

REPORT

of the Great Lakes Research Consortium

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Research Groups Join Forces to Plan Major Study of Lake Ontario and the St. Lawrence River

for more information on GLRC research projects see page 12

It's been more than twenty years since the last binational, comprehensive, multi-disciplinary research study of Lake Ontario was undertaken as part of the International Field Year of the Great Lakes. We believe its time for a new ecosystem-level effort to advance understanding of the interacting chemical, physical and biological processes which determine the conditions of the lake and river. The St. Lawrence River - Lake Ontario (SLRLO) Initiative was launched this year by the New York Great Lakes Research Consortium and other US and Canadian institutions to develop and promote integrated, large-scale collaborative research on Lake Ontario and the St. Lawrence River.

According to Dr. Joseph DePinto, Director of the Great Lakes Program at the University at Buffalo and member of the SLRLO Steering Committee, "the SLRLO group is interested in advancing the state of the science by focusing on the key information needs of those attempting to manage components of the Niagara River-Lake Ontario-St. Lawrence River ecosystem." The proposed SLRLO research program grows out of a set of management issues and questions associated with such activities as the Niagara River Toxic Management Plan and RAP, the Lake Ontario LaMP, the Lake Ontario Fish Community Objectives, St. Lawrence River management issues, and RAPs within the Lake Ontario and St. Lawrence River systems. The research team assembled so far for SLRLO consists of around forty researchers actively working to address such topics as risk assessment and management of toxic chemicals, ecosystem dynamics, sportfisheries management, lake levels, sustainable economic development, nearshore productivity, drinking water quality, and land use impacts.

The next meeting of the SLRLO team will be held April 26th and hosted by the St. Lawrence River Institute of Environmental Sciences, a major SLRLO collaborator. The meeting will be held in conjunction with the International Conference on the St. Lawrence River Ecosystem at the NAV CAN Conference and Training Centre in Cornwall. Those interested in attending the SLRLO meeting should contact David Lean at dlean@oreo.science.uottawa.ca. Conference information can be found at www.glen-net.ca/slriols/.

The activities of the SLRLO Initiative are led by a steering committee comprised of representatives of the participating organizations including Jack Manno, New York Great Lakes Research Consortium; Joseph DePinto, University of Buffalo Great Lakes Program; John Hassett, SUNY College of Environmental Science and Forestry; David Lean, University of Ottawa; Jeffrey Ridal, St. Lawrence River Institute of Sciences; Don Mackay, Environmental Modeling Center, Trent University; and Joseph Makarewicz, SUNY Brockport. The New York Sea Grant Institute is also a participating organization in the Initiative. For more information, contact: The Great Lakes Research Consortium at (315) 470-6816 or visit our website at <http://www.esf.edu/glrc/slrllo.htm>



Useful Information for
New York's Great
Lakes Research
Community



Of Legislators and Original Instructions

*Commentary from the Executive Director
Jack Manno*

I recently traveled with my colleague Michael Connerton to Albany where we crammed fourteen separate meetings into a single day, traipsing from office to office using the stairway to avoid the overcrowded elevators on a busy lobby day at the New York State Capital. We were trying to convince legislators who represent districts in the Great Lakes basin that our Consortium is deserving of continued funding for another year. Luckily it's become a rather easy task.

Over the years the legislators have grown increasingly aware of the importance and value of the Great Lakes to their constituents and to themselves. They recently formed a Coalition of Great Lakes Legislators to exchange information and coordinate their responses to common constituent concerns. They understand that each Great Lakes-related problem a constituent brings to them is usually a manifestation of complicated ecological relationships with biological, chemical, physical, social and economic aspects to consider. Making public policy related to managing complex ecosystems is a major intellectual and political challenge.

Our state legislators understand the necessity for gradually and incrementally improving our understanding of the Great Lakes through careful observation and experimentation over a long period of time. There really is no way around it. We are the stewards of the lakes and all the life

that has come to depend on them. Human action can protect the lakes or harm them. The sheer magnitude of the human economy and its physical impacts on the ecological dynamics of the lakes makes it unconscionable for us to ignore them. To resurrect and slightly modify an old slogan: "If you think research is expensive, try ignorance."

Every few months legislators are jolted into awareness of the lakes by another problem, another situation whose understanding requires systematic knowledge of natural phenomena in the lakes. Sometimes they hear from friends and individual constituents or often they hear from organized groups who believe their interests are threatened by changes in the lakes. They want their elected representatives to do something to protect their interests.

People shout, "do something," when the lake levels rise to threatening heights. Even something as deceptively simple as the inflow and outflow of water can't be simply modeled. Its not just the obvious things like rain and snow and obstructions at outflow points that cause lake levels to rise but also the subtle accumulative action of countless small commercial and residential development projects throughout the lake watersheds slowly reducing the capacity of wetlands and rivers to hold their water.

People shout "do something" when Cormorants return to Lake Ontario after a toxic induced absence, and then reproduce extravagantly filling the newly opened ecological niche in the less toxic lakes and eating their fill of bass otherwise meant for free-spending anglers. Are the cormorants an invading pest or benign creatures taking their natural place in the Creation?

In the highly altered ecosystem that Lake Ontario has become, nothing is "natural," because everything is affected by human activities, whether humans are conscious of it or not. On the other hand, humans are just as "natural" as anything else. According to the Iroquois people who were the original stewards of this particularly wet corner of the planet, every creature has its original instructions, the natural things for it to do, its place in the web of life. The fish know their instructions and carry them out. The Cormorants do as well. So does every other plant and animal, the wind, rain and stars.

Humans have a particularly important task that's natural for us to do. We are conscious and we have intelligence. Our job is to see the world, name it and understand it. We are the ones who have the job of caretaking. After all is argued, analyzed and published, that's what Great Lakes research is about— using our intelligence, our observational skills, our creativity in designing experiments, inventing tools, following our original instructions so that we may better understand and take care of these incredible Sweetwater Seas.

"After all is argued, analyzed and published, that's what Great Lakes research is about— using our intelligence, our observational skills, our creativity in designing experiments, inventing tools, following our original instructions so that we may better understand and take care of these incredible Sweetwater Seas."



GLRC Report

Editors: Jack Manno and Michael Connerton
The GLRC *Report* is published annually to supplement our electronic newsletter which is sent out to our members on a monthly basis.

Great Lakes Research Consortium

The Consortium's mission is to improve our understanding of the problems facing the Great Lakes. Toward this we have established three goals:

- to facilitate research and scholarship on Great Lakes issues,
- to provide opportunities for training and education of students on Great Lakes-related topics and,
- to aid in the dissemination of information gathered through the research endeavors of the Consortium.

