



Climate Ready: Ontario's Adaptation Strategy and Action Plan (2011-2014)

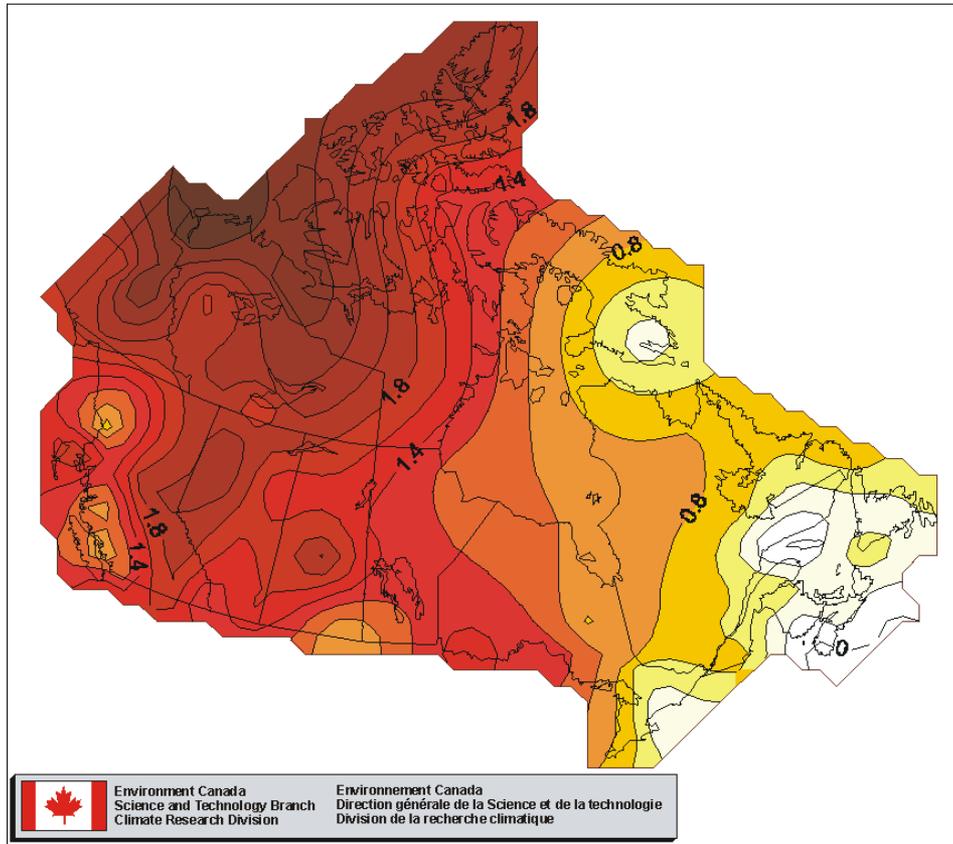
Ministry of the Environment
February 2012

What is Adaptation?

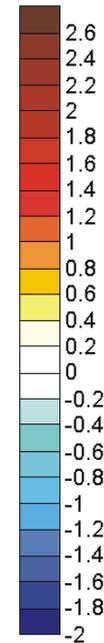
- Adapting to climate change will require a fundamental shift in how governments develop policy and deliver on their core business to ensure our economy and our communities are:
 - Coping with increased risk - taking measures to reduce the negative effects of climate change
 - Taking advantage of the positive effects – seeking opportunities
- This will require a longer-term view, ensuring future climate impacts (not just historical data) are considered/mainstreamed in decision-making.
- Examples of Adaptation :
 - Designing roads, bridges and buildings to better withstand greater storm activity (e.g., ensuring culverts can withstand increased flow, utilizing permeable pavement materials)
 - Replanting different tree species – to deal with warmer climates and increased pest activity (e.g., pine beetle, spruce bud worm)
 - Changing agricultural patterns (planting different crops, taking advantage of longer growing seasons)

How is Ontario's Weather Changing?

