**FINLAND**

1. **Organization**

The Finnish Meteorological Institute (FMI) is responsible for the sea-ice information service in Finland. The operational Ice Service started in 1915. The service is intended to meet the needs of national and international shipping as well as other activities where sea-ice information is required, in particular fisheries, coastal and harbour activities, forecasting and climatology. The ice season in the Baltic normally begins at the end of October, when ice starts to form in the northernmost archipelagoes of the Bay of Bothnia and lasts until the end of May or beginning of June. Sea surface temperature (SST) charts are published between mid-October and the end of ice season.

2. **Data acquisition**

(*a*) Sea ice

Ground truth input data: Finnish and Swedish icebreaker reports several times a day in plain language; daily or weekly coastal station reports from 20–30 stations in plain language; ice charts over observation areas and ice and snow thickness profiles; daily or weekly reports from ships in plain language.

Space-borne: all NOAA AVHRR passes in 1.1-km resolution, all MODIS passes in 250 m resolution, about 450 RADARSAT-2 ScanSARHuge screens per winter in 100-m resolution, and 300 COSMOSkyMed ScanSARHuge images in 100m resolution. VIIRS and TerraSAR-X data are in experimental use.

(*b*) Sea surface temperatures

Ground truth input data: 13 automatic stations, twice a week measurements from 10 coastal stations; icebreakers; 20–30 merchant vessels with hull thermometers measuring along tracks covering the Baltic Sea.

3. **Output production**

(*a*) Ice charts

About 170 Ice Charts are issued daily during the ice season, on Mondays and Thursdays SSTs are included with 30-year averages. Charts are e-mailed daily ore available to users via dedicated service packages or internet (www.iceservice.fi).

Type of chart (scale, areas, others): Mercator projection, and since 1 January 2006, covering east of 9°00´E the Baltic Sea, Skagerrak and the Swedish Kattegat and Vanern and Malaren lakes. A simplified ice chart over the Baltic Sea is issued once a week and published on the internet.

(*b*) Bulletins on ice condition

Bulletins on ice conditions in the Baltic Sea, including restrictions to navigation, operational areas of icebreakers and traffic information, are e-mailed and broadcasted in the radio. The Finnish Ice Report in plain language in Finnish, Swedish and English and in the Baltic Sea Ice Code is broadcast in GMT network and in coastal radio stations on a daily basis. Coded sea-ice information from 93 areas or fairways in Baltic Sea Ice Code is included on bulletins.

(*c*) Other information products

Digital satellite images (SAR and visual bandwidth) sent to Finnish and Swedish icebreakers. High-resolution (500-m) ice thickness charts over the SAR images are available operationally at http://polarview.fimr.fi).

A sample daily ice chart is shown in Appendix 1.

4. **Forecasts and forecasting methods**

(*a*) Forecast models: HELMI Northern Baltic Sea dynamic-thermodynamic ice model. HIGHTSI Thermodynamic sea ice model (Finnish-Chinese).

(*b*) HELMI forecasts are provided for the Baltic Sea, 48 hours in advance for ice concentration, level ice thickness, total ice thickness, ridged ice density, ridged ice height, ice motion (direction and velocity), and areas of ice compression. Ice forecasts with six parameters in 3-hour time intervals are available on a daily basis at <http://polarview.fimr.fi>. Sample charts are given in figures V-2 and V-3, Appendix 2.

(*c*) Once a week 10-day ice thickness development and brief weather forecasts in plain language are provided to the Finnish Transport Agency the Winter Navigation department.(*d*) The Finnish Ice Service responds to enquiries from users and provides a range of specialized forecasting, consultation and advisory services on a best-effort, cost-recovered basis.

5. **Publications**

(*a*) Regular – at five-year intervals;

(*b*) Irregular.

6. **Mailing and Internet addresses**

Finnish Meteorological Institute (FMI)

Finnish Ice Service

PO Box 503

FI-00101 Helsinki

Finland

Telephone: +358 29 539 3464 (during ice season)

Fax: +358 29 539 3413

E-mail: iceservice@fmi.fi

Internet: www.iceservice.fi