Member Institutions

University at Albany
SUNY Brockport
University at Buffalo
Buffalo State College
Clarkson University
Cornell University
SUNY College of Environmental Science & Forestry
SUNY Cortland
SUNY Fredonia
SUNY Geneseo
SUNY Oswego
Syracuse University

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1999 Great Lakes Research Consortium

Students and Faculty Brave Winter Storm to Attend Annual Conference



Students and faculty from as far away as Ottawa and Buffalo clenched their teeth and held onto their steering wheels just a little tighter than usual on January 15-16 to attend the Consortium's Ninth Annual Conference at SUNY College of Environmental Science and Forestry in Syracuse.

Despite dire predictions of bad weather from area weathermen, the conference was well attended with nearly forty students presenting the results of their research to a sturdy group of weathered scientists and their students. Brave faculty from our member campuses and Canadian affiliates also helped make the conference a success by acting as panel speakers, session moderators, awards judges, and whatever else it took to pull off a Great Lakes research conference!

On Thursday afternoon, the day before the conference, things looked pretty bleak as snow and ice and cancellations poured in, but Consortium staff held out hope that the weather would clear in time for the two day event which began on Friday. Although Friday morning was still stormy in some parts of the area, it was clear enough by mid morning for students and faculty to begin their trek to the Conference.

By the time the plenary talk began in early afternoon, things were looking up as around forty people listened to **Dr. David Lean** from the University of Ottawa speak about the latest initiative by the Consortium and other institutions to develop a binational, multi-investigator, multidisciplinary

coordinated research project on the St. Lawrence River-Lake Ontario ecosystem (see page 1). This effort stresses the ecosystem approach as central to our understanding of the interactions that influence the overall health of the ecosystem and the only way to predict the effects of a multitude of environmental stressors. As David's talk ended, more students and faculty had braved the storm and arrived in time to ask questions and initiate a short and interest-



David Lean

ing discussion about the initiative and the other things Dr. Lean spoke about.

After some minor adjustments to the schedule due to a few cancellations, the first of the student research sessions went off without a hitch. Excellent presentations about limnology, and ecology of lakes and streams were given by students from Brockport and Ottawa and equally stimulating research about biomonitoring was presented by students from Ottawa, Oswego and Buffalo State College.

EMERGING ISSUES PANEL

Next, it was the faculty's turn to talk about some of their research in a panel discussion about Emerging Issues in the Lake Ontario-St. Lawrence ecosystem. They did not disappoint those who had risked their lives, or at least their weekends, to trudge through the snow and listen to what they had to say.

Dr. Ed Mills of Cornell joked that although he had given a talk several years in a row, exotic species somehow remains an emerging issue. Given the recent arrival of another aquatic nuisance to the Lake Ontario ecosystem in the past year, exotic species continues to be a serious threat to the Great Lakes. *Cercopagis*, a spiny form of zooplankton poses threats to other zooplankton and the stability of the rest of the ecosystem. Its effects remain to be seen but it is another example of an exotic species introduced by ballast water from oceangoing ships coming in through the St. Lawrence River. In recent years several exotics have been transported in similar fashion from the Baltic region of Asia, and Dr. Mills warned that more may be coming unless effective measures are implemented to control their transport vector. For more information contact Ed Mills at elm5@cornell.edu.

Another exotic, the alewife, and the rest of fishery of Lake Ontario was the focus of the talk given by **Dr. Donald Stewart** from ESF. He presented some ominous predictions about declining populations of alewife. Since alewife is the main source of food for

(continued on page 6)

Student/Faculty Conference

Former Co-Director Werner Honored

Friends, colleagues and students gathered during the GLRC's annual conference to pay tribute to Dr. Robert G. Werner. Dr. Werner, one of founders and original Co-Directors of the Consortium, has most recently been the GLRC campus representative from ESF, and has been active in Great Lakes Fisheries research for decades. He recently retired from his academic duties to concentrate on research, writing and enjoying life.

Bob Werner came to Syracuse in 1966 from Indiana University where he received his Ph.D. while studying centrarchid life history strategies. Since then he has made significant research contributions to every aspect of aquatic life in the Finger Lakes, the Adirondacks, Oneida Lake, and the Great Lakes including his most recent research on pike and muskellunge in the St. Lawrence River. His research has varied from sunfish, to suckers, to sturgeon, and rainbow trout to zebra mussels, plankton and aquatic insects. From this he produced scores of research papers, and graduate theses, several book chapters, and a wonderful book on the Freshwater Fishes of New York that continues to be used by students of Ichthyology. Not only has Dr. Werner had an impressive research career but he has balanced this with his contributions to teaching, professional societies, academic governance, and advisory panels. Most notably, he has served the American Fisheries Society for over thirty years as a member, as President

(continued on page 6)



Rick Smardon congratulates Dr. Werner (right) for his contributions to the GLRC and to Great Lakes research.

Student Research Celebrated at Annual Conference

On January 15-16, the ninth annual Student/Faculty Conference, sponsored by the Great Lakes Research Consortium, in conjunction with the New York Sea Grant Institute was held. This Conference is a unique opportunity for students conducting Great Lakes related research to present their findings to the research community. This year six students were recognized for their outstanding work in several research areas. In recognition of this superior achievement, a Don Rennie Memorial Award was awarded to each of the following:

Limnology and Ecology

Rob A. Klumb, Cornell University, for his presentation "Role of Three Lake Ontario Embayments for the Production and Rearing of Larval Alewives (*Alosa pseudoharengus*) and Other Fishes"

Environmental Contaminants

Benjamin Connor, SUNY Oswego, for his presentation "Adsorption and Dechlorination of Polychlorinated Biphenyls by Zero Valent Iron"

Environmental Contaminants

Douglas Crump, University of Ottawa, for his presentation "The Effects of Enhanced UV-B Radiation on the Development of Embryos and Larvae for Eight Temperate Amphibian Species in Natural Pond Conditions in Southern Ontario"

Poster Presentation

Yuansheng Tan, SUNY-Albany, for his presentation "Pr-synaptic Depression of Synaptic Transmission by Non-coplanar PCBs" OR "Non-coplanar PCBs Kill Cerebellar Granule Neurons"

Chemistry/Sediment Dynamics

Rajat K. Chakraborti, University of Buffalo, for his presentation "Dynamic Particle Characterization during Aggregation Using Image Processing Techniques"

Nicolle S. Tulve, Clarkson University, for her presentation "Interactions of Natural Colloidal Material and Phenanthrene in the Aquatic Environment"

More Emerging Issues in the Great Lakes

(continued from page 4)

the top predators in the Lake, the fishery of Lake Ontario may be in serious jeopardy. Dr. Stewart is working on refining models that predict the abundance of alewife and their predators. For more information, he can be contacted at djstewar@mailbox.syr.edu.

