

REPORT

of the Great Lakes Research Consortium

inside

-
- 2 *Message from the Executive Director*

 - 4 *GLRC Student Faculty Conference*

 - 4 *Emerging Issues in the Great Lakes*

 - 8 *Great Lakes Roundtable*

 - 10 *News from UB's Great Lakes Program*

 - 12 *News from other Member Campuses*

 - 13 *Research News & Announcements*

 - 17 *Projects Initiated by the GLRC in 1997/98*

 - 20 *GLRC Spring Seminar Series*



Useful Information for
New York's Great
Lakes Research
Community

LEGISLATORS FORM GREAT LAKES COALITION

The Great Lakes Research Consortium recently initiated and helped organize a Great Lakes Legislative Roundtable which took place on Thursday, March 5. Nearly thirty New York state legislators and legislative staff members from Great Lakes districts gathered in Grand Island, NY for a Roundtable discussion of several key issues regarding the lakes. The intent of the meeting was to provide a forum for clarifying issues that affect constituents, and to determine action steps that legislators can take to effectively resolve these issues. The outcome of the meeting was an agreement to establish a bi-partisan coalition of Senators and Assemblymembers to work together for Great Lakes causes.

For more about the
Great Lakes Roundtable
see pages 8-9, 16

The Great Lakes are the focus of many complex and diverse public policy issues concerning the management, protection, use and development of this important resource. At the same time issues such as fisheries, lake level management, toxics, recreation, tourism and economic development are common concerns for many New York citizens. This commonality, according to the organizers, was one of the main reasons for holding the Roundtable.

With the majestic Niagara River as a backdrop, the afternoon began with a working luncheon in which several speakers set the stage for the Roundtable. After Commissioner John Cahill and Region 9 Director Gerry Mikol welcomed a crowd of approximately sixty people, NY state Senator George Maziarz reviewed some of the most important Great Lakes issues facing legislators and other stakeholders (*see article, page 8*). He stressed that although there may be differences of opinion about an issue's importance depending on where one lives in the Basin, there is also a commonality among all Great Lakes citizens because of their reliance on the Lakes for many facets of their lives. Assemblyman Paul Tokasz spoke next, and he expressed the same notion and proposed it as a reason for establishing a powerblock of legislators to collaborate on behalf of the Great Lakes and its people. Jack Manno, Executive Director of the Great Lakes Research Consortium rounded out the introductory addresses by reviewing the history of New York's role in Great Lakes management, and he set the stage for the day's focus on ultimately improving the condition of the Lakes and the quality of life for the citizens that surround them. (continued on page 16...)



From left to right, DEC Commissioner John Cahill, DEC Region 9 Director Gerry Mikol and Assemblyman Paul Tokasz



Cooperation among Competing Campuses, Commentary from the Executive Director

Jack Manno

The Great Lakes Research Consortium exists primarily to create the conditions in which cross-disciplinary and multi-institutional collaboration in environmental research on the Great Lakes can occur. If we've learned nothing else in doing environmental research, we've certainly learned that collaboration, at least at some level, is essential if the results are going to be relevant to the real problems of the lakes. No one lab, university or department has all the expertise nor the equipment for research that will give a realistic snapshot of the lakes' complex ecological relationships. The lakes are chemical stews, biologically diverse, physiologically variable, geologically complex and dramatically affected by societies and their laws and institutions. No one can know all there is to know even about a small pond never mind the world's largest system of fresh surface water. But we do need to grasp a big picture, especially when asking the important questions the answers for which we turn to science. We may not expect the chemist to know all about plankton and fish, but by framing questions with ecologists and biologists the chemist will best contribute to understanding such important phenomena as the bioaccumulation of toxic chemicals in fish flesh. There are countless examples of this need for collaboration.

In the politics of higher education and research in New York, it appears that the trend is toward encouraging increased competition among the state's colleges and universities. There seems to be a naive belief in competition as the great motivator of excel-

lence and efficiency. Of course there has always been an active competition for students, for research dollars, for attention and prestige but in the past this competition has been moderated by a belief that the State University system could and should make it possible and even rewarding to collaborate toward larger system goals which transcend the interests of any single institution. The Great Lakes Research Consortium was created by SUNY to be a model for this kind of multi-unit collaboration, and it even encouraged the private schools such as Clarkson, parts of Cornell and Syracuse

University to join with the SUNY schools. Mechanisms were created to simplify the sharing of resources among these institutions. The Consortium, housed at ESF, helped the other member schools build their programs and obtain external support without charging additional overhead to the schools receiving the funds. The Consortium has so far succeeded as a

model of collaboration, but today in higher education in general, and in SUNY in particular, the trend is away from broad mission focus, toward more emphasis on the needs and ambitions of individual institutions, which can sometimes run counter to broader social goals.

While the campuses gear up for the new wave of competition, they may end up having less time for and interest in cooperation. This could do significant harm to the Great Lakes Research Consortium and similar cooperative efforts. In this atmosphere it's useful and interesting to look at what social scientists have discovered about cooperation and competition. The results of hundreds of studies on competition and cooperation undertaken over the past several decades are summarized in a book by David and Roger Johnson, "Cooperation and Competition: Theory and Research." The

"it is clear that cooperative efforts result in higher achievement and greater productivity than do competitive efforts"

results of the social science are clear, looking at 374 studies since 1898 the authors concluded "that cooperative efforts result in higher achievement and greater productivity than do competitive efforts" Among the insights from this work is the fact that competition does improve performance and efficiency but only under certain very particular circumstances. What's intriguing about these circumstances is that they require a great deal of cooperation to achieve. Competition which enhances outcome, therefore, only occurs in the context of cooperation; in fact it is a subset of the category of cooperative activities. Competition "works" when all parties know the rules and abide them, in fact cooperatively make and remake them. For competition to "work" competitors must also be fairly evenly matched and all must believe each has a reasonable chance of winning. Lastly and somewhat counterintuitively, competition works best in improving performance when who wins and who loses is relatively unimportant. According to Johnson & Johnson, " High levels of anxiety appear when winning becomes too important" and with it all the negative consequences of the irrationality that accompanies such anxiety.

Science is replete with much good competition. The members of the Great Lakes Research Consortium annually compete for funding for seed projects intended to build capacity in a certain area of Great Lakes science and lead to additional outside funding. The rules of this competition are clear and are made by the representatives of the member institutions. The goals of the competition are linked to the Consortium's mission to improve understanding of the Great Lakes and improve cooperation between the member schools. At least two member institutions are required to collaborate

on a successful proposal.

Good competition, successful competition, requires more, not less, system-wide collaboration, as any fan of the NCAA knows. If New York's colleges and universities are going to be encouraged to increasingly compete against each other, then it's more important than ever that we work together to articulate clear missions for research and education and the mechanisms and rules for accomplishing them. Among the most important missions should be improving understanding of the environment of the state, including especially the Great Lakes. We need a real commitment on the part of SUNY to collaborative efforts among the system units.



GLRC Report

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

Great Lakes Research Consortium

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

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

Member Institutions

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

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1998 Great Lakes Research Consortium

Emerging Issues in the Great Lakes: A Panel Discussion



Each year at the Great Lakes Research Consortium Student/Faculty Conference we hold a panel discussion on new and emerging issues in the Great Lakes. We ask a small group of scientists and scholars in each of several disciplines to venture an educated guess as to where things are headed in the Great Lakes. What are the key scientific trends and what are some of their implications for public policy? Here's some of what panel members presented this year:

Exotic Species

Ed Mills, Cornell University

Plants and animals from distant parts of the world have entered the Great Lakes in waves of significant invasion over the past 150 years, according to Professor Ed Mills, the Director of Cornell University's Biological Field Station on Oneida Lake and a respected expert on exotic species. The most significant of these waves came with the building of canals: the Erie Canal which linked the lower lakes for first time with the Hudson River system, the Welland Canal which bypassed Niagara Falls and allowed passage from Ontario to Erie and to the upstream lakes, and finally the St. Lawrence Seaway which brought ocean-going vessels into the system. Exotic species are certainly not unique to the Great Lakes. Mills' tables showed 4500 exotic species in the U.S. In general, the percentage of exotics which end up having significant disruptive effects in the host ecosystem tends to be consistent at about 15%. Mills documents 142 exotic species which have come to populate the Great Lakes, 113 in the Hudson River. Most alien species arrive by unintentional release, although some are deliberately planted for beneficial purposes, such as the several non-native varieties of salmonids planted to replace the depleted stocks of top predators mainly in Lakes Ontario and Michigan. Today most introduc-

tions occur accidentally by ships in their ballast waters. Mills recommended reading the book "Ecological Detective" by Gilmore for the interesting story of the discovery of introduced species and the tracking of their sources.

