LAKE ERIE QUALITY INDEX
2022 REPORT

Ohio | Lake Erie Commission

As one of the world's largest freshwater lakes, Lake Erie provides beautiful scenery and memorable experiences and is an amazing resource to Ohioans and visitors. As the southernmost lake of the Great Lakes, it has the warmest waters, produces the most fish, and provides incredible boating, birding, fishing, economic opportunities, and fun.

Ohio's Lake Erie coast has beaches, islands, and some of the best boating in the world. Each year, an increasing number of Lake Erie boaters sail open waters and explore Ohio's lakeside state parks, including Kelley's Island, Geneva on the Lake, Marblehead Lighthouse, and Maumee Bay. They use Ohio's numerous marinas including, Put-in-Bay on South Bass Island, Toledo Skyway, Safe Harbor Sandusky, North Coast in Ashtabula, and more.

Lake Erie draws anglers from around the world to Ohio to experience the "Walleye Capital of the World." Lake Erie's abundant fisheries include yellow perch, small and largemouth bass, and more. The shores of Lake Erie are home to beautiful birds, from bald eagles to warblers.

Lake Erie is an essential natural resource. It supplies drinking water for millions of people, provides habitat for thousands of species, and serves as a passageway through which Ohio goods reach the global marketplace. Its shores are home to millions of Ohioans and thousands of businesses, and the watershed provides fertile lands for growing grapes at award-winning wineries and crops that feed millions of people.

Whether you live, learn, work, or play on Lake Erie's shores, you will be sure to enjoy the beautiful sights of blue waters, golden sunsets, and sandy beaches. You'll hear the sounds of birds singing, ships sailing, people swimming, and jet skis zooming.

"Lake Erie is an ecological treasure, an important part of Ohio's economy, and a recreation destination prized by visitors and residents."

- Director Lydia Mihalik - Ohio Department of Development

A NOTE FROM THE GOVERNOR

Dear Ohioans,

Lake Erie is one of the state's greatest treasures. From the almost 3 million Ohioans who get their drinking water from Ohio's Great Lake to the 11 million tourists who visit Ohio's North Coast, this resource influences the lives of so many of us.

The walleye fishing on Lake Erie has never been better in my lifetime, and it's amazing to see that the bald eagle population has rebounded faster and greater than expected.

Because of the importance of Lake Erie to Ohio, it's critical that we assess how we're doing in protecting its waters and environment. Water clarity, recreational boating, and recreational beach quality are all doing well, and have helped in the result of a strong tourism industry along the lake.

While there is much to celebrate about the progress made to protect the Lake Erie, there is still much work to be done. The excessive nutrient load running into Lake Erie continues to cause unacceptable harmful algal blooms (HABs) every summer in the Western Basin. HABs put public health at risk and effect our ability to boat, swim, and fish in the area for parts of the season each year.

To reduce HABs and the sources that contribute to them, I launched H2Ohio in 2019 with support from the Ohio General Assembly. H2Ohio is a comprehensive, data-driven water quality plan to reduce harmful algal blooms, improve wastewater infrastructure, and prevent lead contamination. Over 2,600 producers have enrolled in H2Ohio farm best management practices, covering 1.6 million acres.

In 1992 the Ohio Lake Erie Commission was established. This year, we are celebrating the Commission's 30th anniversary as well as the Ohio EPA's 50th anniversary. As the coordinating body for the state on Lake Erie, the Commission collaborates with our state agencies, research institutions, and federal agencies to evaluate Lake Erie and prepare this assessment of what's happening in Ohio's waters.

Though additional work on HABs is still needed, this report considers 36 metrics and confirms many Lake Erie successes. Let's celebrate successes while continuing to work to make all of Lake Erie as clean and healthy as possible for today and the future.

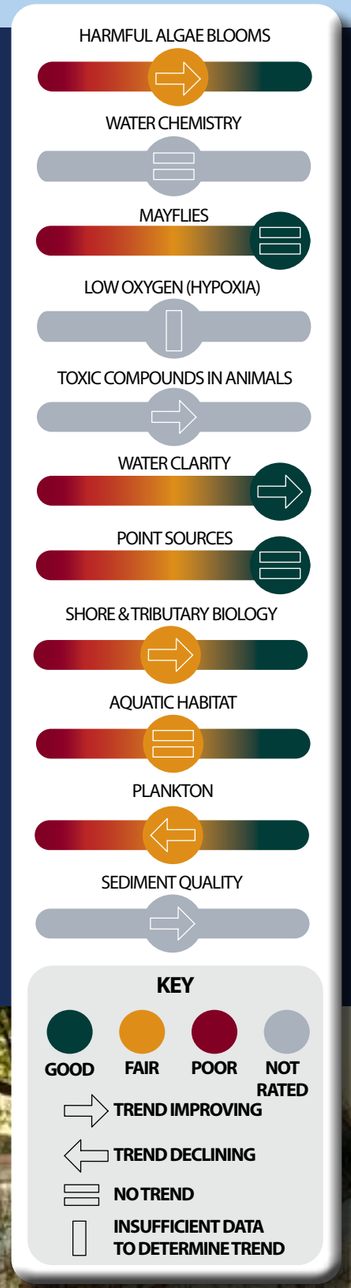
Very respectfully yours,

MIKE DEWINE
GOVERNOR

ENVIRONMENT QUALITY

Ohio Environmental Protection Agency (Ohio EPA) sets and enforces standards for air, water, and waste management and for cleanup of sites contaminated with hazardous substances. Actions under the Clean Water Act and state initiatives like H2Ohio continue to support clean water in Lake Erie and beyond.

This section covers how clean the water is in the natural environment, and it includes the physical, chemical, and biological components of water. Good environmental quality supports sustainable human use and a healthy ecosystem, and untreated wastewater, harmful algal blooms, industry, and nonpoint source pollution can harm environmental quality. Ohio EPA conducts regular monitoring and then works with communities to address pollutants.



Improving water quality is central to Governor Mike DeWine and Ohio Environmental Protection Agency (Ohio EPA). The Governor's H2Ohio Initiative covers all areas of water quality, with the Ohio Environmental Protection Agency leading efforts to improve water quality through funding water and wastewater infrastructure, fixing or replacing failing household sewage treatment systems, replacing lead service lines in drinking water systems, and at childcare facilities, and increased water monitoring.

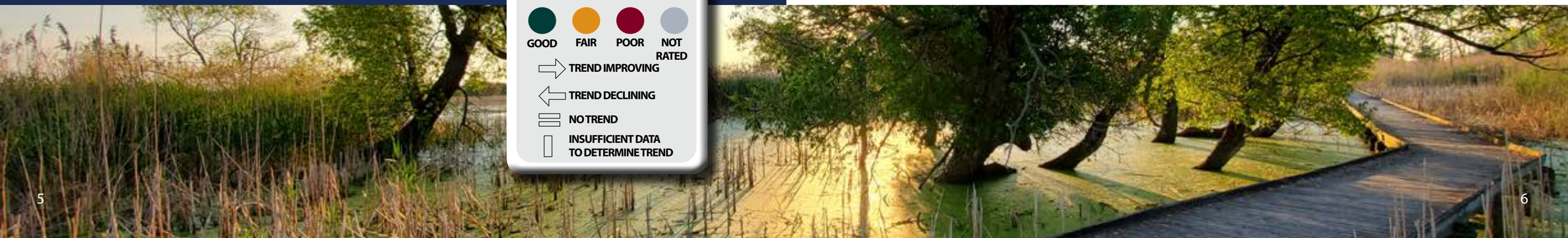
To date, Ohio EPA has funded 29 critical water and wastewater projects across the state, 23 local health districts to fix or replace failing household sewage treatment systems, lead service line replacements in eight communities, and the installation of 20 rain gauges in Northwest Ohio to improve weather forecasting and rainfall estimates.

There are other ways Ohio EPA works to improve water quality in the Lake Erie basin. To address impaired public drinking water supply and recreation uses due to harmful algae in the Western Lake Erie Basin, Ohio EPA is developing a Total Maximum Daily Load Report to address shoreline and open water impairments caused by cyanobacteria harmful algal blooms. Ohio EPA has been working with stakeholders throughout this process and will continue until the report is complete in 2023.

Ohio EPA works with federal, state, and local partners to make progress on the Areas of Concern in the basin. Improvements are being made, including a full delisting of the Ashtabula Area of Concern in August 2021.

We are proud of the ongoing work being done to help Ohio achieve its water quality goals.

LAURIE A. STEVENSON
DIRECTOR , OHIO ENVIRONMENTAL PROTECTION AGENCY



AMBIENT WATER QUALITY

HARMFUL ALGAE BLOOMS (HABs) are caused by excessive growth of algae that produce toxins. Ohio EPA, in partnership with NOAA, is measuring how long and how severe the HABs are in Lake Erie. Satellite imagery is used to count how many ten-day periods have widespread and intense HABs present in the lake each year. Lake Erie is currently considered impaired for recreation use, and this metric is rated **FAIR** and improving. For more details about this metric, see the Ohio EPA Integrated Report.

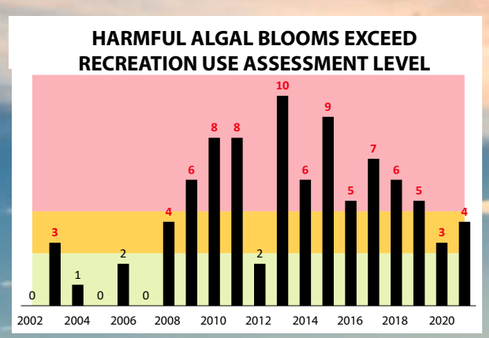
WATER CHEMISTRY measures the ability of Lake Erie to maintain its fish and plant life. We have selected nutrients (phosphorus and nitrogen) and chloride to measure Lake Erie water chemistry. These parameters are naturally occurring, but the amounts in the lake can increase due to human activity.

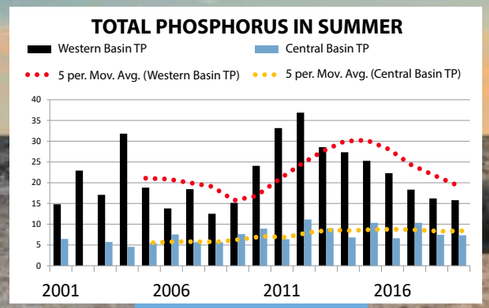
Nutrients in certain ratios drive growth of algae and aquatic plants. Excessive phosphorus can lead to nuisance or harmful algae blooms, but levels that are too low reduce the numbers of fish. In Lake Erie, nitrogen is typically so abundant that phosphorus is the limiting nutrient. Availability of nitrogen may affect which algae are able to grow and possibly the amount of toxin they are able to produce.

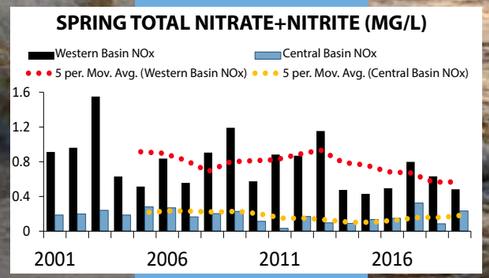
Chloride occurs naturally in water as a component of salts dissolved from rocks. Chloride levels in water that are higher than natural levels may indicate that chloride has come from other sources such as highway salt, brines from oil and gas well drilling, sewage effluent, landfills, irrigation drainage, animal manure and fertilizers, and industrial waste.

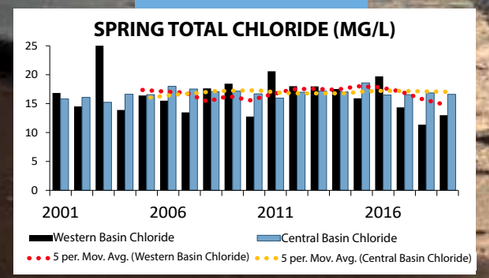
With controls at sewage treatment plants, a ban on phosphorus detergents, and agricultural conservation practices, phosphorus has dropped considerably since the highest levels recorded in the 1970s. In the western basin, the 5-year average for phosphorus was 19.6 ug/L. This is a decreasing trend since a peak over 30 ug/L in 2011-2012. In the central basin, the 5-year average for phosphorus was 8.4 ug/L.

Nitrate + nitrite levels peaked in the late 1990s, and have since dropped in both the western and central basins. The central basin 5-year average is 0.14 mgN/L.









After declining to levels near those in the central basin, nitrate + nitrite levels in the western basin have increased again to a 5-year average of 0.41 mg N/L.

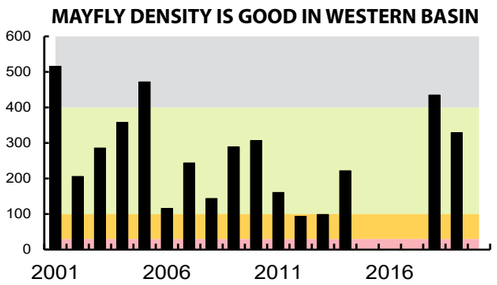
Total chloride concentrations are higher in both basins now than in past decades. The most recent 5-year averages were 16.7 mg/L in the central basin and 13.6 mg/L in the western basin. These values are about 15% higher in the central basin and 30% higher in the western basin than in the 1990s. This metric is **NOT RATED**.

MAYFLIES indicate Lake Erie's health because the juvenile nymphs form lives in shallow, productive lakes with soft sediments and well-oxygenated water. They are eaten by several Lake Erie fish.

This metric uses the number of nymphs per square meter of bottom substrate. The desired number is 100-400 nymphs per square meter in the western basin. Lower numbers would be too small to sustain the Lake Erie fishery. Higher mayfly numbers are a nuisance for people living along the shoreline.

Since 2000, the average density of mayfly nymphs across the western basin was 100-516 nymphs per square meter. These densities are reflective of good habitat conditions. As of 2019, the two year running average density was 382 nymphs per square meter which is rated **GOOD**.

Mayflies were abundant in parts of the central basin in the pre-1950s. Samples collected in the central basin in 1997-2005 had very few nymphs between the cities of Huron and Conneaut, Ohio. This indicates no improvement in habitat conditions for bottom-dwelling animals, such as burrowing mayflies, in this area. There continues to be insufficient oxygen in deep waters of the central basin to permit survival of mayflies (see Hypoxia section, next).



