Spring 2000

Volume 12, Number 1

# REPORT

of the Great Lakes Research Consortium

## inside



*Useful Information for New York's Great Lakes Research Community*

# Consortium Grants Pay Off

The Great Lakes Research Consortium has helped generate millions of dollars in outside funding for researchers at its member campuses. This was the result of a recent survey conducted by the Consortium, which followed up on the investments it has made in its small grants program over the last five years.

**For information on this year's grants programs, please see page 9**

Each year the GLRC small grants program provides funds to researchers at New York member institutions who propose research that has the potential for developing into major cooperative projects capable of competing for larger sources of funding. The Consortium also supports research development activities such as workshops and task groups intended to encourage and promote the development of major collaborative research proposals among its members. Occasionally large equipment with significant research capacity is also purchased and shared between campuses.

Investments by the Consortium have apparently paid off for many of the members who have received funding. A follow-up survey conducted this past month shows that Consortium seed grants have generated an estimated five million dollars from a Consortium investment less than one-tenth the size of the pay off. Provided state funding, each year the Consortium invests approximately one hundred thousand dollars to fund small grants for Great Lakes research and research development projects. Despite the instability of securing state funds on an annual basis, the Consortium has continued to dedicate a large portion of its annual budget for supporting Great Lakes research and for maintaining the capacity of New York's research community to compete for funding.

The majority of researchers that responded to the Consortium survey said that the initial start-up funds provided by the Consortium led to larger grants, and many continue to pursue funding based on their initial research objectives. The good news came from GLRC members in many areas of expertise, from scientists who study contaminants to those who study fish. Researchers who received equipment grants said that it helped them meet matching requirements, and bolstered their sampling capabilities. Those who received research development grants for a task group or workshop said that GLRC support and committment to cooperative research helped build collaborations that prevailed over grant proposals that lacked cohesive teams of researchers. Many of these teams still exist and work together on projects.

There are numerous stories of success. For example, the GLRC Atmospheric Deposition Task Group, was formed in 1997 by SUNY Fredonia's Michael Milligan and researchers from Buffalo (Hornbuckle and Vermette) to study the long range transport of persistent toxic substances. Since its inception, the task group has added members from Clarkson University (Hopke and Holsen), SUNY Oswego (Chiarenzelli) and Binghamton University (Graney). Along the way, the GLRC supported several steps toward developing a larger research effort by awarding small equipment grants and support for the task group (total of about $15K). In 1999, the investment paid off when the group received a substantial grant from the New York State Energy Research and Development Agency to expand the scope of their research. For more information, contact task group leader Philip Hopke of Clarkson University at *hopkepk@clarkson.edu.*

# Taking Stock of the GLRC in 2000

## *Commentary from the Executive Director*

*Jack Manno*

The Great Lakes Research Consortium last undertook a strategic planning process in 1991. We thought about what we wanted to accomplish by 1996 and we made plans to achieve those goals. A review of that plan shows that many of the short term goals have been accomplished. Some were probably either not feasible or not wise, and with some we just fell short. We've also made significant progress toward achieving many of our longer term goals. It is probably time again to perform a thorough review of our operations and mission. Our Campus Representatives will meet this summer with members of our Board of Governors in Oswego for a two day retreat to launch a new strategic planning process. You are invited to send me your thoughts and suggestions about the GLRC to *jpmanno@mailbox.syr.edu.* I want to start this process with some of my thoughts about what we've done well and the challenges we face.

*What's positive about the GLRC in the current situation?*
First of all, the fact that we exist is no small accomplishment. When I came to ESF to work with the GLRC, I visited several faculty members to seek their advice about how the Consortium should operate and what it should accomplish. I was surprised by the level of skepticism I found. What I heard was that in academia, interdisciplinary and multi-institutional centers, institutions, consortia and the like are often created but few have staying power. Despite rhetoric to the contrary, the system is not set up to reward cooperative behavior. A young scientist must concentrate on a very narrow segment of a problem in order to make a significant and unique contribution to his or her discipline. The application of environmental knowledge to management and policy is left to others. Accomplished scientists may have more freedom to tackle larger environmental questions but they have enormous demands on their time and attention. In addition, despite all the potential benefits of multi-institutional cooperation in the study of the environment, each institution must look out for its own interests in an increasingly competitive environment. This often creates an atmosphere of distrust. None of the people I consulted back in 1986 believed the GLRC would be around and thriving in the 21st century, yet we are. As I said, it's no small accomplishment.

And we continue to grow. We started in 1986 with 5 member campuses and about fifty participating faculty, some of whom reluctantly joined after a two year period of rancor about who would house the Consortium, how it would be managed and how its funding would be dispersed. The Consortium survived its early years thanks in large part to the persistence and vision of the SUNY Research Foundation's Jim Kalas who saw the GLRC as a potential model for SUNY cooperation (see Kalas tribute, page 9). Also significant was the creative leadership of ESF Provost Bill Tully who offered ESF as the "host" campus (rather than the "lead" campus) and who created the directorate, Board and campus representative structure. The two co-directors Rick Smardon and Bob Werner launched the sequence of research development activities which remains today the basis on which the GLRC operates. Today we have sixteen member campuses in New York and nine affiliated schools in Ontario and well over three hundred participating scientists and scholars. Great Lakes researchers from New York and Ontario are taking the lead in many of the most important scientific and policy issues affecting the Great Lakes. This growth has occurred at the same time that many Great Lakes institutions as well as many cooperative institutions in SUNY have been in decline. This year we've had the largest and most successful seminar series we've ever had (see article, page 10) as well as the biggest turnout yet for our annual student/faculty conference. Many of the research teams that began in the Consortium this year are undertaking major new research projects on the lakes and the range of subjects we are addressing is broader than ever.

