

Tackling Algae in Lake Erie and Lake St Clair



Nov 29th, 2016
London, Ontario
Sandra George – ECCC
Matt Uza -MOECC

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Today you will hear about...

Quick facts about Lake Erie
Lake Erie Algal Issues
GLWQA Nutrients Annex
Phosphorus Reduction Targets
Domestic Action Plans
Wastewater



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About Lake Erie

- Includes Huron-Erie Corridor (including Lake St. Clair)
- Shallowest and warmest of the Great Lakes
- Most biologically productive
- 13.5 million people in watershed
- Intensive land use – both urban and agriculture
- Provides drinking water for over 11 million people
- 8 billion gallons per day of treated sewage into Lake Erie and waterways
- 60-80% agricultural land use
- Many areas of significant ecological interest
- Thriving sports and commercial fishery
- Shared jurisdictions: Canada/U.S.
- U.S. watershed 2x size of Canada's



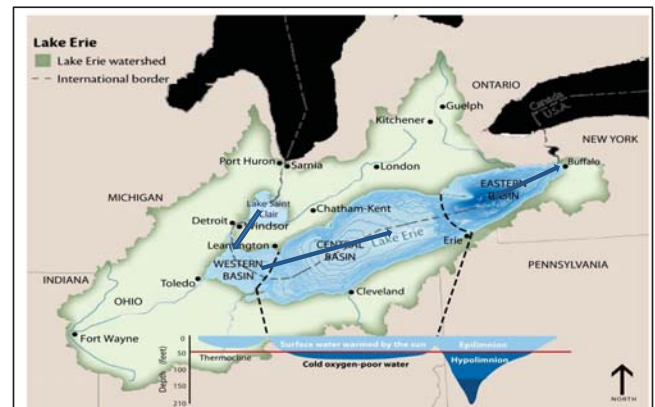
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Canada

Ontario

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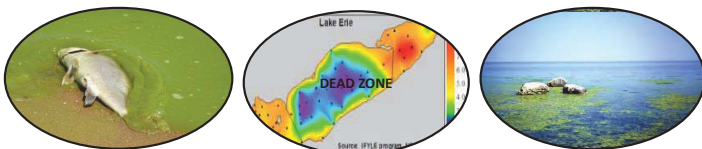
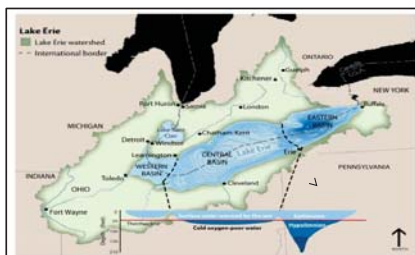
How water moves through Lake Erie



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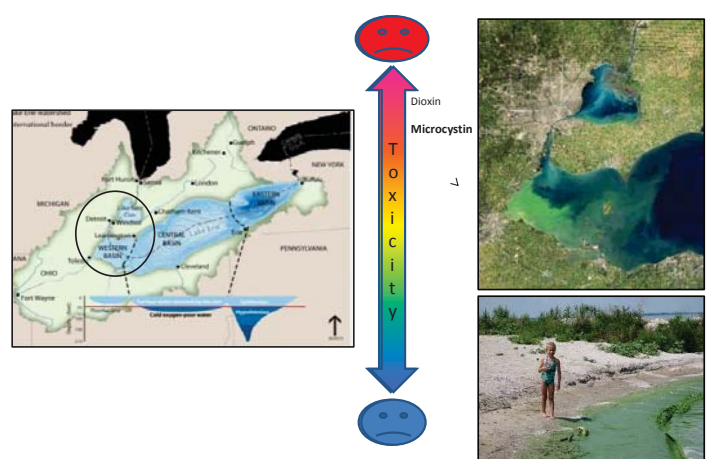
Lake Erie's response to excessive phosphorus differs depending where you are ..



