



Manitoba Climate Resilience Training: Climate Preparedness 101

Asha Nelson, Project Coordinator

March 5, 2025

Acknowledgement

ClimateWest's work occurs on the traditional land of many Indigenous Nations and covers the Territories of Treaties 1 through 8, and 10.

Our office is located on Treaty 1 Territory, the historic meeting place of the Anishinaabeg, Cree, Inninewuk, Anishininiwag, Dakota and Dene, and the Homeland of the Métis Nations.

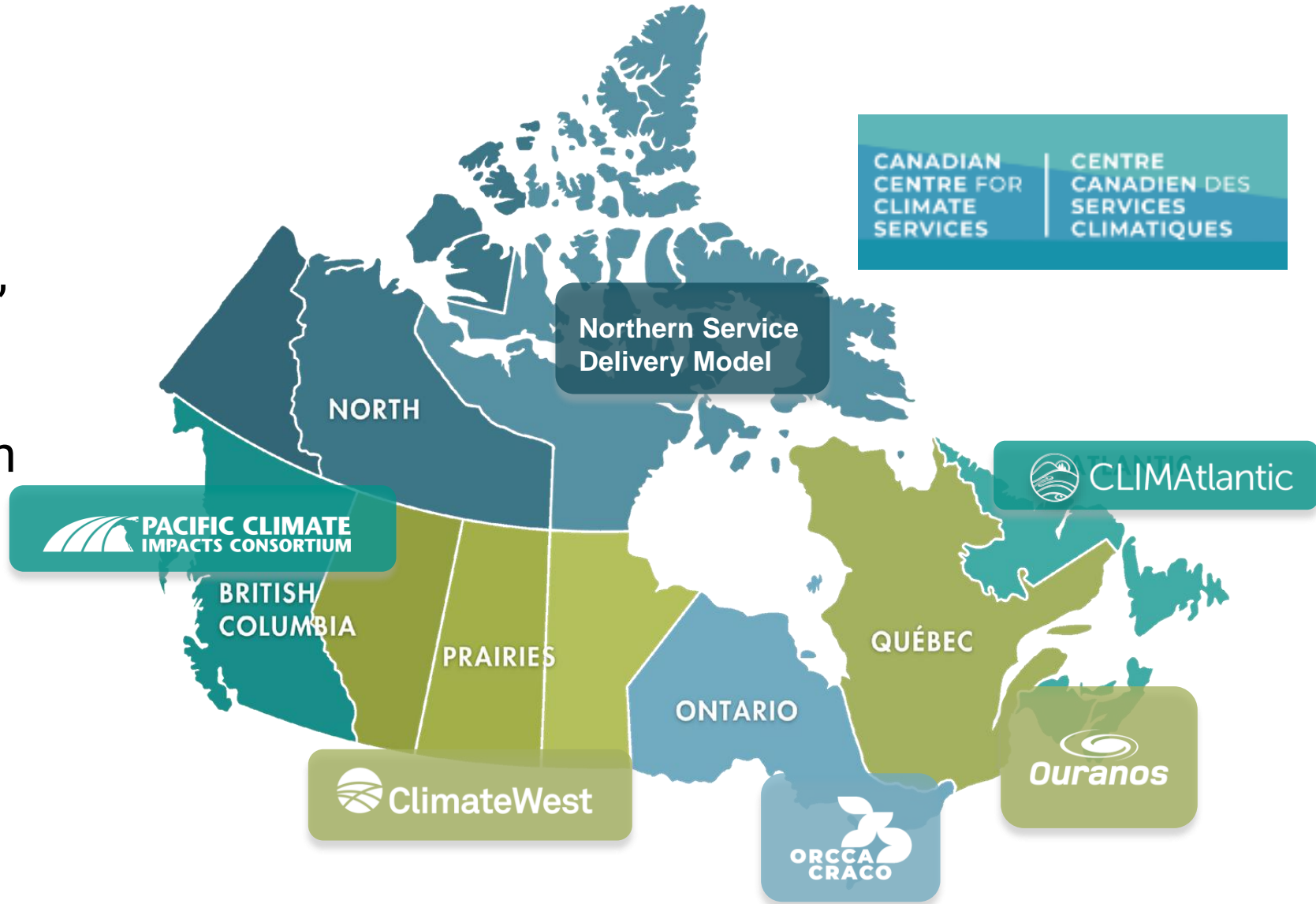
Overview

- ClimateWest
- Manitoba Department of Environment and Climate Change
- Q&A

Who is Climate West?

ClimateWest's Mandate:

To deliver credible, useful, and timely climate information, data, and tools tailored to the region in support of positive adaptation to a changing climate.



What does ClimateWest do?



Amplifier



Connector



Collaborator



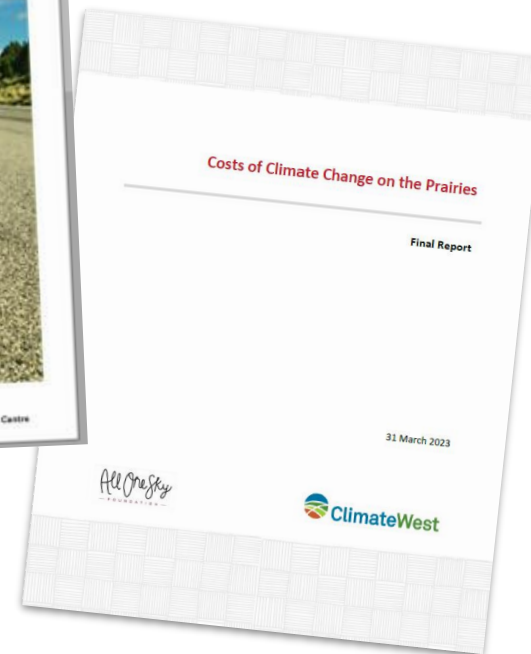
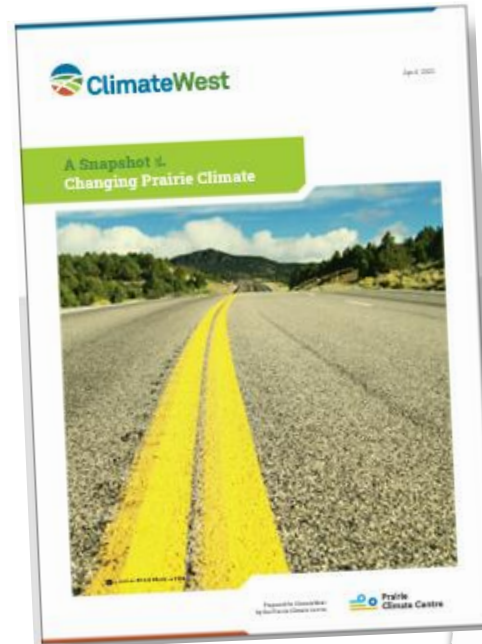
Champion



