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Climate Change

Climate change can be described as a shift in the average weather experienced by a region, as measured by indicators such as temperature, precipitation, wind patterns, and storms. Climate change does occur naturally – ice ages have come and gone in northern Alberta. Today, however, climatic changes are larger, and happening more rapidly, than those of the past. This acceleration of climate change is largely considered to be due to human activities that release large quantities of *greenhouse gases* into the atmosphere.

Greenhouse gases, which include water vapour, carbon dioxide, methane, and nitrous oxide, trap solar energy within our atmosphere, preventing it from dissipating into space. While this “greenhouse effect” is normal, and indeed essential for regulating the earth’s temperature in a range that allows life, accumulation of these gases *above natural levels* is producing a rapid increase in global temperature. The average global temperature has already increased by about 0.5°C in the past one hundred years, and is expected to increase further.

Rising temperatures and changes in precipitation are expected to affect ecosystems and human society around the world. All climate-change models agree that warming will be greater in the Arctic than in equatorial regions, potentially leading to:

- Melting of permafrost, affecting ecological communities that rely on it and requiring changes to infrastructure
- Increased flooding in coastal areas as sea levels rise
- Increased frequency of forest fires and drought due to higher temperatures and drier climates
- Increased frequency and magnitude of severe weather events and storms
- Changes in river flow regimes, especially spring runoff, due to lower snowpack and earlier warm temperatures, and increased frequency and magnitude of flooding
- Decreases in surface and groundwater levels
- Retreating glaciers
- Changes in species distribution, including wildlife, forests, plants, and crops

Climate change may have important implications for the communities that rely on the Athabasca River. The Athabasca Glacier, one of six large outlet glaciers from the Columbia Icefield, is one of the main sources of the Athabasca River and extends for approximately 6 kms from the Columbia Icefield. Historical records show that the Athabasca Glacier has retreated by about 1.5 km over the last 125 years, and research indicates that recently the rate at which the Athabasca Glacier is melting has accelerated when compared with the last 40 years. Should the glacier disappear altogether, as predicted by some scientists, the flow regime of the Athabasca River will be dramatically different from current conditions.



Climate change will likely alter ice break up patterns on the Athabasca River.

Source: Cayla Eastman
(click to enlarge)

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