

REPORT

of the Great Lakes Research Consortium

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Strategic Plan Envisions Network of Research, Education and Outreach Facilities on the Lakes

Last summer the Great Lakes Research Consortium brought together many of our designated campus representatives and several members of our Board of Governors and began a process to adopt a strategic plan for the next five years. For two days on the shore of Lake Ontario in Oswego we looked at our previous plan that had expired in 1998 and evaluated our successes and shortcomings against the plan's goals. For the most part, we were pleased with what we had accomplished. We had grown significantly and now consisted of sixteen member schools in New York with nine affiliates in Ontario. The research programs of the GLRC had greatly expanded in scope and quantity. There was an active network of researchers working closely together on a wide range of scientific questions whose answers were essential for understanding and protecting the Great Lakes. Now, many believed, it was time for the Consortium to take the next step. What was the next step, we asked, and worked hard together on the answer.

For one thing, despite our success we still did not have a major research facility on the Lakes in New York. The discussion of a new facility became, in essence, a deep exploration of the meaning of "Consortium" and why our multi-disciplinary and multi-institutional effort seemed to work, when so many other similar partnerships failed. It is important to our success that the Consortium staff and headquarters concentrates on supporting the research efforts of our participating faculty and not have a major research program of its own that competes with those participating members. Would a major new facility become identified as THE GLRC and become a competitor for research dollars rather than an organizer and promoter of the interests of all our member campuses? How would we decide where it should be located? If we didn't decide to build a new facility, then would several member schools pursue their own facility plans and compete with each other for limited resources? Could we survive the inevitable internal tensions that might result?

As the discussion continued it became clear that what would be best for New York and the Consortium was not a single major new facility at all but instead a string of facilities, a network spanning the "North Coast" of New York from Lake Erie to the St. Lawrence River. The Great Lakes-St. Lawrence River system has countless access points where experiments, surveillance and monitoring are needed. The type of equipment and facility required varies tremendously depending on whether the issue is food web dynamics, fish health, ecological impacts of fluctuating water levels, sediment transport or toxic chemical contamination. No one facility can or should do it all. The answer hit us all as a sudden insight. What was preferable was a network of facilities, all working together like the Consortium already does, each located on or near a different type of environment, contributing its unique expertise, running different kinds of vessels, some with classroom space, some with specialized laboratories, all powered by clean, renewable energy and many accessible to the public and hosting outreach and naturalist programs. This is the vision that we arrived at and adopted in the Strategic Plan.



Useful Information for
New York's Great Lakes
Research Community



The Economics of Great Lakes Related Research

*Commentary from the Executive Director
Jack Manno*

The job of Great Lakes research costs money, lots of it. We need people in boats on the water, people on the shore measuring and observing, people in the lab, experimenting. We also need an extensive education system to train people to use the tools of observation and experimentation. We need buildings, tools, equipment, supplies. We need to meet with each other to share information. We need support staff and administrators. All of this combines to create a system of information gathering and knowledge-creation devoted to understanding the physical, chemical, biological and ecological dynamics going on in this immense, watery world we call the Great Lakes. It seems so clear to me why we would want to know these things that I'm surprised when I'm asked to justify the costs by using some economic logic. My mind usually shifts quickly over to the familiar retort, "If you think knowledge is costly, try ignorance."

Yet I do get the point of the question. We are asking for public money, after all. People want a good rationale for the expenditure and the common language that seems to work these days is the language of economic investments. Everyone seems to want me to show the returns on investments to Great Lakes research. Well I point out how important the Lakes are to all of us: how many of us depend on them for drinking water, electricity production, commercial transport, recreation, and so on. We'd better understand what's going on with them. Most of what's happening is invisible to the uninitiated. You can spend your life by the lakes and never know about their chemical composition, the life in their depths, the micro- flora and fauna, the unexpected currents, the complex web of life, the industrial stew

carried by the winds, the strange creatures hitchhiking aboard seaway vessels, and on and on. You'd know a lot about the lakes just by living by them, more about many of the important nuances and pleasures of the lakes than any of our scientists do, but you wouldn't have a clue about many of the things that determine the fate of the lakes. If you really want to know the value of clean lakes, think about what it would cost today to reestablish the native fish community that has been lost; reproduce the wetlands that once bred the lakes' natural abundance; revive the commercial fishing industry now decimated; reproduce the livelihoods lost by indigenous people who once depended on the lakes for everything. This is, after all, the accepted methodology for doing natural resource damage assessments; the emphasis is on restoration of resource services to their baseline conditions, compensation for loss in value of the injured natural resources from the time of injury until full recovery, and the costs of doing the actual damage assessment.