In the Great Lakes, non-native invaders such as the lamprey and zebra mussel have had dramatic impacts on Great Lakes ecological dynamics. The key needs for future research are in understanding ecological effects, methods of prevention and predicting potential new invaders and their sources.

Having recently returned from Russia and a study of Lake Baikal the most voluminous of Great Lakes, Mills described the situation there. Industrialization and increasing opportunities for trade mean nearly pristine Siberian lakes will likely experience alien invasions as they are developed. History shows that certain species are highly opportunistic and can quickly overwhelm native assemblages of plants and animals which have not evolved in the presence of the new conditions wrought by the invader. Ecosystems that go from pristine to developed are likely to experience invasions by exotics and their consequences. Lake Baikal could be a fascinating laboratory in which to study either the effects of invasions or the possibilities of prevention. For more information, contact Dr. Mills at elm5@cornell.edu.

Great Lakes Fisheries

Bob Werner, SUNY ESF

Given the ever-changing ecological dynamics of the lakes caused by changing species composition and varying human interventions, managing Great Lakes fisheries is a constant challenge. Scientists are continually developing and improving their tools for understanding the lakes and the fishes in them. Professor Bob Werner, a fisheries biologist with long-standing interest in the St. Lawrence River and Finger Lakes discussed these changes and how they might affect future research. There is a growing appreciation for the interactions between different factors that affect conditions for fish. Managing fisheries effectively requires a better understanding of these interactions: nutrient control, stocking decisions, land use patterns and exotic species introductions need to be understood in relation to each other in an ecosystem paradigm. Werner pointed to improvements in modeling capacity and in surveillance by hydroacoustics as two technologies that are making a shift to an ecosystem paradigm more possible. The key topics for research Werner sees are:

- how to characterize and protect the habitat required by different fish,
- how to restore ecological function after important areas have been altered,
- how to find optimal balance between the forage base and stocking levels,
- how might the conditions for Great Lakes fish be affected by global climate changes,
- how are fish being affected by trace pollutants that act as endocrine disruptors.

For more information, Dr. Werner can be contacted at rgwerner@mailbox.esf.edu.

Student/Faculty Conference

Student Research Celebrated at Annual Conference

On January 16-17, the eighth annual Student/Faculty Conference, sponsored by the Great Lakes Research Consortium was held in conjunction with New York Sea Grant Institute which provided funds for the Don Rennie Memorial awards. Close to one hundred students, faculty and research scientists met to exchange information about problems facing the Great Lakes and possible solutions.

This Conference is a unique chance for students conducting Great Lakes related research to present their findings to the research community. This year thirty-six student presenters took this opportunity to make public their developing research. Seven students were recognized for their outstanding work in a variety of research areas. In recognition of this superior achievement, a Don Rennie Memorial Award was awarded to each of the following:

Great Lakes Policy

Dena Owens, SUNY-ESF, for her presentation "Adaptive Management and Remedial Action Planning in the Great Lakes". For additional information, Dena can be reached at 315-423-7400 or dmowens@mailbox.syr.edu.

Chemistry & Toxicology

Janick Lalonde, University of Ottawa, for her presentation "Spatial and Temporal Trends of Mercury Levels in Different Fish Species of the St. Lawrence River". 613-562-5800 or jlalonde@science.uottawa.ca

Poster Presentation

Gideon Oenga, SUNY-Albany, for his presentation "The Effects of Polychlorinated Biphenyls (PCBs) and 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) on Human Breast and Endometrial Carcinoma Cells: Applications of the Competitive Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) for Evaluating Changes in Gene Expression". 518-446-9420 or oenga@wadsworth.org

Ecology & Limnology

Michael J. Connerton, SUNY-ESF, for his presentation "Developing Spatially-Explicit Models of Stream Ecosystems: Starting From the Bottom Up". 315-470-6564 or mjconner@mailbox.syr.edu

Ecology & Limnology

Darran L. Crabtree, SUNY-ESF, for his presentation "Estimating Rates and Exploring Potential Causes of Larval Fish Drift Between Adjacent Ecosystems". 315-474-0159 or dlcrabtr@mailbox.syr.edu

Environmental Engineering

Ashutosh Khandelwal, University of Buffalo, for his presentation "Analysis of Transport of Sequentially Decaying Reaction Products Under Nonequilibrium Sorption Conditions". 716-645-2114 or khand-a@acsu.buffalo.edu

Ravikumar V. Pragada, University of Buffalo, for his presentation "One Dimensional Numerical Model for Particulate Transport in a Lake with Benthic Nepheloid Layer". 716-832-4517 or rvp@acsu.buffalo.edu



GLRC/NSF Faculty Enhancement Program

For the fifth consecutive time, the Great Lakes Research Consortium has received funding from the National Science Foundation to hold its Undergraduate Faculty Enhancement Program. This program, "Applied Environmental Problem-Solving" is directed at faculty who teach environmental-related courses at U.S. colleges. It demonstrates environmental problem-solving techniques as an effective teaching strategy for encouraging undergraduate student interest in the en-

vironmental sciences. As participants are being exposed to innovative concepts and techniques developed by the Great Lakes research community, they also learn how to integrate environmental problem solving into curricula at their home institutions. The program is held on the shores of Lake Ontario at SUNY Oswego from June 7 - 22, 1998.

The program is taught by **Dr. Jim Haynes** of SUNY Brockport who is the lead instructor and coordinator of the overall program, along with **Dr. Ron**

Scrudato, Director of the SUNY Oswego Environmental Research Center, **Dr. Don Stewart**, of SUNY College of Environmental Science and Forestry, **Dr. Tom Young**, Professor from Clarkson University, **Professor Jim Pagano**, Assistant Director of Oswego's Environmental Research Center, and **Dr. Ronald Engel**, Associate Professor of SUNY Oswego. For information about the program, contact Haynes at 716-395-5783 or jhaynes@acspr1.acs.brockport.edu

More Emerging Issues in the Great Lakes

(continued from page 4)



Contaminants and Human Health

Tom Darville, SUNY Oswego

Tom Darville is the director of the Oswego Newborn and Infant Health Project begun by the late Helen Daly. Helen initiated the project to follow-up on some of the results she reported of experiments in which she fed laboratory animals Lake Ontario fish testing several behaviors linked to possible neurological damage. These results showed that rats fed Lake Ontario salmon were significantly more reactive to aversive events than were those fed Pacific Ocean salmon or commercially prepared rat chow. In light of earlier work done in Michigan by the Jacobsons, Helen was intrigued with what might be going on with children born to mothers who had consumed Lake Ontario salmon in their lifetimes.

Tom Darville discussed some of the early results of that work which showed that even quite low PCB levels in mothers could have detrimental effects based on studies done on infant orientation behaviors and toddler temperament. He said that new studies were needed to show the effect on emotion and personality; further study was also needed on the timing of mothers' exposure. There were still questions about what exactly in the fish was responsible for the effects seen and that more laboratory research was needed to look at the endocrine effects of different homologues of PCBs. He mentioned other work being done in Maryland possibly linking PCBs and attention deficit disorders. Although many suspect a link between environmental pollution and childhood attention problems, little scientific work has yet been done to determine the facts. For more information, contact Tom Darville at darville@oswego.edu.

Environmental Advocacy

Margaret Wooster, Great Lakes United

Margaret Wooster, described the environmental advocacy work of Great Lakes United which she serves as Executive Director. GLU is a binational coalition of 173 organizations in Canada and the United States. In the future, environmental advocacy, she maintains, will focus on the theme of "Finishing the Job." Although much progress has been made in reducing most of the worst pollution of the lakes and cleaning up some of the legacy of past pollution, there was much left undone in eliminating long-lived poisons from the lakes. With the devolution of environmental responsibility more and more from the federal to the state and local levels, environmental groups are increasingly focused on rivers and watersheds, working at the local level to improve farming practices, restore

degraded riparian areas and adopting other ecologically sound land use practices. GLU's job is to focus the attention of these local groups on some of the regional and binational issues which affect them, especially the need to complete the implementation of the Great Lakes Water Quality Agreement which the US and Canadian governments first signed in 1972. Contact Margaret at wooster@igc.apc.org.

