Province of Ontario
Water Conservation and Efficiency Program Annual Review 2018

The following information is submitted by the Province of Ontario to the Great Lakes Regional Body pursuant to the provisions in the Agreement Article 304 of the *Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement* (Agreement).

1. Lead agency and contact person:

Jason Travers, Director
Natural Resources Conservation Policy Branch
Ontario Ministry of Natural Resources and Forestry

2. Status of Ontario's water conservation and efficiency goals and objectives consistent with the Basin-wide goals and objectives

In 2012 Ontario adopted water conservation and efficiency goals and objectives that are consistent with the Basin-wide goals and objectives. The goals and objectives were developed based on stakeholder consultation, Indigenous engagement, and public comments received.

Ontario's goals are identical to the goals prescribed in the Agreement. Ontario's objectives are consistent with the regional objectives adopted for the Basin and have been tailored for Ontario to reflect the direction in the *Water Opportunities and Water Conservation Act,* 2010, and to address stakeholder and Indigenous community requests to emphasize the importance of taking ecological water needs into account in decision making, in keeping with the broader ecosystem protection and restoration goals of the Agreement.

Ontario's water conservation goals and objectives are available at:
http://www.ontario.ca/environment-and-energy/ontarios-water-conservation-and-efficiency-goals-objectives-and-programs

3. Ontario's water conservation and efficiency program overview

Ontario's water conservation and efficiency program consists of a wide variety of statutes, programs and policies administered across six ministries. See Appendix A for descriptions of Ontario's contributing water management and conservation statutes, programs and policies.

4. Consistency with Regional Objectives

Ontario's program is consistent with the regional objectives in the promotion of environmentally sound and economically feasible water conservation measures. The programs (statutes, programs and policies) below may link to more than one objective. See Table 1 and Appendix A.

Table 1: Regional Objectives and Ontario's Water Conservation and Efficiency Program

REGIONAL OBJECTIVES	LEGISLATIVE OR PROGRAM CITATION
1) Guide programs toward long-term sustainable water use and management including taking ecosystem needs for water into account	Ontario is implementing a range of adaptive programs and conservation and efficiency strategies that consider long-term sustainable water use taking into account the importance of water to related ecosystems – such as through the assessment of water taking applications as described above, preparation of source protection plans to protect existing and future sources of drinking water in terms of both water quantity and quality, development of water

REGIONAL OBJECTIVES	LEGISLATIVE OR PROGRAM CITATION
	budgets to estimate surface and groundwater supplies, water use and water quantity risk assessments, and action to protect the Great Lakes. The most relevant programs are: 1. Ontario's approach to building resilience 2. *Ontario Water Resources Act* and Water Management: Policies, Guidelines, Provincial Water Quality Objectives 3. *Ontario Water Resources Act* and Regulations 4. *Clean Water Act, 2006* 5. *Conservation Authorities Act, 1990* 6. *Lakes and Rivers Improvement Act, 1990* 7. *Endangered Species Act, 2007* 8. Great Lakes Wetland Conservation Action Plan 9. *Greenbelt Act, 2005* and Greenbelt Plan 10. *Niagara Escarpment Planning and Development Act* and Plan 11. Ontario's Biodiversity Strategy 12. Biodiversity: It's In Our Nature – Ontario Government Plan to Conserve Biodiversity 2012-2020 13. Ontario's Great Lakes Strategy 14. Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2014 15. *Great Lakes Protection Act, 2015* 16. Joint Strategic Plan for the Management of Great Lakes Fisheries 17. *Lake Simcoe Protection Act, 2008* and Lake Simcoe Protection Plan, 2009 and associated Subwatershed Plans and Water Budgets 18. A Wetland Conservation Strategy for Ontario 2017-2030 19. *The Crown Forest Sustainability Act, 1994*
2) Adopt and implement supply and demand management to promote efficient use and conservation of water resources.	Ontario has a range of programs that manage water supply and demand to achieve efficient use and conservation of water resources — including promoting innovative water technologies through WaterTAP established under the Water Opportunities and Water Conservation Act, requiring water conservation plans by municipalities in the Oak Ridges Moraine and Lake Simcoe areas, promoting green infrastructure in municipal stormwater management systems and establishing water efficiency standards in Ontario's Building Code. The most relevant programs are: 20. *Water Opportunities and Water Conservation Act*, 2010 21. Financial Plans Regulation under the *Safe Drinking Water Act*, 2002 22. *Building Code Act*, 1992 and the Building Code

REGIONAL OBJECTIVES	LEGISLATIVE OR PROGRAM CITATION
	23. *Green Energy Act*, 2009 24. *Oak Ridges Moraine Conservation Act*, 2001 and Plan 25. *Places to Grow Act*, 2005 and Growth Plans 26. *Planning Act, 1990* and Provincial Policy Statement, 2014 27. Municipal Stormwater Management Systems 28. Ontario's Water Sector Strategy
3) Improve monitoring and standardize data reporting among State and Provincial water conservation and efficiency programs.	A range of Ontario programs support improved monitoring and standardized data reporting related to water supply, water use and conservation/ efficiency – for example, water use information for Permits To Take Water is collected, analyzed and reported, and watershed-based teams declare low water condition based upon provincial water monitoring and varying levels of conservation are required depending upon the low water conditions. The most relevant programs are: 29. Ontario Low Water Response 30. Ontario Surface Water Monitoring 31. Provincial Groundwater Monitoring Network 32. Water Use Reporting 33. Mapping and Geomatics Services Section 34. Ontario's Provincial Fish Strategy: Fish For The Future 35. The Ontario Geological Survey's Groundwater Mapping Initiative 36. Stream Water Quality Monitoring and the Multi-Watershed Nutrients Study 37. Fish Contaminant Monitoring Program 38. Great Lakes Intake Program
4) Develop science, technology and research.	The following programs encourage science, technology and research to implement the best in water, wastewater and stormwater technology: 39. Ontario Clean Water Agency 40. Water Technology Acceleration Project (WaterTAP) 41. Southern Ontario Water Consortium 42. Green Focus on Innovation and Technology 43. Investment Accelerator Fund 44. Ministry of Agriculture Food, and Rural Affairs-University of Guelph Agreement Research Program 45. New Directions Research Program 46. Anishinabek/Ontario Fisheries Resource Centre 47. Ontario's Cleantech Strategy

REGIONAL OBJECTIVES	LEGISLATIVE OR PROGRAM CITATION
5) Develop education programs and information sharing for all water users.	Ontario is implementing a range of education programs and other programs that raise awareness of the importance of water and the value of conservation, efficiency and cost-saving, and which promote the sharing of best management practices, through the following programs: 48. Walkerton Clean Water Centre 49. Water Efficiency Labelling 50. Best Management Practices 51. Canada-Ontario Environmental Farm Plan Program and Canadian Agricultural Partnership Cost-share Funding Assistance Program 52. Species at Risk Stewardship Program 53. Invading Species Awareness Program 54. Land Stewardship and Habitat Restoration Program 55. Eastern Habitat Joint Venture 56. Ontario Parks Water Conservation Initiatives

5. Ontario's water conservation and efficiency program implementation timeline and status

Ontario's water conservation and efficiency program is in place and is being implemented.

Appendix A: Description of Ontario's Contributing Water Management and Conservation Statutes, Programs and Policies

The following statutes, programs and policies contribute to achieving Ontario's goals and objectives for water conservation and efficiency. The statutes, programs and policies may link to more than one goal or objective.

OBJECTIVE 1) GUIDE PROGRAMS TOWARD LONG-TERM SUSTAINABLE WATER USE AND MANAGEMENT INCLUDING TAKING ECOSYSTEM NEEDS FOR WATER INTO ACCOUNT

To achieve this objective, Ontario has a range of adaptive programs and conservation and efficiency strategies that consider the importance of water to related ecosystems, working with local stakeholders, and improving water demand forecasts, and water budgets.

1. Ontario's approach to building resilience

Ontario is currently developing a comprehensive, made-in-Ontario environment plan that will help protect and conserve our air, land and water, address urban litter and waste, increase our resilience to climate change, and help all of us do our part to reduce greenhouse gas emissions. Ontario's plan is expected to be released for consultation in fall 2018.

2. *Ontario Water Resources Act* and Water Management: Policies, Guidelines, Provincial Water Quality Objectives

The legislative authority to manage water comes from the *Ontario Water Resources Act*, *Environmental Protection Act* and other legislation. Ontario's Water Management: Policies, Guidelines, Provincial Water Quality Objectives gives direction on how to manage the quality and quantity of both surface water and groundwater. Surface water and groundwater quantity is to be managed to ensure a fair sharing, conservation, and sustainability of the resource. Water conservation is defined as the preservation of the quantity of available water through judicious use, reuse and minimal wastage.

https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives

3. *Ontario Water Resources Act* and Regulations

Water takings in Ontario are governed by the *Ontario Water Resources Act* and the Water Taking and Transfer Regulation (Ontario Regulation 387/04). The purpose of the *Ontario Water Resources Act* is to provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, to promote Ontario's long-term environmental, social and economic well-being.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o40_e.htm

According to the *Ontario Water Resources Act*, any person taking more than 50,000 litres of water on any day must first obtain a Permit to Take Water from the Ministry of the Environment, Conservation and Parks. Water taken for domestic uses, watering of livestock or poultry, firefighting, wetland conservation, a weir that was constructed prior to March 29, 2016 and passive and/or active in-stream diversions for construction purposes is exempted from the requirement to obtain a permit. The Ministry's guiding policy for issuing permits is to ensure the fair sharing, conservation, and sustainable use of the surface and ground waters in the province.