Annual Temperature Trend, 1948-2008



degrees C



- Increase of 1.4°C in **average temperatures** across Ontario since 1948
- 2010 hottest year on record
- Heat waves are expected to increase over time

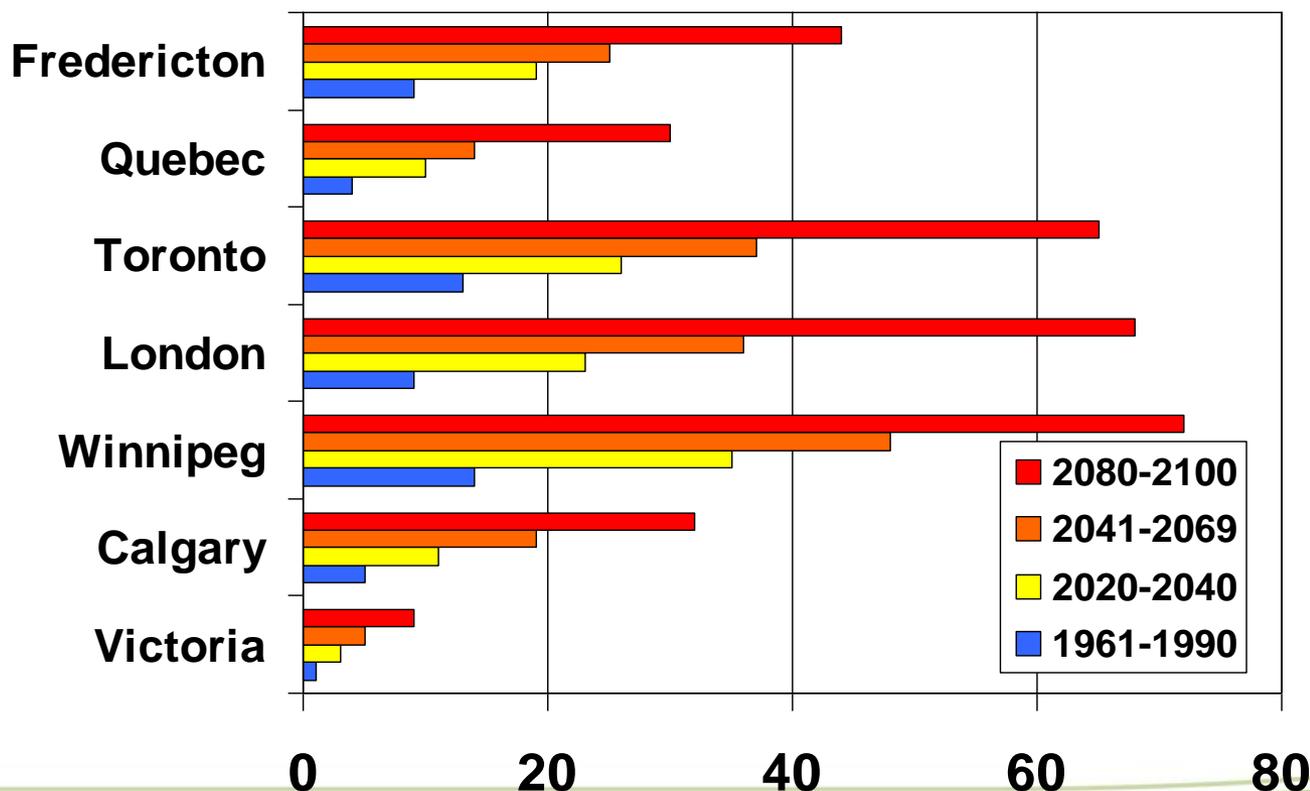
Changes

- Small temperature changes bring big changes in weather patterns. As a result, Ontario will face varying regional impacts:
 - More intense and frequent storms (extreme wind and rain)
 - Some regions will face more frequent and severe flooding; while others will face more extreme and severe droughts
 - Longer and more frequent heat waves
 - Northern spread of diseases (warmer weather / winters allow spread of disease vectors, Ticks and Lyme Disease, Mosquitoes and West Nile virus)



