

New York Great Lakes Initiative for Science and Education

A Project of the Great Lakes Research Consortium

Great Lakes Research Consortium scientists have been warning for some time that despite the clean-up successes of the last two decades, New York's Great Lakes are highly altered ecosystems, unstable and prone to crisis.

The Need to Expand New York's Great Lakes Research Capacity

The Great Lakes Research Consortium in cooperation with our member institutions announces our plans to significantly improve New York's Great Lakes research infrastructure. We plan on expanding our current network of field stations, vessels and educational facilities throughout New York's Great Lakes-St. Lawrence region. Our number one priority is to improve the Great Lakes through scientific understanding and technological advances. There are few issues more important for Upstate New York than the health of the Great Lakes environment. Consider the following:

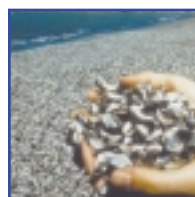


- Nearly three million New Yorkers depend on the Great Lakes for drinking water.
- Over six million people annually visit parks along New York's Great Lakes corridor.
- Clean fresh water is likely to be *the* most important resource for future economic development and settlement patterns in the US.
- Nearly 80 million tons of cargo move through New York's Great Lakes ports.
- Anglers spend around \$134 million per year at New York's Great Lakes fishing locations. Many upstate small businesses cater to the fishing public.
- Better than half the land in New York's Lake Erie and Ontario basins is in agricultural use.
- Among the Great Lakes states, New York ranks first in hydroelectricity production, supplying around 10% of the entire state's power demand.
- New York has the second longest shoreline of any of the Great Lakes States. We have a significant portion of what is, in effect, the North Coast of the United States.
- The products and services of water protection, environmental clean-up and habitat restoration are a multi-billion dollar industry and one that is guaranteed to grow. New York can and should be in the lead.



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The Growing Great Lakes Crisis

New York's Great Lakes are once again in serious trouble. Toxic algal blooms, massive fish die-offs, wetlands degrading to thick monocultures of cattails, birds sick and dying from fish-borne botulism, dramatic population decline of important recreational fish species, loss of native biota, reports of hormone-mimicking chemicals and traces of pharmaceutical drugs in the water, beach closings – these are clear signs of environmental crisis. Great Lakes Research Consortium scientists have been warning for some time that



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

WATER

- Nearly 3 million New York citizens get their 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, mining, commercial, agriculture and power.
- More than two hundred million gallons per day are consumed from the Great Lakes Basin. (USGS 1990)

FISHING

- On-location expenditures by fishermen are estimated at \$134 million annually (Connelly et al 1999).
- There were more than 126,000 private boat trips and 14,400 charter boat trips in Lake Ontario in 1996. (NY Sea Grant)
- Lake Erie's commercial fishing industry is worth an estimated \$60 million (SOLEC 1997)

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despite the clean-up successes of the last two decades, New York's Great Lakes are highly altered ecosystems, unstable and prone to crisis. A recent conference on New York's North Coast, sponsored by the Consortium, highlighted the water quality problems of the nearshore zone of Lake Ontario that have gone largely ignored. Without ongoing study of the lakes' ecology and hydrology and the impacts on them from climate change, sprawl, aging wastewater infrastructure, environmental release of new chemicals and pharmaceuticals and frequent colonization by invasive species of plants and animals, we will have no chance to protect these lakes for our future. Research – high-quality environmental research – is absolutely essential to inform our public policy on protection and restoration of the Great Lakes.



The Crisis of the Late 60s and 70s

From the mid 1960s to the late 1970s, New Yorkers were shocked by what had happened to their Great Lakes. A huge oxygen-depleted zone formed annually in Erie's central basin creating large areas of water deadly to aquatic organisms. Algal blooms turned the water a murky green that washed up on Erie's beaches leaving thick mats of rotting algae to sicken the air. For the first time in people's memories, the familiar swarms of mayflies failed to make their annual appearance. Fish populations plummeted. What was once one of the premier freshwater fisheries in the world was devastated. Meanwhile, in Toledo and in Buffalo, Lake Erie tributaries proved that with enough pollution, rivers will burn. Vacationers went elsewhere. Property values bottomed. It was an ecological and environmental nightmare. Since all of Erie's water gradually fills Lake Ontario's depths, that lake was not far behind. Especially in the nearshore zone, Erie's conditions were replayed in Ontario with algal blooms and windrows of dead and dying alewife with no predators to control their out of control population. New York's Great Lakes were a mess.

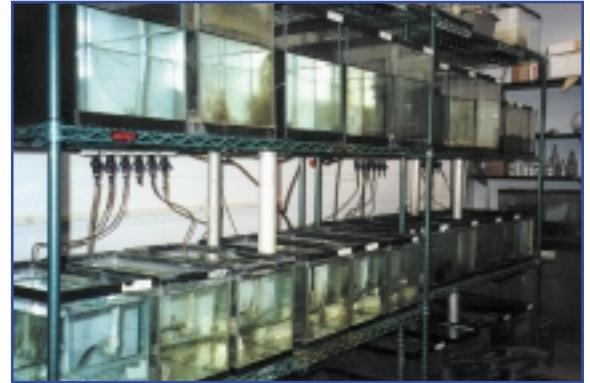
The Scientific Response

Citizen outrage and responsible political leadership led to a strong commitment to clean up our lakes. Nationwide, the lakes' plight became a symbol that was partly responsible for the historic passage of the Clean Water Act. Yet all the political will and personal passion could accomplish nothing without science. Throughout the Great Lakes, scientists put their attention to uncovering cause-effect relationships, modeling interactions amongst simultaneously operating processes and recommending real solutions. It was a great example of the benefits of applied environmental research. Scientists explained the root causes of lake-suffocating algae blooms. They experimented with non-native salmon and trout and began stocking programs that recreated the top of the food chain and revitalized sport-fishing. Scientists uncovered new



Important for Upstate New York health of the Great Lakes environment.

threats in the form of industrial chemicals. For all the billions that were spent in the clean-up effort, many billions more were saved by knowing which causes were the most important, producing the evidence that forced industry to comply, demonstrating the need to upgrade sewage treatment and advancing the technologies that made pollution prevention possible.



