

Preliminary Findings Policy Tools for Water Pollution Control: Addressing Nutrient Enrichment & Harmful Algal Blooms in Lake Eire

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- ❖ Multiple state and federal water quality officials who have provided insights to inform this work.



Purposes



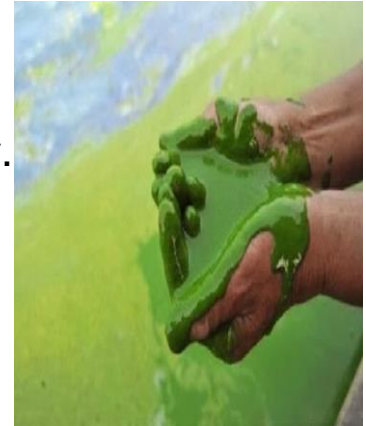
- ❖ Share highlights from *preliminary* findings* on:
 - Policy tools for nutrient control being implemented in the Ohio Lake Erie Basin
 - Strategies and policy tools used elsewhere which might be considered for Ohio.
 - Lessons and policy tools policymakers & natural resource administrators may want to consider for the Ohio Lake Erie basin.

- ❖ Solicit your input regarding questions/issues to be addressed as we complete work this project.
 - ❖ Particularly interests in your thoughts on criteria that might be used as basis for recommendations for policy transfer.

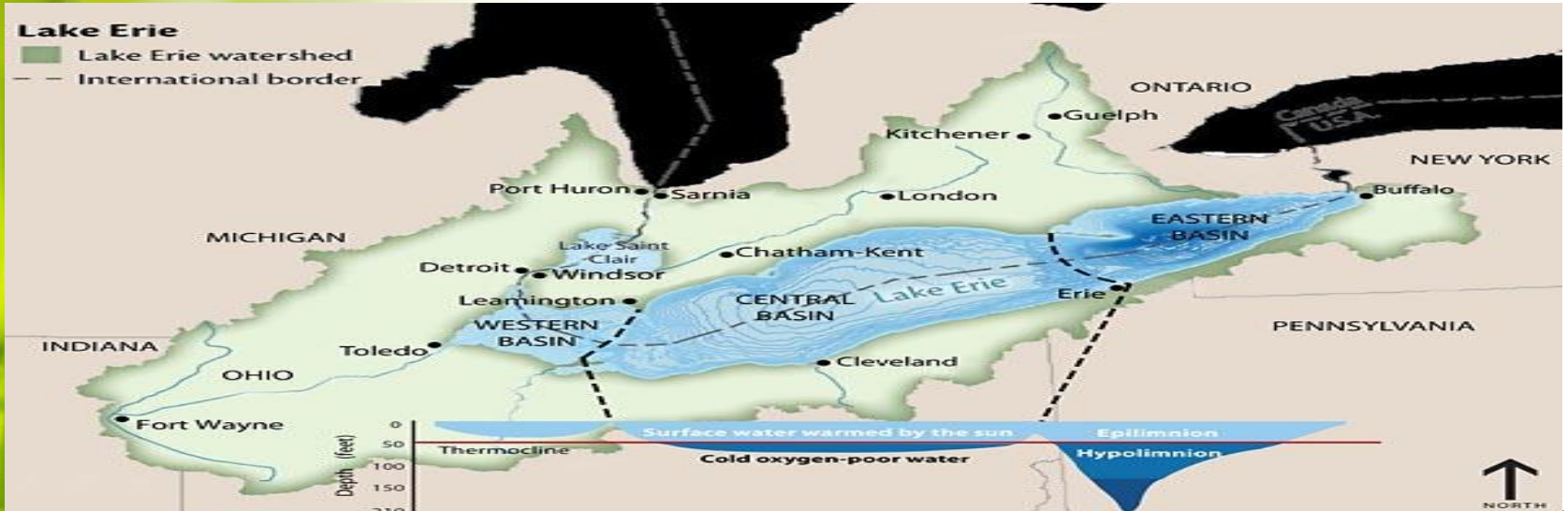
*Because findings presented here are preliminary, they should not be quoted or cited as yet with the authors' permission.