Dr. John Farrell, also of ESF, presented another threat to the fishery of the Lake Ontario-St. Lawrence River ecosystem i.e., water levels. Water level management continues to be a serious issue for homeowners in the Basin who want lower levels, and boat owners who want higher levels, but Dr. Farrell and other proponents of fish and wildlife habitat wish water level control could be relaxed altogether. He pointed to water level control as a cause for loss of diverse wetland habitat. Monoculture wetlands made up of cattails and Phragmites are negatively affecting the fish and wildlife that rely on diverse wetlands for rearing of their young and other aspects of their life history. John is currently working with the NY Department of Transportation on a project to develop methods for restoring wetlands impacted by water levels. John can be reached at jmfarrell@mailbox.syr.edu.



From left to right, Tom Young, Gordon Fraser, and Don Stewart

Dr. Tom Young of Clarkson University spoke about another persistent yet emerging issue in the St. Lawrence River Lake Ontario ecosystem. Modeling the fate and transport of persistent organic pollutants has been the focus of his research and others for decades and great strides have been made in predicting the concentrations of these chemicals in the water, sediment, and biota of the lakes. Still, more research is needed that accurately predicts the exchange of pollutants between the various media of the system, especially between the water and the air, since this amount may be significant due to the vast surface area of the Lakes. This and other issues are being addressed by members of the SLRLO Research Initiative (see front page). For more information contact Tom Young at tctyoung@draco.clarkson.edu.

Global climate change may significantly affect the earth's weather, water levels, and biota including the Great Lakes but these effects remain uncertain. This was the emerging issue discussed by **Dr. Gordon Fraser** of the Great Lakes Center for Environmental Research and Education. He listed various potential impacts of climate warming including reduced snow cover, increase in water temperature, increase in the duration of storms, water level rise (or fall?) and each of these have positive and negative consequences (continued on page 13)

Bob Werner Retires from SUNY ESF (continued from page 5)

of New York's Chapter, and as President of the Early Life History section of the national organization. Bob's experience has also been valuable to advise and serve on such panels as the IJC Council of Great Lakes Research Managers, New York Sea Grant, Upstate Freshwater Institute, the NY Federation of Lake Associations and the NY Fisheries Congress. Dr. Werner also served as Co-Director of the Great Lakes Research Consortium from its inception in 1986 until 1995. These impressive career highlights were reviewed by **Dr. Neil Ringle** of ESF at this year's annual banquet, but Neil spoke most of all about Bob Werner's wisdom, his kindness, and his creativity as an excellent example to all of us.

Dr. Werner was met with a standing ovation when he accepted an award for his outstanding contributions to the Consortium and Great Lakes research from Consortium

Directors Rick Smardon and Jack Manno. He spoke about the dramatic changes that he witnessed in his career on the Great Lakes. When he first came to New York, the lakes were incredibly polluted, nutrients were out of control, and dead alewife were washing ashore due to the lack of a keystone predator. Since then tremendous progress has been made, but he reminded everyone that new problems and opportunities for research emerge every year and this is why organizations such as the Consortium are so important.

Although Dr. Werner's retirement will mean less active teaching responsibilities, he will maintain an office at ESF to continue mentoring his students, dabbling in research, writing, and serving in other professional capacities. He can be reached at rgwerner@mailbox.syr.edu.

Support for Promising Students of GL Research

ALCAN Aluminum supports Great Lakes Undergraduate Research

The Alcan Aluminum Corporation of Cleveland, Ohio has agreed to match the contributions of four Consortium member campuses to fund a new GLRC undergraduate fellowship. This fellowship will provide support for promising undergraduates who are conducting Great Lakes related research at their respective colleges. Our newest member campuses at SUNY Cortland, Geneseo, Fredonia and Syracuse University will be the first campuses to offer the GLRC-Alcan Undergraduate Fellowship. If this year's program is successful, Alcan has indicated that they may support the fellowship in future years. Future fellowship opportunities will be offered to other Consortium campuses on an annual rotating basis. Individual campuses decide on the award process to select their undergraduates. Those interested in more information should contact their GLRC campus representative or call the Consortium at 315-470-6816.

The fellowship was made possible mainly due to the efforts of Consortium Campus Representative **Jim Pagano** of SUNY Oswego and **Peter Segretto** and **Steve DuBois** of Alcan Aluminum Corporation. Jim brought the opportunity to the attention of the GLRC Board of Governors and worked closely with Peter and Steve to arrange the details of the awards. Alcan Aluminium Corporation is a multinational company engaged in all aspects of the aluminum industry. With operations and sales offices in more than 30 countries, the Alcan Group is one of the most international aluminum companies in the world and a leading producer and marketer of rolled aluminum products.



SUNY ESF President Ross Whaley and Jack Manno meet with Jim Pagano, Peter Segretto and Steve Dubois

GLRC Awards First Capstone Fellowship

Recognizing the importance of supporting promising student researchers, the Consortium created a new Capstone Fellowship to help graduate students doing Great Lakes-related research. **Nicolle S. Tulve** has been awarded the first GLRC Capstone Fellowship to assist her in completing a doctoral degree at Clarkson University. Her research, under the tutelage of Dr. Thomas C. Young, is focused on contaminants in bottom sediments, and the natural and man-made activities that can alter the natural equilibrium of these contaminants. The object of Tulve's work is to learn more about the interaction of underwater particles and contaminants, which could ultimately lead to more effective remediation strategies. For more information contact Ms. Tulve at tulvens@draco.clarkson.edu or her advisor Dr. Tom Young at tcyoung@draco.clarkson.edu.



Great Lakes Baby!

This was the cheer from the crowd of students and faculty as they sang along with Manhattan's Diane Ponzio, the featured artist at this year's banquet. With Songs like "Didn't We Rock" and "Great Lakes Baby" (sung to the tune of "Twist and Shout") she warmed the bones of everyone who endured the cold, stormy weather to attend the annual Great Lakes conference. Her splendid mix of acoustic guitar and soulful singing created a sort of Italian funk (as Jack Manno put it), which put a typically staid group of scientists on the edge of their seats, listening to her intriguing stories and singing along to her heartfelt songs. Her performance was a perfect ending to a day full of interesting science, stimulating presentations and Great Lakes Baby! Diane can be reached at pontunizio@aol.com.



