Project

VALIDATION REPORT – Q1

Global Sea Ice

Reference: MYO-WP14-SIW-OSISAF-GLO-SIT_SIE_SIC-OBS-VALIDATION_Q1

Project N°: FP7-SPACE-2007-1	**Work programme topic:** SPA.2007.1.1.01 - development of upgraded capabilities for existing GMES fast-track services and related (pre)operational services
Start Date of project: 2009/04/01	**Duration**: 36 Months

WP leader: met.no	**Issue:** 1.0
Contributors: Lars-Anders Breivik, Steinar Eastwood , Esben Stiegård Nielsen	
Date: April2011	**4 April 2011**
Dissemination level:CO	

CHANGE RECORD

Issue	Date	§	Description of Change	Author	Checked By
1.0	2011-04-04		New	Lars-Anders Breivik	

TABLE OF CONTENTS

GLOSSARY AND ABBREVIATIONS

AMSR	Advanced Microwave Scanning Radiometer
NetCDF	Network Common Data Form
OSI SAF	Ocean and Sea Ice Satellite Application Facility
SAR	Synthetic Aperture Radar
SIW	Sea Ice and Wind

I.1   Overall description of validation task

The objective of the validation is to characterize accuracy and quality of the delivered SIW TAC products. Validation is a continuous on going activity and will mainly be based on operational data, but can be supported by campaign data.

The global sea ice products are existing products from EUMETSAT Satellite Application Facility for Ocean and Sea Ice, OSI SAF (met.no). The calibration task is therefore

1) Document that the content of these products are as specified. This is done by reference to the OSI SAF operational validation.

2) Verify that the products at the MyOcean ftp server are equivalent to the OSI SAF products.

I.2   Description of validation system

The global products are sea ice concentration, edge, type and drift. These are operational products from the OSI SAF which is delivered to MyOcean in order to ease and enhance the use in operational oceanography.

The OSI SAF sea ice products are described in http://saf.met.no/docs/ss2_pmseaice_v3p6.pdf

The production of these files will be done by the OSI SAF production system. NetCDF product files are then made available at the MyOcean SIW TAC server. The delta development for MyOcean is coastal interpolation and filling of missing data around the North Pole (the pole holes) will be calibrated as a part of the OSI SAF Integration Test procedures for operational implementation.

I.3   Validation results

The OSI SAF sea ice products are validated operationally by the OSI SAF. The validation routines are described on http://osisaf.met.no/validation/.

For ice drift, see http://osisaf.met.no/docs/REPORT_OSISAF_LRSeaIceDrift_Validation.pdf. The validation results are reported monthly (quarterly for sea ice drift). For the MyOcean calibration tests, the validation results for the last year (last 12 months) are regarded.

Below validation examples from last quartile are presented:

I.3.1   Validation against DMI ice charts

The ice charting division at DMI (Greenland Ice Service) produces in average 3-5 charts per week. Most charts cover the Cape Farewell area, but also the east and west coast of Greenland are frequently covered. The areas covered are shown as black squares in the figure below. Besides the service related to navigational charts the Greenland Ice Service produces one weekly product covering all of Greenland and usually based on navigational charts, AVHRR and MODIS data.

The validation is carried out as a weekly validation by means of automatic comparison of OSI SAF grid with navigational ice charts for ice edge and ice concentration. The weekly ice chart and the OSI SAF product are gridded into a common projection and resolution. Following this a gridpoint by gridpoint comparison is carried out. Only gridpoints based on Radarsat high resolution data are used. For each ice chart concentration level the deviation between ice chart concentration and OSI SAF ice concentration is calculated. Afterwards deviations are grouped into categories, i.e. +/-10% and +/-20%. Furthermore the bias and standard deviation is calculated for each concentration level. The bias and standard deviation are reported for ice (> 0% ice concentration), for water (0% ice concentration) and for both ice and water as a total.
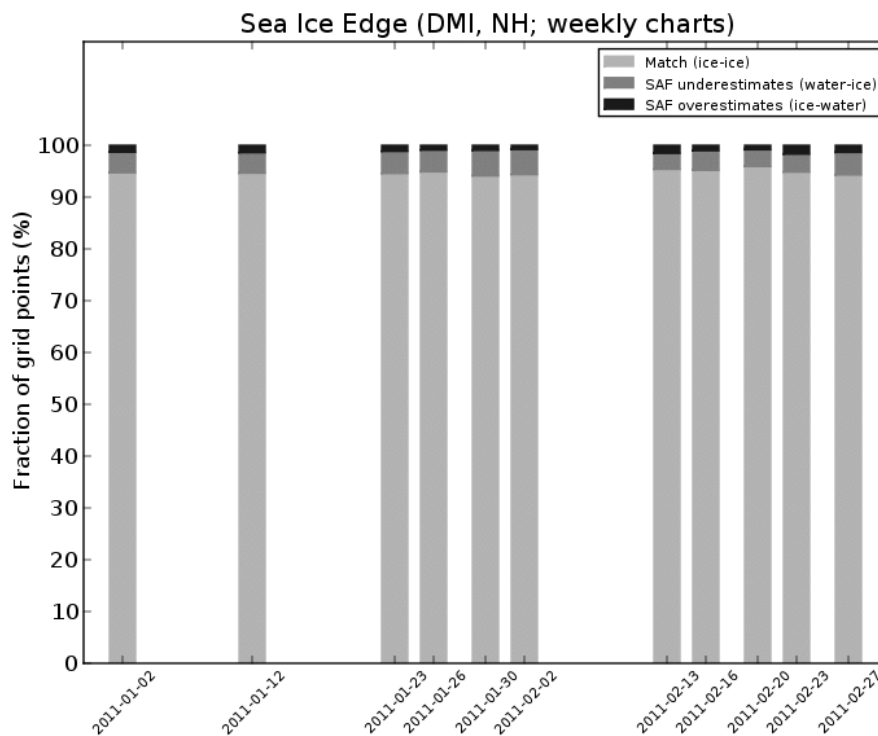