Facilitator



Translator





ClimateWest

Building Prairie Resilience

Connect With Us

Help Desk: 204-995-6514

Email: info@climatewest.ca

X: [@climatewest_ca](https://twitter.com/climatewest_ca)

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Website: climatewest.ca

Newsletter: scan QR code



Climate Preparedness 101

Webinar # 1
March 5, 2025

Elaine Fox

Manager

Climate Preparedness and Communication

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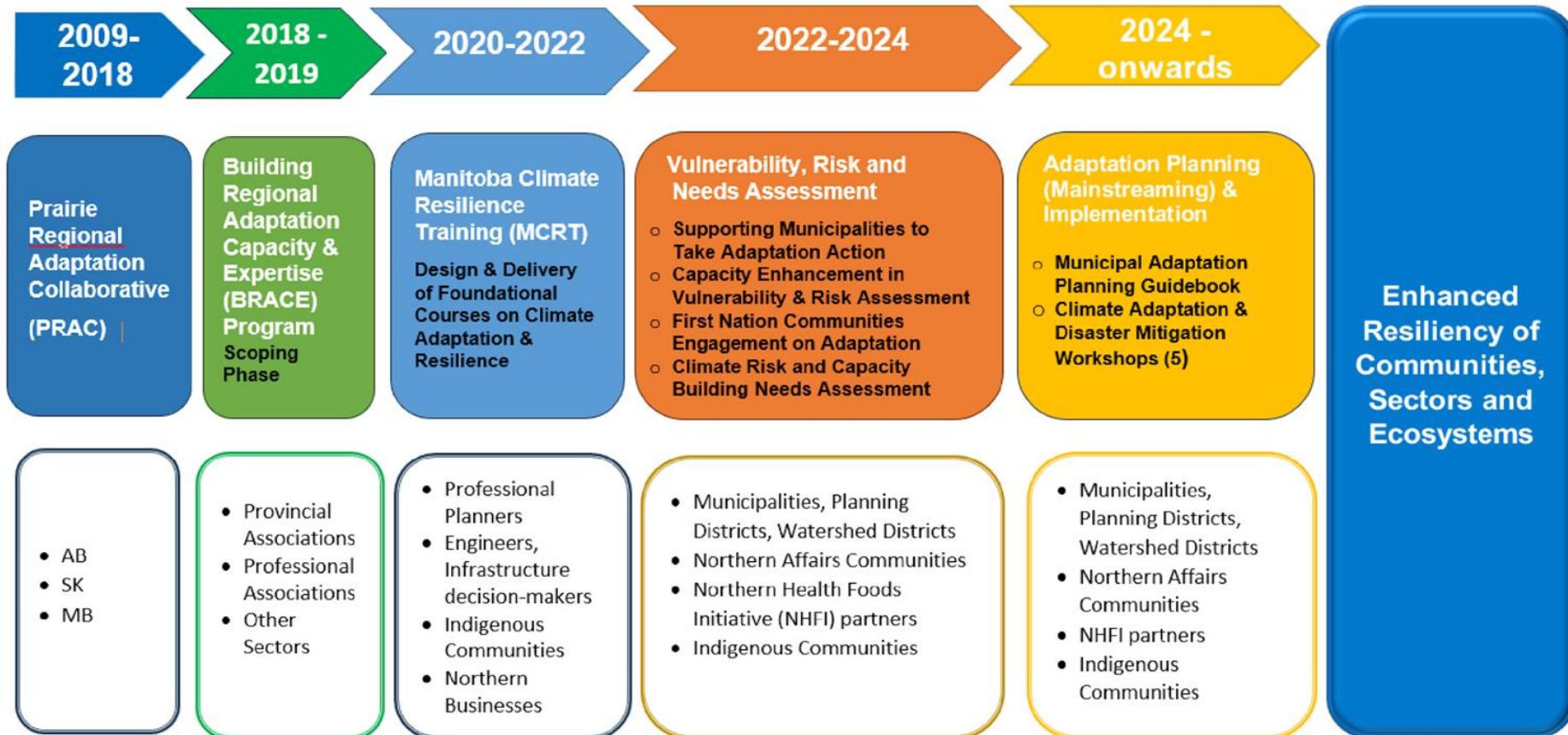
WEBINAR OUTLINE

- ❖ **MCRT Progress and Webinar Series Objective**
- ❖ **Climate Change Basics**
 - Climate Adaptation & Mitigation
 - Climate Scenarios, Climate Models
- ❖ **Climate Trends & Risks**
- ❖ **Net-Zero**
- ❖ **Climate Change Costs**
- ❖ **Climate Services**
- ❖ **Key Takeaways**



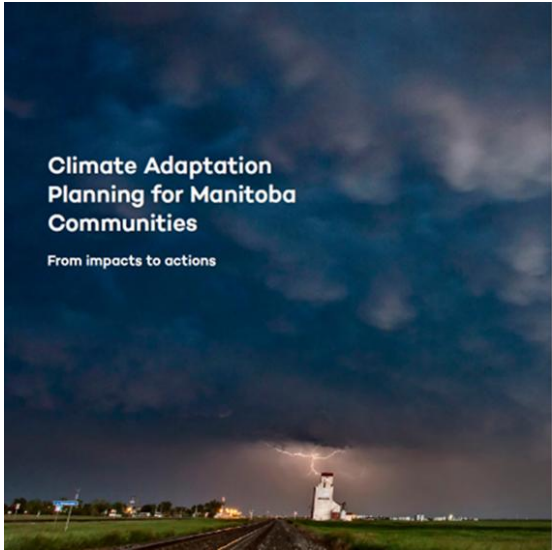
MCRT Progress

Manitoba Climate Adaptation Initiatives Climate Adaptation and Disaster Mitigation Workshops



MCRT Webinar Series

OVERALL OBJECTIVE: Gain the knowledge and skills to integrate climate considerations into planning and decision making which will help you prepare for hazards and take advantage of opportunities.

