

REPORT

of the Great Lakes Research Consortium

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Consortium Goes to Washington

Consortium Directors Richard Smardon and Jack Manno took their case to Washington on May 8 to gain support among New York's congressional representatives for a new comprehensive, federal Great Lakes restoration strategy, and to promote New York and the Great Lakes Research Consortium as essential leaders in the federal plan.

The briefing was part of a meeting organized by SUNY Chancellor Robert King and Olwen Huxley, a staffmember of the Northeast-Midwest Coalition and an aid to Congressman Jack Quinn. Representatives from the SUNY Research Foundation, and several Consortium campuses spoke to the staff members of New York's congressional delegation, Governor Pataki's office, and the Congressional Great Lakes Task Force. Chancellor King and the SUNY Administration have recently launched an initiative to obtain \$38 million in federal support for the creation of a Great Lakes Research Consortium network of research, education and outreach facilities.

Momentum has been building across the Great Lakes region in support of developing a major federal initiative to restore the Great Lakes ecosystem, similar to the recent effort to protect and restore the Everglades at an estimated cost of \$7.8 billion over twenty years. The Great Lakes Congressional Delegation recently asked the Great Lakes Governors to come up with a priority list for a Great Lakes restoration package before going forward with possible legislation. In their briefing to New York's delegation on May 8th, Smardon and Manno asked New York's representatives to make sure that any federal Great Lakes restoration package does not leave New York behind. The state needs a major investment in its research and education infrastructure as part of a larger plan for restoring the environmental and economic prosperity of communities from Buffalo to Plattsburgh. Manno told the delegation that "the lack of suitable facilities and vessels to conduct Great Lakes research has constrained environmental research and reduced the opportunities available to the general public, academic institutions, and school children to learn about and appreciate the importance of the Great Lakes to New York. A \$38 million investment in the Facilities Network of the Great Lakes Research Consortium would partially correct the imbalance in federal funding to New York, and it would give the state the research ability it needs to become a leader in a long term Great Lakes restoration plan."

The GLRC network is distributed along New York's "North Coast" with facilities on Lake Erie, Lake Ontario, the St. Lawrence River, the Finger Lakes, and Lake Champlain. While some facilities are planned, most already exist and require expansion, equipment upgrades or other improvements. Together, the facilities provide ready access to a diversity of ecosystems including wetlands, large rivers and large lakes distributed throughout an array of watersheds encompassing urban, suburban, and agricultural development. The facilities network includes the Great Lakes Institute with facilities at Buffalo and Brockport, the Montezuma Wetlands Complex and Research Institute, the Lake Ontario Research Center at SUNY Oswego, the GLRC Central Office, the Cornell Biological Field Station, SUNY ESF Thousand Islands Biological Station, the Great Rivers Institute and the Lake Champlain Research Institute. Along with nearly 300 researchers of various disciplines, this network of nine research and education

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Useful Information for
New York's Great Lakes
Research Community



A Great Time for Action

*Commentary from the Executive Director
Jack Manno*

The present moment may be just the time for historic advances in the cause of Great Lakes protection and restoration. Or it could be a time of lost opportunity and regrets. Several things are happening and coming together that will require us to really understand the chemical, physical, biological and social relationships that determine the condition of the Great Lakes. There has never been a greater need for Great Lakes research nor a better time for New York State to decide to take its rightful leadership role in Great Lakes decision-making and the supporting science it requires. Here are just some of these:

- **Review of Water Level Regulation** - The International Joint Commission is undertaking a review of the regulation plan that guides the management of flows through dam system on the St Lawrence River. For the past fifty years these flows have been managed to benefit commercial shipping and hydropower production and protect shoreline property owners. Little or no regard has been given to the long-term environmental impacts on the ecosystems of the river or Lake Ontario, nor to the concerns of recreational boaters. In order to adopt new operational rules, we need a much more refined understanding of the relationship between complex patterns of high and low water and the condition of wetlands, fish spawning areas and other important habitats.
- **Protecting the Great Lakes from Large Scale Water Export and Diversions** - The Governors and Premiers of the Great Lakes States and Provinces have agreed to develop an Annex to the Great Lakes Charter for new decision rules to regulate water export and diversion. The persuasive arguments for such restrictions will come from the ecological impacts of increased withdrawals and permanent reductions in supply. We need a better understanding of these impacts, especially in light of the regional climate models that forecast lower supplies in a warmer world.
- **Seaway development** - Of all the ways to move goods, water transportation is the most energy efficient, and on a global scale potentially the most environmentally benign. The idea of an inland route for ocean-going vessels has long been a dream of economic developers in the Great Lakes port cities. Today most cargo is offloaded in Montreal and transferred to rail, truck or Lakers, the ships designed for the lakes. There is a new move afoot in Congress to expand the system. We need to know in great predictive detail what such construction would mean for the ecology and environment of the Lakes and Rivers.
- **Tourism promotion** - Europeans are rediscovering America. So is the rest of the world. Standing at Niagara Falls you're likely to hear ten or more languages at once. People have always come here to visit our natural wonders, or to fish, and many come for our cities even when they don't know they are in the freshwater capital of the world. Now there are proposals for inter-city ferries, cruise-ships, eco-tours, aquariums and more. This new interest in the lakes will thrive as long as we keep them clean. A thorough understanding of the multiple threats facing us in the near future and what we can do about them is necessary.
- **Fishery management** - The put-and-take fishery based on transplanted non-native top predator fish was a successful response to the devastation that had virtually wiped out the large predatory fish of the Great Lakes. Although more than 30 years in the works, it doesn't make sense as a permanent solution. Stocking of preferred sport fish will continue probably indefinitely, but we also have the ability to help produce a mostly self-sustaining and healthy population of fish in all the lakes, fish that can produce good protein for subsis-

tence and for commercial purposes. This will require much greater understanding of the lakes ecosystem dynamics and a major commitment to cleaning up the toxic legacy that continues to pollute large, long living fish.

• **New threats to water quality and human health** - For the past two decades we have focused on a handful of chemicals that we know are harmful and that we know are present. Those two characteristics — harmful and present— define what we mean by a priority pollutant. There are thousands of new compounds and old ones in new uses, and releases that we don't know nearly enough about. Our focus on the "priority pollutants" may have blinded us from understanding the new threats from pharmaceuticals, household products, common fire retardants in our electronic equipment, and a range of commercial substances and by-products. Many with the potential to be active in the human and animal hormonal system. We need a new commitment to find pollutants in our water, identify them and understand their potential action. Preferably, we need to understand the full environmental impacts of commercial products before they are ever released and be able to prevent their release when warranted.

• **Great Lakes Ecosystem Restoration** - With all these issues coming to a head, there have been calls for a new, system-wide approach, a Great Lakes Restoration Plan on the scale of the multi-billion dollar South Florida and Everglades ecosystem restoration. This would require taking funding for Great Lakes activities, including research, to a whole new level.

