Developing Ontario's Next Adaptation Plan

Ontario Climate Symposium 2017

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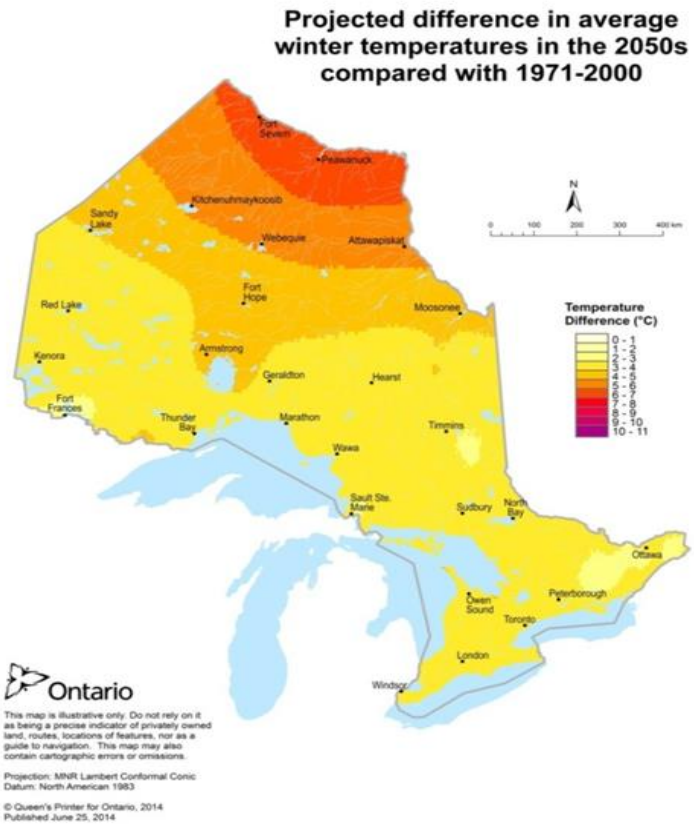
Changing Climate

- Most recent World Meteorological Organization's (WMO) Statement on the State of the Global Climate confirmed that 2016 was the warmest year on record.
- 10 warmest years on record have been recorded since 1998.
- Average temperatures in Ontario have increased by 1.4ºC since 1948
- Scientists project that by 2050, the average annual temperature in Ontario will increase by 2.5°C to 3.7°C
- Shift has made reliance on historical data insufficient in protecting our economy from adverse effects of the changing climate.



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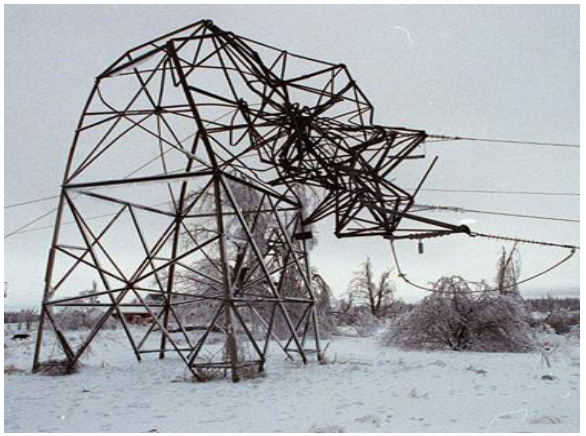
Impacts of Changing Climate

- Warmer temperatures are leading to increase in variability and severity of weather events, such as severe storms, flooding, droughts, and heat waves.
- Impacts vary on a regional scale but are affecting multiple economic sectors.



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Impacts Are Already Being Felt in Ontario

Spring Frost/Dry Summer

2012 Fruit trees crop losses estimated at $115 M

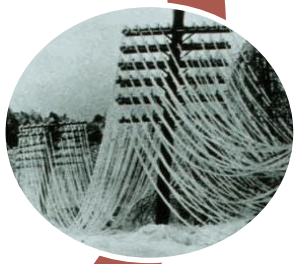
Tornadoes/Severe wind

2009 Vaughan and Grey County : $76 M in insured losses

2010 Leamington: $120 M

2011 Goderich: $110 M

$ Billions



Ice Storm

1998 Ontario/Quebec: $5 B in damages; over $1.6 B in insurance claims (CBC)

December 2013, $200 million - pushed yearly national weather losses to record $3.2B (IBC)

Flooding/ Thunderstorm

Water damage is now #1 source of household claims in Ontario

2005 Finch Avenue washed out: $500M in damages

2013 Toronto: $850 M – estimate of insured property damage

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Flooding

Warmer temperatures, heavier rainfall and extreme weather have resulted in an increase in flooding events across the province

