

CLIMATE CHANGE

COMMUNITY BASED CLIMATE MONITORING
NETWORKING SESSION

NOVEMBER 18, 2020

AL DOUGLAS



CLIMATE RISK INSTITUTE

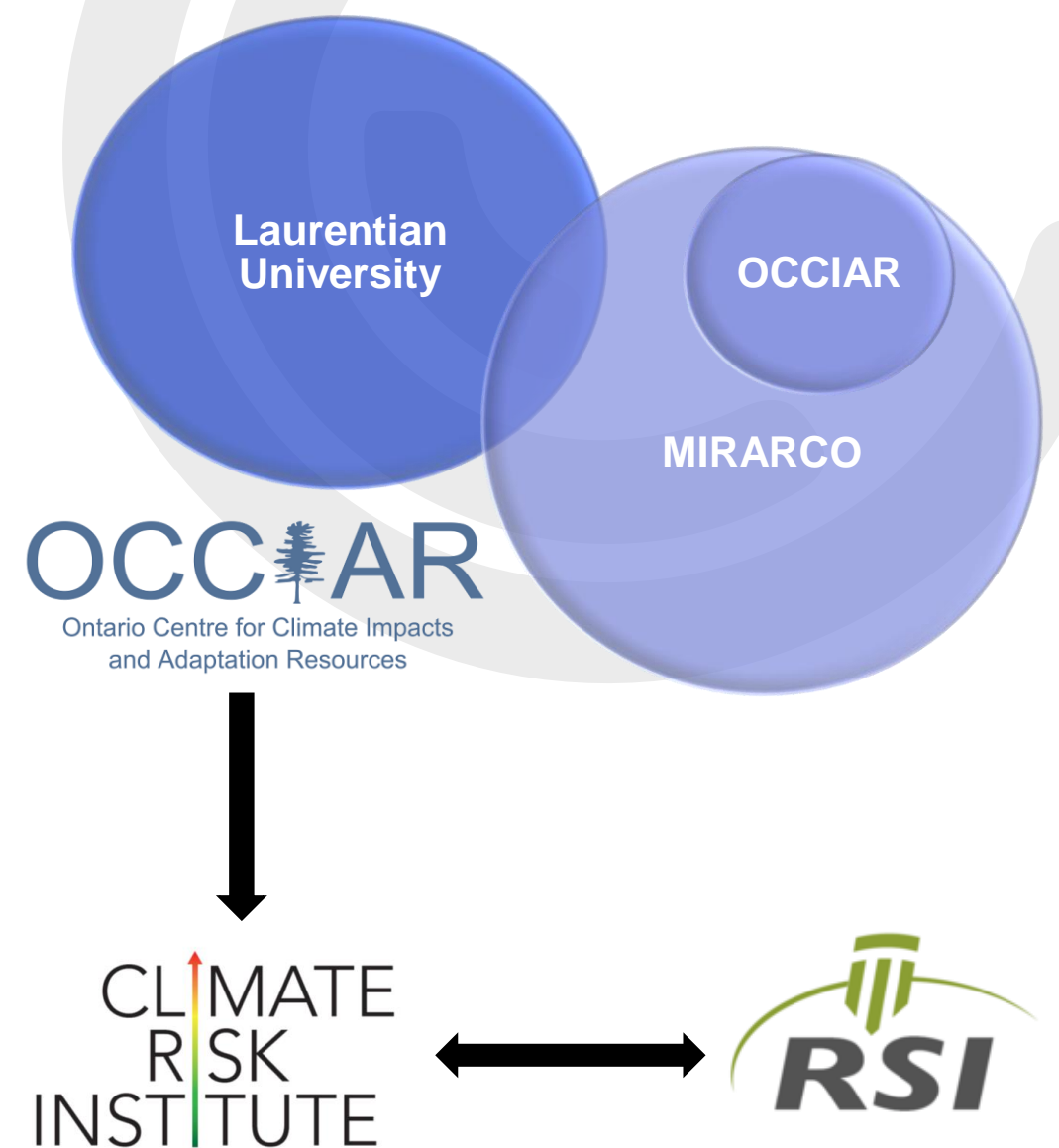
- Provision of [climate services](#) to various domestic and international stakeholders
- Provision of [datasets, analytical tools, and expert interpretation](#) of options for building climate resilience into policy, programs, strategy, planning and operations
- A collaborative approach to harness the wisdom of [local experience and knowledge](#)
- Previously known as the [Ontario Centre for Climate Impacts and Adaptation Resources](#) (OCCCIAR) at MIRARCO Mining Innovation

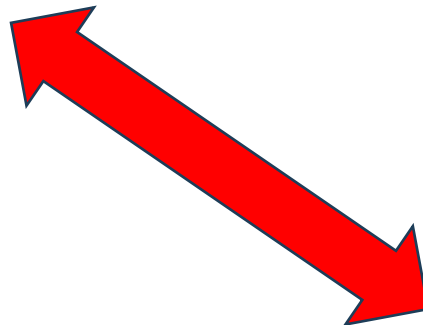
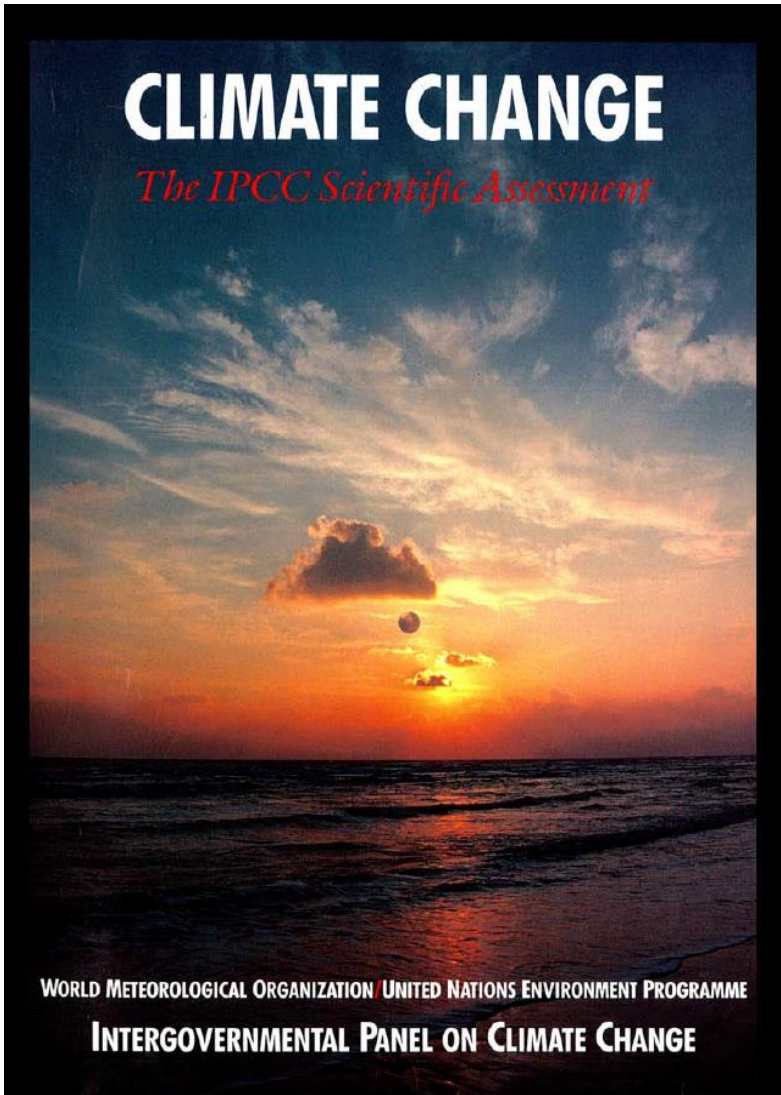


CRI TRANSITION FROM OCCIAR

Formed in July of 2019, the Climate Risk Institute (CRI) is a not-for-profit, academic based climate adaptation services hub

