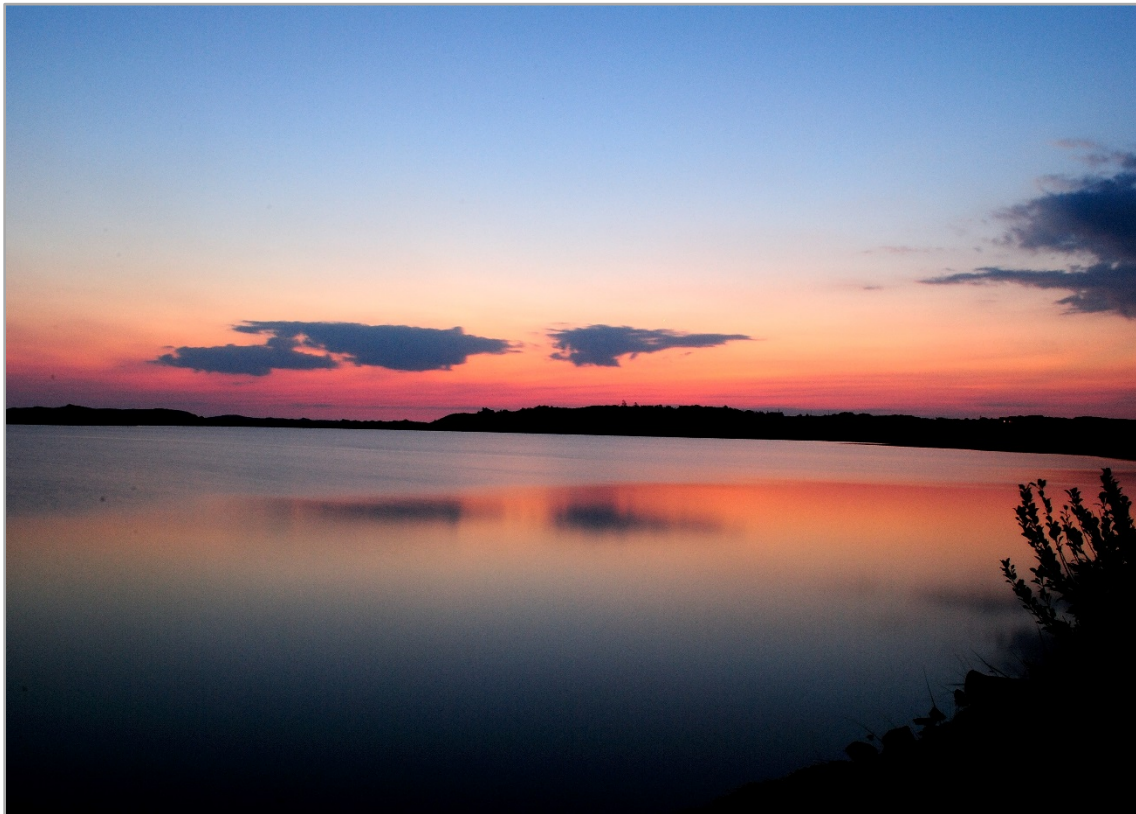




# Ohio 2018 Integrated Water Quality Monitoring and Assessment Report



*Lake Erie*

Division of Surface Water  
Final Report

June 2018

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## List of Acronyms and Abbreviations

|         |   |
|---------|---|
| AmphIBI | amphibian index of biotic integrity   |
| AMP     | Atrazine monitoring program   |
| AOC     | Area of Concern (as identified under the Great Lakes Water Quality Agreement)       |
| ARRA    | American Recovery and Reinvestment Act of 2009                                      |
| AU      | assessment unit   |
| BAV     | beach action value  |
| BEACH   | Beaches Environmental Assessment and Coastal Health (Act)                           |
| BMP     | best management practice  |
| BNR     | biological nutrient removal   |
| BUI     | Beneficial Use Impairment (as described in the Great Lakes Water Quality Agreement) |
| CABB    | Center for Applied Bioassessment and Biocriteria                                    |
| CAFO    | Concentrated Animal Feeding Operations  |
| CDBG    | Community Development Block Grant   |
| CDC     | Center for Disease Control  |
| cfu     | colony forming unit   |
| Corps   | U.S. Army Corps of Engineers  |
| CREP    | Conservation Reserve Enhancement Program  |
| CRP     | Conservation Reserve Program  |
| CSO     | combined sewer overflow   |
| CSP     | Conservation Stewardship Program  |
| CWH     | coldwater habitat   |
| CWA     | Clean Water Act   |
| DDAGW   | Division of Drinking and Ground Waters  |
| DDT     | dichlorodiphenyltrichloroethane   |
| DEFA    | Division of Environmental and Financial Assistance                                  |
| DES     | Division of Environmental Services  |
| DLG     | digital line graph  |
| DRG     | digital raster graphic  |
| DSW     | Division of Surface Water   |
| EAG     | External Advisory Group   |
| EPA     | Environmental Protection Agency   |
| EQIP    | Environmental Quality Incentives Program  |
| EWH     | exceptional warmwater habitat   |
| FCA     | fish consumption advisory   |
| FFY     | federal fiscal year   |
| FSA     | Farm Service Agency   |
| FWPCA   | Federal Water Pollution Control Act   |
| GIS     | Geographic Information System   |
| GLLA    | Great Lakes Legacy Act  |
| GLRC    | Great Lakes Regional Collaboration  |
| GLRI    | Great Lakes Restoration Initiative  |
| GLSM    | Grand Lake St. Marys  |
| GLWQA   | Great Lakes Water Quality Agreement   |
| GRP     | Grassland Reserve Program   |
| GRTS    | Generalized Random Tessellation Stratified (survey design)                          |
| HAB     | harmful algal bloom   |
| HSD     | honest significant difference   |
| HUC     | hydrologic unit code  |