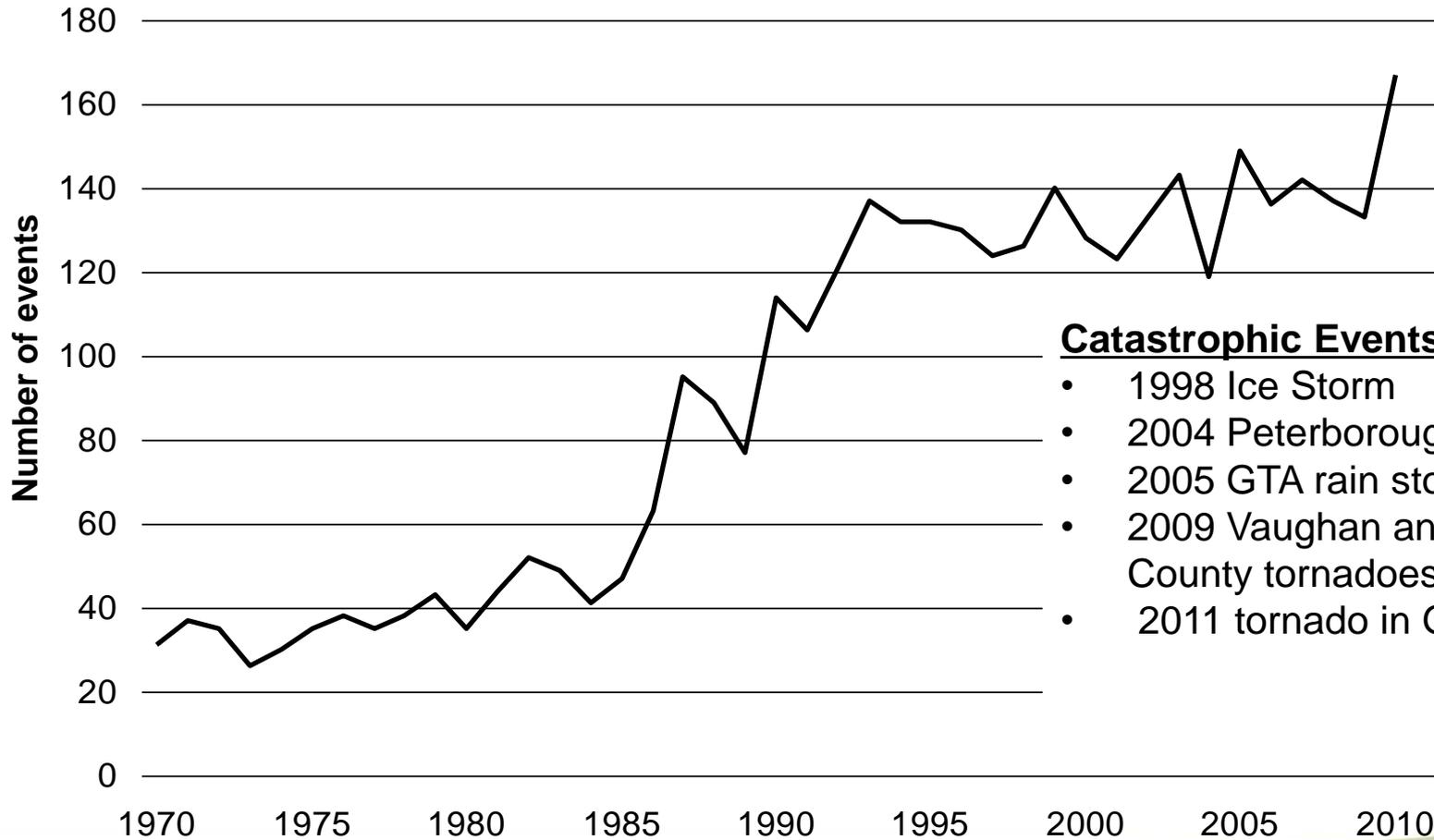
Context – Heat Days

Number of hot days* per year



*A hot day is defined as a day with a maximum temperature above 30C

Catastrophic Events in Canada 1970-2010



Catastrophic Events in Ontario:

- 1998 Ice Storm
- 2004 Peterborough flood
- 2005 GTA rain storm
- 2009 Vaughan and Grey County tornadoes
- 2011 tornado in Goderich

Source: Swiss Re, sigma

Finch Avenue Washout 2005

In August 2005, up to 175 mm of rain fell in a very small area of Toronto over a short period of time, washing out Finch Avenue and causing extensive damage to both public and private property:

- Two broken gas mains
- Infrastructure failure, section of Finch Ave. washed away (5 months re-open, further impacting local homes and businesses - \$45M)
- Backed up storm sewers
- >4200 basements flooded



Damages and costs caused by this event could potentially have been mitigated in local planning processes by the use of:

- permeable pavements
- wrapping of communication cables
- wider culvert
- improved road drainage



2 High Pressure Gas Mains

Broken Watermain

Broken Maintenance Hole

Bell Canada Infrastructure

Bell Canada Infrastructure

Parks Path

Toronto Hydro and Rogers Cable

1998 Ice Storm

Severe Winter Storm in Eastern Ontario, Québec and the Maritime Provinces in 1998 – resulted in \$179 M in damage costs to Ontario – (*Ontario Ministry of Municipal Affairs and Housing*)



- Ice loading damaged and brought down power lines, telephone cables, transmission towers and utility poles

- Over 1.2M people in Eastern Ontario experienced loss of electricity for periods of a few hours to almost three weeks (*source: Natural Resources Canada – 2007 National Assessment*)

- 700,000 insurance claims were filed for storm-related damages in Ontario and Québec - total payouts \$1.5 Billion

Source: Natural Resources Canada

Extreme Wind / Tornadoes

In 2009, Vaughan and Grey County tornadoes resulted in \$76M in insurance claims

Wind damage resulting in personal injury, infrastructure and property damage, and power failures

An August 21, 2011 tornado in Goderich resulted in \$110M in damage to the city's downtown core and disruptions in electricity and natural gas utilities

Source: Insurance Bureau of Canada



Value of Adaptation

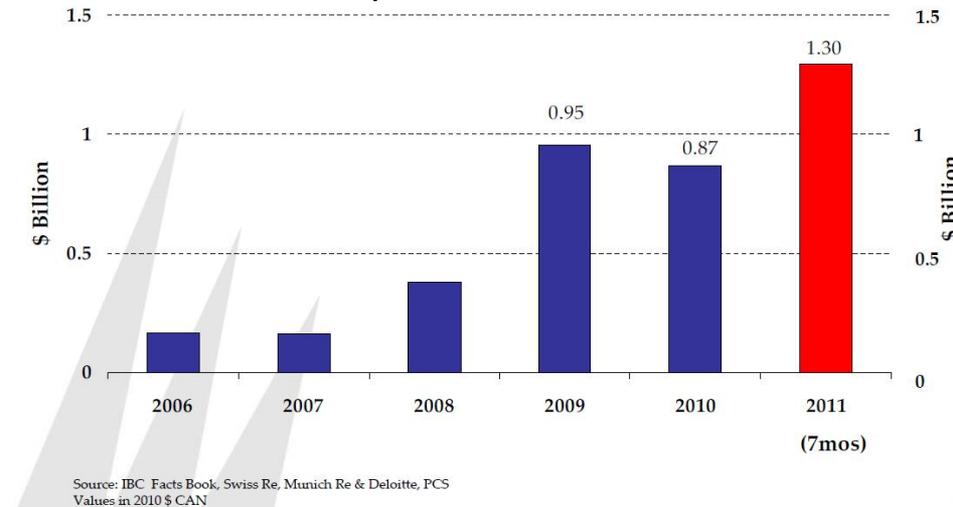
- **Cost of adaptation increases when action delayed**
 - Cost of climate change in Canada could escalate from roughly \$5 billion per year in 2020 to \$21-43 billion by 2050 (National Round Table on the Environment & Economy, 2011).
 - In Toronto, climatic changes causing increases in the number of heat and ozone related deaths could increase costs related to premature mortality risks (insurance) by \$2.6 billion per year by the 2050s.
 - In Ontario, the impacts to timber supply due to increased pest disturbances, fires and changes to forest growth, will cost the economy a minimum of \$2 billion per year by 2050.
- **Value of early action and targeted investment**
 - Well-targeted, early investment to improve climate resilience is likely to be cheaper and more effective than complex disaster relief efforts after the event.
- **Economic Opportunities**
 - Adaptation measures can spark innovation (e.g. new drip irrigation technologies in Leamington).
 - Longer growing seasons have enabled a vineyard to be established on Manitoulin Island.