- The transition included the adoption of all past and current OCCIAR resources, tools and most importantly, staff
- CRI mandate focuses on communication, capacity building and collaborative adaptation planning
- www.climateriskinstitute.ca





CLIMATE CHANGE

800,000 Years of CO₂

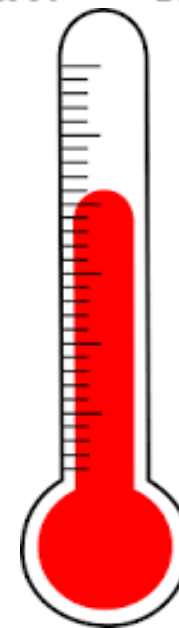
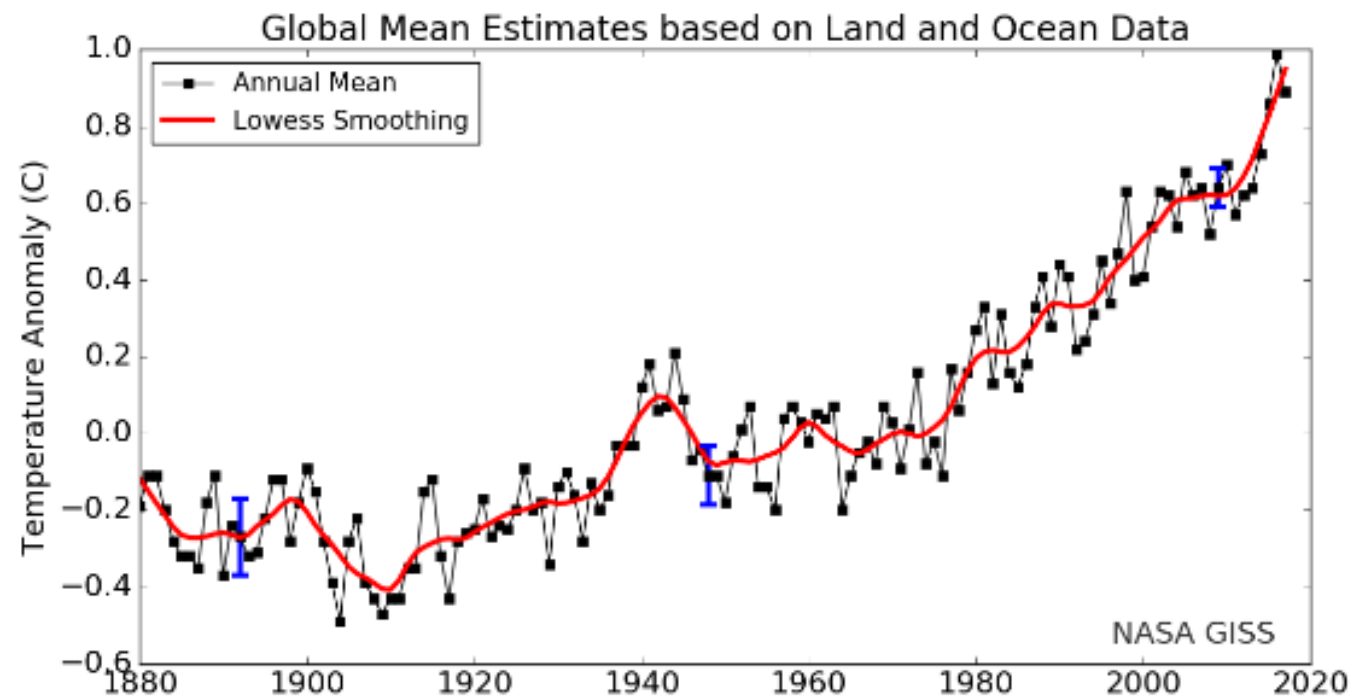
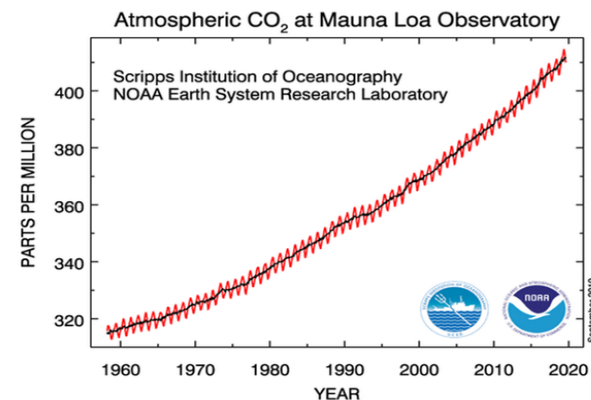
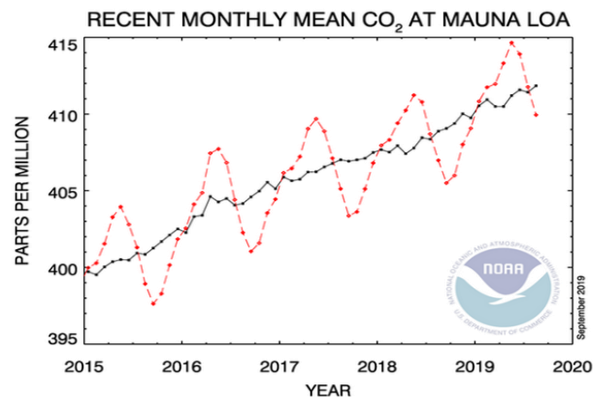


Data: Luthi, et al., 2008

CLIMATE CENTRAL

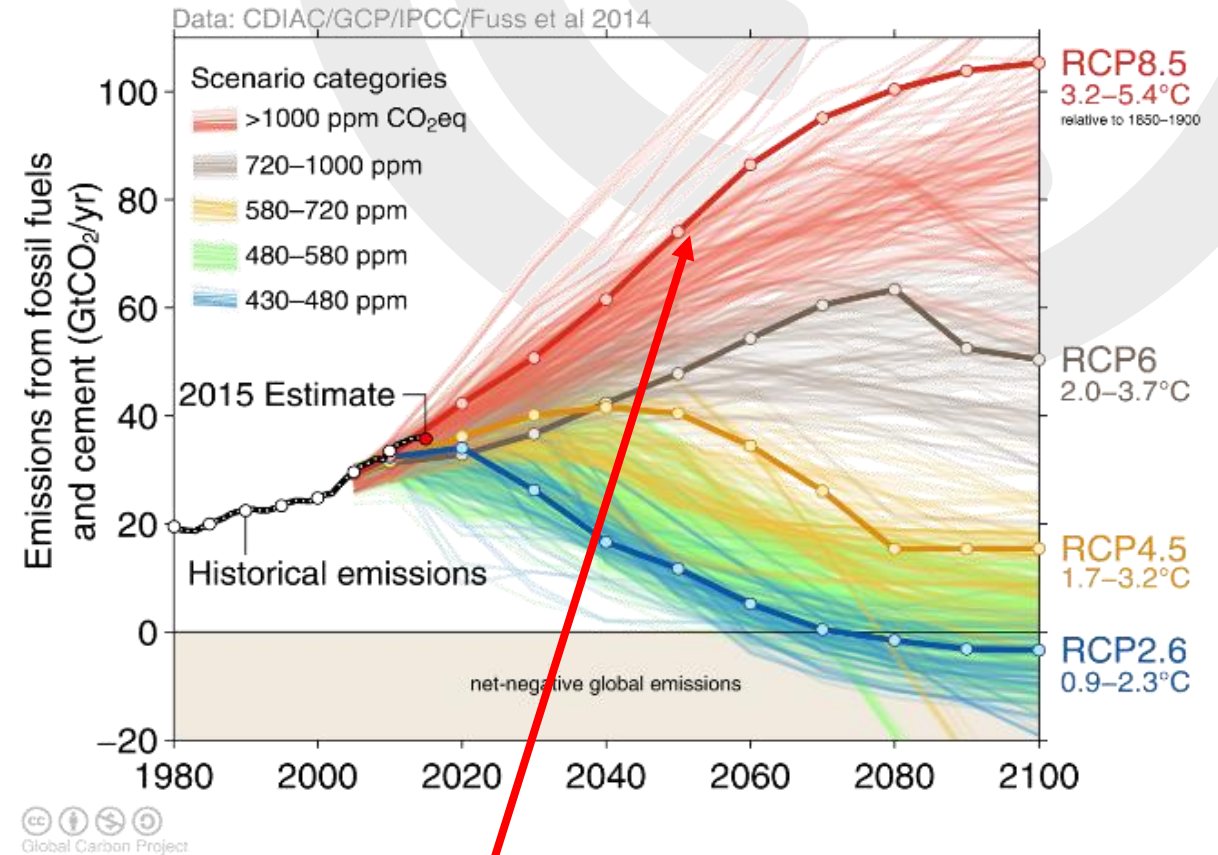
Monthly Average Mauna Loa CO₂

August 2019: 409.95 ppm
August 2018: 406.99 ppm
Last updated: September 5, 2019



REPRESENTATIVE CONCENTRATION PATHWAYS (RCPs)