Perhaps most significant but most difficult to describe is the cooperative spirit and individual leadership initiative that abounds in the Consortium. This is a group of people who work together very well. All the campus reps and board members have consistently acted in their professional lives with great consideration toward the interests of the GLRC as a whole. In addition, several scientists and scholars have taken leadership in building cooperative, multi-campus research teams in their area of interest. This makes it work- taking individual responsibility for thinking well about the whole. Ultimately this is the basis for a new kind of holistic science which the environment sorely needs.

*What is favorable and unfavorable for our further development?*

The current situation has much that is favorable for the GLRC's further development:

1) Environmental awareness is experiencing yet another of its

many revivals that is likely to continue in the coming period. Economic prosperity raises many questions about how we should invest society's financial resources. Often in our personal finances when we start to catch up, we take the opportunity to repair and improve our homes. Likewise it's time to repair the damage that time and human wear and tear has inflicted on our home, the Earth. The Earth's water systems need some attention, also the air, the heating system, the roof over our head. It is clearly time to reverse the negative trends and begin financing this home improvement. It can't be put off any longer. It's time to call in the experts. Just like you can't fix your home if you don't know the basics of carpentry and home repair, we can't repair the earth without solid knowledge of how the natural systems we rely on work. There has never been a greater need for knowledge of natural systems. We're among those who can obtain that knowledge about the Great Lakes region and it is one of the most important and most precious corners of Creation.

2) The Great Lakes are under enormous stress and this is likely to increase. The lakes have been highly altered by careless human activities. They are subject to radical transformations in food web and natural community structure. Associated stress makes living things even more vulnerable to the effects of harmful chemicals. Throw in the impacts from global climate change and we have the recipe for environmental disasters. No one can predict the form these crises are likely to take but I'm confident that the next several years will hold a few unpleasant surprises. This will further raise public concern and awareness of environmental conditions.

3) There is an increasing appreciation of the need for a multi-disciplinary, complex-systems approach to problem-solving even if there is little experience and even less success at doing it well. Our experience and even greater potential at multi-disciplinary team-building should serve us well in responding to future needs.

4) There is growing interest and political initiative, especially in Western NY, to create a new Great Lakes institute for laboratories and research on the model of major centers in other Great Lakes states, other marine centers such as Woods Hole and others. The recent initiative by the Pataki administration to create such a center for the Hudson River has spurred calls for a similar initiative on the Great Lakes.

5) Our capacity and ability to perform top quality research continues to increase. Many of our schools have invested in the most advanced analytical tools. Our researchers are making significant advances in their ability, for example, to monitor and analyze long-range transport of pollutants, understand and model ecosystem dynamics, utilize remote sensing and satellite data for environmental analysis, and gather a broad range of real time water quality data.

*What is unfavorable for our further development?*

1) Much of the newly revived environmental awareness is focused on global and local rather than regional environmental issues. The unique status the Great Lakes once had, with some of the most highly visible environmental problems, is gone. The Great Lakes are in better shape than in the recent past, while conditions appear to be declining for near shore ocean environments and many of the major river systems in the country. At the same time attention is focused on global environmental problems such as climate change. This tends to shift attention away from the lakes to other major issues.

2) There is an atmosphere of increased competition among universities for students and financial support. This makes it more difficult to sustain a culture of openness and collaboration. In addition, the competition forces organizations to measure success by the amount of research support obtained. With the way we function as a Consortium, research grants accrue to the member schools rather than to the GLRC's central office. We have to get better at documenting our impact, while at the same time distributing credit and resources to our member schools.

3) Many of our most successful researchers are nearing retirement, have left a member school or have become involved in other types of research. Although we have many new junior faculty interested in Great Lakes environmental research we have lost a great deal of skill, reputation and experience.

The GLRC is a uniquely cooperative venture that has learned how to foster collaboration in environmental research. This spirit will hopefully grow as we address the problems we face and plan a successful future for our organization.


## GLRC Report

Editors: Jack Manno and
Michael Connerton


## Great Lakes Research Consortium

The Consortiums'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
Binghamton University
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
SUNY Plattsburgh
SUNY Potsdam
Rochester Institute of Technology
Syracuse University



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# Tenth Annual Conference Biggest Ever

Whether it was the beautiful weather, the added membership, or the luck of the Irish, a large crowd of students and faculty gathered together on March 17-18 to attend the Consortium's tenth annual conference at SUNY College of Environmental Science and Forestry in Syracuse.

Over sixty students from nearly every member campus and several Canadian affiliates presented their research to an interested crowd of nearly one hundred environmental chemists, engineers, toxicologists, biologists, and others delighted to celebrate the St. Patrick's Day weekend with a good dose of Great Lakes research. The conference date was moved from February to March this year to avoid the stormy weather of previous conferences. The move paid off with almost fifty percent more presentations from undergraduate and graduate students than last year. With increased participation came new sessions in atmospheric deposition, remote sensing, and methods of assessing water quality. Faculty participation also increased, as many new members assisted as session moderators, awards judges or whatever else it took to help make the conference a rousing success!

The conference began on Friday afternoon with students and faculty greeted by pizza, refreshments, and welcoming remarks from SUNY ESF Provost and GLRC Board member **William Tully**. Dr. Tully reminded everyone about the uniqueness of the Consortium and the special role that it has played for nearly fifteen years in facilitating research and scholarship on Great Lakes problems in New York and throughout the Basin. One of the highlights of the Consortium's activities has always been its annual conference, which for ten years has brought faculty and their students together to share information, develop partnerships, and remind themselves how important their research is to the Great Lakes ecosystem.

