissenids (zebra and quagga mussels) on the benthic ecology (e.g., Diporeia).

**Dr. Susan Cushman**, stream ecologist, HWS, investigated the benthic ecology at the stream sites

for an evaluation of the environmental stress placed on the benthic community.

**Dr. Tara Curtin**, paleoclimatologist, HWS, investigated the historical change in organic and inorganic carbon burial in the sediment column, building on earlier work by Cliff Callinan and Hank Mullins.

**Dr. Jim Ryan**, environmental biologist, HWS, investigated the concentration of various herbicides, pesticides, antibiotics, and environmental estrogens in the streams and lake, analyzing bi-monthly stream samples.

**Marion Balyszak**, Director, Finger Lakes Institute is continuing an investigation of the current water quality protection legislation in the Finger Lakes region to determine which practices might make the most sense to help protect the water quality in Owasco Lake and the other Finger Lakes.

Institute for the Application of Geospatial Technology (IAGT) – is completing land use and other GIS maps in conjunction with Barry Nelson of Penn State.

### Cayuga Lake Research

The Finger Lakes Institute is investigating water quality issues in Cayuga Lake, focusing on the nutrient and suspended sediment-rich bottom waters in the southern portion of the lake. **Dr. John Halfman**, Professor of Hydrogeochemistry and Limnology, Hobart and William Smith Colleges, along with students, collected and evaluated secchi disk depths and water column profiles of temperature, salinity, turbidity and chlorophyll, and analyze lake and stream water samples for nutrient concentrations (total phosphates and dissolved phosphate, silica and nitrate), algal (chlorophyll) concentrations, plankton enumerations, and turbidity.

The network of lake data should yield spatial and temporal trends to pinpoint likely sources for the nutrients and total suspended solids. These sources will also be substantiated by analyzing the available tributary water quality data from researchers, federal, state and local agencies and water quality groups to fill in gaps with our own tributary analyses, focusing on the southern end of the lake.

### Honeoye Lake Tributary Monitoring Project

**Dr. Bin Zhu**, Research Scientist at the Finger Lakes

Institute, is completing water quality sampling of Honeoye Lake tributaries for the period May 1, 2007 – August 30, 2008. During each sampling, water samples were collected and sent to Life Sciences Laboratories in Canandaigua for nutrient analysis for total phosphorus, soluble orthophosphate, total suspended solids, total Kjeldahl nitrogen, and nitrate/nitrite. Water flow was also measured each time.

### Seneca Lake Macrophyte Study

**Dr. Bin Zhu** finalized some preliminary survey plans in 2007 for conducting a first time macrophyte study in Seneca Lake in 2008. The project will investigate the diversity and localized growing environment of submerged macrophytes in Seneca Lake, comprising an initial study for the long-term research of responses of macrophytes to water quality changes in this lake.

In summer 2007, **Dr. Bruce Gilman** at Finger Lakes Community College and Zhu collaborated on a macrophyte survey in Owasco Lake. Once work on Seneca Lake is completed, this research will enable a comparison of aquatic macrophytes in Honeoye Lake, Owasco Lake, and Seneca Lake with the three lakes forming a gradient of water quality, therefore comparisons of macrophyte distribution and diversity in the three lakes will provide more meaningful and informative results as to the responses of macrophytes to water quality changes.

A report will be prepared after data are collected and analyzed which will include macrophyte species richness, macrophyte biomass, Secchi depth, total phosphorus concentrations of water and sediment in each transect and the whole lake and the comparisons of macrophyte species in the three lakes.

—Submitted by Marion Balyszak

### SUNY Oswego

A \$10,000 grant paid SUNY Oswego meteorology students to help better forecast lake-effect snowstorms off Lakes Erie and Ontario. The National Weather Service's new weather researching and forecasting model was making mistakes, and **Professor Robert Ballentine's** team of eight students helped find out why. "I never realized that lake-effect storms could be so fickle," sophomore Joe Wegman said. "Seeing what happens has greatly

enhanced my understanding of how lake-effect storms work.” The grant was from the University Corporation for Atmospheric Research, a nonprofit consortium of North American universities, under the Cooperative Program for Operational Meteorology, Education and Training.