Now it also seems obvious to me that the reason we need public rather than private money is that, except in rare cases, the returns on these investments are not going to accrue to individual investors. In fact some of this knowledge, like the neurological damage done to infants born to mothers who eat contaminated fish, has what might be called negative economic value. What was once a money-making resource, tasty Great Lakes fish, loses considerable monetary value as a result. Would we really be better off not knowing this? Actually many people will indeed benefit economically from this news. All the people whose job it is to carry out the clean-up projects or design and sell the pollution prevention

devices or even the people who figure out how to raise clean fish and sell them, all benefit from the need to clean our lakes to the point where the fish are safe to eat again. It's interesting, however, how these economic benefits get counted instead as costs. It's important to remember that all economic costs are somebody's economic benefits.

For the past decade and a half the Great Lakes Research Consortium has been spending about \$200,000 each year of state money to organize and service a coordinated state-wide program of Great Lakes research in New York. Another \$2-3 million in research is generated by New York's Great Lakes researchers partly or fully as a result of the Consortium's activities. Some of this is federal money, some private. A share is the State's. In sum, the state's investment in the GLRC has been small and the returns substantial.

In New York, we have several small and struggling research field stations and environmental education centers scattered throughout the Great Lakes region. This year we have asked the federal government and the state to make a major investment in these facilities and to link them together into a GLRC network of facilities. The administrative infrastructure is already in place and our track record is solid.

Most of the federal government's investments in Great Lakes research goes to the upper Great Lakes regions. EPA's Great Lakes offices are in Chicago. NOAA's Great Lakes laboratories are near Detroit. The Great Lakes Commission is in Ann Arbor. The Army Corp is in Detroit. New York rarely thinks of itself as a Great Lakes state, the way, say, Wisconsin does. Most people are sur-

prised to learn the extent of our Great Lakes coast or that the amount of Great Lakes water we withdraw and use exceeds Wisconsin's and all the other state's but Michigan's. It's time for New York to get a fair share of federal Great Lakes investments.

Some of the research generated as a result of this new initiative will yield direct economic benefits to New York that may help struggling rural communities in upstate New York. Effective protection and management of fresh water may well be the most important economic issue of this century. New York could be in the forefront for developing the tools, techniques and services required. But more than the economic benefits gained and costs avoided is involved. The Great Lakes- St. Lawrence River System is the single most important feature of a huge portion of our state. We have a responsibility to understand it as fully as possible. No private industry is going to take on that task. The profits accrue to all of us and can not be effectively captured by private investors. It is left to us, the citizens and our elected representatives, to make the necessary investments. The federal government can and should taken a major role. The Great Lakes are a national resource. Together, with the help of the state and federal governments, New York will soon have the premier freshwater research capacity in the world.



GLRC Report

Editors: Jack Manno and Michael Connerton

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
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
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Directorate

Richard Smardon, Co-Director
Jack Manno, Executive Director
James Haynes, Co-Dir. of Research

Office

24 Bray Hall
SUNY ESF
Syracuse, NY 13210
(315) 470-6816
FAX 470-6970
email: jpmanno@mailbox.syr.edu
http://www.esf.edu/glrc



2001 Student/Faculty Conference

Conference Attendance Continues to Grow

The Consortium's annual conference continued to grow as the number of participants this year reached an all time high of over 130 participants.

On March 16-17, students and faculty gathered on the campus of SUNY ESF to share the results of their research and to discuss emerging issues facing the Lakes. Highlights of the conference included John Jackson's keynote presentation about water conservation strategies, a faculty panel discussion addressing emerging issues in Lakes, research planning meetings, student presentations, and a banquet featuring singer-songwriter Colleen Kattau and our own Jack Manno as backup singer.

KEYNOTE SPEAKER

The conference commenced with a keynote address by **John Jackson**, past president of Great Lakes United, and current leader of the St. Clair River International Citizen's Network. John has worked for nearly twenty years on advocating environmental policy initiatives within the Great Lakes basin, and has led various citizen action and grassroots efforts to protect and restore the Great Lakes.

Mr. Jackson spoke about the importance of an ambitious regional water conservation strategy to protect Great Lakes waters and ecosystems. The effects of climate change on water supply, increasing use and proposed new diversions and commercial export all combine to threaten our region's water. John discussed the importance of establishing reforms that address across-the-board changes to the basin's water system. He proposed a comprehensive set of conservation and restoration objectives, including a list of data collection and research needs to help guide future decisions about water use.

