

Status of Water Quality in Ohio: The 2018 Integrated Report

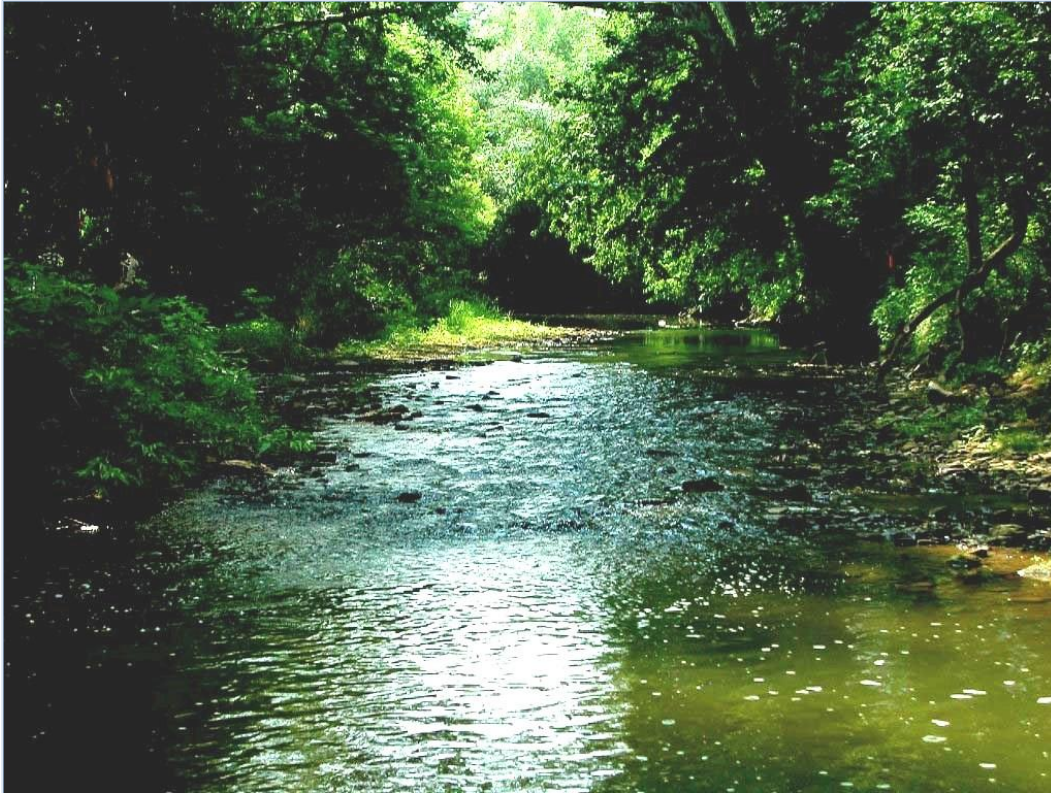
April 25, 2018



Today's Topics

- Overview of the 2018 Integrated Report
 - Purpose and requirements
 - Assessment overview
- Differences from the 2016 Integrated Report
- Lake Erie update
- Results and trends in Ohio water quality
- Impairment causes

Clean Water Act



The goal is to restore and maintain the chemical, physical and biological integrity of the Nation's waters.

Relationship of the Integrated Report to the Clean Water Act (CWA)

- Fulfills two CWA reporting requirements:
 - Section 305 requires periodic reporting on the condition of a State's waters.

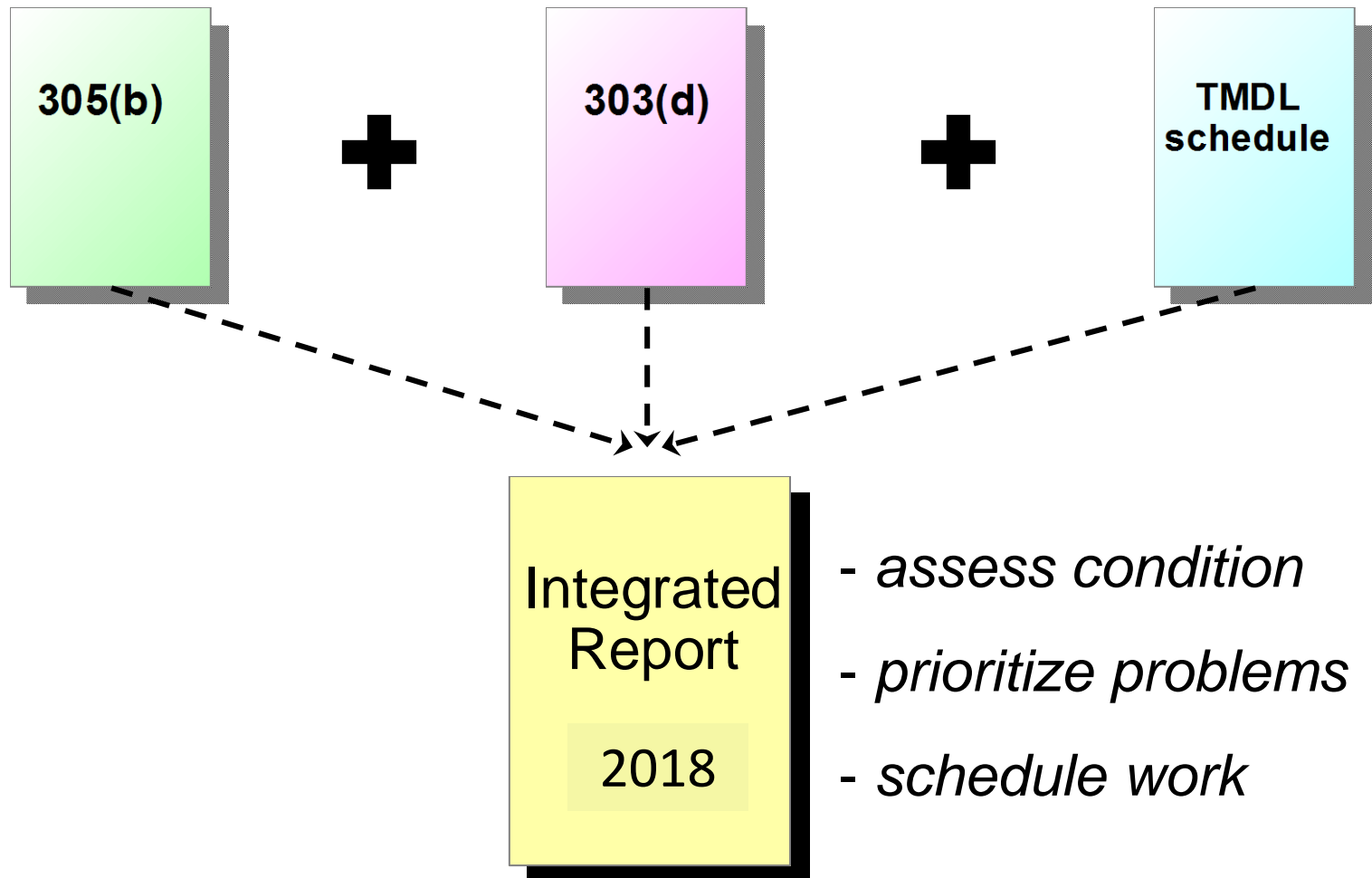
Ohio has reported every two years since 1988.

