Binational Phosphorus Load Reduction Efforts to Prevent Lake Erie HABs

Santina Wortman, EPA Region 5

Region 5 HABs Workshop

April 27, 2016

Outline

- GLWQA: binational framework for nutrient management
- Lake Erie phosphorus reduction
  - Process for developing targets
  - Expected outcome for the Lake
- Domestic action plans
  - Timing and content
  - Early actions
- Next Steps

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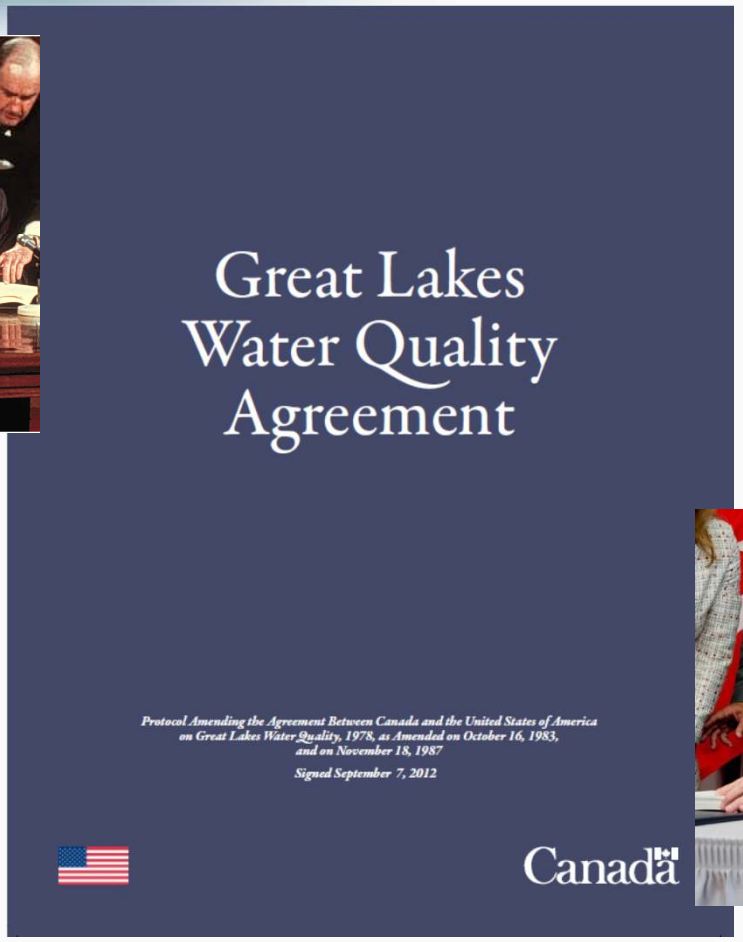
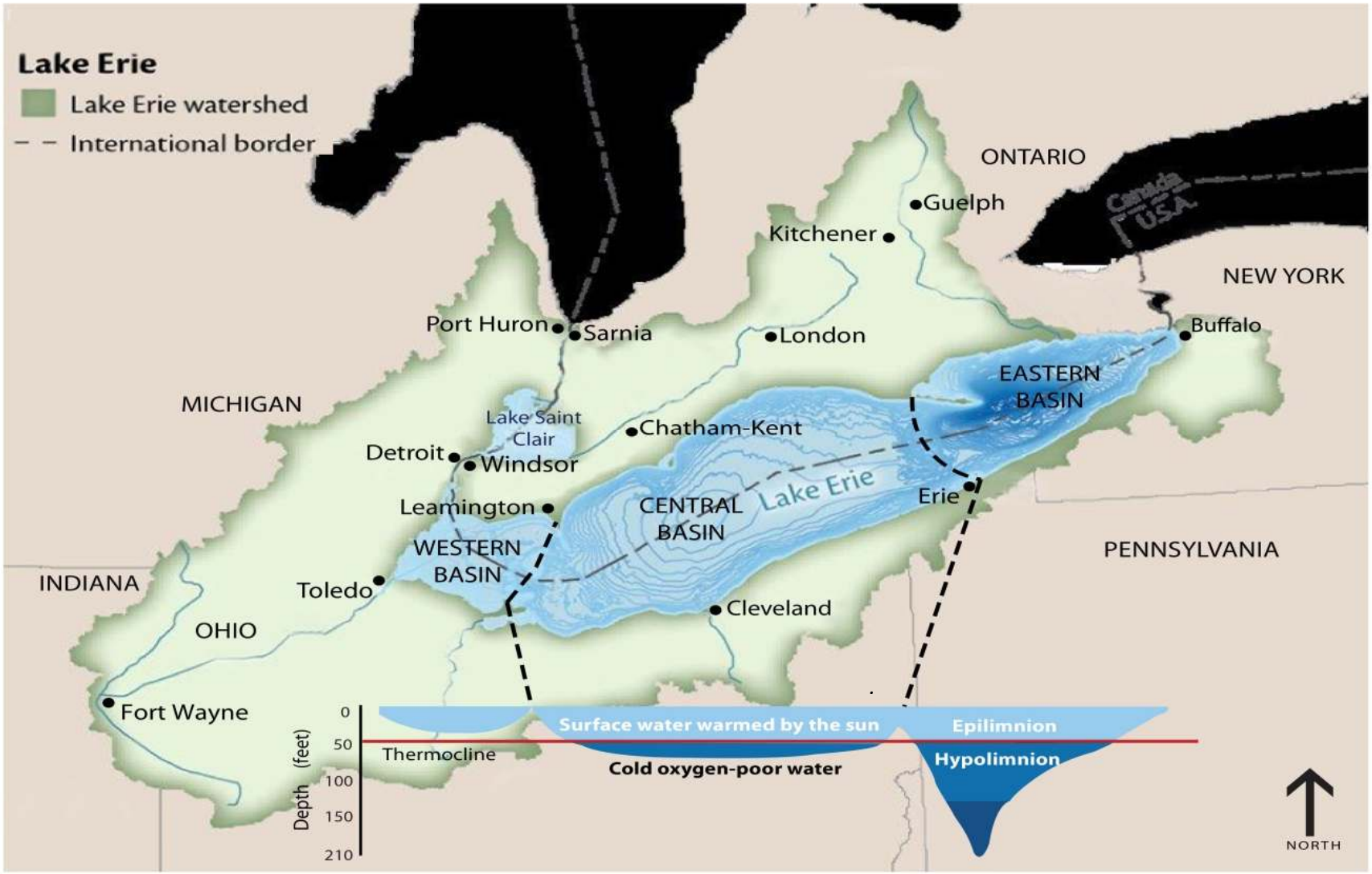

