

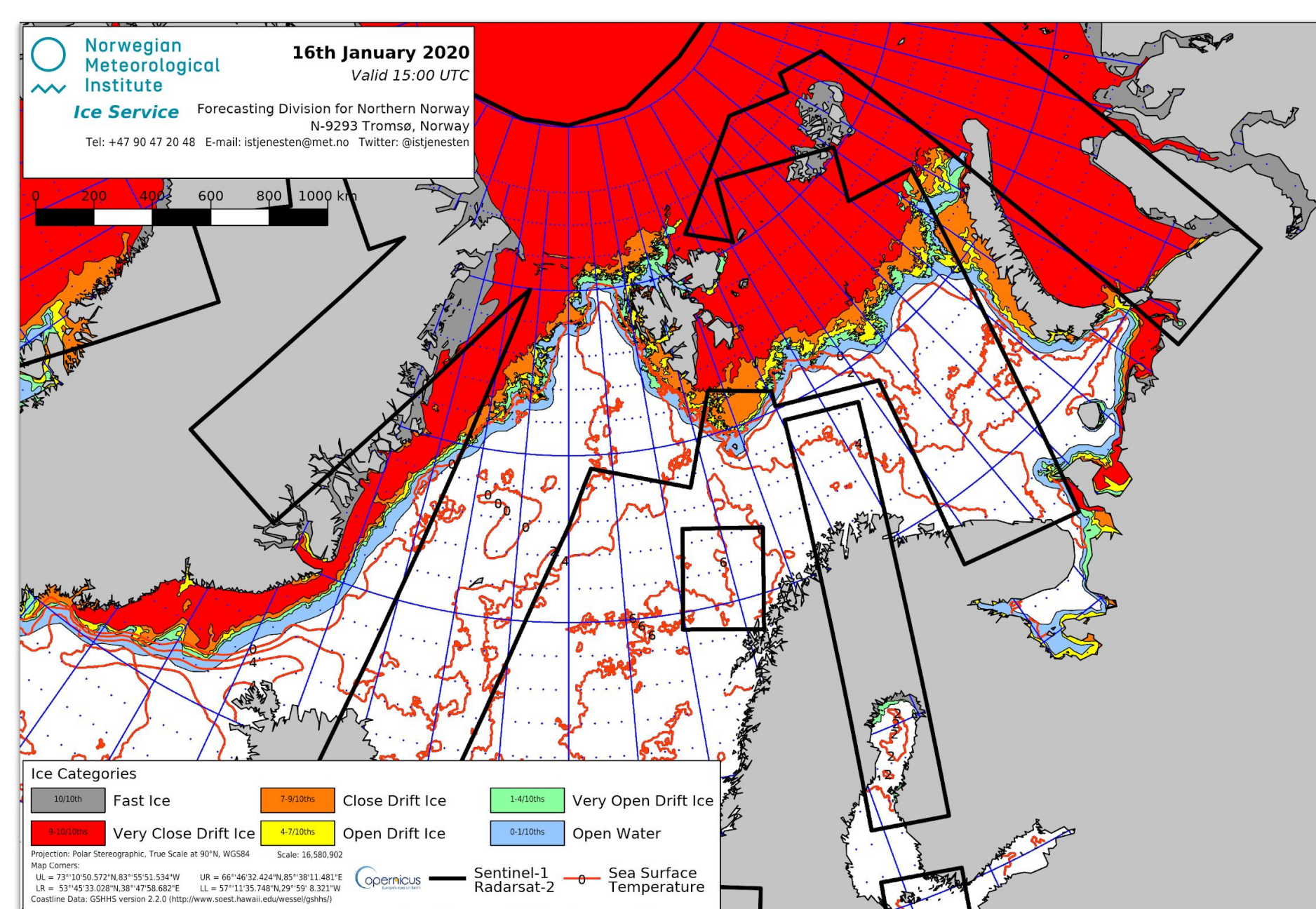
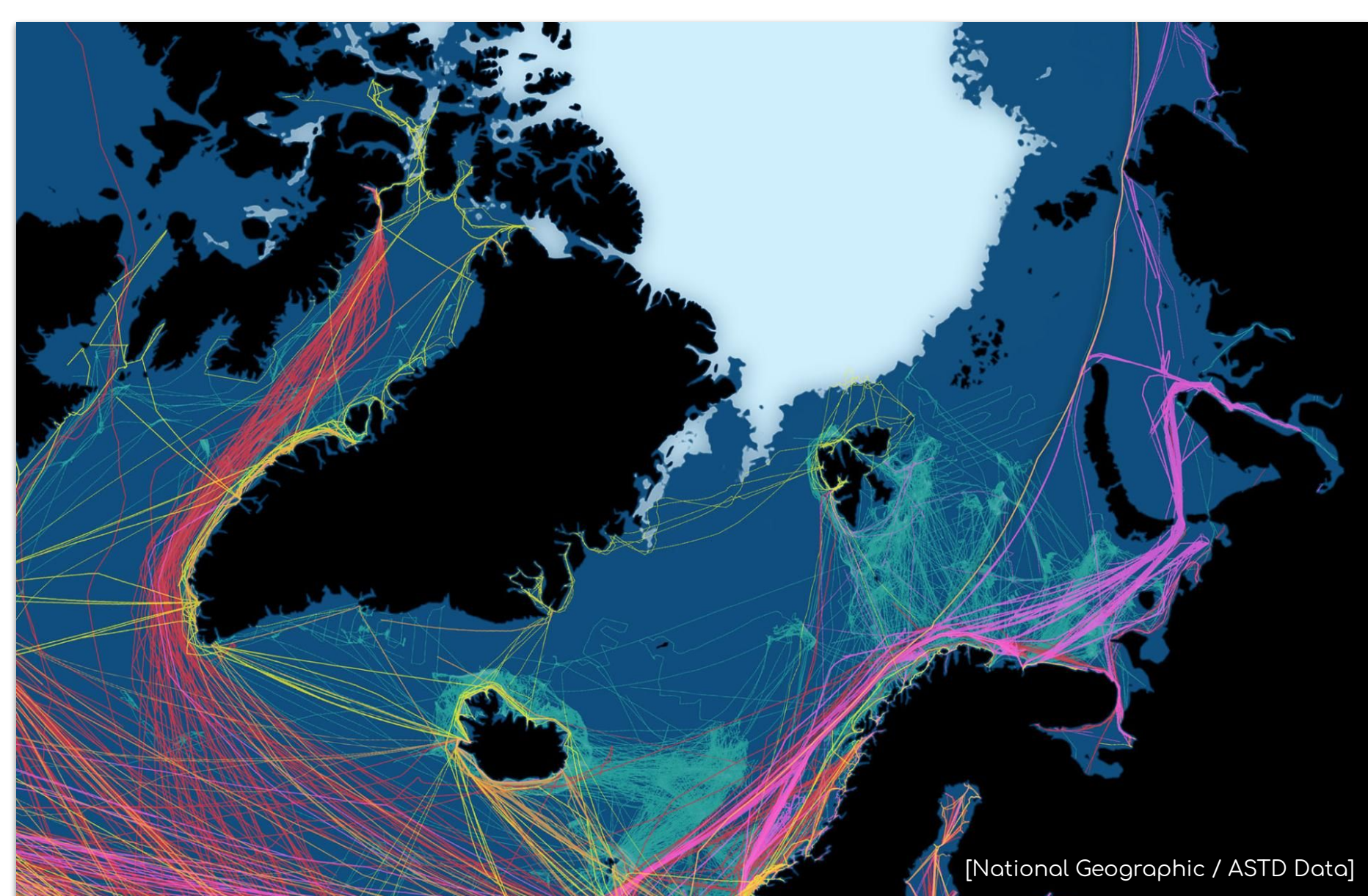
Extending the Ice Watch system as a citizen science project for the collection of in-situ sea ice observations