|                 |   |
|-----------------|---|
| IBI             | index of biotic integrity                       |
| ICI             | invertebrate community index                    |
| IDP             | indirect discharge permit                       |
| IR              | Integrated Report                               |
| kg              | kilogram  |
| L               | liter   |
| LA              | load allocation                                 |
| LAMP            | lakewide action and management plan             |
| LCI             | Lake Condition Index                            |
| LDI             | Landscape Development Intensity                 |
| LEAU            | Lake Erie assessment unit                       |
| LEC             | (Ohio) Lake Erie Commission                     |
| LENT            | Lake Erie nutrient targets                      |
| LEPF            | (Ohio) Lake Erie Protection Fund                |
| LH              | lake habitat                                    |
| LHD             | local health district                           |
| LRAU            | large river assessment unit                     |
| LRW             | limited resource water                          |
| LTCP            | long-term control plan                          |
| MBI             | Midwest Biodiversity Institute                  |
| MF              | membrane filter                                 |
| mg              | milligram                                       |
| mi <sup>2</sup> | square miles                                    |
| mL              | milliliter                                      |
| MIwb            | modified index of well-being                    |
| MOR             | monthly operating data                          |
| MPN             | most probable number                            |
| MRBI            | Mississippi River Basin Initiative              |
| MS4             | municipal separate storm sewer systems          |
| MWH             | modified warmwater habitat                      |
| NARS            | National Aquatic Resource Survey                |
| NCCA            | National Coastal Condition Assessment           |
| NCWQR           | National Center for Water Quality Research      |
| NEORS           | Northeast Ohio Regional Sewer District          |
| ng              | nanogram  |
| NHD             | National Hydrography Dataset                    |
| NLCD            | National Land Cover Dataset                     |
| NOAA            | National Oceanic and Atmospheric Administration |
| NOI             | notice of intent                                |
| NPDES           | National Pollutant Discharge Elimination System |
| NPS             | nonpoint source                                 |
| NRCS            | Natural Resources Conservation Service          |
| NSMP            | Nonpoint Source Management Plan                 |
| NSSP            | National Shellfish Sanitation Program           |
| NWI             | National Wetland Inventory                      |
| NWQI            | National Water Quality Initiative               |
| OAC             | Ohio Administrative Code                        |
| ODH             | Ohio Department of Health                       |
| ODNR            | Ohio Department of Natural Resources            |
| OMZA            | outside mixing zone average                     |

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| ORC      | Ohio Revised Code   |
| ORSANCO  | Ohio River Valley Water Sanitation Commission             |
| OSIP     | Ohio Statewide Imagery Program                            |
| OTMP     | Ohio Tributary Monitoring Program                         |
| OWDA     | Ohio Water Development Authority                          |
| OWRC     | Ohio Water Resources Council                              |
| PAHs     | polyaromatic hydrocarbons                                 |
| PHA      | public health advisory                                    |
| ppb      | parts per billion   |
| PCB      | polychlorinated biphenyls                                 |
| PCR      | primary contact recreation                                |
| PDWS     | public drinking water supply                              |
| POTW     | publicly owned treatment works                            |
| PS       | point source  |
| PTI      | permit to install   |
| PTO      | permit to operate   |
| PWS      | public water supply                                       |
| QA       | quality assurance   |
| QC       | quality control   |
| QDC      | qualified data collector                                  |
| QSC      | Quicksilver Caucus  |
| RAP      | Remedial Action Plan                                      |
| RAS      | return activated sludge                                   |
| RF3      | Reach File Version 3                                      |
| RM       | river mile  |
| SDWA     | Safe Drinking Water Act                                   |
| SDWIS    | Safe Drinking Water Information System                    |
| SFY      | state fiscal year (July 1 to June 30)                     |
| SIU      | significant industrial user                               |
| sq mi    | square miles  |
| SSM      | single-sample maximum                                     |
| STORET   | STOrage and RETrieval (a U.S. EPA water quality database) |
| STV      | statistical threshold value                               |
| SWIF     | Surface Water Improvement Fund                            |
| SWIMS    | Surface Water Information Management System               |
| TDS      | total dissolve solids                                     |
| TMDL     | total maximum daily load                                  |
| TNTC     | too numerous to count                                     |
| TOC      | total organic carbon                                      |
| µg       | microgram   |
| USDA     | United States Department of Agriculture                   |
| U.S. EPA | United States Environmental Protection Agency             |
| USC      | United States Code  |
| USGS     | U.S. Geological Survey                                    |
| UV       | ultraviolet   |
| VIBI     | vegetation index of biotic integrity                      |
| VIBI-FQ  | VIBI – floristic quality                                  |
| WAS      | waste activated sludge                                    |
| WAUs     | watershed assessment unit                                 |
| WBLE     | western basin of Lake Erie                                |