**KEYNOTE SPEAKER**

The keynote speaker **Michael Gilbertson** from the International Joint Commission also reminded everyone about the difference that their research has made, and can make, to the policies governing Great Lakes water quality. He and many others have been investigating the effects of persistent toxic substances on human and wildlife populations for over thirty years. He spoke about how scientists are required to "prove" causal relationships between injuries to biota and exposure to persistent toxic substances. This proof is necessary for them to

*Michael Gilbertson*

make unconditional statements about the link between specific chemicals and the injuries they cause. This slows the development of effective policies to regulate these chemicals, their discharge and cleanup. Recent developments in the area of forensic toxicology and causality have created a shift in thinking about the criteria necessary for scientists to make statements about "actual effects" and managers to take the regulatory action to minimize those effects. Michael provided a list of these causality criteria and then he described evidence to meet each one. Along with the evidence, he emphasized the long list of scientists who have contributed to the research that has been so important in galvanizing the scientific foundations of regulatory action such as the Great Lakes Water Quality Agreement. Michael's presentation gave the students and faculty a great sense of the importance of the research they do. For more information about causality, the regulatory process and the GLWQA, Mike Gilbertson can be reached by email at *GilbertsonM@ijc.wincom.net.*

# Awards for Excellence Presented to Students

On March 17-18, the Great Lakes Research Consortium held its tenth annual Student Faculty Conference in conjunction with New York Sea Grant Institute. 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 their superior achievement, a Don Rennie Memorial Award was awarded to each of the following:

**Remote Sensing**

**David Bonter**, SUNY College of Environmental Science and Forestry, for his presentation "Nearshore Habitat Priorities for Migratory Passerines"

**Environmental Engineering**

**Jagjit Kaur**, SUNY at Buffalo, for her presentation, "Modeling the Effect of Zebra Mussels (*Dreissena polymorpha*) on PCB Cycling in Saginaw Bay".

**Poster Presentation**

**Mary Arnold**, SUNY Brockport, for her poster, "The Paleolimnology of Sodus Bay"

**Fisheries and Ecology**

**Brian Smith,** SUNY College of Environmental Science & Forestry, for his presentation, "Year Class Formation in St Lawrence River Northern Pike"

**Fisheries and Ecology**

**Adam Zerrenner,** University of Vermont, School of Natural Resources, for his presentation "Compensatory Mechanisms: Implications for Sea Lamprey Control"

**Joe DePinto Memorial Award**

**Rolando Raqueño**, Rochester Institute of Technology for his presentation "Hyperspectral Analysis Tools for the Multiparameter Inversion of Water Quality Factors in Coastal Regions."

**Chemistry and Toxicology**

**Tina Battaglia** of SUNY Fredonia for her outstanding student presentation " Field Study of the Atmospheric Concentrations of Polyaromatic Hydrocarbons (PAH) in the Great Lakes Region of New York State."

# Great Lakes Education Initiatives

## ALCAN Aluminum Continues Support for Undergraduate Research

The Alcan Aluminum Corporation of Cleveland, Ohio has agreed to continue its support of an undergraduate fellowship begun last year with the Great Lakes Research Consortium. The Corporation matched the contributions of four Consortium member campuses to provide support for promising undergraduates who are conducting Great Lakes related research at their respective colleges. This year's GLRC-Alcan fellowships were offered to students at Buffalo State College, Clarkson University, SUNY ESF, and the University of Ottawa. All of the campuses have identified students that will benefit from the fellowship. They will be working on their projects this summer.

Last year's fellowship recipients gave presentations at this year's GLRC conference in March. The fellowship enabled Jeffrey Diers of SUNY Geneseo to learn about Lake Erie's inshore communities and the importance of these areas for juvenile life stages of fish. Jon Duncan of SUNY Geneseo examined long -term changes of macrophytes in Conesus Lake and found that many things can affect their biomass and species composition including nutrients and storms. Heather Gewandter, also of Geneseo, studied zebra mussels and learned that their spawning coincides with bright moonlight. Ellen Lawrence of SUNY Cortland analyzed animal tissues for PCBs and learned how congeners are allocated differently to brain, liver, and fat. Suzanne Knowles of Syracuse University studied the diversions of water from the Great Lakes and the policy surrounding this issue. All of the students did an impressive job.

Consortium members can look forward to the research results of this year's fellowship recipients at next year's conference. For more information contact Jack Manno at *jpmanno@mailbox. syr.edu.*

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 leading international aluminum companies in the world and a leading producer of rolled aluminum products.

## GLRC Explores Possibilities for Great Lakes Academic Program

Several members of the Consortium recently formed a task group in order to assess the policies and procedures needed to effectively implement an inter-campus academic program focused on teaching Great Lakes topics to graduate and undergraduate students within the Consortium.

The new task group, led by SUNY Brockport's **Jim Haynes** seeks to explore the possibilities for utilizing the vast expertise of Consortium faculty to educate students on issues related to the Great Lakes. As a first step, the task force conducted a survey at this year's annual conference in order to assess the desires of students and faculty about the kinds of topics and format of courses they would like to see offered in such a program. Next, the task group will assess the potential mechanisms that are required to enable Consortium member institutions to develop and implement inter-campus academic programs. Because the Consortium is comprised of both state and independent institutions, and because state and campus policies are not necessariliy conducive to inter-campus participation, collaborative academic programs are often difficult or impossible to implement. The task group will identify the major impediments and develop a set of recommendations to overcome any hurdles they find.