Harmful Algae Blooms in Lake Erie

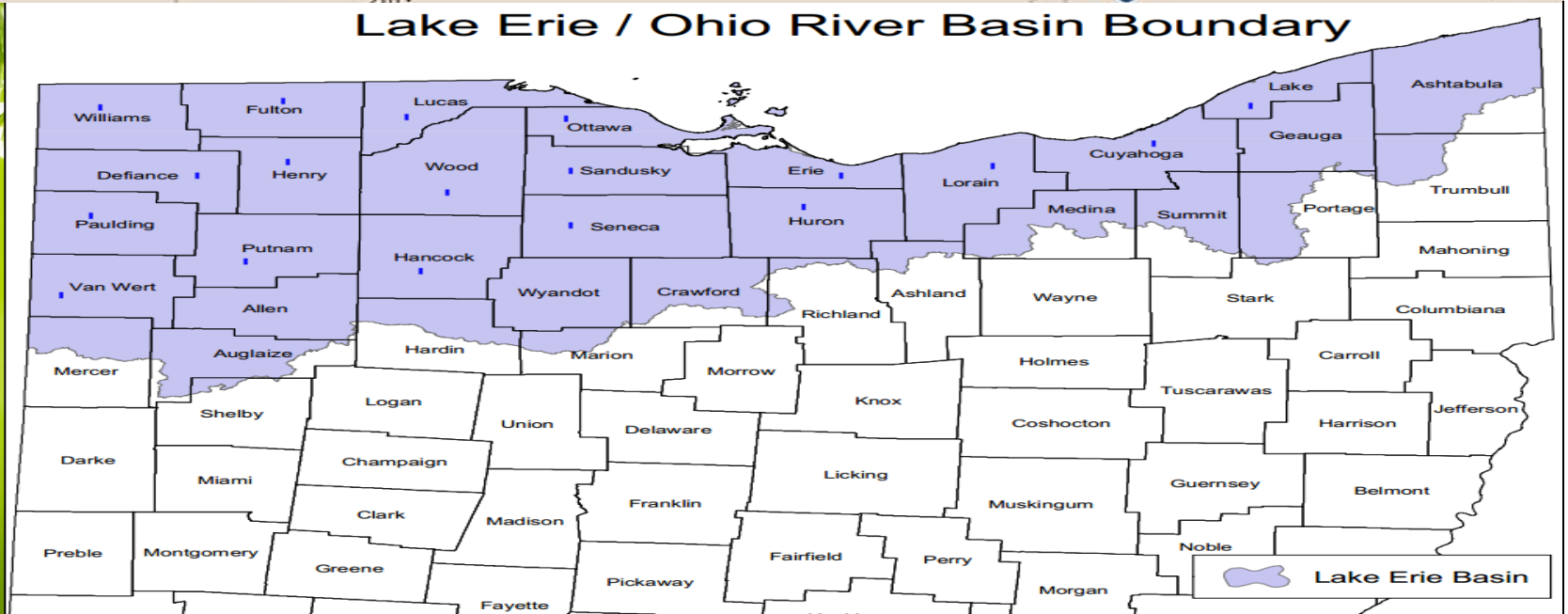
- ❖ Have become recurring events
 - ❖ Massive bloom in 2011.
 - ❖ Major bloom in 2014 contaminated the Toledo Water Supply, creating substantial problems for a major Ohio City.
 - ❖ Another record setting bloom this past year (2015).
- ❖ Pose risks to human and ecological health (EPA, 2015).
- ❖ Result from nutrient flows and insufficient ecological assimilative capacities for nutrients.
 - ❖ Phosphorus is a key concern & there are continuing concerns about nitrogen contributions as well.
 - ❖ Agriculture a key contributor.
- ❖ There are now multiple discussions and abatement efforts being undertaken to reduce nutrient flows and HABs in the Lake Erie water basin.
 - ❖ With this work, we hope to contribute to this discussion.



