



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Canada

Introducing the Canadian Centre for Climate Services

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Clean Air Partnership

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CANADIAN CENTRE FOR
CLIMATE SERVICES

CENTRE CANADIEN DES
SERVICES CLIMATIQUES

Canada's Climate is Changing

- **Effects of widespread warming** are evident in many parts of Canada and are projected to intensify in the future
- These changes can bring **significant impacts** and **risks**
 - Infrastructure, health, food security, and economy can all be affected
- **Climate data and information helps** to understand and plan for these changes, to **reduce vulnerabilities and risks, adapt** and **build climate resiliency**



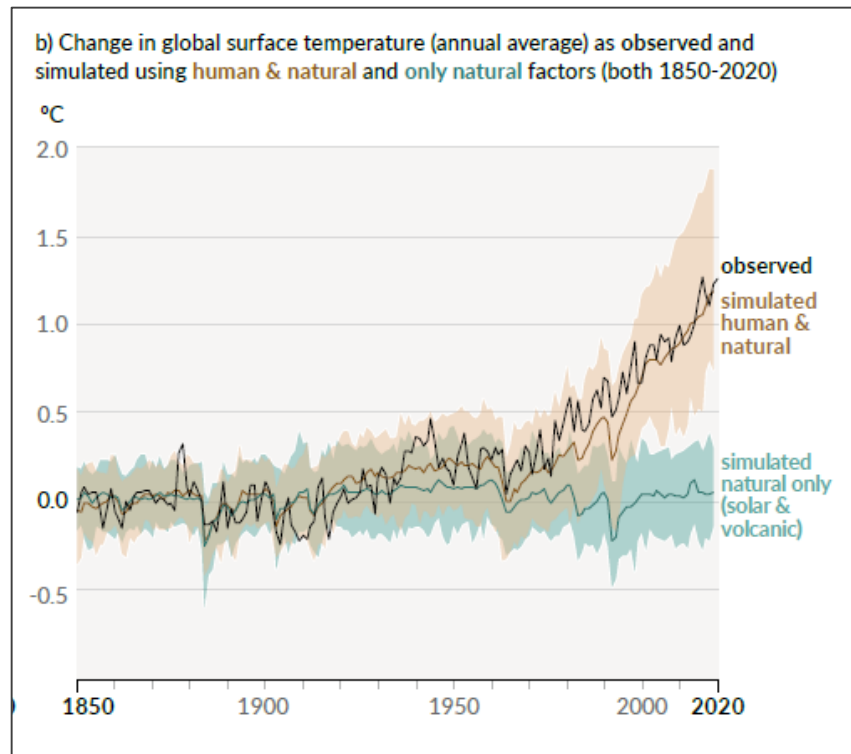
[Canada in a Changing Climate](#) (2019 – onwards)