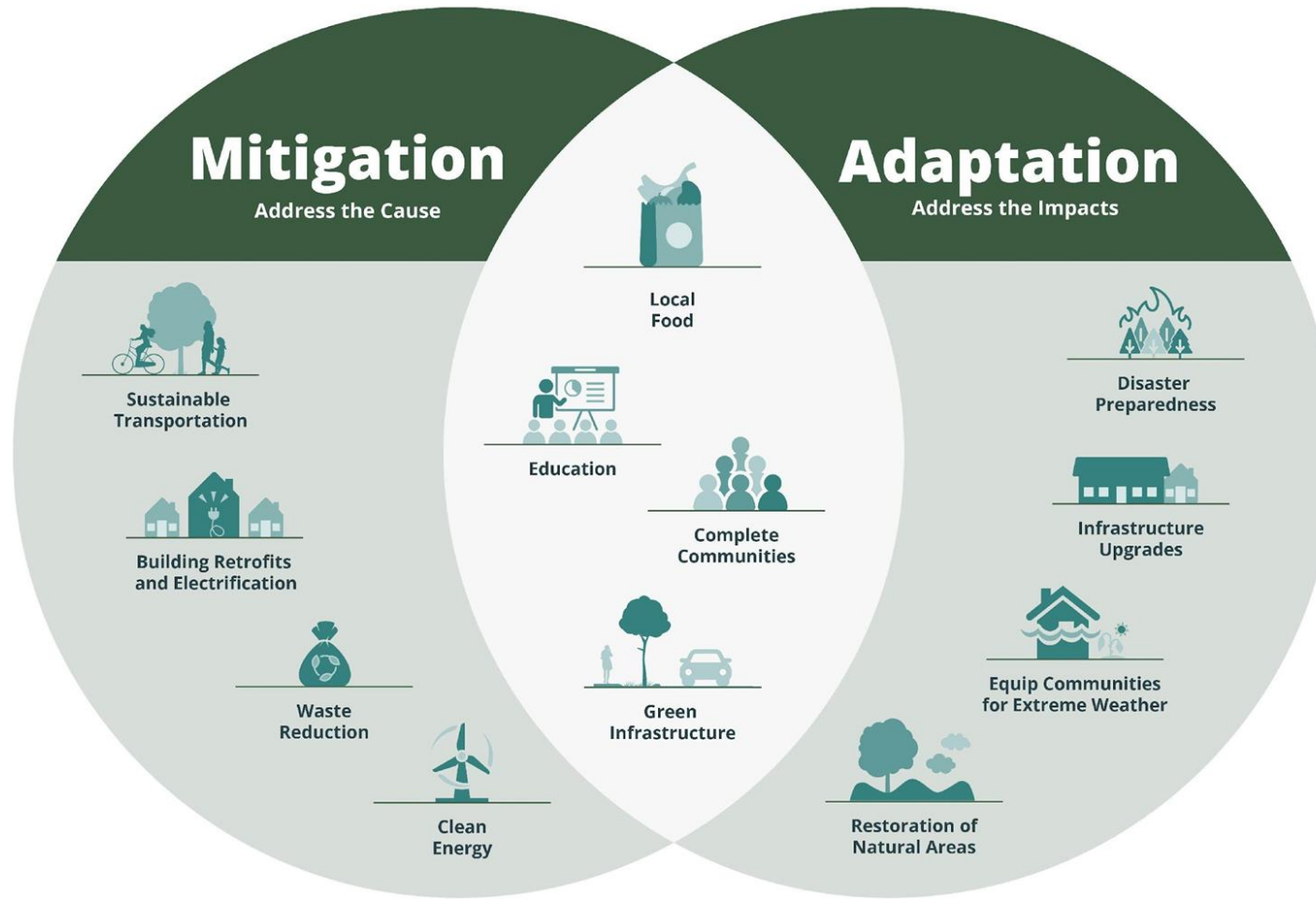


Climate Preparedness 101
March 5, 2025

How to Conduct a Vulnerability and Risk Assessment (VRA)
March 12, 2025

Climate Adaptation Planning
March 19, 2025

Climate Adaptation and Climate Mitigation



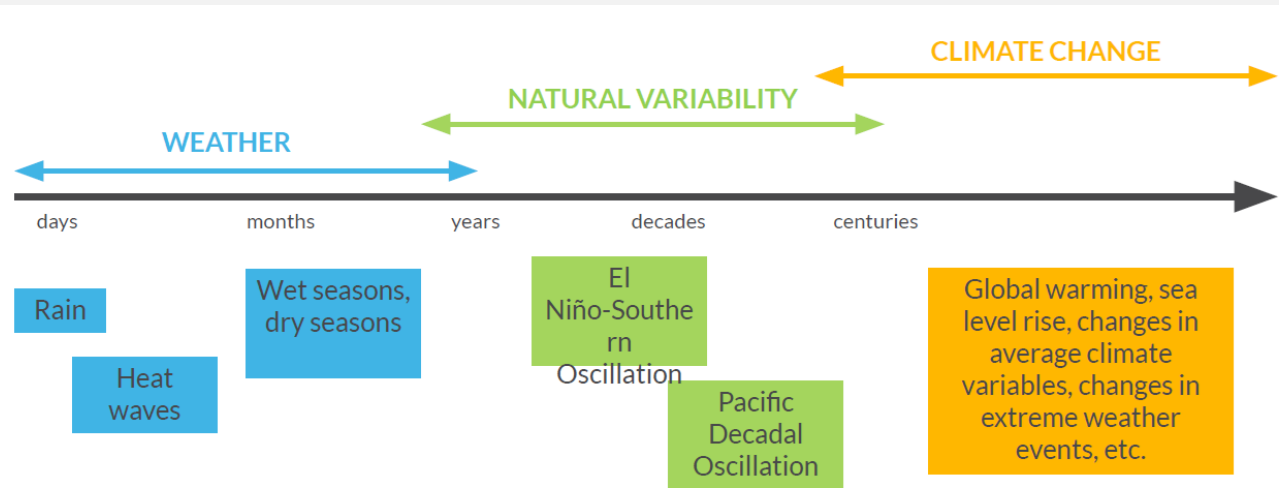
Climate Adaptation vs. Disaster Mitigation vs. Preparedness

Are we talking about the same thing? **Yes**

- Being proactive to avoid hazards/impacts caused by climate
- Resiliency is achieved by adapting to a changing climate or mitigating potential threats
- Understanding forecasts and your vulnerability and risk improves planning and decision making



Climate vs Weather:



Adapted from Pacific Climate Futures, Ouranos, and ClimateData.ca.

