

# GREAT LAKES PROTECTION IN ONTARIO



Ontario East Municipal Conference

Ambassador Hotel & Conference Centre – Kingston

Presenters: Richard Raeburn-Gibson and Dawn Walsh

September 10, 2014

# GREAT AND LARGE



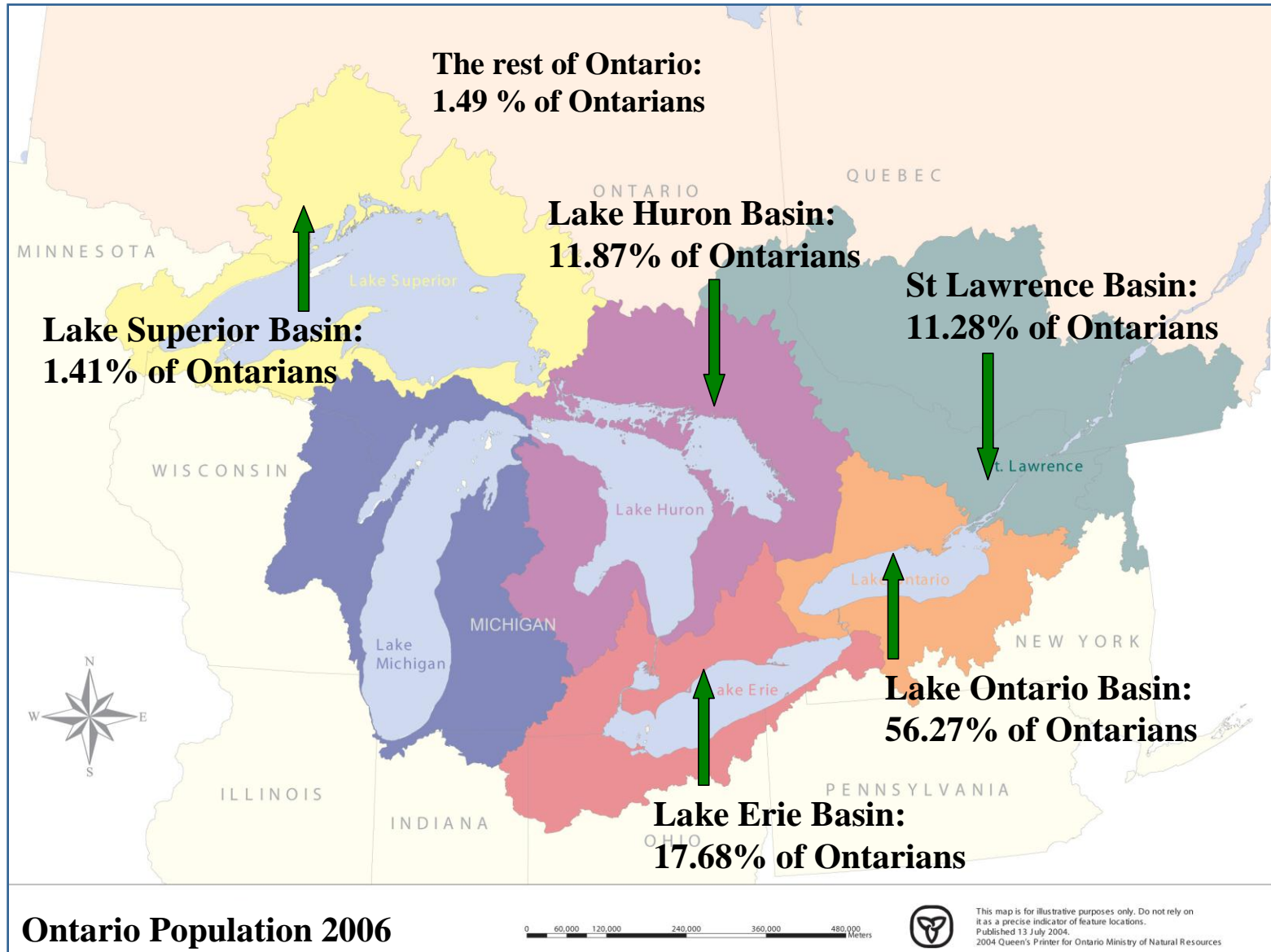
**Great Lakes Basin**  
**764 565 km<sup>2</sup>**



**Great Britain**  
**229,848 km<sup>2</sup>**



# HOME TO 98% OF ONTARIANS



# POWER GENERATION



- Great Lakes support more than 80% of power generated in Ontario



Sir Adam Beck Generating Complex on the Niagara River  
(Ontario Power Generation)



Pickering nuclear station from the shores of Lake Ontario  
(Media Commons)



Enwave's Deep Lake Water Cooling (DLWC) system, Toronto -  
the world's largest lake-source cooling system.





