

# Sea ice data for Arctic navigation

The rapid warming of the Arctic has led to a decrease in annual sea ice extent around Svalbard. Sea ice conditions are also becoming more unpredictable. The Norwegian MET office runs an Ice Service that uses spaceborne synthetic aperture radar data (Sentinel-1 and RADARSAT-2) to map sea ice in the Svalbard area. This is an operational service that is therefore not only used by scientists but

also end-users that need near real-time information for e.g. shipping, tourism, and emergency management. Currently, ice charts may be downloaded from MET Norway itself as PDFs. As a consortium partner of the Svalbard Integrated Arctic Earth Observing System (SIOS), these data products will also be made available as NetCDF files via the SIOS data access point.

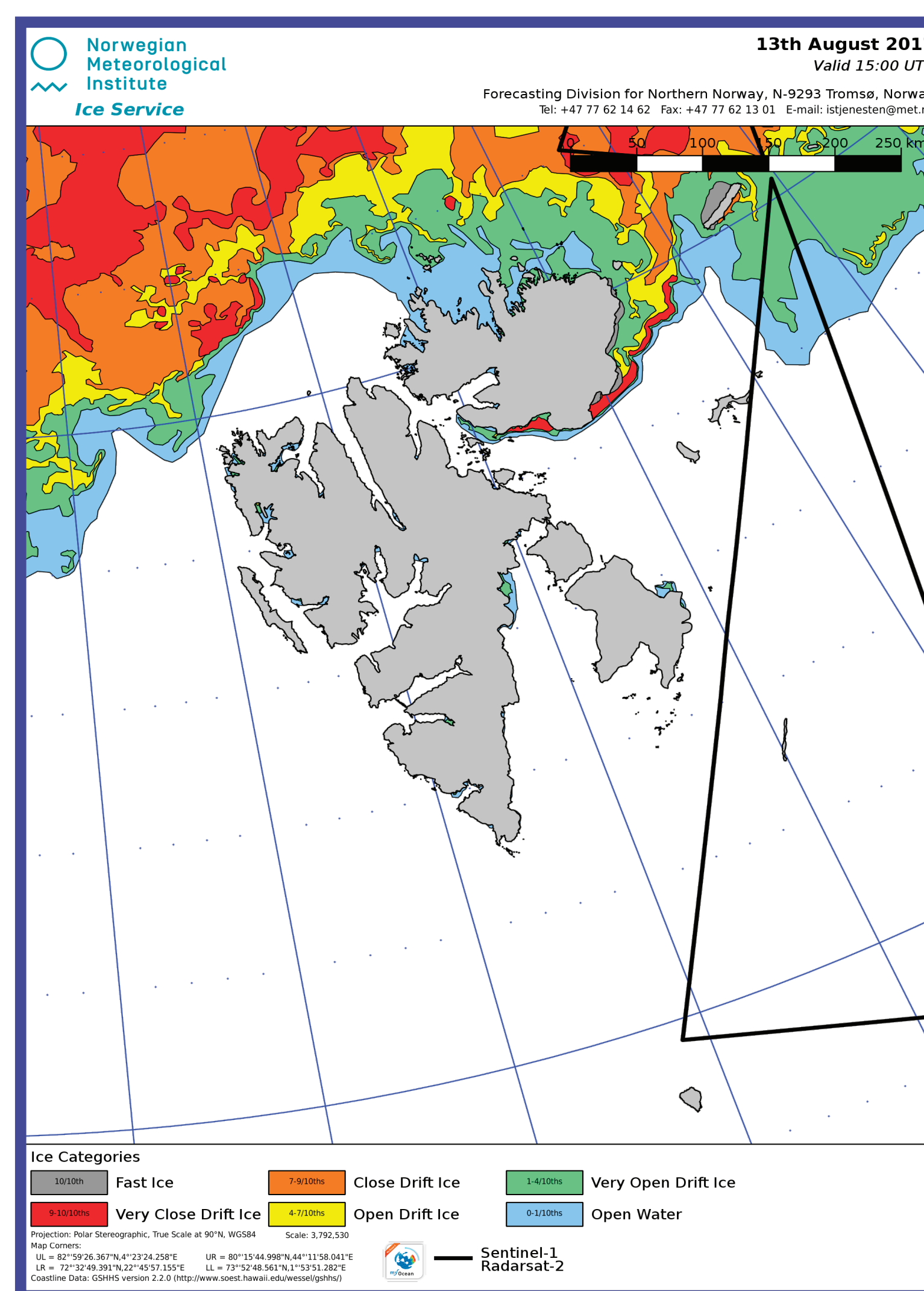
The **Svalbard Integrated Arctic Earth Observing System (SIOS)** is an international research infrastructure for Arctic Earth System Science, coordinating a regional observing system for long-term measurements in and around Svalbard.

To complement the in-situ measurement network, tailor-processed satellite Earth Observation (EO) data are included in the observing system.

SIOS is a forum for interdisciplinary collaboration that will enable us to better understand the links in the Earth System of Svalbard.



[www.sios-svalbard.org](http://www.sios-svalbard.org)



## Beyond the ice edge

The marginal ice zone is a dynamic boundary where the ice edge gives way to open ocean and drifting ice floes. Ice export from the Arctic Ocean to the North Atlantic is along the Fram Strait between Svalbard and Greenland, while the West Spitsbergen Current transports warm Atlantic waters north. More recently a gradual warming of these waters has been linked to the reduction of sea ice in the Svalbard area.

All these connections may be monitored with the help of satellite data with applications not only to scientific studies on climate change but also to Arctic shipping and navigation.

## Case Study – Interview with captain Roger Kaspersen of the RV Lance

Roger Kaspersen has been the captain of the Norwegian Polar Institute's RV Lance for over a year now. He tells us that the ice charts are critical to his daily activities. Standing on the bridge of RV Lance he points to a folder in which daily print-outs of the MET Norway ice charts are found. They download them via Iridium satellite connections. Last winter, there was more ice than usual in the Fram Strait. "We were only at six degrees West. Normally we should be 12 degrees but we had to stop." Kaspersen recounts how he used the ice charts to decide when to safely stop

heading West. "At the beginning of August we were up here at 81 degrees North" he points at a print-out and shows us the course he had plotted. Realising he had piloted Lance straight through drift ice we asked whether he could easily navigate through these icy waters. He nodded. From the ice chart the captain gets a feel for the ice type, and depending on ice type the ship will sail these Arctic waters, but ultimately it is a matter of navigating between floes. Kaspersen says with a smile, "it is the ice that tells me the course I need to take."



Captain Roger Kaspersen with the SIOS Remote Sensing Officer Anna Maria Trofaier.

The Svalbard Ice Service produces operational ice charts based on manual interpretation of products derived from synthetic aperture radar (SAR) data using an automated algorithm. SARs are active microwave sensors that also run during the polar night.



Research vessel Lance during the N-ICE2015 expedition.  
Photo credit: Norwegian Polar Institute