SUNY Oswego’s student chapter of the American Meteorology Society has organized an annual Lake Effect Conference that has featured presentations from professionals, professors, alumni and students on lake-effect weather in its first two years, 2006 and 2007. “We hope that this research will help operational forecasters predict and warn the public of significant weather events,” said chapter president **Meredith Mendel**.

The National Institutes of Health has awarded a grant of more than \$200,000 to researchers at SUNY Oswego to continue their investigation into the effects of low levels of lead on cardiovascular functioning in children and to look into exactly how lead produces those effects.

A National Science Foundation grant will bring two new high-tech instruments to campus for work that researchers say is of incalculable value to environmental projects and undergraduate opportunities. Nearly \$69,000 from the major research instrumentation grant allowed the college’s Environmental Research Center to purchase two Agilent 7890A gas chromatographs, plus related computers and technology that will upgrade research on air and water contaminants in the Great Lakes region, said **Jim Pagano**, director of the center and a member of the chemistry faculty. SUNY Oswego and SUNY Fredonia collaboratively applied for, and received, three brand-new machines in all.

Two students and two professors at SUNY Oswego will conduct meaningful research on the genetics of local species under a Student/Faculty Collaborative Challenge Grant. Students **Kyle Pursel** and **Matthew Volny** will work with biological sciences faculty members **Peter Rosenbaum** and **Amy Welsh** to detail the genetics of wood turtles and eastern chipmunks under the grant. Under a new grant, SUNY Oswego faculty and students have begun research that will result in teaching modules that make use of such new technologies as satellite imaging of the earth and geographic information systems.

SUNY Oswego’s Environmental Research Center is participating in a \$1.75 million, five-year

project to monitor the health of fish in all five of the Great Lakes. Researchers from Clarkson University, SUNY Oswego and SUNY Fredonia are collaborating on the monitoring program, which is funded by the U.S. Environmental Protection Agency’s Great Lakes National Program.

Four years of federal funding totaling \$800,000 will help a SUNY Oswego team of researchers to continue its study of how exposure to environmental pollutants before birth influences behavior as children mature toward adulthood. The four-year grant from the Center for Disease Control’s Agency for Toxic Substances and Disease Registry will support a study that began in 1990 monitoring newborns who had prenatal exposure to polychlorinated biphenyls (PCBs). **Dr. Paul Stewart, Dr. Jacqueline Reihman** and **Dr. Edward Lonky** of Oswego’s psychology department will now follow their subjects from the age of about 15 to 18, through September 2011, and they will look at the effects of two additional pollutants -- mercury and lead -- both alone and combined with each other and PCBs. Stewart directs the Oswego Children’s Study at SUNY Oswego’s Center for Neurobehavioral Effects of Environmental Toxins in Mahar Hall. “Jim Pagano (of the college’s chemistry department) did the PCB analysis for much of our study,” he added.  
—Submitted by James Pagano

## SUNY Plattsburgh

SUNY Plattsburgh participated in several research projects on Lake Champlain in the past year. As part of a NOAA-funded study of blue-green algae, (MERHAB-LGL) the Lake Champlain Research Institute is developing and refining a new field method for mapping surface algal blooms. In addition LCRI worked with the Lake Champlain long term monitoring program to identify zooplankton from 14 monitoring sites bi-weekly throughout the field season. Other projects for 2007 included a study of fish passage barriers in Adirondack streams and a study of nutrient loading in an agricultural watershed. In addition we have a strong watershed research group working on nutrient loading, invasive plants, and pelagic plankton, watershed ecosystem integrity, and GIS wetland mapping. Plattsburgh is getting ready for ground breaking on a new chemistry science building in 2008.