The task group will report their findings to the GLRC Board of Governors in June. For more information contact Dr. Haynes at *jhaynes@brockport.edu.*

*Alcan representatives stand with student and faculty of this year's fellowship schools. From left to right, Steve Dubois and Peter Segretto (Alcan), Karin Limburg (ESF), Harry Belizaire (U. Ottawa), David Lean (U. Ottawa), and Tom Young (Clarkson University).*

# Campus Updates...*Consortium Grows to Sixteen Campuses*

**Buffalo State College** participates in the GLRC primarily through its Great Lakes Center for Environmental Research and Education, including its Laboratory for Environmental Toxicology. The Center's research, led by **Dr. Gordon Fraser** is currently focused on erosion rates of Great Lakes shorelines, the effects and control of zebra mussels, and 3D imaging of the variation of water quality in the Great Lakes. Buffalo State is currently joining efforts with the University at Buffalo and SUNY Brockport in hopes on establishing a Great Lakes research institute in Western New York.

Researchers at **Clarkson University**'s Rowley Laboratory for Civil and Environmental Engineering continue to make major contributions in the research areas of physical, chemical and biological treatment processes, oil and chemical spills, and air transport and deposition of environmental contaminants. **Dr. Tom Young** has been active in the Consortium's efforts to improve the modeling of the fate and transport of toxic substances in Lake Ontario as well as the GLRC's task force on academic programs.

Scientists at **Cornell University** research Great Lakes exotic species, freshwater zooplankton, fish-zooplankton interactions, the role of alewife predation on lake trout, and chemical contaminants in Great Lakes sportsfish, as well as water resources management and assessment of Great Lakes policy agreements. Researchers at Cornell and colleagues from GLRC schools are embarking on three new Sea Grant funded projects. The projects include: 1) the early life history of salmonines in Lake Ontario (with SUNY-ESF, Syracuse University, NYSDEC, USGS, SUNY-Brockport, University of Toronto, and Ontario Ministry of Natural Resources), 2) the ecology of a new invader to the Great Lakes (*Cercopagis pengoi),* with SUNY Brockport, and 3) using zooplankton as an index of biotic integrity in the Great Lakes (with the Canadian Center of Inland Waters and the Freshwater Institute in Winnipeg). The Cornell Biological Field Station is seeking a fisheries ecologist whose focus would be on inland waters of New York State. Researchers at Cornell and elsewhere are developing a synthesis paper as a sequel to the late Jack Christie's paper on Salmonid Communities in Oligotrophic Lakes (SCOL) for Lake Ontario. The Great Lakes Fishery Commission is organized SCOL II for all the Great Lakes and colleagues from Cornell, SUNY-ESF, and SUNY Brockport were involved in this landmark event.

Scientists at **SUNY Albany**'s Wadsworth Center School of Public Health contribute to the work of the GLRC as they study the neurotoxicity of fish-borne contaminants, the system effect of PCBs, biodegradation of xenobiotics, and the global nitrogen cycle. For the past several years the program has focused on human health effects of contaminants in the St. Lawrence River, particularly near the Mohawk nation of Akwesasne.

Researchers at **SUNY Brockport**'s department of Biological Sciences are researching plankton dynamics, aquatic nuisance species, watershed ecology, eutrophication, fish habitats and biological indicators of stream health. **Dr. Jim Haynes** recently led the GLRC's academic program assessment (see related article). They also contribute to the GLRC in the area of environmental analysis and education programs. Brockport has recently hired a new benthic ecologist, **Dr. Pat Harris**.

The **University at Buffalo**'s main connection with the GLRC is through its Great Lakes Program, the mission of which is to develop, evaluate, and synthesize scientific and technical knowledge on the Great Lakes ecosystem in support of public education and policy formation. Longtime director, **Dr. Joseph DePinto** is leaving the program (see related article) and will be succeeded by **Dr. Joseph Atkinson**. The current research focuses on the development of a long term plan to improve modeling capabilities for toxic chemicals in Lake Ontario, the analysis of the impact of zebra mussels on phytoplankton and PCB dynamics in Lake Erie, and the atmospheric deposition of PCBs, trans-nonachlor, atrazine and nutrients to Lake Michigan.

At **SUNY Cortland**, researchers are looking into the effects of environmental toxins on humans, plants and amphibians, the environmental conditions that influence the distribution of PCBs, and aquatic biogeochemistry with emphasis on streams, wetlands and lakes. **Dr. John Lombardo** is continuing his research that may shed light on possible connections between PCB exposure and hyperactivity in humans.

At **SUNY College of Environmental Science and Forestry**, Great Lakes related research is being conducted in the areas of wetlands management and policy, ecosystems modeling, chlorinated hydrocarbons in the Great Lakes, fish behavior and ecology, larval fish ecology, trophic interactions and population dynamics of fishes, St. Lawrence fisheries, and fish and bird metabolism. **Dr. Richard Smardon** and GLRC Executive Director **Jack Manno** are teaching a course on Great Lakes Policy. Several new researchers with Great Lakes related interests have recently joined the ESF faculty — **Drs. Beth Boyer** and **Ted Endreny**, hydrologists with interest in watershed management and nutrient dynamics, **Dr. Karin Limburg**, a systems ecologist with interest in fish ecology and **Dr. Kim Schulz**, an ecologist who studies food web dynamics.

