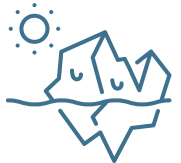
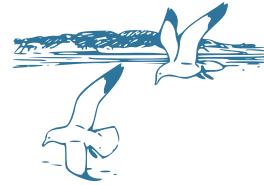
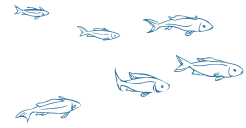


# Considering Some Environmental Impacts of Climate Change in NL

## HOW CAN WE PROTECT OUR OCEANS?

- Replace gillnets with sustainable fishing gear & support bycatch reduction research.
- Make offshore oil production less hazardous to seabirds.
- Explore post-oil economic alternatives for the province.
- Extend carbon tax to industry & invest in reduction & removal of atmospheric CO<sub>2</sub>.
- Establish independent, comprehensive monitoring of the western North Atlantic.
- Promote eco-literacy in schools, communities & post-secondary institutions.
- Mobilize communities & support local projects.
- Strengthen & renew rural communities.
- Support sustainable local food sources.
- Reduce the environmental impact of coastal aquaculture.
- Reduce wind-blown litter from landfills & plastic pollution by fishing gear & sewage.



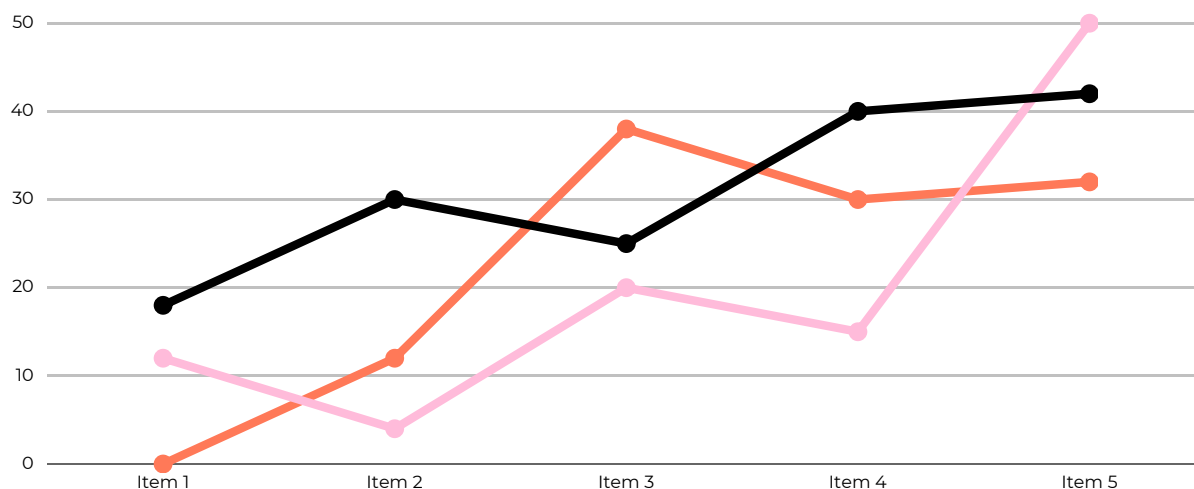


# WHAT DOES CLIMATE CHANGE LOOK LIKE IN RURAL COMMUNITIES?

- Climate change is affecting rural and remote communities
- Local and Indigenous Knowledge are key to adaptation and understanding climate impacts
- Climate change is challenging livelihoods and economies
- Critical infrastructure and services are at risk
- Individual and community health and well-being are being negatively affected
- Climate change is resulting in intangible losses and damages
- Local participation in adaptation decision-making improves outcomes

# ASKING THE BIG QUESTIONS

Tarasov and Finnis, Chapter 1



As temperatures rise, we expect to see changes in precipitation patterns (more water for some, more drought for others), an increase in the strength and/or frequency of severe storms, a rise in flood risk for many locations, massive ecosystem disruptions (especially in the Arctic), rising sea level, and increasing rates of coastal erosion. We expect that most of Canada will experience fewer direct effects than much of the rest of the world. Still, the total climate change cost to Canada is conservatively expected to reach \$21-43 billion per year by 2050; worst-case scenarios raise this to \$91 billion/year (National Round Table on the Environment and the Economy, 2011).

The projected impact of climate change on Newfoundland and Labrador is expected to vary considerably from one part of the province to another. Parts of the island may see only a modest increase in temperature, protected by the climate-moderating influences of the open ocean. Northern Labrador, however, can expect to see greater than global average climate change within the coming century.

The province has begun warming, with mean temperatures over 1998-2011 rising by ~1.0o C on the island (Finnis, Sarkar & Stoddart, 2015) and ~1.5o C on average over Labrador (Finnis & Bell, 2015). Like most other places, the warming is strongest during the winter (~2.5o C in Labrador, and 2.2o C in western NL). Sea ice extent and duration has also declined, and by some measures this loss, at 17% loss per decade, is higher in the Labrador Sea than that experienced by any other region in Canada (Henry, 2011). The trends are projected to continue, and even accelerate, over the next century.

# WHAT TO EXPECT

## IN NEWFOUNDLAND AND LABRADOR

The province has begun warming, with mean temperatures over 1998-2011 rising by ~1.0o C on the island (Finnis, Sarkar & Stoddart, 2015) and ~1.5o C on average over Labrador (Finnis & Bell, 2015). Like most other places, the warming is strongest during the winter (~2.5o C in Labrador, and 2.2o C in western NL). In an effort to avoid these consequences, world governments have made a joint commitment to limiting mean global warming to 2o C. To many, this warming threshold may seem to be small and arbitrary. It is not. Worse, we are currently unlikely to meet this limit. The scale of global mean temperature change over the next century is on trajectory to approach that of the difference between the present and the peak of the last ice age (which is estimated to have been between 4 and 5 C cooler).



The increase in seasonal temperatures will offer a beneficial direct impact on growing season and yearly heat units for farmers and gardeners in the province.



the geographic and seasonal expansion of many existing and newly introduced pests and plant diseases



Coastal sea level is rising on the eastern side of the province (averaging +2 mm/year around St. John's over the decade). Projected increases in ocean volume indicate sea level rise across the province by 2050 will likely be least 30 cm, assuming no action, enhancing the vulnerability of some coastal ports and communities to flooding and erosion

### MANY INTERCONNECTED IMPACTS

Today, loss of coastal winter sea ice is already accelerating coastal erosion, as waves that would have once been buffered by coastal ice can now attack the coastline directly.

ocean warming is anticipated to continue and potentially accelerate the ongoing trend of northward migration of various fish stocks.

When CO<sub>2</sub> dissolves in water, it forms carbonic acid and much of the anthropogenic CO<sub>2</sub> is absorbed by the oceans, leading to ocean acidification. The increasing acidity makes it harder for small plankton to form their protective carbonate shells. Given that plankton form the base of the marine food chain changes in plankton communities may have large impacts on the ocean ecosystems and fisheries.