

Box 4.2: Responding to rapid northern change

The circumpolar Arctic is warming at about three times the global average, making this region – and the people who call it home – among the most affected by climate change. Rapid and often irreversible changes are redefining its environmental and socio-economic landscapes.

According to Canada's *Changing Climate Report* (2019), northern warming will continue, whether the world follows a high or low trajectory for greenhouse gas emissions. The high-emission scenario could lead to temperatures and extreme events that are four times the global average. Loss of sea ice and thawing permafrost are forming feedback loops that will exacerbate climate change.

The Canadian High Arctic Research Station Act (2015) created Polar Knowledge Canada as the lead federal agency for strengthening Canadian leadership in polar science and technology. Polar Knowledge Canada is funding innovative research to support efforts in mitigation and adaptation.

For example, the Oceans Network Canada, which is based at the University of Victoria, received support in 2018 that has enabled it to set up community observatories in northern areas for joint research with indigenous communities. This research will combine physico-chemical water sampling with change monitoring and traditional and local knowledge.

From 2020 to 2023, Polar Knowledge Canada's pan-northern Science and Technology Program will fund projects on the three following themes: understanding dynamic northern ecosystems in the context of rapid change; advancing sensible energy, technology and infrastructure solutions for the North; and bridging northern community wellness and environmental health. These projects will build on previous efforts, such as the Arctic Zoonoses Network, a community-centred monitoring network for vector-borne diseases and wildlife zoonosis in a changing Arctic.

The Canadian High Arctic Research Station opened in 2019 in

Cambridge Bay. It offers a unique space for enhancing international co-operation in Arctic research. The station provides access to research sites, infrastructure and data and has already hosted international researchers from several countries, including Japan and the Republic of Korea. Built from a design benefiting from Inuit knowledge, the station is embedded in a local community and is intended to develop bridges between science and society. The aim is to develop research capacity attuned to community needs in the Arctic.

If there is a single argument for a collaborative approach to a shared Arctic and northern future, it is the shared and complex challenges posed by climate change. The response of all partners to this challenge must be no less transformative in scale, scope or duration.

Source: Polar Knowledge Canada; Ministry of Crown-Indigenous Relations and Northern Affairs (2019) *Arctic and Northern Policy Framework*. Government of Canada: Ottawa