European Union

Copernicus
Europe's eyes on Earth

EARSC
European Association of Remote Sensing Companies

THE GREEN LAND

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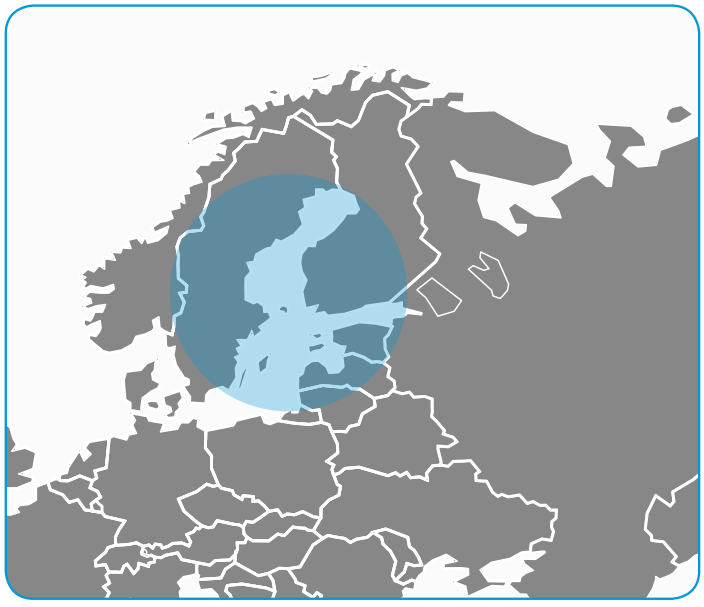
WINTER NAVIGATION IN THE BALTIC

What it is about

Winter navigation in the Baltic has an outstanding importance for the Finnish economy. Over 90% of Finnish imports and exports travel by sea, making Finland virtually an island. After the 1971 decision that all major Finnish ports (25) should be kept open through the winter, it was decided in 2003 to use radar satellite imagery to replace the helicopters that were previously used onboard icebreakers for guidance.

Whilst helicopters provide an instant view, they have their disadvantages: conditions may change under bad weather and they may not be able to fly. Radar satellite imagery on the other hand provides a synoptic view and works at all weather conditions day and night.



What we found

- The use of satellite-based sea ice charts enables improved and more efficient navigation helping icebreakers and ships save time and money by reduced use of fuel.
- Given the crucial role of ports to the Finnish economy to "keep the country running", benefits are felt throughout the whole value chain.
- Thanks to the free and open satellite imagery, the service can be guaranteed throughout the year independently from the weather conditions and the helicopter pilot's experience.
- Icebreakers use the imagery directly rather than relying on an image interpreter located in a control room since by being in the middle of the ice each captain has important in-situ information on the conditions simply by looking over the bows allowing for a better and more complete picture.

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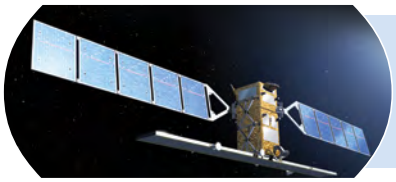
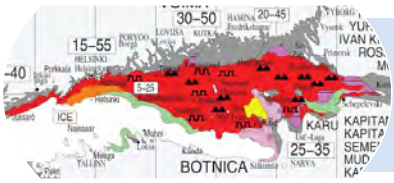


The satellite data
Copernicus Sentinel-1 provides free-of-charge frequent all-weather, day-and-night C-band radar images over the Baltic.



The Service Provider
The Finnish Meteorological Office (FMI) produces daily maps of the ice conditions.

The Primary User
Icebreakers use the ice maps to find the best routes through the ice.

€2.3m pa

Secondary Beneficiary
Ships save fuel and time.

€7.9-12.7m pa

Tertiary Beneficiary
Ports are able to operate more efficiently.

€4.2-21m pa

Quaternary Beneficiary
Factories are able to operate all year round.

€6.3-63m pa

End User Beneficiary
Citizens can be sure that the supermarkets (and petrol stations and pharmacies) are stocked.

€3.5-17.5m pa

Total benefits: €24-116m pa

About the project

Through a series of case studies, EARSC aims to gather quantitative evidence that the usage of Copernicus Sentinel data provides an effective and convenient support to various market applications. These studies are undertaken in the frame of the project "Assessing the detailed economic benefits derived from Copernicus Earth Observation data within selected value chains: a bottom-up study survey", under an assignment from the European Space Agency.

Download the full report from the project website

http://earsc.org/sebs