Great Lakes
Water Quality
Agreement
Protocol Amending the Agreement Between Canada and the United States of America
on Great Lakes Water Quality, 1978, as Amended on October 16, 1983,
and on November 18, 1987
Signed September 7, 2012
Canada

2012

Annex 4: Nutrients

The Lake that Acts as 3 Lakes

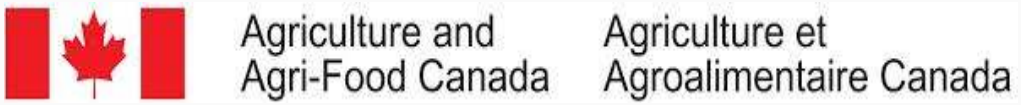


Nutrients Annex

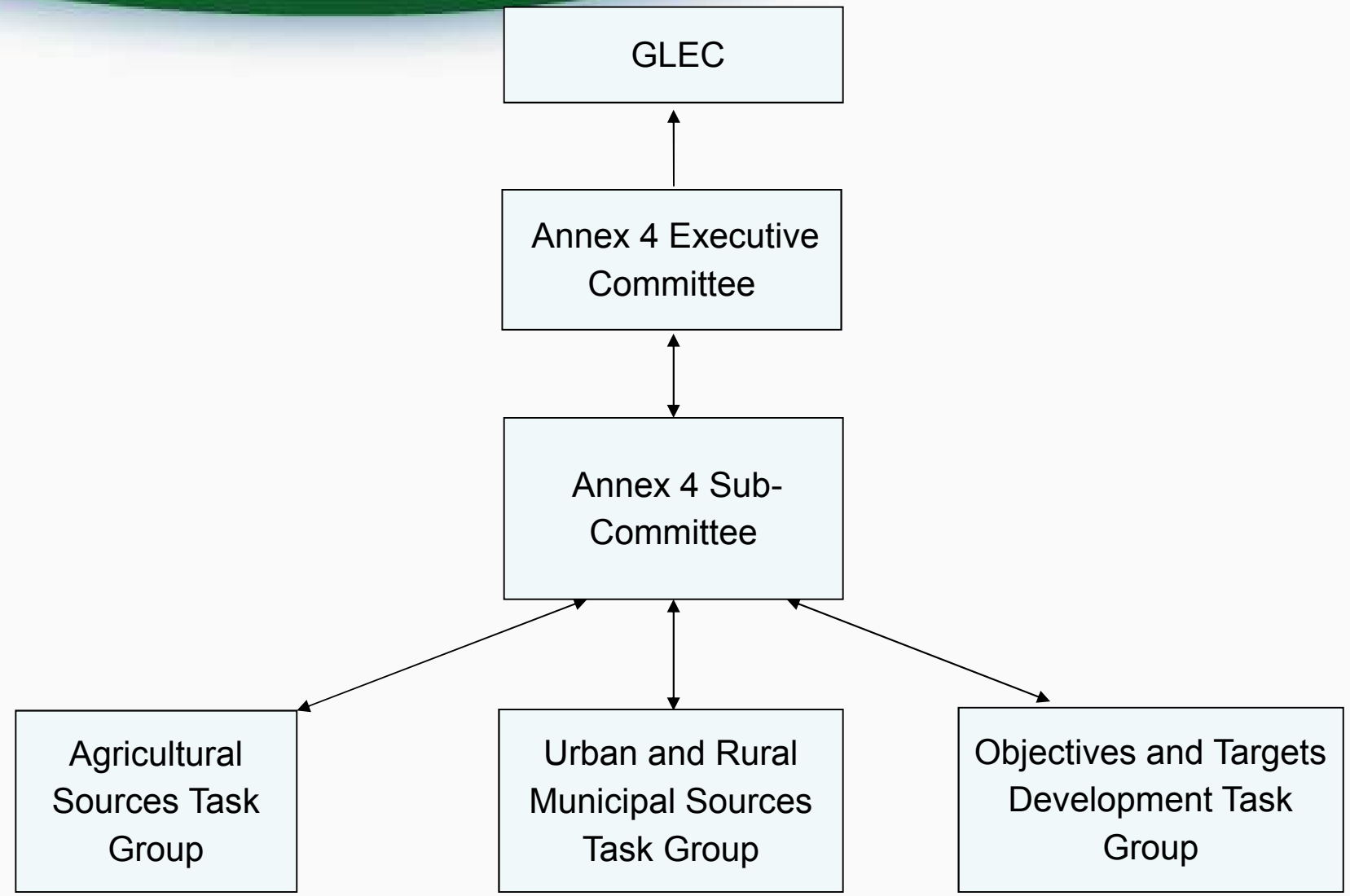
In cooperation and consultation with stakeholders –

- Review, revise and/or develop concentration and loadings objectives for offshore and nearshore waters of Great Lakes **starting with Lake Erie**
- Establish allocations by country
- Establish load reduction targets for priority watersheds that have significant or localized impact
- Implement P reduction programs
- Monitor and report progress