Several Reports

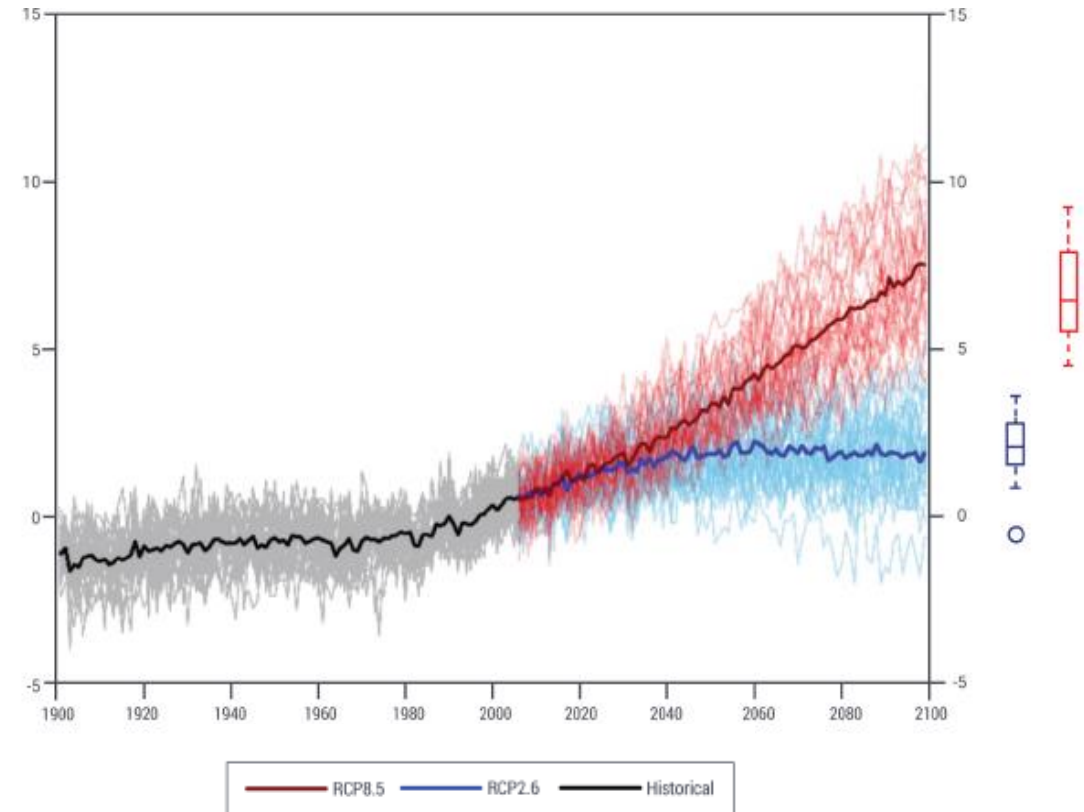
Climate Report, National Issues, Regional perspectives, Health, Map of Adaptation Actions

Climatic Changes That We Are Seeing

- **World temperature** has increased 1.1°C in past 150 years
- **Canada** has warmed 2X the global rate, 3X in the North, in the past 120 years



Change in global surface temperature.
IPCC. 2021. [AR6](#). SPM, Fig. 1b.



Canada's Projected Annual Temperature Change.
[Canada's Changing Climate Report](#). 2019. Fig. ES2, 4.8

Climate Change Impacts & Risks

PERMAFROST
Thawing permafrost affects northern building and infrastructure



REDUCED SEA ICE COVER
Affects traditional livelihoods and economic development

PESTS
Increased pest activity, like the Pine Beetle



WINTER ROADS
Reduced reliability and access to remote mines and communities



ECOSYSTEM CHANGES
Affects country's food supply and species at risk

WILDFIRE
Higher risks of fire and a longer fire season



HEALTH
Impacts due to vector-borne diseases, like Lyme disease



SEA LEVEL RISE
Increased coastal erosion, affects coastal communities, property value, insurance

GLACIERS
Affects hydro electricity power resources and drinking water



DROUGHT
Impacts agriculture and drinking water availability

FLOODING
Affects infrastructure and supply chains



LAKE LEVELS
Affects shipping, hydro, recreation, etc.



HEAT ISSUES
Health issues related to heat stress are magnified in urban areas.

Climate change impacts in Ontario

Ontario is already experiencing impacts and these impacts are expected to continue in the future.

- Rising temperatures
- Extreme weather
- Impacts to lakes and rivers
- Impacts on food systems

An Ontario chapter under the Regional Perspectives report is expected to be released later this year.



Action on Climate Change

To reduce the impacts of climate change, the world is trying to keep warming under 2 °C. There are two key actions that society can take to address climate change:

- **GHG Mitigation**

- Reducing greenhouse gases (GHGs) and helping systems absorb carbon.

- **Adaptation**

- Adjusting to current and future climatic changes, to reduce harm, obtain opportunities and increase **resilience**.