— Submitted by Tim Mihuc



## SUNY Potsdam

**Glenn Johnson** is on sabbatical in Costa Rica with **Tom Langen** and studied hot spots of wildlife road mortality on pan-American highway. He is also studying wildlife road mortality in the North Country. He recently published book on herps of NYS and studies ecology and conservation of blanding's turtles. He was elected to Environmental management council.

**Bill Romey** was on sabbatical and went to study grouping behavior of fish and insects at University of Leeds (UK). He wrote 5 papers which are in press or submitted.

**Robert Ewy**, Research focuses on how plants respond to environmental stresses. Currently studying the effect of elevated levels of atmospheric carbon dioxide and ozone on soybeans at the SoyFACE field site in Champaign, IL.

**Jan Trybula**, Three undergraduate students and Dr. Trybula have been conducting dragonfly & damselfly surveys as part of the New York Dragonfly and Damselfly Survey. Primarily they've been surveying the Oswegatchie, Grasse, Raquette, and St. Regis basins, as well as adjoining areas of the St. Lawrence River. We have a number of new locations for Species of Special Concern, a number of county records in St. Lawrence, Franklin, and Hamilton Counties, and a new state record - *Arigomphus cornutus*, the Horned Clubtail Dragonfly.

She also has an undergraduate student who is currently doing an internship with **John Petreszyn** of the Friends of Sandy Pond Beach in Sandy Island Beach State Park on the eastern shore of Lake Ontario. She has been studying control of Purple Loosestrife by the beetle *Galerucella calmariensis*. She is also assisting in dune protection and restoration projects.

**Walter Conley**, presented *After the Storm: The Affect of Hurricane Katrina on the Distribution and Abundance of Common Coastal Fishes and Shrimp in the Mississippi Sound* at the Campus Festival and will be submitted to BIOS.

**Jason Schreer** conducted a study on barotrauma in fish in the St. Lawrence River. Published paper with Potsdam Student on air-exposure and exercise in largemouth and smallmouth bass. Submitted strategic grant to NSERC with Cooke and others from Carleton on Human dimensions of catch-and-release. "Inland recreational fisheries in a changing

environment: coupling biological and social sciences to ensure a sustainable recreational fishing industry in Canada"—Submitted by Jason Schreer

## Queens University

**Shelley Arnott** has ongoing research on Bythotrephes. She uses inland lakes as a model system but this work could also be applied to the Great Lakes.

Biology professor **Peter Hodson** and his team of toxicologists and chemists have received \$536,450 from the Natural Sciences and Engineering Research Council (NSERC) to solve the mystery of Lake Ontario's disappearing eel population.

Declared a "species of concern" under Canada's new Species at Risk Act, American eels have until recently supported a multi-million-dollar historic fishery in Ontario and an even larger industry in Quebec. But with rapidly decreasing numbers of eels, the Ontario fishery has been closed and the Quebec fishery is in serious decline.

"A prime suspect in the case of the missing fish is the accumulation of toxic chemicals by the parent eels as they feed, grow, and mature in polluted freshwater lakes and streams," says Dr. Hodson. "Our task will be to determine whether female eels transfer sufficient chemicals to their offspring to cause their death before reaching Lake Ontario."

The team hopes to learn whether chemicals have played a role in the decline of the eel, whether some lakes and rivers are better than others for re-stocking with juvenile eels, which chemicals are the "bad actors" and whether eels pose a hazard to human consumers.

American eels begin their lives as eggs hatching in the Sargasso Sea near Bermuda. They take years to reach freshwater streams where they mature to a length of up to a metre before returning to their birth waters to spawn and die. However, since the mid 1980s there has been a spectacular drop in the numbers of juvenile eels migrating to Lake Ontario from the Sargasso Sea, and a corresponding decline in the numbers of adults.

"The loss of eels is significant from an economic, cultural, and ecological perspective," says Dr. Hodson, adding that the impact on other fish species in Lake Ontario of removing a top predator has yet to be recognized.

