

Coordinator: Stein Sandven, deputy coordinator: Hanne Sagen, Nansen Environmental and Remote Sensing Center

Partners: Mathilde Sørensen, University of Bergen, Department of Earth Science

Kjell Eivind Frøysa, Western Norway University of Applied Sciences,

Øystein Godøy, Norwegian Meteorological Institute

Søren Rysgaard, University of Manitoba, Canada

Maribeth Murray, University of Calgary, Arctic Institute of North America, Canada

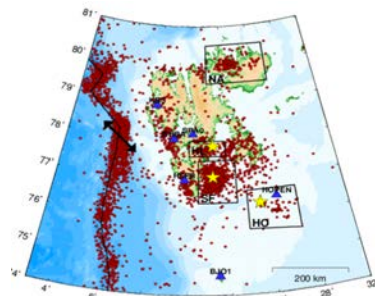
Peter Pulsifer, University of Colorado, National Snow and Ice Data Center, USA

The main goal of the UAK project, is to build and maintain partnerships between educational and research institutions in Norway, USA and Canada on four selected Arctic topics.

UAK organizes workshops, research schools, training of students and exchange visits of scientists between the project partners in Norway, USA and Canada.

Topic 1: Natural and human-made hazards addressing earthquakes, slope failures and ice-related risks. The studies include physical processes and causes behind the hazards, how they can be monitored and how risks can be minimized and impact mitigated.

Earthquake activity in the Svalbard region



Courtesy L.Ottemöller, UiB

Direct events

- Earthquakes
- Landslides/submarine slides
- Snow avalanches
- Volcanic eruptions
- Extreme meteorological events
- Floods

Triggered events

- Tsunamis
- Landslides/submarine slides
- Snow avalanches
- (Volcanic) earthquakes

Climate change effects

- Thawing of permafrost
- Increased rainfall
- Changes in sea ice cover

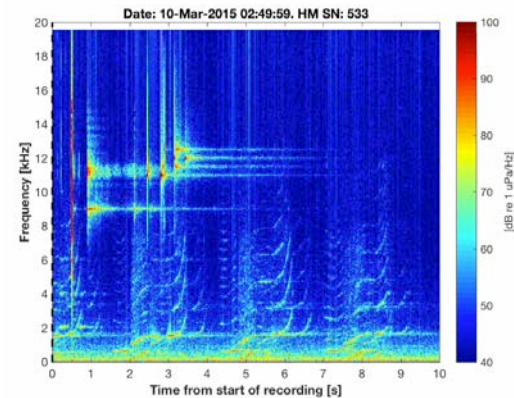
Bowhead whale



http://www.daviddarling.info/encyclopedia/B/bowhead_whale.html

Topic 2: The ocean acoustic environment in the Arctic is affected by natural processes such as weather and ice conditions, marine life such as whales, and human activities such as ship traffic and oil and gas exploration.

Signals from a bowhead whale



Example of acoustic data showing moans from a bowhead whale at a constant frequency in a series of pulses varying in intensity, and duration. (<https://www.nersc.no/project/under-ice>)

- Bowhead whales live entirely in fertile Arctic and sub-Arctic waters
- Bowhead whale and other marine animals use sound to communicate, locate food, and navigate underwater
- They are able to produce and receive complex sounds to communicate different messages quickly and over long distances in the ocean.
- Different species have their own characteristic sounds
- Noise pollution in the ocean is an indicator for good environmental status in the ocean (Eu's Marine Strategy Framework Directive)

Landslide in Svalbard

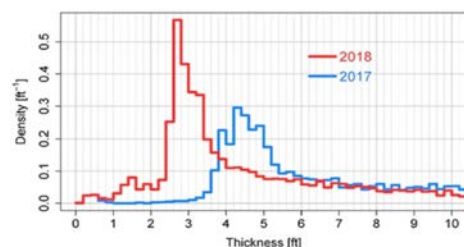


Photo by L. Iversen, NERSC

Topic 4: Community-based monitoring evolves as an important contribution to an integrated Arctic Observing System, with focus on collaboration and communication between academic research and local communities.

Observing landfast sea ice in Alaska

The Alaska Arctic Observation and Knowledge Hub (AAOKH) is a community based observations program managed at the University of Alaska Fairbanks that employs local Inupiat residents in many Arctic Alaska communities to make near daily observations, including descriptions of the landfast/shorefast ice-scape. Their observations provide unique insight into landfast ice features and processes that are changing with a changing climate and are important for safe use of the landfast ice extent as a platform for subsistence activities and travel between adjacent communities.



Thickness of landfast ice provided by the AAOKH (Courtesy Josh Jones, UAF)

Topic 3: Cross-disciplinary data management and building knowledge from the increasing amount of data in the Arctic, especially from satellites, is important. UAK provides training of scientists and data managers in the FAIR principles

The FAIR principles state that data should follow a life cycle implying that data are

- Findable
- Accessible
- Interoperable, and
- Reusable

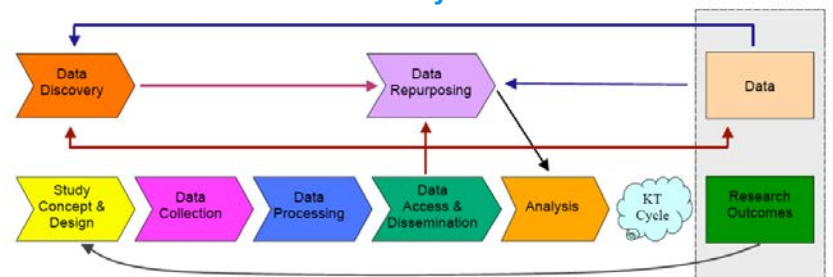
Orthophoto of Longyearbyen

(<https://geodata.npolar.no>)

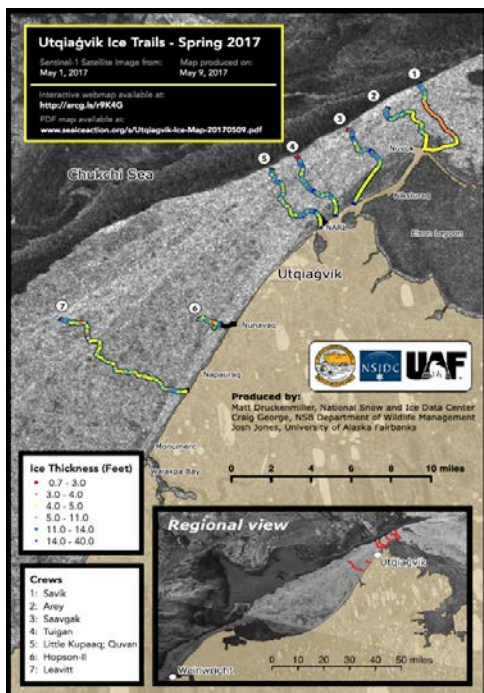


High-resolution lidar image that can be used to create maps for landslide hazards in Longyearbyen. Courtesy Th. Tunesen, UiB

The Data Life cycle



<http://datalib.library.ualberta.ca/~humphrey/lifecycle-science060308.doc>



Courtesy: Josh Jones, UAF