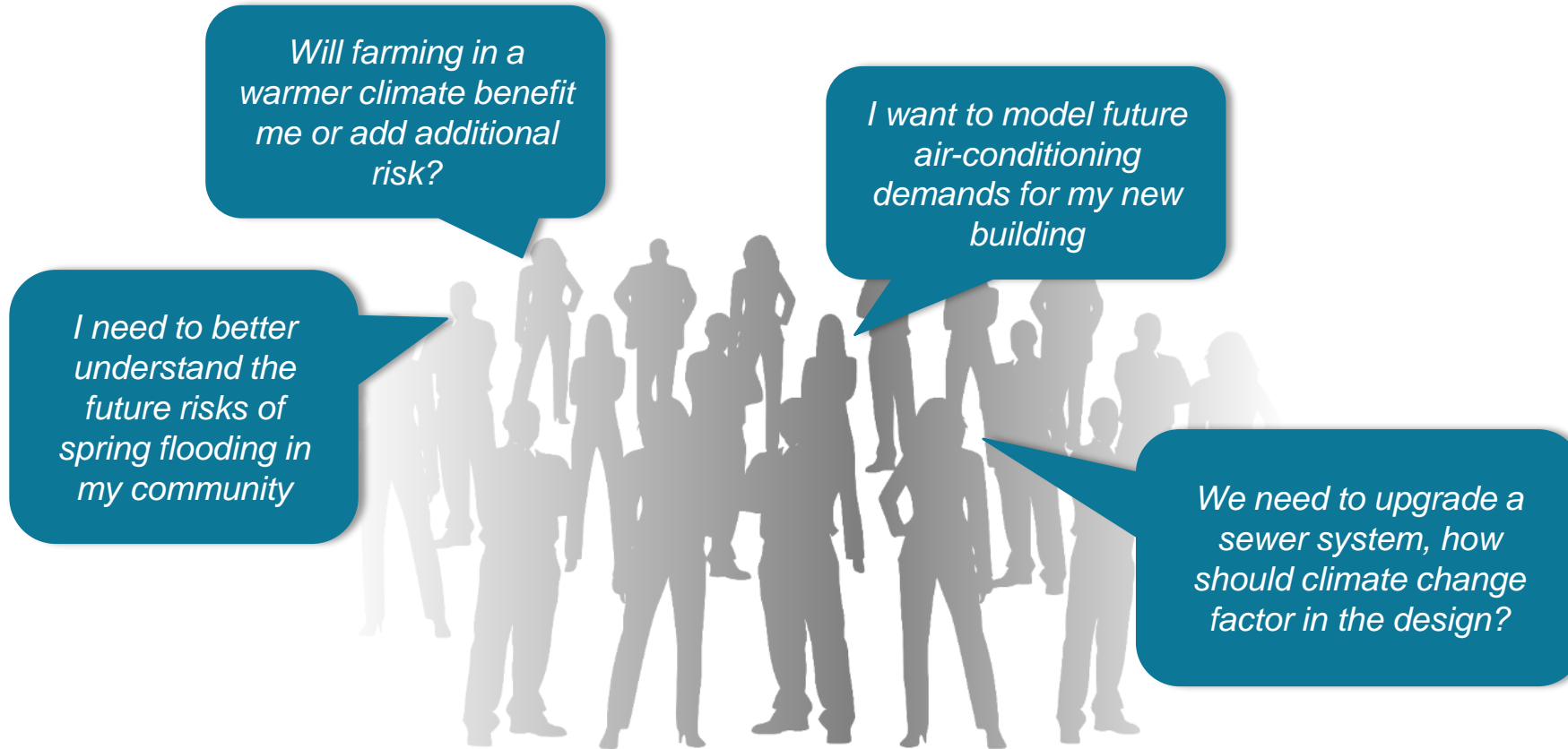
Climate Data Informs Adaptation

Role of Canadian Centre for Climate Services:

- Access to historical climate data
- Access to future climate projections
- Tailored products
- Resources and information
- Training and support



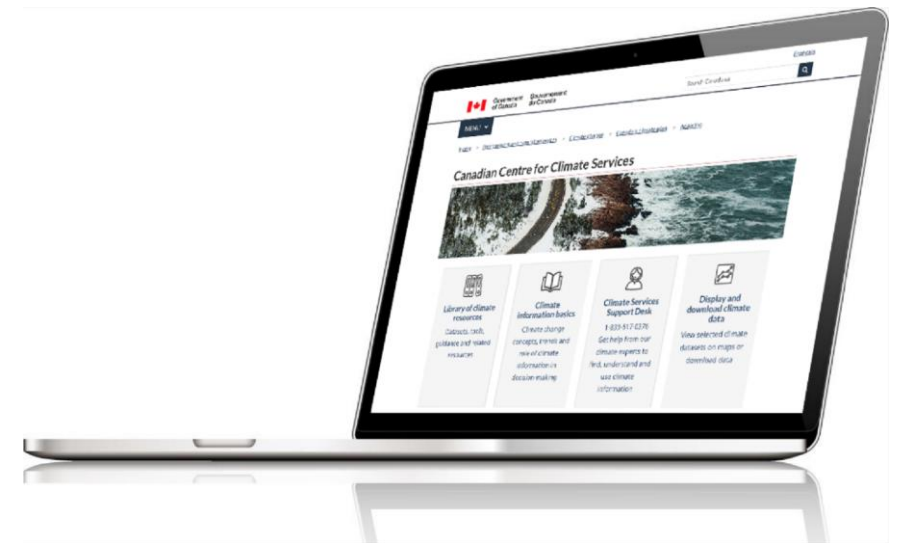
Decision Makers Have Many Questions...