• **HELP** - HELP stands for Hydrology for Environment, Life and People. It's a United Nations effort to encourage information sharing among major watersheds throughout the world so that we can learn from each other's experiences. Lake Ontario has been design-

nated as one of these watersheds, one where enough institutional infrastructures already exist to act system-wide, across national borders and among states and provinces. The rest of the world wants to learn from both our mistakes and successes. What we do here will matter everywhere.

It's time for New York State to take the lead in these major new efforts on behalf of the lakes. New York is the furthest downstream of the Great Lakes states. We inherit the problems everyone else washes downstream. But historically New York has not only not taken the lead, we've been the poor cousin of Great Lakes funding. Analyses we did in support of our request for federal funding for new research, education and outreach facilities suggests that New York has long been systematically underfunded. According to several indicators including shoreline length, population, water use, pollution problems, watershed size, federal taxes paid, etc, New York should receive somewhere between 12 - 18 percent of total federal funding for Great Lakes activities. In fact, we receive somewhere between 3 - 8 percent, according to figures obtained through the Congressional Research Service and other sources.

Now is the time for New York to step forward to lead in the Great Lakes. Once our facilities initiative is implemented we will have in New York, the premiere freshwater research capacity, distributed, networked and collaborative. We welcome your support in making this happen.



GLRC Report

Editors: J.P. Manno, M.J. Connerton, and C.J. Cryslar

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
Rochester Institute of Technology
SUNY College of Environmental Science & Forestry
SUNY Cortland
SUNY Fredonia
SUNY Geneseo
SUNY Oswego
SUNY Plattsburgh
SUNY Potsdam
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Directorate

Richard Smardon, Dir. Administration
Jack Manno, Executive Director
James Haynes, 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



2002 Student/Faculty Conference

Conference Tries Out New SUNY ESF Facilities

The new state of the art classroom facilities at SUNY ESF got an overwhelming “thumbs-up” from more than 115 students and faculty who gathered on the campus to share the results of their research and to discuss emerging issues facing the Great Lakes.

Excellent presentations were given by fifty-three students on March 15-16 in ten sessions covering fish ecology, environmental engineering, chemistry, toxicology, limnology, and public policy. Undergraduate participation continued to rise with ten students giving presentations, two earning awards for best overall poster and best talk in limnology and ecology (see awards, next page).

Highlights of the conference included Jack Manno’s keynote presentation about the importance of Great Lakes research, a faculty panel discussion on emerging issues in the Lakes, research planning meetings, student presentations, and a banquet featuring historian Sally Roesch Wagner.

KEYNOTE SPEAKER

The conference opened with a keynote address by Jack Manno, Executive Director of the Consortium. Jack talked about the history of Great Lakes environmental science and policy, and the important roles that researchers play in shaping the management of the Lakes. Jack pointed out that many of the first breakthroughs in the natural sciences happened in the Great Lakes Basin. For example, the concept of natural succession was refined on the dunes of Lake Michigan, Great Lakes researchers made the discoveries that DDT leads to eggshell thinning in fish-eating birds, that excessive phosphorus leads to eutrophication, and that PCBs and dioxin can cause significant reproductive and behavioral problems in animals. Jack highlighted the importance of students’ research to not only the Great Lakes, but often many of the things we learn are used by the rest of the world.

PANEL DISCUSSION

This year’s faculty panel focused on current trends in Lakes Erie, Ontario, and the St. Lawrence River and described new and emerging research issues. Assistant Professor Alicia Perez-Fuentetaja, of SUNY Fredonia, called for more research on botulism Type-E, a bacterium that has killed thousands of birds on Lake Erie since 1999. Neither the sources of, nor the pathways of the bacterium are well known, and basic questions need answers such as the extent of Type E botulism in fish and sediments, or the specific ecological conditions required for Type E production and transfer to birds. For more information contact Alicia at fuentep@fredonia.edu.

Tim Mihuc, Director of SUNY Plattsburgh’s Lake Champlain Research Institute, spoke about an emerging research technique that uses fatty acid signatures to trace food web pathways. This technique may have advantages over traditional techniques such as isotope analysis because fatty acids provide more specific capabilities to trace pathways. Tim will be forming a Consortium food web task group to investigate the potential of this emerging technique. For more information, contact Tim at timothy.mihuc@plattsburgh.edu.

John Hassett, Professor and Chair of the Chemistry Department at ESF, discussed the results of his research about how much gasoline is lost from outboard motors, especially two-stroke engines. He found that surface waters in swimming areas with high boat traffic could contain substantial amounts of gasoline. Although most compounds are soluble or eventually evaporate, the concentrations of gasoline in swimming areas are high enough to cause taste and odor concerns for swimmers or homeowners with water intakes close to the surface. For more information contact John at jphassett@mailbox.syr.edu.



Ryerson student Lindsey Pyatt at this year's poster session

Ted Endreny from SUNY ESF discussed a United Nations initiative called Hydrology for Environment, Life, and Policy (HELP). Ted and others worked to have Lake Ontario designated as an operational basin. The HELP Initiative has asked for participation from basins where the science of hydrology is helping solve multiple issues involving water law and policy, water resources management, ecological, recreational and other stakeholder needs. Ted believes the Lake Ontario-St. Lawrence River water levels study will provide a case study valuable to other basins facing similar problems. For more information contact Ted at te@esf.edu

Mike Connerton of the GLRC closed out the panel with a presentation on the Great Lakes Research Consortium Facilities Network. With over 300 hundred faculty and nine research facilities, each with their various specialties, the GLRC is equipped to provide problem solving research on almost any issue facing the Great Lakes. Contact Mike at mjconner@mailbox.syr.edu for more information (see cover story).



2002 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 16, six 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 two years ago.

Susan Burns Environmental Chemistry Award

Kelly Lowe, SUNY ESF won for her presentation, "Photochemical Model for Mirex in Lake Ontario."

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

Fish Ecology

Thomas Hughes, SUNY Brockport for his presentation, "Population Characteristics, Habitats, and Movements of Lake Sturgeon (*Acipenser fulvescens*) in the lower Niagara River."

Environmental Engineering

James Craig, University at Buffalo for his presentation, "Modeling Groundwater/Surface Water Interaction with the Analytic Element Method"

Limnology and Ecology

Daniel White, SUNY Brockport won for his presentation, "The Significance of Phosphorus Released from the Sediment Under Anoxic Conditions in Sodus Bay, N.Y."

Melanie McFadden of Syracuse University

won for her presentation "Lake Ontario Primary Productivity Over the Last 17,000 Years: Evidence for Unprecedented Eutrophication During Historic Times."

Public Policy

Gerald Bove, University at Buffalo won for his presentation, "Spatial Analysis of Mortality Rates of Bladder And Rectal Cancers Along the Shores of Lake Erie."

Best Poster Presentation

Constance Sullivan, SUNY Potsdam for her poster, "Is Polychlorinated Biphenyl Contamination Passed Between Generations of Aquatic Vertebrates?"

