OSI SAF CDOP2

—

HALF-YEARLY OPERATIONS REPORT

—

1st half 2015

—

12 November 2015

–

version 1.1

Prepared by DMI, Ifremer, KNMI, Météo-France and MET Norway.

Table of contents

1 Introduction

1.1 Scope of the document

The present report covers from 1st of January to the 30th of June 2015.

The objective of this document is to provide EUMETSAT and users, in complement with the web site www.osi-saf.org, an overview on OSI SAF products availability and quality, main anomalies and events, product usage, users' feedback, and updated available documentation.

- Low and Mid latitude (LML) Centre (Sub-System 1, SS1), under M-F responsibility, processes and distributes the SST and Radiative Fluxes products covering LML, North Atlantic Regional (NAR) and Global areas. Ifremer contributes to the products distribution and archiving,

- High Latitude (HL) Centre (Sub-System 2, SS2), under MET Norway responsibility with the co-operation of DMI, processes and distributes the Global Sea Ice products, the High Latitude SST and the High Latitude Radiative Fluxes,

- Wind Centre (Sub-System 3, SS3), under KNMI responsibility, processes and distributes the Wind products.

1.2 Products characteristics

The characteristics of the current products are specified in the Service Specification Document [AD-1] available on the OSI SAF web site at:

http://www.osi-saf.org/biblio/bibliotheque.php

1.3 Reference and applicable documents

1.3.1 Applicable documents

[AD-1] : Service Specification Document, SeSp, version 2.5 (12 June 2015)

1.3.2 Reference documents

[RD-1] : ASCAT Wind Product User Manual
OSI-102, OSI-102-b, OSI-103, OSI-104, 0SI-104-b

[RD-2] : RapidScat Wind Product User Manual
OSI-109

[RD-3] : Low Earth Orbiter Sea Surface Temperature Product User Manual
OSI-201, OSI-202, OSI-204, OSI-208

[RD-4] : Atlantic High Latitude L3 Sea Surface Temperature Product User Manual
OSI-203

[RD-5] : Geostationary Sea Surface Temperature Product User Manual
OSI-206, OSI-207

[RD-6] : Atlantic High Latitude Radiative Fluxes Product User Manual
OSI-301, OSI-302

[RD-7] : Geostationary Radiative Flux Product User Manual
OSI-303, OSI-304, OSI-305, OSI-306

[RD-8] : OSI SAF Sea Ice Product User Manual
OSI-401-a, OSI-402-a, OSI-403-a

[RD-9] : 50 Ghz Sea Ice Emissivity Product User Manual
OSI-404

[RD-10] : Low Resolution Sea Ice Drift Product User Manual
OSI-405

[RD-11] : Medium Resolution Sea Ice Drift Product User Manual
OSI-407

[RD-12] : Global Sea Ice Concentration Reprocessing Product User Manual
OSI-409, OSI-409-a, OSI-430

1.4 Definitions, acronyms and abbreviations

AHL	Atlantic High Latitude
AMS	American Meteorological Society
ASCAT	Advanced SCATterometer
ATL	Atlantic low and mid latitude
AVHRR	Advanced Very High Resolution Radiometer
BUFR	Binary Universal Format Representation
CDOP	Continuous Development and Operations Phase
CMS	Centre de Météorologie Spatiale
DLI	Downward Long wave Irradiance
DMI	Danish Meteorological Institute
DMSP	Defense Meteorological Satellite Program
ECMWF	European Centre for Medium range Weather Forecasts
EPS	European Polar System
FAQ	Frequently Asked Question
FTP	File Transfer Protocol
GLB	Global oceans
GOES	Geostationary Operational Environmental Satellite
GOES-E	GOES-East, nominal GOES at 75°W
GRIB	GRIdded Binary format
GTS	Global Transmission System
HIRLAM	High Resolution Limited Area Model
HL	High Latitude
HRIT	High Rate Information Transmission
Ifremer	Institut Français de Recherche pour l'Exploitation de la MER
IOP	Initial Operational Phase
KNMI	Koninklijk Nederlands Meteorologisch Instituut
LEO	Low Earth Orbiter
LML	Low and Mid Latitude
MAP	Merged Atlantic Product
MET	Nominal Meteosat at 0°longitude
MET Norway	Norwegian Meteorological Institute
Metop	METeorological OPerational Satellite
M-F	Météo-France
MGR	Meta-GRanule
MSG	Meteosat Second Generation
NAR	Northern Atlantic and Regional
NCEP	National Centre for Environmental Prediction
NESDIS	National Environmental Satellite, Data and Information Service
NetCDF	Network Common Data Form
NMS	National Meteorological Service
NOAA	National Oceanic and Atmospheric Administration
NPP	NPOESS Preparatory Project
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NRT	Near Real-Time
NWP	Numerical Weather Prediction
OSI SAF	Ocean and Sea Ice SAF
QC	Quality Control
R&D	Research and Development

RMDCN	Regional Meteorological Data Communication Network
RMS	Root-Mean-Squared
SAF	Satellite Application Facility
Std Dev	Standard deviation
SEVIRI	Spinning Enhanced Visible and Infra-Red Imager
SIST	Sea Ice Surface Temperature
SMHI	Swedish Meteorological and Hydrological Institute
SSI	Surface Short wave Irradiance
SSMI	Special Sensor Microwave Imager
SSMIS	Special Sensor Microwave Imager and Sounder
SSIST	Sea and Sea Ice Surface Temperature
SST	Sea Surface Temperature
TBC	To Be Confirmed
TBD	To Be Defined
UMARF	Unified Meteorological Archive & Retrieval Facility
WMO	World Meteorological Organisation
WWW	World Wide Web

table 1 : Definitions, acronyms and abbreviations.

2 OSI SAF products availability and timeliness

As indicated in the Service Specification Document [AD-1], operational OSI SAF products are expected to be available for distribution within the specified time in more than **95%** of the cases where input satellite data are available with the nominal level of quality, on monthly basis.

Section 2.1 shows the measured availability on the local FTP servers.

Section 2.2 shows the measured availability via EUMETCast.

The dissemination of the OSI SAF products via EUMETCast implies an additional step, not under the strict OSI SAF responsibility, but general EUMETSAT's one.

The measured availability of the Global **Sea Ice concentration (resp. edge, type)** products corresponds to the situation when a product file is provided within 5 hours, whatever if there are input data or not. The sea ice type is the last product being produced, therefore the most likely to be outside this 5 hour spec.

The **RapidScat 2 hours and 3 hours wind products** originate from independent input data streams and have different timeliness requirements (120 minutes and 180 minutes). The availability is defined as the percentage of products which are available within the specified timeliness where valid input satellite data are available. So the number of 3 hours products available within 180 minutes can be lower than the number of 2 hours products available within 120 minutes, depending on the received input data at KNMI.

2.1 Availability on FTP servers

Ref.	Product	JAN. 2015	FEB. 2015	MAR. 2015	APR. 2015	MAY 2015	JUN. 2015
OSI-102	ASCAT-A 25 km Wind	100	100	100	100	100	99.9
OSI-102-b	ASCAT-B 25 km Wind	99.9	100	100	100	100	100
OSI-103	ASCAT-A 12.5 km Wind	100	100	99.9	100	-	-
OSI-104	ASCAT-A Coastal Wind	99.0	99.9	99.8	99.8	99.3	99.8
OSI-104-b	ASCAT-B Coastal Wind	99.8	99.8	99.9	99.9	98.7	98.2
OSI-109-a	RapidScat 25 km Wind 2 hours	-	-	-	98.1	100	100
OSI-109-b	RapidScat 50 km Wind 2 hours	-	-	-	98.1	100	100
OSI-109-c	RapidScat 25 km Wind 3 hours	-	-	-	98.3	100	99.8
OSI-109-d	RapidScat 50 km Wind 3 hours	-	-	-	98.3	100	99.8
OSI-201	GLB SST	100	98.21	100	100	98.39	100
OSI-202	NAR SST	100	99.11	99.19	95	98.39	99.17
OSI-203	AHL SST / NHL SSIST	100	100	98.4	100	100	100
OSI-204	MGR SST	99.84	97.79	99.08	99.85	98.51	99.65
OSI-206	METEOSAT SST	100	99.85	99.06	100	98.66	99.86
OSI-207	GOES-E SST	99.87	99.40	99.19	99.86	98.39	100
OSI-208	IASI SST	99.34	99.27	98.70	98.99	98.10	99.72
OSI-301	AHL DLI	100	100	96.8	100	100	100
OSI-302	AHL SSI	100	100	96.8	100	100	100
OSI-303	METEOSAT DLI	100	99.85	97.98	100	97.72	100
OSI-304	METEOSAT SSI	100	99.85	97.98	100	97.72	100
OSI-305	GOES-E DLI	100	99.93	99.60	100	97.65	100
OSI-306	GOES-E SSI	100	99.93	99.60	100	97.65	100
OSI-401	Global Sea Ice Concentration	100	100	100	100	100	100
OSI-402	Global Sea Ice Edge	100	100	100	100	100	100
OSI-403	Global Sea Ice Type	100	100	100	100	100	100
OSI-404	Global Sea Ice Emissivity	100	100	96.8	96.7	100	96.7
OSI-405	Low Res. Sea Ice Drift	100	100	96.8	100	100	100
OSI-407	Medium Res. Sea Ice Drift	100	100	95.2	100	100	100

table 2 : Percentage of OSI SAF products available on the local FTP servers within the specified time over 1st half 2015.

Note : The timeliness of the wind products on the KNMI FTP server is not measured separately and therefore the figures in table 2 are copied from table 3 for the wind products. Since the EUMETCast transmission is known to add only a very small delay to the timeliness, the availabilities on the KNMI FTP server are very close to or slightly better than the figures measured via EUMETCast.

Comments :

OSI-103 was discontinued from 28 April 2015 (already replaced by OSI-104 and OSI-104-b).
OSI-109 was declared operational by Steering Group on the 23 March 2015.

See anomaly details in section 3.

2.2 Availability via EUMETCast

Ref.	Product	JAN. 2015	FEB. 2015	MAR. 2015	APR. 2015	MAY 2015	JUN. 2015
OSI-102	ASCAT-A 25 km Wind	100	100	100	100	100	99.9
OSI-102-	ASCAT-B 25 km Wind	99.9	100	100	100	100	100
OSI-103	ASCAT-A 12.5 km Wind	100	100	99.9	100	-	-
OSI-104	ASCAT-A Coastal Wind	99.0	99.9	99.8	99.8	99.3	99.8
OSI-104-	ASCAT-B Coastal Wind	99.8	99.8	99.9	99.9	98.7	98.2
OSI-109-	RapidScat 25 km Wind 2 hours	-	-	-	-	-	100
OSI-109-	RapidScat 50 km Wind 2 hours	-	-	-	-	-	100
OSI-109-	RapidScat 25 km Wind 3 hours	-	-	-	-	-	99.8
OSI-109-	RapidScat 50 km Wind 3 hours	-	-	-	-	-	99.8
OSI-201	GLB SST	100	98.2	100	100	100	100
OSI-202	NAR SST	100	100	100	95	99.2	99.2
OSI-203	AHL SST / NHL SSIST	100	100	98.4	100	100	100
OSI-204	MGR SST	99.8	97.9	99.7	99.9	99.7	99.7
OSI-206	METEOSAT SST	100	99.8	99.7	99.7	98.9	99.9
OSI-207	GOES-E SST	100	99.8	99.9	99.9	98.7	100
OSI-208	IASI SST	100	99.3	99.3	99.3	99.3	99.9
OSI-301	AHL DLI	100	100	96.8	100	100	100
OSI-302	AHL SSI	100	100	96.8	100	100	100
OSI-303	METEOSAT DLI	100	100	99.7	100	99.2	99.8
OSI-304	METEOSAT SSI	100	99.8	99.7	100	99.2	99.8
OSI-305	GOES-E DLI	99.8	100	99.6	100	98.8	100
OSI-306	GOES-E SSI	99.8	100	99.7	100	98.8	100
OSI-401	Global Sea Ice Concentration	100	96.4	96.8	100	100	100
OSI-402	Global Sea Ice Edge	96.8	96.4	96.8	100	100	100
OSI-403	Global Sea Ice Type	98.4	96.4	96.8	100	100	100
OSI-404	Global Sea Ice Emissivity	100	100	96.8	96.7	100	96.7
OSI-405	Low Res. Sea Ice Drift	100	96,4	96.8	100	100	100
OSI-407	Medium Res. Sea Ice Drift	100	100	95.1	100	98.4	100

table 3 : Percentage of OSI SAF products delivered via EUMETCast within the specified time over 1st half 2015.

Comments:

OSI-208 was available to all users on EUMETCast on the 8 January 2015.
OSI-103 was discontinued from 28 April 2015 (already replaced by OSI-104 and OSI-104-b).
OSI-109 was declared operational by Steering Group on the 23 March 2015 and made available on EUMETCast from the 23 June 2015.

See details in section 3.

3 Main anomalies, corrective and preventive measures

In case of anomaly (outage, degraded products…), correspondent service messages are made available in near-real time to the registered users through the Web site www.osi-saf.org.

3.1 At SS1

In April 2015, there has been an interruption of the NAR SST S-NPP production due to a preprocessing problem since 14/04/15. The cloud mask has been affected by the non reception of the data of the NWP nominal model. Based on a backup NWP model inputs, the cloud mask resumed with a possible non-nominal quality and the NAR SST S-NPP production restart on 17/04/15. The nominal NWP model was reused operationally on 11/05/15 and the cloud mask was then nominal.

3.2 At SS2

In January, March, May and June 2015 OSI SAF MR Ice Drift (January and May) and GBL Sea Ice Emissivity (March and June) were missing for approximately a day per event due to bugs in the chains but not in the main algorithms. These bugs are very hard to discover before they suddenly occur. They were corrected, so the same bug cannot occur again. If it is in some code that is used in more products it is corrected in all the products.
In March and April 2015 OSI SAF AHL SST and Flux and OSI SAF GBL Sea Ice Emissivity respectively were delayed due to server problems and network outage. The products were made available as fast as possible.

3.3 At SS3

A small calibration change (drop in backscatter for all beams) has occurred **in October 2014** in the ASCAT instrument on Metop-A. This has led to a drop in average wind speed of approximately 0.06 m/s. The impact for near-real time users is minimal but corrective measures will be taken when it comes to reprocessing climate data records. The reason for the change has been investigated by EUMETSAT and industry but is not clear yet.

In May and June there have been some periods with large fractions of rejected and missing winds in the RapidScat wind products. This was due to issues in the input data and connected with the Space Station orbit pitch.

4 Main events and modifications, maintenance activities

In case of event or modification, corresponding service messages are made available in near-real time to the registered users through the Web site www.osi-saf.org.

4.1 At SS1

From 8 January 2015, the IASI SST product, in GHRSST Data Specification 2, is available to all users on the three beams of EUMETCast. The product has been declared operational on 28 may 2015, and available from the OSI-SAF ftp site at Ifremer or via EUMETcast.

4.2 At SS2

On the 15 June 2015, the updated version 1.2 of the reprocessed sea ice concentration data set (OSI-409-a) was released. The data set now covers the period Oct 1978-Apr 2015. Version 1.2 is an extension in time of version 1.1 (OSI-409), adding the period from October 2009 to April 2015. There is no change in the algorithms or processing chain used.

On the 26 July 2015, the global continuous reprocessed sea ice concentration offline product (OSI-430) was released. This product is a continuous reprocessing to continue the OSI SAF reprocessed sea ice concentration data set (OSI-409-a) that covers the period 25th October 1978 - 15th April 2015. This offline product is a daily product, is delivered with a monthly delay (33 days) and is available since 16 April 2015 onwards.

More details about the products are available here:
http://osisaf.met.no/p/ice/index.html#conc-cont-reproc

7 July 2015 - Improved sea ice products
Improved versions of sea ice concentration, edge, type and LR ice drift have been made available to users. Both the old operational and new improved products are made available in an overlapping period through FTP. This has been explained to the users through a service message (# 1099).

4.3 At SS3

The global Metop-A ASCAT Hamming window based 12.5 km wind product (OSI-103) was discontinued on 28 April 2015.
The ISS/RapidScat winds were declared operational in March. They are available on EUMETCast for all users since 23 June 2015.

5 OSI SAF products quality

5.1 SST quality

The comparison between SST products and Match up data bases (MDB) gathering in situ (buoy) measurements is performed on a routine basis for each satellite.

Hourly SST values are required to have the following accuracy when compared to night time buoy measurements (see Service Specification Document [AD-1]) :

- monthly bias (Bias Req in following tables) less than 0.5° C,
- monthly difference standard deviation (Std Dev Req. in following tables) less than 1°C for the geostationary products (METEOSAT and GOES-E SST), and 0.8°C for the polar ones (GBL, NAR, AHL, MGR and IASI SST).

According to GHRSST-PP project, for IR derived products, the normalized Proximity Confidence Value scale shows 6 values : 0: unprocessed, 1: cloudy, 2: bad, 3: suspect, 4: acceptable, 5: excellent. A quality level is provided at pixel level. Those values are good predictors of the errors. It is recommended not to use the confidence value 2 for quantitative use. Usable data are those with confidence values 3, 4 and 5.

The list of blacklisted buoys over the concerned period is available here :
ftp://ftp.ifremer.fr/ifremer/cersat/projects/myocean/sst-tac/insitu/blacklist

In the following maps, there are at least 5 in situ measurements per box.

5.1.1 METEOSAT SST (OSI-206) quality

The following maps indicate the mean night-time and day-time SST error with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://www.osi-saf.org/production/cms/validation_sst_geo.php.

The operational SST retrieval from MSG/SEVIRI and GOES-E updated chain validation report v1.1 (http://www.osi-saf.org/biblio/docs/ss1_geo_sst_val_rep_1_1.pdf) gives further details about the regional bias observed.

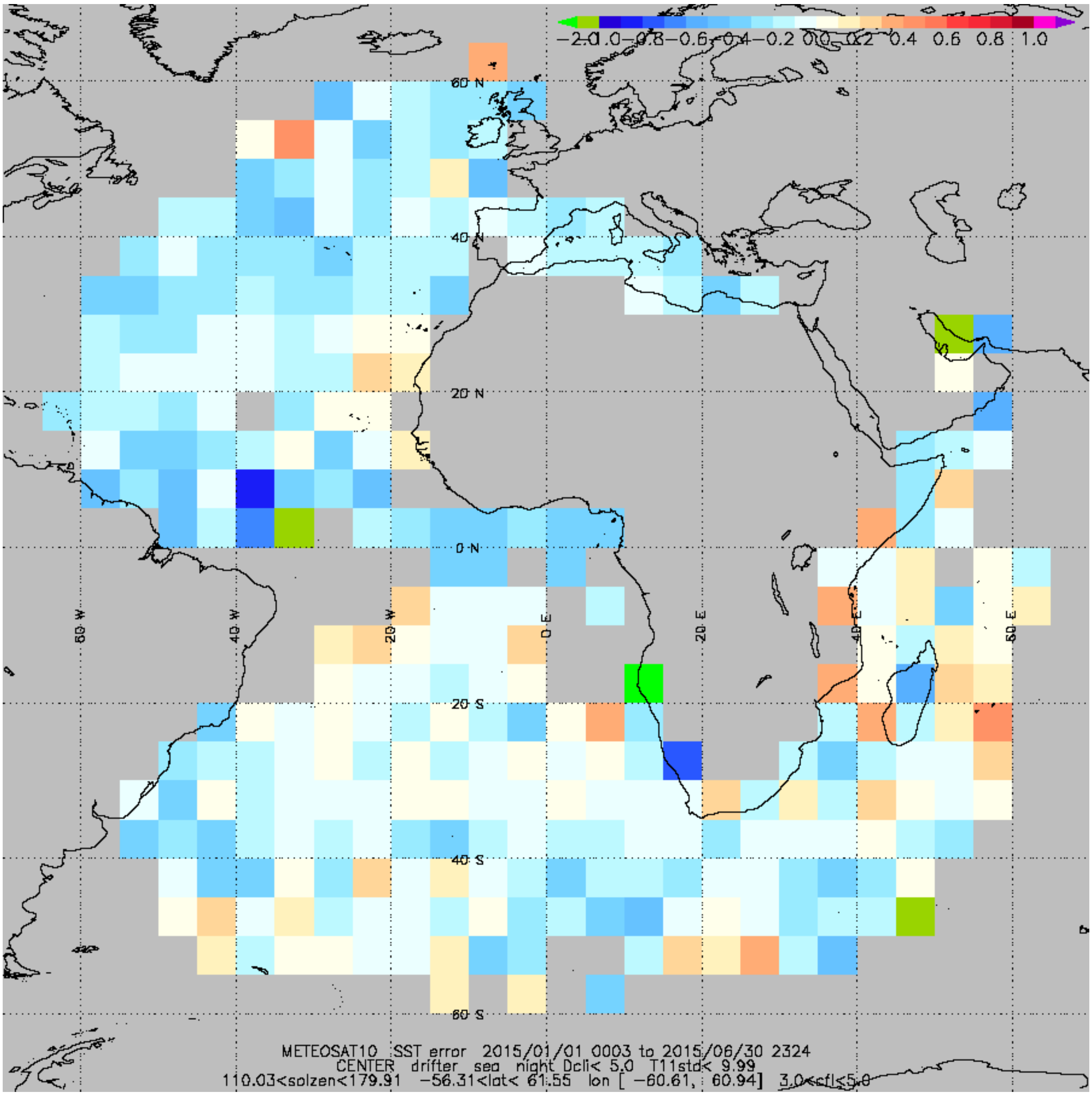

Figure 1 : **mean METEOSAT night-time SST error with respect to buoys measurements for quality level 3,4,5**

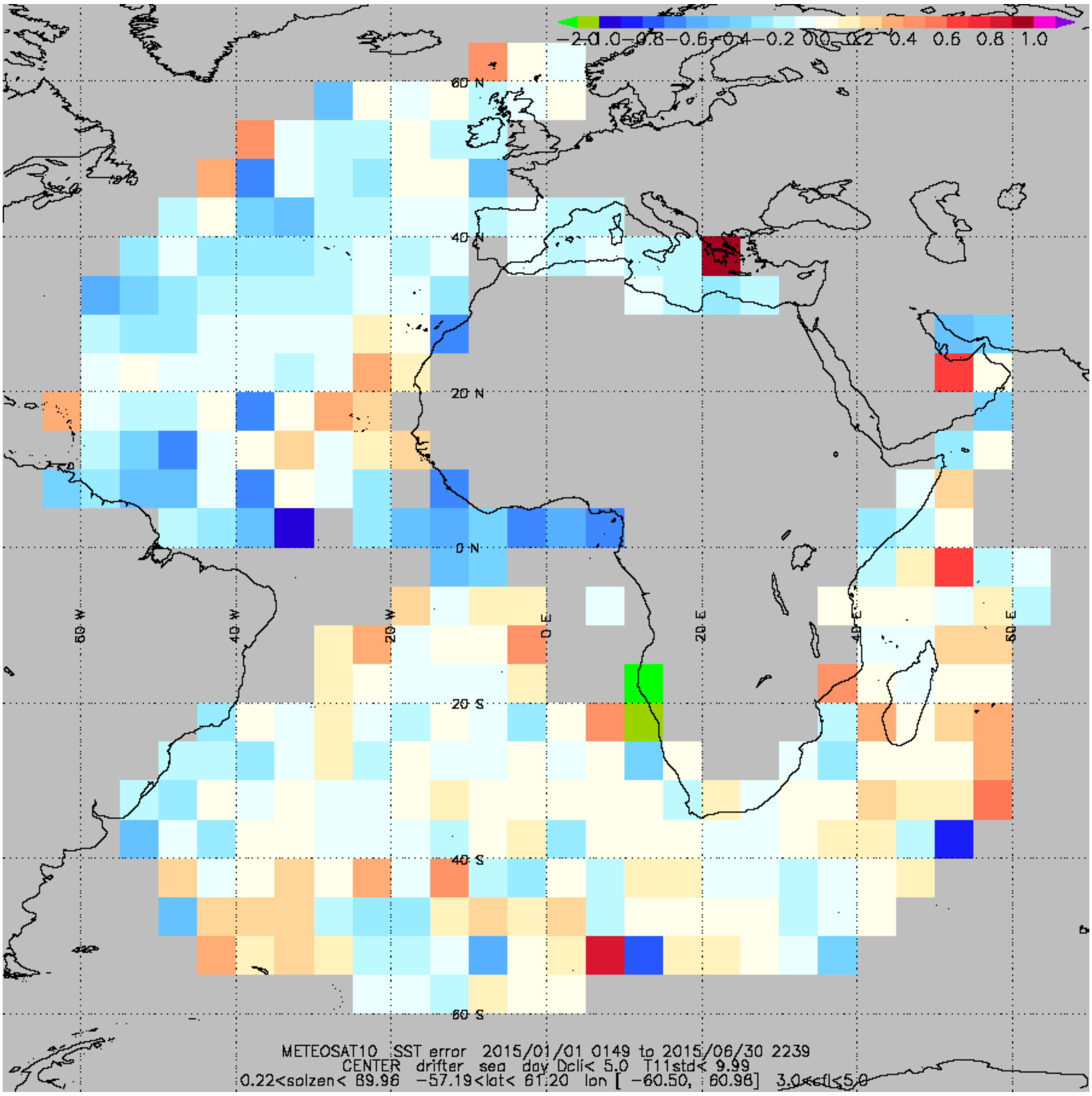

Figure 2 : mean METEOSAT <u>day</u>-time SST error with respect to buoys measurements for quality level 3,4,5

The following table provides the METEOSAT-derived SST quality results over the reporting period.

METEOSAT night-time SST quality results over 1st half 2015							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2015	15714	-0,11	0,5	78	0,54	1	46
FEB. 2015	12197	-0,08	0,5	84	0,59	1	41
MAR. 2015	13067	-0,1	0,5	80	0,57	1	43
APR. 2015	12951	-0,15	0,5	70	0,62	1	38
MAY 2015	12137	-0,12	0,5	76	0,57	1	43
JUN. 2015	13205	-0,19	0,5	62	0.58	1	42
METEOSAT day-time SST quality results over 1st half 2015							
JAN. 2015	23555	-0,05	0,5	90,00	0,51	1	49,00
FEB. 2015	17299	-0,03	0,5	94,00	0,52	1	48,00
MAR. 2015	18417	-0,03	0,5	94,00	0,53	1	47,00
APR. 2015	17976	-0,090	0,5	82,00	0,55	1	45,00
MAY 2015	18738	-0,090	0,5	82,00	0,57	1	43,00
JUN. 2015	23602	-0,190	0,5	62,00	0,6	1	40,00
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

table 4 : METEOSAT SST quality results over 1st half 2015, for 3, 4, 5 quality indexes.

Comments: Quality results are good and quite stable.

The following graphs illustrate the evolution of METEOSAT-derived SST quality results over the past 12 months.

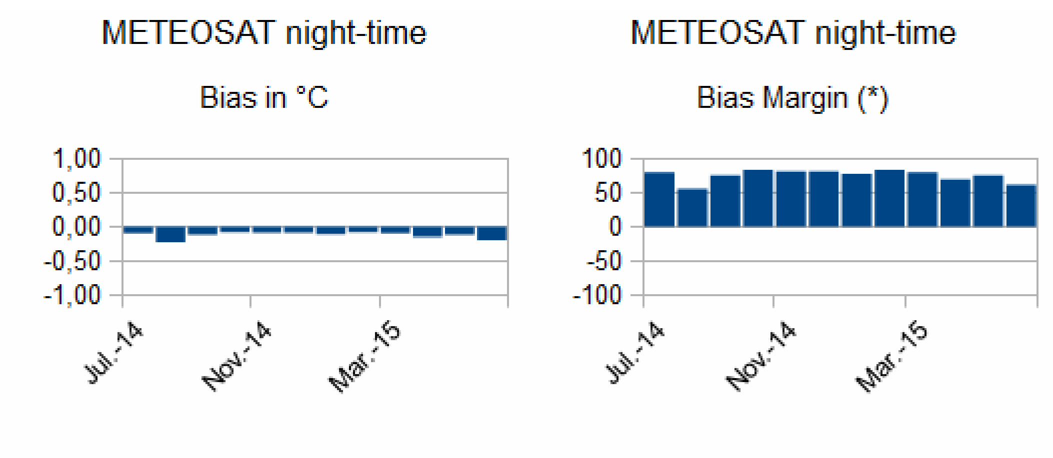

Figure 3 : Left: METEOSAT night-time SST Bias. Right METEOSAT night-time SST Bias Margin

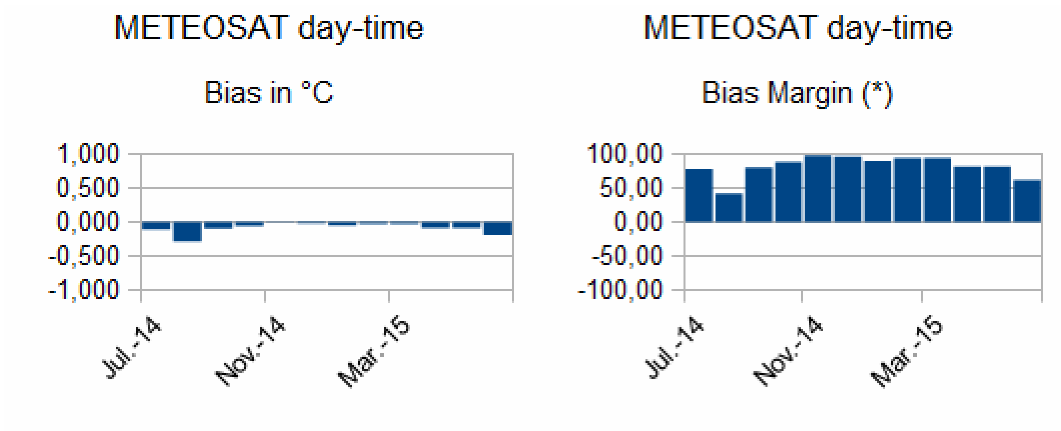

Figure 4 : Left: METEOSAT day-time SST Bias.
Right METEOSAT day-time SST Bias Margin

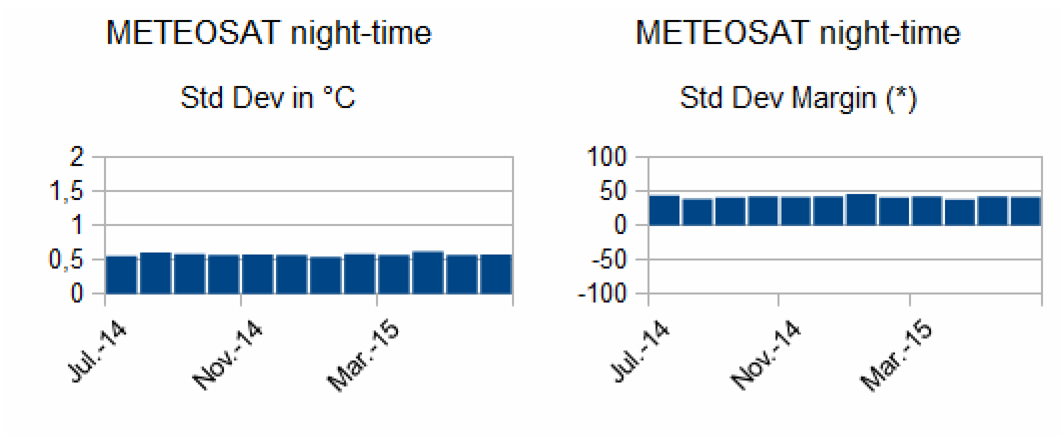

Figure 5 : Left: METEOSAT night-time SST Standard deviation.
Right METEOSAT night-time SST Standard deviation Margin.

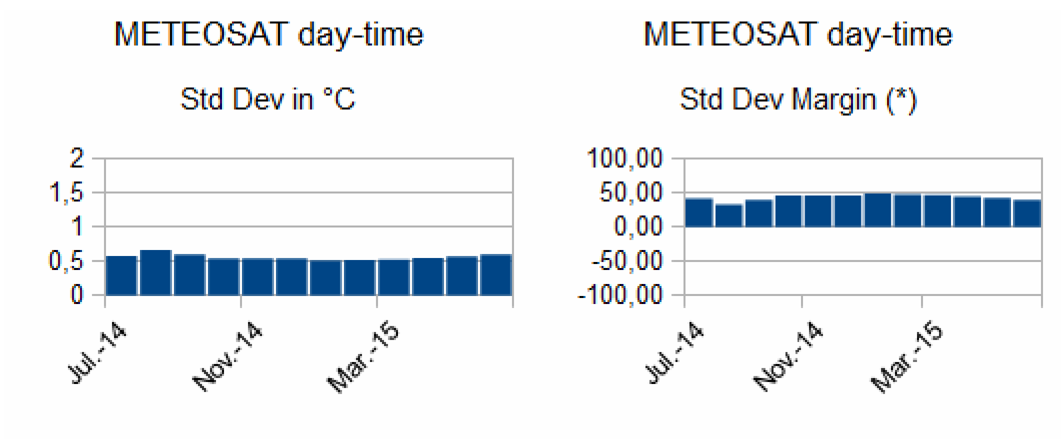

Figure 6 : Left: METEOSAT day-time SST Standard deviation.
Right METEOSAT day-time SST Standard deviation Margin.