- RCPs are “**representative**” of possible future greenhouse gas (GHG) concentration scenarios.
- They focus on the “**concentrations**” of GHGs that lead directly to a change in climate.
- They include a “**pathway**” – the trajectory of GHG concentrations over time to reach a particular radiative forcing at 2100.
- **Four pathways** have been selected for climate modeling and research (RCP2.6, RCP4.5, RCP6 and RCP8.5) which describe different climate futures – all of which are considered possible depending on how much GHGs are emitted in the years to come.



Our current path

Shared Socio-economic Pathways - SSPs





CLIMATE CHANGE OVERVIEW

CLIMATE CHANGE IN CANADA

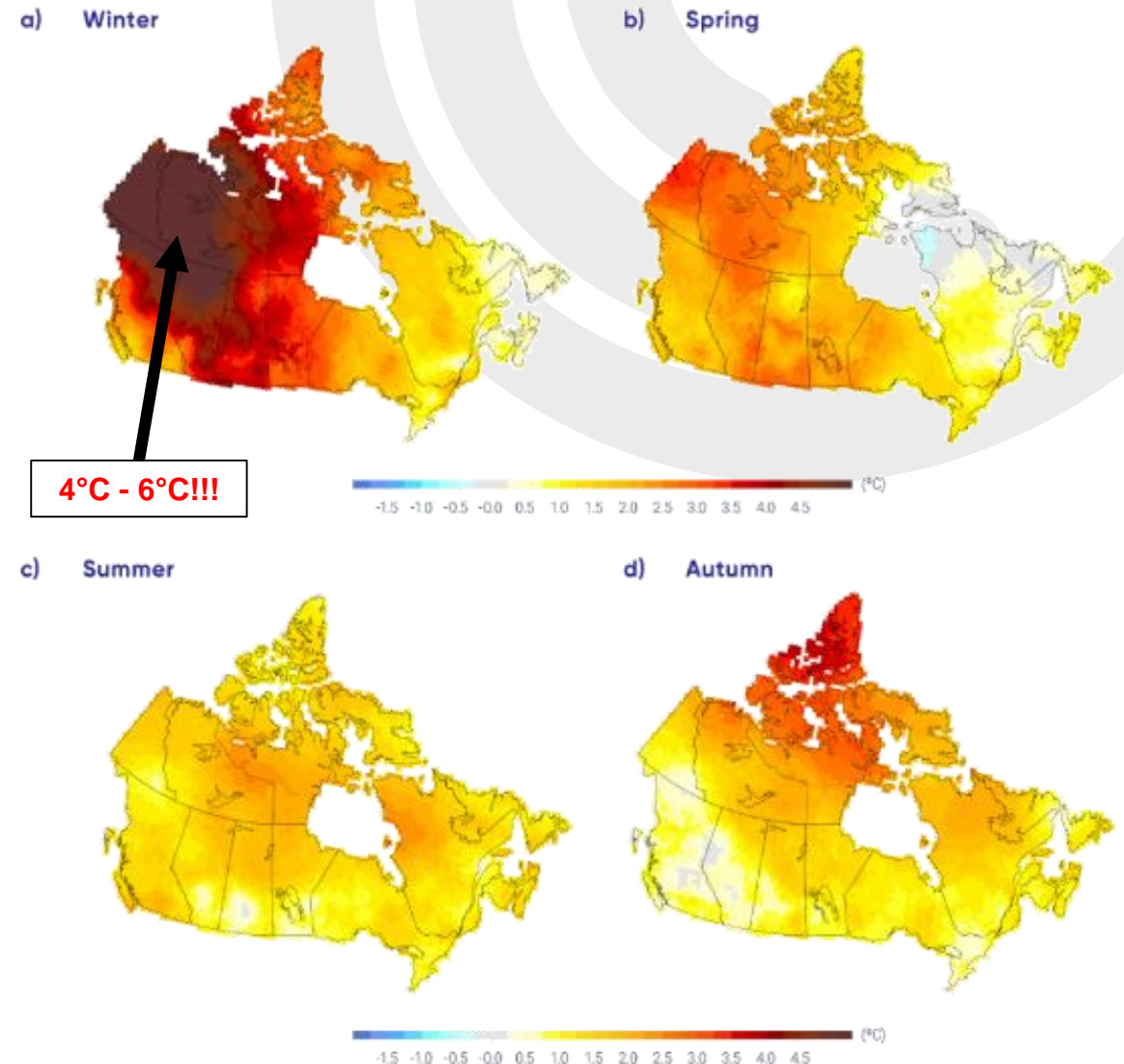
Temperature

- 1.7°C increase to date; double the global rate.
- Seasonal warming pronounced in winter.
- **Ontario** experienced an average annual temperature increase of 1.4°C between 1948-2012.