Weather

- Changes by the hour, day or week
- Readily observable



Climate

- Changes by the decade, century or millennia
- An averaged calculation of weather over longer time periods



Natural Variability

- Natural changes and fluctuations in the climate that occur over short periods, like months, years, or decades

“Climate is what we expect, weather is what we get”
– Mark Twain

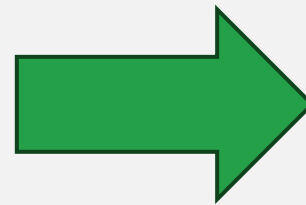


Climate scenarios

Calculating emissions helps to illustrate the range of potential futures based on varying amounts of greenhouse gases and projected rates of warming

CMIP5	
RCP	Representative Concentration Pathway
2.6	Significant reductions, negative emissions technologies Aims to limit warming to below 2 C, Very stringent mitigation pathway
4.5	Emissions peak around 2040, then decline, Moderate increase in temperatures, Intermediate stabilization pathway
8.5	High emissions, no significant mitigation, Substantial increase in temperatures, Business as usual scenario.

Coupled Model Intercomparison Project (CMIP)
A global effort to improve climate models and understand how our climate is changing.



CMIP6

- Clearer forecast and stronger predictions
- Better understanding of how the different parts of the climate system operates
- Easier to downscale for local use
- Socio economic data & policy

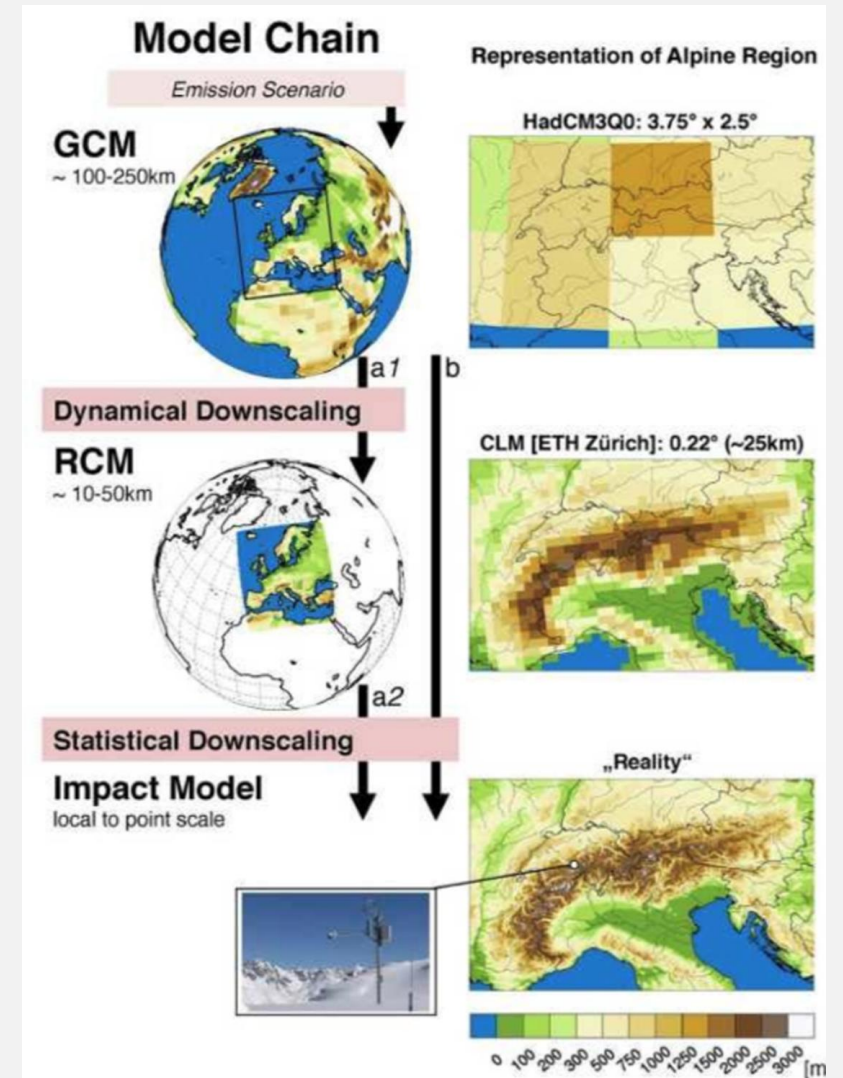
Future Forecasts

How do we know what's going to happen next?

- Climate models are essential tools for scientists.
- These models allow us to reconstruct past climates, simulate the current climate, and evaluate how future climates may be different.

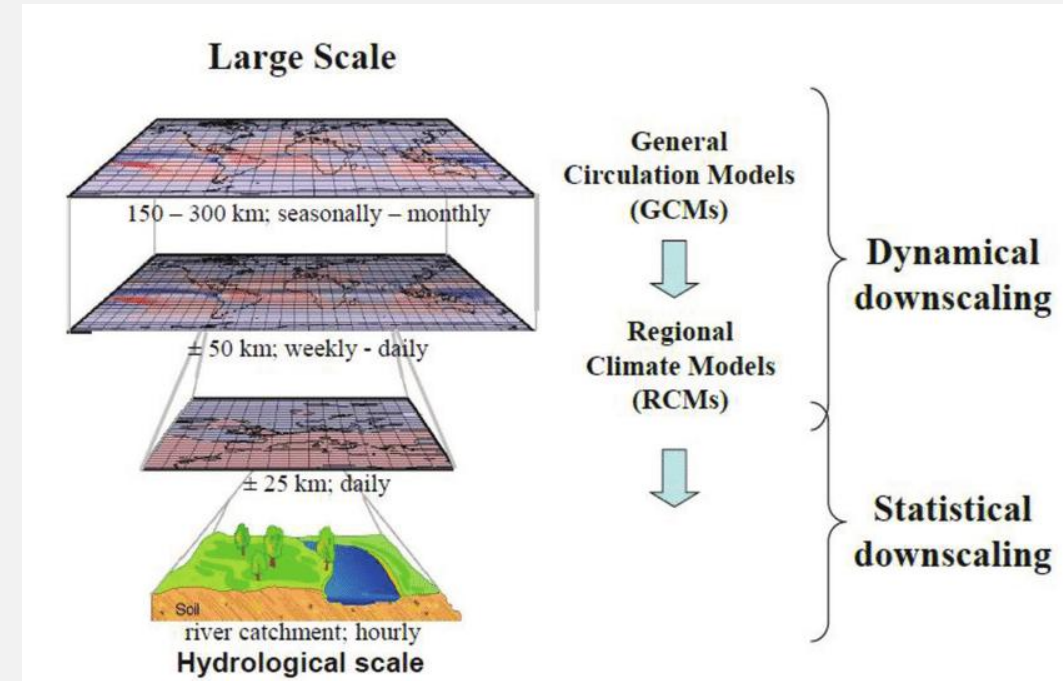
What do climate models project?

- Models produce projections of future climates by determining how the climate will react to changes in greenhouse gases in our atmosphere.
- The more GHGs there are, the more energy remains in the atmosphere and temperatures increase.
- Accuracy of forecasts improves when you use several climate models.