SAMPLING STATIONS FOR LOW DISSOLVED OXYGEN (HYPOXIA)

HYPOXIA exists when oxygen levels in the water are too low for fish or mayflies to breathe. This can occur along the bottom of Lake Erie's central basin, especially near the sediments where biological activity uses up oxygen. For drinking water treatment plants, low levels of oxygen in the intake water cause problems by changing the water chemistry in ways that make it more difficult to treat for taste and odor before it comes out at home faucets.

Some hypoxia is expected due to naturally occurring lake and weather conditions, but its severity and extent is believed to be increased by human activity. In particular, hypoxia has been linked to excess algae growth due to high phosphorus runoff. Under Annex 4 of the Great Lakes Water Quality Agreement of 2012, the U.S. and Canada developed target oxygen levels for the central basin of Lake Erie.

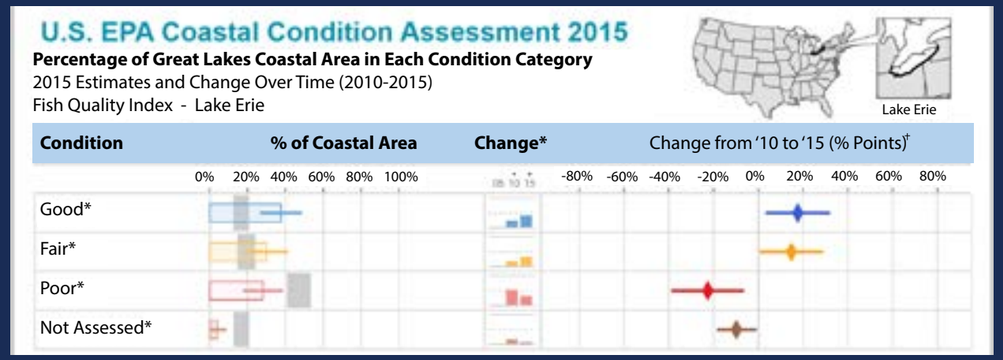
Each year U.S. EPA's research vessel, the R/V Lake Guardian, measures dissolved oxygen from an established network around the lake. Ohio EPA has been supplementing this work by sampling transects closer to the shore to provide a detailed look at the edges of the hypoxic zone. Sampling data through 2019 show that the central basin consistently has a large area of hypoxia each year in August-September.

NOAA has developed a forecast to assist water treatment operators along Ohio's central basin shoreline by providing an early warning of potential low oxygen conditions in the intake water. For a dynamic model display of hypoxia development, see the videos on NOAA's Experimental Hypoxia Forecast website.

The Commission has not assigned a score to this metric. Ohio is working with our partners to better understand how to track and report on this metric. This metric is **NOT RATED.**

TOXIC COMPOUNDS can transfer through the food web to top-level predators. These compounds can cause both acute and chronic toxic effects on wildlife. In the previous LEQI, nestling bald eagle blood samples from Ohio locations were used to develop this metric. This monitoring is not done on a regular basis, and current results are not available. Ohio bald eagle populations have increased and are meeting the goal of 1.2 fledglings per nest. This suggests that toxic compounds are not causing noticeable harm to the bald eagle population in Ohio.

U.S. EPA's National Coastal Condition Assessment measures concentrations of toxic compounds in whole fish. Results are screened to evaluate potential harm to fish-eating wildlife. This Fish Quality Index has ratings of good, fair, or poor for each location sampled based on toxic compounds found in composite samples. The number of sites of each rating are added up. In 2015, 38% of the sites were rated Good, 20% were rated Fair, and 28% were rated Poor. This has improved since 2010 when 50% of the sites were rated Poor.

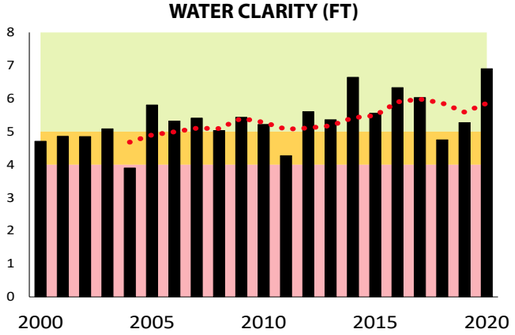


WATER CLARITY in the 1970s was quite low - less than 3 feet. Lake Erie began to clear after nutrients were regulated more intensively as a result of the Great Lakes Water Quality Agreement of 1972.

The invasive zebra and quagga mussels were accidentally introduced in the 1990s. They clear the water by filtering out green algae as they feed. This has had undesirable effects on the food chain. However, water clarity increased to over 6 ft. by 1992, and the running average has been over 5 ft. since 2006.

This metric uses the depth of light penetration as measured with a black and white disk known as a Secchi disk. Secchi data from ODNR, Division of Wildlife, have been collected during routine fish sampling surveys since 1970. The five-year moving average is 5.9 ft., and this receives a rating of **GOOD**.

Future trends in water clarity will be influenced by a complex set of factors that relate to weather, temperature, lake levels, and sediment and nutrient loads from tributaries and urban sources.



POINT SOURCES are any water discharges from a pipe that comes from an individual place such as an industrial facility or wastewater treatment plant. Responsibility for the discharge can be assigned directly to the owner.

Since the passage of the Clean Water Act, facilities have been required to obtain permits under the National Pollutant Discharge Elimination System. These permits regulate the amount of pollutants released into United States waters. Permit limits are expressed as average monthly or maximum daily loads. Because of this permitting system, over the last 50 years, there have been tremendous improvements in the reduction of point source pollution entering Lake Erie.

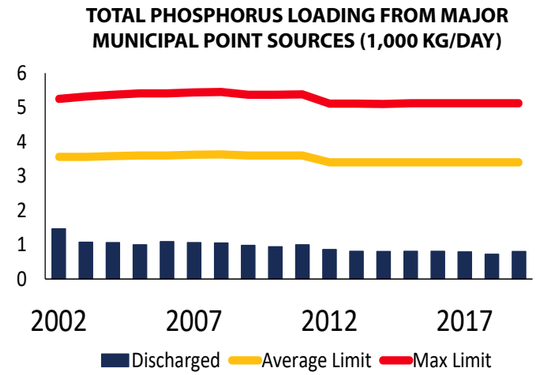
This metric looks at the loading of phosphorus, nitrogen, and mercury into Lake Erie from all major Ohio dischargers in the basin. These dischargers are required to monitor and report on the amounts discharged. Permitted loads are calculated by multiplying the concentration limits times the total water discharged by the facility.

Sewage treatment plant discharges are a much larger source of phosphorus than industrial dischargers. Current loads of phosphorus from the 74 major municipal point sources in the Lake Erie watershed are well below both maximum daily and average monthly permit limits.

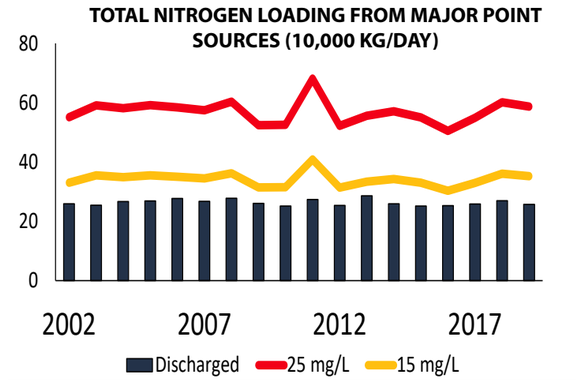
Ammonia nitrogen can be very toxic to aquatic communities when released in elevated concentrations. Limits for ammonia are focused on maintaining healthy near field aquatic ecosystems so this has been removed from the LEQI. Other forms of nitrogen are more important in Lake Erie as nutrients and are provided here as Total Nitrogen compared to permit limits for the 74 major municipal facilities. On average over these years, oxidized forms of nitrogen (NOx) are 76% of the total.

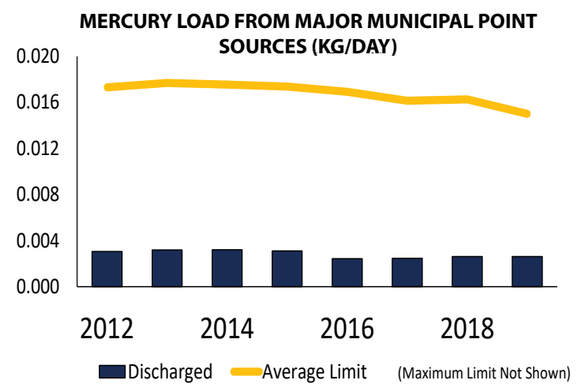
Mercury is a toxic byproduct of industrial processes and can cause harm to fish and wildlife populations as well as humans. The primary source for mercury is atmospheric deposition, even for point sources themselves. The sum of the maximum load limit is 5.7 kg/day which is much higher than would show easily on this chart.

As the loading limits for each of these pollutants are currently being met by wide margins, this metric is rated **GOOD**.



POLLUTION SOURCES
(POINT SOURCES)





AMBIENT BIOLOGY

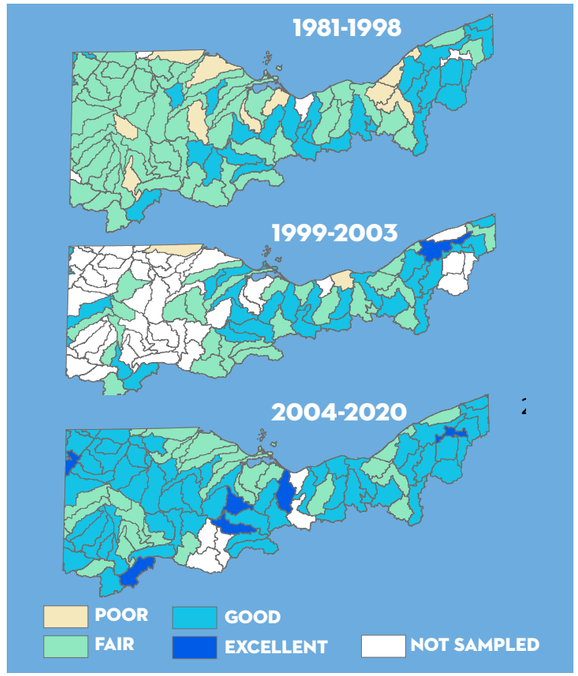
SHORE & TRIBUTARY BIOLOGY is assessed using fish communities as an indicator of overall ecosystem health. This integrates a wide range of environmental factors. Ohio EPA uses an Index of Biotic Integrity, or IBI, to determine a score for fish community health based on how well it approaches ideal conditions.

The IBI uses 12 fish community characteristics based on species numbers, behavior, what they eat, and community health.

The three areas that are monitored include the Lake Erie shoreline, freshwater estuaries, and tributary streams. For the purposes of measuring biological integrity, the shoreline is defined as the lake's edge to 3 meters depth. An estuary is a transition zone in a river that flows into a freshwater lake that includes the portion of the river affected by the water level and water chemistry of the lake. Tributary streams are those rivers and streams that flow into Lake Erie along Ohio's coast.

The overall average score for the Lake Erie shoreline was **FAIR.** Of the three water body groupings, the estuaries ranked the lowest quality as evaluated using this metric. The average for all estuaries was Fair, an improvement over the Poor received in the last report although the number of sampling sites was limited. The average score for the tributary streams was Fair. While conditions are on an improving trend, fish communities in Lake Erie estuaries, tributaries, and nearshore areas continue to be affected by excess nutrient enrichment, sediment runoff, and habitat destruction.

There have now been more than three decades of IBI data collected in the Lake Erie basin. Since the 1990s, fish communities have improved in the shoreline area (+1.6 since pre-1999), the estuaries (+5.4 since 2003, +6.7 since pre-1999), and the tributary rivers and streams (+1.7 since 2003, +4.5 since pre-1999). These improvements are likely due to changes in land use practices and actions under the Clean Water Act such as stream restoration that result in improved habitat conditions.



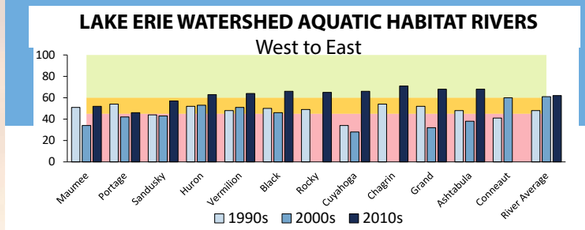
Area	Pre-1999 IBI	Rating	1999-2003 IBI	Rating	2004-2020 IBI	Rating
Lake Erie Shoreline	**32.9**	**FAIR**	**36.4**	**FAIR**	**34.5**	**FAIR**
Lucas County	26.6	POOR	37	FAIR	36.4	FAIR
Ottawa County	27.1	POOR	23.3	POOR	30.5	FAIR
Erie County	30.9	POOR	33.7	FAIR	26.5	POOR
Lorain County	36	FAIR	41	GOOD	33.8	FAIR
Cuyahoga County	30	FAIR	37.8	FAIR	35.7	FAIR
Lake County	32.5	FAIR	35.8	FAIR	39.7	FAIR
Ashtabula County	35.3	FAIR	38.3	FAIR	38.9	FAIR
Sandusky Bay	34.9	FAIR		ND	33.5	FAIR
Bass Islands	34.6	FAIR	40.4	GOOD	35.3	FAIR
Kelleys Island	41.5	GOOD	40.7	GOOD	35	FAIR
Estuaries	**24.3**	**POOR**	**25.6**	**POOR**	**31.0**	**FAIR**
Maumee	18	POOR	21.4	POOR	30.5	FAIR
Portage	23.2	POOR	25.4	POOR	31.4	FAIR
Sandusky	23.7	POOR	19.7	POOR	24.1	POOR
Huron	22.1	POOR	18.8	POOR	26.8	POOR
Vermilion	31.1	FAIR	29	POOR		ND
Black	25.5	POOR	42.6	GOOD	35.1	FAIR
Rocky	26.2	POOR	17	POOR		ND
Cuyahoga	10.4	POOR	11	POOR	24.8	POOR
Chagrin	29.2	POOR		ND		ND
Grand	31.8	FAIR	32.6	FAIR	34.4	FAIR
Asht./Conneaut	26.6	POOR	38.6	FAIR	40.8	GOOD
Rivers	**32.9**	**FAIR**	**35.7**	**FAIR**	**37.4**	**FAIR**
Maumee	26.8	POOR	36.2	FAIR	35.2	FAIR
Portage	25.1	POOR	28.3	POOR	32.4	FAIR
Sandusky	28.8	POOR	34	FAIR	35.7	FAIR
Huron	35.4	FAIR	35.2	FAIR	42.9	GOOD
Vermilion	41.1	GOOD	35.7	FAIR	40.9	GOOD
Black	31	FAIR	35.1	FAIR	35.5	FAIR
Rocky	32.3	FAIR	34.2	FAIR	38.9	FAIR
Cuyahoga	25.6	POOR	33.8	FAIR	32	FAIR
Chagrin	38.6	FAIR	38.7	FAIR	38.6	FAIR
Grand	41.5	GOOD	43.5	GOOD	40.2	GOOD
Asht./Conneaut	35.4	FAIR	38	FAIR	38.8	FAIR

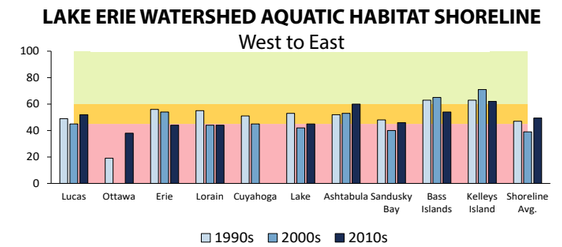
AQUATIC HABITAT is where aquatic organisms find food, shelter, and everything else they need to live. Even in clean water, they need the right physical structure and conditions.

