

Impacts of climate change on northern society and economy

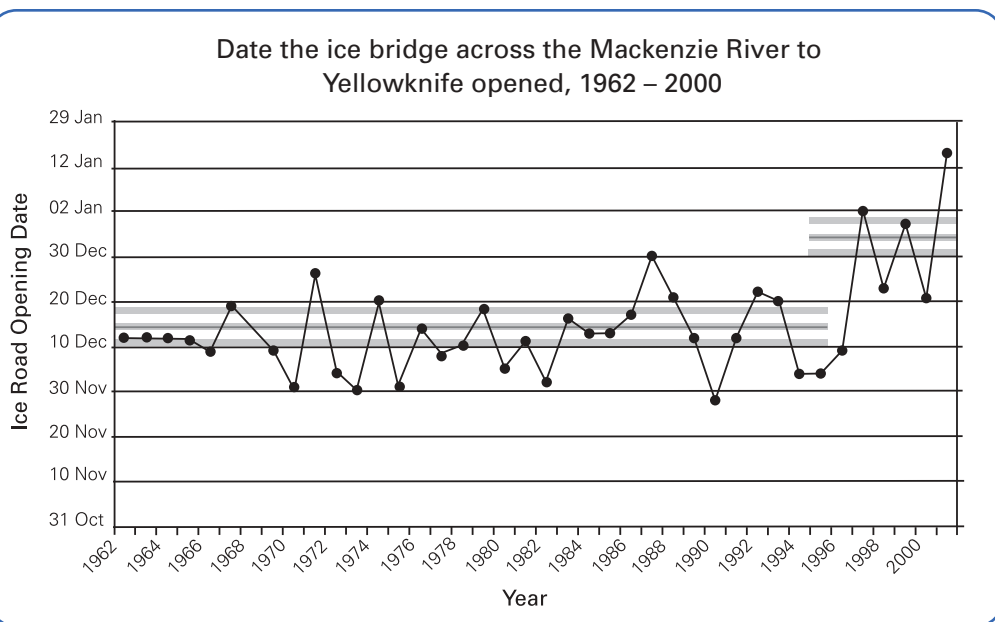
Changes in climate have the potential to affect how Yukoners live and work. Much of the Yukon is underlain by permafrost. If this permafrost becomes unstable there will be negative effects on our transportation systems, industrial activity, and municipal infrastructure. Many Yukon residents enjoy hunting, fishing, and gathering plants and berries from Yukon ecosystems. The location and availability of these food sources may change as ecosystems shift. Yukon ecosystems are also an integral part of the social fabric of the Yukon. First Nations continue to have a strong relationship with the land, both spiritually and as a source of healthy food and medicine. Some of the possible impacts of climate change on the socio-economic conditions in the Yukon and across northern Canada are described below.

Agriculture

Soils and climate conditions in the North are generally unfavourable to agricultural production. However, some areas in the Yukon have a moderate agricultural capability, and agriculture is a small but important component of the Yukon wage economy. An increase in the growing season may enable cultivation of a wider variety of crops and increased yields. Longer growing seasons may also increase the potential for greenhouse production. However, the capability for enhanced agricultural production as a result of climate change is limited by soil conditions and future precipitation patterns.

Infrastructure

In some areas permafrost melt will increase the risk of landslides. In some municipalities permafrost melt threatens the structural integrity of older buildings, water supplies, and waste disposal



Graph Source: Government of Northwest Territories

infrastructure. Melting of permafrost may cause the rupture and buckling of pipelines and storage tanks used for water and sewage. Roads, airstrips, and buildings will also suffer from ground instability, particularly in areas where the soil contains a lot of ice. If precipitation amounts increase, culverts and bridges may have to be replaced or rebuilt to allow for the passage of greater volumes of water.

Industry

Climate change has the potential to significantly affect commercial and industrial activity. Changes to precipitation could require costly upgrades and redesign of tailings dams and water diversion structures in the mining industry. As well, an increase in the frost-free period could affect access to oil and gas exploration sites, where these sites are accessed via winter roads built on frozen ground. More erratic winter conditions could affect the developing film production sector in the Yukon, as one of the major

factors in its success has been the ability to provide snow much earlier and much later than other locations. On the positive side, longer, warmer summers could increase tourism and the number of visitors to the northern territories.

Transportation

In many areas of the North, transportation routes rely on the properties of frozen ground materials for stability. Warmer winters are causing problems for ice roads. They are freezing later and melting earlier in the spring. This has made transporting goods to the communities and mines that depend on these roads more difficult. As the climate changes and temperatures rise, these problems are expected to increase. With warmer temperatures, the Northwest Passage may become an international shipping route. While this may bring opportunities for enhanced trade, there



are also many potential environmental and social implications. Indeed, the matter is already raising questions of Canadian sovereignty over Arctic waters.