The Lake Erie Watershed



Lake Erie / Ohio River Basin Boundary



Methods and Approaches: Overview

- ❖ Purpose – understand current nutrient reduction efforts and enable lesson drawing from other water basin programs to inform nutrient policy/management in the Lake Erie basin.
 - ❖ Potential beginning of larger effort to identify policy tools for responding to climate change impacts associated with nutrients.
- ❖ Collection of descriptive data and information.
 - Inventory current efforts and policy tools used for nutrient reduction in Ohio Lake Erie Basin.
 - Screen and assess watershed management strategies and policy tools for nutrient control in other American watershed basin programs.
 - Compare policy tools in Lake Erie basin to those in other watersheds. Looked most deeply at:
 - Chesapeake Bay Program (CBP)
 - Long Island Sound Study (LISS) Program
 - Tampa Bay Estuary Program (TBEP)



Preliminary Findings: Inventory of Nutrient Controls in NE Ohio

A. Regulatory Policy Tools

1. Traditional NPDES permitted wastewater discharges – 1,148 permits in the Lake Erie Basin (excludes storm-water & “CAFO’s”)
 - a. 102 (9%) are “majors”
 - b. 1046 (91%) are “minors”
 - c. Assessed final effluent limits on nutrients & monitoring requirements for these permits.
 - All “traditional” discharging wastewater systems.
 - Publicly Owned Treatment Works (POTWs), which are likely to discharge nutrients.



Preliminary Findings: NPDES Permits Discharging to Lake Erie Water Basin

	Nutrient Final Effluent Limit? (N or P or Both)		Total
	Yes	No	
Major Permits	83 (81%)	19 (19%)	102 (100%)
Minor Permits	599 (57%)	447 (43%)	1046 (100%)
Total	682 (59%)	466 (41%)	1148 (100%)

*Of the 102 major permits, 56 are Publicly Owned Treatment Works (POTWs) which typically discharge P and N.

Preliminary Findings: Point Source Controls on Phosphorus

		Phosphorus Final Effluent Limit? (P)		Total
		Yes	No	
POTWs	Majors*	55 (98%)	1 (2%)	56
	Minors	17 (9%)	170 (91%)	187
Non-POTWs	Majors	24 (52%)	22 (48%)	46
	Minors	9 (1%)	850 (99%)	859
Total		105 (9%)	1043 (91%)	1148

* 10 of 56 (18%) of Major POTWs have average monthly Total P concentration limits of less than 1 mg/l.

Preliminary Findings: Inventory of Nutrient Controls in NE Ohio

A. Regulatory Policy Tools – continued.

2. Permitted Storm-water Discharges

- a. 53 Lake Erie basin communities with CSOs
- b. Other storm-water permits in counties in the basin include:
 1. Municipals – phase 1 & 2 = 135
 2. Construction General Permits = 6,942 covered
 3. Industrial Storm-water = 1,265 covered

3. Agriculture Permits in Ohio (CAFO's/CAFFs)

- a. 12 (of 35) NPDES covered CAFO's are in Ohio Lake Erie Basin
- b. 113 ODA permitted Livestock operations are in Ohio Lake Erie basin.
- c. Other agricultural operations subject to regulatory intervention when/if problems identified.
 - Distressed Watersheds Rules (2010)



Preliminary Findings: Inventory of Nutrient Controls in NE Ohio

B. Financial Expenditures Relating to Nutrient Reductions

1. Federal and State Funds for point sources:
 - a. Water Pollution Control Loan Fund – **\$452 million** in loans and grants for point sources, statewide, in 2014.

2. Federal funds for non-point source nutrient reduction programs:
 - a. Four federal agencies – **16 programs** focus on nutrient reduction.
 - b. Agriculture – **7 programs, \$90.1 million** statewide in 2014.
 - c. USEPA, USDOJ, & NOAA – **9 programs, \$33.1 million** in Lake Erie Basin in 2014.

3. State of Ohio funds for non-point source nutrient reduction.
 - a. Six state agencies – **14 programs, \$21.1 million** in 2014.



