



## Lake Ice Monitoring

Polar View's Lake Ice Monitoring Service delivers information about the location and extent of ice cover to researchers and decision makers in northern communities in near real-time. This information is typically used in conjunction with other data sources to assess the level of lake ice freezing and melting. Lake ice status, including freeze-up and the break-up dates, provides vital information for subsistence hunters and also offers useful data for climate change research.

The Lake Ice Monitoring Service uses satellite Earth Observation (EO) data captured by both ENVISAT and RADARSAT-1 satellites to measure changes over time in the water bodies of the regions. The changing composition of the thickening ice causes the radar waves to interact with the surface in different ways, producing different image textures. The Lake Ice Monitoring products are also supported by relevant contextual data such as near real time weather data, traditional local knowledge and real time ice thickness data provided by in situ ice profiling equipment.

Lake Ice Monitoring products can be accessed at <http://nunavik.lakeice.ca>.

### Service Provider

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The service is provided by Hatfield Consultants (Hatfield) of West Vancouver, British Columbia, Canada, in collaboration with Strata360 of Montreal, Québec, Canada. Hatfield is an environmental consulting company specializing in environmental monitoring and the application of Earth Observation (EO) data.

Hatfield provides high quality environmental services for private and public sector clients throughout the world, including North and South America, Asia, Europe and Africa. Strata360 is a multimedia company, specializing in traditional knowledge and community engagement.

## Geographical Coverage

The service currently covers two study areas across Ungava Bay: the George River area, North of Kangiqsualujuaq and the Payne River region, surrounding the community of Kangirsuk. The study area can be seen in the map below.



## Current Users

Users currently include the Nunavik Research Centre, based in Kuujuaq, and the communities of Kangirsuk and Kangiqsualujuaq. Through the winter months, they need information on the current state of lake ice in specific lakes of the Nunavik region. Nunavik Research Centre need information on lake ice to understand how the changing climate is impacting Arctic char fisheries and the communities require the information to plan hunting expeditions across these fishing zones. The timing of freeze-up and break-up of lake ice is important information in relation to the movements of the fish that over-winter in the coastal lakes of the region.

## Benefits and Impacts of the Service

The primary benefits of the Lake Ice Monitoring Service are the improvement of lake ice information for specific lakes in the Nunavik region that support Arctic char fisheries; a vital resource for the people of the region. A longer-term aim of the Lake Ice Service is to develop an

understanding of the impacts of climate change on the lakes and aquatic ecosystems of the region.

Additional anticipated improvements to the service include a travel safety product, which will integrate Traditional Ecological Knowledge (TEK) information with EO data to provide advisory information about the safety of traditional travel routes.

## Training Available

Training is made available upon request with a particular emphasis on providing support to communities so they are able to utilize the web-portal effectively.

## Technical Specifications

**Sensor:** RADARSAT-1, ENVISAT ASAR

**Spatial Coverage:** 12 Lakes and stretches of river in a study area of ~22,000km<sup>2</sup> in northern Canada

**Spatial Resolution:** 8m and 25m

**Availability of Data:** Data acquired monthly and semi-monthly, but processed in Near Real Time (NRT)

**Duration of Season:** 8- 9 months (November to June)

## What is Polar View?

Polar View offers integrated monitoring and forecasting services in the Polar Regions as well as mid-latitude areas using satellite earth observation data to support improved decision-making, planning and adaptation to climate change. Polar View is funded by the European Space Agency (ESA) under the GSE programme, which promotes the utilization of satellites for public good and in support of public policy. Our services take the form of enhanced sea ice information (charts and forecasts), snow maps and glacier and iceberg monitoring data. We also provide monitoring services of lake and river ice and ice-edge. Polar View services support safe and cost-effective marine operations, improved water management, balanced and sustainable economic development, and environmental monitoring.

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