Nutrients Annex Subcommittee

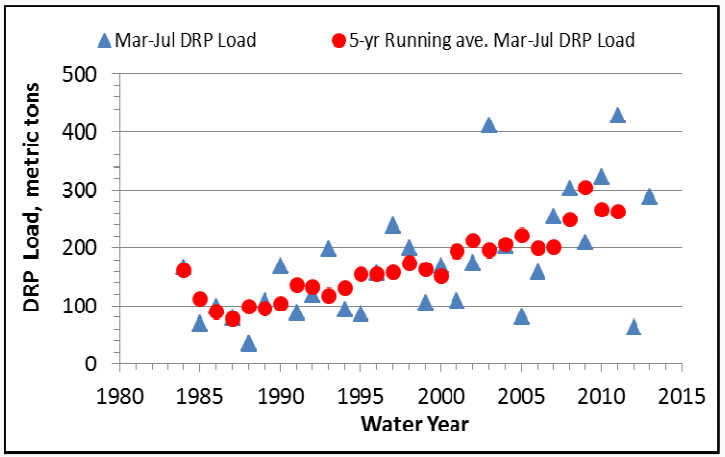


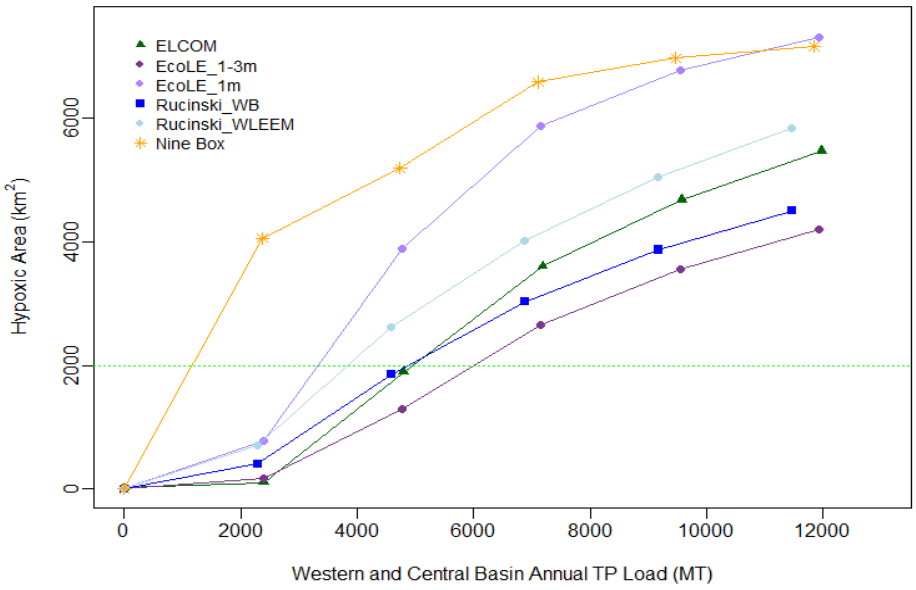
