

Co-production of shorefast ice knowledge in Uummannaq, Greenland

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Fieldwork: <https://sarah-cooley.com/uummannaq-greenland-2019>



Different modes of shorefast ice travel in Uummannaq Bay

Project Objectives: The overarching goal of the project is to understand the impacts of environmental change and how they matter to individuals, communities, and institutions in the Arctic by co-producing salient, timely and credible knowledge about shorefast ice in the Uummannaq region of West Greenland. To complete this goal, we will leverage large satellite remote sensing datasets, community-based monitoring and local and Indigenous knowledge. The involvement of residents and institutions in Uummannaq at all stages of the project, in combination with ongoing observations, will lay the foundations for ongoing community support and enable new insights into the complex repercussions of climate change. The findings will also enhance the ability of local residents and institutions to make informed and embedded choices concerning natural resource governance and management, as well as choices about individual and collective trajectories towards a desirable and sustainable future.

Keywords: sea ice, climate change, unmanned aerial vehicles (UAVs), drones, satellite remote sensing, community-based monitoring, Indigenous knowledge, Greenland

Progress To Date/Future Plans: Completed field campaign (April-May 2019) in Uummannaq which achieved many of the initial project goals. Made first major steps towards understanding the importance of shorefast ice for livelihoods and lifestyle of people in Uummannaq. Learned a lot from our outreach events and initiated some good relationships with local people. Conducted repeat drone surveys investigate shorefast ice melt and breakup at high spatial and temporal resolution. Documented shorefast ice breakup timing over the last twenty years in Uummannaq Bay using Landsat, Sentinel-2 and Moderate Resolution Imaging Spectroradiometer (MODIS).

Highlights or Expected Outcomes: Our satellite remote sensing research demonstrates that springtime air temperature is the dominant control on shorefast ice breakup, allowing us to make empirical predictions of shorefast ice breakup into the future using CMIP5 outputs. This work was recently accepted in Nature Climate Change, keep an eye out for the paper in May! One of the major findings of the fieldwork was learning that human activities may have an important impact on shorefast ice breakup in Uummannaq Bay. In some years, an ice-strengthened vessel breaks up the ice so that cargo ships can come to export frozen fish. The human impact on shorefast ice breakup was something we had not anticipated and adds another interesting dimension which may be important for understanding the impacts of environmental change in Uummannaq Bay.

NNA Community Collaboration and Research Coordination: We are working in Greenland and hope to be there every spring, although we had to cancel this year because of the virus. We have developed some good relationships with residents in Uummannaq and are interested to learn about how our experiences compare with other projects in other regions of the Arctic.

Advice for Overcoming NNA Project Challenges: Building relationships with local residents takes time. This can be difficult when there are other expectations of us as researchers (e.g. reports, articles, teaching). We would be interested to learn about ways of ensuring continuation of research and outreach activities beyond the 3-year project timeline. Perhaps some Navigating the New Arctic super-sites?