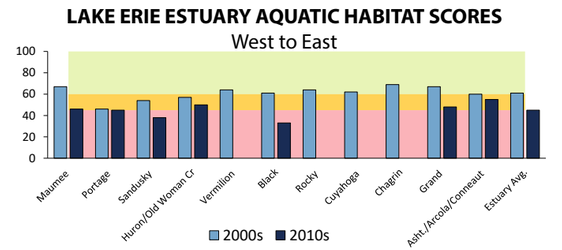
Rivers and streams are evaluated for the habitat suitability of material on the stream bed, suitable cover, channel shape, nearby land use, riffle/pool structure, and stream channel gradient. Lake Erie habitats are evaluated based on bottom material, suitable cover, shoreline shape, nearby land use, and type and quantity of aquatic vegetation.

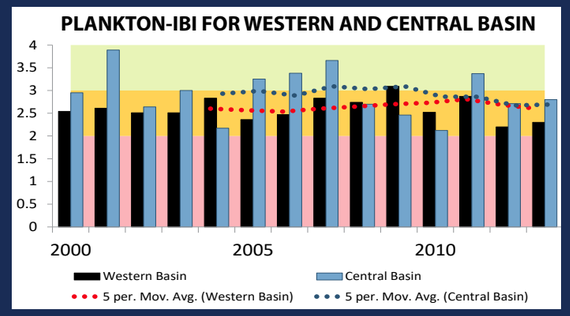
Current aquatic habitat conditions in rivers and streams on average in the 2010s are **GOOD** (62) with the trend increasing. Extensive work done under the Clean Water Act is thought to have been an important factor in increasing scores since the 1990s.

A habitat evaluation has also been developed for the Lake Erie shoreline and estuaries. This is not an overall evaluation of the near shore habitat in Lake Erie, but it provides information for localized areas. These lakeshore sites on average rank **FAIR** (49) with some areas improving and others staying the same or declining. Estuaries were **FAIR** (45) with the trend not determined due to limited data. The overall rank for this metric is **FAIR** (52) with no overall trend.









PLANKTON are important parts of the food web and respond quickly to changes in the water chemistry of the lake. The abundance and kinds of phytoplankton (microscopic plants) and zooplankton (microscopic animals) form the basis for the Plankton Index of Biotic Integrity (P-IBI).

The P-IBI is measured using plankton present in June-August. Ratings for the western basin were Good in the mid-1990s and declined to Fair in the late 1990s. This declining trend in scores in the western basin has continued through 2013 and is statistically significant.

For the central basin, values have fluctuated, and there is no significant trend overall. Although a Good rating was calculated as recently as 2009, the five-year running average P-IBI for the central basin in 2013 was rated **FAIR**.

Characteristics in the plankton that affected the metric scoring include a dramatic increase in the numbers of algae that produce toxins and a shift in the amounts of various zooplankton species.

SEDIMENT QUALITY

SEDIMENT QUALITY is improving in Lake Erie. Some areas still contain sediments contaminated by past discharges. There has been a significant reduction of sediment contamination through regulations that limit discharges and through removal of contaminated sediment dredged from Ohio's federal commercial navigational harbors on Lake Erie. Ohio is working closely with federal and local partners through the Areas of Concern Program, Dredge Material Program, and other programs to further evaluate sediment, implement sediment remediation projects, and beneficially use dredged sediment as an alternative to open lake disposal. Since the 2004 LEQI, approximately 1 million cubic yards of contaminated sediment have been removed from three Great Lakes Legacy Act (GLLA) projects conducted in Ohio AOCs at Ashtabula, Ottawa River, and Otter Creek (Maumee AOC).

As of 2021, five additional GLLA project areas have been identified and are underway with associated clean-up goals in the Cuyahoga and Maumee AOCs. These projects continue to be assessed for their implementation as funding and feasibility are deemed available with extensive coordination through their local, state, and federal partnerships. This metric is **NOT RATED**.

Areas of Concern (AOC) under the Great Lakes Water Quality Agreement, are defined as geographic areas "where significant impairment of beneficial uses has occurred as a result of human activities." The AOC program focuses on areas where limitations to support aquatic life exist, most notably contaminated sediment. In Ohio, these areas include portions of the lower Maumee, Black, Cuyahoga and previously, Ashtabula watersheds. Since the 2004 LEQI, substantial progress has been made in all four of Ohio's AOCs through restoration actions and the removal of beneficial use impairments (BUIs). All BUIs were removed by 2020 in the Ashtabula River AOC, and was delisted as an Area of Concern in 2021. Between 2014 and 2021, thirteen BUIs out of a total of 34 BUIs were removed. A key indicator of AOC improvement is remediation of contaminated sediment in these AOCs.

PROGRESS BY THE NUMBERS

Number of BUIs Removed

13 / 34

Percentage of Management Actions Complete

28% / 100%

Number of Areas of Concern Delisted

1 / 4

Contaminated Sediment Removed:
1 million cu yards

Cuyahoga River

Ohio's Dredge Material Program includes eight federal commercial navigational Lake Erie harbors. The commodities that pass through these harbors generate an estimated $25 billion a year in business revenue and support 130,000 jobs. These harbors need to be regularly dredged to remove accumulated sediment to keep the shipping channels open. Historically, most of the dredged sediment was disposed of in Lake Erie's open waters, adding large amounts of sediment and nutrients and impacting water quality.

The overall goal of Ohio's Dredge Material Program is to improve Lake Erie water quality by addressing potential impacts from dredged material. To meet that goal, the program has two sub-goals: as of July 2020, none of the dredged material is placed in the open waters of Lake Erie; and by July 2025, sedimentation in the Lake Erie watershed will be minimized.

With support from Ohio and federal partners, local managers are developing and implementing dredge sediment beneficial use projects that include using dredge as a farm field soil amendment, as marketable soil, and for wetlands and other ecosystem creation and restoration projects. Implementation of dredge sediment beneficial use projects serve as a sediment quality metric.

In **Toledo Habor,** the Toledo-Lucas County Port Authority completed upgrades in 2020 to confined disposal Facility 3, to facilitate the hydraulic placement (pumping) of over 650,000 cubic yards of dredged sediment annually as an alternative to open-lake placement, shown below. Dewatered dredged sediment will become available for beneficial use projects.

Toledo Harbor

Beginning in 2022, 140,000 cubic yards of sediment dredged annually from **Sandusky Harbor** will be beneficially used to create 32 acres of wetlands, along the Cedar Point Causeway. At least three dredged sediment cycles, totaling over 400,000 cubic yards, will be used to create fish and wildlife habitats and passive recreational opportunities.

Lorain Harbor will construct the Black River Dredge Material Beneficial Use Facility. Dredged sediment will be hydraulically unloaded into innovative dewatering devices called GeoPools. Once dry, dredge sediment will be excavated, and soil blends will be created and sold as marketable soil and farm amendments.

Cleveland Harbor annually has approximately 200,000 cubic yards of dredged sediment hydraulically pumped and dewatered in its sediment recycling facility managed by the Cleveland-Cuyahoga County Port Authority, shown below. On average, approximately 140,000 cubic yards of Cuyahoga River sediment is recycled and reused every year in a wide array of soil blends and products. This represents the beneficial reuse of over half of the volume of federal navigation channel dredging that occurs in Cleveland Harbor every year.

Cleveland Harbor

During routine dredging of **Fairport Harbor**, course-grained sandy sediment from the entrance channel is beneficially used for littoral nourishment along a nearshore area east of the harbor. Fine-grained sediment dredged from the Grand River will be hydraulically placed into a sediment recycling facility that will be constructed through the Lake Development Authority at the former North Park Fly Ash Facility, beginning in 2022.

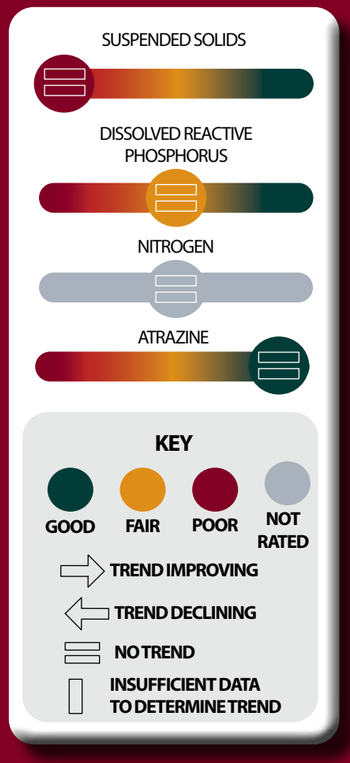
Ashtabula Harbor dredged sediment will be used to create 16.5 acres of submerged aquatic and emergent wetlands inside the eastern breakwater of Ashtabula Harbor, starting in 2022. Approximately 400,000 cubic yards of dredged sediment will be beneficially used during the next ten years.

Conneaut Harbor will be constructing a sediment recycling facility through the City of Conneaut on property leased from Canadian National Railway. Dredged sediment will be hydraulically unloaded into the facility, and the dewatered sediment will be sold as marketable soil.

WATERSHED SOURCES

The Ohio Department of Agriculture (ODA) oversees Ohio's food supply, and animal and plant life for overall safety while creating economic opportunities for Ohio's farmers, food processors, and agribusinesses.

Most of the Lake Erie watershed in Ohio is agricultural land. Water moves across the land and through the ground, picking up natural and human-made substances, and ultimately flows into lakes, rivers, and coastal waters. This water can carry pollutants such as sediments, nutrients, and pesticides that can influence the health of Lake Erie.



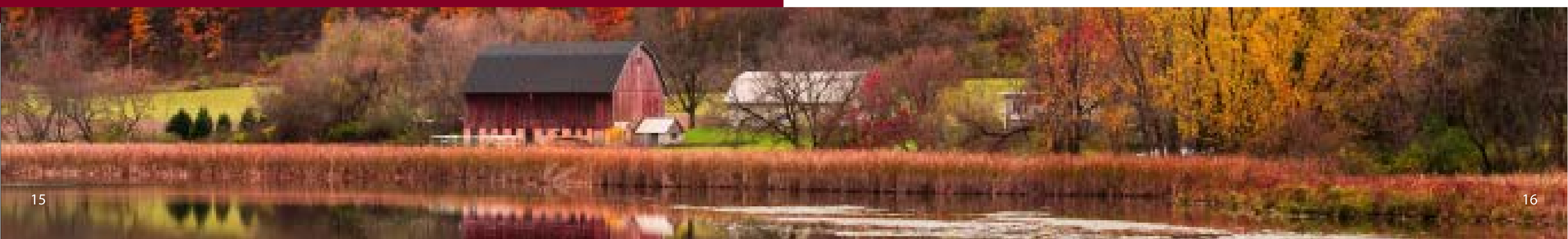
Governor Mike DeWine's H2Ohio Initiative spans all areas of water quality, with the Ohio Department of Agriculture (ODA) leading efforts to reduce phosphorus runoff.

Reducing phosphorus runoff is critical in improving water quality. However, there is no one-size-fits-all solution. That is why H2Ohio incentivizes farmers to implement seven proven, science-based, cost-effective, best management practices: Voluntary Nutrient Management Plan (VNMP); Variable Rate Phosphorus Application; Phosphorus Placement; Manure Incorporation; Conservation Crop Rotation; Cover Crops; and Drainage Water Management. Producers can work with their Soil and Water Conservation District to determine which practices will have the most effectiveness on their farm while still producing a high yield of crop.

Initially, H2Ohio was available to producers in a targeted 14-county area in the Maumee River Watershed within the Western Lake Erie Basin (WLEB). Producers' response to Ohio's first voluntary water quality initiative was remarkable. After first-round sign-ups, more than 1,800 producers enrolled more than 1.1 million acres into voluntary nutrient management plans.

With continued funding through the Ohio Legislature, the H2Ohio program expanded to the 10 remaining counties in the WLEB, and further expansion across the state is expected. We are proud of our agricultural community and its commitment to helping Ohio achieve its water quality goals.