Subcommittee Structure

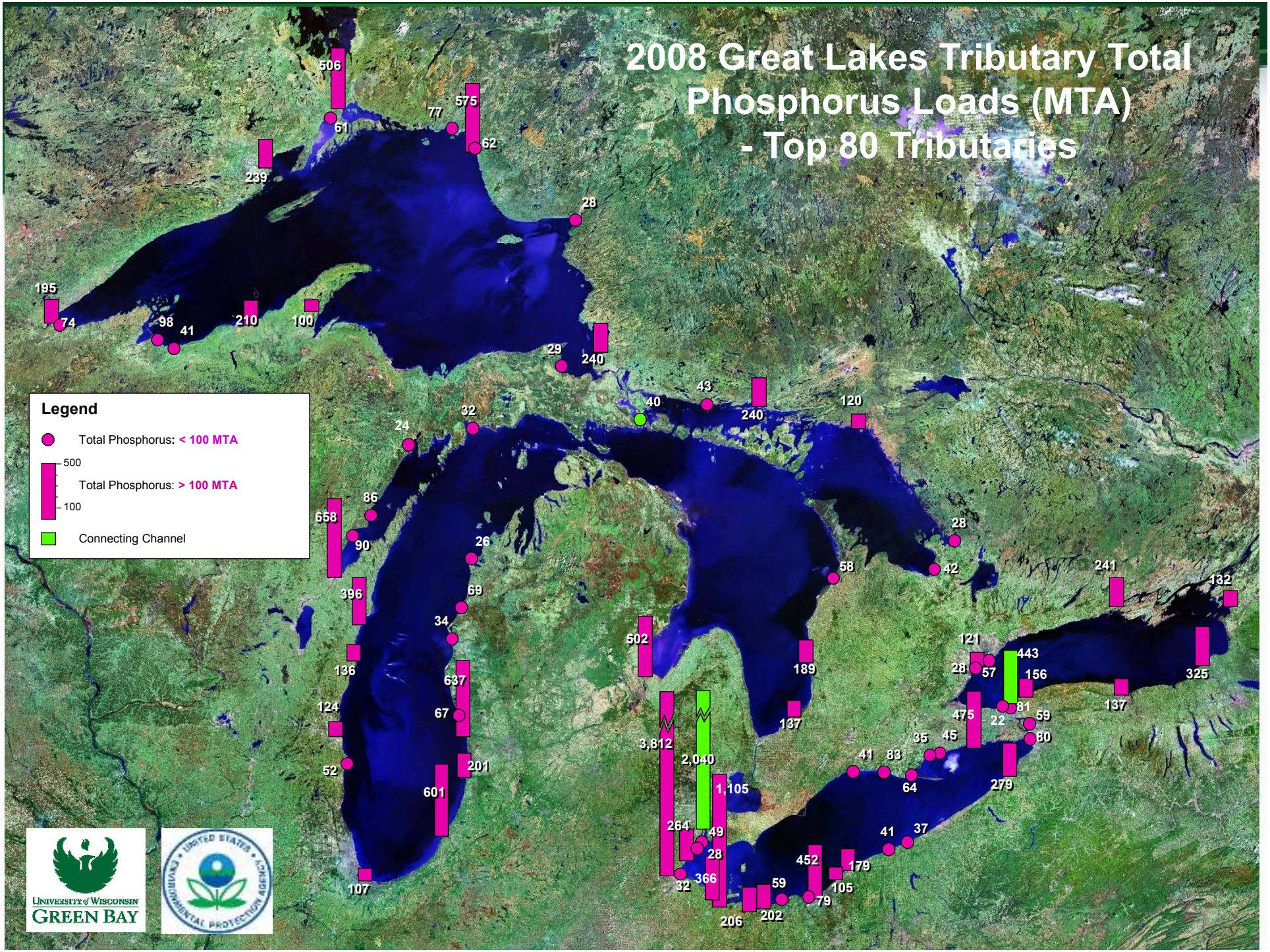


The Objectives and Targets Development Task Team:

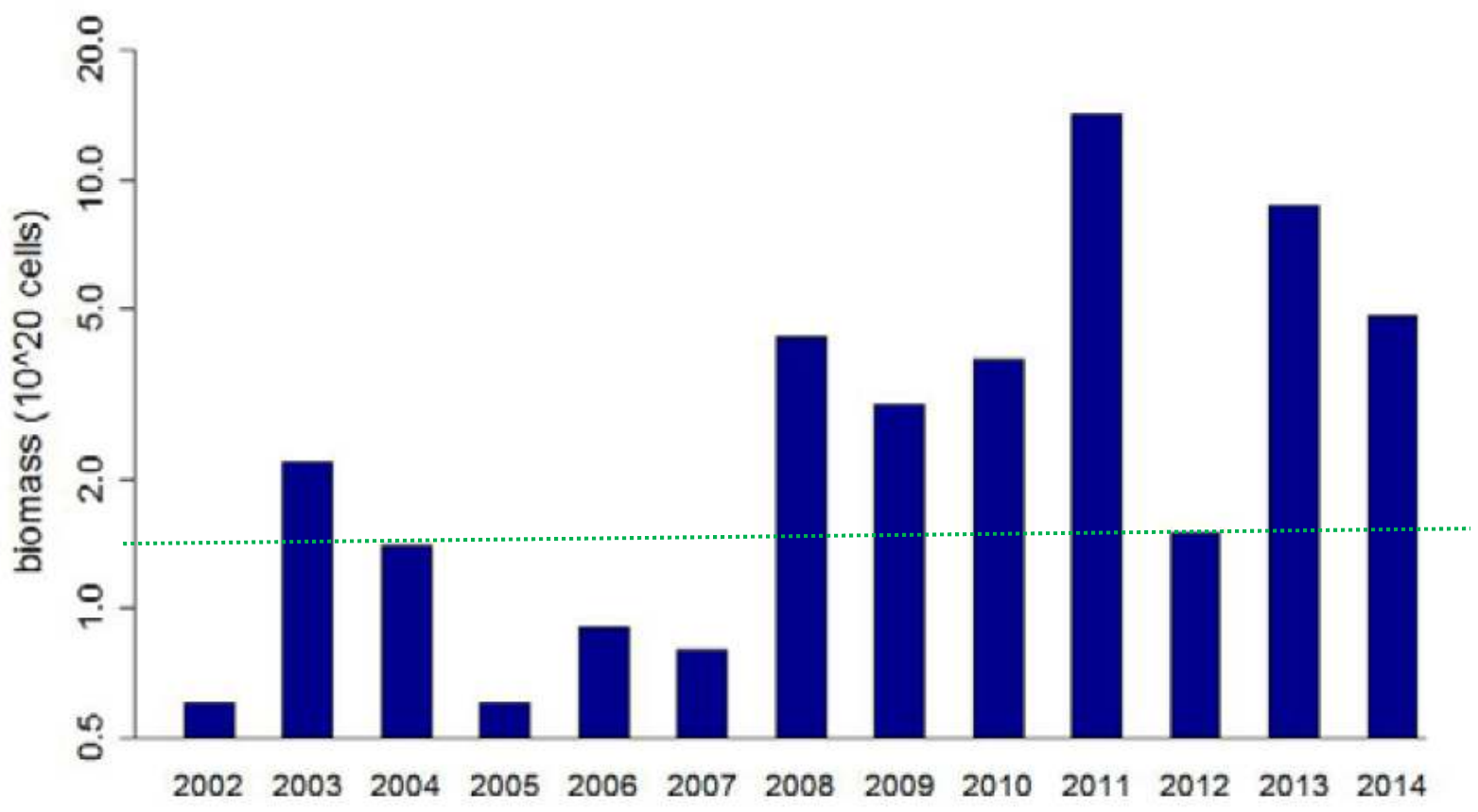
- Evaluated conditions in the lake
- Determined what's limiting algal growth
- Established eutrophication response indicators and benchmarks
- Developed multi-modeling approach to link P loadings to eutrophication responses
- Developed load response curves
- Selected P loads from curves that met eutrophication response indicator benchmarks
- Recommended Loading targets






2008 Great Lakes Tributary Total Phosphorus Loads (MTA) - Top 80 Tributaries
Legend
Total Phosphorus: < 100 MTA
500
Total Phosphorus: > 100 MTA
100
Connecting Channel
506
61
77
575
62
239
28
195
74
98
41
210
100
29
240
40
43
240
120
32
24
658
86
90
26
69
396
34
136
637
67
124
52
601
201
107
58
42
28
241
132
502
189
121
28
57
443
156
81
59
80
475
22
137
325
137
3,812
2,040
1,105
35
45
41
83
64
279
264
49
28
366
32
206
202
59
79
452
179
105
41
37
University of Wisconsin Green Bay
United States Environmental Protection Agency

Expected Outcome for HABs



Cyanobacterial biomass for western Lake Erie based on measurement from satellite. (Stumpf personal communication, updated from Stumpf et al., 2012).