Climate Impacts – Insurance

Impacts

- Insurance sector is concerned with rising costs from climate impacts (particularly from water damage/flooding)
- Losses related to water damage (e.g. basement flooding) #1 cost to Canadian insurers (\$1.5 billion annually, Insurance Bureau of Canada)
- Finch Ave. washout is the 3rd most expensive catastrophic event in Canadian history, cost mainly covered through insurance payouts

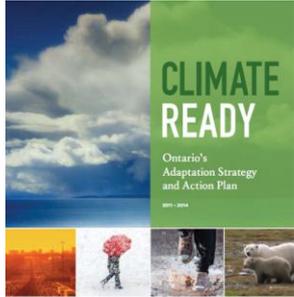
Catastrophic Insurance Losses in Canada



Consideration of Climate Impacts

- Insurance industry investing in research to promote reduced risk
- Sector likely to pass on increased cost to consumer, or deny coverage in areas of high risk – which may result in increased pressure on province assistance/relief

Climate Ready: Ontario's Adaptation Strategy and Action Plan



 Ontario

In April 2011, Climate Ready was released; the Strategy and Action Plan:

- *Climate Ready* was developed in response to the advice of the Expert Panel on Climate Change Adaptation, and represents 37 actions across 12 government ministries to help the province adapt to the impacts of climate change.
- MOE met with a range of key stakeholder groups in assessing its response to the advice of the Expert Panel – from the Ontario Medical Association and Ontario Federation of Agriculture to the Association of Municipalities of Ontario and Conservation Ontario.
- MOE will continue to work with partner ministries and external partners during the implementation of the Strategy and Action Plan as it is a four year living document with a future vision.
- In many cases, ministries will have individual engagement processes to support their actions under the plan (e.g. Provincial Policy Statement, Ontario Building Code). MOE supports these processes by assigning staff leads to each file to ensure consistency and effective integration.

Ontario's Adaptation Vision and Goals

VISION

- A province prepared for the impacts of a changing climate through implementation of policies and programs that minimize risks to our health and safety, the environment and the economy, and maximizes the benefits from opportunities which may arise

GOALS

1. Avoid loss and unsustainable investment, and take advantage of economic opportunities
2. Take reasonable and practical measures to increase climate resilience of ecosystems
3. Create and share risk-management tools to support adaptation efforts across the province
4. Achieve a better understanding of future climate change impacts across the province
5. Seek opportunities to collaborate with others

Actions to Deliver the Strategy and Action Plan

- Action 1: Require consideration of climate change adaptation
 - To ensure that government policies and programs consider the impacts of climate change
- Action 2: The province will take leadership role and drive the implementation of the Adaptation Strategy and Action Plan
 - Act as a catalyst for new policy; assist review of existing policies
 - Report on adaptation actions
 - Develop risk-management framework to guide adaptation decision-making
 - Sustain adaptation actions across government
 - Co-ordinate/undertake economic and climate impact studies
 - Integrate science and policy
 - Be a resource for the public and government on adaptation
 - Establish OPS Climate Modelling Collaborative
 - Chair cross-ministry steering committee to ensure integration across government

Climate Ready Actions



Water Resources

- A changing climate will affect both water quantity and quality. Intense rain storms and changes in the annual snow melt may cause flooding to happen more often. A changing climate may lead to reduced winter ice cover on lakes, lower lake levels and more frequent water shortages due to increased evaporation rates.
- Some of the actions include:
 - promoting water conservation through the new Water Opportunities and Water Conservation Act, 2010 (Action 3)
 - ensuring climate change considerations are integrated into Ontario's drinking water safety net and source water protection framework (Action 9)
 - developing an Adaptation Strategy for Lake Simcoe (Action 20)
 - building consideration of climate change impacts and adaptation actions in all Great Lakes Agreements (Action 18).