- Costly damage to infrastructure, roads, bridges, water systems, power lines, buildings, and homes, as well as a surge in insured losses:
  - In May 2013 - Thunder Bay declared state of emergency after homes were flooded and sewer systems overwhelmed.
  - July 8, 2013 - Greater Toronto Area had record breaking 126mm of rain in a few hours.
  - April 13, 2014 – City of Belleville declares state of emergency after severe storm and flooding.
  - May 4-7, 2017 - Sustained heavy rains across Ontario and Quebec causing flooding in many areas, and calls for evacuation of Toronto Island residents.

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Severe Storms

Severe storm events attributed to increasingly variable and volatile weather patterns:

- In 2009, Vaughan and Grey County tornadoes resulted in $76M in insurance claims.
- In June 2010, wind and thunderstorm event in Leamington resulted in $120M in insurance claims.
- In August 2011, tornado in Goderich resulted in heavy damage to the city's downtown core and disruptions in electricity and natural gas utilities.

Tornado damage in Vaughan, 2009

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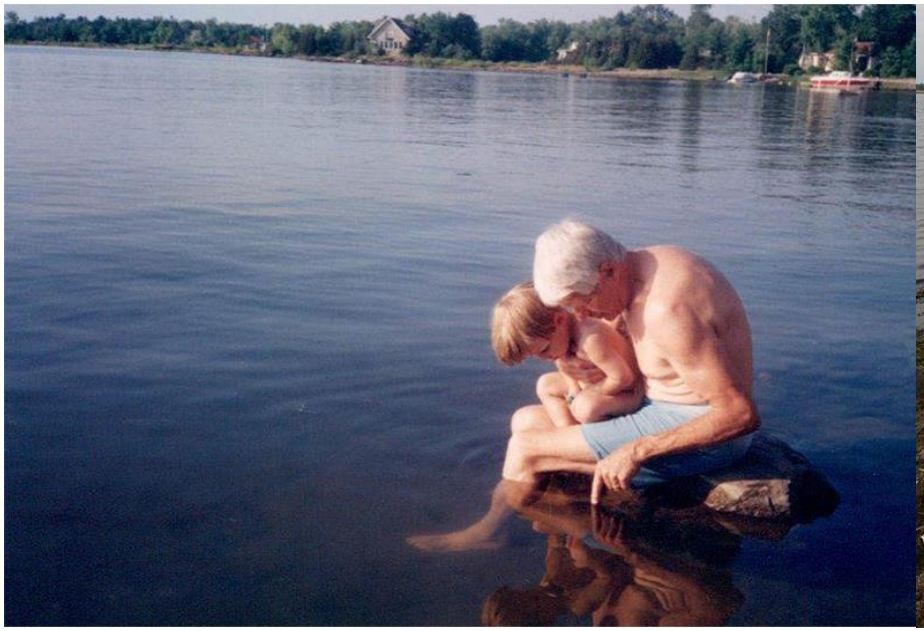
Low and High Water Levels



1994

2013

The family of 21-year-old Lauren Patchett has owned a cottage in Honey Harbour, Georgian Bay for decades. The submerged rock where her grandfather, Richard McPhail, sits in this 1994 picture with water to his knees while holding 2-year-old Lauren on his lap is now well back from the water's edge.

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Agriculture

An increase in climate variability is impacting Ontario's agricultural sector. For example:

- More difficult to predict the types of grapes to grow for wine industry;
- Asparagus may be ready for harvest sooner or prone to late frost damage;
- Over 80% of Ontario's apple crop lost to frost damage in 2012;
- Extreme heat/drought can make crops more vulnerable to pest infestations.

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The North

- Canada’s ice roads — more than 3,300 miles of them — have been freezing later and melting earlier, drastically reducing the window of time that isolated communities rely on to restock a year’s worth of vital supplies.
  - In northern Ontario, 32 Indigenous communities of the Nishnawbe Aski Nation, depend on the winter road system to replenish stocks of fuel, food and building materials.
  - Each community needs about 264,000 gallons of fuel each year - 40 tanker trucks. Flying it in would cost an additional $520,000 per community.