- Over 95% of Ontario's agricultural lands are in the Great Lakes basin.
- Ontario is Canada's largest food processing sector

Greenhouses Niagara Falls



A vineyard's drip irrigation system  
(Ministry of Agriculture, Food and Rural Affairs)



Ontario is home to Canada's largest food processing sector



- Ontario's shipping industry generates about \$2.6 billion annually to the economy.



Framed by the Blue Water Bridge, two lake freighters take on cargo in Sarnia Harbour

# MANUFACTURING



- 75% of Canada's manufacturing takes place in the Great Lakes basin.



Oakville Ford plant



A solar panel assembly facility in Welland. The facility relies on parts shipped from Korea.



# FISHING



- Commercial fishing contributes \$234 million and Recreational fishing contributes more than \$600 million annually to Ontario's economy



Commercial fishing on Lake Huron (Ministry of Natural Resources)



A day fishing on Lake Ontario (Ministry of Natural Resources)





- Annually more than 70 million tourists visit Great Lakes region injecting \$12.3 billion into the economy.



Playing in Georgian Bay  
(Ontario Tourism Marketing Partnership Corporation)



Summer sailing in Lake Ontario



Paddling a voyageur canoe on the Kaministiquia River, Lake Superior

# THE NATURE OF THE GREAT LAKES



- One of the most biodiverse geographies in Canada with approximately 4000 species of plants, fish and wildlife



The Great Lakes-Upper St. Lawrence River population of the Lake Sturgeon is threatened (US Fish & Wildlife Service)



Blanding's turtle, a threatened species endemic to the Great Lakes Basin (Ministry of Natural Resources)



Bald eagle, a Species of Concern in Ontario (Bill Cole)

# ENJOYING THE GREAT LAKES



**Manitoulin Island, Lake Huron  
(Ontario Tourism Marketing Partnership  
Corporation, J. Speed)**



**Children play at Petticoat Creek Conservation Area, Lake Ontario,  
Pickering (Ontario Tourism Marketing Partnership Corporation)**



**Hiking the Tobermory shoreline  
(Ontario Tourism Marketing Partnership Corporation)**



# BINATIONAL GREAT LAKES PROTECTION





## **1960s-1970s: Great Lakes were suffering from:**

- Toxic Chemicals
- Excess Nutrients (Algae)
- Polluted harbours, bays and waterfronts
- Invasive sea lamprey

## **1970s -1980s: Jurisdictions collaborated to tackle these problems**

### **Great Lakes responded well through the 1990s**

- Reduced toxic chemicals
- Cleaned up several highly polluted areas
- Water quality improved and algae was dramatically reduced
- 90% reduction in lampreys and recovery of many fisheries



Transformer and adult sea lamprey mouths (Ministry of Natural Resources)

# AREAS OF CONCERN



Binational AOCs ([Environment Canada](#))

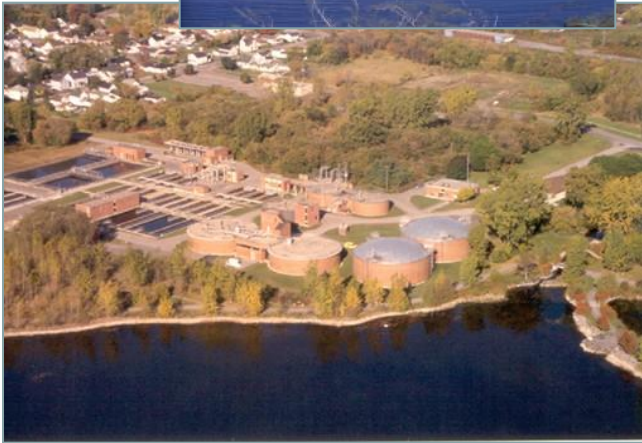


# ST. LAWRENCE RIVER (CORNWALL) AREA OF CONCERN



Worked with partners including municipalities to:

