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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

EXPERT TEAM ON SEA ICE – FIFTH SESSION

STEERING GROUP FOR THE PROJECT GLOBAL DIGITAL SEA ICE DATA BANK (GDSIDB) – THIRTEENTH SESSION

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REPORTS BY THE MEMBERS OF THE ETSI

FINLAND

Summary and Purpose of Document

This document describes the sea ice information services provided by the Finnish Ice Service.

ACTION PROPOSED

The Team is invited to:

(a) Note and comment on the information contained in the report, as appropriate;

(b) Take the report into account in relevant agenda items.

References: none

Appendices: none

Finland Report
March 2014

Introduction

1. Operational ice service started in Finland in 1915 under the Finnish Scientific Society. In 1919-2008 the Finnish Ice Service has operational under the Finnish Institute of Marine Research, and since 2009 under Weather and Safety Center in the Finnish Meteorological Institute (FMI). The Service is responsible for charting and forecasting of the Baltic Sea ice conditions. The main purpose of the ice service is to serve the whole Finnish state (authorities, companies, media, and people) with reliable and quality sea ice information. The ice service secures smooth marine transportation and decreases risk of ship accidents during the Baltic Sea ice season.

Drivers and users

2. Marine transport is the main driver when ice services are developed. Finland is depending on the marine transport. In the year 2011 88.5% expert and 82 % of import was done with marine transport. In Finland more than 100 million tons were marine transported in 2009 of which about 40-45% during winter months. In the Baltic Sea about 800 million tons were marine transported in 2009 of which about 40% during winter months. Finnish marine transportation is expected to grow into 110 million tons by 2020.

3. The users of operational ice information are vessels, icebreakers, pilots, icebreaking leaderships, maritime authorities, ports, shipping companies, export and import companies, etc. The main users are Finnish and Swedish icebreakers, Finnish and Swedish icebreaking authorities (Finnish Transport Agency and Swedish Maritime Administration), and Arctia Shipping Ltd (operator of Finnish icebreakers). Since October 2005 ice charts and ice reports have been available free-of-charge at Internet. In the winter 2011-12 more than 1 million requests were for ice charts. From 2007 Finnish ice service has also provided ice information to Baltic Icebreaking Management (BIM) via its web pages.

Coverage, products and services

4. Ice monitoring area covers the Baltic Sea, Kattegat, Skagerrak, and Swedish lakes of Vanern and Malaren. Ice season starts in mid-October with sea surface temperature charts published twice a week, followed by daily ice charts normally between mid of November and end of May.

5. Sea surface temperature charts updated on Mondays and Thursdays including means of 1970/1971-1999/2000 for comparison. SSTs are included the ice charts. Ice charts on daily basis covering the Baltic Sea, Kattegat, Skagerrek, and Swedish lakes Vanern and Malaren (about 53º 20'N 9º 00'E -66º20'N 31º00'E). The B&W and color coded ice charts include ice conditions in WMO ice symbols, icebreakers, restrictions to navigation and traffic control information. Ice reports in plain language are published in Finnish, Swedish and English on daily basis. They include description of ice conditions, information of Finnish icebreakers, restrictions to navigation and traffic control information. Ice conditions in Baltic Sea Ice Code are provided on daily basis. All SAR images and useful Modis images are sent in near real time to Finnish and Swedish icebreakers. High-resolution ice thickness charts based on SAR data are published with the spatial resolution of 500m always when SAR data is available. Ice forecasts for +48h are published on daily basis in 3h time-steps and with 7 parameters.

Products and services are available free-of-charge

Ice charts and ice reports:
http://www.iceservice.fi
http://www.baltice.org
http://www.bsis-ice.de

High-resolution ice thickness charts at:
http://polarview.fimr.fi
http://www.baltice.org
http://www.polarview.org

+48h Ice forecasts at:
http://polarview.fimr.fi
http://www.baltice.org
http://www.polarview.org

Other services and products are available on request.

Data sources

6. Main data sources are satellite data and in situ measurements. Main space-borne data are Wide Swath SAR data from RADARSAT-2, COSMOSkyMed and TerraSAR-X. About 750 images were used in ice season of 2012-2012. Noaa AVHRR data is used on daily basis, and 8-12 images used in a day. Modis data has been used operationally since 2007. In situ data consists of icebreaker observations delivered by both Finnish and Swedish icebreakers many times a day (edges, boundaries, thickness, pressure fields, deformation, drift, etc.); about 20 ships are providing both ice information and they are also measuring sea surface temperatures. FMI has about 25 ice observation stations, where clear ice, snow ice and snow thicknesses are measured and observations on ice conditions are recorded on daily or weekly basis.

Validation

7. Main validation data of products and services are collected on regular basis from icebreakers (edges, boundaries, thickness, drift), and during various field campaigns.

Medium range forecasting

8. Medium range ice forecasts are provided to Finnish icebreakers, Finnish icebreaking authorities (Finnish Transport Agency), Arctia Shipping Ltd and shipping companies. This service includes 10-day forecasts of development of ice conditions.

Training

9. Training of icebreaker personnel is done in 1-2 times a year by organizing workshops. Main purpose is to exchange ideas for developing new services and products, and develop present services and products to user friendly. Training of other user groups is not frequent

Research and development

10. FMI has been actively developing high-resolution numerical ice compression forecasts. The ensemble forecasting is under development. The sea ice remote sensing from navigational radars is under development, now FMI has equipped three radars along the Finnish coast with ice detection hardware. FMI is developing new ice charting program based on ArcGIS10. The goal is to have program in operation by the end of 2014. FMI has

upgraded the Sodankylä a satellite station with new antenna, facilities and hardware. Sodankylä station is now capable of downlinking, processing and distributing COSMOSKyMed data. Ice service is involved WINMOS project with task in educating seafarers, ice data provider for simulators and new ice management system IBNext development. Transferring the method from Baltic Sea to the Arctic first year ice, where high-resolution ice thickness charts are produced by using SAR data, is under development.

International activities

11. FMI has been active in Baltic Sea ice Meeting (BSIM).

12. FMI has been active in International Ice Charting Working Group (IICWG).

13. FMI is the founding member of European Ice Services (EIS). FMI hosted EIS meeting in 2011 and has been active in the group.

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Appendices: none