The EUMETSAT Network of Satellite Application Facilities

OSI SAF
Ocean and Sea Ice

OSI SAF CDOP2

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HALF-YEARLY OPERATIONS REPORT

–

1st half 2016

–

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version 1.0

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1 Introduction

1.1 Scope of the document

The present report covers from 1st of January to 30th of June 2016.

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 www.osi-saf.org, the OSI SAF web site.

1.3 Reference and applicable documents

1.3.1 Applicable documents

[AD-1] : Service Specification Document, SESP, version 2.8

1.3.2 Reference documents

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

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

[RD-3] : ASCAT L2 winds Data Record Product User Manual
OSI-150-a, OSI-150-b

[RD-4] : Reprocessed SeaWinds L2 winds Product User Manual
OSI-151-a, OSI-151-b

[RD-5] : Low Earth Orbiter Sea Surface Temperature Product User Manual
OSI-201-b, OSI-202-b, OSI-204-b, OSI-208-b

[RD-6] : Atlantic High Latitude L3 Sea Surface Temperature Product User Manual
OSI-203

[RD-7] : Geostationary Sea Surface Temperature Product User Manual
OSI-206, OSI-207

[RD-8] : Atlantic High Latitude Radiative Fluxes Product User Manual
OSI-301, OSI-302

[RD-9] : Geostationary Radiative Flux Product User Manual
OSI-303, OSI-304, OSI-305, OSI-306

[RD-10] : Product User Manual for OSI SAF Global Sea Ice Concentration
OSI-401-b

[RD-11] : Global Sea Ice Edge and Type Product User's Manual
OSI-402-b, OSI-403-b

[RD-12] : 50 Ghz Sea Ice Emissivity Product User Manual
OSI-404

[RD-13] : Low Resolution Sea Ice Drift Product User's Manual
OSI-405-b

[RD-14] : Medium Resolution Sea Ice Drift Product User Manual
OSI-407

[RD-15] : 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
ASCAT	Advanced SCATterometer
AVHRR	Advanced Very High Resolution Radiometer
BUFR	Binary Universal Format Representation
CDOP	Continuous Development and Operations Phase
CMS	Centre de Météorologie Spatiale (Météo-France)
DLI	Downward Long wave Irradiance
DMI	Danish Meteorological Institute
DMSP	Defense Meteorological Satellite Program
ECMWF	European Centre for Medium range Weather Forecasts

EDC	EUMETSAT Data Centre
EPS	European Polar System
FTP	File Transfer Protocol
GBL	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
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 or MET	Norwegian Meteorological Institute
Metop	METeorological OPerational Satellite
MF	Météo-France
MGR	Meta-GRanule
MSG	Meteosat Second Generation
NAR	Northern Atlantic and Regional
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
NIC	National Ice Center (USA)
OSI SAF	Ocean and Sea Ice SAF
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
SSI	Surface Short wave Irradiance
SSMI	Special Sensor Microwave Imager
SSMIS	Special Sensor Microwave Imager and Sounder
SST/IST	Sea Surface Temperature/ sea Ice Surface Temperature
SST	Sea Surface Temperature
TBC	To Be Confirmed
TBD	To Be Defined
WMO	World Meteorological Organisation

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.

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.

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.

Please find in section 3 comments on the tables included in section 2.1 and 2.2.

2.1 Availability on FTP servers

Ref.	Product	JAN. 2016	FEB. 2016	MAR. 2016	APR. 2016	MAY 2016	JUN. 2016
OSI-102	ASCAT-A 25 km Wind	100	99.8	99.9	99.9	100	100
OSI-102-b	ASCAT-B 25 km Wind	100	99.8	100	99.9	99.9	100
OSI-104	ASCAT-A Coastal Wind	99.8	99.6	99.8	99.7	99.7	99.8
OSI-104-b	ASCAT-B Coastal Wind	99.9	99.7	99.9	99.9	99.9	99.8
OSI-109-a	RapidScat 25 km Wind 2 hours	99.3	99.5	98.1	98.3	81.3	99.2
OSI-109-b	RapidScat 50 km Wind 2 hours	99.3	99.3	97.8	98.3	81.3	99.2
OSI-109-c	RapidScat 25 km Wind 3 hours	99.5	99.8	98.7	98.6	99.8	99.2
OSI-109-d	RapidScat 50 km Wind 3 hours	99.5	99.8	98.4	98.6	99.8	99.2
OSI-201	GBL SST	98.3	98.2	100	100	98.3	96.6
OSI-202	NAR SST	98.3	96.5	100	100	99.1	95.8
OSI-203	AHL SST / NHL SSIST	100	100	100	98.3	100	98.3
OSI-204	MGR SST	98.4	97.7	99.6	100	98.7	96.2
OSI-206	METEOSAT SST	98.3	99.4	99.2	100	96.9	89.2
OSI-207	GOES-E SST	97.9	99.1	98.5	100	95.5	85.1
OSI-208	IASI SST	83.5	93.4	99.3	99.6	97.0	93.4
OSI-301	AHL DLI	100	100	100	100	100	100
OSI-302	AHL SSI	100	100	100	100	100	100
OSI-303	METEOSAT DLI - hourly	97.9	99.1	99.1	99,4	98.1	95.4
	METEOSAT DLI - daily	100	100	100	100	100	93.3
OSI-304	METEOSAT SSI - hourly	97.9	99.1	99.1	99,4	98.1	95.4
	METEOSAT SSI - daily	100	100	100	100	100	93.3
OSI-305	GOES-E DLI - hourly	98,1	98,7	98,1	99,9	98	95,4
	GOES-E DLI - daily	100	100	100	100	100	93.3
OSI-306	GOES-E SSI - hourly	98,1	98,7	98,1	99,9	98	95,4
	GOES-E SSI - daily	100	100	100	100	100	93.3
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	100	86.7	100	100
OSI-405	Low Res. Sea Ice Drift	100	100	100	100	100	100
OSI-407	Medium Res. Sea Ice Drift	100	100	100	98.3	98.3	98.3

table 2 : Percentage of OSI SAF products available on the local FTP servers within the specified time over 1st half 2016

2.2 Availability via EUMETCast

Ref.	Product	JAN. 2016	FEB. 2016	MAR. 2016	APR. 2016	MAY 2016	JUN. 2016
OSI-102	ASCAT-A 25 km Wind	100	99.8	99.9	99.9	100	100
OSI-102-b	ASCAT-B 25 km Wind	100	99.8	100	99.9	99.9	100
OSI-104	ASCAT-A Coastal Wind	99.8	99.6	99.8	99.7	99.7	99.8
OSI-104-b	ASCAT-B Coastal Wind	99.9	99.7	99.9	99.9	99.9	99.8
OSI-109-a	RapidScat 25 km Wind 2 hours	99.3	99.5	98.1	98.3	81.3	99.2
OSI-109-b	RapidScat 50 km Wind 2 hours	99.3	99.3	97.8	98.3	81.3	99.2
OSI-109-c	RapidScat 25 km Wind 3 hours	99.5	99.8	98.7	98.6	99.8	99.2
OSI-109-d	RapidScat 50 km Wind 3 hours	99.5	99.8	98.4	98.6	99.8	99.2
OSI-201	GBL SST	100	> 89.66	100	100	100	100
OSI-202	NAR SST	100	> 96.55	100	100	100	100
OSI-203	AHL SST / NHL SSIST	100	100	100	100	100	100
OSI-204	MGR SST	99.3	> 95.27	99.6	99.9	99.8	99.8
OSI-206	METEOSAT SST	99.4	> 95.26	100	100	99.6	100
OSI-207	GOES-E SST	99.4	> 95.26	99.6	100	100	100
OSI-208	IASI SST	80.4	> 78.56	99.8	99.5	97.9	98.2
OSI-301	AHL DLI	100	100	100	100	100	100
OSI-302	AHL SSI	100	100	100	100	100	100
OSI-303	METEOSAT DLI - hourly	99.0	> 95.1	98.6	100	99.7	99.7
	METEOSAT DLI - daily	96.7	> 96.5	100	100	100	100
OSI-304	METEOSAT SSI - hourly	99.3	> 95.4	99.9	100	99.9	99.9
	METEOSAT SSI - daily	100	> 96.5	100	100	100	100
OSI-305	GOES-E DLI - hourly	99.6	> 94.2	99.7	100	99.6	99.9
	GOES-E DLI - daily	100	> 96.5	100	100	100	100
OSI-306	GOES-E SSI - hourly	98.5	> 94.1	98.4	100	99.3	99.7
	GOES-E SSI - daily	100	> 96.5	100	100	100	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	100	86.7	100	100
OSI-405	Low Res. Sea Ice Drift	100	100	100	100	100	100
OSI-407	Medium Res. Sea Ice Drift	100	100	100	98.3	98.4	98.3

table 3 : Percentage of OSI SAF products delivered via EUMETCast within the specified time over 1st half 2016

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

Since 2016 1st half, the calculation of the performance has been homogenise with other production centers, taking into account the real availability on EUMETCast and on the FTP server, as the user have.

Unfortunately, for EUMETCast, the measurement, based on the reception, was incomplete in February 8th and part of 9th, because of the loss of information. This is the reason why we have introduced the ">" sign in table 3. For OSI-202, 204, 206, 207, 208, 303, 304, 305, 306 a potential of 3 to 4 % good results could possibly be added, and 6% for OSI-201.

The low performance of OSI-208 in January and February, both for EUMETCast and FTP server, was due to the new calculation which had an impact on the timeliness. However, the IASI SST performance was improved with the switch on Metop-B on February 23th, because of an early reception of IASI data from EUMETSAT in comparison with previously Metop-A.

In June, two periods of unavailability of the Ifremer FTP server (16th and 18th) have impacted the performance. The data have been put with delay on the FTP server on 21 June.

3.2 At SS2

- 19.01.2016 – Medium resolution ice drift archive was updated, to remove an earlier reported bug in the time stamp of the product.

- 01.03.2016 – A processing error lead to a large missing sector in the ice edge, type and low resolution drift products. The processing error was corrected, products reprocessed and made available on the FTP server.

- 06.04 – 11.04.2016 – Unstable delivery of SSMIS F17 and corrupted data lead to degraded sea ice products (except MR ice drift). It was decided to replace SSMIS F17 with SSMIS F18 in the production chains, and this was implemented. First for ice concentration (11th April), then ice edge, type and LR ice drift (12th April), ice emissivity (turned off for 8 days) on 19th April and continuous reprocess ice concentration on 26th April.

- In June 2016, the medium resolution sea ice drift had one day were the product was delayed since the product was generated but not distributed. The error was corrected.

3.3 At SS3

- RapidScat winds have been degraded (wind speed drop of ~1.0m/s) between 11 February and 3 March due to an unstable loopback calibration pulse.
- Due to an anomaly in the KNMI EUMETCast reception station on 27 March, the global Metop-A ASCAT winds have been interrupted between 11:42 and 15:12 sensing time. The global Metop-B ASCAT winds have been interrupted between 12:18 and 15:57 sensing time.
- The reduced availability of the RapidScat 2 hours products (OSI-109-a and OSI-109-b) in May 2016 was due to the input data being produced with larger delays at JPL. In fact, most of the delayed files were only a few minutes late.

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

Since December 2015, the METEOSAT SST (OSI-206) and the GOES SST (OSI-207) were disseminated in L3C NetCDF4 on Ifremer FTP server in parallel with the L3C NetCDF3 dissemination. The NetCDF3 operational production was stopped on the 2nd of February.

On 23h of February, the "Metop-B" SST products [OSI-201-b, OSI-202-b, OSI-204-b, OSI-208-b] were operationally distributed both on EUMETCast and on Ifremer FTP server, replacing the "Metop-A" SST ones [OSI-201, OSI-202, OSI-204, OSI-208].
Since this switch, the Metop GLB SST (OSI-201-b) and Metop NAR SST (OSI-202-b) products were flipped north-south in GRIB files (NetCDF files were not affected). This has been corrected on the 17th of March.

4.2 At SS2

The improved sea ice concentration has been declared operational and on May 26th 2016 the shift was made between OSI-401-a and OSI-401-b.
More details about the improvements are documented here:
http://osisaf.met.no/p/ice/new_ice_conc.html

This upgrade did result in some problems for users, even though the OSI-401-b product had been made available on FTP and EUMETCast several months in advance. Both the file name and file structure of the GRIB files were changed, and users that were not aware of these changes, had problems when the distribution of OSI-401-a was turned off. Some lessons to be learned from this:

- Avoid changes in formats and file names if not necessary.
- Not all users get the information from service messages.
- The GRIB format has very little flexibility for changes and almost no room for metadata, which is useful for tracking changes. The NetCDF format is much better and should be the preferred format for product distribution.
- Quality control must be improved when introducing significant changes like this time.

In June 2016, the climatological filtering of the sea ice concentration OSI-401-b was updated to better represent the sea ice conditions after user's query.

4.3 At SS3

AWDP v2.4 was implemented in operations on 29th May for ASCAT-A and ASCAT-B wind processing. This release featured:

- Some changes in the redundancy flag setting.
- Some minor changes in the NetCDF format.
- The ASCAT-A backscatter corrections were updated to compensate for the instrument anomalies that occurred in autumn 2014 and that resulted in an average wind speed drop of approximately 0.06 m/s.

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/lml/#qua_SST%Metop%20GBL%20SST_monthly%20map_monthly_Night%20time.

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

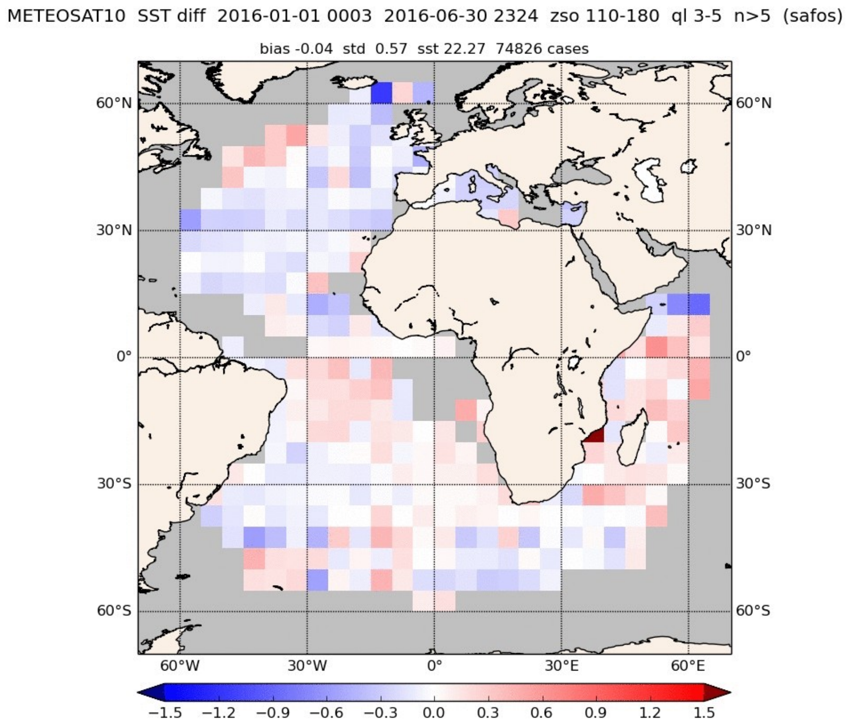


Figure 1 : mean METEOSAT <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5

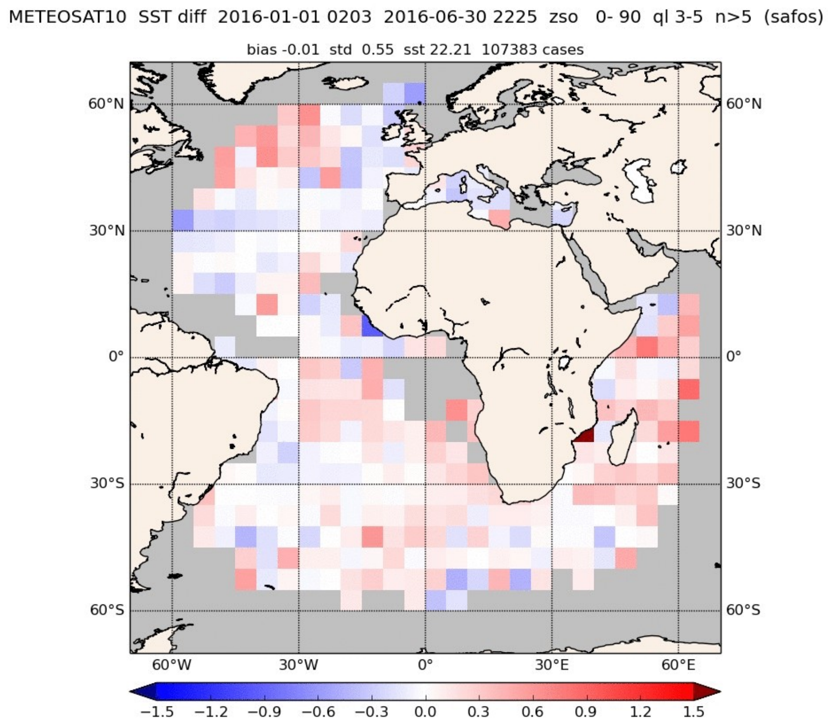


Figure 2 : mean METEOSAT <u>day</u>-time SST error with respect to buoys measurements for quality level 3,4,5

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

METEOSAT night-time SST quality results over 1st half 2016							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2016	11085	-0.08	0.5	84	0.53	1	47
FEB. 2016	11114	0.11	0.5	78	0.59	1	41
MAR. 2016	13454	-0.06	0.5	88	0.59	1	41
APR. 2016	17432	0.01	0.5	98	0.57	1	43
MAY 2016	12963	-0.02	0.5	96	0.55	1	45
JUN. 2016	12229	0.01	0.5	98	0.57	1	43
METEOSAT day-time SST quality results over 1st half 2016							
JAN. 2016	16396	0	0.5	100	0.49	1	51
FEB. 2016	14636	-0.03	0.5	94	0.52	1	48
MAR. 2016	16819	-0.01	0.5	98	0.54	1	46
APR. 2016	23116	0	0.5	100	0.55	1	45
MAY 2016	21299	-0.03	0.5	94	0.53	1	47
JUN. 2016	19958	0.05	0.5	90	0.61	1	39
(*) 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 2016, for 3, 4, 5 quality indexes.

Comments: Overall quality results are good and quite stable.

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

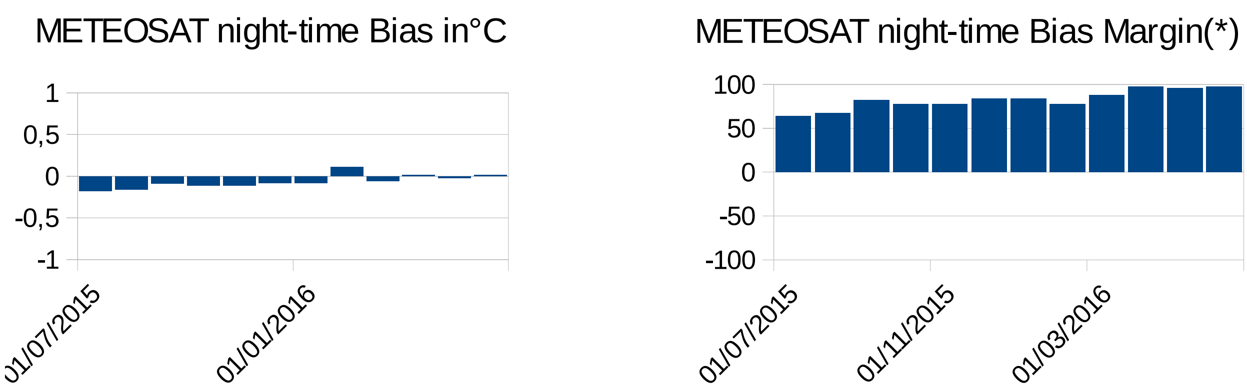


Figure 3 : METEOSAT night-time, SST Bias & SST Bias Margin

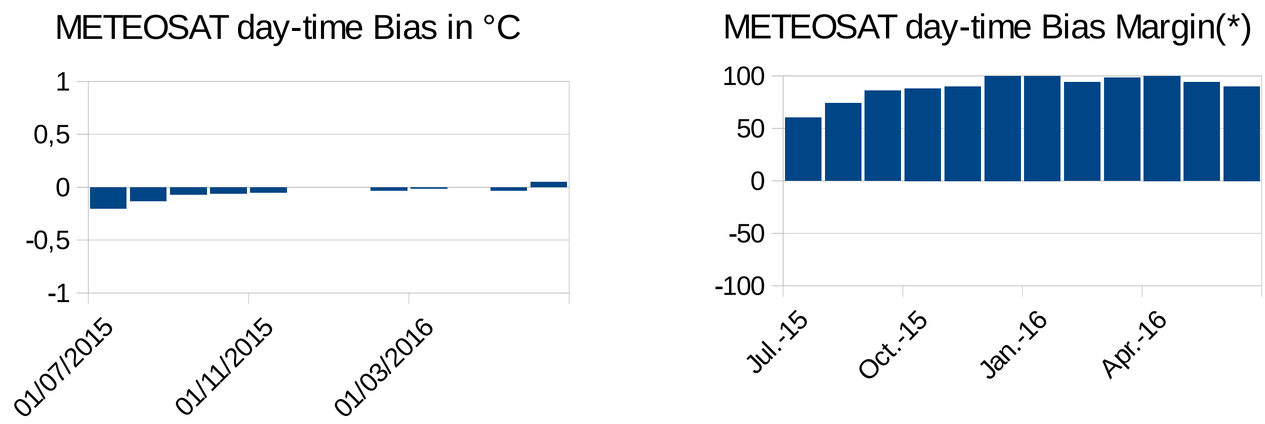


Figure 4 : METEOSAT day-time, SST Bias & SST Bias Margin

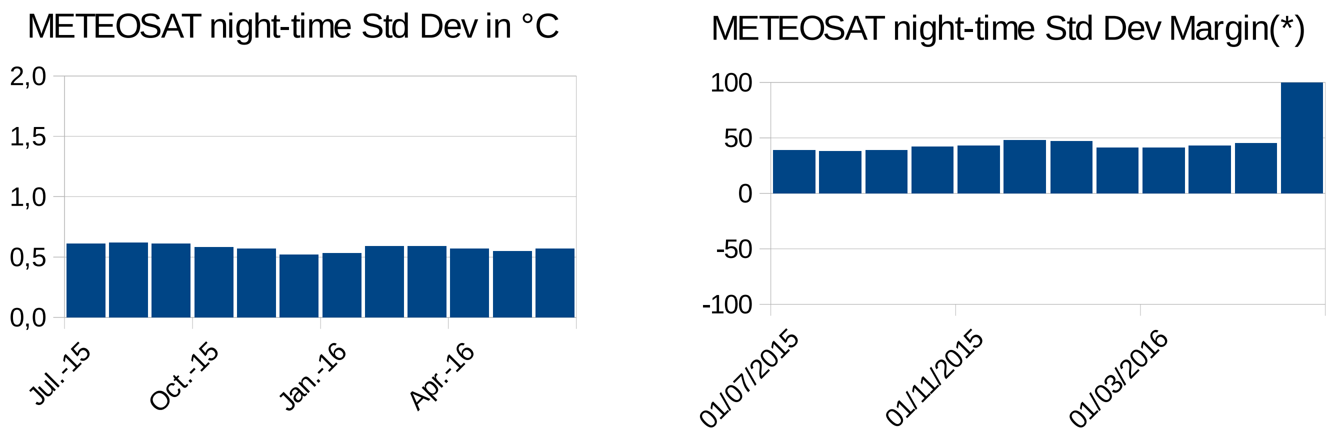


Figure 5 : METEOSAT night-time, SST Standard deviation & SST Standard deviation Margin