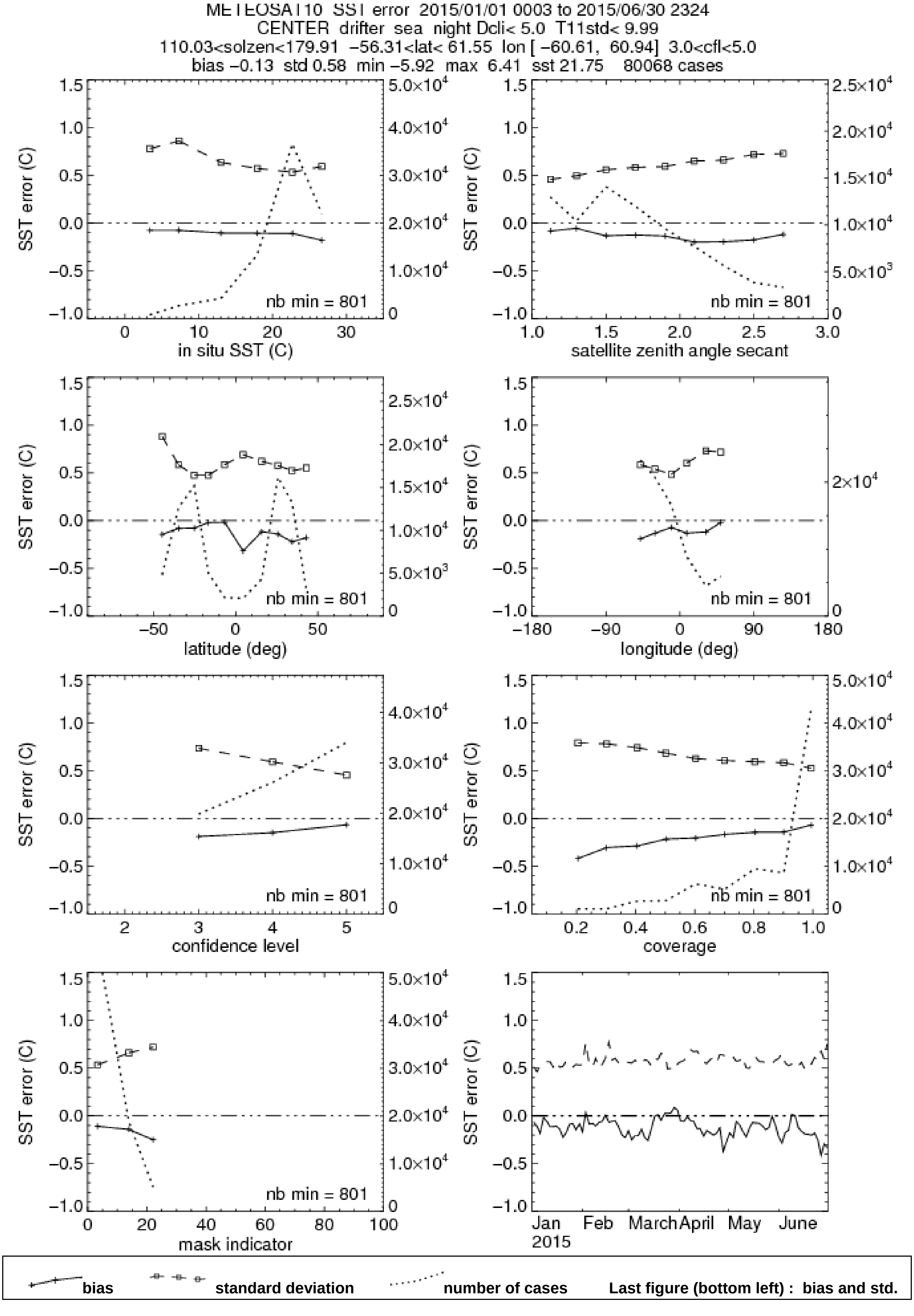

Figure 7 : Complementary quality assessment statistics on METEOSAT SST, night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

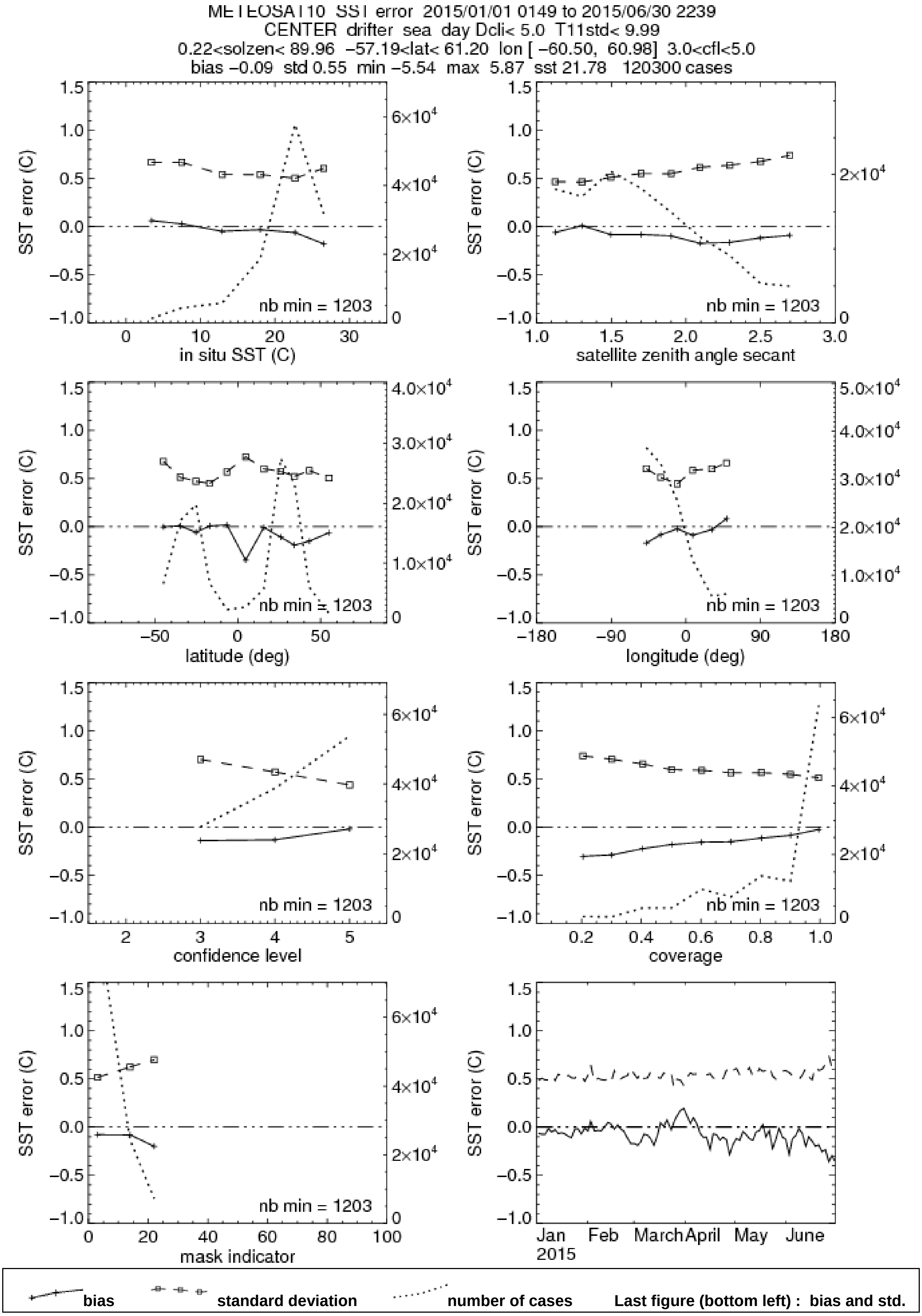

Figure 8 : Complementary quality assessment statistics on METEOSAT SST, day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

5.1.2 GOES-E SST (OSI-207) quality

The following maps indicate the mean night-time SST error with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://www.osi-saf.org/production/cms/validation_sst_geo.php.

The operational SST retrieval from MSG/SEVIRI and GOES-E updated chain validation report v1.1 (http://www.osi-saf.org/biblio/docs/ss1_geo_sst_val_rep_1_1.pdf) gives further details about the regional bias observed.

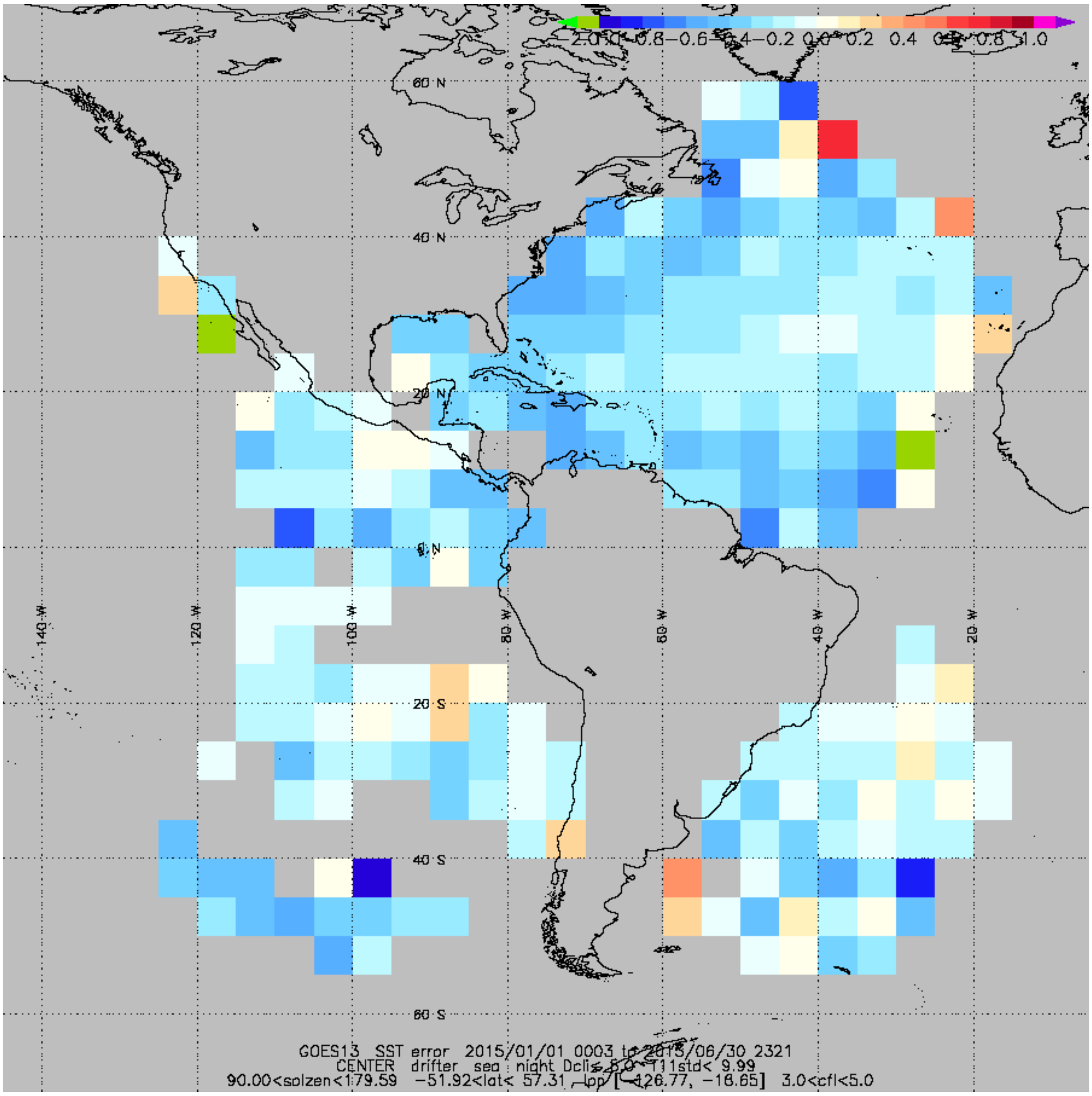

Figure 9 : mean GOES-E night-time SST error with respect to buoys measurements for quality level 3,4,5

The following table provides the GOES-E-derived SST quality results over the reporting period.

GOES-E night-time SST quality results 1st half 2015							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2015	19178	-0.16	0.5	68	0.48	1	52
FEB. 2015	15030	-0.15	0.5	70	0.5	1	50
MAR. 2015	17907	-0.14	0.5	72	0.51	1	49
APR. 2015	15072	-0.26	0.5	48	0.52	1	48
MAY 2015	15999	-0.28	0.5	44	0.47	1	53
JUN. 2015	20902	-0.28	0.5	44	0.45	1	55
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

table 5 : **GOES-E SST quality results over 1st half 2015, for 3, 4, 5 quality indexes**

Comments: Quality results are good and quite stable.

The following graphs illustrate the evolution of GOES-E-derived SST quality results over the past 12 months.

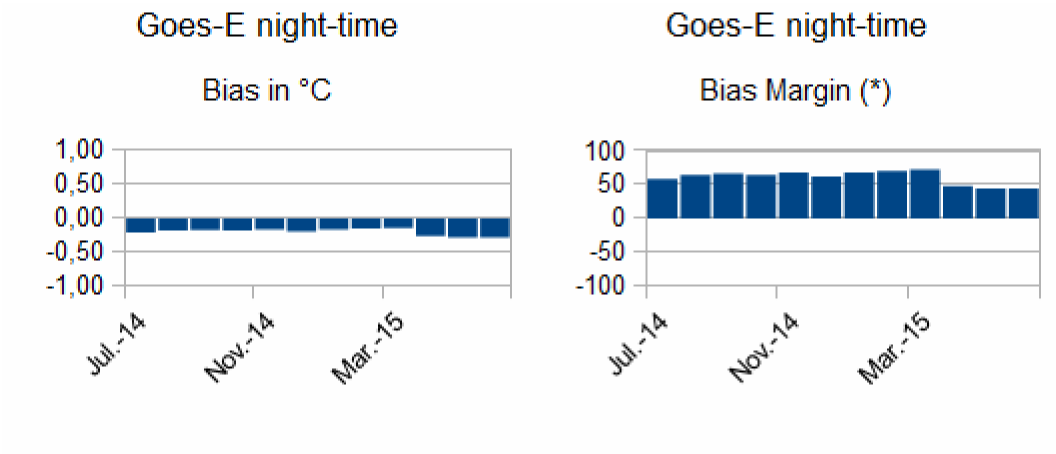

Figure 10 : **Left: Goes-E night-time SST Bias.**
Right: Goes-E night-time SST Bias Margin.

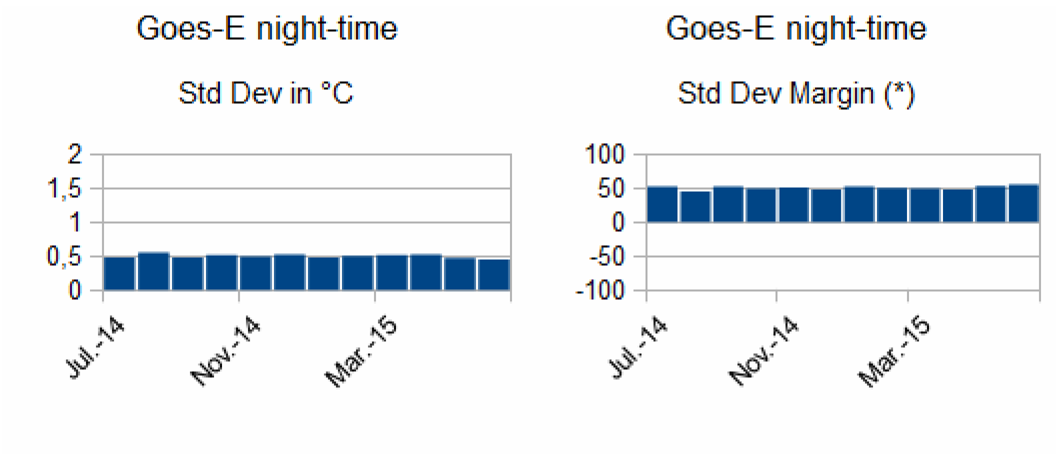

Figure 11 : **Left: Goes-E night-time SST Standard deviation.**
Right Goes-E night-time SST Standard deviation Margin.

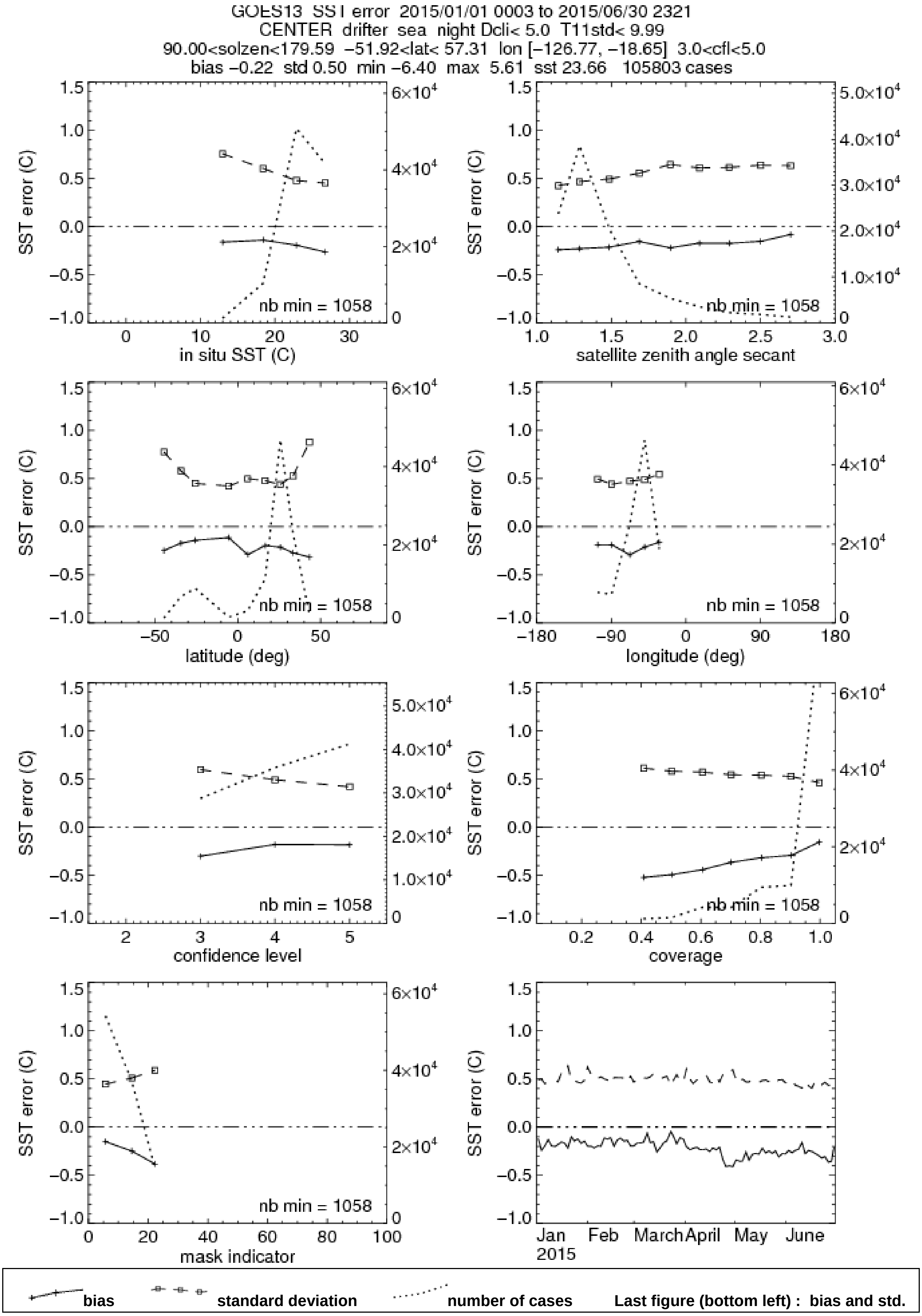

Figure 12 : Complementary quality assessment statistics on GOES-E SST, <u>night</u>-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

5.1.3 NAR SST (OSI-202) quality

The operational NAR SST is processed for satellite/sensor, Metop/AVHRR and S-NPP/VIIRS.
Currently Metop-B and S-NPP are used.

The comparison between NAR SST products and Match up data bases (MDB) gathering in situ (buoy) measurements is performed on a routine basis for each operational S-NPP and Metop satellite.

5.1.3.1 NPP NAR SST quality

The following maps indicate the mean night-time and day-time SST error with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://www.osi-saf.org/production/cms/validation_sst_leo.php.

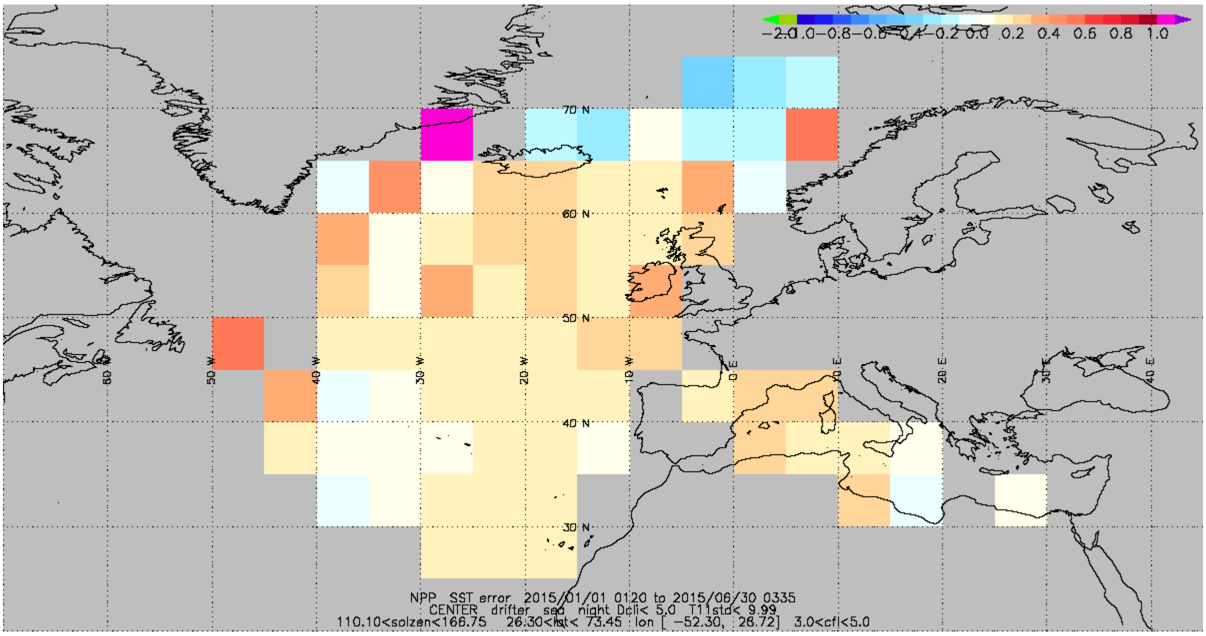

Figure 13 : mean NPP NAR <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5

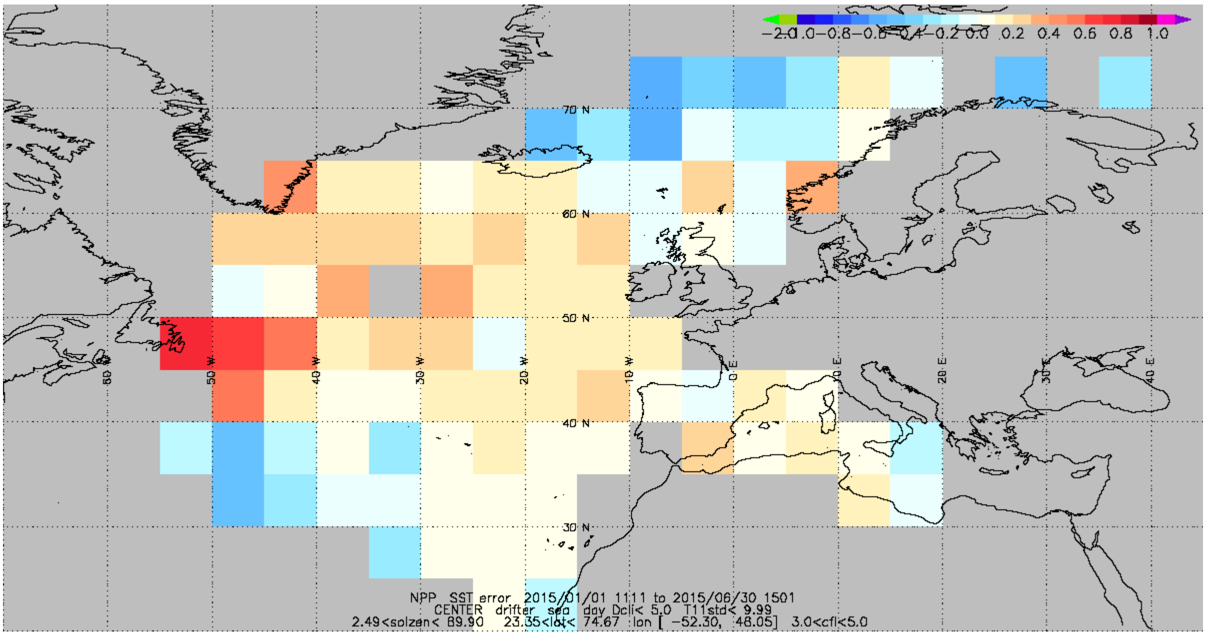

Figure 14 : mean NPP NAR day-time SST error with respect to buoys measurements for quality level 3,4,5

The following table provides the NPP-derived SST quality results over the reporting period.

Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
NPP NAR night-time SST quality results over 1st half 2015							
JAN. 2015	588	0.15	0.5	70	0.33	0.8	59
FEB. 2015	408	0.16	0.5	68	0.42	0.8	48
MAR. 2015	454	0.18	0.5	64	0.28	0.8	65
APR. 2015	320	0.13	0.5	74	0.26	0.8	68
MAY 2015	263	0.09	0.5	82	0.30	0.8	63
JUN. 2015	338	0.06	0.5	88	0.32	0.8	60
NPP NAR day-time SST quality results over 1st half 2015							
JAN. 2015	512	0.01	0.5	98.00	0.58	0.8	27.50
FEB. 2015	439	0.09	0.5	82.00	0.42	0.8	47.50
MAR. 2015	707	0.04	0.5	92.00	0.44	0.8	45.00
APR. 2015	841	0.05	0.5	90.00	0.43	0.8	46.25
MAY 2015	1016	-0.01	0.5	98.00	0.56	0.8	30.00
JUN. 2015	985	0.07	0.5	86.00	0.58	0.8	27.50

(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|))
(**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req))
100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.

table 6 : Quality results for NPP NAR SST over 1st half 2015, for 3, 4, 5 quality indexes

Comments: Quality results are good and quite stable.

The following graphs illustrate the evolution of NPP NAR SST quality results over the past 12 months.

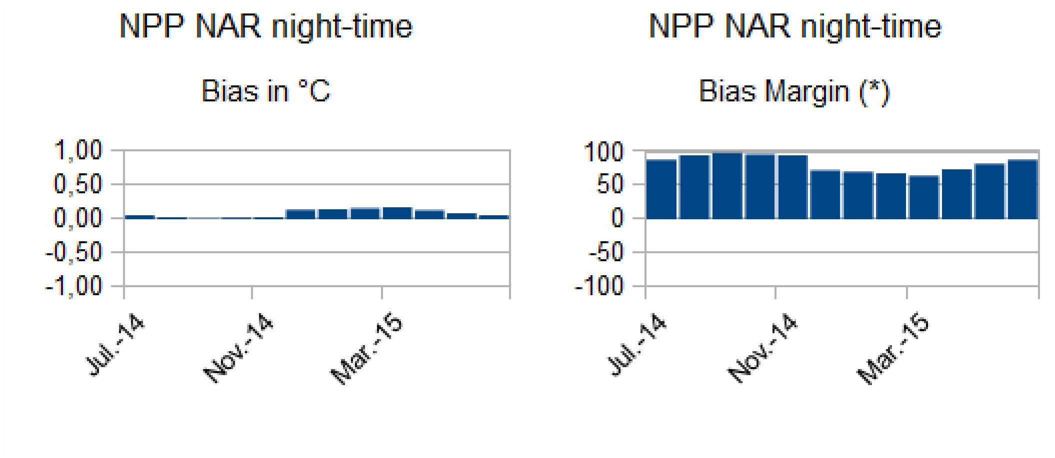

Figure 15 : Left: NPP NAR <u>night</u>-time SST Bias.
Right : NPP NAR <u>night</u>-time SST Bias Margin.

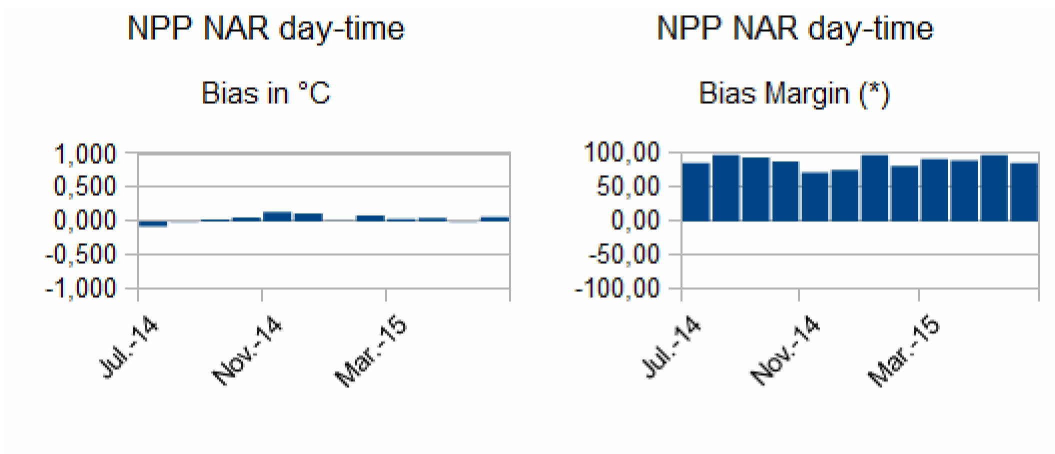

Figure 16 : Left: NPP NAR <u>day</u>-time SST Bias.
Right : NPP NAR <u>day</u>-time SST Bias Margin.

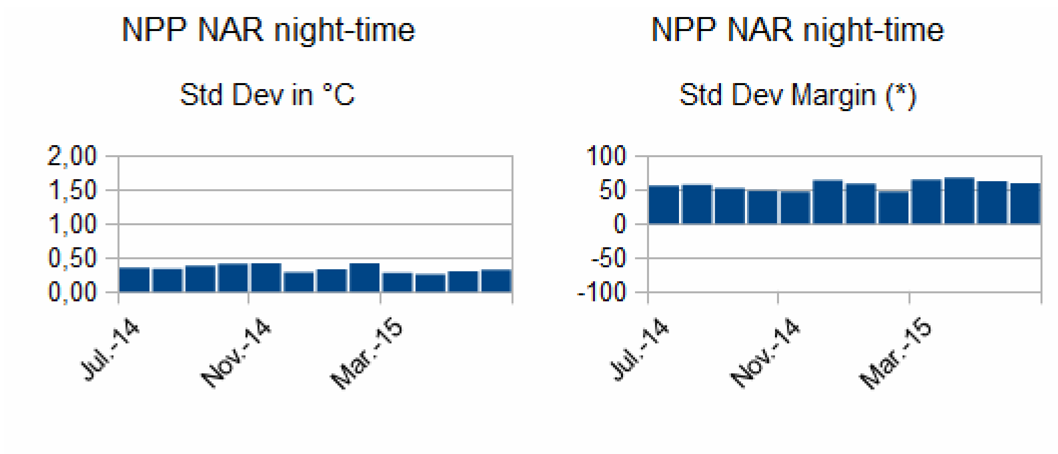

Figure 17 : Left: NPP NAR <u>night</u>-time SST Standard deviation.
Right : NPP NAR <u>night</u>-time SST Standard deviation Margin.

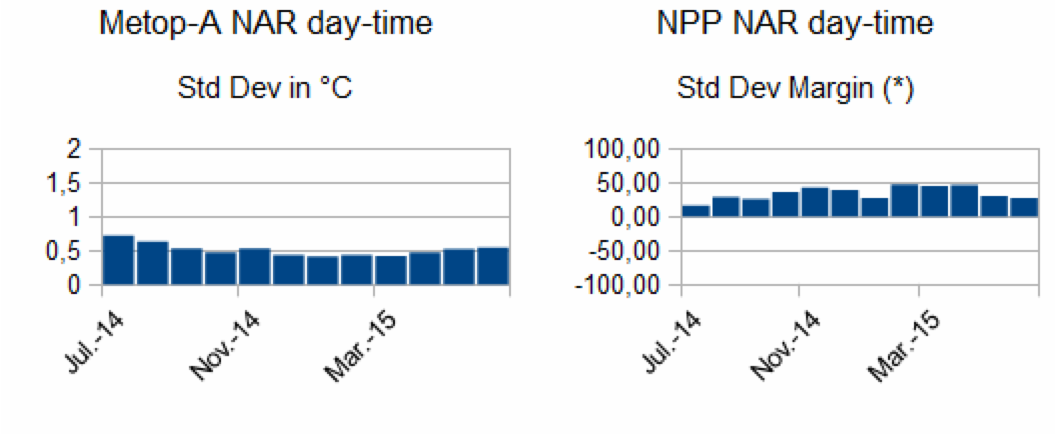

Figure 18 : Left: NPP NAR day-time SST Standard deviation.
Right : NPP NAR day-time SST Standard deviation Margin.

