Division of Surface Water Updates

Operator Training Committee of Ohio

Wastewater Workshop

April 3, 2018

Ohio Environmental Protection Agency

Today's Topics

- Nutrients
  - Lake Erie and Gulf of Mexico Loading Targets
  - Results of Lake Erie Basin Monitoring
  - Statewide Nutrient Mass Loading Report
  - Results Phosphorus Optimization Survey
  - Future Legislative Initiative
  - Proposed Lake Erie Assessment Unit
- CSO Public Notice for Lake Erie
- Operator Shortage
- NPDES Fee Consolidation

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Water Impacts from Nutrients

- Increase in Harmful Algal Blooms (HABs)
  - Beach Advisories
  - Cost of Drinking Water Treatment and additional Regulations
- Changes in Aquatic Communities
- Anoxic Zones in Central Basin of Lake Erie and Gulf of Mexico
- Impact on Tourism

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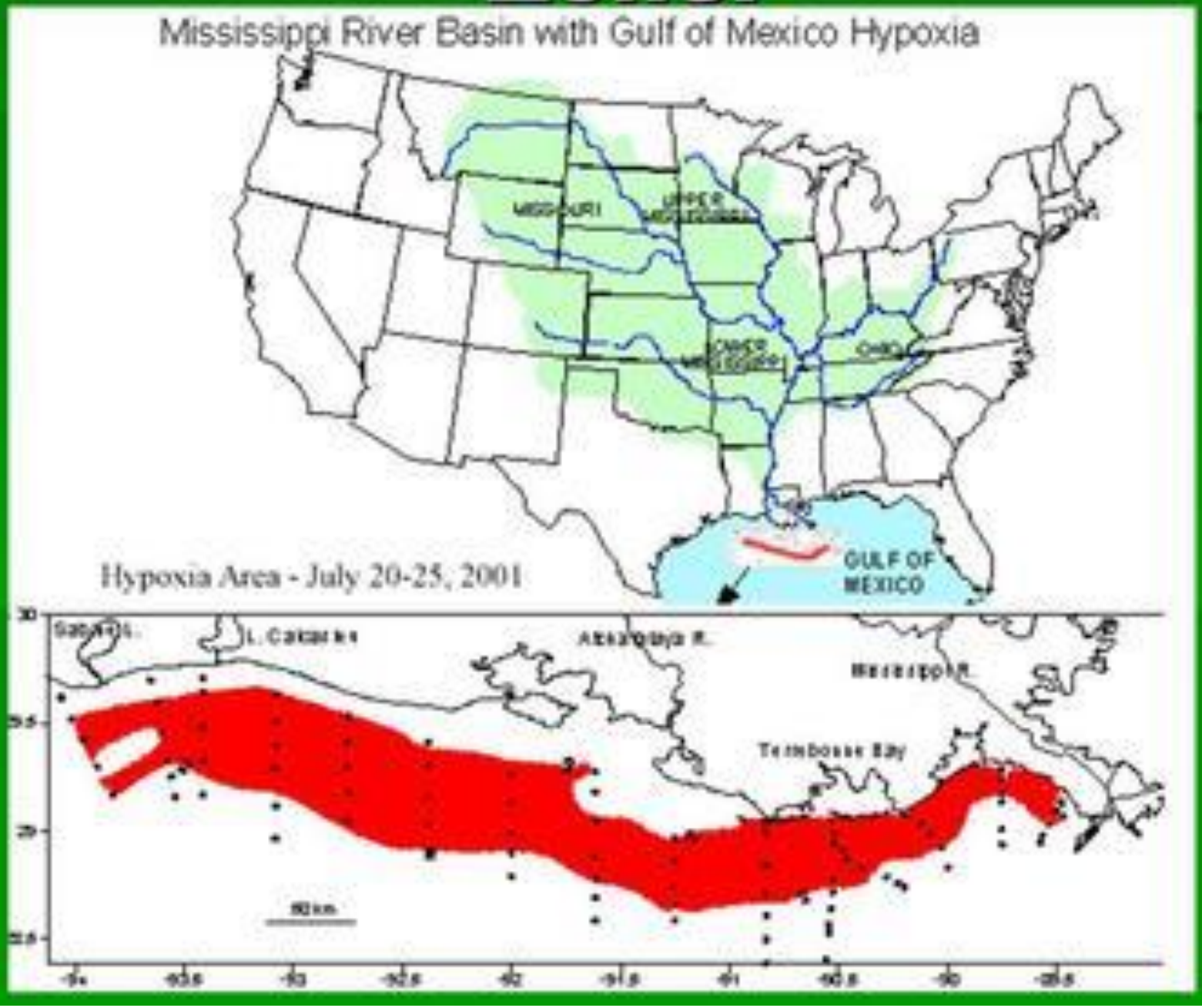
Lake Erie – Toledo Drinking Water 2014

Ohio River – 600 mile algal bloom 2015

The Gulf of Mexico Hypoxia Zone:



Nutrient Loading Targets

- Great Lakes Water Quality Agreement Annex 4
  - Western Lake Erie Basin
    - Goal –HAB toxins and bloom equal to 2004 2012, 9 years out of 10.
    - Target – Spring Loading (Mar – Jul) of **860 tons Total Phosphorus** and **186 tons Dissolved Reactive Phosphorus**
    - Maumee River, target load corresponds to a **Flow Weighted Mean Concentration of 0.23 mg/L TP and 0.05 mg/L DRP**

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Nutrient Loading Targets

- Central Lake Erie Basin
  - Goal – Minimum Dissolved Oxygen of lake bottom waters of 2 mg/l
  - Target – Annual Load of **6,000 tons Total Phosphorus**
- Gulf Hypoxia Task Force
  - Goal – Hypoxia zone less than 5,000 km^2 (1930 mi^2)
  - Target – 20% annual reduction of Total Nitrogen and Total Phosphorus

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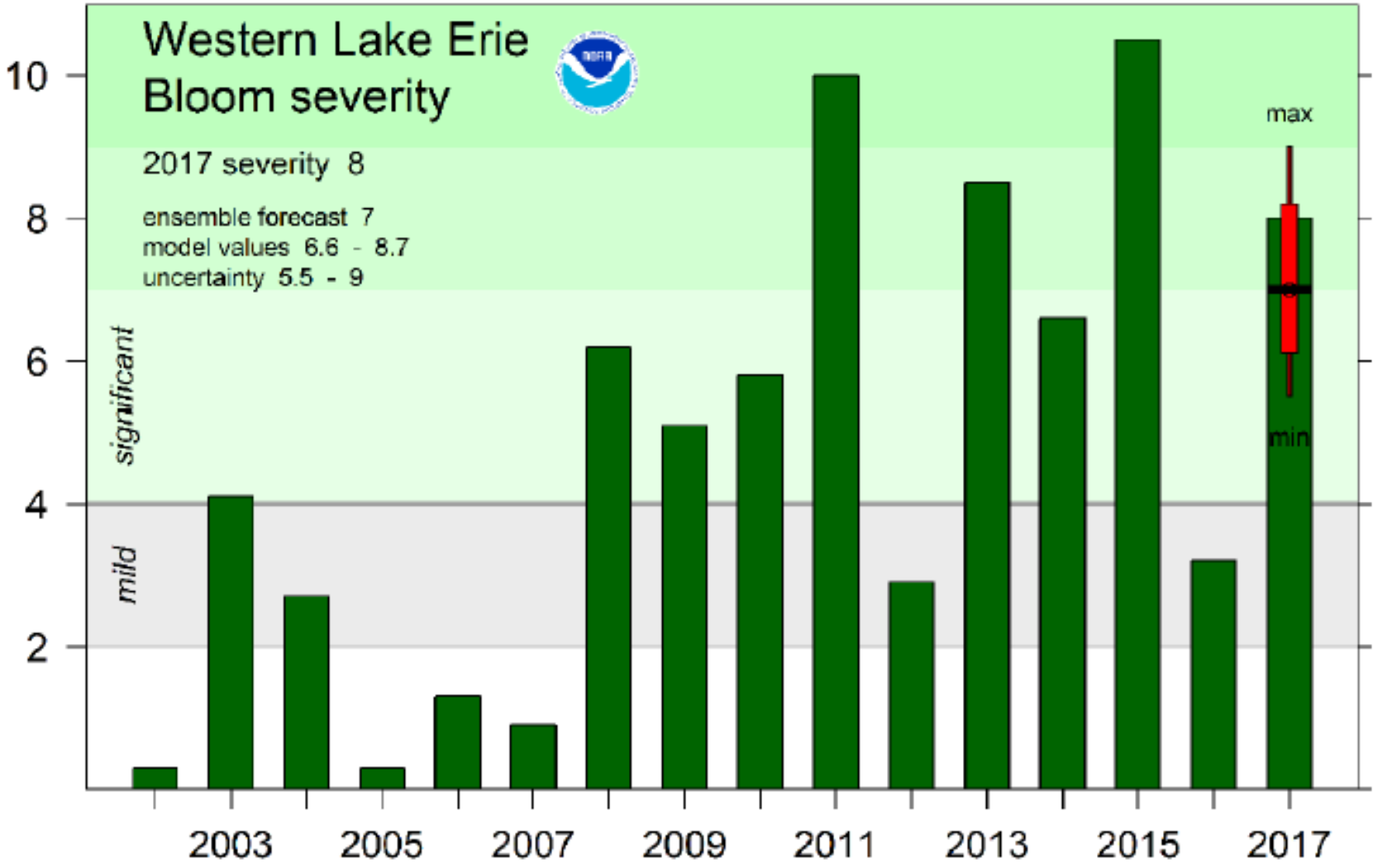

