GenARCC Genomic Adaptation and Resilience to Climate Change

Aquatic and Coastal **ECOSYSTEMS**

WITH THE LONGEST COASTLINE OF ANY COUNTRY and over two million lakes and rivers, aquatic and coastal ecosystems are central to Canada's biodiversity, economy, and cultural identity.

IMPACTS OF CLIMATE CHANGE INCLUDE:

Physiological stress due to higher temperatures

Competitive interactions and the spread of pathogens

Altered food webs due to changes in species diversity and abundance

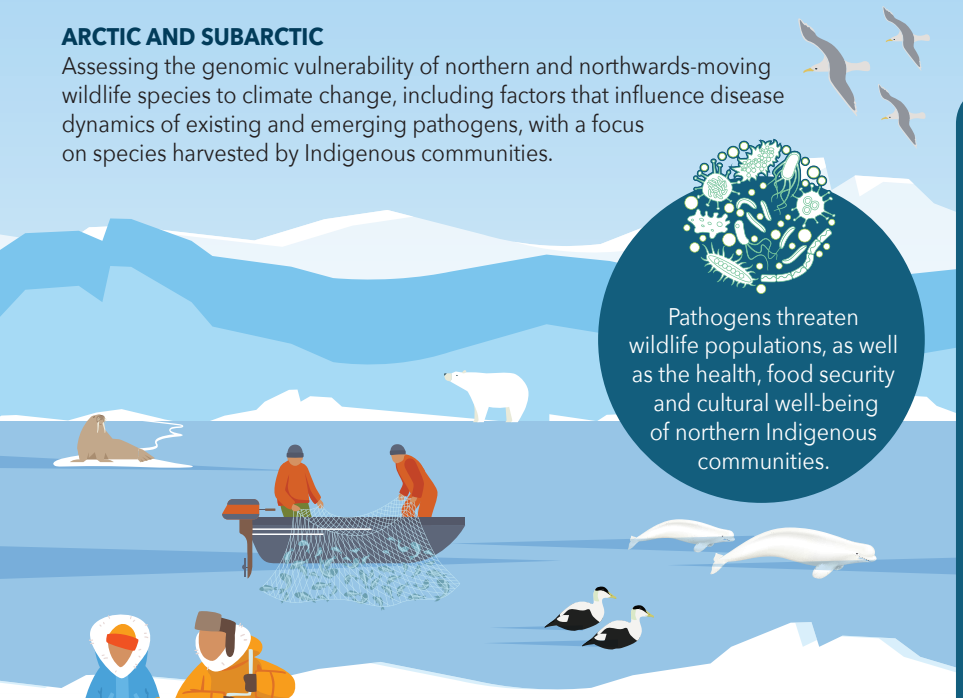
GENOMICS

Every living being has a genome: the complete set of genetic information (DNA) that provides instructions for its development and functioning. Using genomic tools, scientists can assess populations' ability to adapt to changing environments and predict whether populations will be vulnerable to climate change.

RESEARCH ACTIVITIES

ARCTIC AND SUBARCTIC

Assessing the genomic vulnerability of northern and northwards-moving wildlife species to climate change, including factors that influence disease dynamics of existing and emerging pathogens, with a focus on species harvested by Indigenous communities.



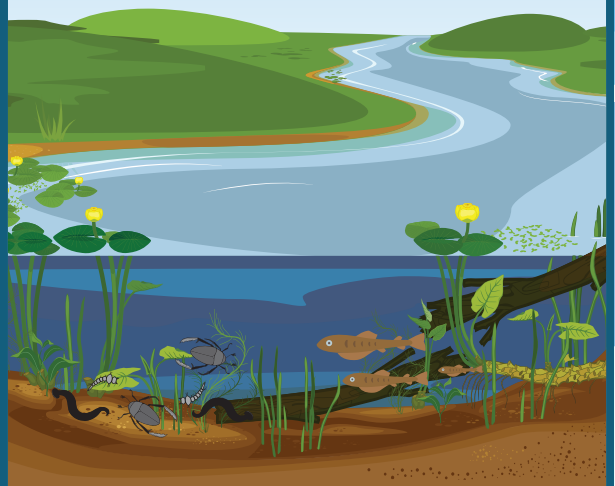
Pathogens threaten wildlife populations, as well as the health, food security and cultural well-being of northern Indigenous communities.

It is essential to collaborate with northern Indigenous communities to identify research needs, collect samples, and exchange knowledge.

Pacific salmon are becoming more common in the western Arctic, exposing Arctic salmonids to new pathogens, and increasing competition.

EASTERN FRESHWATER RIVERS

Studying interactions within a salmonid food chain in rivers with different thermal regimes to predict the effects of climate change on freshwater ecosystems.



All species in an ecosystem are interconnected via the food web. A change in the abundance or diversity of species can have cascading effects, threatening the stability and productivity of the entire ecosystem.

OUTCOMES

GENERATE foundational genomic data and resources

PREDICT the capacity of aquatic and coastal species to adapt to future climate scenarios

IDENTIFY RISKS to wildlife health, human health, and food security

PROVIDE SCIENCE ADVICE to inform climate-resilient management and conservation

GenARCC is a collaborative five-year project funded by the Government of Canada. Through partnerships with Indigenous communities, academic institutions, provincial and territorial governments, and industry, GenARCC aims to use genomic tools to inform climate change adaptation and promote resiliency.

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