The Water Taking and Transfer Regulation and Permit to Take Water Manual outlines the specific requirements related to applying for and holding a permit and identifies the matters that the Ministry must consider when reviewing a permit application.

http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_040387_e.htm

https://ia902301.us.archive.org/25/items/permittotakewate00snsn8696/permittotakewate00snsn8696.pdf

Among the matters considered by the Ministry when reviewing a permit application is whether water conservation measures are to be implemented in the use of water, in accordance with sector best water management standards and practices if these are available. As part of their permit application, proponents must complete and submit a "Schedule 1 – Implementation of Water Conservation in accordance with Best Management Practices and Standards for the Relevant Sector". This Schedule provides details about sector-specific best management practices (e.g., Environmental Farm Plan, Audubon Cooperative Sanctuary Program for Golf Courses) to be applied to the proposed water taking and specifies the water conservation measures and practices they are currently implementing or anticipate implementing over the duration of the permit. Applicants must also state their goals for reducing the use, loss, or waste of water, or for increasing the efficiency of their water use (e.g., litres per day per unit of production or litres per day per capita for the residential use).

On December 16, 2016, Ontario implemented a moratorium on every new or expanding water bottling facility that takes groundwater and is required to have a water taking permit under the *Ontario Water Resources Act*, until January 1, 2019. On October 30, 2018, Ontario posted a proposal to extend the moratorium on new or expanded permits to take groundwater to produce bottled water for up to one year, until January 1, 2020. While the moratorium is in place, Ontario plans to undertake further research to ensure long-term water protection, including considering the impacts of climate change and future demand on water sources. Ontario will also engage Indigenous partners, communities and industry on any potential changes to water quantity management practices.

https://www.ontario.ca/laws/regulation/r16463

In April 2017, the Ministry released new stricter requirements for renewals of existing bottled water permits to take groundwater. The new rules strengthen Ontario's permit to take water program by increasing public reporting and transparency and enhancing scientific requirements. Effective August 1, 2017, water bottling companies that take groundwater and are required to

have a permit under the *Ontario Water Resources Act* must pay a new additional fee of $500 per million litres.

https://www.ontario.ca/laws/regulation/r17176

http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2017/012-9151_d.pdf

4. *Clean Water Act, 2006*

The purpose of the *Clean Water Act* is to protect existing and future sources of drinking water in Ontario in terms of both quality and quantity of water. It is part of the Ontario Government's commitment to ensure the sustainability of clean, safe drinking water for Ontario communities.

Source protection plans are in effect across Ontario and are intended to protect sources for about 450 municipal drinking water systems, covering areas where over 95 per cent of the province's population live. The plans contain a series of locally-developed policies such as prohibiting the activity or regulating it through risk management plans, provincial approvals, land use planning tools or non-regulatory approaches such as education and outreach and incentive programs. Plans may also include policies around water conservation and/or water efficiency. Municipalities, the Province, and others are implementing actions on the ground to protect the quality and quantity of sources of municipal drinking water.

As a first step, science-based assessment reports were developed to identify where sources of water are vulnerable to contamination and depletion. As part of this, water budgets were developed to evaluate how much water exists both at the surface and below ground, how it moves, and how much water is withdrawn, to identify potential water shortages on a subwatershed scale. Part of this process is also looking at the long-term water supply and determining current or future water availability and ecological needs. Furthermore, these water budgets consider drought climate conditions and the potential impact on supplies of drinking water.

As a requirement under the *Clean Water Act*, source protection planning also considered several federal and provincial Great Lakes agreements, including the Great Lakes Charter and the Great Lakes-St Lawrence River Basin Sustainable Water Resources Agreement.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_06c22_e.htm

5. *Conservation Authorities Act, 1990*

The *Conservation Authorities Act* provides a statutory framework for the creation, funding and the operation of conservation authorities; municipalities petition the Province to form or join a conservation authority to be able to participate in shared local resource management with other municipalities in a common watershed and in shared programs with the Province. As public-sector organizations, conservation authorities implement programs that serve both Provincial and municipal interests. There are 36 conservation authorities in Ontario today.

Conservation authorities currently undertake a shared program with the Ministry of Natural Resources and Forestry related to public safety and natural hazard prevention and management. Program activities include flood and erosion control operations, flood forecasting and warning, ice management, as well as hazard prevention by input into municipal planning documents. Water-related natural hazard technical information can be developed in shoreline and watershed plans. In a delegated role from the Ministry of Natural Resources and Forestry, conservation authorities review municipal plans and site plan applications made under the Planning Act for consistency with the natural hazards policies of the Provincial Policy Statement, 2014.

Each conservation authority also has a provincially-approved 'Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses' under the Act. Conservation authorities regulate development and activities through a permitting process in areas prone to water related hazards (floodplains, shorelines, wetlands, hazardous lands) that fall within the authority's jurisdiction. The conservation authority considers the impact of a development on the control of the natural hazards (flooding, erosion, dynamic beaches, pollution or the conservation of land) and considers permits for activities that may change or interfere with the existing channel of a watercourse or with a wetland.

Additional local resource management programs are determined by the conservation authority boards of directors which are comprised of municipal appointees. These additional programs reflect local priorities within the watershed and the capacity of the conservation authority and may include activities such as stewardship, land securement, watershed studies, education and recreation. Conservation authorities may also comment on municipal planning documents according to their own board approved policies as a public body.

By contract or agreement, authorities may provide additional technical advice or other services to municipalities, such as assessment of environmental impacts, hydrogeology services, stormwater management advice, natural heritage advice, septic system reviews, tree planting and other activities.

Conservation authorities also have responsibilities under other provincial legislation, programs or through agreements with other government agencies. For example, conservation authorities undertake the duties of source protection authorities under the *Clean Water Act, 2006*, and participate in the Ontario Low Water Response Program.

www.ontario.ca/lowwater

https://www.ontario.ca/environment-and-energy/conservation-authorities

6. *Lakes and Rivers Improvement Act, 1990*

The *Lakes and Rivers Improvement Act* (LRIA), administered by the Ministry of Natural Resources and Forestry, provides the Minister with the legislative authority to govern the design, construction, operation, maintenance and safety of dams in Ontario. The definition of a dam includes a dike, diversion, channel alteration, culvert or causeway.

The purposes of the Act are to provide for:

- the management, protection, preservation and use of water in Ontario;
- the protection and equitable exercise of public rights in or over water in Ontario;
- the protection of interests of riparian owners;
- the management, perpetuation and use of the fish, wildlife and other natural resources dependent on the lakes and rivers;
- the protection of the natural amenities of the lakes and rivers; and
- the protection of people and property.

Approval may be required for the construction of new dams and for certain alterations to existing dams. The LRIA Administrative Guide and supporting Technical Bulletins outline ministry requirements and technical guidance for applicants seeking approval for dam related works. The Ministry also engages key dam owners through a Dam Owners Advisory Committee to seek advice on government policies and initiatives related to the regulation and management of dams

Dams may provide for a few objectives, including waterpower generation, municipal water supply, flood low water mitigation, wetland habitat management, navigation for commercial and recreational purposes, and other municipal, commercial and industrial use.

https://www.ontario.ca/laws/statute/90l03

https://www.ontario.ca/page/dam-management

7. *Endangered Species Act, 2007*

With the passage of the *Endangered Species Act in 2007*, Ontario became a North American leader in protection and recovery for the province's more than 200 species at risk and their habitats. Many species at risk and their habitats in the Great Lakes Basin are now legally protected under the Act. Some of these protected species, including the Lake Sturgeon and American Eel, are also the focus of rehabilitation efforts under the Canada – Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2014.

The key to protecting many species at risk is protecting and restoring their habitats. Conserving water helps to maintain habitat conditions for many species at risk and will aid in their recovery. For example, the recovery of both Lake Sturgeon and American Eel would be enhanced by promoting passage around water control and waterpower structures, both of which may be used to alter river flows and can affect water levels in downstream lakes and wetlands.