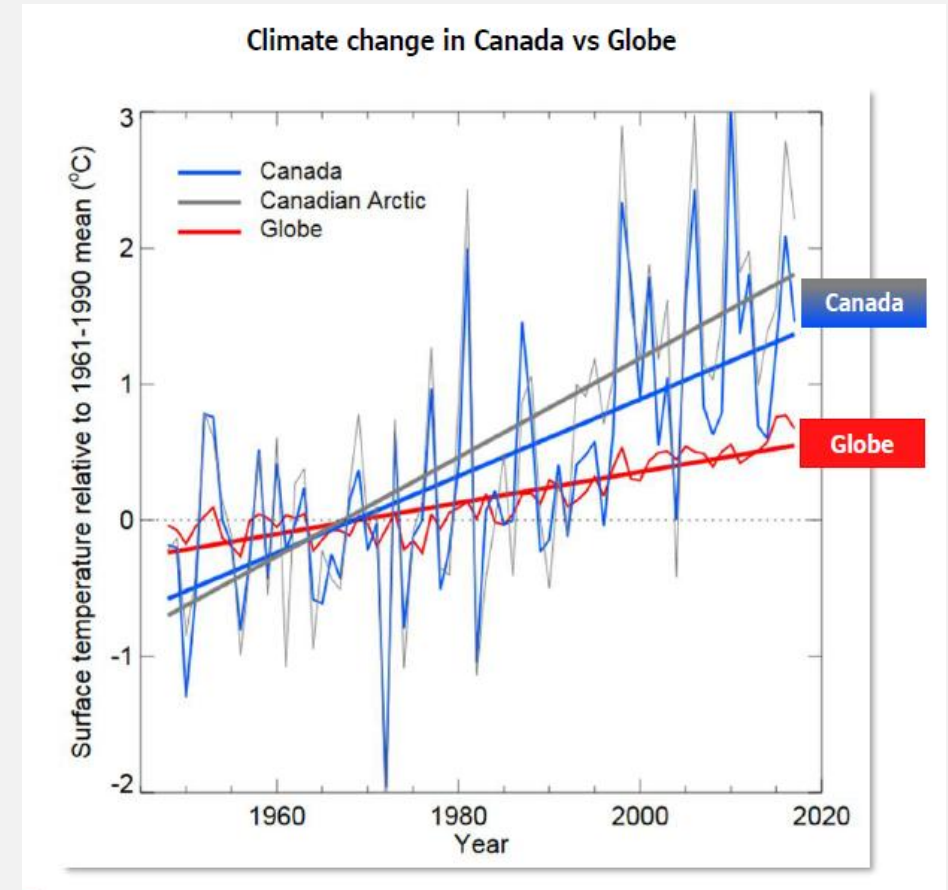
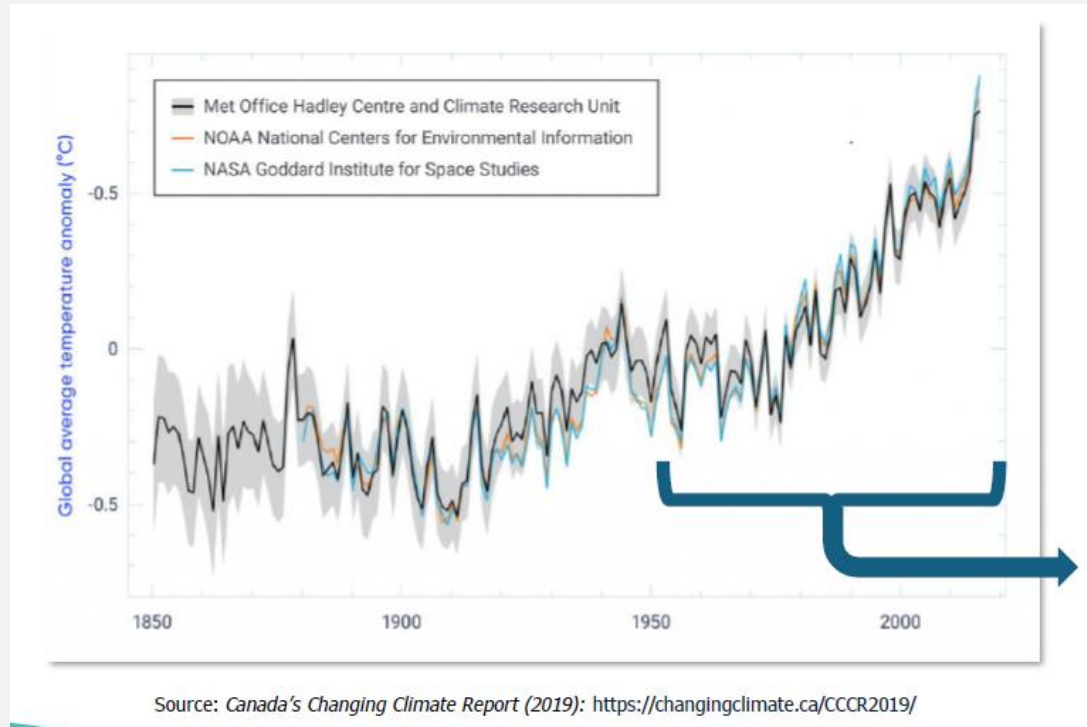


How do we know climate models work?

- Climate models are very good at simulating the climates of the past and current. Therefore, there is a high probability that their projections for the future are valid.
- The warming of the last century can only be simulated when GHGs are added to the atmosphere
- Greenhouse gases are attributable to human activity of fossil fuel burning
- Global climate models need to be downscaled to a local level to support decision making
- It is more reliable to have multiple climate models than just a single model.

