

**WRITTEN TESTIMONY OF
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE**

**BEFORE
REPRESENTATIVE MARK S. KIRK**

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Thank you, Representative Kirk, for inviting me here today to talk about Great Lakes Restoration Efforts. I am Pat Montanio, and I am the Chief of the Damage Assessment Center within the National Ocean Service, at the National Oceanic and Atmospheric Administration in the Department of Commerce. The Great Lakes are an indispensable part of our nation's natural resources and sustain a significant portion of the U.S. economy. Great Lakes habitats are components of complex ecosystems beginning inland at the headwaters of streams. The health of these habitats and the region itself is dependent on the quality of an ecosystem's physical and chemical processes and associated biological communities. The degradation and loss of these habitats affects the viability of important natural resources valued by the Nation. The region's 60 million people place significant demands on the Great Lakes for drinking water, transportation, recreation, food production, and manufacturing. As demand grows due to increases in the region's population, the sustainability of water quality and human health is challenged.

Habitat loss and degradation are region-wide issues that span the entire Great Lakes basin. Beach closings, large-scale contaminated sites, invasive species, and fish consumption advisories are some of the impacts resulting from habitat loss and degradation in the Great Lakes. Overall, the United States and Canada have identified 43 Areas of Concern (AOC) within the Great Lakes with severe environmental degradation including sediment and water contamination and impaired fish and benthic communities.

Strong partnerships designed to share expertise, knowledge, and resources are the key to effective restoration and protection. Restoration efforts need to also be accompanied by sufficient data collection, which will allow us to measure the effectiveness of restoration efforts in achieving our goals. NOAA's science-based approach will ensure efforts are directed at the most important sources of problems, and that the socio-economic consequences of restoration efforts are evaluated.

To help establish regional collaboration and enhance integration, on May 18, 2004, President Bush signed an Executive Order that described the Great Lakes as a "national treasure" and established a cabinet-level Great Lakes Interagency Task Force. The

Department of Commerce is represented on this Interagency Task Force by the Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator, VADM Conrad C. Lautenbacher.

In December 2004, this regional collaborative effort was officially launched in Chicago with the creation of the Great Lakes Regional Collaboration of National Significance (GLRC), a unique partnership of key members from federal, state, and local governments, tribes, and other stakeholders. NOAA is heavily invested in this effort. In addition, NOAA is one of the 11 agencies on the Regional Working Group and has an expert on each of the 8 strategy teams developed as part of the GLRC.

The GLRC strategic planning process, launched in December 2004, builds upon extensive past efforts and works toward a common goal of restoring and protecting the Great Lakes ecosystem for this and future generations. The draft, "A Strategy to Restore and Protect the Great Lakes," was released for public comment on July 7; the comment period closed on September 9, 2005. In addition, public hearings on the draft strategy were held throughout the Great Lakes region. This strategy is in its development stages and has not yet been officially endorsed by any GLRC member agencies or partners. All written comments received through the public comment process will be reviewed and considered as the strategy is revised later this year. The GLRC has brought together a broad range of interests and partners, and the final strategy will result from a truly historic effort. We expect that this strategy will propose an achievable, forward-looking vision to restore and protect the Great Lakes for the benefit of all.

NOAA Restoration Programs and Activities

In recognition of the continued need for collaboration and integration, within the FY 2006 President's Budget Request for restoration activities is \$1,500,000 to establish a Great Lakes Habitat Restoration Program, emphasizing protection and restoration of NOAA's trust resources at the watershed scale within the Great Lakes Areas of Concern. NOAA's program will focus on restoring Great Lakes aquatic resources and will provide technical support for commonly occurring lake-wide problems (e.g., invasive species, contaminated sediment and the presence of persistent contaminants, and loss of high-quality fish and wildlife habitat).

The NOAA Habitat Program will build on NOAA's existing Great Lakes habitat restoration efforts. Specifically, the Program will establish a cross-NOAA Habitat Restoration Program Office at NOAA's Great Lakes Environmental Research Laboratory (GLERL), to coordinate habitat restoration and protection efforts. Taking into account the priority needs identified by the Great Lakes Interagency Task Force, NOAA will focus its restoration and protection efforts to support ongoing efforts at watersheds within Great Lakes Areas of Concern.

The goal of NOAA's habitat restoration and protection activities is to ensure that ocean, coastal and Great Lakes ecosystems contain sufficient quantity and quality of habitat to

support economic vitality, sustainable fisheries, and the recovery of protected species. To achieve this goal, the NOAA Habitat Program, a matrix-managed program, protects and restores habitats that support NOAA's trust resources and are essential to the long-term health and sustainability of coastal and marine ecosystems. The NOAA Habitat Program applies the latest science and technology to ensure that ecosystem productivity, function, and services are protected and restored, utilizing a variety of strategies and measures authorized by legislative and executive mandates. In addition, the NOAA Habitat Program works to (1) advance the science (including social sciences) underlying coastal habitat restoration and protection, and develop improved technology for achieving successful outcomes, and (2) to transfer restoration and protection information, technology and results of monitoring, research, and other evaluations to the private and public sectors and other governmental agencies at the federal, state, and local levels through education and outreach.