Canadian Centre for Climate Services

- **Support Desk** to answer questions and navigate resources
- **Website:**
 - Climate datasets and climate data portals for a variety of users
 - Library of 300+ climate resources
 - Intro to climate information concepts
- **Training resources** and on-demand workshops
- **Climate Resilience Assessment Worksheets**
- **Tailored products**
- **Map of Adaptation Actions** with Canadian case studies on how Canadian communities and sectors are adapting to climate change

“Provides Canadians with information and support to consider climate change in their decisions.”



 **1-833-517-0376**

Climate Services Support Desk

ccsc-cccs@ec.gc.ca

- Helps users find the **right datasets** and **information**
- Provides **guidance** for understanding and using data
- Draws on a **network of experts** to respond to inquiries



Feedback

Your feedback is welcome.
Leave us your comments and suggestions.



Inquiry

Get help from our climate experts to find, understand, and use climate information.

Library of Climate Resources

- **300+** links to climate datasets, tools, guidance and related resources
- Collection of **climate resilient standards**
- Useful for impact, vulnerability and risk **assessments**, and for adaptation **planning**
- **Search** using filters or keywords

7 Steps to Assess Climate Change Vulnerability in Your Community | Guidance

This workbook helps communities plan for climate change by assessing vulnerability to identified hazards.
Organization: Government of Newfoundland and Labrador, Memorial University
Sub-organization:
Resource formats: **Vulnerability or risk assessment**

A Guidebook on Climate Scenarios: Using Climate Information to Guide Adaptation Research and Decisions | Guidance

This guidebook supports decision-makers in understanding climate information, modelling, and how climate change scenarios can be used to inform adaptation.
Organization: Ouranos
Sub-organization:
Resource formats: **Scientific synthesis**

A Made-in-Saskatchewan Climate Change Strategy | Additional resources

This website provides an overview of climate change strategy of Saskatchewan
Organization: Government of Saskatchewan
Sub-organization:
Resource formats: **Adaptation planning**

A Practitioner's Guide to Climate Change Vulnerability and Risk Assessments | Guidance

This guide provides tools and techniques for how climate change vulnerabilities and risks can be integrated into decision-making for ecosystems in Ontario.
Organization: Government of Ontario, Resources (OCCO)
Sub-organization: Government of Ontario, Ministry of Natural Resources and Forestry
Resource formats: **Vulnerability or risk assessment**

A Primer for Understanding Concepts, Principles and Language Use Across Disciplines | Guidance

This primer helps engineers and climate specialists collaborate more effectively in carrying out climate change vulnerability and risk assessments. It does this by explaining important differences in how practitioners from these two respective disciplines understand particular concepts, principles, and vocabulary.
Organization: Nodelcorp, Government of British Columbia, Pacific Climate Impacts Consortium
Sub-organization: BC Ministry of Transportation and Infrastructure
Resource formats: **Scientific synthesis** **Vulnerability or risk assessment**

Adapting to a Changing Climate in Nova Scotia: Vulnerability Assessment and Adaptation Options | Additional resources

Sector

- Agriculture (25)
- Coastal management (31)
- Ecosystems and biodiversity (22)
- Energy (3)
- Forests (22)

▼ Show more
✕ Clear all

Hazard / Impact

- Air quality (6)
- Drought (18)
- Erosion (14)
- Extreme weather (27)
- Fire (16)