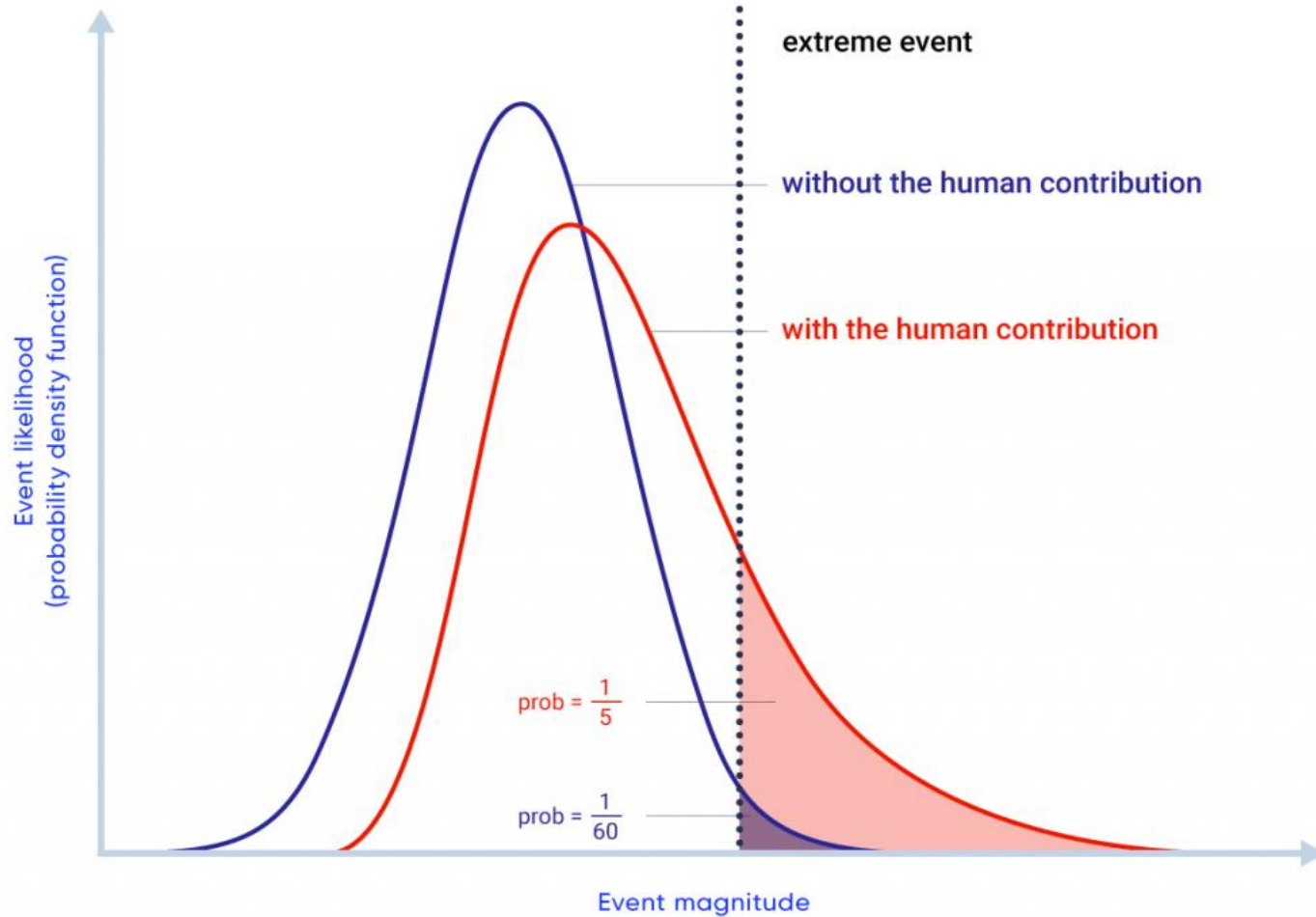
Precipitation

- Shift towards more rain, less snow.
- Decrease in snow accumulation.
- Extremes changing in concert with means.

Mean seasonal temperature (1948-2012)



Climate change and extreme weather event attribution



CLIMATE
SCIENCE
BASICS:

- 1 **It's warming.**
- 2 **It's us.**
- 3 **We're sure.**
- 4 **It's bad.**
- 5 **We can fix it.**

(Thanks to [Dr. Kimberly Nicholas](#) for [putting it so simply](#)).



CLIMATE IMPACTS

COMMUNITIES AND INDIGENOUS PEOPLE



CBC, 2016

Melting permafrost and ice instability affecting transport, travel and ultimately the availability of certain staples.



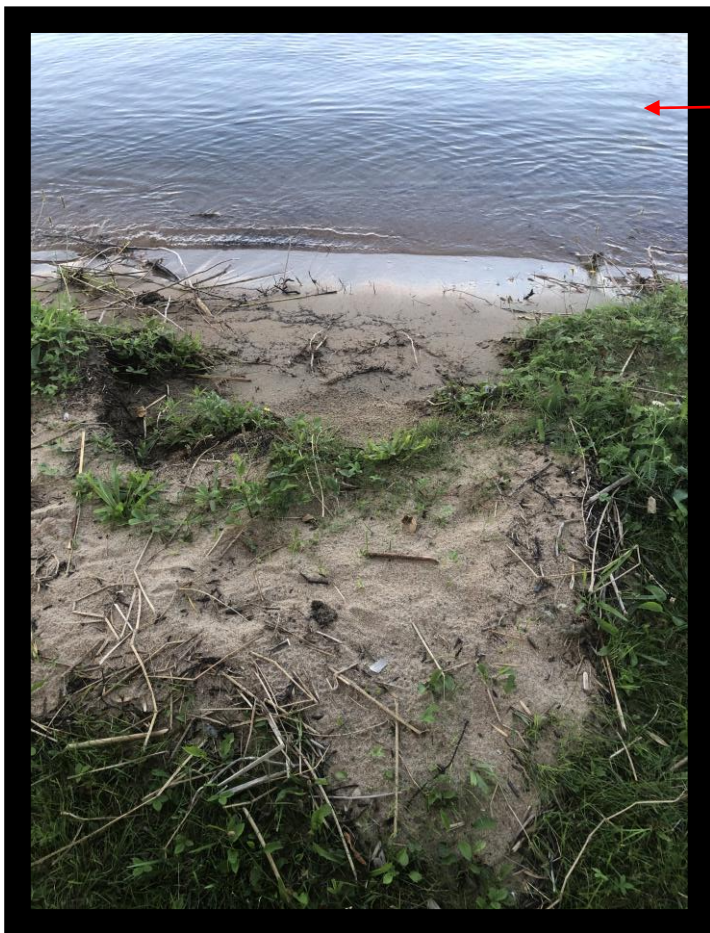
Degraded water quality can lead to health risks and reduce access to drinking water.



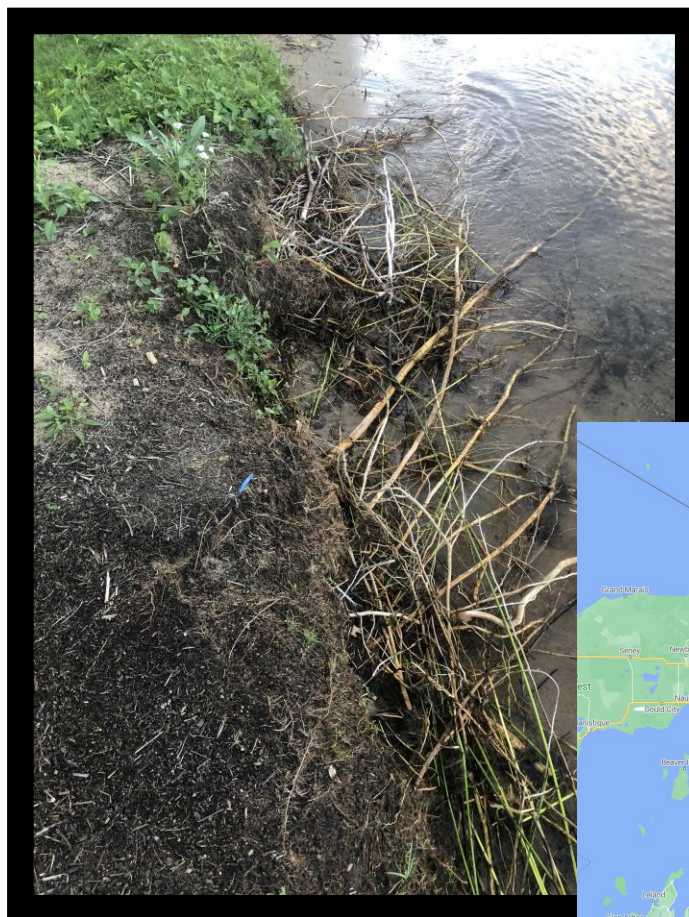
Ontario Travel Guide

Warmer winters alter species habitat and movement affecting hunting and trapping.