History Happened Here!

Why was the Great Lakes region of New York a hotbed of ideas for radical reform in the 19th century?

According to author and historian Dr. Sally Roesch Wagner, nineteenth century feminists didn't need to imagine an egalitarian society, they experienced one when in the company of neighboring Iroquois tribes.

At this year's banquet, Dr. Roesch Wagner presented the story of how native American women of the Haudenosaunee (Six Nations Confederacy) influenced the early women's rights campaigns in New York's Great Lakes region. Dr. Wagner provided some very insightful historical evidence suggesting that



Sally Roesch Wagner

women of the Haudenosaunee- who enjoyed rights of property, voting, dress, and marriage in the 19th century probably inspired women such as Elizabeth Cady Stanton, Matilda

Joslyn Gage, and others to seek similar freedoms. Sally Roesch Wagner is a founder of one of the nation's first women's studies programs, and author of many books and articles on the women's movement and radical reform in the 19th century. Her talk informed and inspired us about a little known part of our region's history. For more information visit the web at www.nyhistory.com/sallyroeschwagner



A Network of Research and Education Facilities

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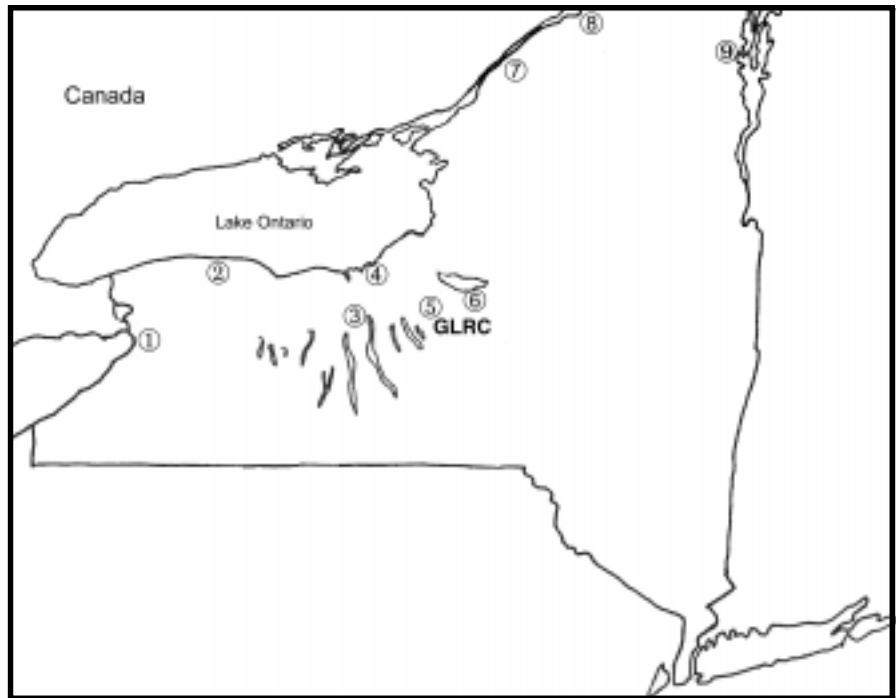
facilities is situated perfectly to provide the Great Lakes Basin with the facilities it needs in the lower lakes, and an unmatched research capacity worldwide.

Each of the facilities has its own unique research specialties, and together they provide a complete package of research and education capabilities.

1) The Great Lakes Institute's Facility at Buffalo State College will provide New York's researchers, educators, and the general public with access to Lake Erie and the Niagara River. It specializes currently in fisheries ecology, chemical and hydrodynamic modeling, watershed hydrology, and geographic information systems. Plans for expansion of an existing center include an enlarged laboratory and offices for as many as 25 researchers of many disciplines, with integrated educational and outreach components for students and others to learn about the Great Lakes. In addition, the Center for Computational Research at the University of Buffalo will become the major terminal for the Institute, creating a clearinghouse for all research of the GLRC.

2) The Great Lakes Institute's Facility at Brockport will provide research and outreach access to New York on the western end of Lake Ontario and will become one of the few centers of its kind to integrate science with art and culture. Currently, SUNY Brockport houses state of the art water chemistry labs, and maintains several aquaculture ponds on its campus, but lacks adequate access to the lake. Plans for a new facility include access to Lake Ontario, laboratory and office space, art studios, and facilities to educate people about the natural and cultural history of the Great Lakes.

3) The Montezuma Wetlands Research Institute is a 36,000 acre complex of environmentally diverse habitats including wetlands, agricultural lands, upland forest, grasslands and open water, where scientists specialize in wetlands ecology and restoration, waterfowl biology, and public outreach. The current center is not large enough to accommodate large school groups. The proposed Crusoe Conservation Center would provide expanded research and educational opportunities.



Great Lakes Research Consortium Facilities Network

4) The Lake Ontario Research Center at SUNY Oswego specializes in gathering and disseminating critical information about the biological and neurobehavioral effects of pollution, the airborne transport of pollutants, and techniques for environmental remediation. The current facility lacks adequate boat access to the lake, and needs upgrades to its laboratory and meeting facilities. The proposed development would include construction and operation of a new research/academic facility that would provide large and small boat access to eastern Lake Ontario, state of the art analytical support for chemically characterizing environmental samples, and facilities for instruction of academic science programs at all levels including teacher education.

5) The Great Lakes Research Consortium Central Office proposes to expand and upgrade its offices at SUNY ESF including the purchase of a dedicated server for the Consortium's website. The expanded website will include a publications clearinghouse, and space to coordinate data management and research for the lower lakes and the St. Lawrence River. Funding will also support academic programs and fellowships for promising students conducting research on the Great Lakes.

6) Cornell's Biological Field Station is internationally recognized for its continuous long-term database on the fish and limnology of Oneida Lake and for its contributions to the understanding of aquatic food webs and invasive species in Oneida lake and the Great Lakes. The



Facilities Network.. continued from page 6

station's full potential would be realized with upgrades to its existing field equipment, laboratory and teaching facilities. Acoustic gear and equipment for assessing aquatic organisms, and buoys to obtain real time water quality data would help quantify the degree of spatial variation in the lake. A multi-user laboratory with auto-analyzing chemical equipment, continuous flow through mesocosms, and computers with GIS/visualization software would provide the tools necessary for a better understanding of the watershed processes that are impacting the health of Oneida Lake.

7) The SUNY ESF Thousand Islands Biological Field Station provides New York and the Great Lakes with important information about the ecology of large rivers and coastal wetlands, especially New York's highly-valued pike and muskie fisheries. The proposed renovation of existing laboratory and housing facilities on Governor's Island, and better shore-based facilities would provide year round access to the river and give the station the ability to expand its research program by accommodating more students and researchers.