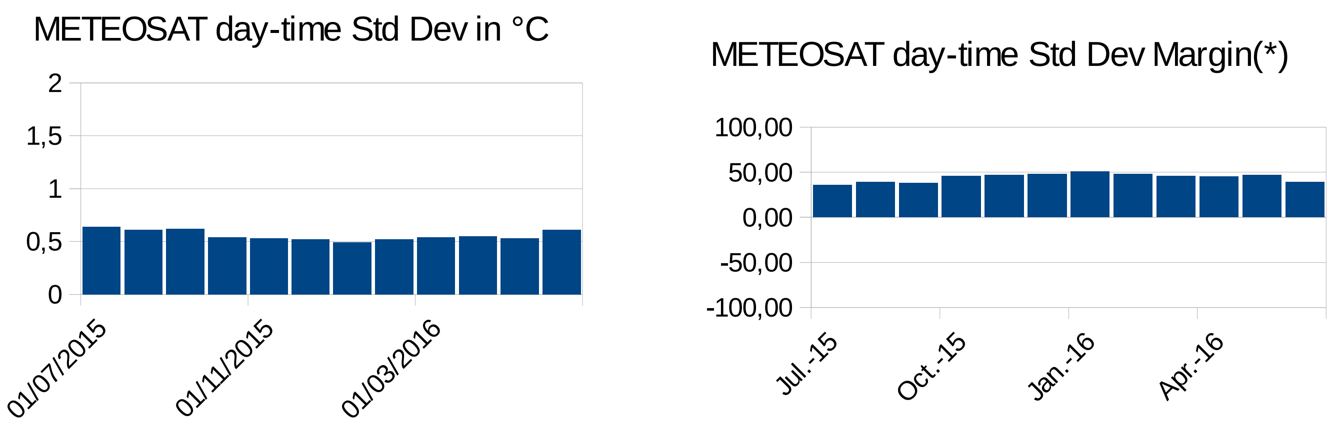


Figure 6 : METEOSAT day-time, SST Standard deviation & SST Standard deviation Margin

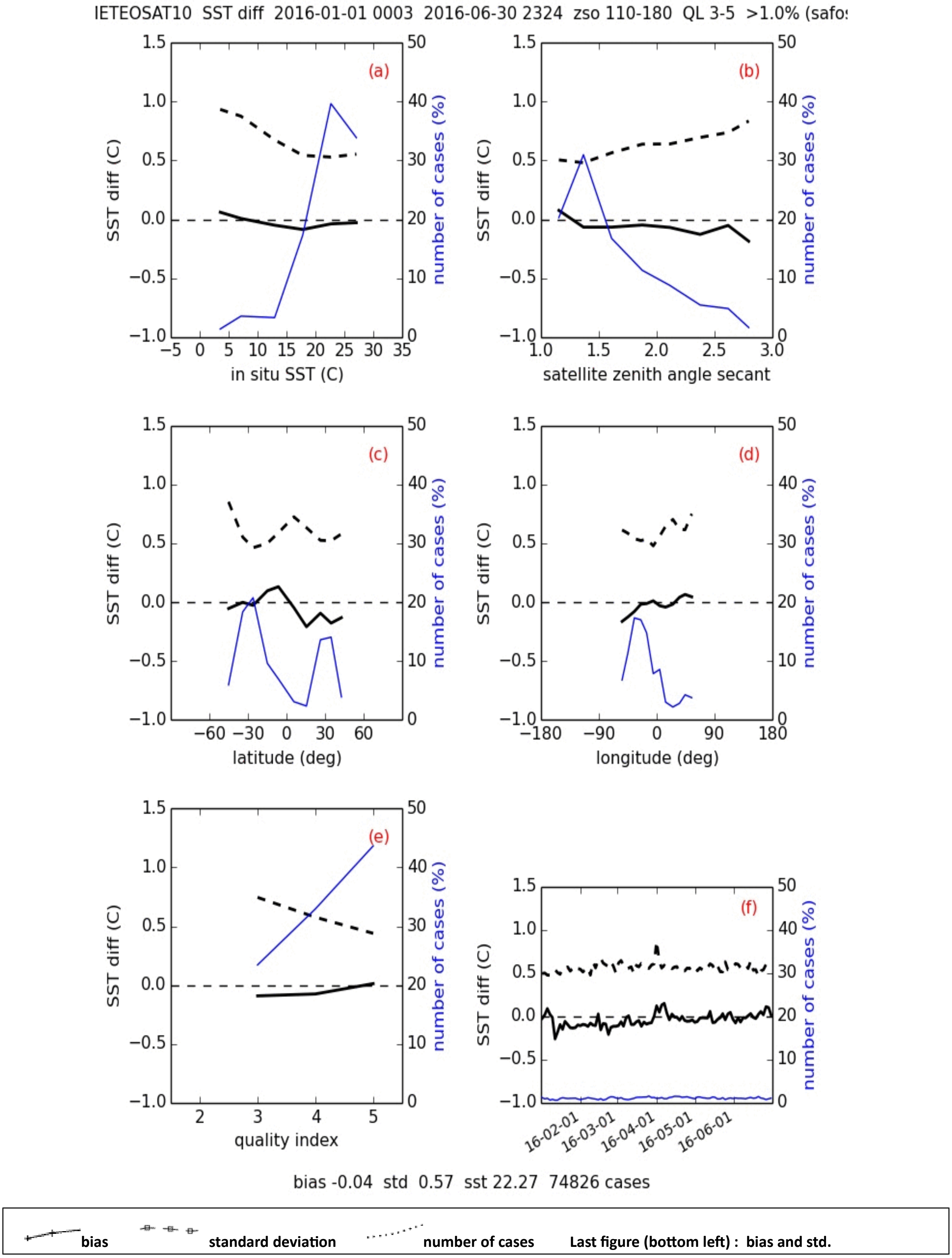


Figure 7 : **Complementary quality assessment statistics on METEOSAT SST, night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)**

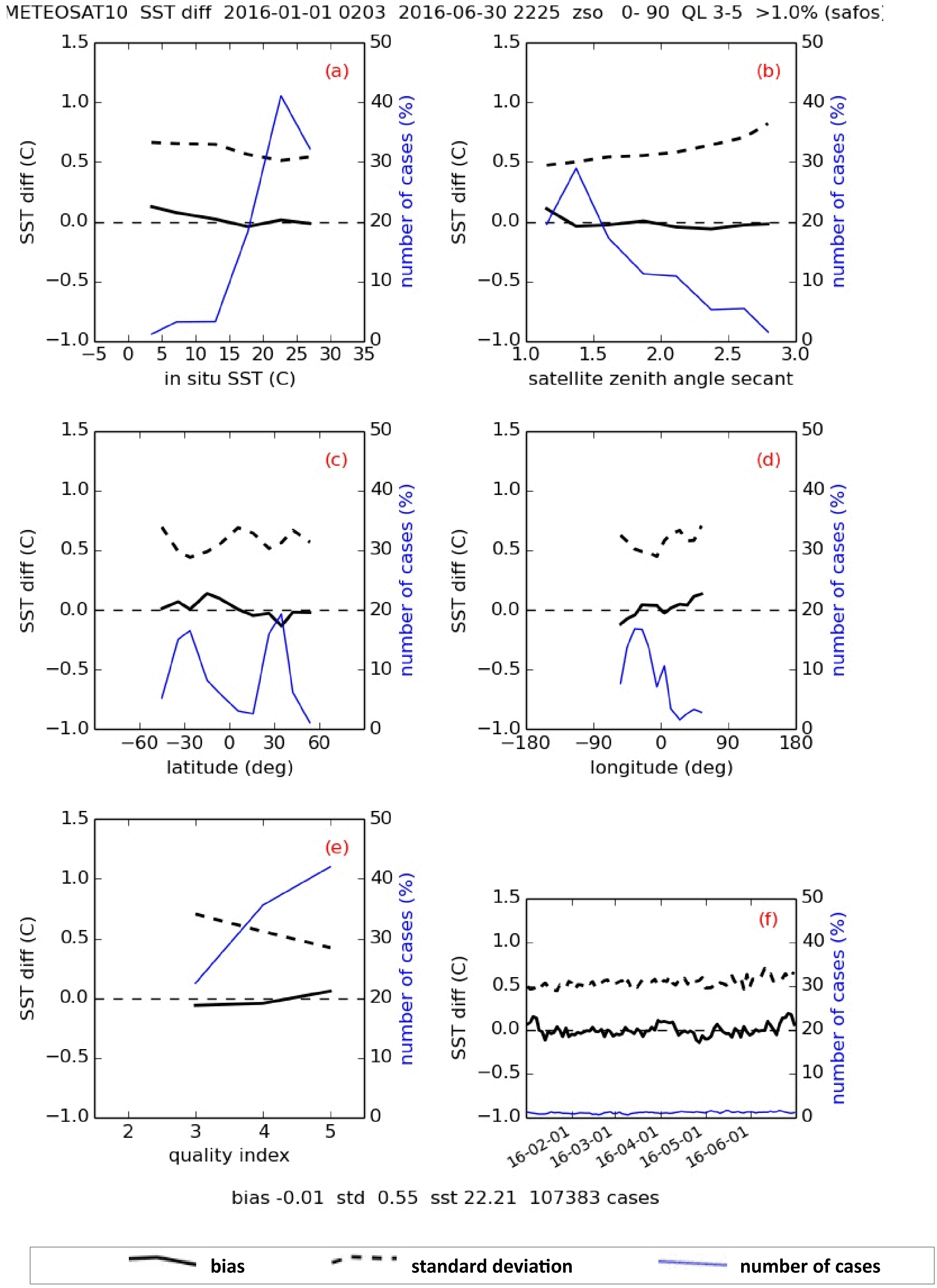


Figure 8 : Complementary quality assessment statistics on METEOSAT SST, day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

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.

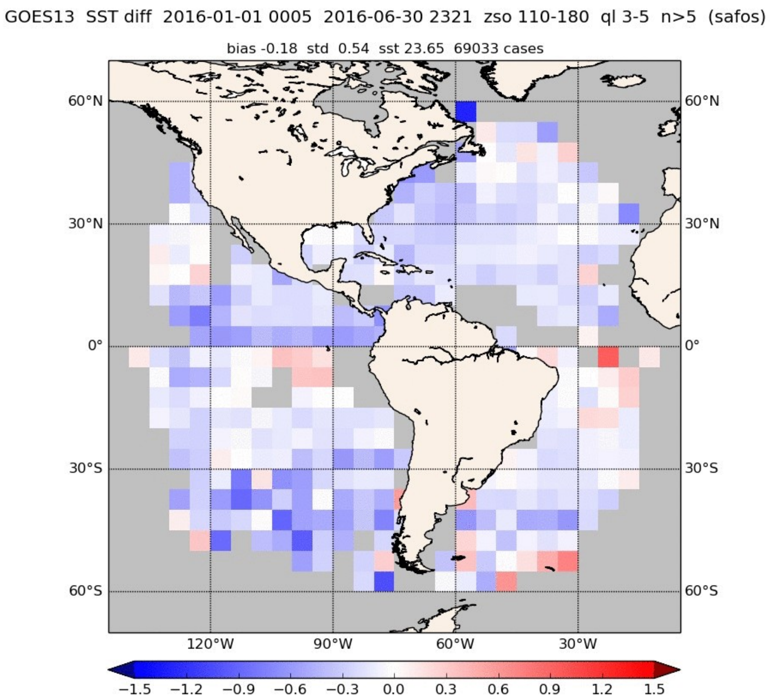


Figure 9 : mean GOES-E night-time SST error with respect to buoys measurements for quality level 3,4,5

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

GOES-E night-time SST quality results 1st half 2016							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2016	12872	-0.17	0.5	66	0.51	1	49
FEB. 2016	14248	-0.16	0.5	68	0.57	1	43
MAR. 2016	13158	-0.19	0.5	62	0.56	1	44
APR. 2016	12640	-0.21	0.5	58	0.56	1	44
MAY 2016	9896	-0.21	0.5	58	0.49	1	51
JUN. 2016	9252	-0.17	0.5	66	0.51	1	49

(*) 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 2016, for 3, 4, 5 quality indexes

Comments: Overall 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.

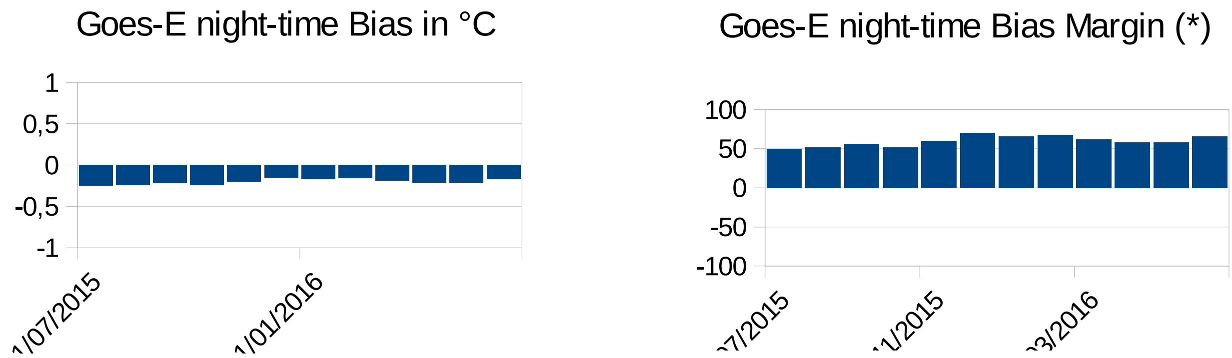


Figure 10 : **Goes-E night-time, SST Bias & SST Bias Margin.**

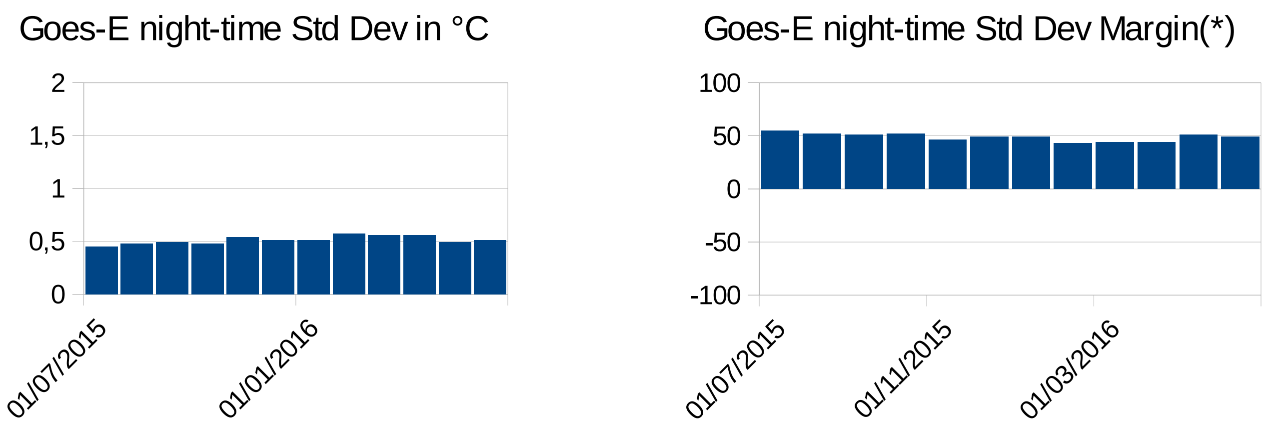


Figure 11 : **Goes-E night-time, SST Standard deviation & SST Standard deviation Margin.**

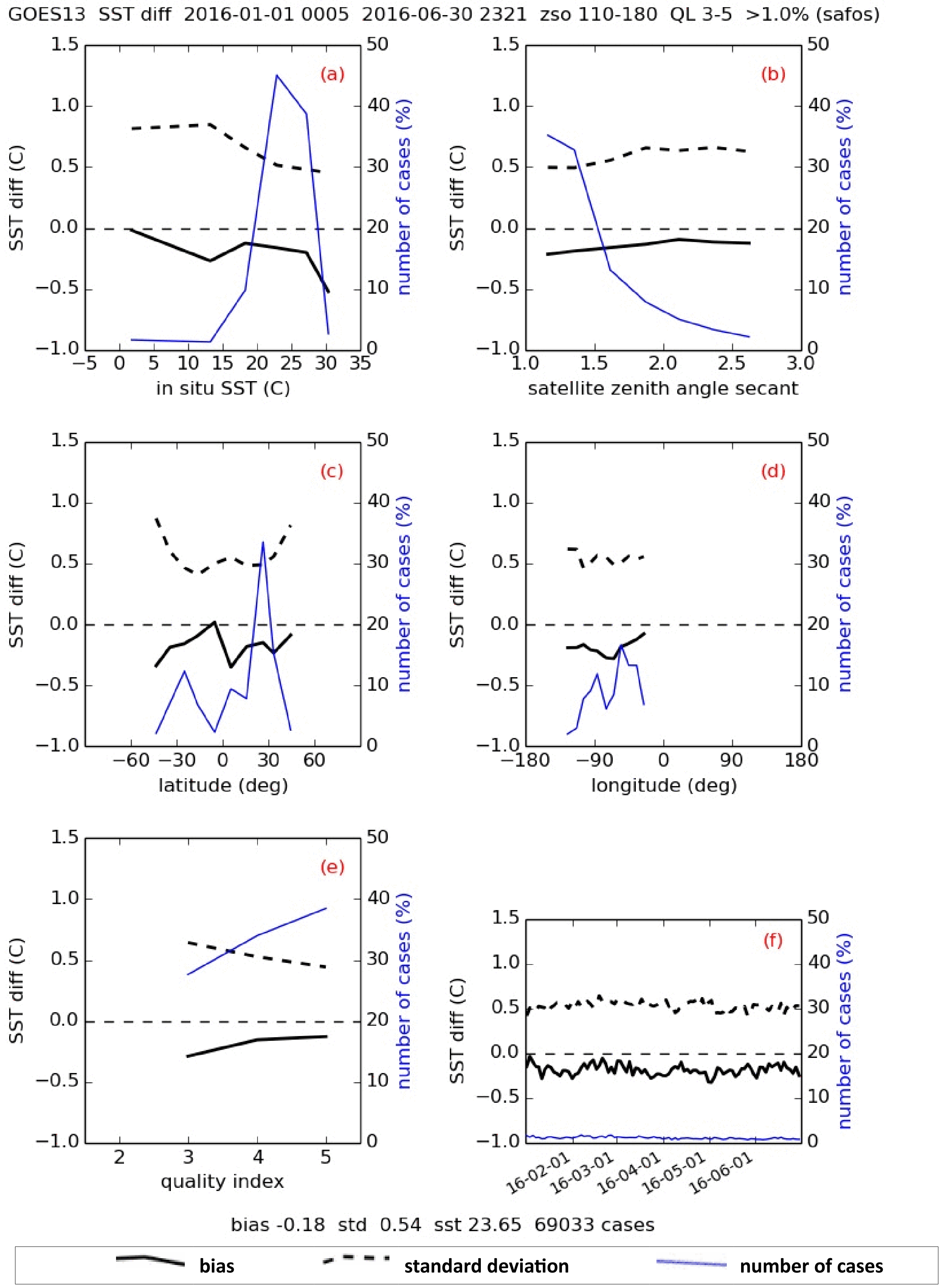


Figure 12 : Complementary quality assessment statistics on GOES-E SST, night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.3 NAR SST (OSI-202) quality

The operational NAR SST is processed for satellite/sensor, Metop/AVHRR (currently Metop-B) and S-NPP/VIIRS.
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.

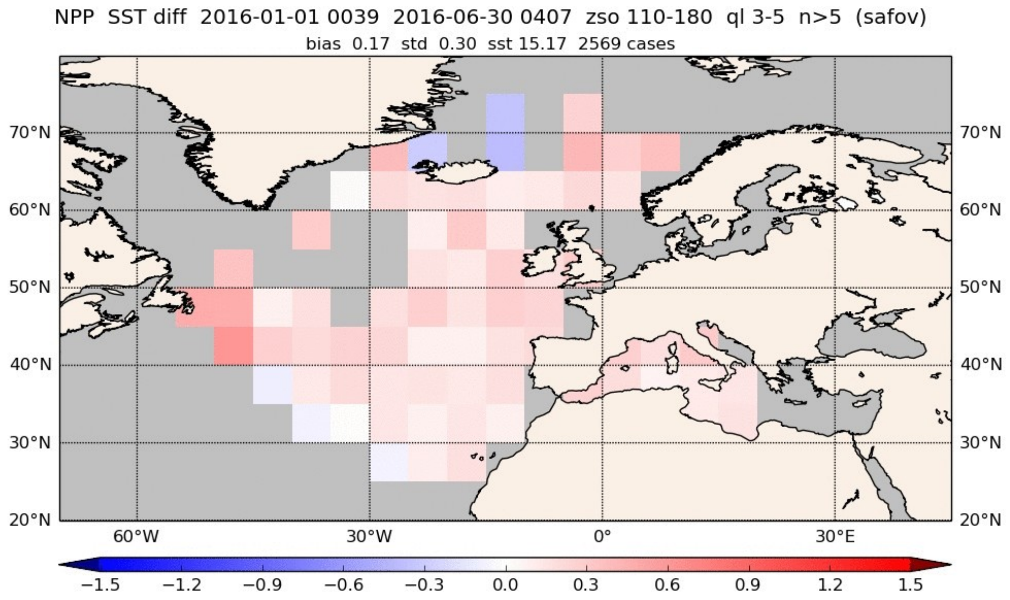


Figure 13 : mean NPP NAR <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5

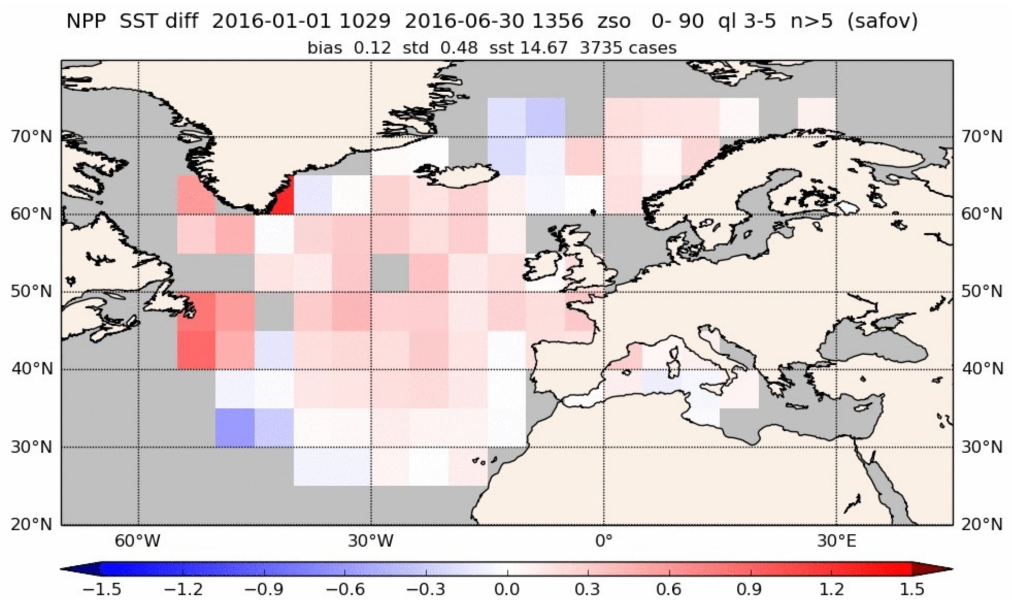


Figure 14 : mean NPP NAR <u>day</u>-time SST error with respect to buoys measurements for quality level 3,4,5

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

NPP NAR night-time SST quality results over 1st half 2016							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2016	526	0.15	0.5	70	0.27	0.8	66.25
FEB. 2016	453	0.09	0.5	82	0.46	0.8	42.50
MAR. 2016	347	0.19	0.5	62	0.24	0.8	70.00
APR. 2016	491	0.15	0.5	70	0.37	0.8	53.75
MAY 2016	448	0.18	0.5	64	0.35	0.8	56.25
JUN. 2016	346	0.2	0.5	60	0.26	0.8	67.50
NPP NAR day-time SST quality results over 1st half 2016							
JAN. 2016	440	0.14	0.5	72	0.54	0.8	32.50
FEB. 2016	453	0.09	0.5	82	0.46	0.8	42.50
MAR. 2016	503	0.16	0.5	68	0.41	0.8	48.75
APR. 2016	750	0.07	0.5	86	0.48	0.8	40.00
MAY 2016	907	0.08	0.5	84	0.43	0.8	46.25
JUN. 2016	714	0.2	0.5	60	0.56	0.8	30.00
(*) 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 6 : Quality results for NPP NAR SST over 1st half 2016, for 3, 4, 5 quality indexes.

