



Overview on Green Infrastructure Actions within the Draft Canada-Ontario Action Plan for Lake Erie

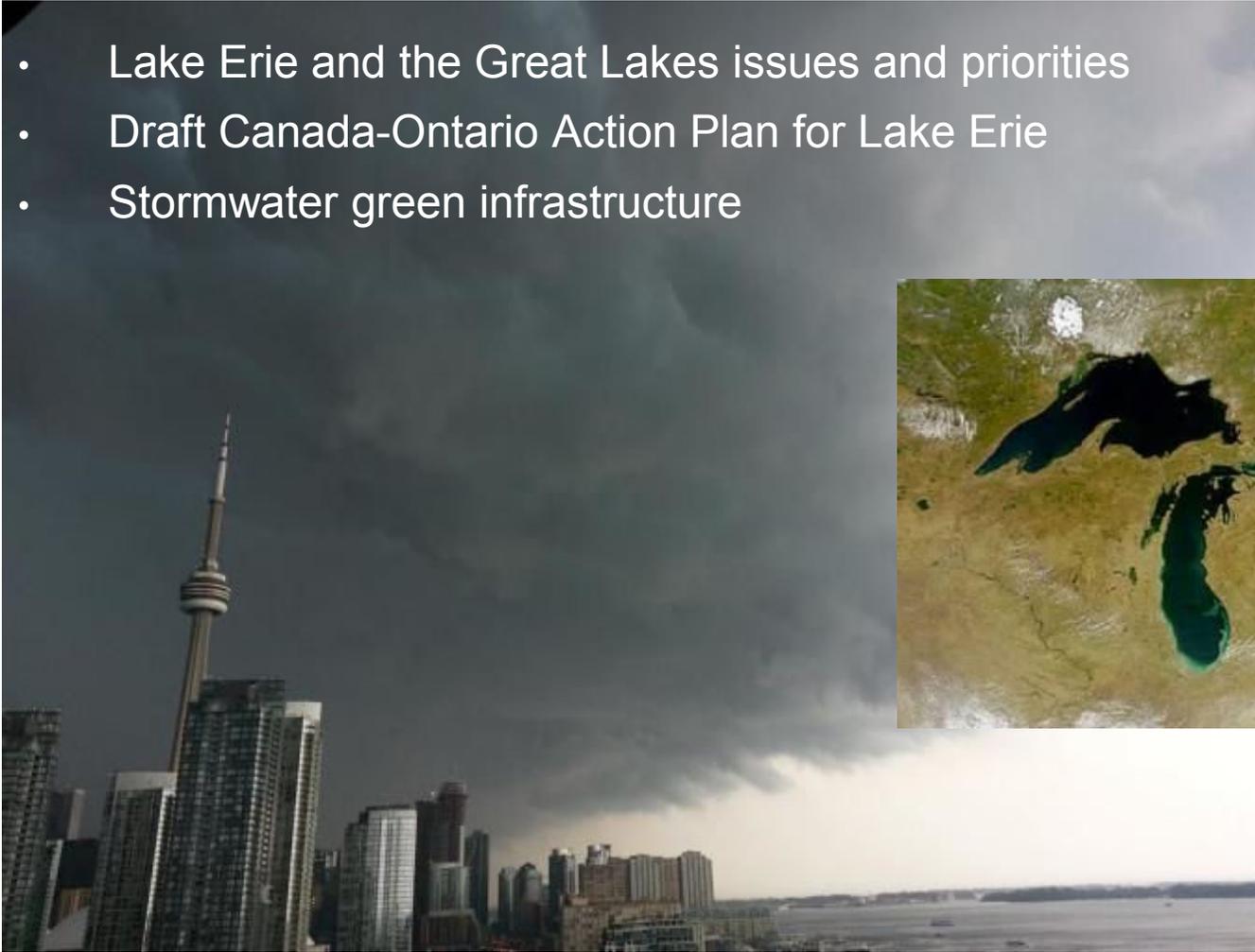