DORTHY PELANDA
DIRECTOR, OHIO DEPARTMENT OF AGRICULTURE



WATERSHED SOURCES

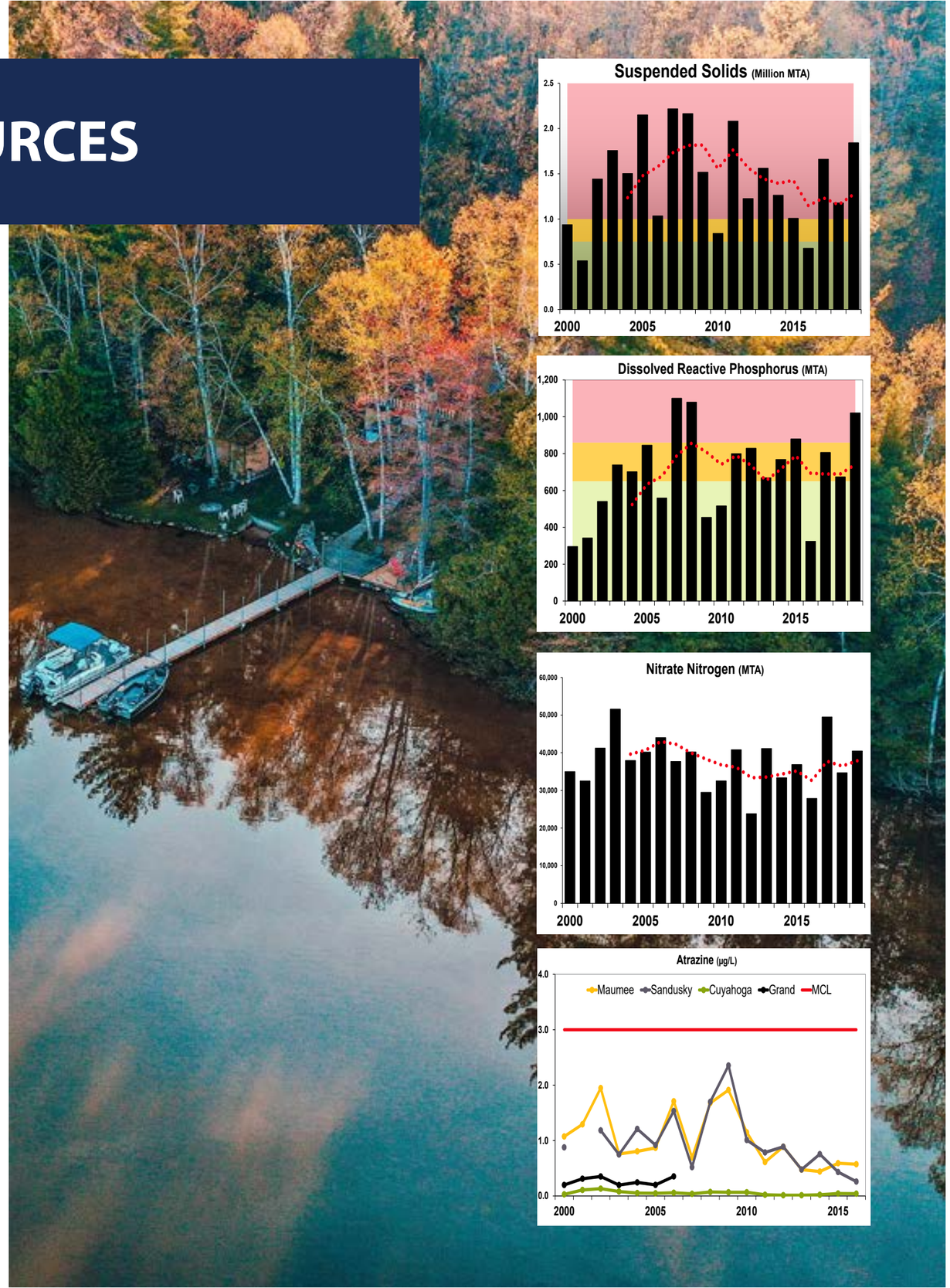
WATERSHED SOURCES of pollution (or "nonpoint" sources) come from water moving across the land or through the ground, picking up natural and human-made substances, which are ultimately deposited in lakes, rivers, and coastal waters. The water that carries this pollution originates from natural processes such as rain and snowmelt, or from people watering crops or lawns. Pollutants such as sediment, nutrients, and pesticides were selected for this report because they influence the health of the lake by altering water clarity, encouraging algae growth, and damaging the bugs, fish, and animals using the water.

The National Center for Water Quality Research at Heidelberg University measures sediment as suspended solids - the dirt carried off land - in the Maumee, Sandusky, Cuyahoga, and Grand Rivers (data for the Grand River up to 2006, with estimated amounts after that year). They also measure nutrients, including nitrogen (as nitrate + nitrite) and dissolved reactive phosphorus, and concentrations of the widely used crop pesticide atrazine.

Loadings, which are the total amount of the substance in the water, are calculated by multiplying the concentration times the amount of water moving past the sampling point in the river. The loads fluctuate a great deal from year to year. This reflects the influence of weather, particularly the timing and intensity of storm events relative to the agricultural cycle. Intense storms that occur at times when fields are bare or shortly after pesticides are applied can export such high quantities of material that one storm runoff event can dominate the entire year's load.

Generally, loads and concentrations are higher for most years in the Maumee and Sandusky Rivers than they are in the Cuyahoga and Grand Rivers because of the larger watershed area of the Maumee and the prevalence of farming in the Maumee and Sandusky River Watersheds. The Cuyahoga and Grand Rivers have more forest and urban land use and smaller amounts of agriculture.

Using a 5-year running average, the current



suspended solids loading to the lake from these four rivers is 1.3 million metric tons per year, and this metric is rated as **POOR**. Although the running average exceeds 1 million metric tons, there have been three years in the last decade where suspended solids were in the good to fair range, and the recent five year trend is less than the highest levels in the years 2003-2013.

Dissolved reactive phosphorus (DRP) has increased in Lake Erie since the mid-1990s. These increases coincide with increasing harmful algal blooms in the Western Basin of Lake Erie. Five-year running averages suggest no trend in total loads of DRP. However, in 9 of the past 15 years, levels are still higher than reported in the 2004 Lake Erie Quality Index.

For the first time, the Commission has developed a scoring method for DRP. This is based on the recommendations made by the Annex 4 Subcommittee under the Great Lakes Water Quality Agreement. In a 2015 report, they recommended a 40% reduction from loading levels measured in 2008 will produce the desired lake conditions in 9 out of 10 years.

Taking the annual loading from these four rivers in 2008, we have created one level threshold at 60% (a 40% reduction) that would represent "Good" and another threshold at 80% (a 20% reduction) that indicates "Fair". Only two years of the past ten (2010-2019) have been below the 40% reduction target amount. Six of the past ten years are in the 20%-40% range. The 5-year running average shows no trend, moving up and down primarily due to the influence of flow conditions. This condition is rated **FAIR** for this metric.

Nitrogen (monitored as nitrate) is important for plant growth. It cycles naturally in plants, soils, and water and is also added to farm fields as fertilizer. This metric is not rated. However, five-year running average loads of nitrogen have declined slightly since the peak in 2006 and are now below 40,000 metric tons per year from these four tributaries. This metric is **NOT RATED**.

Atrazine is a critical pesticide for corn crops. It is widely used in the Maumee and Sandusky River basins and could move into waterways. There have been concerns that levels in the rivers might affect aquatic life or sources of drinking water. A study of this pesticide in rivers indicates that atrazine levels have remained well below the Maximum Contaminant Level for drinking water. This metric is rated **GOOD** because even the highest levels are well below the Maximum Contaminant Level. Since the levels were consistently low, this monitoring project has not been continued past 2020.

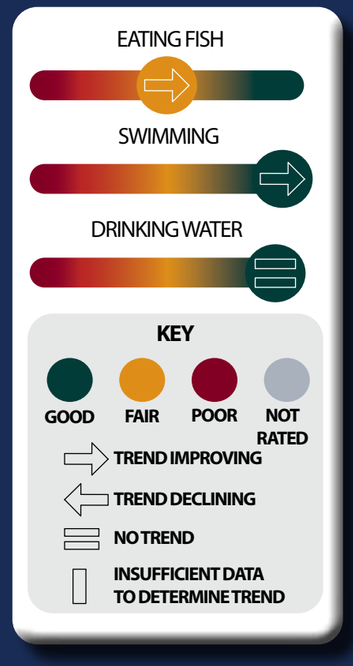
HUMAN EXPOSURE RISKS

The Ohio Department of Health (ODH) is concerned with people's exposure to contaminants in the air, water, and land; how these exposures affect human health; and what levels of exposure are harmful.

Human health can be influenced by many factors, including exposure to physical, chemical, biological, and radiological contaminants in the environment. ODH uses this information to develop guidelines for fish consumption, swimmable waters, and drinkable waters as it relates to Lake Erie. Ohio monitors edible fish for contamination to provide the best possible advice to people who eat fish from Lake Erie and other water bodies in the state.

Swimmable waters are monitored for bacteria and algal blooms, which can cause potential health risks to humans. If levels of bacteria or toxins exceed safe recreational levels at a location, the beach is posted to advise against swimming.

ODH works closely with Ohio EPA, who has jurisdiction over drinking water quality and standards.



Enjoying recreational activities on the waters of Lake Erie, such as catching and eating sport fish, are lifestyle choices that can improve the public health of our communities and support our mission to advance the health and well-being of all Ohioans.

The presence of harmful bacteria and chemicals in the lake can, however, impact the safety of these activities. While these hazards do still occur under certain conditions, improvements in Lake Erie's water quality have led to a reduction in fish consumption advisories. As an example, fish consumption advisories have decreased for yellow and white perch, and increased public messaging about safe fish choices have also made a positive difference.

Along with H2Ohio's work to improve water quality, the Ohio Department of Health (ODH) has worked to improve public health knowledge about avoiding harmful algal blooms and related health effects to protect people and pets.

ODH serves as the state beach coordinator and hosts the BeachGuard website. This website allows our partner monitoring agencies the ability to publicly post water sample results and advisories when thresholds are exceeded. BeachGuard also serves as the advisory notification system to alert the beach-going public when water quality advisories are issued and rescinded for their favorite beach.

BRUCE VANDERHOFF MD, MBA
DIRECTOR, OHIO DEPARTMENT OF HEALTH

HUMAN EXPOSURE

EATING FISH that are sport caught is a popular activity. Every year, anglers catch millions of fish from Ohio waters of Lake Erie. These fish are a high-quality food. However, low levels of chemicals like polychlorinated biphenyls (PCBs), mercury, and lead have been found in Lake Erie fish. Ohio monitors contaminants in edible fish to provide advice to people who eat it.

When fish feed in the lake, they can accumulate contaminants. The fish that were chosen for this metric — walleye, yellow perch, smallmouth bass, channel catfish, steelhead trout, white bass, white perch, freshwater drum, and whitefish — have a wide range of feeding habits. Thus, the measure of fish tissue contamination is a way to measure for contamination in Lake Erie.

Once a year, an advisory is issued through the Ohio Sport Fish Consumption Advisory Program. Advisories give a recommended consumption frequency and the location where it applies for each of these fish species.

Scores were assigned based on the consumption advisory for each species'. The final rating is the sum of all the species scores.

Currently, the statewide recommendation is to limit fish consumption of yellow perch and sunfish to two meals per week, and to limit consumption of other fish species to one meal per week. The consumption advisory for white perch has improved from previously one meal per month to one meal per week. Similarly, common carp under 20 inches can be eaten during one meal per week, a change from the prior one meal per month advisory.

Advisories for several other fish species have changed for Lake Erie since 2004. Channel catfish have been upgraded to one meal per month. Although not included in the metric, lake trout have improved to one meal per month, and chinook salmon are now covered only by the statewide advisory of one meal per week. Advisories were tightened for common carp over 27 inches, which are now one meal per two months.

The overall score for this metric is **FAIR**. The two primary Lake Erie sport fish — yellow perch and walleye — may safely be consumed once or twice per week, while most other species fall under advisories for one meal per month or more restrictive levels. The reduction in fish consumption advisories for several species suggests that water quality in Lake Erie is improving.

Species	Size (inch)	Waterbody	Advisory for Meal Frequency 2022	Score	2019 Total Harvest Weight (lbs)	Weighting Factor (WF)	Scaled score (Score x WF)	Contaminant
Walleye		All Ohio	1 meal/week	3	6,305,313	0.64	1.91	PCBs, Mercury
White Perch			1 meal/week	3	1,027,687	0.10	0.31	PCBs
Yellow perch			2 meals/week	3	1,111,765	0.11	0.34	PCBs, Mercury
Smallmouth Bass		All waters (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky Counties)	1 meal/month	2	16,853	0.00	0.00	PCBs, Mercury
Channel Catfish			1 meal/month	2	489,548	0.05	0.10	PCBs
Steelhead Trout			1 meal/month	2	12,620	0.001	0.003	PCBs
White Bass			1 meal/month	2	254,877	0.03	0.05	PCBs
Freshwater Drum			1 meal/month	2	654,548	0.07	0.13	PCBs
Whitefish	>21		1 meal/month	2	31,409	0.003	0.01	PCBs
				TOTAL	9,904,620		2.85	FAIR

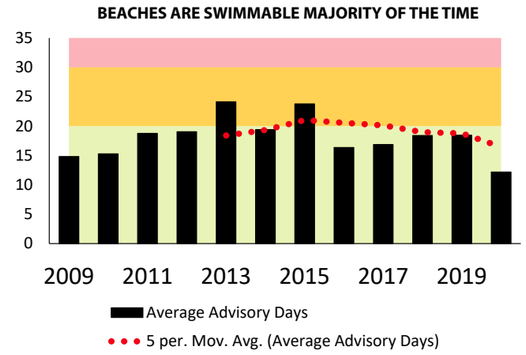
SWIMMING is a common and fun activity in Lake Erie. Ohio's beaches are monitored for bacteria to indicate potential health risks from water borne pathogens. If the bacteria counts are too high, the beach is posted to advise against swimming.

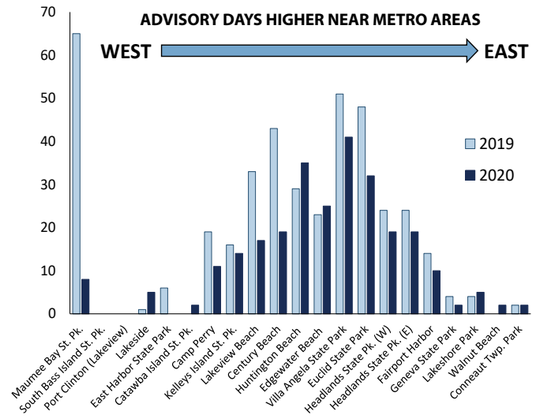
As harmful algal blooms have increased along the shore of Lake Erie, Ohio has started monitoring for algal toxins at state park beaches. If the toxin levels exceed recreational contact levels, the beach is posted to advise against swimming.