Comments: Overall quality results are good and quite stable.

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

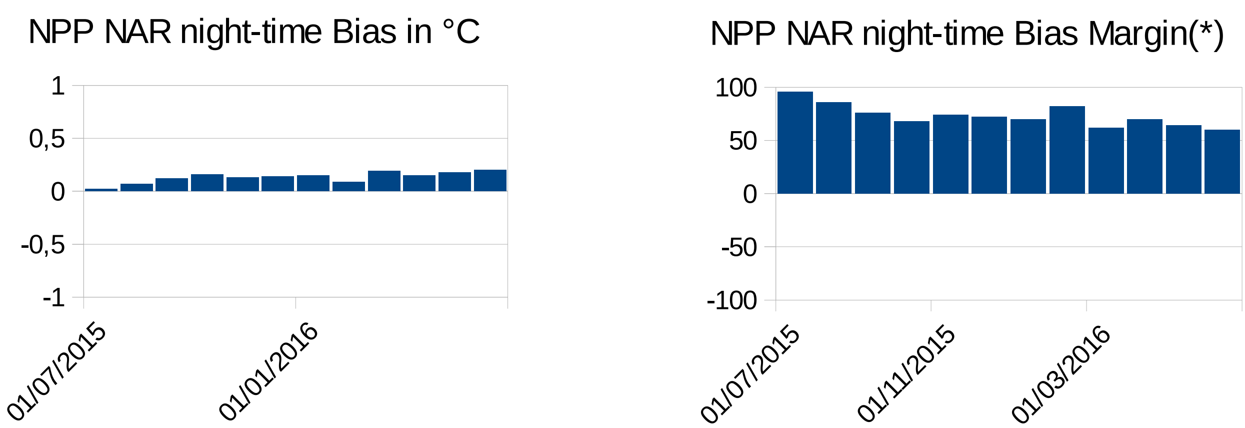


Figure 15 : NPP NAR night-time, SST Bias & SST Bias Margin.

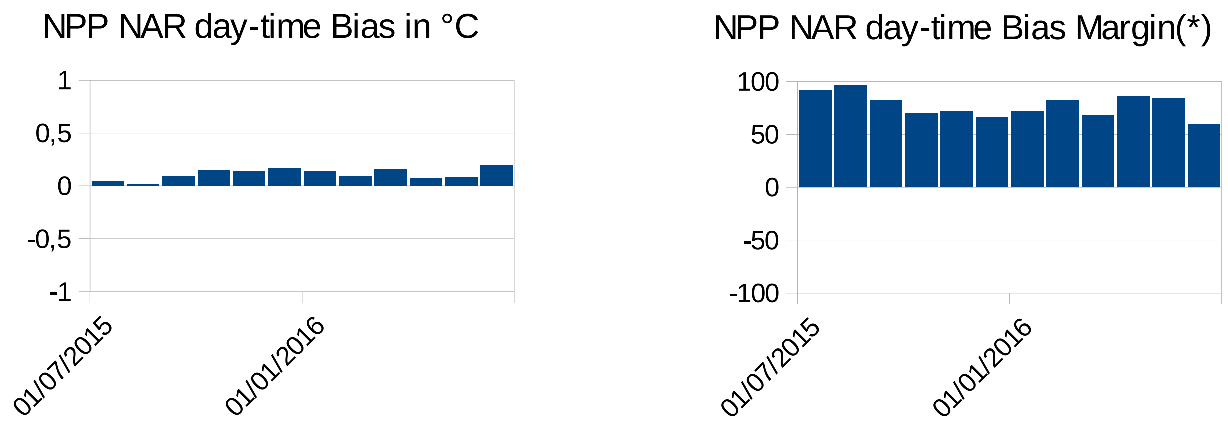


Figure 16 : **NPP NAR day-time, SST Bias.& NPP SST Bias Margin.**

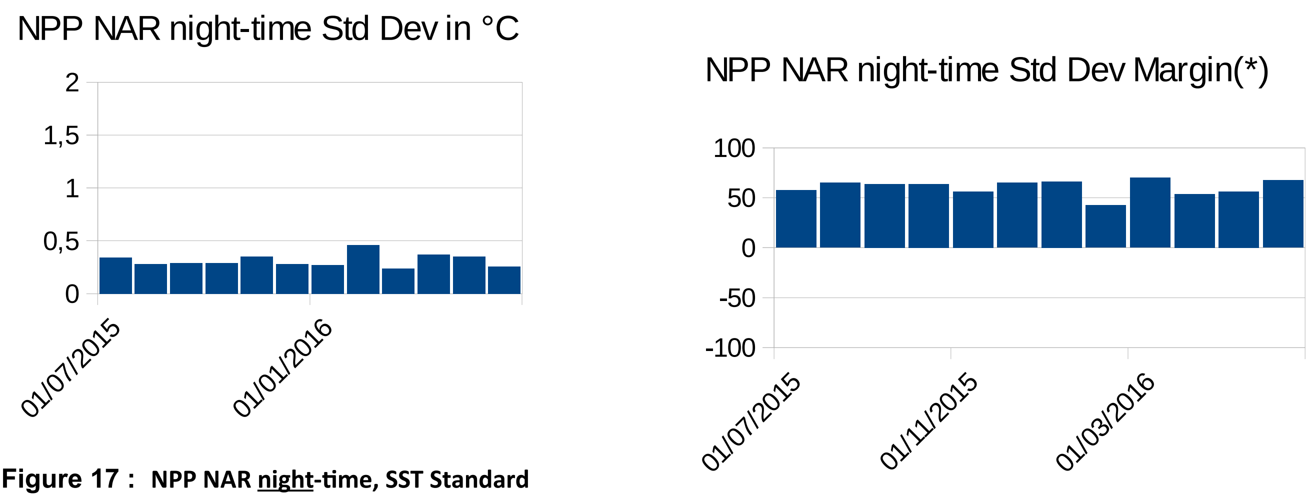


Figure 17 : **NPP NAR night-time, SST Standard deviation & SST Standard deviation Margin.**

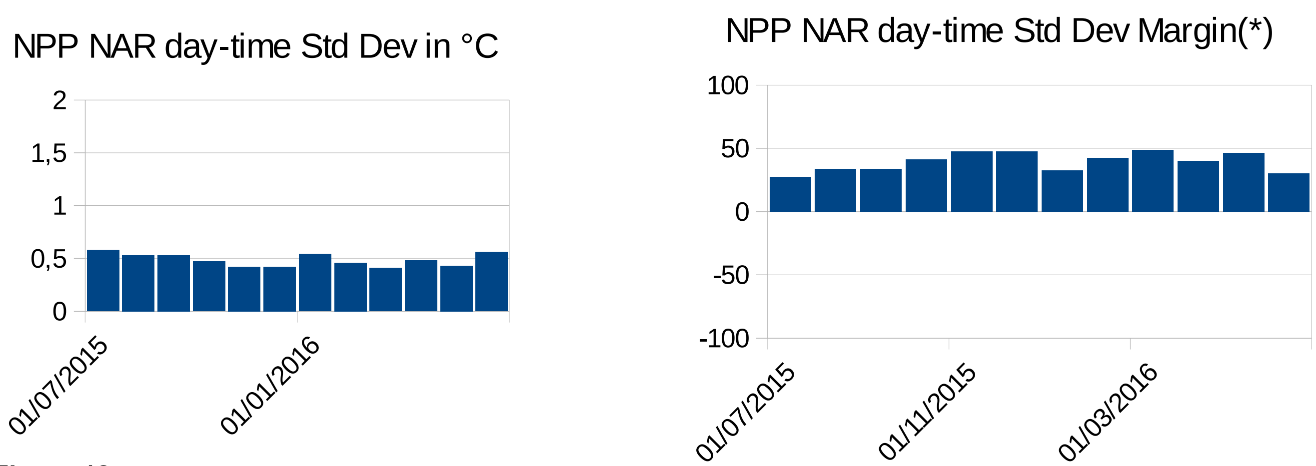


Figure 18 : **NPP NAR day-time, SST Standard deviation & SST Standard deviation Margin.**

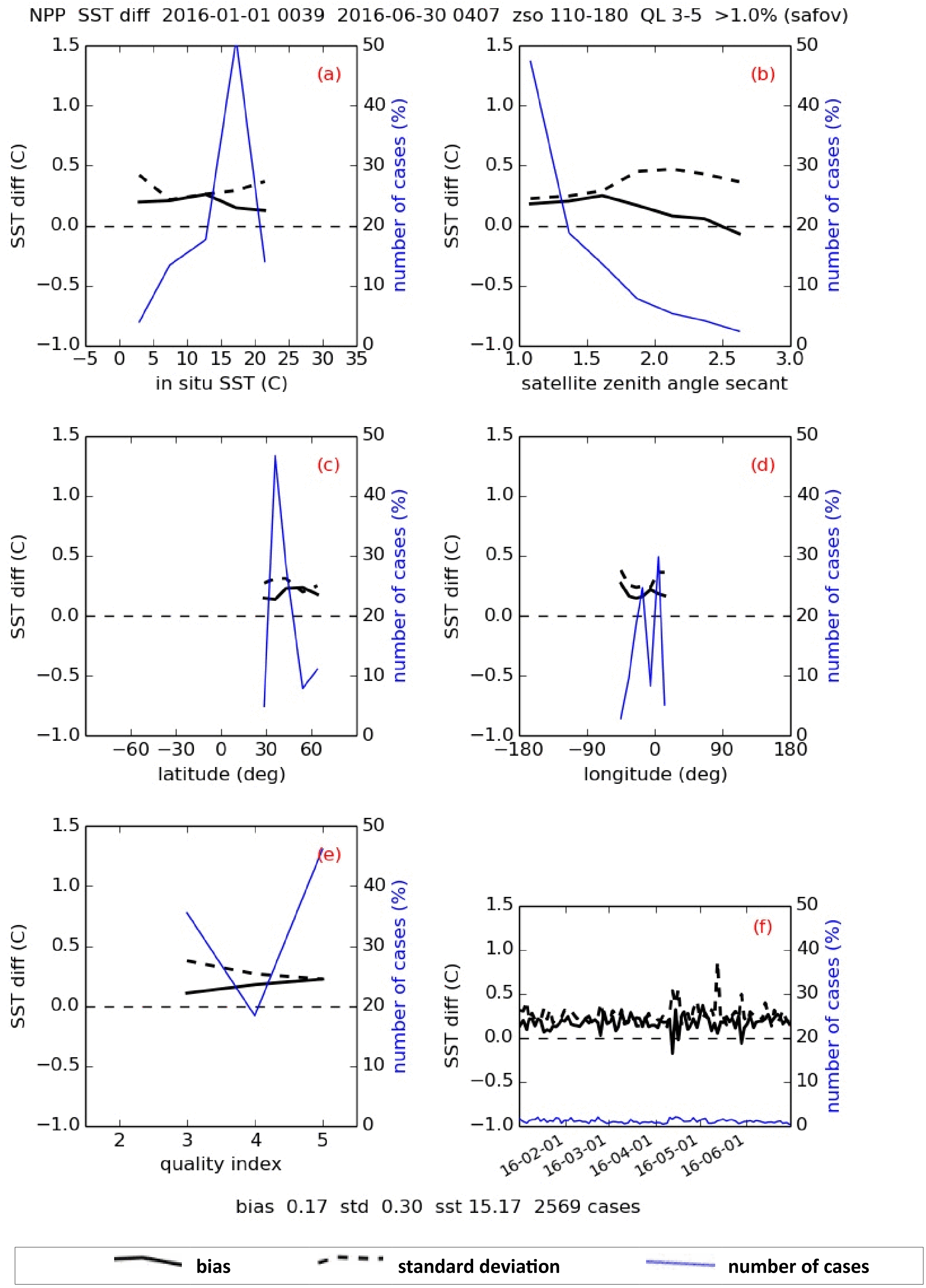


Figure 19 : Complementary quality assessment statistics on NPP NAR SST <u>night-time</u> : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

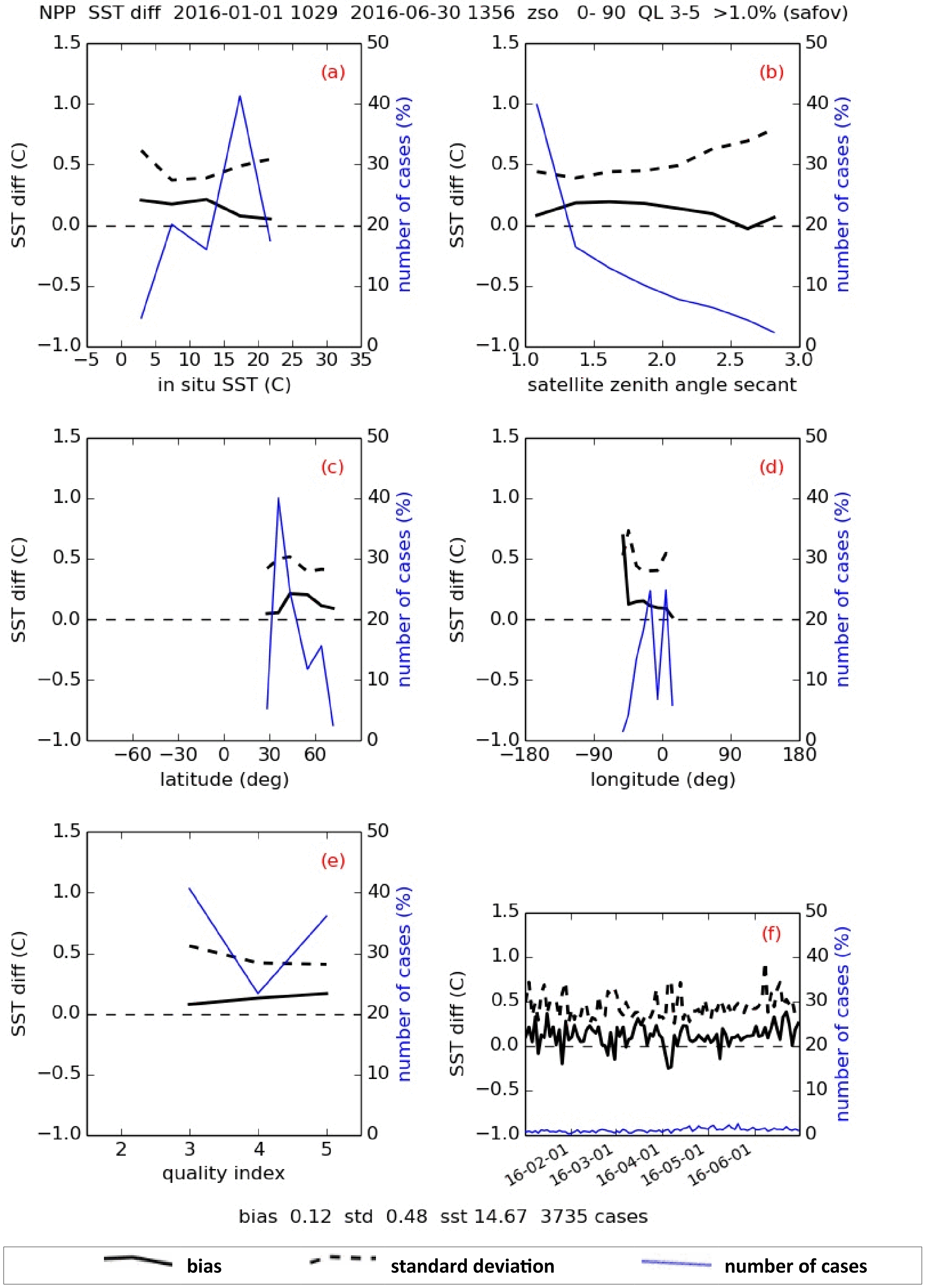


Figure 20 : Complementary quality assessment statistics on NPP NAR SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

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.

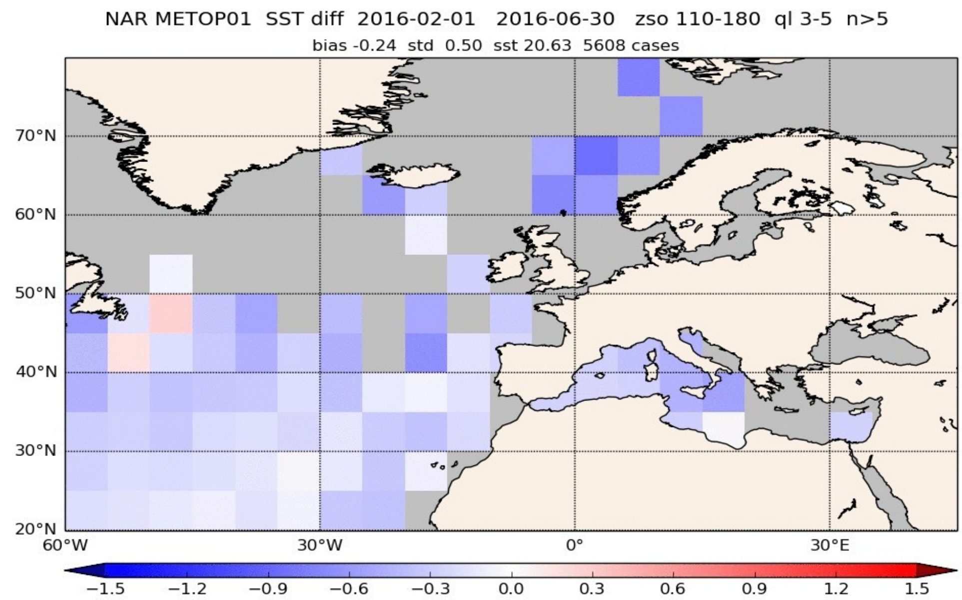


Figure 21 : mean Metop-A/B NAR <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5

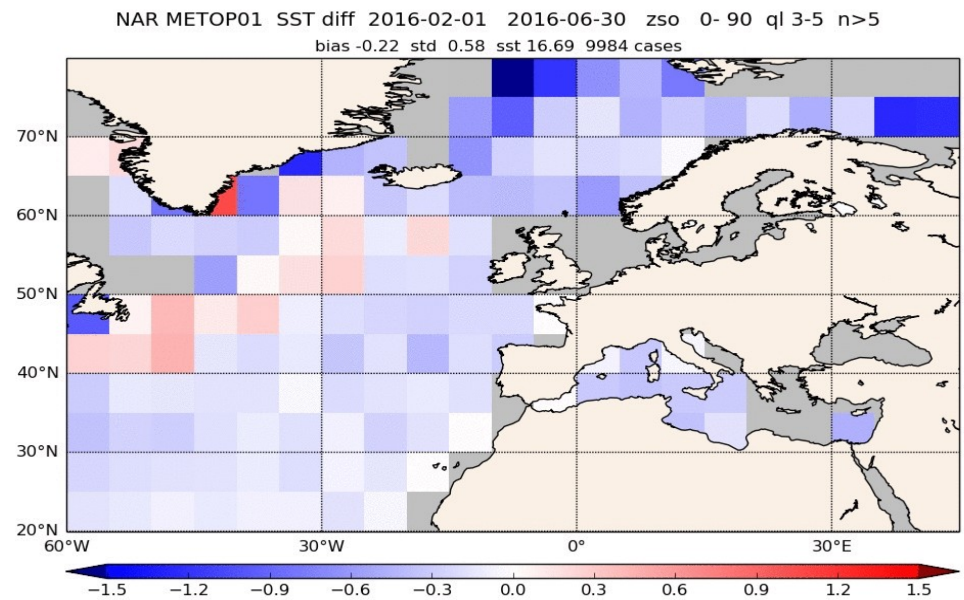


Figure 22 : mean Metop-A/B NAR <u>day</u>-time SST error with respect to buoys measurements for quality level 3,4,5

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

Metop-A/B NAR night-time SST quality results over 1st half 2016							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2016	937	-0.1	0.5	80	0.36	0.8	55.00
FEB. 2016	1209	-0.25	0.5	50	0.6	0.8	25.00
MAR. 2016	1283	-0.27	0.5	46	0.49	0.8	38.75
APR. 2016	1195	-0.27	0.5	46	0.49	0.8	38.75
MAY 2016	1181	-0.17	0.5	66	0.47	0.8	41.25
JUN. 2016	838	-0.15	0.5	70	0.47	0.8	41.25
Metop-A/B NAR day-time SST quality results over 1st half 2016							
JAN. 2016	974	0.08	0.5	84	0.35	0.8	56.25
FEB. 2016	1221	-0.28	0.5	44	0.54	0.8	32.50
MAR. 2016	1658	-0.32	0.5	36	0.47	0.8	41.25
APR. 2016	2028	-0.26	0.5	48	0.46	0.8	42.50
MAY 2016	2668	-0.21	0.5	58	0.57	0.8	28.75
JUN. 2016	2581	-0.08	0.5	84	0.71	0.8	11.25
(*) 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/B NAR SST over 1st half 2016, for 3, 4, 5 quality indexes

Comments :
A very small increase in the bias in March 2016 is noted during day time. The reason is commented section 5.1.4.