▼ Show more
✕ Clear all

Jurisdiction

- Alberta (118)
- British Columbia (179)
- Manitoba (128)
- New Brunswick (135)
- Newfoundland and Labrador (142)

▼ Show more
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Historical / Future

- Future (96)
- Historical (182)

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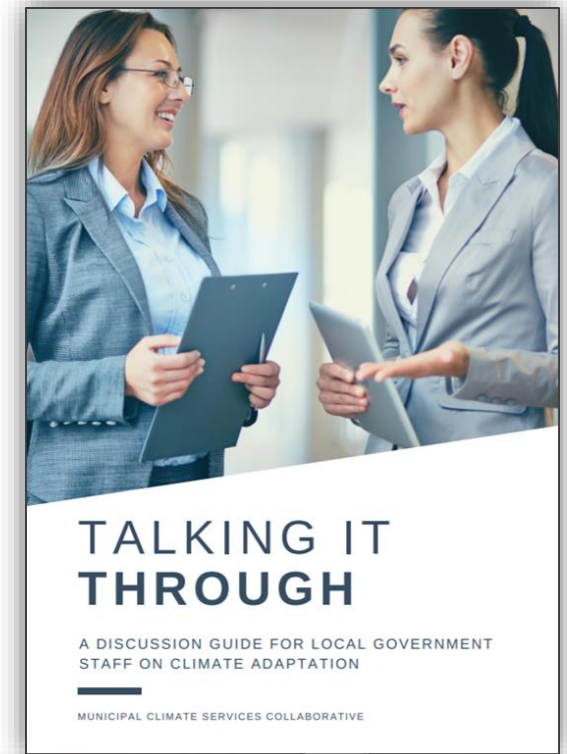
Variables

- Cloud (9)
- Cooling degree days (22)

11

Resources for Municipalities

- Curated list of [climate-related resources for local governments and municipalities](#)
- Consolidation of municipal adaptation codes and standards
 - Including for [infrastructure and buildings](#)
- [Talking it through: Guide for local government staff on climate adaptation](#) (2020)
- 5 case studies that highlight use of climate information to support municipal risk assessment and adaptation
 - [Resilience to riverine flooding](#) – Grand Forks, BC
 - [Integrating climate risks within municipal projects](#) – Windsor, ON
 - [Enhanced drought management](#) – Quinte Conservation, ON
 - [Developing a multi-risk adaptation plan](#) – L'Islet, QC
 - [Adapting to floods and storm surges](#) – Saint John, NB



Developing climate resilient standards and codes



Climate-related resources for local governments

Find relevant resources to learn how to use climate change information within local government risk assessment and adaptation planning contexts.

On this page

- [Background](#)
- [General climate-related resources for local governments](#)
- [Resources by Region](#)

Ecosystem of Climate Data Portals

The CCCS helps support a range of climate data platforms



ClimateAtlas.ca

- Interactive climate data map and visualization tool
- Narrative-driven text, and video content
- Core educational content



ClimateData.ca

- Access climate normals, downscaled future climate model data, IDF curves, and more.
- Custom tools to analyze and extract data
- Sector modules and case studies



Power Analytics & Visualization for Climate Science (PAVICS)

- Advanced climate data tools for academia, climate scenario developers, and other expert users
- Virtual laboratory facilitating the analysis of climate data