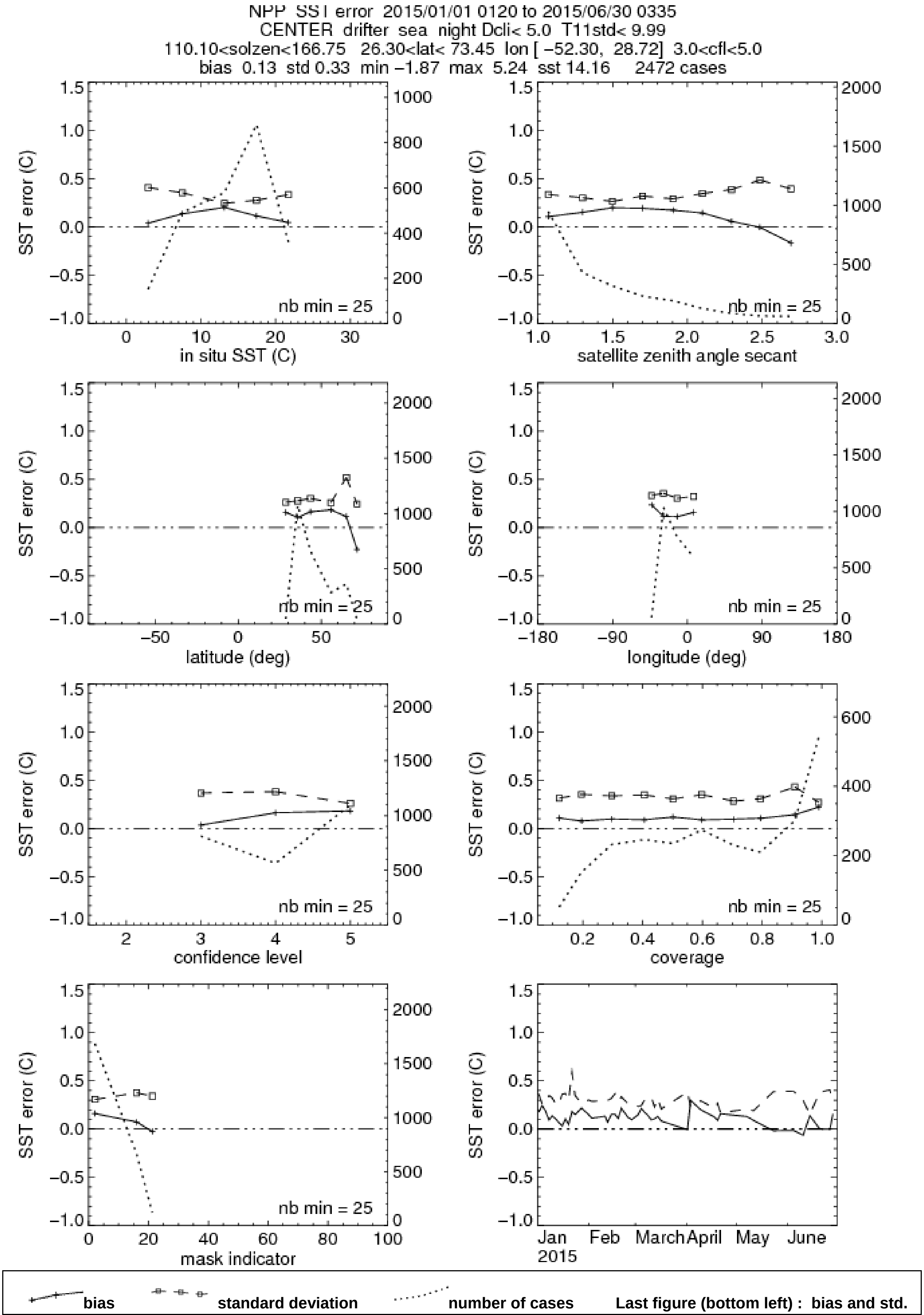

Figure 19 : Complementary quality assessment statistics on NPP NAR SST <u>night-time</u> : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

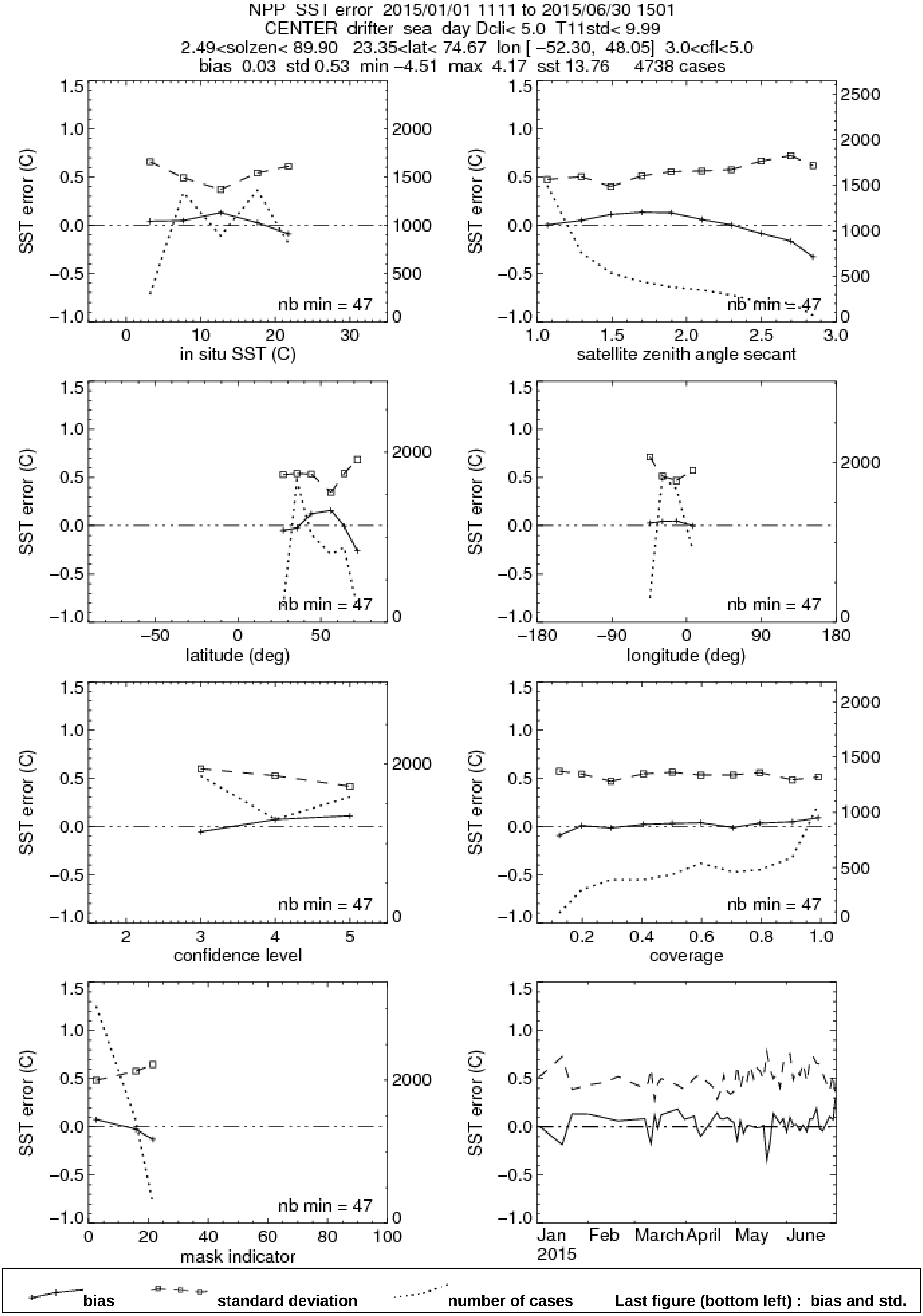

Figure 20 : Complementary quality assessment statistics on NPP NAR SST <u>day-time</u> : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

5.1.3.2 Metop NAR SST quality

The following maps indicate the mean night-time and day-time SST error with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://www.osi-saf.org/production/cms/validation_sst_leo.php.

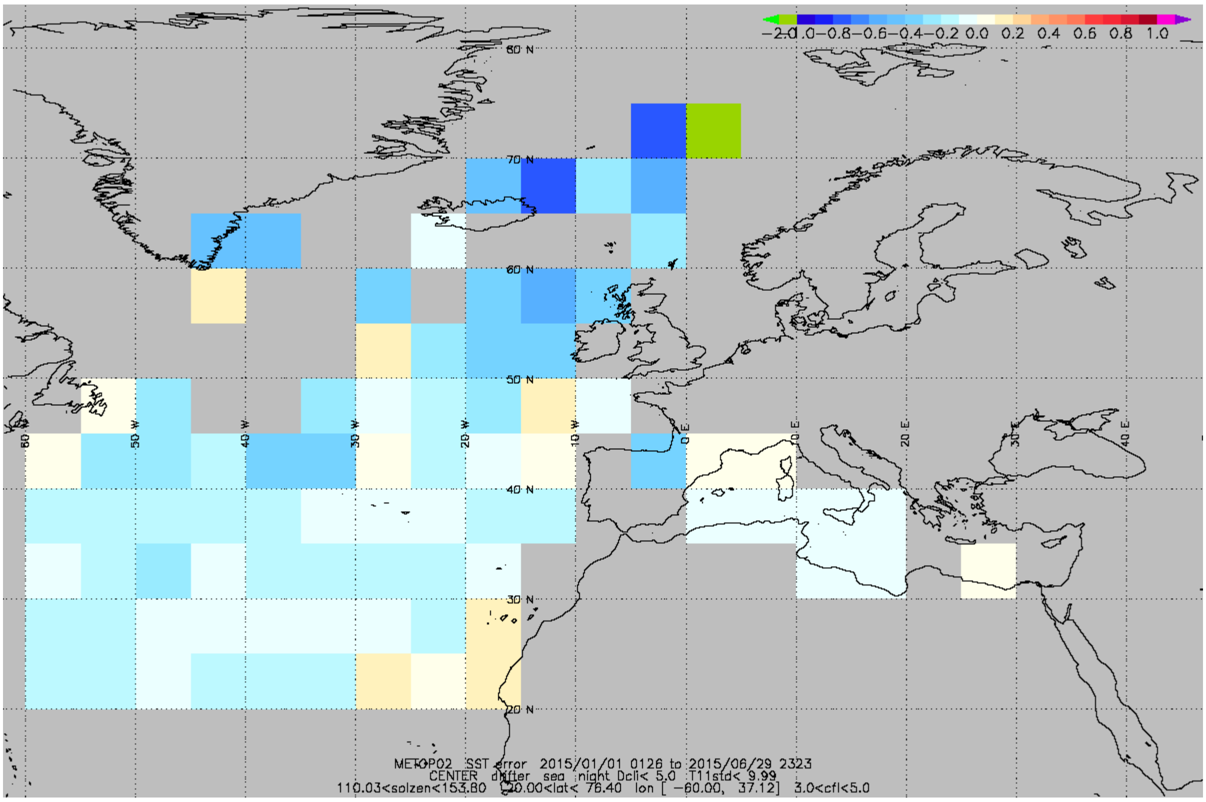

Figure 21 : **mean Metop-A NAR <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5**

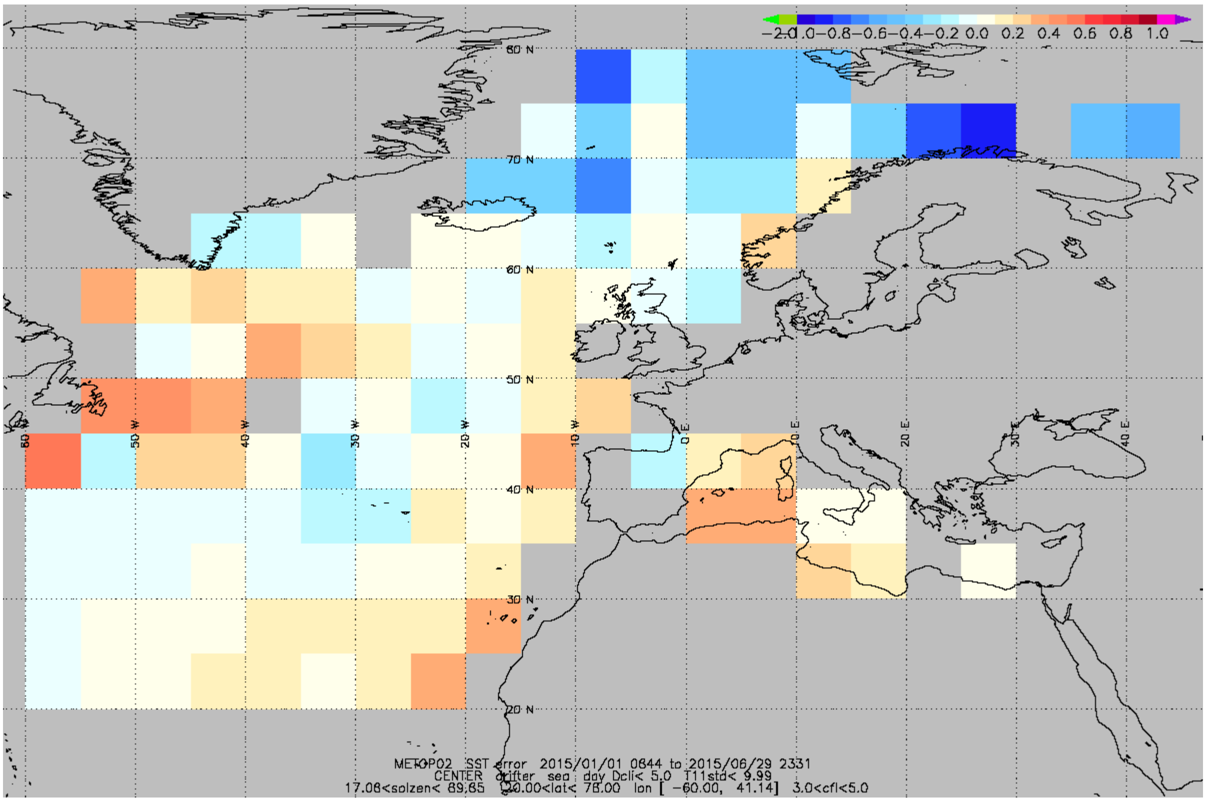

Figure 22 : **mean Metop-A NAR day-time SST error with respect to buoys measurements for quality level 3,4,5**

The following table provides Metop-A-derived SST quality results over the reporting period.

Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
Metop-A NAR night-time SST quality results over 1st half 2015							
JAN. 2015	1198	-0.14	0.5	72.00	0.38	0.8	52.50
FEB. 2015	854	-0.12	0.5	76.00	0.36	0.8	55.00
MAR. 2015	1012	-0.11	0.5	78.00	0.34	0.8	57.50
APR. 2015	830	-0.18	0.5	64.00	0.35	0.8	56.25
MAY 2015	702	-0.12	0.5	76.00	0.37	0.8	53.75
JUN. 2015	897	-0.06	0.5	88.00	0.36	0.8	55.00
Metop-A NAR day-time SST quality results over 1st half 2015							
JAN. 2015	1273	0.04	0.5	92.00	0.41	0.8	48.75
FEB. 2015	1033	0.05	0.5	90.00	0.43	0.8	46.25
MAR. 2015	1320	0.02	0.5	96.00	0.42	0.8	47.50
APR. 2015	1594	-0.05	0.5	90.00	0.47	0.8	41.25
MAY 2015	1781	-0.02	0.5	96.00	0.52	0.8	35.00
JUN. 2015	2417	0.03	0.5	94.00	0.54	0.8	32.50

(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|))
(**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req))
100 refers then to a perfect product, 0 to a quality just as required. without margin.
A negative result indicates that the product quality does not fulfill the requirement.

table 7 : **Quality results for Metop-A NAR SST over 1st half 2015, for 3, 4, 5 quality indexes**

Comments: Quality results are good and quite stable.

The following graphs illustrate the evolution of Metop-A NAR SST quality results over the past 12 months.

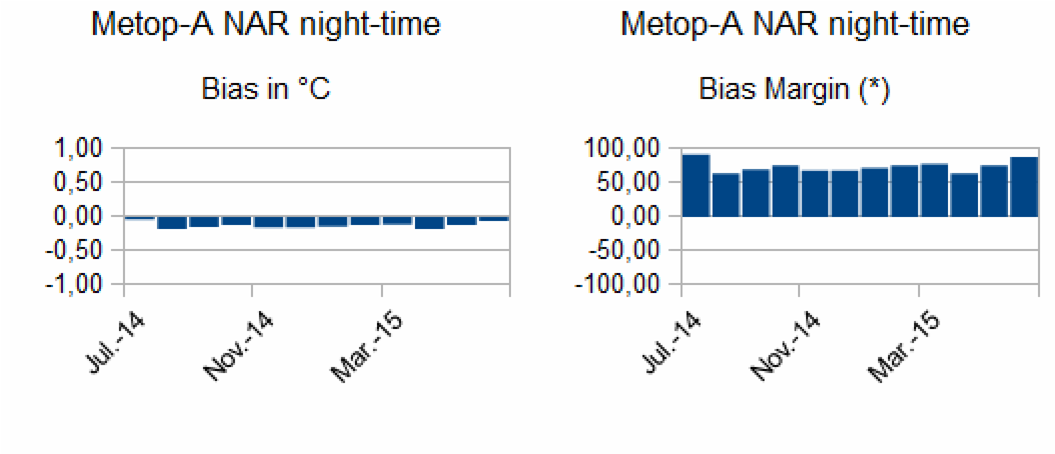

Figure 23 : Left: Metop-A NAR <u>night</u>-time SST Bias.
Right: Metop-A NAR <u>night</u>-time SST Bias Margin.

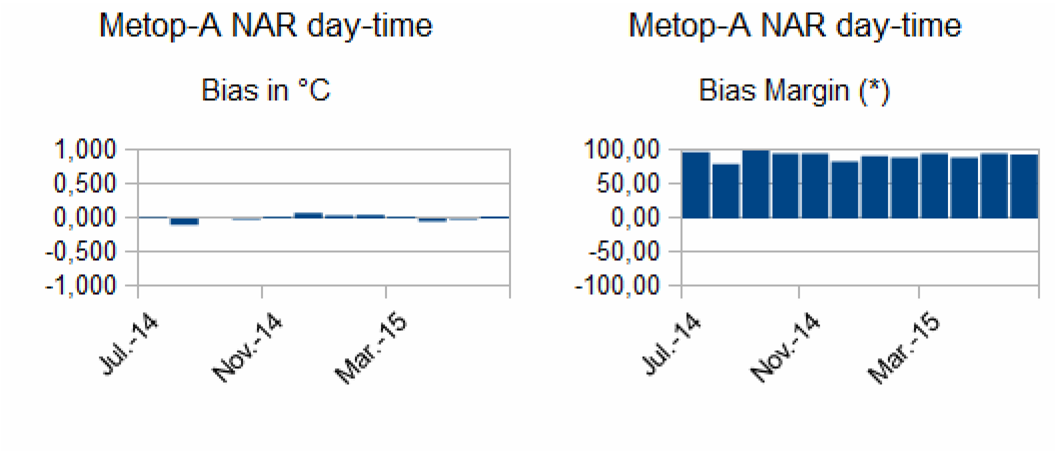

Figure 24 : Left: Metop-A NAR <u>day</u>-time SST Bias.
Right: Metop-A NAR <u>day</u>-time SST Bias Margin.

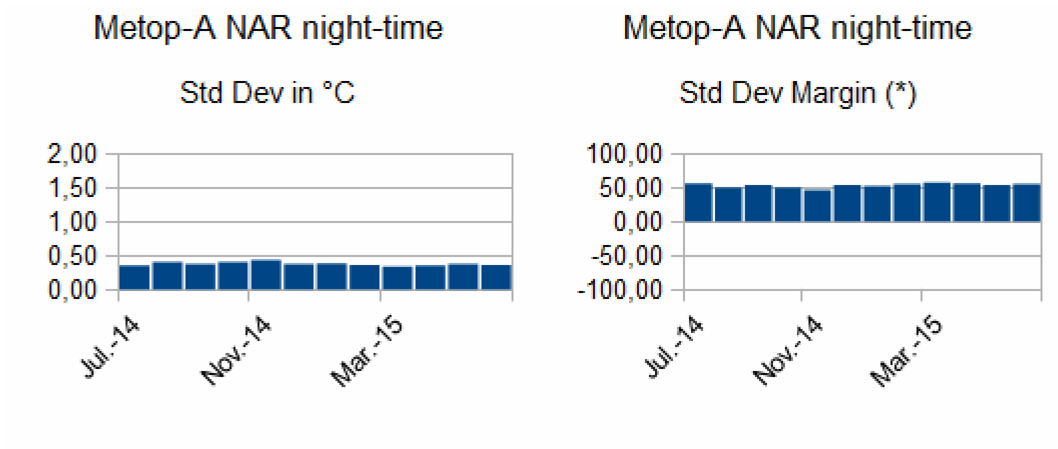

Figure 25 : Left: Metop-A NAR <u>night</u>-time SST Standard deviation.
Right: Metop-A NAR <u>night</u>-time SST Standard deviation Margin.

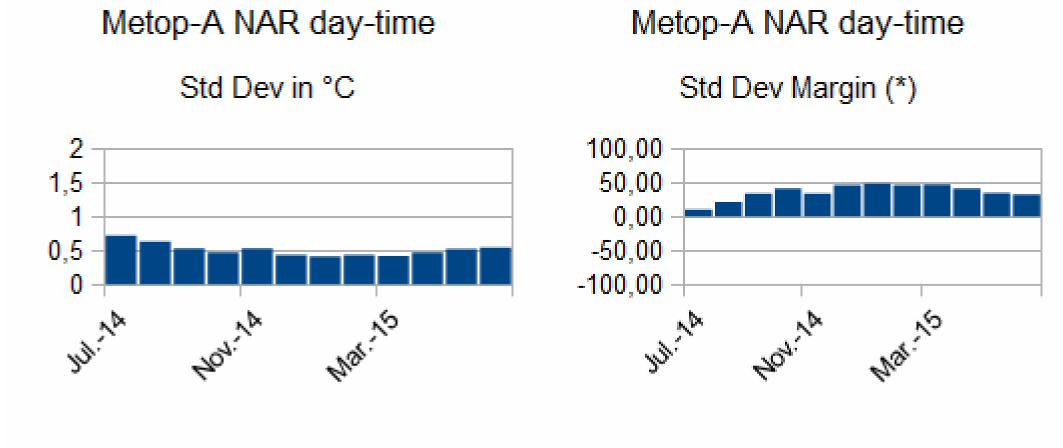

Figure 26 : Left: Metop-A NAR day-time SST Standard deviation.
Right: Metop-A NAR day-time SST Standard deviation Margin.

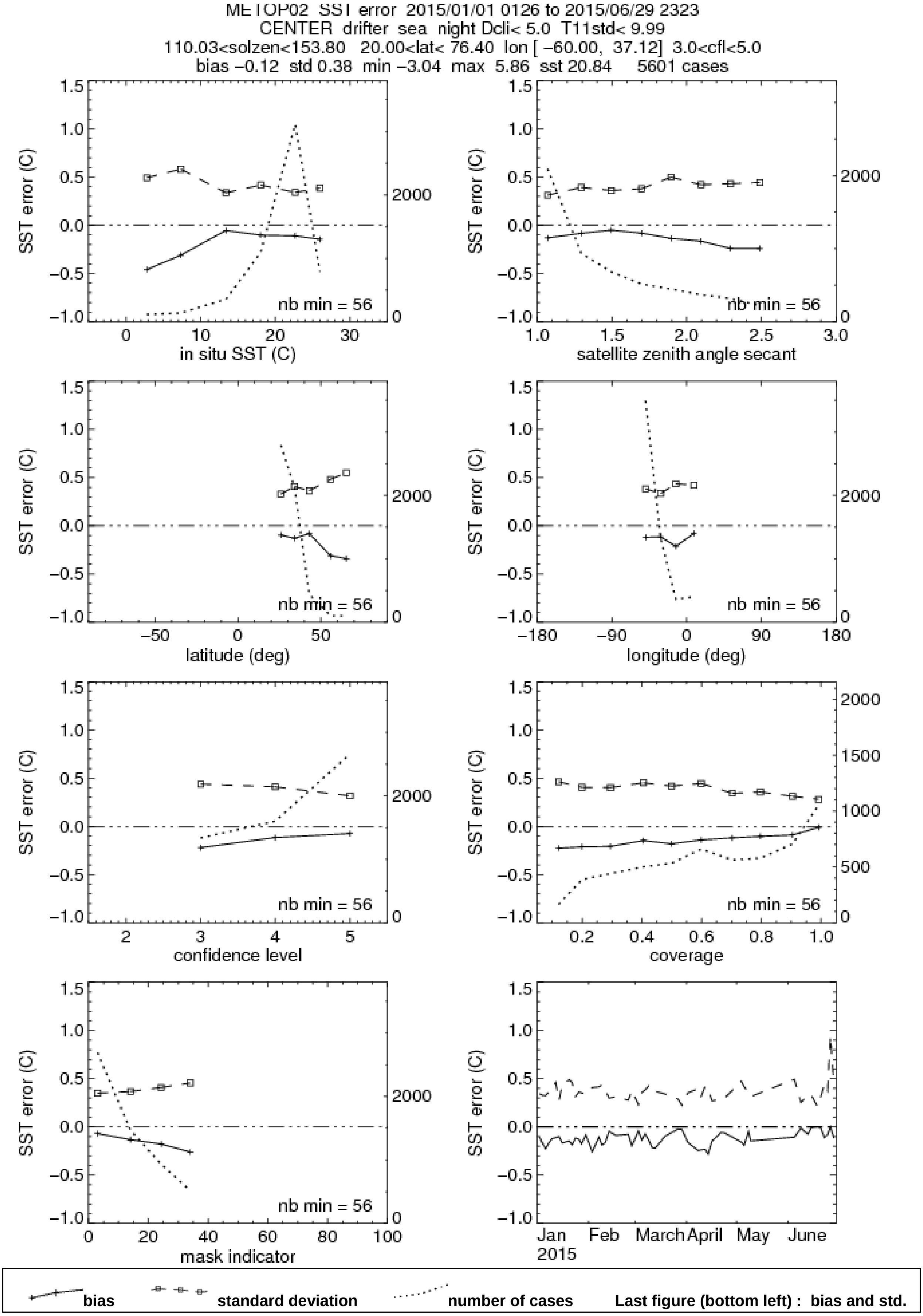

Figure 27 : Complementary quality assessment statistics on Metop NAR SST <u>night</u>-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

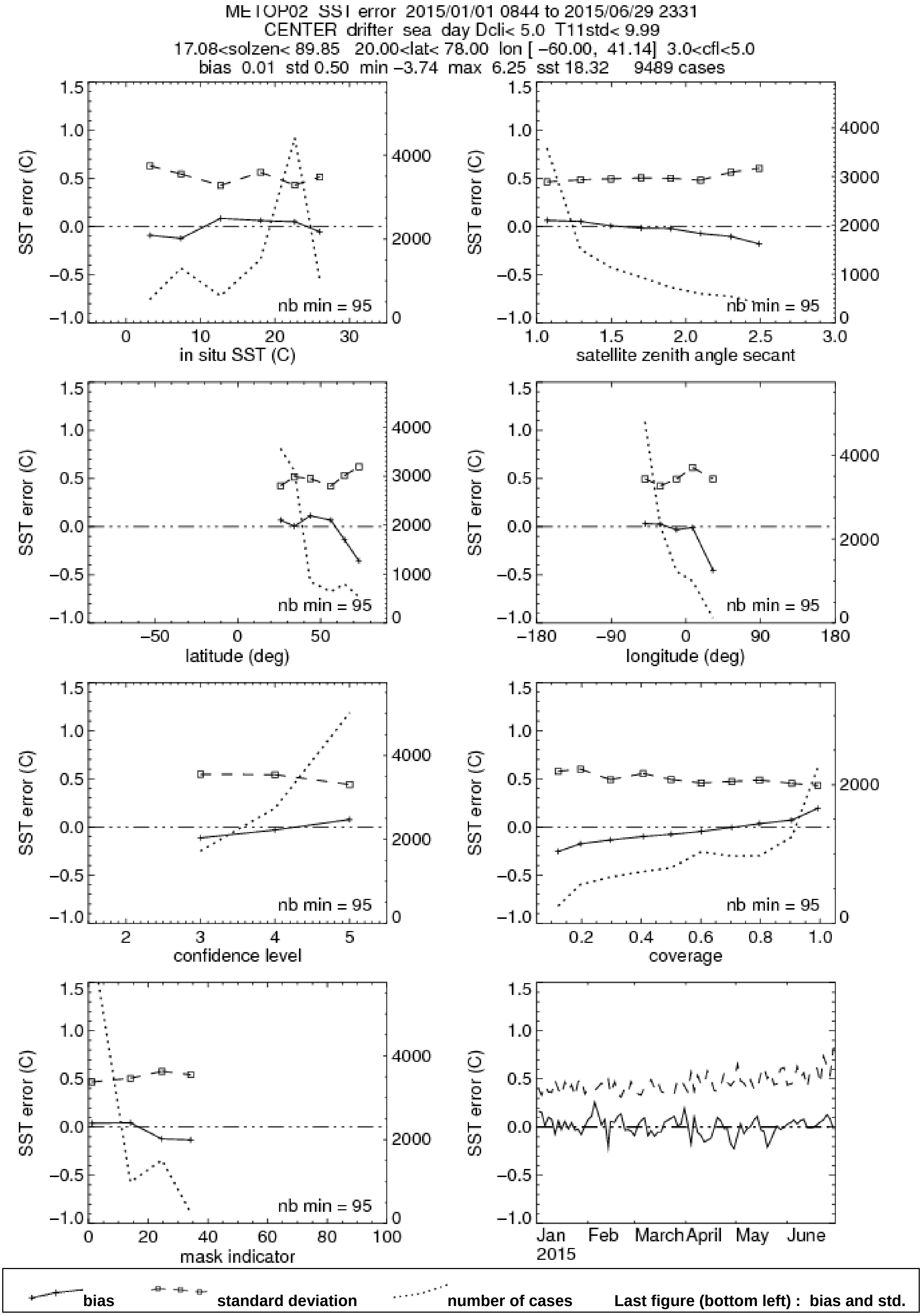

Figure 28 : Complementary quality assessment statistics on Metop NAR SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

5.1.4 GLB SST (OSI-201) and MGR SST (OSI-204) quality

The OSI SAF SST products on global coverage (GLB SST and MGR SST) are based on Metop/AVHRR data, currently Metop-A.
The following maps indicate the mean night-time and day-time SST error with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://www.osi-saf.org/production/cms/validation_sst_leo.php.

The validation Metop/AVHRR SST validation report v2.0 (http://www.osi-saf.org/biblio/docs/ss1_sst_metop_validation_report_2_0.pdf) gives further details about the regional bias observed and their origin.

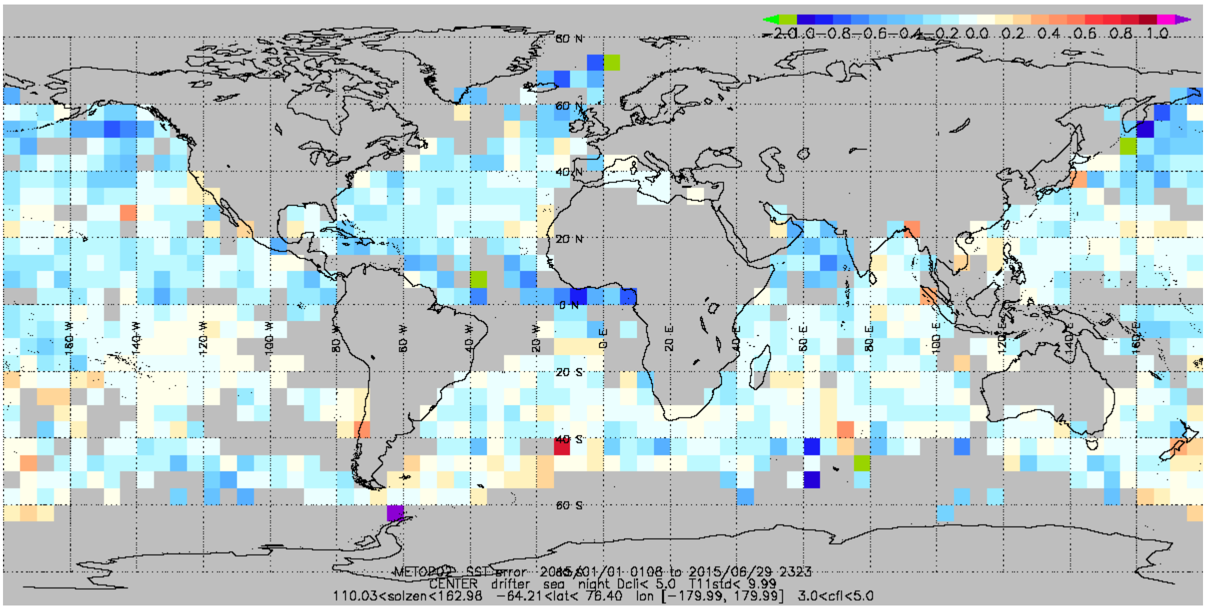

Figure 29 : mean Metop-A <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5

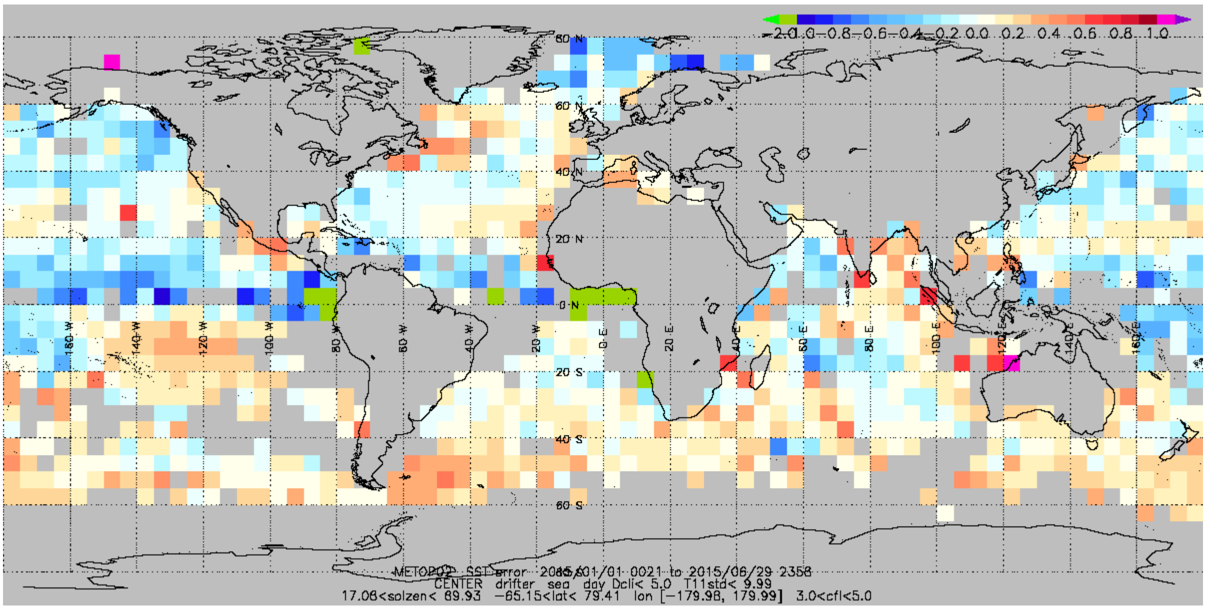

Figure 30 : mean Metop-A <u>day</u>-time SST error with respect to buoys measurements for quality level 3,4,5

The following table provides the METOP-derived SST quality results over the reporting period.

Global Metop-A night-time SST quality results over 1st half 2015							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2015	6874	-0.09	0.5	82.00	0.43	0.8	46.25
FEB. 2015	6001	-0.09	0.5	82.00	0.43	0.8	46.25
MAR. 2015	6588	-0.08	0.5	84.00	0.44	0.8	45.00
APR. 2015	5679	-0.13	0.5	74.00	0.4	0.8	50.00
MAY 2015	6571	-0.12	0.5	76.00	0.41	0.8	48.75
JUN. 2015	5794	-0.10	0.5	80.00	0.43	0.8	46.25
Global Metop-A day-time SST quality results over 1st half 2015							
JAN. 2015	8200	0.05	0.5	90.00	0.54	0.8	32.50
FEB. 2015	7042	0.09	0.5	82.00	0.5	0.8	37.50
MAR. 2015	7877	0.05	0.5	90.00	0.5	0.8	37.50
APR. 2015	7343	-0.010	0.5	98.00	0.54	0.8	32.50
MAY 2015	8747	-0.030	0.5	94.00	0.56	0.8	30.00
JUN. 2015	8685	-0.070	0.5	86.00	0.65	0.8	18.75
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

table 8 : Quality results for global METOP SST over 1st half 2015, for 3,4,5 quality indexes

Comments: Quality results are good and quite stable.
Regional biases visible on Figure 30 are unavoidable limitations due to the method of retrieval which cannot handle all types of atmosphere (humidity profiles).This features are particularly visible during day time because the SST algorithm is only based on 2 channels (11 and 12 micron). During night-time three channels (3.7, 11 and 12 micron) are used which makes the retrieval less sensitive to atmospheric conditions.
These biases are also visible on the latitude-dependence of the error on Figure 36 and they present a seasonal variability which is visible on the time evolution of the error on Figure 36.

The following graphs illustrate the evolution of global METOP SST quality results over the past 12 months.

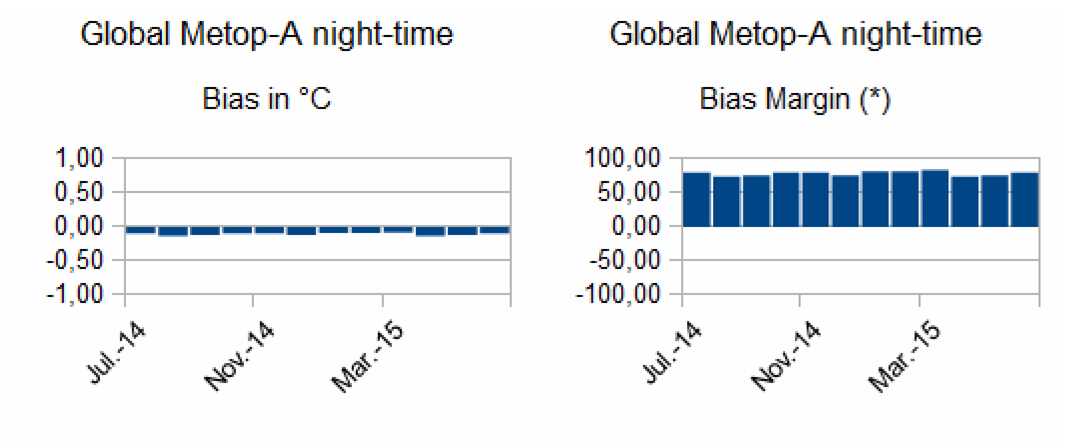

Figure 31 : Left : global Metop-A night-time SST Bias.
Right : global Metop-A night-time SST Bias Margin.

