Environment Canada Environnement Canada

Canada

Current and Emerging Issues for Great Lakes and St. Lawrence Cities:

Harmful and Nuisance Algal blooms in Lake Erie

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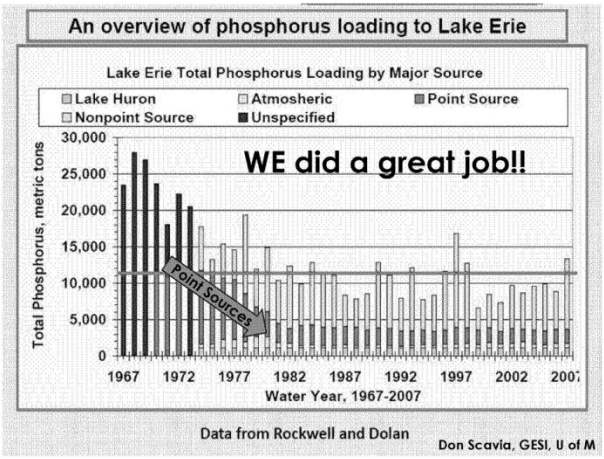
It’s not a New Problem

- Harmful and nuisance algal blooms were a significant problem in Lakes Erie, Ontario and Huron in the 1960s and 1970s.
- Major driver for the signing of the first Canada-United States Great Lakes Water Quality Agreement in 1972
  - The Agreement established binational targets for the reduction of phosphorus discharges to the Great Lakes
- Governments responded by:
  - Regulating phosphorus in detergents
  - Investing in sewage treatment
  - Developing and promoting best management practices for agriculture lands



Harmful and Nuisance algal blooms in Lake Erie have been increasing since the late 1990's

- Harmful and nuisance algal blooms (foul beaches, degrade fish and wildlife habitat, risk animal health and make water unsafe for drinking and swimming thereby impacting commercial fishing, tourism, recreation and property values
- Some blooms produce toxins which require additional treatment before the water is safe for human consumption, resulting in closure of beaches and drinking water intakes, or increased drinking water treatment costs
- Surface blooms vary in timing, extent and duration from year to year
  - In 2011 the bloom extended 5000km2 and levels of toxin (microcystin) reached 50 x the World Health Organization's recommended level for safe recreation and 1,200 x the level for safe drinking water.

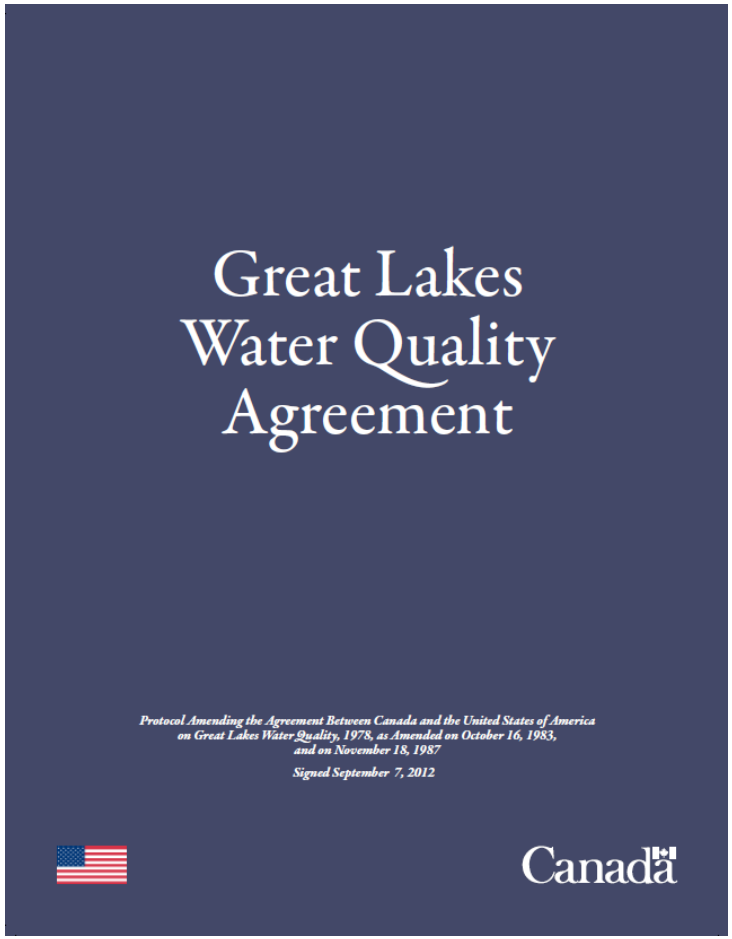




Causes and Sources

- Nutrients (especially phosphorus but also nitrogen) discharges from urban and agricultural landscapes due to changes in land use and land management practices and population growth
- Increased frequency of severe storms
- Changes to water clarity and nutrient flows caused by Aquatic Invasive Species (Zebra and Quagga Mussels)
- Increased temperatures
- Longer growing seasons

The 2012 GLWQA includes commitments to develop new phosphorus targets and action plans



- 2012 Canada-U.S. Great Lakes Water Quality Agreement commitments:
  - Update phosphorus concentration and loading targets, apportioned by country, for Lake Erie by 2016
  - Develop domestic action plans to meet these new targets by 2018.