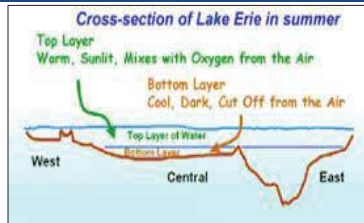
WEST → EAST

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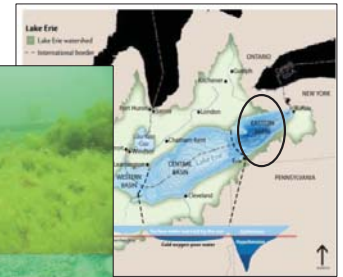
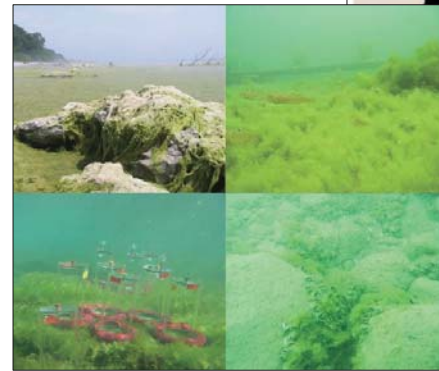
Harmful Algal Blooms in the Western Basin Lake Erie and Lake St. Clair



LOW – NO oxygen at certain times of the year In Lake Erie's Central Basin



Cladophora in the Lake Erie Eastern Basin



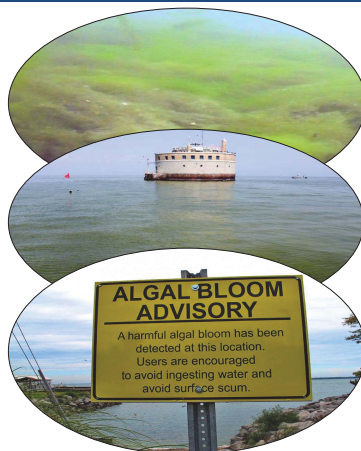
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Algal blooms in Lake Erie have been increasing since the late 1990s

Environmental Impacts

Human Health

Economic



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New Factors at Play



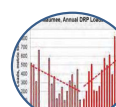
Population growth and land use changes



A changing climate



Ecosystem changes - aquatic invasive species



Bioavailable phosphorus increasing

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Great Lakes Water Quality Agreement

1972



Great Lakes
Water Quality
Agreement

2012



Protocol Amending the Agreement Between Canada and the United States of America
on Great Lakes Water Quality, 1972, as Amended on October 16, 1985,
and on September 19, 2001
Signed September 17, 2012

Canada

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Nutrients- What we must do

In cooperation and consultation with stakeholders, First Nations and Métis, Tribes



- 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
- Develop and implement P reduction plans for each country
- Monitor and report progress, and adaptive management

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Healthy Algal Communities are a Good Thing!

THIS

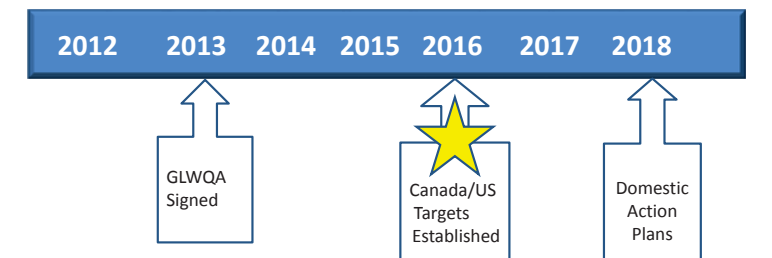


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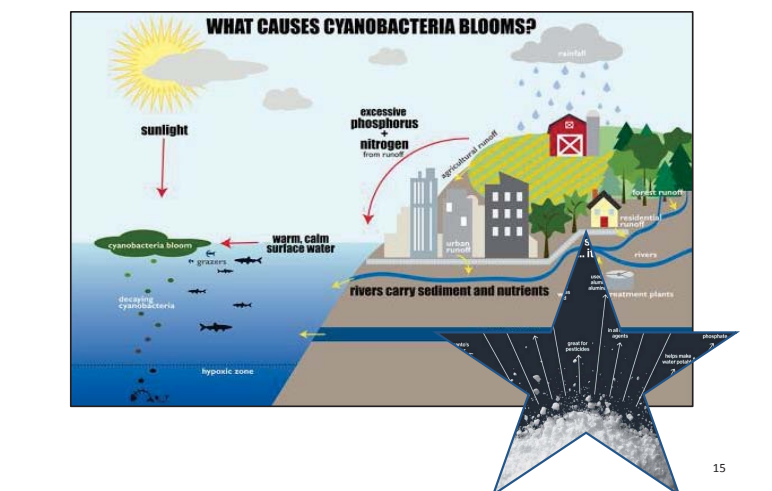