PANEL DISCUSSION

This year's faculty panel focused on current trends in Lakes Erie, Ontario, the St. Lawrence River and described new and emerging research issues that need the attention of Great Lakes faculty and their students. **Joseph**



Keynote Presenter - John Jackson

Makarewicz, professor of biological sciences at SUNY Brockport discussed Lake Ontario and the need for more focused attention on "New York's North Coast". He pointed out that although significant changes have occurred in the offshore as the result of nutrient abatement programs, a lot more work is needed in the nearshore and embayments of Lake Ontario where eutrophication and other problems continue to exist. **Helen Domske**, Associate Director of the Great Lakes Program at the University of Buffalo addressed emerging issues in Lake Erie. She discussed how issues have changed over time in the Lake, from a few obvious problems to the present day when we are faced with a much wider array of more subtle concerns. Present day science and management requires an ecosystem approach, and the involvement of many stakeholders. She called on students and faculty to participate in the Lake Erie LAMP, which

is being developed with an ecosystem approach to management. Emerging issues in the St. Lawrence River were discussed by **David Lean** from the University of Ottawa in which he listed water levels, drinking water taste and odor problems, and large scale ecosystem models as the emerging research issues of today. In addition, **Frank Sciremammano Jr.**, a professor of mechanical engineering at Rochester Institute of Technology, spoke about his participation in a new \$20 million, five-year study of Lake Ontario and St. Lawrence River levels being carried out for the International Joint Commission.

ANNUAL BANQUET

At this year's banquet, **Colleen Kattau** and her entourage of talented musicians entertained us with lively music and humor. In a surprise appearance, Executive Director **Jack Manno** took the stage to sing with members of the Syracuse Community Choir who backed up Colleen on vocals. Later, Jack took the stage again and made an excellent "choo-choo" sound in rhythm to Colleen's song about the decline of the American train in America. Bravo!



Colleen and Jack sing at the banquet.



2001 Student/Faculty Conference

Students Honored for Outstanding Presentations

Each year at the conference, the GLRC and New York Sea Grant recognize students for their excellence in presenting their outstanding contributions to Great Lakes research. On March 17, eight awards were given to students in honor of Don Rennie, a founder of the Consortium. A special award was also presented to a student in environmental chemistry to remember Susan Burns. Susan was an exceptional environmental chemist who worked on mirex in Lake Ontario as a doctoral student at SUNY ESF. Susan had already graduated and accepted a faculty position in the Midwest before a fire tragically took her life last year.

Don Rennie Awards were presented to students in the following categories:

Remote Sensing

Adam Goodenough, Rochester Institute of Technology, for his presentation "Evaluating Water Quality Monitoring with Hyperspectral Imagery"

Chemistry

Charles W. Sharpe, Syracuse University for his presentation, "Mercury Dynamics in Onondaga Lake and Adjacent Wetlands"

Ecology

Roger Ward, SUNY Brockport, for "A Temporal Comparison of Benthic Nepheloid Layers in Lake Ontario and the Larger Finger Lakes of New York State."

Elizabeth Damaske, SUNY Brockport, for "The Invasion of *Cercopagis pengoi* - Its Affects on Trophic Interactions and Contaminant Concentrations in Lake Ontario Biota"

Environmental Engineering

Mike Traynor, Cornell University, for his presentation, "Temporally Dynamic Surface Water--Ground Water Interactions within a Large Near-shore Palustrine Marsh"

Great Lakes Policy

Jacque Antinore, of SUNY Brockport for his presentation, "Water Quality Opinion Survey 2000: Public Attitudes and Knowledge Regarding Water Quality in Monroe County, New York."



This year's award winners

Best Undergraduate Presentation

Tara Bushnoe, Cornell University, for her presentation, "*Cercopagis pengoi* as a Food Resource for Alewife (*Alosa pseudoharengus*) and Rainbow Smelt (*Osmerus mordax*) in Lake Ontario."

Best Poster Presentation

Craig Denesha, Melinda LeBarr, and Melissa Todd, of SUNY Potsdam, for their poster, "An Alternative to Environmentally Induced Metabolic Depression in Lungless Salamanders".

Susan Burns Memorial Award in Environmental Chemistry

Ryan Fuller, SUNY Oswego for his outstanding student presentation "Congener-Specific PCB Assessment of Oswego River Sediment Cores."

Thank you to all of the students who presented this year and the faculty who supported their efforts to make this event a success!





Great Lakes Research Seminar Series

This year's spring seminar series was both exciting and informative. Reports from those who participated expressed enthusiasm for the speakers and their lectures.