- Section 303(d) requires States to list and prioritize impaired waters.

Ohio has reported every two years since 1992 (except 2000).

- “Integrated” into a single report in 2002.

Reporting/Listing in a Nutshell



What is a TMDL?

- TMDL: **T**otal **M**aximum **D**aily **L**oad: the maximum amount of a pollutant a water body can contain and still maintain water quality standards
- A written, quantitative assessment of water quality problems and contributing sources of pollution

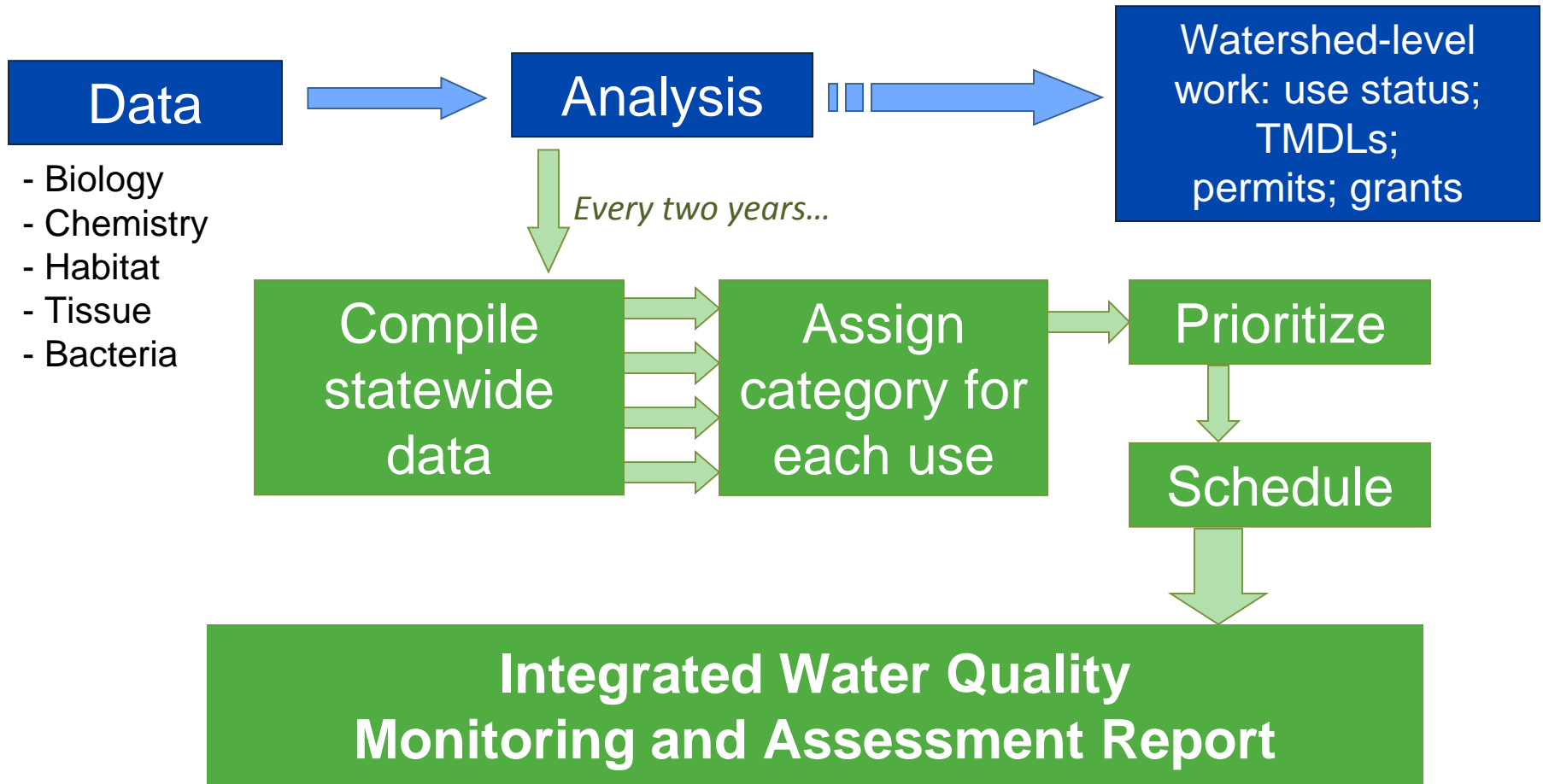
What is a TMDL?