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Time-bounded Commitments for Lake Erie

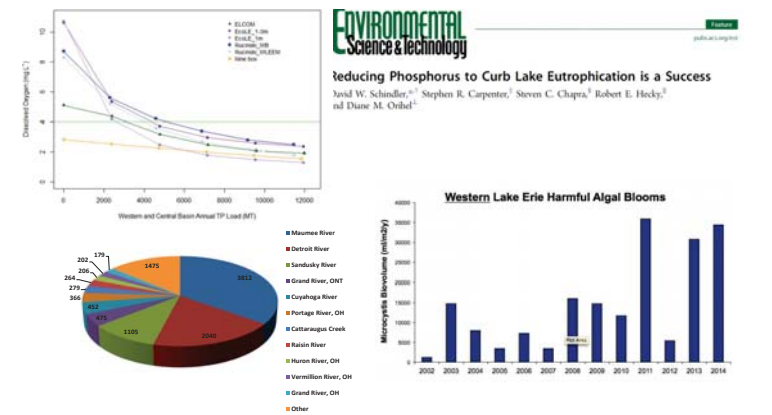


Why did we target phosphorus?



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Phosphorus Targets for Lake Erie Science and Modelling

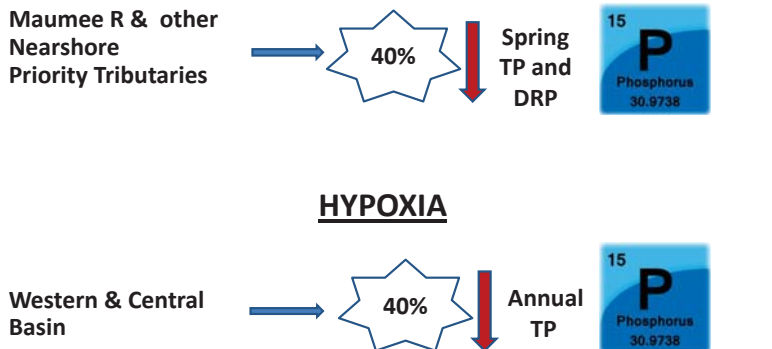


Strong Public support for Targets



Binational Phosphorus Load Reduction Targets

HARMFUL ALGAL BLOOMS

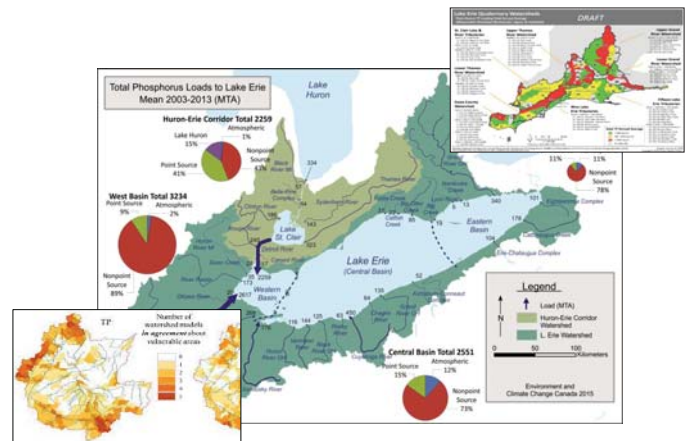


Nearshore Priority Tributaries



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Sources of phosphorus vary by watershed



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Domestic Plans



Image: Ohio Sea Grant

To be successful is going to take all of us!

