Biological and Ecological Science for Ohio “The Buckeye State”

Ohio is home to lakes, rivers, streams, wetlands, forests, prairies, and 312 miles of Lake Erie shoreline. These resources sustain Ohio’s communities by supporting vital sectors of the economy and cultural heritage such as fishing, hunting, and other outdoor recreation. Lake Erie provides drinking water for 3 million Ohioans, supports 124,000 Ohio jobs, and generates $1.8 billion in tourism revenue to the State. Outdoor recreation is enjoyed by nearly 60 percent of Ohio residents. Annually, it is estimated that outdoor recreation generates $24.3 billion in consumer spending across the State, creates 215,000 jobs, and raises $1.5 billion in State and local tax revenue.

The USGS Ecosystems Mission Area

The U.S. Geological Survey (USGS) Ecosystems Mission Area, the biological research arm of the Department of the Interior, provides science to help Ohio achieve sustainable management and conservation of its biological resources and the ecosystems that sustain these resources. This work is done within the broader mission of the USGS—to serve the Nation with science that advances understanding of our natural resources, informs land and water stewardship, and helps safeguard communities from natural and environmental hazards.

In 2014, the City of Toledo issued a “do not drink, do not boil” advisory to more than 400,000 residents due to a harmful algal bloom (HAB) in western Lake Erie. USGS research provides understanding of the conditions that give rise to HABs and helps managers develop strategies to improve local conditions.

Walleye are a renowned Lake Erie game fish that help bring 1.1 million anglers, who spend $1.1 billion on fishing-related expenses, to Ohio’s Lake Erie region annually. Using technological advances like acoustic telemetry, USGS and Ohio scientists discovered walleye using broader and deeper habitats than previously recognized. This information was used to improve sustainable management of the Lake Erie walleye fishery.

Sustaining Ohio’s Lake Erie Fishery

Fishing in Lake Erie provides an economic driver and a way of life for coastal communities in Ohio. Lake Erie supports a $750 million recreational fishery and well over one-half of all Great Lakes commercial fishing. For more than 50 years, the USGS has surveyed offshore waters for prey fish such as gizzard shad, emerald shiners, rainbow smelt, freshwater drum, and white perch. These surveys were done by USGS scientists using an oceanographic-sized research vessel stationed in Ohio. State and Canadian Provincial fishery managers rely on this information to ensure cooperative binational management of a sustainable Lake Erie fishery.

Combatting Harmful Algal Blooms

An overabundance of nutrients and certain weather conditions can lead to harmful algal blooms (HABs) in western Lake Erie. HABs in the lake have harmed tourism and threatened human health by making water temporarily unsuitable for drinking, swimming, and recreation. The USGS partnered with the Great Lakes Commission to establish the Great Lakes HABs Collaboratory, which brings together leading scientists and local decision-makers to improve understanding of and potential management solutions for HABs.
Invasive species introduced to the Great Lakes have dramatically changed coastal and offshore ecosystems, affecting water quality and recreational fisheries. Several nonnative carp species, originally imported from Asia, are some of the most worrisome invaders currently threatening Lake Erie. Grass carp reproduction has been documented in Ohio tributaries to Lake Erie and research shows there is enough food to sustain bighead and silver carp in the lake. In Ohio and throughout the Great Lakes and upper Mississippi River region, the USGS provides managers with scientific information, risk assessment, and tools to improve surveillance, prevention and control strategies for managing these invasive carp species.

Sharing Information about Wildlife Diseases

The USGS manages an internet-based tool, WHISPers, that provides managers with current information about wildlife diseases like chronic wasting disease, epizootic hemorrhagic disease, and avian influenza that can affect Ohio’s game populations. Ohio’s wildlife managers use WHISPers to monitor the health of wildlife and develop strategies for responding to disease events, as well as to share information about disease occurrences with other scientists and managers. This tool is part of USGS efforts to work with partners to safeguard human, wildlife, and ecosystem health.