8) The Great Rivers Institute is a planned facility envisioned to operate in partnership with several academic

institutions and as part of the St. Lawrence Aquarium and Ecological Center near Robinson Bay, New York. The aquarium will expand tourist and educational opportunities in the North Country while the research center will specialize in studying large river ecosystems of the world. The center will depend on the aquarium for its educational outreach and the aquarium will depend on the center for developing new knowledge that informs its visitors about the natural history and management of the St. Lawrence River and other large rivers of the world.

9) The Lake Champlain Research Institute at SUNY Plattsburgh provides research and educational opportunities for students and faculty on Lake Champlain and specializes in PCBs, food web ecology, fish ecology, and recreation management. The current center lacks a shore-based facility with easy access to laboratories and office space. The proposed center will include wet laboratories and a flow-through experimental system to simulate natural lake conditions for studying aquatic biota.

Manno and Smardon are hopeful that the federal budget will include some funding in the upcoming year's cycle for the proposed facilities initiative. For more information contact Jack Manno at jpmanno@mailbox.syr.edu.

Conference Addresses New York's Troubled North Coast

Although Lake Ontario has seen significant improvements to its overall water quality over the last twenty years, there are new threats and old pollution problems in its nearshore waters. This was the focus of the North Coast Conference held on May 3 outside Rochester, New York, where more than 175 people met to voice their concerns, discuss solutions, and explore the need for a unified front to address the water quality problems plaguing New York's shoreline.

"We've done a very good job of cleaning up our offshore water, but the coastal waters, the areas where people come in contact most with the lake, still have the most problems," said Joseph Makarewicz, Director of Environmental Sciences at SUNY Brockport.

Most of the eight counties along New York's 300-mile north coast must deal with algae problems, overgrown weeds, zebra mussels, and fluctuating water levels. Many communities are forced to close beaches once or twice a summer because of high bacteria counts, and others have given up on their waterfronts because of contaminated sediments and other problems.

"We finally get it in New York. The waterfront is not our back door. It's our front door," Secretary of State Randy Daniels said at the conference. "We must work together to protect it."

"We don't want people to believe we're done," said Mario DelVicario, chief of Community and Ecosystem Protection Branch of the U.S. Environmental Protection Agency. He said that although pollution has declined in the past 15 years, the lake suffers from impairments such as algae, weed growth and zebra mussels.

The outcome of the conference was a commitment to continue the Embayment Initiative that seeks a broad-based, adequately funded program targeted at improving water quality of the embayments and tributaries of the North Coast. For more information, or copies of *New York's North Coast A Troubled Coastline*, that documents the problems, contact Joseph Makarewicz at jmakarew@brockport.edu.



New York's North Coast: A Troubled Coastline

It is time to recommit ourselves to celebrate, protect and restore one of New York's greatest treasures- its North Coast.

Senator George D. Maziarz

Excerpted from remarks given by Senator Maziarz at New York's North Coast Conference.

So often, and for good reasons, we think of the Great Lakes as only huge masses of water, and the serious challenges as facing only the open water. But that's not the whole picture. That's like viewing the oceans without considering the shorelines that define the oceans. From the open, deep waters, New York may be the south shore of Lake Ontario, but from New York, Lake Ontario marks our North Coast and this coast is just as lovely, has just as much grandeur and is just as valuable as any part of our nation's East and West Coasts. In many ways that we will consider today, it is on this North Coast that we must make the necessary changes to protect the future of the lakes.

The title of today's conference also highlights the fact that even though we have made considerable progress in cleaning up the open waters of Lake Ontario, much remains to be done nearer the shores. We need to put as much effort into addressing the challenges facing the near shore zone as we do the open water because this is the place of greatest ecological productivity and also the place where our citizens, our farms, our industries, and lots of wildlife encounter the lakes. Our North Coast is a treasure but remains, at times, troubled indeed.

We are at an important crossroad in the history of the Great Lakes. For the past thirty years we have made steady progress in improving water quality. The concentrations of the Great Lakes priority pollutants have steadily dropped. We are approaching the point where fish caught from these waters could become once again a regular part of a healthy diet. The water is often sparkling clear. Photos on a sunny summer day often resemble the great beaches and shores of our other coasts.

We have the opportunity to build on our successes. Lake Ontario can become a greater draw for people and business that seek the security and pleasure of a healthy environment, clean drinking water, natural beauty and a vibrant economy. Swimming, boating, fishing, and history-based tourism can be a regular part of the experi-

ence of our communities. If we make the right choices now we will celebrate even greater success in the years ahead. U.S. Environmental Protection Agency administrator Christine Whitman recently announced the Great Lakes Strategy 2002-A Plan for the New Millennium. Under Governor George Pataki's leadership, New York is an active, engaged partner in the U.S. Policy Committee that created this plan to integrate existing environmental protection efforts in the Great Lakes and cooperatively work with the broader Great Lakes community to advance the restoration and protection of the Great Lakes Basin Ecosystem. This renewed national and state attention is very good news.

Today more than ever, we are at an historic crossroad to address the signs of danger in our troubled North Coast. Let me remind us of a few of those troubles.

Run-off, polluted rain and snow, and water levels that are too low, likely combine to create conditions in which nuisance algae flourish, foul our beaches, threaten the taste and odor of our drinking water and spoil recreation. Invasive species of aquatic weeds and nuisance organisms disrupt the fragile ecological relationships that benefit us in complex ways and maintain the health and integrity of near shore environments. Newly measured pollutants from our home and garden products, pharmaceutical drugs and our mountains of electronic waste threaten to overwhelm the progress we've made in reducing toxic chemicals, and potentially threaten our health. The spread of wildlife diseases such as the avian botulism that has struck Lake Erie could put even more strain on our North Coast.

As a Senator and Co-Chair of the New York Coalition of Great Lakes Legislators, I am deeply concerned about the choices we make in the short term as well as the long term to choose the path of restoration and protection.

So I propose to you a New York Great Lakes Strategy. It consists of

1. Focusing our attention on the North Coast's harbors and embayments: In the past we focused on the open waters of Lake Ontario. The International Joint

Commission identified Areas of Concern specifically because each was a source of pollution to the international waters. It was Canada's and our obligation to reduce and eventually eliminate such cross-border pollution. But the North Coast's many bays, inlets, ponds and wetlands require our concern as well. Despite the clean-up successes in the open waters of Lake Ontario, the bays and inlets of the North Coast have shown little signs of improvement. Our programs need to shift or extend some attention to these problems. We need a long-term commitment to addressing the sources of water quality problems and a renewed dedication to clean up. I endorse the North Coast Embayment Initiative as a way to focus our efforts.

2. Getting New York's Fair Share of Great Lakes

Federal Funding: New York State has rarely been at the center of Great Lakes activities. Even though we are the furthest downstream and therefore receive pollutants and problems from our upstream neighbors, federal programs rarely focus on New York's conditions. The Great Lakes National Program office is in Chicago. The National Oceanic and Atmospheric Administration Great Lakes Laboratories are in Michigan. Headquarters for most Great Lakes programs are in Wisconsin, Illinois and Michigan. The North Coast of New York represents approximately 17% of the Great Lakes shoreline, second only to Michigan, yet recent estimates by the New York Great Lakes Research Consortium show that New York receives around 8% of dedicated Great Lakes federal funding. This disparity needs to be addressed.