Climate Ready Actions



Buildings & Infrastructure

- Changing weather impacts all classes of infrastructure from buildings, roads and bridges to hydro-transmission lines, and stormwater drainage. Impacts may cause flooding, road washouts, ice and windstorm damage.
- Some of the actions include:
 - MOE is working with MMAH and industry stakeholders (Insurance Bureau of Canada, Institute for Catastrophic Loss Reduction) to promote changes to the Building Code that would increase resiliency in light of a changing climate (e.g. proposals are being considered related to hurricane straps for garage roofs and backflow prevention devices).(Action 5)
 - On behalf of the Ministry of Infrastructure, Infrastructure Ontario (IO) is working to assess future climate impacts on three public buildings in southwestern Ontario:
 - Brantford Courthouse, Jail and Land Registry (Brantford);
 - Ontario Provincial Police Headquarters (London); and
 - Garden City Tower (St. Catharines).
 - The assessments and final report are expected to be completed by March 31, 2012.(Action 6)
 - re-aligning and strengthening the winter road network in Northern Ontario (Action 11)

Climate Ready Actions

Health

- Supporting the development of a heat vulnerability tool to identify at-risk populations (Actions 24 and 35)
- Raising awareness of Lyme disease, as disease vectors expand into new areas of Ontario with warming temperatures (Action 25)

Agriculture

- Developing new approaches to protect plant health by undertaking research on new crops and best management practices (Action 13)
- Protecting animal health through detection and surveillance of new and emerging animal diseases (Action 12)



Climate Ready Actions

Communities

- Taking climate change adaptation considerations into account in the Provincial Policy Statement and increasing local awareness of land use planning tools that support adaptation (Action 22)
- Providing outreach and training to support communities as they assess local impacts and put effective adaptation strategies into place (Actions 28 and 35)
 - MOE's Community Adaptation Initiative is hosting workshops on the **promotion and delivery of resources, outreach and capacity building.**

Modeling & Science

- MOE has evaluated surface water quality and groundwater monitoring programs to determine their suitability for climate change adaptation and detection. 5 sensitive watersheds have been selected and being equipped with integrated water monitoring stations. 2 additional stations have been equipped through work under the Clean Water Act. MOE will complete installation of integrated water monitoring stations by 2012. (Action 31)
- Establishing an OPS Climate Modelling Collaborative to strengthen the application of climate projections in government decision-making (Action 34)