"Didn't We Rock, Didn't We Roll"

News from our *Member Campuses*

Cornell Holds Great Lakes Acoustic Workshop III

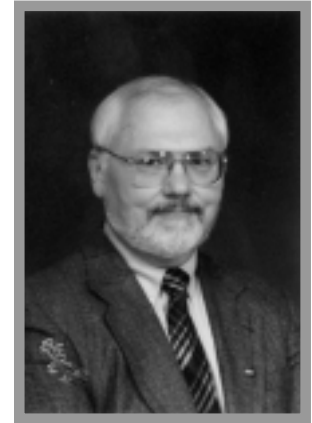
A workshop with 30 scientist and managers from around the Great Lakes met at the Cornell Biological Field Station, February 11-12, to discuss the use of acoustic techniques. Participants came from Israel, Sweden, Norway, Canada, both US coasts and three bioacoustic manufacturers. After initial presentations on techniques, sampling design and case studies from Lake Superior, Hudson River, Lake Kinneret and the North Sea, various software approaches was discussed into late evening. The next day, workgroups attempted to discuss similarities and differences in how the technique is used around the world and in the Great Lakes region in particular. Researchers working on all Great Lakes, including Lake Champlain were present. The workshop was a continuation of the acoustic workshops I and II sponsored by the Great Lakes Research Consortium and was organized by **Lars Rudstam, John Horne and Guy Fleischer**. Their intent is to continue the process with the goal of solving mutual problems and standardization of techniques in the Great Lakes region. This workshop was sponsored by the Great Lakes Fisheries Commission. For more information contact Dr. Rudstam at lgr1@cornell.edu

Smardon Appointed to Legal Advisory Board

Consortium Co-Director Rick Smardon was recently appointed to the Advisory Board for the Legal Institute for the Great Lakes which is at the University of Toledo College of Law. There are some twenty-one advisory board members representing all points of the Great Lakes community. He will take Dr. Robert Hennigan's position, also of ESF, at his suggestion and represent the New York State academic community. For more information contact Dr. Smardon at rsmardon@mailbox.syr.edu

Fraser Appointed New Director of Great Lakes Center at Buffalo State College

Dr. Gordon Fraser was appointed as the Director of the Great Lakes Center for Environmental Research and Education at Buffalo State College in October, 1998. He comes to Buffalo from the University of Indiana where he worked as a senior scientist at the Indiana Geological Survey, Director of the Center for Geospatial Data Analysis, and Associate Professor in the Department of Geological Sciences. He received his B.S., M.S. and Ph.D. from the University of Illinois. His research interests include watershed dynamics, earth surface processes and GIS applications.



Recently, Dr. Fraser has also taken an interest in climate change and its effects on the Great Lakes. He is organizing a GLRC task group or workshop to focus on the issue. Those interested in participating should contact Dr. Fraser at frasergs@buffalostate.edu.

National Science Foundation Will Support Innovative New Clarkson Graduate Program With \$2 Million

The National Science Foundation (NSF) announced that it will put \$2 million toward the establishment of a new doctoral program at Clarkson University with the theme of Environmental Manufacturing Management. Faculty from all four of Clarkson's schools (Engineering, Business, Liberal Arts and Science) will participate in the program which is aimed at providing graduate students with strong technical skills, coupled with the environmental, managerial, ethical, economic, policy and communications skills needed to be successful in the management of wastes associated with industrial manufacturing processes.

The NSF has indicated that the training grants are "intended to produce a diverse group of engineers and scientists who are well-prepared for a broad spectrum of emerging career opportunities in industry, government and academe".

Graduate students supported under these fellowships will be exposed to multidisciplinary research themes in emerging areas of science and engineering, and areas that cross traditional boundaries, uniting faculty from several departments and/or institutions.

For more information, contact Clarkson Professor **Thomas L. Theis**, Chair of the Department of Civil and Environmental Engineering at 315-268-6529, or via email at theist@clarkson.edu; Director of News Services Michael P. Griffin at 316-268-6481, or at home at 315-265-5584; or NSF Media Contact K. Lee Herring at 703-306-1070 or kherring@nsf.gov. An abstract of Clarkson's grant is available on the Web at <http://www.nsf.gov/cgi-bin/showaward?=&9870646>. For more details about IGERT see <http://www.nsf.gov/igert>.

More News from our *Member Campuses*

Third Biennial Great Lakes Student Summit Planned at University of Buffalo

Students and their teachers from Great Lakes states and Ontario will journey to Buffalo on May 12-14 for the Third Biennial Great Lakes Student Summit. The theme of the summit is, "The Great Lakes: Your Concerns, Our Concerns, Areas of Concern."

This year's summit will focus on problems facing the Great Lakes, especially issues being addressed in the Areas of Concern around the basin. Organizers are hoping for participation from every AOC on both sides of the border. With the help of the Great Lakes Sea Grant Network and regional Remedial Action Plan Committees, it is hoped that student participation can be expanded. The agenda for 1999 will include presentations, workshops and activities designed to inform, inspire and motivate student interest and involvement on issues affecting Areas of Concern throughout the Great Lakes. As with the past two summits, students will have an opportunity to showcase research and environmental projects they are involved with in their areas of the Great Lakes basin. These inspiring presentations have been a highlight of past summits, and organizers hope these dramatic presentations will once again demonstrate the commitment that students have to protecting the Great Lakes ecosystem.

The 1999 Great Lakes Student Summit is being sponsored by the County of Erie, and the Erie County Environmental Education Institute, in cooperation with the Great Lakes Program at the University at Buffalo, New York Sea Grant, and the Great Lakes Center at Buffalo State College. For further information on the summit contact John Hood using e-mail at: hoodj@cdbg.co.erie.ny.us or by phone at (716) 858-6370.



Recent Publications



*great lakes
program*

- David C.J.D. Hoyal, Marcus I. Bursik, Joseph F. Atkinson, and Joseph V. DePinto. Filtration Enhances Suspended Sediment Deposition from Surface Water to Granular Permeable Beds, *Water, Air and Soil Pollution* 99:157-171, 1997
- Monograph No. 12: "Lake Ontario Research and Management Workshop", Proceedings of a two-day workshop, Sept. 10-11, 1998 (\$10.00)
- Monograph No. 11: "Proposed Chlorine Sunsetting in the Great Lakes Basin: Policy Implications for New York State", Joseph V. DePinto and Jack Manno (\$10.00)

For a complete list of publications by the Great Lakes Program, visit the GLP website at wings.buffalo.edu/glp/glppub.html. To order by mail, please send a check made out to 'UB Foundation Activities' along with your order to: Great Lakes Program, State University of New York at Buffalo, 202 Jarvis Hall, Buffalo, NY 14260-4400. Phone orders at (716) 645-2088 or fax (716) 645-3667. Requests can be emailed to moshenko@eng.buffalo.edu.