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

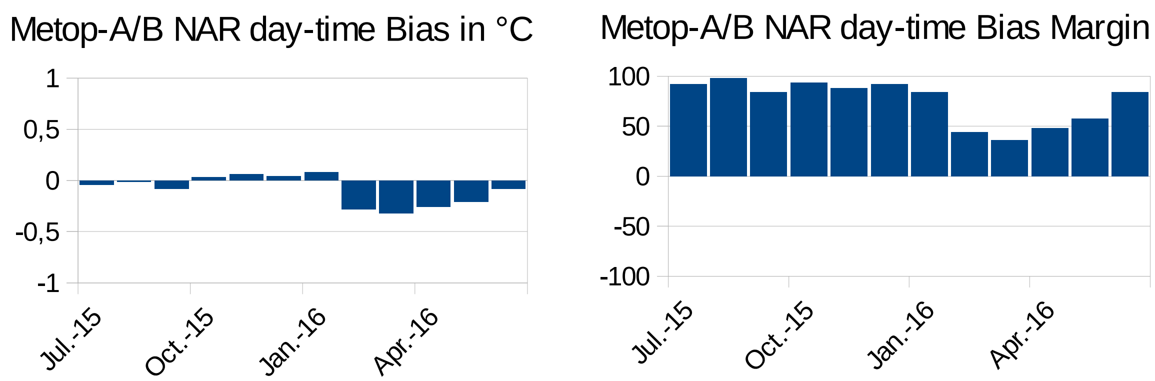


Figure 23 : Metop-A/B NAR day-time, SST Bias & SST Bias Margin.

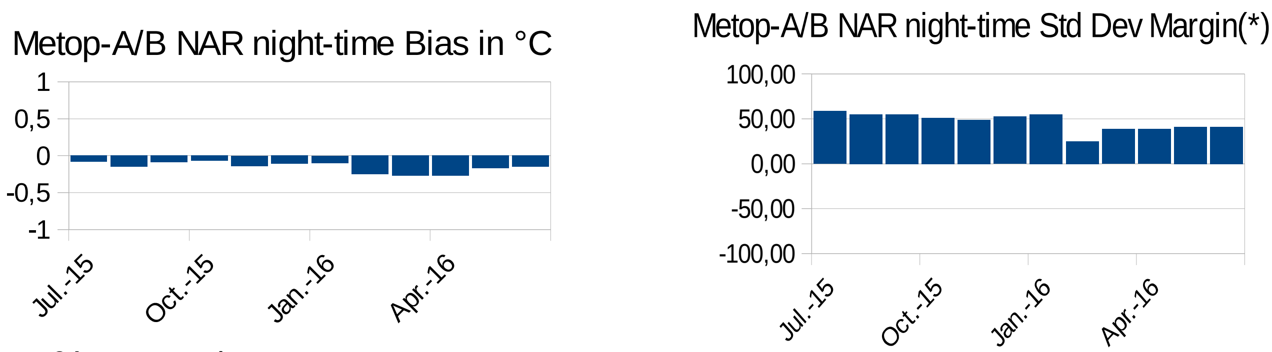


Figure 24 : Metop-A/B NAR <u>night</u>-time, SST Standard deviation & SST Standard deviation Margin.

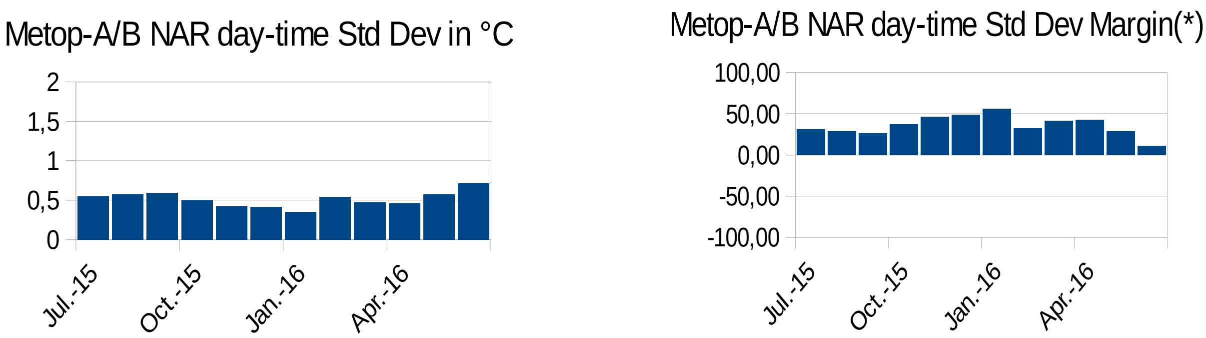


Figure 25 : Metop-A/B NAR <u>day</u>-time,SST Standard deviation & SST Standard deviation Margin.

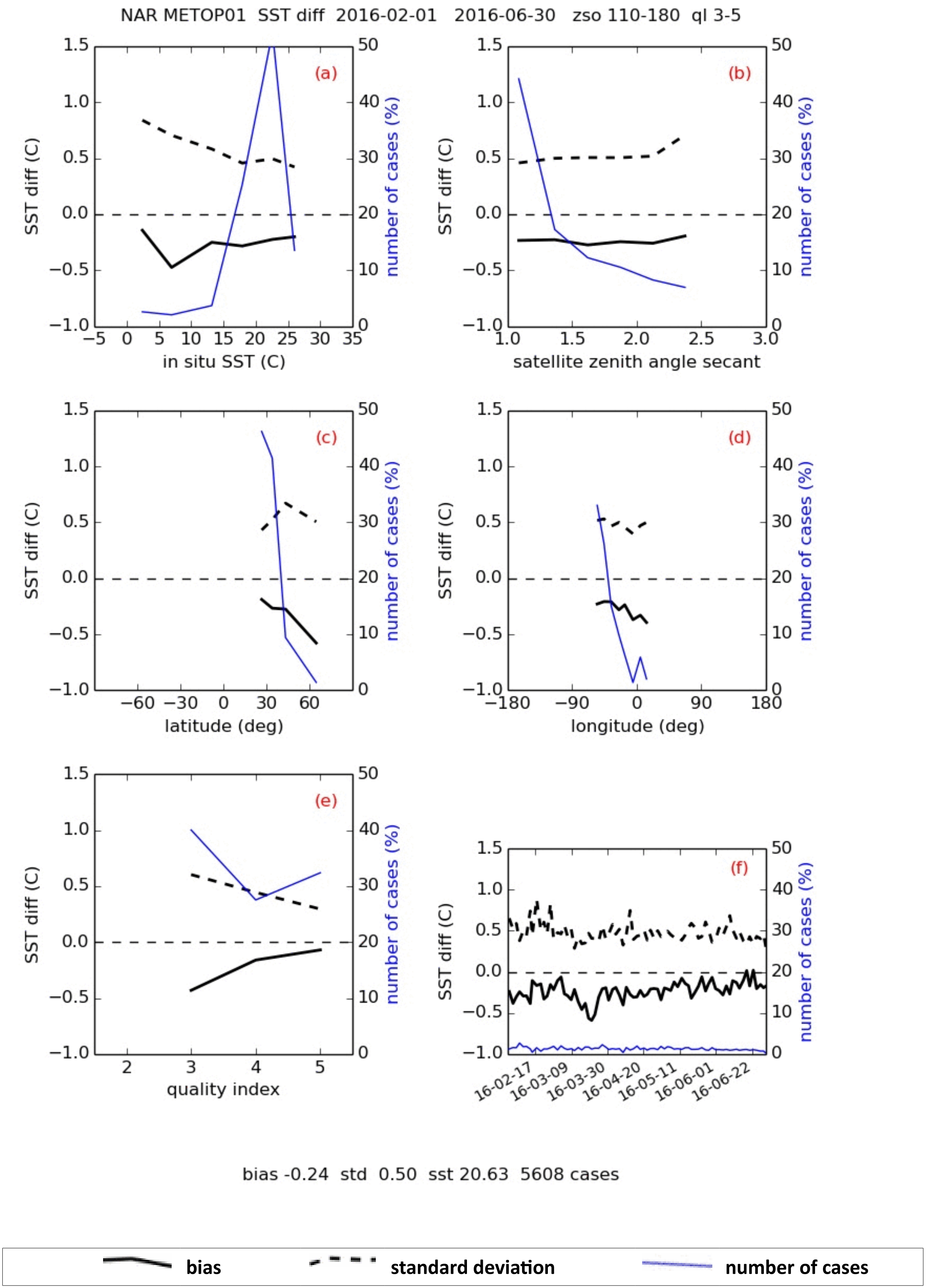


Figure 26 : **Complementary quality assessment statistics on Metop NAR SST night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)**

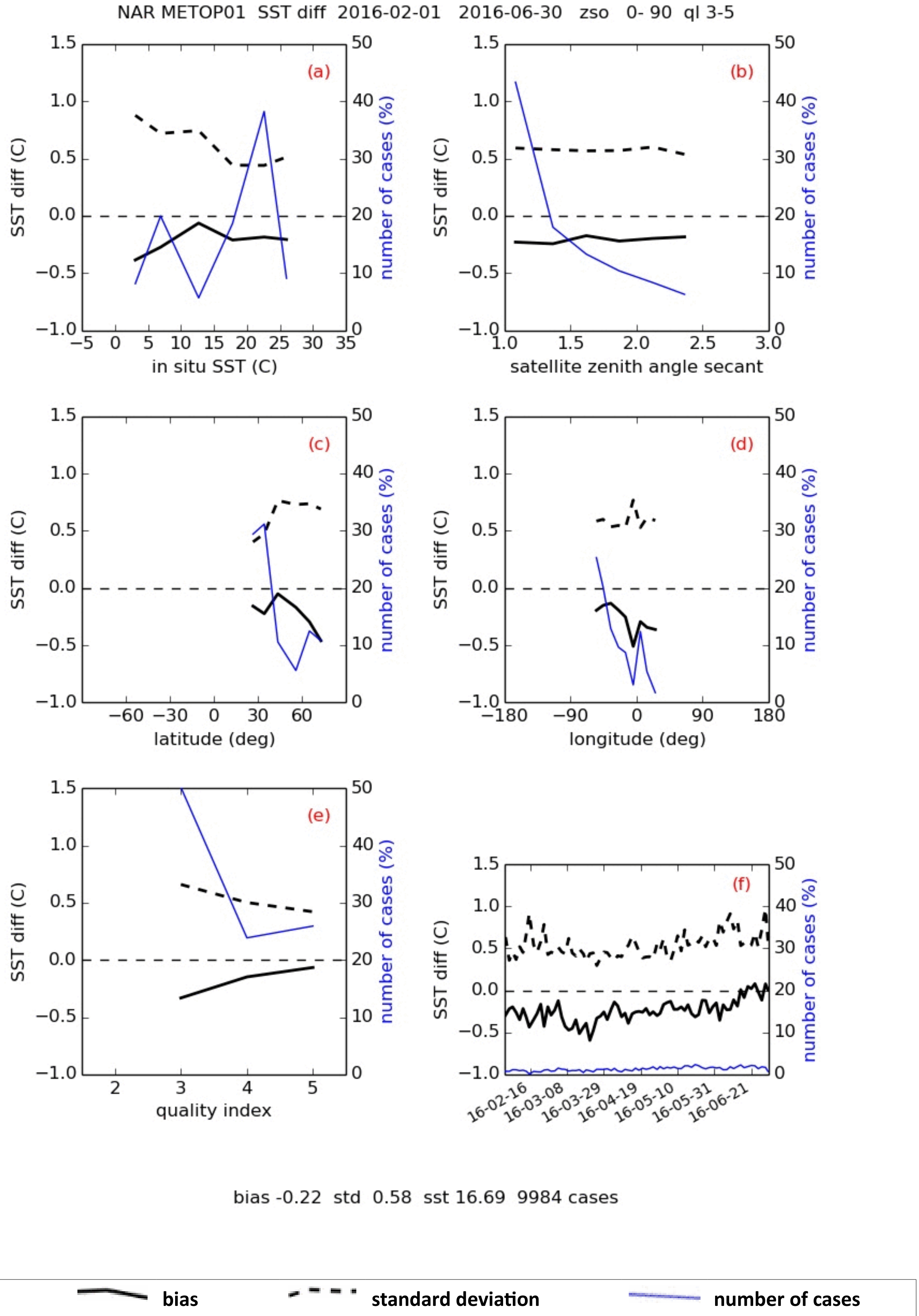


Figure 27 : **Complementary quality assessment statistics on Metop NAR SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)**

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

The OSI SAF SST products on global coverage (GBL SST and MGR SST) are based on Metop/AVHRR data, currently Metop-B.
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 Metop/AVHRR SST validation report, available on www.osi-saf.org, gives further details about the regional bias observed and their origin.

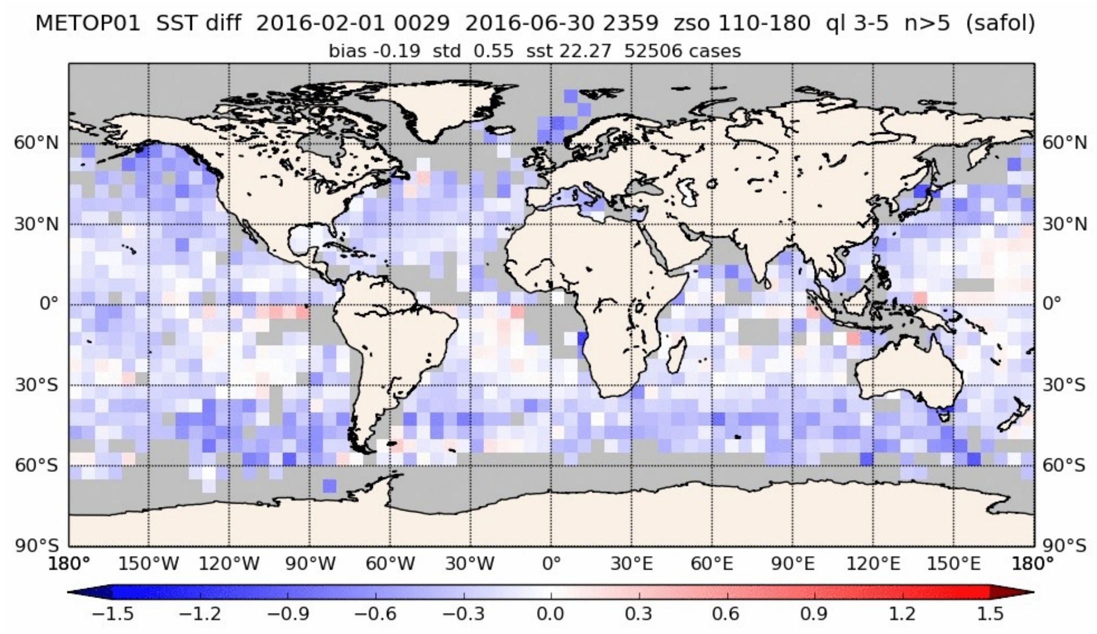


Figure 28 : mean Metop-A/B <u>night</u>-time SST error with respect to buoys measurements for quality level 3,4,5

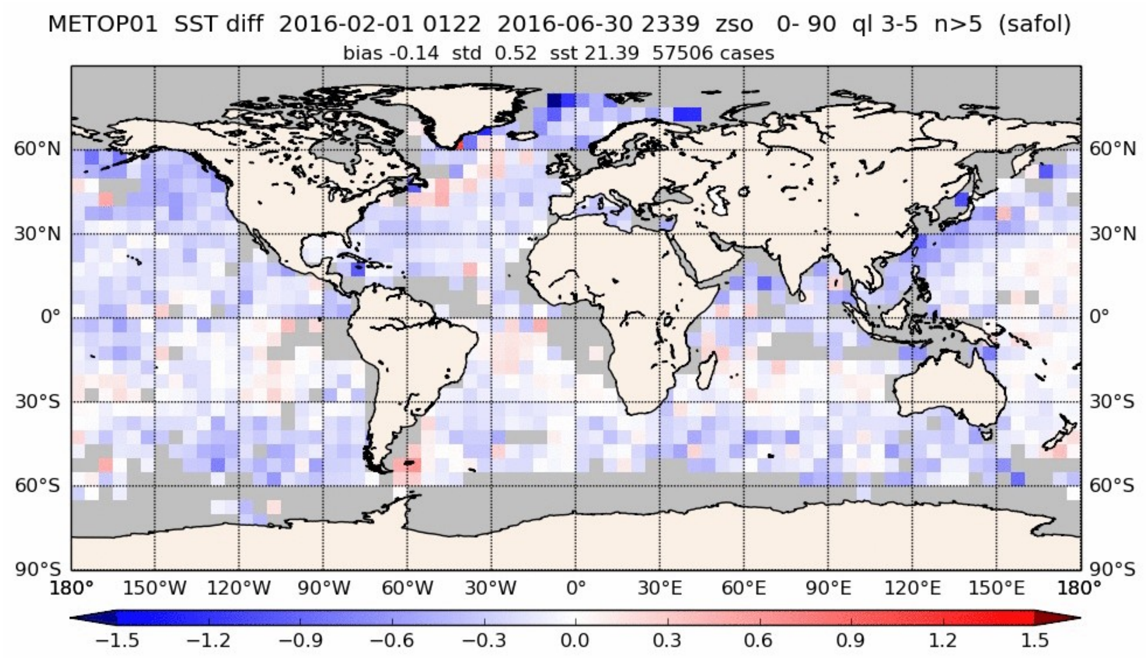


Figure 29 : mean Metop-A/B <u>day</u>-time SST error with respect to buoys measurements for quality level 3,4,5

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

Global Metop-A/B night-time SST quality results over 1st half 2016							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2016	6593	-0.08	0.5	84	0.42	0.8	47.50
FEB. 2016	10496	-0.18	0.5	64	0.58	0.8	27.50
MAR. 2016	11787	-0.26	0.5	48	0.57	0.8	28.75
APR. 2016	11702	-0.17	0.5	66	0.56	0.8	30.00
MAY 2016	10379	-0.15	0.5	70	0.53	0.8	33.75
JUN. 2016	9810	-0.15	0.5	70	0.52	0.8	35.00
Global Metop-A/B day-time SST quality results over 1st half 2016							
JAN. 2016	7763	0.01	0.5	98	0.56	0.8	30.00
FEB. 2016	10737	-0.12	0.5	76	0.49	0.8	38.75
MAR. 2016	12125	-0.26	0.5	48	0.56	0.8	30.00
APR. 2016	12953	-0.12	0.5	76	0.49	0.8	38.75
MAY 2016	12139	-0.12	0.5	76	0.52	0.8	35.00
JUN. 2016	11840	-0.1	0.5	80	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 8 : Quality results for global METOP SST over 1st half 2016, for 3,4,5 quality indexes

Comments :

One can notice a larger bias than usual in March 2016 both during day and night time. This is clearly visible on Figures 34f and 35f. The cause is explained in the following:
On the 23rd of February, the new global SST L2 product based on METOP-B/AVHRR (OSI 204), became operational. This new product incorporated a new SST retrieval scheme, with a SST correction step based on RTTOV computations using OSTIA and ECMWF short term forecasts.

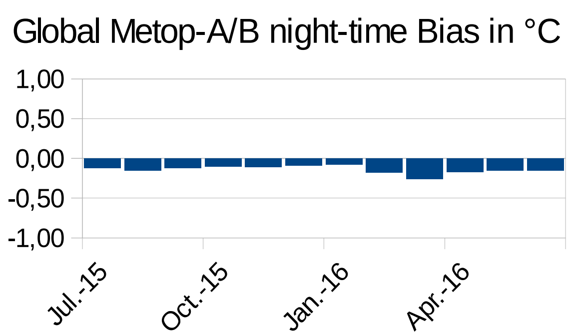
Unfortunately, OSTIA is also using OSI SAF METOP/AVHRR products as a reference to de-bias other satellite SST sources (originally, OSTIA was using ENVISAT/AATSR products, which were the most accurate ones, as a reference satellite SST source, but ENVISAT is dead since 2012). When OSTIA started to use the new OSI SAF METOP-B/AVHRR SST products, a positive feedback started to develop, with cold biases growing at high latitudes in both hemispheres. Basically, the SST correction scheme used in OSI SAF chain assumes that OSTIA is overall unbiased. This is the case everywhere except at high latitude. Broadly speaking, our methodology corrects the SST to match OSTIA, and OSTIA uses MGR SST (OSI-204) product as a reference: this is a vicious circle where small errors accumulates over time in the high latitudes.

OSI SAF team noticed the problem and contacted OSTIA people on Monday 21st of March. They immediately switched back to the former OSI SAF METOP-A/AVHRR SST product, which doesn't include this SST correction based on RTTOV, and hence is independent from OSTIA. OSI SAF will maintain the old METOP-A/AVHRR SST production as long as necessary for the

OSTIA team to find another reference satellite SST source. OSTIA team is currently working on using NPP/VIIRS as reference.

This event has only impacted March statistics and since then, everything is back to normal. It has not impacted at all MSG products since they only cover the Atlantic Ocean up to 60°N, and a very small impact is visible on the Metop/AVHRR NAR product which is sampling a small portion of the Atlantic high latitudes.

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



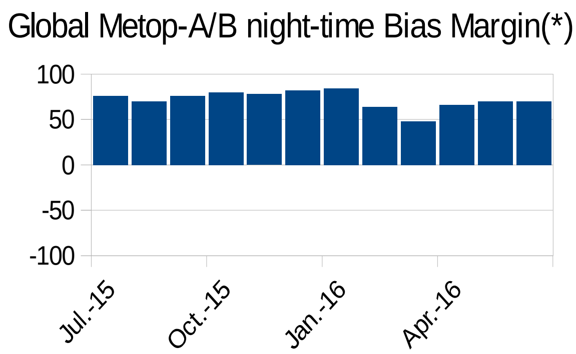
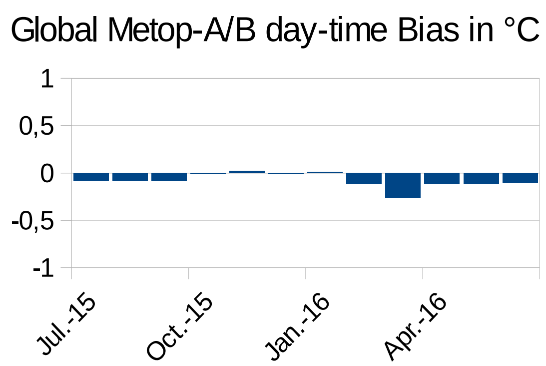


Figure 30 : global Metop-A/B,night-time SST Bias & SST Bias Margin.