To accomplish these objectives in the Great Lakes region, NOAA will (1) identify partner agencies at bi-national, federal, state/provincial, and local levels, (2) develop a strategy to foster renewed collaboration and integration, (3) plan and carry out demonstration ecosystem restoration projects dealing with lake-wide problems, and (4) provide coordination of NOAA habitat restoration and protection efforts being carried out in the Great Lakes region. The NOAA Habitat Program will work closely with the President's Interagency Task Force to provide scientific expertise and guidance on Great Lakes restoration.

The NOAA Habitat Program's efforts will include (1) ongoing efforts in contaminant mitigation and remediation to support our state and federal partners at Superfund sites, (2) one or more community-based demonstration restoration projects in the AOC's that are based on science, are ecosystem focused, and deal with significant problems and lake-wide improvements. A competitive community-based proposal process should provide for partnerships and additional funds from other federal agencies, states, and local municipalities. Project areas will be selected at locations where maximum use can be made of ongoing restoration efforts and partnerships. Selections will be based on the availability of matching funds, significance of the problem to the Great Lakes, value of the project as a demonstration project for the Great Lakes region, and scientific merit of the restoration.

The NOAA Habitat Program will develop a stronger NOAA presence and leadership in habitat restoration in the Great Lakes region and demonstrate the process and value of using a science-based, ecosystem approach in restoration and protection efforts. These demonstration projects will be monitored during the restoration phase, and analyses and assessment after the restoration has been completed. Working with our partners, results will be used to apply lessons learned to other restoration efforts throughout the Great Lakes basin.

I would now like to highlight some of our current restoration work in the Great Lakes. Several NOAA programs, including the NOAA Habitat Program, Coastal Zone

Management Program, and the Sea Grant Program, are actively involved in restoration activities.

NOAA's Office of Response and Restoration, part of the NOAA Habitat Program, is currently using its expertise in contaminant mitigation and remediation to support our state and federal trustee partners at Superfund sites. Our efforts support site evaluation, assessment, and cooperative settlements for integrated remediation and restoration of contaminated sites, including the development of long-term monitoring programs to measure cleanup success and recovery of natural resource.

One example of NOAA's work with our partners in cleaning up and restoring hazardous waste sites in the Great Lakes region is the Fox River Superfund Site in Wisconsin, where the trustee agencies completed a final Joint Restoration Plan and Environmental Assessment for the Lower Fox River and Green Bay in June 2003. One settlement for natural resource damages at this site provides for the immediate acquisition and protection of more than 1,060 acres of wetland and upland habitat, and \$8.5 million for additional habitat acquisition and protection, specific recreational enhancement projects, and other water quality improvement, fishery enhancement, and habitat improvement projects, consistent with the site restoration goals.

NOAA and the Great Lakes states' Coastal Zone Management (CZM) Programs support Great Lakes protection and restoration through the implementation of each state's CZM program. Numerous habitat restoration and water quality related projects and activities have been directly supported through CZM funding. The CZM programs protect existing Great Lakes natural resources such as wetlands, sand dunes, and other critical coastal habitats through coastal planning and permitting programs.

For example, over the past 5 years the Wisconsin Coastal Management Program (WCMP) has focused on wetlands protection and habitat restoration and is funding numerous projects within this area. The WCMP supported projects using Geographical Information Systems (GIS) to inventory and assess small wetland restoration projects in Sheboygan and Manitowoc counties. Over the past 20 years, government agencies have constructed hundreds of small wetlands on private lands within these counties. Prior to the development of this GIS project, data on these wetland restoration sites were vague, inconsistent, and primarily only available in hard files.

Our National Geodetic Survey (NGS) and Center for Operational Oceanographic Products and Services (CO-OPS) also support restoration activities. We are collaborating with the Canadian government and five State Departments of Transportation to conduct a Global Positioning System (GPS) survey of benchmarks throughout the Great Lakes region. The survey is designed to maintain accurate height relationships between U.S. and Canadian water level gauges, and to reconcile differences between various data used in this area.

NOAA's Sea Grant program is also involved in restoration activities. Under the leadership of the Natural Resources Research Institute, Sea Grant helped evaluate alternative septic systems such as aerobic treatment coupled with drip dispersal, constructed wetlands, sand filters, in-ground and modular peat filters, textile filters, and shallow trenches to understand their capacity to remove nutrients and pathogens and to assess the overall cost-effectiveness of the different systems. State legislators, state agency commissioners, county commissioners, township officials, and even homeowners are among those who have viewed the alternative systems. This project has led to significant changes in state rules and codes regarding septic systems in northern Minnesota.