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Background

The Arctic and Antarctic regions play a critical role in regulating and driving the Earth's climate and ecological systems, but are currently experiencing significant change. New economic opportunities are resulting in increased attention and the number of vessels travelling in these regions is rapidly increasing.



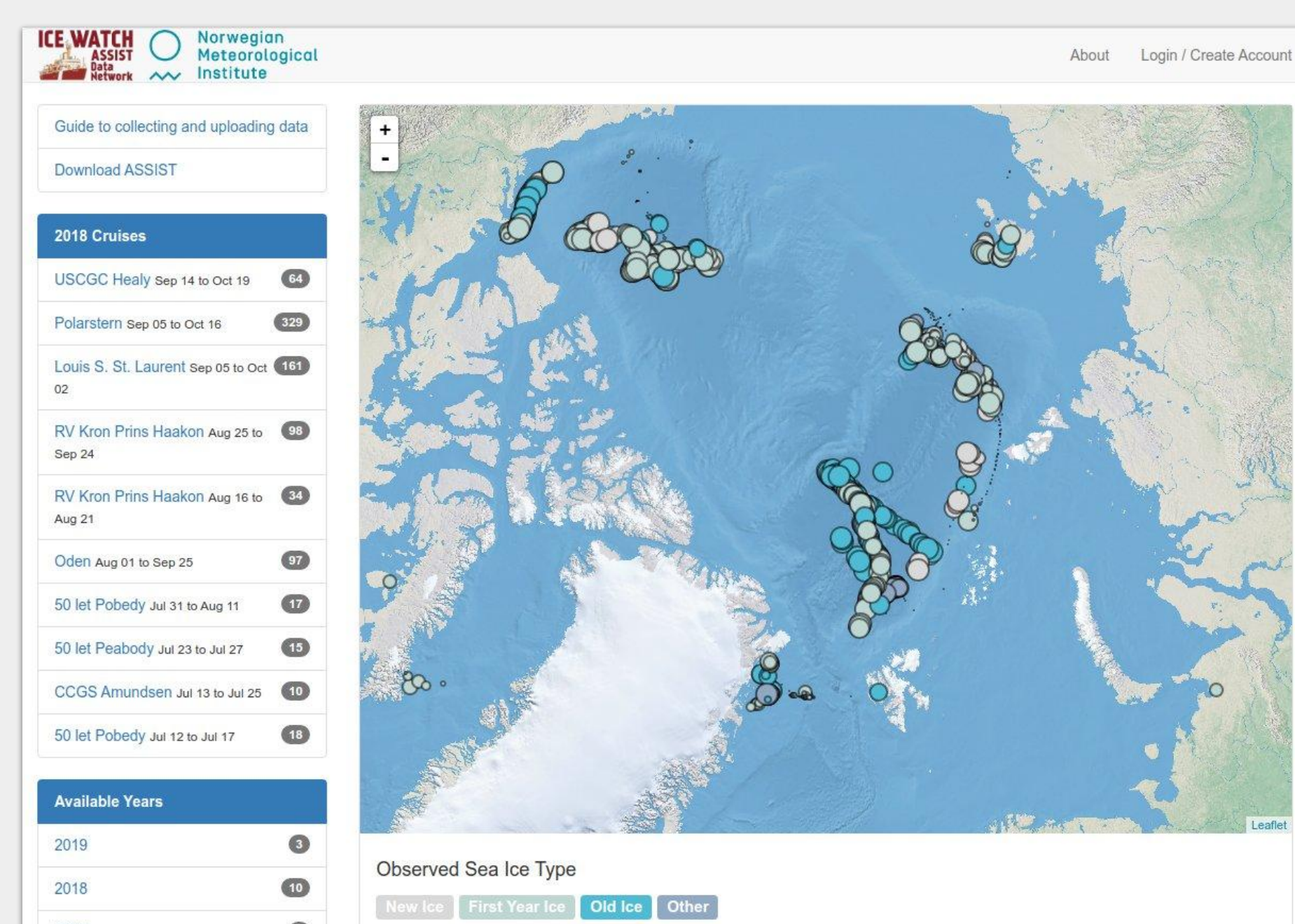
The Norwegian Ice Service, part of the Norwegian Meteorological Institute, provides ice charts for the European sector of the Arctic on a daily basis. Ice charts are drawn manually, and are time-consuming and labour intensive to produce. The lack of in-situ data hinders the accuracy of the products and makes it nearly impossible to train automatic classifiers to help analysts.

Meanwhile, the rapidly increasing number of vessels in the Arctic means that the risk of a serious incident is constantly increasing.



It is vital that vessels can receive **high-quality, timely and reliable information** about sea ice and iceberg conditions to ensure that they can **navigate efficiently and safely** with minimal risk to the environment. **In-situ observations are essential** for this.

Current



The Ice Watch program coordinates the collection of routine visual observations of sea-ice including icebergs and meteorological parameters.