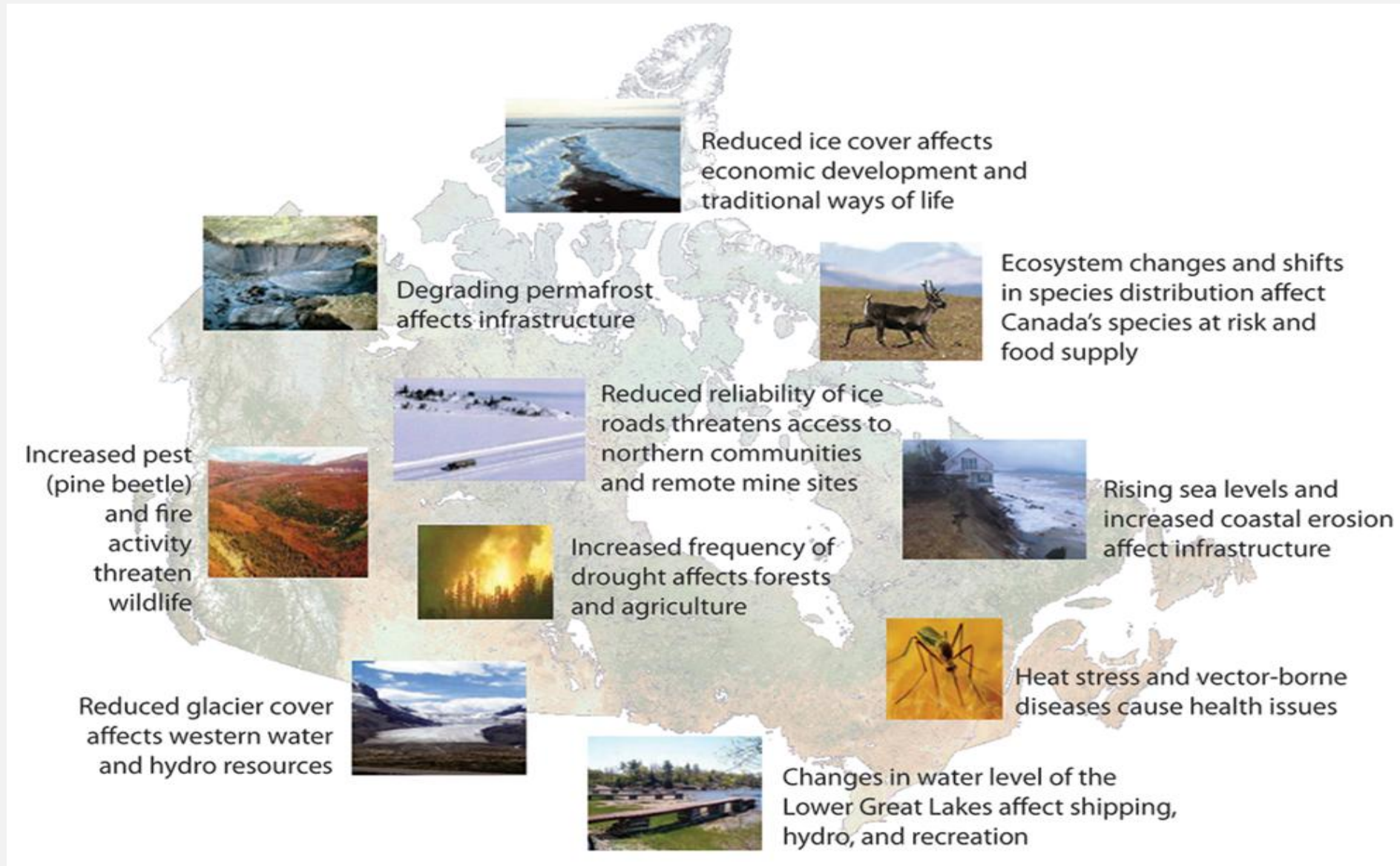


Global vs. Canada Temperature Change



On average, Canada is warming at twice the rate of the rest of the world. This trend is even more pronounced in Northern Canada, where the warming rate is nearly three times the global average

Climate Risks from Coast to Coast to Coast



Climate Change Impacts on Manitoba

Flooding
Extreme rainfall
Rapid snowmelt



Drought



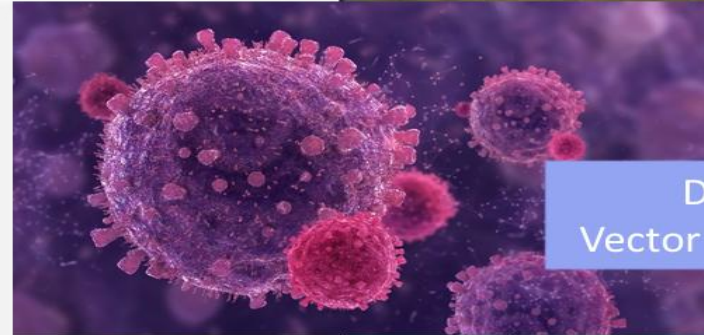
Wildfire



Wind Events



**Disease
Vector or Zoonotic**



**Winter roads and
northern infrastructure**



**Invasive
species**

**Low water
levels**



- Extended Growing and Recreational Seasons
- Heat Stress on People and Animals
- Mental Health and Eco-Anxiety



Reaching Net Zero

The climate will continue to warm until global greenhouse gas emissions are reduced to net-zero, at which point the temperature will stabilize

Net-zero means balancing the amount of greenhouse gases released into the atmosphere with an equivalent removal or offset of GHGs.

This balance is crucial to prevent the worsening of climate change hazards, such as extreme weather events, rising sea levels, loss of biodiversity and spread of disease.

Net-zero establishes a set limit to what we need to prepare, adapt and build to as protective tolerances. It further reduces the extremes of climate hazards and compensation paid out.

Reaching Net Zero allows us to build modernized economies in physically safe communities from climate hazards.



Alexandra Bourne

Senior Policy Advisor
Climate Preparedness and Communications

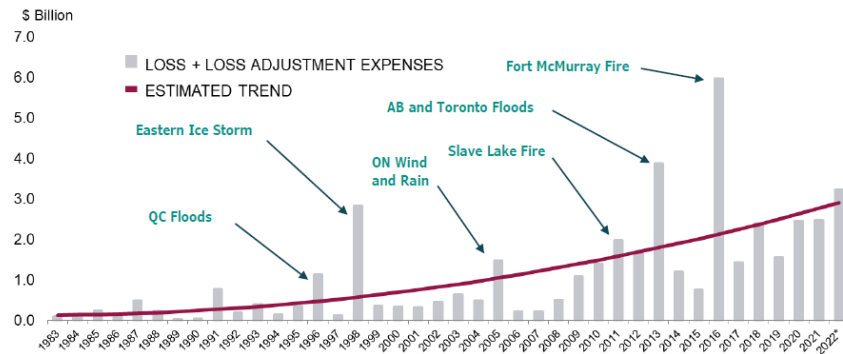
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The Costs of Climate Change

Insured catastrophic* losses in Canada

*A catastrophic loss = 1 event costing \$30 (25 prior to March 2022) million or more in insured damages



Source: IBC Facts Book, PCS, CatiQ, Swiss Re, Munich Re & Deloitte
Values in 2022\$ CAN, *2022 preliminary

* Catastrophic loss = 1 event costing \$30 million (\$25M prior to March 2022) or more in insured damages

Average Annual Payouts:

- \$440 M (1983 -2000)
- \$675M (2001 to 2010)
- \$2.3 B (2011-2020)
- \$3.1 B (2023)
- \$8.5 B (2024) worst year to date

Insurance Bureau of Canada

This is just private insurance.