NOAA's Efforts to Improve Water Quality

Nowhere are human health issues so tightly coupled to coastal regions than in the Great Lakes, because of the high concentration of people, major cities, and industries in the watershed. The Great Lakes are the only coastal waters in the Nation used as a source of drinking water, providing direct drinking water to over 40 million people. Despite major advances in the last several decades, the water quality of the Great Lakes remains at risk due to population growth, stresses along the shoreline, and emerging contaminants. This has significant human health impacts.

In 2004, in recognition of the links between the Great Lakes and human health, the NOAA Office of Global Programs competitively funded the Center of Excellence for Great Lakes and Human Health (the Center). The Center is housed at the Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, Michigan, and is a collaborative effort of ten partner institutions including NOAA, the Environmental Protection Agency (EPA), the U.S. Geological Survey, Michigan State University, University of Michigan, and the Great Lakes Human Health Network.

The overall purpose of the Center is to use a multidisciplinary approach to make forecasts that reduce the risk to human health in the Great Lakes in three main areas — water quality, beach closures, and harmful algal blooms. The Center will conduct research, apply new technologies and develop capabilities to provide public-domain forecasting methods, and develop a strong outreach and education program for public and user communities to raise awareness of Great Lakes human health issues.

Three issues related to the Great Lakes and human health that NOAA is focusing on are (1) microbial contamination, (2) mercury deposition and accumulation, and (3) harmful algal blooms.

Fecal pollution and microbial contamination continue to be one of the most frequently identified causes of impairment of waters in the Great Lakes Basin. The sources of these microbial contaminants include ballast water, combined sewer overflows (CSOs), sanitary sewage overflows (SSOs), sewage discharges and biosolids, septic tank

discharges, stormwater, animal wastes associated with non-point source pollution, wildlife, and harmful algal blooms (HABs).

NOAA scientists have been particularly active in exploring how mercury compounds are transported through the environment and end up as materials that are hazardous when consumed. The question of how best to regulate and control mercury in the environment is peculiarly suited to examination by NOAA, since the matter extends from the transport of precursors through the atmosphere to the bioaccumulation of its chemical products in fish eaten by humans. We are working with others to determine whether the major threats to human health are due to emissions from nearby or distant sources.

The questions being addressed have focused attention on the need to look at the entire life cycle of mercury. Our scientists are looking into the atmospheric aspects of the problem, from emissions, through atmospheric chemical reactions, and leading to deposition. We are studying the behavior of mercury compounds once they are deposited to ecosystems. The EPA is an active partner in these studies.

Addressing Harmful Algal Blooms is another priority for NOAA and the Administration, as indicated in the President's Ocean Action Plan. NOAA, through the Joint Subcommittee on Ocean Science and Technology, is re-establishing the Interagency Task Force on Harmful Algal Blooms and Hypoxia. NOAA and EPA are sponsoring a conference to address freshwater harmful algal blooms in September where the Great Lakes region will receive significant focus.

To further address the issue of harmful algal blooms in the Great Lakes, NOAA, through GLERL, established a research program to determine the factors controlling the levels of microcystin in lake waters. Microcystin is a toxin produced by various strains of the blue green algae of the genus *Microcystis*. Satellite images are used to identify probable *Microcystis* bloom events, which triggers additional water sampling to complement our routine sampling efforts. The results are then made available to the public through a link on the GLERL website (<http://www.glerl.noaa.gov/>). This program is an example of NOAA utilizing its remote sensing and shore-side resources to provide timely information on an aquatic toxin with implications for human health.

NOAA researchers have discovered that the invasive zebra mussel readily feeds on most species of Great Lakes algae but avoids ingesting *Microcystis*. When extended to a lake-wide scale, the fact that zebra mussels feed heavily on all algal species except *Microcystis* indicates that *Microcystis* has a competitive advantage over other algal species, which may allow it to grow into large blooms in a short time span. NOAA's research program is committed to understanding these complex ecosystem linkages to the benefit of human health in the Great Lakes region.

The link between water quality and human health is not only a challenge for researchers, it presents a challenge with respect to education and outreach of the public on potential public health concerns. Through NOAA's Sea Grant program, various researchers and

academics team up to get information to the public. Now fish advisory information on PCBs is accessible and available in Korean, Spanish and Polish languages to reach many of the 534,000 people comprising non-English-speaking audiences in Illinois and Indiana.