The development and use of the Arctic Shipborne Sea Ice Standardization Tool (ASSIST) software has enabled the program to collect over 6 800 records from numerous ship voyages and is complementary to the Antarctic Sea-ice Processes and Climate (ASPeCt) in the Antarctic. The data is free to access and download from the icewatch website:

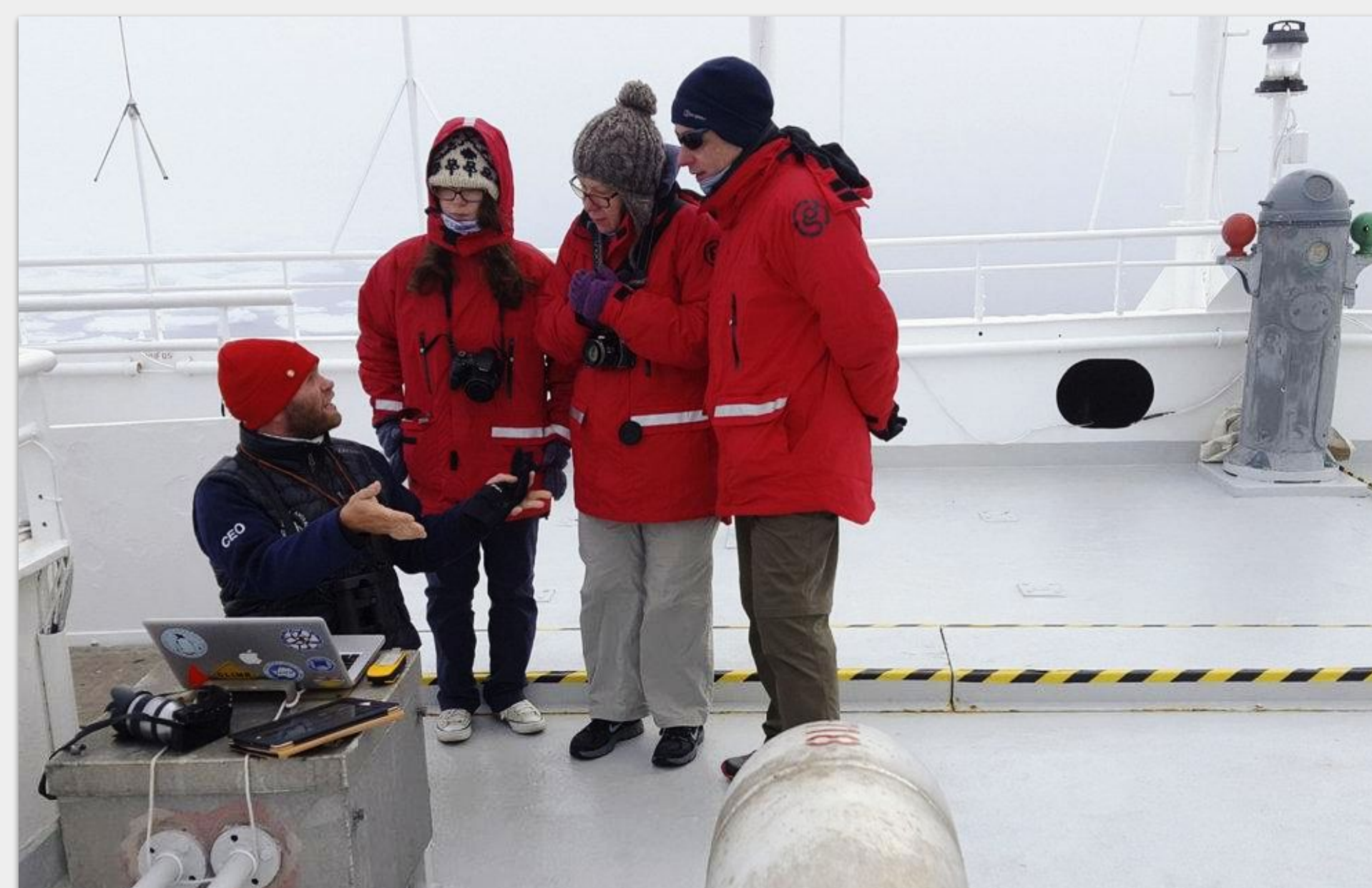
<https://icewatch.met.no> →



However, the current Ice Watch ASSIST software is limited to use by scientists and others trained in sea ice observations, because the system is complex and not straightforward to install. The reach of the current system is therefore limited.

At the same time, a large number of the vessels in the Arctic are cruise vessels carrying hundreds of tourists. These are generally people motivated by an interest and curiosity for the polar environment who would love the chance to further our understanding and help protect the region.

Citizen science therefore has benefits for many parties - citizen scientists can contribute to monitoring the arctic environment, and at the same time improve their own safety through better access to in-situ data. This presents an appealing opportunity not only for researchers and ice analysts, but also for citizen scientists and cruise operators to get involved.



