



Impacts on Fish and Fowl

All creatures, great and small, are impacted by climate change. This backgrounder highlights how the changing climate is impacting some creatures that live in water – fish, and some that live on it – ducks.

Fried Fish Anyone?

Some fish live in the salty water of our oceans and some hang out in the freshwater of our lakes and rivers. For example, trout only live in fresh water but salmon live mostly in the ocean, until they travel into fresh water to spawn. Different species can survive in each type of water.

Different species also live in different temperatures of water. For example, some species, like Arctic Char, are better adapted to living in cold water than other fish are.

However, it is cold-water fish like the Arctic Char that might have the hardest time with climate change. This is because as the climate warms, the waters the fish live in will warm also. Cold-water fish will need to find colder waters or adapt to the warmer waters. If the char and other cold-water species move on to colder waters somewhere else, how do you think this might affect the people and animals that usually eat them?



A warmer climate also poses problems for salmon as they move upriver to spawn. Salmon stop eating and rely on stored fat when they enter fresh water for the swim upstream. Salmon are cold-blooded – their metabolism is tied to the temperature of the surrounding water. If the water is too warm, salmon use up their energy stores and are unable to reach their spawning grounds. Warmer waters also increase the risk of bacterial and fungal infections in salmon.

Excerpted from "Salmon in Hot Water," a poster by Natural Resources Canada



Fish that survive in warmer water may actually benefit from climate change. For every 1°C increase in water temperatures, warmer water fish species are expected to move up to 150 kilometres north into waters that are too cold for them right now.

There are a few other ways that climate change might affect fish:

- Some parasites that live on fish may survive and reproduce faster in warmer water. In 1999, Chinook salmon in the Yukon River were found to be carrying a parasite (*Ichthyophonus hoferi*) that had never been seen in northern wild salmon before. More parasites could threaten the health of some fish
- Warmer weather will cause more water to evaporate. More evaporation could lower water levels in lakes and rivers. If this happens, salmon may not have enough water in the rivers and creeks to get to where they need to go to spawn. Streams and creeks that get their water from melting glaciers shouldn't have a problem with water levels because glaciers will melt even more with climate change and keep the streams full...unless of course the glacier completely melts! If this happens, then there may be no more water for these streams.
- Warmer water in spawning streams could also affect the hatching of fish-eggs because there is less oxygen in warm water.
- Warming temperatures are causing permafrost to melt. This melting permafrost is already causing more landslides and erosion along riverbanks (see *Backgrounder 6*). This causes more dirt – also called sediment – to fall into the water. This dirt can cover up the gravel areas in which some fish need to spawn. More sediment in the rivers can also make it more difficult for fish to breathe.





“At the mouth of Prince River [in Nunavut] there used to be a lot of fish and you used to be able to get char. There’s been a lot less fish because there’s not as much water anymore. And we used to be able to get a lot of fish all the time at Qikiqtaujaq and all the other places where you can get fish. The fish were more plentiful and they used to be bigger. Now you hardly get char anymore at Prince River or any of these fishing places because the water level has gone down.”

L. Arngaa’naaq, Baker Lake. Quoted in “These Things are Really Happening: Inuit Perspectives on the Evidence and Impacts of Climate Change in Nunavut” by Shari Fox. The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change, edited by Igor Krupnik and Dyanna Jolly, 2002.

Lucky – or Unlucky – Ducks?

Climate change seems to create both winners and losers in the world of birds. Climate change is allowing some bird species to expand their range further north. On the other hand, climate change is making it harder for other birds to survive in places they usually hang out.

As regions of the Arctic warm, some birds that used to be rare in the far north are now being seen more often. For example, an increase in both Shoveler and Ring-necked ducks has been recorded in the Old Crow Flats in northern Yukon over the past 20 years. Ring-necked ducks had never even been seen in this area before 1983.



The presence of new duck species farther north is likely a sign that the habitat has become more suitable for warmer weather ducks. It is also possible that destruction of habitat in areas farther south has caused ducks to move north in search of suitable habitat. As temperatures continue to increase, summers will be longer than they used to be, so more vegetation will be around for more weeks of the year. This means more food for young birds so that more will survive and be ready for the long flight south in the fall.



Longer summers also mean there is more time to nest and raise babies before the ducks have to fly south again. Perhaps it's not surprising that more duck species would move north to take advantage of this warming trend.

In the Eastern Arctic, temperatures are currently cooler than they used to be. This is part of natural variations that happen in the Arctic's climate. These shorter-term cooling periods are also having an impact on local birds. For example, some researchers believe that snow geese that used to nest in areas like southwest Baffin Island or Southampton Island are spending more time farther south because it is currently too cold in their old stomping grounds.

So these snow geese are setting up their nests and having their babies in the western Hudson Bay coastal flats north of Churchill, Manitoba. Because there are so many more birds spending time in this part of Hudson Bay, the plants in the area are becoming overgrazed. The fragile arctic ecosystem in the area is having a hard time supporting all the birds that are flocking to it!



In the area around Sanikiluaq (an island of Nunavut that is found in the eastern part of Hudson Bay), recent cooling trends have also meant there is more ice on the water. People on this island have noticed that the Eider ducks, which depend on open water for food and warmth, have been suffering.

This cooling trend in the eastern Arctic will change. Like most of the world, over time this region should experience an increase in the average temperature because of climate change.

What About the Other Critters?

To learn more about other animals that live in or by the waters of the ocean, check out Backgrounder 10. You can also read more about the animals that live on the land in Backgrounder 8.

Strange birds

"There were some strange birds that have never been seen before. A flock of I don't know what kind of birds, they'd never been seen before. They captured a turkey vulture this fall, I don't know what it's doing here!"

*Participant from
Fort MacPherson, NWT
at the 7th Annual Gathering
of the Arctic Borderlands
Ecological Knowledge
Co-op (2002).*



Key Points

- ★ As climate change warms northern waters, warm water species will benefit and likely expand their range north. However, cold-water species might have a harder time surviving.
- ★ Warmer temperatures should lead to more evaporation from lakes and rivers. This could have a negative impact on fish that need enough water to travel to their spawning areas.
- ★ In the Eastern Arctic, weather has been cooling and some birds, like snow geese, are nesting further south than they used to. However, this region is also likely to begin to warm in the coming decades.
- ★ Warmer weather in parts of the Arctic is resulting in new duck species being seen in the North.



Want to Know More?

Check out these websites for more about what's happening to fish and fowl in the Arctic:

- **Arctic Borderlands Ecological Knowledge Co-op:**
www.taiga.net/coop/indics/ocduck.html – Information about changing duck populations the Old Crow flats.
- **CBC News:** http://www.cbc.ca/stories/2002/08/06/char_020806 – This article – “Landlocked Char Suggest Climate Change – explains what’s happening to the char and why.”
- **Community Adaptation and Sustainable Livelihoods:**
www.iisd.org/casl/projects/inuitobs.htm – Don’t miss the video, *Sila Alangotok: Inuit Observations on Climate Change*. You can view a short version at this site, or get information on buying it.
- **Taiga Net (Climate Change and Fish Habitat):**
<http://www.taiga.net/reports/dfo1.html> – A discussion of the possible effects of climate change on northern aquatic habitats in the Upper Yukon River Basin.
- **Book:** Krupnik, Igor and Jolly, Dyanna (eds). 2002. *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change*. Fairbanks, Alaska: Arctic Research Consortium of the United States.