NOAA's Invasive Species Activities

It is also important that I address the impacts of invasive species on the Great Lakes ecosystem. The poster child for aquatic invasions—the zebra mussel—was first discovered in Lake St. Clair in 1988. However, we are acutely aware of the fact that the invasive species problem is not a single species problem. Approximately 180 nonindigenous aquatic species have become established in the Great Lakes. Many of these species have only had minimal impacts on Great Lakes resources, but a few have profoundly changed Great Lakes ecosystems and been very costly.

Research can provide important improvements to the scientific basis for our decision-making as it relates to invasive species. GLERL is NOAA's leading institution for aquatic invasive species research and has a legislative mandate to conduct such research. All of GLERL's research on invasive species falls within the priorities set by the Aquatic Nuisance Species Task Force and builds directly on the National Management Plan. The Sea Grant program also conducts extensive invasive species research, education and outreach, working closely with GLERL and other parts of NOAA. NOAA is working with our many partners to address several current areas of research, including ballast water exchange, technology, vessels declaring 'no ballast on board' or NOBOB's, patterns of invasion, and impacts.

We only have to look at the spread of zebra mussels and the continuing effort to manage the sea lamprey to realize that we will be living with the consequences of past introductions. However, we have made progress towards reducing the risks associated with the most significant pathway for introductions into coastal areas — ballast water. The regulatory measures already in place requiring ballast water exchange should reduce the number of new introductions from external ballast water discharges. We are optimistic that ongoing research will lead to a number of promising technologies in the near future.

In many ways, the progress is the result of a virtually unprecedented degree of cooperation by a number of different federal agencies, universities and the private sector. This cooperation has involved advance planning as well as sharing expertise and resources.

NOAA's Outreach Efforts in the Great Lakes

NOAA reaches out to the Great Lakes community through several programs including Sea Grant and our Coastal Zone Management programs.

Sea Grant's integrated research, education and outreach provides resources to address problems identified by coastal residents and businesses, and local, regional, state and federal agencies. Through the Great Lakes region's seven Sea Grant programs, based at the nation's top public research universities, cooperative institutes, and other extramural grant programs, NOAA is able to mobilize significant independent science and advice from the academic community on the complete range of issues faced by the Great Lakes.

As an extension of the nationwide CoastWatch program, the NOAA CoastWatch Great Lakes Regional Node located at GLERL and the Great Lakes Sea Grant Network have worked collaboratively to develop a successful CoastWatch website specifically tailored to Great Lakes users (<http://www.coastwatch.msu.edu/>). This site includes up-to-the-minute surface water temperatures for all Great Lakes — a tremendous resource for commercial and recreational fishers. The lake, regional, and port image charts are updated four times daily and help recreational and industrial anglers save fuel by pinpointing likely areas for fishing. Nearly 808,000 Great Lakes surface water temperature images were downloaded from the site during six months of the 2003 fishing season.

Sea Grant is helping the public in the Great Lakes by providing clearly articulated, understandable information about the dangers of contaminated shellfish, the need for improved water quality, coastal health, and public safety. "Contaminants in Fish and Seafood" is a new 12-page brochure developed by Sea Grant that explains the potential health impacts on babies and children from eating even small amounts of mercury or PCB-contaminated fish.

Through our Coastal Zone Management program, the Wisconsin Coastal Management Program (WCMP) supports education programs for landowners. In FY 2004, the WCMP funded the Wisconsin Wetlands Association's Wetland Restoration Workshops for Coastal Landowners. More than 56 participants attended the four workshops funded through this project, and follow up surveys indicated that of the landowners responding to the survey, 69% have either begun wetland restoration efforts or plan to begin restoration within the next year. More than 30 % of respondents have enrolled or applied for enrollment in a federally funded wetland restoration program.

Minnesota's Lake Superior Coastal Program funds workshops for construction site storm water pollution control. One example is the workshop held by the Regional Stormwater Protection Team. The Regional Stormwater Protection Team is a group that is dedicated to protecting and enhancing the region's shared water resources through stormwater pollution prevention; membership includes local governments and groups, including Sea Grant and the cities of Superior, Duluth, Proctor, and Hermantown. The workshop organized by the Regional Stormwater Protection Team educated contractors, developers and local-decision makers about construction site storm water control practices. As part of the workshop, a flow chart was developed to explain the stormwater permitting process within the state and information was compiled from local government officials on local storm water and erosion control ordinances. In addition to presentations of various

storm water control techniques, the workshop also incorporated hands-on demonstrations of several sediment control Best Management Practices. Sixty-eight participants attended the workshop and 40% said it was their first training on sediment and erosion control techniques.

Conclusion

As you can see, NOAA is involved in Great Lakes protection and restoration activities from research, to on-the-ground restoration activities, to improving water quality, and outreach and education. Thank you for inviting me here today to discuss this critical resource. I would be happy to answer any questions.