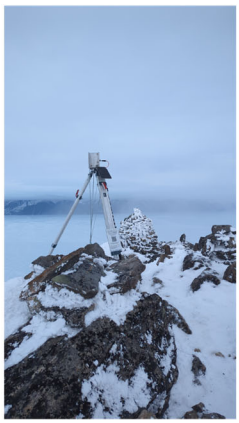
A longitudinal study weaving together Inuit and scientific observations of environmental change and its impacts in the Eclipse Sound region, Nunavut

Interdisciplinary PhD project in oceanography





Background:
The Arctic is warming three times faster than the global average: its mean annual surface temperature rose by 3.1 °C between 1971 and 2019 (AMAP, 2021). The resulting loss of sea ice, together with growing marine traffic, is putting more and more pressure on Arctic marine ecosystems and on Inuit communities, for whom ice is central to travel, hunting and cultural life. Detecting these changes and understanding what drives them remains a complex problem. The meaningful participation of Inuit, drawing on both their knowledge and scientific knowledge, is now recognized as essential to this understanding. Indeed, combining several modes of observation, including local knowledge and scientific observations, increases confidence in each observation, broadens the information available and helps identify the mechanisms at play (Huntington et al., 2004). Yet most studies infer local impacts from climate models and general meteorological variables, which are rarely defined according to the conditions that matter to people.

Little has been done to track how Inuit observations of environmental change evolve over time at the community scale. In Mittimatalik (Pond Inlet, Nunavut), some twenty years ago, Elders and local experts documented the environmental changes they were observing. These observations form a rare baseline, grounded in Inuit knowledge (Inuit

Qaujimajatuqangit), against which two decades of change can now be measured. They are complemented by instrumental data that characterize environmental change, particularly with regard to ice and weather.

The aim of the proposed project is to characterize, through a mixed-methods approach rooted in Inuit knowledge, the environmental changes that have occurred over the past 20 years in the Eclipse Sound region and their impacts on the local social-ecological system. The analyses will draw on a reanalysis of archival interviews, on new participatory methods carried out with the community, and on quantitative observations (weather stations, autonomous cameras, Canadian Ice Service ice charts, satellite imagery). The work will follow a partnership approach that respects the principles of Indigenous data sovereignty. Specifically, the student will (i) compare Inuit observations from 20 years ago with those of today, including changes in the thresholds between safe and dangerous conditions; (ii) map the changes by overlaying quantitative sea-ice data on Inuit observations; and (iii) analyze risks and adaptation strategies with the community, then co-develop a stewardship framework for the interview data.

We are looking for a candidate who is:

- interested in bringing together Inuit knowledge and scientific knowledge;
- open to partnership approaches and to co-producing knowledge with communities;
- open to mixed methods, both qualitative and quantitative, in their analyses.

The project will be carried out in collaboration with local partners.
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References

- AMAP (2021). *Arctic Climate Change Update 2021: Key Trends and Impacts. Summary for Policy-makers.* Arctic Monitoring and Assessment Programme.
- Ford, J. D., Clark, D., Pearce, T., Berrang-Ford, L., Copland, L., Dawson, J., New, M. et Harper, S. L. (2019). Changing access to ice, land and water in Arctic communities. *Nature Climate Change*, 9(4), 335–339. https://doi.org/10.1038/s41558-019-0435-7
- Huntington, H. P. et al. (2004). Matching traditional and scientific observations to detect environmental change: a discussion on Arctic terrestrial ecosystems. *Ambio*. 33(13), 18–23.