- Develop and implement the Cornwall Sediment Strategy
- Upgrade Sewage Treatment Plant
- Develop of a Pollution Prevention Control Plan
- Implement tributary restoration projects
- Develop a private residential septic system assessment program



Worked with partners including municipalities to:

- Reduce phosphorous loads from municipal point sources including upgrades to sewage treatment
- Implement 500 projects to reduce non-point source phosphorus.
- Develop and implement Sediment Management, Fisheries Management & Habitat Strategies
- Develop Pollution Prevention & Control Plans



## Beach Closures and Algae

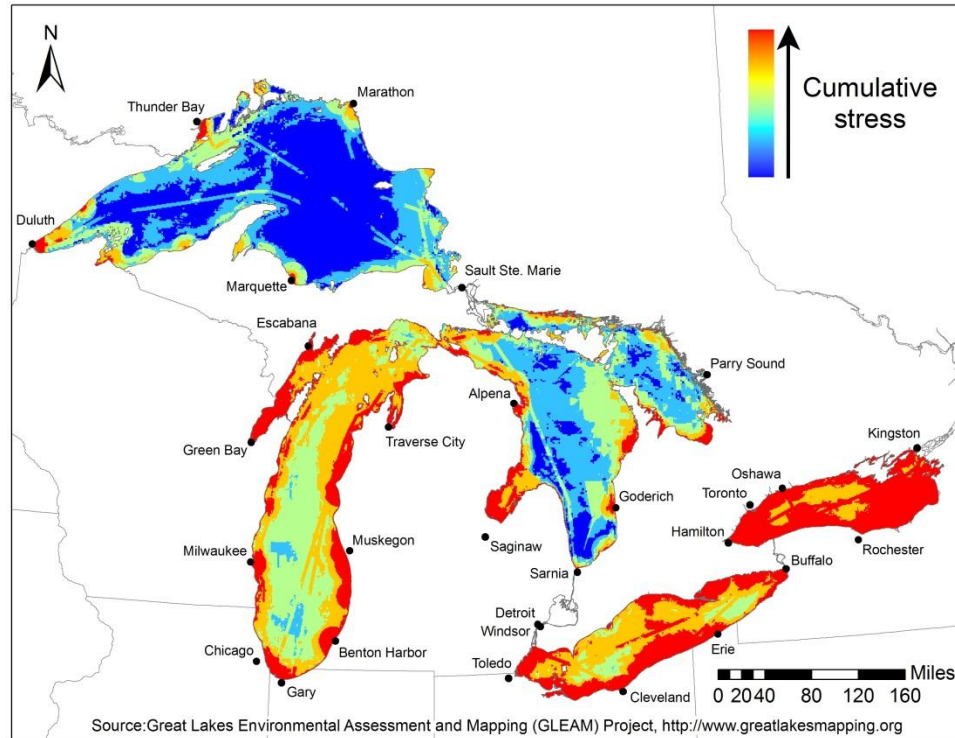
- Degrading shorelines and waterfronts
- Beach postings
- Waterfronts covered in nuisance algae
- Massive blooms of potentially toxic algae

## Invasive Species

- Food web changing, decline in fisheries
- Clogged water intakes
- More pathogens
- Risk of new invaders: Asian carp

## Population Growth

- Increased stormwater and wastewater, treatment not keeping pace
- Loss of natural cover
- More water consumption



## Natural Heritage

- Loss of critical habitat
- Declining coastal health
- More species at risk
- Loss of natural and cultural heritage

## Harmful Pollutants

- Chemicals of emerging concern (e.g. some flame retardants, pharmaceuticals)
- Continued fish consumption restrictions
- Reproductive/immune impairment in some wildlife
- Potential human health impacts