Under the Act, a recovery strategy is to be developed for each species listed as either Endangered or Threatened on the Species at Risk in Ontario list. A recovery strategy provides the Ontario government with the best available scientific information and advice regarding how to protect and recover the species. The government then outlines the actions it plans to take in response to this advice in a government response statement. Recovery strategies and government response statements are available to the public through Ontario's Environmental Registry and the species at risk pages on the Government of Ontario's website.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

http://www.ontario.ca/environment-and-energy/species-risk

8. Great Lakes Wetland Conservation Action Plan

The Great Lakes Wetland Conservation Action Plan (GLWCAP) was crafted in 1994 so government and environmental organization partners could work together more effectively to conserve remaining Great Lakes Basin wetlands. The GLWCAP is the implementation mechanism for the 25-year Strategic Plan for Wetlands of the Great Lakes Basin (1993) and complements the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health. Prepared by a cooperative of government and non-government agencies, the GLWCAP outlines a framework for wetland conservation in the Great Lakes Basin through eight implementation strategies. The Steering Committee is co-chaired by the Ministry of Natural Resources and Forestry and Environment and Climate Change Canada, and includes representatives from Conservation Ontario, The Nature Conservancy of Canada and Ducks Unlimited Canada.

The Ministry of Natural Resources and Forestry, on behalf of Ontario, also supports international efforts to conserve and manage Great Lakes coastal wetlands through its participation in initiatives such as the International Joint Commission's Upper Great Lakes and Lake Ontario-St. Lawrence River water level studies.

http://glwcap.ca

9. *Greenbelt Act, 2005* and Greenbelt Plan

The *Greenbelt Act, 2005* provides the legislative framework for the development and implementation of the Greenbelt Plan. The Act sets out the objectives of the Greenbelt Plan including protection of the land base needed to maintain, restore and improve the ecological and hydrological functions of the Greenbelt Area. The *Greenbelt Act* requires all decisions under the *Planning Act* and *Condominium Act* to conform to the Greenbelt Plan and that municipalities bring their official plans into conformity with the Greenbelt Plan at the time of their next five-year official plan review.

The Greenbelt Plan requires municipalities to provide for a comprehensive, integrated and long-term approach to managing water resource systems and natural heritage systems comprised of key natural heritage and key hydrological features and areas which are to be identified and protected from development and site alteration, along with appropriate buffers.

The Greenbelt Plan area contains numerous watersheds, subwatersheds and groundwater and surface water resources, and several river valleys identified in the Plan. These resources are critical to the long-term health and sustainability of water resources and biodiversity and overall ecological integrity.

Key policies which ensure the protection of water resources in the Greenbelt include those related to: requirements for watershed planning to inform development an infrastructure planning and the identification of a water resources system; and municipalities are required to protect, improve or restore the water resources system including key hydrologic areas (e.g. significant groundwater recharge areas, highly vulnerable areas) and features (e.g. wetlands, permanent/ intermittent streams).

https://www.ontario.ca/laws/statute/05g01

http://www.mah.gov.on.ca/Page13783.aspx

10. *Niagara Escarpment Planning and Development Act* and Niagara Escarpment Plan

The *Niagara Escarpment Planning and Development Act* sets out the legislative framework for the Niagara Escarpment Plan (NEP) and its implementation through a system of development control that is administered by the Niagara Escarpment Commission, a regulatory agency of the Government of Ontario. The purpose of the Act and the NEP is to provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment, and to ensure that only such development occurs as is compatible with that natural environment.

The Plan identifies several land use designations which direct how land can be used throughout the NEP Area and includes policies that guide planning and development to help protect water resources. The NEP was comprehensively reviewed, and an updated NEP was in effect June 1, 2017. The updated NEP includes a new section 2.6 dedicated to development affecting water resources. The development criteria in the updated Plan established key hydrological features and restricts development in and adjacent to these features to protect, and where possible enhance, the quantity and quality of groundwater and surface water.

https://www.escarpment.org/LandPlanning/NEP

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90n02_e.htm

11. Ontario's Biodiversity Strategy

Ontario's Biodiversity Strategy, 2011, is the guiding framework for coordinating the conservation of Ontario's biodiversity. Implementation and reporting on progress of the strategy is guided by the Ontario Biodiversity Council with membership from government, conservation stakeholders, Indigenous organizations and industry. Ontario's Biodiversity Strategy includes actions to reduce threats and enhance the resilience of the Great Lakes through activities including reducing pollution, preventing the introduction and spread of invasive species, implementing legislation to better protect species at risk and their habitats, completing a system of protected areas representative of Ontario's ecosystems, and encouraging private land and water resources stewardship. On an international scale, Ontario participates in efforts to conserve

the diversity of species and ecosystems of the Great Lakes Basin through binational projects that developed biodiversity conservation strategies for each of the Great Lakes.

www.ontariobiodiversitycouncil.ca/ontarios-strategy/

12. Biodiversity: It's in Our Nature, Ontario Government Plan to Conserve Biodiversity 2012-2020

Biodiversity: It's in Our Nature, Ontario Government Plan to Conserve Biodiversity 2012-2020 (BIION) is the Ontario government's implementation plan for advancing biodiversity conservation under Ontario's Biodiversity Strategy, 2011. The plan is an important statement of partnership and commitment across 16 ministries to work together to conserve Ontario's biodiversity.

BIION includes actions and activities to reduce threats and enhance the resilience of the Great Lakes ecosystem including promoting land and water conservation; reducing threats to biodiversity posed by habitat loss, invasive species, pollution, population growth and climate change; enhancing habitats and ecosystem services; and supporting science, research and information management to inform biodiversity conservation.

https://www.ontario.ca/page/biodiversity-its-our-nature

13. Ontario's Great Lakes Strategy

Ontario's Great Lakes Strategy provides a roadmap for how Ontario will focus action to protect the Great Lakes. Ontario's Great Lakes Strategy includes a summary of Great Lakes environmental conditions, a summary of Ontario's actions taken to date, and identification of priority areas for future action.

Goal 2 of Ontario's Great Lakes Strategy (protecting water for human and ecological health) includes actions to improve water quantity management such as fulfilling Ontario's commitments under the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement and promoting water conservation and efficiency under the *Water Opportunities and Water Conservation Act*.

www.ontario.ca/document/ontarios-great-lakes-strategy

https://www.ontario.ca/page/ontarios-great-lakes-strategy-2016-progress-report

14. Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2014

The Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA) is the principal mechanism through which Ontario and Canada coordinate their work to address their respective and shared commitments to protect the Great Lakes. The first COA was signed in 1971. The most recent COA was signed in 2014.

The 2014 COA commits Ontario to improved understanding and implementation of adaptive management approaches to lake level regulation, including enhancing understanding of the water budget within the Great Lakes basin. Ontario is also committed to improved understanding of cumulative impacts of water withdrawals, diversions and consumptive uses, and to producing and maintaining water use data that is made available to water management agencies across the Great Lakes Basin. The 2014 COA also supports enhancing understanding of climate change impacts in relation to the Great Lakes and integrating this information into Great Lakes management strategies.

The 2014 COA also supports implementation of Ontario's Great Lakes Strategy and the 2012 Canada-U.S. Great Lakes Water Quality Agreement. COA includes commitments to address excess nutrients and reduce harmful and nuisance algal blooms starting with Lake Erie. The Canada-Ontario Lake Erie Action Plan identifies more than 120 federal, provincial and partner actions to help achieve the goal of reducing phosphorus entering Lake Erie by 40 per cent by 2025 (from 2008 levels) and help reduce algal blooms which was released in February of 2018 to guide collective efforts to meet phosphorus reduction targets. The agriculture community has provided a broad commitment for participation in the implementation of the Action Plan, including industry leadership on six actions in the plan. The Canada-Ontario Lake Erie Action Plan also fulfills requirements under the *Great Lakes Protection Act* to set a target related to algal blooms, and to prepare a plan setting out the actions to be taken to achieve targets that have been set.

COA expires in December 2019 and Ontario is considering the negotiation of a new agreement with Canada.

www.ontario.ca/page/canada-ontario-great-lakes-agreement

https://www.ontario.ca/page/canada-ontario-lake-erie-action-plan

15. *Great Lakes Protection Act, 2015*

The *Great Lakes Protection Act, 2015* (GLPA) strengthens the province's ability to restore and protect the Great Lakes and St. Lawrence River, as well as the waterways that flow into them.

The GLPA requires Ontario to undertake a review of its Great Lakes Strategy before December 17, 2018, and to report on progress every three years. In preparing a new Great Lakes Strategy, Ontario will explore made-in-Ontario solutions to protect the waters of the Great Lakes basin and keep the Great Lakes clean for future generations, while supporting a prosperous economy.