- 12 steps form a problem-solving process:
Assessment → Development → Implementation → Validation
- Essentially a planning and analysis tool; **does not provide additional authority.**
- Once impaired waters are identified the state must take action to improve them – but *if waters reach attainment by other means, a TMDL is not necessary.*

Integrated Report

- U.S. EPA provides guidance.
- Report includes:
 - Methodology
 - Decision for each water body assessed
 - Data description (supports the listing of each impaired water)
 - Impairment causes and sources available online
 - TMDL and monitoring schedules
- U.S. EPA approves list of impaired waters (Section L4).

Integrated Report Process



Compile Statewide Data

- Each Integrated Report typically adds two new years' worth of data, as was the case this cycle.
- Data are pulled from databases.
 - Level 3 external data
 - Most data collected by Ohio EPA
- Ohio EPA determines attainment at individual sites.
 - Detailed information available in watershed reports
- Each use is assessed independently.

Defining Assessment Units

- States define an “assessment unit,” then report on its condition.
- Ohio defines three types:
 - Watershed units: 1,538 12-digit HUCs
Average drainage area: 27 square miles
 - Large river units: 38 pieces of 23 big rivers
Average length: 32 miles
 - Lake Erie units:
 - Four shoreline (western, Sandusky Bay, central, islands)
 - Three open water units (western, Sandusky Bay, central)

Large Rivers vs. Watersheds: What's the Difference?

- Watersheds
 - Sites that drain less than 500 square miles
 - Best way to evaluate and solve problems
- Large rivers
 - Sites that drain more than 500 square miles
 - Not impacted in short-term by what's happening on immediate banks

Assign Category

- Site data collected into an assessment unit
- Methodologies based on water quality standards have been established for each use
- Analyzed for each use independently
 - Category 1: Fully supporting
 - Category 3: Can't tell, not enough information
 - Category 4: Not supporting and does not require action
 - Category 5: Not supporting and requires action

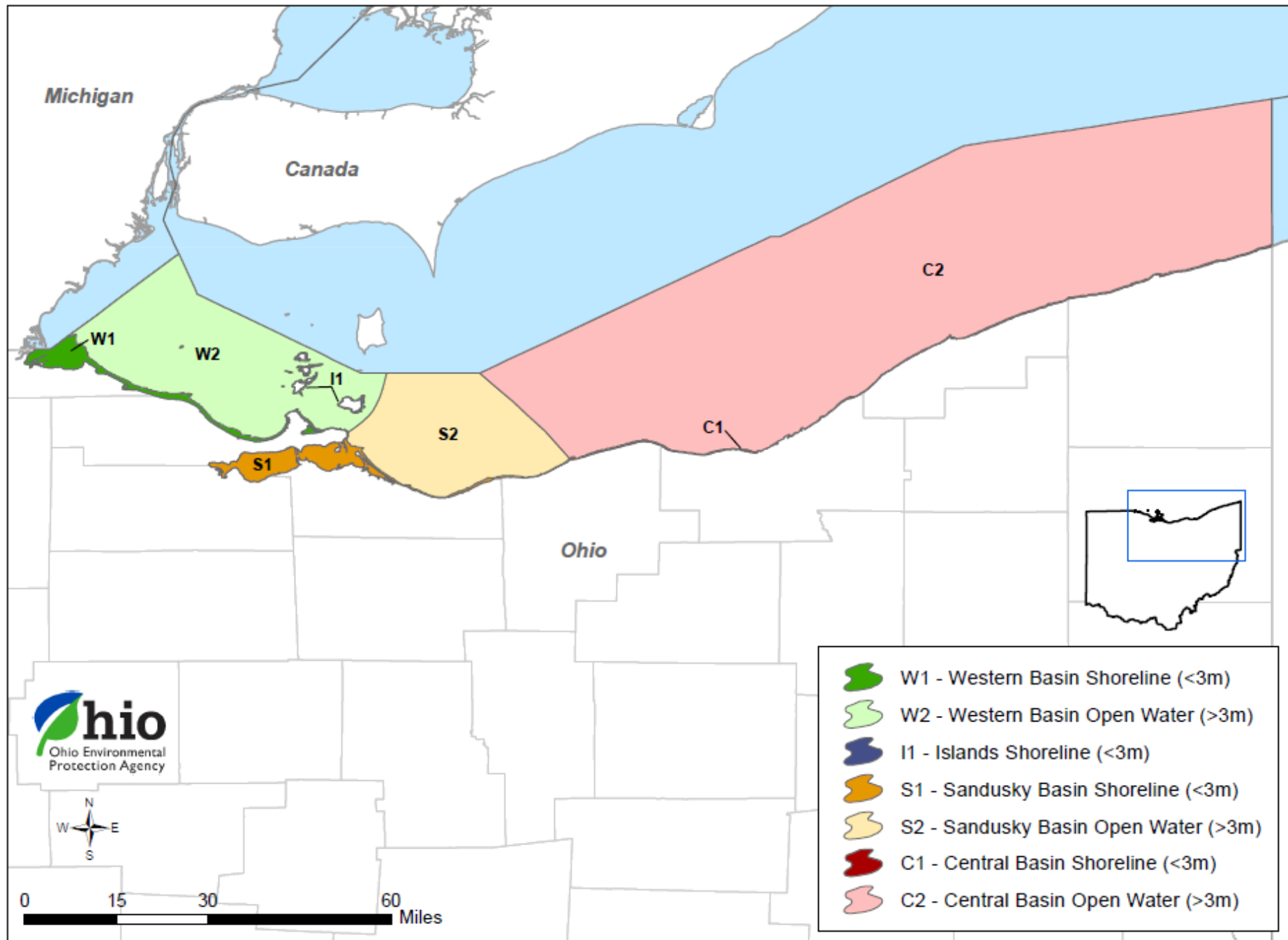
What's Changed Since 2016?

- Analysis and listings are based on 2015-2016 data, with some 2017 data
- New subsection discussing Ohio's approach to addressing nutrients in Lake Erie
- Reorganization of information

Proposed Lake Erie Assessment Procedure

Ohio has been working with researchers from The Ohio State University, the University of Toledo, Bowling Green State University and the National Oceanic and Atmospheric Administration (NOAA) to develop a science-based approach that uses satellite data that serves as a credible model for Ohio to use in assessing the open waters of Lake Erie in the 2018 Integrated Report.