Green Infrastructure Champions Workshop

October 5, 2017

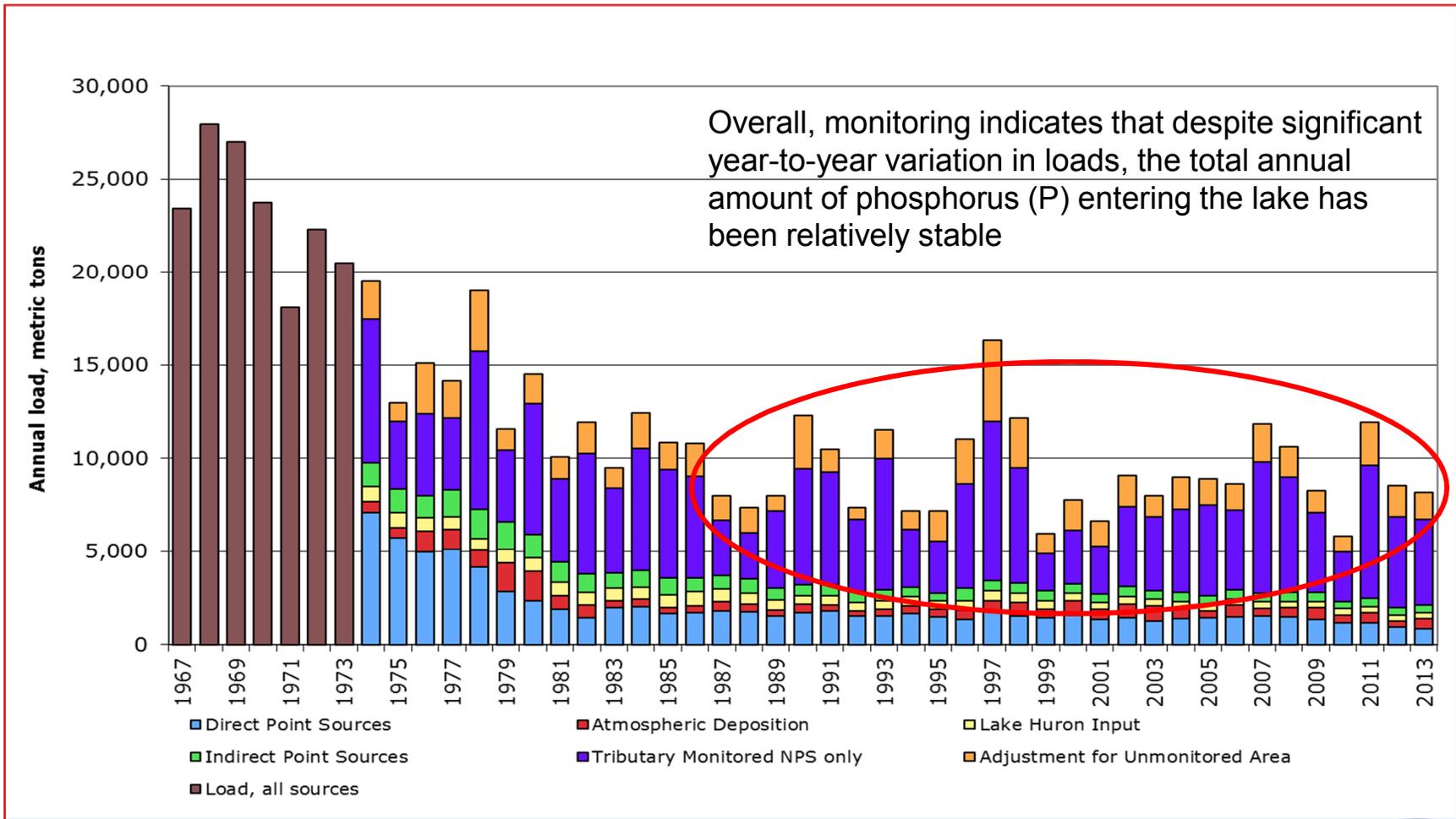
Ministry of the Environment and Climate Change

