

Cover photos: Landsat 7 satellite image of western Lake Erie Basin and Detroit River corridor provided by USGS Landsat Project; Upper left: angler with walleye (*Sander vitreus*) by Jim Barta; Middle left: lake sturgeon (*Acipenser fulvescens*) by Glenn Ogilvie; Lower left: *Hexagenia* by Lynda Corkum; Center: lake whitefish (*Coregonus clupeaformis*) by James Boase/U.S. Fish and Wildlife Service; Lower right: juvenile peregrine falcon (*Falco peregrinus*) by Craig Koppie/U.S. Fish and Wildlife Service; Bottom left: bald eagle (*Haliaeetus leucocephalus*) by Steve Maslowski/U.S. Fish and Wildlife Service.



STATE OF THE STRAIT
STATUS AND TRENDS OF KEY INDICATORS

Edited by: John H. Hartig, Michael A. Zarull, Jan J.H. Ciborowski, John E. Gannon,
Emily Wilke, Greg Norwood, and Ashlee Vincent

2007

STATE OF THE STRAIT
STATUS AND TRENDS OF KEY INDICATORS

2007

Edited by:

John H. Hartig, U.S. Fish and Wildlife Service
Michael A. Zarull, Environment Canada
Jan J.H. Ciborowski, University of Windsor
John E. Gannon, International Joint Commission
Emily Wilke, Southwest Michigan Land Conservancy
Greg Norwood, U.S. Fish and Wildlife Service
Ashlee Vincent, University of Windsor

Based on the Detroit River-Western Lake Erie Indicator Project, a three-year U.S.-Canada effort to compile and summarize long-term trend data, and the 2006 State of the Strait Conference held in Flat Rock, Michigan

Suggested citation: Hartig, J.H., M.A. Zarull, J.J.H. Ciborowski, J.E. Gannon, E. Wilke, G. Norwood, and A. Vincent, eds. 2007.

State of the Strait: Status and Trends of Key Indicators.

Great Lakes Institute for Environmental Research, Occasional Publication No. 5,
University of Windsor, Ontario, Canada.

ISSN 1715-3980

Report also available at:

www.StateoftheStrait.org

www.epa.gov/med/grosseile_site/indicators/index.html

1.0 EXECUTIVE SUMMARY

The Detroit River and western Lake Erie are located in the industrial and agricultural heartland of the Great Lakes basin ecosystem. As a result of historical water pollution problems, this region has many long-term, environmental and natural resource data sets. A U.S.-Canada project was initiated in 2005 to assemble as many of these long-term data sets (most with 30 or more years of data) as possible to produce a State of the Strait Report in 2007. Detailed indicator summaries were prepared to examine the trends and interpret and translate the scientific information for policymakers and managers.

On December 5, 2006, a State of the Strait Conference was convened in Flat Rock, Michigan to review available trend data, develop key findings, and discuss possible management actions and research needs. This State of the Strait Conference laid the foundation for a comprehensive and integrative assessment of the state of the Detroit River and western Lake Erie ecosystem. Presented below are the major conclusions and recommendations from this assessment, based on 50 indicator/trend data summaries.

Over 35 years of U.S. and Canadian pollution prevention and control efforts have led to substantial improvements in environmental quality. However, the available information also shows that much remains to be done. Examples of environmental improvements include: reductions in oil, phosphorus, chloride, and untreated waste from combined sewer overflow discharges; declines in contaminants in fish and wildlife; and substantial progress in remediating contaminated sediment.

Improvements in environmental quality have resulted in significant ecological recovery in this region. Trend data document an increase in the populations of bald eagles, peregrine falcons, lake sturgeon, lake whitefish, walleye, and burrowing mayflies to large areas from which they had been extirpated or negatively impacted.

This ecological recovery is remarkable, but many environmental and natural resource challenges remain. Six key environmental and natural resource management challenges include:

- population growth, transportation expansion, and land use changes;
- nonpoint source pollution;
- toxic substances contamination;
- habitat loss and degradation;
- introduction of exotic species; and
- greenhouse gases and global warming.

Research/monitoring must be sustained for effective management. Indeed, without research/monitoring, management is flying blind. Six priority research/monitoring needs based on this comprehensive and integrative assessment include:

- demonstrate and quantify cause-effect relationships;
- establish quantitative endpoints and desired future states;
- determine cumulative impacts and how indicators relate;
- improve modeling and prediction;
- prioritize geographic areas for protection and restoration; and
- foster long-term monitoring for adaptive management.

Clearly, there is a need for comprehensive and integrative assessments of ecosystem health; however, no mechanism currently exists to continue this work. Collectively, millions of dollars are spent annually on research, monitoring, and environmental management in the Detroit River and western Lake Erie. Comparatively, very little is spent on a periodic comprehensive and integrative assessment of ecosystem health. Therefore, it is recommended that

resources be pooled through the Canada-U.S. collaborative monitoring effort under the Binational Executive Committee (BEC) on a regular basis (e.g., at least every five years) to undertake comprehensive and integrative assessments of the health of the Detroit River and western Lake Erie ecosystem. Key coordinating organizations that should be responsible for these assessments include the Remedial Action Plans for Areas of Concern, the Lake Erie Lakewide Management Plan, the Detroit River International Wildlife Refuge, the Lake Erie Committee of the Great Lakes Fishery Commission, watershed and conservation organizations, and land use/transportation planning organizations like the Southeast Michigan Council of Governments.

The assessment presented in this report will serve as a baseline that can be improved upon in the next iteration in the spirit of adaptive management.

Quantitative targets or endpoints do not exist for most indicators. Of the 50 time trend data sets assessed, only 17 have quantitative targets. Only five of the 17 indicators with targets are meeting them. Therefore, it is recommended that

a high priority should be placed on quantifying targets and endpoints for indicators in order to clearly focus management efforts and track progress consistent with adaptive management. The responsibility for quantifying targets and endpoints should rest with the key coordinating organizations such as those identified above.

All trend databases are important to the organizations and agencies collecting the data. However, future iterations of comprehensive and integrative assessments may want to focus on a smaller set of key indicators that best meet the needs of management. In addition, this assessment was heavily weighted on state information – there are 38 state, seven pressure and five response indicators. It is further recommended that

future comprehensive and integrative assessments of the Detroit River and western Lake Erie should include more pressure and response indicators as they become developed, and more economic and social indicators, including indicators of sustainability and human health. Examples of available pressure and response trend data include: air emissions, watershed-specific urban and agricultural nonpoint source loadings, watershed-specific impervious land use, other watershed-specific land-based stressors as summarized by the Great Lakes Environmental Indicator Project (<http://glei.nrrri.umn.edu>), industrial point source loadings, etc.

Finally, some trend data were only available from one side of the international border. Therefore, it is recommended that

binational harmonization be achieved to truly undertake comprehensive and integrative assessment.