GLRC researchers at **SUNY Fredonia** are studying freshwater bivalve physiology, the formation of trace pollutants, and analyzing chlorinated organics. For the past two years **Dr. Michael Milligan** has co-chaired the Consortium's task force on atmospheric transport and deposition of toxic substances which has focused on improving high volume sampling methods for analyses of PAHs, PCBs and pesticides. The group has begun a new project with support of the New York Sate Energy Research and Development Agency to determine relative contributions of Midwest and New York power plants to the load of airborne pollutants in New York.

Researchers at **SUNY Geneseo** are focusing their work on microbial ecology of stressed environments, air/water interface, hypersaline environments, groundwater and river erosion, and post-glacial Lake Ontario water level changes.

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**Binghamton University** is one of four campuses to join the Great Lakes Research Consortium this year. There has been considerable enthusiasm among the faculty in exploring ways they can contribute to Great Lakes research. Already Binghamton scientists have taken the lead on developing new areas of research for the GLRC. Geologist **Dr. Joseph Graney** is developing methods for improving the analytical capabilities of the GLRC atmospheric deposition task force in its efforts to better characterize the amounts and types of pollution deposited on New York's Great Lakes watershed from distant sources. Dr. Graney's demonstration project will improve our capability to track the source and fate of trace metals measured in aerosol samples. Another Binghamton project led by Dr. **Omowunmi Sadik** is developing biosensors for in-situ monitoring of PCBs.

**Rochester Institute of Technology**, new to the consortium this year, is initiating a new Environmental Science program directed by **Dr. John Waud** with strong emphasis on issues pertaining to the Great Lakes. The program offers a sequence of courses that involve extensive field work. This year-long sequence uses the Great Lakes as a venue to present important environmental principles and to address environmental issues. In addition, researchers at the Chester F. Carlson Center for Imaging Science are studying hyperspectral remote sensing as applied to water quality, GIS projects dealing with Great Lakes diversity and the tracking of water quality in the Great Lakes basin.

**SUNY Plattsburgh**, new to the consortium this year, will participate in the Consortium primarily through the Lake Champlain Research Institute. The Institute was established in 1996 to support basic and applied research on freshwater ecosystems in the Lake Champlain basin and the Adirondacks. The Director is **Dr. Tim Mihuc**. The Institute has both laboratory and field-based facilities. This summer the Institute is sponsoring undergraduate research programs funded by the National Science Foundation. They will also host high school students for a ten day program on the Adirondacks and Lake Champlain. There will also be a workshop for limnology teachers held in August. For more information contact Tim Mihuc at *timothy.mihuc@plattsburgh.edu.*

Another new partner in our consortium, **SUNY Potsdam**, is active with the GLRC through their involvement with the St. Lawrence Aquarium and Ecological Center and the Great Rivers Research Institute. Among current research projects are the conservation biology of endangered species, microbial populations of bodies of water in the Great Lakes region, and the social impact of oil spills. **Dr. Glenn Johnson**, is co-chairing the GLRC's task force on reptiles and amphibians in the Great Lakes.

## Campus Updates...continued from page 6

At the Environmental Research Center at **SUNY Oswego**, scientists are at work on several projects involving Great Lakes contaminants. The Center does congener-specific PCB analysis for researchers at Oswego and others. Research at Oswego includes studies of reptiles and amphibians in the Great Lakes and studies assessing the effects on laboratory rats fed Lake Ontario salmon. The biology department has developed an interdisciplinary course focusing on the interactions of biological, geological and environmental components of the Great Lakes ecosystem.

Researchers at **Syracuse University** are studying the transport of PCBs and other contaminants through soils and air, aquatic chemistry, and light stable isotope geochemistry. Dr. Harry Lambright at the Maxwell School of Public Policy have been working with colleagues at the University of Windsor on U.S./ Canada transboundary environmental relations. **Dr. Christine Mayer**, is a new member of the Biology faculty and is part of a team of researchers (Cornell, SUNY Brockport) working this summer on a project concerned with the introduction of an exotic amphipod to Lake Ontario. **Drs. Hank Mullins** and **Bill Patterson**, Earth Sciences department, are working on a GLRC funded project to describe the ecological history of Lake Ontario.

# Call for Papers: 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 fifth volume of the *Great Lakes Research Review* focuses on research being conducted in the Lake Erie 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.*

# Projects Initiated by the Consortium in 1999/00

*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 eight new research and education projects. The grants awarded this year will fund projects in a wide range of subjects, including fish & wildlife, exotic species, remediation, atmospheric deposition and community education. The teams include researchers from member schools, as well as other colleges and universities and community organizations.*

Atlantic salmon once represented a major component of the Lake Ontario fish community. By the late 1890s, however, salmon were extirpated from the Lake Ontario ecosystem. Attempts at restoration over the past one hundred years have been unsuccessful largely because of a lack of understanding about constraints regulating survival and growth of Atlantic Salmon. **Dr. Neil Ringler** of SUNY ESF, will lead a research project that will evaluate certain hypotheses regarding factors that constrain production of Atlantic salmon in streams. This project, a collaboration between researchers at ESF and Cornell University, will provide important information about reestablishing Atlantic salmon to its native range. Besides an analysis of the environmental constraints on survival and growth of Atlantic salmon juveniles, fisheries managers will be provided with information about the importance of strain differences for stocking Lake Ontario tributaries, and improved strategies for stocking programs. For more information contact Dr. Ringler at *nmringle@mailbox.syr.edu.*