To help deliver on goals under the COA and the GLPA, Swim Drink Fish Canada is developing a new digital tool to raise awareness of, and appreciation for, the importance of the Great Lakes and the issues facing them. The Great Lakes Guide provides a window to Ontario's Great Lakes parks, lakes and natural areas. The Guide seeks to enhance knowledge and understanding through inclusion of Indigenous knowledge, active engagement of youth in Great Lakes issues, and interactive features to profile Ontario's parks and conservation areas.

https://www.ontario.ca/page/protecting-great-lakes

https://www.ontario.ca/laws/statute/15g24

https://greatlakes.guide/

16. Joint Strategic Plan for the Management of Great Lakes Fisheries

The Joint Strategic Plan for Management of Great Lakes Fisheries is a world-renowned model for ensuring that Canada and the U.S. agree on how best to manage and sustain common Great Lakes fish stocks. The Great Lakes Fishery Commission, a secretariat that coordinates fisheries management and research on the Great Lakes, coordinates implementation of this historic plan, originating in the 1950s and last revised in 1997. The Ministry of Natural Resources and Forestry represents Ontario on four out of five Great Lakes Fishery Commission lake committees and on the Council of Lake Committees. The lake committees are responsible for developing fish-community goals and objectives for each Great Lake, as well as plans for managing, preserving and restoring Great Lakes fish species and their habitats.

The Joint Strategic Plan makes a clear connection between fish habitat, water quality and water use. The plan highlights impacts on fish during spawning and the potential for large-scale diversions to impact fish. Thus, the plan clearly identifies a need to ensure the conflicting goals of users consider impacts on fish, an important aquatic resource.

www.glfc.org

17. *Lake Simcoe Protection Act, 2008* and Lake Simcoe Protection Plan, 2009 and associated Subwatershed Plans and Water Budgets

The *Lake Simcoe Protection Act, 2008* provides the legislative framework for the development and implementation of the Lake Simcoe Protection Plan. The Lake Simcoe Protection Plan is a comprehensive roadmap for Ontario and its partners to work together to improve the health of the watershed.

A key objective of the Plan is to promote greater efforts to conserve and use water more efficiently, to meet future demands for water within sustainable limits. To advance this objective, Ontario supports a wide range of work with partners addressing water quantity changes on the landscape.

Ontario undertakes or supports monitoring and research in the Lake Simcoe watershed with the Lake Simcoe Region Conservation Authority to understand the impacts of land use on water quality and quantity, and to make sure that any recommended courses of action are based on sound evidence. For example, Tier Two Water Budgets have been created for all subwatersheds in the Lake Simcoe watershed. These assessments are being used to inform municipal water conservation and efficiency plans and municipal decisions concerning growth and development; water-taking strategies and decisions concerning Permits to Take Water; and the identification of significant groundwater recharge areas.

Ontario is also supporting action from other water use sectors by encouraging the development and implementation of water conservation practices in the agricultural, tourism and construction sectors. For example, the Lake Simcoe Region Conservation Authority is encouraging low impact development to improve water quantity control, reduce flood risks, and increase resilience to climate change.

Ontario has also supported work by the University of Western of Ontario to understand more about the major groundwater recharge and discharge functions in Lake Simcoe.

18. A Wetland Conservation Strategy for Ontario 2017-2030

Building on over 30 years of positive achievement in conserving Ontario's wetlands, A Wetland Conservation Strategy for Ontario 2017-2030 is a framework to guide the future of wetland conservation across the province. The Strategy includes a clear vision, goals and desired outcomes, and a series of actions the government is taking, or will undertake, by 2030.

The guiding principles for the strategy recognize that wetlands are integral components of their watersheds, natural heritage and hydrologic systems, and part of the larger landscape. Included in the comprehensive suite of government actions are actions to better communicate the value of wetlands and foster their stewardship, improve mapping required for water balances and source water protection, improve understanding of the relationship between wetlands and ground and surface waters, support research into how wetlands are responding to climate change as well as their role in adaptation strategies and climate resiliency, and finally the development of policy to improve wetland conservation. Together, these actions and many more will be important for meeting the target of a net gain in wetland area and function where wetland loss has been the greatest. The Province will report on progress every 5 years beginning in 2020.

http://apps.mnr.gov.on.ca/public/files/er/a-wetland-conservation-strategy-for-ontario-2017-2030.pdf

19. *Crown Forest Sustainability Act, 1994*

Ontario Ministry of Natural Resources and Forestry is the lead ministry for the management and regulation of forest management in Ontario. The *Crown Forest Sustainability Act* (CFSA) provides the legislative framework for the sustainable management of forests on Crown lands in Ontario. Under the Act, there are four manuals that guide various aspects of forest management in Ontario and an array of guides that provide direction on acceptable forest management practices that conserve biodiversity by emulating natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air, and social and economic values.

Under the CFSA, the Forest Management Guide for the Protection of Biodiversity at the Stand and Site Scales outlines standards, guidelines, and best management practices for forest operations around various water features including those within the Great Lakes watershed. For example, the guide outlines water crossing guidelines that protect water quality and fish habitat

to minimize the effects of forest management on water resources. These are intended to protect and maintain the ecological function of aquatic and wetland ecosystems, with consideration of the role of natural disturbances.

https://www.ontario.ca/laws/statute/94c25

https://dr6j45jk9xcmk.cloudfront.net/documents/4816/stand-amp-site-guide.pdf

OBJECTIVE 2) ADOPT AND IMPLEMENT SUPPLY AND DEMAND MANAGEMENT TO PROMOTE EFFICIENT USE AND CONSERVATION OF WATER RESOURCES

To achieve this objective, Ontario has a range of programs that manage water supply and demand to achieve efficient use and conservation of water resources — including promoting innovative water technologies, green infrastructure and water use efficiency.

20. *Water Opportunities and Water Conservation Act, 2010*

The *Water Opportunities and Water Conservation Act* passed in November 2010 contains five schedules. Schedule 1 enacts a stand-alone act, the *Water Opportunities Act, 2010* (see below for details). Schedules 2 to 5 amend existing legislation in respect of water conservation and other matters. The Act builds upon Ontario's expertise in clean water technology and sets out a framework to make the province a North American leader in water innovation to help address global water challenges. Among other things, the Act sets the framework to encourage Ontarians to use water more efficiently by creating and implementing innovative approaches to protect water resources for current and future generations.

The *Water Opportunities Act, 2010* also includes authority to require municipalities and other municipal service providers to prepare municipal water sustainability plans that would include an asset management plan, a financial plan, a water conservation plan, strategies for maintaining and improving the service, a risk assessment and other prescribed information; authority to require prescribed information on or with municipal water bills to promote transparency; authority to set aspirational targets for water conservation and other matters; and authority to require public agencies to prepare water conservation plans. This includes authority to require public agencies to achieve water conservation targets and consider technologies, services and practices that promote the efficient use of water when making capital investments or purchasing goods and services.

The Act also amended the *Ontario Water Resources Act* to enable regulations for water efficiency standards or requirements for prescribed appliances and products. No person would be permitted to offer for sale, sell or lease a prescribed appliance or product unless it meets the water efficiency standard or requirement set out in the regulations. These are tools that will enable Ontarians to use water more efficiently to conserve and protect water resources.

The Act also amended the *Building Code Act, 1992*. These changes require the Minister of Municipal Affairs and Housing to initiate reviews of the Building Code with reference to

standards for water conservation every five years, rename the Building Code Energy Advisory Council to the Building Code Conservation Advisory Council, and expand the mandate of this Council to include advising the Minister on the Building Code with reference to standards for water conservation.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_10w19_e.htm

21. Financial Plans Regulation under the *Safe Drinking Water Act, 2002*

Ontario put in place a licensing framework under the *Safe Drinking Water Act* for municipal residential drinking water systems – the Municipal Drinking Water Licensing Program. Financial plans are one of the elements that the owner of a municipal drinking water system must have in place for a licence to be issued or renewed.

A Financial Plans Regulation and Financial Plans Guidance Document were prepared and put into effect by the province in 2007. The Regulation outlines requirements set out by the Minister of the Environment, Conservation and Parks for financial plans that are required to obtain a licence under the *Safe Drinking Water Act*. Taken together, the Financial Plans Regulation and Guideline are a key step in the province's long-term strategy to ensure the financial sustainability of municipal drinking water and wastewater systems.

http://www.e-laws.gov.on.ca/html/source/regs/english/2007/elaws_src_regs_r07453_e.htm

http://www.ontla.on.ca/library/repository/mon/18000/275984.pdf

22. *Building Code Act, 1992* and the Building Code

Ontario's Building Code is a regulation under the *Building Code Act, 1992* that sets out technical and administrative requirements that must be met when a building is constructed, renovated, demolished or undergoes a change of use.

One way to conserve water is to design buildings so that they use less water. Ontario's Building Code has been amended over the past 20 years to include increasingly progressive water conservation requirements.

Conservation is one of the objectives of the Building Code. Over time, water conservation requirements for plumbing fixtures have been enhanced so that today, very high-efficiency toilets (4.8 litre or 4/6 litre dual flush), urinals (1.9 litre) and showerheads (7.6 litres/minute) are required as a minimum in new construction and renovations. The Building Code has also been amended to allow for more plumbing functions to reuse storm sewage, greywater and rainwater and to remove barriers to water reuse, thereby increasing certainty in the building industry about the uses of these green technologies.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_92b23_e.htm

http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_120332_e.htm

23. *Green Energy Act, 2009*

On May 14, 2009 the Ontario legislature passed the *Green Energy Act* to remove barriers to and promote opportunities for renewable energy projects, promote a green economy and promote and expand energy conservation. Amendments in 2010 expanded the guiding principles for the Government of Ontario to consider when constructing, acquiring, operating and managing government facilities. The guiding principles now include:

- Reporting on water use associated with government facilities;
- Ensuring water efficiency is considered in planning and designing government facilities; and
- Using technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario's water resources.