Contents

- Lake Erie and the Great Lakes issues and priorities
- Draft Canada-Ontario Action Plan for Lake Erie
- Stormwater green infrastructure



Lake Erie Canada–US Phosphorus Loads Over Time

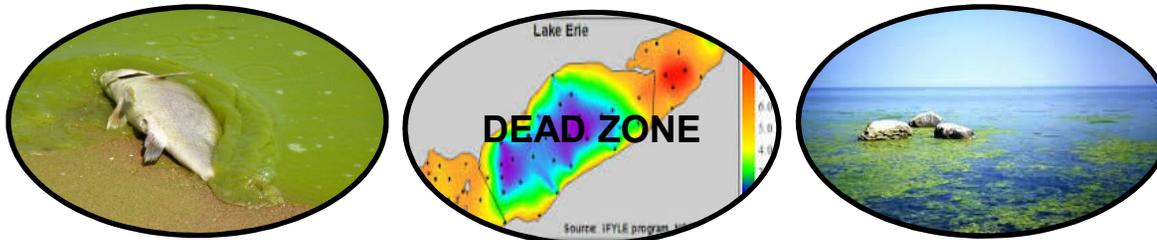
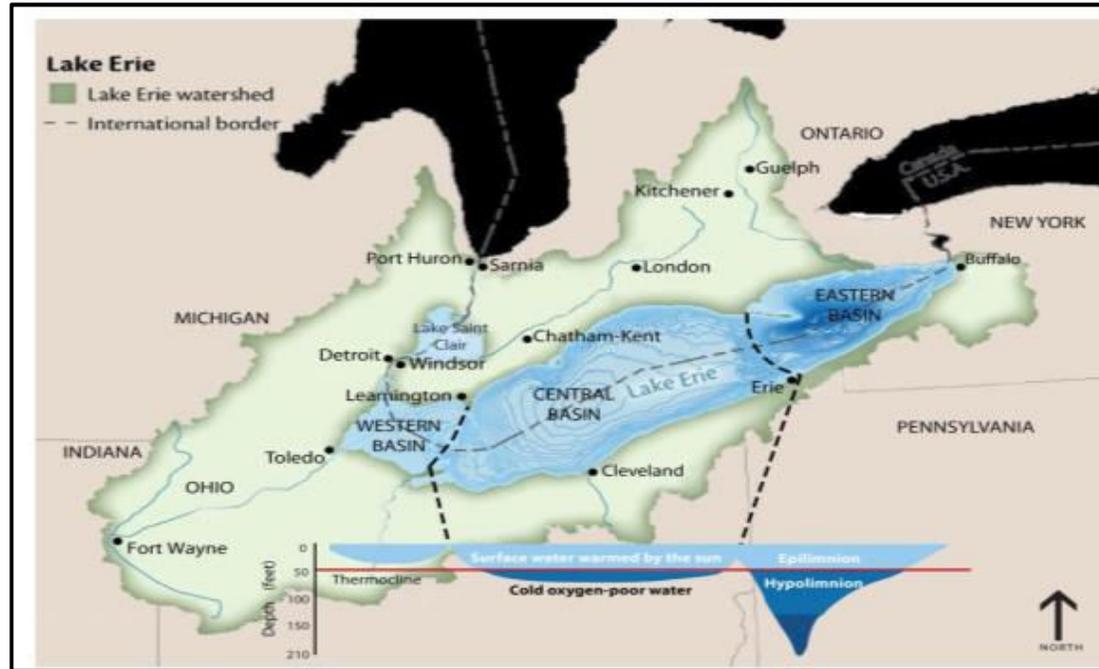


New Factors at Play

- **Population growth and land use changes**
 - Changes in phosphorus discharges from urban and agricultural landscapes due to changes in land use and management practices
- **Changing climate**
 - Increased frequency of severe storms
 - Increased temperatures
 - Longer growing seasons
- **Ecosystem changes – aquatic invasive species**
 - Changes to water clarity and nutrient cycling caused by Zebra and Quagga mussels
- **Bioavailable phosphorus increasing**
 - Linkages to above factors