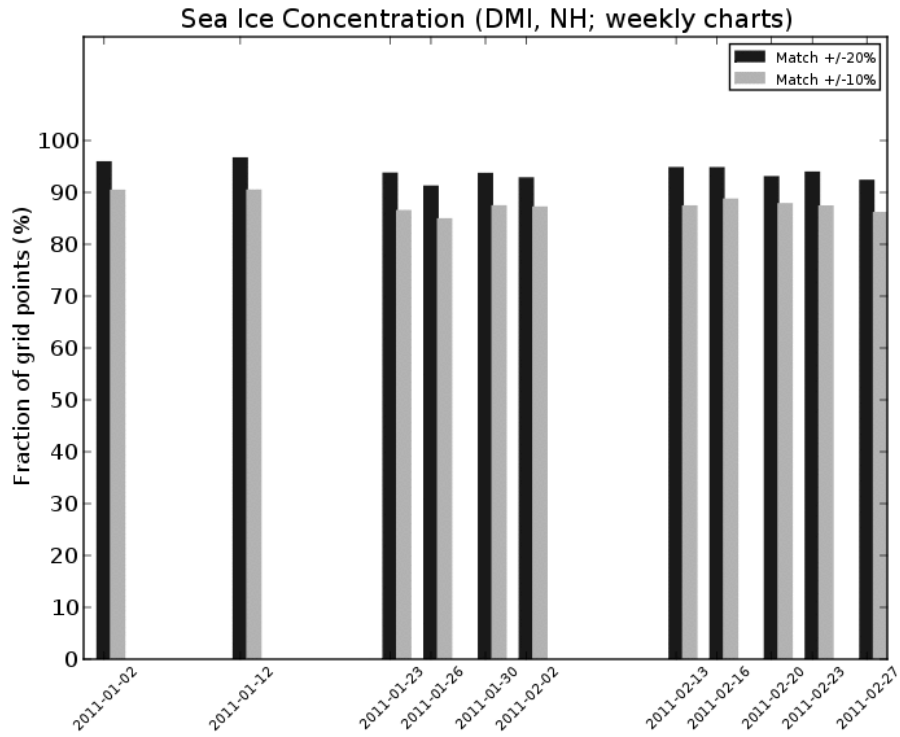Figure 1: Validation of ice edge January and February 2011.

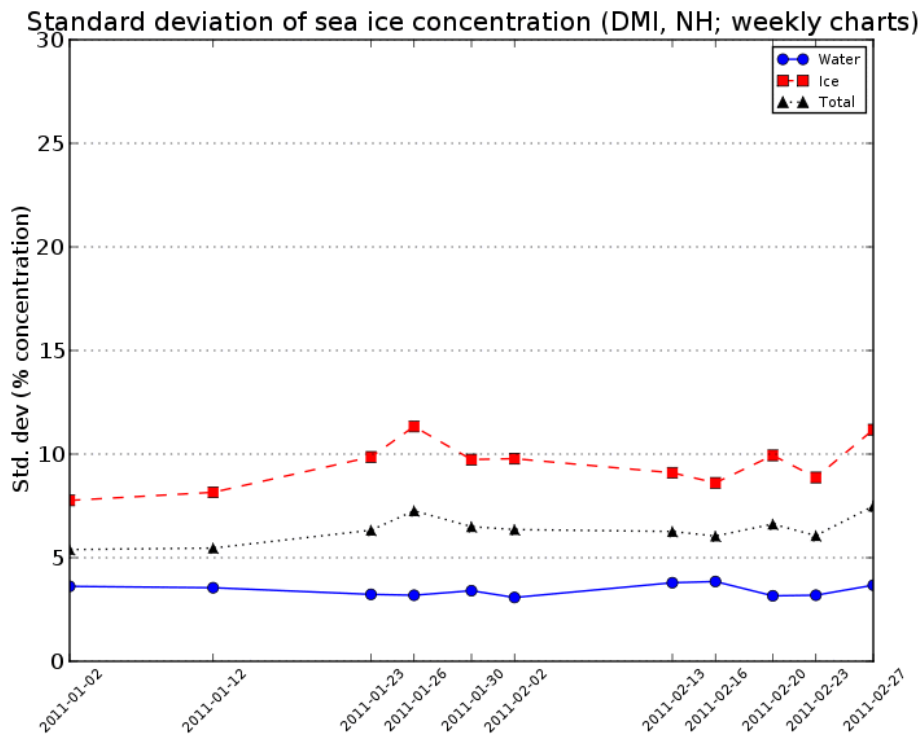Figure 2: Validation of ice concentration January and February 2011.

Figure 3: STD of ice concentration January and February 2011.

I.3.2 *Validation against met.no ice charts*

The Sea Ice service at met.no produce daily ice charts covering the Fram Strait to the Barents Sea with main emphasize on the areas around Svalbard. Areas where independent information (manual inspection of SAR, MODIS and AVHRR) are utilized are marked by the ice service. These are then collocated with the OSI SAF ice product. The focus is on areas close to the ice edge.

Below tables with results from comparing the OSI SAF ice concentration and ice edge products are given. These validation results are representing areas close to the ice edge. Areas further into the Artic ice have not been included. Including these areas would have increased the validation "score". The validation results gives the relative performance in the areas close to the ice edge and for example illustrates the problems finding the ice edge during late summer.

Tables with daily updated validation results are found at

http://osisaf.met.no/validation/val_svalbard.shtml.