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| WEG   | (Ohio EPA's) wetland ecology group         |
| WHIP  | Wildlife Habitat Incentives Program        |
| WHO   | World Health Organization                  |
| WLA   | wasteload allocation                       |
| WPCLF | Water Pollution Control Loan Fund          |
| WQ    | water quality                              |
| WQC   | Water Quality Certification (Section 401)  |
| WQM   | Water Quality Management (plan)            |
| WQPSD | Water Quality Permit Support Document      |
| WQS   | water quality standards                    |
| WRP   | Wetlands Reserve Program                   |
| WRRSP | Water Resource Restoration Sponsor Program |
| WSRLA | Water Supply Revolving Loan Account        |
| WWH   | warmwater habitat                          |
| WWTP  | wastewater treatment plant                 |

## Executive Summary

The *Ohio Integrated Water Quality Monitoring and Assessment Report* summarizes water quality conditions in the State of Ohio. This report satisfies Ohio's water quality reporting requirements under Sections 303(d), 305(b) and 314 of the federal Clean Water Act. This report was last updated in 2016. **Analysis and listing changes are based on data collected during 2015 and 2016 for aquatic life and human health (fish tissue) uses; recreation and public drinking water supplies uses consisted of data from 2016 and 2017.**

Using methods devised to determine the suitability of waters for four specific uses—aquatic life (fish and aquatic insects), recreation (such as boating and swimming), human health (related to fish tissue contamination) and public drinking water supplies—available data were compared with water quality goals. The results indicate which waters are meeting goals and which are not. Waters not meeting the goals for one or more of the four types of uses are referred to as *impaired*. The waters found to be impaired are prioritized and scheduled for further study and restoration.

This report describes the methods used to judge impairment of each type of use and have evolved in each reporting cycle as the Agency gains access to more data and develops better ways to interpret them.

Results are reported for 1,538 watershed units, 38 large river units (in Ohio's 23 rivers that drain more than 500 square miles) and seven Lake Erie units. Additional information on streams draining between 20 and 500 square miles is also presented as this subset of waterbodies is used to calculate and track progress of Ohio's 80 percent full attainment by 2020 goal for wading and principal streams and rivers.

The percent of monitored miles of Ohio's large rivers in full attainment stayed steady compared to the same statistic reported in the 2016 IR. The 100 percent full attainment by 2020 aquatic life goal statistic for Ohio's largest rivers now stands at 87.5 percent, compared to 87.4 percent from the 2016 report. Conversely, smaller streams continue to improve with the percent of assessed sites in full aquatic life use attainment increasing from 66.1 percent to 69.3 percent. The top reasons for aquatic life impairment continue to be sediment, nutrients, habitat modification, hydromodification and organic enrichment.

For the human health use (fish tissue), polychlorinated biphenyl (PCB) contamination in fish is the cause of most of the human health impairments in Ohio. Mercury is the second leading cause.

The chemicals of concern causing impairment of the public drinking water supply use include nitrate, atrazine and cyanotoxin (due to certain algae). The primary source of the chemicals is nonpoint source runoff from agricultural land use. Additional sources of nitrate include home and commercial fertilizer application, failing septic systems, unsewered areas and wastewater treatment plant discharges. Of the 119 public drinking water supply assessment units, 37 are now listed as impaired by algae, with another 17 on the watch list for algae.

The recreation (bacteria) use analysis focuses on the number of bacteria in the water. For Lake Erie public beaches, the frequency of swimming advisories varies widely, ranging from 1.2 percent to more than 50 percent. Generally, beaches located near population centers have the most problems. Results are also reported for streams and inland lakes.

The recreation use has also been assessed for algae impacts in the western basin of Lake Erie. The western basin shoreline, the islands shoreline and the western basin open water assessment units are all listed as impaired by algae.

Of the 6,316 possible category assignments, the 2018 303(d) list includes changes in 209, with 69 delistings and 135 new listings. Most 303(d) removals and new listings are due to new data.

## Changes since the 2016 Integrated Report

Changes made between the 2016 Integrated Report and the 2018 Integrated Report are as follows:

- This report contains revised assessment units for the entire Ohio portion of Lake Erie in Section D1.
- This report also discusses future methodology development for recreation assessment of Lake Erie based on algae blooms in Section I.
- The methodology for evaluating the recreation (bacteria) use has been updated to include the revised *E. coli* water quality criteria, effective January 2016, in Section F1.
- A new subcategory, 5p, was added to track which impairments are based on threatened status, primarily for nutrients.