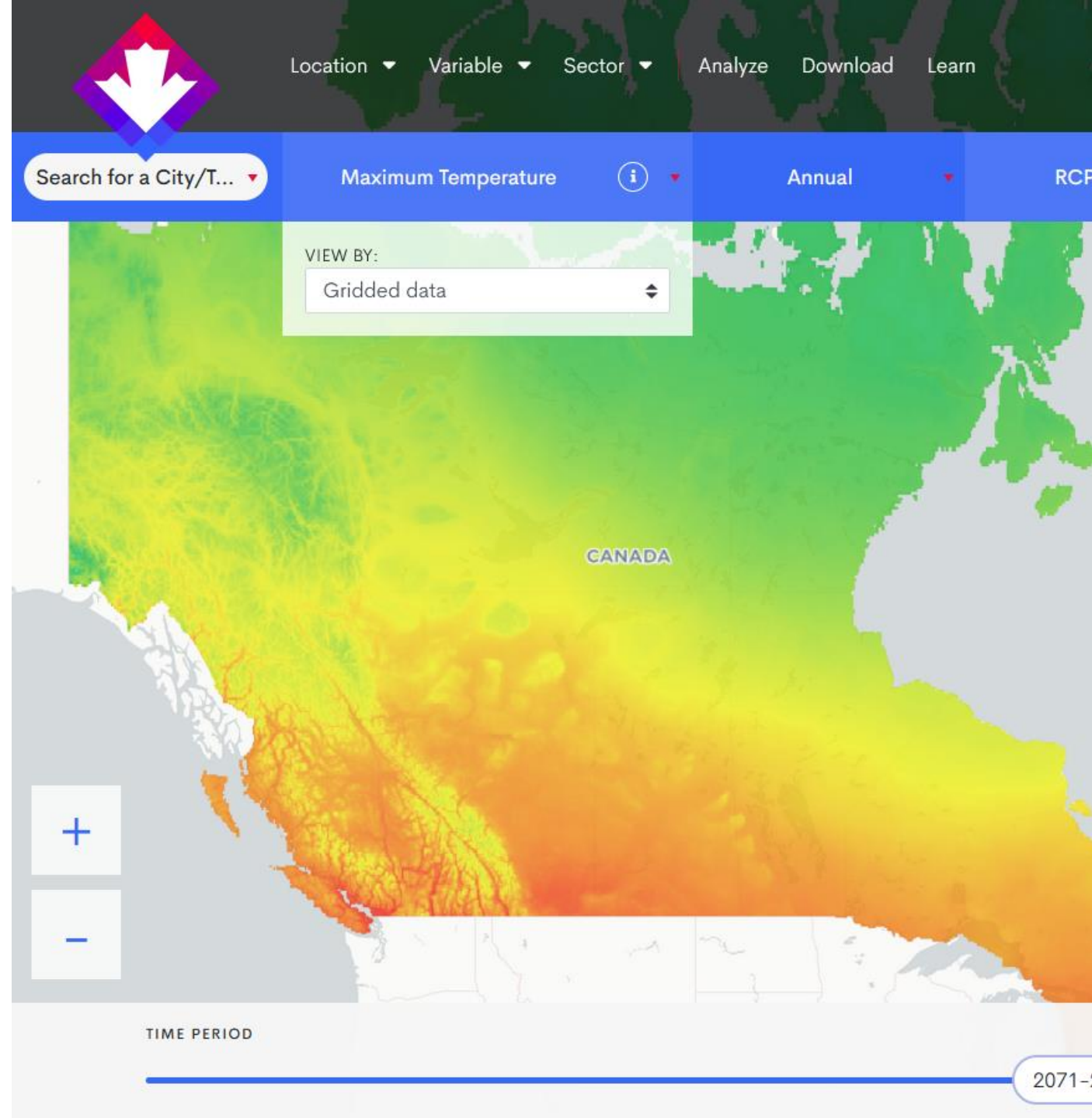
ClimateData.ca

Climate Data

- High resolution climate data
- Temperature and precipitation variables and climate indices
- Relative sea level change
- Observed climate normals and daily data download
- Intensity Duration Frequency (IDF) curves
- Local and national scale charts and maps
- Ability to compare emission scenarios
- Customizable tools to analyze and extract data

Helpful Resources

- Sector modules with tailored case studies
- Learning Zone



ClimateData.ca Find Local Data

- Select a variable, including historical station data and IDF curves
- Select Annual, seasonal or month time steps
- Select emission scenario
- Download data
- Download chart image
- Adjust time scale to customize output



ClimateData.ca Sector Modules



Health

Emergency Measures
Health Infrastructure
Public Health
Data by Health Region



Agriculture

Drought
Crop Pests
Risk Management
SPEI



Buildings

Extreme heat
Permafrost
Decision support tool
More soon...



Transportation

Winter Roads
Asphalt Performance Grading
Extreme Precipitation
More soon...

ClimateData.ca Learning Zone

ClimateData.ca/learn/

- Introduction to climate information for decision making
- Understanding historical data
- How to use ClimateData.ca
- Downloadable training materials
- *More coming soon!*

Historical Weather Station Observations

Learn about Canada's weather station monitoring network and how long-term observations from these stations help build Canada's climate record.