Lake Erie Assessment Units

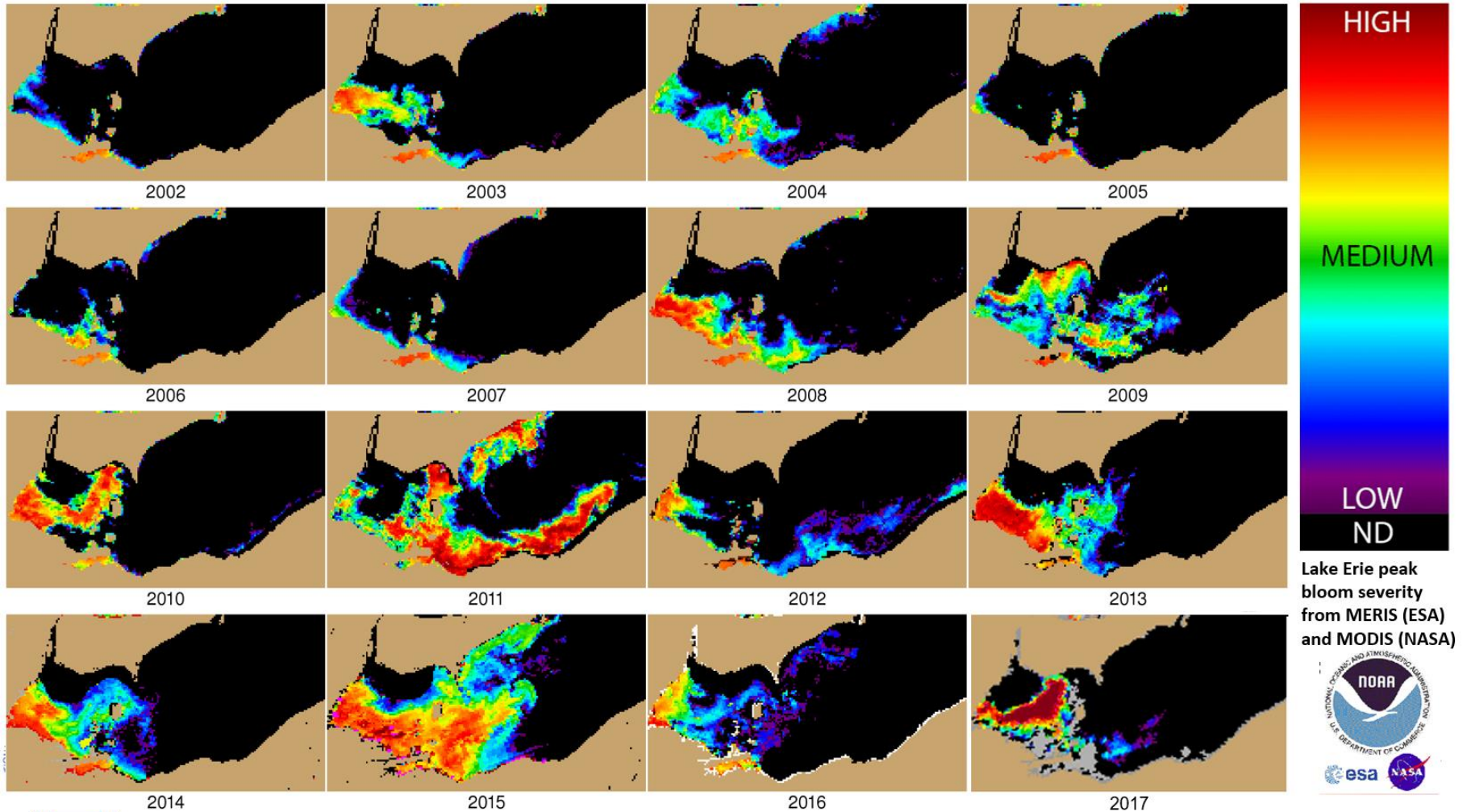


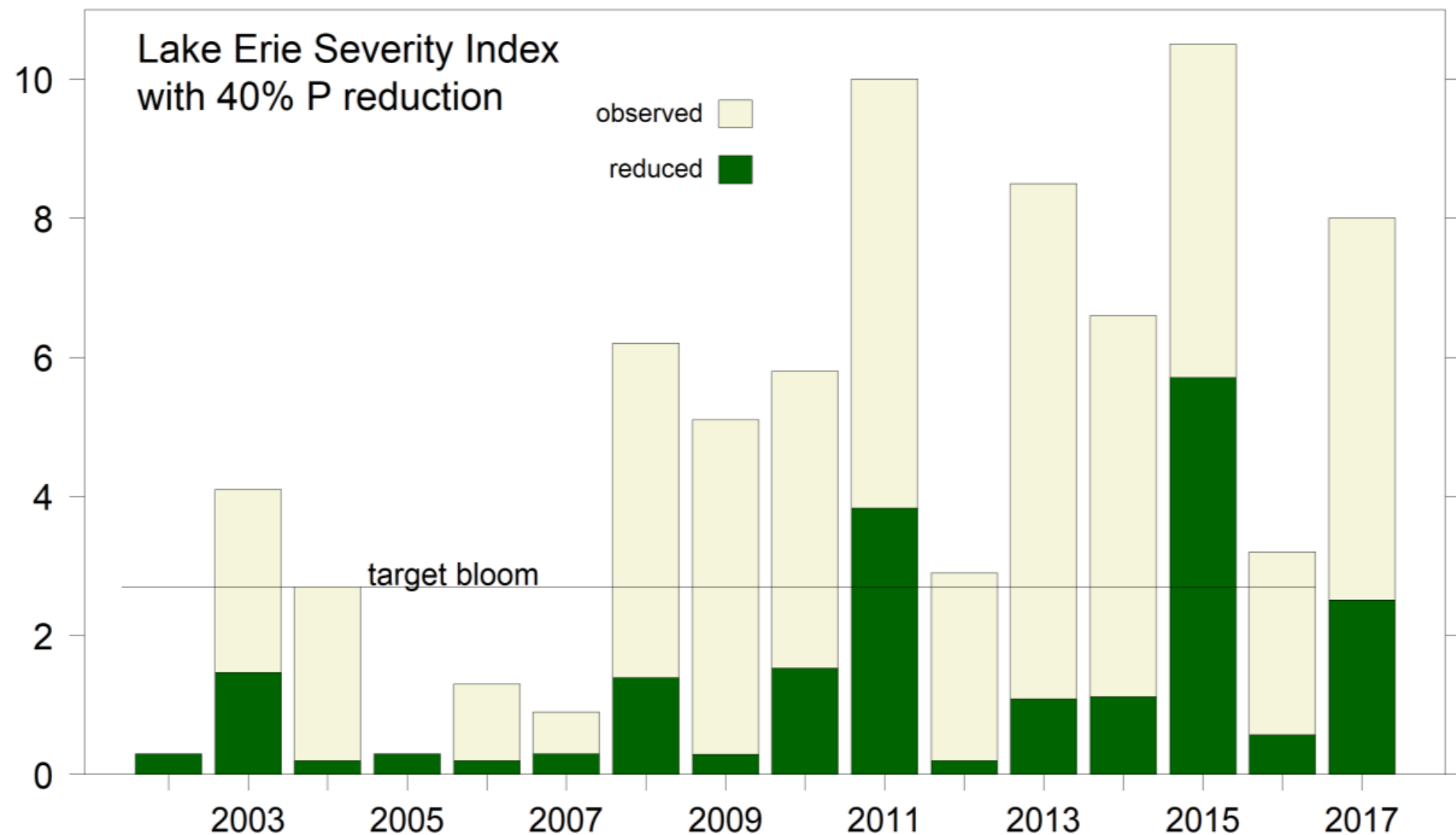
Lake Erie

Recreation Use Assessment for Algal Blooms

- Uses satellite data from NOAA
- Considers bloom coverage of the western basin open water unit through the algae season (July–Oct.) over multiple years
- Based on Great Lakes Water Quality Agreement Annex 4 goals for bloom size/severity

Lake Behavior





Bloom severity observed and projected (with 40% TP reduction) since 2002. Courtesy of Dr. Rick Stumpf, NOAA National Centers for Coastal Ocean Science.

Cell Count in Detail

- Assessing July through October; broken into 10-day “frames”.
- Within each “frame”, calculate average % of shape file covered by 20,000 cells/ml. If THREE “Seasonal Frames” > 30% of total area within a year then year is considered “exceeded”.
 - Three violated 10-day “frames” need NOT be consecutive.
- If any TWO of SIX consecutive years are violated (i.e., exceeded) then the western basin open waters would be “impaired”.

- 1 July-10 July
- 11 July-20 July
- 21 July-30 July
- 31 July-9 Aug.
- 10 Aug.-19 Aug.
- 20 Aug.-29 Aug.
- 30 Aug.-8 Sept.
- 9 Sept.-18 Sept.
- 19 Sept.-28 Sept.
- 29 Sept.-8 Oct.
- 9 Oct.-18 Oct.
- 19 Oct.-31 Oct.

Lake Erie – Western Basin

≥30% coverage at ≥20,000 cell/ml		
Year	10-day frames exceeding	total frames