Laws and Policies

Barry Boyer, University at Buffalo Law School

Barry Boyer followed neatly on Margaret Wooster's comments continuing to detail the changes in the way Great Lakes policies are developed and implemented. These changes, including an emphasis on voluntary compliance, building partnership, "paralysis by analysis" and property rights extremism, Boyer argued were decidedly in the interests of dischargers rather than environmental protection. Regulators still claim lack of resources for new regulation and enforcement even though budget deficits are no longer a factor. In the changing political fashions of environmental protection, cooperation is in and coercion is out. This cooperation, Boyer maintains, comes with little accountability. Most new environmental protection programs build on the idea of forming partnerships among stakeholders with shared interests in protecting resources. The only problem is that in these partnerships corporations tend to be the "senior partner," the ones with the most resources to bring to the table. If regulation is threatened, affected interests often succeed in delaying them, arguing against their scientific and political supporting foundations. When all else fails, right-wing ideological influences on current politics has made property rights arguments particularly salient.

So what lies ahead? Boyer predicts perhaps a few more large-scale attempts at regulatory approaches such as the Great Lakes Water Quality Initiative, but these most likely will be vigorously opposed. There will be more emphasis on deriving measurable indicators of environmental quality which can be monitored and against which environmental success (or failure) can be measured. Boyer believes that the 1998 congressional elections may be critical in setting the tone for environmental politics. There will also be a continuing shift to local government as the actor with the most direct responsibility and an accompanying rediscovery of principles in common law that can be used for environmental protection. Mostly, Boyer counsels patience while waiting for a major shift in the political landscape toward a renewed environmental activism. Contact Barry at boyer@ubvms.cc.buffalo.edu

Emerging Issues continued....

The Legacy of PCBs

Brian Bush, SUNY Albany School of Public Health

The synthesis and large-scale production of Polychlorinated Biphenyls were of great value to society and a significant advance for public safety. Their extraordinary capacity to insulate made it possible to make smaller and more numerous electrical transformers and other equipment while greatly reducing the fire and explosive hazards. PCBs had many other uses where substances needed lubrication under extremely high heat. Bush explained that they also turned out to be cheap to make. Their low cost led to profligate use in capacitors, transformers, gas transmission turbines, vacuum pumps, circuit breakers, switches, reclosers, cable, and voltage regulators. At one time they were also used in hydraulic fluid, plasticizers, adhesives, fire retardants, wax extenders, dedusting agents, pesticide extenders, inks, lubricants, cutting oils, heat transfer systems, and carbonless reproduction paper. Before the fact of their dangers were widely accepted, they were distributed in vast quantities throughout the environment. Being virtually indestructible was a benefit to industry but a major problem in the

environment. Although they are no longer manufactured, they are virtually everywhere; scattered by the winds, clinging to sediment, and accumulating in fatty tissues of living beings.

According to Bush, nearly every study of mammalian systems has identified the deleterious effects of PCBs which include cancer, effects on sex hormones, the immune system and the brain. This being the case, the main effort over the next two decades should be the removal and destruction of the compounds from the environment as expeditiously as possible. Enough toxicology and epidemiological studies have been reported to support public policy that put the highest priority on PCB removal and destruction. The most recent of these studies showing a possible bioaccumulation factor for mammals from PCB vapor in air as high as 10,000,000 has further clinched this argument. For more information, Brian can be reached at bbush@wadsworth.org

Hazardous Waste Remediation

Ron Scudato, SUNY Oswego Research Center

Following neatly on Brian Bush's talk, Ron Scudato, Director of the SUNY Oswego Research Center spoke of how the field of hazardous waste remediation is evolving. He stressed the importance of two-way communi-

cation between regulators, the affected community and scientists. Ron has worked as a consultant for communities dealing with Superfund remediation. He also noted the lack of data on the long-term effectiveness of various treatment and containment methods, pointing out that the general public mistakenly believed that remediation meant removal and treatment, whereas much remediation is in-place capping and containment.

Ron predicted that the trend toward ever lower tolerance limits for exposure to a select group of highly toxic compounds would continue as we improved our capacity to measure minute concentrations of certain compounds. This would likely conflict with the opposite trend toward in-place solutions. He also predicted that exposure to airborne contaminants coming from both active waste sites and sites under remediation will come to be recognized as a greater hazard than currently believed. This may once again raise the level of public concern about exposure to toxic chemicals in hazardous waste sites, particularly as more and more people recognize that many sites are still a long way from being remediated while much of the total available funding for Superfund cleanups has already been expended. Contact Ron at scudato@oswego.edu for information

One of New York's Greatest Resources **The Great Lakes**

- Nearly 3 million New York Citizens get their drinking water from the Great Lakes Basin.
- The Great Lakes Basin supplies nearly 4 billion gallons of freshwater per day to New York for drinking water, industry, agriculture and power.
- Nearly 6 million people visited NY state parks along the Great Lakes corridor in 1996.
- Approximately 80 million tons flow through New York Great Lakes ports annually.
- Great Lakes and their adjoining rivers supply about 10 percent of the state's power demand
- An estimated 90 million dollars are brought to Great Lakes communities by non local fishermen.

The Future of the Great Lakes is the Future of Our Constituents

Talk Given by NY Senator George Maziarz
at the Great Lakes Roundtable

The Great Lakes Roundtable opened with comments from New York State Senator George Maziarz in which he reviewed some of the most important issues facing citizens that live within the Basin. Below is a copy of his remarks.



Thanks to all of you 1) for recognizing that the problems facing the Great Lakes deserve a renewed awareness and commitment for moving towards solutions and 2) for recognizing that together, in our roles as legislators, we have unique opportunities and enormous potential for influencing that awareness and commitment.

As you all probably know, the Great Lakes contain 95% of the U.S. surface fresh water supply and contain enough water to cover the continental United States under 9.5 feet of water. In the 1960s, the massive fish kills and the dead stinking algae mats covering Lake Erie's beaches sparked an international outcry that resulted in environmental policy, agreements, and treaties. In 1998, the problems that the Great Lakes still face are not as sensational as this, but are as critical and far reaching. You don't see it announced all over the news headlines, but we are at a critical juncture.

Admittedly, the problems are complex, often international, with diverse interests, sometimes with competing science, competing politics and politicians, and competing visions. It can often seem that the problems are too much to get a handle on, let alone to solve, especially as individual legislators. The temptation is to wait to react to

issues brought to our attention by angry, frustrated constituents or natural disasters or to focus on certain issues without placing them in the larger context. We are here today to be proactive and to place our district issues in the larger context.

We have committed to work together this afternoon on behalf of the Great Lakes in recognition of its critical link to the health and economic vitality of our constituents. I hope that today marks the beginning of us working together as New York Great Lakes Legislators to educate ourselves, and to put attention back on the Great Lakes, and to help create conditions that will advance the resolution of Great Lakes challenges.

We may not be able to be the ones to literally solve the water quality, fisheries, air borne pollution and other environmental problems facing the Great Lakes and its rivers, but as legislators, working together, we can play significant roles in raising awareness, exercising influence, and creating dialogue that will move us towards solutions. The future of the Great Lakes is the future of our constituents. Our responsibility as legislators is to do whatever we can to act as catalysts for the health of the Great Lakes' ecosystems for increased understanding and consensus on difficult issues.

Paul Tokasz is going to speak after me about the roles that we can play as legislators. Before he does that, I want to briefly review some of the issues that we have in common. Last month, many of us took advantage of an opportunity to discuss the issues and concerns of your districts with members of the sponsoring organizations that I mentioned earlier.

Here are three of the themes that emerged from those meetings.

Theme 1. We agree that things aren't simple. We appreciate the linkages among all the diverse pieces of the Great Lakes ecosystem, that nothing stands apart from the influence of and on everything else.

Theme 2. We agree that although many of the problems facing the Great Lakes are scientific and technical, they have far reaching, profound effects on the quality of life of our communities. Both the economy and human health are undeniably linked to environmental health of the Great Lakes. For example, whether people want to live in a place, feel good about a place, feel safe in a place, want to invest in its future, want to visit a place as tourists—these all depend

on a healthy Great Lakes, the lakes themselves and the entire basin. These are key issues of quality of life.

Here are a few of the issues that cut across our districts and need to be of concern to us all.

Commercial and sports fisheries. How strong the future of the Great Lakes commercial and sports fishery will be is uncertain. It certainly is contentious. Historically fisheries have been managed without recognizing the influence of other Great Lakes factors such as nutrient control, land use impacts, colonial bird populations, particularly cormorants, toxic chemical exposures, and especially exotic species invasions such as zebra mussels. We no longer can manage simply by maximizing a single resource, or attacking problems as though they are independent pieces of a machine with no impact on anything else. Instead, we must promote a full understanding of the complicated ecological relationships, perhaps through wide-ranging public dialogue among diverse parties.