It doesn't include all 3 levels of government costs or that of business and individuals

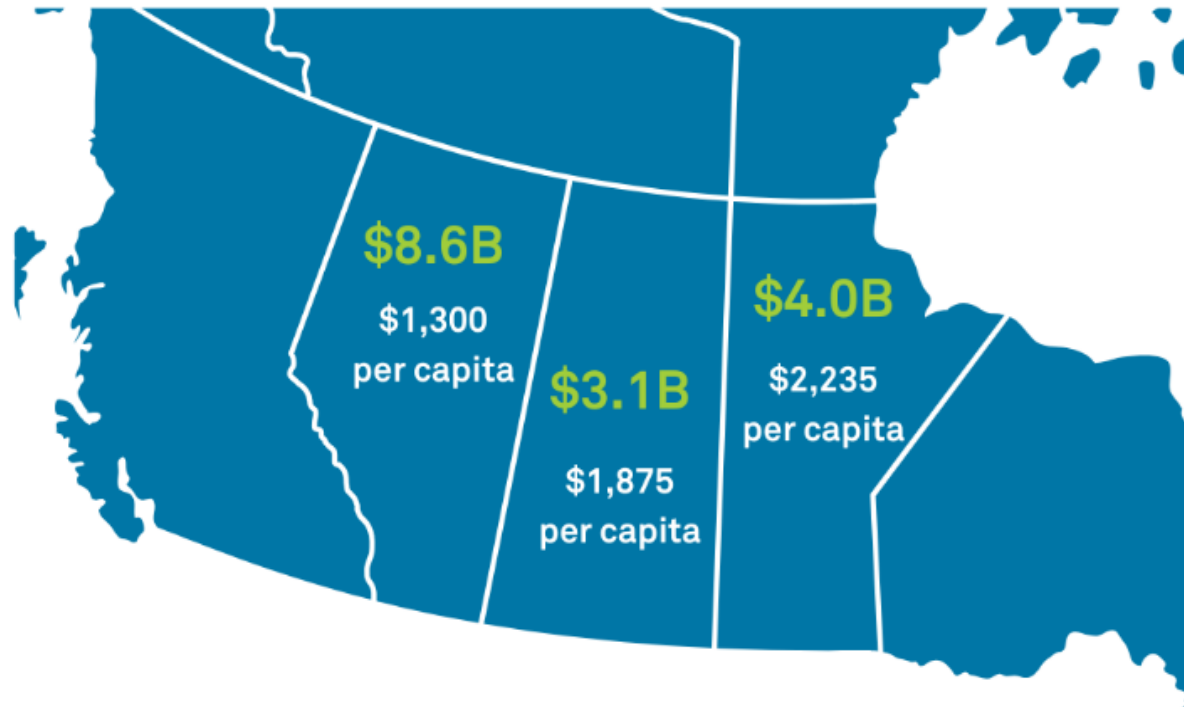
Canada: Insured Catastrophic Losses in 2024



*The amount of insured damage is an estimate provided by CatiQ (www.catiq.com) under licence to IBC.

Prairies: Costs of Climate Change

Projected total annual costs across the
Prairie provinces (2050s)



= \$15.7B

economic losses
attributable to climate
change across all
three provinces, based
on a high emissions
scenario

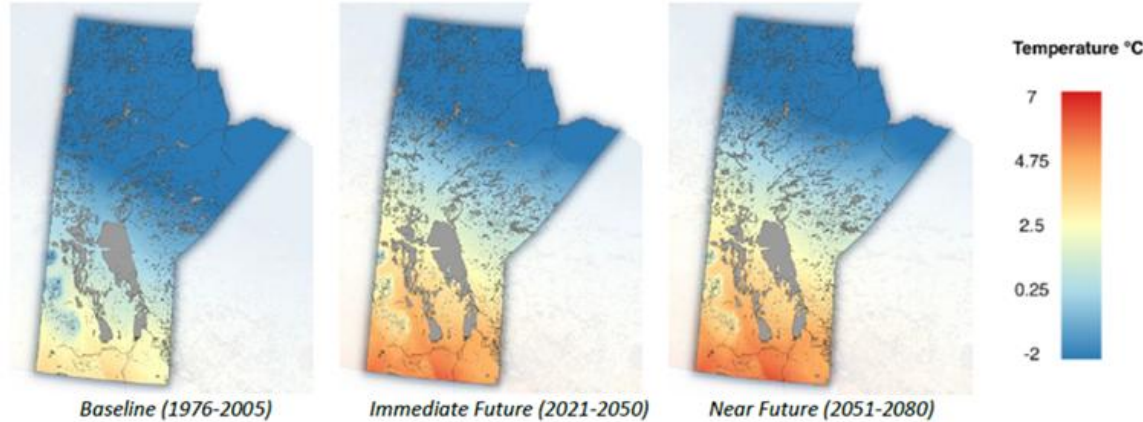
Read the full report: climatewest.ca/publications



MANITOBA CLIMATE
RESILIENCE TRAINING

Climate Change in Manitoba

Average Annual Mean Temperature



- Milder, shorter and wetter winter
- Hotter, drier summers
- Change in timing of fall and spring

Average annual temperature is projected to increase by at least 2°C across the province for the time period 2021-2050.

This warming presents itself in more frequent and severe weather events.

Projected Changes in Summer

- Drier conditions increasing the length of the forest fire season
- Increase in the Urban Heat Island (UHI) effect
- Increased energy/cooling strain for communities
- Increased health risks for at-risk populations
- Growing zones are moving north increasing the length of the growing season and the species range

Climate Variable or Index	Description	2021-2050 High Carbon Scenario	
		Southern Manitoba	Northern Manitoba
Very Hot Days	Number of days with temperatures above +30°C each year.	↑ 17 days	↑ 1 day
Heat Waves	Number of occurrences of 3 or more consecutive days with maximum temperatures above 30°C per year.	Double to triple the number of heat waves in southern Manitoba.	
Tropical Nights	Number of nights with minimum temperatures above 20°C per year.	↑ 1 to 5 days	No change to ↑ 1 day
Summer Precipitation	Total precipitation in June, July, and August.	↑ 1% to 2%	↑ 3% to 5%

Projected changes in Spring and Fall

- Warmer and wetter
- Timing of shoulder seasons will change as well, with spring potentially starting earlier and fall ending later
- Southwestern Manitoba expected to see a bit more precipitation, while Eastern Manitoba will see less
- Longer growing season
- New patterns of precipitation
- Higher demand on stormwater management