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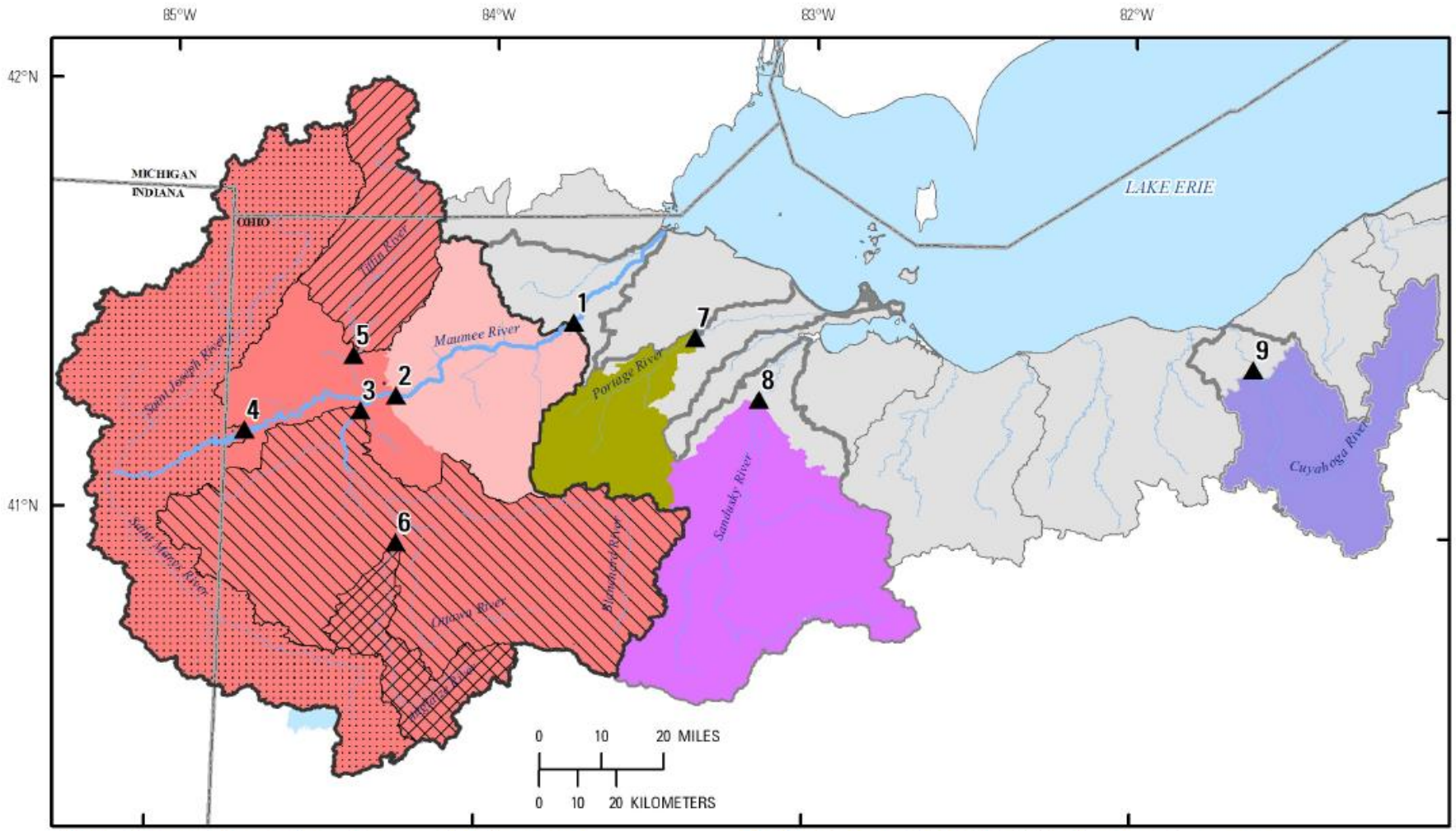

Figure 1: Sampling stations discussed in this report.

Station 1: Gage 04193500 - Maumee River at Waterville
Station 2: Gage 04192500 - Maumee River near Defiance
Station 3: Gage 04191500a - Auglaize River near Defiance d/s Dam
Station 4: Gage 04183500 - Maumee River at Antwerp
Station 5: Gage 04185318 - Tiffin River near Evansport
Station 6: Gage 04186500 - Auglaize River near Fort Jennings
Station 7: Gage 04195500 - Portage River at Woodville
Station 8: Gage 04198000 - Sandusky River near Fremont
Station 9: Gage 04208000 - Cuyahoga River at Independence

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2017 Lake Erie Basin Monitoring