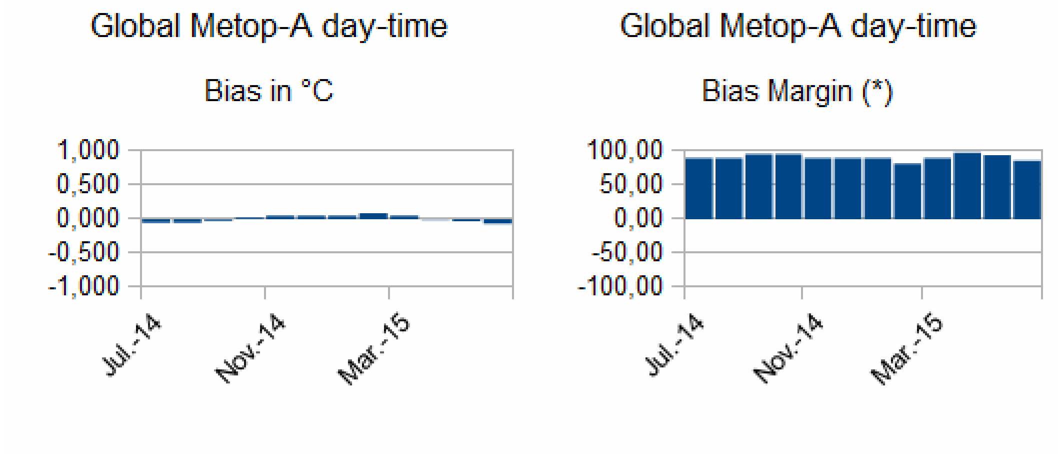

Figure 32 : Left : global Metop-A <u>day</u>-time SST Bias.
Right : global Metop-A <u>day</u>-time SST Bias Margin.

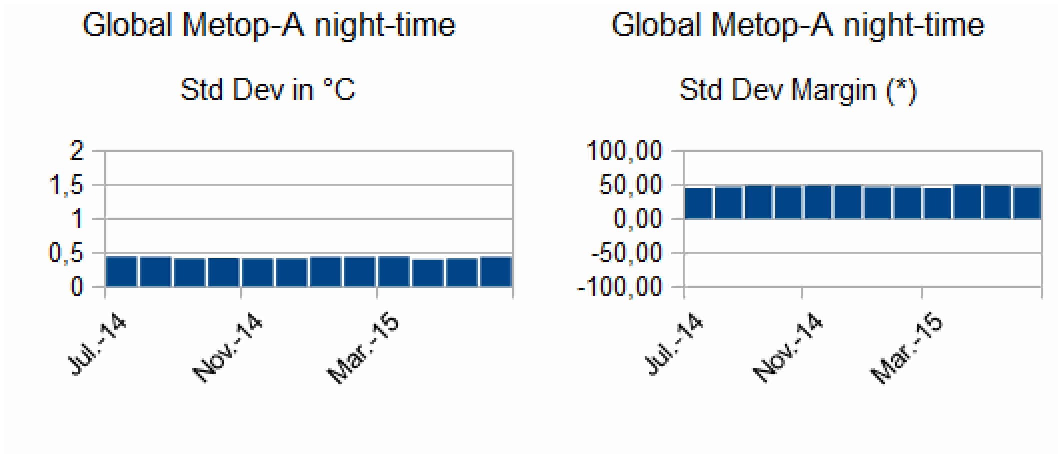

Figure 33 : Left: global Metop-A <u>night</u>-time SST Standard deviation.
Right: global Metop-A <u>night</u>-time SST Standard deviation Margin.

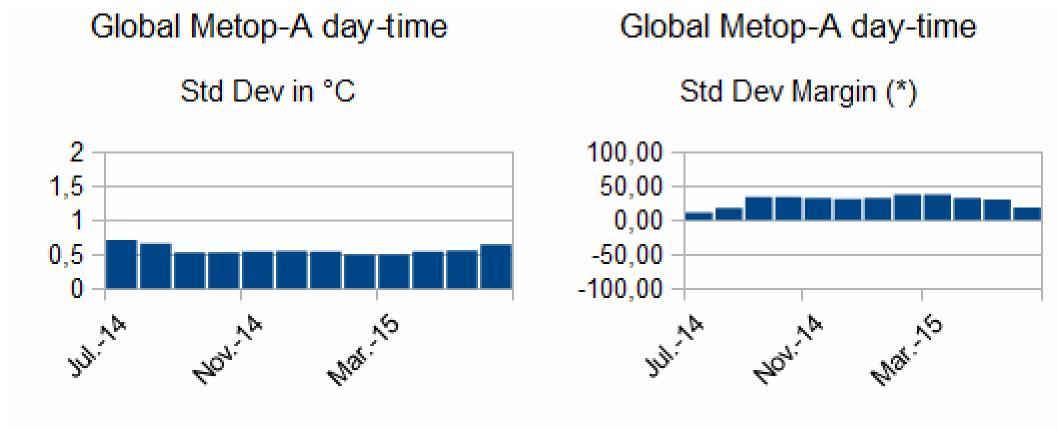

Figure 34 : Left: global Metop-A <u>day</u>-time SST Standard deviation.
Right: global Metop-A <u>day</u>-time SST Standard deviation Margin.

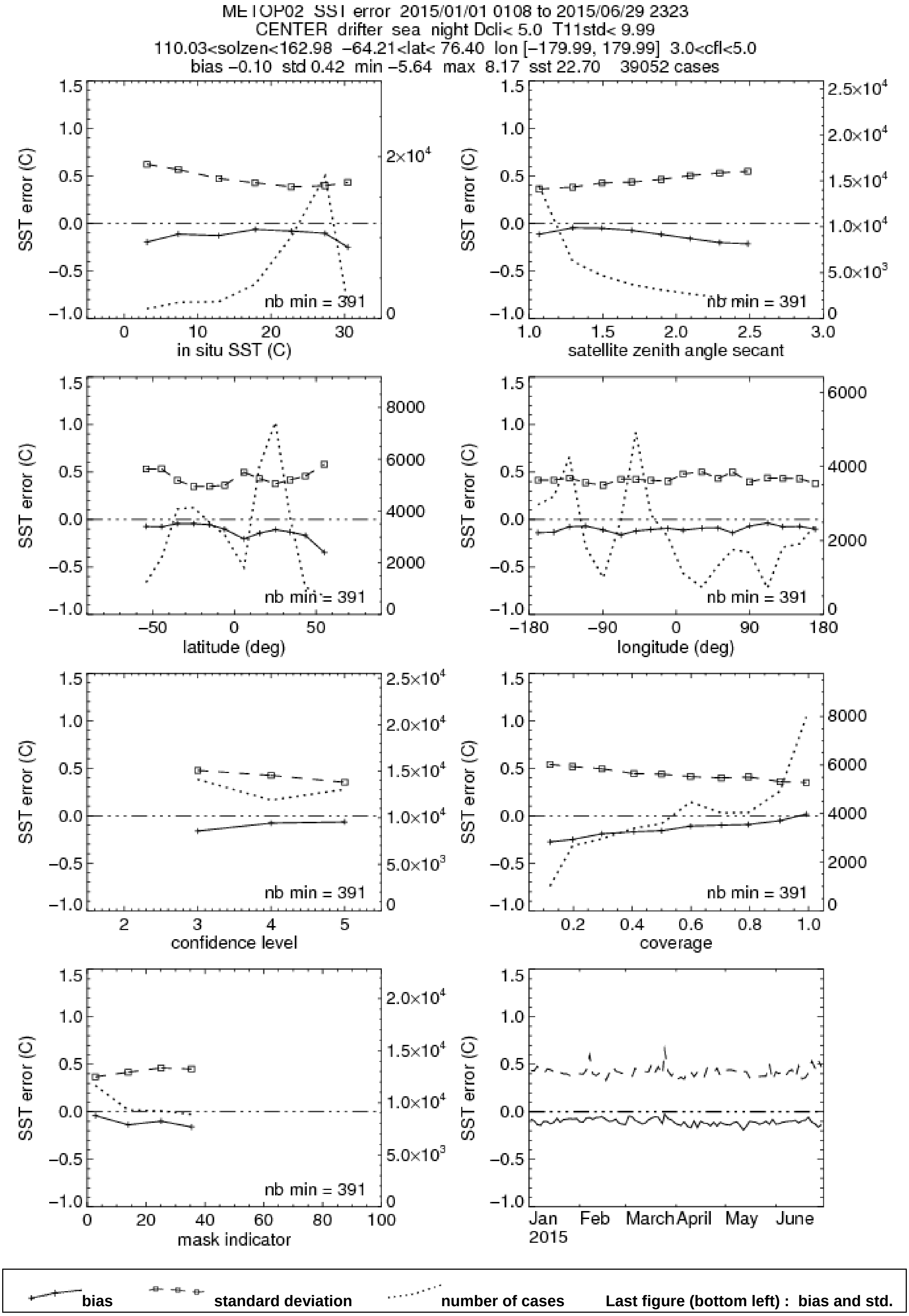

Figure 35 : Complementary quality assessment statistics on Metop GLB SST night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

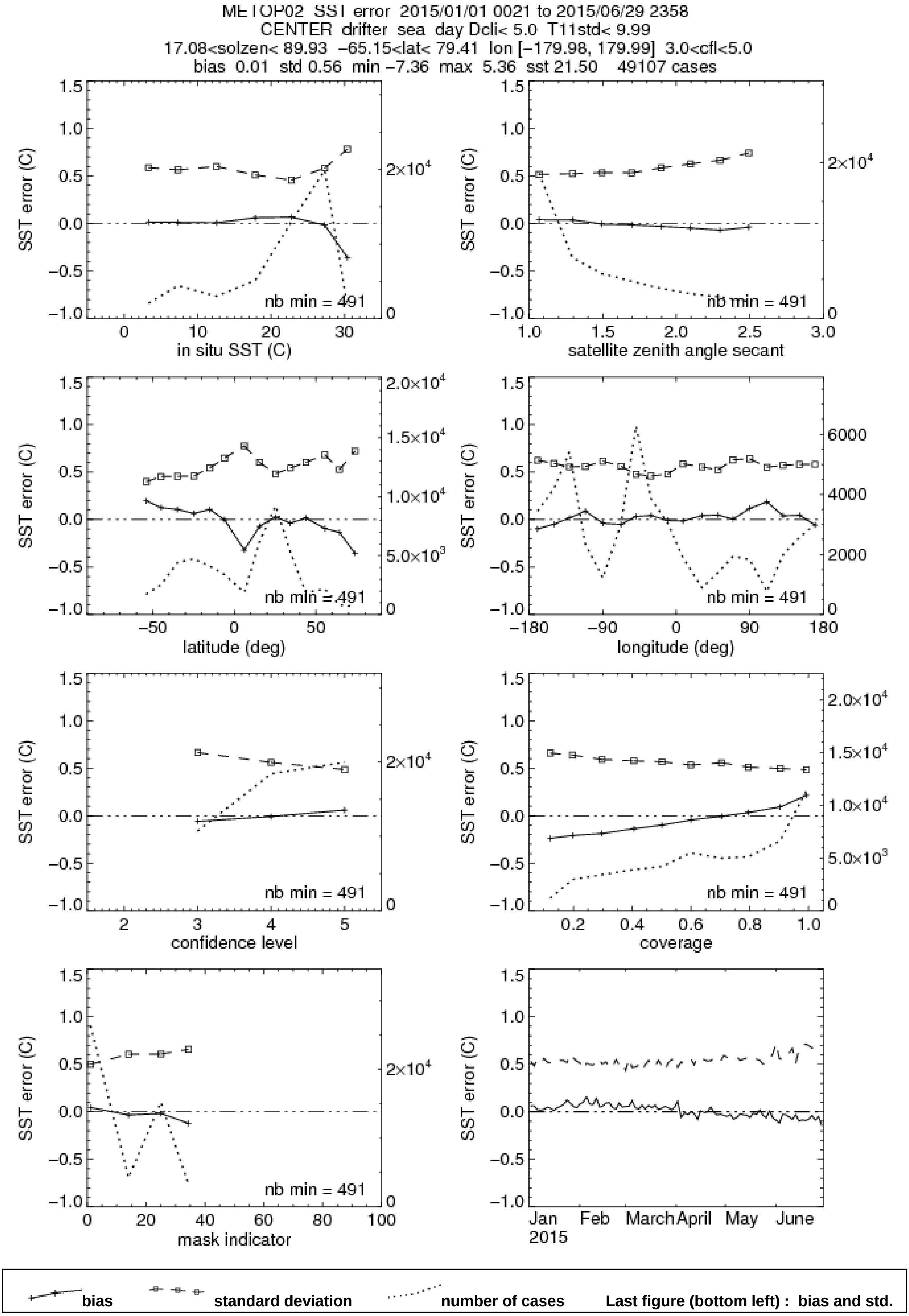

Figure 36 : Complementary quality assessment statistics on Metop GLB SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST, satellite zenith angle secant, latitude, longitude, confidence level, coverage, mask indicator and and time

5.1.5 AHL SST (OSI-203) quality

The Atlantic High Latitude SST (AHL SST) is derived from polar satellites data, currently AVHRR on NOAA-18, NOAA-19 and METOP-A.

The following table provides the AVHRR-derived AHL SST quality results over the reporting period.

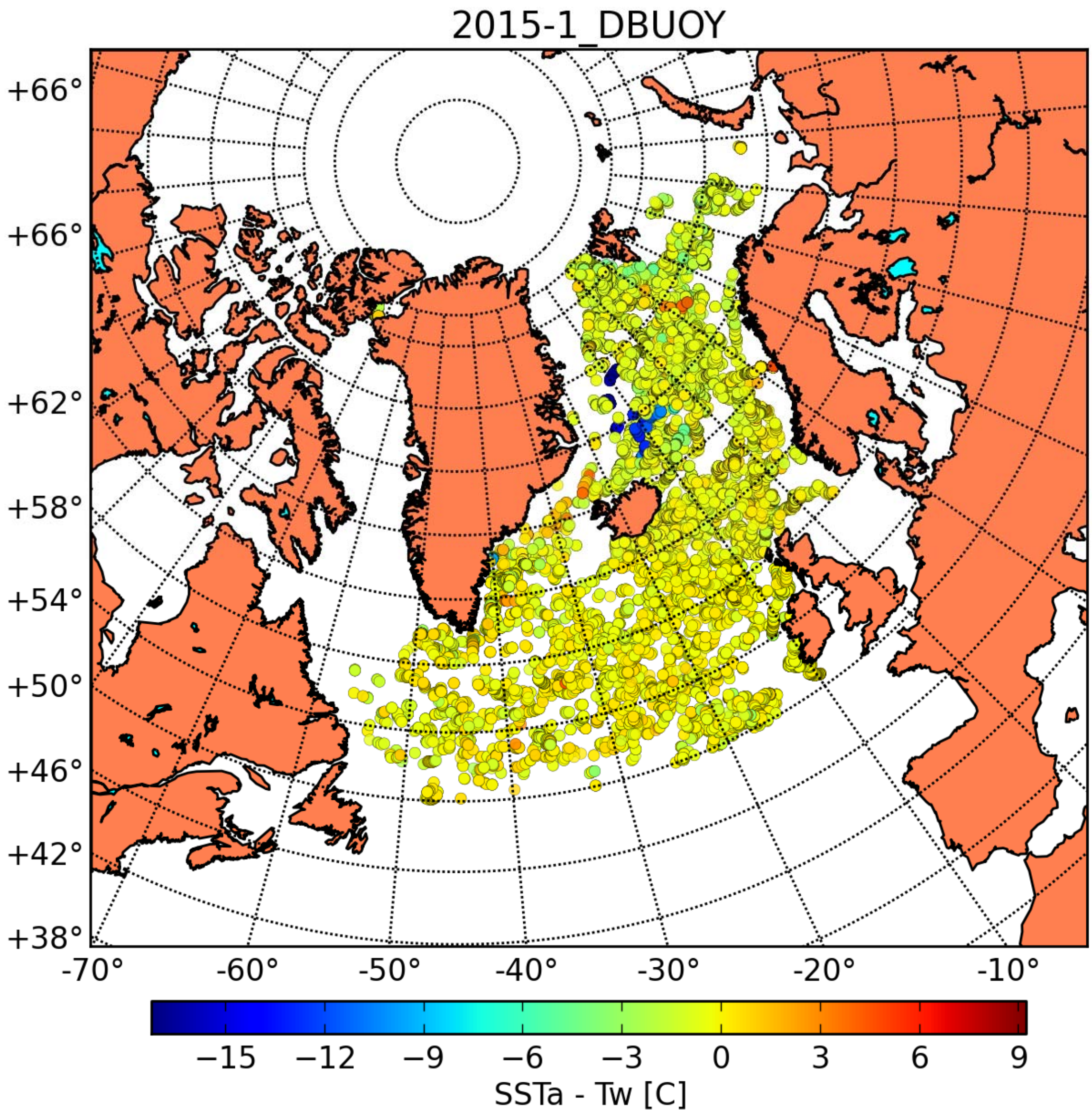

Figure 37 : JAN. 2015 to JUN. 2015 mean AHL night-time SST error with respect to buoys measurements for quality level 3,4,5

AHL AVHRR SST quality results over JUL.2014 to JUN. 2015, night-time							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JUL.2014	1219	-0.41	0.5	18.65	1.06	0.8	-32.59
AUG.2014	1606	-0.57	0.5	-13.27	1.02	0.8	-27.14
SEP.2014	1743	-0.57	0.5	-14.37	0.86	0.8	-7.75
OCT.2014	1668	-0.47	0.5	6.59	0.70	0.8	12.05
NOV.2014	1294	-0.47	0.5	6.87	0.74	0.8	7.73
DEC.2014	945	-0.58	0.5	-16.56	0.75	0.8	5.86
JAN. 2015	1142	-0.54	0.5	-8.56	0.75	0.8	6.54
FEB. 2015	774	-0.47	0.5	5.01	0.81	0.8	-1.60
MAR. 2015	1274	-0.43	0.5	14.20	0.73	0.8	9.34
APR. 2015	1482	-0.43	0.5	13.44	0.77	0.8	3.37
MAY 2015	1255	-0.34	0.5	32.94	0.70	0.8	12.50
JUN. 2015	526	-0.21	0.5	57.37	0.84	0.8	-5.22
AHL AVHRR SST quality results over JUL.2014 to JUN. 2015, day-time							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JUL.2014	1200	-0.20	0.5	60.38	0.82	0.8	-2.01
AUG.2014	1477	-0.31	0.5	38.25	0.80	0.8	-0.55
SEP.2014	1613	-0.34	0.5	31.55	0.67	0.8	16.06
OCT.2014	1539	-0.47	0.5	5.64	0.73	0.8	8.71
NOV.2014	1266	-0.56	0.5	-12.62	0.77	0.8	3.69
DEC.2014	1019	-0.58	0.5	-15.89	0.74	0.8	7.34
JAN. 2015	1253	-0.61	0.5	-21.27	0.74	0.8	7.76
FEB. 2015	772	-0.48	0.5	4.97	0.79	0.8	1.06
MAR. 2015	1087	-0.34	0.5	31.56	0.66	0.8	17.34
APR. 2015	1307	-0.26	0.5	48.14	0.53	0.8	33.22
MAY 2015	1217	-0.21	0.5	57.97	0.60	0.8	24.93
JUN. 2015	565	-0.03	0.5	93.04	0.65	0.8	18.90
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

table 9 : **Quality results for AHL AVHRR SST over JUL.2014 to JUN. 2015, for 3,4,5 quality indexes, by night and by day.**

Comments:

The night time results are for the AHL 12 hourly product centered at 00 UTC. The results for first half of 2015 show a general cold bias, slightly below the requirement for January. The standard deviation is usually within the requirement except slightly above in February and June.
The daytime results are all within the requirement for first half of 2015, except a cold bias in January. So the daytime results are better than the night time results. This is probably because cloud masks are usually less accurate at nighttime, and undetected clouds will lead to a cold bias in the SST products.

5.1.6 IASI SST (OSI-208) quality

The product requirements for IASI SSTs are to have a target accuracy of 0.5K bias and 0.8K standard deviation compared to drifting buoy SSTs.

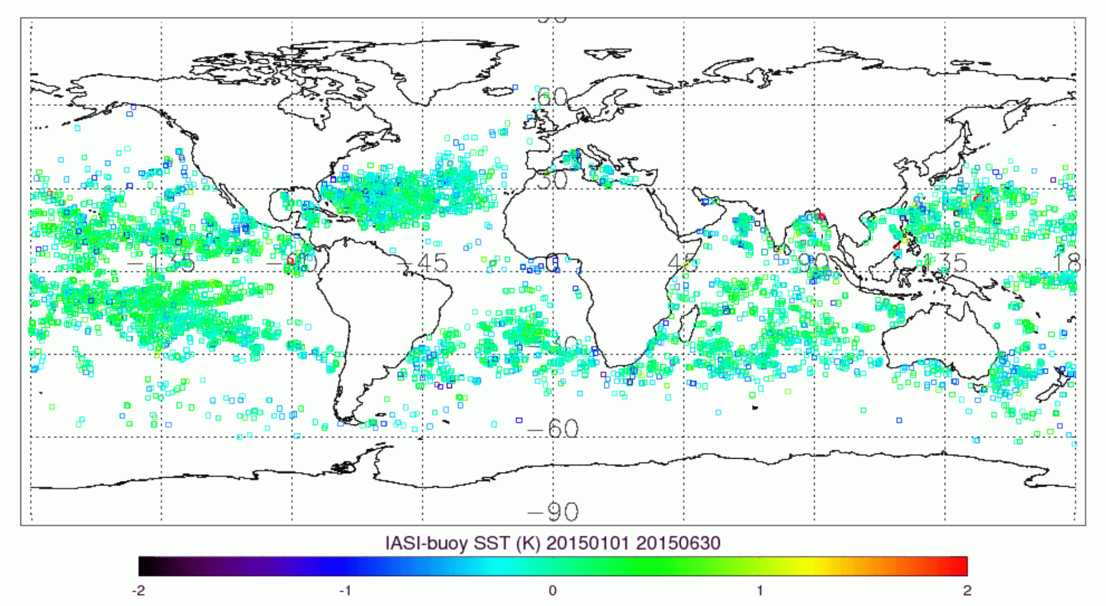

Figure 38 : Mean Metop-A IASI <u>night</u>-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 January to June 2015

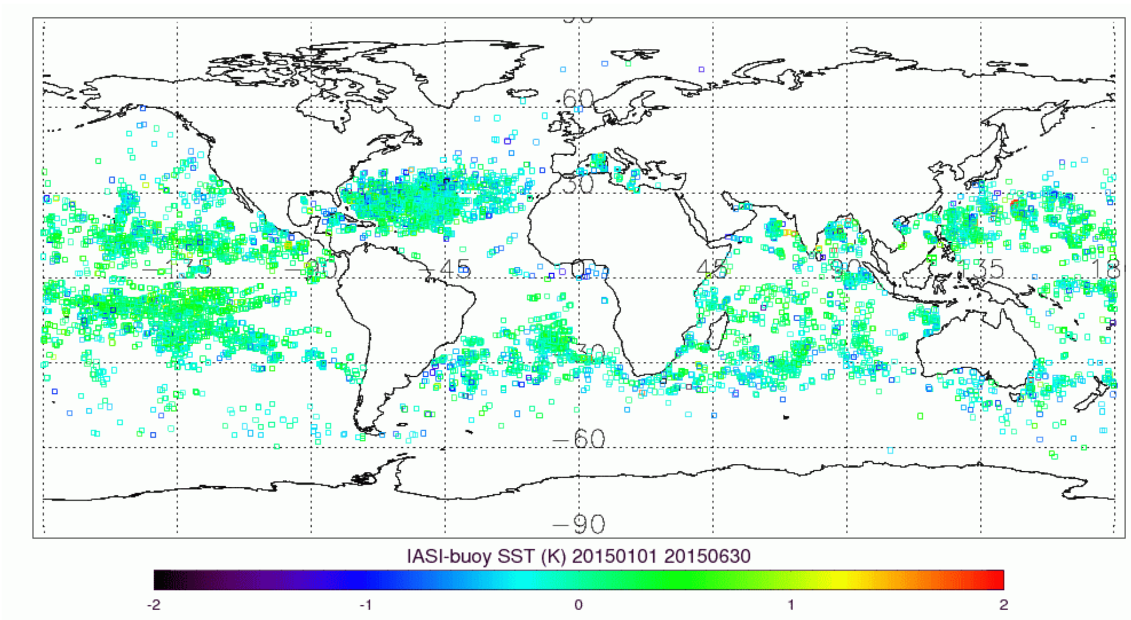

Figure 39 : Mean Metop-A IASI <u>day</u>-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 January to June 2015

The following table provides the METOP-A derived IASI SST quality results over the reporting period.

Global Metop-A IASI night-time SST quality results over 1st half 2015							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)

JAN. 2015	2742	0.01	0.5	98	0.35	0.8	56.25
FEB. 2015	2915	0.01	0.5	98	0.37	0.8	53.75
MAR. 2015	2804	-0.03	0.5	94	0.38	0.8	52.5
APR. 2015	1394	-0.05	0.5	90	0.37	0.8	53.75
MAY 2015	3172	-0.06	0.5	88	0.37	0.8	53.75
JUN. 2015	2845	-0.17	0.5	66	0.42	0.8	47.5
Global Metop-A IASI day-time SST quality results over 1st half 2015							
JAN. 2015	3037	0.05	0.5	90	0.37	0.8	53.75
FEB. 2015	2373	0.01	0.5	98	0.35	0.8	56.25
MAR. 2015	3650	-0.02	0.5	96	0.39	0.8	51.25
APR. 2015	2113	-0.03	0.5	94	0.39	0.8	51.25
MAY 2015	2986	-0.03	0.5	94	0.35	0.8	56.25
JUN. 2015	3200	0.02	0.5	96	0.42	0.8	47.5
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

table 10 : **Quality results for global METOP-A IASI SST January to June 2015, for Quality Levels 3, 4 and 5**

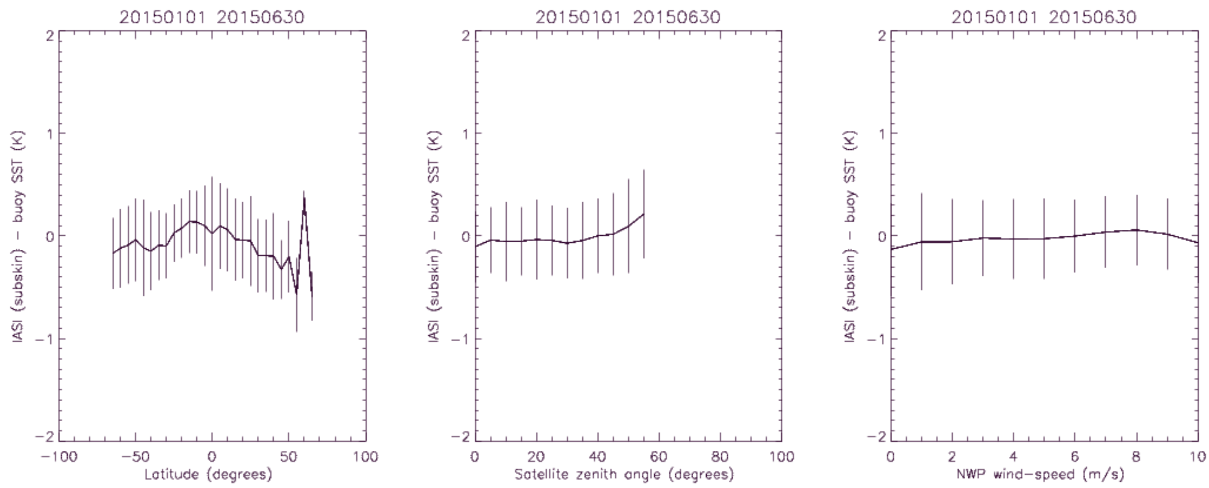

Figure 40 : **Mean Metop-A IASI night-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5 January to June 2015**

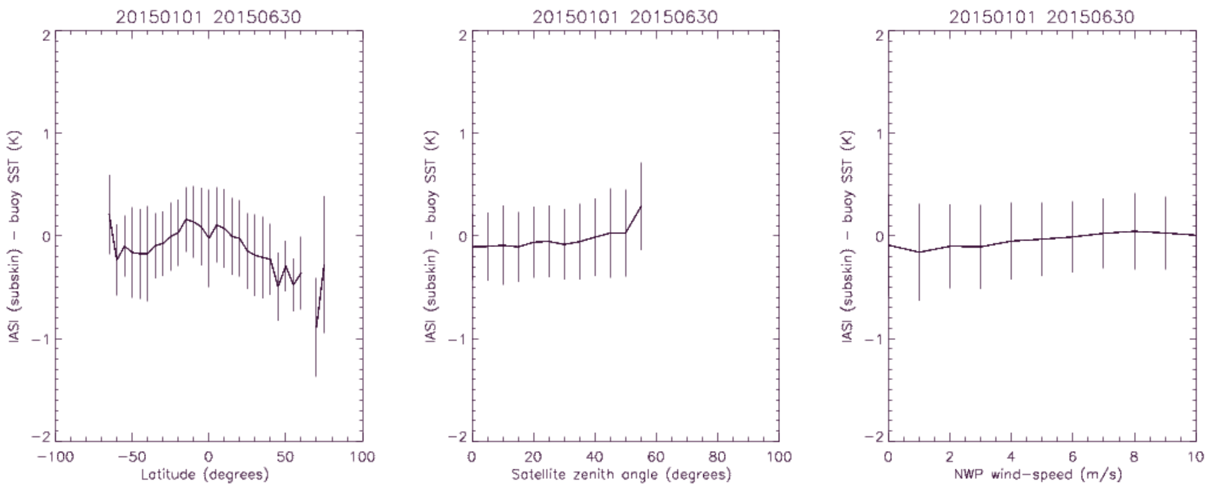

Figure 41 : **Mean Metop-A IASI day-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5 January to June 2015**

Comments:

Over the six month reporting period the night-time mean IASI bias (for quality levels 3 and above) against drifting buoy SSTs is -0.04K with a standard deviation of 0.38K (n=16878); and the day-time mean bias is -0.01K, standard deviation 0.38K (n=17443). The monthly mean and whole time period results are within the target accuracy.

5.2 Radiative Fluxes quality

5.2.1 DLI quality

DLI products are constituted of the geostationary products (METEOSAT DLI and GOES-E DLI) and the polar ones (AHL DLI). DLI values are required to have the following accuracy when compared to land pyrgeometer measurements :

- monthly relative bias less than 5%,
- monthly difference standard deviation less than 10%.

The match-up data base the statistics are based on is continuously enriched, so that, for the same period, results may evolve depending on the date when the statistics were calculated.

5.2.1.1 METEOSAT DLI (OSI-303) and GOES-E DLI (OSI-305) quality

The list of pyrgeometer stations used for validating the geostationary DLI products is available on the OSI SAF Web Site from the following page:
http://www.osi-saf.org/voir_images.php?image1=/images/flx_map_stations_2b.gif

The following table provides the geostationary DLI quality results over the reporting period.

Geostationary METEOSAT & GOES-E DLI quality results over 1st half 2015										
Month	Number of cases	Mean DLI in Wm^{-2}	Bias in Wm^{-2}	Bias in %	Bias Req In %	Bias Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev Req In %	Std Dev margin (**) in %
JAN. 2015	4246	267.83	-8.71	-3.25	5.0	34.96	7.67	7.67	10.0	23.27
FEB. 2015	4044	261.75	-8.38	-3.20	5.0	35.97	8.39	8.39	10.0	16.14
MAR. 2015	4369	289.71	-7.22	-2.49	5.0	50.16	6.55	6.55	10.0	34.45
APR. 2015	4212	308.57	-3.68	-1.19	5.0	76.15	5.39	5.39	10.0	46.14
MAY 2015	5758	333.58	-0.69	-0.21	5.0	95.86	5.01	5.01	10.0	49.94
JUN. 2015	4868	361.97	-2.27	-0.63	5.0	87.46	4.78	4.78	10.0	52.18
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.										

table 11 : Geostationary DLI quality results over 1st half 2015.

Comments: The negative DLI bias observed from January to March is typical of winter conditions. The formation of inversion layers during clear nights reduced the air temperature at 2 m compared to the atmospheric upper layer temperatures. The DLI algorithm only uses the 2m temperature, leading to an underestimation in such conditions.

The following graphs illustrate the evolution of Geostationary DLI quality over the past 12 months.

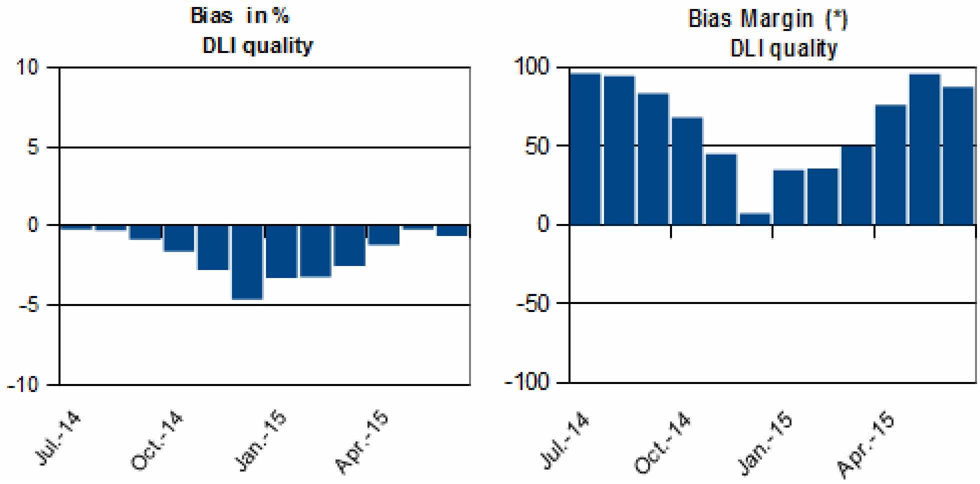

Figure 42 : **Left: Geostationary DLI Bias. Right Geostationary DLI Bias Margin .**

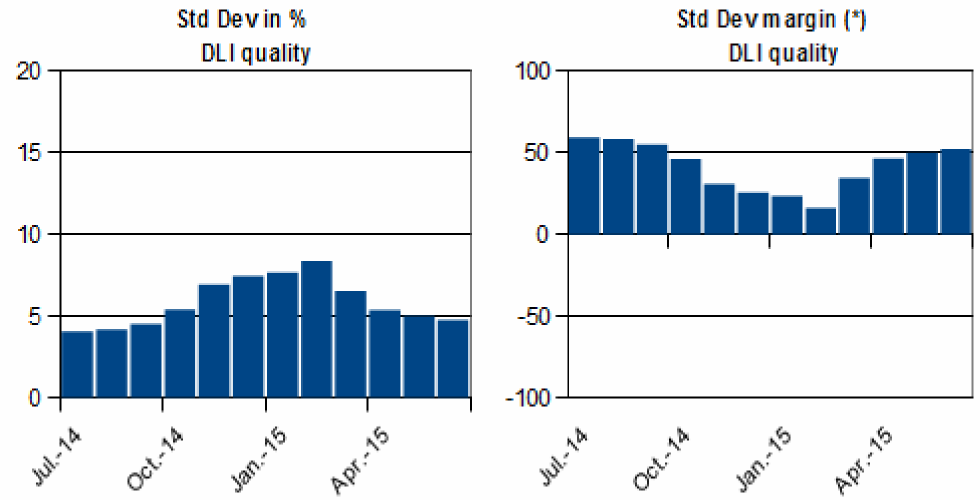

Figure 43 : **Left: Geostationary DLI Standard deviation. Right DLI Geostationary Standard deviation Margin.**

5.2.1.2 AHL DLI (OSI-301) quality

The pyrgeometer stations used for quality assessment of the AHL DLI product are selected stations from Table 14. Specifically the following stations are currently used.