Amendments to the *Green Energy Act in 2016* presented new opportunities to conserve water and energy by enabling the implementation of two new conservation initiatives.

First, the *Green Energy Act* prohibits the sale of products in Ontario that do not meet prescribed energy and water efficiency standards. On December 2, 2016, Ontario filed Ontario Regulation 419/16, which amended Ontario Regulation 404/12, Energy and Water Efficiency – Appliances and Products to include, among other things, new water efficiency standards for products using both energy and water such as clothes washers and dishwashers. The Amendment came into effect on January 1, 2017. Setting water efficiency standards for these products reduces water and energy use and further lower greenhouse gas emissions.

The second energy and water conservation initiative is the Large Building Energy and Water Reporting and Benchmarking program, which requires commercial, multi-unit residential and some industrial buildings that are 50,000 square feet or larger to annually report their energy and water consumption and GHG emissions to the Ministry of Energy. The information will be benchmarked against other similar buildings and portions of the data will be publicly disclosed. Making the information publicly available can help building owners better manage energy and water use and costs and help the market value efficiency in purchasing, leasing and lending decisions. On February 6, 2017, Ontario Regulation 20/17, Reporting of Energy Consumption and Water Use, was filed, which sets out the details of the reporting requirements.

On September 20, 2018, the Ontario government introduced Bill 34 *Green Energy Repeal Act, 2018*. Bill 34, if passed, would repeal the *Green Energy Act, 2009*. Provisions related to conservation and energy efficiency would be re-enacted in a new Part II.3 of the *Electricity Act, 1998*.

https://www.ontario.ca/laws/statute/09g12

24. *Oak Ridges Moraine Conservation Act, 2001* and Plan

The *Oak Ridges Moraine Conservation Act, 2001* provides the legislative framework for the development and implementation of the Oak Ridges Moraine Conservation Plan. The Act

requires all decisions under the *Planning Act* and *Condominium Act* to conform to the Oak Ridges Moraine Conservation Plan and that municipalities bring their official plans and zoning by-laws into conformity with the Plan.

The Oak Ridges Moraine Conservation Plan, 2017 provides a long-term framework for land use designations and policies and requires that municipalities further implement these directions through their official plans and zoning by-laws. It identifies a natural heritage system comprised of Cores and Linkage Areas and goes on to define key natural heritage and hydrological features which are to be identified and protected, along with defined buffers. It also provides mapping of landform conservation areas and highly vulnerable aquifer areas, requires watershed plans and the preparation of water conservation plans and water budgets, and requires the identification and protection of municipal well-head protection areas and restricts certain types of stormwater management facilities in order to protect the ground water resources in the Moraine's aquifers – which provide drinking water for over 250,000 people and provide the baseflow for the vast majority of streams running north and south off the Moraine – the regional groundwater divide for central Ontario.

The Oak Ridges Moraine Conservation Plan requires that every upper-tier municipality and single-tier municipality within the designated Oak Ridges Moraine plan area begin to prepare a water budget and conservation plan for every watershed whose streams originate within the municipality's area of jurisdiction. The Plan prohibits major development unless the watershed plan for the relevant watershed has been completed; the major development conforms with the watershed plan; and a water budget and conservation plan is completed and demonstrates that the water supply required for the major development is sustainable.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_01o31_e.htm

http://www.mah.gov.on.ca/Page13788.aspx

25. *Places to Grow Act, 2005* and Growth Plans

The *Places to Grow Act, 2005* provides the legislative framework for the development and implementation of growth plans for any part of the province. The Act clearly establishes the provincial interest in coordinated regional growth management and infrastructure investment. It sets a broad scope for growth plans, allowing for province-wide relevance and application, and gives growth plans status. The Act requires that all decisions under the *Planning Act* and *Condominium Act, 1998* must conform to a growth plan and that municipal official plans be brought into conformity within three years of the effective date of a growth plan.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_05p13_e.htm

Growth Plan for the Greater Golden Horseshoe, 2017

The Growth Plan for the Greater Golden Horseshoe, 2017 represents the province's long-term vision for managing the rapid growth that is forecast for this region to 2041. The Plan contains

requirements for watershed planning to inform land use and infrastructure master planning, the identification of water resource systems and the protection of key hydrologic features and key hydrologic areas, and policies for evaluation of water availability and assimilative capacity needed to service current and forecasted growth.

The Plan also includes water conservation and efficiency policies which municipalities are required to implement through official plan policies and other strategies.

https://www.placestogrow.ca/index.php?option=com_content&task=view&id=9&Itemid=14

Growth Plan for Northern Ontario

The Growth Plan for Northern Ontario, 2011 is a 25-year plan to guide decisions and investments to build a globally competitive northern economy that is resilient and sustainable. The Plan includes a chapter on the environment which sets out policies to encourage municipalities to contribute to the protection of surface water and ground water features. Additionally, Northern economic and service hubs are to identify environmental sustainability objectives and develop policies and programs to achieve water conservation.

https://www.placestogrow.ca/index.php?option=com_content&task=view&id=53&Itemid=65

26. *Planning Act, 1990* and Provincial Policy Statement, 2014

The *Planning Act* provides the legislative basis for the land use planning system in Ontario. Municipalities are the main implementers of provincial land use planning policies through their official plans and zoning by-laws and their decisions on planning applications. Their decisions and plans are required by the *Planning Act* to conform (or not conflict) with provincial plans and to be consistent with policies in the Provincial Policy Statement, 2014. A variety of other legislation may also apply when municipalities are making decisions on applications or when creating their planning documents.

The *Planning Act* contains the process requirements for public notice and consultation rules governing municipal processing of land use proposals or documents and the framework for appeals to the Ontario Municipal Board. The planning process provides an opportunity for an inter-disciplinary assessment of matters pertaining to land use, including the integration of water-related considerations.

Issued under the authority of section 3 of the *Planning Act*, the Provincial Policy Statement, 2014 provides policy direction on matters relating to land use planning that are of provincial interest. For example, policy 1.6.6.1 of the Provincial Policy Statement, 2014 states that planning for water and sewage services shall promote water conservation and water use efficiency. In addition, policy 2.2.1 states that planning authorities shall protect, improve or restore the quality and quantity of water by, among other things, “planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality” and using the watershed as the ecologically meaningful scale for planning. It calls for planning authorities to identify the water resource system, including ground and surface water features and functions

necessary for ecological and hydrological integrity of the watershed, and maintain linkages among hydrologically connected water-based and terrestrial-based features.

Under the *Clean Water Act*, source protection plans were developed locally based on scientific assessments that identified vulnerable areas related to municipal drinking water systems that must be considered by planning authorities when implementing policy 2.2.1 of the Provincial Policy Statement, 2014. These source protection plans also identify areas where water supplies are vulnerable to depletion and may include policies to find efficiencies in the use of water including developing water conservation plans to address these water supply risks.

http://www.mah.gov.on.ca/Page215.aspx

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90p13_e.htm

27. Municipal Stormwater Management Systems

The Ministry of the Environment, Conservation and Parks has created several documents for municipalities, community groups, businesses and anyone who is interested in managing stormwater and reducing pollution at its source. They include the Stormwater Management Planning and Design Manual, March 2003; Understanding Stormwater Management: An Introduction to Stormwater Management Planning and Design; and summaries of several stormwater projects completed with provincial assistance.

Preserving flow (e.g., by conserving water) is one of several objectives for stormwater management as stated in the 2003 Stormwater Management Planning and Design Manual:

- Preserve groundwater and baseflow characteristics, protect water quality;
- Reduce occurrences of undesirable geomorphic change (e.g., stream erosion);
- Reduce flood damage potential;
- Maintain appropriate diversity of aquatic life and opportunities for human uses; and
- Maintain the natural hydrologic cycle to the greatest extent possible.

https://www.ontario.ca/document/stormwater-management-planning-and-design-manual-0

In 2010, Ontario completed a review of the need for a new policy, act or regulation to deal with municipal stormwater management systems in Ontario municipalities considering climate change. The review identified a need for a stormwater management policy framework, with emphasis on improving stormwater management at the source through green infrastructure and low impact development practices to reuse the water or infiltrate into the ground. Further, increased collaboration for source control practices is needed between all partners including residents, businesses, conservation authorities and all levels of governments.