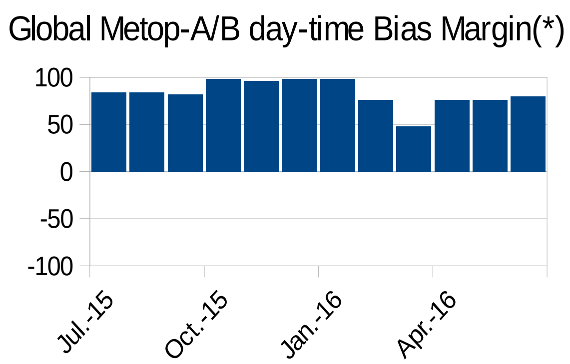
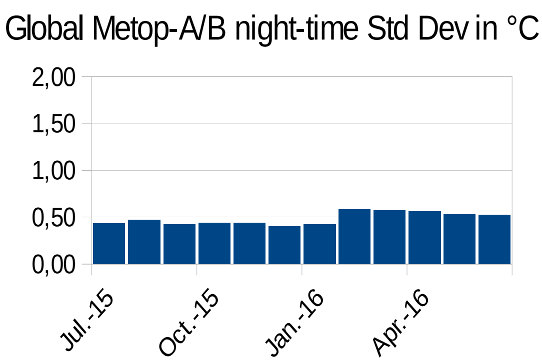


Figure 31 : global Metop-A/B day-time, SST Bias & SST Bias Margin.



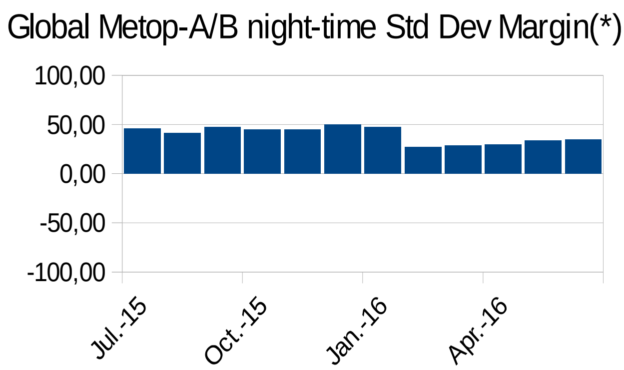


Figure 32 : global Metop-A/B night-time, SST Standard deviation & SST Standard deviation Margin.

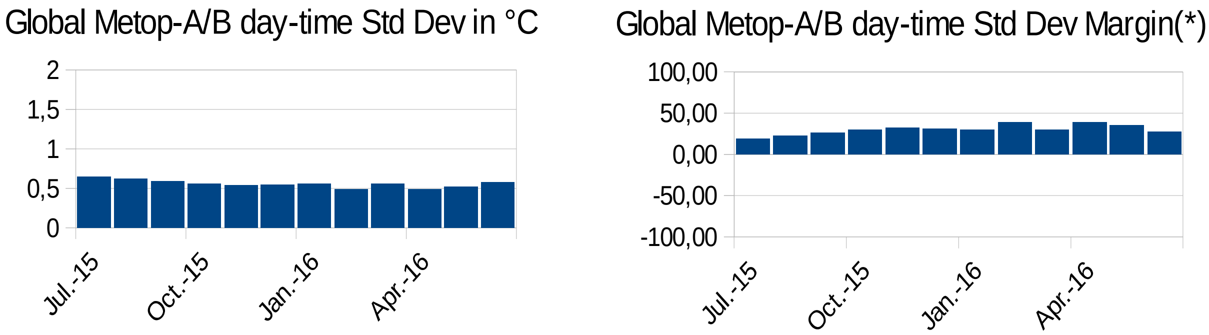


Figure 33 : global Metop-A day-time, SST Standard deviation & SST Standard deviation Margin.

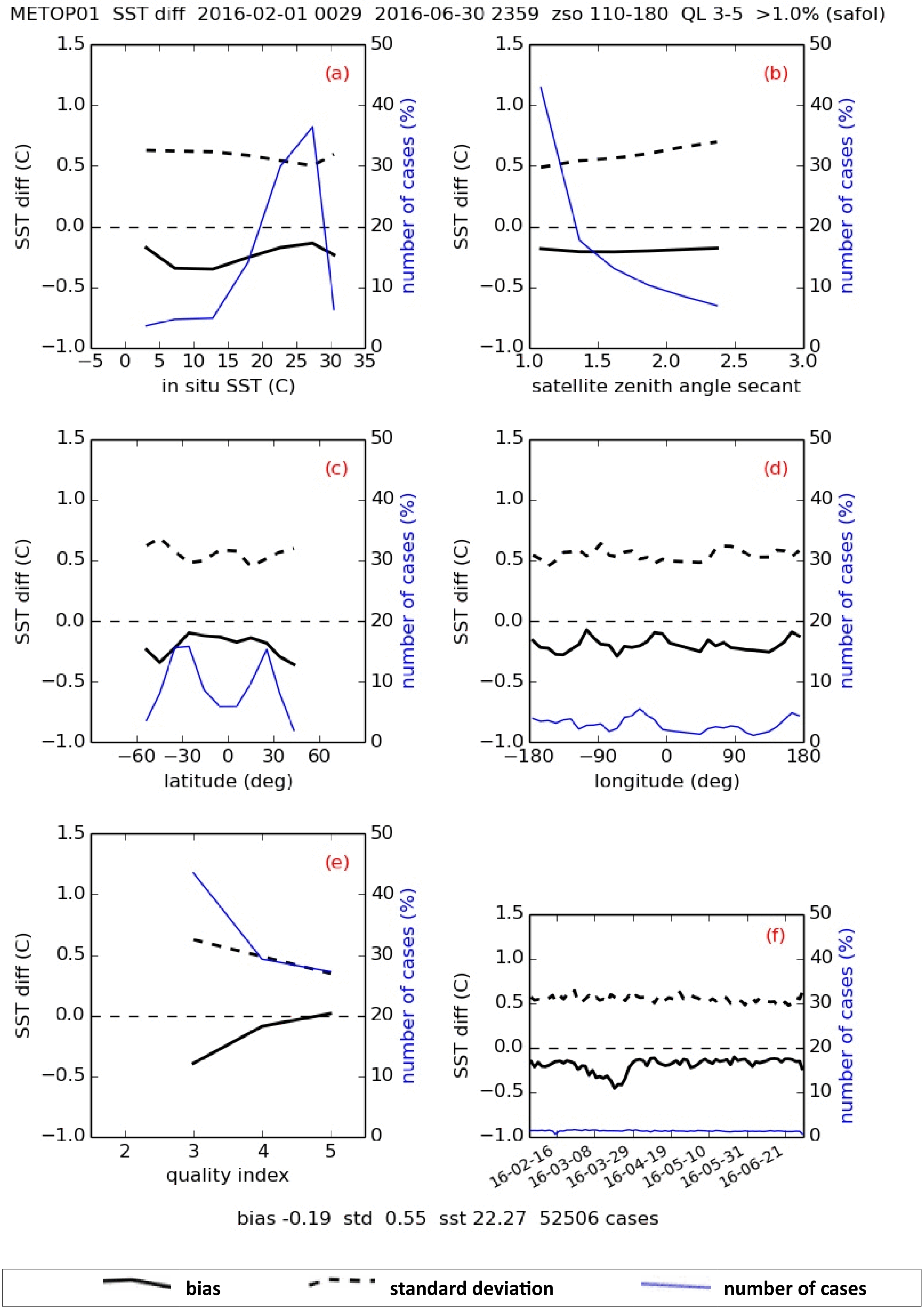


Figure 34 : Complementary quality assessment statistics on Metop GBL SST night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

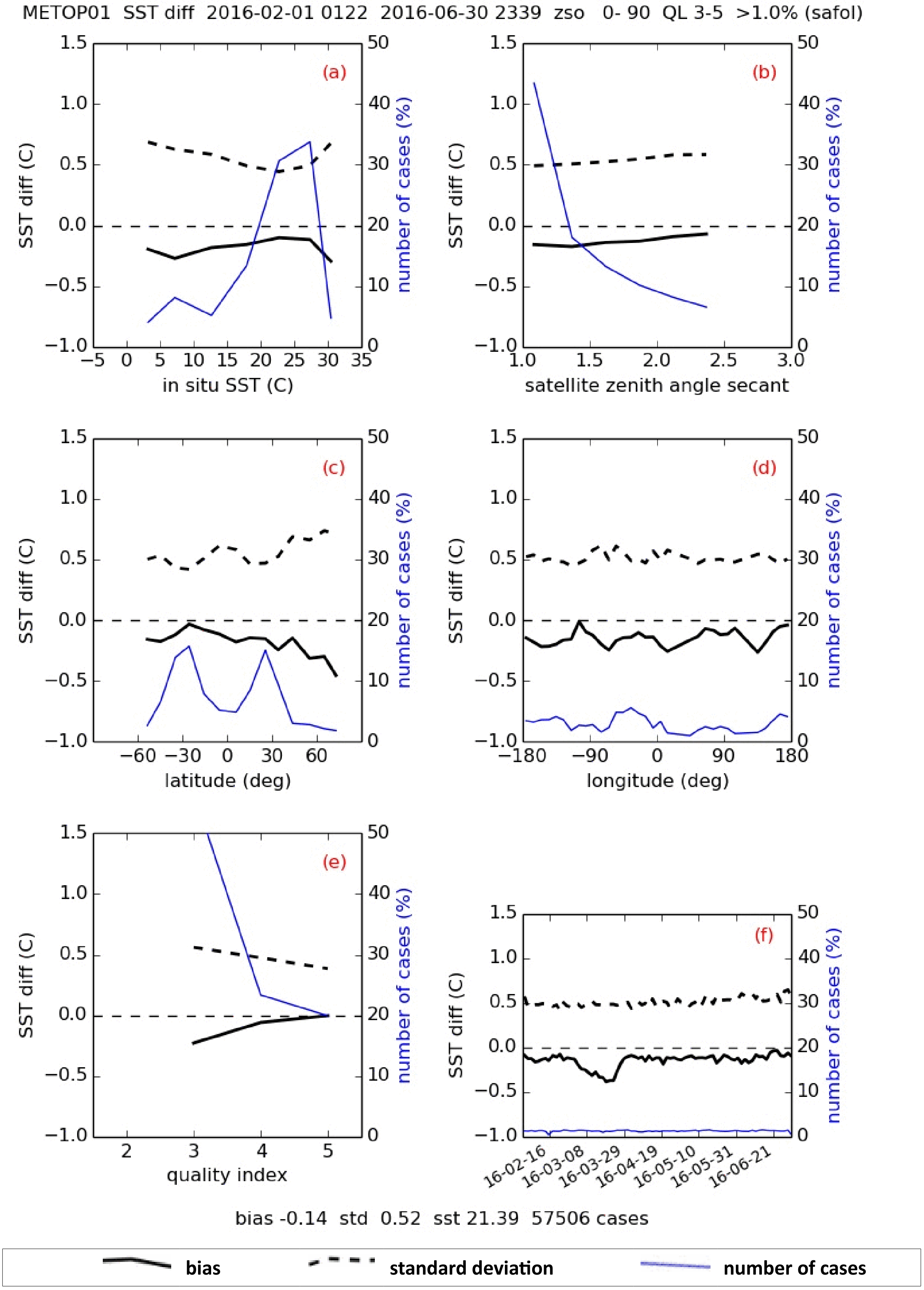


Figure 35 : **Complementary quality assessment statistics on Metop GBL SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f).**

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.

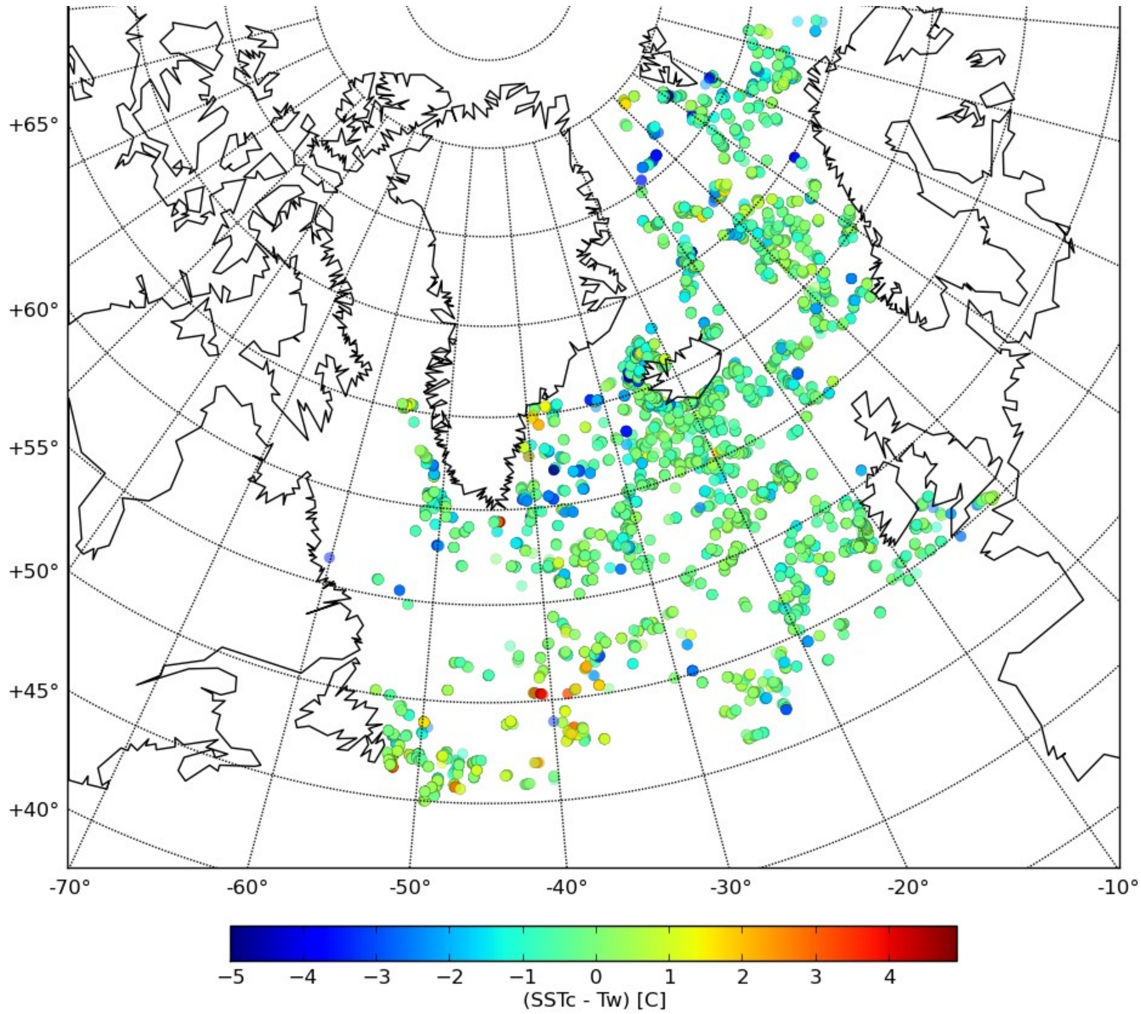


Figure 36 : JAN. to JUN. 2016 mean AHL night-time SST error with respect to buoys measurements for quality level 3,4,5

AHL AVHRR SST quality results over JUL. 2015 to JUN. 2016, night-time							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JUL. 2015	645	-0.21	0.5	58.3	0.75	0.8	6.8
AUG. 2015	826	-0.29	0.5	41.8	0.89	0.8	-11.4
SEP. 2015	888	-0.47	0.5	6.2	0.89	0.8	-10.8
OCT. 2015	1058	-0.47	0.5	5.2	0.83	0.8	-3.3
NOV. 2015	638	-0.32	0.5	35.2	0.72	0.8	10.3
DEC. 2015	391	-0.31	0.5	38.8	0.64	0.8	20.5
JAN. 2016	319	-0.24	0.5	51.3	0.74	0.8	7.8
FEB. 2016	96	-0.36	0.5	27.9	0.74	0.8	7.3
MAR. 2016	122	-0.24	0.5	52.6	0.71	0.8	10.9
APR. 2016	163	-0.37	0.5	26.7	0.67	0.8	15.6
MAY 2016	163	-0.33	0.5	34.7	0.65	0.8	19.2
JUN. 2016	123	-0.12	0.5	76.0	0.85	0.8	-6.8
AHL AVHRR SST quality results over JUL. 2015 to JUN. 2016, day-time							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JUL. 2015	992	-0.08	0.5	83.7	0.61	0.8	24.3
AUG. 2015	1195	-0.06	0.5	87.3	0.70	0.8	11.4
SEP. 2015	1312	-0.25	0.5	48.7	0.76	0.8	4.9
OCT. 2015	1634	-0.29	0.5	41.7	0.74	0.8	7.8
NOV. 2015	933	-0.35	0.5	30.6	0.72	0.8	10.6
DEC. 2015	599	-0.43	0.5	14.0	0.70	0.8	12.8
JAN. 2016	965	0.38	0.5	23.4	0.77	0.8	4.2
FEB. 2016	731	-0.29	0.5	41.8	0.66	0.8	17.2
MAR. 2016	709	-0.22	0.5	55.7	0.58	0.8	27.1
APR. 2016	766	-0.22	0.5	56.7	0.57	0.8	28.4
MAY 2016	756	-0.15	0.5	70.7	0.59	0.8	26.1
JUN. 2016	5531	-0.14	0.5	71.6	0.73	0.8	9.1

(*) 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. 2015 to JUN. 2016, for 3,4,5 quality indexes, by night and by day.

Comments: The bias of the AHL SST product is within the the requirement for all months in first half of 2016, both nighttime and daytime. For standard deviation the product is within the requirement every month at nighttime and daytime, except for June at nighttime.

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.

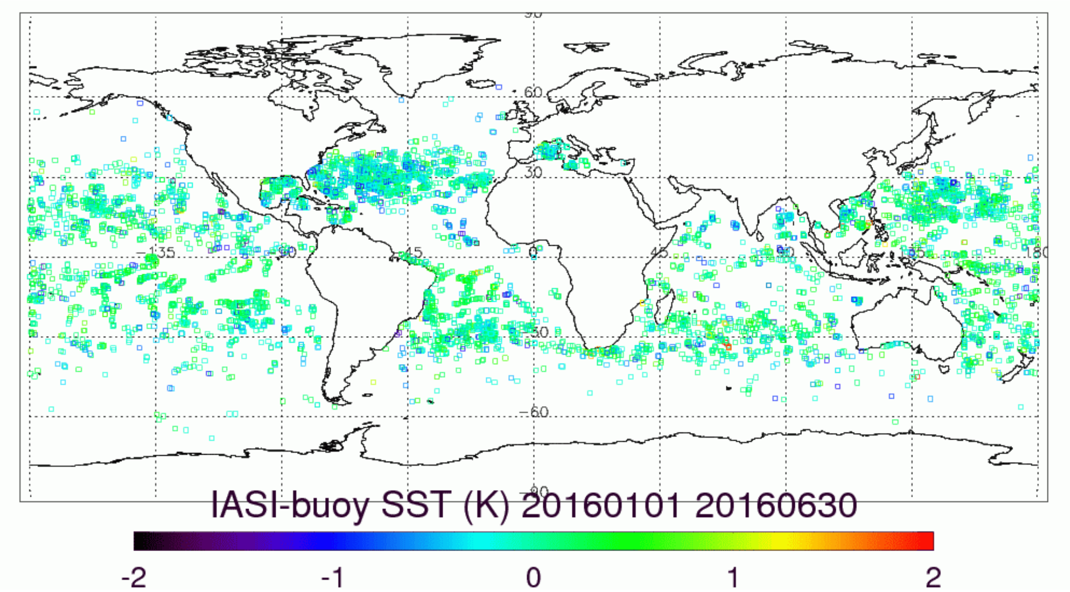


Figure 37 : Mean Metop-8 IASI night-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 January to June 2016

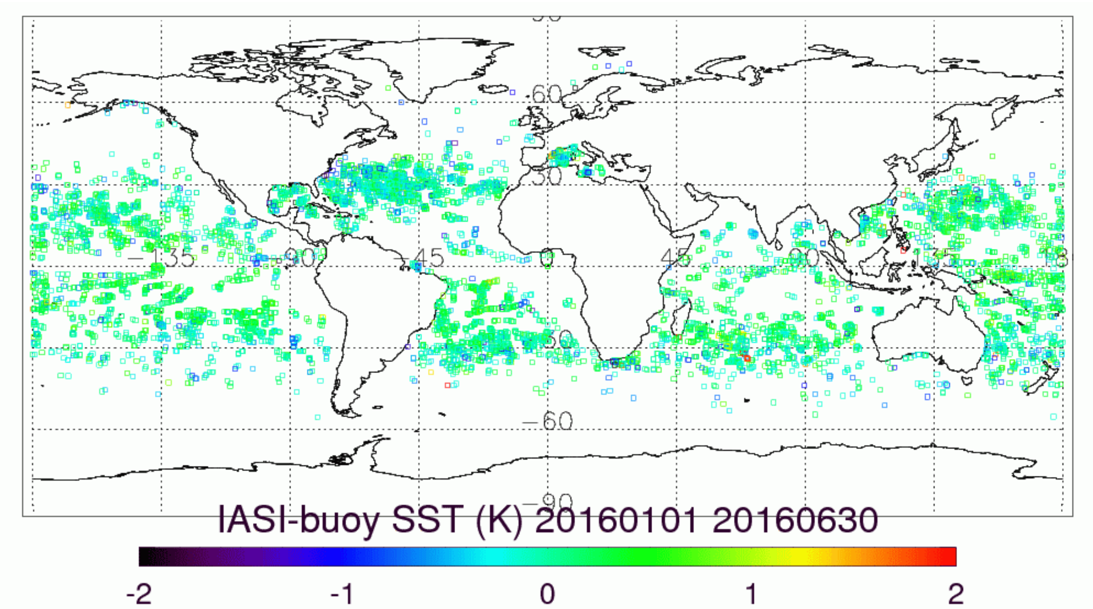


Figure 38 : Mean Metop-B IASI day-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 January to June 2016

The following table provides the METOP-B derived IASI SST quality results over the reporting period (except January: Metop-A).