Binational Phosphorus Load Reduction Targets/Allocations

Lake Ecosystem Objectives Great Lakes Water Quality Agreement Annex 4, Section B	Western Basin of Lake Erie	Central Basin of Lake Erie
Minimize the extent of hypoxic zones in the Waters of the Great Lakes associated with excessive phosphorus loading, with particular emphasis on Lake Erie	40% reduction from 2008 loads in total phosphorus entering the Western Basin and Central Basin of Lake Erie – from the United States and from Canada - to achieve 6000 MT Central Basin load. **This amounts to a reduction from the United States and Canada of 3,316 metric tons and 212 metric tons, respectively**	
Maintain algal species consistent with healthy aquatic ecosystems in the nearshore Waters of the Great Lakes	40% reduction in spring total and soluble reactive phosphorus loads from the following watersheds where localized algae is a problem:	
	Thames River - Canada Maumee River - US River Raisin - US Portage River - US Toussaint Creek - US Leamington Tributaries – Canada	Sandusky River - US Huron River, OH – US
Maintain cyanobacteria biomass at levels that do not produce concentrations of toxins that pose a threat to human or ecosystem health in the Waters of the Great Lakes	40 % reduction in spring total and soluble reactive phosphorus loads from the Maumee River (U.S.)	N/A


Lake Erie Priority Tributaries for Nearshore Blooms
Lake Huron
Lake Ontario
Thames River
St. Clair River
Lake St. Clair
Eastern Basin
Lake Erie
(Central Basin)
Leamington Tribs
River Raisin
Western Basin
Toussaint Creek
Portage River
Huron River
Maumee River
Sandusky River
Legend
Tributary Outlet
L. Erie Watershed
L. Huron Watershed
0
50
100
Kilometers
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Daniel Obenour, UM/NCSU
Mary Anne Evans, USGS

Progress Toward Meeting GLWQA Commitments

Moving forward: Domestic Action Plans

- Timing & approach
- Strategic implementation
- Adaptive management

Commitments & Interim Goals

- Western Lake Erie Collaborative – Ontario, Ohio & Michigan committed to achieve 40% by 2025
- Joint Action Plan – all Lake Erie States & Ontario; interim goals for 2020
- Indiana, Ohio, Michigan and Pennsylvania developing domestic action plans to meet Annex 4 targets

Key Components of DAPs

- Watershed specific characterization of loads
- Define specific programs, actions and delivery mechanisms
- Establish timelines and benchmarks to gauge progress
- Develop a “trigger mechanism” that enables the modification of programs and actions based on results and new information

New Funding Initiatives

- NRCS - 3 year $41 M WLEB Initiative doubles the acreage under conservation
- GLRI $11.8M in 2014 (cover crops & controlled drainage programs, OEPA tributary monitoring, NOAA forecasting tools, etc.)
- Ontario - Great Lakes Agricultural Stewardship Initiative - $12 M
- Several initiatives in Ohio, Indiana