Most of the harvest of American eels is exported to a global market, particularly to Western Europe and Asia where they are smoked, jellied, marinated, and even served raw as sushi. They are so highly prized that prices are rising as supplies dwindle.

The Queen's-led research team will study eels from both clean and polluted habitats, as well as those stored frozen since the 1980s. They will compare the concentrations and toxicity of chemicals in the tissues of eel among different habitats and provide a perspective on past contamination.

Co-investigators on his team include:

**John Casselman** (Biology) and **Stephen Brown** (Chemistry) from Queen's; **Mehran Alaei** (Environment Canada); **Niels Bols** (University of Waterloo); **Catherine Couillard** and **Michel Lebeuf** (Fisheries and Oceans Canada); **Whitney Hable** and **Ken Oliveira** (University of Massachusetts, Dartmouth); **Jocelyne Pellerin** and **Emilien Pelletier** (Université du Québec); and **Guido van den Thillart**, U. of Leiden.

The study is supported by Environment Canada, Fisheries and Oceans, the Ontario Ministry of Natural Resources, and the Ministère des Ressources Naturelles et de la Faune du Québec.

—Submitted by Shelley Arnott and Peter Hodson

## Rochester Institute of Technology

### NASA Landsat TM and Landsat ETM+ Thermal Calibration

The Digital Imaging and Remote Sensing group at RIT has a long history of supporting the thermal calibration of NASA's suite of Landsat satellites. Dr. John Schott (PI) has lead this research project that focuses on continued monitoring of the Landsat 5 ETM+ thermal band and further refinement of the Landsat 5 TM calibration history. During this year much effort has been dedicated to collecting ground truth for both Landsat 5 and 7 and updating RIT's Landsat 5 TM calibration procedure. It has also included development of a proposed method to more effectively convert GLOS buoy data subsurface temperatures into surface skin temperatures to gain a significant improvement in the historical calibration data for Landsat 5.

The Landsat sensor performance is compared to ground truth temperatures collected from Lake

Ontario and Lake Erie. Surface measurements are augmented with simultaneous thermal imagery with RIT's MISI airborne sensor. Final calibration results are reported as a comparison of sensor reaching radiances and known surface radiances propagated to the sensor altitude.

### NASA Landsat Data Continuity Mission (LDCM)

The Landsat Data Continuity Mission (LDCM) is a satellite sensor system designed as the replacement for the current Landsat 5 and 7 sensors. **Dr. John Schott** (PI) is a member of the LDCM Science Team with the charge to evaluate and demonstrate the potential for LDCM to perform quantitative analysis of fresh and coastal waters with a level of fidelity that's comparable to the state of the art for open ocean studies and at a much finer spatial resolution needed for fresh and coastal waters. LDCM will have a blue band and improved signal-to-noise ratio (SNR) offering the potential for long term monitoring of fresh and coastal waters such as the Great Lakes that was not possible with the existing Landsat sensors. The study will assess the potential of LDCM thermal and reflective data to analyze fresh and coastal water conditions and transport processes.

### Hydrogen Generation from Great Lakes Hydropower.

**Dr. Jerry Takacs** and his collaborators are studying the feasibility of using hydropower associated with the Great Lakes (Niagara Falls and High Falls in Rochester) for the generation of hydrogen, which is a very effective carrier of energy. This work has led to a textbook which is scheduled for publication by John Wiley & Sons during 2008. The reference is R. Press, K. S, V. Santhanam, A. Bailey, M. Miri and G. A. Takacs, "Introduction to Hydrogen Technology", John Wiley & Sons, New Jersey, in press (2008). The book will be used in a new RIT undergraduate course entitled "Survey of Chemistry for Hydrogen Technology."