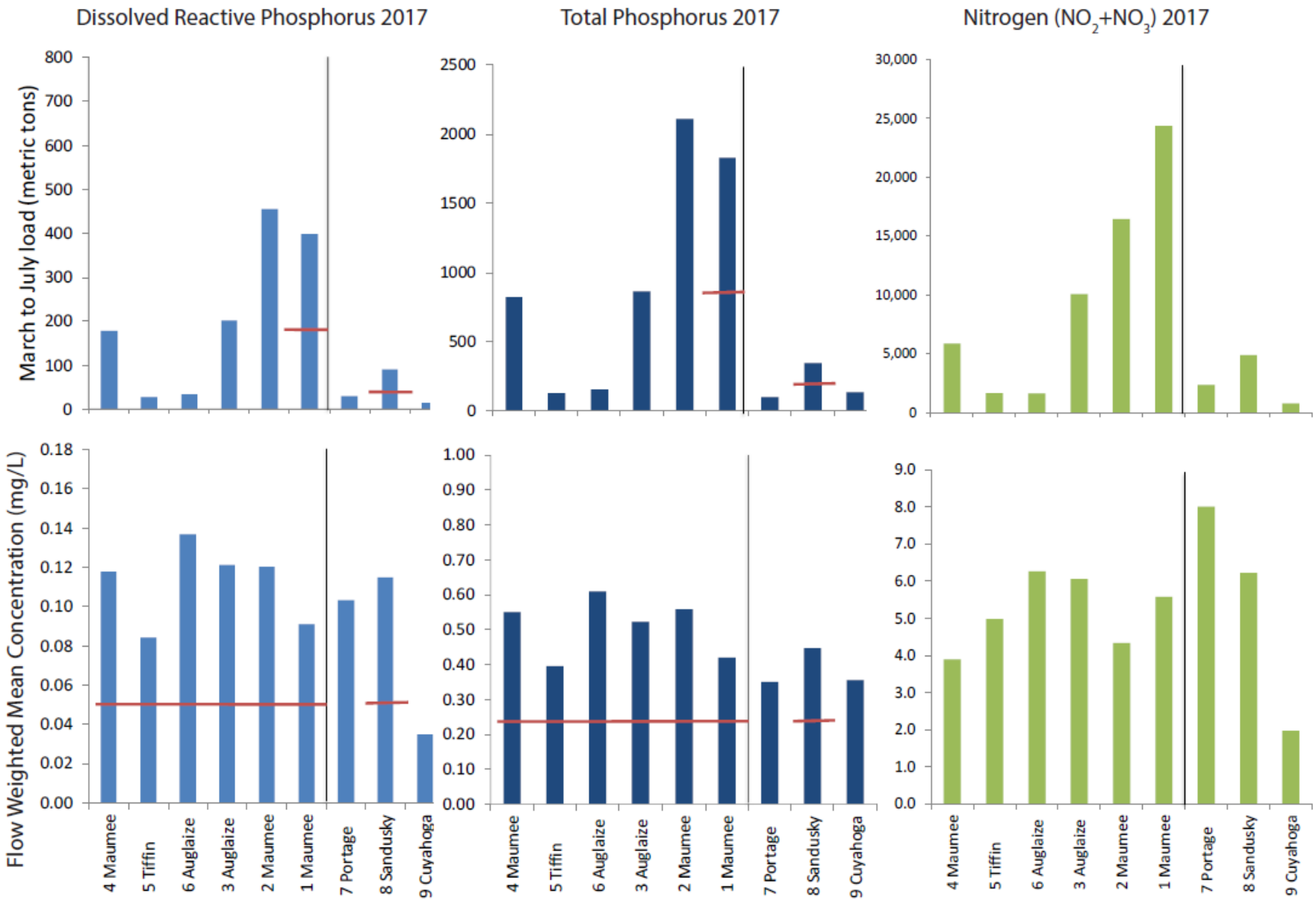

Figure 2: Side by side comparison of loads and flow weighted mean concentrations. Axis titles at bottom and left. Red lines indicate target levels at the points where they apply (not all targets are the same at all locations).

How Does 2017 Compare

Waterville Station

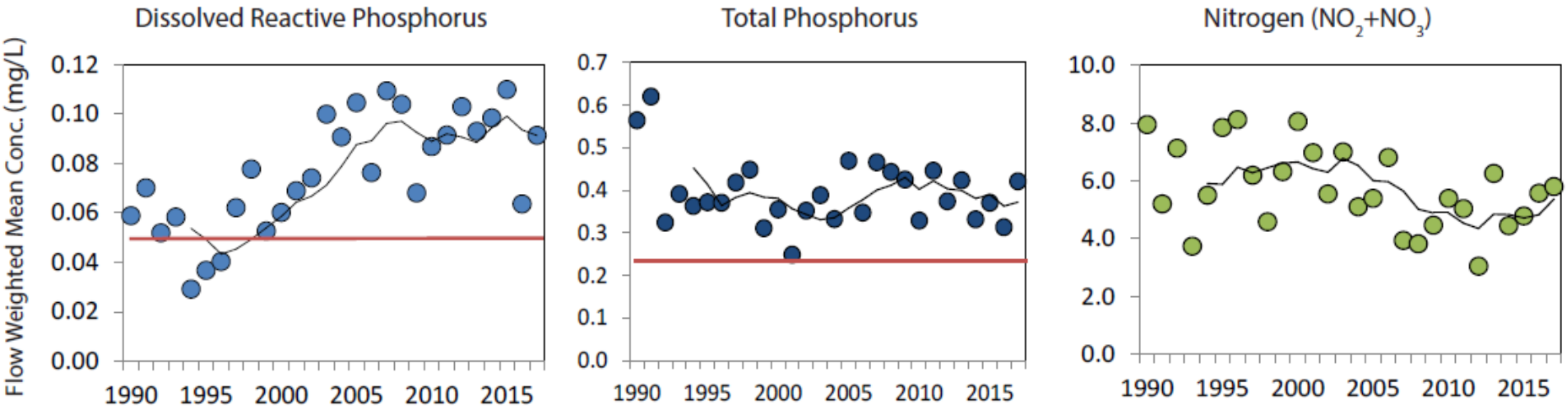

Figure 3: Annual nutrient flow weighted mean concentrations for the Maumee River at Waterville by water year. The five-year running average (black line) smooths out annual variation and shows trends. The red line is the Annex 4 target flow weighted mean concentrations.

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When Does TP Enter the River - 2017