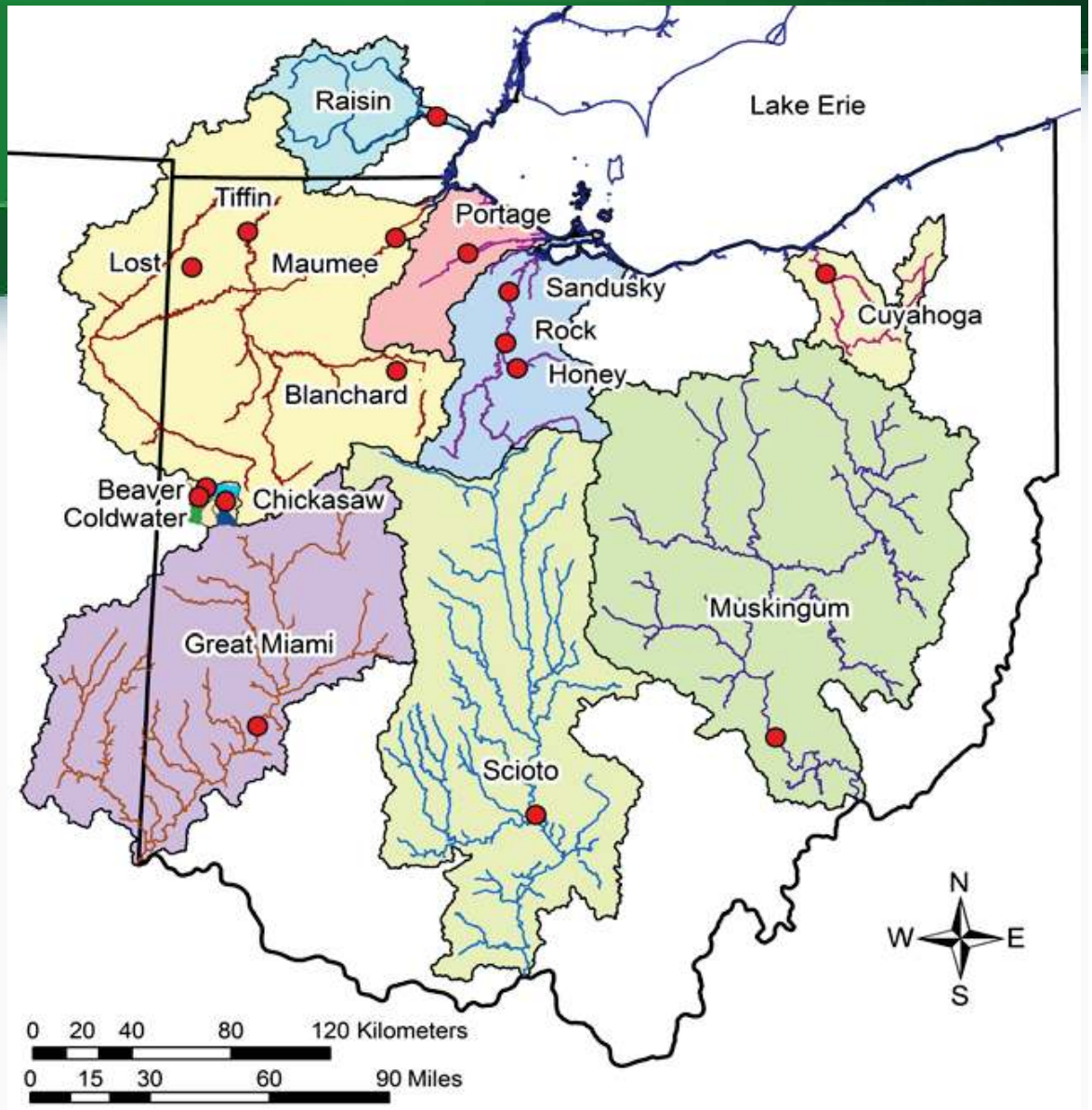
How are we going to track progress?

According to NEMWI's study –

40% phosphorus load reduction attributable to implementation of agricultural bmps *can* be detected within 10 years, with:

1. Adequate monitoring (right places, frequency, duration and supporting information), accompanied by
2. Aggressive implementation on the ground within the first few years

We have to be strategic about where to implement and where to monitor in order to track progress towards meeting the load reduction goals for the Lake.



Active Stations in the Heidelberg Tributary Loading Program as of April 2014

Next Steps

- Binational P Reduction Strategy in prep
- Revisit Target for Eastern basin of Lake Erie
- Domestic Action Plans by February 2018
- Next up: Lake Ontario

Questions?