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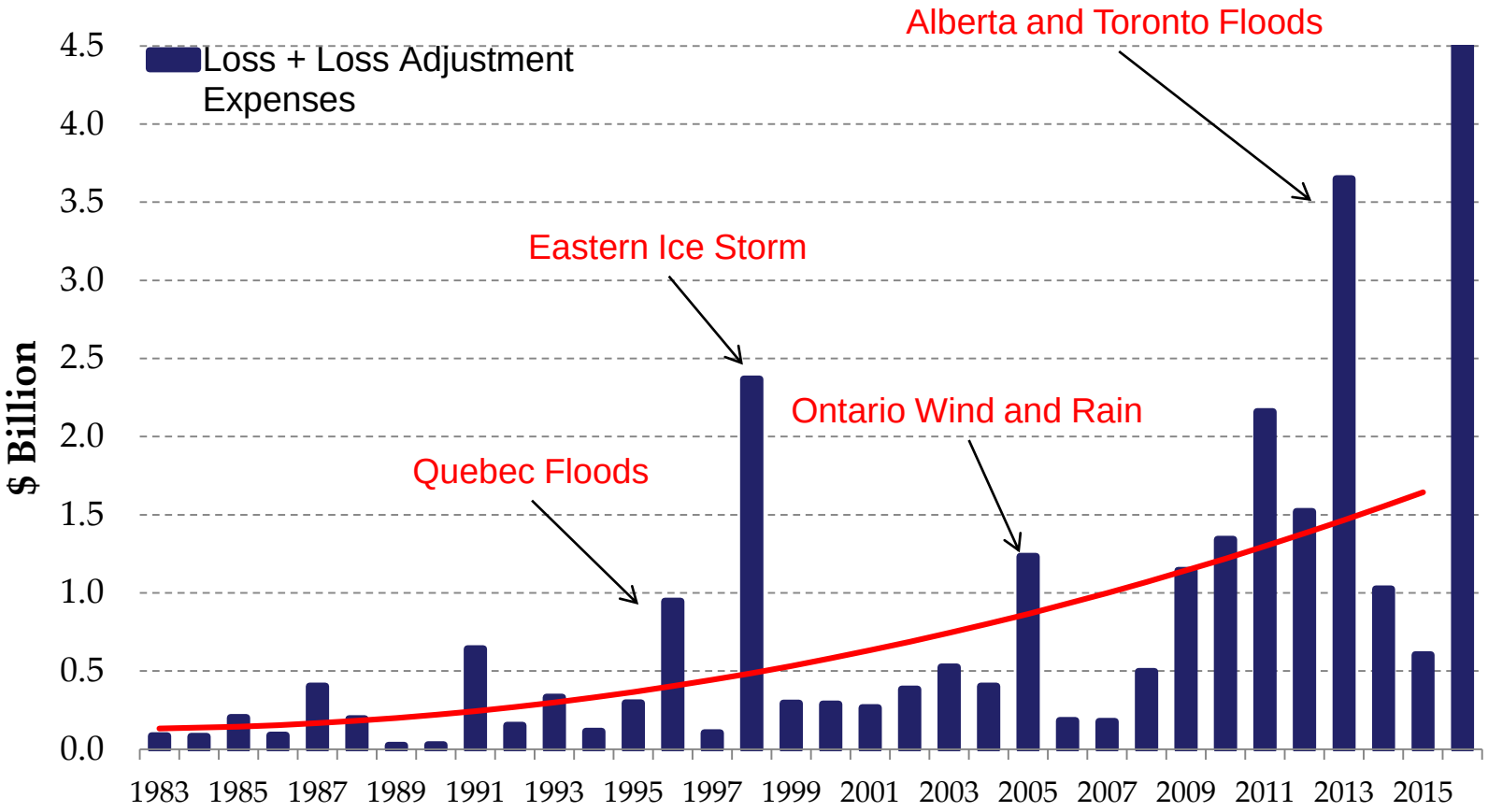
Cost of Insured Losses in Canada



Source: IBC Facts Book, PCS, CatIQ, Swiss Re, Munich Re & Deloitte
Values in 2015 $ CAN