I hope that today marks the beginning of us working together as New York Great Lakes Legislators to educate ourselves, and to put attention back on the Great Lakes, and to help create conditions that will advance the resolution of Great Lakes challenges.

Lake levels and shoreline erosion. As we know, it's not that easy to manage lake levels on a basin-wide basis, but we also know that our constituents understandably feel passionately about the issue. The goal is to alleviate the negative impacts of extreme high and low levels, protecting a level of stability of the shoreline and the biological diversity of the shoreline regions.

Toxic chemical contamination and airborne pollutants and their effects. We recognize that the Great Lakes are plagued by problems associated with certain substances which persist in the environment and are known to have toxic effects in living organisms, including people. As a result, diverse, and sometimes confusing, fish consumption advisories remain in effect for the entire NY Great Lakes region. There is still much that we don't know for sure about the effects of environmental pollutants found in the Great Lakes. What we do know is that much of the information that is known suggests that the harm is widespread enough to merit public concern. But all this needs to be addressed without negatively impacting recreational fishing activities that don't involve consumption.

We all agree that the health of the Great Lakes is linked to *healthy economic development*. For example, tourism. Over 6 million people a year visit NY State Parks along the Great Lakes-St. Lawrence corridor. People come to experience recreational opportunities afforded by the Great Lakes ecosystems. Healthy lakes promote healthy tourism, and sensitive waterfront revitalization efforts promote healthy lakes and protect vital wetlands. Again, that human—Great Lakes link.

Theme 3. We agreed that the concern with economic issues as one of the most critical, overriding components of quality of life of Great Lakes communities.

Whether the issue is sports fisheries, lake levels, coastal wetlands, chemical contamination, tourism, urban areas, park development and lake access, waterfront revitalization plans, or support for scientific monitoring and research we, together as legislators, can play stronger roles in more diverse ways to raise

awareness and move towards greater understanding of, greater appreciation for, greater resources allocated towards, and greater consensus on building a healthy Great Lakes.

Today, we will be engaged in a professional facilitated discussion to further consider common issues and determine what our initial actions might be. I'm excited about this historic opportunity to be the first Great Lakes state in which its legislators have joined together to gain strength, resources, creativity, and effectiveness in meeting the needs of our constituents and the Great Lakes ecosystem.

For a report on the Great Lakes Roundtable see page one and page 16.



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

Zebra Mussels and PCBs - A Case Study of Saginaw Bay

Dr. Joseph DePinto, GLP Director, is working with Dr. Victor Bierman of Limno-Tech, Inc., on a project entitled, "The Effect of Zebra Mussels on Cycling and Potential Bioavailability of PCBs: Case Study of Saginaw Bay". The focus of the project relates to one of the hypothesized ecological effects of the zebra mussel stressor: the effect of zebra mussel activities on the transport and fate of PCBs in affected aquatic systems. The project's hypothesis states that the invasion of zebra mussels in Saginaw Bay has altered cycling and phase distribution of PCBs in such a way as to increase the bioavailability of externally loaded PCBs in both the water column and the sediments of the system. This is truly an ecosystem problem because it involves the interaction of several important stressors: nutrient loading and associated plankton production, exotic species, and synthetic organic chemical contamination.

This research project addresses two significant questions regarding the response of Saginaw Bay to the invasion of zebra mussels. The first question has to do with the relative impact of phosphorus loading controls and the zebra mussel invasion on the production dynamics and biomass of the base of the food chain (phytoplankton) in Lake Erie. The second question deals with the considerable uncertainty about the impact of zebra mussels on the cycling of hydrophobic organic chemicals (HOCs), like PCBs, in the lake and on their bioaccumulation. In order to effectively manage this system - as well as other aquatic systems in the Great Lakes basin undergoing similar perturbations - we must understand the effects that the zebra mussel invasion is having on primary production and PCB bioaccumulation. Decisions regarding nutrient and HOC loading controls, fish stocking, fish consumption advisories, and fish harvesting regulations will be affected by these processes. Another benefit of this project is that the modeling framework developed will serve as a vehicle to synthesize all of the individual research on the ecological behavior of zebra mussels in the Great Lakes into an ecosystem-level understanding of this important issue. In doing so, it will be an invaluable research tool to identify data and understanding gaps and help direct future research and field monitoring programs. For more information, contact Dr. DePinto at depinto@eng.buffalo.edu

Research Focuses on Control of Zebra Mussel Veligers

Dr. John Van Benschoten, Great Lakes Program faculty affiliate and New York Sea Grant researcher, is involved in a project that examines what effects coagulants have on controlling zebra mussels. Coagulants are chemicals that cause particles in the water to stick together and form a mass. Van Benschoten and his colleagues recognized early in the study that the coagulants could have potential adverse effects due to the formation and settlement of floc (the mass formed by coagulants) in the intake pipes. They found that coagulants killed veligers largely because they make water more acidic. As a result, the scientists concluded that mild acidification of water at the intake shows great potential for water utilities needing to control mussels.

For more information on this project, contact Dr. John Van Benschoten, SUNY at Buffalo, 716-645-2114, ext. 2330; or e-mail: jev@acsu.buffalo.edu

Lake Ontario Modeling Workshop Proceedings

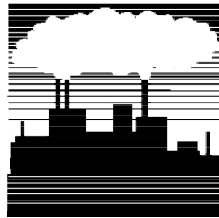
The Great Lakes Program is finalizing proceedings from the two-day workshop entitled, A Long Term Plan to Improve Modeling Capabilities for Toxic Chemicals in Lake Ontario. The workshop was sponsored by: U.S. Environmental Protection Agency - Region II, Great Lakes Program - University at Buffalo, New York Great Lakes Research Consortium, and the Canadian-American Studies Committee at UB, through the Canadian Consulate.

The workshop was related to the project entitled: A Long Term Plan to Improve Modeling Capabilities for Toxic Chemicals in Lake Ontario. The Principal Investigator and Project Director is Dr. Joseph V. DePinto, Director of Great Lakes Program. The workshop brought together 50 research scientists, managers, agency representatives and students.

The purpose of the July 30-31, 1997, workshop included the review of the draft implementation plan and an opportunity to make recommendations for its revision and to prioritize the activities to be undertaken as part of this long-term model improvement program. Another goal of the workshop was to alert the research team to any sources of potentially useful data that may have been overlooked. Our final goal was to identify and prioritize what research and data collection should be undertaken to reduce the most significant limitations in the most effective and cost-efficient manner.

Work continues with this research project, and a follow-up workshop is scheduled for fall 1998. Proceedings will be sent to workshop participants; others interested in receiving a copy of the proceedings should contact the Great Lakes Program at the University of Buffalo by calling (716) 645-2088.

Lake Michigan Mid-Winter Cruise: A "Chilling" Look at Atmospheric Deposition



Great Lakes Program faculty affiliate Dr. Keri C. Hornbuckle spent two weeks this winter out on the frigid waters of Lake Michigan, along with her research team (Sondra Miller and Jerel Bogdan) studying atmospheric deposition. Dr. Hornbuckle is Principal Investigator for an EPA-GLNPO research project studying the role that atmospheric deposition plays in the whole-lake cycling of many organic compounds in Lake Michigan. Dr. Hornbuckle hypothesizes that the magnitude of atmospheric deposition of a set of hydrophobic organic compounds (HOCs) to Lake Michigan is at least partly dependent on the partitioning behavior of the compounds between water and sediment in the water column and seasonal meteorological/hydrological events.