### Forecasting Beach Closures at Ontario Beach, Rochester, NY.

With funding from NOAA/GLERL, **Dr. Anthony Vodacek** and his students are developing an integrated system for predicting beach closures at Rochester's public beach on Lake Ontario. The Monroe County Health Department uses a set



of criteria for deciding beach closures that are tightly coupled to the behavior of the Genesee River plume. The forecasting system is based on an integration of hydrological modeling of the Genesee River, hydrodynamic modeling of the river plume distribution in the lake, and radiative transfer modeling of the reflectance from the river plume in the lake. MODIS 250 meter data using the 645 nm red channel effectively captures the river plume distribution and is assimilated into the model using an Ensemble Kalman Filter. The data assimilation technique adjusts the model according to the satellite view of the river plume, providing better predictions of sediment concentrations in front of the beach than the model would provide without data assimilation. This can lead to forecasts of beach closings (using forecasted weather data) and better use of the limited resources the County has available for monitoring the water quality at the beach.

**Dr. Yan Li** completed her dissertation research based on this approach. The reference for her dissertation is Li, Y., 2007. "An Integrated Water Quality Modeling System with Dynamic Remote Sensing Feedback." Unpublished Ph.D. Dissertation, Rochester Institute of Technology.  
—Submitted by *Anthony Vodacek*

## Ryerson University

**Dr. Gideon Wolfaardt**, Associate Professor and Canada Research Chair in Environmental Interfaces and Biofilms, Department of Chemistry and Biology has taken over as director of the program.

New faculty:

**Dr. Rachel Dodds**, Assistant Professor, Hospitality and Tourism Management

**Dr. Christopher Gore**, Assistant Professor, Department of Politics and Public Administration

**Recent Theses:**

*A Planning Tool of Urban Greenroofs* (2007)  
Angela Y.T. Au

*Adsorption and Partitioning Behaviour Of Selected Trace Polycyclic Synthetic Musks in a Suspended Growth Aerobic Activated Sludge System* (2007)  
Vince Pileggi

*Drinking Water Quality and Trust Communities and Risk Information* (2007)

Caitlin Burley

*"Sustainable but just on the edge:" The strength and fragility of the commercial whale-watching industry in the lower Bay of Fundy, New Brunswick, Canada* (2007)  
Eli Bamfo

*The Ecological Effects of Land-Appling Municipal Biosolids on Nitrogen-Fixing Bacteria* (2007)  
Leigh Holt

*The Role of PI3K Signaling in Enteropathogenic Escherichia coli Induced Apoptosis* (2007)  
Heather Park

*Trends in Public Attention to the Environment from 1956 to 2005* (2007)  
Alison Holmes  
—Submitted by *Michael Bardecki*

## St. Lawrence University

The new Johnson Hall of Science, which now houses Biology, Chemistry, Biochemistry and Neuroscience, is finished and the faculty have moved into over the summer. It held classes this fall. A new major within the Biology department, called Conservation Biology, has been approved by the state of New York. The Biology department hired a new faculty member in Conservation Biology - **Sue Wilson**. She studies birds and their habitat in Peru. **Ning Gao**, is still, I think, continuing her mercury mass balance work for the Lake Champlain Basin. I am putting together a manuscript on heavy metals in zebra mussels in the upper St. Lawrence River sampled from six sites from 1994 through 2005.

—Submitted by *Carrie Johns*

## Syracuse University

1) **Hank Mullins** and **Chris Scholz** have developed a new bathymetric map of Skaneateles Lake. Further, Chris and Hank will meet with **Dr. Bob Werner** (retired SUNY-ESF, and one of the founding fathers of the GLRC) to discuss the "milfoil problem" in Skaneateles Lake.

2) **Xiaoxia Chen** and **Prof. Charles Driscoll** recently completed a manuscript on nutrient dynamics of embayment ecosystems of Lake Ontario. Several factors are important in regulating nutrient

concentrations in Lake Ontario embayments including land use, hydraulic residence time and connection with Lake Ontario. Further, mass balances were calculated for embayments, based on tributary and Lake Ontario inputs. The embayments are net sinks for nitrate and dissolved silica, and net sources for ammonium. Some embayments appear to be net sources for total phosphorus and dissolved organic carbon. The authors believe this apparently anomalous behavior for these nutrients is due to near embayment inputs (septic for total phosphorus; wetlands and macrophytes for dissolved organic carbon).