FORMAT ▶ TIME TO COMPLETION 2 min

Gridded Historical Data

How are weather station observations used to create a country-wide view of Canada's weather? Learn about ANUSPLIN, the interpolation tool used to create gridded historical datasets.

FORMAT ▶ TIME TO COMPLETION 2 min

Modelled Historical Data

ClimateData.ca provides historical climate simulations from 24 climate models developed by scientists from around the world. Learn why climate models are run over the historical period and how you can access this data.

FORMAT 📄 TIME TO COMPLETION 3 min

Which Historical Data Set Should I Use?

Learn about four types of historical data: historical weather station data, adjusted and homogenized data, gridded historical data, and modelled historical data. Find out which ones could be most relevant to you.

FORMAT 📄 TIME TO COMPLETION 3 min

Changingclimate.ca Map of Adaptation Actions

- One-stop-shop for **examples** of climate change adaptation actions from across Canada.
- Users can filter by **climate issue** (e.g. *flooding, fire events, invasive species*), **sector** (e.g. *Agriculture and Food, Communities, Infrastructure*), **location**, and **more**.
- **Submit** your own adaptation examples for inclusion on the Map.



Contact Us @ ec.carteadapt-mapadapt.ec@canada.ca

Map of Adaptation Actions

Integrating climate risks within municipal projects

The City of Windsor sought to **integrate climate change considerations into their municipal decisions** in order to address impacts already being faced from climate change, such as:

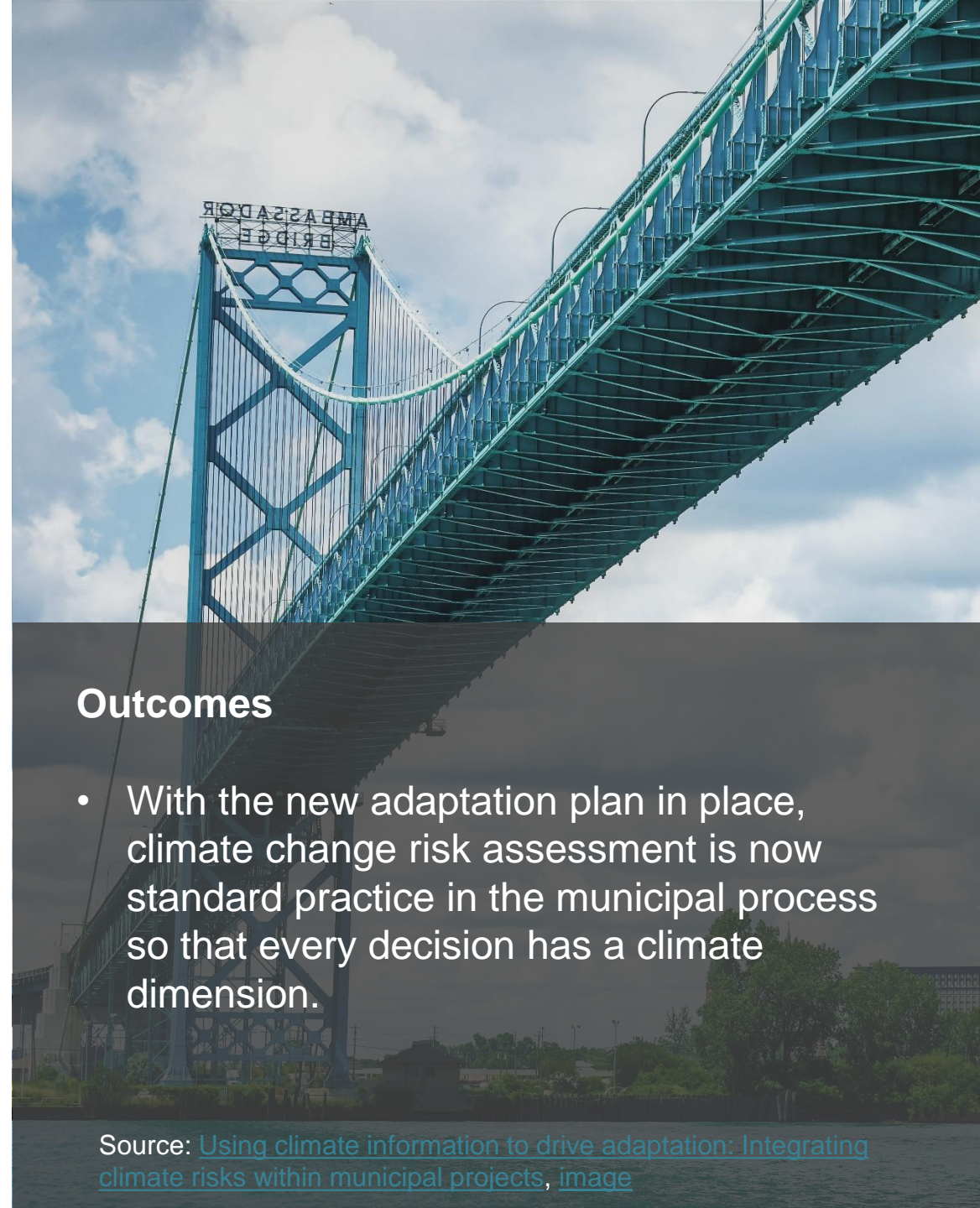
- *Extreme heat events*
- *Severe precipitation events causing flooding*
- *Increased vector borne disease and invasive species*