Ontario Regional Adaptation Collaborative

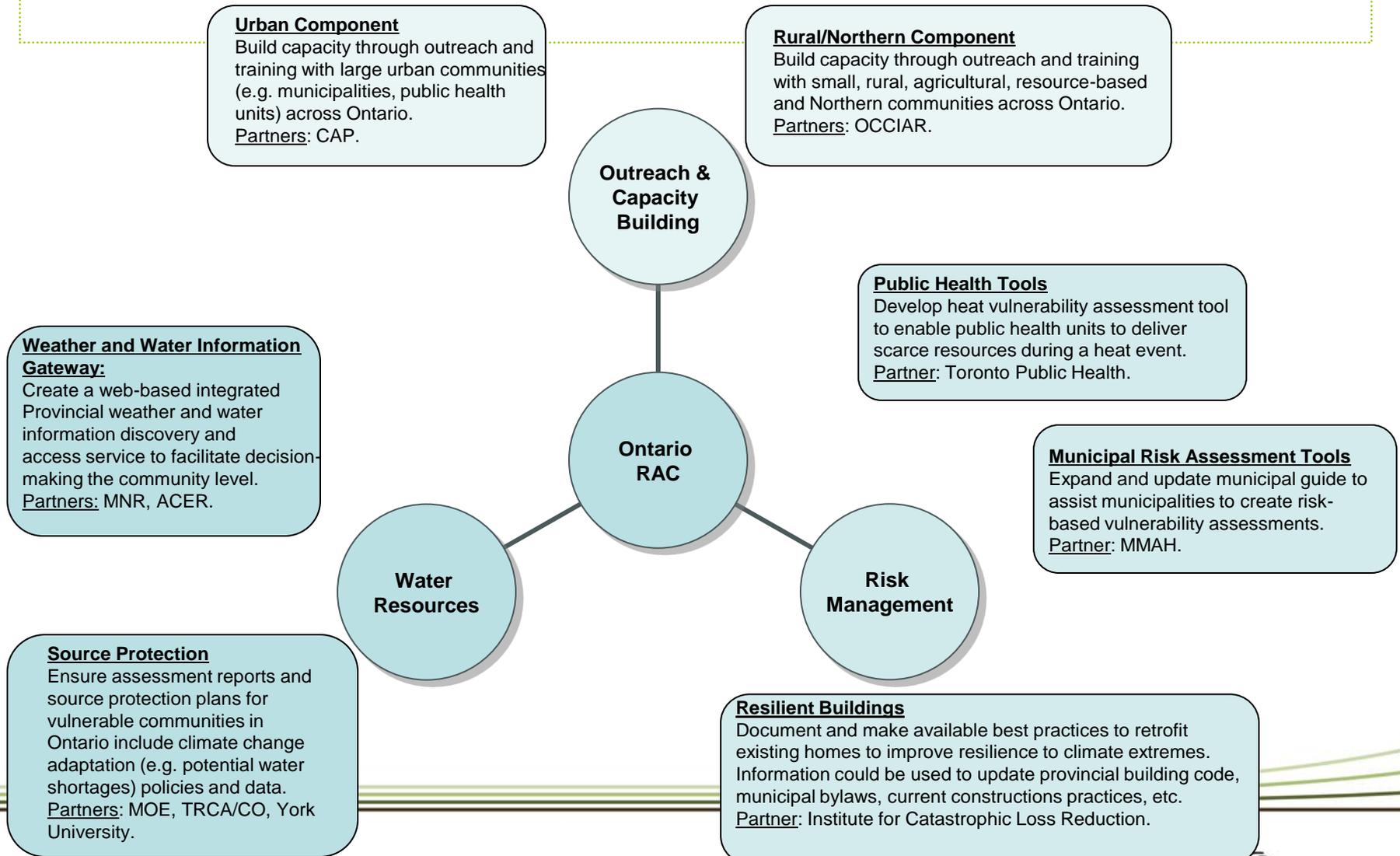
Action 35: Establish and Lead Ontario's Regional Adaptation Collaborative (RAC)

- MOE leads and administers Natural Resources Canada (NRCan) funding program.
- Current funding round ends March 2012.
- New program being developed by federal government (\$148M over the next 5 years).

- Ontario is one of 6 RACs across Canada, with a program value of over \$6M, with projects running from December 2009–March 2012.

- Ontario RAC partners:
 - Ministry of the Environment, Source Protection Programs Branch
 - Ministry of Natural Resources;
 - Ministry of Municipal Affairs and Housing;
 - Ontario Centre for Climate Impacts and Adaptation Resources (OCCIAR);
 - Toronto Public Health;
 - York University;
 - Toronto and Region Conservation Authority;
 - Institute for Catastrophic Loss Reduction;
 - Clean Air Partnership; and
 - Association for Canadian Educational Resources.

Ontario Regional Adaptation Collaborative



Accountability

- Annual report to the public on the action plan
 - Part of Ontario's Climate Change Annual Report
 - Indicator of success will be that adapting to climate change becomes integrated into policies, programs, information and monitoring across government
- Ongoing access to experts
 - Provides Ontario with the best advice on climate projections, adaptation strategies and sector specific considerations

Next Steps

- Each goal includes a future vision which identifies potential areas of priority for consideration in the future
- Over the next four years, we will be looking for opportunities across government to further integrate adaptation into government policies and programs
- We welcome your feedback and will be working closely with MOE divisions and other ministries to implement and profile the good work that is being done to ensure Ontario is CLIMATE READY