

Environmental Trends in British Columbia: 2007

Climate Change



As greenhouse gas concentrations in the atmosphere increase, global temperatures are also rising because more energy from the sun is being trapped by the atmosphere.

Records show that global temperatures, averaged world-wide over the land and sea, have been rising. The average global air temperature increased almost twice as fast in the last 50 years as it did in the last 100 years, showing that the rate of change is increasing.

British Columbia is experiencing a pattern of warming consistent with broader North American and global trends.

In general, cold days and nights and frost have become less frequent, while hot days and nights and heat waves have become more common.

Climate change is anticipated to impact all aspects of our lives including:

- climate systems by increasing frequency and severity of extreme weather events
- ecosystems by causing changes to vegetation, species composition and ecosystem functioning
- socio-economic systems by causing instability in ecosystem-based economic activities such as agriculture, forestry, and fishing, as well as rising costs of adaptation
- human health by increasing the risk of heat related illnesses as well as the ranges of warm climate diseases (such as malaria).



Photo: Ministry of Forests & Range



Photo: BC Parks



Photo: Ministry of Transportation & Highways

The following indicators show climate trends and greenhouse gas emissions for B.C.

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Long-term trends in air temperature

Air temperature influences many physical and biological systems as it affects the rate of natural processes such as evaporation, plant transpiration, water temperatures, and the melting of snow and ice.

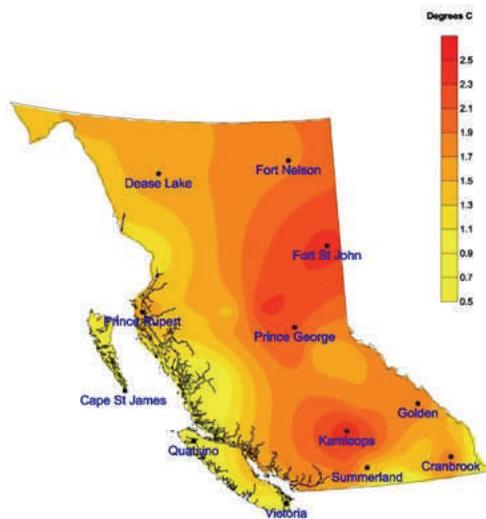
Air temperature is also one of the most easily measured and directly observable indicators of climate change.

Data collected at climate stations since 1950 show that air temperatures have risen throughout British Columbia.

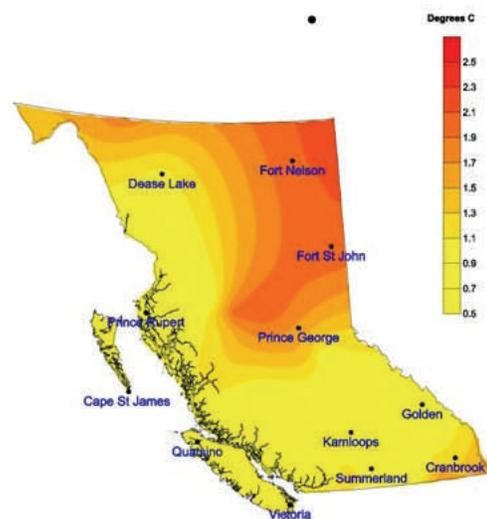
- The greatest increases have been recorded in the northern and interior regions, with average increases of 0.3 to 0.5 °C per decade at most locations.
- Overall, the overnight minimum air temperatures in the province have been increasing faster than the daytime maximums. Climate models show that hot extremes will become more frequent and cold extremes less frequent.
- Extreme events are critically important -- human health and the distribution of plants, animals and ecosystems can be affected by extreme conditions more than by changes in average conditions.

Fifty-year trends in daily minimum and maximum temperatures, 1950-2001

Trend in Minimum Temperatures from 1950



Trend in Maximum Temperatures from 1950



Source: Environment Canada

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Long-term trends in precipitation

Precipitation (rain & snow) is naturally highly variable across the province. Climate change, however, is expected to cause a shift to more frequent wet years, greater year-to-year variability, and more extreme precipitation events.

Declining snowpacks are a concern because they affect many aspects of water resources, from instream flows for fish to community water supply, soil moisture, and aquifer recharge.

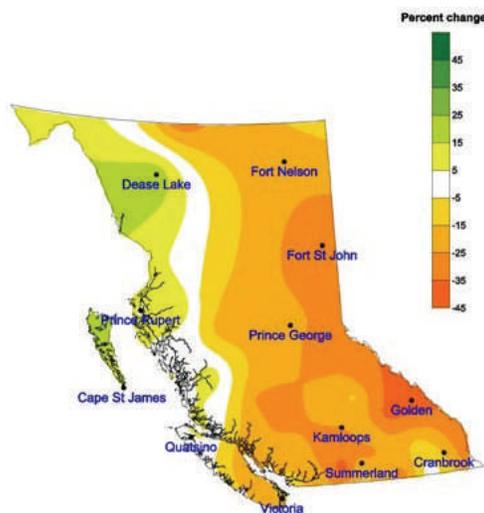
- Data collected at B.C. climate stations show that, since 1950, winters throughout most of the province are becoming drier, while spring and summer seasons are becoming wetter.