2012	2	12
2013	10	11
2014	6	12
2015	9	11
2016	5	10
2017	7	11

The number of 10-day time frames exceeding the 30% coverage threshold (with 20,000 cells/mL or greater) in the western basin open water unit for each year beginning in 2012.

2018 Lake Erie Results

Use Designation Impairment	Western Shoreline	Western Open Water	Islands Shoreline	Sandusky Shoreline	Sandusky Open Water	Central Shoreline	Central Open Water
Aquatic Life Use (<i>Biological Community/Diversity</i>)	✓		✓	✓		✓	
Public Drinking Water Supply (<i>Microcystins</i>)	✓	✓	✓	✓	✓		✓
Human Health (<i>Fish Tissue</i>)	✓		✓	✓		✓	
Recreation (<i>E. coli</i>)	✓		✓	✓		✓	
Recreation (<i>Algae</i>)	✓	✓	✓				

Lake Erie

Ohio is actively addressing nutrients in Lake Erie.

- Great Lakes Water Quality Agreement
- Lake Erie Collaborative Agreement
- Ohio's Domestic Action Plan
- TMDLs for Lake Erie Watershed

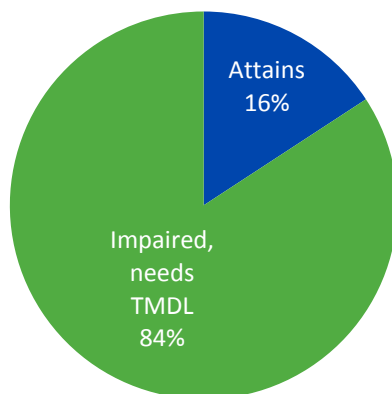
Lake Erie

- Statewide Nutrient Reduction Strategy
- GLRI Demonstration and Nutrient Reduction Projects
- Various legislation
 - Ohio SB 1; Ohio SB 150; Ohio HB 64
 - Ohio Clean Lakes Initiative
 - Healthy Lake Erie Initiative
- Targeted funding to Ohio Public Water Systems and WWTPs

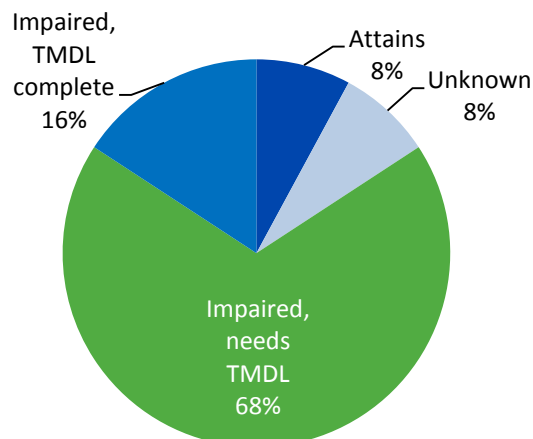
Large River Results by Beneficial Use

(percent of assessment units indicated by status)