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The Economy

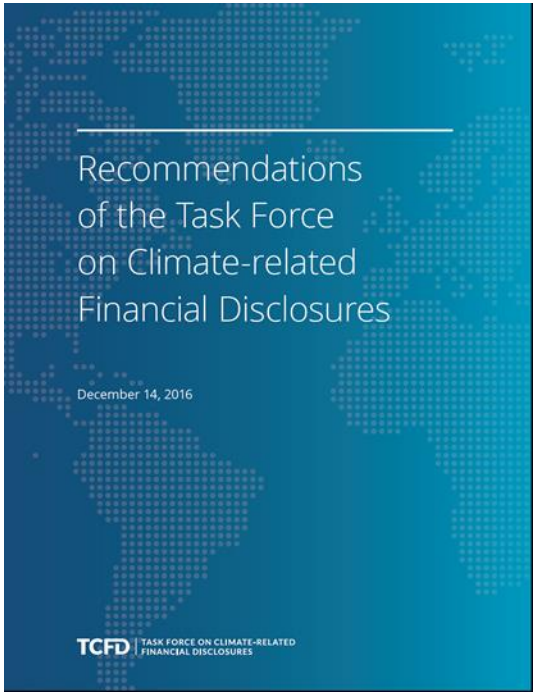
- In March 2017, The Bank of Canada's Deputy Governor, Timothy Lane, gave a speech stating that Canada's economy is already being impacted by more frequent extreme events, and that climate change will have material and pervasive effects on Canada's economy and financial systems.

- In 2011, The National Round Table on the Environment and the Economy estimated the annual costs to the Canadian economy will reach $21-$43 billion by 2050.

- Earlier this month, Alberta's largest power utilities (TransAlta, Capital Power) had their credit ratings downgraded due to weakened long-term risk profile assessment:
  - Credit-rating agencies are increasingly placing importance on the way that environmental, social and governance (ESG) factors could change the risk profiles of the companies and other debt issuers that they assess.

Financial Sector

- At the April 2017 Globe Capital summit in Toronto, major institutional investors warned that capital markets will increasingly judge companies based on their climate risks.
- In December 2016, the Task Force on Climate-related Financial Disclosures released recommendations for companies to provide voluntary, consistent climate-related financial risk disclosures.
- In January 2017, OPTrust was the first pension plan in Canada ($18 billion in assets) to release a detailed analysis and disclosure of the potential climate change risks to its investment portfolio.
- Black Rock – the world's largest investment firm (US$5 trillion managed assets) – already assesses companies on how they disclose climate-related risks and how well their board understands those risks.



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Global and National Action on Climate Change

- Tackling climate change is an urgent priority for the international community and an **opportunity to shift towards a global low-carbon and climate resilient economy** (Paris Agreement, Dec. 2015)
- As a first step towards implementing these commitments Canada's First Ministers released the Vancouver Declaration on Clean Growth and Climate Change on March 3, 2016.
  - "Building on commitments… we are moving toward a pan-Canadian framework for clean growth and climate change that will meet or exceed Canada's international emissions targets, and will transition our country to a stronger, more resilient, low-carbon economy..."
- Ontario has been participating in developing the Pan-Canadian Framework including **measures to adapt to the impacts of climate change and build resilience**.

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Climate Ready: Ontario's Adaptation Strategy and Action Plan

- In Ontario, the province released its first adaptation plan called *Climate Ready: Ontario's Adaptation Strategy and Action Plan,* in 2011.
- The plan comprised a total of 37 actions across the government to be undertaken 2011-2014.
- One key over-arching action in Climate Ready established the requirement to consider adaptation to the impacts of climate change across ministries:

Require consideration of climate change adaptation (all ministries)

- Ensure that legislation, policies and programs are modified to consider climate change adaptation
- Provincial Parks Planning Manual, Far North Land Use Strategy, Provincial Policy Statement (2014), *The Infrastructure for Jobs and Prosperity Act* (2015)

Climate Ready - Progress

The Provincial Policy Statement (2014) enhanced policies for climate change adaptation and mitigation including:

- Promoting efficient, resilient development and land use that consider the impacts of a changing climate;
- Requiring infrastructure planning to consider the impacts from climate change;
- Encouraging green infrastructure and strengthening stormwater management requirements;
- Requiring consideration of climate change impacts that may increase the risk associated with natural hazards.

The Infrastructure for Jobs and Prosperity Act (2015) supports long-term infrastructure planning and investments, with climate change adaptation as a key principle:

- “Infrastructure planning and investment should minimize the impact of infrastructure on the environment and respect and help maintain ecological and biological diversity, and infrastructure should be designed to be resilient to the effects of climate change”

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Climate Ready - Progress

Land Use Planning Tools

- Coordinated Plans Review - Growth Plan, Greenbelt Plan, Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan
  - proposed amendments on climate change mitigation and adaptation, including greenhouse gas emissions inventories and reduction plans, the completion of infrastructure vulnerability risk assessments, and enhanced requirements for watershed and stormwater planning.
- Guidance Material - Developing guidance to support the implementation of the PPS policies regarding climate change mitigation and adaptation (to be released after the completion of the Coordinated Plans Review).