Great Lakes Directory Available Online

The New York Coalition of Great Lakes Legislators recently identified the need for useable reference tools that legislators can easily access to assist them in understanding the players and policies which influence Great Lakes management issues. The Great Lakes Program, University at Buffalo and New York Sea Grant were funded last year by the GLRC and the New York Great Lakes Protection Fund to develop a searchable database. With the new database, legislators, staff members, agency representatives, extension staff, and others can obtain up-to-date information and contacts to help them with their responsibilities regarding the Great Lakes. The development of the Lower Great Lakes Database will also give agency staff members, Sea Grant extension specialists, researchers, administrators and students resources and contacts for joint projects and collaborative efforts. The site can be accessed at wings.buffalo.edu/glp/database/index.html.

Great Lakes Program Unveils New Web Site!

The University of Buffalo's Great Lakes Program recently updated its website to include several new features including information about the Great Lakes Program, recent news, a list of the Engineering Seminar Series (Spring 1999), descriptions of current research projects, online access to "Perspectives" and the "Great Lakes Research Review", a list of recent publications and links to other environmental resources. The site can be found at wings.buffalo.edu/glp/main.html.

Research News and Announcements


Upcoming GL Conferences and Workshops

April 26-28th "Sharing Knowledge, Linking Sciences: Transitions in the St. Lawrence River." An International Conference on the St. Lawrence River Ecosystem, 1999 NAV CAN Conference and Training Centre, Cornwall, Ontario. Conference information can be found at www.glen-net.ca/slr/ies/

April 29 - May 2 AWRA Mid-Atlantic Conference; Unified Watershed Assessment: Where do we go from here? April 15-16, 1999, Best Western Inn at Hunt's Landing, 900 Routes 6 & 209, Matamoras, Pennsylvania 18336, 717-491-2400, fax 491-2422

May 24-28 International Association of Great Lakes Research. Case Western University, Cleveland, Ohio. For more information see below.

June 11-13 -17th Annual General Meeting, Great Lakes United, in Hamilton, Ont. at McMaster University. For more info contact glu@igc.apc.org

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 **IAGLR '98 Conference May 24-28**

The International Association for Great Lakes Research will hold its 42nd annual conference on Great Lakes Research May 24-28 at Case Western Reserve University in Cleveland, Ohio. At this conference researchers exchange information on all aspects of great lakes from around the world. The theme of this year's conference is Great Lakes, Great Science, Great Cities. Pre-registration deadline is May 1. Members of IAGLR will receive registration information and further details in IAGLR's April Lakes Letter. Non-members may contact Wendy Foster (313-747-1673) at the IAGLR business office to receive registration materials or visit IAGLR's website at www.iaglr.org.

Consortium Funds Research Task Forces for 1998-99

Dr. Margaret Shannon at the University of Buffalo, is leading a new task force which examines governance processes in the Great Lakes. Dr. Shannon and colleagues at SUNY College of Environmental Science & Forestry and the University of Waterloo are developing a core group of researchers, scholars, and practitioners interested and active in Great Lakes governance issues. One of their goals is to increase the research capacity and funding for Great Lakes governance research. As their first step, the task force intends to develop a questionnaire to assess how different agency programs are achieving their goals. For more information contact Dr. Shannon by email at mshannon@acsu.buffalo.edu.

Dr. Gordon Fraser, Director of the Great Lakes Center for Environmental Research and Education at Buffalo State College is forming a brand new task force to look at climate change and its effects on the Great Lakes. This global problem may significantly affect the earth's weather, water levels, and biota including the Great Lakes but these effects are uncertain. This task force is considering the possible consequences of climate change on the Great Lakes and developing research to address these concerns. Anyone interested in joining the task force should contact Dr. Fraser by email at frasersg@buffalostate.edu.

Funding was also given for continuing a task force that has been researching persistent organic pollutants with respect to their transport to, deposition in, or emission from Lakes Erie, Ontario and the St. Lawrence River. This year's task force, led by **Dr. Philip K. Hopke** of Clarkson University, includes members from Clarkson, SUNY-Fredonia

and SUNY-Oswego. For more information, contact Dr. Hopke by email at hopkepk@draco.clarkson.edu

A Task Force is intended to increase the Consortium's capacity for addressing research topic areas by developing research proposals or policy, attending meetings, or providing technical assistance on behalf of the Consortium. In the past, the Consortium has supported task groups on neurotoxicology, modeling ecosystem dynamics, taste and odor problems in drinking water, Great Lakes education and others. For more information, contact Jack Manno at jpmanno@mailbox.syr.edu

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Great Lakes Research Review

Several years ago, staff from the Great Lakes Program, The Great Lakes Research Consortium and New York Sea Grant realized that an information gap existed between peer reviewed journals and newsletter type information related to Great Lakes research. The *Great Lakes Research Review* was created to fill that gap by providing a substantive overview of research being conducted throughout the basin.

THE UPCOMING ISSUE:

The fourth volume of the *Great Lakes Research Review* focuses on research being conducted in the Lake Ontario-St. Lawrence River ecosystem. Those who may have questions or are interested in submitting an article to the second issue of this volume should contact Jack Manno, Executive Director of the Great Lakes Research Consortium at 315-470-6816 or jpmanno@mailbox.syr.edu.

More Research News and Announcements

EPA Funding Opportunities

Support for Research on Airborne Particulate Matter Health Effects. Awards will be up to \$200,000 per year with a duration of up to three years. Deadline: 6/2/99 Contact: Deran Pashayan, Natl. Ctr. for Env. Res./Quality Assur., 401 M Street, S.W., Washington, DC 20460, pashayan.deran@epamail.epa.gov, <http://www.epa.gov/ncercqa>, 202-564-6913.

Support for Research on Drinking Water. The projected award is up to \$175,000 per year with a duration of two or three years. Deadline: 5/19/99 Contact: William Stelz, Natl. Ctr. for Env. Res./Quality Assur., 401 M Street, S.W., Washington, DC 20460, stelz.william@epamail.epa.gov, <http://www.epa.gov/ncercqa>, 202-564-6834.