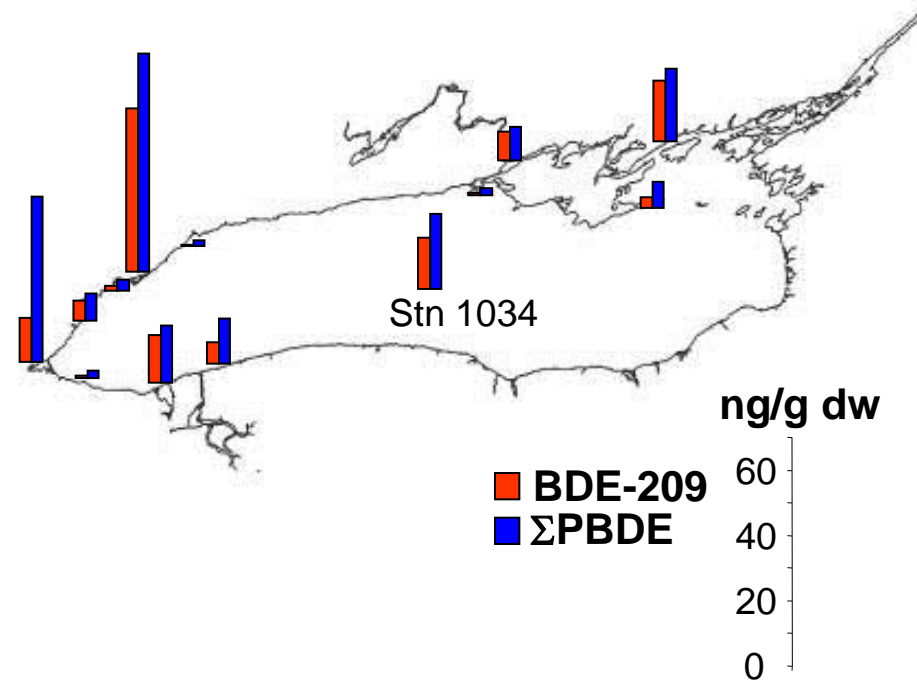
## Climate Change

### May impact:

- Lake level change
- Water availability
- Intensity of storms
- Stressed infrastructure
- Increased flooding

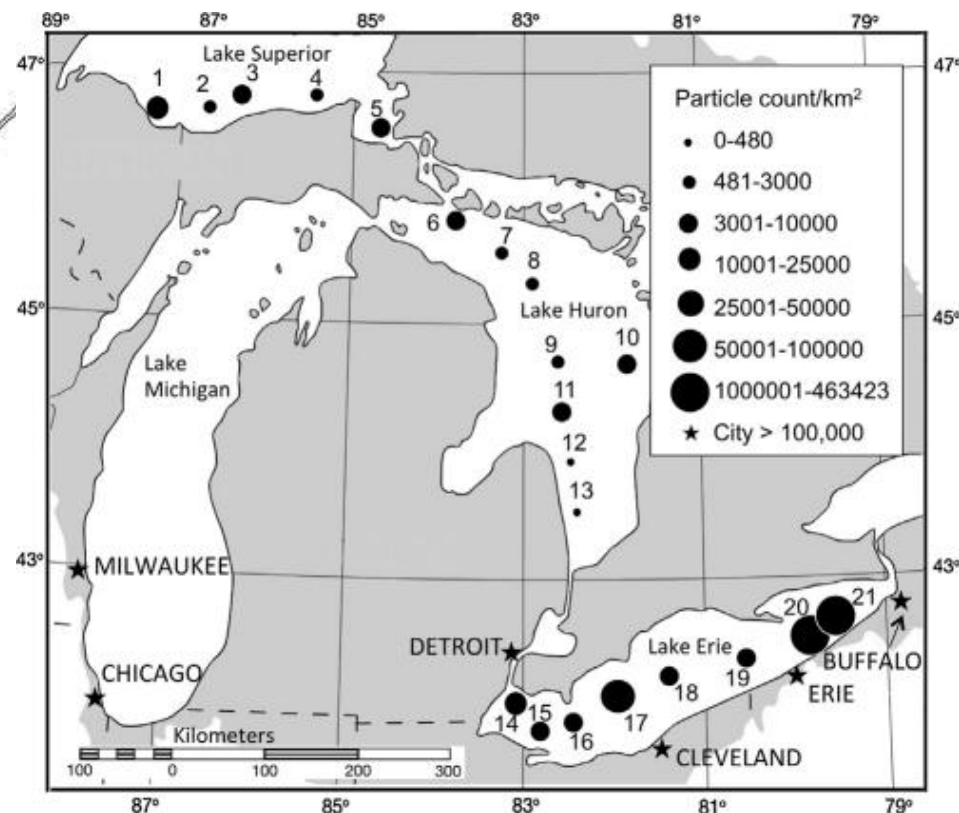


# NEW CHEMICALS OF CONCERN



Distribution of brominated flame retardants in Great Lakes sediments

Source: Ministry of the Environment



Distribution of plastic particles by count for 21 samples collected in three of the Great Lakes.