- Ekofisk
- Jan Mayen
- Bjørnøya
- Hopen
- Schleswig
- Hamburg-Fuhlsbuettel
- Sodankylä
- Kiruna
- Svenska Högarna
- Visby

More information on the stations is provided in 5.2.2.2.

The following table provides the AHL DLI quality results over the reporting period.

AHL DLI quality results over JUL.2014 to JUN. 2015								
Month	Number of cases	Mean DLI in Wm^{-2}	Bias in %	Bias Req In %	Bias Marg in %(*)	Std Dev In %	Std Dev Req In %	Std Dev margin (**) in %
JUL.2014	341	346.38	5.57	4.49	5.0	10.2	10.46	3.03
AUG.2014	296	336.82	1.37	4.24	5.0	15.2	10.58	3.17
SEP.2014	291	317.36	-1.04	2.48	5.0	50.4	14.41	4.58
OCT.2014	310	308.89	2.22	1.46	5.0	70.8	14.66	4.82
NOV.2014	290	294.37	8.32	2.96	5.0	40.8	13.65	4.79
DEC.2014	300	277.05	5.56	2.97	5.0	40.6	15.07	5.54
JAN. 2015	248	278.31	4.61	2.99	5.0	40.2	15.69	5.85
FEB. 2015	303	270.29	1.47	0.90	5.0	82	15.17	5.78
MAR. 2015	300	277.01	-1.66	1.23	5.0	75.4	14.67	5.35
APR. 2015	327	281.41	-2.28	2.46	5.0	50.8	12.49	4.44
MAY 2015	339	297.38	-3.48	2.96	5.0	40.8	12.96	4.37
JUN. 2015	316	312.44	0.13	3.71	5.0	25.8	11.78	3.78
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.								

table 12 : AHL DLI quality results over JUL.2014 to JUN. 2015.

Comments: The requirement was met in all months for this reporting period for both bias and standard deviation. No difference between southern and northern stations are evident from the validation performed this time. Issues with the cloud mask/type are still under investigation.

5.2.2 SSI quality

SSI products are constituted of the geostationary products (METEOSAT SSI and GOES-E SSI) and polar ones (AHL SSI). SSI values are required to have the following accuracy when compared to land pyranometer measurements :

- monthly relative bias less than 10%,
- monthly difference standard deviation less than 30%.

The match-up data base the statistics are based on is continuously enriched, so that, for the same period, results may evolve depending on the date when the statistics were calculated.

5.2.2.1 METEOSAT SSI (OSI-304) and GOES-E SSI (OSI-306) quality

The list of pyranometer stations used for validating the geostationary SSI products is available on the OSI SAF Web Site from the following page:
http://www.osi-saf.org/voir_images.php?image1=/images/flx_map_stations_2b.gif

The following table provides the geostationary SSI quality results over the reporting period.

Geostationary METEOSAT & GOES-E SSI quality results over 1st half 2015										
Month	Number of cases	Mean SSI in Wm^{-2}	Bias in Wm^{-2}	Bias in %	Bias Req in %	Bias Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev Req in %	Std Dev margin (**) in %
JAN. 2015	4499	309.5	18.47	5.97	10.0	40.32	84.69	27.36	30.0	8.79
FEB. 2015	5232	351.71	18.15	5.16	10.0	48.39	91.78	26.10	30.0	13.02
MAR. 2015	5973	378.68	26.72	7.06	10.0	29.44	97.77	25.82	30.0	13.94
APR. 2015	6366	449.83	22.69	5.04	10.0	49.56	84.7	18.83	30.0	37.24
MAY 2015	8295	456.76	5.41	1.18	10.0	88.16	82.8	18.13	30.0	39.57
JUN. 2015	7889	483	8.9	1.84	10.0	81.57	85.84	17.77	30.0	40.76
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.										

table 13 : Geostationary SSI quality results over 1st half 2015.

Comments: A positive SSI bias is observed from January to April, due to the stations located in Guyana and Carribean, and probably corresponding to questionable data at 3 stations. The pyranometer calibration coefficient values at these stations have been checked, showing no obvious anomaly. Two stations, Desaix and Rochambeau, show results returning to normal in May, while Le Raizet (Guadeloupe island) still show a positive SSI bias.

The following graphs illustrate the evolution of Geostationary SSI quality over the past 12 months.

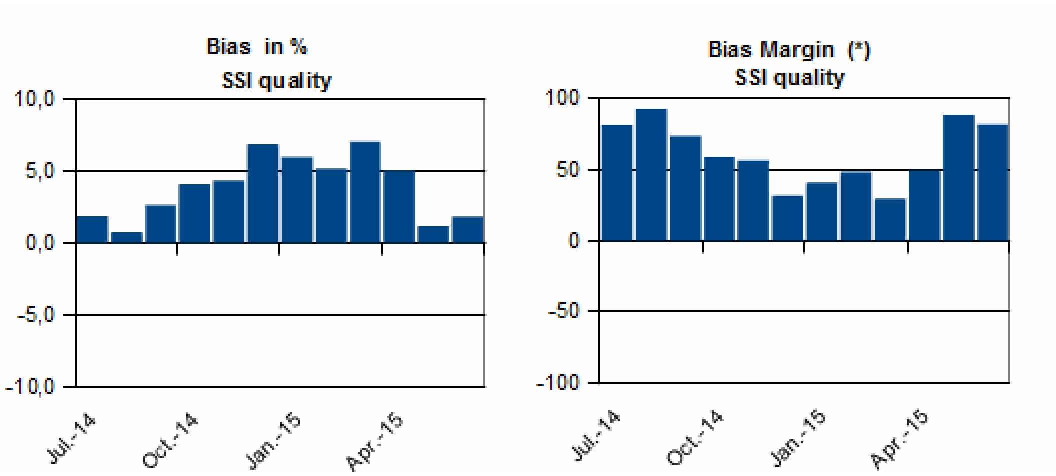

Figure 44 : Left: Geostationary SSI Bias. Right Geostationary SSI Bias Margin.

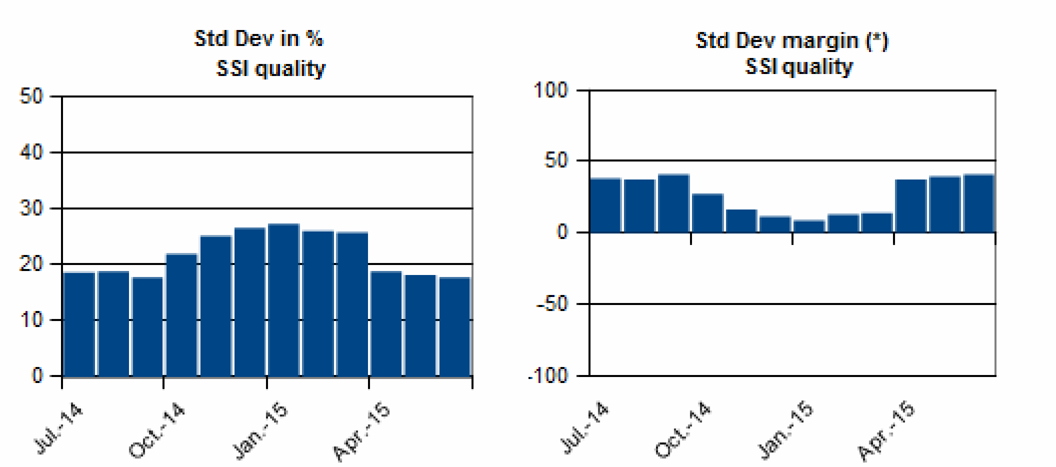

Figure 45 : Left: Geostationary SSI Standard deviation. Right Geostationary SSI Standard deviation Margin.

5.2.2.2 AHL SSI (OSI-302) quality

The pyranometer stations used for quality assessment of the AHL SSI and DLI products are shown in the following table.

Station	StId	Latitude	Longitude		Status
Apelsvoll	11500	60.70°N	10.87°E	SSI	In use, under examination due to shadow effects.
Løken	23500	61.12°N	9.07°E	SSI	Not used currently
Landvik	38140	58.33°N	8.52°E	SSI	In use
Særheim	44300	58.78°N	5.68°E	SSI	In use
Fureneset	56420	61.30°N	5.05°E	SSI	In use
Tjøtta	76530	65.83°N	12.43°E	SSI	In use
Ekofisk	76920	56.50°N	3.2°E	SSI, DLI	In use, minor shadow effects at certain directions.
Holt	90400	69.67°N	18.93°E	SSI	Not used currently
Bjørnøya	99710	74.52°N	19.02°E	SSI, DLI	In use, Arctic station with snow on ground much of the year.
Jan_Mayen	99950	70.93°N	-8.67°E	SSI, DLI	In use, Arctic station with snow on ground much of the year, volcanic ash deteriorates instruments in periods.
Schleswig	10035	54.53°N	9.55°E	SSI, DLI	In use
Hamburg-Fuhlsbuettel	10147	53.63°N	9.99°E	SSI, DLI	In use
Jokioinen	1201	60.81°N	23.501°E	SSI	In use
Sodankylä	7501	67.37°N	26.63°E	SSI, DLI	In use
Kiruna	02045	67.85°N	20.41°E	SSI, DLI	Only DLI used so far.

Station	StId	Latitude	Longitude		Status
Visby	02091	57.68°N	18.35°E	SSI, DLI	Only DLI used so far.
Svenska Högarna	02492	59.45°N	19.51°E	SSI, DLI	Only DLI used so far.

table 14 : ***Validation stations that are currently used for AHL radiative fluxes quality assessment.***

The stations used in this validation is owned and operated by the *Norwegian Meteorological Institute*, *University of Bergen, Geophysical Institute, Bioforsk, FMI and DWD. Data from DWD are extracted from WMO GTS, data from the other sources are received by email and direct connections. More stations are being considered for inclusion.*
Ekofisk is still scheduled for removal as the platform is being phased out. However, it is still available and discussions on how to continue these measurements continue. It is however expected that this station will be unavailable for some periods when the platform is removed.

The pyranometer stations used for validation of the AHL SSI product are selected stations from table 14. There are some differences in the stations used for SSI validation compared to DLI. The reason for this is partly the observation programme at stations, but also that SSI validation is more sensitive to station characteristics than DLI.
The following stations are currently used:

- Apelsvoll
- Landvik
- Særheim
- Fureneset
- Tjøtta
- Ekofisk
- Jan Mayen
- Bjørnøya
- Hopen
- Schleswig
- Hamburg-Fuhlsbuettel
- Jokioinen

A report from OSI SAF about the validation data used for validating the high latitude surface radiative flux products is available here :
http://osisaf.met.no/docs/osisaf_cdop2_ss2_rep_flux-val-data_v1p0.pdf

The following table provides the AHL SSI quality results over the reporting period.

AHL SSI quality results over JUL. 2014 to JUN. 2015										
Month	Number of cases	Mean SSI in Wm^{-2}	Bias in Wm^{-2}	Bias in %	Bias Req in %	Bias Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev Req in %	Std Dev margin (**) in %
JUL.2014	243	5.08	2.57	42.61	10.0	-326.1	5.40	68.73	30.0	-129.1
AUG.2014	219	20.16	1.62	13.78	10.0	-37.8	7.62	37.02	30.0	-23.4
SEP.2014	243	68.51	5.39	12.54	10.0	-25.4	12.46	18.94	30.0	36.87
OCT.2014	235	136.38	7.60	8.40	10.0	16	15.57	11.67	30.0	61.1
NOV.2014	215	198.49	13.31	8.37	10.0	16.3	23.06	11.69	30.0	61.03
DEC.2014	232	223.48	2.55	6.53	10.0	34.7	28.05	12.86	30.0	57.13
JAN. 2015	366	12.18	3.53	31.82	10.0	-218.2	8.34	50.54	30.0	-68.47
FEB. 2015	327	25.81	3.44	35.02	10.0	-250.2	12.23	62.20	30.0	-107.33
MAR. 2015	354	71.31	6.48	12.54	10.0	-25.4	13.97	23.32	30.0	22.27
APR. 2015	354	137.44	8.77	8.17	10.0	18.3	22.81	17.65	30.0	41.17
MAY 2015	366	173.51	15.34	9.06	10.0	9.4	27.94	16.28	30.0	45.73
JUN. 2015	348	210.39	15.24	8.82	10.0	11.8	29.92	14.42	30.0	51.93
(*) Bias Margin = 100 * (1 - (|Bias / Bias Req|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.										

table 15 : AHLSSI quality results over JUL. 2014 to JUN. 2015

Comments :

The validation requirements for this reporting period were met in April through June for the bias and March through June for the standard deviation. As mentioned in the previous half-yearly report, work is in progress to improve the performance over snow covered surfaces, and there is also ongoing work to further examine the characteristics of the validation stations handled. Besides the issues raised earlier with snow covered surfaces and the performance of the cloud mask in certain regions, some issues with the handling of clear and overcast situations have been identified and are currently under evaluation in a test processing scheme.

5.3 Sea Ice quality

5.3.1 Global sea ice concentration (OSI-401) quality

The OSI SAF sea ice concentration product is validated against navigational ice charts, as these are believed to be the best independent source of reference data currently available. These navigational ice charts originates from the operational ice charting divisions at DMI, MET Norway and National Ice Center (NIC). The ice charts are primarily based on SAR (Radarsat and Sentinel-1) data, together with AVHRR and MODIS data in several cases. The quality assessment results are shown separately for the three different sets of ice charts.

For the quality assessment at the Northern Hemisphere, performed twice a week, the concentration product is required to have a bias and standard deviation less than 10% ice concentration on an annual basis. For the weekly quality assessment at the Southern Hemisphere the concentration product is required to have a bias and standard deviation less than 15% ice concentration on an annual basis.

For each ice chart concentration level the deviation between ice chart concentration and OSISAF 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. We use conventional bias and standard deviations for all calculations.

In addition, statistics from manual evaluation (on the confidence level of the products) are shown as additional information. There is no requirement on these statistics. The error codes for the manual evaluation are shown below.

Error code	Type	Description
1	area	missing data
2	point	open water where ice was expected
3	area	false ice where open water was expected
4	point	false ice induced from SSM/I processing errors
5	point	other errors
6	point	noisy false ice along coast

table 16 : Error codes for the manual registration

For the Northern Hemisphere, these quality assessment results are given for the Greenland area. This area is the area covered by the Greenland overview ice charts made by DMI used for the comparison to the sea ice concentration data. The charts can be seen at http://www.dmi.dk/hav/groenland-og-arktis/iskort/.

They cover the waters surrounding Greenland including the Lincoln Sea, the Fram Strait, the Greenland Sea, the Denmark Strait and Iceland, the Southern Greenland area including Cape Farewell, the Davis Strait and all of Baffin Bay.

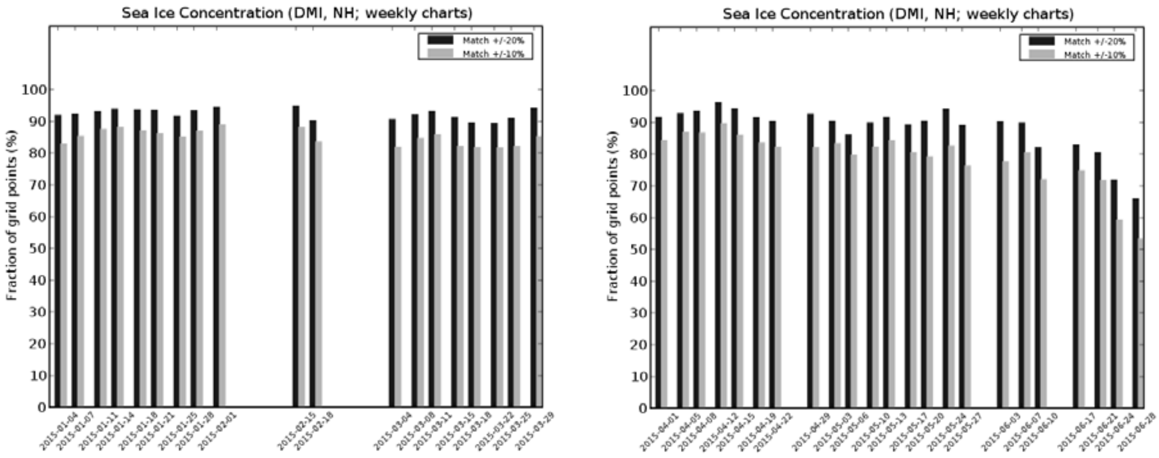

Figure 46 : Comparison of ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. Northern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%.

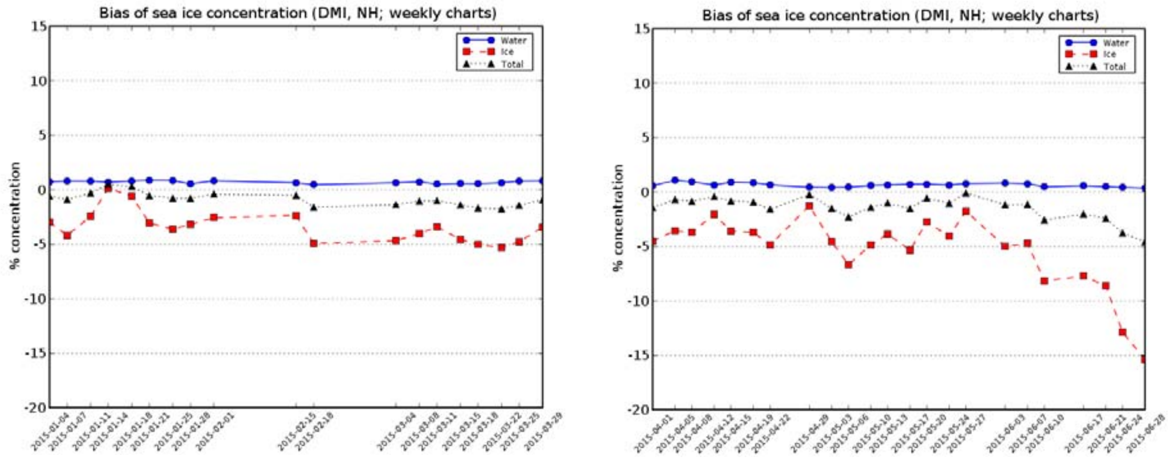

Figure 47 : Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for three categories: water, ice and total. The total difference is the difference between the ice analysis and sea ice concentration product within the area covered by the ice analysis including both ice and water. When the difference is below zero, the OSI SAF sea ice concentration has a lower estimate than the ice analysis. Northern hemisphere.

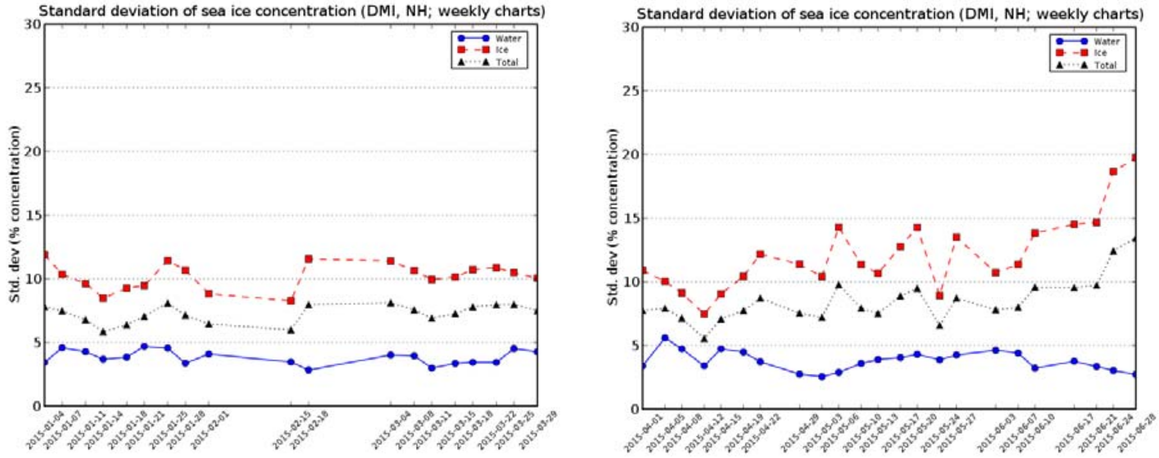

Figure 48 : Standard deviation of the difference in ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for three categories: water, ice and total. Northern hemisphere.

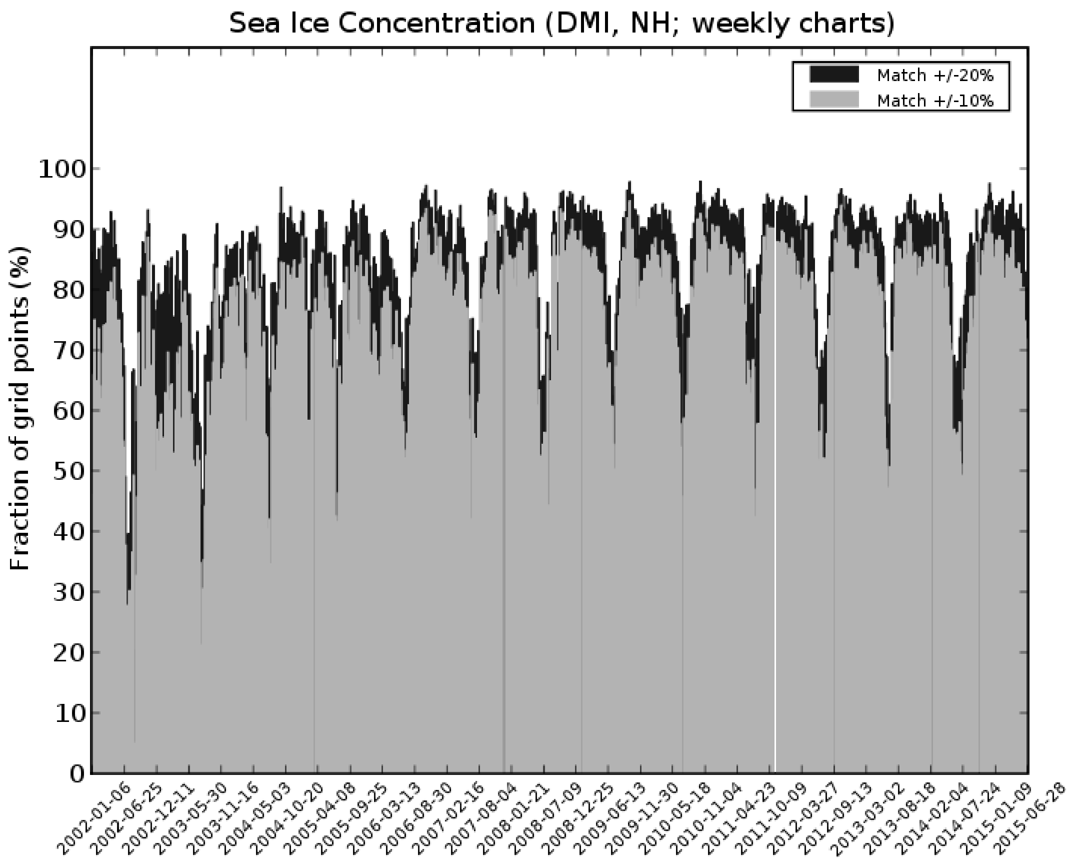

Figure 49 : Multiyear variability. Comparison between ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Northern hemisphere.

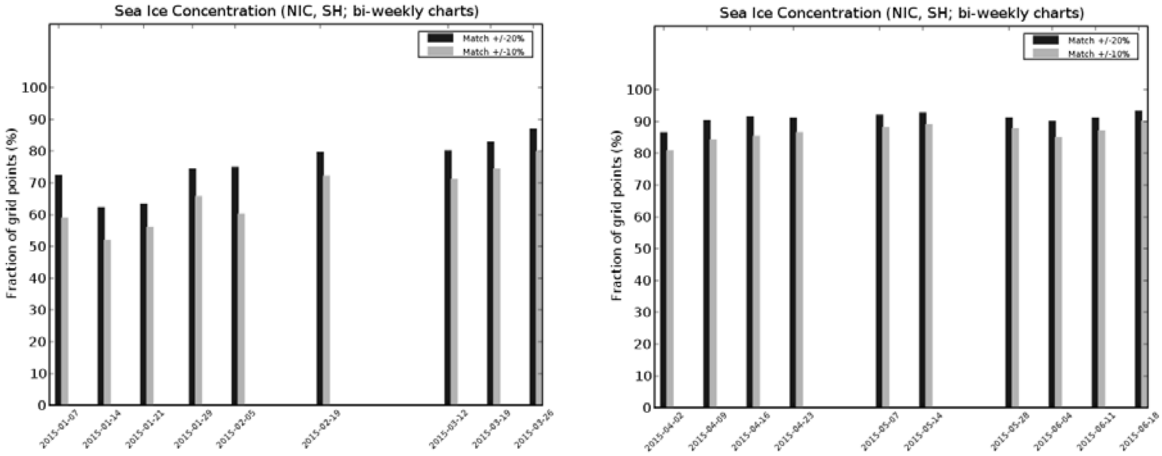

Figure 50 : Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/-10%, and likewise for +/-20%. Southern hemisphere.

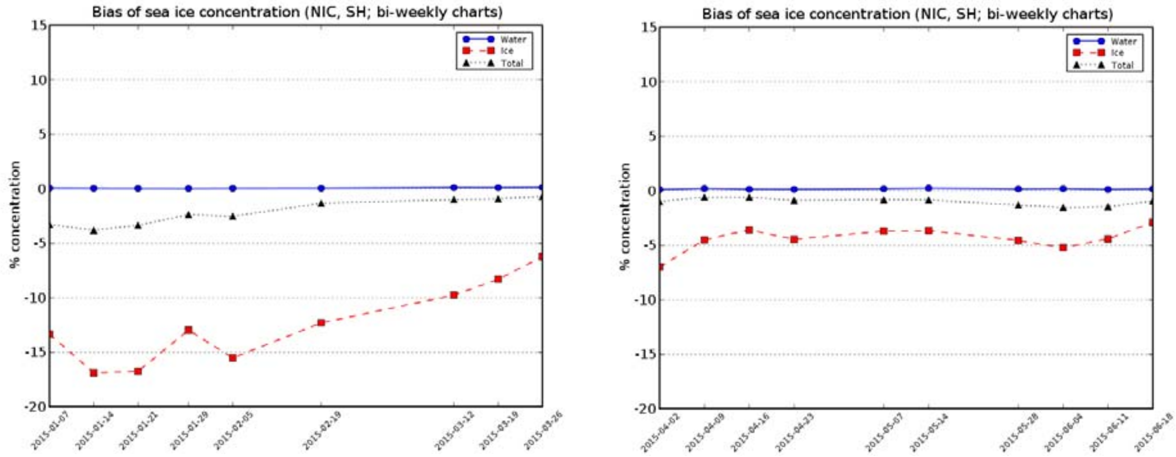

Figure 51 : Difference between the ice concentrations from the NIC ice analysis and OSI SAF concentration product for three categories: water, ice and total. The total difference is the difference between the ice analysis and sea ice concentration product within the area covered by the ice analysis including both ice and water. When the difference is below zero, the OSI SAF sea ice concentration has a lower estimate than the ice analysis. Southern hemisphere.

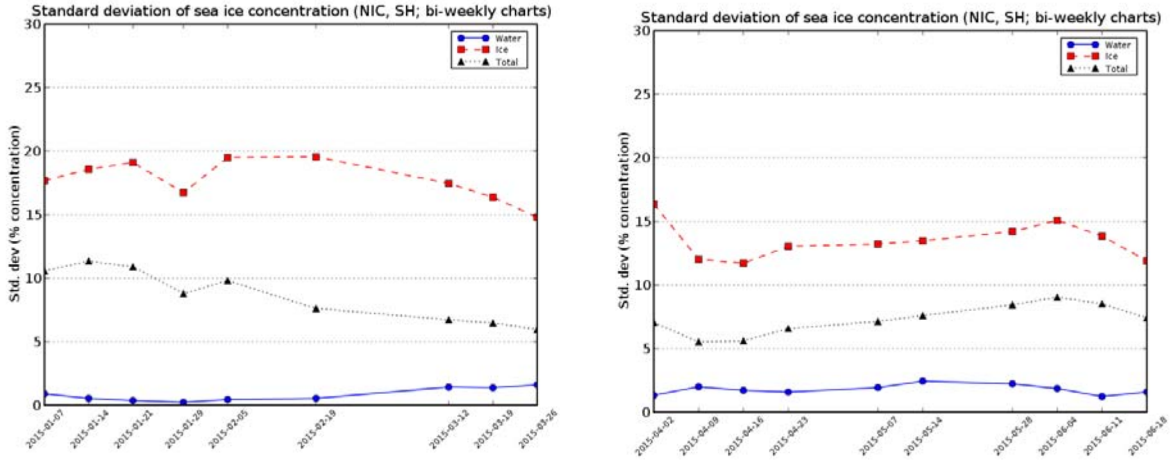

Figure 52 : Standard deviation of the difference in ice concentrations from the NIC ice analysis and OSI SAF concentration product for three categories: water, ice and total. Southern hemisphere.

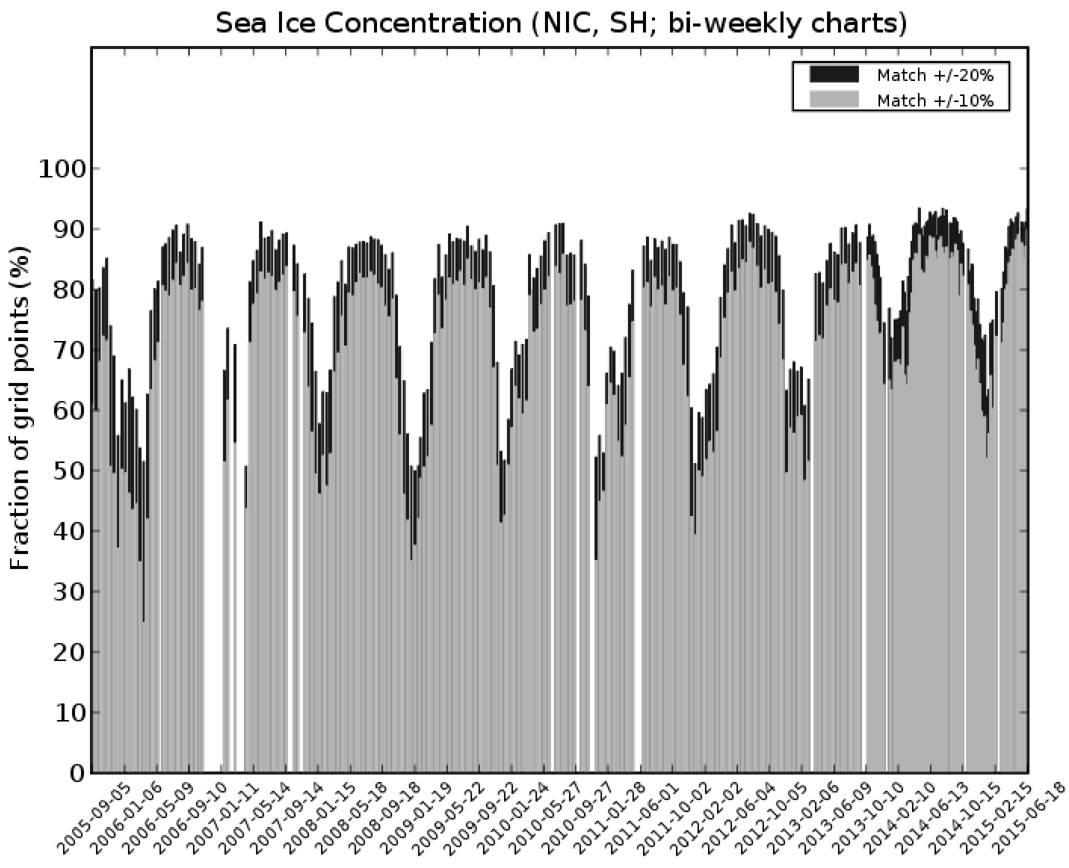

Figure 53 : Annual variability. Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Southern hemisphere.

Concentration product					
Month	+/- 10% [%]	+/- 20% [%]	Bias [%]	Stdev [%]	Num obs
JUL. 2014	70.29	85.89	-4.82	13.27	236916
AUG. 2014	76.49	87.38	-4.50	12.26	204740
SEP. 2014	71.32	83.19	-6.52	13.39	99234
OCT. 2014	81.06	91.28	-3.52	10.32	113121
NOV. 2014	77.15	89.70	-4.74	10.82	67801
DEC. 2014	78.95	89.49	-5.02	11.61	14696
JAN. 2015	86.06	93.10	0.44	9.71	17294
FEB. 2015	86.63	95.75	0.29	8.54	6207
MAR. 2015	87.06	94.93	-1.77	9.04	19077
APR. 2015	84.80	94.39	-0.94	8.55	26132
MAY 2015	87.80	95.26	-0.39	7.84	45491
JUN. 2015	83.86	93.01	-2.04	8.84	61991

table 17 : **Monthly quality assessment results from comparing the OSI SAF sea ice concentration product to MET Norway ice service analysis for the Svalbard area. From JUL. 2014 to JUN. 2015. First two columns shows how often there is agreement within 10 and 20% concentration.**

Based on the quality flags in the sea ice products, monthly statistics for the confidence levels are derived for each product type. Explanation (see Product User Manual for more details): Code 1-5 is given as fraction of total processed data (code 5+4+3+2+1 = 100%). 'Unprocessed' is given as fraction of total data (total data = processed data + unprocessed data).