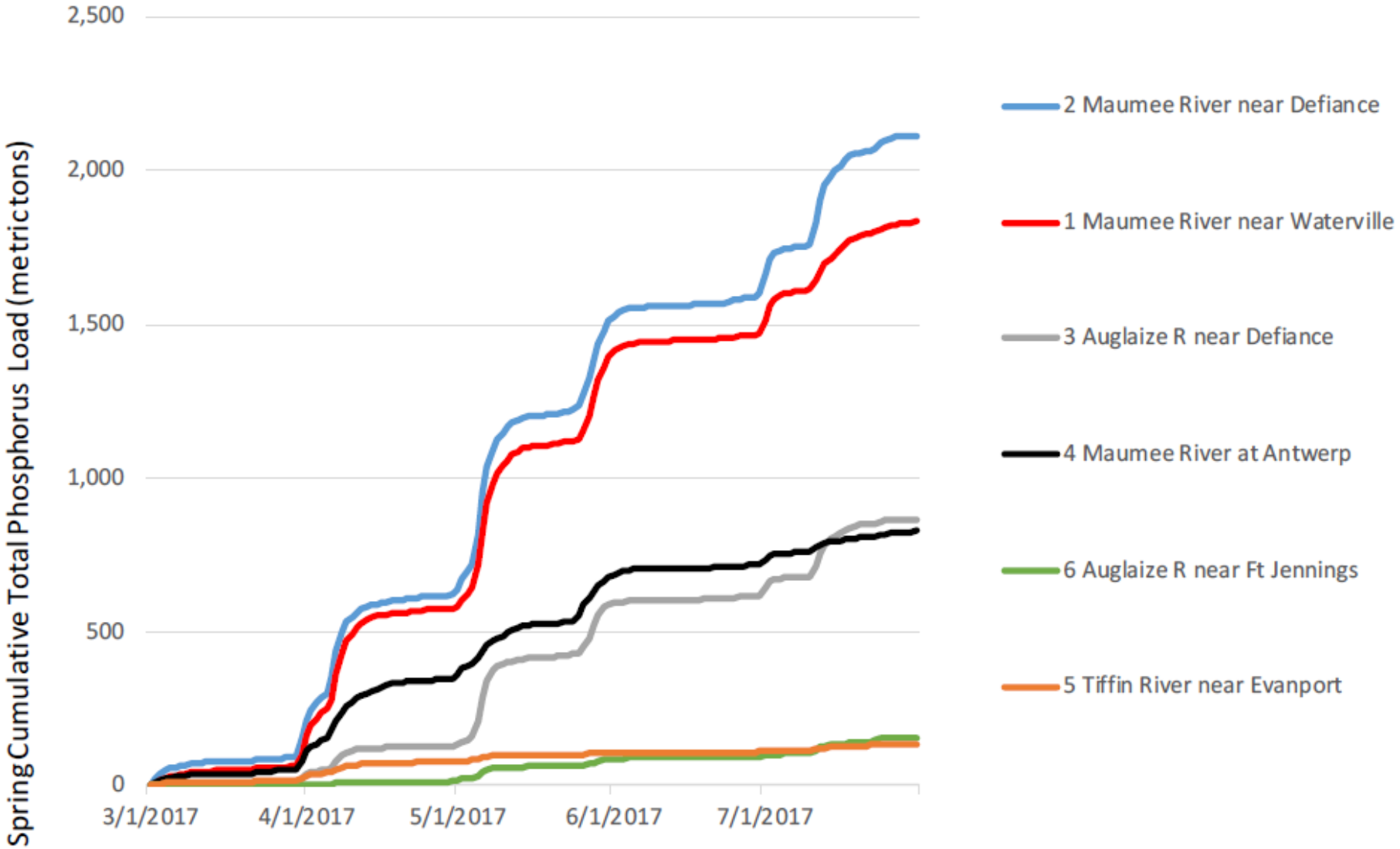
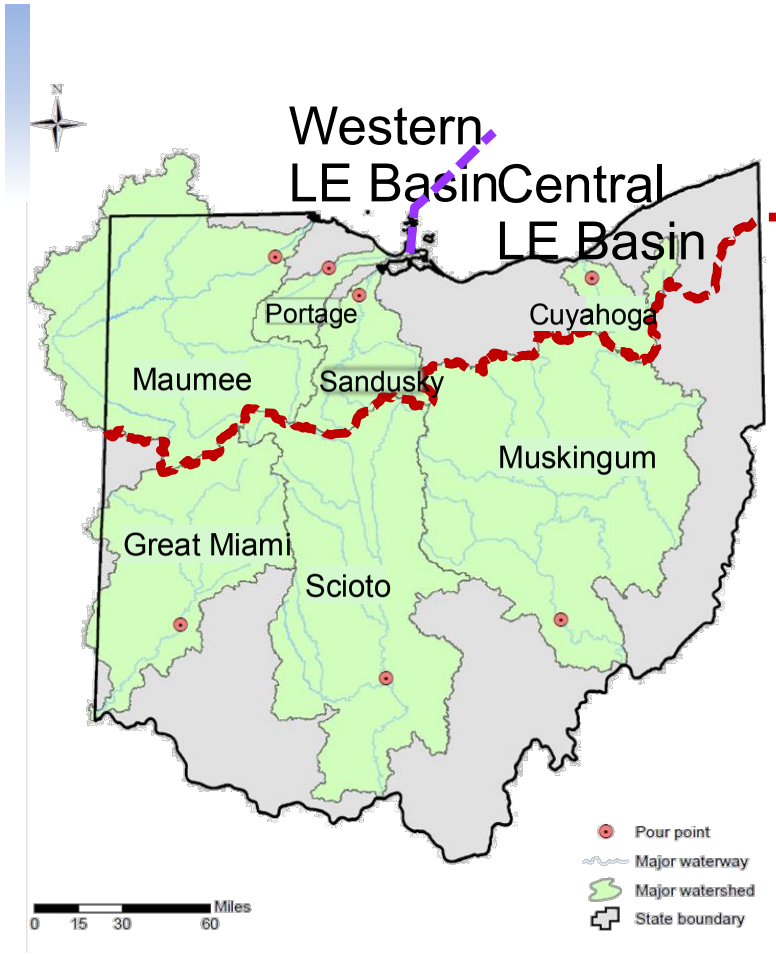


Figure 5: Cumulative total phosphorus loads at monitoring stations in the Maumee River watershed.

Ohio EPA's Nutrient Mass Balance Study for Ohio's Major Rivers



Lake Erie Basin

Ohio River Basin

Study Area Covered

- 7 major watersheds
- 26,000 sq. mi. (in Ohio)
- 63% of Ohio's land area

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2016 Ohio Statewide Nutrient Mass Loading Report

- Established by HB 64 (July 2015) - ORC 6111.03(U)
- Report every two years, due at same time as IR
- Based on Water Year (Oct- Sept)
- Know Stream Loadings and Point Source Loadings (includes combined sewer est.)
- Estimate Home Sewage
- Remainder is Nonpoint Source (urban and rural)

$$\boldsymbol{Total\ Load} = \boldsymbol{PS} + \boldsymbol{HSTS} + \boldsymbol{NPS}$$

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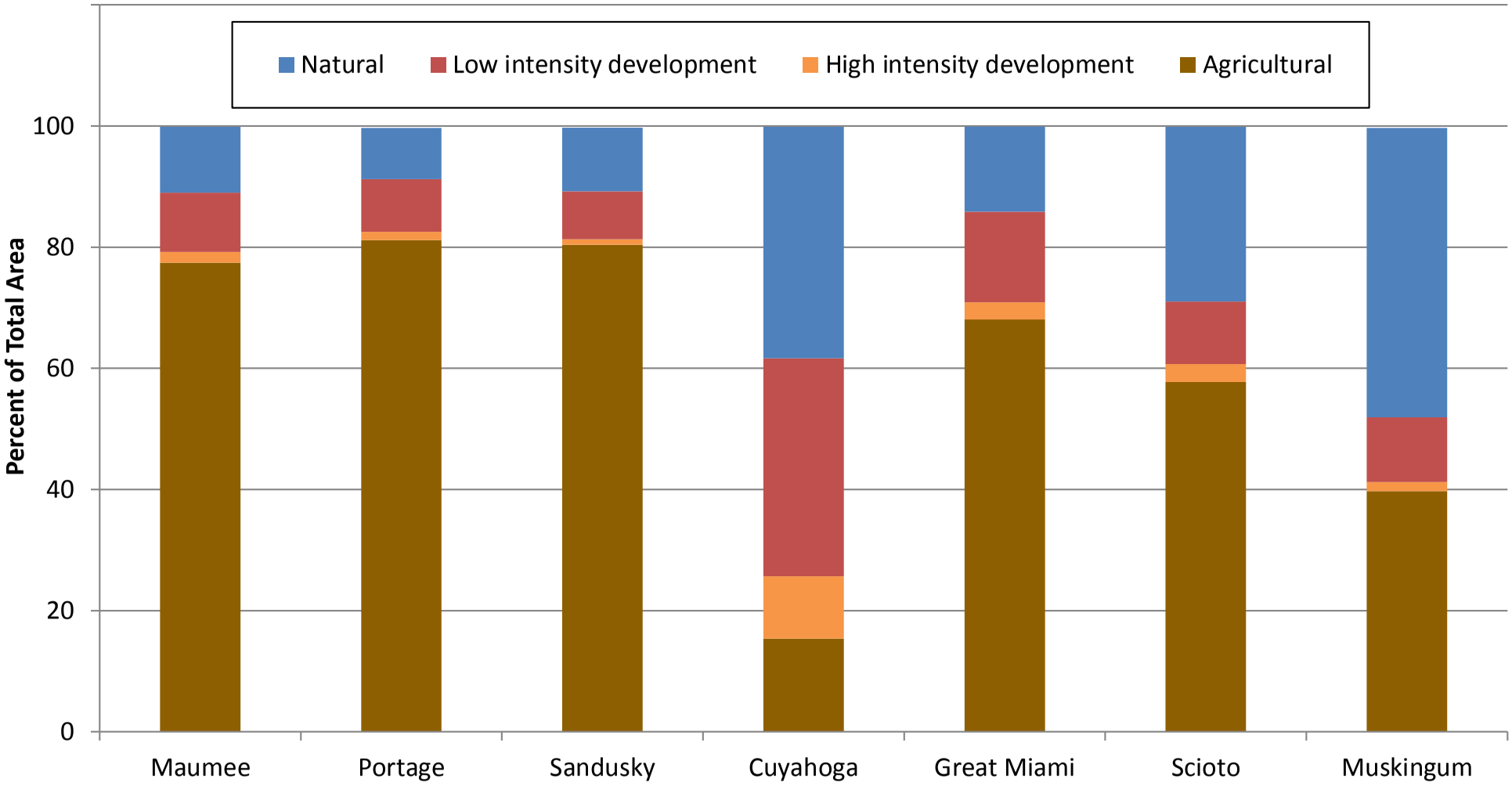
Land Use