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



WEST → EAST

Need for Action

- Without reducing the amount of phosphorus entering the lake, extensive algae growth and low oxygen conditions anticipated to continue or worsen
 - In the Ontario portion of the Lake Erie basin (similar to the U.S. side), a significant portion of the loads are from non-point sources
 - Given the number and types of sources, multi-jurisdictional and multi-stakeholder collaboration and partnerships are essential
 - While most of the phosphorus is coming from U.S. sources, Canada must still do its fair share
- Canada and the U.S. developed binational phosphorus reduction targets for Lake Erie in 2016 – Ontario fully supports the targets and participated in their development.
- Ontario and Canada are leading the development of an Action Plan for Lake Erie – to be in place no later than February 2018.



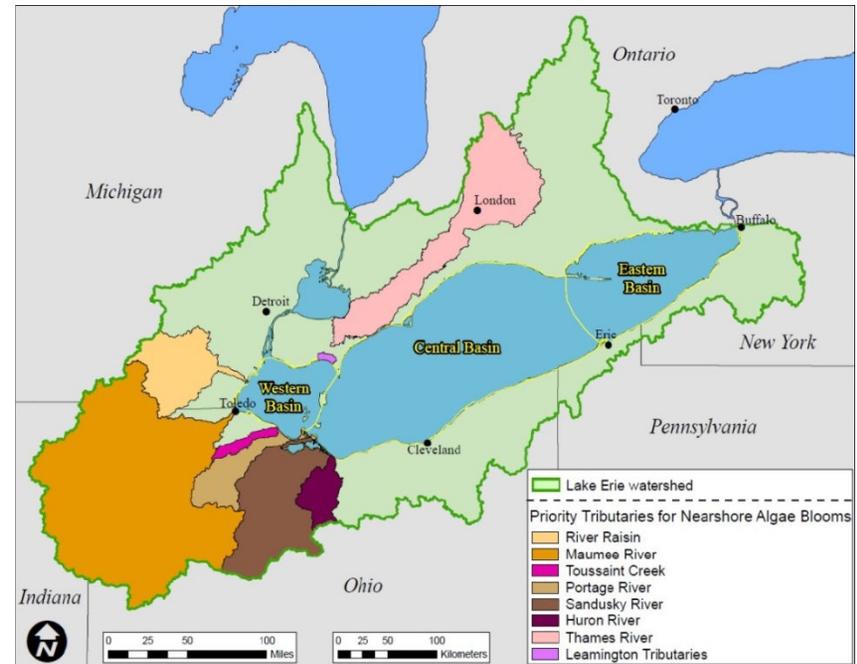
Ontario's Lake Erie Commitments

The Action Plan for Lake Erie will help Ontario meet several other commitments, including:

- Ministry of Environment and Climate Change's commitment to establish an algal bloom target by November 2017 and associated action plan under the Great Lakes Protection Act (GLPA)
 - GLPA target adopted in October 2016 – 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 percent reduction by 2020, in order to assist in the reduction of algal blooms
- Western Basin of Lake Erie Collaborative Agreement between the Premier of Ontario and the Governors of Michigan and Ohio (June 2015) – 40% reduction in the western basin by 2025, with an aspirational target of 20% by 2020
- Great Lakes Commission's Joint Action Plan developed in collaboration with Ontario and bordering states of Michigan, Ohio, Pennsylvania and New York, which included ten high level recommendations for action (September 2015)