One of the speakers, **Bob Baier from SUNY Buffalo**, presented his research on Biomaterials, Biofilms, and Bioinvasions: International Research and Advanced Education Opportunities. The seminar was well attended with approximately 40 faculty and students. While on Clarkson's campus Dr. Baier took advantage of his time and met with several others as well as giving a second lecture for the Center of Advanced Materials Processing. There is awareness and a possibility that may lead to future collaboration on the topic of biofilms.

Another speaker in the spring seminar series was **Jan Ciborowski of the University of Windsor**. His presentation addressed the Ecological, Energetic, and Mass Balance Implications of Burrowing Mayfly Repopulation of Lake Erie. While on SUNY ESF's campus Jan had the opportunity to converse with fellow colleagues and researchers and he stated "I can't express strongly enough how important and valuable an initiative this program is for fostering communication among universities." There has been some talk about the Canadian Affiliates developing a Canadian version of the Consortium.

Robert Paehlke from Trent University spoke at Syracuse University. His talk was on the Cities and Sustainability in the Great Lakes Region. From this lecture an initiative to develop a US/Canada research collaboration that will focus on environmental policy is hopeful.

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 the Spring 2001 seminars:

- *Modeling Photochemical Processes in the Great Lake*, **John Hassett** at Rochester Institute of Technology.
- *Wastewater Treatment in Constructed Wetlands: the Minoa (NY) Experience*, **Thomas Young** at SUNY Plattsburgh.
- *What Watching Coral Reef Fishes Tell Us About Ecology*, **Peter Sale** at University of Waterloo.

- *Time Travelers: the Ecological and Evolutionary Impacts of Zooplankton with Long-Lived Dormant Eggs*, **Nelson Hairston** at University of Windsor.
- *High Resolution Life History Records of Great Lakes Fishes Derived from Stable Isotope Values of Otoliths: Implications for Management of Fisheries*, **William Patterson** at Cornell University.
- *Time Travelers: the Ecological and Evolutionary Impacts of Zooplankton with Long-Lived Dormant Eggs*, **Nelson Hairston** at SUNY ESF.
- *Biomaterials, Biofilms, and Bioinvasions: International Research and Advanced Education Opportunities*, **Robert Baier** at Clarkson University.
- *Origins of the Great Lakes*, **Robert Gilbert** at Rochester Institute of Technology.
- *Cities and Sustainability in the Great Lakes Region*, **Robert Paehlke** at Syracuse University.
- *Reproductive Behavior of Round Gobies*, **Lynda Corkum** at Buffalo State College.
- *Lake Michigan Mass Balance Project: The Importance of Atmospheric Deposition*, **Thomas Holsen** at University of Buffalo.
- *Ecological, Energetic, and Mass Balance Implications of Burrowing Mayfly Repopulation of Lake Erie*, **Jan Ciborowski** at SUNY ESF.
- *Special Variability of Habitat in the Littoral Zone of Lakes*, **Helene Cyr** at University of Ottawa.
- *Impacts of Disturbance on Stream Ecosystems: Case Study of the Yellowstone Fires*, **Timothy Mihuc** at SUNY Geneseo.

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



Great Lakes Education Initiatives

Students Continue to Benefit from GLRC-ALCAN Aluminum Fellowship

The Alcan Aluminum Corporation has supported Great Lakes related research by sponsoring fellowships for three consecutive years for a total of twelve undergraduate students. The fellowship funds, which are matched by participating Consortium member campuses, are used to conduct research and generate information about the Great Lakes and its resources. The support also enables students to gain valuable experience on the Great Lakes.

Four students, representing three campuses, received GLRC-Alcan fellowships for the 2000-2001 academic school year. In the established tradition, this year's students presented their findings at the GLRC Annual Student Faculty Conference. **Stephanie Kroll** of SUNY ESF studied the competition between Atlantic salmon and introduced rainbow trout juveniles. **Katherine Cunningham** of Cornell University examined the energy density of young-of-the-year alewife and rainbow smelt in Lake Ontario. **Tara M. Bushnoe**, also from Cornell University, learned about *Cercopagis pengoi*, a new exotic species in Lake Ontario. **Harry Belizaire** of the University of Ottawa focused his project on the photochemical degradation of methyl mercury in aquatic systems.

The generosity of the Alcan Aluminum Corporation will continue to support the Alcan Fellowship program for an additional year. Four new students have been chosen to receive Alcan fellowships and they will be conducting research throughout the summer and fall 2001 semesters. The recipients are Katie L. Stammler of the University of Windsor, Daniel White of SUNY Brockport, Celia Fan of Ryerson University, and Stacy M. Trey of SUNY Oswego.