Dr. Hornbuckle undertook a pilot scale sampling expedition this winter aboard the EPA's research vessel, the Lake Guardian, to gather preliminary data to test this hypothesis and to guide future sampling efforts. The objectives for this sampling expedition and overall proposal are: 1) to collect air and water samples during the initial cruises of EEGLE (Episodic Events - Great Lakes Experiment, a project sponsored by NSF and NOAA); 2) to analyze these samples and a set of sediment samples for a suite of HOCs; 3) to interpret the data with respect to air/water exchange and sediment/water partitioning using data collected during EEGLE and the data collected in 1991-1995 by Dr. Hornbuckle, the LMMB (Lake Michigan Mass Balance Program, sponsored by GLNPO/EPA), and other available data and; 4) to provide recommendations to the EEGLE and LMMB projects on the use of the LMMB data set and the design of future sampling and modeling efforts. For more information on this project, see the following web site: <http://wings.buffalo.edu/ees/faculty/hornb/eegle.htm>

In a related project, Dr. Hornbuckle is working with Dr. Joseph DePinto, Director of the Great Lakes Program, on research also supported by GLNPO/EPA. The project is entitled, "Atmospheric Loadings of PCBs, Transnonaol, and Atrazine to Lake Michigan." The hypothesis of the project is that the magnitude of atmospheric deposition of target compounds to Lake Michigan is dependent on the proximity to major industrial centers (spatial factors) and seasonal meteorological/hydrological trends (temporal factors). The researchers propose to 1) summarize the current knowledge of atmospheric depositional processes; 2) review and evaluate the data from the Lake Michigan Mass Balance (LMMB) Project; 3) estimate the atmospheric deposition and loadings to Lake Michigan of target compounds with respect to spatial and temporal variability; 4) calculate the uncertainty associated with atmospheric deposition of target compounds; and 5) provide loading estimates in a format useful to the LMMB modeling effort.

Great Lakes Research Review

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

The first two-issue volume focused on the fate and transport of toxic substances and the effects of toxics, the second two-issue volume examined Great Lakes fisheries issues while the third volume featured articles on exotic species.

THE UPCOMING VOLUME:

The fourth volume of the *Great Lakes Research Review* will focus on research being conducted in the Lake Ontario-St. Lawrence River ecosystem. Those who may have questions or are interested in submitting an article, should contact Helen Domske, Associate Director of the Great Lakes Program at 716-265-4088 or sgbuffal@cce.cornell.edu



INTERNATIONAL ASSOCIATION
OF GREAT LAKES RESEARCH

IAGLR '98 Conference May 18 - 22

The International Association for Great Lakes Research will hold its 41st annual conference on Great Lakes Research May 18- 22 at McMaster University in Hamilton, Ontario, Canada. At this conference researchers exchange information on all aspects of great lakes from around the world. The theme of this year's conference is Great Lakes Habitat Restoration and Conservation. Pre-registration deadline is May 1. Members of IAGLR should have received registration information and further details in IAGLR's April Lakes Letter. Non-members may contact Wendy Foster (313-747-1673) at the IAGLR business office to receive registration materials.

News from our Member Campuses



Photoinduced Ozonolysis using O₂-Free Ozone

Professor Yuzhuo Li continues his study of fundamental photochemical reactions involving ozone in water that may be utilized in the development of treatment processes.

Past research suggests that the reaction between ozone and the organic molecule occurs when the latter is in the triplet state. Unfortunately, triplet state molecules are rapidly quenched with oxygen, which is usually present due to the way ozone is made. This problem has been overcome by using a trapping method to separate ozone from oxygen, allowing Li and his coworkers to look at just the ozone reaction without complications due to quenching from the oxygen. Under these circumstances, three mechanisms are possible:

1. Ozone in the ground state reacts with the organic in the ground state,
2. Ozone in the excited state reacts with the organic in the ground state, and
3. Ozone in the ground state reacts with the organic in the excited state.

For some compounds, one or another of the three mechanisms will dominate the actual reaction. For example, anthracene will react with ozone to form anthraquinone. Other chemicals, such as naphthalene, seem to react according to more than one of the three mechanisms. The team is also interested in what sort of products form from each mechanism. If the oxidation of PCBs goes through an extremely toxic intermediate, such as chlorinated dibenzofurans or dioxins, it would be desirable to know this before treating wastewater or doing some sort of remediation using this technique.

Presently, Li's group is investigating these processes with PCBs, halogenated PAHs (polycyclic aromatic hydrocarbons), and an explosive compound, TNT. They are using kinetics and photochemical techniques to look at the three mechanisms and hope to separate all three and establish exactly what happens in each case. Preliminary results to date indicate that the ozone in the excited state and the organic in the ground state are relatively minor contributors — excited state ozone will react with water to form peroxide, and water is in much higher concentration than the organic, which may be in a concentration range of ppb or ppt.

In the School of Engineering

Dr. Hayley Shen and her colleagues, Dr. R. Lougeay of SUNY-Geneseo, and Dr. Paul Hopkins of SUNY-ESF, have been granted funds to establish a GLRC Task Group on modeling ice dynamics through the use of remote sensing applications. This task force evolved from a GLRC Small Grants award which sponsored a workshop on the same topic.

In the School of Science

Dr. Phil Hopke has begun a collaboration with Dr. Keri Hornbuckle of SUNY Buffalo and Dr. Michael Milligan of SUNY Fredonia for the purpose of establishing another GLRC Task Group. This group will investigate processes, transport, and other air-water interactions of interest involving contaminants in the Great Lakes.

FREDONIA

Orvis Joins Biology Faculty

This past Fall, the biology department hired Dr. David Orvos, an environmental biologist. Dr. Orvos received his Ph.D. at Virginia Tech., and for the past seven years has worked as an environmental consultant and in industrial research and development, most recently with SmithKline Beecham in Philadelphia in their environmental research laboratory. His research background and interests are in fish toxicology, environmental risk assessment, and fate and transport of environmental pollutants. He was hired by the biology department to help develop SUNY Fredonia's new undergraduate major in environmental science, which has been specially designed to provide an emphasis on environmental risk assessment. While with SmithKline Beecham, Dr. Orvos helped to develop risk assessment strategies for the Chesapeake Bay, and co-chaired a joint NOAA/EPA sponsored meeting held to study this issue. Now at Fredonia, he is interested in applying his background to Great Lakes research.

From the Chemistry Department

Michael Milligan's research group is now routinely sampling the rural air from the NADP acidic precipitation field site located about seven miles from the Lake Erie shore and 13 miles from the Fredonia State campus in Chautauqua County. With the help of undergraduate and graduate research students, high volume air sampling runs are being conducted on an approximate monthly basis. Currently, the group is analyzing for PCBs, PCDD/Fs, PAHs, and hexachlorobenzene, and is focusing on the vapor/particulate partitioning of these compounds as a function of atmospheric temperature.

If you have any questions, please contact Michael Milligan at 716-673-3500 or milligan@oak.ait.fredonia.edu

Research News and Announcements

NSF & Lucent Technologies Foundation provide research funding.

The National Science Foundation and the Lucent Technologies Foundation jointly provide funding to support fellowships in areas of research or teaching that advance the emerging field of industrial technology. Fellowships provide \$50,000 per annum for two years to fund an individual or several individuals working together. Deadline: 05/29/98. Contact: Fred Thompson, Program Director, Environmental Tech, Suite 565, 4201 Wilson Boulevard, Arlington, VA 22230, E-mail: athompso@nsf.gov, Web Site: <http://www.nsf.gov/pubs/1998/nsf9890/nsf9890.htm>, Tel: 703-306-1320, Fax: 703-306-0312

Women's Health & Environmental Contamination Workshop

Friday, April 17, 1998, 9AM-4PM, Holiday Inn, Executive Tower, 222 S. Cayuga St. Ithaca, N.Y., Cost: \$55.00. This full day workshop will address links between women's health and environmental issues. The workshop will conclude with a Community Action Panel addressing the efforts being made in our County and State to address women's health and environmental issues. Registration Deadline: April 10, 1998. Presenter: Sandra Steingraber, Ph.D., biologist, poet, cancer survivor and author. Contact: Maureen Kelly, Planned Parenthood of Tompkins County, 314 W. State St., Ithaca, NY 14850, 607-273-1526, ext 126 or maureen_kelly@ppfa.org

USEPA Call For Abstracts - "Strengthening the Foundation of the Nation's Water Quality Program." 1998 meeting on Water Quality Standards, Water Quality Criteria and Implementation, including Water Quality-Based Permitting. Location: Wyndham Franklin Plaza Hotel, 17th & Race Streets, Philadelphia, PA 19103, 215-448-2000, fax-215-448-2864. Deadline for submis-

sion of abstracts: May 1, 1998. Contact: The Cadmus Group, Inc., 4900 Seminary Rd., Suite 600, Alexandria, VA 22311, 703-998-6862, press 2190, mrm98@cadmusgroup.com or website: www.epa.gov/OST or www.epa.gov/OWM.

American Water Works Association Research Foundation Funding 35 research projects in 1998 totalling over \$10 million. Requests for proposals available on the foundation's Website: <http://www.awwwarf.com>. First due date for proposals 5/4/98. For more information call 303-347-6117.