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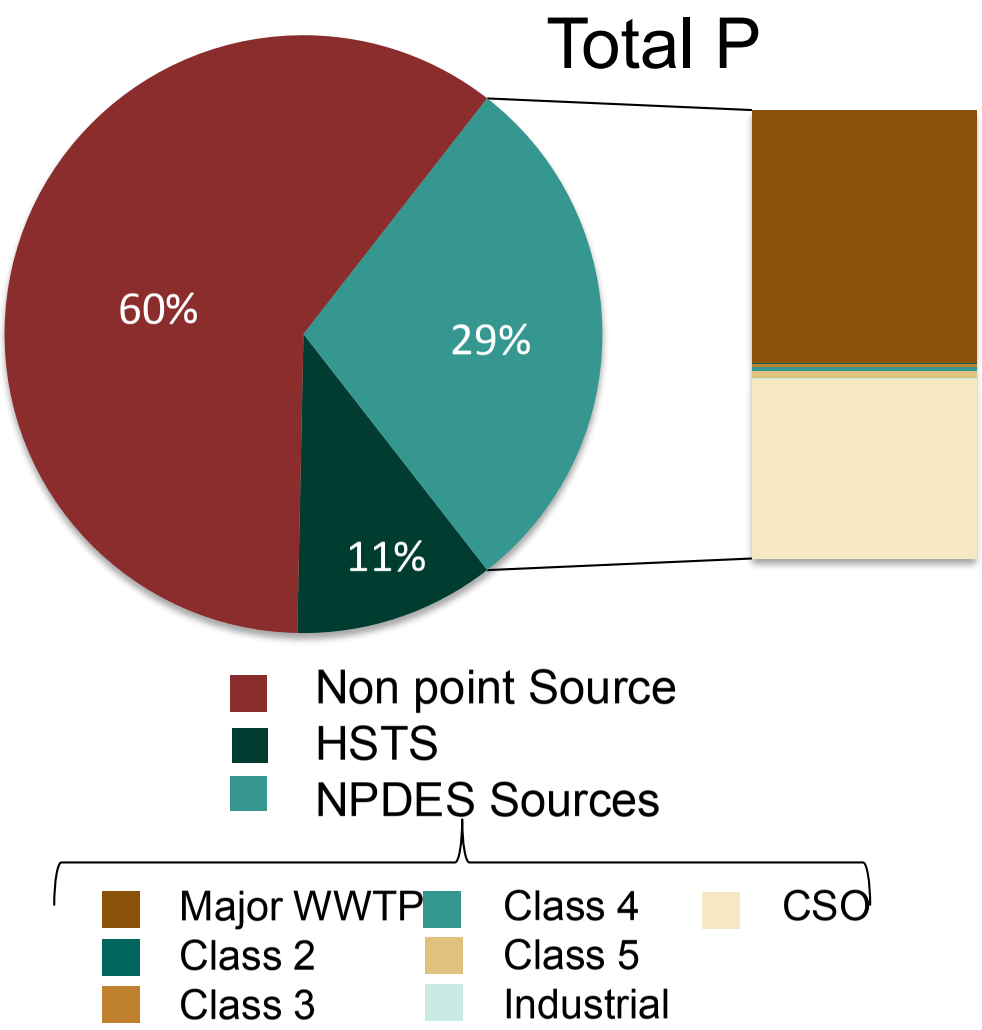
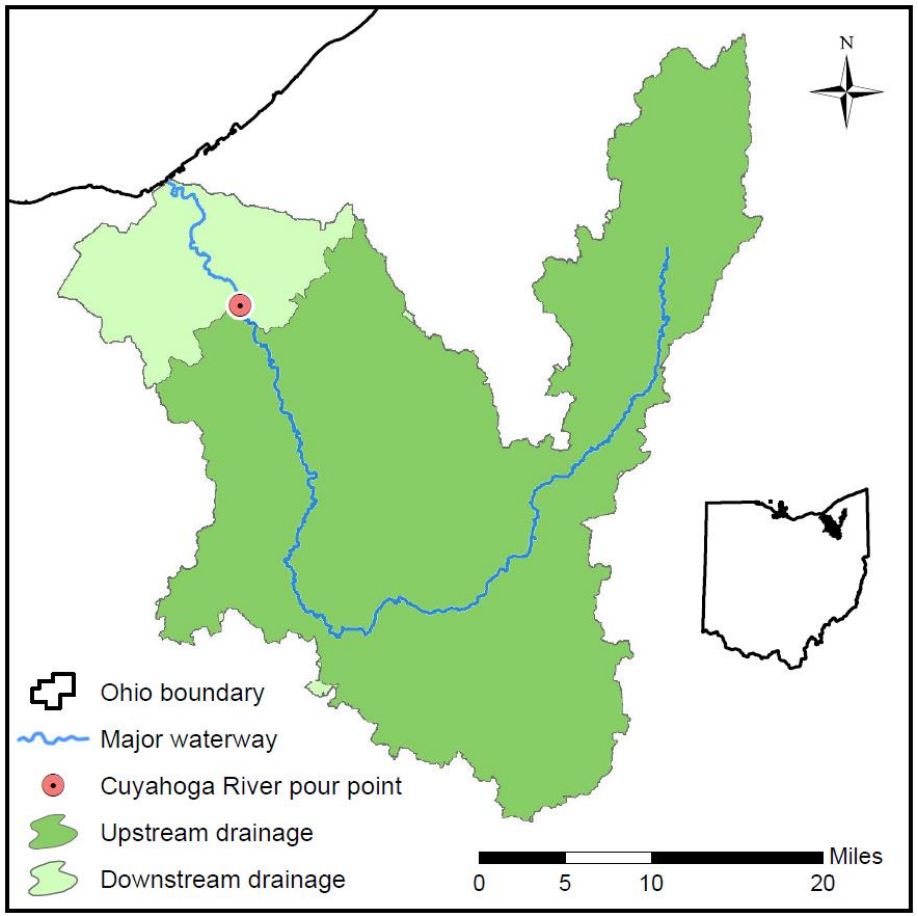
wy13 Loading Breakdown - Cuyahoga Watershed