HIGH WATER LEVELS + WIND

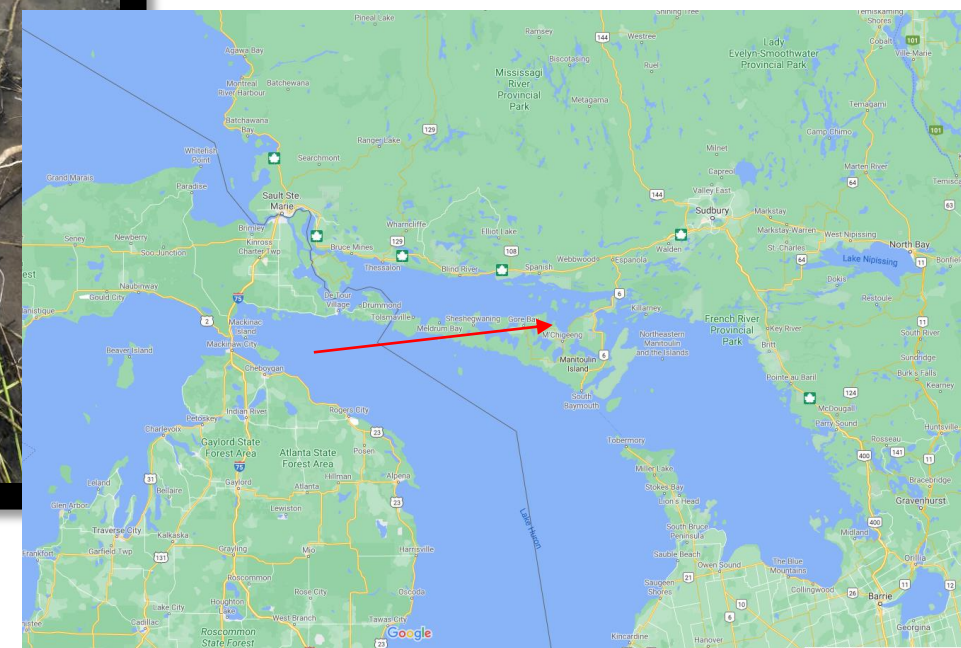


High water levels + wind (direction) -----sand wash up



Erosion + exposure of roots

Dry rot, extended shoreline instability, tree loss



SECTOR IMPACTS – EG. MINING



Warmer temperatures and thawing permafrost



Increasing extreme weather can challenge tailings ponds and dams, affect water availability and water quality



Climate induced droughts and altered precipitation patterns may affect water and energy availability and impact procession, refining, site rehabilitation and other uses.

CLIMATE CHANGE ON THE CHIPPEWA'S OF GEORGINA ISLAND AND LAKE SIMCOE



Andrew Big Canoe
Georgina Island elder

"When I was a kid, we used to be able to cross on the ice in the first week of December and I can remember driving across it in a car in mid-March. Now the bay doesn't freeze until after January 1st."

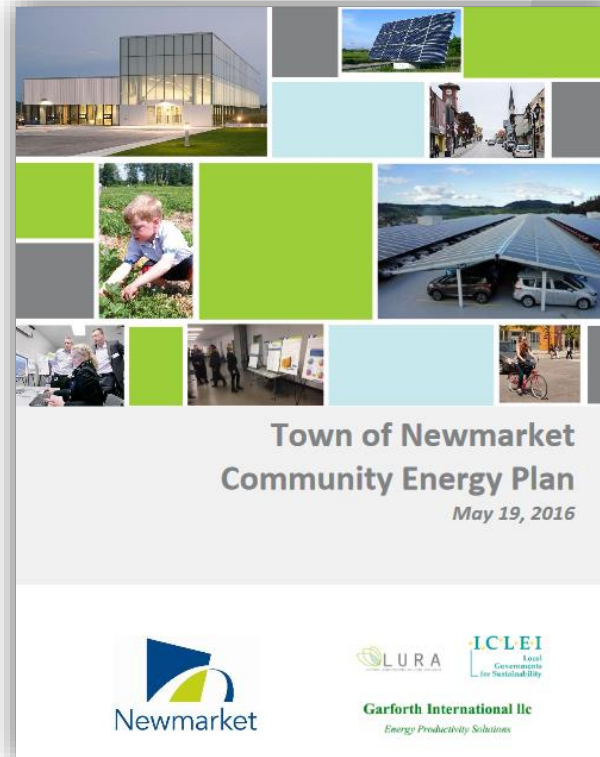
- Andrew Big Canoe of GIFN



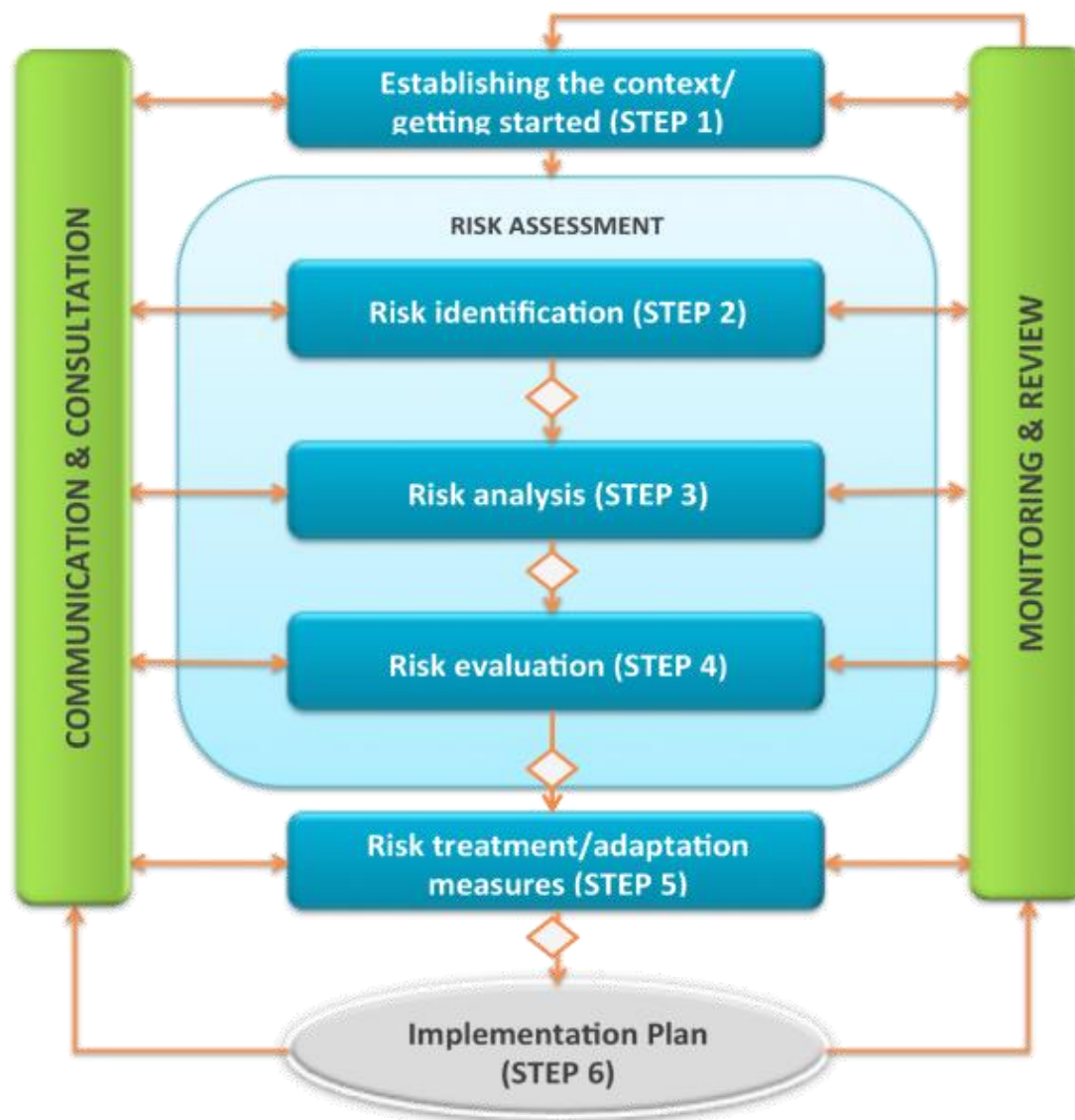


RESPONDING TO CLIMATE CHANGE

MITIGATION



RISK MANAGEMENT FRAMEWORK



ISO 31000:2018

ISO 14090:2019 Principles, requirements and guidelines

ISO 14091 Adaptation to climate change – Vulnerability, impacts and risk assessment (still in development)

RISK ASSESSMENTS

Risk Assessments

- Used to identify, evaluate and prioritize the likelihood and consequences of climate change impacts.
- Applies relevant, up-to-date climate information.

