

WHAT IS CLIMATE CHANGE?

ANY CHANGE IN CLIMATE OVER TIME DUE TO NATURAL FACTORS, HUMAN ACTIVITY, OR BOTH

THE CLIMATE IN CANADA VARIES BY REGION, AND FROM YEAR TO YEAR

CLIMATE CHANGE AFFECTS CANADA'S BIODIVERSITY, ECONOMY AND THE HEALTH OF CANADIANS

ACROSS CANADA

COMMUNITIES, ORGANIZATIONS AND ALL LEVELS OF GOVERNMENT ARE WORKING TOGETHER TO RESEARCH CLIMATE CHANGE

KEY IMPACTS OF CLIMATE CHANGE

INCREASED MELTING OF SNOW AND ICE COVER

MORE EXTREME PRECIPITATION, E.G., FREEZING RAIN

ADAPTATION AND MITIGATION ARE STRATEGIES FOR RESPONDING TO CLIMATE CHANGE

OCEAN ECOSYSTEMS SUFFERING FROM WARMING

AIR TEMPERATURES ARE RISING

GREENHOUSE GAS EMISSIONS ARE THE MAIN CAUSE OF CLIMATE CHANGE

MORE FREQUENT FOREST FIRES

DROUGHTS BECOMING MORE SEVERE

Adaptation involves modifying our decisions, activities and ways of thinking to adjust to a changing climate

Goals



Increasing our capacity to adapt



Improving our ability to thrive under different climate conditions



Building resilience to extreme weather and climate changes

Examples



Forest protection



Infrastructure and building design



Flood protection



Changing agricultural practices

Planting different crops to respond to changing growing seasons and temperatures, or planting a variety of crops to reduce damage from pests that could migrate northward

Overlapping examples



Green infrastructure



Water and energy conservation

Mitigation aims to reduce the causes of climate change

Goal



Cut down greenhouse gas emissions

Examples



Energy efficient technology



Sustainable transportation



Industrial process improvements



Renewable energy



Creating community and home gardens
Increasing local agricultural capacity helps reduce the need to import food over long distances, and by extension the consumption of fossil fuels

Climate Change: Adaptation and Mitigation

Climate Change and Biodiversity

Biodiversity is about living things

and their relationships with each other



This includes **species**, **ecosystems** and the **ecological processes** of which they are a part

The **earlier arrival** of spring changes the **life cycles** of many plants that provide food and habitat for other species



Many species won't be able to

adapt

quickly enough to changes in their

environment



Habitat fragmentation



happens when natural landscapes are broken up by development such as river dams and highways, which can interrupt migration routes

Phenological mismatches

happen when the life cycles of dependent species change and no longer match up

E.g., migratory species arrive at a site after their prey has passed

Northern ecosystems

are vulnerable to habitat loss and could see an influx of new species and diseases from the south



More CO₂ in the atmosphere and higher temperatures could lead to **longer growing seasons** for forests

Habitat destruction

In **prairie ecosystems**, more droughts will likely harm the growth of natural grasslands



Extreme storms and **rising sea levels** can cause coastal squeeze

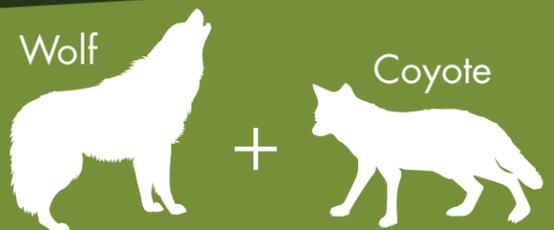


Climate change can cause **Range contraction**

when already limited habitats change and shrink further



Climate change can lead to competition for resources among species, as well as bigger and more frequent **infestation outbreaks**



Hybridization

is the mixing of different but similar species, and can drive rare species to extinction or increase adaptability

Climate change causes harmful algae growth in **marine ecosystems**, which are also at risk of pollution, commercial fishing and wetland drainage



Preservation through adaptation



Protect - nature reserves and marine sanctuaries
Connect - wildlife crossings, bridges and corridors
Restore - selective fishing, animal breeding programs

CLIMATE CHANGE AND THE ECONOMY

For the whole Canada in a Changing Climate report, visit Adaptation.NRCan.gc.ca

ENERGY

Warmer winters decrease the use of natural gas and heating oil

More air conditioning in the summer increases electricity consumption

Extreme weather is a common cause of interruptions in power supply

FORESTRY

Changes in forest composition, pest and disease outbreaks, and more frequent fires could lead to more mill closures and lost jobs

Winter tourism such as skiing will suffer shorter seasons

TOURISM

Warm weather tourism such as camping is expected to grow

More frequent droughts and heat waves

HOUSING

Land-use planners can encourage the construction of homes in areas protected from hazards associated with extreme weather events