- Climate model projections for 2050 suggest that the north eastern areas of the province may become wetter and the southern interior may become marginally drier in the winter. The southern and coast regions are projected to become drier in the summer.

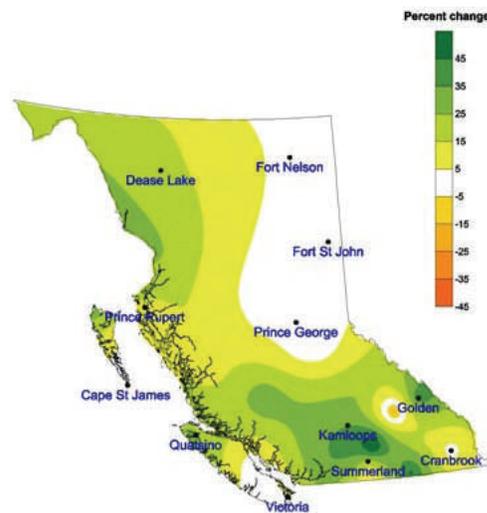
- An analysis of snowpack records shows that the greatest average decrease in snowpack has been in the mid-Fraser River system, while snowpack has increased at some northern sites.

Fifty-year trends (% change) in daily winter and summer precipitation, 1950-2001

Trend in Winter Precipitation from 1950



Trend in Summer Precipitation from 1950



Source: Environment Canada

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CASE STUDY: The Mountain Pine Beetle in British Columbia

Forests in interior B.C. are experiencing the largest mountain pine beetle outbreak ever recorded in the province. The mountain pine beetle (*Dendroctonus ponderosae*) attacks mature pine trees and their larvae feed on the inner bark, eventually killing the tree.



Photo: Ministry of Forests & Range

The needles of dying trees turn red and then grey, leaving a pattern of green, red and grey trees in the forest.

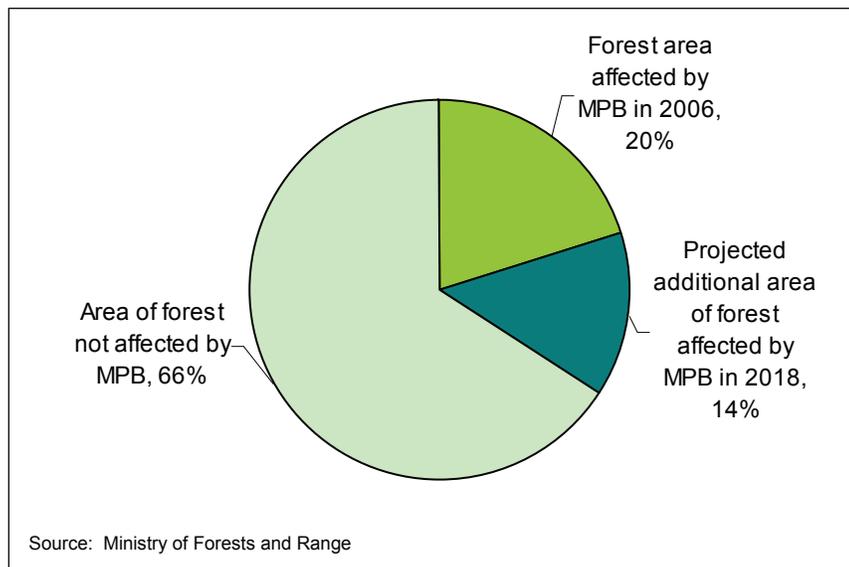
Mountain pine beetles have always been a natural part of B.C.'s pine forest ecosystem, but cold winter temperatures have kept their numbers in check. The environment has become much more favourable for the beetles in recent years because:



Photo: Ministry of Forests & Range

- due to global warming, the mild winters have not been cold enough to kill over-wintering beetles in the trees, and
- due to fire suppression efforts, there are now three times more mature lodgepole pines in interior forests than there were a hundred years ago.

Total forest area in BC affected by mountain pine beetle now and in the future.



- As of 2006, about 20% of the province's total forest area had been affected.
- About 40% of the saleable pine in the province has likely already been killed.
- Since 2004 the volume of pine killed each year has declined.
- By 2018 when the infestation is projected to have run its course, over 78% of the mature pine will have been killed, affecting about one-third of the total area of B.C. forests.



Photo: Ministry of Forests & Range

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Taking Action - What is being done?

Provincial Government: See BC's Climate Action Plan and other initiatives on the LiveSmart BC website:

<http://www.livesmartbc.ca/government/index.html>

What can you do?

LiveSmart BC helps British Columbians make environmentally responsible choices that save money at home, at work, on the road and in our communities.

<http://www.livesmartbc.ca/>



For detailed information on these and other indicators, including an in-depth report [pdf], see the Environmental Trends in British Columbia: 2007 website:

<http://www.env.gov.bc.ca/soe/et07/>