Beaches closer to heavily populated urban areas have more advisory days. This occurs because storm runoff washes pollutants from these areas into the storm sewers, which ultimately drain into Lake Erie.

This metric is based on the number of advisories for bacteria posted in the summer at 19 consistently monitored public beaches on Lake Erie's shoreline.

There is a five-year running average of 16.5 advisory days per season, which scores **GOOD**. This means that the beaches are swimmable, on average, just over 83% of the time in a typical year. The recent five year running average is improving.





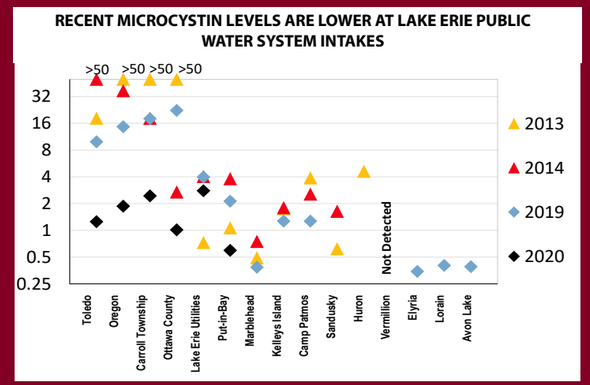
PUBLIC DRINKING WATER systems along Ohio's Lake Erie shoreline supply 25 Ohio communities, serving a combined population of over 2.6 million people that use Lake Erie as their source water.

Water treatment plants are required to monitor treated water for organic chemicals, metals, pesticides, disinfection by-products, and disease-causing microorganisms for which maximum contaminant levels (MCLs) have been established. No water treatment plants in Ohio have measured contaminants in their treated water that have violated a federal MCL due to the water from Lake Erie.

Ohio EPA has developed a methodology for assessing algae-produced toxin concentrations. Eight Lake Erie water systems now monitor for microcystins, and Ohio EPA routinely monitors five additional Lake Erie water systems. Ohio EPA has sampled 16 Lake Erie water systems for algae-produced toxins in response to algal blooms on Lake Erie since 2014.

Microcystins have been detected in the raw, untreated source water for some Lake Erie public water supplies in some or all years since 2011. Raw water intake concentrations of microcystins have been greatest in the western Lake Erie basin (maximum >50 ug/L) but are very rarely over 10 ug/L at other intakes along Lake Erie.

Water systems spend hundreds of thousands of dollars on advanced treatment technologies to remove the toxins. They have been implementing upgrades to increase capacity for algae-produced toxin removal and ensure safe drinking water. Due to substantially increased monitoring and completion of plant upgrades, Ohio has not had a "Do Not Drink" advisory due to microcystins since 2014. This metric is rated **GOOD**.



TOURISM & REDEVELOPMENT

Ohio's 300 miles of Lake Erie coastline are one of the largest contributors to Ohio's $47 billion tourism industry. The Ohio Department of Development (ODOD), through its office of TourismOhio, oversees the *Ohio. Find It Here.* marketing campaign that promotes Ohio as a great place to live, work, and play.

Through its *Ohio. Find It Here.* marketing, TourismOhio often features world-famous amusement parks, public beaches, incredible boating, and world-class fishing and bird watching that attract visitors from around the world.

ODOD provides assistance to clean up brownfield sites. Brownfield sites are abandoned, idled, and under-used industrial, commercial, and institutional properties where expansion or redevelopment is complicated by known or potential releases of hazardous substances or petroleum. Many of these projects have taken place in 35 of the counties within Ohio Lake Erie's watershed. These regions vary from dense metropolitan cities to large agricultural areas and include forests and coastlines. Uses of land within the watershed include residential, commercial, and public parks, and industries include manufacturing, transportation, shipping, distribution, farmland, and livestock production.

Ohio's Lake Erie watershed attracts millions of visitors each year. At the Ohio Department of Development (ODOD), we work with local communities to make improvements that benefit residents and businesses, and we market the area to visitors to keep new money coming into the region through tourism spending.

Tourism is big business in the state of Ohio, and that is especially true along the shores of Lake Erie, where visitors can experience a diverse offering of activities such as boating, fishing, parks, trails, beaches, roller coasters, resorts, birding, wineries, and more. The counties along Lake Erie are a major contributor to Ohio's tourism industry, which sees 219 million visits a year, generating $47 billion in visitor spending for our state and supporting more than 411,000 jobs.

To create new opportunities for economic development and tourism in the region, Governor Mike DeWine and Lt. Governor Jon Husted are investing hundreds of millions of dollars to clean up brownfield sites and remove blighted properties in the region and statewide. These efforts will help communities remove contaminated materials and unsafe buildings, which will enable these areas to be redeveloped into productive economic sites, including boat docks and riverfront trails.

Lake Erie is an incredible natural wonder that shapes our state. As Ohioans, we are fortunate to have 300 miles of coastline along it. And at ODOD, we are proud to continue land use and redevelopment programs that keep the land along the lake clean and support its vibrant communities, and we will continue to support Ohio's growing tourism industry along the lake's shores and islands through our marketing. Joy, Happiness, Excitement. *Ohio. Find It Here.*

LYDIA MIHALIK
DIRECTOR, OHIO DEPARTMENT OF DEVELOPMENT

LAND USE

LAND USE across the Lake Erie watershed varies widely from dense metropolitan regions surrounded by medium-density residential areas to agricultural areas and forested open lands. Parks, wetlands, and urban farms may be found throughout and vary in size.

Development pressure in the watershed is generally very low. The population is flat or declining in many areas. A 2019 estimate for the total population is 4,117,275. This estimate is a 1.6% reduction from 2010 or approximately 66,789 fewer people.

There are opportunities for land use to change from undeveloped to developed or to improve stormwater management in existing areas. Ohio supports the responsible development or redevelopment of properties in the Lake Erie watershed such that stormwater runoff is managed to keep the lake water clean.

Brownfield redevelopment, when paired with appropriate cleanups and stormwater management, reduces pressure to convert existing agricultural or green space. Both the Ohio Brownfield Program and the Voluntary Action Program through Ohio EPA facilitate the cleanup of contaminated sites for reuse. Since 2000, 192 sites totaling 3,458 acres have been approved through the program within the eight coastal Lake Erie counties.

Conservation sets aside land that helps filter stormwater so that the streams and lake are cleaner. Regional park systems, regional land conservancies, and state agencies such as ODNR continue to identify and purchase land where critical habitat and species exist or where linkages protect riparian corridors while providing recreational uses. Since 2015, approximately 30,000 acres in the Lake Erie watershed have been changed to protected status. There is no goal for this metric, so it is **NOT RATED**. However, we consider the trend improving due to increased programs for brownfield redevelopment and conservation.

VOLUNTARY ACTION PROGRAM ACTIVITY 2000-2020 ALONG LAKE ERIE

Total Sites Coastal Counties	192
Total Acres Coastal Counties	3,458
Total Sites Watershed Counties	323
Total Acres Watershed Counties	6,799

TOURISM

TOURISM is an important economic driver along the more than 300 miles of Lake Erie coastline in Ohio. Visitors are attracted to the region for public beaches, a burgeoning wine industry, a world-famous amusement park, incredible boating, and world-class fishing and birding.

In 2021, Ohio's Lake Erie region generated a record $17.2 billion in total business sales and 126,243 jobs, according to a study conducted by *Tourism Economics*. And in 2020 and 2021, Ohio's shores and islands of Lake Erie became even more popular with consumers' increased interest in outdoor activities.

Sport fishing in Ohio's Lake Erie waters typically totals $1.3 billion annually. Many areas along the lake saw a dramatic increase in fishing-related business in 2020 and 2021. Numerous new charter boats started up along with bait and tackle shops.

Northwest Ohio is known as the "Warbler Capital of the World" and holds a 10-day festival called "The Biggest Week in American Birding." The nationally recognized and increasingly popular festival attracts an estimated 100,000 birders from all 50 states and around the world.

Ohio's wine country is burgeoning along Lake Erie. The microclimates created by the lake are ideal for growing grapes and provide ideal conditions for more than 30 Ohio wineries along the lake that are year-round tourist destinations.

For more than 150 years, the Lake Erie Shores & Islands region has been a popular destination for families. With 29 beaches, waterfront dining, shopping, and historic sites, the region offers something

for everyone. The area is also home to Cedar Point, one of the top-rated amusement parks in the world.

Cleveland is the biggest metropolitan area along the lake. Its many beaches and lakefront parks offer opportunities for Cleveland's 19 million-plus visitors a year to enjoy the lake. From kayaking, watercrafting, paddle boarding, and fishing to sightseeing cruises and lakefront trails with stunning views, Lake Erie is at the heart of many memorable Cleveland adventures.

Tourism growth for the Lake Erie region is directly related to the investments in advertising and public relations by the state of Ohio and its tourism partners. Every county along the lake has a visitors bureau that is funded through locally approved bed tax. In addition, the office of TourismOhio at the Ohio Department of Development oversees the *Ohio. Find It Here.* marketing campaign that works with the local visitors bureaus to help attract tens of millions of visitors a year to the region.

Lake Erie provides many wonderful attractions for visitors from across the state and the world. The partnership between local tourism businesses and *TourismOhio* will continue to bring awareness to the region as a great tourism destination. It will capitalize on the increasing popularity of outdoor activities while engaging the traveling public with its incredible tourism product.

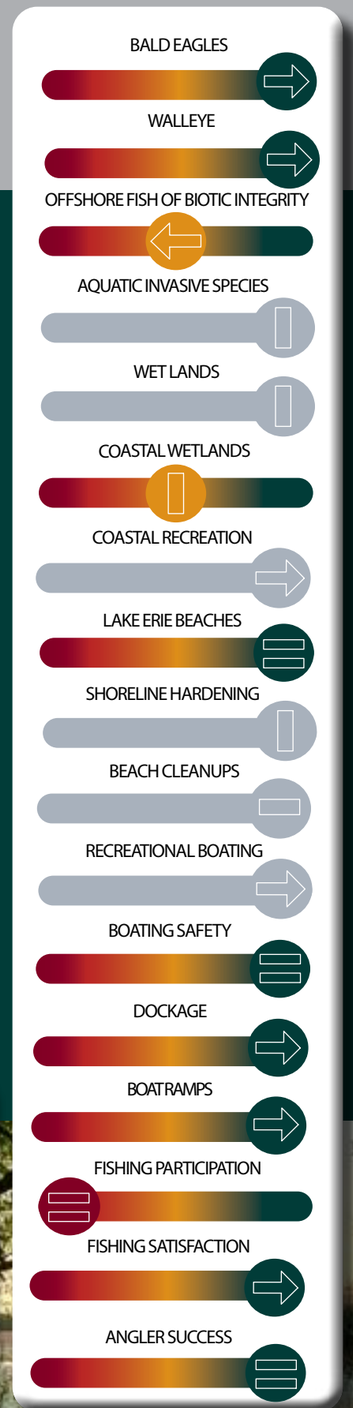
ECONOMIC IMPACT OF TOURISM IN OHIO'S EIGHT LAKE ERIE COASTAL COUNTIES IS ROBUST

	2015	2017	2019	2021
Sales	$14.1 billion	$15.1 billion	$16,8 billion	$17.2 billion
Employment	123,880	127,852	130,107	126,243
Wages	$3.7 billion	$4 billion	$4.3 billion	$4.8 billion
State Taxes Generated	$538 million	$573 million	$616 million	$674 million
Local Taxes Generated	$360 million	$390 million	$433 million	$510 million

WILDLIFE & RECREATION

The Ohio Department of Natural Resources (ODNR) serves as a steward to the animals, plants, forests, wetlands, and places for people to play and have fun along Lake Erie.

ODNR owns and manages more than 800,000 acres of land, including 75 state parks, 24 state forests, 140 state nature preserves, and 150 wildlife areas. This includes seven state parks with beaches along Lake Erie. The department also has jurisdiction to oversee the use of the more than 2.25 million acres of Ohio waters of Lake Erie. ODNR works to conserve and improve fish and wildlife resources and their habitats for sustainable use and appreciation by all.



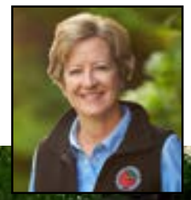
With unmatched beauty, recreational opportunities, and diverse wildlife, Lake Erie is one of the greatest and most important resources in the Buckeye State. The Ohio Department of Natural Resources (ODNR) is committed to protecting, preserving, and improving this body of water that is vital to the health and happiness of all Ohioans.

ODNR is focused on the conservation of everything the lake has to offer, while keeping recreation a priority. Our marinas provide safe harbor for those coming in after casting a line, the water just off the shores of our beaches is ideal for paddling and water skiing, and our campgrounds give families and friends a place to gather and rest after a long day on the lake. These activities are not only important to those visiting, but they also draw in business, promote tourism, and ultimately benefit the local economy and create jobs.

From the water to the skies, visitors can see proof of the conservation work being done to not only retain habitat for wildlife but improve it. Sometimes called the Walleye Capital of the world, the species' population has skyrocketed to historic levels, in part thanks to work by our Division of Wildlife. Bald eagles are another true success story of work by Ohio's frontline conservationists. Once considered endangered, now it takes only a pair of binoculars to spot this patriotic bird along the lake.

We are finding innovative ways to keep Lake Erie healthy. Since its inception in 2019, ODNR has played an important role in growing Governor Mike DeWine's H2Ohio initiative, a wide-reaching approach to solving Ohio's water quality problems. To date, we have brought more than 100 wetland projects to life, and have plans for many more. These natural infrastructure solutions are key to the future of resolving Ohio's water quality issues.

Here at ODNR, we value everything Lake Erie has to offer and are determined to not only maintain its health and beauty, but to leave it better than it was before.