Support for Research on Combustion Emissions. Support is provided to academic and nonprofit institutions located in the U.S., and state or local governments for research on topics that will supplement current understanding of risks posed by the emission of contaminants from hazardous waste incinerators and combustion facilities. Proposals may request funding for projects up to \$125,000 per year, with a duration of up to three years. Deadline: 5/19/99. Contact: Thomas Veirs, Natl. Ctr. for Env. Res./Quality Assur., 401 M Street, S.W., Washington, DC 20460, veirs.thomas@epamail.epa.gov, <http://www.epa.gov/ncercqa>, 202-564-6831.

Support for Research in Info. & Computing Tech. for Multi-Discipline Ecosystem Modeling. Support is provided to academic and nonprofit institutions, and state or local governments for proposals aimed at developing high performance information and computing technologies for use in ecosystem assessment and management. The

projected award range is up to \$300,000 per year for up to three years. Deadline: 5/12/99. Contact: Chris Saint, Natl. Ctr. for Env. Res./Quality Assur., 401 M Street, S.W., Washington, DC 20460, saint.chris@epamail.epa.gov, <http://www.epa.gov/ncercqa>, 202-564-6909.

Support for Exploratory Research.

Support is provided to academic and nonprofit organizations, and state or local agencies for innovative, and possibly high risk, research that may help define and understand significant environmental problems emerging in the future and describe approaches to addressing current problems requiring more innovative solutions. The project award range is from \$75,000 to \$125,000 per year for up to two years. Deadline: 6/23/99. Contact: Bala Krishnan, Natl. Ctr. for Env. Res./Quality Assur., 401 M Street, S.W., Washington, DC 20460, krishnan.bala@epamail.epa.gov, <http://www.epa.gov/ncercqa>, 202-564-6832.

EPA/NSF/USDA Support for Water and Watersheds Research.

Support is provided to academic and nonprofit institutions located in the U.S., and state and local governments to develop an improved understanding of the natural and anthropogenic processes that govern the quantity, quality, and availability of water resources in natural and human-dominated systems. Awards are expected to range from \$100,000 to \$300,000 per year for two to three years. Deadline: 5/28/99 Contact: Dr. Robert E. Menzer, National Center for Environmental, Research and Quality Assurance (8703R), 401 M Street, S.W., Washington, DC 20460, menzer.robert@epa.gov. Web Site: <http://www.epa.gov/ncercqa> Tel: 202-564-6849

Directory of St. Lawrence River- Lake Ontario Scientists Will Be Compiled

Dr. David Lean at the University of Ottawa, Department of Biology is a member of the Steering Committee of the Bi-national St. Lawrence River-Lake Ontario Research Initiative (see page 1) in collaboration with the Great Lakes Consortium, Syracuse New York. As one step toward better collaboration between scientists, we are putting together a directory of scientists. This network will be a tool for scientists to communicate and share their common interest. We need to know where you are working and what are your interests. Our aim is to have this directory ready for distribution at this year's conference April 26-28, 1999 in Cornwall, ON. We can accomplish more when we know what each other is doing. Such cooperation also provides an excellent opportunity to integrate programs that stand a better chance in receiving major funding. If you are interested in being part of this directory please reply to ccollard@riverinstitute.com with your name, address, affiliation, contact information and about 10 lines or less to describe your plans or interests for research on the St. Lawrence River and its tributaries. Contact: Christina Collard (For David Lean, Administrator and Conference Co-ordinator), St. Lawrence River Institute of Environmental Sciences, 1111 Montreal Road, Suite 144, Cornwall, ON, K6H 1E1, 613-936-6620 Fax: 613-936-1803, ccollard@riverinstitute.com, Website: <http://www.riverinstitute.com>





Projects Initiated by the Consortium in 1998/99

This year, through the Consortium's (GLRC) small grants program and the New York Great Lakes Protection Fund small grants program, the GLRC was able to initiate fifteen new research and education projects. The grants awarded this year will fund projects in a wide range of subjects, including fish & wildlife, persistent toxins in the environment, remediation technologies, and community education & governance. The teams include researchers from member schools, as well as other colleges and universities and community organizations.

FISH AND WILDLIFE

Role of Lipids in Cold Tolerance of Alewife and Blueback Herring



This research focuses on two related species, alewife and blueback herring, who are not native to the Great Lakes, but who have established themselves as part of the ecosystem. In some years, alewives experience large die-offs usually during harsh winters. It is thought that a combination of poor condition and low temperature is the cause of these deaths. Because these species have become an important part of the Great Lakes ecosystem, both as forage fish and prey for larger fish, the ability to predict their die-offs has been identified as a critical need in planning for the stocking of Great Lakes fisheries. Randal J. Snyder of Buffalo State; Todd Hennessey from SUNY Buffalo and David MacNeill of NY Sea Grant hope to develop models to predict the occurrence of alewife and blueback herring die-offs so that fisheries biologists can make informed management decisions regarding Great Lakes fisheries. For further information, contact: Dr. Snyder at snyderrj@buffalostate.edu.

Assigning Conservation Priorities to Great Lakes Coastal Habitats Used by Migrating Songbirds

In their last State of the Lakes Ecosystem Conference, the US EPA and Environment Canada rated the ecological health of Lakes Ontario and Erie's nearshore as mixed or poor and deteriorating. New research by Therese M. Donovan of SUNY-ESF and Christopher Norment of SUNY-Brockport will study some of these habitats and the effects they may have on migrant birds. Their project involves assigning conservation priorities to Great Lakes coastal habitats used by migrating songbirds. The team is conducting extensive research, using Doppler radar technology, to identify sites along Lake Ontario and Lake Erie that consistently host large numbers of migrant birds. They will pass this information along to land managers and conservation agencies in the region. For further information, contact: Dr. Donovan at donovan@mailbox.syr.edu

Lake Ontario Atlantic Salmon Workshop: Biology, Conservation and Restoration



Atlantic salmon was once a major part of New York's fish community as well as an important economic resource. Today only a small population of this species exists within New York State. Many factors have been identified as possible causes of their decline, among them dam building, overfishing, deforestation, decreased water quality and the introduction of non-native species, such as the alewife. These factors could continue to impede restoration efforts. This workshop brought together members of a task group to exchange information, focus and coordinate activities, discuss research needs and propose specific actions to move them forward on the implementation of a renewed Atlantic salmon restoration and management program in the Great Lakes. The workshop took place in the Fall of 1998 at SUNY-ESF, and consisted of a series of presentations by experts conducting research on Atlantic Salmon in New York, Canada and the Northeast. For further information, contact: Dr. Neil Ringler of SUNY ESF at nmringle@mailbox.syr.edu

Application of Otolith Microchemistry to Assessment of Thermal History and Metabolic Processes in Great Lakes Fishes