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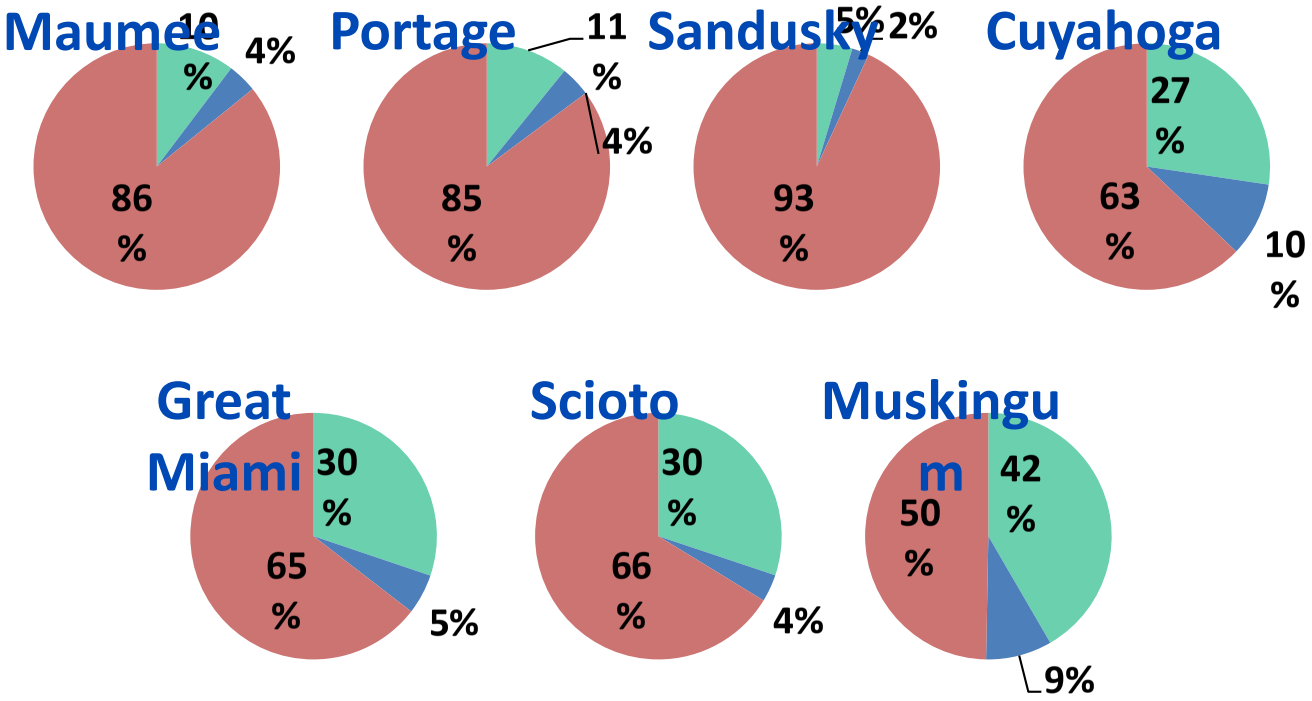
Total Phosphorus Loads by Source:

Major Ohio Watersheds (average wy13-14)



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S.B. 1 Total Phosphorus Optimization - Survey Results

- 112 reports from Major Facilities - 100% compliance!
- About 20 plants indicated they can meet 1.0 mg/L currently without any upgrades
- That leave about 92 Majors that would need to perform additional treatment or upgrades to meet a new phosphorus limit of 1 mg/L

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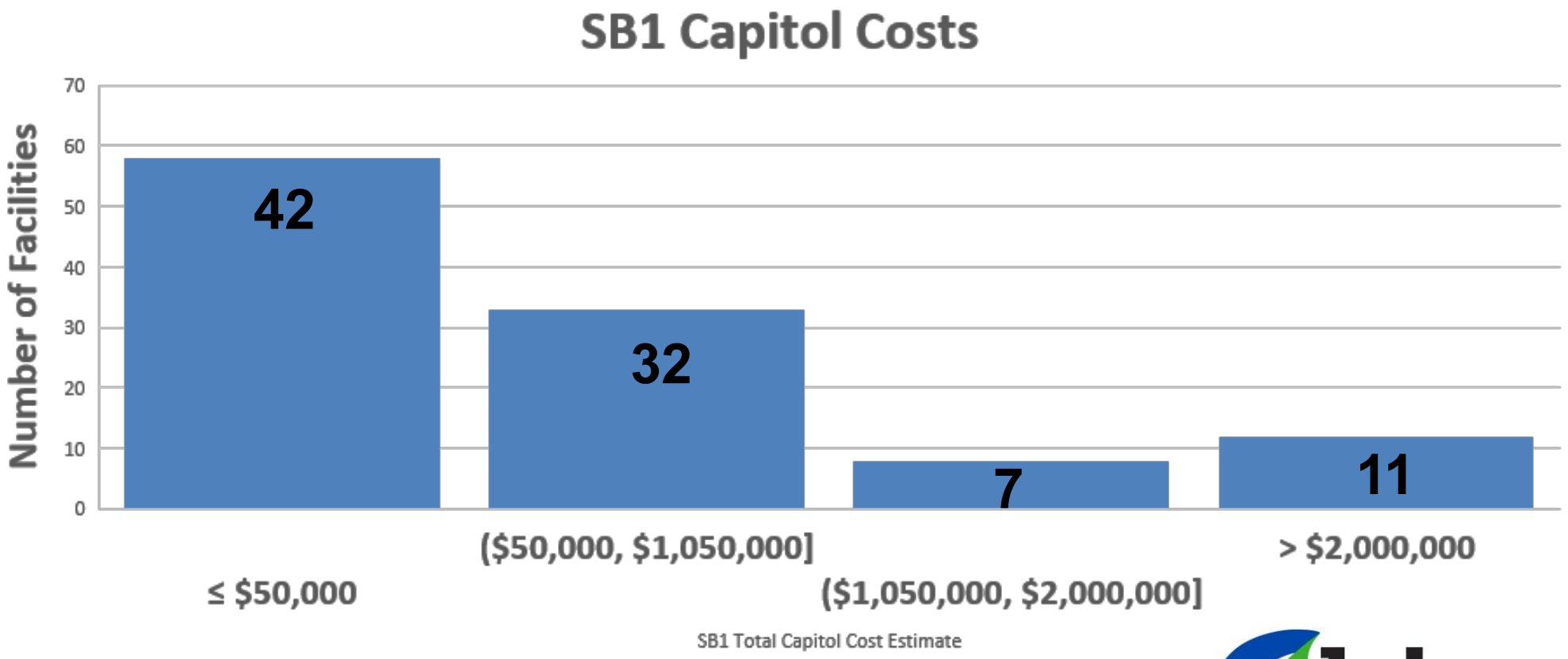
Type of Facility	Total Number	Number of Impacted		Annual Cost	Pounds of Phosphorus Removed Annually
		Facilities	Households	Per Household	Statewide
Major Municipal	239	92	1,609,232	$11.50	2,323,192
Significant Minor Municipal	100	55	79,994	$20.87	84,095
Minor Municipal	249	176	86,903	$21.46	106,102
Small Minor	1422	1330	51,440	$19.13	51,348
Industrial	1097	39	--	--	76,193
Total:	3107	1692	1,827,569		**2,640,930**

92 Major Facility Breakdown



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Future Legislative Initiatives

Statewide NPDES phosphorous permit limit:

- To address threats to public water systems, recreation on inland lakes and other downstream problems associated with excess nutrients

- Currently the major POTWs in the Lake Erie Basin have a total phosphorous limit of 1 mg/L

New Farming Requirements

- Expand the definition of “agricultural pollution” to include fertilizer

- Farmers in areas defined by ODA as “watersheds in distress” submit Nutrient Management Plans for how they use fertilizer on their land

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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 will serve as a credible model for Ohio to use in assessing the open waters of Lake Erie in our draft 2018 Integrated Report