Preliminary Findings: Inventory of Nutrient Controls in NE Ohio

C. Management of Policy Tools

1. Lots of Organization-based tools identified:
 - a. Multiple *state agencies* (6) support nutrient reduction efforts.
 - b. Ongoing engagement with *federal agencies* (4), in addition to Great Lakes National Program Office coordination.
 - c. *Cross-state engagement* with other States (Great Lakes Governors Association, etc.)
 - d. *Cross-national engagement* with Canada, via International Joint Commission and implementation of the GLWQA.

2. Maybe too many organizations -- multi-organizational coordination framework does not appear strong.



Preliminary Findings: Programs with “Effectiveness” Focus

- Common Characteristics -- CBP, LISS, TBEP:
 - A single “institutional home” for basin-wide assemblage of information on nutrient management problems and interventions.
 - This “institutional home” may coordinate:
 - Scientific efforts to guide interventions and to identify priority areas to reduce nutrients.
 - Systems for tracking implementation progress and performance, and then reporting on it.
 - Includes mechanisms for updating that information and making it available.



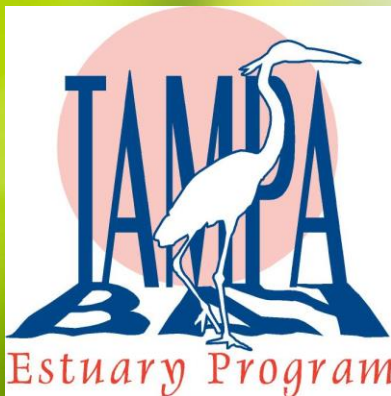
Preliminary Findings: Policy Tools Used in Other Basins

- Policy tools used in other basin programs, *but not in Ohio Lake Erie basin*:
 - a. Regulatory Tools:
 - a. More stringent AFO regulatory requirements (CBP-MD)
 - b. Water Quality Standards, an impairment designation, and TMDL processes (CBP States)
 - c. WQ trading policies/"bubble" policies (LISS, CBP states)
 - d. Agriculture Uncertainty programs (CBP – VA & MD)
 - e. State fertilizer requirements (TBEP – FL)
 - b. Financial Investment Tools
 - a. Budget Surplus set-asides (CBP-VA)
 - b. Private sector funding (TBEP)




Preliminary Findings: Policy Tools Used in Other Basins - continued

- Management Frameworks for Policy Tools used in other basin programs, *but not in Ohio Lake Erie basin:*
 - a. Centralized basin-wide administration & implementation management
 - b. Water Quality Standards for Nutrients & TMDLs
 - c. Implementation action tracking & accountability framework
 - d. Broad-based Nutrient Management Consortium.



Lessons for Lake Erie Policymakers

- ❖ There are multiple authority-based tools in place (regulations), but they are not comprehensive.
 - ❖ Minor permits without limits on phosphorus.
 - ❖ Major POTW permits – not as stringent as they might be?
 - ❖ More could be done to monitor and upgrade storm-water and agriculture interventions?
- ❖ Spending lots of \$ (\$100's of millions annually) – is more money the answer?
- ❖ Other US basin-wide programs – CBP, LISS Program, & TBEP -- offer lessons & policy tools which may be considered.
 - ❖ Integrated institutional responsibility for management – information, scientific enterprises, etc.
 - ❖ Tracking and accountability appears necessary for measure and perhaps progress as well.
- ❖ There are also other policy tools that can be considered, a number of which are used in other basin-wide programs.
 - ❖ More stringent agricultural regulations.
 - ❖ WQ trading policies to reduce costs and generate incentive for NPS actions.
 - ❖ WQ standards, impairment designation, and TMDL(s), perhaps after cross-national allocations are made through “Annex 4” process?



Lessons
Learned

Final Thoughts

- ❖ There have been multiple responses to the Toledo water supply crisis since last year.
 - ❖ They are to be commended, but not – alone -- constitute a good long term strategy.
- ❖ Current nutrient management efforts in the Ohio Lake Erie Basin are substantial, but they are not sufficient.
 - ❖ We have continuing HAB problems, and responses that look more like “stove-piped” efforts than a cohesive “watershed-based” approach.
- ❖ Other US basin-wide programs – Chesapeake Bay, Long Island Sound, TBEP -- offer lessons and policy tools which can be considered.



Thank You!



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