3. Building a world-class system of environmental education, outreach and research:

New York is fortunate to have diverse research organizations whose biophysical as well as social scientists have been producing valuable ecosystem and cultural understanding and reliable research data about human health and the environment. Research partners such as New York Sea Grant, the DEC's Great Lakes Program, and many others stand in support of the Great Lakes Research Consortium's proposal to establish a system of shore-based research stations, education facilities and public outreach centers all along New York's North Coast. These sites will give us the ability to be on the water, in the labs, and among the communities, focusing on the causes of the problems of the North Coast and building the sustained scientific and social capacity to manage and monitor North Coast clean-up. The Consortium has asked for \$38 million dollars from federal sources to build and equip these facilities. The New York Coalition of Great Lakes Legislators will continue to advocate that New York's Senators and Members of Congress take the lead in obtaining this dedicated federal funding.

4. Protecting Great Lakes water from the threat of diversions, waste and poor management.

lake levels that are too high produce frustration and anger for shoreline property owners, lake levels that are chronically too low are troublesome also because they compound the ecological and recreational problems in our bays and inlets. In addition, our water is attractive to states and even other countries that have mismanaged water and growth for decades and now fear water shortages. The possibility still exists that the Great Lakes could be drawn upon to quench distant thirst or to fill greedy pockets. We in New York are particularly vulnerable at the end of the chain of Great Lakes. We must take the lead in developing a sound water management strategy and efficient political safeguards to prevent future diversions or large-scale exports. We will need to show ourselves capable of protecting the lakes and conserving them for the future if we are to make a strong legal and moral case to reject future demands on our resources.

5. Preparing Now for Future Threats: Understanding and appreciating the lakes and especially our North Coast has to be a high priority if we are to prevent future disasters. We need a sound system for preventing the entry of harmful invasive species into our ports. We need to monitor and understand the potential harm from our home and garden products. We need to fully understand the impacts of water level regulation on our coastal environment and make changes to the regulation plan that can help prevent ecological degradation of these areas. Any proposals to upgrade and expand the Seaway system must meet strict environmental standards.

6. Building and Maintaining Collaborative Energy:

This is where the proverbial rubber meets the road because the best science in the world won't do us any good if we can't get it reflected in policy, embraced by stakeholders, and implemented effectively.

The long list of this conference's co-sponsors and your presence demonstrate the existence of, and the potential for even greater collaboration among federal, state, and tribal partners. Municipalities; business & industry; private owners; environmentalist organizations; citizens; scientists; and even politicians can pursue cooperative actions to clean up and protect New York's North Coast.

As we open today's conference, let me say again, "we are at a crossroad." The challenge is great but our agenda is clear. It is time to recommit ourselves to celebrate, protect and restore one of New York's greatest treasures, its North Coast. It's simply the right thing to do and the necessary thing to do for all of the vulnerable living resources that depend on it, including us.

I hope this conference will strengthen existing alliances and forge new ones, reenforce our commitment, and put us on the path of restoration and protection of New York's troubled North Coast, and the Great Lakes. Thank you for caring so much. Now let's get to work!



Great Lakes Research Seminar Series

Participation in this year's GLRC Seminar Series, with eleven fall speakers and fourteen in the spring was the best yet. Seventeen presentations took place at member schools in New York and eight at Canadian affiliate schools. Five Canadian speakers and twenty from the U.S. spoke on a wide range of topics including ultraviolet radiation, toxins, exotic species, geology, climate change, fish energetics, remote sensing, wetlands, amphibians, and water levels, as well as sustainable development and the politics of Great Lakes environmental protection. Our seminars attracted record numbers of participants with an estimated total of 875 persons meeting to learn, share thinking, and exchange information. As in other years, we are hopeful that our seminars will lead to future collaborative research projects.

We find that these seminars foster good relationships among our members. Feedback from participants was positive. Speakers expressed their satisfaction with the opportunity to network with fellow scientists, and lauded the seminar organization and the hospitality of the host schools. One such speaker, Lino Grima from the University of Toronto, spoke to a full house at SUNY Fredonia, where Alicia Perez-Fuentetaja had advertised the event on local radio, attracting some community members along with the college community. He appreciated the contacts he made and the tour he was given around Fredonia's countryside. According to Jim Haynes, Marc Rosen's presentation at SUNY Brockport had a great turnout and resulted in an excellent discussion afterward. John Hassett from SUNY ESF highly recommended the presentation by John Schott on remote sensing, and called Joe Gardella's talk on Brownfields and environmental chemical analysis "provocative."

Thanks to all whose participation once again made our seminar series a success! A list of this year's topics, speakers and locations follows.

- *Ultraviolet Radiation and the Great Lakes*, **Ralph Smith** at the Rochester Institute of Technology
- *Cyanobacteria Toxins in New York State Waters — Overview and Results from the 2000 and 2001 Survey*, **Greg Boyer** at the University at Buffalo
- *Optimizing Position within a Group: Understanding Why Animals in Swarms, Schools and Flocks Choose Certain Positions*, **William Romey** at SUNY Geneseo
- *An Update on Aquatic Exotic Species in the Great Lakes*, **Helen Domske** at the University of Waterloo
- *The Importance of Atmospheric Deposition to the Great Lakes*, **Tom Holsen** at Binghamton University
- *Coming Clean in the Mud: Uncovering Histories of Microevolutionary and Community Responses of Grazers to Environmental Change in Lakes Using the Sediment Egg Bank*, **Nelson Hairston** at the University of Toronto, and SUNY Geneseo
- *Risk Management for Climate Change*, **Phillipe Crabbé** at Clarkson University
- *High Frequency Climate Change in the Northeast during the Late Quaternary*, **Ray Spear** at the University of Waterloo
- *The Myth of Sustainable Development*, **Charles Hall** at the University of Guelph
- *The Energetics Basis of Fish Population Dynamics*, **Don Stewart** at the University of Windsor
- *The Politics of Great Lakes Environmental Protection: Past, Present and Future*, **Jack Manno** at SUNY Brockport
- *Remote Sensing of the Great Lakes: What We Can See, What We Can't See, and What We May See in the Near Future*, **John Schott** at SUNY ESF
- *Constructed Wetlands for Water Renovation — A Case Study*, **Tom Young** at the University of Guelph
- *What Can Lipids/Fatty Acids Tell Us About Ecosystem Function?* **Michael Arts** at SUNY Plattsburgh
- *Assessing International Heritage Functions of Wetlands*, **Richard Sardon** at Syracuse University
- *Behavioral Effects of PCB Exposure*, **David Berger** at the University of Ottawa
- *Larval Dispersal and the Connectance of Fish Populations*, **Peter Sale** at Cornell University
- *Environmental Chemical Analysis and Public Service Learning: Brownfields and Residents in Western New York*, **Joseph Gardella** at SUNY ESF
- *Reducing Energy Use and Environmental Impact Cost-effectively: Case Study for a University*, **Marc Rosen** at SUNY Brockport
- *Amphibians in Disturbed Environments: Case Study at Onondaga Lake, N.Y.*, **Peter Ducey** at the University of Ottawa
- *Complexity Science and the Bays of Lake Ontario*, **Mark Bain** at the University at Buffalo
- *Determining the Value of Great Lakes Resources*, **Hugh Canham** at Clarkson University
- *Great Lakes Water Levels: Enhancing Resilience*, **Lino Grima** at SUNY Fredonia



Great Lakes Education Initiatives

GLRC-Alcan Fellowships Support Undergrad Research

Another four students benefited from the GLRC-Alcan undergraduate fellowship program in 2001-02. 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. The Alcan Aluminum Corporation has supported a total of twelve students since the program began three years ago.