MARY MERTZ
DIRECTOR OF OHIO DEPARTMENT OF NATURAL RESOURCES

Mary Mertz

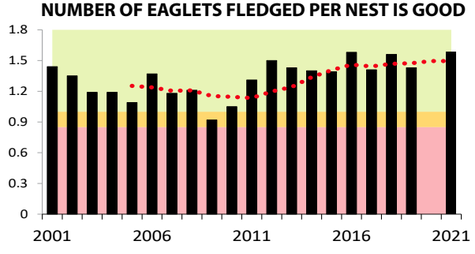
WILDLIFE

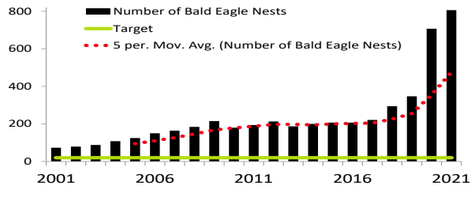
BALD EAGLES are a top-level predator with an important role in the Lake Erie ecosystem. Most live in the marsh region of northwest Ohio, along the Sandusky River, and throughout the Lake Erie watershed and shoreline in northern Ohio. Bald eagles prefer secluded nests that are near water and food. They feed mainly on fish, other birds, and small mammals. Their reproductive success can serve as an indicator of the health of the species and of the ecosystem.

A productivity rate of 1.0 young per nest ensures a healthy eagle population. The current productivity, using a 5-year running average, is 1.4 young per nest or **GOOD**. An estimate of more than 200 eagles per year have fledged from Ohio nests in nine of the last ten years.

In 2021, there were an estimated 806 eagle nests throughout the state, more than 9 times the 88 nests reported for the 2004 LEQI. This robust number is rated **GOOD**. Eagle recovery has far surpassed the USFWS Northern States Bald Eagle Recovery Plan (1983) goal of 20 nesting pairs by the year 2000 and has been a resounding success.

NUMBER OF EAGLETS FLEDGED PER NEST IS GOOD





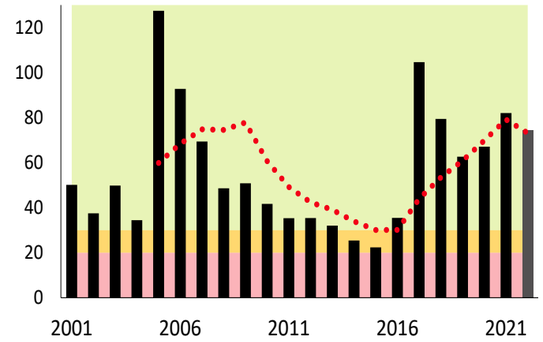
WALLEYE are a top predator and keystone species in the fish community of Lake Erie. Fisheries managers rely on annual surveys of young of the year walleye to help monitor population trends.

The Lake Erie Committee of the Great Lakes Fishery Commission has stated a vision in the 2020 Fish Community Objectives that the Lake Erie basin "will consist of diverse fish communities that support ongoing societal benefits, including a thriving recreational fishery, improved fish habitat, and desirable ecosystem performance, and reduced adverse impacts from invasive fish. Walleye are intensively managed to sustain harvest within prescribed limits by Canadian and U.S. fisheries industries through cooperative interagency science.

The Walleye Management Plan 2015-2019 was determined to be a success and was extended for 2020-2024. The Lake Erie Committee has identified a population of between 26-40 million walleye with a diverse age structure to attain the "Maintenance" category.

The model population for the five-year running average far exceeded this in 2005 following a spectacular year class hatched in 2003. The result was several years of excellent fishing. The population returned to this level in 2021 following consistent and often strong hatches that began in 2014. These hatches have resulted in an abundant walleye population comprised of a broad range of ages and sizes. Excellent fishery performance is anticipated for the next decade. The rating for this metric is **GOOD**.

WALLEYE POPULATION IS GOOD

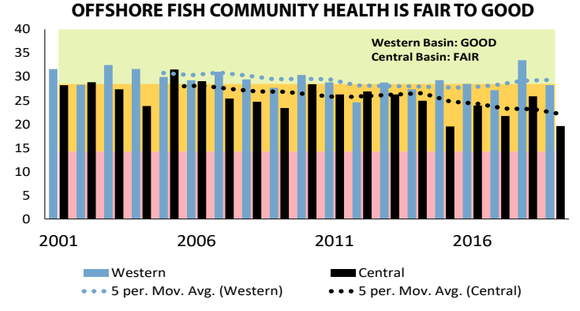


OFFSHORE FISH biological integrity assessment uses twelve measures, focusing on the number of different species, their behavior type, groups of species that use similar resources, community health, and fish abundance.

Over the years, there has been a high degree of variability in fish collection due to strong or weak year classes of particular individual species of fish. This makes it harder to detect significant trends.

Despite this, there appears to be a persistent reduction in the number of pollution-tolerant fish species in the central basin and a slight downward trend in the percent of tolerant species in the western and central basins. Native juvenile minnows have declined in both basins, but especially in the western basin. This metric is rated **FAIR**.

OFFSHORE FISH COMMUNITY HEALTH IS FAIR TO GOOD



AQUATIC INVASIVE SPECIES

are all types of plants, animals, and other living things that are not native, harmful, and are able to survive in Lake Erie. The spread of these species damages existing food webs and human infrastructure, causing hundreds of millions of dollars of damage each year and requiring tens of millions of dollars of expense aimed at control and prevention.

This metric is not quantified, therefore **NOT RATED**, because it is not possible to know exactly when a species is introduced, and data on the rate of introductions are not readily available.

An invasive species of focus in Ohio over the past five years is the grass carp. Around 2012, reports of fertile grass carp were received by ODNR. After surveys documented eggs and reproducing populations, grass carp were identified as a key target because of their potential to harm Lake Erie fish and plant species. In 2019, ODNR and agency partners initiated a Lake Erie Grass Carp Response Strategy that is the State's plan to monitor populations, prevent additional introductions, and eradicate grass carp in the western basin of Lake Erie with the primary focus on the Sandusky and Maumee Rivers. To date, over 430 adult grass carp have been removed.

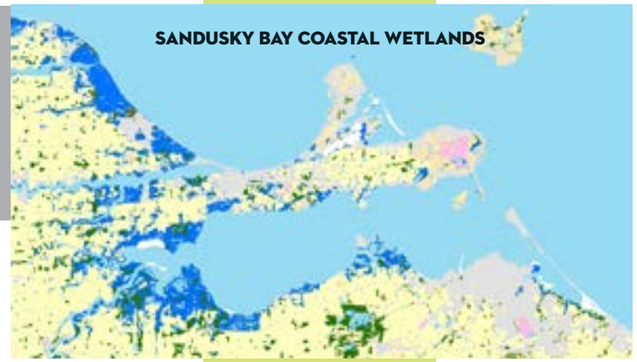
WETLANDS

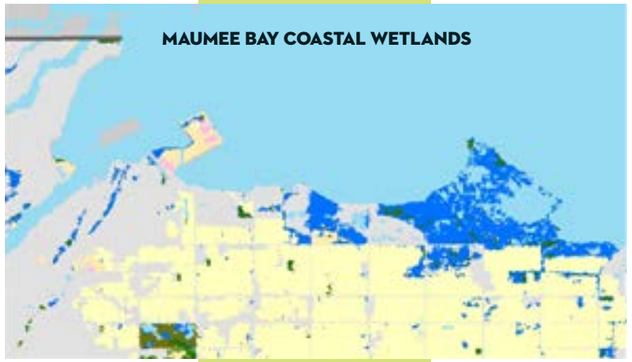
WETLANDS are very diverse in their vegetation and structure, so it has been difficult to consistently measure their location and extent across the entire Lake Erie watershed.

The National Wetlands Inventory provides resource managers with maps and other information about wetlands. Using aerial imagery from 2006, there were 47,323 individual wetlands identified by this method in Ohio's Lake Erie watershed, totaling 289,447 acres. ODNR is working with the U.S. Fish and Wildlife Service on updating this data set.

Additional data come from the National Oceanic and Atmospheric Administration's Coastal Change Analysis Program (C-CAP). This program produces national standardized land cover change products from satellite data for coastal regions of the U.S., including the Great Lakes. In 2010, there were 546,041 acres identified as wetlands in Ohio's Lake Erie watershed. In 2016, this number was 480,033 acres of wetlands, which is 13% lower.

The Ohio Lake Erie watershed has hundreds of thousands of acres of coastal, inland, and streamside wetlands. The ODNR H2Ohio Program is aggressively restoring wetlands across the state. There is no target value for the acreage of wetlands, and so this metric is **NOT RATED.**





LEGEND

Wetland Categories

- Palustrine Emergent Wetland
- Palustrine Forested Wetland
- Palustrine Scrub/Shrub Wetland
- Palustrine Aquatic Bed
- Water

COASTAL WETLANDS with a natural hydrological connection to Lake Erie are an important habitat for the reproduction, growth, and survival of many species of wildlife and plants that live in and around Lake Erie. ODNR's H2Ohio Program is enhancing this natural connection using fish passage and water level management structures.

Measuring changes in coastal wetland biological integrity can indicate how well these biological communities are supported. Resource managers use plant communities to measure wetland conditions because of the number of contributions they make to the ecosystem and the relative ease of sampling.

Ohio EPA and The Ohio State University developed a vegetation index of biological integrity specific to coastal wetlands (VIBI-C). An overall score for the VIBI-C can range from 0 to 70. A score greater than 50 is considered Excellent, between 33 and 50 is Good, between 17 and 33 is Fair, and less than 17 is Poor.

Twenty plots in 15 coastal wetlands were evaluated using the Ohio EPA/OSU survey. These sites consist of small, historically persistent coastal wetlands. The VIBI-C scores in the 2000-2004 survey averaged 56.2, which is a rating of Excellent. In 2014, the average score for these same sites was 41.8 or a rating of Good. The difference in these scores represents a 14.6% reduction of the average VIBI score over a 10-14 year period.

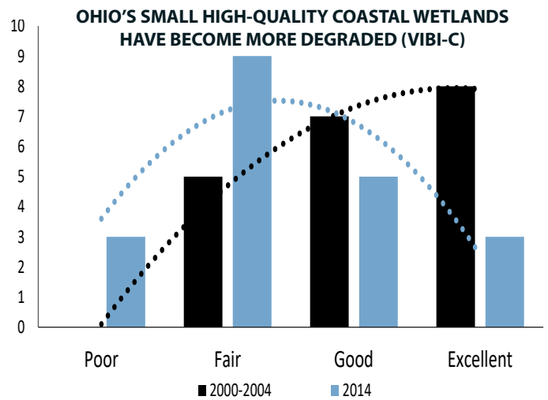
The primary reason for this reduction in average scores in this study was the increase in dominance of invasive plant species, particularly non-native cattails, non-native common reed, and reed canary grass. Two wetlands that remained close in score from 2000-2004 to 2014, Arcola Creek and Meadowbrook, had undergone managed cattail removal. Despite the lower scores, many of the native species were present in both surveys.

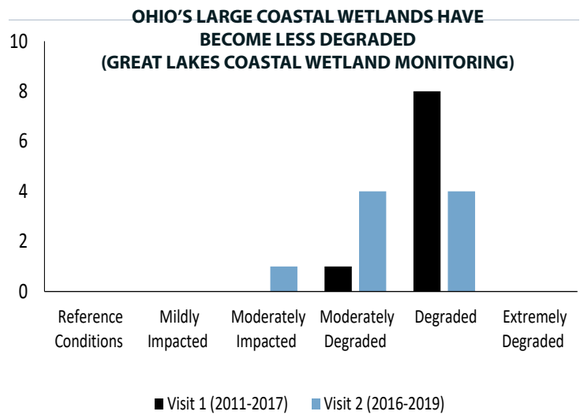
A separate, more recent survey (2011-2019) using a different methodology called the Great Lakes Coastal Wetland Monitoring Program (CWMP) has been developed at Central Michigan University. This method is used across the Great Lakes as part of the State of the Great Lakes indicators, which are used to help track progress under the Great Lakes Water Quality Agreement between the United States and Canada.

For the CWMP, 14 of the coastal wetlands that are monitored are located in Ohio. Two sites, Old Woman Creek and Plum Brook, were monitored by both groups, with the previous work conducted by the state of Ohio.

In the scoring system, there are six categories ranging from Extremely Degraded on the low end (0-0.79) to Reference Conditions on the high end (>=4.20). The nine Ohio coastal wetlands sampled were all rated Degraded or Moderately Degraded on their first visit (2011-2017). By the second visit (2016-2019), Plum Brook Area Wetland #3 had improved from Degraded to Moderately Impacted, and Plum Brook Area #2, Mentor Marsh, and Ottawa National Wildlife Refuge Wetland had improved from Degraded to Moderately Degraded.

These two scoring systems are not directly comparable. The sites were different, and the methods were different. The results suggest that small high-quality coastal wetlands are decreasing in quality, but large low-quality coastal wetlands are increasing in quality. This metric is rated **FAIR**, data are insufficient to determine the trend.





COASTAL RECREATION & BEACHES

COASTAL RECREATION facilities are one of the state priorities being addressed by ODNR. The Department completed a statewide comprehensive outdoor recreation plan (SCORP) in 2018. This plan was developed with input from throughout Ohio and offers strategies to enhance recreational opportunities in the state.

Part of the basis for this plan was a survey of Ohio residents, which asked respondents about recreational activities they participated in during 2016. The information in this survey was used to describe recreation at or near Lake Erie.

The SCORP survey does not fully distinguish Lake Erie from other recreational bodies of water. For the purpose of this metric, responses from people living in counties along Lake Erie Shore were considered. This metric includes 1,039 people living in the eight counties that border the lake. The respondents were 546 women and 493 men, almost entirely white (95%) and predominantly middle class (67% with household incomes between $50,000-$150,000).

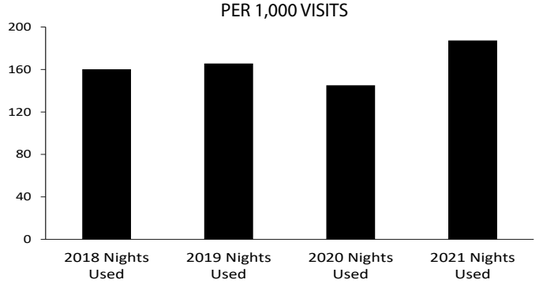
Swimming was an extremely popular activity, with 595 participants (57%). This included swimming in any natural body of water in the coastal county, not just Lake Erie. This does not include people who reported only swimming in swimming pools.