Global Metop-A/B IASI night-time SST quality results over 1st half 2016							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2016	2011	-0.03	0.5	94	0.40	0.8	50
FEB. 2016	1367	-0.05	0.5	90	0.38	0.8	52.5
MAR. 2016	1608	-0.04	0.5	92	0.39	0.8	51.25
APR. 2016	1468	-0.03	0.5	94	0.41	0.8	48.75
MAY 2016	2492	-0.08	0.5	84	0.40	0.8	50
JUN. 2016	2388	0.03	0.5	94	0.44	0.8	45
Global Metop-A/B IASI day-time SST quality results over 1st half 2016							
JAN. 2016	1925	0.07	0.5	86	0.38	0.8	52.5
FEB. 2016	1066	0.02	0.5	96	0.39	0.8	51.25
MAR. 2016	1715	0.05	0.5	90	0.35	0.8	56.25
APR. 2016	1468	-0.03	0.5	94	0.41	0.8	48.75
MAY 2016	2492	-0.08	0.5	84	0.40	0.8	50
JUN. 2016	2388	0.03	0.5	94	0.44	0.8	45
(*) 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-B IASI SST over 1st half 2016, for Quality Levels 3, 4 and 5 (January: MetopA)

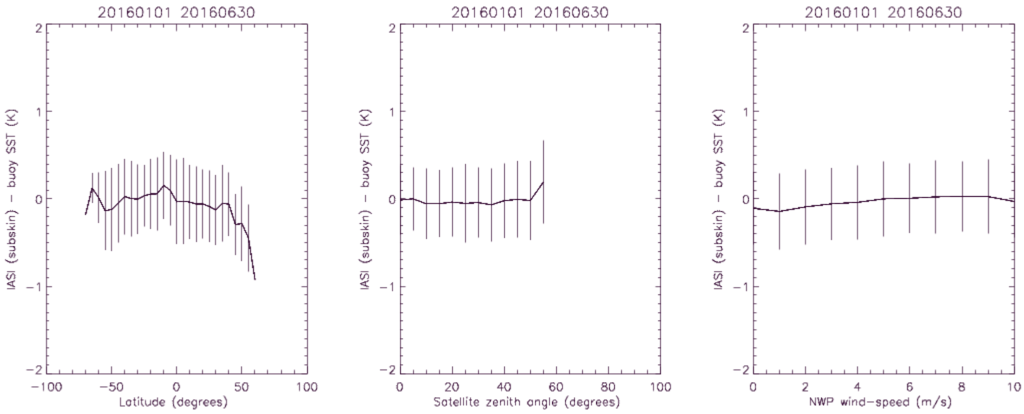


Figure 39 : Mean Metop-B IASI night-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5, Jan. 2016 to JUN. 2016

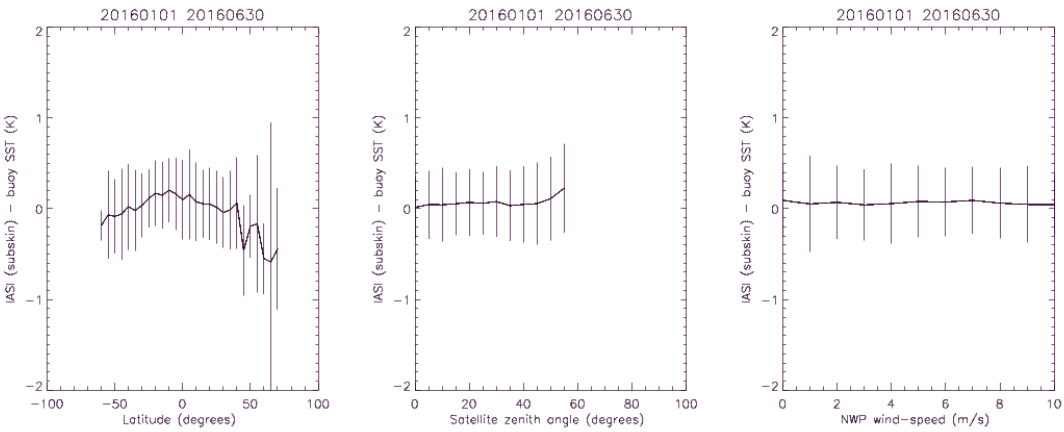


Figure 40 : Mean Metop-B IASI day-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5, JUL. 2016 to JUN. 2016

Comments:

Over the six month reporting period the night-time mean IASI bias (for quality levels 3 and above) against drifting buoy SSTs is -0.02K with a standard deviation of 0.42K (n=6375); and the day-time mean bias is 0.07K, standard deviation 0.40K (n=7389). The monthly mean and whole time period results and 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 2016										
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 %
JUL. 2015	4314	376.37	0.54	0.14	5.0	97.13	15.36	4.08	10.0	59.19
AUG. 2015	4499	368.27	1.53	0.42	5.0	91.69	16.20	4.40	10.0	56.01
SEP. 2015	4976	348.18	-1.54	-0.44	5.0	91.15	15.69	4.51	10.0	54.94
OCT. 2015	4957	317.68	-4.32	-1.36	5.0	72.80	18.06	5.68	10.0	43.15
NOV. 2015	3941	293.32	-4.89	-1.67	5.0	66.66	17.98	6.13	10.0	38.70
DEC. 2015	4317	296.52	-8.86	-2.99	5.0	40.24	22.83	7.70	10.0	23.01
JAN. 2016	5157	265.13	-9.84	-3.71	5.0	25.77	21.81	8.23	10.0	17.74
FEB. 2016	4158	275.94	-6.52	-2.36	5.0	52.74	18.92	6.86	10.0	31.43
MAR. 2016	4684	297.25	-4.73	-1.59	5.0	68.17	19.03	6.40	10.0	35.98
APR. 2016	4128	309.03	-3.65	-1.18	5.0	76.38	17.13	5.54	10.0	44.60
MAY 2016	4414	335.64	-2.96	-0.88	5.0	82.36	16.66	5.54	10.0	44.60
JUN. 2016	4168	364.50	-1.56	-0.43	5.0	91.44	15.04	4.13	10.0	58.70
(*) 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 2016.

Comments: Results are within specifications.

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

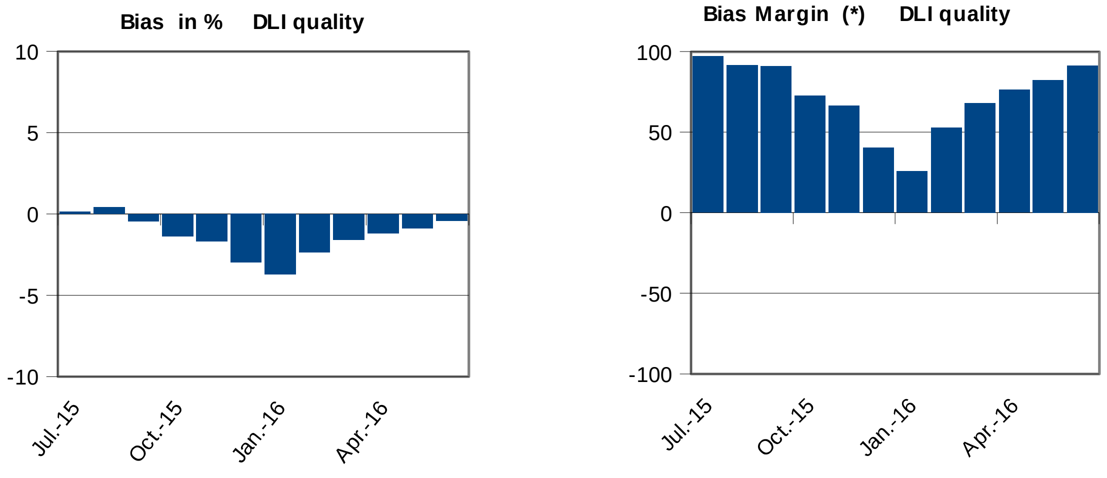


Figure 41 : Geostationary DLI, (left) Bias. (right) Bias Margin .

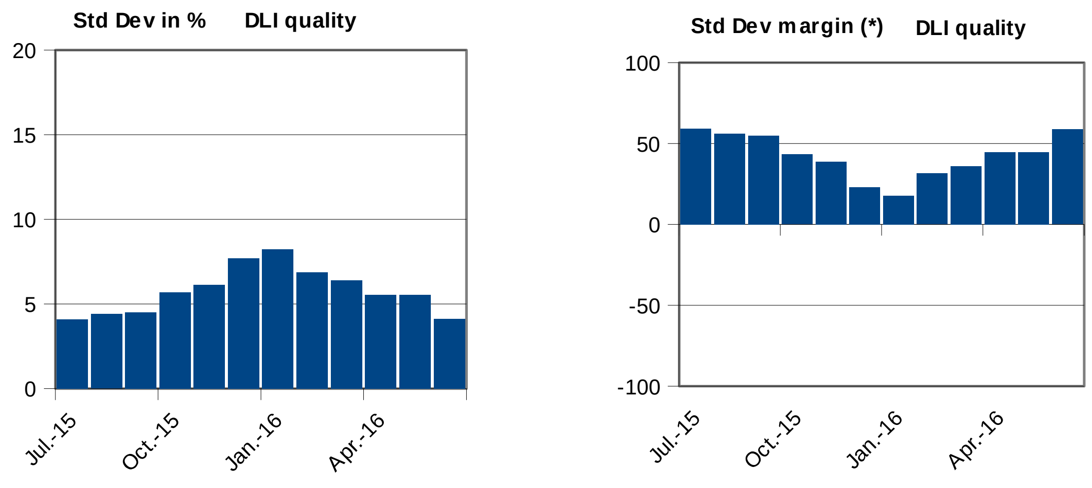


Figure 42 : Geostationary DLI, Standard deviation & DLI Geostationary Standard deviation Margin.

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 :

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

These stations are briefly described at http://nowcasting.met.no/validering/flukser/. 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. 2015 to JUN. 2016								
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. 2015	277	331.60	4.11	5.0	17.8	3.51	10.0	64.9
AUG. 2015	310	334.34	6.17	5.0	-23.4	3.22	10.0	67.8
SEP. 2015	210	322.00	4.03	5.0	19.4	4.21	10.0	57.9
OCT. 2015	210	297.87	2.48	5.0	50.4	5.66	10.0	43.4
NOV. 2015	296	295.89	2.89	5.0	42.2	6.15	10.0	38.5
DEC. 2015	235	281.06	3.20	5.0	36	7.14	10.0	28.6
JAN. 2016	310	264.04	2.76	5.0	44.8	6.92	10.0	30.8
FEB. 2016	288	275.57	3.77	5.0	24.6	5.84	10.0	41.6
MAR. 2016	288	273.33	3.27	5.0	34.6	6.48	10.0	35.2
APR. 2016	296	278.74	3.64	5.0	27.2	4.67	10.0	53.3
MAY 2016	300	301.01	6.55	5.0	-31	4.44	10.0	55.6
JUN. 2016	275	319.56	5.07	5.0	-1.4	4.25	10.0	57.5
(*) 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 12 : AHL DLI quality results over JUL. 2015 to JUN. 2016.

Comments : The requirements are not met in May and June. The reason for this is overestimation of the incoming longwave irradiance at the station Hamburg-Fuhlsbuttel. Evaluation of the observations reported from this station did not reveal any specific issues, leaving possible causes to be found in the input data. These have yet not been validated.

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 2016										
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. 2015	7336	480.23	11.43	2.38	10.0	76.20	80.37	16.74	30.0	44.21
AUG. 2015	7013	469.66	9.48	2.02	10.0	79.82	80.3	17.10	30.0	43.01
SEP. 2015	6526	433.61	16.85	3.89	10.0	61.14	88.54	20.42	30.0	31.94
OCT. 2015	5976	377.63	12.84	3.40	10.0	66.00	71.19	18.85	30.0	37.16
NOV. 2015	4533	347.77	15.53	4.47	10.0	55.34	70.98	20.41	30.0	31.97
DEC. 2015	3820	321.29	14.59	4.54	10.0	54.59	82.62	25.72	30.0	14.28
JAN. 2016	4901	312.73	15.17	4.85	10	51.49	87.58	28.00	30	6.65
FEB. 2016	5152	330.93	13.18	3.98	10	60.17	76.8	23.21	30	22.64
MAR. 2016	6572	397.72	13.3	3.34	10	66.56	86.3	21.70	30	27.67
APR. 2016	6181	421.77	14.55	3.45	10	65.50	84.89	20.13	30	32.91
MAY 2016	7546	448.53	-3.59	-0.80	10	92.00	80.61	17.97	30	40.09
JUN. 2016	7418	463.72	-1.13	-0.24	10	97.60	80.69	17.40	30	42.00

(*) 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 13 : Geostationary SSI quality results over 1st half 2016.

Comments: Results are within specifications.

The graphs below illustrate the Geostationary SSI quality over the past 12 months.

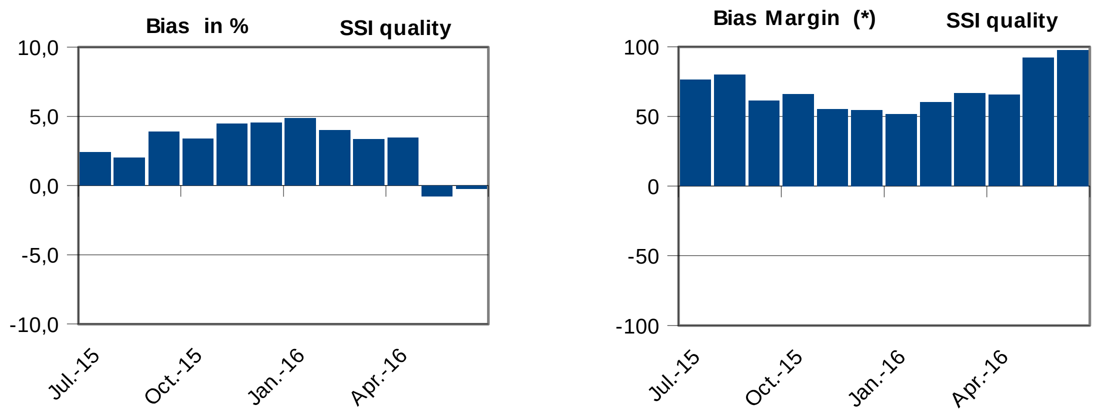


Figure 43 : Geostationary SSI (left) Bias. (right) Geostationary SSI Bias Margin.

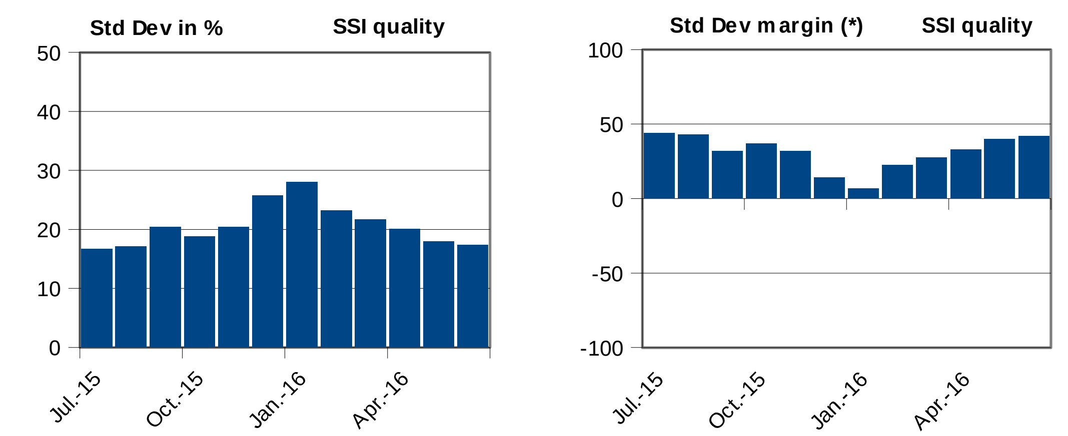


Figure 44 : Geostationary SSI Standard deviation & Geostationary SSI Standard deviation Margin.

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.
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	The station was closed due to major change on the platform. Instrumentation is recovered and work in progress to remount the equipment.
Bjørnøya	99710	74.52°N	19.02°E	SSI, DLI	In use, Arctic station with snow on ground much of the year.
Hopen	99720	76.51°N	25.01°E	SSI, DLI	In use, Arctic station with snow on ground much of the year. Strong shadow effect by mountains.
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. DLI was added to this station during the spring of 2016.
Sodankylä	7501	67.37°N	26.63°E	SSI, DLI	In use, temporarily disabled for SSI validation. Problems likely to be connected with snow on ground.
Kiruna	02045	67.85°N	20.41°E	SSI, DLI	Only DLI used so far.
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*, *Finnish Meteorological Institute (FMI)*, *Swedish Meteorological Institute (SMHI)* and Deutscher Wetterdienst (*DWD*). Data from DWD and SMHI are extracted from WMO GTS, data from the other sources are received by email or through other direct connections. More stations are being considered for inclusion.

The station at Ekofisk was closed in July 2015, instruments are recovered and work in progress to remount equipment on a new platform. This is however pending financial support. As this was the only pure maritime station available, this is a serious drawback for evaluation of the performance of the flux products.

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
- 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. 2015 to JUN. 2016										
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. 2015	303	187.43	9.64	7.31	10.0	26.9	28.53	15.36	30.0	48.8
AUG. 2015	305	145.35	-0.33	9.88	10.0	1.2	23.46	18.48	30.0	38.4
SEP. 2015	235	101.77	4.65	4.76	10.0	52.4	18.58	18.18	30.0	39.4
OCT. 2015	240	50.41	2.08	7.87	10.0	21.3	11.87	24.11	30.0	19.63
NOV. 2015	295	12.64	0.85	15.39	10.0	-53.9	11.16	58.85	30.0	-96.17
DEC. 2015	260	5.60	3.24	17.02	10.0	-70.2	10.25	58.59	30.0	-95.3
JAN. 2016	306	8.31	5.04	49.26	10.0	-392.6	7.58	48.50	30.0	-61.67
FEB. 2016	286	27.94	7.21	28.12	10.0	-181.2	14.99	52.15	30.0	-73.83
MAR. 2016	306	68.72	14.84	21.51	10.0	-115.1	17.56	26.08	30.0	13.07
APR. 2016	296	135.90	17.29	13.31	10.0	-33.1	25.01	18.46	30.0	38.47
MAY 2016	296	199.17	14.08	8.10	10.0	19	25.93	13.45	30.0	55.17
JUN. 2016	289	214.79	12.91	7.74	10.0	22.6	29.67	13.89	30.0	53.7
(*) 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 : AHL SSI quality results over JUL. 2015 to JUN. 2016

Comments : As before, the SSI product does not meet the requirements during the dark season and when the surface is covered by extensive snow cover. For May and June the product meets all requirements when the station Landvik is removed from the analysis (done in the numbers presented above). Analysis of the observations at Landvik revealed too low observations. Without knowing the reason, the station was removed from this validation report, and a more careful evaluation will be done. The problem appears to be most evident in the period April-June, with May being worst. If the Bjørnøya and Sodankylä stations are removed from the analysis, requirements are met in April as well, leaving a strong influence of low signal to noise stations on the overall performance results.

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.

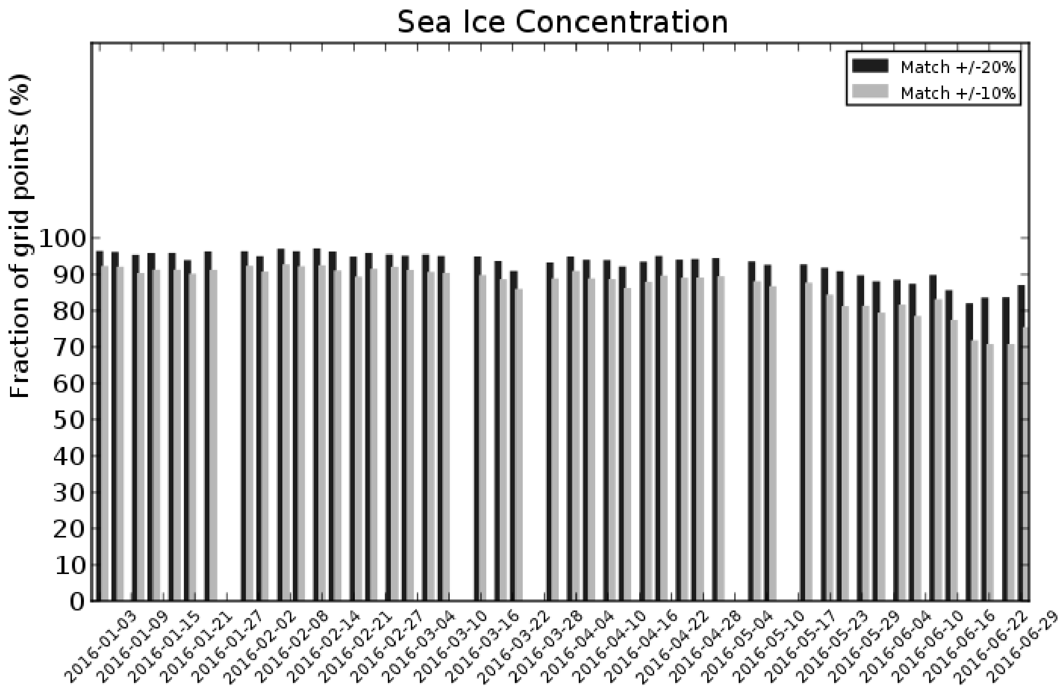


Figure 45 : Comparison of ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. Northern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%

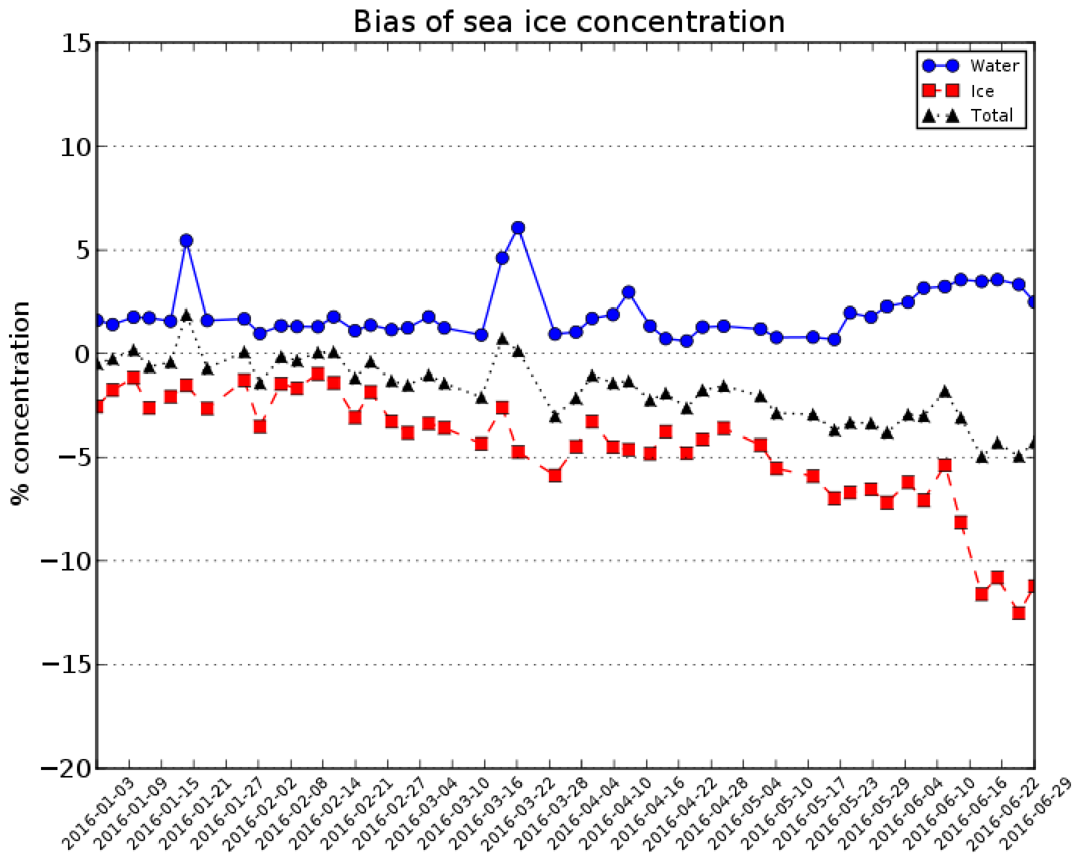


Figure 46 : Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for three categories: water, ice and total. The total difference is the difference between the ice analysis and sea ice concentration product within the area covered by the 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