The GLRC-Alcan Fellowship recipients in 2001-02 were 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. **Katie Stammler** and Linda Corkum examined the behavior of male round gobies, an exotic fish species that is thought to be displacing native mottled sculpin populations with their aggressive defense of shelters. She concluded that resident male gobies will maintain their shelter site with aggressive acts unless challenged by an intruder of larger size. She also found that male gobies are a very aggressive fish regardless of whether they are territory holders or not, which she suggests may have been instrumental in the success of gobies in the Great Lakes. **Daniel White** studied phosphorus dynamics in Sodus Bay of Lake Ontario with Joe Makarewicz of SUNY Brockport. He compared the relative loadings of phosphorus from the watershed with estimated loadings from existing sediments in the bay. By conducting detailed sampling of the water column's temperature, oxygen, and phosphorus profile, Dan concluded that the majority of phosphorus was coming from the sediments by resuspension during periods of hypolimnetic anoxia, and that this phosphorus was stimulating late-summer algal blooms in the bay. **Stacy Trey** worked with Jim Pagano of SUNY Oswego on a method for extracting PCBs using steam distillation. Apparently, using this method for PCB analysis is difficult, so they tried a modified apparatus and were able to recover nearly 82 percent of the PCBs, and from 76 to 86 percent of the PCB homologues. Successful extraction depended on the degree of chlorination of the PCBs. **Celia Fan** worked with James Li from Ryerson on modeling and analysis of stream erosion in highly urbanized areas such as the city of Toronto. Celia found that erosion control measures are only effective in watersheds with less than 40 percent urbanization.

All of the GLRC-Alcan Fellowship students presented their results at the GLRC annual conference in March, 2002 and did an excellent job. Dan White won an award for best student presenter in the Limnology section.



Jacob Napieralski, SUNY College at Buffalo prepares to take a water sample at this year's Summer Institute

Consortium's Great Lakes Summer Institute Revived!

The Great Lakes Research Consortium sponsored a two and a half week intensive training course on Great Lakes water quality analysis and modeling from June 9-25, 2002 at the SUNY College at Buffalo. The course was open to graduate and upper level undergraduate students from member institutions of the Great Lakes Research Consortium. Students received hands-on experience with field techniques, including both ship-based and land-based sampling. Lectures about Great Lakes water chemistry, water quality and hydrologic modeling were taught by **Joseph F. Atkinson** from the Great Lakes Program at University at Buffalo, **Gordon Fraser** from the Great Lakes Center of SUNY College at Buffalo, **James N. Jensen** from the University at Buffalo and **Shreeram Imandar** from SUNY College at Buffalo. Room and board was provided.

The course was the result of the efforts of the participating faculty and the GLRC Academic Program Task Force, led by GLRC Research Director Jim Haynes, and it revived the Consortium's "Great Lakes Summer Institute" after a four-year hiatus. The Summer Institute is slated to become part of an ongoing program that will be hosted at Buffalo and SUNY Brockport in alternate years. The academic program task force is also seeking funds to continue or expand the program. For more information contact Joseph Atkinson at atkinson@eng.buffalo.edu, or Jim Haynes at jhaynes@brockport.edu.



News from Our Member Campuses...

Syracuse and Cornell Team to Study Zebra Mussel Effects on Benthos

In a new project funded by New York Sea Grant, researchers from Syracuse University and Cornell are investigating the increasing importance of benthic processes in Lake Ontario. Since the invasion of zebra mussels almost a decade ago, water clarity has increased because of the tremendous filtering capacity of mussels. Increased clarity allows more light to reach the bottom of lakes in deeper areas, and more light has changed the distribution and abundance of aquatic macrophytes. **Christine Mayer** and Sea Grant scholar **Bin Zhu** from Syracuse University are working with **Ed Mills, Lars Rudstam, and Dean Fitzgerald** of Cornell University to experimentally measure the effects of changing light and nutrients on benthic primary production in different habitats. They will assess the historical and current distribution of larger rooted plants, and create a GIS model of changes in benthic habitat that may affect important fish species. For more information contact Christine Mayer at cmayer@syr.edu.

In a related project, Dr. Mayer and her graduate student, **Peibin Qin** are collaborating with **Kimberly Schulz** and **Mark Teece** at SUNY ESF to assess the effects of *Dreissena*-induced changes in water clarity and nutrient loading on biochemical characteristics of primary producers. In this project, they are collecting preliminary data on fatty acid composition and nutrient ratios of benthic algae grown in different water clarity and nutrient conditions.



News from SUNY ESF

Theodore Endreny (Environmental Resources and Forest Engineering) attended the meeting of the UNESCO Hydrology for Environment, Life, and Policy (HELP) Interim Management Committee in Stockholm, Sweden in April and presented the status of Lake Ontario as a participating HELP basin. Ted has taken the lead in getting the Lake Ontario designated as a HELP Basin. He has garnered the endorsement of the USEPA, Environment Canada, and the interest of the IJC. We are targeting ongoing water levels research as a project to highlight in the HELP discussions. Follow up on meetings will be held this August in Kalmar, Sweden, and all interested Lake Ontario policy makers, managers, scientists, and citizens are invited to participate. For more information, contact Ted at te@esf.edu.

Donald Stewart (Environmental and Forest Biology) co-chaired a session at the IAGLR meeting on Vision, Visibility and Viability in Fish Populations. He can be reached at djstewar@mailbox.syr.edu.

Susan Senecah (Environmental Studies) is serving as Director of the New York Coalition of Great Lakes Legislators. Nearly 25% of the NYS legislators represent districts in the Great Lakes Basin. Her email is ssenecah@syr.edu.

John Farrell (EFB) and **Donald Leopold** (EFB) are co-PIs on a grant from the Great Lakes Protection Fund "Restoration of coastal wetlands in the St. Lawrence River through re-establishment of natural hydrologic regimes" (\$222,000; October 1999 to December 2002). Contact John at jmfarrel@mailbox.syr.edu for more information.