Source: Eriksen, M., et al. Microplastic pollution in the surface waters of the Laurentian Great Lakes. Mar. Pollut. Bull. (2013)

# NUISANCE AND HARMFUL ALGAE



Lake Erie algae bloom visible from space, 2011 (NOAA)



As seen from the air, a boat cuts through an algae bloom in Lake Erie, 2011



Ajax shoreline park fouled by algae, 2008



# INVASIVE SPECIES



Silver carp jumping after being disturbed by boats on the Illinois River  
(Great Lakes Fishery Commission)



European frog-bit, an invasive aquatic plant found in Lake Ontario, Lake Erie and other inland waters  
(Ministry of Natural Resources)



Measuring invasive Phragmites (European common reed), an invasive plant causing damage to Ontario's wetlands  
(Ministry of Natural Resources)



Zebra and Quagga Mussels (D. Britton)

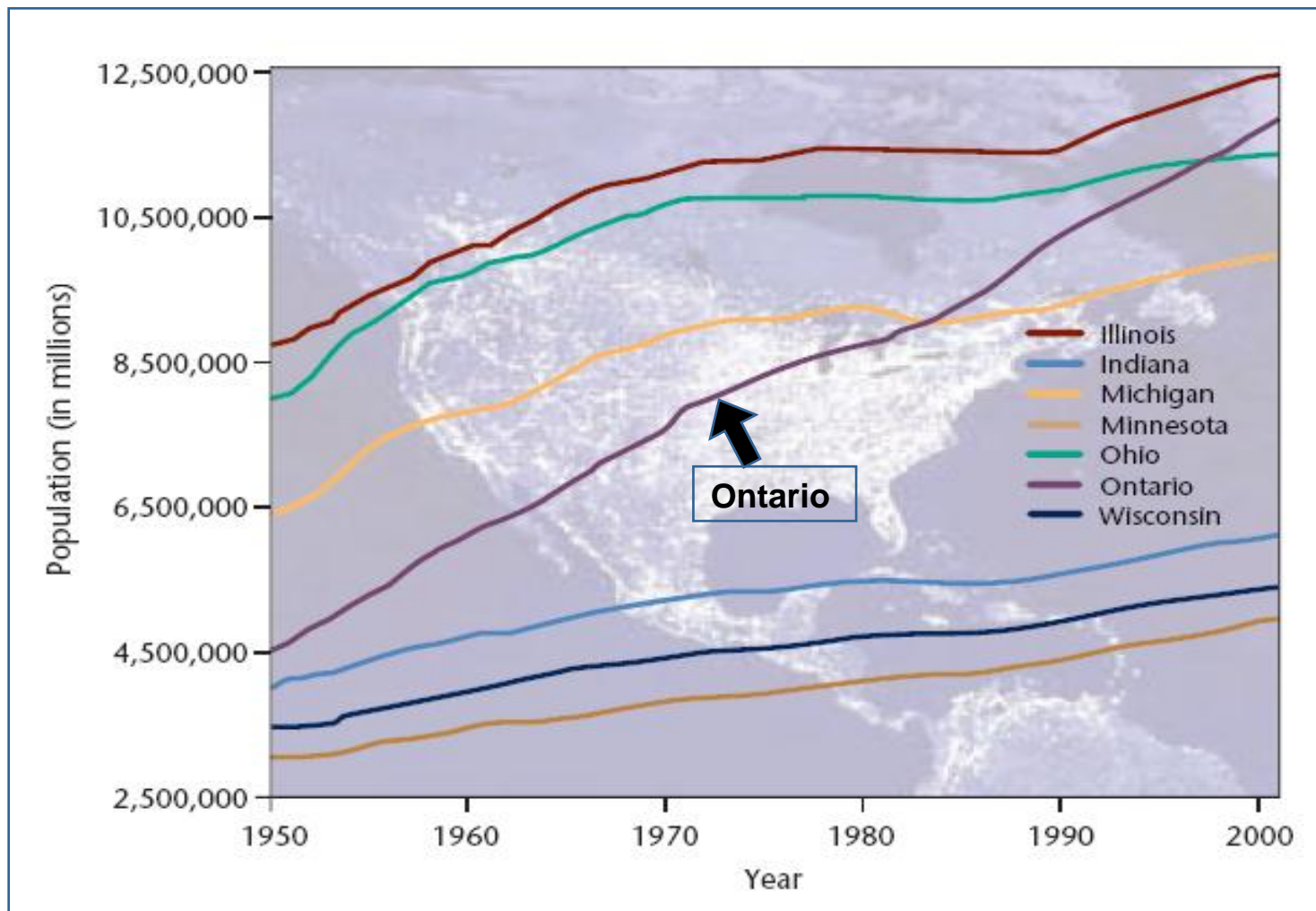


Public outreach at Lake Superior Day 2011 (J. Bailey)





## Comparative Population Growth in Ontario and Great Lakes States



Source: *Confronting Climate Change in the Great Lakes Region*, A Report By The Union of Concerned Scientists and The Ecological Society of America, 2003

# CHANGING CLIMATE



Lake Huron low water levels, 2004 (R. Schwartz, Climate Change Impacts and Adaptation: A Canadian Perspective (Government of Canada))