Ontario is in the process of drafting a low impact development guidance manual that will assist proponents in implementing their efforts.

https://www.ontario.ca/page/policy-review-municipal-stormwater-management-light-climate-change

28. Ontario's Water Sector Strategy

On January 9, 2013, the government released Ontario's Water Sector Strategy. Through the strategy, Ontario aims to become a North American leader in the development, demonstration, commercialization and sale of water technologies. The Strategy builds on Ontario's strong foundation of water companies, researchers, demonstration and commercialization capabilities, and supportive policies. It focuses on three key actions:

- Driving Adoption of Innovative Technologies;
- Attracting Investment and Increasing Access to Global Markets; and
- Creating a Competitive Ontario Advantage.

The strategy can be accessed at:
http://www.watertapontario.com/a/brochures/20130523230443_waterstrategyen.pdf

OBJECTIVE 3) IMPROVE MONITORING AND STANDARDIZE DATA REPORTING AMONG STATE AND PROVINCIAL WATER CONSERVATION AND EFFICIENCY PROGRAMS

To achieve this objective, Ontario has a range of programs that improve monitoring of water supply, use and conservation/efficiency and standardizing data reporting among state and provinces.

29. Ontario Low Water Response

The Ministry of Natural Resources and Forestry oversees the Ontario Low Water Response program which provides a framework to enable local response in the event of a drought/low water. The Ministry of Natural Resources and Forestry collects, monitors and analyzes stream flow and climate data to provide early warnings, and to support local drought response. The early warning framework utilizes three levels of drought/low water status, based on precipitation and stream flow deficit conditions. Local Water Response Teams are encouraged to outline voluntary contingency measures within the watershed to achieve water use reduction targets. Water permit holders may be contacted to help achieve water reduction targets and are formally regulated through the Ministry of the Environment, Conservation and Parks Permit-to-Take-Water Program. Increasing water conservation is strongly encouraged and communicated as water scarcity increases. The program is currently being modernized to streamline the response process, clarify roles and responsibilities and allow for increased autonomy in local decision making.

http://www.ontario.ca/page/low-water-response-program

30. Ontario Surface Water Monitoring

The Ministry of Natural Resources and Forestry administers the bi-lateral 'Canada-Ontario Agreement on Hydrometric Monitoring' which funds stream flow monitoring infrastructure,

technology and data collection protocols on behalf of the province. The Ministry of Natural Resources and Forestry collects, monitors and analyzes stream flow and climate data through a provincial network of over 650 stations. This information is used to provide early warnings for flooding and drought/low water to identify locations throughout the province where potential risks may exist. The mandate for this work is founded in Lieutenant Governor Order-in-Council under the *Emergency Management and Civil Protection Act* for the purposes of emergency planning and public safety. Additionally, this information supports a broad spectrum of water-related decision-making for the management, use and sharing of water resources.

http://ontario.ca/page/surface-water-monitoring

http://www.ontario.ca/law-and-safety/flood-forecasting-and-warning-program

31. Provincial Groundwater Monitoring Network

The Provincial Groundwater Monitoring Network monitors and reports on ambient groundwater levels and quality in aquifers across Ontario, through a network of over 480 monitoring wells. Rain gauges established at 65 of the monitoring sites provide insight into how groundwater levels are responding to precipitation and changing weather patterns. The water level and chemistry data produced under this program support climate change detection and adaptation activities, drought response, assessment of permit to take water applications, source water protection activities, and water budget and cumulative impact studies.

http://www.ontario.ca/environment-and-energy/provincial-groundwater-monitoring-network

32. Water Use Reporting

Under Ontario Regulation 387/04, every holder of a Permit to Take Water is required to report daily water use for each calendar year by March 31 of the following year. This also applies to water taking activities prescribed under the Registrations Under Part II.2 of the Act – Water Taking (Ontario Regulation 63/16). These data are used to inform the broad water management programs for the province.

Provincial reporting of withdrawals, consumptive uses and diversions to the Great Lakes Commission's Regional Water Use Database is coordinated by the Ontario Ministry of Natural Resources and Forestry in collaboration with the Ontario Ministry of Environment, Conservation and Parks. Investments continue to be made to enhance the regional data processing and assessment.

http://www.glc.org/work/water-use

https://waterusedata.glc.org/

33. Mapping and Geomatics Services Section

The Mapping and Geomatics Services Section provides leadership and coordination to capture, create and maintain the province's foundation geospatial data (e.g., roads, water, utilities,

wetlands, elevation and aerial imagery) and works to ensure information about Ontario's water resources is available to provincial ministries, municipalities, conservation authorities and others to create maps, conduct geographic analysis and support decisions about the province's water resources. The Ontario Hydrology Network; Ontario Integrated Hydrology; provincial elevation and imagery layers; and enhanced watershed boundaries are all examples of datasets produced by the Mapping and Geomatics Services Section that can support the implementation of the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement.

Mapping and Geomatics Services Section has developed the Ontario Flow Assessment Tool (OFAT) to allow water professionals in the public and private sectors and academia to analyze and understand water flow. The application allows for watersheds to be generated, characterized and flows estimated for any location in Ontario. Statistics and mapping from OFAT can be used for applications such as water permitting, water use reporting and water quantity assessment.

https://www.ontario.ca/page/land-information-ontario

https://www.ontario.ca/page/watershed-flow-assessment-tool

34. Ontario's Provincial Fish Strategy: Fish for the Future

Ontario's abundant aquatic resources support a diverse range of year-round recreational, commercial and First Nation and Métis fisheries. Together, these activities and their supporting industries are estimated to contribute more than $2.2 billion annually to Ontario's economy. The Provincial Fish Strategy outlines goals, objectives and tactics to improve the conservation and management of fisheries and the ecosystems on which fish communities depend; and to promote, facilitate and encourage fishing.

Ontario's 20 Fisheries Management Zones have been established to protect and maintain Ontario's high-quality fishing opportunities. To enhance public involvement and decision-making in managing and ensuring the sustainability of its recreational fisheries resources, Ontario created complementary Fisheries Management Zone Advisory Councils for each zone.

In support of fisheries management, the Ministry of Natural Resources and Forestry implemented a broad-scale monitoring program for inland lakes. The broad-scale monitoring program is a long-term effort to monitor the health of Ontario's lakes and their fisheries. The goals of the program are to: describe the distribution of aquatic resources in Ontario lakes; identify stresses on these resources; track trends in indicators of the health of Ontario's fisheries, lake ecosystems and aquatic biodiversity; and assess and report on the status of fisheries in Ontario. A wide range of variables are monitored: fish are netted to determine abundance, sex, length and weight; tested for contaminants in collaboration with the Ministry of the Environment, Conservation and Parks; temperature/oxygen and water quality is analyzed; invasive species are documented; and fishing effort is estimated.

Intensive monitoring occurs on each of the Great Lakes to provide information on the fish communities and fisheries they support. These monitoring programs inform the development of

lake-specific Fish Community Objectives and are used to establish allowable harvest levels for fisheries within the lakes.

https://www.ontario.ca/page/fishing

35. The Ontario Geological Survey's Groundwater Mapping Initiative

The Ontario Geological Survey's groundwater mapping initiative contributes geoscience data and information to water management initiatives, including the development of GIS-based geological maps/databases, groundwater vulnerability maps, regional (3-D) aquifer subsurface mapping in bedrock and surficial sediments, karst mapping, watershed characterization, thematic studies, regional groundwater geochemistry studies, method/protocol and product development.

http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth

http://www.mndm.gov.on.ca/en/mines-and-minerals/geoscience/groundwater

36. Stream Water Quality Monitoring and the Multi-Watershed Nutrients Study

The Ministry of Environment, Conservation and Parks' Provincial Water Quality Monitoring Network measures and reports on stream water quality across Ontario with focussed studies related to pesticides, climate change, drinking water source protection, and roads. Collected data allows for the recognition of trends and correlations, informs land use planning decisions, assessments of water taking applications and wastewater discharges. The Multi-Watershed Nutrients Study was launched in 2013 to assess the interaction between agricultural land use and nutrient loadings in streams draining to the Great Lakes. The study will inform potential management actions to mitigate nutrient losses from agricultural systems.

http://www.ontario.ca/environment-and-energy/provincial-stream-water-quality-monitoring-network

37. Fish Contaminant Monitoring Program

The Ministry of Environment, Conservation and Parks' Fish Contaminant Monitoring Program monitors persistent toxic contaminants (e.g., mercury, PCBs, dioxins/furans, organochlorine pesticides) in both large bodied (sport) and forage fish from the Great Lakes and inland lakes and rivers. The program started in 1967 and is an exemplary partnership between the Ministry of Environment, Conservation and Parks and the Ministry of Natural Resources and Forestry. It is one of the largest, most comprehensive programs of its kind worldwide. The monitoring data are used for a variety of purposes including providing advice on the safe consumption of fish through the Guide to Eating Ontario Fish. The data are also used to evaluate the success of remedial measures, track long-term trends in fish contaminant levels, examine the status of Areas of Concern, support environmental assessments related to First Nations concerns, provide advice to First Nations communities, and conduct cumulative impact assessments. The program informs management and policy decisions. It also supports legislation and policies to protect Ontario's

water, including the *Great Lakes Protection Act*, the Great Lakes Water Quality Agreement and Canada-Ontario Agreement, the *Clean Water Act*, the *Environmental Protection Act*, the *Ontario Water Resources Act*, the *Pesticides Act*, the *Toxics Reduction Act*, the *Far North Act*, the *Source Water Protection Act*, and the *Lake Simcoe Protection Act*.