Donald Leopold is co-PI with **M. Bain, E.A. Cowen, D.P. Loucks, N. Hairston, Jr., R.J. Pendall, C. Driscoll, and S. Ellner** on an NSF Biocomplexity grant: "Physical, biological, and human interactions shaping the ecosystems of freshwater bays and lagoons" (\$3,000,000; October 2000 to September 2005). Contact Don at dendro@mailbox.syr.edu

Donald Leopold and **James Gibbs** (Both EFB) are co-PIs on a grant from IJC: "Plant and waterbird diversity relative to water levels in the Lake Ontario/St. Lawrence River region" (\$58,312; September 2001 to November 2002). For more information contact James at jpgibbs@mailbox.syr.edu.

John Farrell will receive a grant from the IJC: "Fish Recruitment-Evaluation of Hydrologic Management on northern pike and muskellunge performance in Lake Ontario and the Upper St. Lawrence River". Contact jmfarrel@mailbox.syr.edu.

John Farrell, Donald Leopold, Jack Manno and James Gibbs serve on the Lake Ontario-St. Lawrence River Water Levels Study Environmental Technical Working Group. For more information, contact Jack at jpmanno@mailbox.syr.edu.

Gregory Boyer and co-PI **Timothy Mihuc** (SUNY Plattsburgh) have received a grant from New York Sea Grant to develop an antibody based ELISA assay for anatoxin-a, the toxin responsible for the death of dogs on Lake Champlain. Dr. Boyer is also working with Prof. Steve Wilhelm (Univ. Kentucky) to look at molecular markers for biosynthesis genes for microcystins, the hepatotoxin produced by blue-green algae. Field trials will be carried out on Lake Erie. For more information contact glboyer@esf.edu.



More News from Our Member Campuses...

News Tidbits from Our Campus Reps...

The GLRC Campus Representatives provided these news briefs from their respective campuses.

At the University of Buffalo, **Joe Atkinson** will be working on a Great Lakes National Program Office project with Joseph DePinto to further develop the LOTOXII model of toxic chemical behavior in Lake Ontario. The new version will include detailed hydrodynamic modeling. Joe Atkinson was appointed U.S. Lead of the Environmental Technical Working group for the IJC binational water levels study. Nine students completed their degrees as the first graduating class of the new environmental engineering BS degree program in May. Along with the Great Lakes Center at Buffalo State College, the Great Lakes Program is running a Consortium-funded "Great Lakes Institute" for students from member campuses of the Consortium this summer.

The SUNY Fredonia Biology Dept. has hired a zoologist (Carrie Kazial) and shortly will be advertising for a Botanist. **Alicia Perez-Fuentetaja**, **Ted Lee** and **Mark Clapsadl** have received a grant from the Great Lakes Fish and Wildlife Restoration Act to study the food web origin of the botulism outbreaks in Lake Erie. Also, SUNY-Fredonia organized a workshop on botulism, sponsored by GLRC and Sea Grant, to identify areas of research on that topic.

At Clarkson University, **Phil Hopke** and **Tom Holsen** have a collaborative grant with **Jim Pagano** at SUNY Oswego and Mike Milligan at SUNY Fredonia to study atmospheric inputs of toxic chemicals to Lake Ontario.

At the Rochester Institute of Technology, an Environmental Sciences major is well under way with 12 students. A new wetland course is being offered in conjunction with the Montezuma Wildlife Refuge. **Karl Korfmacher** has joined the faculty specializing in Geographic Information Systems and Remote Sensing Applications. **Tony Vodacek** is working on remote sensing of benthic algae along Lake Ontario using an improved airborne sensor. **John Waud** and **Tony Vodacek** are participating in a new biomonitoring project at Montezuma wetlands.

Ed Mills reports from Cornell University that the new NSF-funded experimental facility is under construction at Cornell's Biological Field Station on Oneida Lake. Ed is also working with **Hank Venderploeg** on a synthesis paper related to the several aquatic species that have moved into the Great Lakes from the Caspian Sea. The paper will offer a never way to understand exotic invasions. The team at Oneida Lake is working on cormorant-fish interactions, the history of Lake Ontario shoals, understanding the impact of "benthification" as zebra mussels and others transform the ecology of lakes, an acoustic survey of Lake Champlain and a project studying the exotic zooplankton, *Cercopagis*.

SUNY Oswego researchers are currently working on several collaborative projects. The Lake Ontario Air Deposition Study will assess the effects of Lake Ontario and large cities on atmospheric contaminant loading. This EPA-funded project originally came out of the work of the GLRC funded atmospheric task force with researchers from Clarkson (**Tom Holsen** and **Phil Hopke**), SUNY Oswego (**Jim Pagano**), and SUNY Fredonia (**Mike Milligan**). Environmental health researchers at SUNY Oswego are assess-

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Fredonia Researchers Search for Botulism Source

The Biology Department at SUNY Fredonia has three scientists involved in deciphering the sources of botulism type E in Lake Erie. **Theodore Lee**, **Mark Clapsadl** and **Alicia Perez-Fuentetaja** have submitted proposals to fund their research and will start to collect data this field season. They are also organizing a workshop on botulism at SUNY Fredonia sponsored by Sea Grant and SUNY Fredonia. This workshop is a follow-up to a previous workshop held in Buffalo organized by Sea Grant. The goal of the workshop is to foster collaboration around the lake on botulism research and to organize research priorities and research groups. For more information, contact Alicia at fuentep@fredonia.edu

Brockport, Geneseo and RIT Receive EPA-USDA Grant to Evaluate Impact of BMPs on Watersheds

Researchers from SUNY Brockport, SUNY Geneseo and the Rochester Institute of Technology will partner with local agricultural agencies and farmers around Conesus Lake to investigate the ecosystem impacts of Best Management Practices (BMPs) on mitigating nutrient and soil loss in watersheds. The team, led by **Joseph Makarewicz** of SUNY Brockport and **Isidro Bosch** from SUNY Geneseo received a \$628,000 grant from the U.S. Environmental Protection Agency and the U.S. Department of Agriculture.

This multi-dimensional proposal represents an integrated approach of academics, extension and farming interests to conduct hypothesis-based research at the watershed level. For more information contact Joe at jmakarew@brockport.edu.



Projects Initiated by the Consortium in 2001/02

In 2001, the Great Lakes Research Consortium in cooperation with the New York Department of Environmental Conservation and the New York Great Lakes Basin Advisory Council provided small grants to help build new environmental research, education or remediation capacity in the state with earnings that accrue from New York State's investment in the regional Great Lakes Protection Fund. This program was developed to provide "seed" money for new, cooperative approaches to researching and protecting the environmental quality of the Great Lakes. Following are brief descriptions of the projects that have been funded this year.