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.

GLRC Awards Three Capstone Fellowships to Graduate Students

This year the Great Lakes Research Consortium expanded to three the number of scholarships offered to graduate students for assistance in completing their final year. In response to the success and enthusiasm of graduate students, the GLRC hopes to continue to award more fellowships in the future.

A capstone fellowship was awarded to doctoral student **Jagjit Kaur** at SUNY Buffalo for her research entitled, "Development of an Aquatic Ecosystem Model to study the Effect of Zebra Mussel on Polychlorinated Biphenyl Cycling in Saginaw Bay." The aim of this research is to quantify the relative impacts of zebra mussels on the production dynamics and the transport and fate of PCBs in affected aquatic systems. It is hypothesized that zebra mussel invasion has altered PCB phase distribution and cycling such that the bioavailability of externally-loaded PCBs in the water column and sediments of the system has been increased. Saginaw Bay was chosen as the ideal location for zebra mussel impact assessment because it offers ideal habitat for zebra mussels, and prior to mussel invasion, baseline measurements are well documented.

A capstone fellowship was granted to a masters of science research project by **Sandra Parker** of Cornell University entitled, "The Effect of Oligotrophication and Dreissenid Invasions on Eastern Lake Erie's Forage Base, the Rainbow Smelt." This research focuses on temporal and spatial variation in lower trophic level dynamics, historical and current rainbow smelt diet composition, impact of nonindigenous species (*Dreissena polymorpha*, *Dreissena bugenis*, *Bythotrephes longimanus*) on food web dynamics, and the relationship between recent and historical changes on the deterioration of rainbow smelt stocks in the eastern basin of Lake Erie.

Doctoral candidate **Robert A. Klumb** of Cornell University is the recipient of the third capstone fellowship for his research project entitled, "The Role of Embayments and Inshore Areas of Lake Ontario as Nursery Grounds for Young-of-Year Alewife." This project seeks to determine the role that embayments and inshore areas of Lake Ontario play as young-of-year alewife nursery grounds.



News from Our Member Campuses...

Facilities Network Planned (continued from page 1)

From there we took the idea to the DEC and the State University of New York central administration which wholeheartedly supported the notion. The NY DEC is supporting the initiative through the NY Great Lakes Protection Fund to plan a network of research stations, laboratories and educational facilities along the entire length of New York's Great Lakes shore. Chancellor Robert King and the administration of the State University of New York have launched an initiative to obtain \$31 million in federal support (\$9 million in FY 01/02) for creating a network of shore-based research stations, vessels, laboratories and facilities for environmental science, education and outreach over the next three years. The network will include an expanded Great Lakes Institute in Buffalo as a cooperative venture between Buffalo State College and the University at Buffalo with a partner facility on Lake Ontario associated with SUNY College at Brockport. The Great Rivers Institute is planned for the St. Lawrence River with the support of the NY Power Authority. Improvements will be made to research field stations and educational facilities at Oswego, Clayton, Plattsburgh, Oneida Lake and the Montezuma Wetlands Complex. The entire system will create in New York the world's premier freshwater research and education capacity.

National Science Foundation Funds Lake Ontario Embayment Study

Researchers affiliated with the Great Lakes Research Consortium and **Cornell's Center for the Environment** are beginning a five-year study of how physical, biological, and human interactions influence Lake Ontario's bays and embayments. The study will occur along the New York coast of Lake Ontario and is sponsored by a \$3 million National Science Foundation biocomplexity grant. The project will be carried out by a team of biologists, engineers, and planners from Cornell, Syracuse University, and the State University of New York College of Environmental Science and Forestry. **Dr. Mark Bain**, assistant professor and assistant leader in the New York Cooperative Fish and Wildlife Research Unit at Cornell University heads up this project.

Shackelton Point Gets Boost for Research Facilities

Efforts to expand the experimental capability of the **Cornell University Biological Field Station** located on the south shore of Oneida Lake were greatly enhanced by funds to construct a multi-user experimental research facility by the National Science Foundation's Division of Biological Infrastructure program. The building will be designed for maximum use and experimental flexibility to enable projects ranging from biogeochemistry to fish energetics to nutrient dynamics to land-water interactions. For further information, contact **Dr. Ed Mills**, Director of the Cornell Biological Field Station.



Air Quality Center Award

Syracuse University's Charlie Driscoll, and **Clarkson University** researchers, **Tom Holsen** and **Philip Hopke**, are involved in the New York State Environmental Quality Systems Center award. The center will focus on both ambient and indoor environments with air quality being a major focus, but urban ecosystems including run-off will also be a potential part of the center's focus.