www.ontario.ca/fishguide

38. Great Lakes Intake Program

The Great Lakes Intake Program monitors and reports on water quality and algae in the nearshore of the Great Lakes – St. Lawrence River system and in Lake Simcoe since the 1960s. Using water treatment plant intakes as collection points, untreated water samples are collected weekly or biweekly, year-round, and analyzed for water chemistry, including nutrients and planktonic algae. Program data are used to evaluate the current status of source water quality and assess long-term trends to evaluate the cumulative impacts of multiple environmental stressors such as nutrient loading, invasion by exotic species, and climate change. Data is also used to evaluate the effectiveness of broad scale pollution control measures, and to inform decision making to restore, protect and conserve the Great Lakes and Lake Simcoe. The program supports the *Great Lakes Protection Act*, the Great Lakes Water Quality Agreement and Canada-Ontario Agreement, the Lake Erie Domestic Action Plan, the *Lake Simcoe Protection Act*, the *Clean Water Act*, and the *Source Water Protection Act*.

https://www.ontario.ca/data/lake-water-quality-drinking-water-intakes

OBJECTIVE 4) DEVELOP SCIENCE, TECHNOLOGY AND RESEARCH

To achieve this objective, Ontario has a range of programs that encourage science, technology and research to implement the best in water, wastewater and stormwater technology.

39. Ontario Clean Water Agency

The *Water Opportunities and Water Conservation Act, 2010* enabled the Ontario Clean Water Agency to finance and promote the development, testing, demonstration and commercialization of technologies and services for the treatment and management of water, wastewater and stormwater. The Ontario Clean Water Agency is a Crown Agency of the province that provides clean water services to municipalities, First Nations communities, institutions and businesses.

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_93c23_e.htm

40. Water Technology Acceleration Project (WaterTAP)

WaterTAP was created as a statutory corporation under Part 2 of *Ontario's Water Opportunities Act, 2010*. Operating since 2012, WaterTAP acts as Ontario's water sector champion by assisting and promoting the development of Ontario's water and wastewater sectors, expanding business opportunities for Ontario companies nationally and internationally, providing a forum for government, the private sector and academic institutions to exchange information and ideas on

how to make Ontario a leading jurisdiction in the development and commercialization of innovative technologies and services for the treatment and management of water and wastewater, encouraging collaboration and co-operation among Ontario's water sector ecosystem, assisting in the development of certification, labelling and verification programs for water and wastewater technologies and services, if requested by the Minister of Economic Development, Job Creation and Trade, and providing the Minister with advice on actions the Government of Ontario should take to assist in fostering the development of Ontario's water and wastewater sectors.

WaterTAP achieves this by working directly with Ontario companies and tech developers to help them commercialize their products while offering export, investment, access to capital, sales, marketing, communications, and policy/regulatory research advice to help Ontario SMEs grow and expand into global markets. WaterTAP also plays a lead role in building/supporting Ontario's larger water sector ecosystem, which includes industry associations, NGOs, academic institutions, accelerators and incubators, testing beds, investors, end-users (e.g., municipalities) and members of the water technology supply chain.

http://www.watertapontario.com/

41. Southern Ontario Water Consortium

The Southern Ontario Water Consortium (SOWC) helps to advance new water technology ideas from research and bench scale through piloting and real-world demonstration.

SOWC is a network of 10 post-secondary institutions that helps companies by connecting them with relevant academic experts. Pilot and full-scale wastewater demonstration facilities anchor the unique suite of facilities offered by SOWC partner institutions. Regulatory approvals for facility use are in place, and SOWC can help its client companies obtain the necessary approvals to demonstrate innovative technologies. SOWC also provides financial support for collaborative industry-led technology development projects through its Advancing Water Technologies program (leveraged federal funding).

https://sowc.ca/

42. Green Focus on Innovation and Technology

To support newly commercialized innovative green technologies, the province introduced the Green Focus on Innovation and Technology. The initiative allows the Government of Ontario to use its buying power to become an early adopter and potential reference customer for new green technology solutions. By purchasing and validating new green products, GreenFIT provides direct support to innovative technology solutions and provides companies with the credibility they need to succeed. The program helps to measure and validate the unique attributes of green technology solutions which may have a higher initial purchase price than traditional items but significant longer-term operational savings, as well as notable environmental, economic, and social impacts.

http://www.doingbusiness.mgs.gov.on.ca/mbs/psb/psb.nsf/English/GreenFIT

43. Investment Accelerator Fund

The Investment Accelerator Fund helps accelerate the growth of new technology companies (including companies focused on water conservation technologies) being established in Ontario and positions them for further investment by angels and venture capitalists. The Fund invests up to $750,000 in companies that have the potential to be global leaders in their field and provide sustainable economic benefits to Ontario.

http://www.marsdd.com/aboutmars/partners/iaf/

44. Ministry of Agriculture, Food and Rural Affairs-University of Guelph Agreement Research Program

The Ministry of Agriculture, Food and Rural Affairs invests in research in seven theme areas through a partnership with the University of Guelph. The Environmental Sustainability research theme focuses on maintaining the ability of natural resources (soil, air, water and biodiversity) to support and strengthen agriculture, food and bio-product sectors and rural communities by evaluating environmental, economic, and social perspectives. To support long-term sustainability of the agri-food sector (agro-ecosystem and food system) and address the concerns of society, the Ministry invests in this research theme to:

- understand the agriculture and food sector's potential risks and benefits to soil, water, air and biodiversity resources;
- provide science for the development of credible and evidence-based government policies, programs and new technologies and practices;
- assess the effect of environmental policies on the agri-environment, agri-food sector's economics and rural society; and
- identify opportunities for agriculture, food, and bioproducts sectors, and rural communities to provide solutions for environmental challenges.

Since 2010, the OMAFRA-UofG Partnership research program has funded 37 research projects related to water management in agriculture and food. Out of these, 14 projects specifically target water use efficiency (technologies for greenhouse, microbrewery and fruit processing waste water treatment, evaluation of the implications of private water supply and waste water systems for rural Ontario municipalities, groundwater recharge and modeling water use efficiency in agriculture).

http://www.uoguelph.ca/research/omafra/index.shtml

45. New Directions Research Program

The purpose of the New Directions Research Program administered by the Ministry of Agriculture, Food and Rural Affairs is to stimulate the sustainable growth and competitiveness of Ontario's agri-food sector through investment in innovative and high-quality research in partnership with industry, rural communities, organizations, other levels of government, and research institutions. The specific priorities for the call for proposals vary annually depending on

the research need to address emerging issues. This program included water management as one of the priorities in its annual call for proposals for 3 years (2010/11, 2011/12 and 2012/13) and funded a total of 13 water management research projects across the province during that period. The 2013/14, 2014/15 and 2015/16 calls for proposal included a climate change priority that funded two water related projects (out of total 6 climate change projects) linking to climate change impacts on agri-food water use.

Altogether, since 2010, the New Directions Research Program has funded overall 16 water management research projects which focused in the areas of water use efficiency, waste water treatment and recycling, modelling ground water under a changing climate, water quality etc.

http://www.omafra.gov.on.ca/english/research/new_directions/

46. Anishinabek/Ontario Fisheries Resource Centre (AOFRC)

The Anishinabek/Ontario Fisheries Resource Centre was established in 1995 and continues to serve as an independent source of information on fisheries assessment, conservation, and management, promoting the value of both Western science and Indigenous knowledge of the land and water. Since its establishment, the AOFRC has completed over 400 fisheries projects with First Nations and government agencies across the province, including creel surveys, index netting projects, tagging studies, fish habitat inventories, and syntheses of fisheries data for formulating resource management plans. This type of information contributes to measuring the success of water conservation and fisheries management efforts.

http://www.aofrc.org/

47. Ontario's Cleantech Strategy

Ontario is currently developing a Cleantech Strategy to help establish the province as a North American cleantech leader. This will be done by leveraging provincial areas of competitive strength to meet growing national and international demand for new technologies, while supporting climate change goals.

Water and wastewater is one of the four key sub-sectors on which the strategy will focus. The strategy will aim to help companies scale, encourage adoption of their technologies, and globally export these products and services.

The strategy is currently in its final stages of development and is expected to be publicly released in November 2017.

OBJECTIVE 5) DEVELOP EDUCATION PROGRAMS AND INFORMATION SHARING FOR ALL WATER USERS

To achieve this objective, Ontario has a range of education programs and other programs that raise awareness of the importance of water and the value of conservation, efficiency and cost-saving, and to share best management practices.