National Sea Grant College Program Support provided for research, education, and advisory activities focused on increasing the value of public benefits from basic research leading to the development and use of marine resources. Priority areas include research on living resources, non-living resources, technology and commercial development, environmental studies, and human resources. Contact: Ronald C. Baird, Director, National Sea Grant College Program, 1315 East-West Highway, SSMC3 Room 11716, Silver Spring, MD 20910, rbaird@rdc.noaa.gov, 301-713-2448 Fax: 301-713-0799. Specific deadline dates are established by State Sea Grant Program directors; most conduct competitions every two years. Eligible applicants are U.S. research institutions and individual U.S. researchers. Institutions or individuals from foreign nations are not eligible applicants, but are encouraged to participate as collaborative partners. Applicants in states with Sea Grant College programs should apply to their state program. Applicants in states that do not have Sea Grant College programs should apply directly to the national office by submitting a brief letter describing the proposed project. Prospective applicants should request a copy of the

current guidelines for "NOAA's National Sea Grant College Program" and a list of State Sea Grant program directors.

Soil and Water Conservation Society Annual Conference -San Diego, CA, July 5-9, 1998. "Balancing Resource Issues". Lodging: SWCS has reserved rooms at the Hyatt Regency San Diego, for reservations call 800-233-1234; Hostels-several available <http://www.hostels.com/us.ca.html>, Camping-reservations 800-44-7275, www.destinet.com. Travel: United Airlines official carrier, 1-800-456-0978 Registration: SWCS home page: <http://www.swcs.org/> Mail to Annual Conference Registration, SWCS, 7515 NE Ankeny Road, Ankeny, IA 50021-9764 or fax to 515-289-1227

NSF Funding Available

Up to five years of support is provided for projects related to environmental biology, including systematic and population biology, ecological studies, and long-term projects in environmental biology. Support is provided for basic and applied research, research-related activities and equipment, operating research facilities, and improving research collections. Deadline(s): 6/15/98, 12/15/98. Contact: Directorate for Biological Science, Division of Environmental Biology, 4201 Wilson Boulevard, Room 635N, Arlington, VA 22230 <http://www.nsf.gov/bio/deb/debpd.htm> 703-306-1480, fax 703-306-0367. Duration: 5 YEARS Proposals must be prepared and submitted in accordance with the Grant Proposal Guide (NSF 98-2), available from the NSF Clearinghouse, 301-947-2722, pubs@nsf.gov.



Consortium Funds Research Task Forces for 1997-98

Atmospheric Transport of Chlorinated Dioxins and Furans

Polychlorinated dioxins and furans (PCDD/Fs) have gained much notoriety over the past fifteen years as highly persistent trace pollutants responsible for such health effects as endocrine disruption, birth defects, developmental and behavioral effects, and cancer. Although they have been detected all over the globe, data on atmospheric transport processes, concentrations and seasonal variations are sparse and the mechanisms of transport are poorly understood. This task group will continue to study the underlying physical/chemical mechanisms which describe the long range transport of PCDD/Fs in the atmosphere through a combination of field measurements, laboratory absorption experiments and mathematical modeling. Members of the Task Force include Drs. Michael S. Milligan of SUNY-Fredonia, Stephen J. Vermette of Buffalo State College, Phil Hopke of Clarkson University, and Keri Hornbuckle of SUNY-Buffalo. For further information contact: Michael Milligan at 716-673-3500 or milligan@oak.ait.fredonia.edu

Ecosystem Dynamics

This task group has recently finished working on a proposal to initiate a Coastal Intensive Site Network (CISNet) site. The proposal is entitled "Understanding the Factors Governing the Productivity and Distribution of Nearshore Biological Communities in the Great Lakes — Niagara River Plume and South Shore of Lake Ontario." While there are other CISNet sites in the Great Lakes, there are no existing sites in Lake Ontario, a lake whose coastal habitat is undergoing significant changes and is the subject of considerable fisheries management interest.

The focus of this study is to develop a mechanistic understanding of the physical, chemical, and biological processes which lead to the establishment and maintenance of gradients in biological communities (e.g., lateral distributions in biomass and associated productivity, nearshore-offshore differences in dominant species and food chain structure) between the nearshore and offshore environments of a typical coastal region. The development of a coastal ecosystem model will aid coastal resource managers by providing a quantitative understanding of the relationship between the variety of stressors to which these ecosystems are subject and the distribution and productivity of their biological communities. Task force members are Drs. Joseph V. DePinto of SUNY-Buffalo; Edward Mills, Lars Rudstam, Barbara Knuth and Rebecca Schneider of Cornell University; Joseph Makarewicz of SUNY-Brockport; J. Michael Jech, and Hunter J. Carrick of Buffalo State College; Thomas C. Young of Clarkson University, and Donald Stewart of SUNY-ESF. For further information contact: Joe DePinto at 716-645-2088 or depinto@superior.eng.buffalo.edu

Comparative Risk & Great Lakes Policy

A goal of the Great Lakes Research Consortium is to encourage the integrated management of the Great Lakes Basin as a single ecosystem. There are two countries and multiple states and cities involved and limited resources with which to address health and environmental risks. The purpose of this research group is to assess the interplay between risk - to the environment and to health and

government policy-making. The Great Lakes Research Consortium's goal of an integrated management approach requires a better understanding of how risks are identified, communicated, screened, prioritized and then addressed through the political/policy process. It is hoped that the work of this group will stimulate the requisite linkages leading to a concrete proposal to NSF or a private foundation. The task force has met three times and is making progress in getting more focused on their research. Currently, they are looking at three cases as a basis for studying issues in Great Lakes decision making relating to comparative risk. They are: phosphates, mercury and hormonal mimicking. Lee Cervený, a Syracuse University graduate assistant, is performing research on all of these topics. Drs. W. Henry Lambright and Allan Mazur of Syracuse University; William Leiss of Queen's University and Richard Smardon and Brenda Nordenstam of SUNY-ESF are members of the task force. Debora Van Nijnatten of the University of Windsor has joined the task force as a temporary replacement for Bill Leiss. For further information, contact: Henry Lambright at 315-443-1890 or whlamabri@maxwell.syr.edu

Remote Sensing & Ice Dynamics

This task group held a workshop for the purpose of bringing together researchers and practitioners with expertise in state-of-the-art and emerging remote sensing techniques, ice dynamics modeling, and lake ecology and hydrology. Remote sensing has begun to play an increasingly important role in many Civil and Environmental Engineering applications. Ice production and movement in the Great Lakes system have a multitude of implications—ice acts as an insulator, it

Task Forces continued...

blocks the solar energy into the lake water, it retards the wind mixing and heat transfer through the lake water, it alters the sediment movement on the lake bed, and creates hazards during the breakup season. The final report of this workshop is the basis for the awarding of this year's grant which is being used to generate a state-of-the-art summary of the remote sensing and modeling capabilities for use on the Great Lakes. This summary will be authored by Hayley Shen, of Clarkson University, Son Nghiem, from NASA/JPL and Mike Manore of RADARSAT. Both directors of the US National Ice Center and the Canadian Ice Center have expressed interest in the work, but not in the organization of it. Members are Drs. Hayley H. Shen Clarkson University, Ray Lougeay of SUNY-Geneseo, and Paul F. Hopkins SUNY-ESF. For further information, contact Hayley Shen at 315-268-6614 or hshen@sun.soe.clarkson.edu

Impact on Land-use on the Nearshore Ecosystem of Lake Ontario

The nearshore area is of great importance to the overall Great Lakes ecosystem. It supports the highest species diversity within each lake, including many threatened or endangered species. All species of Great Lakes fishes use these waters during one or more critical life cycle stage, and it is a major habitat for other groups, such as water organisms, mammals, and macroinvertebrates. These waters are also the most exposed to a variety of human activities which can impact on many aspects of nearshore ecosystems. This task force will focus on the effects seen at the community and ecosystem levels, and will seek to develop techniques to monitor and assess these effects. Seated on the task force are Drs. Kenton M. Stewart of SUNY-Buffalo; D. Dudley Williams, Yong Cao, Nancy E. Williams of the University of Toronto; and Thomas P. Diggins of SUNY-Brockport. For further information, contact D.D. Williams at 416-287-7423 or caddis@lake.scar.utoronto.ca