Scientists Form Team to Study New Invader

Researchers at **SUNY Brockport** will continue Sea Grant funded work on *Cercopagis pengoi* - the fishhook flea. This work is in collaboration with **Hugh MacIsaac** and **Igor Griorovich** at **University of Windsor** and **Ed Mills** and **Lars Rudstam** at **Cornell University**. The team of scientists are examining the biology and ecology of the fishhook flea. The focus of Cornell University's study is *Cercopagis pengoi*'s predators, and the University of Windsor is determining what *Cercopagis pengoi* feeds on. SUNY Brockport researchers are focusing on feeding as well as field aspects, abundance and biomass, and whether or not they are affecting the biomagnification of toxics.



More News from Our Member Campuses...



News from **the University of Buffalo Great Lakes Program**

Lake Erie Avian Botulism Workshop

The Great Lakes Program joined forces with New York and Pennsylvania Sea Grant to help organize the first workshop on Avian Botulism in Lake Erie. The program was held on January 24-25, 2001, in Erie, Pennsylvania. More than 60 researchers, fishery and wildlife biologists, resource managers and agency representatives were brought together to learn about botulism and recent outbreaks along the Lake Erie shoreline. The goal of the workshop was to share findings from both the American and Canadian shores and to develop regional "response teams" and a research agenda for future efforts. Organizers wanted to determine the extent of the botulism problem based on geography and environmental conditions that existed during outbreaks that occurred in 1999 and 2000. During the second day of the workshop, several breakout sessions were convened to address the research agenda questions that were posed to participants. Proceedings from the workshop are available by contacting the Great Lakes Program at the University at Buffalo.

Great Lakes Student Summit 2001 **The Fourth Biennial Student Summit**, co-sponsored by the Great Lakes Program at the University at Buffalo, brought over 240 students, volunteers and teachers together in Buffalo, New York, from May 9-11, 2001. Participants, from New York, Ohio, Pennsylvania, and Ontario, came together to learn about the Great Lakes and share their research and environmental awareness. The theme for 2001, "Great Lakes, Great Rivers," encouraged students to study the rivers and Great Lakes that make up their own watersheds and determine what they can do to preserve these valuable resources. One of the most memorable events of the summit was the creation and presentation of a "Promise to Future Generations" that students delivered to government and agency representatives from the U.S. and Canada. The dignitaries were impressed by the students' commitment to put their promise into action as they returned home.

Advisory Board Convened

Following the departure of **Dr. Joseph DePinto** last summer from the University at Buffalo, **Dr. Joseph Atkinson** assumed the role of Director of the Great Lakes Program. As part of this transition, an advisory board meeting was convened last December. This is the first time a board meeting had been held in several years and this meeting served as an opportunity to reacquaint members with the Program and to solicit needed input for deciding future directions. Presentations by Atkinson and **Helen Domske**, Associate Director, summarized the history and evolution of the Program and its present position and activities. Board members provided a number of excellent suggestions and a follow-up meeting will be planned as soon as the Program's status at the University is confirmed for next year.

DEC Appoints New Great Lakes Coordinator

New York State Department of Environmental Conservation (DEC) Commissioner John P. Cahill announced that Donald Zelazny has been appointed as the agency's new Great Lakes Programs Coordinator. "The Great Lakes and its watershed are a vital resource, providing significant environmental, economic, and recreational benefits to the people of New York State and the entire country," Commissioner Cahill said. "I am confident that Donald Zelazny will provide the necessary leadership and direction needed to help New York effectively manage our Great Lakes programs to ensure the future health of these important waterbodies." In his new post, Zelazny is responsible for administering the New York State Great Lakes Protection Fund research grant award process, overseeing ongoing development and implementation of the Lake Erie and Lake Ontario Lakewide Management Plans and the Niagara River Toxics Management Plan, and representing DEC on several basin-wide Great Lakes committees, councils and commissions. He also serves as the DEC liaison to the New York State Great Lakes Basin Advisory Council and the New York State Coalition of Great Lakes Legislators.

A native of western New York, Zelazny joins the DEC after leaving his position as an Environmental Protection and Public Affairs Officer for the U.S. Coast Guard Reserve. He also has 20 years experience as an environmental consultant to the U.S. Environmental Protection Agency, Department of Defense, and state and local agencies in watershed protection, toxic substances control and citizen participation.



Projects Initiated by the Consortium in 2000/01

Nine projects were selected this year to receive grants of up to \$25,000 each from the New York Great Lakes Research Consortium. Faculty and students from the member schools engage in multidisciplinary cooperation, combining their research facilities and scientific expertise toward a better understanding of the Great Lakes and the development of techniques for their protection and restoration. In addition to four seed grants for research awarded this year, the Consortium is funding two task groups, and three capstone fellowships (see page 7).