IJC Advice,
"A Balanced Diet for Lake Erie"

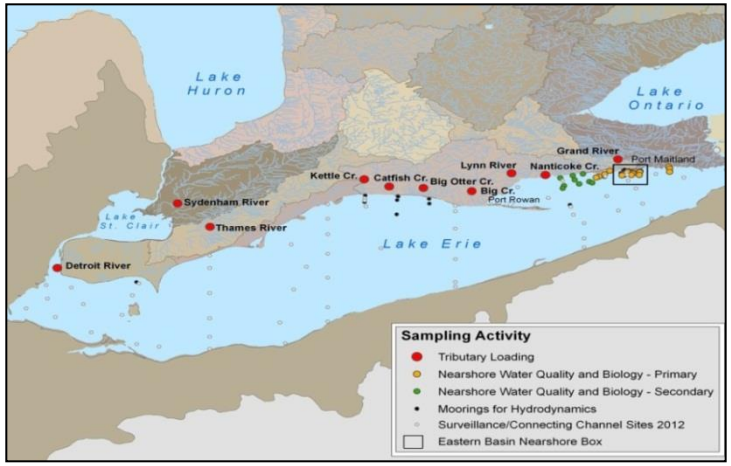
- Under the GLWQA, the International Joint Commission (IJC) has a "standing reference" to provide advice to Canada and the United States on the restoration and protection of the Great Lakes.
- IJC Report has been helpful in bringing needed attention to the issue, describing the magnitude of the problem and in recommending and policy options that should be considered.

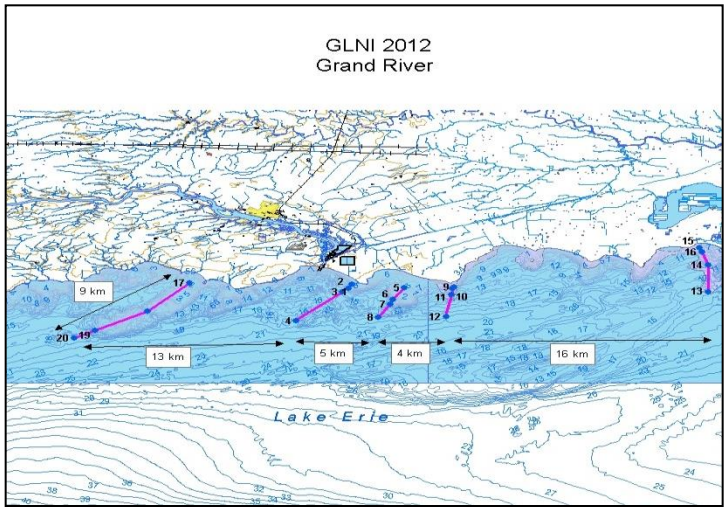
It's Complicated!

- What is the end goal for algae in Lake Erie – it's not zero!
- How much of a reduction in phosphorus inputs will be required to achieve this goal?
- How should phosphorus reductions be divided between Canada and the United States?
- Within Canada, how should phosphorus reductions be divided between sectors / watersheds / communities?
- What are the most cost effective ways of achieving phosphorus reductions, and how should costs be shared by levels of government and the private sector?
- And how will we measure success?

Canada's Great Lakes Nutrient Initiative (GLNI)

- The Initiative ($16M/4 years) will:
  - Establish current **nutrient loadings** from Canadian tributaries
  - Enhance knowledge of the **factors that impact** algae growth
  - Support the development of phosphorus concentration and tributary load reduction targets apportioned by country