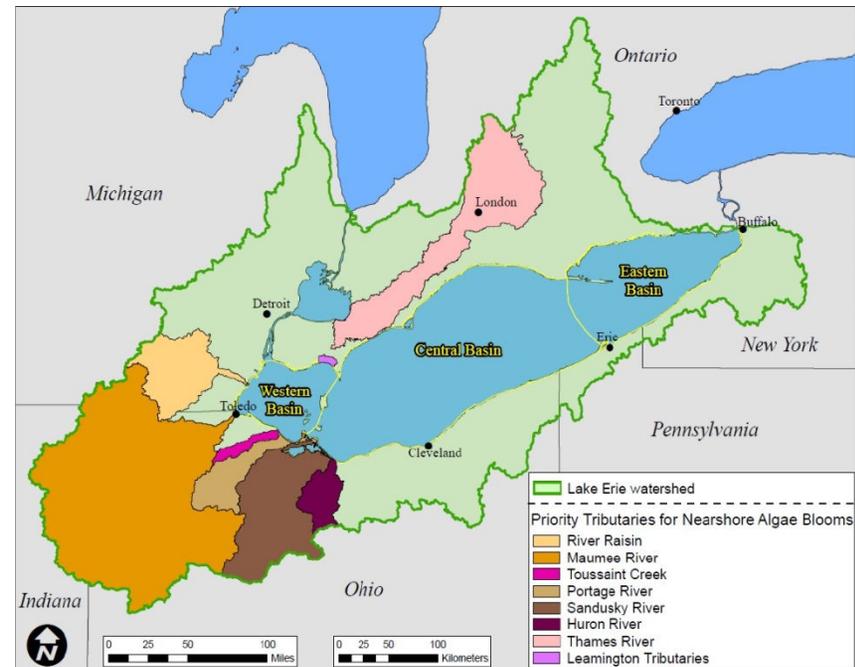
Binational Targets Applicable to Canadian Side: Central Basin Target

- Target is a 6,000 tonne annual total phosphorus load into the central basin, coming from all U.S. and Ontario sources (using a 2008 base year)
- **Annual total phosphorus load reductions from 2008 levels** needed from U.S. and Ontario point and non-point sources is 3,527 tonnes which equates to a **40% reduction**
 - **Ontario's allocated share is 212 tonnes**
- Aimed at minimizing low oxygen zones unsuitable for aquatic life in the central basin, by achieving an average dissolved oxygen level of 2 mg/L in the late summer deep waters of the central basin



Binational Targets Applicable to Canadian Side: Nearshore Targets (Thames River, Leamington Tributaries)

- **40% reduction** in spring loadings of total phosphorus and soluble reactive phosphorus from the Thames River and several streams identified in the Leamington area from 2008 levels.
- In Ontario, meeting these targets will help address harmful algal blooms which have been observed along south shore of Lake St. Clair and along the Leamington area shoreline.
- **Note:** Western basin target to reduce the severity of major harmful algal blooms in the open waters of the basin involves spring TP/SRP load reductions in the Maumee River watershed in Ohio, Michigan, and Indiana (i.e., does not apply to Ontario).



- Target for the eastern basin has not been established and needs further assessment.

What's in the Draft Action Plan?

- Draft Plan posted on EBR registry in March 2017
 - Considered input from early engagement and EBR posting
 - High level – likely to get more specific over time
- Draft Plan includes:
 - Characterization of landscape, history, trends, loadings, economic implications, and sources
 - Phosphorus reduction targets
 - Actions grouped into five categories:
 - Reduce Phosphorus at the Source
 - Ensure Effective Policies, Programs and Legislation
 - Improve the Knowledge Base
 - Educate and Build Awareness
 - Strengthen Leadership and Coordination
 - 76 actions:
 - Canada and Ontario actions to-date
 - Actions across all Lake Erie basins and Lake St. Clair
 - Mix of new and existing, regulatory and voluntary actions that agencies could commit to at this time
 - Science to support monitoring and modelling, and development of eastern basin target
 - Adaptive management framework
 - Reporting and accountability

Partnering in Phosphorus Control:

Achieving Phosphorus Reductions in Lake Erie from
Canadian Sources

The Canada-Ontario Draft Action Plan

Gathering Ideas

Spring Engagement

- April and May 2017
 - April 18 – Lake Erie Nutrients Working Group
 - April 19, 25, 26 – sector based sessions (Agriculture, CA, NGO, Municipal)
 - May 16 & 18 – public sessions
 - May 29 - First Nations – Coordinated by Chippewa of the Thames
- Purpose is to seek input from sectors and partners on proposed actions
 - What's missing?
 - Refinements to proposed actions
 - Identify actions of partners for inclusion in the plan
 - Which of the proposed actions do others see themselves helping to implement?
 - Additional actions that others can commit to