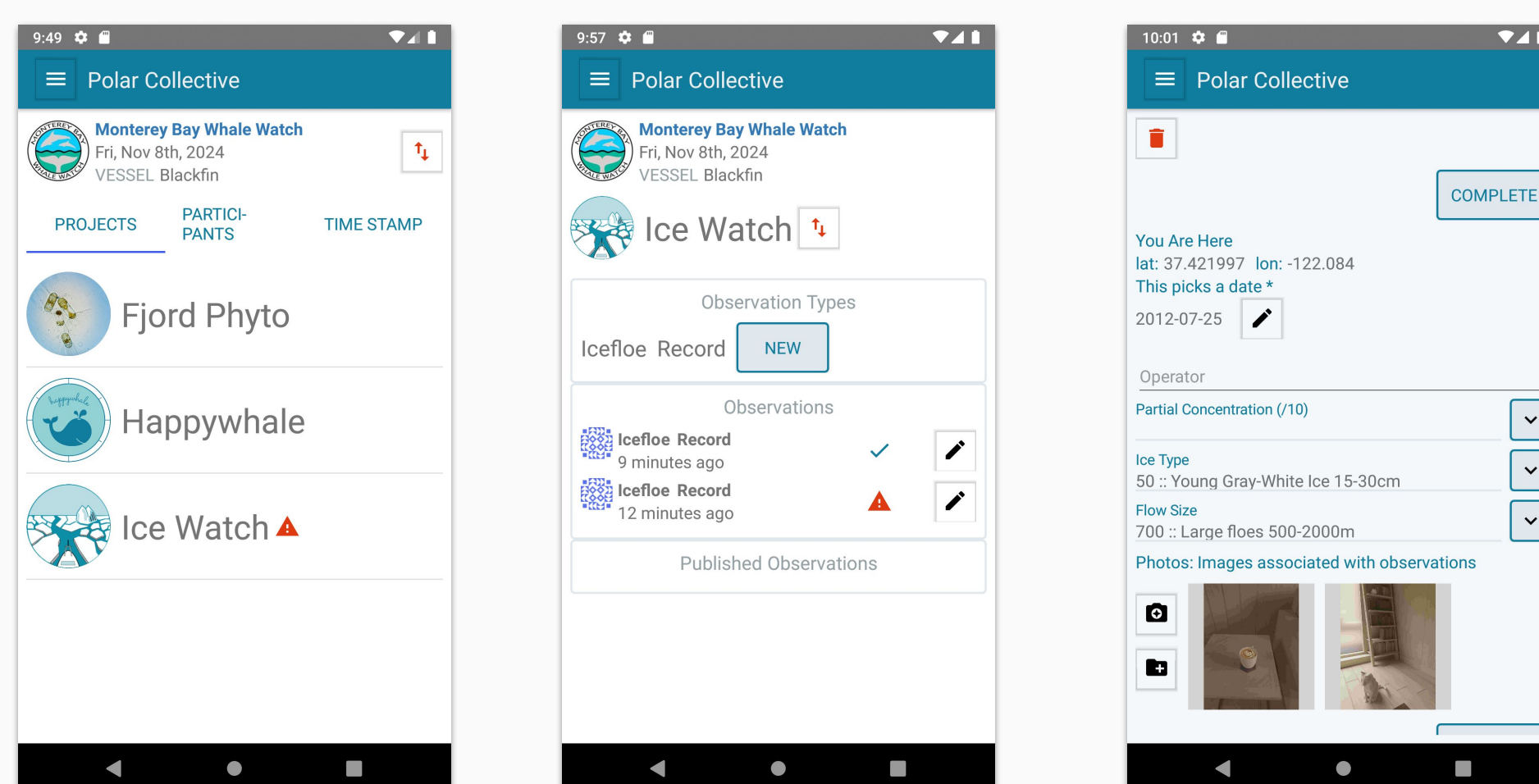
Future



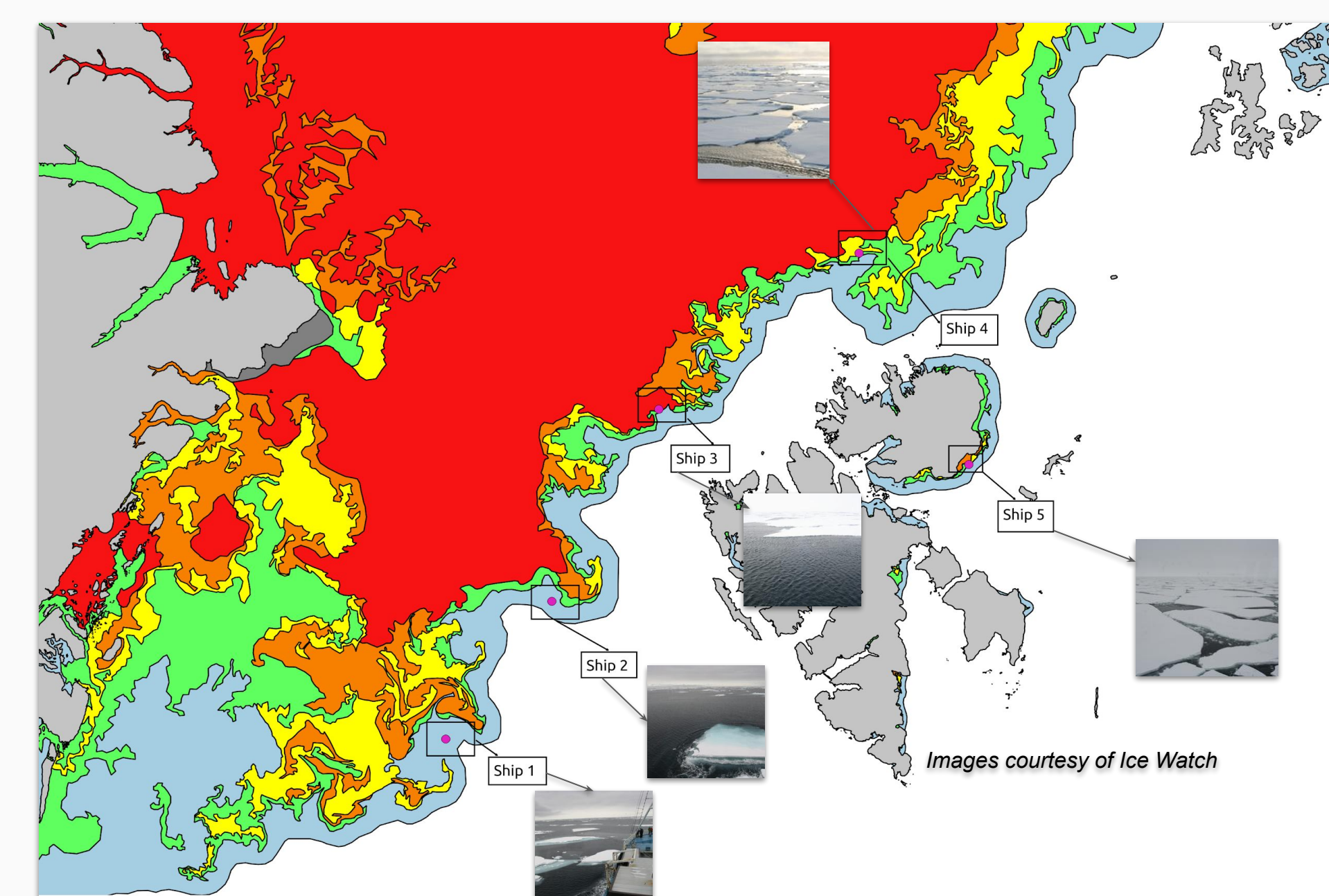
The Norwegian Meteorological Institute and the Polar Citizen Science Collective are developing an Ice Watch module within the Polar Citizen Science Collective App. This will provide a **simple and accessible** way for citizen scientists to collect sea ice observations in the Arctic.

The app will simplify the current collection and submission of sea ice observations using the ASSIST system, and make the process more accessible and engaging for a wider audience.

Along with existing Ice Watch data, the data collected will be freely available for research purposes. The Norwegian Ice Service will use the data in the Horizon 2020 ExtremeEarth and Norwegian Centre for Research-based Innovation (SFI) CIRFA projects, which aim to develop deep learning algorithms to automatically classify sea ice and icebergs using Sentinel satellite data. The Ice Watch in-situ dataset can be used for training and validating these algorithms.



The data collected will also be incorporated into the ice charting systems within the Norwegian Ice Service to **improve the products we generate**, and are developing, for marine traffic.



The app will be tested during the Arctic summer season 2020, and we hope it will be available for **release towards the end of 2020**. Follow us on social media for updates!

Contact Information

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Acknowledgments



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