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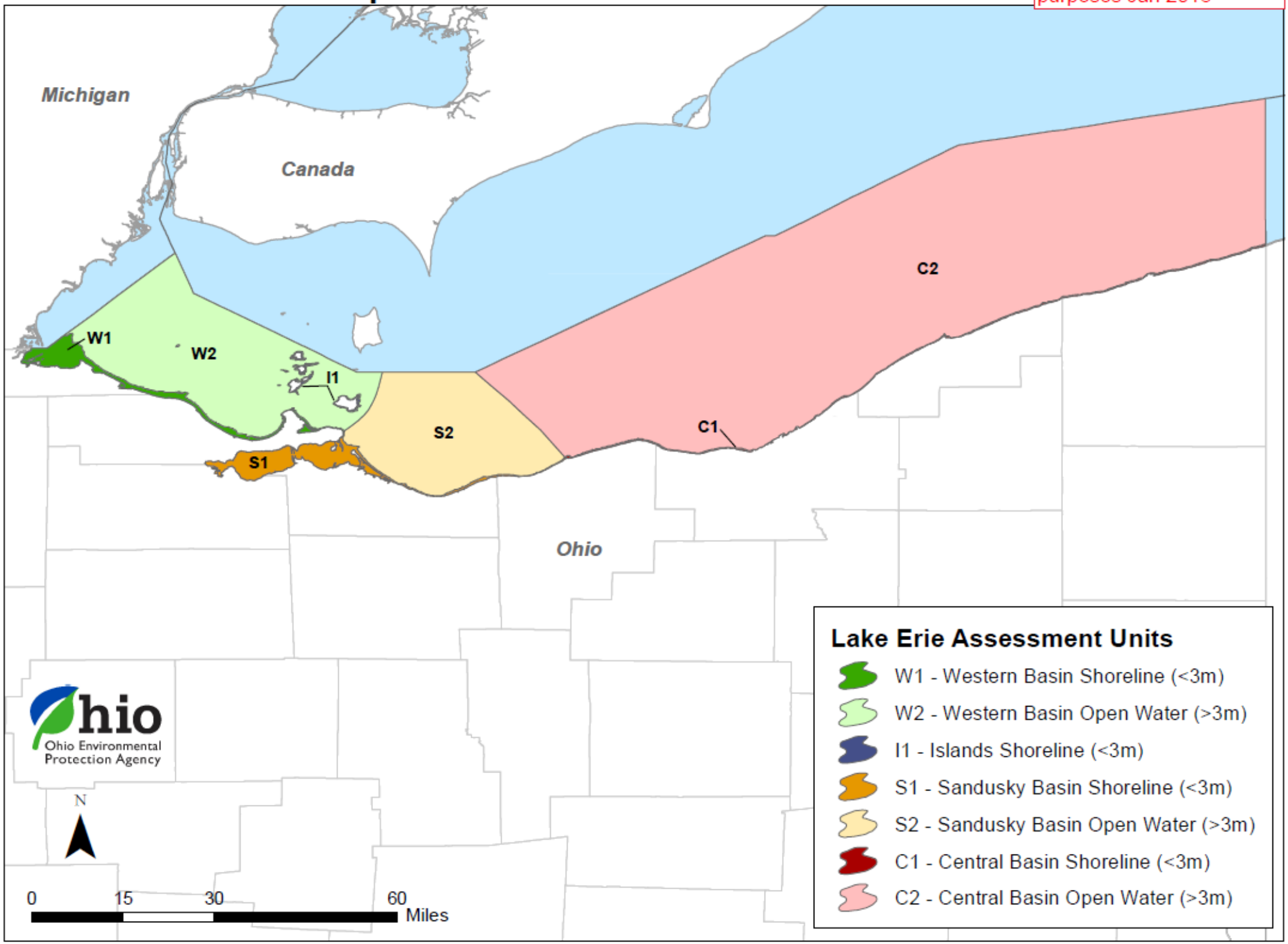
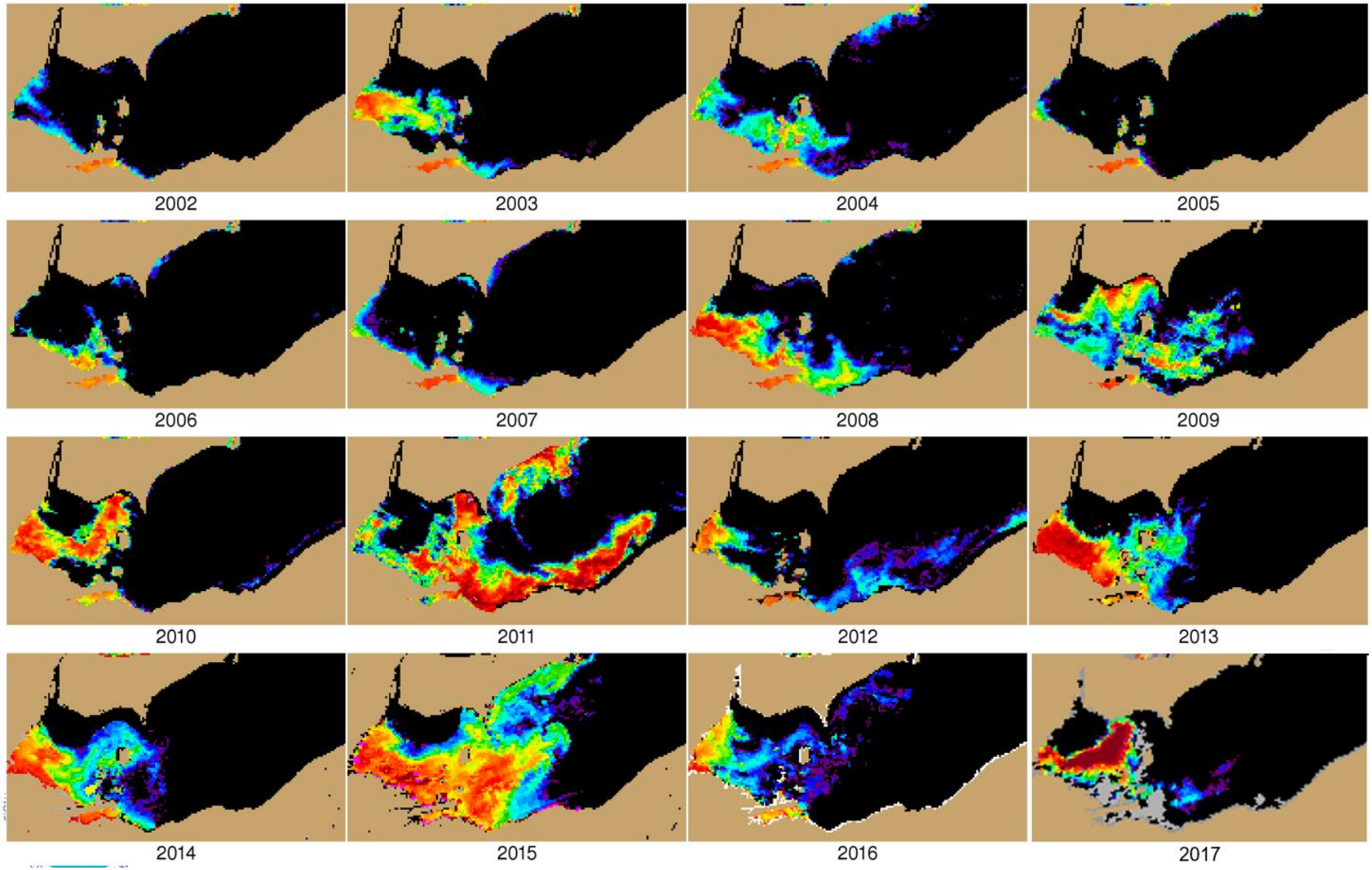
Proposed Ohio Lake Erie Assessment Units

draft for discussion purposes Jan 2018



Annual Satellite Images



Lake Erie peak bloom severity from MERIS (ESA) and MODIS (NASA)

Cell Count in Detail

- Assessing July though 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.