This research applies a promising new technique to study the life history of Great Lakes fishes. William Patterson of Syracuse University, and Donald Stewart of SUNY ESF are using a chemical compound to study otoliths, the bony structures in the inner ear of fish, in order to better understand the growth of these fishes. The team is looking at samples from several different species of Great Lakes fish each year. This study aids in analyzing the effects of fishery management on the population dynamics of these fish. For further information, contact: Dr. Patterson at wppatter@syr.edu



More Projects Initiated In 1998/99

COMMUNITY EDUCATION AND GOVERNANCE

Pollution Prevention in the Great Lakes: An Industry-University Crossdisciplinary Course

The survival of the chemical process industry in the Great Lakes Region is threatened by two challenges: international competition and stringent emission regulations. To meet emission standards, the industry has traditionally implemented pollution abatement strategies that result in a substantial cost to companies. This cost is forcing the US industry to adopt a new paradigm called "pollution prevention." This approach integrates pollution abatement strategy into the process design stage itself, which leads to manufacturing processes that minimize waste generation. To accomplish this reengineering process, a new generation of design engineers with the skills to incorporate environmental considerations is needed. The goal of the project by Ashish Gupta and Joseph DePinto of SUNY-Buffalo and Scott Weber of NYS-CIWM, is to design, develop and teach a case-study based course on pollution prevention in the Great Lakes that will initiate technology transfer from research institutions to industry, and will enhance the adoption of integrated waste reduction approaches into regional industry. For further information, contact: Dr. Gupta at ashishg@eng.buffalo.edu.

The Creation of Reference Tools to Increase Involvement of New York Legislators in Great Lakes Policy

See article on Page 9. For further information, contact: Dr. Senecah at ssenecah@mailbox.syr.edu

Great Lakes Pollutant Discharge Mapping and Education Project

In 1996, New York state approved the Discharge Notification Act, which requires all facilities that have a permit and discharge into the state's surface waters to post a sign identifying the outfall point and provide citizens with information about how to find out more about the discharge. Runoff from heavy rainfall or snow melt causes an increase in the volume of untreated wastewater to sewage treatment plants. Combined sewer overflows (CSOs) are deliberate discharge points used to release untreated sewage which can't be processed by the sewage treatment plant during periods of high flows. Sanitary sewer overflows, or SSOs are points where untreated sewage flows from failing infrastructure or manhole covers. This project is mapping where SSOs and CSOs are entering directly into Lake Erie and its tributaries in Erie County, and distributing this information to interested Great Lakes stakeholders. Topographical models will be used along with the map at public events, schools and workshops to help educate the public on how to reduce the impact from these sources of pollution. For further information, contact Sarah J. Meyland, of the Citizens Environmental Research Institute at (516) 390-7150.



Loosening the Social and Environmental Knots in Big Hollow Brook

This project involves local community teachers, and scientific expertise in the assessment of water quality in a small watershed on the St. Lawrence River. Karen Vermillion of the St. Regis River Association and Jan Wojcik of Clarkson University are conducting the project. Members of the Association are contacting local landowners to help them assess how well their septic systems are working and are helping fund improvements to those septic systems found to be failing. Association member teachers are also teaching courses about real-life application of scientific expertise to environmental remediation. Field work in the courses bring students to landowners and involve them in the project. The Association hopes that this project will lead to the re-opening of swimming facilities and the reintroduction of brook trout to Big Hollow Brook. For further information, contact Dr. Vermillion at the St. Regis River Assoc. (315) 265-5438.

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Emerging Issues

(Continued from page 6)
associated with them. For example, higher water temperature may increase the risk for bacterial contamination which may increase costs associated with drinking water, but it may also extend the swimming and boating season which may have positive effects on the economy due to increases in tourism. It's these kinds of paradoxes and interconnectivity that leave us with a need for research on potential impacts from global climate change. For more information contact Dr. Fraser at fraser@buffalostate.edu.



More Projects Initiated In 1998/99

COMMUNITY EDUCATION

(continued from page 13)

Analysis of Herpetofaunal Distributions in Wetlands of the Eastern Great Lakes: Public Participation Phase

Amphibians and reptiles play significant roles in all wetland ecosystems, including wetlands of the Great Lakes. They are predators on numerous insects and are important food for many large vertebrates. In addition, amphibians act as important indicators of environmental quality because they utilize both aquatic and terrestrial aspects of Great Lakes ecosystems, and they are especially sensitive to their surroundings. Numerous studies around the world have indicated that amphibian populations are declining, but these results are inconclusive due to the lack of adequate surveys. This project is encouraging public participation in surveys by providing high school science classes with teaching materials, instructions, classroom visits by biologists, and a comprehensive, interesting web site about reptiles and amphibians of the region. The high school classes and their teachers will be encouraged and instructed in collecting survey data for amphibian and reptile populations. The completed project will result in a set of baseline data for the distributions of herpetofaunal populations of the region, an analysis of these distributions in relation to specific environmental and land-use variables, a better informed general public, and a collaborative network of university researchers, state biologists, and volunteers. For further information, contact: Dr. Ducey at duceyp@cornell.edu



REMEDIATION TECHNOLOGY

The Role of Vegetation in Reducing Bioavailable PAH Concentrations

High levels of polycyclic aromatic hydrocarbons, or PAHs, pose a threat to natural and economic resources of the Great Lakes because of their potential to endanger human and wildlife health. Dr. Ruth Yanai and David McMillan of SUNY-ESF and their associates are studying the potential for reducing the amounts of PAH entering public waterways in New York State by phytoremediation, a relatively new clean-up technology that uses plants to remediate PAH contaminated soils. The goal of this research is to describe soil development associated with the ecological restoration of recently deposited sediments dredged from New York's canal systems. Through the publishing of these results, we will gain an improved understanding of the potential for reductions in human health risk through vegetation re-establishment and soil development. For further information, contact Dr. Yanai at (315) 470-6955.

