

# Benefits of Reducing Western Lake Erie Hazardous Algae Blooms

# Qualifications and Experience

With its proximity to the industrial centers of Ohio and Michigan, western Lake Erie has been important for industry and transportation since the 1900's. Although years of industrial use degraded the lake, Clean Water Act implementation led to its recovery and restored western Lake Erie as the world's largest freshwater fishery and an attractive place for boating and beach going. Despite this recovery, recent years have seen the return of hazardous algal blooms (HABs). HABs are out-of-control algae that clog and discolor waterbodies and can be toxic. Warm water and excessive nutrient releases contribute to HABs, and these factors are increasing in many areas. Nutrient loading to western Lake Erie is driven by Ohio's Maumee River. Unfortunately, unlike the "point sources" regulated under the CWA, the nutrients that feed these HABs come from disparate sources; reducing them can be complex and expensive. The International Joint Commission (IJC) was interested in understanding the economic implications of western Lake Erie HABs. The IJC engaged Veritas Economics along with Environmental Consulting and Technology and Frank Lupi of Michigan State University to evaluate the relationship between HABs in western Lake Erie and the economics of recreation, water withdrawals, tourism, property values, income, and employment. Results indicate substantial impacts in Ohio, Michigan, and Canada. Ultimately, implementing the H2Ohio plan ([www.h2.ohio.gov](http://www.h2.ohio.gov)) will substantially reduce nutrients entering western Lake Erie. However, HABs continue to form during the summer months, including another large bloom during 2019.

HABs can interrupt ecological services on a broad scale for significant time periods, and, consequently, the economic implications of HABs in Lake Erie are far-reaching and complex. HABs result in two primary concerns for Lake Erie: the formation of an enlarged, deep-water hypoxic zone in the central basin that has led to large fish kills and noxious odors, and the production of neurotoxins that are difficult to detect and costly to remove from drinking water sources. Veritas identified and estimated the economic benefits of reducing future HABs by developing economic models that link data on the presence and severity of HABs with changes to each of the following:

- ▶ Residential Property Values
- ▶ Tourism and Commerce
- ▶ Recreation including: fishing, beach-going, and boating

The economic methods Veritas employed are based on the concept of willingness to pay for improvements in ecological services. These improvements impact values which result in changes to behaviors, activities, and economic benefits. This relationship is depicted in Figure 1. To estimate the economic impacts of reducing hazardous algae blooms in western Lake Erie, Veritas conducted Input-Output Analysis using IMPLAN to estimate changes in direct, indirect, and induced expenditures resulting from tourism improvements expected to occur.

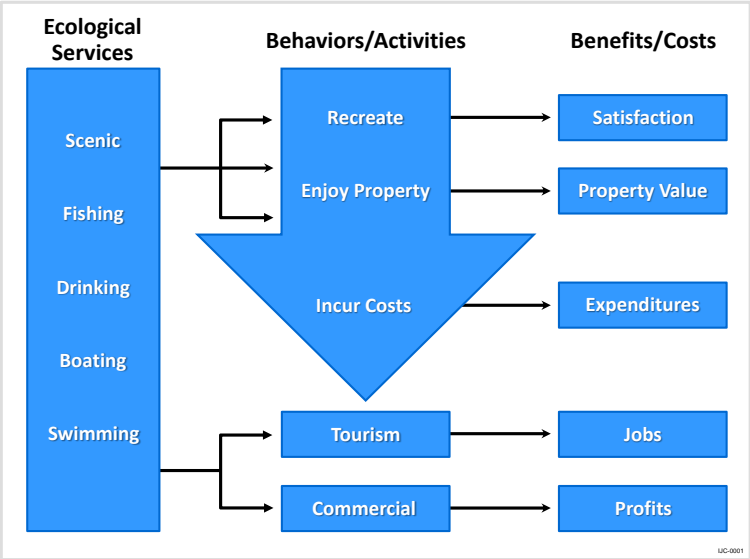


Figure 1: Overview of the Economic Modeling Process

**References:**

"Economic Benefits of Reducing Harmful Algal Blooms in Lake Erie", M. Bingham, S. K. Sinha, and F. Lupi, Environmental Consulting & Technology, Inc., Report, 67 pp, September 2015.