Where are we now

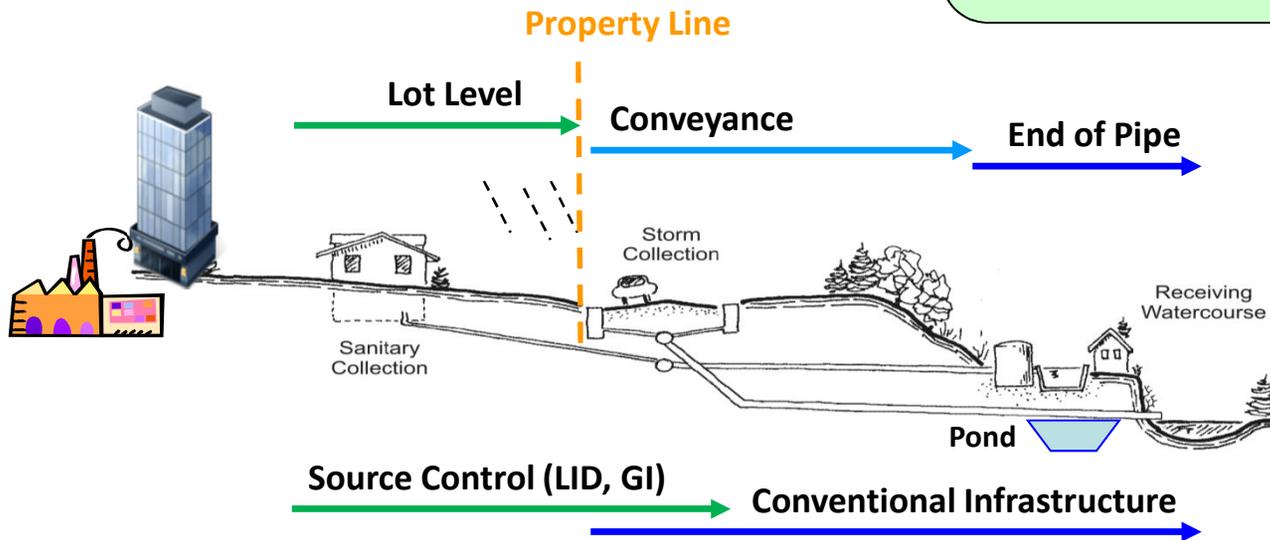
- Received 2100 comments
- Over this past summer analyzed comments and revised plan
- Another round of engagement fall 2017 – “What’s new?”
- Finalize the Plan on or before February 2018



Stormwater Basics

- Stormwater is rainwater (and snowmelt) that contacts land or a surface and runs-off or infiltrates

- **ISSUE:** Increased urban impervious surfaces increase run-off. 10% run-off increases to 55% in highly urban area
- **ISSUE:** Picks-up pollutants, nutrients



- **Source control:** Managing rain where it falls or snow melts through Green Infrastructure (**GI**), Low Impact Development (**LID**)

- Past focus on conventional infrastructure (sewers, ponds) through ECAs – moves water away from property to elsewhere

Why People Care about Stormwater Management



- Human Health, Safety and Infrastructure
 - Municipal and transportation infrastructure undermined
 - Flooding and erosion - basement flooding
 - Contributes to CSOs and beach closures
 - Impacts businesses, insurance costs
 - Cumulative impact on Lake Erie and other lakes – nuisance and toxic algae
 - Climate change

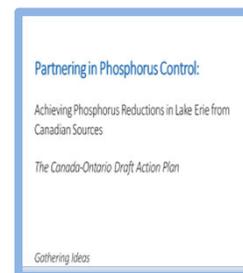
Types of Stormwater Green Infrastructure



Source control: Managing rain where it falls or snow melts

- Rain garden
- Green roof
- Permeable pavement
- Rainwater harvesting and reuse

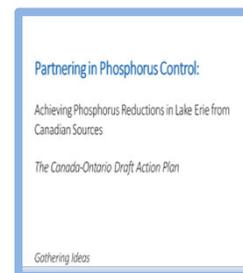
Stormwater Green Infrastructure Actions in the Draft Action Plan