Benefits:

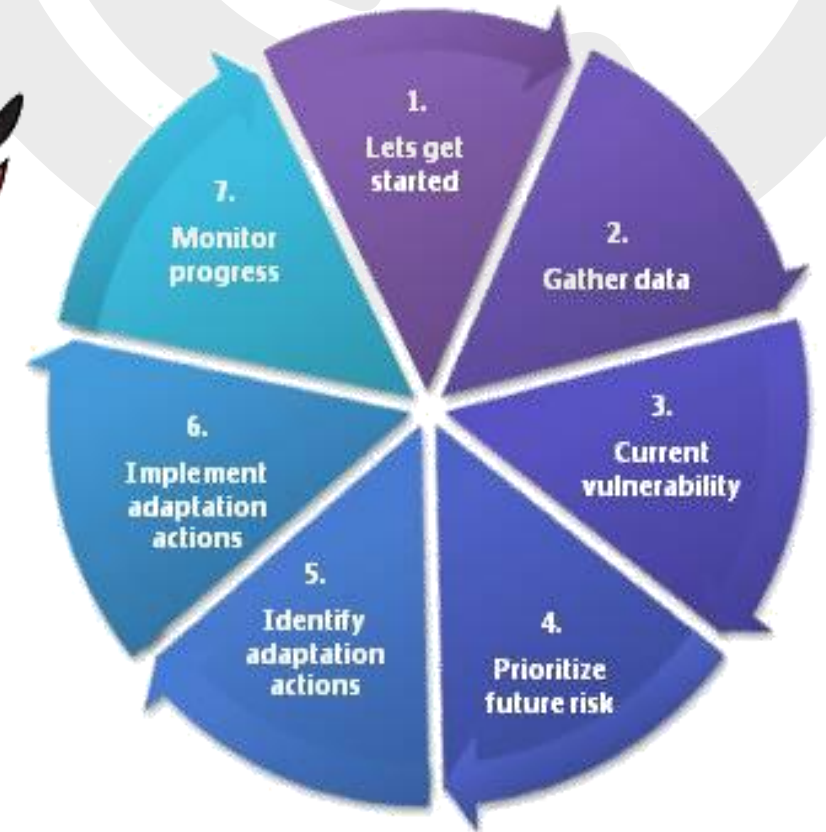
- Guides adaptation planning efforts
- Locates vulnerabilities
- Identifies best efforts and implementation actions

Event Risk Rating					
Consequence Likelihood	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Medium (5)	Significant (10)	Significant (15)	High (20)	High (25)
4 Likely	Medium (4)	Medium (8)	Significant (12)	High (16)	High (20)
3 Possible	Low (3)	Medium (6)	Significant (9)	Significant (12)	High (15)
2 Unlikely	Low (2)	Low (4)	Medium (6)	Significant (8)	Significant (10)
1 Rare	Low (1)	Low (2)	Medium (3)	Medium (4)	Significant (5)

[Assessing potential winter weather response to climate change and implications for tourism in the U.S. Great Lakes and Midwest](#)

EXAMPLE OF SUCCESS

Adaptation Planning with the Georgina Island First Nations



CC ADAPTATION PLANNING FRAMEWORK

1. Let's get started
2. Gather data
3. Assess current vulnerability
4. Prioritize future risk
5. Identify adaptation actions
6. Implement adaptation actions
7. Monitor progress



COMMUNITY ENGAGEMENT

- Very important component of process
- Information sessions
- Interactive workshops
- Establish Advisory Committee

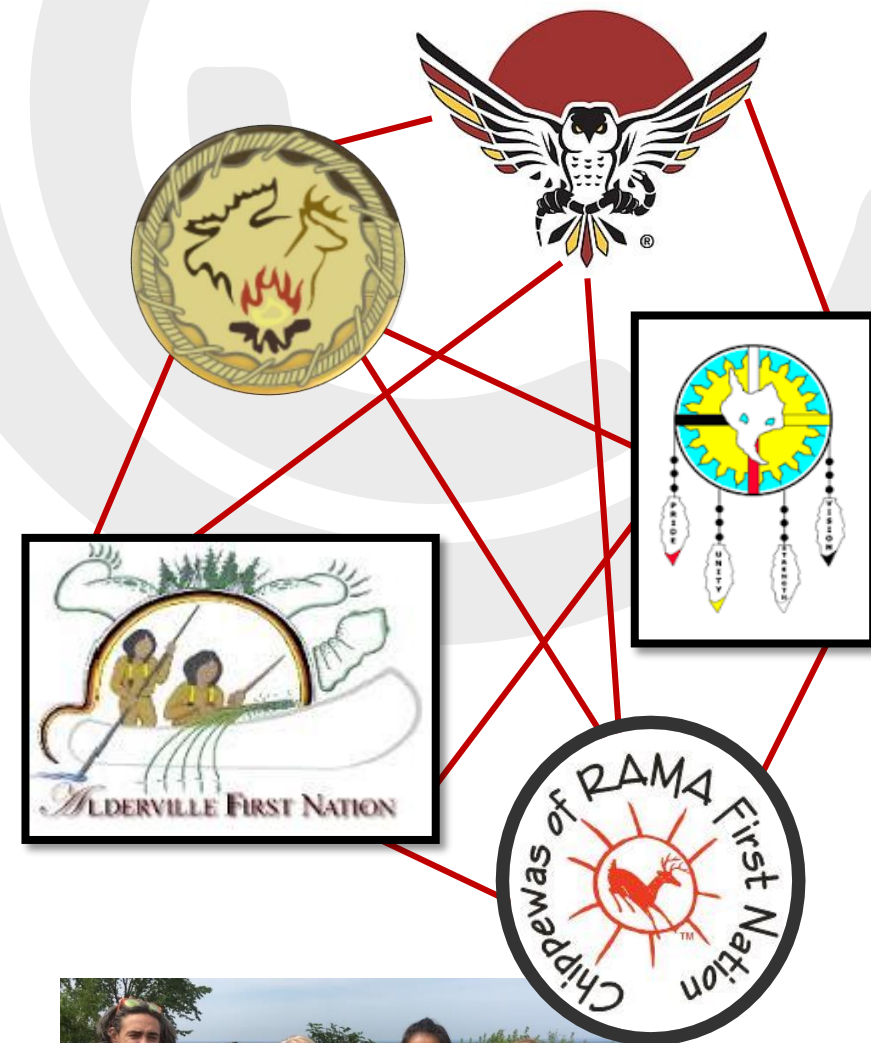


Photos: Information Sessions (with Bingo), Interactive Workshop, Georgina Island First Nation, Leanne Echum