Great Lakes Governance

The purpose of this task force is to initiate research projects on governance issues in the Great Lakes. Dr. Shannon, together with Professor George Francis of the University of Waterloo, will be United States and Canadian co-chairs undertaking to prepare a background paper for the State of the Lakes Ecosystem Conference (SOLEC), sponsored by the US Environmental Protection Agency and Environment Canada, to be held in October in Buffalo, NY. The subject of this paper will be the development of a set of indicators to measure the effectiveness of stewardship and sustainability programs in the Great Lakes ecosystem, with the goal being the identification of the best direction for policy research and effective governance toward improving stewardship and sustainability in the Great Lakes ecosystem. Margaret Shannon and Errol Meidinger of Syracuse University, and Barry Boyer of SUNY-Buffalo College of Law make up the task group. For further information, contact Margaret Shannon at 315-443-5871 or mshannon@acsu.buffalo.edu

Visit the GLRC Homepage

www.esf.edu/glrc
for quick links to:

our member campuses
and their representatives

grants programs

GLRC seminar schedule

electronic newsletter

research funding news
& announcements

other Great Lakes sites

Upcoming GL Conferences and Workshops

April 29 - May 2 - 5th International Conference on the St. Lawrence River Ecosystem hosted by the St. Lawrence River Institute of Environmental Sciences. Conference information can be found at www.glen-net.ca/slr/ies/

May 18-22 - 41st Annual Conference on Great Lakes Research, sponsored by the International Association for Great Lakes Research, in Hamilton, Ontario. POC: iaglrbus@ismil.net

May 28-29 - National Research Council Symposium on Remediation of Contaminated Sediments, National Academy of Sciences, in Washington DC. POC: reible@wst3.che.lsu.edu

June 5-7 - Annual General Meeting, Great Lakes United, in Milwaukee, WI. POC: glu@igc.apc.org

June 6-10 - National Conference on Environmental Engineering, in Chicago, IL. POC: Dr. Cecil Lue-Hing, 312-751-5190.

July 8-10 - Great Lakes-St. Lawrence Mayors' Conference, in Windsor, Ontario. POC: sthorp@glc.org

July 20-21 - Workshop on natural coastal hazards of flooding and erosion in the Great Lakes, in Milwaukee, WI. POC: jkeillor@seagrant.wisc.edu

July 30 - Binational Executive Committee meeting, in Chicago, IL. POC: elster.mark@epamail.epa.gov

September 25-26 - Areas of Concern Workshop: Transferring Successful Strategies and Techniques, sponsored by the International Joint Commission, in Gary, IN. POC: kirschnerb@ijc.wincom.net

October 19-20 - Annual Meeting of Great Lakes Commission, in Buffalo, NY. POC: mtonahue@glc.org

Legislators meet to discuss the Great Lakes continued from cover page...

After introductory addresses, legislators sat at the Roundtable and participated in a three hour professionally facilitated discussion about the common issues facing their districts. These issues were identified from conversations that members of the sponsoring organizations had with legislators prior to the Roundtable. Rather than debate the issues, legislators worked towards identifying needs and actions that would move towards resolving the issues and what roles they could take in doing so. Some of the needs that they identified were:

- Greater legislative awareness of Great Lakes issues
- Improved information sources for the public
- Greater collaboration with Ontario by way of opportunities for exchange at the government level
- Unified state policy on Great Lakes water levels, including data
- Better understanding of factors, both controllable and natural, that affect lake levels
- Short term strategy to address owner's problems caused by lake levels
- Better coordination of GL studies, policy and information between all state agencies
- More focused research on Great Lakes ecosystem
- Assessment of state's current approach to Great Lakes issues
- Infusion of sportfishing promotion into tourism efforts
- Better promotion of the Great Lakes as a world class resource

The result of the discussion was a unanimous agreement to establish the NY Coalition of Great Lakes Legislators (NYCGLL) which might, among other things, act as a mechanism to create a visible powerblock of Great Lakes Basin legislators in order to effectively raise awareness of issues at the local, state, federal and international levels; enhance legislators own understanding of the Great Lakes issues; and gain effectiveness in creating conditions that will support the resolution of Great Lakes challenges. The coalition agreed to meet again within 60 days to further refine their initial agenda.

It was the general sense that even though legislators cannot accommodate long meetings like the Roundtable very often, this gathering was an excellent opportunity to better connect with the seemingly complex challenges facing the Great Lakes. Participants went away hopeful for progress.

The event was co-sponsored by the NYS Department of Environmental Conservation, Senator George D. Maziarz, Assemblyman Paul Tokasz, New York Great Lakes Research Consortium, New York Great Lakes Basin Advisory Council, the Great Lakes Program at the University of Buffalo and New York Sea Grant. The NYS Attorney General's office also participated.

Legislators that attended were Richard Dollinger, Sam Hoyt, George Maziarz, Patricia McGee, Charles Nesbitt, Thomas Reynolds, David Seaman, Richard Smith, and Paul Tokasz. Other legislators were represented including Richard Anderson, John DeFrancisco, Anthony Nanula, Mary Lou Rath, Robin Schimminger, William Stachowski, Dale Volker, and Sandra Lee Wirth. Other notable participants were: John Cahill, DEC Commissioner; John Sheffer, former legislator and currently Director of the Institute for Rural Government and Regional Growth; Gerald Mikol, Director DEC Region 9 ; John Hicks, Director DEC Region 7 ; and Tom Brown DEC Region 6 Director.

ACTIONS that the NY Coalition of Great Lakes Legislators might take to support the common issues facing their districts...

Act as a catalyst:

- Chart organizational responsibilities of federal, state and Canadian players so that all stakeholders can better access information, understand problems, streamline processes.
- Clarification of lake level issues, e.g. compilation and clarification of support available to landowners, initiating contacts with federal sources and others to secure appropriations for data collection.

Act as a convener of:

- creative forums, legislative hearings and information meetings at which constituents can focus on Great Lakes issues
- forums at which public policymakers from NY, US and Canada can meet to exchange views, and goals for Great Lakes management

Develop strategies to build support and leverage for greater marketing of GL resources

- build visibility and promote Great Lakes fishing of all kinds (shoreline, deepwater, stream)
- clarify fish consumption guidelines and reframe to protect the public health and promote the recreational aspects of sports fishing
- advocate for effective promotion of Great Lakes in the I Love NY program.

Act as a mechanism to promote the effective use of NYS money spent on Great Lakes programs

- maximize funding of programs addressing Great Lakes issues that impact the entire Basin
- evaluate funding cycles for effectiveness and address NY Great Lakes Protection Fund problems
- initiate an examination of the current state policy approach to addressing Great Lakes issues

Develop legislative strategies that will increase awareness and priority of GL issues

- request guest speakers at committee meetings
- sponsor special topic events for legislators
- advocate for creation of special task forces

Projects Initiated by the Consortium in 1997/98



This year, through our small grants program, the Consortium was able to initiate and supply funding for four research projects and several workshops. The research groups include individuals from GLRC member schools, as well as other Universities and Agencies, who come together to develop cooperative approaches to research and education.

REMEDIATION TECHNOLOGY.		
Microbial and Metallic Iron Mediated Dechlorination of Polychlorinated Biphenyls in Sediment		
Roger C. Sokol Ronald Scrudato	SUNY-Albany SUNY-Oswego	This team is exploring a relatively new remediation technology that uses microbes to lower the potential toxicity of PCBs by reducing the amount of chlorine in the compound, and testing a new technique that uses iron to enhance the capacity of microbes to transform PCBs into less toxic compounds. Dr. Sokol reports that initial findings indicate no dechlorination of the PCB mixture after 24 hours regardless of the size of the iron particles used or the metal to solution ratio. However, a PCB mixture (Aroclor 1254) was dechlorinated within only 3 hours when iron particles coated with palladium were added to the solution. The success of this project could further our ability to dechlorinate PCBs which will minimize human health risks in our environment. <i>For further information, contact: Roger Sokol at sokol@wadsworth.org</i>
Preventing Discharges of Coal Tar and Creosote to Surface Waters Through Immobilization of Subsurface Sources		
Susan E. Powers Alan J. Rabideau	Clarkson University SUNY-Buffalo	This research focuses on evaluating the feasibility of treating contaminated groundwater by placement of a reactive barrier in a trench between the contamination and the lake. The hypothesis is that the multiphase flow processes, and discharge to surface waters, can be controlled by adjusting the aqueous phase pH; this adjustment affects the surface charge of these chemicals, thereby influencing capillary flow. Dr. Powers reports that preliminary test results from Clarkson University indicate a correlation between pH and wettability. The group is also experimenting with the immobilization of a non-aqueous phase liquid source; thus far results suggest this would be best accomplished at the lower pH conditions. At SUNY Buffalo the work focuses on the feasibility of altering the groundwater geochemistry to achieve the conditions appropriate for immobilization. A mathematical model has been developed to describe the transport of protons and buffering ions through the subsurface, a complex process involving significant interaction with the soil chemistry. <i>For further information, contact: Susan Powers at seo@draco.clarkson.edu</i>