Research Seed Grants

Lake Ontario Algae Cause and Solution Workshop

The accumulation of algae and its subsequent decomposition along the Lake Ontario shoreline contributes to bathing beach closures and causes strong, putrid odors along residential and recreational areas of the Lake shoreline. The increasing problem is impeding access to lakeshore recreational areas, forcing residents indoors or out of town, and spurring citizens to organize and demand government actions to address the problem. Several factors have been identified as contributing to the problem of increased algae growth and accumulation, but the relative importance of each of those factors has not been agreed to or communicated to local governments or citizens. Efforts are also under way by the public engineering and works community to design projects for diverting algae away from the public bathing beach at Ontario Beach Park in Monroe County. There is a need to bring all available information on the issue of Lake Ontario algae growth and management together to seek a common understanding of the dynamics of the natural ecosystem and the potential for successful intervention into the natural system causing the algae growth and accumulation.

This need was met by a one day workshop held on May 30, 2002 in Greece Town Hall, Monroe County, New York. The workshop examined factors contributing to algae growth in Lake Ontario and the potential solutions to manage its growth and accumulation. Speakers from the New York Great Lakes Research Consortium, Environment Canada, Sea Grant Extension and the U.S. Army Corp of Engineers presented on the basic biology of algae growth, recent research, history and trends, and overview of past and current efforts to manage algae. Proceedings of the roundtables will be prepared and used to pursue additional needed research and to develop a core of scientific information to use in evaluating algae accumulation interventions and in communicating with the public. The workshop is cosponsored by the GLRC, New York Sea Grant, Monroe County Department of Health, and the Water Education Collaborative. For more information contact Karen Paris Tuori, Monroe County Health Department at 716-374-6937.

Environmental Risk Protection and Sport Fish Consumption Advisory Awareness on the Cattaraugus Indian Reservation

Certain communities may be at higher risk for exposure to toxic substances in their environment. For example, Native American anglers and consumers of sport fish may not be aware of sport fish consumption health advisories for contaminated waters. Yet, Seneca Nation community members reside within close proximity to several popular fishing locations, including the Cattaraugus Creek and Lake Erie. Therefore, the goal of this project is to develop and test a pilot survey with the Seneca of the Cattaraugus Indian Reservation in Irving, NY. The New York State Angler Cohort Study, Great Lakes United, and Cattaraugus Indian Reservation Health Clinic administrators will work together to construct a survey gathering information on community members' knowledge, attitudes, and practices of sport fishing and sport fish consumption advisory awareness. The survey will be based on findings from previous research in other minority communities, as well as specific information regarding local issues of concern on the reservation and surrounding waters. Pilot testing will reveal any revisions in survey content or procedure necessary prior to administering the survey to the health clinic clients. Participation from the Seneca community in this project will ensure public input into the research and educational processes. Close cooperation among the three collaborating groups will be essential to the success of this project. The New York State Angler Cohort Study will be responsible for survey format and content, with guidance from Seneca community members, from Great Lakes United, and the health clinic who will also act as interviewers to pilot test the survey. This survey will generate data regarding a vulnerable community's attitudes and knowledge about an important Great Lakes issue. The results of future larger-scale surveys will be essential in the programming of educational interventions within the community. For more information, contact John E. Vena, University of Buffalo, at jvena@acsu.buffalo.edu



Spatial Distribution and Foodweb Impacts of Echinogammarus Ischnus, An Invasive Benthic Crustacean

It seems that every year brings with it another exotic species to the Great Lakes. These species can often spread rapidly, dominate native or other naturalized species, and change food web dynamics by eating prey or by providing new sources of food for predators. This study will increase our understanding of how a recently introduced amphipod, *Echinogammarus ischnus* may influence the dominant, resident amphipod species, *Gammarus fasciatus* as well as the near shore fishes that feed upon amphipods in the Great Lakes. It will quantify the current and historical spatial distribution of *E. ischnus* in Lake Ontario and its contiguous inland waters. It will conduct laboratory experiments to quantify cannibalism and mutual predation of the two amphipods, and determine the extent to which different fish species prey on the amphipods. This project involves investigators from Syracuse University (Christine Mayer), Cornell University (Edward Mills and Nancy Tisch) and the United States Geological Survey (James McKenna). In addition, the project will provide opportunities for undergraduate research at both academic institutions. For more information contact Christine Mayer at cmayer@syr.edu



Echinogammarus ischnus

Identifying Sediment Source Areas for a Highly Polluted Urban Creek

Scajaquada Creek in Erie County has been identified as one of the most polluted tributaries contributing to the Niagara River AOC. High concentrations of heavy metals, PCBs, and dioxins have been reported in the Creek sediments and are a cause of concern. Dredging of the existing sediment beds is one of the proposed remedial solutions. Recent data suggests that suburban development activities in headwater reaches appear to be contributing a majority of the current sediment load to the creek. These new sediment contributions are increasing the cost and effort required to dredge contaminated sediments. Furthermore, it is suspected that these sediments increase the eutrophication of the stream. Natural resource agencies responsible for the health of the watershed are very keen on identifying these sources so that appropriate management measures can be implemented to control the new sources of pollution. This study will identify these new sediment source areas and quantify their contributions using a combination of monitoring and modeling approaches. The GIS based SWAT model will be implemented for the watershed to develop sediment budgets for subbasins and creek reaches. The model will be calibrated and verified using monitored data. The GIS based model will be used as a tool by the resource agencies to identify critical source areas of sediment and to target appropriate management practices (riparian buffers, filter strips, etc.) for these locations. Knowledge of sediment contributors will also provide some scientific basis for citizens groups in the watershed to argue their case (for reducing sediment pollution to the creek) with suburban town councils and zoning authorities. For more information, contact Shreeram Inamdar, SUNY College at Buffalo, Great Lakes Center at inamdasp@bscmail.buffalostate.edu

Campus News...continued from page 13

ing the effects of environmental contaminants on childhood development and cardiovascular functioning. This multi-year collaboration, funded by multiple NIEHS grant and a grant from ATSDR includes Paul Stewart, Brooks Gump, Tom Darvill, Jackie Reihman, Ed Lonky, and Jim Pagano.

SUNY Potsdam representative **Margaret Voss** reported that an environmental science program with 2 aquatic biology positions is in the works there. Also vertebrate physiologist **Jason Shreer** recently joined the faculty. Jason's research is on the diving physiology of marine mammals from the North Atlantic and St. Lawrence estuary.

Gordon Fraser from Buffalo State's Center for Environmental Research and Education reported on the hiring of three new faculty members. One is an analytical chemist from Russia, one is a geneticist, and the other is a wetlands ecologist/biogeochemist. The Center also hired a new boat captain for the 46' Seneca. Center researchers will be working on studying eel movements around dams. Buffalo State received 4 new grants from NOAA studying metabolites of PAHS in humans. They are also working on a sediment yield model for the Buffalo River watershed, and a fish-abatement program. The fisheries lab is completed.

Check Out Our WebSite!



Visit the Consortium's Website for quick links to:

Our Member Campuses and their Representatives

A Directory of Great Lakes Researchers

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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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