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Proposed Lake Erie Impairment

	≥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

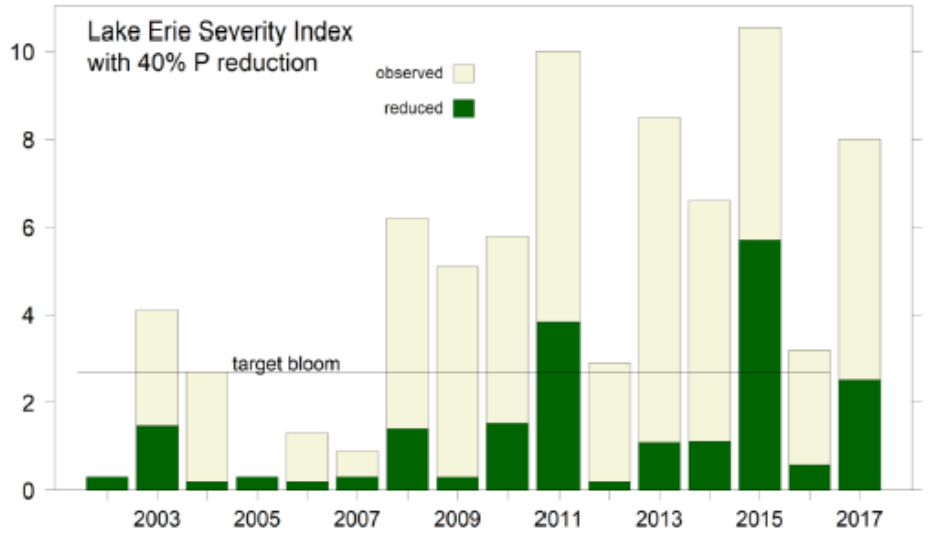

Figure F-9 — Bloom severity observed and projected (with 40 percent TP reduction) since 2002. Courtesy of Dr. Rick Stumpf, NOAA National Centers for Coastal Ocean Science.

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CSO Public Notification for Great Lakes

- Effective February 7, 2018
- Applicable only to CSO communities in the Lake Erie Basin
- Three major components:
    - Public Notification Plan
    - Timely notice and meaningful follow-up of CSO events
    - Annual Report

www.epa.gov/npdes/combined-sewer-overflows-public-notification-requirements-great-lakes

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CSO Public Notification for Great Lakes
Public Notification Plan

- Due August 7, 2018
- Must submit Plan with subsequent NPDES renewals

- Install outfall signs
- Identify public access areas affected by CSOs
- Identify public entities affected by CSOs

- Protocols for initial and supplemental notification
- Methods for CSO data collection

Seek input from and make plan available to the public!

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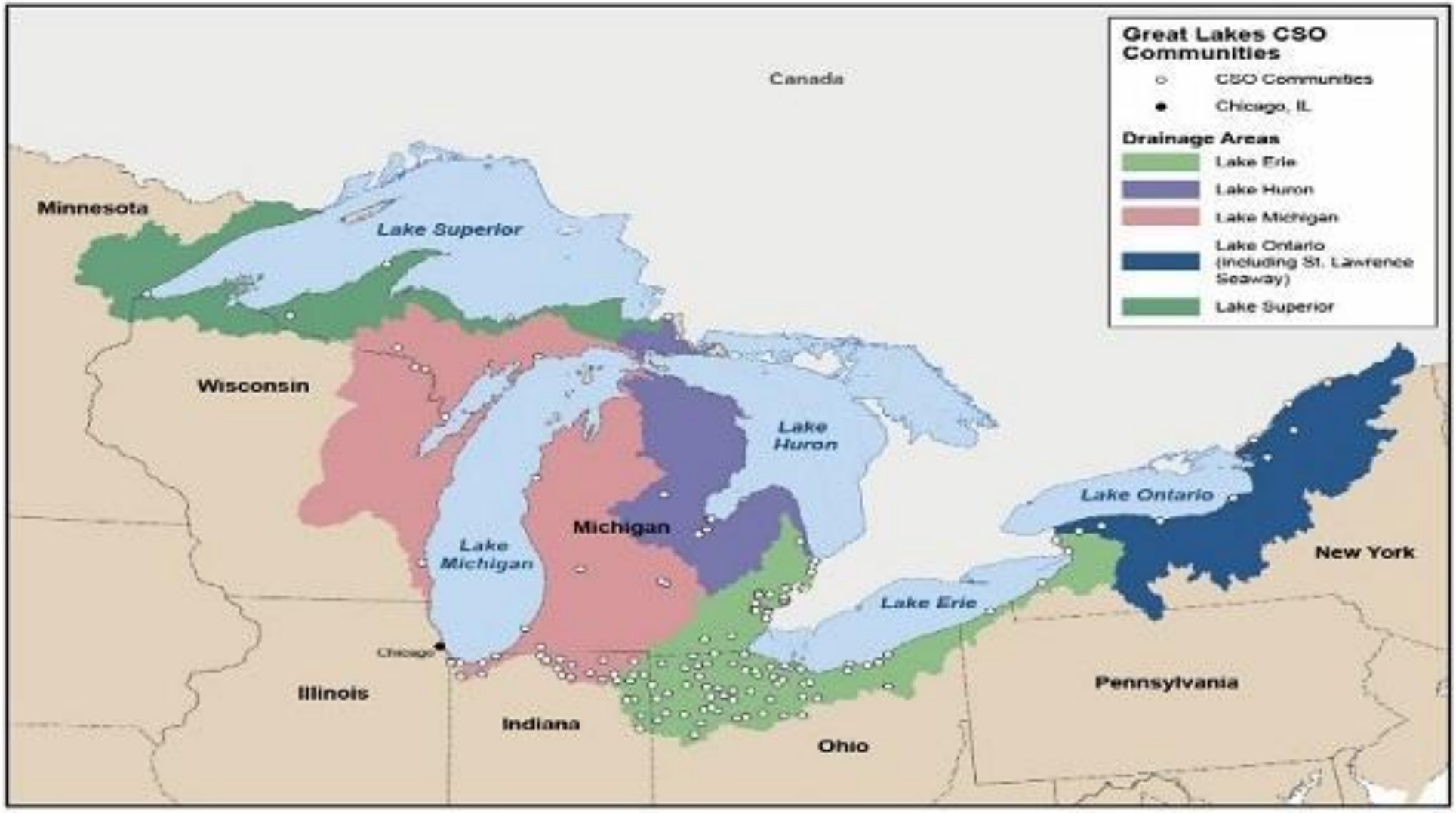

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CSO Public Notification for Great Lakes

CSO Event Notification

- <u>Implement Plan by November 7, 2018</u>
- Initial Notification to public and local health department within 4 hours of *becoming aware* of CSO event
- Supplemental Notification to public and local health department within 7 days of *becoming aware* of CSO event

Examples of data to be included:

- Date, time, and location
- Affected water body and public access areas
- End time or if event is ongoing, and total volume
- Permittee point of contact

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CSO Public Notification for Great Lakes **Annual Report**

- Due May 1 each year (starting in 2019)
  - Must make Annual Report available to public
  - Provide report access instructions to Ohio EPA & USEPA

- Examples of data to be included:
  - CSO locations, dates, times, volumes and causes for the past year
  - Descriptions of public access areas affected by CSOs
  - CSO monitoring and precipitation data
  - Summary of Nine Minimum Controls implementation strategy

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Operator Shortages

- Hosting a summit to address shortage of Certified Wastewater/Drinking Water Plant Operators in Ohio
- Education, training/apprenticeships, retention/succession planning, salaries, resource sharing, other barriers, etc

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2017 Sewer and Water Rate Survey

Office of Fiscal Administration

Sewer System	
Number of certified operators employed for your wastewater treatment works, including collection	
Number of uncertified employees assisting with operation of your facility	

Number of above employees in classification shown:	Number	Average Hourly Salary
WC1		$
WC2		$
WWA		$
WW1		$
WW2		$
WW3		$
WW4		$

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2017 Sewer and Water Rate Survey

Office of Fiscal Administration

Number of employees above eligible to retire in:	
Less than five years	
6-10 years	
More than 10 years	

Type of emergency power equipment in use	
Onsite Generator	☐
Portable Generator	☐
Multiple Independent Power	☐
None	☐
Other (specify below)	☐

Consolidated NPDES Fee

- Existing NPDES Fees
  - Application Fee ($200)
  - Issuance Fee ($0 - $750 based on outfall design flow)
  - Annual Discharge Fee
- New language in 3745.11 (HB 49) - Consolidated application fee and issuance fee ($200 + ($0 - $750/outfall))
- Change will occur in STREAMS
- Legislation only consolidated fees, there was no increase in the fee structure

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Questions?

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