CHECKUP

Assessing Ecosystem Health of the Detroit River and Western Lake Erie

STATE of the STRAIT

2020

EXECUTIVE SUMMARY

The Canada-U.S. State of the Strait Conference is a biennial forum that brings stakeholders together to assess ecosystem status and provide advice to improve research, monitoring, and management programs for the Detroit River and western Lake Erie. It now has a 22-year history of transboundary cooperation to better inform ecosystem-based management. The 2006 conference compiled long-term datasets on 50 indicators and performed a comprehensive assessment of ecosystem health. The 2019 conference performed an updated comprehensive assessment of ecosystem health based on 61 indicators.

Although there has been considerable improvement in the Detroit River ecosystem and a surprising and heartening recovery of biota since the 1960s, much additional cleanup and restoration needs to be undertaken to restore the region's physical, chemical, and biological integrity as called for in the Canada-U.S. Great Lakes Water Quality Agreement. Western Lake Erie is now at risk of crossing several potential tipping points caused by the interactions of a variety of drivers and stresses. This report identifies eight key environmental and natural resource challenges that are threatening ecosystem health and recommended next steps:

- climate change;
- eutrophication and algal blooms;
- toxic substance contamination;
- invasive species;
- habitat loss and degradation;
- nonpoint source pollution;
- human health and environmental justice; and
- population growth, transportation expansion, and land use changes.

Environmental and natural resource laws need to be protected and enforced, as they are the foundation of environmental protection efforts. Considerable voluntary, collaborative initiatives, that go beyond regulatory compliance, will also be needed. The Detroit River and western Lake Erie are microcosms of human use and abuse of the Great Lakes and should be viewed as a "proving ground" for restoring ecosystem health and advancing ecosystem-based management. This comprehensive ecosystem health assessment is a good example of a trans-national network working to strengthen science-policy-management linkages in support of remediation and restoration. Further investment in this transnational network is warranted.

Although the total number of indicators assessed and the percentage of indicators with quantitative targets have increased between the 2006-2007 assessment and the 2018-2019 assessment, the percentage of achievement of quantitative targets has decreased slightly. Continued priority must be placed on science-based, quantitative, target setting for ecosystem integrity. Long-term monitoring is essential in order to practice adaptive management that assesses state of the ecosystem, sets management priorities, and implements management actions in an iterative fashion for continuous improvement. Without a commitment to science-based quantitative target setting and long-term monitoring, management is flying blind.

Climate change is the most pressing environmental challenge of our time. Indeed, addressing any of the eight environmental and natural resource challenges identified above is demanding, but mitigating them all at once and in the face of the climate change crisis is daunting. Climate change will make the scientific understanding of many of the other environmental and natural resource challenges more difficult and will make solving them more complicated. Indeed, climate change has been called a "threat multiplier" where warmer, wetter, and wilder climatic conditions amplify other threats like harmful algal blooms, combined sewer overflow events, species changes, poor air quality effects on vulnerable residents, and more.

With increasing pressure placed on the Detroit River and western Lake Erie by growing human populations and increasing human activities, both scientists and resource managers need a better understanding of the relationships between cumulative stress from human activities and valued ecosystem services. Indeed, we will need a stronger scientific foundation that informs both policy makers and the broader society, strengthens ecosystem-based management, and creates a dynamism among the public, private, academic, philanthropic, and nongovernmental sectors to retreat from current potential tipping points and avoid further environmental, societal, and economic harm.

Science-informed policy and management should have a clear understanding of root causes of problems. However, that will not always be possible. All decisions about water should be made based on the precautionary principle that states that when human activities may lead to unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. Indeed, the 2012 Great Lakes Water Quality Agreement calls for strengthened measures to anticipate and prevent ecological harm.

The major accomplishment of the public outcry over water pollution of the Detroit River, Lake Erie, and other degraded ecosystems in the 1960s was clearly the enactment of many important environmental laws and a binational agreement, including the Canada Water Act of 1970, the U.S. National Environmental Policy Act of 1970, the Canada-U.S. Great Lakes Water Quality Agreement of 1972, the U.S. Clean Water Act of 1972, the U.S. Endangered Species Act of 1973, and the U.S. Toxic Substances Control Act of 1976.

A major accomplishment of recent decades has been the establishment of a plethora of nongovernmental environmental and conservation organizations like Citizens Environmental Alliance, Friends of the Rouge, Friends of the Detroit River, Detroit River Canadian Cleanup, Detroiters Working for Environmental Justice, Essex County Field Naturalists' Club, International Wildlife Refuge Alliance, Detroit Riverfront Conservancy, SEMI Wild, Belle Isle Conservancy, and more. These informed, engaged, and vocal nongovernmental organizations are building capacity for cleanup and restoration and helping create a sense of place in this watershed that bodes well for the future. Continued investment in nongovernmental organization capacity building is warranted.

Education is an important key to the way people understand and value the places they call home and the ecosystems within which they live. Solutions to problems arise out of cooperative learning. Cooperative learning is essential to address the current challenges facing southeast Michigan and southwest Ontario. Indeed, cooperative learning, reconnecting people to waterways via greenways and blueways, and place-making can help lead to development of a stewardship ethic. For over two decades, the State of the Strait Conference has practiced cooperative learning through public and student involvement, with no registration fees.

International events, economic changes, and impacts of climate change will test the Great Lakes basin in future decades. Our region's ability to effectively meet these challenges will require foresight, investment, and cooperation. Adequate investments are not currently being made in monitoring and evaluation, and our region's intellectual and environmental capital isn't being leveraged sufficiently, thereby limiting our region's ability to address economic and environmental challenges and compete with the rest of the world. The State of the Strait Conference has a more than 20-year history of cooperative binational efforts to strengthen science-policy-management linkages in support of ecosystem health. Governmental, business, and foundation sector investments in the State of the Strait Conference will be needed to sustain this important work.

As was noted at the Rio de Janeiro Earth Summit, humanity stands at a defining moment in history. One choice in life is to follow a path toward stewardship of our natural resources and sustainable development. Another choice is to continue to deplete natural capital, degrade environments, and impose limitations on the choices available to our children and grandchildren. As the Global Environment Facility has stated, the legacy is ours to shape.

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