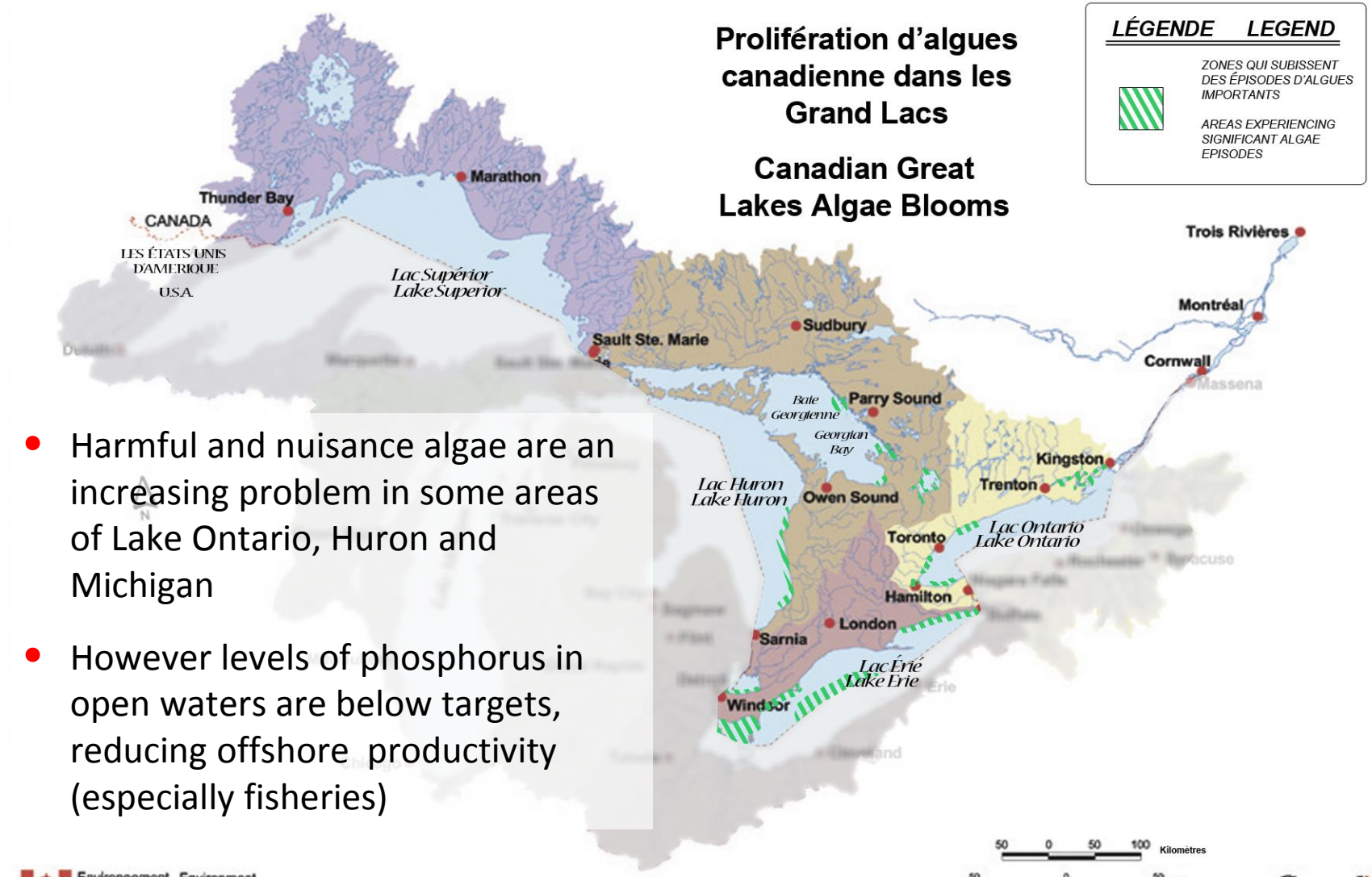




Path forward

- **Phosphorus Objectives for Lake Erie by 2016**
  - Draft phosphorus objectives targeted for late 2014
  - Expert and stakeholder consultation targeted for Spring 2015.
  - Finalization in 2016.
- **Development of Domestic action plans by 2018**
  - Work underway with Conservation Authorities to identify early actions, lay groundwork for targets
  - Domestic action plan to be developed 2016 -2018 based on targets and policy recommendations.

And it gets even more complex… as we turn to addressing algal issues in the other Great Lakes



- Harmful and nuisance algae are an increasing problem in some areas of Lake Ontario, Huron and Michigan
- However levels of phosphorus in open waters are below targets, reducing offshore productivity (especially fisheries)

Cities and local governments are also taking action

- In many municipalities;
  - Wastewater treatment plants are being optimized
  - Management of stormwater ponds is improving
  - There are bans on phosphorus in lawn fertilizers
  - Street sweeping
  - Implementing green infrastructure and LID features
- Conservation authorities are;
  - Coordinating the development of watershed management plans
  - Sharing best practices around stormwater management
  - Education of local stakeholders and citizens

TAKE HOME MESSAGES

- Algae is a significant problem and significant effort will be required to address it.
- We have successfully addressed this problem before and we can be successful again.
- Continued engagement of cities – in decision-making, and in taking action – is critical to success.
- Work is ongoing, and consultations are expected to ramp up in 2015 in advance of Lake Erie targets (2016) and action plans (2018).