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Canada's Domestic Action Plan (DAP)

- One plan to meet GLWQA/COA commitments
(will also meet Western Basin of Lake Erie Collaborative Agreement, Ontario's Great Lakes Protection Act and the Great Lakes Commission's Lake Erie Nutrient Targets Working Group's Joint Action Plan)
- Includes:
 - Actions for Western and Central basin
 - Eastern basin – tbc
 - Actions of governments and other partners (e.g., Conservation Authorities, municipalities, etc.)
- Living document 5 year plan starting 2018
- Engagement throughout the process of development and beyond...
- Improvements to plan overtime
- Sustainable planning and adaptive management
- Completed on or before Feb 2018 – GLWQA
- Delivered in partnership by the following 5 lead agencies:
 - Environment and Climate Change Canada (ECCC)
 - Agriculture and Agri-Food Canada (AAFC)
 - Ontario Ministry of the Environment and Climate Change (MOECC)
 - Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
 - Ontario Ministry of Natural Resources and Forestry (MNRF)

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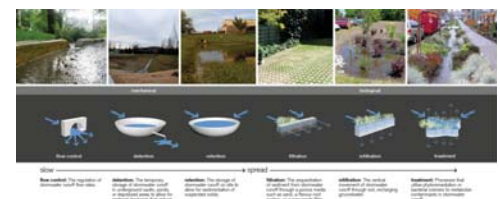
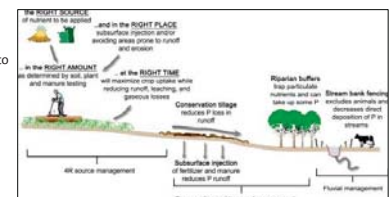
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Potential Actions

The suite of potential actions that will achieve the greatest nutrient reductions while being the most effective in terms of cost, time and desired outcomes

Approaches to achieve the 40% - What we know

- Reductions from all sectors are required
- Adopt a multi barrier approach - suites of practices need to be implemented to significantly reduce P losses
- Target specific practices and geographies
- Enhanced outreach/education is essential
- Costs are highly variable depending on which actions are selected



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What we have heard so far...

- Need target for the Eastern Basin
- Requires holistic approach
- Significant investments required
- All sources need to be addressed including potential instream sources
- All programs/policies should be reviewed and updated as necessary bearing in mind economic impacts
- Sustainability focus – consider environment, social and economic perspectives
- Clear timelines for implementation
- Integrated coordinated research, monitoring and modelling networks need to be established and maintained
- Integrated planning at all levels (plot-subwatershed-watershed-basin-lake)
- Need to establish appropriate and measurable baselines and metrics to track progress
- Increase engagement efforts
- Target high contributing areas and large sources first
- Process to fill gaps in knowledge
- Look forward – future climate trends, urbanization, agriculture
- Recognize industry leaders
- Solutions that support innovation

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Actions to Reduce Phosphorus Loads from Municipal Urban Sources to Help Meet Binational Lake Erie Targets Under a Canada-Ontario Action Plan for Lake Erie



- Ontario Ministry of the Environment and Climate Change
- City of London Council - November 29, 2016

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Ontario - Policy Proposal Notice for Lake Erie

On October 6th, Ontario (MOECC in collaboration with OMAFRA and MNRF) posted on the EBR for public comment a Policy Proposal Notice for 45 days which:

1. Sets out Ontario's target under GLPA of 40% phosphorus load reduction by 2025 (from 2008 levels) for the Ontario portion of the western and central basins of Lake Erie, as well as an aspirational interim goal of a 20% reduction by 2020
2. Seeks public input on preliminary list of Ontario's proposed actions which may be incorporated in the draft Canada-Ontario Action Plan for Lake Erie
 - Proposed preliminary actions are grouped into several broad themes:
 - Point source reductions (e.g., **municipal and industrial wastewater**)
 - Non-point source reductions (e.g., **stormwater**)
 - Agricultural source reductions
 - Natural heritage (e.g., wetlands)
 - Science, monitoring and reporting
 - Posting will facilitate the development of additional actions, or the modification of the proposed actions, for the draft Action Plan

The Policy Proposal Notice can be found on the www.ebr.gov.on.ca by searching the number 012-8760



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Ontario's Proposed Phosphorus Reduction Actions of Interest to Urban Municipalities

***Note: These are actions proposed for inclusion in a future Action Plan for Lake Erie, per the October 6, 2016 EBR posting. Additional actions are under development and will be included in a draft Action Plan for Lake Erie (date of posting tbd).**

*Point Sources:

