

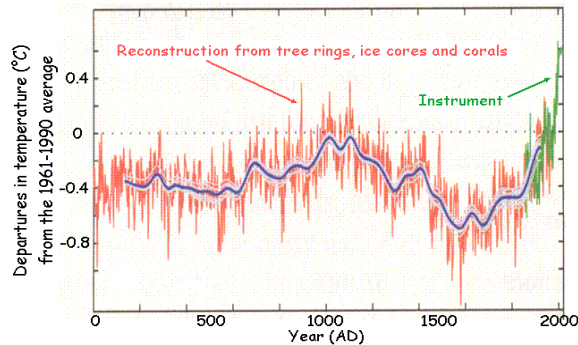
Climate Change 101

Atmospheric Warming and Climate Change

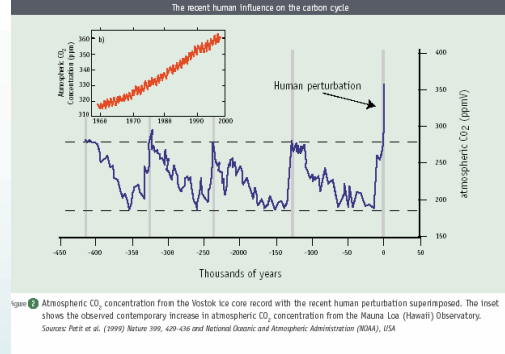
The global atmosphere warmed by 0.6°C during the 20th century. Although people tend to use the two terms interchangeably, global warming is only one aspect of climate change. Warming of the atmosphere affects other aspects of the climate system: the temperature of surface air, land, water, and ice; the water content of air, clouds, snow and ice; wind and ocean currents; ocean temperature, density, and salinity; and physical processes such as precipitation and evaporation. Climate change manifests differently from one part of the world to another, and some regions, including northeastern Canada, are cooling.

The average person thinks of climate change as a gradual increase in average annual temperature and other aspects of climate. It also includes changes in the frequency and/or severity of extreme events such as heat waves, droughts, and high-intensity rainfalls, and in related events such as flooding. It may in future include abrupt and severe shifts in regional climate.

Temperature of Northern Hemisphere AD 1-2000



Atmospheric Concentration of Carbon Dioxide



Causes of Atmospheric Warming

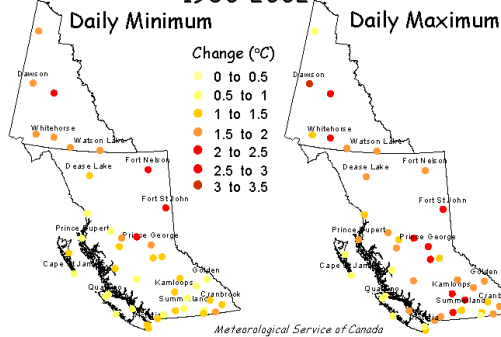
Climate varies naturally over time, and scientists have identified natural causes for such short- and long-term variability, including changes in the energy output from the sun, the distribution of land and ocean, the reflectivity of the earth's surface, the orbit of the earth, and the occurrence of volcanic eruptions and other cataclysmic events.

There is strong scientific evidence that most of the warming observed over the last 55 years is due to changes in the atmospheric concentration of carbon dioxide (CO₂) and other greenhouse gases, and to human activities that produce these gases, notably the use of fossil fuels. The concentration of CO₂ in the atmosphere increased from 280 parts per million (ppm) in 1750 to 380 ppm in 2005. CO₂ concentration is likely increasing faster than at any other time in the past 20,000 years.

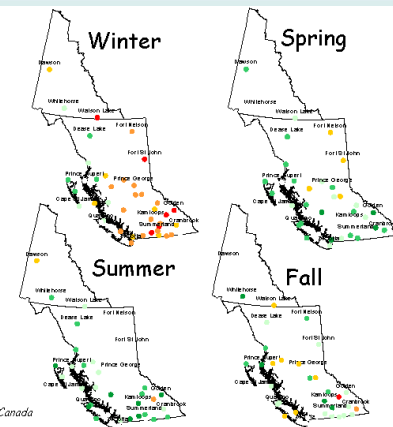
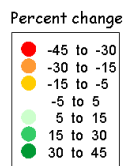
Future climate change will depend on future greenhouse gas emissions. With a rapid shift away from fossil fuels and toward cleaner technologies, CO₂ concentrations in 2100 could be as low as 490 ppm. With continued reliance on fossil fuels and existing technology, CO₂ could increase by up to 1260 ppm.

Past Climate Change in British Columbia

Trends in Annual Temperature 1950-2002



Trends in Seasonal Precipitation 1950-2002



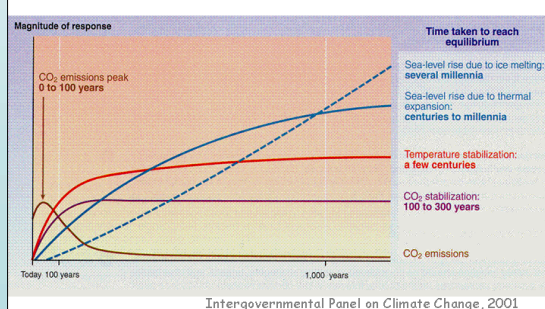
What Can We Expect in Future?

The amount of future warming will depend on how fast humans continue to add greenhouse gases to the atmosphere, and how the climate system responds. Climate change scenarios project that global temperature will rise by 1.4°C to 5.8°C between 1990 and 2100.

Projected impacts on western North America include: 1°C to 4°C warming by 2100, with the interior and north warming faster; proportionally greater warming in winter; increased precipitation, with more rain and less snow; reduced snow pack; glacier and ice pack retreat; and earlier spring thaws. Changes in regional climate will affect natural systems and human communities. Regional impacts include: changes in river flow patterns; increases in the frequency and severity of fire, pest and disease outbreaks, and other natural disturbances; large scale ecosystem shifts; loss of area in some ecosystems; and species-level impacts.

Climate scientists warn that further climate change is unavoidable because the climate system will continue to respond to the excess greenhouse gases already in the atmosphere. It will take 100 to 300 years to stabilize the concentrations of these gases in the atmosphere. It will take a few centuries for temperature to stabilize. Sea level will continue to rise for millennia. Human communities therefore need to adapt to climate change and its impacts. In addition, while we cannot stop or reverse climate change, by reducing global greenhouse gas emissions we may slow the warming trend and provide more time for biological systems and human communities to adapt.

CO₂ concentration, temperature and sea level will continue to rise for centuries



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