

## Sea ice remote sensing R&D at Finnish Meteorological Institute

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The presence of sea ice has large practical and economical importance in several countries and regions in the world. Satellite based timely information on sea ice condition and its variability is essential for all operations in ice-covered areas. In the Baltic Sea ice information is mainly needed for ship navigation and planning of icebreaker operations, but in the Arctic marginal seas like Barents and Kara Seas also for off-shore operations and fishery. Sea ice information is also input data for numerical weather prediction models and it can be assimilated to sea ice models for better short-term prediction of ice conditions.

As a part of Marine Research Unit the Ice Research Group conducts research and development of sea ice products based on satellite data and sea ice models. The main target area has been the Baltic Sea where satellite data in ice monitoring and R&D has been operational since 1978, and SAR data since 1992. In recent years we have also developed sea ice products for the Barents and Kara Seas based on earlier Baltic Sea products and also on some new methods. The main source for the sea ice products are SAR images due to their fine resolution (10-100 m) and independence of cloud cover. Other satellite data utilized includes radiometer and optical data.

Here we give overview of the current operational sea ice products: e.g. Baltic Sea level ice thickness chart and ice drift chart showing also convergence/divergence ice zones, delivered through Polar View (ESA) and MyOcean (EC) project web-portals, and some products under development, e.g. sea ice thickness chart for the Barents and Kara Seas based on a sea ice thermodynamic model and multisensor satellite data, see Fig. 1. The sea ice products are derived with automatic algorithms incorporating statistical relationships between sea ice characteristics and satellite signatures, modelled sea ice parameters, image processing and pattern recognition.

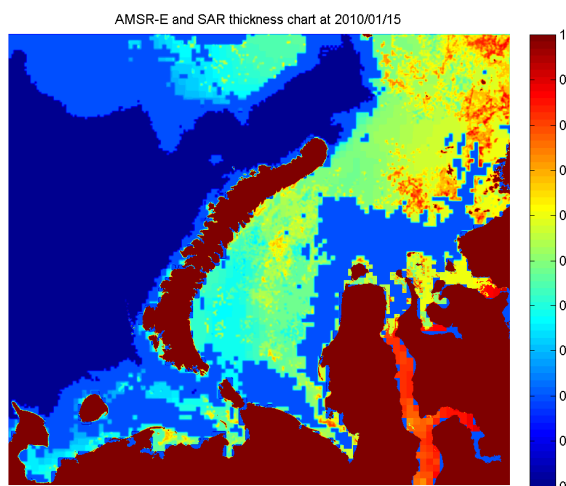


Fig. 1. Sea ice thickness chart on 15 Jan 2010 based on ENVISAT ASAR WSM, AMSR-E and a sea ice thermodynamic model data. The chart covers part of the Barents and Kara Seas. Each grid cell represents the mean thickness over the cell. The grid size is 1x1 km. The ice thickness range is from 0 to 1 m.