COMMUNITY ADAPTATION LIAISONS

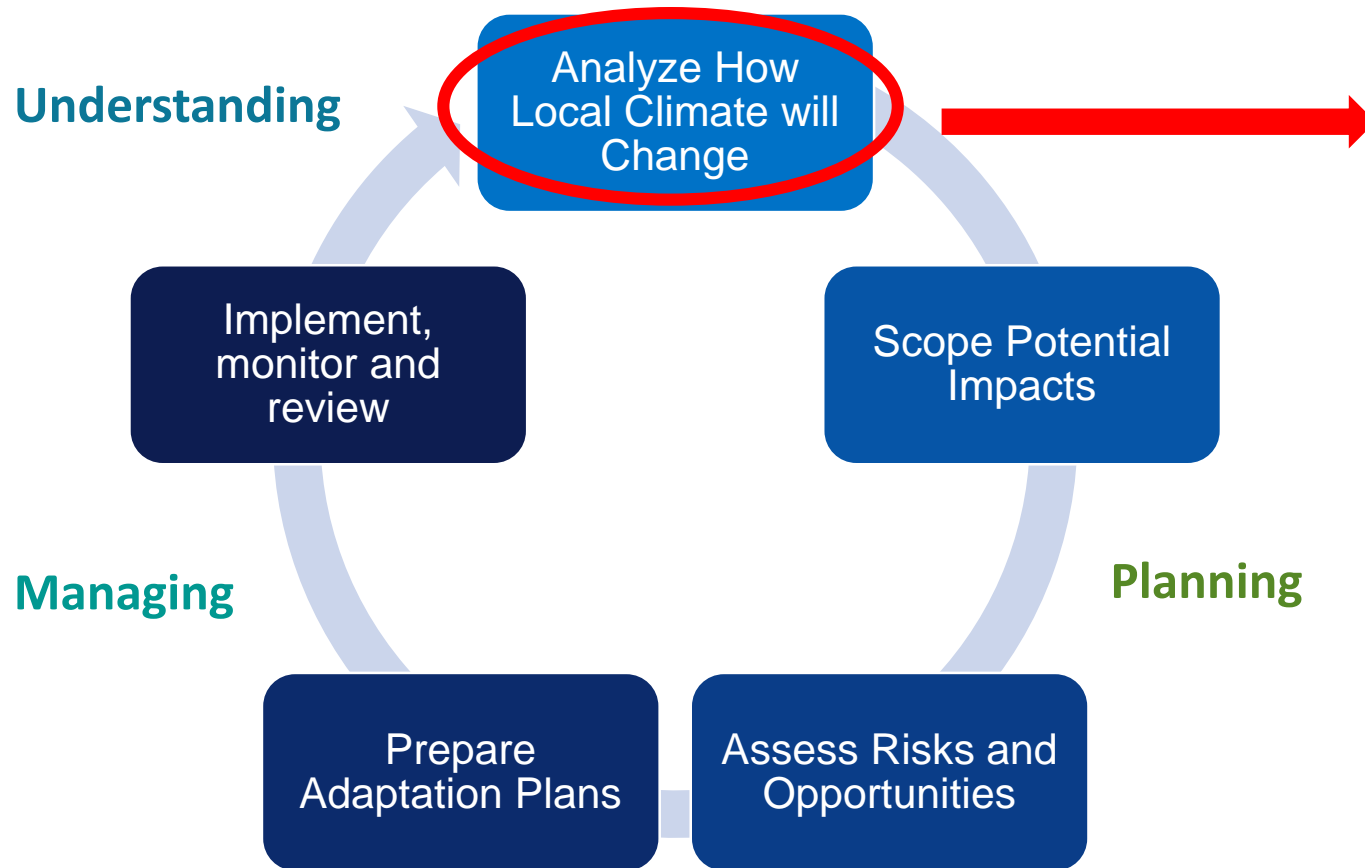
- **Community Adaptation Liaisons (CALs)** are members of the community who are hired to lead climate change adaptation efforts in the community. This helps to **build capacity** within the community itself.
- Adaptation work conducted by Georgina Island First Nation and its CAL led to **adaptation planning in other First Nation communities** in Ontario.
- **Result:** creation of an **adaptation network** of CALs working together and sharing knowledge on how to adapt to risks.

Ultimate Goal = CALs are climate champions in their community.



CLIMATE DATA INFORMS ADAPTATION MEASURES

Climate Change Adaptation Cycle



Climate data and information is one important part of the adaptation cycle used for:

- Assessing historical climatic baselines and conditions
- Assessing future impacts and opportunities

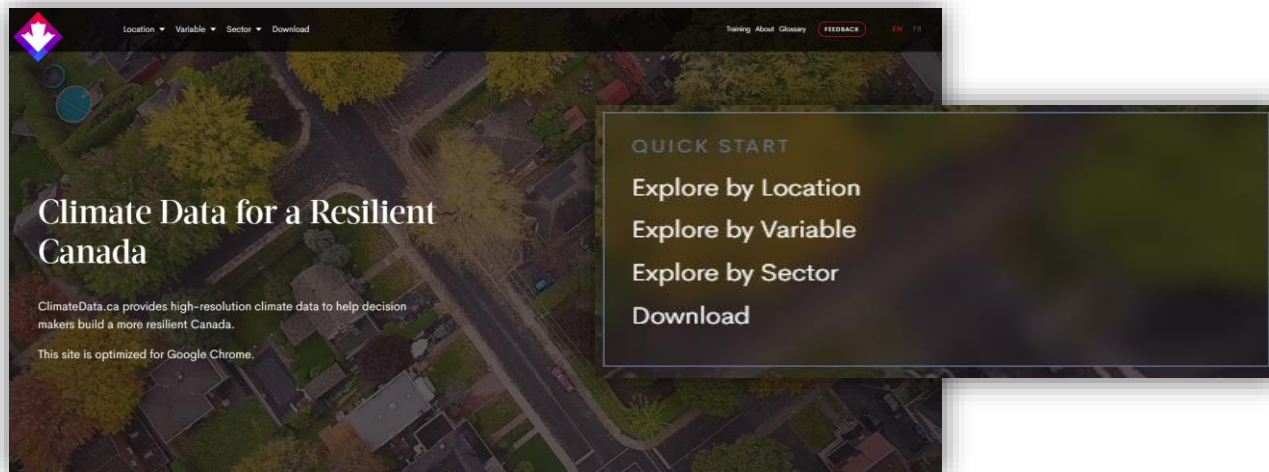
TRADITIONAL KNOWLEDGE AND WESTERN SCIENCE

Traditional Knowledge (TK) is the foundation of adaptation planning in First Nation communities.

- Surveys and one-on-one interviews can be used to engage community members about **observations of change and impact**
- **Western science to supplement/support TK.**
- There are five areas in which western science and TK compliment one another:
 - As local-scale expertise
 - As a source of climate history and baseline data
 - In formulating research questions and hypotheses
 - As insight into impacts and adaptation in communities
 - For long-term community-based monitoring

The applicability of TEK, associated with socioeconomic and adaptive human responses to environmental change can make an important contribution to understanding the impacts from climate change and strategies for adaptation.

FEATURES OF CLIMATEDATA.CA



Explore climate data by:

- Location
- Variable
- Sector
- Or download in multiple formats

Canadian Centre for Climate Services



Library of climate resources

Datasets, tools, guidance and related resources



Climate information basics

Climate change concepts, trends and role of climate information in decision-making



Climate Services Support Desk

1-833-517-0376
Get help from our climate experts to find, understand and use climate information