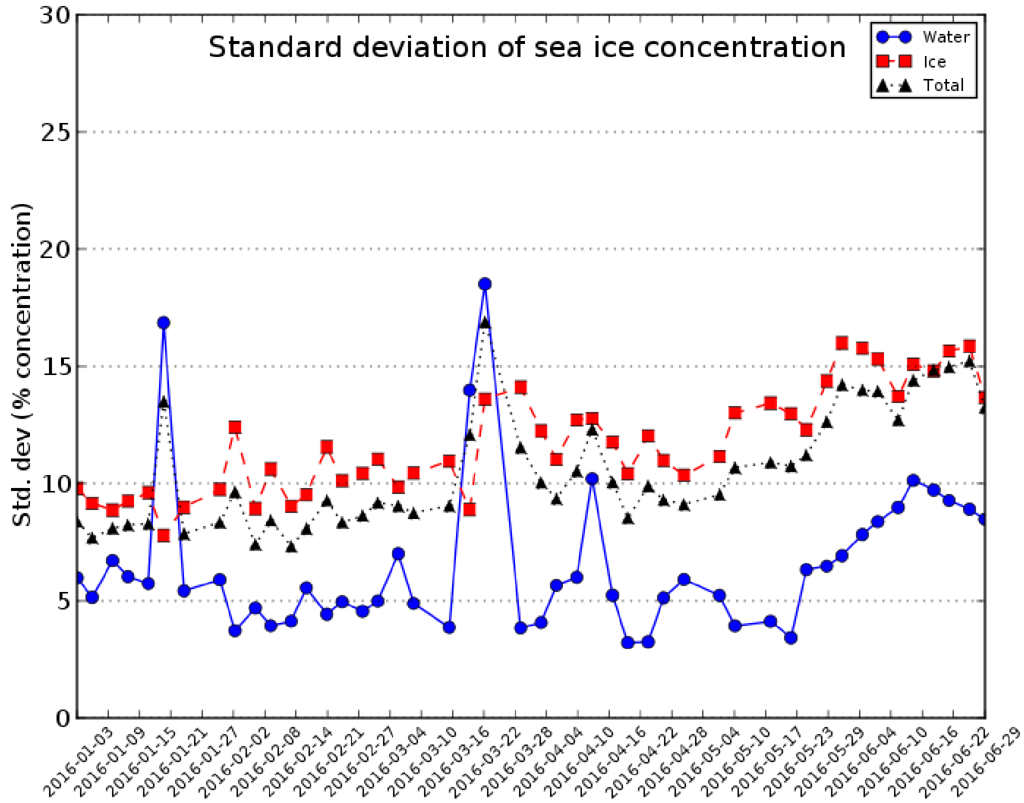


Figure 47 : Standard deviation of the difference in ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for three categories: water, ice and total. Northern hemisphere

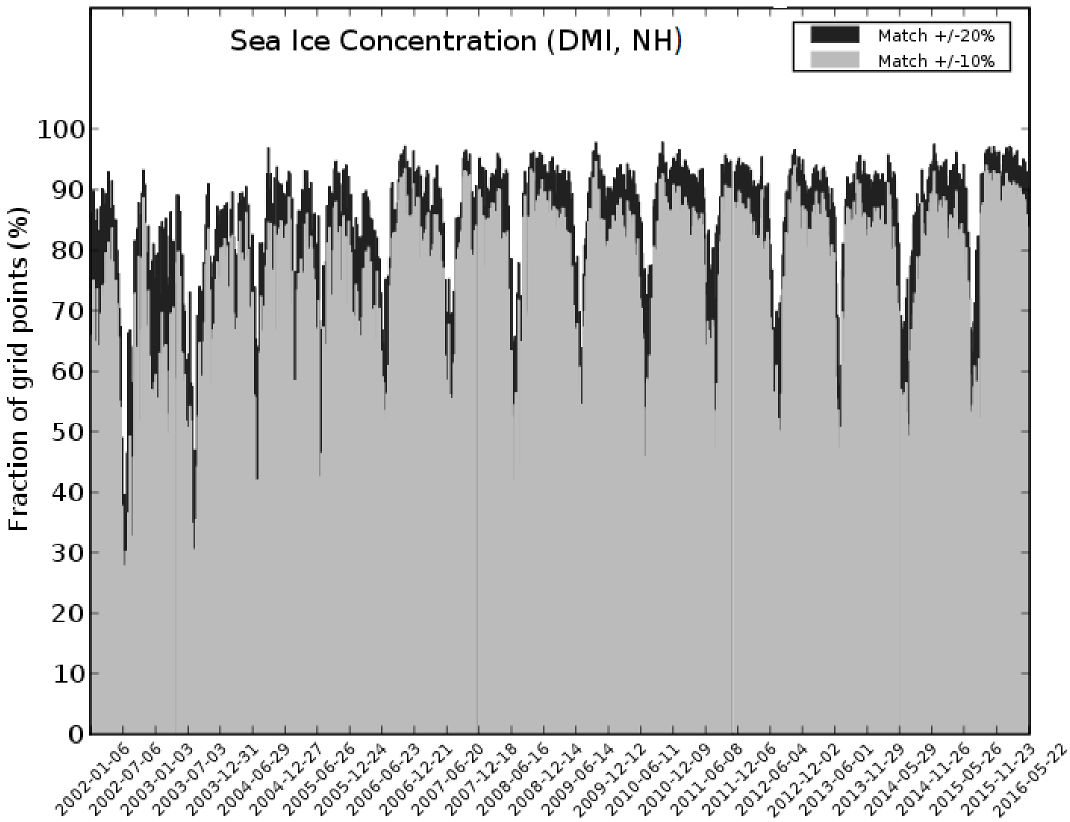


Figure 48 : Multiyear variability. Comparison between ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Northern hemisphere

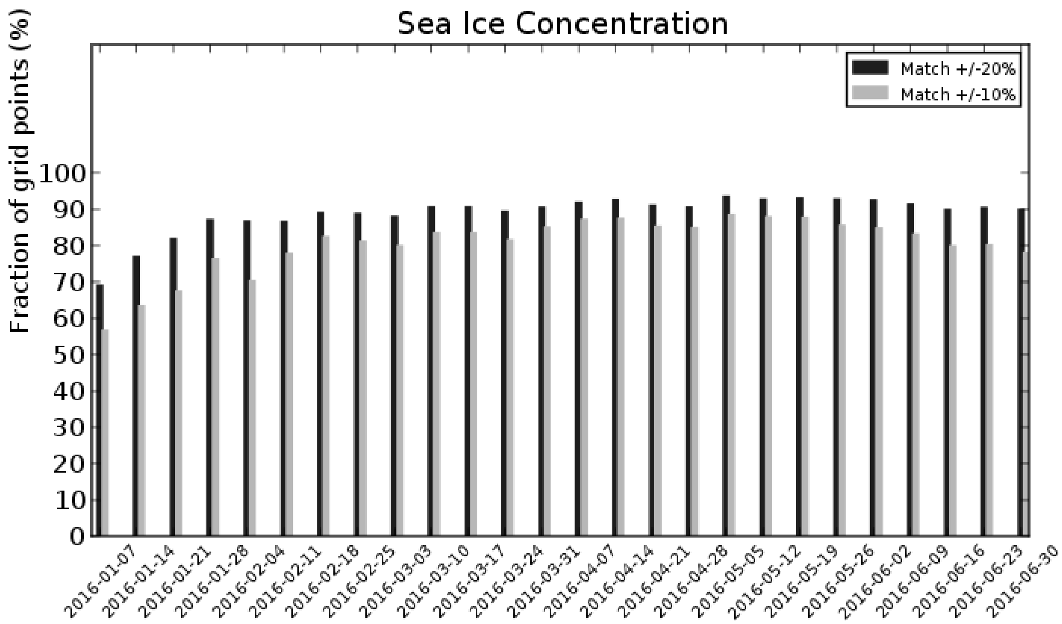


Figure 49 : **Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/-10%, and likewise for +/-20%. Southern hemisphere**

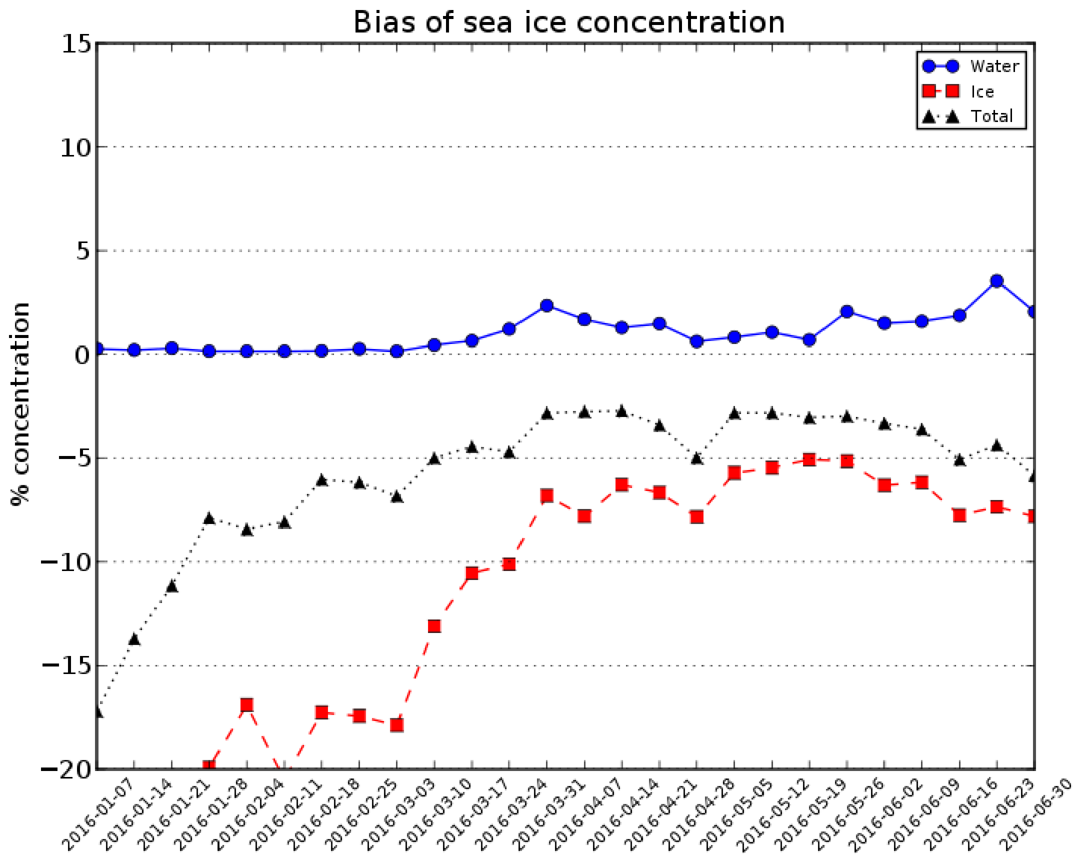


Figure 50 : **Difference between the ice concentrations from the NIC ice analysis and OSI SAF concentration product for three categories: water, ice and total. The total difference is the difference between the ice analysis and sea ice concentration product within the area covered by the ice analysis 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**

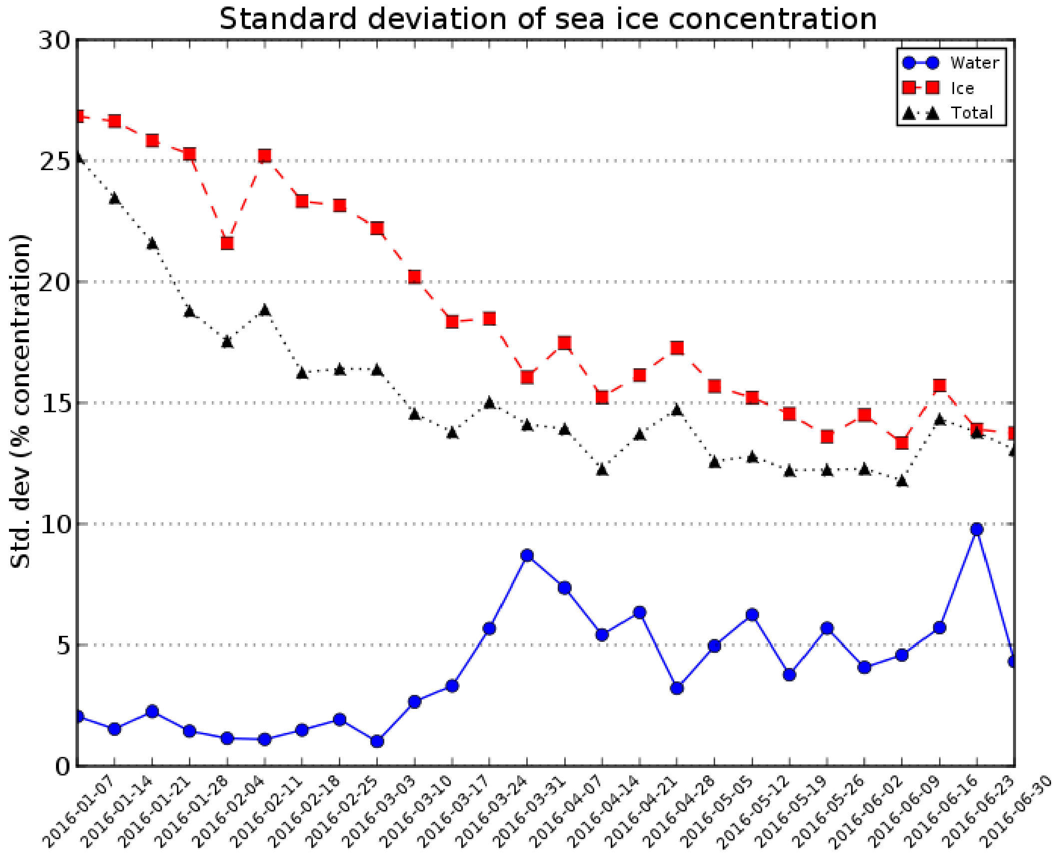


Figure 51 : Standard deviation of the difference in ice concentrations from the NIC ice analysis and OSI SAF concentration product for three categories: water, ice and total. Southern hemisphere

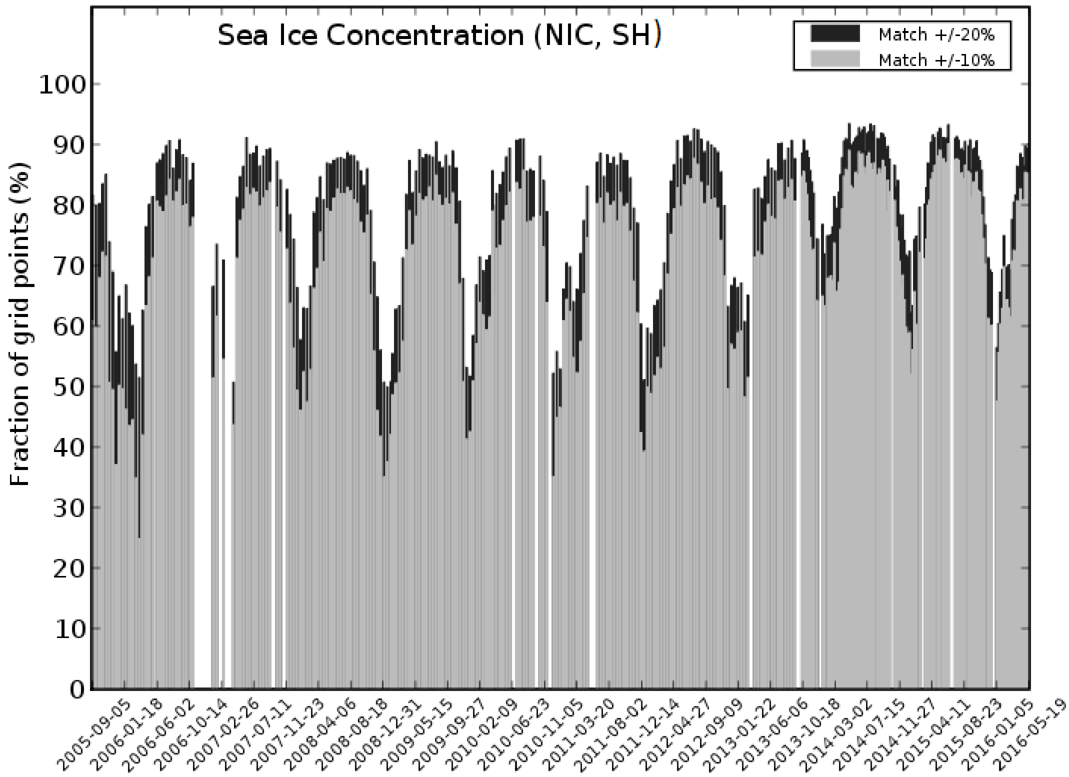


Figure 52 : Multiyear variability. Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Southern hemisphere

Concentration product					
Month	+/- 10% [%]	+/- 20% [%]	Bias [%]	Stdev [%]	Num obs
JUL. 2015	75.07	89.31	-5.13	11.11	83345
AUG. 2015	82.76	86.75	-4.83	12.29	114501
SEP. 2015	93.24	96.17	-0.80	6.69	154481
OCT. 2015	93.00	96.91	-0.49	5.82	65428
NOV. 2015	85.97	94.15	-2.44	8.04	100600
DEC. 2015	86.03	93.59	-2.82	8.84	83119
JAN. 2016	83.72	92.18	-2.71	9.92	93146
FEB. 2016	83.68	91.58	-3.26	10.22	111214
MAR. 2016	80.21	88.57	-1.74	12.86	104517
APR. 2016	78.95	88.18	-2.12	11.62	101317
MAY 2016	74.68	86.85	-5.92	11.71	106914
JUN. 2016	NA	NA	NA	NA	NA

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. 2015 to JUN. 2016. 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. 2016	86.77	12.17	1.03	0.03	0	55.95
FEB. 2016	85.79	12.91	1.26	0.03	0	55.98
MAR. 2016	85.33	13.32	1.32	0.03	0	55.97
APR. 2016	85.17	13.47	1.33	0.03	0	55.91
MAY 2016	85.07	13.75	1.15	0.03	0	53.22
JUN. 2016	83.23	15.79	0.96	0.02	0	44.78

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. 2016	91.70	8.13	0.16	0.01	0	22.59
FEB. 2016	93.58	6.29	0.12	0.00	0	22.58
MAR. 2016	93.92	5.96	0.12	0.01	0	22.57
APR. 2016	92.86	6.95	0.18	0.01	0	22.58
MAY 2016	90.58	9.22	0.20	0.01	0	21.55
JUN. 2016	85.93	13.9	0.16	0.00	0	18.00

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

Comments:

Figure 47 and Figure 51 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.

Average yearly std.dev. for the period JAN. 2016 – JUN. 2016 is 10% and 15% for the NH and SH hemisphere products, respectively, and thus fullfill the service specifications.

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.

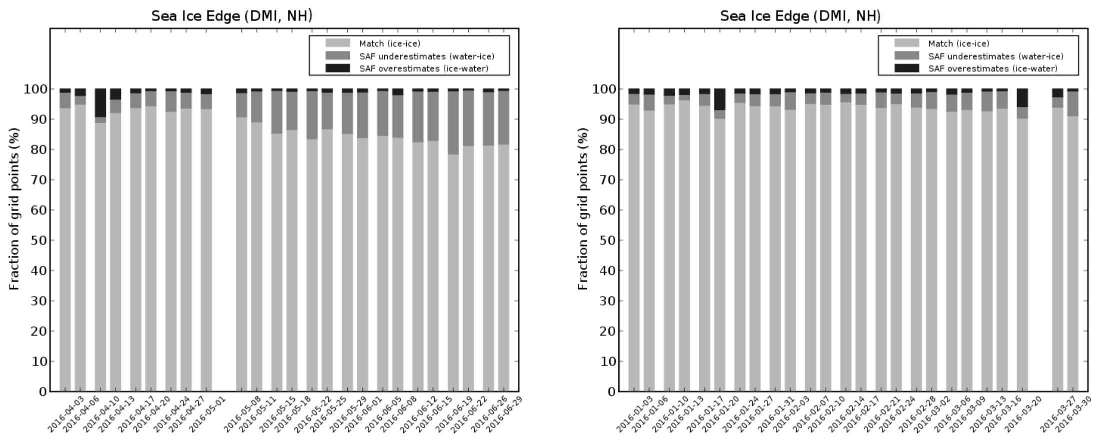


Figure 53 : Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category

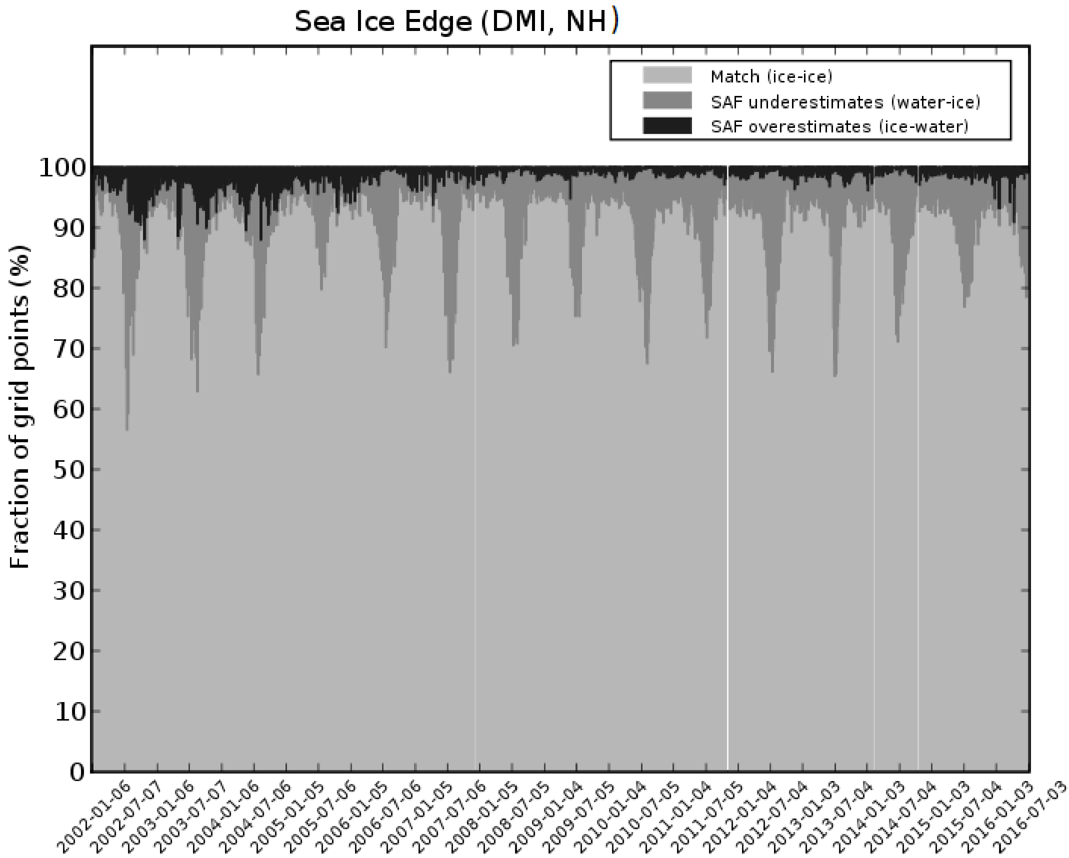


Figure 54 : Multiyear variability. Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF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

