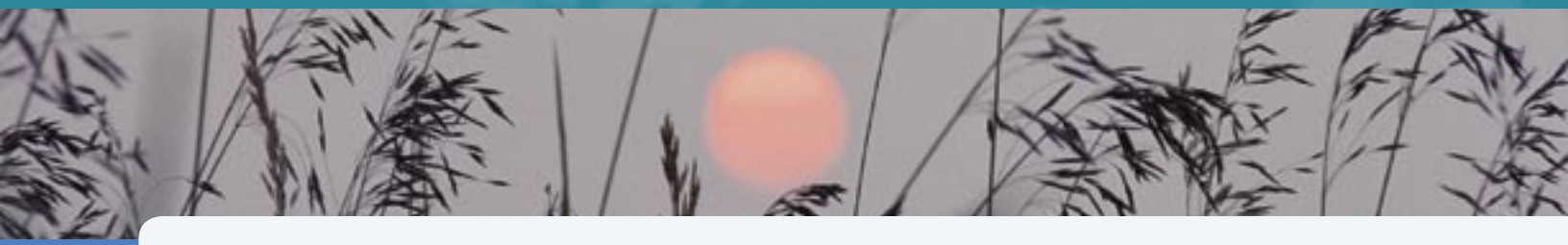

What is causing climate change?

In the early 19th century, scientists discovered that trace amounts of atmospheric gases, including carbon dioxide and methane, were responsible for retaining some of the sun's heat in the lower atmosphere. They theorized that without these gases, the earth's temperature would not support the variety of life found on this planet.

However, the huge amount of fossil fuels burned since the Industrial Revolution has increased the atmospheric concentration of these gases and dramatically changed the energy balance of the planet, retaining heat that otherwise would be radiated out into space. Like the glass in a greenhouse, this raises the average air temperature in the lower atmosphere. More energy is retained as heat or manifested as extreme weather events. The result is climate change.

Since the Industrial Revolution, atmospheric concentrations of carbon dioxide have mushroomed from 280 parts per million to 380 parts per million – levels far higher than at any time during the last 450,000 years.[1] By 2050, greenhouse gas concentrations are predicted to climb to 560 parts per million. Unless strong measures are taken, scientists say we can only expect the situation to get worse.

Why is climate change a problem?

Earth's atmosphere is a dynamic system driven by complex interactions between solar energy, atmospheric composition, and the heat capacity of oceans and continents. A small change to one component can cause a large disturbance to the whole system. These changes can be gradual, but they may also be sudden and irreversible once certain thresholds have been crossed. The science of climate change is complex, but scientists are now able to predict overall changes in weather patterns.

Canada will be among the countries most affected by climate change. Canadians will suffer new insect infestations, the spread of insect-borne and heat-related diseases, melting permafrost, floods, droughts, more frequent forest fires, severe storms, heat waves, and more frequent and worse urban smog.

There has already been an increase in the frequency and severity of extreme weather events in Canada. Forest fires, insects, and diseases have affected twice as much of the Canadian boreal zone in the 1980s and 1990s as in previous decades.

Other examples of climate change from across Canada:

- **In British Columbia**, warmer waters are affecting the spawning and migration of salmon. The B.C. interior forest industry is facing a widespread infestation of the mountain pine beetle, whose numbers are normally kept in check by cold winter weather.
- **In Alberta and Saskatchewan**, severe droughts have been ravaging the Prairie provinces. Environment Canada reports that the prairies are actually drier now than they were in the 1930s.

- **In Ontario**, warmer weather causes more air pollution and smog. In Ontario alone, smog costs more than $1 billion a year in hospital admissions, emergency room visits and absenteeism, according to the Ontario Medical Association.
- **In Quebec**, the flooding of the Saguenay River valley in 1996 caused about $1.1 billion worth of damage and killed 10 people. Damage from the 1998 ice storm was also in the billions.
- **In Atlantic Canada**, sea levels are rising and severe storms in New Brunswick and Prince Edward Island during the past few years have damaged coastal communities.
- **In northern regions**, scientists are already reporting serious changes in the polar bear population. Warmer Arctic weather patterns are causing earlier ice break up and are affecting the feeding habits of the bears, which use the ice as a platform to hunt for seals.

[1] *Climate and Atmospheric History of the Past 420,000 Years from the Vostok Ice Core, Antarctica,* J. R. Petit *et al.,* Nature, Vol. 399, June 3, 1999 pp.429-436

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