3) **Prof. Driscoll** and **Dr. Steve Effler** of the Upstate Freshwater Institute are principal investigators for a new project entitled “An Intelligent Urban Environmental System (i-UES) for Central New York Water Resource Management” funded through the Syracuse Center of Excellence’s CARTI program. Innovative approaches are necessary to protect aquatic ecosystems from human disturbances. An ongoing research project is addressing this issue for interconnected aquatic ecosystems in Central New York, including local water supplies, Onondaga Creek, Onondaga Lake, the Three Rivers system, and Oswego Harbor, through the development of an intelligent urban environmental system (i-UES). This project builds on previous research, featuring robotic water quality monitoring and automated data delivery to stakeholders. The goals of this study are to: (1) expand the existing i-UES, geographically and technologically; (2) understand the water quality responses of linked lakes and rivers to urban impacts; and (3) investigate the transport, transformations, and fate of particles, phosphorus, nitrogen and mercury in the system. The study approaches include: (1) operation of a network of fourteen robotic monitoring platforms, (2) field surveys, (3) interpretation of water quality data within the context of urban impacts and lake-river interactions, and (4) development of a mathematical model. Expected results and benefits of the project are: (1) improved understanding and management of regional freshwaters, (2) advancements in the i-UES concept, (3) depiction of transformations, transport and fate of critical contaminants in the system and prevailing loads to Lake Ontario.

4) The EPA Region 2 Environmental Finance Center

at Syracuse University, led by **Mark Lichtenstein**, recently began a \$123,694 project funded by the US Department of Agriculture that will address gaps that exist in infrastructure management for rural and low income Lake Ontario communities. In collaboration with the public/private partnership Lake Ontario Coastal Initiative (LOCI) based in Rochester, this project will offer training and technical assistance in the areas of water and wastewater management. Training will focus on efforts to establish working collaborations among government officials and nonprofit and private sector programs that provide technical assistance. Implementation of the elements of this project are expected to result in a number of positive outcomes including, but not limited to, improved and more successful applications for financial assistance; creation of opportunities for intergovernmental cooperation on drinking and surface water protection; and a deeper understanding of how infrastructure gaps impact nearshore Lake Ontario water quality. —Submitted by *Lisa Cleckner*

## University of Toronto

We recently hired in the Department of Biology, University of Toronto Mississauga. **Steve Short** is an Assistant Professor with interests in the molecular ecology of aquatic organisms. Here is a brief description of his research (web page [http://www.utm.utoronto.ca/~w3bio/faculty\\_and\\_research/short.htm](http://www.utm.utoronto.ca/~w3bio/faculty_and_research/short.htm)):

“My research focuses on the molecular ecology of aquatic microorganisms. As the major primary producers in freshwater and marine ecosystems, phytoplankton are key components of aquatic food webs and biogeochemical cycles. Moreover, the discovery of abundant viruses in all aquatic environments suggest that they are important agents of phytoplankton mortality. Thus, my research focuses on the role of viruses in phytoplankton population and community ecology. To better understand the complex interactions of phytoplankton and their viruses, I use quantitative molecular techniques to examine their community composition and dynamics in natural environments and laboratory cultures.”—Submitted by *Gary Sprules*

## 2007/08 Seminar Series

### FALL 2007:

**October 4**, at SUNY Plattsburgh, Lars Rudstam, from Cornell University, presented *Ecology of the Dominant Zooplanktivore in Lake Ontario – the Mysid Shrimp*.

**October 24**, at SUNY Potsdam, Peter Wells, from the University of Toronto, presented *Free Radical Determinants of Neurodegenerative Disease*.

**November 7**, at Queens University, Mark Noll, from SUNY Brockport, presented *Cycling of Phosphorus in a Managed Lake Ecosystem*.

**November 7**, at Cornell University, Greg Boyer, from SUNY ESF, presented *Toxic Cyanobacteria in the Great Lakes: Problems, Issues and Solutions*.