Recognizing the critical importance of the trophic state of Lake Ontario to the region's general ecology and water quality, as well as the present and future sport fishing industry and tourist trade, the Consortium is supporting another research project led by **Dr. Henry Mullins** of Syracuse University. This project will initiate new research on the long term history of primary productivity in Lake Ontario in order to provide a natural baseline against which historical and future changes can be compared. Scientists will test the hypothesis that productivity in Lake Ontario may have been greater than anytime within the past 200 years during the Holocene Period (~9000 to 4000 years ago). Summer temperatures then were 2-3 degrees Celsius warmer than today due to increased rates of chemical weathering. This project would be the first of its kind. It is hoped that the project will provide considerable new insight into the natural history of biological productivity in eastern Lake Ontario over the past 10,000 years. For further information, contact Dr. Mullins at *earth@syr.edu.*

Another seed grant for research is aimed at the study of a new invading species, *Echinogammarus ischnus* which has become the dominant amphipod species in western Lake Erie. The project will be led by **Dr. Nancy Tisch** of Cornell University, and will compare the life history traits of the new invading species with another more established species. They will quantify interspecific variation in traits from coexisting populations and across a range of conditions in which food and temperature are varied in a controlled experiment. The first objective of the proposed study is to quantify growth rate variation, size and age at maturation, and size-specific fecundity for the two species. For more information, contact Dr. Tisch at *nt34@cornell.edu.*

**Dr. Joseph Graney** from SUNY Binghamton will specifically demonstrate how integrated particle characterization and trace metal measurement capabilities can be added to future consortium proposal submissions. His project intends to demonstrate that equipment housed in the Department of Geological Sciences at SUNY Binghamton can be used to achieve two goals. The first is to increase the analytical and research capabilities of the Air Transport and Deposition Task Force in ongoing and future research projects, specifically in the area of trace metals research. The second goal is to demonstrate to others interested in trace metals found in aerosols near the Great Lakes how supplemental information can be obtained from archived aerosol samples through integrated Environmental Scanning Electron Microscope (ESEM) and Inductively-Coupled Plasma Mass Spectrometer (ICP-MS) measurements. Results from this demonstration project will assist in policy-making decisions concerning the source, transport, and fate of toxic compounds throughout the Great Lakes region. For more information contact Dr. Graney at *jgraney@binghamton.edu.*

Concerns regarding the water quality of the Great Lakes basin are focusing on the community level in Rochester. Monroe County is in the process of creating a Water Education Collaborative that would coordinate and implement educational efforts in the Rochester Embayment Watershed that drains into Lake Ontario. **Margit Brazda** of the Monroe County Health Department will lead a project entitled, Survey of Public Attitudes and Knowledge Regarding Water Quality in Monroe County. This project will conduct a random phone survey in Monroe County to poll people about their attitudes and knowledge regarding water quality issues. This information would then be used by the collaborative to focus their education efforts on the most important and/or misunderstood issues. For more information contact Ms. Brazda at *mbrazda@mcls.rochester.lib.ny.us.*

Another research project addressing water quality is entitled, Novel Biosensor for In-situ Detection of Chlorinated Organic Compounds in the Great Lakes, led by **Dr. Omowunmi Sadik** of the State University of New York at Binghamton. The objective of his project is to develop biosensors for in-situ monitoring of polychloriated biphenyls (PCBs), as these are common ground and surface water pollutants in the Great Lakes. The biosensors will be developed using a novel combination of regulatory proteins as sensor molecules embedded in conductive polymer matrix to allow direct, in-situ, detection and quantitation of contaminants. Experiments will be performed to demonstrate the sensitivity, selectivity and accuracy of the biosensors. For more information contact Dr. Sadik at *sadik@binghamton.edu.*

# Other Campus News

## Prominent Researcher Leaves New York for Michigan

The State University of New York along with the Great Lakes Research Consortium will lose one of its most outstanding researchers this year. He is leaving the University of Buffalo to join a private consulting firm, Limno Tech International of Ann Arbor, Michigan.

*UB's Joe DePinto says goodbye to the Consortium*

Dr. DePinto is Professor of Environmental Engineering and director of the University of Buffalo's Great Lakes Program. He has been part of the research community in New York and the Great Lakes for over twenty years. During that time he has worked on various important issues including eutrophication, toxic chemical exposure analysis, contaminated sediment analysis and remediation, and watershed and whole lake modeling.

Dr. DePinto has received over $4 million in grants and contracts for studies relating to understanding and quantifying the impacts of pollutants on natural aquatic ecosystems. These have led to the publication of scores of publications, and dozens of masters and doctoral theses. Recent projects include the development of an integrated exposure model for PCBs in Green Bay, investigation and modeling of nutrient cycling/food web interactions in Lake Ontario and development of a geographically based watershed analysis and modeling system (GEO-WAMS). His research is only matched by his contributions to public service, professional societies, and advisory boards including the Council of Great Lakes Research Managers, IJC, IAGLR, and SOLEC.

**Joe has served the Great Lakes Research Consortium** as UB's Campus representative since joining the faculty of UB in 1991, and as the Consortium's Research Director from 1996-98. He surely will be missed for his broad understanding of Great Lakes issues, his dedication to the Consortium and its ideals, and his connection with the research and management community, which has continually helped stear the GLRC towards emerging issues important for staying on the cutting edge of research.

## Consortium Says Farewell to One of Its Founders

Students and faculty took a moment at this year's annual conference to say farewell to John "Jim" Kalas and thank him for his years of dedicated service to the Consortium. Jim is one of the founders of the Consortium. He has served as a member of the GLRC Board of Governors since its inception, and most recently, lead the Board as Chairman. Dr. Kalas is retiring this year from the State University of New York after more than thirty years. When the Consortium was first formed in 1986, **Jim Kalas**, who worked for the Research Foundation then, was instrumental in gaining support for the Consortium within SUNY. Since then, he has worked for SUNY central adminstration, served as the interim president at SUNY Potsdam and as president of Empire State College. According to fellow board member and long time colleague **Doug Harke** from SUNY Geneseo, "throughout Jim's various positions, one thing that hasn't changed is his committment and hard work for education and research."