Climate Variable or Index	Description	2021-2050 High Carbon Scenario	
		Southern Manitoba	Northern Manitoba
Spring Precipitation	Total precipitation in March, April, and May.	↑ 7% to 13%	
Fall Precipitation	Total precipitation in September, October, and November.	↑ 6% to 10%	
Date of Last Spring Frost	Approximate beginning of the growing season.	← 7 to 10 days	
Date of First Fall Frost	Approximate end of the growing season.	→ 9 to 14 days	

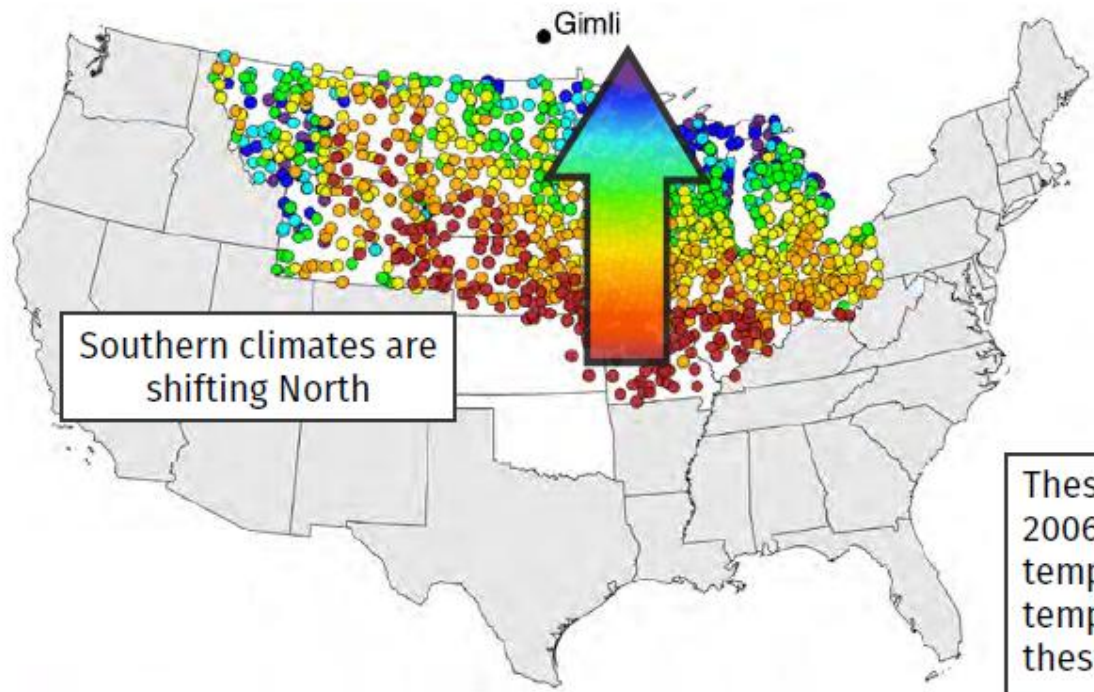
Projected Changes in Winter

- Degradation of permafrost
- Increase in freeze/thaw cycles degrading infrastructure
- Loss of insulating snow layer for overwintering plants
- Shortening of winter road season
- Increased risk of out-of-season storms

Climate Variable or Index	Description	2021-2050 High Carbon Scenario	
		Southern Manitoba	Northern Manitoba
Extreme Cold Days	Number of days with temperatures below -30°C each year.	↓ 7 days	↓ 28 days
Coldest Minimum Temperature	Coldest minimum temperature of the year.	↑ 3.5°C to 4°C across Manitoba	
Frost Days	Number of days with temperatures below 0°C each year.	↓ 19 to 20 days	↓ 17 to 18 days
Winter Precipitation	Total precipitation (rain and snow) in December, January, and February.	Up to ↑17%	

What is our Future Climate?

Summer Average Maximum Temperature



Analogue Years (Average Temp)

1991 - 2005	(23.9 °C)
2006 - 2020	(24.6 °C)
2021 - 2035	(25.5 °C)
2036 - 2050	(26.3 °C)
2051 - 2065	(27.6 °C)
2066 - 2080	(28.9 °C)
2081 - 2095	(30.1 °C)

These are American stations whose 2006-2020 average summer maximum temperatures are **within 0.5°C** of the temperatures projected for Gimli in these 15-year periods.

Source: Prairie Climate Centre, 2024.

How can you access and use climate information?

Climate services

- aims to equip decision makers with better information to help them prepare for climate variability and change.
- recognizes that decision makers need climate information in a form that is compatible with the decisions they need to make.



Climate Service Organizations

Canadian Centre for Climate Services

www.canada.ca/climate-services



Government of Canada

Gouvernement du Canada

Canadian Climate Data

www.ClimateData.ca



ClimateWest



Prairie Climate Centre

From Risk to Resilience



Eco-West

Éco-Ouest

CANADA

Climate Atlas of Canada

www.climateatlas.ca



Climate Atlas of Canada



IISD

International Institute for Sustainable Development

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Tools and Resources



Key Takeaways

- Human activities are increasing greenhouse gas emissions in the earth's atmosphere and are driving global temperature rise.
- Models have demonstrated that Canada's climate has changed because of global temperature increase, impacting all regions, and providing opportunities.
- We have and will continue to experience increased frequency and severity of climate events.
- The climate will stabilize once we achieve and maintain net-zero global greenhouse gas emissions.
- We will not revert to past climate conditions and will adapt to the new realities.
- Inaction is more costly than taking action. The Climate Risk Institute states for every \$1 invested, you save \$5 in future costs.
- It is important to consider climate change risk and opportunities in decision-making.
- Climate services are available in Manitoba and across the Prairies region and Canada to support climate-smart decision-making and resilient infrastructure design.
- **Being prepared for a changing climate helps to build resilience for a safe, healthy and prosperous Manitoba.**



WEBINAR SERIES

Manitoba Climate Resilience Training



Wednesdays @ 10:00 - 11:00 AM CT

March 5 Climate Preparedness 101

March 12 How to Conduct a Vulnerability and Risk Assessment

March 19 Climate Adaptation Planning



MANITOBA CLIMATE RESILIENCE TRAINING

[REGISTER NOW](#)

Thank you!!

Elaine Fox
Manager, Climate Adaptation
Elaine.Fox@gov.mb.ca

Alexandra Bourne
Senior Policy Advisor
Alexandra.Bourne@gov.mb.ca

Ramon Sales
Senior Policy Analyst
Ramon.Sales@gov.mb.ca

Climate Preparedness and Communications Branch
Climate Action and Energy Innovation Division
Manitoba Environment and Climate Change
E: ccinfo@gov.mb.ca Ph: 204-945-7246



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