- Work with partners to update provincial policies for Lakes Erie and Ontario to establish a legal effluent discharge limit of 0.5 mg/L of total phosphorus for municipal sewage treatment plants (STPs) having average daily flow capacity of 3.78 million litres or more per day.
- Continue to support the development of area-wide optimization programs for municipal wastewater treatment plants to reduce phosphorus loads from STPs and include Lake Erie as the priority geography for this effort. As part of this effort, Ontario encourages municipalities to consider, where appropriate, optimization of municipal wastewater treatment plants to improve plant performance and lower phosphorus discharges.
- Work with partners to reduce loadings where feasible, through upgrades from secondary to tertiary level of treatment for STPs that have an average daily flow capacity of 3.78 million litres or more per day in the Lake Erie basin, as well as improvements to wastewater treatment and collection infrastructure to reduce combined sewer overflows and bypasses, and stormwater management systems (including facility rehabilitation and incorporating green infrastructure).

*Non-point Sources:

- Ontario is working with developers and others to promote and support the use of green infrastructure and low impact development (LID), including clarifying and enhancing policies, and developing green standards. Ontario is in the process of drafting a LID guidance manual that will assist proponents in implementing their efforts. The draft manual is expected to be available for public comment in early 2017.



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Background – Federal Infrastructure Funding

•The 2016 Federal Fall Economic Statement committed \$180 billion towards infrastructure spending over 12 years. This includes \$14.3 billion over 5 years for Phase One (starts in 2016-17), and \$81 billion over 11 years for Phase Two, across Canada.

•The \$14.3 billion in short-term funding includes:

- **Green Infrastructure - \$5 billion** over five years for investments in water, wastewater and other green infrastructure across Canada (including for First Nations).
 - Included within the \$5 billion for Green Infrastructure is **\$2 billion** over three years for a new **Clean Water and Wastewater Fund (CWWF)** for provinces, territories and municipalities.
 - Ontario's share of the CWWF is **\$570 million**.

•The \$81 B in long term Phase Two funding over 11 years includes:

- **Green Infrastructure - \$21.9 billion** to support investments across Canada that target reducing greenhouse gas emissions, enhance greater climate change adaptation and resilience; and ensuring community access to clean air and safe drinking water;
 - Ontario is in discussions with Canada regarding the design of Phase Two
 - Wastewater infrastructure for Lake Erie remains a priority for Ontario



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Clean Water and Wastewater Fund – Ontario Overview

- On September 14, 2016, Canada and Ontario signed a bilateral agreement to make funding available under the federal Clean Water and Wastewater Fund (CWWF).
- Accelerates short-term community investments, while supporting the rehabilitation and modernization of drinking water, wastewater and stormwater infrastructure.
- Canada providing up to 50 per cent of this funding while Ontario will invest up to 25 per cent. Municipalities, First Nations and Local Services Boards will cover remaining costs.
- Allocations under the CWWF were based on a formula - all eligible municipalities and LSB's received a letter indicating the amount of funding each is eligible to apply for.
- Eligible recipients were required to submit project lists by October 31, 2016.
- Wide range of capital and non-capital projects were eligible.
- Project submissions currently being assessed for eligibility.
- Projects to be substantially completed by March 31, 2018 (up to 25% of costs can be incurred up to March 31, 2019 with approval)



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CWWF Opportunity: Potential Wastewater Projects to Support Phosphorus Reduction



•Capital Projects:

- Treatment plant upgrades from secondary to tertiary
- Improvements (e.g., new, replacement, rehabilitation, repair) to collection and/or treatment works that would lead to a reduction in volumes of CSO's/bypasses
 - e.g., sewer separation and replacement, reduce inflow/infiltration, CSO storage or satellite treatment
- Improvements to stormwater management infrastructure
 - e.g., rehabilitation/repair/improve existing works (e.g., pond cleanouts, retrofit green infrastructure)

•Non-capital Projects:

- Planning, assessments and engineering-type work that are precursors to larger projects which could only be funded/completed post-2018, potentially under phase two, for example:
 - to support upgrades from secondary to tertiary at larger wastewater treatment plants
 - major collection system upgrades to reduce existing significant CSOs and/or bypasses
- Optimization work (e.g., studies/technical assistance) aimed at reducing effluent phosphorus concentrations to below 0.5 mg/L for secondary wastewater treatment plants within the basins of Lakes Erie and Ontario