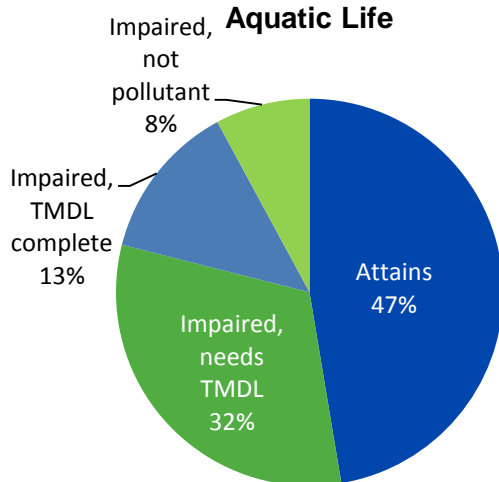
Human Health (fish tissue)



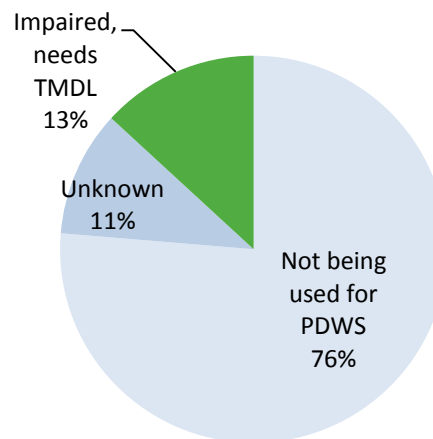
Recreation



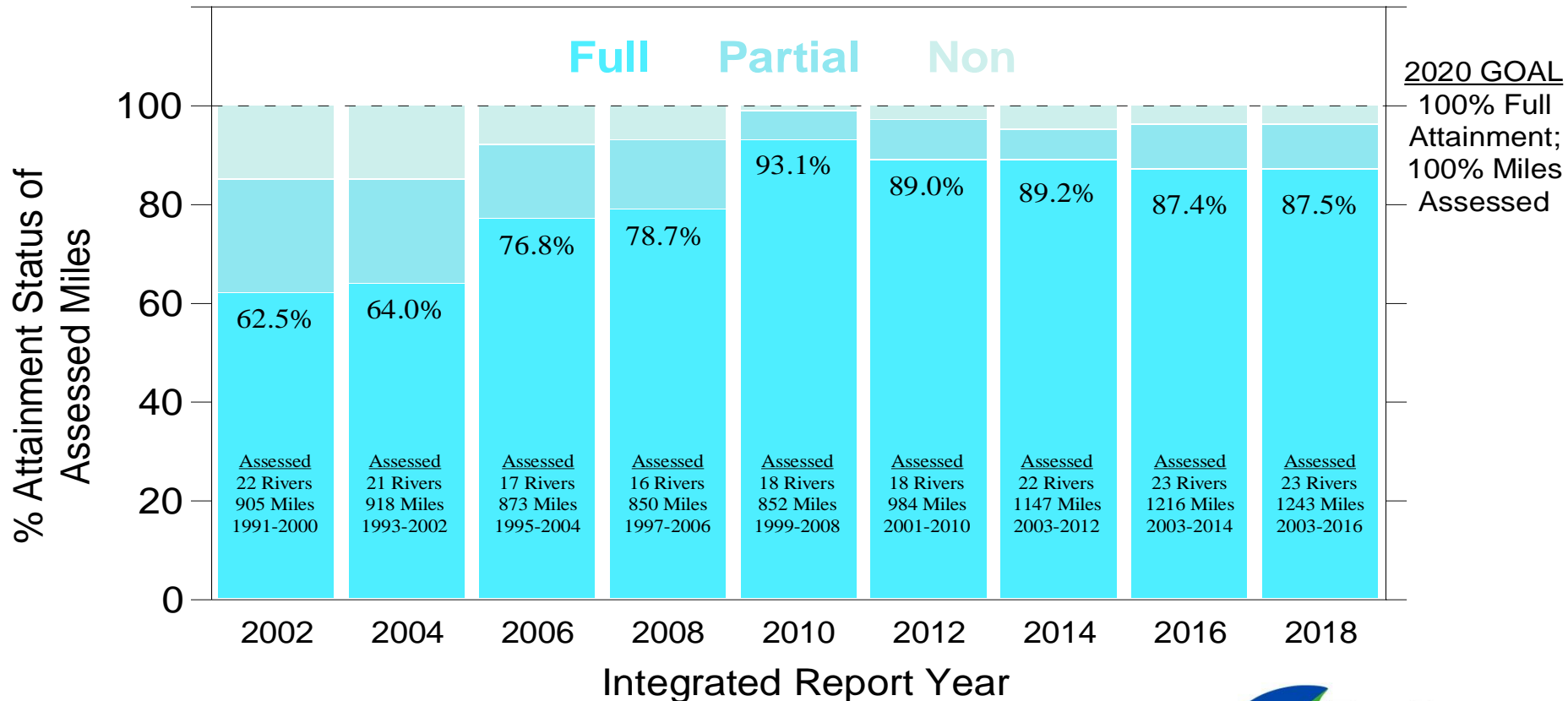
Aquatic Life



Public Drinking Water Supply



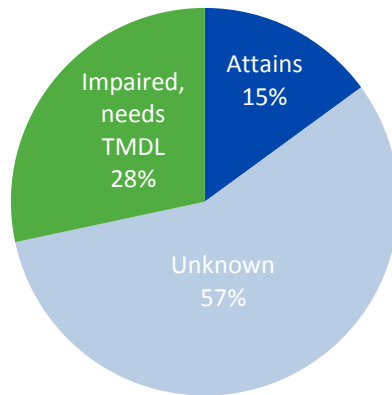
Aquatic Life Trends: Large Rivers



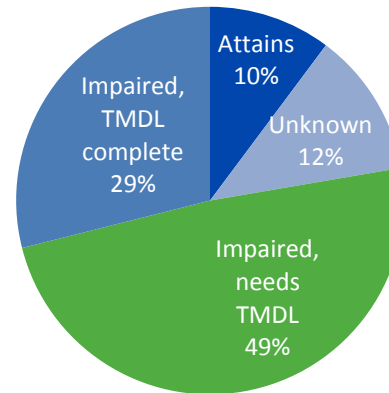
Watershed Results by Beneficial Use

(percent of assessment units indicated by status)