**November 9**, at the University at Buffalo, Tom Holsen, from Clarkson University, presented *Mercury Cycling in the Environment*.

**November 12**, at SUNY Brockport, Alan Rabideau, from the University at Buffalo, presented *Ecosystem Restoration in Western New York*.

**November 28**, at Buffalo State College, Wayne Forsythe, from Ryerson University, presented *GIS-Based Analysis of Great Lakes Sediment Contamination*.

**December 13**, at the University of Ottawa, Michael Twiss, from Clarkson University, presented *Phytoplankton Dynamics in the St. Lawrence River Measured Using Advanced Instrumentation*.

### SPRING 2008:

**February 7**, at the University of Waterloo, Steven Liss, from the University of Guelph, presented *Pathogen-Floc Interactions and the Potential Fate and Transport of Pathogens in Surface Waters and in Sub-Surface Environments*.

**March 27**, at the University of Waterloo, Chris Walcek, from the University at Albany, presented *Climate Topics: Convenient and Inconvenient Evidence Regarding Global Climate Change*.

**March 28**, at Clarkson University, Jules Blais, from the University of Ottawa, presented *Biologically Mediated Transport of Contaminants to Aquatic Systems*.

**April 2**, at the University at Buffalo, Tony Vodacek, from the Rochester Institute of Technology, presented *Predicting Beach Closures Using an Integrated Modeling System with Remote Sensing Feedback*.

**April 15**, at SUNY Brockport, Randal Snyder, from Buffalo State College, presented *Fatty Acids and Cold Tolerance in Freshwater Alewives*.

**April 16**, at Queens University, Lino Grima, from the University of Toronto, presented *Will Canada's Well Run Dry? Policies that Demonstrate that We Value Water*.

**April 18**, at Clarkson University, Charles O'Neill, from New York Sea Grant, presented *Invasive Species and New York's Natural and Built Environments*.



## Proposed Seminars for 2008/09

***Water Resources Research at the Syracuse Center of Excellence and Its Importance for Economic Development in Central Upstate NY***

Dr. Lisa Cleckner, Syracuse Center of Excellence, Syracuse University; Either Semester.

***Geospatial statistics and public service learning in community based environmental and urban brownfield science and policy.***

Dr. Joseph Gardella, University at Buffalo; Either Semester.

***Water and the Ecocity***

Dr. William Tully, SUNY-ESF; Either Semester

***Mercury in the Environment: Cycling and Sources***

Dr. Thomas Holsen, Clarkson University; Spring Semester.

***Environmental and Energy Benefits of Biofuels - A Lifecycle Perspective***

Dr. Susan Powers, Clarkson University; Spring Semester.

***Biodegradation of pharmaceuticals in biological treatment systems***

Dr. Diana Aga, University at Buffalo; Spring Semester.

***Preventing Biofouling without Poisons: Lessons from Bioengineering***

Dr. Robert Baier, University at Buffalo; Either Semester, video conference (no travel)

***Fatty Acids and Thermal Tolerance in Freshwater Alewives***

Dr. Randal Snyder, Buffalo State College; Either Semester.

***Five millennial-long paleo-hydrographs for the Upper Great Lakes constructed from ancient shorelines***

Dr. John Johnston, University of Waterloo; Fall Semester.

***Locating and mitigating hotspots of road mortality of turtles and other herpetofauna along rural highway networks.***

Dr. Tom Langen, Clarkson University, Either Semester.

***Isolation and Characterization of hydrocarbon degrading bacteria from soils from Western New York.***

Dr. Jeffrey Lodge, Rochester Institute of Technology, Spring Semester.

***Peak Oil, energy return on investment and our economic future***

Dr. Charles Hall, SUNY-ESF Either Semester.

***Microcystin research in southern Ontario: some recent results***

Dr. Stephanie Guildford, University of Minnesota, Duluth, Spring Semester.