Canoeing or kayaking on Lake Erie has also become extremely popular, with 237 people reporting participation in this activity. This was more than the number of people reporting participation in powerboating, jet skiing, or sailing. Powerboating or waterskiing was the third most popular activity in the Lake Erie coastal counties.

Because this survey was not designed to quantify the demand for coastal recreation, no score is assigned in this report.

People come to visit Lake Erie from all over Ohio. Many people who come to Lake Erie stay at the seven State Park facilities. This includes camping and lodge facilities at East Harbor State Park, Geneva State Park, Kelleys Island State Park, Maumee Bay State Park, Middle Bass Island State Park, North Bass Island, and South Bass Island State Park. In recent years these numbers have increased to over 180,000 nights per year. This metric is **NOT RATED**; the trend is improving.

NIGHT STAYS AT LAKE ERIE STATE PARK FACILITIES
PER 1,000 VISITS

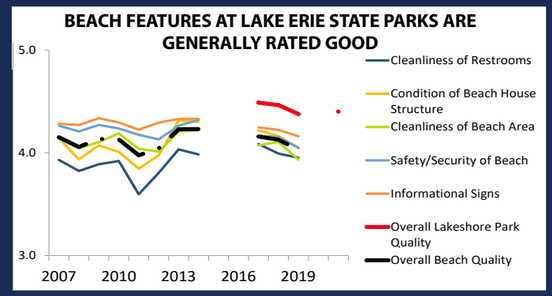


BOATING OR SWIMMING ACTIVITY	ONE OR MORE TIMES A WEEK	ONCE OR TWICE A MONTH	A FEW TIMES DURING THE YEAR	INTERESTED BUT DID NOT PARTICIPATE	NOT INTERESTED IN THIS ACTIVITY
Swimming in Lake, Pond, or River	50	114	431	243	201
Canoeing/Kayaking on Lake Erie	12	49	176	515	287
Powerboating or Waterskiing	29	40	136	290	544
Paddleboarding/Stand-Up Paddleboarding	8	14	118	409	490
Canoeing/Kayaking in ADA Launch Area	9	23	101	364	542
Jet Skiing	8	19	91	332	589
Sailing	10	16	44	397	572

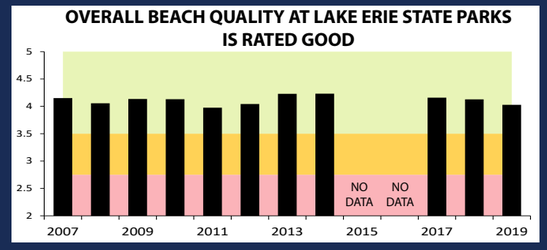
LAKE ERIE BEACH access is available at seven Ohio state parks along the Lake Erie coastline. Since 2007, 500-2,000 park visitors per year have rated various aspects of beach quality at these state parks. The categories surveyed included cleanliness of beach restrooms, condition of beach house structure, cleanliness of beach area, safety and security of the beach, and informational signs.

The running overall average score (2017-2019) for the quality of the state-owned public beaches along Lake Erie was rated Good. Data are not sufficient to determine a five-year trend. The slight drop in rating in 2019 is attributed to the negative effects of high lake water levels on beaches and campgrounds near beaches, which was frequently mentioned in the comments provided by visitors. This metric is rated **GOOD**, with no trend.

BEACH FEATURES AT LAKE ERIE STATE PARKS ARE GENERALLY RATED GOOD



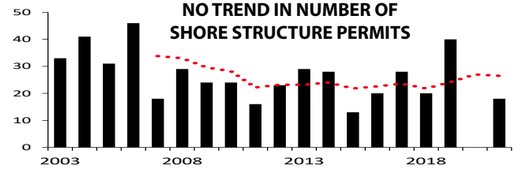
OVERALL BEACH QUALITY AT LAKE ERIE STATE PARKS IS RATED GOOD



SHORELINE HARDENING is done to keep river mouths open and protect property against directly breaking wave energy. Harbor protection structures allow river mouths to stay open by shunting sand out into the lake. Artificial structures pass wave energy to the next length of shoreline, which begins to erode in turn. Construction of new shore protection is still occurring now.

Shoreline hardening can affect fishing, swimming, boating, beaches, property values, animal habitat, and other aspects of the Lake Erie coast that make it a prized natural resource. No goals have been set on how much of the shoreline can be armored while still maintaining a healthy biological community, so this metric is **NOT RATED**.

NO TREND IN NUMBER OF SHORE STRUCTURE PERMITS



BEACH CLEANUPS are organized by several non-governmental organizations, where local citizens can receive training and assistance to clean local beaches. For Adopt-a-Beach in 2019, 3,296 volunteers collected 8,452 pounds of garbage. During the pandemic year of 2020, Adopt-a-Beach cleanup opportunities were available for individual, and 237 volunteers collected 924 pounds of garbage. In Northwest Ohio in 2019, Partners for Clean Streams coordinated 1,165 volunteers who removed 22,941 pounds of trash from local waterways. In 2020, there were 609 volunteers who were able to remove 20,121 pounds of trash despite the need for pandemic precautions. This metric is **NOT RATED**.

BOATING

RECREATIONAL BOATING continues to be a popular activity on Lake Erie. One indicator of this popularity is the number of recreational boat registrations submitted each year.

In the eight Lake Erie coastal counties, registrations for all recreational boats increased markedly between 2011 and 2021, from 79,825 to 109,161 registrations. This is **NOT RATED**, but the trend is increasing.

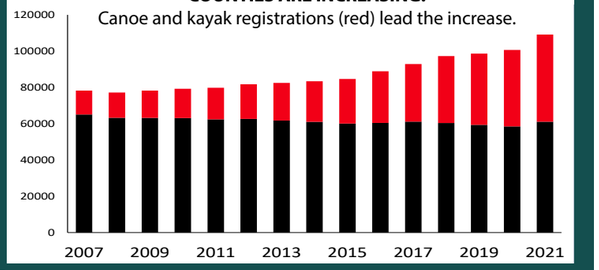
Canoeing and kayaking continue to grow as outdoor activities in the Lake Erie region. Since 2011, canoe and kayak registrations have nearly tripled within the eight Lake Erie coastal counties, growing from 17,393 in 2011 to 48,072 in 2021.

Statewide, boating registrations continue to grow as well. In 2011, registrations for all vessel types equaled 433,110 and over the last decade has grown to 643,862 registered vessels.

People come to go boating on Lake Erie from all over Ohio. Survey respondents who reported that they had gone canoeing or kayaking on Lake Erie came to visit from 58 of Ohio's 88 counties. The most common reason for this activity is for fun or entertainment.

TOTAL BOAT REGISTRATIONS IN THE EIGHT COASTAL COUNTIES ARE INCREASING.

Canoe and kayak registrations (red) lead the increase.

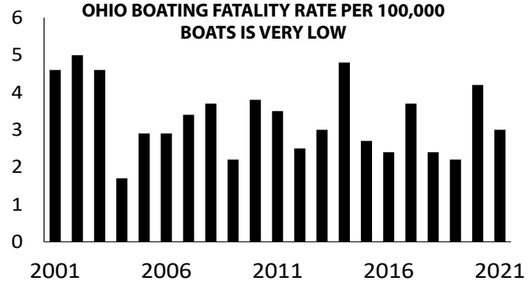


BOATING SAFETY is measured by state rankings, with a goal of being in the top 10 of all states for the least number of fatalities.

Ohio ranked as one of the top three among the states in 2019 per 100,000 recreational boats registered. This correlates to a score of **GOOD,** which continues a decades long improving trend.

There are very few boating related deaths total in Ohio and even fewer on Lake Erie. From 2014-2020, deaths on Lake Erie ranged from two to nine individuals. There were four fatal incidents resulting in five deaths listing Lake Erie as the body of water. This amounts to 19% of all Ohio boating fatalities for 2020.

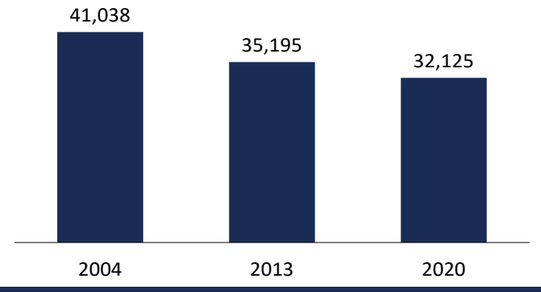
OHIO BOATING FATALITY RATE PER 100,000 BOATS IS VERY LOW



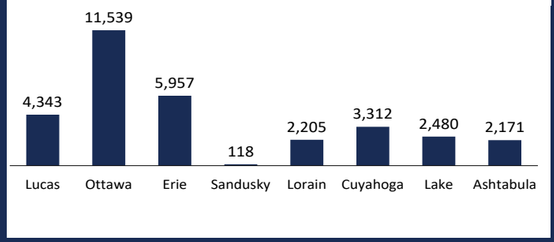
DOCKAGE includes both permanent berths and transient spaces that are available for travelers. According to the ODNR Division of Parks and Watercraft Facility Inventory, there were 32,624 docks (lease, tie-up, transient) available along Lake Erie in 2020. Nearly 70% of the docks are located in four western Lake Erie counties of the state. There is no target so there is **NO RATING** for this metric.

PUBLIC AVAILABLE DOCKAGE HAS DECREASED SINCE 2004

Includes leased, transient, and temporary tie-ups.



PUBLICLY AVAILABLE DOCKAGE IS CONCENTRATED ALONG WESTERN BASIN OF LAKE ERIE

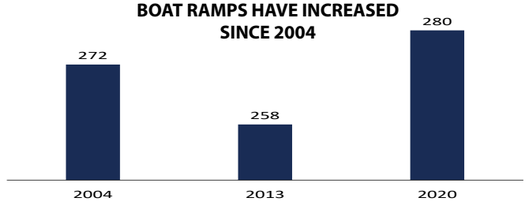


BOAT RAMP or launch lane availability is directly related to a boater's satisfaction with the lake. The ODNR Division of Parks and Watercraft Facility Inventory includes 81 publicly accessible boat launch facilities along the Lake Erie shoreline as of 2020 and a total of 329 launch facilities available, under both public and private ownership.

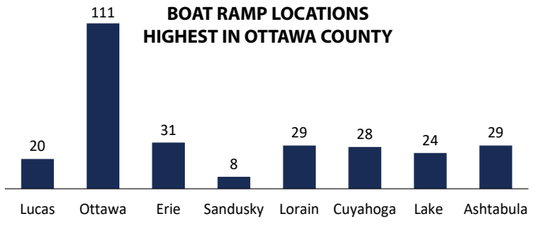
The ODNR Division of Parks and Watercraft regularly evaluates the condition of launching facilities. They use this information in part to allocate public funds dedicated to new or improved publicly owned boat launch facilities. Each location is given condition scores for each type of ramp that is available.

Of the 49 locations evaluated in 2020, 35 had one or more concrete ramps. The average ramp condition score at these locations was 2.40 or Good. Six locations with other types of ramps were rated poor. Overall, the boat launch condition for publicly available ramps is rated **GOOD**.

BOAT RAMPS HAVE INCREASED SINCE 2004



BOAT RAMP LOCATIONS HIGHEST IN OTTAWA COUNTY

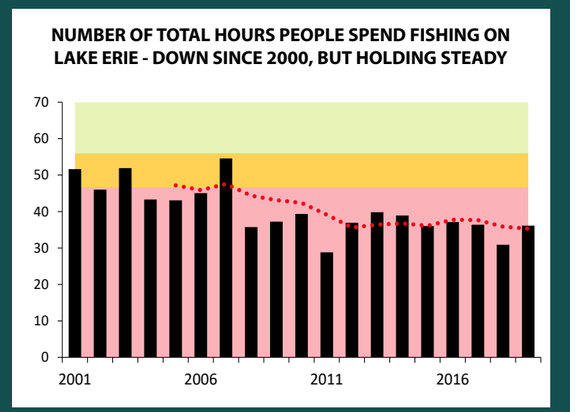


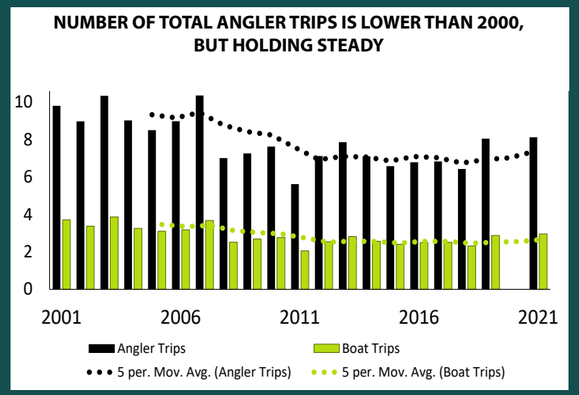
FISHING

FISHING PARTICIPATION is measured as the amount of time that is spent by individuals taking part in fishing. A quality Lake Erie fishery will interest more anglers in participating for longer periods of time. Based on license sales and surveys, there are approximately 400,000 anglers that fish on Lake Erie.

The annual fishing effort in the 2000s averaged around 5 million hours. The value of 2.7 million hours in 2011 was the lowest since then, with extraordinarily poor fishing conditions that year. From 2015 to 2019, effort had rebounded to 3.6 million hours.

Participation was relatively stable between 2010-2014 and 2015-2019, despite a definite increase in fishery performance during the latter half of this decade. Angler efficiency has increased with the advent of advanced SONAR/GPS and improved trolling tools and techniques. Fewer hours are required to harvest limits when anglers are more efficient. In 2019, there were 804,724 angler trips and 287,674 boating trips in Lake Erie. Based on this 5-year running average, the rating for this metric is **POOR**.





FISHING SATISFACTION is essential to keeping Lake Erie a top destination for anglers. The best means of measuring this satisfaction is to ask those who use the lake for fishing.

Each year, ODNR Fisheries staff collects data from anglers returning from their fishing trips. During the 2017 angler survey, anglers were asked to rate the success of their fishing trip on that particular day of fishing. Anglers were asked to rate their fishing trip as: (1) successful, (2) not successful or (3) not sure. Data was collected from June 1 to the end of the survey in October (N=4,007). 78% of the responses came from the private boat fishery (N=3,110) and 22 % from the charter boat fishery (N=897). There is no goal for this metric, and it is **NOT RATED**.