Forestry

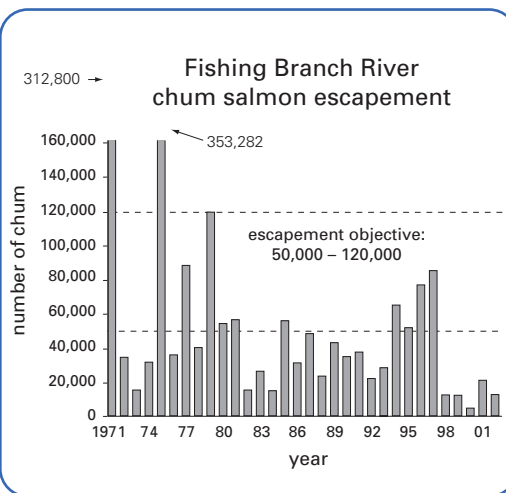
In Yukon, forestry is a small but important contributor to the economy, and there is interest in growth in this sector. Climate change has the potential to both positively and negatively affect the forestry sector. In the Yukon, the number of forest fires and hectares burned has been increasing since the 1960s. This trend is expected to continue, as temperatures warm and lightning storms become more frequent. Spruce Bark beetles killed almost all of the mature white spruce over some 200,000 hectares in the Alsek River corridor in Kluane National Park and in the Shakwak Valley north of Haines Junction between 1994 and 1999. A series of mild winters and springs provided good breeding conditions for the beetles, allowing them to multiply rapidly. On the positive side, warmer temperatures and the potential for increased precipitation may reduce the time needed for forests to grow to maturity.

The last couple of springs, some hunters didn't go out to the Mackenzie because they didn't trust the ice to travel. You have to be careful how you travel.

Aklavik resident

cited from Arctic Borderlands Ecological Knowledge Co-operative's 2002 Community Monitoring Report.

Quotations used with permission: www.taiga.net/coop



Climate change may be one of the factors affecting chum escapement.

Graph Source: Department of Fisheries and Oceans

Hunting, trapping and traditional lifestyles

Many Yukon residents depend on hunting, fishing, and gathering to provide a portion of their diet. For example, Yukon anglers eat almost 100,000 wild fish every year. Some people live a subsistence lifestyle, with food from the land making up a large portion of their total diet, while others supplement their diet with food harvested from the wild. This food provides a healthy alternative to store-bought foods and can reduce food bills. There are also 352 registered trapping concessions in the Yukon and 7 group trapping areas. Approximately 50% of these Yukon trappers are First Nation members.

Changes in sea ice, seasonality of snow, and habitat and diversity of food species will affect hunting and gathering practices

and could threaten long-standing traditions and ways of life. Increased temperatures cause birds, mammals, and insects to move farther north every year. Elders are already reporting species of birds and wildlife that have never been seen as far north before. Changes to the range, number, and health of animals, fish, and plant species will ultimately affect the lives of the First Nation people who depend on them. This may lead to changes in hunting and harvesting practices, and may threaten traditional food supplies. Traditional knowledge is used to predict weather patterns and ice conditions, and guide hunters in their travels and work. However, as temperatures increase and ice conditions change, predictions become more difficult and traveling more dangerous.

Health

One of the predicted results of climate change is an increase in the number and severity of extreme weather events. Floods, droughts, and strong wind events have the potential to threaten people's lives and livelihoods. Flooding has caused damage to a number of Yukon communities in the past, and a forest fire destroyed a significant portion of the town of Faro as it was being built. Another threat comes from disease. The southern part of Canada is being effected by vector-borne diseases such as West Nile disease, and there is a concern that this disease may be transported north by migrating birds.

Research

Research is underway in northern Canada to help understand the impacts of climate change on northern communities and economies. The Northern Climate Change Infosources Database (<http://yukon.taiga.net/infosources/>) contains a listing of research reports that are available and the northern office of the Canadian Climate Impacts and Adaptation Research Network tracks projects that are currently underway (<http://www.taiga.net/c-ciarn-north/>).

Additional reading

Cohen, S (ed). 1997. *The Mackenzie Basin Impact Study*. Environment Canada. Available at <http://yukon.taiga.net/knowledge/resources.html>

Intergovernmental Panel on Climate Change. *Climate Change 2001: Impacts, Adaptation and Vulnerability*. Available at <http://www.ipcc.ch/>

Taylor E. and B. Taylor. 1997. *Responding to Global Climate Change in British Columbia and Yukon*. Environment Canada.

Health Canada: Climate Change and Health
<http://www.hc-sc.gc.ca/english/protection/climate.html>

Canadian Climate Impacts and Adaptation Research Network
http://www.c-ciarn.ca/index_e.asp