

# SEA ICE AND CLIMATE CHANGE

## The Northern Canadian Experience

### Arctic Sea Ice

covers about **7%** of the world's ocean surface [1].



**CRYSTAL FORMATION**  
1st stage of formation

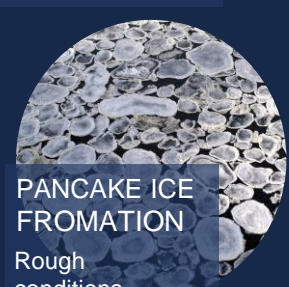


Sea ice is a layer of frozen water floating on top of the ocean, important for animals and people to hunt and travel on its surface [1].



**NILAS ICE FORMATION**  
Calm conditions

In calm waters, 'nilas' (smooth sheets of thick ice) are the first ice to form. In rough conditions, what is called 'pancake ice' forms [1].



**PANCAKE ICE FORMATION**  
Rough conditions

**50%**



sea ice cover decrease from 1979-2000 average [2]



### Impacts of a Changing Climate

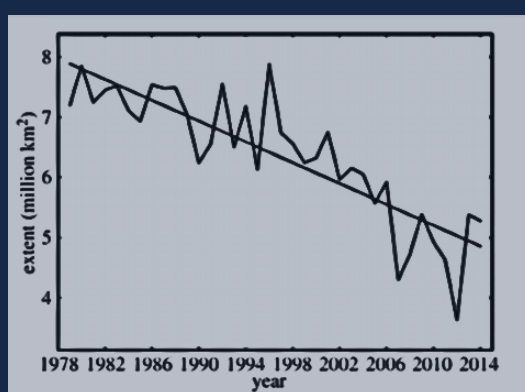


Figure 1. Average September sea ice extent for 1979–2014 (Serreze & Stroeve, 2015)

Arctic sea ice extent has been decreasing for decades [2]. The Arctic region has been warming at a significantly faster rate than anywhere else globally in a process known as Arctic Amplification. A shift from older, thicker ice to younger, seasonal ice means ice is thinner and less stable [2][3]. This has major implications for ice forecasting in northern Canada [2].

**54°N 58°W**

### Rigolet, Labrador: a case study

Rigolet is home to the southern-most Inuit community in the world, now experiencing their second relocation in 60 years because of a changing climate [4]. Labrador is one of the fastest warming places on the planet. In a community where access occurs only by boat, snowmobile and plane, the predictability of sea ice is essential [3][4].

### Major sea ice concerns



Hazardous travel from early sea ice break-up [3][4]



Reduced ice stability for hunting [4]



Changes in wildlife abundance and diversity [4]



### The voices of the future

40% of the population in Rigolet is between 0- 25 [4]. Youth are noticing big changes in quality of life. Initiatives are being developed to improve education for youth in adaptive measures which could shape the future of Rigolet [4].

### “Angry, helpless, frustrated and depressed”

These are just some of the terms Rigolet residents use to describe their experience in a changing world [3].

**95.5%**

of Rigolet residents have noticed decreased extent and stability of sea ice [3]

**8-10°**

above normal winter temperatures between 2010-2011 in Rigolet [4]



**Youth represent**

**40%**

of the Rigolet population [4]



[1] (NSIDC) National Snow and Data Ice Center. (n.d) 'All about sea ice'. Retrieved from <https://nsidc.org/cryosphere/seaice/index.html>

[2] Serreze, M. C., & Stroeve, J. (2016). Arctic sea ice trends, variability and implications for seasonal ice forecasting. *Philosophical Transactions*, 373(20140159), 1-16.

[3] Willox, A. C., Harper, S. L., Ford, J. D., Landman, K., Houle, K., Edge, V. L., & Rigolet Inuit Community Government. (2012). 'From this place and of this place.' Climate change, sense of place and health in Nunatsiavut, Canada. *Social Science & Medicine*, 75(3), 538-547.

[4] MacDonald, J. P., Harper, S. L., Willox, A. C., Edge, V. L., Rigolet Inuit Community Government. (2013). A necessary voice: Climate change and lived experiences of youth in Rigolet, Nunatsiavut, Canada. *Global Environmental Change*, 23(1), 360-371.

[1] Title image: Retrieved from <https://unsplash.com/photos/Wgilk0Lo7-A>

[2] Ice crystal: Retrieved from [https://unsplash.com/photos/Jh\\_2BmhFAG](https://unsplash.com/photos/Jh_2BmhFAG)

[3] Nilas: Retrieved from <https://www.arcticphotoshop.com/places/alaska/sheets-nilas-sea-ice-overlap-interlocking-fingers-1591291.html>

[4] Pancake ice: Retrieved from <https://www.amusingplanet.com/2013/06/pancake-ice.html>

[5] Map: Retrieved from <http://nfandlab.blogspot.com/2012/08/rigolet-labrador.html>

[6] Canada map: Retrieved from <https://www.dacoromania.org/so/canada-map/>