SPECIES	SUCCESSFUL	UNSUCCESSFUL	NOT SURE	TOTAL
Walleye	71.2%	26%	2.8%	2,603
Yellow Perch	57%	39%	4%	1,171
Largemouth Bass	87%	10%	3%	100
Smallmouth Bass	51.7%	46.6%	1.7%	58
Steelhead Trout	82.1%	18%	0%	39
Channel Catfish	100%	0%	0%	1
Anything that Bites	54.3%	45.7%	0%	35

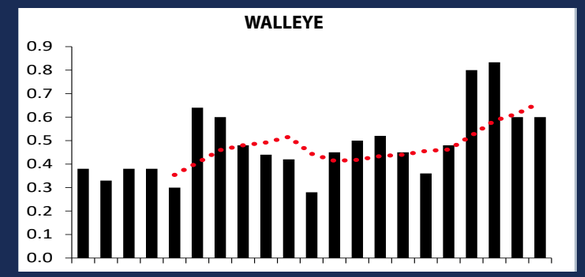
ANGLER SUCCESS is measured by annual catch rates for three popular Lake Erie sport fish: walleye, yellow perch, and smallmouth bass.

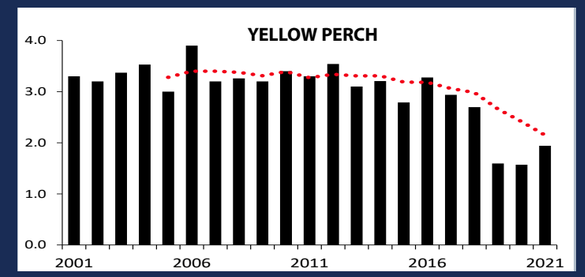
Walleye are the signature sport fish for Lake Erie. The catch rate goal for this species is 0.4 per hour, or about 3 fish per 8 hours of effort. Walleye catch rates in recent years have been strongly supported by recent large year classes. Annual catch rates have been above the goal almost every year since a large influx of fish matured in 2006, and this results in a Good rating.

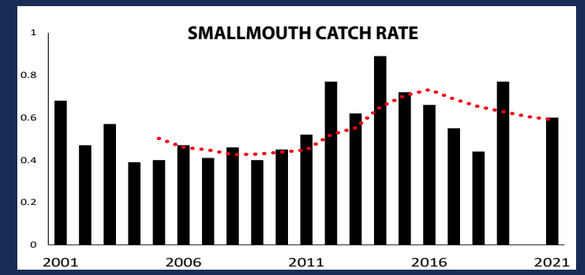
The goal for yellow perch is 4 per hour or about 32 fish per 8 hours of effort. Yellow perch catch rates since 1995 have consistently been just over 3 per hour, with an average of 3.3 for the five years ending in 2013. This results in a rating of Fair.

Both kept and released numbers are used for smallmouth bass because most anglers voluntarily practice catch-release on this species. The goal for this species is 0.5 per hour. Starting in 2011, the catch rate has only been under 0.50 in one year, 2018. This metric is rated Good.

The overall rating for the metric is **GOOD**. With some catch rates increasing and some declining, overall there is no trend in catch rates.





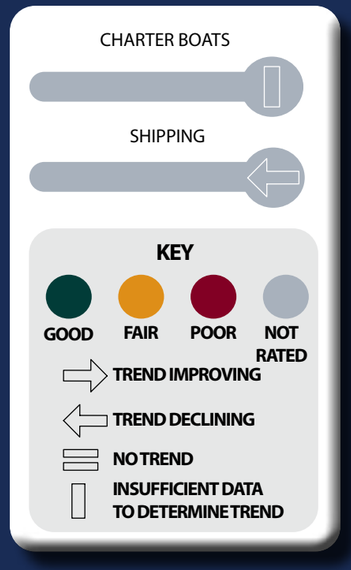


MARITIME INDUSTRY

Ohio Department of Transportation (ODOT) provides safe and easy movement of people and goods from place to place. ODOT's greatest opportunity in maritime transport is planning and making targeted investments, primarily in landside connections to port facilities. These improvements can reduce transportation costs with better connectivity and transportation options for shippers.

The eleven commercial ports along Ohio's portion of Lake Erie provide considerable support of the region's economy. They include coastal ports that have established supply chain links that move most of Ohio's international trade.

ODOT does not have responsibility for charter boat activity, though our charter boats are part of a thriving maritime economy in Ohio's waters and coastline of Lake Erie.



The importance of Lake Erie to Ohio's economy is unmistakable, and the lake's health is paramount to Ohio's future. Throughout the Lake Erie watershed, as the Ohio Department of Transportation (ODOT) builds, maintains, and supports infrastructure to move freight and people, our environmental process services division works hard to ensure projects do not adversely affect water quality, threatened and endangered species, and other natural and cultural resources.

Ohio has 736 miles of waterways suitable for transportation use, including 264.6 coastal miles along Lake Erie, 11 navigable miles along the Maumee River, and 9 navigable miles along the Cuyahoga River. Ohio's nine lake ports move almost 40 million tons of cargo each year, providing tens of thousands of jobs and over $2.72 billion in revenue. Maritime transportation is critical to the competitiveness of many of Ohio's most important key economic sectors – by keeping transportation costs low. ODOT works with JobsOhio and other economic development agencies in the State, including those at the local level, to promote Ohio's maritime transportation as a key component of Ohio's broader multimodal transportation system.

JACK MARCHBANKS
DIRECTOR, OHIO DEPARTMENT OF TRANSPORTATION

Jack Marchbanks

CHARTER BOATS

CHARTER BOATS provide opportunities for Ohioans and visitors to get out onto Lake Erie and catch fish. These small businesses contribute to the attractiveness of Lake Erie recreation and support the overall tourism industry. Recent survey work by Ohio Sea Grant provides a snapshot of this activity. The average number of passengers for the 255 captains who responded was approximately 5.3 per typical trip in 2020. There were 707 captains at the time of the survey in 2020. This new metric is **NOT RATED**, and no trend is assigned.

FISHING ACTIVITY	2006	2010	2020
Number of Active Businesses	639	610	707
Number of Trips per Business	44.7	34.6	38
Average Revenue	$18,000	$15,132	$20,664
Total Revenue	$11.4M	$9.93M	$14.6M
Total Trips	28,563	21,082	26,800

SHIPPING

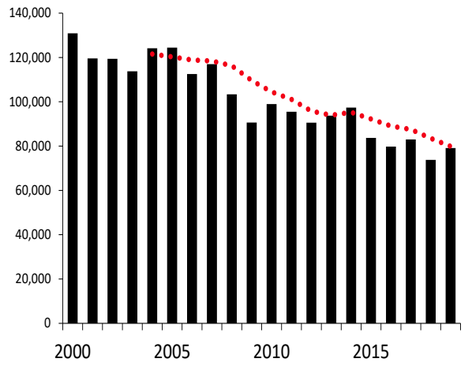
SHIPPING through the eleven commercial ports along Ohio's portion of Lake Erie provides considerable support for the region's economy. This has especially been true over the last 60 years or so as international trading has been able to take place through the Great Lakes-St. Lawrence Seaway.

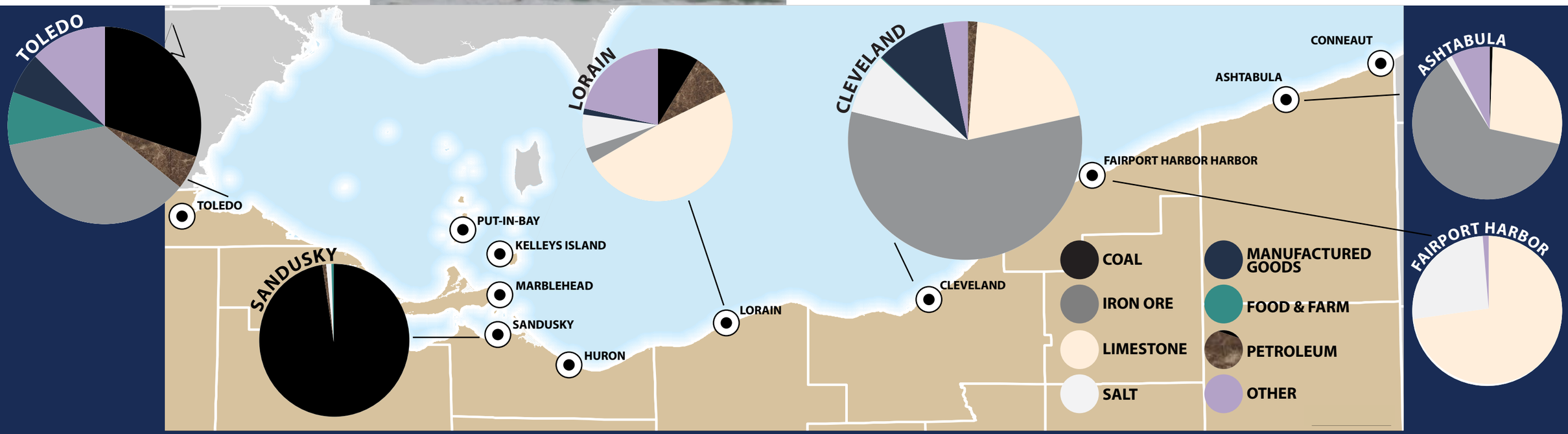
There is no goal for this metric, and it does not receive a score. However, we can track and discuss the overall trends in cargo type and weight.

The ports of Cleveland and Toledo are the two largest in the state, with a major portion of their shipping traffic coming from iron ore and coal. Lorain, Ashtabula, Marblehead, Fairport Harbor, and Cleveland all transport large quantities of limestone each year. Ashtabula and Conneaut move a lot of iron ore. Other important commodities shipped in the region include salt, sand and gravel, clay, petroleum products, and food and farm products. Toledo and Cleveland also move notable amounts of manufactured goods. The types of products shipped have diversified in the last few decades.

In 2017, the total amount of shipments moving through the Ohio Lake Erie system of ports was around 80 million tons. This is a decline in tonnage from record-high cargo weights in Ohio of over 120 million tons in the early 2000s. In a survey of ports across the Great Lakes, a study by Martin Associates for the Lake Carriers Association and other shipping industry groups estimated the economic impact of this activity in Ohio was approximately $3.7 billion in 2017. This metric is **NOT RATED**, and the trend is declining.

SHIPPING IS DECLINING DUE TO DECREASE IN DEMAND FOR COAL





H2Ohio

Governor DeWine created H2Ohio in 2019 as a comprehensive, data-driven approach to combat algal blooms, enhance water quality, and improve water infrastructure over the long term.

These five metrics, discussed in earlier sections, are the factors relevant to H2Ohio actions for the benefit of Lake Erie. H2Ohio intends to reduce Harmful Algal Blooms (HABs) by implementing agricultural best management practices, water drainage management, wastewater infrastructure improvements, wetland creation, and more. Reducing nutrients available in Lake Erie can be measured by Water Chemistry in the Lake, Suspended Solids, and Dissolved Reactive Phosphorus in tributary streams of the watershed. It is expected that these nutrient reductions will also decrease the extent and duration of low oxygen (hypoxia) in the central basin. Reducing HABs in Lake Erie and changing these five metrics will take time. Through baseline conditions, these metrics can be compared to future conditions in the Lake Erie Watershed as H2Ohio efforts continue to be implemented.

SUMMARY

We are pleased to present this 2022 Lake Erie Quality Index. First published by the Commission in 1998, the Index compiles data generated by state agencies in their work to protect, enhance, and improve Ohio's Great Lake for the benefit of all Ohioans and visitors. We have also drawn from relevant federal or local measures of progress to help explain the story of the Lake Erie conditions.

Much has changed in Lake Erie since the previous Index, but many successes continue. We carried forward many of the previous metrics, modified or removed others, and added new metrics to address emerging concerns. The quality of Lake Erie's waters, ecology, and economy continues to be good. Ohio's Lake Erie shoreline continues to be a tourist destination, drawing in people who want to swim, boat, and fish in the Walleye capital of the world. In a few areas, most notably the onset of harmful algae blooms, challenges remain to be addressed.

In this 30th year anniversary of the Ohio Lake Erie Commission, we celebrate the work to fulfill our mission to preserve Lake Erie's natural resources, protect the quality of its waters and ecosystem, and promote economic development of the region. Ohioans and others have donated over $12 million for projects that range from the construction of lake amenities, water-cleaning storm water infrastructure, and tourism assistance, to research projects that have analyzed the coastal economy, jump-started the careers of junior scientists working on Lake Erie, and explored emerging issues such as harmful algae blooms. These projects are funded through the sale of the Lake Erie license plate series. The Commission appreciates the support from every license plate sale and donation to benefit Lake Erie.

In this Index, we see that many of our efforts to protect and improve the Lake – especially its value for recreation, tourism, and drinking water – are working. We have a lot left to learn and work to be done. We look forward to continuing efforts to protect and restore Lake Erie for more decades to come.

JOY MULINEX
DIRECTOR, OHIO LAKE ERIE COMMISSION

OUR MISSION

The Ohio Lake Erie Commission (OLEC) was established to preserve Lake Erie's natural resources, to protect the quality of its waters and ecosystem, and to promote economic development of the region. The director of the Ohio Environmental Protection Agency serves as the Commission's chairman. Additional OLEC members include the directors of the state departments of Transportation, Health, Development Services, Agriculture, and Natural Resources. There are also seven public members appointed by the governor.

LIFE ON LAKE ERIE PHOTO CONTEST

The Life on Lake Erie Photo Contest has been a signature activity of the Commission since 1992. The photo contest encourages amateur photographers to share their pictures capturing the day-to-day lives of the people, plants, and animals that live and thrive in the Lake Erie watershed, and highlights what makes Lake Erie a Great Lake.

LAKE ERIE LICENSE PLATE

The Commission administers the Lake Erie Protection Fund, which is supported in part by sales of the Lake Erie license plate series.

Thank you to our license plate subscribers for supporting the protection and restoration of Lake Erie. You can purchase a license plate wherever plates are sold from one of our three designs.

30 YEARS

Ohio | Lake Erie Commission

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