48. Walkerton Clean Water Centre

The Walkerton Clean Water Centre was established in 2004. The Centre provides training for drinking water operators across Ontario, with a focus on smaller and remote systems, including those serving First Nations. The Centre's Technology Demonstration Facility, with its leading-edge drinking water technologies, is a platform for hands-on training and research on cost-effective solutions for small drinking water systems. The Centre is also responsible for delivering education, information and advice on water treatment, equipment, technology and operational requirements, and environmental issues related to drinking water, such as a course entitled "Water Conservation" that takes participants through a step-by-step process for developing a water conservation plan.

https://www.wcwc.ca/en/

49. Water Efficiency Labelling

The Ministry of the Environment, Conservation and Parks has a promotional partnership agreement with the U.S. Environmental Protection Agency to be part of their WaterSense Program, a water efficiency labelling program for products such as showerheads, faucets, toilets, and pre-rinse spray valves. As a promotional partner, Ontario can share information about the program and promote WaterSense. The WaterSense label lets consumers know they are buying products tested and proven to use 20 per cent less water and will make it easier for Ontarians to make green choices every day. WaterSense also gives tips for saving water around the house. Ontario-based manufacturers can get their water efficient products certified and promoted under the program. Retailers, municipalities and other organizations in Ontario can also participate in WaterSense and help promote the label. More information is available at:

http://www.epa.gov/watersense.

50. Best Management Practices

For the agricultural sector, the Ministry of Agriculture, Food and Rural Affairs has released over 35 booklets and books on best management practices (BMPs), also referred to as environmentally sustainable agricultural practices. BMPs are consensus-based documents developed by multi-disciplinary and multi-agency project teams. This series offers proven, practical and affordable approaches to conserving soil, water and other natural resources in agricultural and rural areas. Four books - Irrigation Management, Water Management, Water Wells and Cropland Drainage - address, among other things, efficient use of water/water conservation, (e.g. water efficient irrigation systems and staggered irrigation schedules, water quality tile drainage installation, maintenance and outlet protection for erosion control and subsurface drainage whereby water use may be conserved). The BMP series can be found here:

http://www.omafra.gov.on.ca/english/environment/bmp/series.htm

For the municipal sector, the Ministry of the Environment, Conservation and Parks provided funding to the Ontario Water Works Association to prepare "Water Efficiency: Best Management Practice" as well as "Outdoor Water Use Reduction Manual" and associated seminars, with order information available at:

http://www.owwa.ca/wp-content/uploads/2012/12/Water_Efficiency_Order_Form_revised.pdf

The Ministry of Agriculture, Food and Rural Affairs developed a series of videos geared towards horticultural growers. The videos take existing Ministry print information and workshops and present information in short 2 to 3-minute videos. A series for irrigators and for greenhouses introduce water efficiency practices. The videos can be seen here:

http://www.omafra.gov.on.ca/english/crops/hort/videos.htm

51. Canada-Ontario Environmental Farm Plan Program and Canadian Agricultural Partnership Cost-share Funding Assistance Program

The Ontario Ministry of Agriculture, Food and Rural Affairs, in partnership with Agriculture and Agri- Food Canada supports the development and delivery of the Canada-Ontario Environmental Farm Plan program. The Environmental Farm Plan (EFP) is a confidential, voluntary self-assessment that farmers undertake to review potential environmental risks associated with their farm operations. Farmers attend an EFP educational workshop, complete a review of their operation, and develop an individualized Action Plan to address identified concerns. Action Plans may be submitted for independent review to verify appropriateness of the actions proposed for mitigating identified areas of risk. The EFP promotes water conservation and water efficiency, raising farmers' awareness of legislative requirements, and best practices.

Participation in EFP and completion of a reviewed plan are required prior to a producer applying for cost-share funding for environmental projects under the Canadian Agricultural Partnership – Cost-share Funding Assistance program.

The Canadian Agricultural Partnership Cost-Share Funding Assistance program supports a range of best management practices project categories supporting soil health and water quality, with co-benefits to climate resilience, habitat and biodiversity.

Funding support for both programs is currently provided by the Ministry of Agriculture, Food and Rural Affairs and Agriculture and Agri-Food Canada under the federal-provincial Canadian Agricultural Partnership. Both programs are delivered locally to farmers, on behalf of government, by the Ontario Soil and Crop Improvement Association.

http://www.omafra.gov.on.ca/english/environment/efp/efp.htm

52. Species at Risk Stewardship Program

The Species at Risk Stewardship Program is a Ministry of Natural Resources and Forestry funding program to encourage and support the recovery and protection of species at risk and their habitats through stewardship and research activities. Since 2007, Ontario has supported

over 1000 stewardship projects including over 100 research projects through the program. The program is open to a wide variety of individuals and groups. Examples of eligible aquatic-related activities could include inventory, monitoring, research or outreach work related to aquatic species at risk, enhancing and protecting aquatic habitat of species at risk or the development and implementation of Best Management Practices to help avoid or mitigate threats to species such as Lake Sturgeon or American Eel.

http://www.ontario.ca/page/grants-protecting-species-risk

53. Invading Species Awareness Program

The province-wide Invading Species Awareness Program is a longstanding partnership of the Ministry of Natural Resources and Forestry and the Ontario Federation Anglers and Hunters launched in 1992. The program focuses on education and outreach to prevent the spread and or introduction of invasive species in Ontario as well as programs designed to monitor the occurrence and distribution of invasive species. The program has worked with the ministry and other partners to develop a web based tracking system and mobile App www.eddmaps.org/Ontario which will serve as a key prevention tool helping Ontario to detect and track the spread of invasive species.

http://www.invadingspecies.com/

54. Land Stewardship and Habitat Restoration Program

The Land Stewardship and Habitat Restoration Program (LSHRP) is a competitive funding program through which the Ministry of Natural Resources and Forestry supports on-the-ground efforts in habitat enhancement and ecological restoration to advance Ontario's biodiversity conservation objectives at a landscape level. The fund is open to incorporated organizations across Ontario, including Indigenous communities or organizations, conservation organizations, businesses, municipal governments and non-government organizations. Since its launch in 2013, the LSHRP has funded a variety of aquatic-related projects, including stream restoration, riparian plantings, fencing to exclude livestock from lakes and waterways, invasive species control, wetland creation, and fish habitat restoration. The Ministry allocates $300,000 to the fund annually to meet these biodiversity conservation objectives. Successful applicants are eligible for funding of up to $20,000 per project, with a 1:1 match funding requirement.

Since 2013, the LSHRP fund has helped to improve, restore or create over 6,392 acres of area, supported plantings of over 119,391 trees and shrubs, and leveraged over $3M in project partner funding.

www.ontario.ca/lshrp

55. Eastern Habitat Joint Venture

The Eastern Habitat Joint Venture (EHJV) is a collaborative partnership working together to conserve wetlands and other habitats that are important to waterfowl and other migratory birds.

Since 1986, the EHJV has helped to implement habitat conservation programs that support continental waterfowl objectives identified under the North American Waterfowl Management Plan. The Joint Venture also supports the mission of the North American Bird Conservation Initiative, an inter-governmental and inter-agency initiative to conserve all native birds and the habitats that support them.

The EHJV, one of 20 Joint Ventures in North America, spans the six eastern-most Canadian provinces: Ontario, Québec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador. Ontario EHJV partners include the Government of Canada (Environment Canada – Canadian Wildlife Service), the Government of Ontario (Ministry of Natural Resources and Forestry, Ministry of Agriculture, Food and Rural Affairs), Ducks Unlimited Canada, the Nature Conservancy of Canada and Bird Studies Canada. The Ministry of Natural Resources and Forestry has provided financial support for wetland conservation by Ontario EHJV partners since 1994.

http://www.ehjv.ca/

56. Ontario Parks Water Conservation Initiatives

Ontario Parks is responsible for the operation and protection of over 330 parks, covering 8.2 million hectares that attract over 10.5 million visits each year. Over the last few years, Ontario Parks has undertaken several initiatives to conserve water use within parks. Initiatives include the use of low-flow fixtures in park washrooms, variable frequency driven distribution pumps, solar hot water assist and propane water heaters to reduce reliance on hydroelectric power, cold water meters in new buildings to monitor water usage, use of polyethylene piping in water distribution systems to reduce leakage, and monitor for water system leakage, identify and make repairs in a timely manner. While several of our operating parks are municipally connected to sewerage, most parks rely on septic treatment systems to safely return the water to the local environment.

Ontario Parks permanently protects over 12,000 square kilometres of water including lakes, rivers and wetlands. These areas are managed with a priority on ecological integrity, or environmental health, for the benefit of the people of Ontario and their visitors. This priority on ecological integrity is demonstrated at multiple scales; through a robust policy framework that outlines permitted activities, to park and park zone classifications that protect aquatic features (such as waterway class parks), to park-specific management plans that document park values, pressures, vision, site objectives, and management direction in the form of site specific management policies and implementation actions (e.g. wetland restoration).

www.ontarioparks.com