*Jack Manno presents Jim Kalas (right) with a symbol of gratitude for his years of dedication to the Consortium.*

## GLRC Funded Research (continued from page 8)

In 1997, a Rochester Embayment Remedial Action Plan (RAP) was developed. In preparation of the RAP, it was determined that the Genesee River suffers from degradation of benthos. A study entitled, Macroinvertebrate Study to Determine Whether or Not a Benthic Use Impairment Currently Exists in the Lake Ontario Portion of the Rochester Embayment Area of Concern, conducted by **Dr. Joseph Makarewicz**, will focus on macroinvertebrate community structure and on an indicator species in Lake Ontario. By comparing results to the Olcott Reef Study, a reasonable picture of the health of the benthic community is possible. Results will be used to identify use impairments indicating the effectiveness of the RAP. For more information contact Dr. Makarewicz at *jmakarew@brockport.edu*.

To help reestablish Atlantic salmon in Lake Ontario, **Dr. Donald Stewart** of SUNY Environmental Science and Forestry, will evaluate two genetic strains of Atlantic salmon for differences between over winter survival in the Lake Ontario watershed. His research entitled, Over Winter Survival and Bioenergetics of Two Strains of Atlantic Salmon (Salmo salar), will identify the potential differences in growth and survival between strains, especially during the critical over winter period that is important for successful reestablishment of Atlantic salmon to the Lake Ontario watershed. This research will provide essential information about stocking certain genetic strains and over winter survival, including metabolic demands, for the early life stages of Atlantic salmon. For more information contact Dr. Stewart at *djstewar@mailbox.syr.edu.*

# Great Lakes Research Seminar Series

This year's seminar series was the most successful yet, with a total of 25 seminars, attended by an estimated 750 people. Five Canadian affiliates hosted eight seminars and all but four of our New York schools arranged a seminar in either the Fall or Spring semester.

We heard from several of the campus representatives following the seminars they hosted. John Schott had this to say about the Rochester Institute of Technology's seminar: " The talk by Keith Tinkler (Quaternary History of Niagara Falls) was attended by approximately 30 faculty and students. It provided a very interesting and enjoyable history of the modern evolution of the Niagara River. The presentation was stimulating enough to generate hallway conversation of geology for several days afterwards." At SUNY ESF, Jack Manno reported that David Carpenter's presentation, Bioaccumulation and Human Health Effects of Toxic Substances, played to a "full house." And Jim Haynes' talk on Hormone Mimics was met with enthusiasm. Tom Darvill "gave a great talk" at SUNY Brockport, with about 30 in attendance, and dinner and conversation were enjoyed following the seminar. There was a large turnout (around 46 at SUNY Brockport) for Robert Gilbert's lecture on Evolution and Origins of the Great Lakes. Charles Hall's presentation, The Myth of Sustainable Development, at the University of Ottawa. "was marvelous," reports Scott Findlay, - "not even standing room in the 85 seat lecture hall, and a great beerfest afterwards attended by about 15 people, with all sorts of good ideas and sparkling repartee. Thanks to the GLRC for a whacking great time!"

Isidro Bosch reports that each of SUNY Geneseo's seminar speakers, Robert Baier (Biomaterials, Biofilms and Bioinvasions: International Research and Advanced Opportunities), and Howard Reissen (The Response of Daphnia to Chaoborus Predation), played to a standing-room only audience of over 45. Reissen's talk was well received, particularly by a group of students learning about biological modeling. Baier spoke of his research on zebra mussels and outlined the opportunities available at the Center for Biosurfaces in SUNY Buffalo. While there, he established a relationship with microbiologist Robert Simon, and the two made plans to collaborate in a distance learning course through the Center. Dr. Bosch was generous in his appreciation of the GLRC: " On behalf of Science students and faculty at SUNY Geneseo, I want to thank the GLRC for promoting and supporting the Seminar Series. These presentations are not only informative and interesting to our students but contribute handsomely to the intellectual exchange on our campus."

It is expected that these seminars will help link researchers with similar interests and lead to collaborative efforts between faculty at our member schools. Thanks to all who took the time to schedule a seminar and take advantage of this opportunity. Following is a list of topics, speakers and locations of this spring's seminars:

- *Bioaccumulation and Human Health Effects of Toxic Substances*, **David Carpenter** at SUNY ESF
- *Planktonic and Benthic Algae of River Systems: Chemical Versus Physical Drivers,* **Frances Pick** at University of Windsor
- *Implementing RAPS and Restoring the Great Lakes,* **Mark Sproule-Jones** at University of Toronto
- *Quaternary History of Niagara Falls*, **Keith Tinkler** at Rochester Institute of Technology
- *Great Lakes Modeling: Practice and Policy Implications,* **Joseph DePinto** at SUNY ESF
- *Are You Mad as a Hatter? The Environmental Chemistry of Mercury,* **Charles Driscoll** at SUNY Albany
- *Chaoborus Predation and Life History Evolution in Daphnia,* **Howard Riessen** at SUNY Geneseo
- *Does the Temperature Variability to Which Organisms are Exposed Change Systematically from Terrestrial to Oceanic Ecosystems?* **Helene Cyr** at Cornell University
- *Developmental Impact of Prenatal Exposure to Environmental Contaminants,* **Thomas Darvill** at SUNY Brockport
- *Green Chemistry: A New Paradigm for Pollution Prevention,* **Ian Brindle** at SUNY Binghamton
- *Biomaterials, Biofilms, and Bioinvasions: International Research and Advanced Education Opportunities,* **Robert Baier** at SUNY Geneseo
- *Mass Balance Modeling of Toxic Contaminants in Lake Ontario in Support of the Lakewide Management Plan*, **Joseph DePinto** at Clarkson University
- *Reducing Uncertainty in Toxic Chemical Models for Lake Ontario,* **Joseph DePinto** at SUNY Plattsburgh
- *Defining the Sources of Airborne PCBs along the St. Lawrence River at Akwesasne,* **Jeffrey Chiarenzelli** at SUNY Fredonia
- *Harmful Algal Blooms: Are They Important in the Great Lakes?* **Gregory Boyer** at Cornell University
- *Commercial Navigation on the Great Lakes,* **Raymond Waxmonsky** at University of Guelph