***Population monitoring, trophic relationships, and levels of bioaccumulative chemicals of concern in mink, a sentinel species.***

Jim Haynes, SUNY Brockport, Either Semester.

***Revitalization of Great Lakes Governance***

Dr. Gail Krantzberg, McMaster University, Fall Semester.

***Aquatic Invasive Species of the Great Lakes Basin: Introductions, Impacts, and Management***

Charles O'Neill, New York Sea Grant, Spring Semester.

***Polyunsaturated fatty acids in the Lake Michigan food web and their effect on yellow perch reproductive success***

Dr. Jacques Rinchar, SUNY Brockport, Spring Semester.

***Climate Change and Great Lakes Levels Management in the Context of Climate change. Will the Well Run Dry? Valuing Water before we Run Out"***

Dr. A.P. Lino Grima, University of Toronto, Fall Semester.

***1. Ecosystem restoration in Western New York***

***2. Is the dual-mode sorption concept useful for environmental modeling?***

Dr. Alan Rabideau, University at Buffalo, Either Semester.

**1. Persistent Organic Pollutants in Male Common Carp and Steelhead Trout in Eastern Lake Erie**

**2. Type E Botulism in Lake Erie: Inter-Annual Differences and Trophic Transfer**

Dr. Alicia Perez-Fuentetaja, Buffalo State College, Spring Semester.

**1. Conservation biology of Blanding's turtles in northern New York**

**2. Conservation strategies for spruce grouse at the edge of the range**

Dr. Glenn Johnson, SUNY Potsdam.

**A cleaner and energy independent America through chemistry, materials and public participation.**

Dr. Stanley Whittingham, Binghamton University, Either Semester.

**1. Global trends in mercury and metal biomagnification in the Great and large lakes of the world**

**2. Role of invasive and introduced species in foodwebs of large lakes and Great Lakes (Lakes Champlain, Simcoe, Nipigon, Ontario, Erie)**

Dr. Linda Campbell, Queen's University, Spring Semester.

**1. Air Pollution Dispersion, the effects of Shear on plumes from point sources**

**2. An overview of the skeptical scientific evidence surrounding the role of humans in climate change.**

Dr. Chris Walcek, University at Albany, Either Semester.

**Round gobies in tributary streams: seasonal abundance, community effects, and energy consumption.**

Dr. Chris Pennuto, Buffalo State College, Spring Semester.

**Paleolimnological Studies of the Peace-Athabasca Delta: An Effective Approach to Assess Natural & Human-Induced Changes at a Landscape Scale**

Roland Hall, University of Waterloo, Fall Semester.

**Interactions at the edge of distributions - on the importance of understanding distributions in Great Lakes pelagia**

Dr. Lars Rudstam, Cornell University, Either Semester.

**Risk assessment of PCB in fish: How to overcome deficiency of congener-specific PCB measurements?**

Dr. Satyendra Bhavsar, University of Toronto, Spring Semester.

**Winter Assessment of Microbial Biomass and Metabolism in Lake Erie**

Dr. Michael Twiss, Clarkson University, Fall Semester.

**Turning Inducible Defenses On and Off: Adaptive Responses of Zooplankton Prey to a Gape-Limited Predator**

Dr. Howard Riessen, Buffalo State College, Either Semester.

**PCB and PBDE Exposure and Effects**

Dr. Paul Kostyniak, University at Buffalo, Fall Semester.

**1. Sustaining the Worlds Wetlands; Story of GL Wetlands Policy Consortium**

**2. Facilitation of Revitalization of Onondaga Creek; An Urban Creek with multiple stakeholders**

Dr. Richard Smardon, SUNY-ESF, Spring Semester.

**1. Fish Gelatin : A use for skin, scales and bones?**

**2. Slaughtering Aquacultured Fish -- the Animal Welfare Issues.**

Dr. Joe Regenstein, Cornell University, Either Semester.

**Toxic Cyanobacteria in the Great Lakes: Problems, Issues and Solutions.**

Dr. Greg Boyer, SUNY ESF, Either Semester