Peterborough flood, 2004 (City of Peterborough)



Humber River stormwater plume flowing into Lake Ontario (City of Toronto)



Black Creek washout of Finch Avenue, 2005 (Ministry of the Environment)



## **Canada-U.S. Great Lakes Water Quality Agreement (GLWQA)**

- Canada and the U.S. signed an amended GLWQA on September 7, 2012

## **Draft 2014 Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA)**

- Negotiations are completed and the 2014 COA is anticipated to be signed by December 2014.

## **Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement/Charter Annex Agreement (2005)**

- Good-faith agreement between Ontario, Québec, and the 8 U.S. Great Lakes States





## Ontario's Great Lakes Strategy

- Released on December 2012.
- Vision: Great Lakes and keep them swimmable, drinkable and fishable.
- Guides Ontario's work with local partners and other governments around the Great Lakes.
- 13 ministries support implementation with Ministry of the Environment and Climate Change as the lead ministry.
- Includes Ontario portions of the Great Lakes Basin and St. Lawrence River Basin.

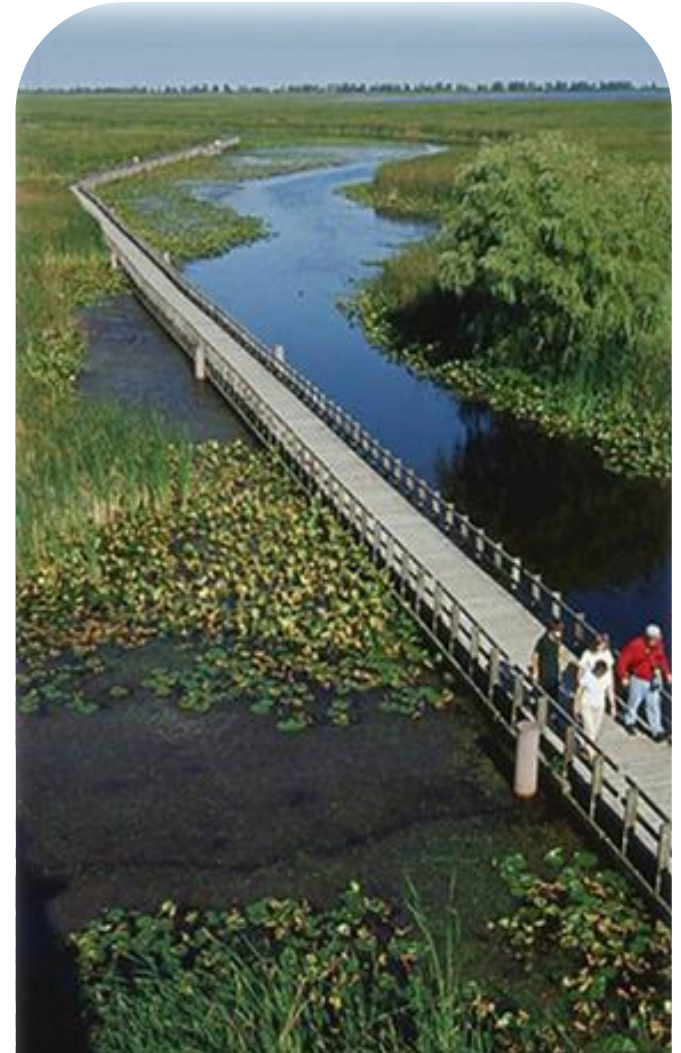
## Proposed Great Lakes Protection Act

- Introduced February 2013 and the government committed to its re-introduction in their platform