Subsidies and other policies promote retrofits that improve energy efficiency and insulation, as well as the resiliency of older homes to extreme weather

Heavier spring melts can increase flood risk

FOOD

Longer and warmer growing seasons would allow crops to be grown farther north, lengthen outdoor feeding seasons for livestock and allow Canada's maple syrup industry to expand northward

Loss and damage due to heavy rainfall, hurricanes, tornadoes, wildfires and winter storms is now more costly than fire and theft

INSURANCE

Homeowners and businesses are already paying more for insurance due to the greater likelihood of extreme weather

MINING

In the mountains, more frequent heavy rain events increase the chance of mudslides and wash out roads, as well as damage mines

Ice roads, which are used for transportation in the North during the winter, are becoming less reliable

Permafrost thawing damages buildings, roads and airport runways

Extreme weather disruptions can delay the distribution of supplies, cause power failures in factories and raise production costs

MANUFACTURING

Climate change can affect the availability of supplies and resources for manufacturing, such as water and timber

CLIMATE CHANGE AND THE ENVIRONMENT

CANADA

has received **16%** more precipitation in the past six decades

Annual average air temperature has warmed

1.5°C 

in the past six decades

The **ARCTIC**

is warming twice as fast as the south



2001-2010: warmest decade on record

Warmer temperatures increase water **evaporation**, leading to bigger and more **dangerous storms**



Temperature over land is **WARMING** faster than over oceans

PERMAFROST

temperatures across the country have increased

There is a great loss of **snow cover** in the **spring** and **summer**



Melting permafrost releases

GREENHOUSE GASES



MELTING GLACIERS

contribute to rising sea levels

SEA ICE

is shrinking more and more

RIVER FLOW

has decreased over the past few decades in southern Canada but increased in northern Canada

STRATIFICATION

is the formation of different layers of water in the ocean

OCEAN ACIDIFICATION

Too much CO₂ is absorbed into the water, making it difficult for some species to build shells and skeletal structures. Some waters are already considered "corrosive" to these organisms.



GLOBAL WARMING

stops these layers from mixing properly, impacting the exchange of nutrients, heat and CO₂

In some areas, there is a lack of oxygen in the water, which is harmful to

MARINE LIFE



Canadians can expect storms, wildfires, heat waves, freezing rain and droughts to become more **common** and **more intense**

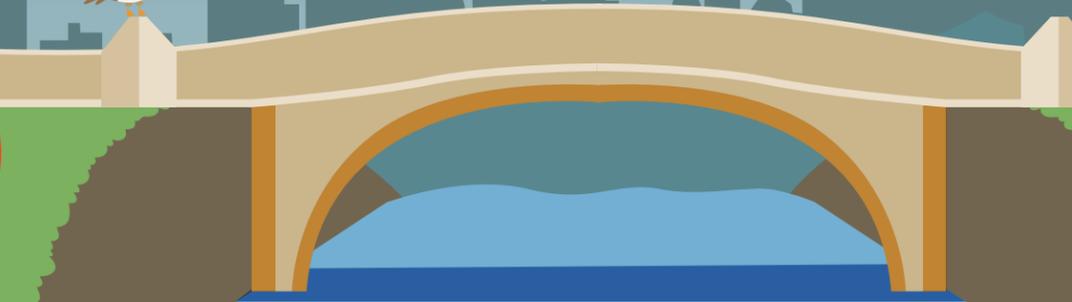
Cities often have **higher temperatures** and **levels of air pollution** than rural areas, conditions which can be exacerbated by **climate change**

CLIMATE CHANGE: HEALTH AND URBAN LIVING

Health and emergency services could struggle to help communities in need of evacuation or treatment for climate change-related disasters



Inhaling smoke from more frequent regional wildfires can cause lung damage and result in the **evacuation of entire communities**



Warming waters can negatively affect freshwater and seafood supplies



Seniors, children, Indigenous peoples, and the socially and economically disadvantaged are most vulnerable to **climate change**

In 2008, air pollution was estimated to be responsible for the death of **21,000 Canadians**



Higher average temperatures could lead to the spread of **rare and exotic diseases** in Canada



In cities, water flows **more rapidly** over land that has been built on and paved over, leading to **flooded or damaged roads, overflow of sewer systems** and **flooded buildings**



Natural disasters can **negatively affect mental health**, causing or contributing to **anxiety, depression, lack of concentration, post-traumatic stress disorder, sleep difficulties** and more



Floods can cause **injuries**, as well as **respiratory illnesses** from mold



Floods, one of the most **common, destructive** and **costly natural disasters** in Canada, are happening **more frequently**



More frequent droughts could lead to **higher food prices**, putting low-income people at risk and increasing **food insecurity**