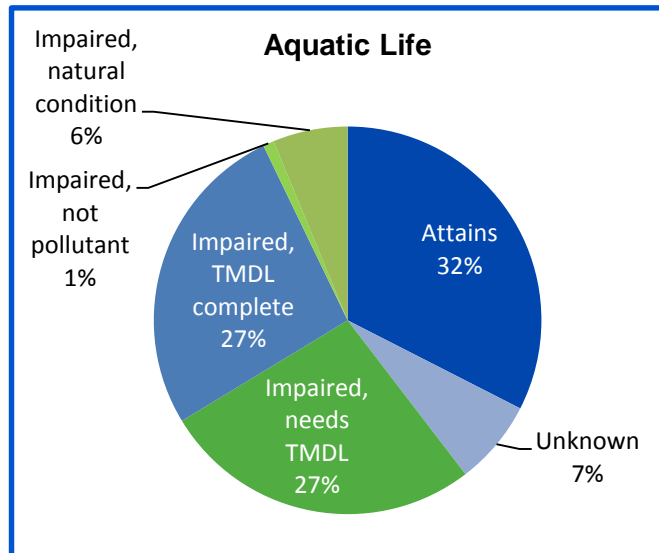
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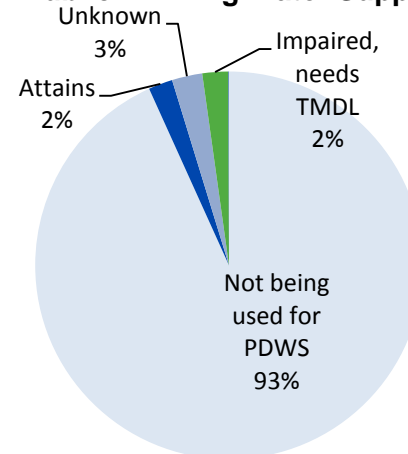
Recreation