## Ontario's Great Lakes Strategy Goals:

1. Engaging and empowering communities
2. Protecting water for human and ecological health
3. Improving wetlands, beaches and coastal areas
4. Protecting habitats and species
5. Enhancing understanding and adaptation
6. Ensuring environmentally sustainable economic opportunities and innovation





Ontario's Great Lakes Guardian Community Fund is helping communities to protect and restore their corner of the Lakes and the St. Lawrence River Basin.

Since 2012, more than \$3 million has been awarded to 156 community-based projects to protect habitats and species, clean up beaches and shorelines, reduce the impact of invasive species and restore wetlands.

Centre for Sustainable Watersheds was awarded \$24,798.00 for their work in reducing the impacts of runoff, erosion and habitat loss in the Gananoque River Watershed.

Ecology Ottawa was awarded \$6,369.00 for their "Adopt-a-stream" Project in partnership with the Rideau Valley CA's City Stream Water Program to protect the Great Lakes-St. Lawrence Watershed.





Several Ontario communities have recently experienced flood damage. Urban runoff can carry unwanted nutrients and harmful pollutants into the Great Lakes. Ontario is advancing innovative approaches to reduce stormwater runoff, such as green infrastructure and low impact development.

- Bay of Quinte Stormwater Management Retrofit EAs
- Planning underway for Low Impact Development Stormwater Management Guidance Manual
- Working in Toronto, Upper Thames River and Thunder Bay watersheds to promote low impact design (LID) for urban stormwater



Stormwater outfall to Lake Ontario, Lucas Point Park, Cobourg Ontario



Ontario is partnering with academia to conduct research to improve understanding of sources of E. coli contamination and causes of other beach impairments such as nuisance algae.

Ontario continues to partner with communities to remediate designated Areas of Concern and other areas.

Ontario and partners have inventoried, evaluated, and mapped more than 125 wetlands (totalling over 10,000 hectares).

# PROTECTING HABITAT AND SPECIES



Ontario is working to protect and restore native Great Lakes fish species and their populations. For example, ongoing partnership efforts to improve habitat and water quality are helping bring back Lake Ontario's Atlantic salmon – Ontario's only native salmon in the Credit River (Mississauga), Duffins Creek (Durham Region) and Cobourg Brook (Northumberland County) watersheds.

Ontario is also working hard to keep Asian carp out of the Great Lakes. In cooperation with partners, the province has strengthened regulations, increased monitoring efforts, and collaborated with researchers to increase understanding of Asian carp biology and behaviour.





Ontario partnered with the Great Lakes and St. Lawrence Cities Initiative on a project to help Great Lakes municipalities adapt to the impacts of climate change.

Ontario scientists are undertaking a multi-year nutrients study across a range of watersheds to better understand the sources of nutrients contributing to unwanted algal blooms.



# ENSURING ENVIRONMENTALLY SUSTAINABLE ECONOMIC OPPORTUNITIES & INNOVATION



Ontario is partnering on innovative projects to keep soil and nutrients on agricultural land and out of the water. For example, Ontario is supporting the work of CleanFARMS a not-for-profit group that helps farmers to help the environment.



Ontario's Water Sector Strategy is helping local water technology companies grow domestically and compete globally. the Water Technology Acceleration Project (WaterTAP) launched in 2012 has championed Ontario as a world water technology hub.

# FOR MORE INFORMATION:



## COA/Great Lakes Strategy

Dawn Walsh

Great Lakes/COA Divisional Project  
Manager

MOECC

[dawn.walsh@ontario.ca](mailto:dawn.walsh@ontario.ca)

Richard Raeburn-Gibson

Director, Eastern Region

MOECC

[richard.raeburngibson@ontario.ca](mailto:richard.raeburngibson@ontario.ca)

## Great Lakes Guardian Community Fund

[jamie.bowles@ontario.ca](mailto:jamie.bowles@ontario.ca)

To download a copy of Ontario's Great  
Lakes Strategy, and for more information:

[www.ontario.ca/HealthyGreatLakes](http://www.ontario.ca/HealthyGreatLakes)