**If you would like to give a seminar at participating campuses, please contact the Consortium at cjcrysle@mailbox.syr.edu**

# Consortium Funds Research Development for 2000

## TASK FORCES

**Dr. Philip Hopke**, of Clarkson University, will continue to lead a task force concerned with the **atmospheric transfer and deposition of pollutants**. Along with fellow researchers from Clarkson , SUNY Fredonia and SUNY Oswego, this task force will facilitate coordination and communication among the three institutions so as to maximize the opportunities for obtaining support for expanded studies of the behavior of persistent organic pollutants with respect to their transport to, deposition in or emission from Lakes Erie and Ontario and the St. Lawrence River. Recently some members of this task force were successful in obtaining a $400,000 grant from New York State Energy Research and Development Authority (NYSERDA), evidence of the large returns on small grant investments. For more information, contact Dr. Hopke at *hopkepk@clarkson.edu.*

Continued funding will go to the **Governance Task Group**, led by **Dr. Margaret Shannon** of SUNY Buffalo, and joined by scholars from SUNY ESF and the University of Waterloo. This group is developing into a region-wide network of scholars and practitioners interested in and concerned with Governance of the Great Lakes. Continuation of funding will enable members to continue to develop joint research and writing projects and continue to develop and maintain a web page to facilitate collaboration and support for seminars. For more information, contact Dr. Shannon at *mshannon@acsu.buffalo.edu.*

**Dr. Peter Ducey** of SUNY Cortland will lead a new task force, studying the status and ecological roles of **amphibians and reptiles** of the Lake Ontario/St. Lawrence River basin. These species are believed to play significant roles in all wetland ecosystems. Predators on numerous invertebrates and small vertebrates, they are important food items for many larger vertebrates, and make up a large portion of the total vertebrate biomass in many wetlands. In addition, it has been suggested that the biphasic life-cycles of many amphibians makes them important conduits for the movement of nutrients and contaminants between terrestrial and aquatic systems, and possibly valuable indicators of environmental quality. This group, comprised of researchers from SUNY Oswego, SUNY Potsdam and the NYS DEC, in addition to SUNY Cortland, will facilitate an increase in collaborative research efforts concerning the status and ecological roles of herpetofauna in these ecosystems. For more information, contact Dr. Ducey at *duceyp@cortland.edu.*

Another new task force, led by **Dr. James Haynes** of SUNY Brockport who is joined by participants from SUNY Oswego and Clarkson University, will assess the policies and procedures needed to implement an effective **academic program** utilizing the resources of the NYS Great Lakes Research Consortium. The task of this group is to assess the potential processes and mechanisms that are required to enable consortium member institutions to develop and implement inter-campus Great Lakes undergraduate and graduate academic programs. For more information, contact Dr. Haynes at ERLINK mailto:jhaynes@brockport.edu *jhaynes@brockport.edu.*

## WORKSHOPS

### Remote Sensing in the Great Lakes

On June 13-14, SUNY ESF will host a workshop to explore the potential of remote sensing for use in systemwide studies of the Lake Ontario-St. Lawrence River ecosystem. Great Lakes researchers will meet with remote sensing experts to initiate new research approaches and exchange of data on water quality, habitat and other Great Lakes issues. The first day will be devoted to technological assessment, summary presentations of environmental issues, and a panel discussion to link issues with potential resolution strategies. The second day will consist of breakout sessions on the identified issues, and discussions of potential projects. For more information, contact Dr. Smardon at *rsmardon@mailbox.syr.edu.*

### Climate Change in the Great Lakes

**Dr. Gordon Fraser** of Buffalo State College, and colleagues at Buffalo State and SUNY Buffalo, will develop a workshop on the Impacts of Global Climate Change on the Great Lakes Basin. The earth's climate is predicted to change because human activities are altering the chemical composition of the atmosphere through the buildup of greenhouse gases - primarily carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons. Researchers of the GLRC have the expertise to develop programs that can address these issues and help planners and policy makers to understand the impacts of global change and to identify sectors which are particularly vulnerable to the stresses that climate change will impart. This workshop will bring together those in the Consortium that are willing to participate in a broad research effort to develop the information needed to assess the impacts of global warming and climate variability in the region. For more information, contact Dr. Fraser at *frasergs@buffalostate.edu.*

# Check Out Our New WebSite!

Visit the Consortium's New Website for quick links to:

Our Member Campuses and their Representatives

A Directory of Great Lakes Researchers

Information about Grants Programs

GLRC Seminar Schedule

Electronic Newsletter and Other Publications

Research Funding News & Announcements

Other Great Lakes Sites

## www.esf.edu/glrc

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