Research Seed Grants

Food webs in river systems may be altered significantly by physical changes in the river; therefore, an understanding of food webs is essential in the development of effective policies for river systems. In the Great Lakes and St. Lawrence River, physical changes resulting from water level fluctuations currently pose a challenge to managers. There is a need to study the ecological effects of such fluctuations, which may include effects on the mobilization of particulate and dissolved organic carbon, and on primary and secondary productivity of various habitats. In a research project led by **Dr. James H. Thorp** of Clarkson University entitled, "Influence of Nutrient Source on Food Webs - Implications for Management of Water Levels in the St. Lawrence River and Lake Ontario", researchers will study food web pathways and nutrient sources in the St. Lawrence River. This study will provide essential data for the support of a full proposal to federal agencies for an extensive study of large river trophic pathways. Dr. Thorp will be joined by colleagues from SUNY Plattsburgh (**Tim Mihuc**) and Fordham University in this experimental study. For more information contact Dr. Thorp at thorp@clarkson.edu.

As recently as 1998, the exotic predatory zooplankton, *Cercopagis pengoi*, invaded Lake Ontario from the Ponto-Caspian region, and has since established itself throughout the Great Lakes and in several inland Lakes of New York State. Scant information exists for this species. Both experimental and observational studies are needed for predicting the effects of this predator on lake systems. A seed grant was awarded to **Dr. Kimberly Schulz** at SUNY-ESF for a project entitled, "Bioenergetic estimation of the predatory impact of the exotic zooplankton *Cercopagis pengoi* in Lake Ontario". Dr. Schulz will work with **Ed Mills** and **Lars Rudstam** of Cornell University and **Joseph Makarewicz** of SUNY Brockport to measure physiological parameters of *Cercopagis* for the sake of constructing a bioenergetics model to predict predation demand. They will measure populations of *Cercopagis* and other zooplankton in Lake Ontario, and utilize the constructed bioenergetics model to determine the consumptive demand for *Cercopagis* populations in order to determine the impact that *Cercopagis* may have on the zooplankton of the Lake. For more information contact Dr. Schulz at kschulz@syr.edu.

A seed grant was awarded to **Dr. Harish C. Sikka** at SUNY Buffalo for investigation of Neurotoxicity of Polybrominated Diphenyl Ethers. Currently, chemicals known as polybrominated diphenyl ethers (PBDEs) are being used as flame-retardants in such products as television sets, furniture, building materials, and computers, and some 80 million pounds are produced annually on a global scale. These chemicals are of particular concern as they are similar in chemical structure and physicochemical nature to other persistent toxic substances such as PCBs and dibenzo-p-dioxins, which are known for their ability to bioaccumulate in the fatty tissue of fish, wildlife, and humans. While PCBs have been largely phased out, production of PBDEs has continued to increase. Therefore future environmental problems may be anticipated. The bulk of the information regarding environmental levels of PBDEs is from European environments—little data exists for North America. The data that exists shows PBDEs to be present in the eggs and tissue of fish-eating birds from six states in the U.S. and from Ontario, Canada, and PBDEs have also been detected in lake trout of Lake Ontario and Lake Huron as well as steelhead trout from Lake Michigan. While limited information exists regarding the widespread occurrence of PBDEs in the environment, even less information exists on the toxicology of PBDEs. A recent laboratory study has demonstrated that two PBDE congeners (PBDE-47 and PBDE-99) are neurotoxic in mice. Dr. Sikka and colleagues from SUNY Buffalo will further investigate the neurotoxicity of PBDEs, specifically PBDE-47 (which has been detected in Great Lakes fish), in rats through utilization of highly sensitive bio-behavioral indicators of neurotoxicity. For more information, contact Dr. Sikka at sikkahc@buffalostate.edu.