More Projects Initiated In 1997/98



RESEARCH WORKSHOPS		
Remote Sensing and Ice Dynamics in the Great Lakes		
Hayley Shen Paul Hopkins Ray Lougeay	Clarkson University SUNY ESF SUNY Geneseo	Ice can affect the waters of the lakes in a variety of ways. Data collected through remote sensing should lead to the creation of mathematical models to predict these effects. This workshop gathered professors and students proficient in remote sensing to discuss the potential of using this new technology to study ice dynamics in the Great Lakes. The final report of this workshop is the basis for the awarding of this year's grant which is being used to generate a state-of-the-art summary of the remote sensing and modeling capabilities for use on the Great Lakes. Further steps will be up to each participant in the workshop. <i>For information contact Hayley Shen at hhshen@sun.soe.clarkson.edu.</i>
Devising a Strategy for Conservation of Culturally Significant Plants in Iroquois Communities		
Robin Kimmerer H. David Greene	SUNY ESF New York Sea Grant	The funds granted this team for the purpose of an exploratory workshop concerning restoration of native medicine plants to Iroquois reservations were transferred to the NY Sea Grant Program. A portion of those funds was used to support a session devoted to medicine plants at the Indigenous Knowledge Conference held at SUNY Buffalo, and Greene's participation in a plant medicines workshop at the Six Nations reserve. Greene used that opportunity to introduce the idea of a full workshop with University partnership to the native community. Ongoing political difficulties in Iroquoia have so far precluded the implementation of the workshop. The funds remain at Sea Grant, awaiting use when the communities are free to participate. <i>For information contact Robin Kimmerer at rwkimmer@mailbox.syr.edu</i>
Environmentally Acceptable Endpoints (EAE) for Hydrophobic Organics in Soils and Sediments		
A. Scott Weber Joseph V. DePinto	University at Buffalo University at Buffalo	The focus of this workshop is to identify key issues relevant to the topic of contaminant partitioning, transport and bioavailability and the exploration of ways that researchers and policy makers in the Great Lakes basin can collaborate to increase understanding of the processes important in establishing appropriate remediation goals. The workshop will include invited presentations from researchers, and presentations by the regulatory community on the current criteria their agency uses to establish guidelines. The recommendations of these workgroups will be published for distribution to the community. <i>For information contact Scott Weber at sweber@ascu.buffalo.edu</i>
Great Lakes Acoustic Workshop II - Geostatistics as a Tool in Acoustic Assessment		
John K. Horne J. Michael Jech Lars Rudstam David MacNeill	Buff State College Buff State College Cornell University NY Sea Grant	This team will organize a workshop to further develop the techniques of high-tech sonar capable of seeing and recognizing fish swimming beneath the surface of large lakes. The workshop is a follow-up to the two day Consortium-sponsored event held in June 1997 which introduced Great Lakes researchers to the state-of-the-art tool of hydroacoustics. This next workshop, to be held in June 1998, will summarize the current state of knowledge of geostatistics and its potential application to acoustic data analysis. It will also give participants a basic understanding of geostatistics and introduce them to new computer software on geostatistics. <i>For further information, contact: John Horne at horne@glc.snybuf.edu</i>



More Projects Initiated In 1997/98

ECOSYSTEM MODELING		
Developing Spatially-Explicit Models for Assessing Production Potential of Streams		
Neil H. Ringler Charles A. Hall Joseph Makarewicz	SUNY-ESF SUNY-ESF SUNY-Brockport	The ecology of the Great Lakes has gone through many dramatic changes over the last decades as a result of pollution, human intervention into water level fluctuations and deliberate and unintentional modification of the fish community. Lake Ontario is again an ecosystem in transition and part of this change includes its streams. Decreased nutrient loading, a result of pollution abatement activities will have an impact on the size and abundance of fishes in the Great Lakes and an efficient method for estimating productivity of stream systems will be useful to understand the potential impact of reduced productivity. These researchers are working to develop spatially-explicit models of stream ecosystems. By combining these two types of data, fish management decisions in the streams of the Great Lakes can be improved. <i>For further information, contact: Neil Ringler at nmringler@mailbox.syr.edu</i>
EXOTIC SPECIES		
International Blueback Herring Symposium		
Dale Baker David G. White Ladd Johnson Robert Werner Edward Mills Lars Rudstam Randall Owens Robert O'Gorman Kyle Hartman David B. MacNeill	Sea Grant, Ithaca SUNY-Oswego Laval University SUNY-ESF Cornell University Cornell University USGS, BRD USGS, BRD West Virginia U. Sea Grant, Brockport	The purpose of this workshop, co-sponsored by the GLRC and NY Sea Grant and scheduled for June 20 at the Cornell Field Station at Shackelton Point, is to summarize the current state of knowledge of blueback herring biology and ecology, to identify research and outreach needs, to stimulate interest and develop research strategies on this issue. The blueback herring, a relative to the alewife, has recently been discovered within the Great Lakes drainage system; its spread may have serious implications for the fishery of Lake Ontario and other Great Lakes. According to Dr. Baker, the possible interaction of this species with other members of the fish community is unknown. They may serve as a new forage species for predatory fish, or they could compete with other species, prey on fish larvae, or contain high levels of thiaminase that will reduce the reproductive success of native species such as lake trout and Atlantic salmon. <i>Preregistration is required through the SUNY Brockport Sea Grant: 716-395-2638 or sgbrockp@cce.cornell.edu. For further information, contact: Dale Baker at drb17@cce.cornell.edu</i>
ATMOSPHERIC TRANSPORT OF TOXIC SUBSTANCES		
Preliminary Study of Sampling, Analysis, and Receptor Modeling for Persistent Organic Pollutants in Coordination with the IADN Program		
Philip K. Hopke Michael Milligan Keri Hornbuckle	Clarkson University SUNY-Fredonia SUNY-Buffalo	The objective of this preliminary study is to bring together the expertise at these three campuses to make better use of the existing Integrated Atmospheric Deposition Network (IADN) database and to enhance the current efforts at Fredonia and Buffalo to gather additional data on atmospheric deposition into the Great Lakes. Meetings will be held between all of the faculty investigators and appropriate research personnel to determine if similar analytical results are obtained for these semi-volatile species, if the trajectory-based receptor models provide sensible results, and if so, develop proposals to appropriate agencies like GLNPO or the EPA Exploratory Research Program

GLRC 1998 Spring Seminar Schedule

DATE	SPEAKER	LOCATION/TIME	TITLE
3/27/98	LARS RUDSTAM Cornell University	U OF BUFFALO - 140 Ketter Hall - 3:30PM	<i>Invertebrate Predators in Great Lakes: The Importance of Mysis for Food Web Dynamics in Lake Ontario</i>
3/31/98	GARY SPRULES University of Toronto	SUNY-ESF - Moon Library Conf. Room - 4:00PM	<i>The Hows and Whys of Spatial Patterns in Great Lakes Zooplankton</i>
4/2/98	JAMES GILLET Cornell University	SUNY-OSWEGO - Hewitt Union Room 232 - 4:00PM	<i>Balance Between Health and Ecological Risk in Super Fund Assessments</i>
4/9/98	SCOTT FINDLAY University of Ottawa	CLARKSON UNIVERSITY - Rowley Lab Room 244	<i>Statistical and Neural Network Approaches to Ecological Risk</i>
4/16/98	JAMES PAGANO SUNY Oswego	SUNY-BROCKPORT - Lennon Hall Room 140 - 4:00PM	<i>Utilization of Anaerobic Bioreactor Assessment and Sampling Systems for Longterm Bioremediation Research</i>
4/16/98	G. WILLIAM PAGE University of Buffalo	SYRACUSE UNIVERSITY - 220 Eggers Hall - 12:00PM	<i>Voluntary Agreements for the Cleanup and Reuse of Contaminated Sites</i>
5/6/98	THOMAS DARVILL SUNY-OSWEGO	SUNY-FREDONIA - 5:00PM	<i>Behavioral Effects in Children of Prenatal Exposure to Great Lakes Toxicants</i>
TBA	PETER G. WELLS University of Toronto	BUFFALO STATE - TBA	<i>Oxidative Damage and Chemical Teratogenesis</i>



**GREAT LAKES RESEARCH
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