Infrastructure Risk Assessments

- Ministry of Infrastructure completed vulnerability assessments on three public buildings.
- MOECC completed risk assessment of a water supply system in Leamington
  - identified flooding risks from potential future climate impacts and measures to limit those risks.

EA Guidance on Climate Change:

- September 2016, MOECC posted draft guidance to assist proponents to incorporate climate change considerations into Environmental Assessments (EA) in Ontario.
- Will help proponents and the public to understand the ministry's expectations about how to include climate change in EA.

Building a new Adaptation Action Plan

- The province has committed to release a **new Climate Change Adaptation Plan** in 2017 that sets out the priorities and actions that Ontario will take to adapt to the effects of climate change.
- New plan will be an enterprise-wide initiative with an all-of-government approach including:
  - Consideration of adaptation actions relevant to the mandate of multiple ministries
  - Actions across all sectors – infrastructure, land-use planning, health, economic resilience, and risk/emergency management
  - Importance of northern, vulnerable and Indigenous communities
- Recognition of progress towards integrating climate considerations into a number of programs and policies. However there is an ongoing need for guidance and capacity building.
- Municipalities play a critical role in land use and infrastructure planning and design, emergency management, and other areas that are priorities for the new plan.

Building a new Adaptation Action Plan

- The new Climate Change Adaptation Plan considers :
  - **Infrastructure**
  - **Public health and safety**
  - **Ecosystems**
  - **Northern and vulnerable communities**
  - **Economy**
  - **Knowledge and adaptive capacity -** provide access to information on climate change impacts to support decision-makers
  - **Public Education and Outreach -** increase awareness of climate impacts and adaptation in order to change behaviour, ensure a cultural shift, and encourage the public to take responsibility for adaptation action

Climate Modelling Collaborative : Provincial Need

- One of the signature actions for the new adaptation plan is the establishment of the **Climate Modelling Collaborative which would:**
    - Ensure open access to standardized climate information to assist both public and private sectors in making informed and evidence-based decisions regarding adapting to climate change and increasing resilience; and
    - Provide climate services that enhance understanding of risks and opportunities to enable effective adaptation action and decision-making at the community level.

- The collaborative would directly support decision-making for:
    - Infrastructure
    - Financial
    - Healthcare
    - Municipal planning

Potential Mandate and Scope of Services

Mandate: Provide one window access to standardized, actionable, and decision-relevant climate science and information for Ontario. Offer user-informed climate services that enhance understanding and management of climate risks and opportunities and enable effective consideration of climate impacts in decision-making

Objectives	Scope of Services
Advance Science	• Ontario regional climate projections/scenarios • Web-based one window access to climate data from multiple sources • Provincial risk and opportunities assessment
Understand Climate Risk	• Risk assessments delivery / training (electronic) • Pilot vulnerability assessments for Northern Indigenous communities • Interpretation/translation services
Inform Decision-making	• Adaptation planning • Pilot projects/case studies • Economic impact analysis - prioritisation (through better understanding or risk, liability / fiduciary responsibility in light of climate change)
Communication and Outreach	• Capacity building (in-person training, workshops, webinars, tutorials) • Data translation services (web-based guidance, in-person training, on-site assistance) • Directory / networking of climate experts (e.g., linking university experts)

Outcomes

Enhanced understanding and management of climate risks

Increased resilience to climate impacts

Partners/Users

- Government Ministries/ Agencies
- Federal Gov't
- Indigenous Communities
- Municipalities/ Conservation Authorities
- Resource/ Business Sectors
- Universities
- Climate Service Providers

Users

Municipalities / Indigenous Communities	Agricultural Sector	Resource Sector	Private Sector (e.g., Insurance, Financial Services)

Understanding Impacts – variables to determine future conditions

Air temperature; Rainfall (mean / heavy); TEK	Air temperature; relative humidity; Rainfall (mean / heavy)	Rainfall (mean / heavy); Solar Radiation; wind speed	Rainfall (mean / heavy); Wind speed; Relative humidity

Promoting Local Adaptive Solutions

➢ Integrating impacts in official plans ➢ Heat Response ➢ Infrastructure Risk assessment ➢ Case Studies	➢ Crop planning ➢ Pest management ➢ Case Studies	➢ Mine closure plans ➢ Species planning for replanting ➢ Forest Fire Planning ➢ Case Studies	➢ Insurance sector policies/rates ➢ Long-term investment planning ➢ Case Studies

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Next Steps

- Currently finalizing draft adaptation plan, and details of the modelling collaborative for public consultation and comments (Summer 2017)

- Anticipating the release of a final plan and the launch of the modelling collaborative by the end of 2017