Of the myriad of highly persistent Great Lakes contaminants, halogenated aromatic hydrocarbons (HAHs) are among the most threatening in terms of wildlife and human health. Within this group, dioxin-like HAHs including certain polychlorinated dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs), and biphenyls (PCBs), carry particular concern as they possess the ability to produce immunotoxicity, carcinogenicity, and adverse effects on reproduction, development, and endocrine functions. Dioxin-like PCDDs, PCDFs, and PCBs have been assigned Toxic Equivalency Factors (TEFs) based on relative po-



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tency to TCDD, which is given a TEF of 1.0. Currently, expensive and time-consuming traditional instrumental analysis methods such as gas chromatography (GC) and mass spectrometry (MS) severely limit the monitoring of temporal trends and potential sources of dioxin-like compounds (TEQs) in the sediments, water, and wildlife of the New York State Great Lakes Basin. As such, a need exists for a cost-effective, rapid bioassay with the ability to test for complex mixtures of compounds that elicit dioxin-like activities in environmental and biological specimens. Seed grant funds were awarded to **Dr. James R. Olson** of SUNY Buffalo for a project entitled Use of a Reporter Gene Bioassay to Screen for Dioxin-Like Compounds in Fish From Lake Ontario and the St. Lawrence River. Dr. Olson is joined by colleagues from SUNY Albany and the NYS DEC for this project, which seeks to validate utilization of this reporter gene bioassay for the screening of dioxin-like compounds in Great Lakes fish. For more information, contact Dr. Olson at jolson@acsu.buffalo.edu.

Task Forces

Among Great Lakes research projects, the social sciences are under-represented despite the fact that interest in and concern about the Great Lakes is often generated through the interaction of natural, physical, and ecological processes. Thus far the workshops, task groups, and research projects aimed at addressing different social scientific concerns have only represented a small piece of needed social science research regarding the Great Lakes. To address this need for Great Lakes social scientific research, funding has been granted for a Task Group on Great Lakes Social Science Research Initiatives led by **Dr. Burrell E. Montz** of Binghamton University. Dr. Montz, together with colleagues from Syracuse University, University at Buffalo, Clarkson University and SUNY - ESF, form this task group which aims to convene researchers of varying backgrounds who share a common goal. The initial focus will be on the lower Great Lakes, though the geographic focus as well as the group of people involved would shortly be expanded outside the range of New York State. The purpose of this Task Group will be to expand upon the diversity of the social sciences to develop a research agenda for the evaluation and better understanding of social systems and physical science interactions. The specific goals of the Task Group are as follows: (1) to identify significant areas of concern within the Great Lakes region; (2) to evaluate the implications that environmental factors have for social systems; and (3) to develop a set of social science research priorities for the Great Lakes. It is anticipated that by the end of the year, the Task Group will

have done the following: convened to share ideas regarding the stated goals above; developed a working paper dealing with social science research needs; collaborated in Working Groups for the development of research projects and proposals; and established which issues in social science research require attention in the Great Lakes region. As the focus of this Task Group promotes Great Lakes research, it corresponds nicely to the goals of the Great Lakes Research Consortium.



Within wetland ecosystems, amphibians and reptiles play significant roles, particularly in their suggested ability to conduct nutrients and contaminants between terrestrial and aquatic systems; as such, herpetofauna may be valuable indicators of environmental quality. Thus far, however, there has been a lack of coordinated efforts to study herpetofauna significance in the St. Lawrence River / Lake Ontario ecosystems. In response to this lack of coordination, a task force led by **Dr. Peter K. Ducey** of SUNY Cortland was formed six months ago to determine the Status and Ecological roles of Amphibians and Reptiles in the Lake Ontario/ St. Lawrence River Basin. Dr. Ducey is joined by colleagues from the NYS DEC, SUNY - ESF, SUNY Potsdam, SUNY Oswego, and Cornell University for this task force, of which the express purpose is to increase collaborative research efforts concerning herpetofauna status and ecological roles in these ecosystems. Initial work of this task force focuses on three area of study: (1) herpetofaunal significance to the broadly-applied ecology of the Great Lakes ecosystem, (2) interactions between human land-use patterns and herpetofaunal distribution, and (3) amphibian and reptile conservation status within the drainage basin. The major goals of the task force are: to identify and link researchers examining Lake Ontario / St. Lawrence River drainage basin herpetofauna; to establish a resource base to assist GLRC members in research, collaboration, and funds acquisition; to hold a GLRC workshop to establish collaborative projects and submit grant proposals; to communicate and coordinate efforts with those of researchers and government agencies in other states and Canada, as well as regional and national Partners for Amphibians and Reptiles; to continue public participation and information efforts regarding wetland conservation status; and to investigate the potential for a symposium on Great Lakes/St. Lawrence herpetofaunal issues to be hosted by a regional or international scientific conference. As public interest in herpetofauna is currently high, and as a number of federal and state programs have recently been completed or are currently underway, it is believed that the present time is critical for the task group to pursue such collaboration and coordination.

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GREAT LAKES RESEARCH CONSORTIUM
24 Bray Hall
SUNY College of Environmental Science &
Forestry
Syracuse, NY 13210
315 470-6816

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