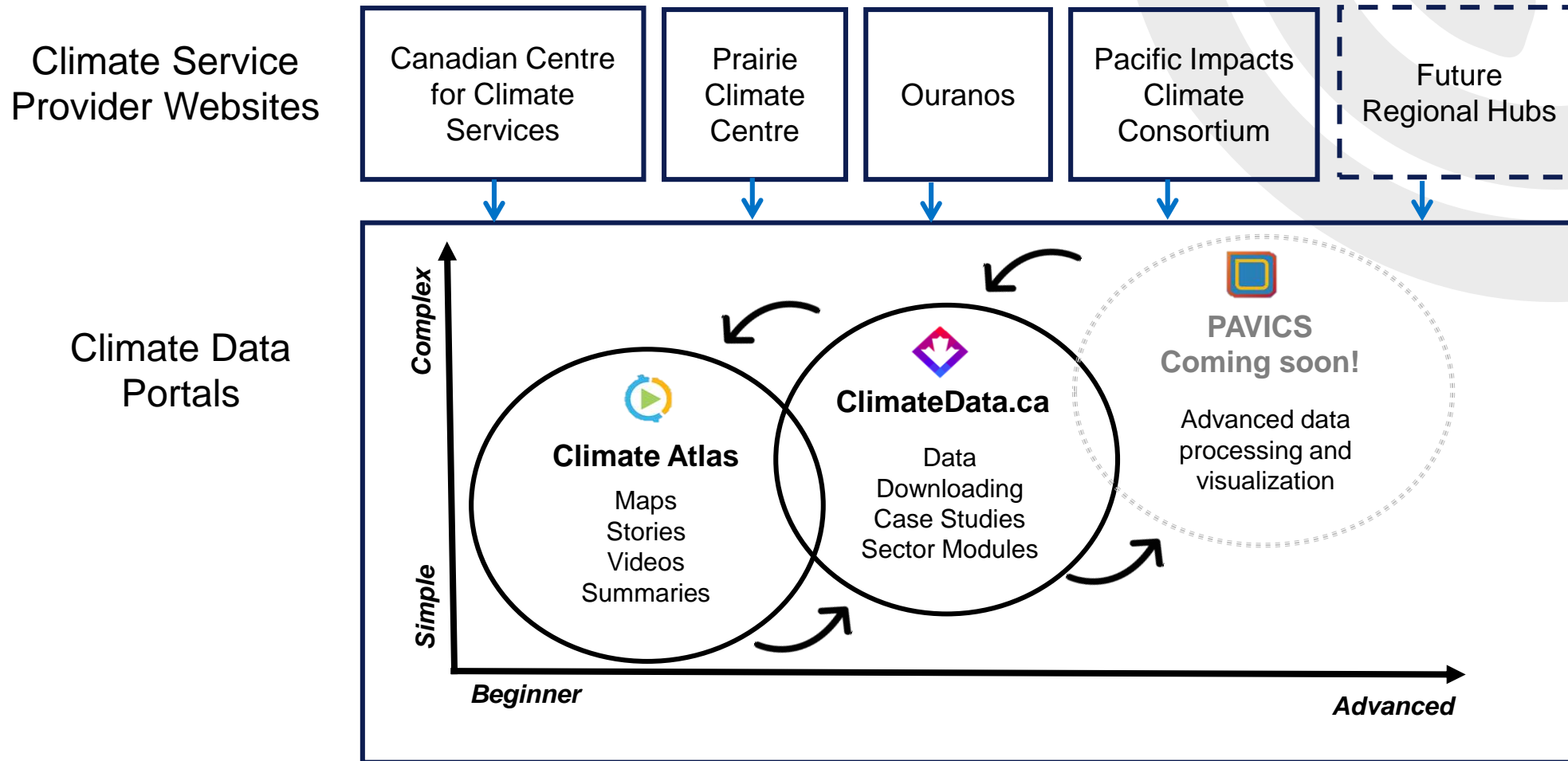
Display and download climate data

View selected climate datasets on maps or download data

ClimateData.ca offers:

- Location based summaries
- Multiple climate variables available at national level scales
- Local and regional scale data download
- And training videos on how to use the site

CLIMATEDATA.CA IS PART OF A SUITE OF PORTALS TO INCREASE ACCESS TO CLIMATE DATA AND INFORMATION



For more information check out the CCCS Website:

www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services/display-download.html

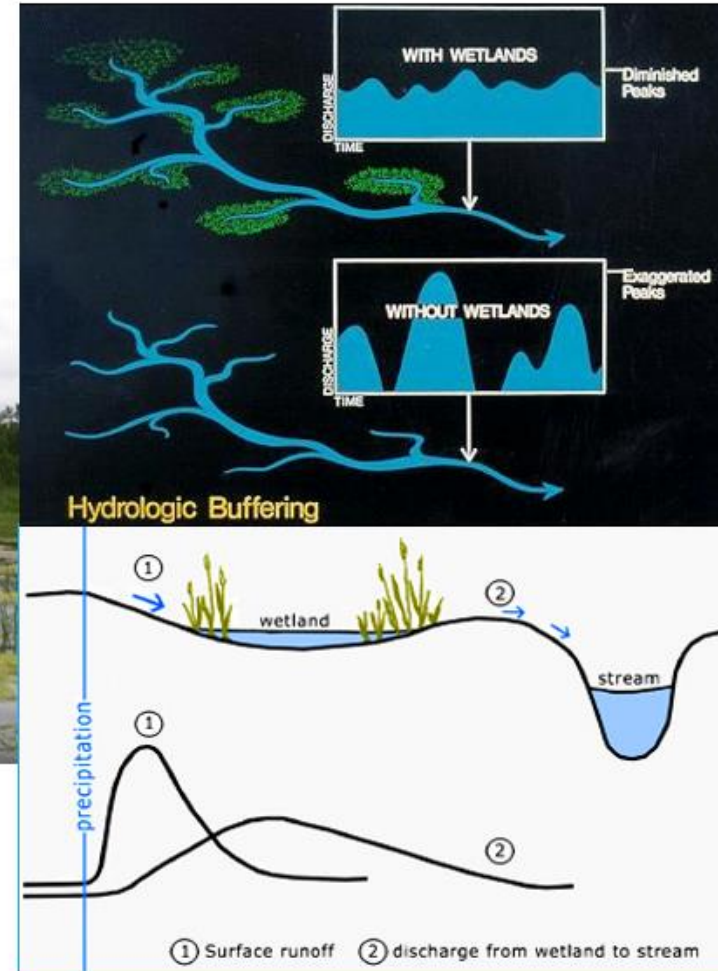


EXAMPLES OF ADAPTATION

ADAPTATION VARIES — BY IMPACT, BY REGION, IN SCALE



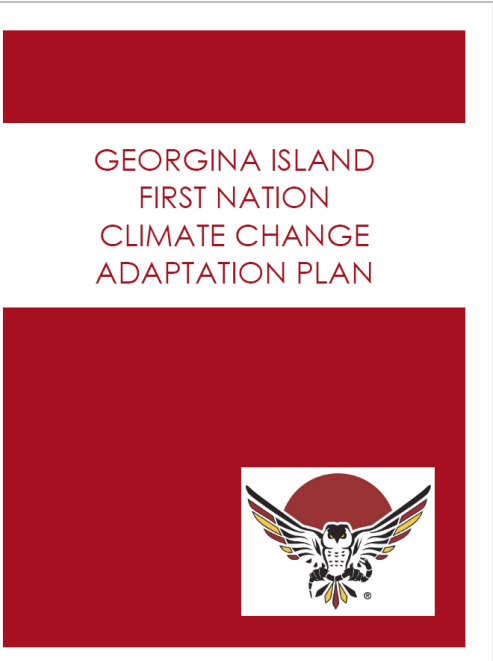
WETLANDS FLOOD ATTENUATION



Source: Ducks Unlimited, 2015

CLIMATE CHANGE PLANS AND IMPLEMENTATION

- **The Chippewas of Georgina Island First Nation** developed a Climate Change Adaptation Plan to raise awareness of, and manage, climate change risks within the community.
 - In total, 67 adaptation measures were developed.



Risk	Description and Adaptation Measure	Past Coping Measure	Capacity Requirements (Cost)		
		e.g. cleared drainage pathways with loader	Technical	Staff	St
Risk Scenario: Changes in winter – Transportation – Damage to ice road landings	Damage to ice road landings ranked as a “very high risk” due the changes in winter temperatures. In addition, damage to ice road landings ranked as a “moderate risk” due to wind. The following adaptations measures could be used to reduce the risks associated with ice road landings.				
	Action: Amend or update Transportation Manual to ensure scheduled and documented monitoring and maintenance of ice road landings is occurring, and how it may need to be adjusted to correspond to milder winters	"stayed home", "used other types of transportation (scoot)", "helicopter to emergency and babies born; had to shop large and wait until good crossing; had to have medicines; helicopter used", "stock up on food", "travelled less"		Staff time to update Transportation Manual/conduct monitoring and maintenance	\$\$
	Action: Develop a communication plan to notify community, on a regular basis, of ice conditions. Utilize "My Community" App	"stayed home", "used other types of transportation (scoot)", "helicopter to emergency and babies born; had to shop large and wait until good crossing; had to have medicines; helicopter used", "stock up on food", "travelled less"		Staff required to develop and implement program	\$ to \$\$

PARTING MESSAGES

- Recognition of, discussion about, the scope of impacts in communities and regions
- Using TK, sound science, mainstream CC adaptation in decision-making – strategic, operational, ecosystems, infrastructure, people
- Many tools, guidance and data available
- Action toward a low-carbon, resilient future



THANK YOU



AL.DOUGLAS@CLIMATERISKINSTITUTE.CA



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