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2015	86.49	12.55	0.94	0.03	0.00	55.96
FEB. 2015	85.87	13.10	1.00	0.03	0.00	55.99
MAR. 2015	85.29	13.59	1.09	0.03	0.00	55.98
APR. 2015	85.37	13.49	1.11	0.03	0.00	55.91
MAY 2015	86.00	12.96	1.01	0.03	0.00	55.64
JUN. 2015	86.53	12.50	0.94	0.03	0.00	55.27

table 18 : **Statistics for sea ice concentration confidence levels, Code 0-5, Northern Hemisphere.**

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2015	88.03	11.69	0.28	0.01	0.00	22.62
FEB. 2015	91.14	8.66	0.20	0.01	0.00	22.60
MAR. 2015	91.91	7.87	0.21	0.01	0.00	22.59
APR. 2015	91.24	8.53	0.22	0.01	0.00	22.58
MAY 2015	89.86	9.87	0.27	0.01	0.00	22.59
JUN. 2015	87.83	11.79	0.37	0.01	0.00	22.62

table 19 : **Statistics for sea ice concentration confidence levels, Code 0-5, Southern Hemisphere.**

Comments: Figure 48 and Figure 52 provides the essential information on the compliance of the sea ice concentration product accuracy, showing the std.dev. of the difference in ice concentration between the OSI SAF product and the DMI ice analysis for NH and NIC ice analysis for SH, respectively. To fulfill the service specification of 10% yearly std.dev. for NH and 15% for the SH, the Total std.dev. (black curve) shall on average throughout the year be below 10% and 15%, respectively.

The validation of the sea ice concentration product against the MET Norway ice charts shows usual validation results, with increased uncertainty during the summer months. The average of the 12 monthly standard deviations is a bit above the requirement of 10.0%. Since the validation data are only collected along the ice edge where the ice concentration is varying the most, we can expect that the standard deviation of ice concentration product in total is below the requirement.

Tables show that the quality of the OSI SAF ice concentration product is somewhat stable in the Arctic freeze-up season and decreasing in the Antarctic melting season.

5.3.2 Global sea ice edge (OSI-402) quality

The OSI SAF sea ice edge product is validated against navigational ice charts, as explained under the previous section on ice concentration.

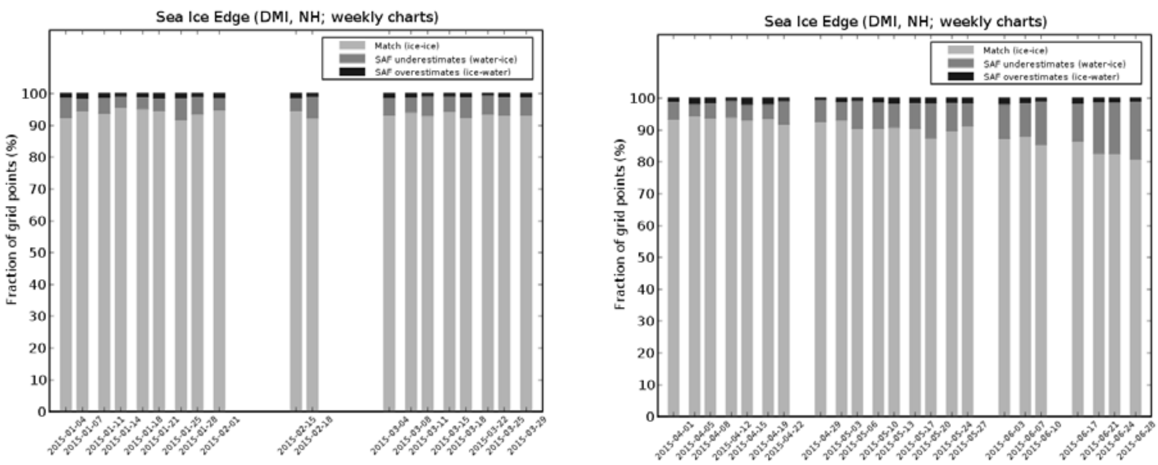

Figure 54 : **Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.**

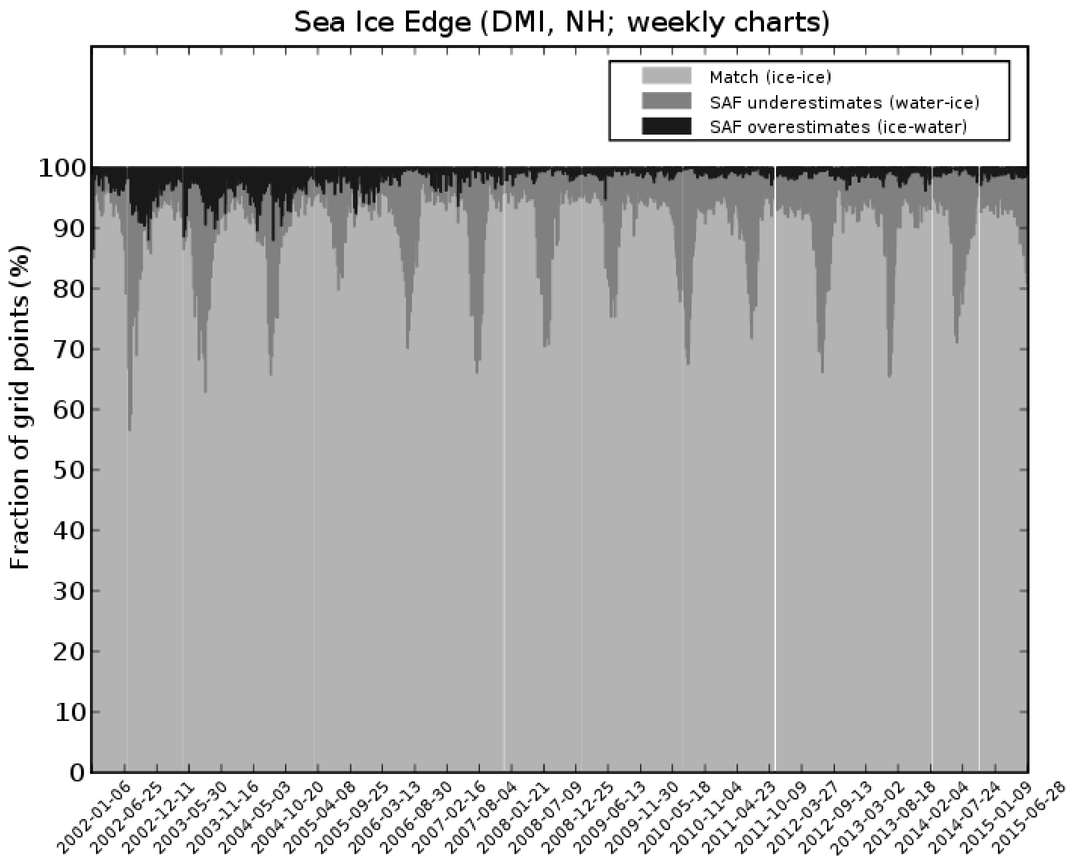

Figure 55 : Multiyear variability. Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.

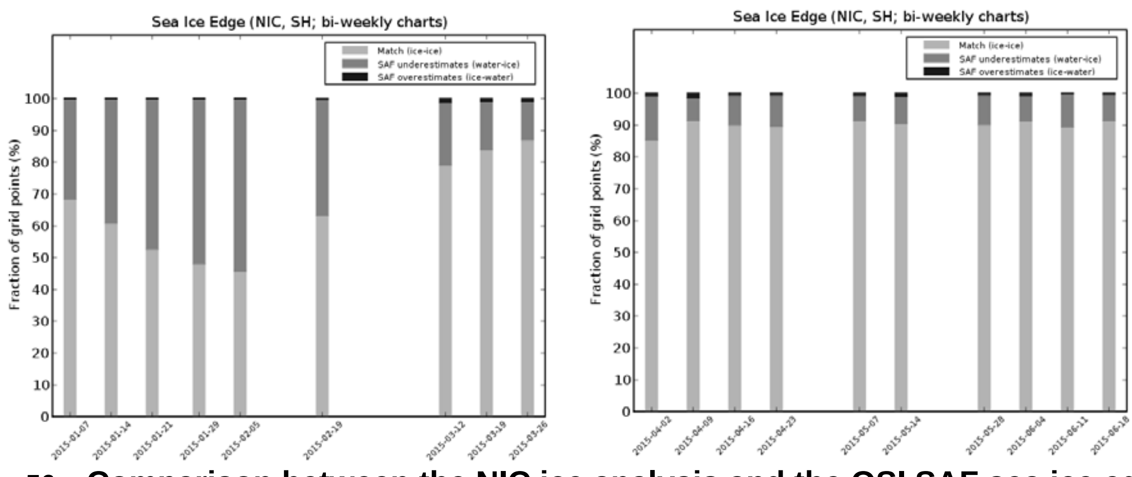

Figure 56 : Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

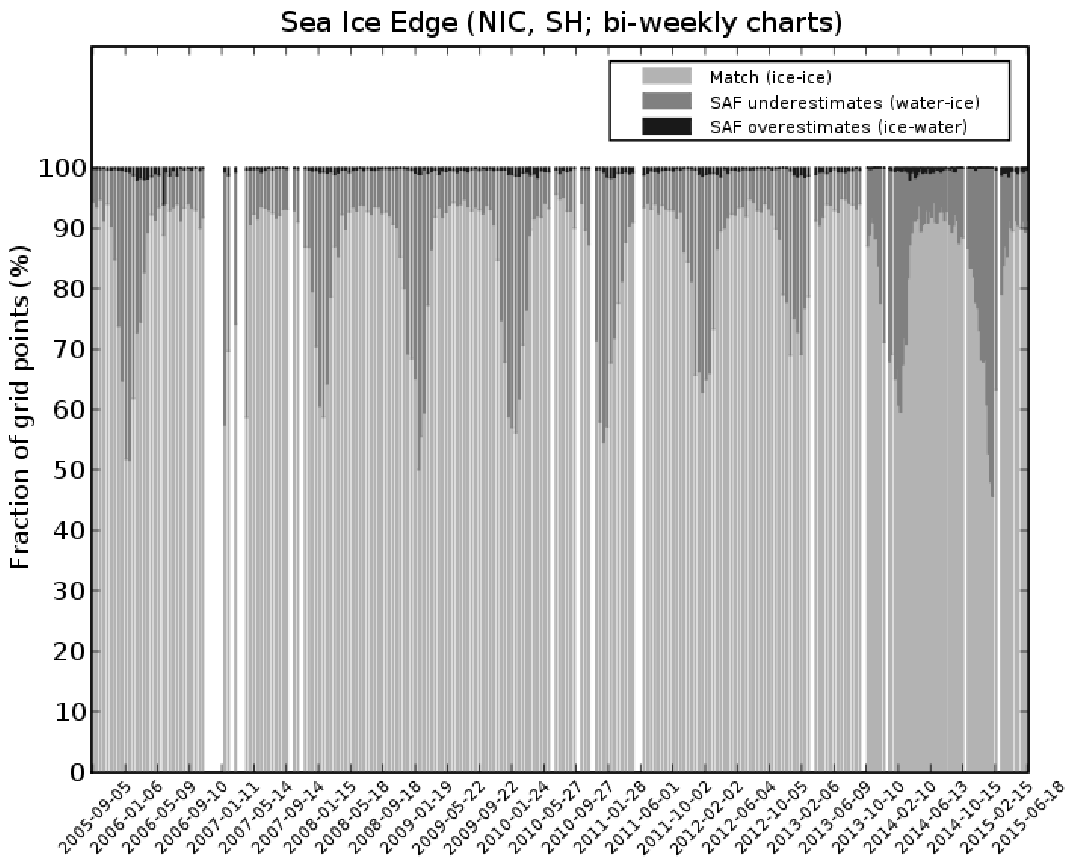

Figure 57 : Annual variability. Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

Month	Correct (%)	SAF lower (%)	SAF higher (%)	Mean edge diff (km)	Num obs
JUL. 2014	94.01	2.07	3.92	21.78	239681
AUG. 2014	95.45	3.21	1.34	18.15	209888
SEP. 2014	95.67	2.40	1.92	12.64	100634
OCT. 2014	96.61	1.02	2.37	9.68	113582
NOV. 2014	96.90	1.66	1.45	9.43	67955
DEC. 2014	96.44	2.60	0.96	8.99	14758
JAN. 2015	97.37	1.37	1.25	8.20	18038
FEB. 2015	97.45	1.12	1.43	8.80	6520
MAR. 2015	98.02	1.32	0.67	10.24	19953
APR. 2015	98.33	0.71	0.96	10.90	26775
MAY 2015	98.56	0.44	1.00	12.28	47609
JUN. 2015	97.98	0.87	1.14	13.95	64287

table 20 : Monthly quality assessment results from comparing OSI SAF sea ice products to MET Norway ice service analysis for the Svalbard area, from JUL.2014 to JUN. 2015. Mean edge diff is the mean difference in distance between the ice edges in the OSI SAF edge product and MET Norway ice chart.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2015	94.98	1.25	2.00	1.39	0.38	55.42
FEB. 2015	94.42	1.31	2.25	1.60	0.42	55.43
MAR. 2015	93.72	1.50	2.49	1.82	0.46	55.42
APR. 2015	93.49	1.53	2.57	1.93	0.49	55.35
MAY 2015	93.41	1.54	2.54	1.98	0.52	55.13
JUN. 2015	92.67	1.66	2.74	2.31	0.62	54.80

table 21 : Statistics for sea ice edge confidence levels, Code 0-5, Northern Hemisphere.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2015	90.49	1.19	1.98	3.80	2.54	22.53
FEB. 2015	92.90	0.95	1.49	2.77	1.88	22.50
MAR. 2015	93.51	0.92	1.48	2.54	1.55	22.49
APR. 2015	93.49	1.00	1.67	2.50	1.35	22.49
MAY 2015	93.17	1.15	1.96	2.52	1.20	22.49
JUN. 2015	92.74	1.35	2.24	2.58	1.10	22.51

table 22 : Statistics for sea ice edge confidence levels, Code 0-5, Southern Hemisphere.

Comments :

The yearly averaged edge difference is 12.1km (average of monthly values) and the target accuracy requirement of 20km edge difference is hence met. The monthly differences are actually below the yearly requirement all months except the month of July, when melting of snow and ice makes the product quality worse.

5.3.3 Global sea ice type (OSI-403) quality

The sea ice type quality assessment is done as a monitoring of the monthly variation of the multi year ice area coverage, as presented in the table below. The monthly standard deviation in the difference from the running mean of the multi year ice area coverage shall be below 100.000km2 to meet the target accuracy requirement.

Month	Std dev wrt running mean [km²]	Mean MYI coverage [km²]
JUL. 2014	-	-
AUG. 2014	-	-
SEP. 2014	-	-
OCT. 2014	56645	2379306
NOV. 2014	75178	2513468
DEC. 2014	68422	2434891
JAN. 2015	41646	2236549
FEB. 2015	44641	2259479
MAR. 2015	37225	1884845
APR. 2015	46322	1892020
MAY 2015	-	-
JUN. 2015	-	-

table 22 : Monitoring of NH sea ice type quality by comparing the multi year coverage with the 11-days running mean.

Comments :
The std dev with regard to the running mean is below the requirement of 100.000km2 for all the months where the product is delivered.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2015	90.42	1.64	6.78	1.05	0.11	55.42
FEB. 2015	89.13	1.87	7.69	1.19	0.12	55.43
MAR. 2015	89.30	1.63	7.87	1.08	0.13	55.42
APR. 2015	89.30	1.59	7.89	1.10	0.13	55.35
MAY 2015	88.01	1.54	7.50	2.82	0.14	55.13
JUN. 2015	86.48	1.33	6.62	5.38	0.19	54.80

table 23 : Statistics for sea ice type confidence levels, Northern Hemisphere.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2015	87.02	0.49	11.58	0.49	0.41	22.53
FEB. 2015	89.75	0.41	9.15	0.37	0.32	22.50
MAR. 2015	90.11	0.36	8.94	0.31	0.27	22.49
APR. 2015	88.69	0.33	10.45	0.29	0.23	22.49
MAY 2015	86.44	0.32	12.76	0.28	0.21	22.49
JUN. 2015	84.06	0.31	15.16	0.28	0.19	22.51

table 24 : Statistics for sea ice type confidence levels, Southern Hemisphere.

5.3.4 Low resolution sea ice drift (OSI-405) quality

Quality assessment dataset

Quality assessment is performed by collocation of the drift vectors with the trajectories of in situ drifters. Those drifting objects are generally buoys (e.g. the Ice Tethered Profilers) or ice camps (e.g. the Russian manned stations) that report their position at typically hourly intervals. Those trajectories are generally made available in near-real-time or at the end of the mission onto the ice. Position records are recorded either via the GPS (e.g. those of the ITPs) or the Argos Doppler-shift system (thos of the iABP). GPS positions are very precise (< 50 m) while those obtained by Argos have worse accuracy (approx. 350 m for 'high quality' records) and are thus not used in this report.

A nearest-neighbor approach is implemented for the collocation, and any collocation pair whose distance between the product and the buoy is larger than 30 km or the mismatch at start time of the drift is more than 3 hours is discarded. The duration of the drifts must also match within 1 hour.

Reported statistics

Because of a denser atmopshere and surface melting, the OSI-405 production is limited to the autumn-winter-spring period each year. No ice drift vectors are retrieved from 1st May to 30th September in the Arctic.

The Low Resolution Sea Ice Drift product comprises several single-sensor (e.g. SSM/I F15 or ASCAT Metop-A) and a merged (or multi-sensor) products that are all processed and distributed on a daily basis. The quality assessment and monitoring results are thus presented for the multi-sensor product (multi-oi) and a selection of the single-sensor ones.

Quality assessment statistics

In the following tables, quality assessment statistics for the Northern Hemisphere (NH) products using multi-sensor (multi-oi) and SSM/I only (ssmi-f15) are reported upon. In those tables, X (Y) are the X and Y components of the drift vectors. b() is the bias and σ () the standard deviation of the error ε(X) = $X_{prod} - X_{ref}$. Columns α, β and ρ are respectively the slope and intercept of the regression line between Prod and Ref data pairs and the Pearson correlation coefficient. N is the number of collocation data pairs.

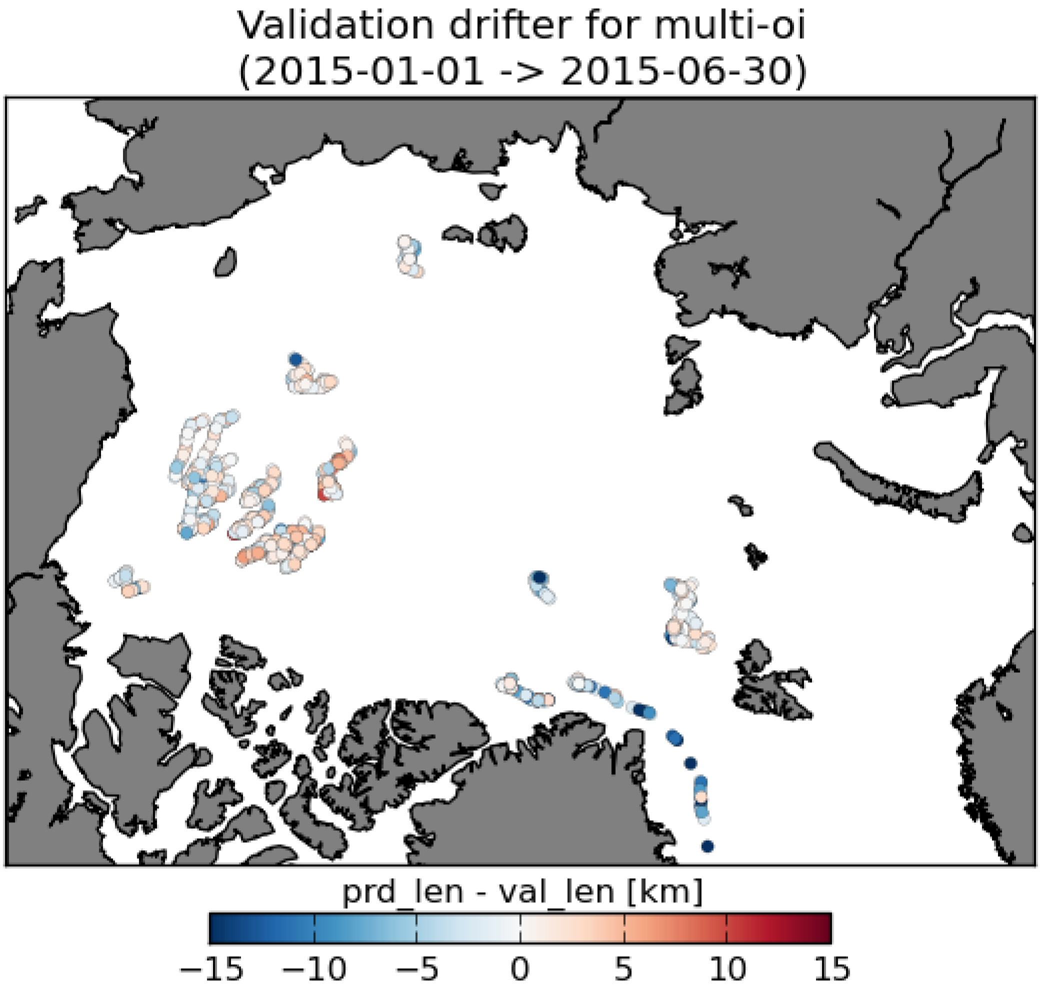

Figure 58 : Location of GPS drifters for the quality assessment period (JAN. 2015 to JUN. 2015). The shade of each symbol represents the bias (prod-ref) in drift length (km over 2 days).

Month	b(X) [km]	b(Y) [km]	σ(X) [km]	σ(Y) [km]	α	β[km]	ρ	N
JUL. 2014	--	--	--	--	--	--	--	0
AUG. 2014	--	--	--	--	--	--	--	0
SEP. 2014	--	--	--	--	--	--	--	0
OCT. 2014	-0.225	+0.280	4.770	5.108	0.90	-0.148	0.93	413
NOV. 2014	+0.459	-0.101	3.508	3.463	0.95	+0.266	0.96	458
DEC. 2014	-0.187	-0.266	2.883	2.961	0.97	-0.243	0.97	477
JAN. 2015	+0.138	-0.301	3.202	3.035	0.93	-0.080	0.95	489
FEB. 2015	-0.669	-0.406	3.601	2.831	0.92	-0.336	0.96	403
MAR. 2015	-0.288	-0.387	3.730	4.334	0.82	-0.019	0.93	405
APR. 2015	+0.172	-0.404	3.411	2.803	0.95	-0.101	0.96	366
MAY 2015	--	--	--	--	--	--	--	0
JUN. 2015	--	--	--	--	--	--	--	0
Last 12 months								

table 25 : Quality assessment results for the LRSID (multi-oi) product (NH) for JUL. 2014 to JUN. 2015.

Month	b(X) [km]	b(Y) [km]	σ(X) [km]	σ(Y) [km]	α	β[km]	ρ	N
JUL. 2014	--	--	--	--	--	--	--	0
AUG. 2014	--	--	--	--	--	--	--	0
SEP. 2014	--	--	--	--	--	--	--	0
OCT. 2014	-0.365	+0.315	4.795	5.090	0.93	-0.155	0.93	346
NOV. 2014	+0.506	-0.120	3.683	3.166	0.97	+0.245	0.96	419
DEC. 2014	-0.135	-0.148	3.427	3.189	0.98	-0.149	0.96	464
JAN. 2015	+0.032	-0.217	3.649	3.390	0.95	-0.092	0.94	474
FEB. 2015	-0.360	-0.434	3.390	2.901	0.96	-0.315	0.96	380
MAR. 2015	+0.001	-0.206	3.272	3.072	0.92	-0.013	0.95	378
APR. 2015	-0.008	-0.363	3.826	3.625	0.95	-0.196	0.94	337
MAY 2015	--	--	--	--	--	--	--	0
JUN. 2015	--	--	--	--	--	--	--	0
Last 12 months								

table 26 : Quality assessment results for the LRSID (ssmis-f17) product (NH) for JUL. 2014 to JUN. 2015.

Comments: The validation results for 1st half-year 2015 are nominal and within requirement. The distribution of AMSR2-based sea ice drift is not yet started. Validation results including AMSR2-based ice motion will be reported in the next HYR, once operational dissemination is started.

5.3.5 Medium resolution sea ice drift (OSI-407) quality

Quality assessment dataset

Quality assessment is performed by collocation of the drift vectors with the trajectories of in situ drifters. Those drifting objects are buoys (e.g. the Ice Tethered Profilers) or ice camps (e.g. the Russian manned stations) that report their position at typically hourly to 3 hourly intervals. They are made available in near-real-time via the GTS network at DMI. Argos data in the DMI GTP data have no quality flags and accuracy can be greater than 1500 m. It has been shown that the MR icedrift error statistics improves significantly when validation is performed against high accuracy GPS drifters only (OSI-407 validation report and Phil Hwang, 2013. DOI: 10.1080/01431161.2013.848309).

A nearest-neighbor approach is implemented for the collocation and any collocation pair whose distance between the product and the buoy is larger than 20 km or temporal difference greater than ±60 minutes from the satellite start time and, likewise, satellite end time is disregarded. The temporal mismatch between satellite pairs and the corresponding buoy data is thus maximum 2 hours, but zero in average.

Reported statistics

The Medium Resolution Sea Ice Drift product comprises two production modes, a summer mode from May to August, and a winter mode from September to April. These modes are using Visible (AVHRR channel 2) and Thermal Infra-Red (AVHRR channel 4), respectively.

The OSI SAF team has identified in August 2015 an unfortunate error in the Medium Resolution Sea Ice Drift product (OSI-407). The product has since the operational production started on the 23 January 2013, been delivering data files with incorrect dates. That is, the start- and end-date stamps are shifted by 1 day. Time-of-day is correct. Thereafter, both productions are assessed : the disseminated product (no date-correction) and the product with date correction.

Quality assessment statistics

Table 27 below, show selected error statistics against drifting buoys. Bias (x-bias, y-bias) and standard deviation of errors (x-std, y-std) are shown, in meters, for the 2 perpendicular drift components (x, y). Statistics from the best fit between OSI-407 and buoy data are shown as slope of fit (α) and correlation coefficient (r). N, indicate the number of data pairs that are applied in the error statistics.

The table shows errors of up to several km for the disseminated product and around/below 1000 m when shifting the start and end dates by -1 day (‘date correction’), as indicated in table. This goes for both the winter and summer production mode, represented by ch4 (Thermal InfraRed) and ch2 (VISible) data respectively. See comment below.

***Summer mode* ch2**	date-correction	x-bias	y-bias	x-std	y-std	α	r	pop
2013 May-Aug	-1d	149	59	787	894	0.963	0.974	140
	none	4071	228	4222	3559	0.299	0.415	116
2015 May, end July to start Aug	-1d	-198	-27	860	961	1.008	0.989	72
	none	3271	5110	6252	6374	0.978	0.742	68

***Winter mode* ch4**	date-correction	x-bias	ybias	xstd	ystd	α	r	pop
2013 Jan-May + Oct-Dec	-1d	-56	215	1016	1180	0.976	0.929	1717
	none	-208	7	3106	3188	0.742	0.610	1674
2014 feb-mar	-1d	-158	142	682	638	1.061	0.987	218
	none	-483	-283	2198	4377	0.091	0.112	218

table 27 : Validation statistics of OSI-407 ice drift product for selected periods. The tables show results from the summer production (top) and winter production (bottom). The OSI-407 product is compared with drifting buoy data from the DMI-GTS data stream. The yellow lines highlight the bug-fixed validation (not yet disseminated). Buoy data are applied without systematic quality control; however, a few data have been removed due to obviously erroneous drift patterns. The removed data are: WMO buoy 48597 from July 22, 2015 and July 6, 2015; WMO buoy 48638 from June 28 and WMO buoy 48644 from July 16.

Comments:

A series of unfortunate events and misunderstandings during migration from test- to operational servers have led to the date-bug in the OSI-407 production. The reason why this is not discovering earlier is that we have thoroughly documented the precision of the product pre-operation in internal and external validation studies. There was no reporting about this product in the previous HYR reports, because we have been working on a new operational setup that we thought was more relevant to focus on.

The near real-time production should re-start with the bug-fixed product at the beginning of September.

The dataset (from the operational production started on the 23 January 2013 to August 2015) will be corrected and made available to users.

The validation is therefore NOT regarding the past 6 month in particular, but selected periods since the product turned operational.

5.4 Global Wind quality (OSI-102(-b), OSI-103, OSI-104(-b), OSI-109)

The wind products are required to have an accuracy of better than 2.0 m/s in wind component standard deviation with a bias of less than 0.5 m/s in wind speed.

The scatterometer winds are monitored against forecast winds of the ECMWF global model. Forecasts of +3 to +15 hours are used and the model winds are interpolated with respect to time and location. The monitoring of relevant quality parameters as a function of time yields a sensitive method of detecting deviations of normal operation. However, one must be careful to regard the difference with reference background NWP model winds as the 'true' accuracy of the product, since both the NWP model winds and the scatterometer winds contain errors. Deviations in product quality usually appear as a step in one or more of the plots. See section 5.4.1 for the monthly averages.

The scatterometer winds are also compared to in situ equivalent neutral wind data from moored buoys, monthly averages are shown in section 5.4.2.

Seasonal weather variations imply differences in mean atmospheric stability, differences in dynamics, and differences in the distribution of wind speeds. These differences cause variations in the spatial representativeness errors associated with scatterometer wind quality assessment and in the difference statistics. Such effects cause seasonal oscillations that appear mainly in the wind speed bias plots against both model winds and buoy winds. For more background information we refer to: Hans Hersbach (2010) *Comparison of C-band scatterometer CMOD5.N equivalent neutral winds with ECMWF*, J. Atmos. Oceanic Technol., 27, 721–736.

We have studied the scatterometer wind speed bias against buoy winds for the tropics and the Northern Hemisphere mid latitudes separately. It appears that the biases in the tropics are fairly constant throughout the year, whereas the wind speed biases in the NH are higher in the winter than in the summer. Hence the seasonal cycles are mainly caused by weather variations in the mid latitudes.

5.4.1 Comparison with ECMWF model wind data

The figure below shows the monthly results of October 2012 to June 2015. Note that the real model winds are converted to equivalent neutral winds by adding 0.2 m/s to the wind speed. In this way, a realistic comparison with the neutral scatterometer winds can be made.

It is clear from the plots in this section, that the products do meet the accuracy requirements from the Service Specification Document [AD-1] (bias less than 0.5 m/s and wind component standard deviation accuracy better than 2 m/s) when they are compared to ECMWF forecast winds. The OSI SAF winds are routinely compared to Met Office NWP model data in the NWP SAF project. Monthly statistics of the products are available as e.g. 2D histograms and map plots, see http://nwpsaf.eu/monitoring/scatter/monthly_mon.html.

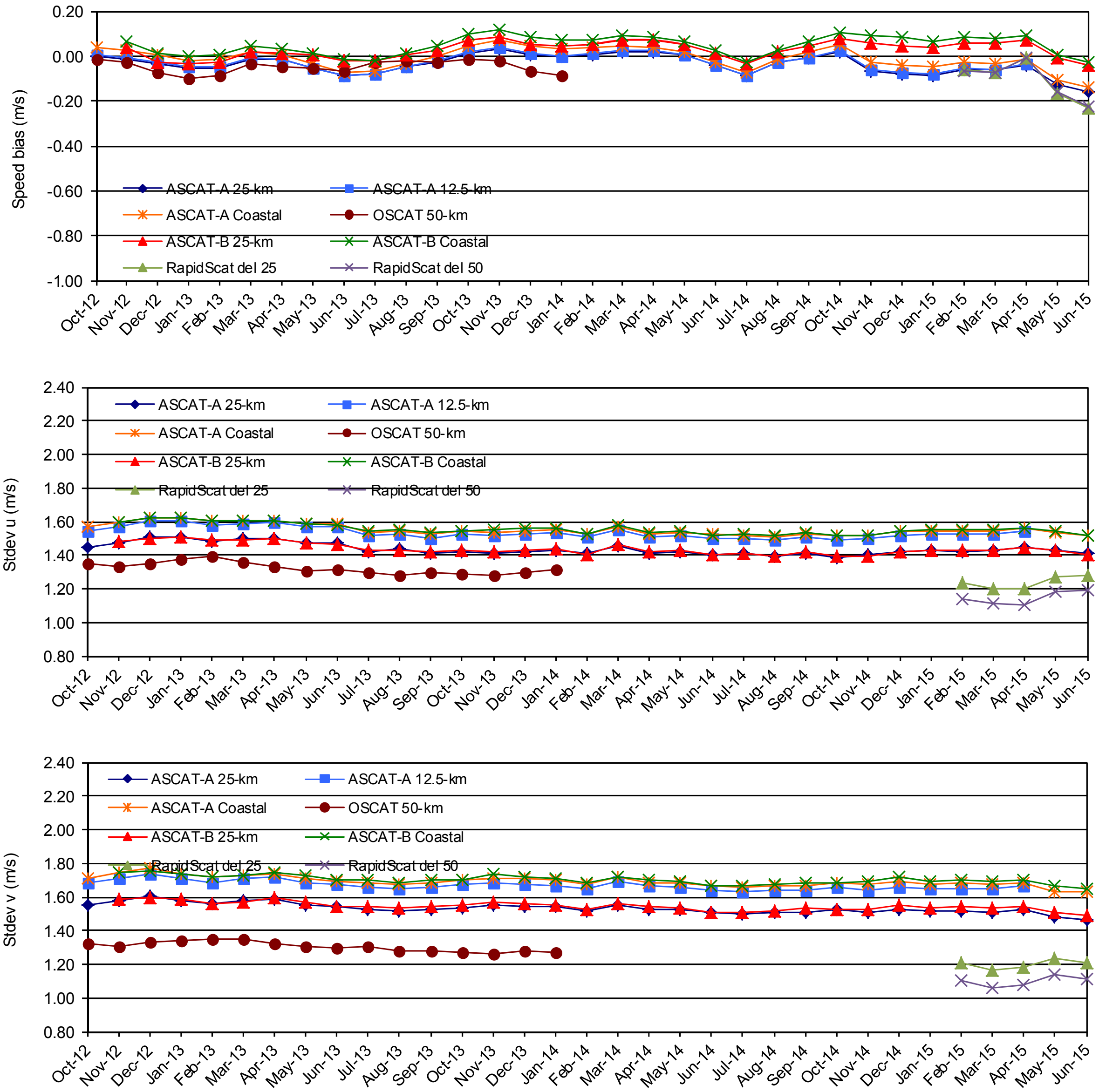

Figure 59 : Comparison of scatterometer winds against ECMWF NWP forecast winds (monthly averages). For each product, the wind speed bias (scatterometer minus ECMWF, top), wind *u* component standard deviation (middle) and wind *v* component standard deviation (bottom) are shown.

5.4.2 Comparison with buoys

We compare the scatterometer winds with wind data from moored buoys on a monthly basis. The buoy data of approximately 150 buoys spread over the oceans (most of them in the tropical oceans and near Europe and North America) are retrieved from the ECMWF MARS archive and collocated with scatterometer winds. The buoy winds are converted to 10-m neutral winds using the LKB model, see Liu, W.T., K.B. Katsaros, and J.A. Businger, *Bulk parameterization of air-sea exchanges of heat and water vapor including the molecular constraints in the interface*, J. Atmos. Sci., vol. 36, 1979.