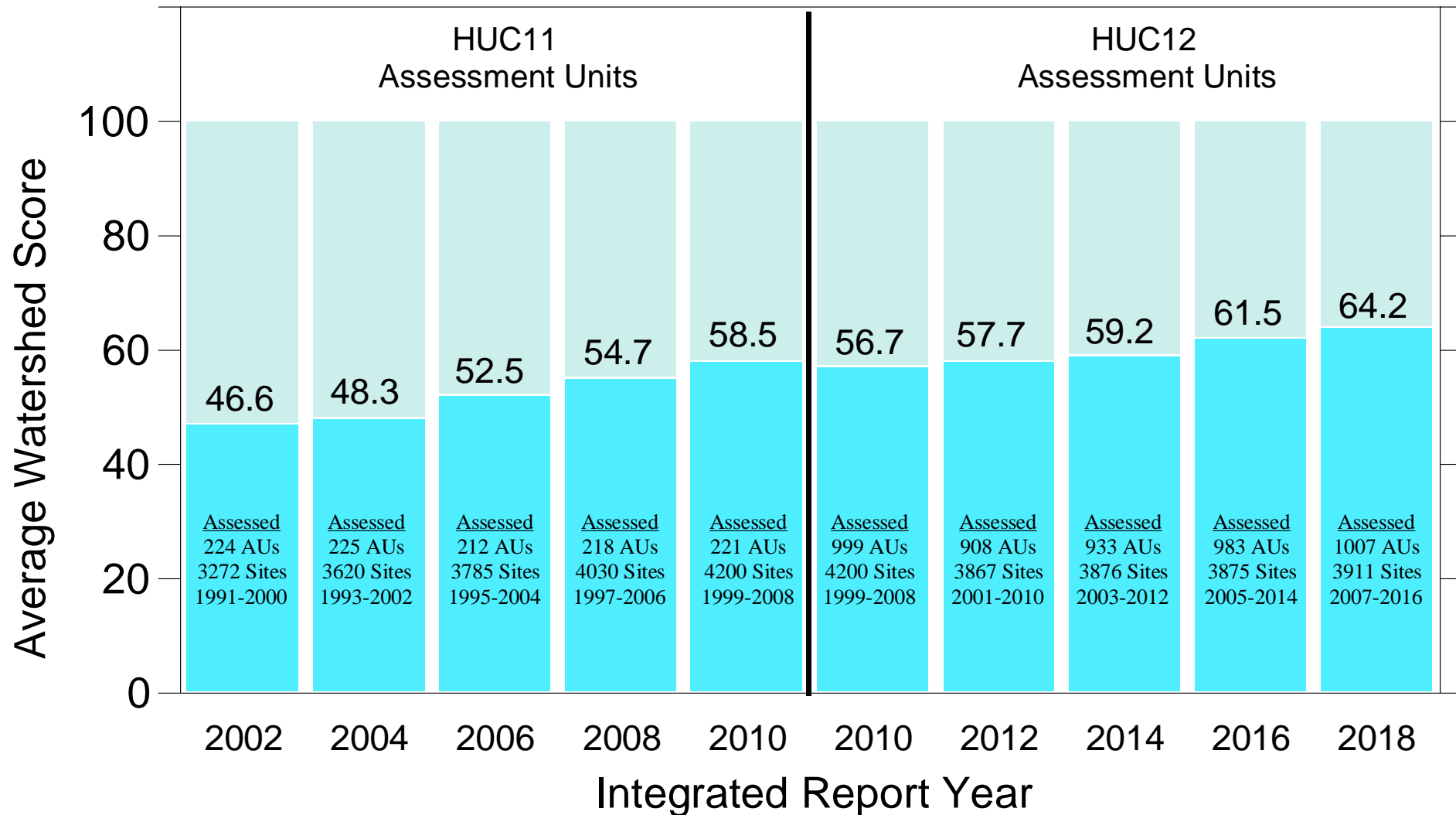
Aquatic Life



Public Drinking Water Supply



Aquatic Life Trends: Watersheds



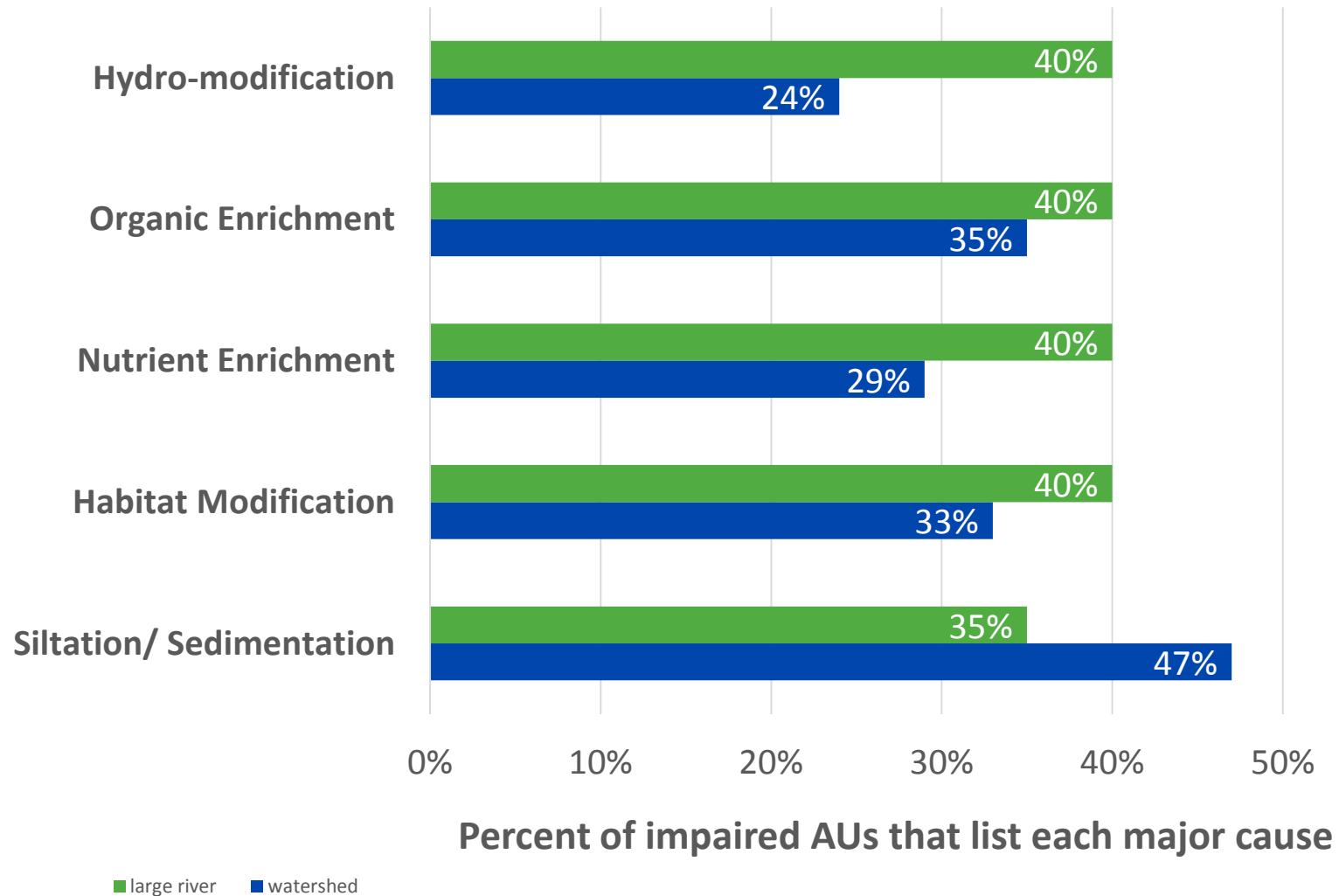
What's Causing the Problems?

Most aquatic life impairment is caused by **land disturbances** related to agriculture activities and urban development.



Five Common Aquatic Life Causes

Percent of impaired assessment units that list each major cause



Hydromodification



Examples:

- stream impoundments (e.g., low-head dams)
- agricultural drainage systems (e.g., field tiles)
- urbanization (e.g., “hardening”)

Streams impacted by hydromodification:

Large Rivers – 40%

Watersheds – 24%

Organic Enrichment and Dissolved Oxygen



Examples:

- wastewater treatment plants
- home sewage treatment systems
- livestock manure discharges

Streams impacted by organic enrichment:

Large Rivers – 40%

Watersheds – 35%

Nutrients



Examples:

- crop fertilization
- urban runoff (e.g., lawn fertilizers)

Streams impacted by nutrients:

Large Rivers – 40%

Watersheds – 29%

Habitat Modification



Examples:

- removal of riparian vegetation
- channelization
- stream bank modifications
- culverting

Streams impacted by habitat modification:

Large Rivers – 40%

Watersheds – 33%

Silt and Sediment

Examples:

- construction
- unrestricted livestock access
- overland erosion



Streams impacted by silt and sediment:

Large Rivers – 35%

Watersheds – 47%

Comments on 303(d) List

Email: epatmdl@epa.ohio.gov

Mail: Ohio EPA, Division of Surface Water
Attn: 303(d) Comments
P.O. Box 1049
Columbus, Ohio 43216-1049

Comments on the 303(d) list must be received by the close of business on **May 4, 2018**. Comments received after this date may be considered as time and circumstances allow.