A historic flood as well as other impacts provided the impetus to update the existing climate change adaptation plan. As part of the new plan, historical and future **climate information must be considered** through risk assessment.

A [Risk Assessment Guidance Document](#) was developed as part of the plan update, which includes data from ClimateData.ca.

Outcomes

- With the new adaptation plan in place, climate change risk assessment is now standard practice in the municipal process so that every decision has a climate dimension.





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Canada

Thank you / Questions

Website

English:

canada.ca/climate-services

Français:

canada.ca/services-climatiques

Climate Services Support Desk



1-833-517-0376

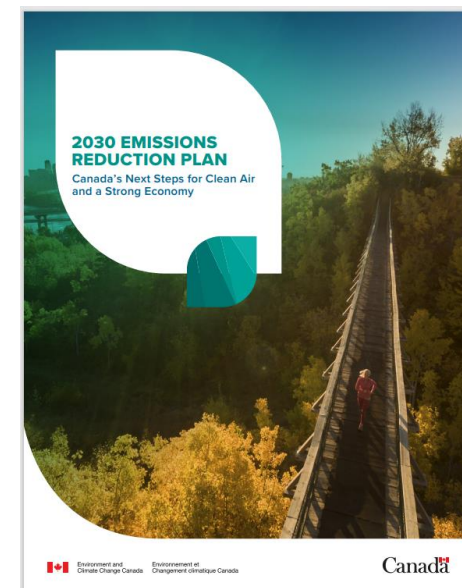


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Additional Resources

Government of Canada Resources

- **Government of Canada [Climate Change website](#)**
 - Including how to take action, funding programs and international efforts.
- **Impacts, Risks & Adaptation**
 - [Canada in a Changing Climate: Advancing our Knowledge for Action](#)
 - [Canada's National Adaptation Strategy](#)
- **GHG Mitigation & Transition**
 - 2022. [2030 Emissions Reduction Plan: Clean Air, Strong Economy](#)
 - 2021 [A Healthy Environment and a Healthy Economy](#)
- **Climate science & Information**
 - [Climate Science 2050: Advancing Science & Knowledge on Climate Change](#)



Other Resources

Intergovernmental Panel on Climate Change (IPCC). 2021.

- [Sixth Assessment Report \(AR6\)](#).



Transitions

- Government of Canada. [Just Transition | Natural Resources Canada](#)
- [Canadian Climate Institute \(CCI\)](#). 2021.

Active Hope/ Eco-Anxiety

- [EcoAnxious.ca](#)
- [Feeling Hopeless About the Climate? Try Our 30-Day Action Plan](#)
- [Finding Hope: Changing the Climate Crisis Conversation \(Katherine Hayhoe\)](#). 2022
- K. Hayhoe. 2021. [Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World](#).
- [How to transform apocalypse fatigue into action on global warming \(Per Espen Stoknes\)](#) 2017