Reduce phosphorus loadings from urban areas

- Ontario and its municipal partners will work towards reducing loadings, where feasible, through: (1) upgrades and other modifications to secondary STPs ...; (2) improvements to wastewater treatment and collection infrastructure to reduce combined sewer overflows and bypasses, and (3) improvements to stormwater management systems (including facility rehabilitation and incorporation of green infrastructure).
- Canada and Ontario will promote eligible investments for the reduction of excess phosphorus from point sources such as municipal wastewater treatments systems or municipal stormwater effluent under applicable infrastructure and other funding programs.
- Ontario will work with developers, municipalities, conservation authorities, and others to promote and support the use of green infrastructure and low impact development (LID) for stormwater management, including clarifying and enhancing policies, and developing green standards. Ontario's draft stormwater LID guidance manual is aimed at assisting proponents in implementing LID and green infrastructure, and will be available for public comment in early 2017.

Stormwater Green Infrastructure Actions in the Draft Action Plan – Con't



Support and strengthen policies, programs and legislation

- Ontario will provide updated guidance related to stormwater management and municipal planning to support the implementation of policies in the Provincial Policy Statement (2014).
- Ontario will update existing wastewater policies (F-series Guidelines and Procedures), and develop stormwater management policies and supporting guidance (e.g., low impact development and green infrastructure) to enhance environmental protection, including reduction of nutrient loadings.

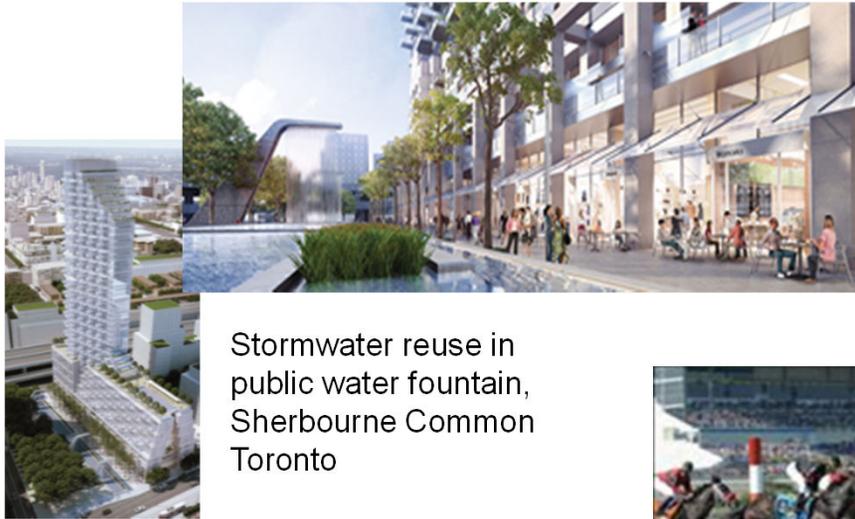
Strengthen decision-making tools

- Ontario will work with municipalities to encourage the development of decision-making tools that help manage phosphorus in urban stormwater at the source.

Proposed MOECC LID Guidance Manual

- MOECC is developing a technical guidance manual for public discussion
 - Multi-stakeholder group has been established to assist
 - Draft guidance run-off volume control target
 - Draft guidance on how to reflect climate change in developing stormwater management with risk assessment
 - Manual will not cover detailed design, siting, or sizing of specific LID facilities – other technical references available
- Draft LID manual expected for public review and consultation by end of year

Innovation, Examples and Opportunities for Stormwater Green Infrastructure



Stormwater reuse in public water fountain, Sherbourne Common Toronto

Stormwater reuse for toilets & landscape, rain garden, retail property, Burlington



Stormwater reuse on race track, Toronto

Greenway bioretention system, new development in Guelph



Stormwater reuse for ice surfacing & toilets, green roof, woodlot, Activa Sportsplex Kitchener



Thank You



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