The Origins of the Great Lakes Research Consortium

Unfortunately for us, only a few New York scientists were able to contribute to this success. New York did not then have a major environmental research center dedicated to Great Lakes science such as existed in Michigan and Wisconsin. As a result, despite the fact that the water crisis was most acutely felt in New York, almost all the federal dollars went to institutions on the upper lakes and it is there that the scientific infrastructure was built and supported. It was for this reason that sixteen years ago SUNY created and the state legislature supported the establishment of the Great Lakes Research Consortium (GLRC). The GLRC became a novel decentralized, collaborative institution, starting with five SUNY colleges and universities in 1986 and expanding to sixteen by 2002, including several private universities. Several multi-talented, multi-campus research teams were formed within the Consortium and these have made major contributions to understanding many facets of the lakes. But despite these successes, New York still receives considerably less than its fair share of Great Lakes programs and investments.

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Estimated Economic Impact of GLRC Facilities Initiative

Local Expenditures in \$ Thousands

CAMPUS	ARCH.	CONST.	SCIENTIFIC POSITIONS		TECHNICIAN POSITIONS		CLERICAL/ MAINTENANCE		STUDENT POSITIONS	
			CURRENT	NEW	CURRENT	NEW	CURRENT	NEW	CURRENT	NEW
Brockport	600	6,000	22	4	0.5	1	2	2	2	2
Buffalo State	1,500	10,000	25	17	25	22	10	7	20	15
Clarkson	500	8,000	0	3	0	4	0	1	0	20
Cornell	50	540	7	3	8	3	4	1	22	4
Oswego	1,000	5,000	10.5	6	3	6	4.5	7	17	18
Plattsburgh	40	800	3	1.5	1.5	0.5	0.5	0	5	8
ESF										
TOTAL	3,690	30,340	67.5	34.5	38	36.5	21	18	66	67

HYDROPOWER

- Among the Great Lakes states, New York ranks first in hydroelectricity production with three large facilities, which together supply about 10% of the state's power demand.

RECREATION AND TOURISM

- The Great Lakes, St. Lawrence River and Niagara River are major destinations for fishing, boating, swimming and other water-related activities.
- Over 6 million people visited New York state parks along the Great Lakes corridor in 1996 (OPRHP 1996)

COMMERCE

- Approximately 80 million tons of commodities flow through New York Great Lakes ports annually.

LAND USE

	% Erie	% Ontario
• Agriculture	63	49
• Residential	12	8
• Forest	23	53
• Other	2	6



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The Need to Support Science in New York

Today, we have many more academic scientists involved in Great Lakes research in New York than we did in the 1960s and 70s, but we still do not have a major, well funded research institute, while our members' field stations and small research vessels go severely underfunded. At the same time, lulled by past successes, the federal and state surveillance and monitoring infrastructure has been allowed to gradually decline. Staff has been cut, field work neglected. Without adequate ongoing, long-term surveillance and monitoring, there is a serious lack of up-to-date information on which to base scientific analysis or to make informed policy decisions.

New York Has Not Received Its Fair Share of Federal Great Lakes Funding

To date New York has not received our equitable share of federal resources devoted to the Great Lakes. What would a fair share be? New York has 19% of the Great Lakes Areas of Concern, 12% of Great Lakes shoreline, 14% of the drainage area, 18% of the population, and pays 20% of the total federal taxes paid by Great Lakes states. From this estimate New York's fair share should be between 15-20%. Calculating the actual amount New York has received using data gathered by the Congressional Research Service and the GLRC, New York received between 3% and 8%, depending on how the estimates are derived.

This inequity has resulted from the same geographic factors we faced when the Consortium was founded. All of the major federal programs and laboratories are located near the upper lakes, in Minnesota (EPA Environmental Research Labs), Wisconsin, Illinois (EPA Large Lakes Research Station, Great Lakes National Program Office) and Michigan (NOAA Great Lakes Environmental Research Lab, National Biological Service Great Lakes Science Center, US Fish and Wildlife Service Great Lakes Fishery Lab, EPA Large Lakes Research Center, Army Corps of Engineers Great Lakes

District Office, USGS Water Resources Division, Great Lakes Fishery Commission). Without significant new investment in Great Lakes science in New York, this unequal distribution of resources will continue well into the future.

New York's Fair Share?

New York possesses –

- 19%** of Great Lakes Areas of Concern
- 12%** of Great Lakes shoreline
- 14%** of drainage area
- 18%** of basin population
- 20%** of total federal taxes paid by Great Lakes states

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**Based on data supplied by Congressional Research Office and other sources analyzed by the GLRC.*