Management of Greenhouse Gas Emissions from Artificial Wetlands Processing Wastewater

Emissions of greenhouse gases such as carbon dioxide and methane are thought to contribute to the problems associated with global warming. Artificial wetlands which are constructed to process wastewater may be emitting large amounts of greenhouse gases to the atmosphere. The purpose of this project is to measure the effects of wetland plants on reducing seasonal greenhouse gas emissions during the treatment of domestic wastewater flowing through artificial wetlands. The project also develops better collabora-

tion and fostering communications between faculty and students from Clarkson University and Plattsburgh State University. For further information, contact project collaborators Donald Adams of SUNY-Plattsburgh at 518-564-4037 or Thomas Young of Clarkson University at tcyoung@draco.clarkson.edu

Use of Novel Enzyme Technology for Removal of Aromatic Pollutants and Colorants from Waste Streams

This research by James P. Nakas and Stuart Tanenbaum of SUNY-ESF explores the use of the oxidative enzyme, laccase, for the bioremediation of selected Great Lakes point-source contamination sites. Specifically, the team intends to use this enzyme to construct a new bioreactor, which is a chamber containing a special barrier that filters water and breaks down chemicals. These are being tested for their ability to remove toxic phenols, chlorophenols, aromatic amines, related colorants and selected pesticide residues from input wastewater streams. Successful results may have positive implications for larger project collaborations, leverage of external funding for anticipated pilot-plant demonstrations, and policy developments based on implementation of biocatalytic membrane reactors for point-source remediations. For further information, contact Dr. Nakas at jpnaikas@mailbox.syr.edu





More Projects Initiated In 1998/99

ATMOSPHERIC DEPOSITION OF PERSISTENT ORGANIC POLLUTANTS

Establishment of Semivolatile Air Monitoring Network for the Southern Great Lakes Basin

This research concentrates on three sites which are ideally suited to study atmospheric transport and deposition related to lake-effect precipitation, a dominant weather factor along the southern and eastern shores of Lakes Ontario and Erie. The accuracy of any model for the Great Lakes could be considerably enhanced by additional data on contaminant volatilization, migration, and redistribution. The ultimate goal of this project is to provide quantitative information on the concentration and composition of organic compounds in air along the southern shore of the Great Lakes basin, and to arrive at a determination of which factors are of significance. Project collaborators include Jeffrey Chiarenzelli, James Pagano & Alfred Stamm of SUNY-Oswego, Michael Milligan from SUNY-Fredonia; and Philip Hopke & Thomas Holsen of Clarkson University. For further information, contact Dr. Chiarenzelli at chiarenz@oswego.edu

Development of an Automated Dry Deposition Sampler to Directly Measure the Dry Depositions of Dioxins

The goals of this project are to design an automated dry deposition sampler that can be used to directly measure dry deposition and to develop analytical techniques to analyze the deposited material for dioxins. The proposed approach is to redesign the automated dry deposition sampler based on proven techniques used in commercial rain samplers. Instead of doors and multiple motors and covers, a roof system and actuator design are used. It

is anticipated that this preliminary work will lead to significant future work to both refine the design of the sampler and deploy the sampler to make dry deposition measurements. Project collaborators include Phil Hopke & Thomas Holsen of Clarkson University, Michael Milligan from SUNY Fredonia and Jeff Chiarenzelli of SUNY Oswego. For further information, contact Dr. Philip Hopke at hopkepk@draco.clarkson.edu.

The Potential for Lake Effect Precipitation to Redistribute Organic Contaminants to Inland Ecosystems

One area significantly effected by lake-effect precipitation is the Tug Hill Plateau region of New York State. This region lies within 30 kilometers of Lake Ontario and is characterized by a rapid increase in elevation from about 80 meters at Lake Ontario to about 300 meters at the plateau. The change in elevation results in cooling of the Lake Ontario derived winds followed by large scale precipitation often resulting in accumulations of more than 100 cm of snow per event. The hypothesis being tested in this project is whether Lake Ontario is a significant source of persistent organic compounds and whether these compounds are accumulating in areas affected by lake effect precipitation. The project is designed to provide an assessment of whether atmospheric redistribution of persistent organic compounds are related to lake-effect events. It forms the basis for an expanded research proposal to gain a better appreciation of the redistribution of persistent organic compounds resulting from volatilization. For further information, contact: Dr. Chiarenzelli at chiarenz@oswego.edu.

Consortium Funds New Equipment Purchase

In order to keep up with the most recent technology, the Consortium this year provided funding for new equipment to **Dr. Joseph Makarewicz** at SUNY-Brockport and his fellow researchers at SUNY-Buffalo and Cornell University. The new equipment, SeaBird SeaLogger CTD (SBE 25), a research grade profiling system for coastal and deep water work, will upgrade the capability of the Consortium to study the waters of the Great Lakes. This acquisition will allow consortium scientists to work faster, cheaper and with more precision, in addition to providing the means to compete with other institutions that have deep water technology. For more information contact Dr. Makarewicz at jmakarew@acspr1.acs.brockport.edu

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GLRC 1999 Spring Seminar Schedule

DATE	SPEAKER	LOCATION/TIME	TITLE
April 23	DEBORA VAN NIJNATTEN University of Windsor	SYRACUSE UNIVERSITY 204-A Maxwell Hall 12:00 Noon	Wistful Reflections of a Northern Neighbour: Canadian Environmental Policy-Making in the 1990s
<i>For more information contact: Lee Cerveny at 315-781-6334 or lkcerven@ican.net</i>			
Apr. 29	RICHARD SEEGAL NYS Dept. of Health SUNY Albany	SUNY Brockport 140 Lennon Hall 4:30-5:30PM	Interactive Neurochemical Effects of Fish-Borne Contaminants
<i>For more information contact: Jim Haynes at 716-395-5783 or jhaynes@brockport.edu</i>			
April 30	JORGE L. ROMEU SUNY Cortland	Clarkson U Room 102 Educational Resources Center 3:30PM	A G PSS Simulation Model for the Design and Optimization of a Network of Small Dams
<i>For more information contact: Thomas Young at 315-268-4430 or tcyoung@clarkson.edu</i>			
TBA	THOMAS YOUNG Clarkson University	SUNY-ESF	Constructed Wetlands for Water Renovation
<i>For more information contact: Don Stewart at 315-470-6924 or djstewart@mailbox.syr.edu</i>			
TBA	HELENE CYR U of Toronto	SUNY Geneseo	Zooplankton Community Size Structure and Taxonomic Composition Affect Size-Selective Grazing in Natural Communities
<i>For more information contact: Robert Simon at 716-245-5007 or simon@uno.cc.geneseo.edu</i>			
TBA	JOHN LOMBARDO SUNY Cortland	SUNY Fredonia	Inhaling & Ingesting PCBs Causes Hyperactivity in Adolescent Male and Female Rats: Implications
<i>For more information contact: Michael Milligan at 716-673-3500 or milligan@fredonia.edu</i>			
TBA	JAMES OLSON SUNY Buffalo	SUNY Albany	Tissue Slices as an <i>in vitro</i> Model for Assessing the Biological Activity of Great Lakes Contaminants in Humans



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