The figure below shows the monthly results of November 2007 to May 2015.

Note that the ASCAT winds before 20 November 2008 are real winds rather than neutral winds. Neutral scatterometer winds are known to be 0.2 m/s higher than real scatterometer winds.

Note also that the statistics as shown for the different ASCAT products are not from a common set of buoy measurements. So the number of scat/buoy collocations differs per product, in some cases we do have an ASCAT coastal wind but no 12.5 km or 25 km wind due to (small) differences in quality control. This sampling issue gives rise to different bias and standard deviation scores in the plots below.

It is clear from the plots in this section, that the products do meet the accuracy requirements from the Service Specification Document [AD-1] (bias less than 0.5 m/s and wind component standard deviation accuracy better than 2 m/s) when they are compared to buoy winds.

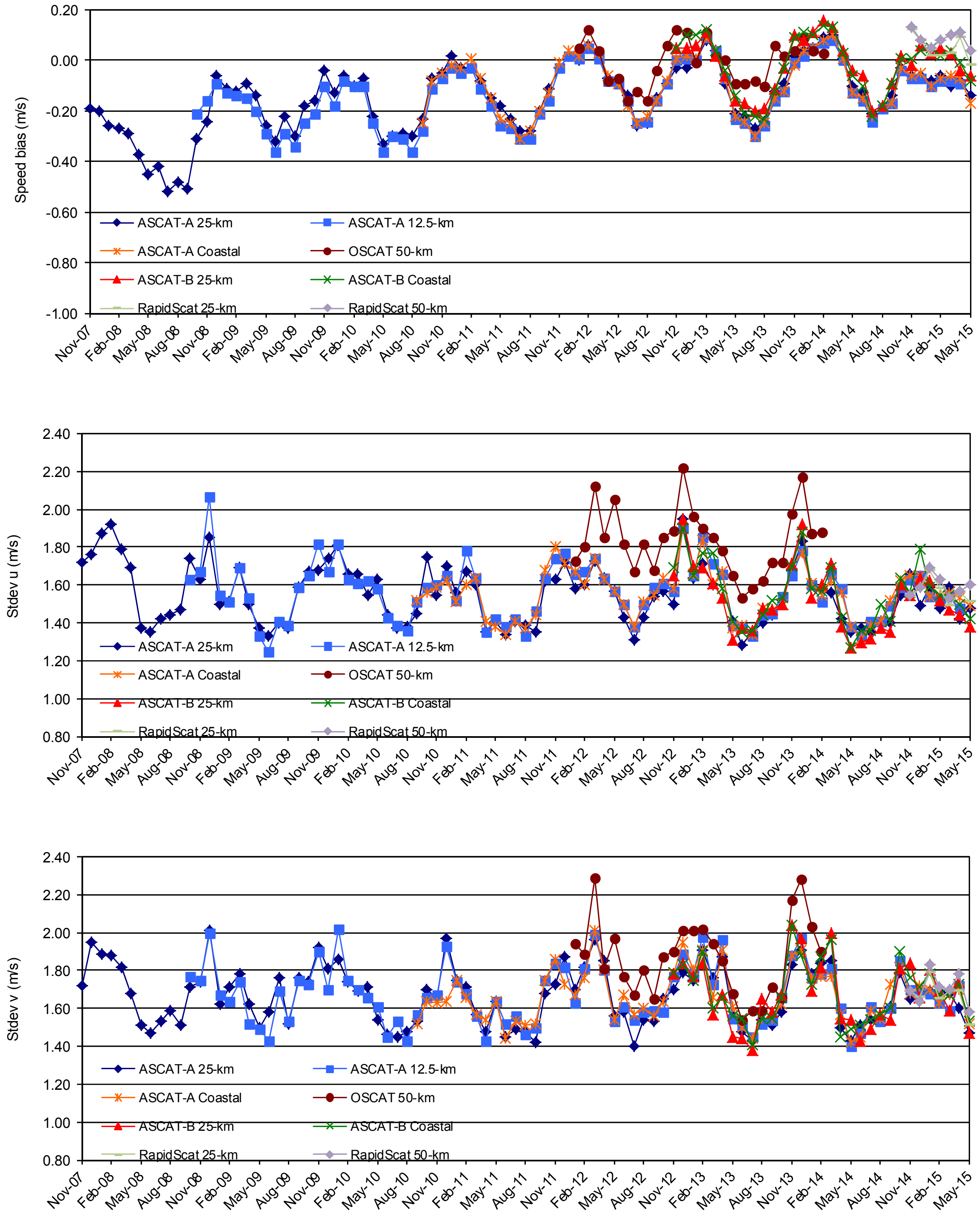

Figure 60 : **Comparison of scatterometer winds against buoy winds (monthly averages). For each product, the wind speed bias (scatterometer minus buoy, top), wind *u* component standard deviation (middle) and wind *v* component standard deviation (bottom) are shown.**

6 Service and Product usage

6.1 Statistics on the Web site and help desk

The OSI SAF offers to the users

- a central web site, *www.osi-saf.org*, managed by M-F/CMS,
- a web site for SS2, http://osisaf.met.no/, managed by MET Norway,
- a web site for SS3, *http://www.knmi.nl/scatterometer/osisaf/*, managed by KNMI.

Users are recommended to make requests preferably through the central Web site Help desk, with the guarantee that their demand will be acknowledged or answered quickly. However for requests concerning the HL or Wind products they may get access to direct contact points at MET Norway or KNMI.

6.1.1 Statistics on the central OSI SAF Web Site and help desk

6.1.1.1. Statistics on the registered users

Statistics on the central Web site use			
Month	Registered users	Pages	User requests
JAN. 2015	947	55914	3
FEB. 2015	959	45535	2
MAR. 2015	962	47463	2
APR. 2015	977	46055	1
MAY 2015	991	41266	2
JUN. 2015	997	59069	4

table 28 : Statistics on central OSI SAF Web site use over 1st half 2015.

Note : At last operations review, it was asked to check the users list and to remove from the list all users with a non valid mail address (OR-8-Action-32).
On the 1 December 2014, an email was sent to all registered users : it generated 143 error emails in return. These 143 accounts were removed from the list in January 2015 : this explains the decrease of the total number of registered users in the figure below.

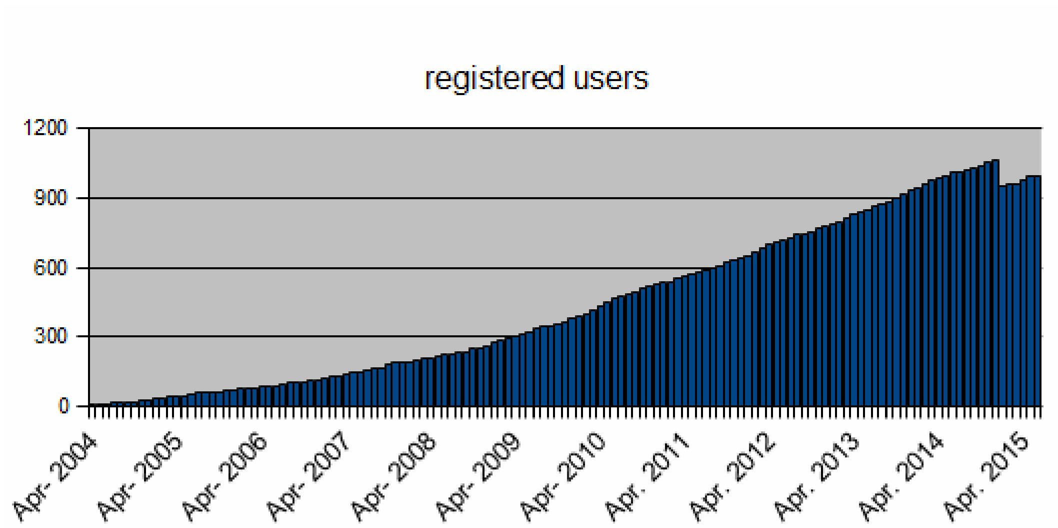

Figure 61 : Evolution of external registered users on the central Web Site from April 2004 to June 2015.

The following table details the list of institutions or companies the registered users are from. Last registrations, made over the reporting period, are overlined in cyan blue..

Country	Institution, establishment or company	Acronym
Argentina	AgriSatelital	AgS
Australia	Bureau of Meteorology	BOM
Australia	Griffith University	Griff
Australia	James Cook University	University of Windsor
Australia	Tidetech LTD	Tidetech
Australia	University Of New South Wales	UNSW
Australia	eMarine Information Infrastructure (eMII), Integrated Marine Observing System (IMOS)	eMII
Belgium	Signal and Image Center	SIC
Belgium	Institut Royal Météorologique de Belgique	IRMB
Belgium	Université catholique de Louvain	UCL/TECLIM
Belgium	Université de Liège	UL
Brazil	Admiral Paulo Moreira Marine Research Institute	IEAPM
Brazil	Centro de Previsao de Tempo e Estudos Climáticos	CPTEC/INPE
Brazil	Fugro Brasil	FGB
Brazil	Instituto de Ciências Atmosféricas, Universidade Federal de Alagoas	UFAL/ICAT
Brazil	Instituto Nacional de Pesquisas Espaciais	INPE
Brazil	Universidade de Brasília - Instituto de Geociências	UNB-IG
Brazil	Universidade de São Paulo	USP
Brazil	Universidade Federal de Alagoas	UFAL
Brazil	Universitade Federal do Rio de Janeiro	LAMCE/COPPE/UFRJ
Brazil	Universidade Federal do Espírito Santo	UFES
Bulgaria	National Institute of Meteorology and Hydrology	NIMH
Canada	Canadian Ice Service	CIS
Canada	Canadian Meteorological Centre	CMC
Canada	Centre for Earth Observation Science	CEOS
Canada	Data Assimilation and Satellite Meteorology, Meteorological Research Branch Environment Canada	ARMA/MRB
Canada	Fisheries and Oceans Canada	DFO/IML/MPO
Canada	Institut National de la Recherche Scientifique	INRS

Canada	Institut de Recherche et de Développement en Agroenvironnement	IRDA
Canada	JASCO Research Ltd	JASCO
Canada	Memorial University of Newfoundland	MUN
Canada	University of Waterloo	UW
Canada	University of Windsor	UWD
Chile	Centro de Estudios Avanzados en Zonas Aridas	CEAZA
Chile	Centro i-mar, Universidad de Los Lagos	I-MAR
Chile	Institut de Fomento Pesquero	IFOP
Chile	Universidad Catolica de la Santisima Concepcion	UCSC
Chile	Universidad de Chile	U Chile
China	anhuigongyedaxue	ahut
China	Chinese Academy of Meteorological Sciences	CAMS
China	China Meteorological Agency	CMA
China	Chinese Academy of Sciences	IOCAS
China	Dalian Maritime University	DMU
China	First Institute of Oceanography, State Oceanic Administration	FIO
China	Fujian Meteorological Observatory	MS
China	HK Observatory	HKO
China	Hust University	
China	Institute of Oceanology, Chinese Academy of Sciences	IOCAS
China	Institute of Remote Sensing Applications of Chinese Academy of Sciences	IRSA/CAS
China	Institute of Tropical and Marine Meteorology	ITMM
China	Nanjing University of Information Science and Technology	NUIST
China	National Marine and Environmental Forecasting Center	NMEFC
China	National Ocean Data Information Service	NODIS
China	National Ocean Technology Center	NOCT
China	National Satellite Meteorological Center	NSMC
China	National Satellite Ocean Application Service	NSOAS
China	Ocean Remote Sensing Institute	ORSI
China	Ocean University of China	OUC
China	Second Institute of Oceanography	SOI
China	Shandong Meteorology Bureau	SDMB
China	Shanghai Ocean University	SHOU
China	Shenzhen graduate school of tsinghua university	
China	South China Sea Institute of Oceanology, Chinese Academy of Sciences	SCSIO, CAS
China	Sun Yat-Sen University	SYSU
China	Third Institute Oceanography	TIO/SOA
China	Tianjin University	TJU
China	Xiamen University	XMU
China	Zhejiang Ocean University	ZOU
Colombia	Universidad Distrital Francisco Jose de Caldas	UDFJDC
Croatia	Rudjer Boskovic Institute	IRB/ZIMO
Cyprus	Offshore Monitoring Ltd	OSM
Denmark	Aarhus University - Department of Bioscience	BIOS
Denmark	Danish Defense Acquisition and Logistics Organization	DALO
Denmark	Danish Meteorological Institute	DMI
Denmark	Royal Danish Administration of Navigation and Hydrography	RDANH
Denmark	Technical University of Denmark, Risø	DTU
Denmark	University of Copenhagen	UoC
Denmark	DHI GRAS	DHI GRAS
El Savador	University of El Savador	UES
Estonia	Estonian Meteorological and Hydrological Institute	EMHI
Estonia	Tallinn University of Technology	TUT
Faroe Islands	Faroe Marine Research Institute	FAMRI

Finland	Finnish Institute of Marine Research	FIMR
Finland	Finnish Meteorological Institute	FMI
Finland	Valtion Teknillinen Tutkimuskeskus	VTT
France	ACRI-ST Brest	ACRI-ST
France	ACRI-ST sophia-antipolis	ACRI-ST
France	ARVALIS Institut du vegetal	ARVALIS
France	African Monitoring of the Environment for Sustainable Development	AMESD
France	Along-Track	Along-Track
France	ATMOSPHERE	ATMOSPHERE
France	Centre de Localisation Satellite	CLS
France	Centre de Soutien Météorologique aux Forces armées	CISMF
France	Centre National de la Recherche Scientifique	CNRS-LOB
France	Centre National de la Recherche Scientifique	CNRS/LOCEAN
France	Centre National d'Etudes Spatiales	CNES
France	CNRS Laboratoire d'Etudes en Géophysique et Océanographie Spatiales	LEGOS/CNRS
France	Collecte Localisation Satellite	CLS
France	Creocean	Creocean
France	Ecole Nationale Supérieure des Mines de Paris	Mines Paris Tech
France	Ecole Nationale des Télécommunication de Bretagne	ENSTB
France	Ecole Nationale Supérieure des Techniques Avancées de Bretagne	ENSTA-Bretagne
France	Ecole Navale	ENGEP
France	Institut de Recherche pour le Développement	IRD
France	Institut Français de Recherché pour l'Exploitation de la MER	Ifremer
France	Institut National de la Recherche Agronomique	INRA
France	Institut National de l'Energie Solaire	INES
France	Institut Universitaire Européen de la Mer	IUEM
France	KiloWattsol	KiloWattsol
France	Laboratoire de Météorologie Dynamique	LMD
France	Laboratoire d'Océanographie et du Climat : Expérimentation et Approches Numériques	LOCEAN
France	Telespazio France	TelespazioFrance
France	Laboratoire de Physique des Océans, Université de Bretagne occidentale	LPO
France	Mercator Ocean	Mercator Ocean
France	Météo-France	M-F
France	Météo-France / Centre National de la Recherche Météorologique	M-F/CNRM
France	MeteoGroup	MG
France	Museum National d'Histoire Naturelle de Paris	MNHN Paris
France	Observatoire français des Tornades et des Orages Violents	KERAUNOS
France	Service Hydrographique et Océanographique de la Marine	SHOM
France	Tecsol	TECSOL
France	TELECOM Bretagne	TB
France	Université de Bretagne Occidentale	UBO
France	Université de Corse, UMR SPE CNRS 6134	UC
France	Université de Strasbourg	UDS
Gambia	Water Resources Department	WRD
Germany	Alfred Wegener Institute for Polar and Marine Research	AWI
Germany	Bundesamt für Seeschifffahrt und Hydrographie	BSH
Germany	Bundesanstalt für Gewässerkunde	BFG
Germany	Center for Integrated Climate System Analysis and Prediction	CLISAP
Germany	Deutscher Wetterdienst	DWD
Germany	Deutsches Luft- und Raumfahrtzentrum	DLR
Germany	Deutsches Museum	DM
Germany	Drift and Noise Polar Services	DNPS
Germany	Energy & Meteo Systems GmbH.	EMSYS
Germany	EUMETSAT	EUMETSAT

Germany	EuroWind GmbH	EuroWind
Germany	FastOpt GmbH	FastOpt
Germany	Flottenkommando Abt GeoInfoD	Flottenkdo GeoInfoD
Germany	Freie Universität Berlin	FUB
Germany	German Aerospace Center	DLR
Germany	German Federal Maritime and Hydrographic Agency	BSH
Germany	HTWK Leipzig	HTWK Leipzig
Germany	Institute of Physics – University of Oldenburg	Uni OL
Germany	Institute for Atmospheric and Environmental Sciences	IAU
Germany	Institute for Environmental Physics Uni. Heidelberg	IUP-HD
Germany	Institute for environmental physics, University of Bremen	IUP, Uni B
Germany	Leibniz Institut fur Meereswissenschaften	IFM-GEOMAR
Germany	Leibniz Institute for Baltic Sea Research Warnemünde	IOW
Germany	Max-Planck-Institute for Meteorology	MPI-M
Germany	O.A.Sys – Ocean Atmosphere Systems GmbH	OASYS
Germany	TU Dresden	TU DD
Germany	University of Hamburg	IFM/Hamburg
Greece	Hellenic National Meteorological Service	HNMS
Greece	National Observatory of Athens	NOA
Iceland	Icelandic Meteorological Office	IMO
Iceland	University of Iceland, Institute of Geosciences	UofI
India	ANDHRA UNIVERSITY	AU
India	Anna University Chennai	GSK
India	Bharathiar University	BU
India	Centre for Mathematical Modelling and Computer Simulation	CSIR C-MMACS
India	CONSOLIDATED ENERGY CONSULTANTS LTD	CECL
India	Indian Institute of Space Science and Technology	IIST
India	Indian Institute of Technology Delhi	IITD
India	India Meteorological Department	IMD
India	Indian National Centre for Ocean Information	INCOIS
India	Indian Navy	IN
India	Indian Space Research Organization	ISRO
India	Ministry of Earth Sciences	MOES
India	Nansen Environmental Research Centre	NERCI
India	National Centre for Medium Range Weather Forecasting	NCMRWF
India	National Institute of Ocean Technology	NIOT
India	National Institute of Technology Karnataka	NITK
India	Naval Physical and Oceanographic Laboratory	NPOL
India	National Remote Sensing Centre	NRSC
India	Oceanic Sciences Divisions, MOG , Indian Space Applications Centre	ISRO
India	South Asia Strategic Forum	SASFOR
India	The Energy and Resources Institute	TERI
India	University of Pune	UP
Indonesia	Bureau of Meteorology, Climatology and Geophysic Region IV Makassar	BMCGR
Indonesia	Maxxima	AIS
Indonesia	Ministry of Marine Affairs and Fisheries	MMAF
Indonesia	Sekolah Tinggi Meteorologi Klimatologi dan Geofisika	STMKG
Indonesia	Vertex	Mr
Iran	hakim sabzevari university	HSU
Israel	Bar Ilan University	BIU
Israel	Israel Meteorological Service	IMS
Israel	The Hebrew University	HUJI
Italy	Agenzia nazionale per le nuove tecnologie, l’energia e lo sviluppo economico sostenibile	ENEA

Italy	Agenzia Spaziale Italiana	ASI
Italy	Centro Euro-Mediterraneo sui Cambiamenti Climatici	CEMCC
Italy	Centro Nazionale di Meteorologia e Climatologia Aeronautic	CNMCA
Italy	EC- Joint Research Centre	EC-JRC
Italy	Epson Meteo Center	EMC
Italy	ESA	ESA/ESRIN
Italy	Fondazione imc – onlus , International Marine Centre	IMC
Italy	Institute of Marine Science – CNR	ISMAR-CNR
Italy	Instituto di BioMeteorologia – Consiglio Nazionale delle Ricerche	IBIMET-CNR
Italy	Instituto Nazionale di Geofisica e Vulcanologia	INGV
Italy	Instituto Scienze dell'Atmosfera e del Clima – Consiglio Nazionale delle Ricerche	ISAC – CNR
Italy	Instituto Superiore per la Ricerca e la Protezione Ambientale	ISRPA
Italy	National Aquatic Resources Research and Development Agency	CITS
Italy	Italian Space Agency	ASI
Italy	NATO Undersea Research Centre	NURC
Italy	Ocean Project	ASD
Italy	Politecnico di Milano	PoliMi
Italy	Politecnico di Torino	DITIC POLITO
Italy	Universita degli Studi di Bari	USB
Italy	university of bologna	DISTA
Iran	Atmospheric Science and Meteorological Research Center	ASMERC
Japan	Atmosphere and Ocean Research Institute, the University of Tokyo	AORI, UT
Japan	Center for Atmospheric and Oceanic Studies	CAOS
Japan	Hokkaido University	HU
Japan	Hydrospheric Atmospheric Research Center	HyARC
Japan	Japan Aerospace Exploration Agency	JAXA
Japan	Japan Agency for Marine-Earth Science and Technology	JAMSTEC
Japan	Japan Meteorological Agency	JMA
Japan	Meteorological Research Institute	MRI
Japan	Tokai University	Tokai U
Japan	Weathernews	WNI
Kenya	Jomo Kenyatta University of Agriculture and Technology	JKUAT
Latvia	Latvian Environment, Geology and Meteorology Centre	LEGMC
Lithuania	Institute of Aerial Geodesy	AGI
Lithuania	Lithuanian Hydrometeorological Service	LHMS
Lithuania	University of Vilnius	VU
Madagascar	Directorat Generale of Meteorology	DGM
Malaysia	Malaysian Remote Sensing Agency	MRSA
Malaysia	faculty of geoinformation and real estate	FGHT
Marocco	University Ibn Tofail	UIT
Mauritius	Mauritius Oceanography Institute	MOI
Mexico	Facultad de Ciencias Marinas, Universidad Autónoma de Baja California	FCM/UABC
Mexico	Instituto Oceanografico del Pacifico	IOP
Mexico	Universidad de Colima	UCOL
Netherlands	Bureau Waardenburg bv	BuWa
Netherlands	Delft University of Technology	TU Delft
Netherlands	Deltares	Deltares
Netherlands	Meteo Consult on behalf of MeteoGroup Ltd.	Meteo Consult
Netherlands	National Aerospace Laboratory	NLR
Netherlands	Nidera	Nidera
Netherlands	Rijksinstituut voor Kust en Zee	RIKZ
Netherlands	Royal Netherlands Meteorological Institute	KNMI
Netherlands	Shell international	Shell
Netherlands	WaterInsight	WaterInsight

New Zealand	Meteorological Service of New Zealand	MetService
New Zealand	University of Canterbury	UC
Niger	African Centre of Meteorological Applications for Development	ACMAD
Nigeria	African Centre of Meteorological Applications for Development	ACMAD
Norway	Institute of Marine Research	IMR
Norway	MyOcean SIW TAC	MyOcean SIW TAC
Norway	Nansen Environmental and Remote Sensing Center	NERSC
Norway	Norge Handelshoyskole	NHH
Norway	Norsk Polarinstitutt	NP
Norway	Norske Meteorologiske Institutt	MET Norway
Norway	Norwegian Defense Research Establishment	FFI
Norway	Norwegian Naval Training Establishment	NNTE
Norway	Norwegian Meteorological Institute	Met.no
Norway	Statoil ASA	
Norway	StormGeo AS	StormGeo
Norway	The University Centre in Svalbard	UNIS
Norway	University of Bergen	UiB
Norway	Uni Research AS	URAS
Oman	Directorate General of Meteorology and Air Navigation	DGMAN
Peru	Instituto del Mar del Peru	IMARPE
Peru	Servicio Nacional de Meteorologia e Hidrologia	SENAMHI
Peru	Universidad Nacional Mayor de San Marcos	UNMSM
Philippines	Marine Science Institute, University of the Philippines	UP-MSI
Philippines	Ateneo de Manila University	ADMU
Poland	Centrum Badan Kosmicznych PAN	CBK PAN
Poland	Institute of Geophysics, University of Warsaw	IGF UW
Poland	Institute of Meteorology and Water Management	IMWM
Poland	Institute of Oceanology of the Polish Academy of Sciences	IOPAN
Poland	Maritime Academy Gdynia	AM/KN
Poland	Media Fm	Media Fm
Poland	Pomeranian University in S³upsk	AP
Poland	PRH BOBREK	Korn
Poland	University of Gdansk, Institute of Oceanography	UG/IO
Portugal	Centro de Estudos do Ambiente e do Mar – Univ Aveiro	CESAM
Portugal	Instituto de Investigação das Pescas e do Mar	IPIMAR
Portugal	Instituto de Meteorologia	IM
Portugal	Instituto Politécnico de Viana do Castelo	IPVC
Portugal	Laboratório Nacional de Energia e Geologia	LNEG
Portugal	Museu Nacional de Historia Natural	MNHN
Portugal	National Remote Sensing Centre	NRSC
Portugal	Universidade de Lisboa	CGUL
Portugal	Universitade dos Acores	UAC
Romania	Mircea cel Batran Naval Academy	MBNA
Romania	National Meteorological Administration	NMA
Romania	University of Bucharest	UB
Russia	V.I.Il`ichev Pacific Oceanological Institute	VIIPOI
Russia	Atlantic Research institute of Marine fisheries and oceanography	AtlantNIRO
Russia	Far Eastern Federal University	FEFU
Russia	Femco-West Ltd brach in Murmansk	FEMCO WEST
Russia	Geophysical Center of Russian Academy of Sciences	GC RAS
Russia	Institute of Ecology and Evolution, Russian Academy of Sciences	IEE RAS
Russia	Russia HycroMetCenter	RHMC
Russia	Kaliningrad State Technical University	KLGTU – KSTU
Russia	Murmansk Marine Biological Institute	MMBI

Russia	Nansen International Environmental and Remote Sensing Center	NIERSC
Russia	Russia State Hydrometeorological University	RSHU
Russia	Shirshov Institute of Oceanology RAS	SIO RAS
Russia	SRC PLANETA Roshydromet	PLANETA
Russia	State research Center Planeta	SRC
Russia	V.I.Il`ichev Pacific Oceanological Institute	POI FEB RAS
Scotland	University of Edinburgh	Edin-Univ
Senegal	Centre de Recherches Océanographiques de Dakar-Thiaroye	CRODT
Senegal	Ecole Supérieure Polytechnique de Dakar	ESP/UCAD
Singapore	Terra Weather Pte. Ltd.	TERRAWX
Singapore	Nanyang Technological University	NG
Slovakia	IBL Software Engineering	IBL
Slovenia	Slovenian Environment Agency	SEA
South Africa	Kaytad Fishing Company	KFC
South Africa	Marine and Coastal Management	MCM
South Africa	South African Weather Service-Cape Town Regional Office	SAWS
South Korea	Korea Meteorological Administration	KMA
South Korea	Korea Ocean Research and Development Institute	KORDI
South Korea	Korea Ocean Satellite Center	KOSC
South Korea	Jeju National University	JNU
South Korea	NATIONAL INSTITUTE of METEOROLOGICAL RESEARCH	NIMR
South Korea	PKNU	MF
Spain	Basque Meteorology Agency	EUSKALMET
Spain	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas	CIEMAT
Spain	Fundacion Centro de Estudios Ambientales del Mediterraneo	CEAM
Spain	Isocero.com	ISOCERO
Spain	Instituto Català de Ciències del Clima	IC3
Spain	Instituto de Ciències del Mar	ICM
Spain	Instituto d'Estudis Espacials de Catalunya	IEEC
Spain	Instituto Canario de Ciencias Marinas	ICCM
Spain	Instituto de Hidráulica Ambiental de Cantabria – Universidad de Cantabria	IH
Spain	Instituto Español de Oceanografia	IEO
Spain	Instituto Mediterraneo de Estudios Avanzados	IMEDEA (CSIC-UIB)
Spain	Instituto Nacional de Meteorologia	INM
Spain	Instituto Nacional de Pesquisas Espaciais	INPE
Spain	Instituto Nacional de Tecnica Aeroespacial	INTA
Spain	MeteoGalicia – Departamento de Climatología y Observación	Meteogalicia
Spain	MINISTERIO DEFENSA – ARMADA ESPAÑOLA	MDEF/ESP NAVY – IHM
Spain	Mediterranean Institute for Advanced Studies	IMEDEA
Spain	Museo Nacional de Ciencias Naturales – Consejo Superior de Investigaciones Cientificas	MNCN-CSIC
Spain	Starlab Barcelona sl.	STARLAB BA
Spain	Universidad Autonoma de Madrid	UAM
Spain	Universidad de Las Palmas de Gran Canaria	ULPGC
Spain	Universidad de Oviedo	UdO
Spain	Universidad Politécnica de Madrid	UPM
Spain	Universidad de Valencia	UV
Spain	Universidad de Valladolid	LATUV
Spain	University of Jaén	UJA
Spain	University of the Basque Country - Department of Applied Physics II - EOLO Group	UPV/EHU
Spain	University of Vigo	CACTI
Spain	Vortex	VORTEX
Sri Lanka	Department of Meteorology	DOM
Sri Lanka	National Aquatic Resources Research and Development Agency	NARA
Sweden	Chalmers University of Technology	CHALMERS

Sweden	Department of Earth Science, Uppsala University	DES-UU
Sweden	Stockholm University	SU
Sweden	Swedish Meteorological and Hydrological Institute	SMHI
Switzerland	Tecnavia S.A.	Tecnavia S.A.
Switzerland	World Meteorological Organization	WMO
Taiwan	Taiwan Ocean Research Institute	TORI
Taiwan	Fisheries Research Institute	FRI
Taiwan	Institute of Amos Physics, NCU ,Taiwan	ATM/NCU
Taiwan	National Central University	NCU/TAIWAN
Taiwan	Taiwan Ocean Research Institute	TORI
Taiwan	Taiwan Typhoon and Flood Research Institute	TTFRI
Turkey	Istanbul Technical University	YE
Turkey	Türkish State Meteorological Services	TSMS
Ukraine	Marine Hydrophysical Institute	MHI
Ukraine	World Data Center for Geoinformatics and Sustainable Development	WDCGSD
United Arab Emirates	International Center for Biosaline Agriculture	ICBA
United Kingdom	Asgard Consulting Limited	Asgard
United Kingdom	Department of Zoology, University of Oxford	UOO
United Kingdom	ECMWF	ECMWF
United Kingdom	ExactEarth Europe Ltd	EEE
United Kingdom	Exprodat	Exprodat
United Kingdom	Flag Officer Sea Training - Hydrography and Meteorology	FOST HM
United Kingdom	Flasse Consulting Ltd	FCL
United Kingdom	GL Noble Denton	GLND
United Kingdom	HR Wallingford	HRW
United Kingdom	Imperial College of London	ICL
United Kingdom	National Oceanography Centre, Southampton	NOCS
United Kingdom	National Renewable Energy Centre	NAREC
United Kingdom	Plymouth Marine Laboratory	PML
United Kingdom	Terradat	TDAT
United Kingdom	Telespazio VEGA	VEGA
United Kingdom	The Scottish Association for Marine Science	SAMS
United Kingdom	UK Met Office	UKMO
United Kingdom	University of Bristol	UoB
United Kingdom	University of East Anglia	UEA
United Kingdom	University of Edinburgh	Edin-Univ
United Kingdom	University of Gloucestershire	Uglos
United Kingdom	University of Leeds	Leeds
United Kingdom	University of Leicester	UoL
United Kingdom	University of Manchester	UMcr
United Kingdom	University of Plymouth	UOP
United Kingdom	University of Southampton	UoS
United Kingdom	Weatherquest Ltd	Weatherquest
Uruguay	DIRECCIÃ“N NACIONAL DE RECURSOS ACUÃTICOS	DNRA
USA	Alaska Department Of Fish and Game	ADFG
USA	Antarctic Support Contract	USAP
USA	Applied Weather Technology	AWT
USA	Atmospheric and Environmental Research	AER
USA	AWS Truepower	AWS
USA	Berkeley Earth Surface Temperature	BEST
USA	Center for Ocean-Atmosphere Prediction Studies	COAPS
USA	Clemson University	CU
USA	Colombia University	CU
USA	Colorado State University	CSU

USA	Cooperative Institute for Meteorological Studies	CIMSS
USA	Cooperative Institute for Research Environmental Sciences	CIRES
USA	Darmouth College	Dartmouth College
USA	Dept. of Environmental Conservation , Skagit Valley College	SVC
USA	Earth & Space Research	ESR
USA	Haskell Indian Nations University	INU
USA	International Pacific Research Institute - Univ. of Hawaii	IPRC
USA	Jet Propulsion Laboratory	JPL
USA	The John Hopkins University / Applied Physics Laboratory	JHU/APL
USA	Joint Typhoon Warning Center	JTWC
USA	Leidos	LEIDOS
USA	Locheed martin Corporation	LMCO
USA	NASA Langley Research Center, Affiliation Analytical Services and Materials, Inc.	NASA LaRC
USA	National Oceanic and Atmospheric Administration	NOAA/NESDIS
USA	National Oceanic and Atmospheric Administration	NOAA/NCDC
USA	National Oceanic and Atmospheric Administration	NOAA/NWS
USA	Naval Postgraduate School	NPS
USA	Ocean Weather Services	OWS
USA	Oregon State University	OSU
USA	Roffer's Ocean Fishing Forecasting Service	ROFFS
USA	Scripps Institution of Oceanography	SIO
USA	Stanford Research Institute International	SRI
USA	Starpath School of Navigation	Starpath
USA	Texas A&M University	TAMU
USA	Texas Commission on Environmental Quality	TCEQ
USA	Tuskegee University	TU
USA	United States Navy	USN
USA	University at Albany-SUNY	UAlbany
USA	University of Maryland	UMCP
USA	University of Miami	RSMAS MPO
USA	University of South Carolina	USC
USA	University of South Florida	USF
USA	University of Washington	UW
USA	Vanderbilt University	VU
USA	Weather Routing Inc.	WRI
USA	Woods Hole Oceanographic Institution	WHOI
Venezuela	Escuela de Ingeniería Eléctrica Universidad	EIEU
Vietnam	Vietnam National Center for Hydro-Meteorological Forecast	NCHMF

table 29 : List of Institutes registered on the central Web Site

Moreover 8 new individual users, i.e. persons independent from any institute, establishment or company, registered on the period.

