USGS
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Biological and Ecological Science for Ohio "The Buckeye State"

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.

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.

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.

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Great Lakes boating, fishing, hunting, and wildlife viewing generate an estimated $50 billion in economic activity annually. Ohio's coastal wetlands contribute to the State's economic vitality by absorbing nutrients from watersheds and providing habitat for fish and wildlife.

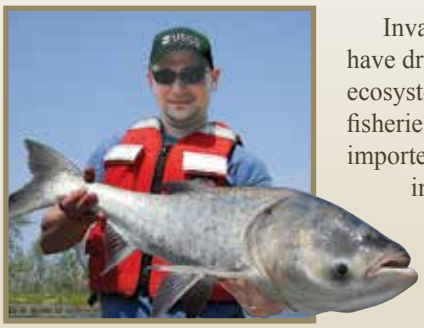
Restoring Ohio's Coastal Wetlands and Waterfronts

Lake Erie's coastal lowlands once supported vast tracts of wetlands that protected water quality, buffered changes in water levels, and provided habitat for fish and wildlife. Birds such as mallard ducks use the coastal areas and inland wetlands and forest lands on their migratory journeys each year through this internationally recognized flyway. Ohio has made substantial investments in revitalizing coastal communities and urban waterfronts with programs that restore coastal wetlands to enhance clean water, fishing, and other recreational opportunities. The USGS and partners developed tools that help Ohio's coastal managers integrate information and visualize wetland restoration projects that will help achieve the State's ecological vision.

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.

Keeping Ahead of a Looming Threat



If they become established in Lake Erie, bighead and silver carp eventually could make up one-third of the total fish weight in the lake, potentially causing declines in the fishery. The USGS works with State and Federal managers to prevent the spread of these invasive fish to Lake Erie.

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.

Surveillance and Control Techniques for Unwelcome Invaders

Quagga and zebra mussels have invaded some lakes and rivers in Ohio, requiring costly surveillance, education, prevention, and management programs. These invaders can have negative repercussions for drinking-water infrastructure, recreation, and native species and their habitats. The USGS supports Ohio's managers as they work to prevent the further spread of these invaders with scientific detection and monitoring tools and by developing control measures.

Invasive zebra mussels are now part of many Ohio lakes and rivers. Ohio uses USGS science and technical assistance to control and prevent further spread of these and other damaging invasive species.

Author: U.S. Geological Survey

For more information:

Ecosystems Mission Area
https://www.usgs.gov/ecosystems/
https://www.usgs.gov/ask/
1-888-ASK-USGS (1-888-275-8747)

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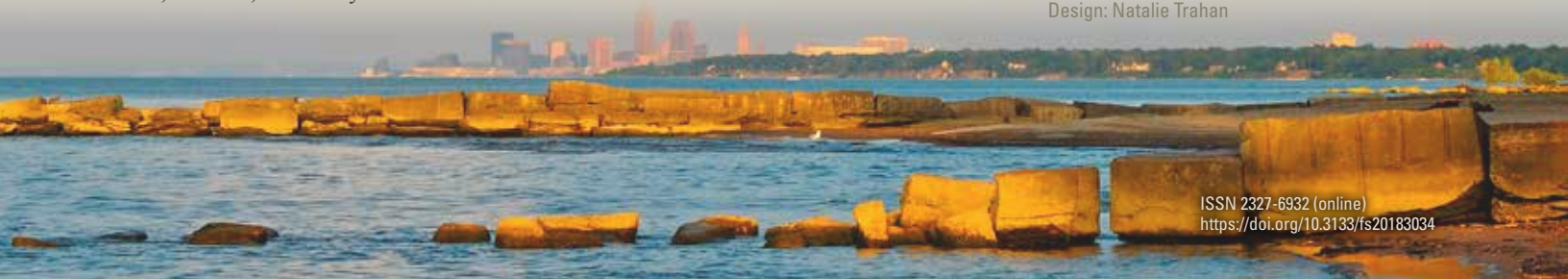

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