6.1.1.2. Statistics on the use of the OSI SAF central Web site.

Usage of the OSI SAF central Web Site by country (top 10) over 1st half 2015 (pages views)						
Countries	JAN. 2015	FEB. 2015	MAR. 2015	APR. 2015	MAY 2015	JUN. 2015
France	25756	20931	12474	17021	12682	19135
Denmark	1946	1041	1418	1085	1139	1437
Germany	864	805	927	962	1626	1001
Netherlands	971	464	1023	1098	773	1107
Sweden	353	943	923	829	919	1253
Italy	811	701	629	616	537	784
Spain	536	779	1537	171	326	513
Norway	522	688	867	659	572	386
China	562	598	1919	8	362	5
Japan	950	338	849	898	110	233

Figure 62 : **Usage of the OSI SAF central Web Site by country (top 10) over 1st half 2015**

6.1.1.3. Status of User requests made via the OSI SAF and EUMETSAT Help desks

Following table provides the status of requests made on the OSI SAF central Help Desk.

reference	Date	subject	status
150001	05/01/2015	Request for SST products on a specific area	closed
150002	07/01/2015	Products missing on Ifremer ftp server	closed
150003	21/01/2015	Winds quicklooks history is only one day for ASCAT-B	closed
150004	09/02/2015	Python scripts to read BUFR data ?	closed
150005	23/02/2015	Problem with quality level in MSG SST product	closed
150006	04/03/2015	Access request to ASCAT wind products in NetCDF	closed
150007	07/03/2015	Request for SST products on a specific area	closed
150008	09/04/2015	Request for wind products on a specific area and specific period	closed
150009	12/05/2015	Request for wind products on a specific area and specific period	closed
150010	21/05/2015	How to open GRIB data ?	closed
150011	02/06/2015	Problem on KNMI website	closed
150012	02/06/2015	Looking for advices on how to use the sea ice concentration product	closed
150013	03/06/2015	Request for SST products for specific periods	closed
150014	24/06/2015	Request to a wrong recipient	closed
150015	02/07/2015	Problem to receive service messages	closed

table 30 : **Status of User requests on central OSI SAF Help Desk.**

Following table provides the status of requests forwarded from EUMETSAT Help Desk.

reference	Date	subject	status
300028935	01/04/2015	Error in BUFR and Fortran bits in wind products	ongoing
300029380	21/05/2015	Information about Wind Vector CellQuality Flag	closed

table 31 : **Status of requests from EUMETSAT Help Desk.**

6.1.2 Statistics on the OSI SAF Sea Ice Web portal and help desk

The following graph illustrates the evolution of visitors on the OSI SAF High Latitude portal (http://osisaf.met.no/).

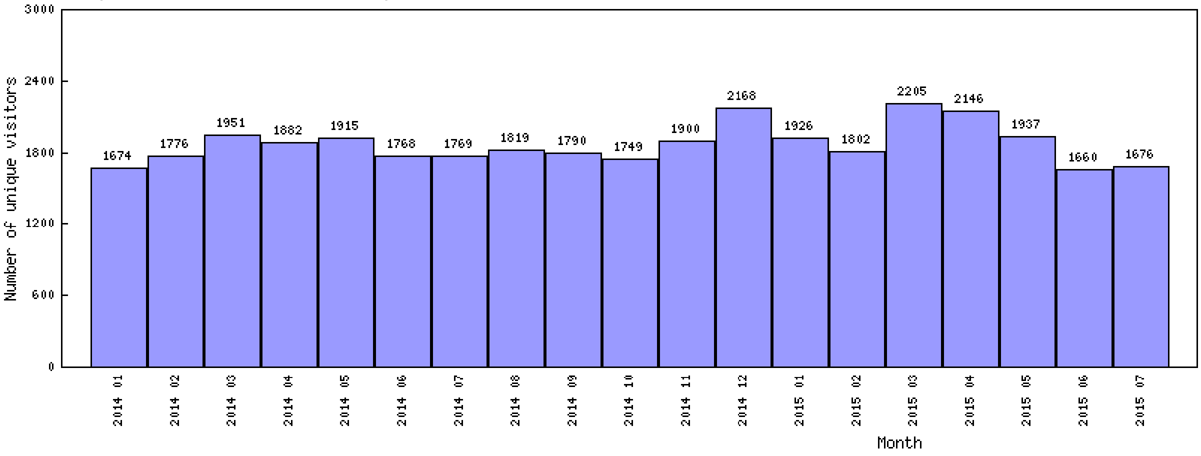

Figure 63 : **Evolution of visitors on the HL OSI SAF Sea Ice portal from January 2014 to JUN. 2015 (http://osisaf.met.no).**

6.1.3 Statistics on the OSI SAF KNMI scatterometer web page and helpdesk

The following graph illustrates the evolution of page views on the KNMI scatterometer web pages, which are partly devoted to the OSI SAF wind products, from August 2005 to June 2015. Only external sessions (from outside KNMI) are counted.

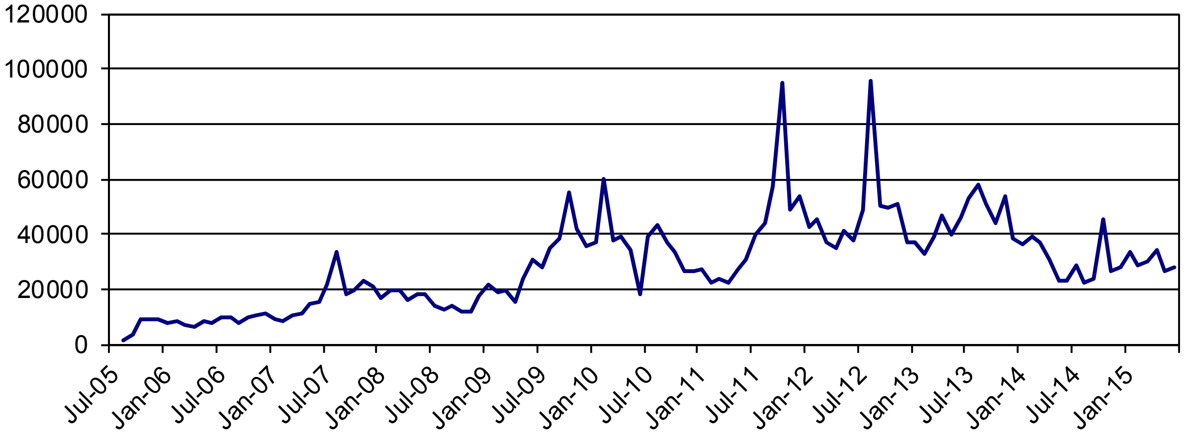

Figure 64 : **Number of page views on KNMI scatterometer website per month.**

At scat@knmi.nl, 84 Emails from 27 different addresses were received in the period Jan-Mar 2015, requesting wind data, processing software, and other support. For Apr-Jun 2015 an additional 102 Emails from 38 different addresses were received. This includes requests in the OSI SAF, the NWP SAF, and the EARS project. The total number of enquiries in this half year was 72, and 48 of them were identified as OSI SAF enquiries. All requests were acknowledged or answered within three working days.

The following table gives the list of the registered wind users at KNMI.

Entity	Shortened name	Country
Environment Canada		Canada
Koninklijk Nederlands Meteorologisch Instituut	KNMI	Netherlands
Centre Mediterrani d'Investigacions Marines I Ambientals	CMIMA-CSIC	Spain
Italian Air Force Weather Service		Italy
Norwegian Meteorological Institute	Met.no	Norway
BMT Argoss		Netherlands
Danish Meteorological Institute	DMI	Denmark
Jet Propulsion Laboratory	JPL	U.S.A.
EUMETSAT		Germany
Institute of Meteorology and Water Management Poland	IMGW	Poland
University of Concepcion CHILE		Chile
Turkish State Meteorological Services		Turkey
National Centre for Medium Range Weather Forecasting India		India
Nanjing University		China
Indian National Centre for Ocean Information Service	INCOIS	India
Rudjer Boskovic Institute / Center for Marine Research		Croatia
Consiglio Nazionale delle Ricerche – ISAC Laboratorio		Italy
Ifremer		France
NOAA/NESDIS		U.S.A.
MetService		New Zealand
UAE Met. Department		United Arab Erimates
The Ohio State University, Dept. of Electrical Eng.		U.S.A.
University of Wisconsin-Madison		U.S.A.
BYU Center for Remote Sensing, Brigham Young University		U.S.A.
Woods Hole Oceanographic Institution		U.S.A.
Remote Sensing Systems		U.S.A.
Institute of Low Temperature Science, Hokkaido University		Japan
Center for Atmospheric and Oceanic Studies, Tohoku University		Japan
Naval Research Laboratory	NRL	U.S.A.
ComSine Ltd		U.K.
Met Office		U.K.
Meteorology and Oceanography Group, Space Applications Centre, ISRO		India
Numerical Prediction Division, Japan Meteorological Agency		Japan
The First Institute of Oceanography	FIO	China
PO.DAAC Data Engineering Team		U.S.A.
ECMWF		U.K.
Satellite Observing Systems		U.K.
Météo France	M-F	France
School of Marine Science and Technology, Tokai University		Japan
Northwest Research Associates		U.S.A.
University of Washington		U.S.A.
Naval Hydrographic Service, Ministry of Defence		Argentina
Swedish Meteorological and Hydrological Institute	SMHI	Sweden

Entity	Shortened name	Country
Chalmers University of Technology		Sweden
Typhoon Research Department, Meteorological Research Institute		Japan
Gujarat University		India
Consiglio Nazionale delle Ricerche	CNR	Italy
Oceanweather Inc.		U.S.A.
Ocean University of China		China
Nanjing University of China		China
Hydrometeorological Research Center of Russia		Russia
Meteorology Scientific Institution of ShanDong Province		China
VisioTerra		France
China Meteorological Administration	CMA	China
Institut de Recherche pour le Développement	IRD	France
Weathernews Inc		Japan
NECTEC		Thailand
University of Ioannina		Greece
Bermuda Weather Service		Bermuda
Chinese Academy of Sciences		China
Naval Postgraduate School		U.S.A.
University of Hawaii		U.S.A.
Chinese Culture University		Taiwan
Federal University of Rio de Janeiro		Brazil
Flanders Marine Institute		Belgium
V. I. Il`ichev Pacific Oceanological Institute		Russia
Jet Propulsion Laboratory	JPL	U.S.A.
NASA		U.S.A.
National Center for Atmospheric Research	NCAR	U.S.A.
Chinese Academy of Meteorology Science		China
Weather Routing, Inc.	WRI	U.S.A.
Instituto Oceanográfico de la Armada		Equador
Leibniz Institute for Baltic Sea Research		Germany
Nansen Environmental and Remote Sensing Center		Norway
UNMSM		Peru
Centro de Estudos do Ambiente e do Mar		Portugal
Andhra University, Visakhapatnam		India
Unidad de Tecnología Marina (UTM – CSIC)		Spain
MyOcean Sea Ice Wind TAC (Ifremer)		France
Jeju National University		Korea
Weather Data Marine Ltd.		U.K.
Admiral Paulo Moreira Marine Research Institute		Brazil
IMEDEA (UIB-CSIC)		Spain
Hong Kong Observatory		Hong Kong
Observatoire Midi-Pyrenees		France
Tidetech		Australia
Weatherguy.com		U.S.A.
Marine Data Literacy		U.S.A.
Hong Kong University of Science and Technology		Hong Kong
Environmental Agency of the Republic of Slovenia		Slovenia
Fisheries and Sea Research Institute		Portugal
National Meteorological Center		China
National Oceanography Centre, Southampton		U.K.
National Taiwan University		Taiwan
Florida State University		U.S.A.

Entity	Shortened name	Country
Charles Sturt University, Wagga Wagga		Australia
Marine and Coastal Management		South Africa
Gent University		Belgium
Department of Meteorology		Sri-Lanka
Gwangju Institute of Science & Technology		South Korea
University of Hamburg		Germany
University of Las Palmas de Gran Canaria		Spain
The Third Institute of Oceanography		China
South China Sea Institute of Oceanology		China
Environmental Research Institute, University College Cork		Ireland
Shan dong meteorologic bureau		China
RPS MetOcean Pty Ltd		Australia
APL-UW		China
Korea Ocean Research and Development Institute		Korea
XMU		China
Collecte Localisation Satellites	CLS	France
Instituto de Meteorologia		Portugal
ISRO - NRSC		India
ACMAD		Niger
UTL-Technical University of Lisbon		Portugal
Bureau of Meteorology		Australia
CPTEC - INPE		Brazil
StormGeo AS		Norway
Vienna University of Technology (TU Wien)		Austria
NSOAS		China
Deutscher Wetterdienst	DWD	Germany
Far-Eastern Centre for Reception and Processing of Satellite Data		Russia
Roshydromet		Russia
Sorbonne Universities		France
Brazilian Navy		Brazil
Hofstra University		U.S.A.
University of Tehran		Iran
Finnish Meteorological Institute	FMI	Finland
Stretch Space Ltd.		U.K.
Korea Institute of Ocean Science and Technology		South Korea
National Satellite Meteorological Center	NSMC	China
Irvin & Johnson Holding Company		South Africa
26 independent users (not affiliated to an organization)		

table 32 : List of registered Wind users at KNMI.

6.2 Statistics on the FTP sites use

6.2.1 Statistics on the SS1 and PO.DAAC ftp site use

SST and fluxes products are available on Ifremer FTP server. Some SST products are also available at the PODAAC. Although outside the OSI SAF the PODAAC kindly provides the OSI SAF with statistics on the downloading of the OSI SAF products on their server.

Number of OSI SAF products downloaded on Ifremer FTP server over 1st half 2015													
		JAN. 2015		FEB. 2015		MAR. 2015		APR. 2015		MAY 2015		JUN. 2015	
		Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC
SST MAP +LML		0	x	5	x	14	x	696	x	0	x	0	x
SSI MAP +LML		0	x	0	x	0	x	0	x	0	x	0	x
DLI MAP +LML		0	x	0	x	0	x	0	x	0	x	0	x
OSI-201	GBL SST	58	3079	66	1396	66	1558	4062	2281	54	1403	3086	1153
OSI-202	NAR SST	673	5062	635	1893	688	2426	577	3495	616	2604	5058	2763
OSI-204	MGR SST	354451	748	300398	523	335763	497	369236	386	344930	387	336585	207
OSI-206	METEOSAT SST	12056	-	18182	-	6159	-	19227	-	14708	-	46684	-
OSI-207	GOES-E SST	6052	-	11288	-	3615	-	13673	-	4093	-	42064	-
OSI-208	IASI SST	14656	-	13352	-	14676	-	42831	-	30769	-	15021	-
OSI-303	METEOSAT DLI	1232	x	1	x	0	x	0	x	0	x	1	x
OSI-304	METEOSAT SSI	10710	x	2384	x	5563	x	2930	x	4508	x	43930	x
OSI-305	GOES-E DLI	31	x	29	x	30	x	30	x	29	x	29	x
OSI-306	GOES-E SSI	936	x	1462	x	756	x	784	x	2118	x	18515	x

table 33 : **Number of OSI SAF products downloaded from Ifremer FTP server and PO.DAAC server over 1st half 2015.**

Note : PO.DAAC statistics about the NAR SST product is the sum of NOAA-17, NOAA-18, NOAA-19 and Metop-A NAR SST products.
Statistics for OSI-206, OSI-207 and OSI-208 in PO.DAAC are not yet available because these products were ingested in PO.DAAC during 1st half of 2015.

Note : NAIAD (http://naiad.ifremer.fr/) is a web interface which allows users to search, visualize and extract products. This discovery access to SST and fluxes products (and also wind products) is not recorded in the table above.
A lot of users only look at the data displayed in the web interface : this is not recorded in the FTP usage statistics provided in this report. Some users use Naiad to select the files they are interested in and then upload the files directly from the FTP server or OpenDAP links : in such case, the files accessed by FTP are indeed recorded in the FTP usage statistics but not the OpenDAP downloads.

At the moment, it is impossible to distinguish users of OSI SAF products in Naiad interface from users of other products. But as said above, the data downloaded through FTP (using Naiad as a file selection tool) are recorded and traced in the reports.

6.2.2 Statistics on the SS2 ftp site use

Sea Ice products are available on MET Norway FTP server. The numbers include the ice concentration, ice edge and ice type product for each product area in GRIB and HDF5 format.

Number of Sea Ice products downloaded on High Latitude FTP server over 1st half 2015							
		JAN. 2015	FEB. 2015	MAR. 2015	APR. 2015	MAY 2015	JUN. 2015
OSI-401	Global Sea Ice Concentration	19965	11913	39511	22324	22718	133897
OSI-402	Global Sea Ice Edge	2632	2337	5990	2597	7004	79948
OSI-403	Global Sea Ice Type	2174	17820	12933	3574	5801	76673
OSI-404	Global Sea Ice Emissivity	241	160	189	486	196	3626
OSI-405	Low resolution Sea Ice Drift	1124	3594	4165	1848	19329	7232
OSI-407	Medium resolution Sea Ice Drift	285	115	155	414	1242	5239
OSI-409	Reprocessed Ice Concentration	110753	51421	41237	6220	52670	401637
Downloaded SST, DLI and SSI over the OSI SAF High Latitude FTP server							
OSI-203	AHL SST	207	224	327	230	365	4173
OSI-301	AHL DLI	0	9	71	0	1	1301
OSI-302	AHL SSI	81	31	3	0	0	1272

table 34 : Number of OSI SAF products downloaded from OSI SAF Sea Ice FTP server over 1st half 2015.

6.2.3 Statistics on the SS3 and PO.DAAC ftp site use

Wind products are available on KNMI FTP server. The products are also available at the PODAAC in NetCDF. Although outside the OSI SAF the PODAAC kindly provides the OSI SAF with statistics on the downloading of the OSI SAF products on their server.

The numbers for the KNMI FTP server are the average number of downloads per product file of the near-real time products. The numbers for PO.DAAC are the downloaded number of archived product files (containing one orbit each) which may cover the whole product history. Note that the BUFR products are also disseminated through EUMETCast.

We provided archived SeaWinds data to 2 users and archived OSCAT data to 1 user during the reporting period.

Number of OSI SAF products downloaded on KNMI FTP server over 1st half 2015													
		JAN. 2015		FEB. 2015		MAR. 2015		APR. 2015		MAY 2015		JUN. 2015	
		KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC
OSI-102	ASCAT-A 25km	20 per file (BUFR) 37 per file (NetCDF)	116886	22 per file (BUFR) 25 per file (NetCDF)	114644	22 per file (BUFR) 24 per file (NetCDF)	34135	18 per file (BUFR) 26 per file (NetCDF)	48260	40 per file (BUFR) 33 per file (NetCDF)	155888	25 per file (BUFR) 32 per file (NetCDF)	14825
OSI-102-b	ASCAT-B 25km	20 per file (BUFR) 32 per file (NetCDF)	69224	20 per file (BUFR) 16 per file (NetCDF)	35331	20 per file (BUFR) 17 per file (NetCDF)	19763	20 per file (BUFR) 18 per file (NetCDF)	10662	20 per file (BUFR) 25 per file (NetCDF)	67103	20 per file (BUFR) 27 per file (NetCDF)	28528
OSI-103	ASCAT-A 12.5km	20 per file (BUFR) 37 per file (NetCDF)	87544	22 per file (BUFR) 25 per file (NetCDF)	21993	22 per file (BUFR) 24 per file (NetCDF)	103015	18 per file (BUFR) 26 per file (NetCDF)	109907	-	195221	-	86508
OSI-104	ASCAT-A Coastal	20 per file (BUFR) 21 per file (NetCDF)	83682	20 per file (BUFR) 20 per file (NetCDF)	45812	20 per file (BUFR) 24 per file (NetCDF)	132201	20 per file (BUFR) 24 per file (NetCDF)	195845	20 per file (BUFR) 31 per file (NetCDF)	190178	20 per file (BUFR) 32 per file (NetCDF)	192804
OSI-104-b	ASCAT-B Coastal	20 per file (BUFR) 14 per file (NetCDF)	44198	20 per file (BUFR) 20 per file (NetCDF)	33371	20 per file (BUFR) 20 per file (NetCDF)	38913	20 per file (BUFR) 18 per file (NetCDF)	36137	20 per file (BUFR) 25 per file (NetCDF)	111368	20 per file (BUFR) 27 per file (NetCDF)	65146

Number of OSI SAF products downloaded on KNMI FTP server over 1st half 2015													
		JAN. 2015		FEB. 2015		MAR. 2015		APR. 2015		MAY 2015		JUN. 2015	
		KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC	KNMI FTP	PO.DAAC
OSI-109-a	RapidScat 25 km Wind 2 hours	-	-	-	-	11 per file (BUFR) 4 per file (NetCDF)	-	11 per file (BUFR) 5 per file (NetCDF)	-	13 per file (BUFR) 9 per file (NetCDF)	-	15 per file (BUFR) 6 per file (NetCDF)	-
OSI-109-b	RapidScat 50 km Wind 2 hours	-	-	-	-	8 per file (BUFR) 4 per file (NetCDF)	-	10 per file (BUFR) 5 per file (NetCDF)	-	12 per file (BUFR) 9 per file (NetCDF)	-	15 per file (BUFR) 6 per file (NetCDF)	-
OSI-109-c	RapidScat 25 km Wind 3 hours	-	-	-	-	11 per file (BUFR) 7 per file (NetCDF)	-	12 per file (BUFR) 9 per file (NetCDF)	-	14 per file (BUFR) 12 per file (NetCDF)	-	16 per file (BUFR) 8 per file (NetCDF)	-
OSI-109-d	RapidScat 50 km Wind 3 hours	-	-	-	-	10 per file (BUFR) 6 per file (NetCDF)	-	11 per file (BUFR) 6 per file (NetCDF)	-	13 per file (BUFR) 11 per file (NetCDF)	-	16 per file (BUFR) 7 per file (NetCDF)	-

table 35 : **Number of OSI SAF products downloaded from KNMI FTP server and PO.DAAC server over 1st half 2015.**

6.3 Statistics from EUMETSAT central facilities

6.3.1 Users from EUMETCast

Here below the list of the OSI SAF users identified by EUMETSAT for the distribution by EUMETCast. The table 43 shows the overall number of OSI SAF users by country at the 6 July 2015. In clear green, the countries with the greatest numbers of users.

Albania	3	Gabon	1	Nigeria	3
Algéria	4	Gambia	2	Norway	4
Angola	2	Germany	97	Oman	2
Argentina	2	Ghana	6	Peru	1
Armenia	1	Greece	12	Poland	11
Australia	1	Guinea	2	Portugal	5
Austria	18	Guinea-Bissau	2	Qatar	3
Azerbaijan	3	Hungary	8	Reunion	1
Bahrain	1	Iceland	1	Romania	5
Belgium	9	India	1	Russian Federation	7
Benin	2	Iran, Islamic Republic Of	4	Rwanda	5
Bosnia And Herzegovina	1	Iraq	1	San Marino	1
Botswana	3	Ireland	5	Sao Tome And Principe	2
Brazil	37	Isle Of Man	1	Saudi Arabia	4
Bulgaria	1	Israel	7	Senegal	6
Burkina Faso	2	Italy	244	Serbia	3
Burundi	2	Jordan	1	Seychelles	2
Cameroon	3	Kazakhstan	3	Sierra Leone	2
Canada	2	Kenya	9	Slovakia	4
Cape Verde	2	Korea, Republic Of	2	Slovenia	1
Central African Republic	2	Kuwait	1	Somalia	1
Chad	2	Kyrgyzstan	1	South Africa	16
China	3	Latvia	1	Spain	43
Comoros	2	Lebanon	3	Sudan	3
Congo	2	Lesotho	2	Swaziland	2
Congo, The Democratic Republic Of The	4	Liberia	2	Sweden	3
Côte D'Ivoire	4	Libyan Arab Jamahiriya	1	Switzerland	9
Croatia	2	Lithuania	2	Syrian Arab Republic	1
Cuba	1	Luxembourg	1	Tajikistan	1
Cyprus	1	Macedonia, The Former Yugoslav Republic Of	1	Tanzania, United Republic Of	3
Czech Republic	14	Madagascar	3	Togo	1
Denmark	4	Malawi	1	Tunisia	2
Djibouti	2	Mali	1	Turkey	6
Dominican Republic	1	Malta	2	Turkmenistan	1
Ecuador	1	Martinique	1	Uganda	3
Egypt	4	Mauritania	2	Ukraine	2
El Salvador	1	Mauritius	7	United Arab Emirates	5
Equatorial Guinea	2	Moldova, Republic Of	1	United Kingdom	119
Eritrea	2	Morocco	5	United States	7
Estonia	3	Mozambique	4	Uzbekistan	1
Ethiopia	5	Namibia	5	Viet Nam	1
Finland	4	Netherlands	25	Zambia	2
France	52	Niger	6	Zimbabwe	3

table 36 : **Overall number of EUMETCast users by country at 06 July 2015.**

6.3.2 Users and retrievals from UMARF

Orders Summary over the 1st half 2015

The table 37 below lists the persons who download data from the EUMETSAT Data Center and the volume of the downloaded data in megabytes (MB) by month. In yellow, the users who have downloaded more than 1GB of data at least during a month.

User Id.	JAN. 2015	FEB. 2015	MAR. 2015	APR. 2015	MAY 2015	JUN. 2015	TOTAL (MB)
monteiroi	434	19	255				708
990609	24						24
MartinsDim	145	165					310
thomas2	988						988
transvalor	13						13
knowwhat		9934		4936			14870
mbrenchley		19					19
simoneta			40				40
ioos2ooi			4309				4309
JoaoGRodri			222				222
hwalther			16				16
vippvikkk					3241		3241
youme_zx					3056		3056
TSMS_arc						5	5
cyn713						22196	22196
grieco						2140	2140
TOTAL	1604	10137	4842	4936	6294	24341	52157

table 37 : **Volume of data downloaded (in MB) by users and by month from EDC over 1st half 2015.**

Ingestion Summary over the 1st half 2015

The next tables list the received percentage of OSI SAF products by month over the period. All products ingestion is over the OSI SAF monthly target performance of 95% :

		JAN. 2015	FEB. 2015	MAR. 2015	APR. 2015	MAY 2015	JUN. 2015
OSI-401	Global Sea Ice Concentration (DMSP-F17)	96,77	100	100	100	100	100
OSI-305	Daily Downward Longwave Irradiance (GOES-13)	96,77	100	100	100	100	100
OSI-306	Daily Surface Solar Irradiance (GOES-13)	96,77	100	100	100	100	100
OSI-305	Hourly Downward Longwave Irradiance (GOES-13)	98,79	100	99,73	96,77	98,79	100
OSI-306	Hourly Surface Solar Irradiance (GOES-13)	98,52	100	99,73	96,77	98,79	100
OSI-207	Hourly Sea Surface Temperature (GOES-13)	98,65	99,85	99,86	96,63	98,65	100
OSI-102-b	ASCAT 25km Wind (Metop-B)	100	100	100	100	100	100
OSI-104-b	ASCAT 12.5km Coastal Wind (Metop-B)	98,86	100	100	100	100	100
OSI-103	ASCAT 12.5km Wind (Metop-A)	98,40	99,74	100	100	100	100
OSI-102	ASCAT 25km Wind (Metop-A)	99,31	100	100	100	100	100
OSI-104	ASCAT 12.5km Coastal Wind (Metop-A)	99,08	100	100	99,76	100	100
OSI-201	Global Sea Surface Temperature (Metop-A)	98,38	98,21	100	100	100	100
OSI-202	NAR Sea Surface Temperature (Metop-A)	96,77	100	100	100	100	100
OSI-301	AHL Downward Longwave Irradiance (Multi Mission)	96,77	100	100	100	100	100
OSI-405	Global Sea Ice Drift (Multi Mission)	100	100	100	100	100	100
OSI-402	Global Sea Ice Edge (Multi Mission)	96,7	100	100	100	100	100
OSI-403	Global Sea Ice Type (Multi Mission)	98,38	100	100	100	100	100
OSI-302	AHL Surface Solar Irradiance (Multi Mission)	96,77	100	100	100	100	100
OSI-203	AHL Sea Surface Temperature (Multi Mission)	98,38	100	98,38	100	100	100
OSI-303	Daily Downward Longwave Irradiance (MSG)	96,77	100	100	100	100	100
OSI-304	Daily Surface Solar Irradiance (MSG)	100	100	100	100	100	100
OSI-303	Hourly Downward Longwave Irradiance (MSG)	98,65	100	99,73	96,77	99,19	100
OSI-304	Hourly Surface Solar Irradiance (MSG)	98,79	100	99,73	96,77	99,19	100
OSI-206	Hourly Sea Surface Temperature (MSG)	98,11	100	99,73	96,77	98,92	99,86
OSI-202	NAR Sea Surface Temperature (NPP)	98,38	100	100	90,00	98,38	98,33
	TOTAL	98,67	99,95	99,83	97,89	99 ,29	99,97

table 38 : Percentage of received OSI SAF products in 1st half 2015.

7 Documentation update

The following table provides the list of documents modified during the reporting period, as well as new documents made available to users. Last version of documents and new documents are available on the central Web Site (www.osi-saf.org).

Top-level documentation :

Name of the Document		Reference	Latest versions	date
OSI SAF CDOP-2 Half-yearly operations report 2014 2nd half	HYR14-H2	SAF/OSI/CDOP2/M-F/TEC/RP/334	1.0	Feb. 2015
OSI SAF CDOP-2 Status Report n°7	SR07	SAF/OSI/CDOP2/M-F/TEC/RP/2-017	1.0	Apr. 2015
OSI SAF CDOP2 Product Requirement Document	PRD	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	3.1	Apr. 2015
OSI SAF CDOP2 Service Specification Document	SeSp	SAF/OSI/CDOP2/M-F/MGT/PL/2-003	2.4	Apr. 2015
OSI SAF CDOP2 Project Plan	PP	SAF/OSI/CDOP2/M-F/MGT/PL/2-005	1.3	March 2015
OSI SAF CDOP2 Master Schedule	MSch	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	1.4	May 2015
Minutes of 7th CDOP2 Steering Group meeting	SG07	SAF/OSI/CDOP2/M-F/MGT/RP/2-107	1.0	May 2015
OSI SAF CDOP2 Configuration Management Plan	CMP	SAF/OSI/CDOP2/M-F/MGT/PL/2-009	1.1	June 2015
OSI SAF CDOP2 Product Requirement Document	PRD	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	3.2	June 2015
OSI SAF CDOP2 Service Specification Document	SeSp	SAF/OSI/CDOP2/M-F/MGT/PL/2-003	2.5	June 2015

table 39 : Top-level documentation updates

Sub-systems documentation :

Name of the Document		Reference	Latest versions	date
Algorithm Theoretical Basis Document for the OSI SAF wind products	ATBD	SAF/OSI/CDOP2/KNMI/SCI/MA/197	1.2	Feb. 2015
Metop-B/AVHRR SAFOLEO ATBD	ATBD	SAF/OSI/CDOP2/M-F/SCI/MA/216	1.1	Feb. 2015
Architecture Design Document LEOSAFO	ADD	SAF/OSI/CDOP2/M-F/TEC/TN/219	1.1	Feb. 2015

Name of the Document		Reference	Latest versions	date
RapidScat winds engineering test report	ETR	SAF/OSI/CDOP2/KNMI/TEC/RP/229	1.0	Feb. 2015
RapidScat wind Product User Manual	PUM	SAF/OSI/CDOP2/KNMI/TEC/MA/227	1.1	Mar. 2015
RapidScat wind validation report	SVR	SAF/OSI/CDOP2/KNMI/TEC/RP/228	1.1	Mar. 2015
SeaWinds wind Climate Data Record PUM	PUM	SAF/OSI/CDOP2/KNMI/TEC/MA/220	1.3	Mar. 2015
SeaWinds wind Climate Data Record validation report validation report	SVR	SAF/OSI/CDOP2/KNMI/TEC/RP/221	1.3	Mar. 2015
ATBD for the OSI SAF Sea and Ice Surface Temperature Processing Chain (OSI-203-a)	ATBD	SAF/OSI/CDOP2/MET/SCI/MA/222	1.1	30 March 2015
OSI SAF Metop-A IASI Sea Surface Temperature L2P (OSI-208) Validation report	SVR	SAF/OSI/CDOP2/M-F/TEC/RP/210	1.4	April 2015
Global Sea Ice Concentration Reprocessing PUM	PUM	SAF/OSI/CDOP/MET/TEC/MA/138	2.0	April 2015
Validation report for OSI SAF Global sea ice conc. reprocessing (OSI-409, OSI-409-a and OSI-430)	SVR	SAF/OSI/CDOP2/DMI/SCI/RP/226	2.0	April 2015
ATBD for the OSI SAF Sea and Ice Surface Temperature (OSI-205)	ATBD	SAF/OSI/CDOP2/DMI/SCI/MA/223	1.1	April 2015
Global Sea Ice Concentration PUM (OSI-401-b)	PUM	SAF/OSI/CDOP2/DMI_MET/TEC/MA/204	1.0	April 2015
Global Sea Ice Concentration ATBD (OSI-401-b)	PUM	SAF/OSI/CDOP2/DMI/SCI/MA/189	1.3	April 2015
Global sea ice concentration SVR (OSI-401-b)	SVR	SAF/OSI/CDOP2/DMI/SCI/RP/225	1.0	April 2015
Global Sea Ice Edge and Type PUM (OSI-402-b, OSI-403-b)	PUM	SAF/OSI/CDOP2/MET/TEC/MA/205	1.1	April 2015
Global Sea Ice Edge and Type ATBD (OSI-402-b, OSI-403-b)	ATBD	SAF/OSI/CDOP2/MET/SCI/MA/208	1.2	April 2015
Global Sea Ice Edge and Type VR (OSI-402-b, OSI-403-b)	VR	SAF/OSI/CDOP2/MET/SCI/RP/224	1.1	April 2015
Low Resolution Sea Ice Drift ATBD (OSI-405-b)	ATBD	SAF/OSI/CDOP/MET/SCI/MA/130	1.1	April 2015
Low Resolution Sea Ice Drift PUM (OSI-405-b)	PUM	SAF/OSI/CDOP/MET/TEC/MA/128	1.7	March 2015
Low Resolution Sea Ice Drift VR (OSI-405-b)	VR	SAF/OSI/CDOP/MET/T&V/RP/131	4	March 2015
Global Sea Ice Concentration PUM (OSI-409, OSI-409-a, OSI-430)	ATBD	SAF/OSI/CDOP/MET/TEC/MA/138	2.1	July 2015
Global Sea Ice Concentration PUM (OSI-409, OSI-409-a, OSI-430)	ATBD	SAF/OSI/CDOP/MET/TEC/MA/138	2.2	August 2015

table 40 : Sub-systems documentation updates

Recent publications

Vogelzang, J., G.P. King and A. Stoffelen, Spatial variances of wind fields: their sensitivity to sampling strategy and their relation to second-order structure functions and spectra
J. Geophys. Res., 2015, 120, doi:10.1002/2014JC010239.

Belmonte-Rivas, M., A. Stoffelen and G.J. van Zadelhoff, The Benefit of HH and VV Polarizations in Retrieving Extreme Wind Speeds for an ASCAT-Type Scatterometer
IEEE Gosci. Remote Sensing Letters, 2014, 52, 7, 4273-4280, doi:10.1109/TGRS.2013.2280876.

Hasager, C., A. Mouche, M. Badger, F. Bingol, I. Karagali, T. Driesenaar, A. Stoffelen, A. Pina and N. Longepe, Offshore wind climatology based on synergetic use of Envisat ASAR, ASCAT and QuikSCAT
Remote Sens. Environ., 2014, 156, 247-263, doi:10.1016/j.rse.2014.09.030.

Zadelhoff, G.J. van, A. Stoffelen, P.W. Vachon, J. Wolfe, J. Horstmann and M. Belmonte-Rivas, Retrieving hurricane wind speeds using cross-polarization C-band measurements
Atmospheric Measurement Techniques, 2014, 7, 473-449, doi:10.5194/amt-7-437-2014.