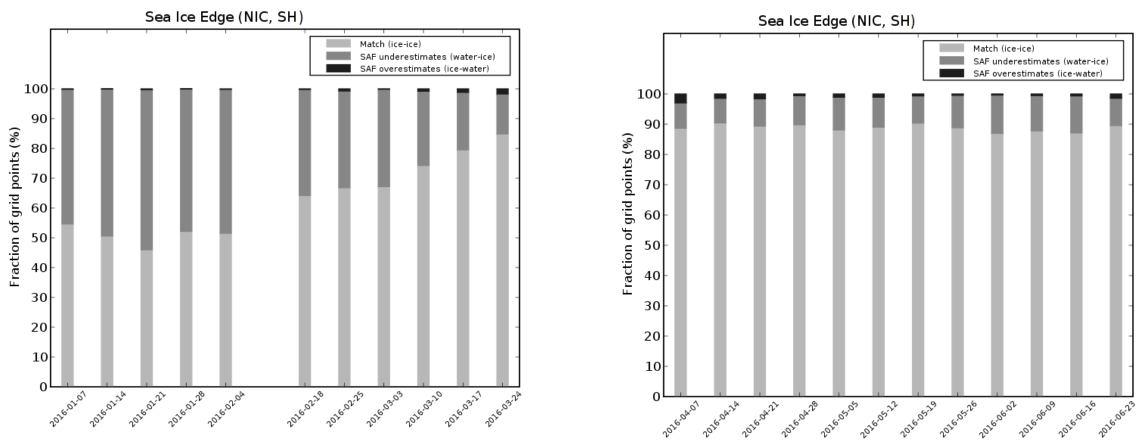


Figure 55 : Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category

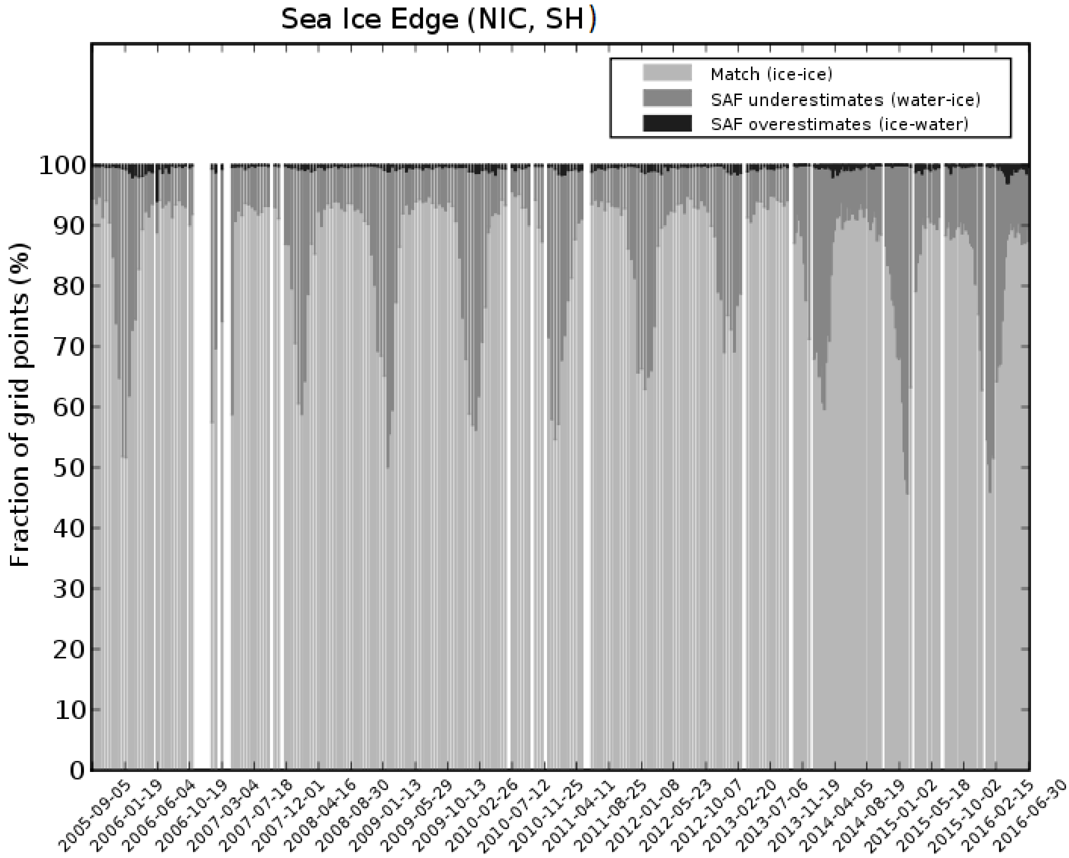


Figure 56 : Multiyear variability. Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category

Month	Correct (%)	SAF lower (%)	SAF higher (%)	Mean edge diff (km)	Num obs
JUL. 2015	97.53	1.48	0.99	13.38	87067
AUG. 2015	96.38	2.54	1.08	22.12	119607
SEP. 2015	98.33	0.80	0.87	14.68	152642
OCT. 2015	98.53	0.58	0.89	12.67	54048
NOV. 2015	97.79	1.20	1.01	13.57	107359
DEC. 2015	97.66	1.26	1.08	12.46	90118
JAN. 2016	96.56	1.73	1.71	13.10	100992
FEB. 2016	96.70	1.37	1.93	14.74	120349
MAR. 2016	94.43	2.08	3.49	17.25	113551
APR. 2016	96.92	1.53	1.56	16.50	109945
MAY 2016	96.75	1.65	1.60	13.78	115467
JUN. 2016	95.07	3.56	1.36	21.04	77826

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. 2015 to JUN. 2016. 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. 2016	89.10	2.58	4.17	3.37	0.79	53.86
FEB. 2016	87.31	3.77	4.53	3.54	0.85	54.13
MAR. 2016	87.50	3.36	4.60	3.68	0.86	54.03
APR. 2016	84.52	4.74	5.93	3.90	0.91	53.96
MAY 2016	85.50	4.34	5.50	3.75	0.91	53.72
JUN. 2016	85.49	4.13	5.47	3.95	0.96	53.44

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. 2016	93.85	0.65	1.47	2.60	1.43	22.39
FEB. 2016	95.10	0.53	1.22	2.08	1.07	22.68
MAR. 2016	95.04	0.55	1.41	2.09	0.91	22.57
APR. 2016	93.62	0.71	2.21	2.59	0.87	22.55
MAY 2016	93.10	0.81	1.54	2.73	0.83	22.52
JUN. 2016	92.30	1.09	2.93	2.90	0.78	22.53

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

Comments : The yearly averaged edge difference is 15.4 km (average of monthly values) and the target accuracy requirement of 20 km edge difference is hence met. The monthly differences are actually below the yearly requirement all months except the month of June and August, when melting of snow and ice makes the product quality worse.

Validation for the ice edge product for southern hemisphere is not yet in place.

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 (std dev) in the difference from the running mean of the multi year ice (MYI) 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. 2015	-	-
AUG. 2015	-	-
SEP. 2015	-	-
OCT. 2015	27887	2612897
NOV. 2015	60933	2274458
DEC. 2015	75493	2161803
JAN. 2016	67203	2162049
FEB. 2016	59477	2041543
MAR. 2016	68648	2039555
APR. 2016	156920	1633922
APR. 2016 F18	33477	1601852
MAY 2016 F18	43035	1046333
JUN. 2016 F18	-	-

table 23 : Monitoring of NH sea ice type quality by comparing the multi year coverage with the 11-days running mean

Note, that the rows from “APR. 2016 F18” to “JUN. 2016 F18” contain values based on SSMIS data from F18 instead of F17. Whereas the values in row “APR. 2016” is the operational product for April containing all daily ice type products in April including SSMIS F17 based products and SSMIS F18 based products.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2016	90.54	1.01	7.59	0.73	0.13	53.87
FEB. 2016	89.55	1.08	8.46	0.77	0.14	54.13
MAR. 2016	88.76	1.17	9.08	0.85	0.15	54.03
APR. 2016	87.63	1.99	9.20	1.00	0.17	53.96
MAY 2016	86.66	1.80	8.01	3.35	0.17	53.73
JUN. 2016	85.35	1.56	6.76	6.15	0.18	53.44

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

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2016	91.55	0.31	0.40	7.53	0.22	22.39
FEB. 2016	93.17	0.25	0.32	6.10	0.16	22.68
MAR. 2016	93.00	0.22	0.28	6.36	0.14	22.57
APR. 2016	91.48	0.21	0.27	7.90	0.13	22.55
MAY 2016	89.38	0.20	0.27	10.02	0.12	22.52
JUN. 2016	86.97	0.20	0.27	12.45	0.11	22.53

table 25 :
Statistics for sea ice type confidence levels, Southern Hemisphere

Comments : The monthly standard deviations of the daily MYI coverage variability in Table 23 is below the requirement of 100.000 km^2 when SSMIS data from DMSP F17 is used before April 2016 and SSMIS data from DMSP F18 is used from April 2016.

In mid-April 2016, the OSI SAF sea ice products were upgraded to use SSMIS data from DMSP F18 satellite instead of F17 due to suddenly degraded SSMIS data from F17 (see News messages from April on osisaf.met.no). Due to the degraded ice products before and under the switch to F18 the standard deviation for April in Table 23 is seen to be high and above the target requirement. Table 23 also includes the April statics based on SSMIS data from only F18 after the switch (from the 15^{th} of April) where the standard deviation is far below the target requirement.

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 (those 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 atmosphere 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 SSMIS only (SSMIS-F17) 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 **$\varepsilon(X) = X_{prod} - X_{ref}$.** Columns **$\alpha$, 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.

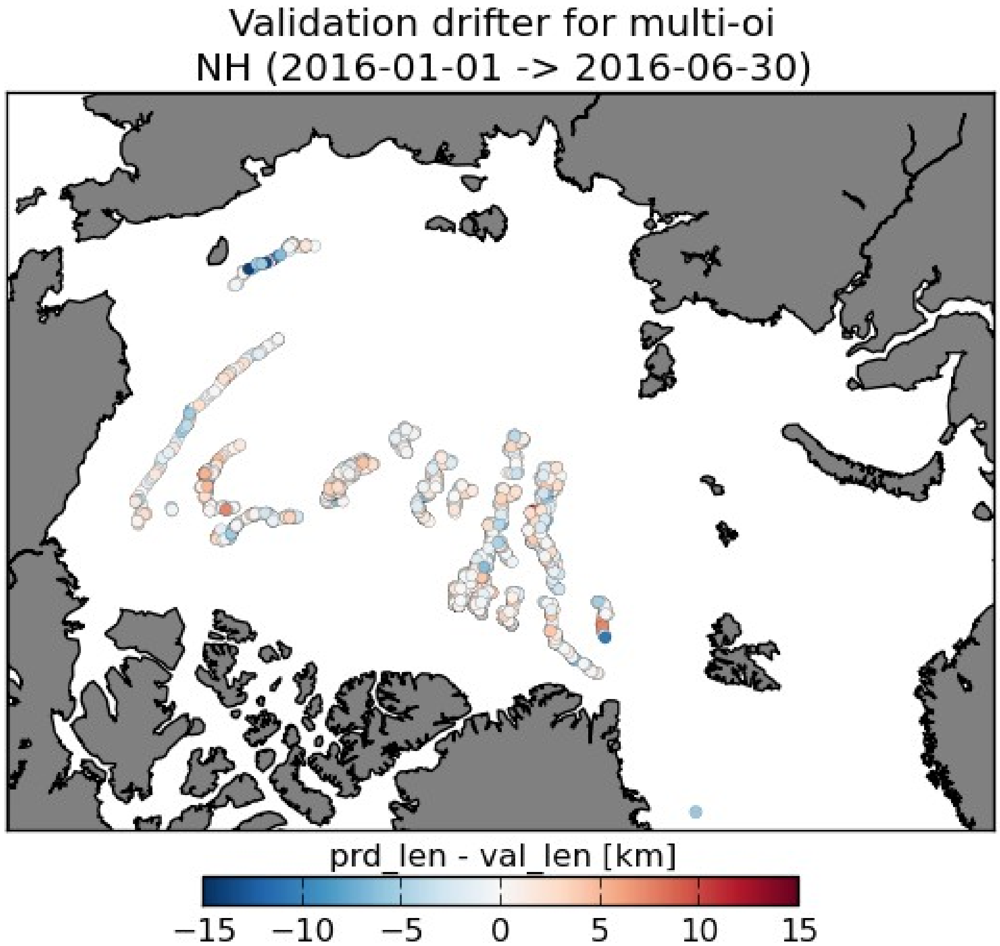


Figure 57 : Location of GPS drifters for the quality assessment period (JAN. 2016 to JUN. 2016). The shade of each symbol represents the bias (prod-ref) in drift length (km over 2 days)

Month	b(X) [km]	b(Y) [km]	(X) [km]	(Y) [km]		[km]		
JUL. 2015	-	-	-	-	-	-	-	0
AUG. 2015	-	-	-	-	-	-	-	0
SEP. 2015	-	-	-	-	-	-	-	0
OCT. 2015	-0.497	+0.754	4.464	4.894	0.77	+1.402	0.91	143
NOV. 2015	-0.455	-0.123	3.165	3.004	0.89	-0.067	0.97	417
DEC. 2015	-0.218	-0.376	3.135	3.498	0.93	-0.169	0.97	415
JAN. 2016	-0.049	-0.145	2.362	2.428	0.95	-0.041	0.98	613
FEB. 2016	-0.262	+0.260	2.669	2.346	0.96	0.039	0.98	536
MAR. 2016	-0.463	-0.143	2.780	2.231	0.91	-0.114	0.95	508
APR. 2016	+0.096	-0.536	1.628	2.147	0.96	-0.110	0.97	446
MAY 2016	-	-	-	-	-	-	-	0
JUN. 2016	-	-	-	-	-	-	-	0
Last 12 months	-0.232	-0.117	2.764	2.772	0.93	-0.032	0.97	3078

table 26 : Quality assessment results for the LRSID (multi-oi) product (NH) for JUL. 2015 to JUN. 2016

Month	b(X) [km]	b(Y) [km]	(X) [km]	(Y) [km]		[km]		
JUL. 2015	-	-	-	-	-	-	-	0
AUG. 2015	-	-	-	-	-	-	-	0
SEP. 2015	-	-	-	-	-	-	-	0
OCT. 2015	-0.422	+0.640	4.509	6.308	0.81	+1.199	0.88	127
NOV. 2015	+0.054	-0.032	4.235	3.881	0.91	+0.192	0.95	360
DEC. 2015	-0.406	-0.523	4.145	3.812	0.96	-0.378	0.96	376
JAN. 2016	+0.001	-0.142	3.815	4.093	0.98	-0.052	0.94	525
FEB. 2016	-0.291	+0.413	4.449	3.833	0.96	0.111	0.94	438
MAR. 2016	-0.172	-0.669	3.407	3.832	0.97	-0.376	0.90	367
APR. 2016	+0.238	-0.458	3.013	3.133	0.99	-0.087	0.93	370
MAY 2016	-	-	-	-	-	-	-	0
JUN. 2016	-	-	-	-	-	-	-	0
Last 12 months	-0.113	-0.170	3.923	3.975	0.95	-0.048	0.94	2563

table 27 : Quality assessment results for the LRSID (ssmis-f17) product (NH) for JUL. 2015 to JUN. 2016

Comments : The quality of OSI-405 series is back to its best, thanks to processing AMSR2-GW1 series (since October 2015). The target accuracy requirement is met.

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 ice drift 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). The CDOP3 WP22910 'HL temperature and sea ice drift in-situ validation database' includes work to archive and improve quality control of drifter data to be used in the MR ice drift validation.

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.

The product requirements for the MR ice drift product on threshold accuracy, target accuracy and optimal accuracy is 5 km, 2 km and 1 km yearly standard deviation, respectively.

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.

Quality assessment statistics

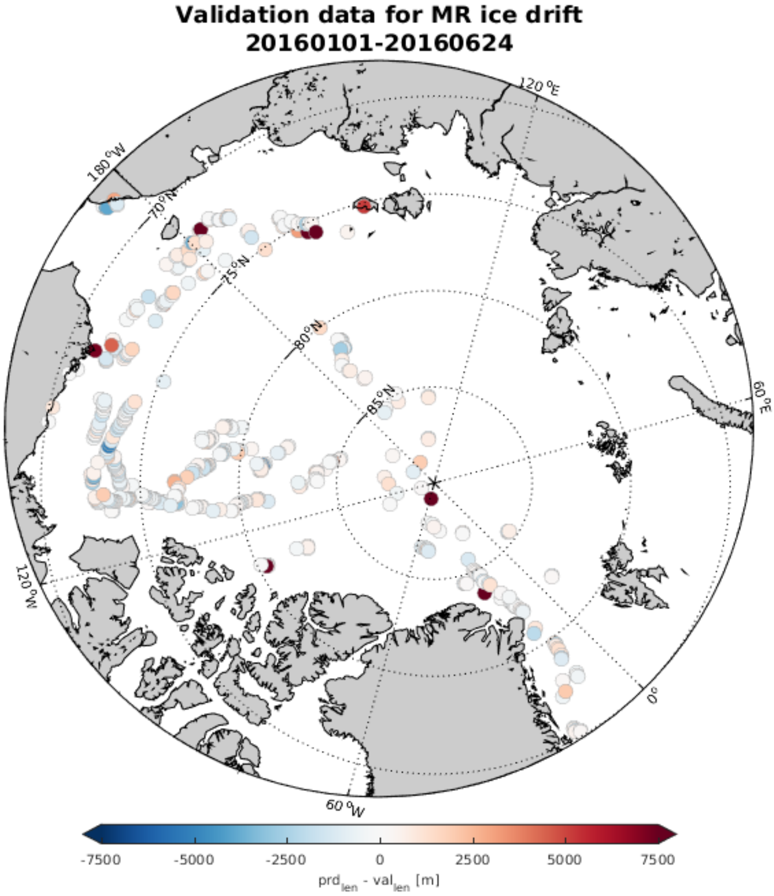


Figure 58 : Location of drifters for the quality assessment period (JAN. 2016 to JUN. 2016). The shade of each symbol represents the difference (prd. – val. data) in drift length in meters

Tables 28 and 29 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.

As already reported in the Half-yearly Operations Report (HYR) for 1st half 2015, unfortunate events caused a date-bug in the OSI-407 production from operational start until August 2015. A corrected product dataset for this period has been re-uploaded and made available to users on osisaf.met.no and the bug-fixed operational production has run since SEP. 2015. Preliminary comparison statistics of the erroneous and the bug-fixed dataset for selected seasonal periods between JAN 2013 and start AUG 2015 was presented in the HYR for 1st half 2015. In addition to the data of the current quality assessment period, and to complete validation statistics for this product, statistics are presented for the full bug-fixed data-set (re-uploaded to users) from APR. 2014 – AUG. 2015 (marked by *).

Month	b(X) [m]	b(Y) [m]	(X) [m]	(Y) [m]		[m]		
APR. 2014*	-1563	854	5423	1429	0.58	104	0.68	20
MAY 2014*	-	-	-	-	-	-	-	-
JUN. 2014*	-	-	-	-	-	-	-	-
JUL. 2014*	464	98	328	69	0.86	-4	1.00	12
AUG. 2014*	86	40	47	41	1.01	-97	1.00	8
SEP. 2014*	-	-	-	-	-	-	-	-
OCT. 2014*	1097	-200	672	940	1.07	-230	0.98	16
NOV. 2014*	987	1360	2031	637	0.94	-1218	0.92	16
DEC. 2014*	-1207	-929	1278	905	0.74	900	0.89	28
JAN. 2015*	315	438	340	525	0.94	-391	0.96	16
FEB. 2015*	78	77	1188	1453	1.16	-64	0.96	24
MAR. 2015*	1375	344	495	179	1.06	-817	0.99	12
APR. 2015*	-41	214	566	538	0.99	-102	0.96	40
MAY. 2015*	252	34	303	625	0.97	-110	0.99	48
JUN. 2015*	109	389	757	1028	0.96	-236	0.95	428
Last 14 months	83	296	1310	1017	0.94	-190	0.93	680

table 28 : MR sea ice drift product (OSI-407) performance, APR. 2014 to JUN. 2015. Corrected re-uploaded dataset, marked by *.

Month	b(X) [m]	b(Y) [m]	(X) [m]	(Y) [m]		[m]		
JUL. 2015*	170	290	1491	2608	0.97	-170	0.86	804
AUG. 2015*	-113	162	624	786	1.07	-37	0.99	92
SEP. 2015	864	1034	2094	2030	1.16	-1004	0.85	16
OCT. 2015	29	268	953	1205	1.00	-146	0.98	292
NOV. 2015	-65	-62	1877	1265	0.98	54	0.96	838
DEC. 2015	-93	212	828	924	1.00	-60	0.99	1501
JAN. 2016	51	184	909	1233	0.94	-59	0.96	756
FEB. 2016	-166	-28	1209	1681	0.98	43	0.98	570
MAR. 2016	-137	207	951	1011	0.99	-40	0.98	1853
APR. 2016	-98	261	1281	1244	0.99	-104	0.97	1626
MAY 2016	334	458	3024	1650	0.80	-346	0.89	288
JUN. 2016	-73	359	987	1899	0.88	54	0.96	100
Last 12 months	-55	195	1300	1398	0.98	-78	0.97	8703

table 29 : MR sea ice drift product (OSI-407) performance, JUL. 2015 to JUN. 2016. Corrected re-uploaded dataset, marked by *.

Comments :

Semi-automatic quality control (based on threshold on maximum buoy drift, visual inspection on drift scatter plots (buoy vs. satellite) and inspection of extreme outliers) has been carried out. In May, June and September 2014 there was only one or no validation data match-up, thus no validation statistics. All months, except from July, September and May 2015 show reasonable correlation with Buoy drift. Large std in September and May 2015 is to some extent due to little data for comparison (N). The product requirement target accuracy of 2km on yearly standard deviation is met.

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

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 2016. 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/site/monitoring/winds-quality-evaluation/scatterometer-mon/.

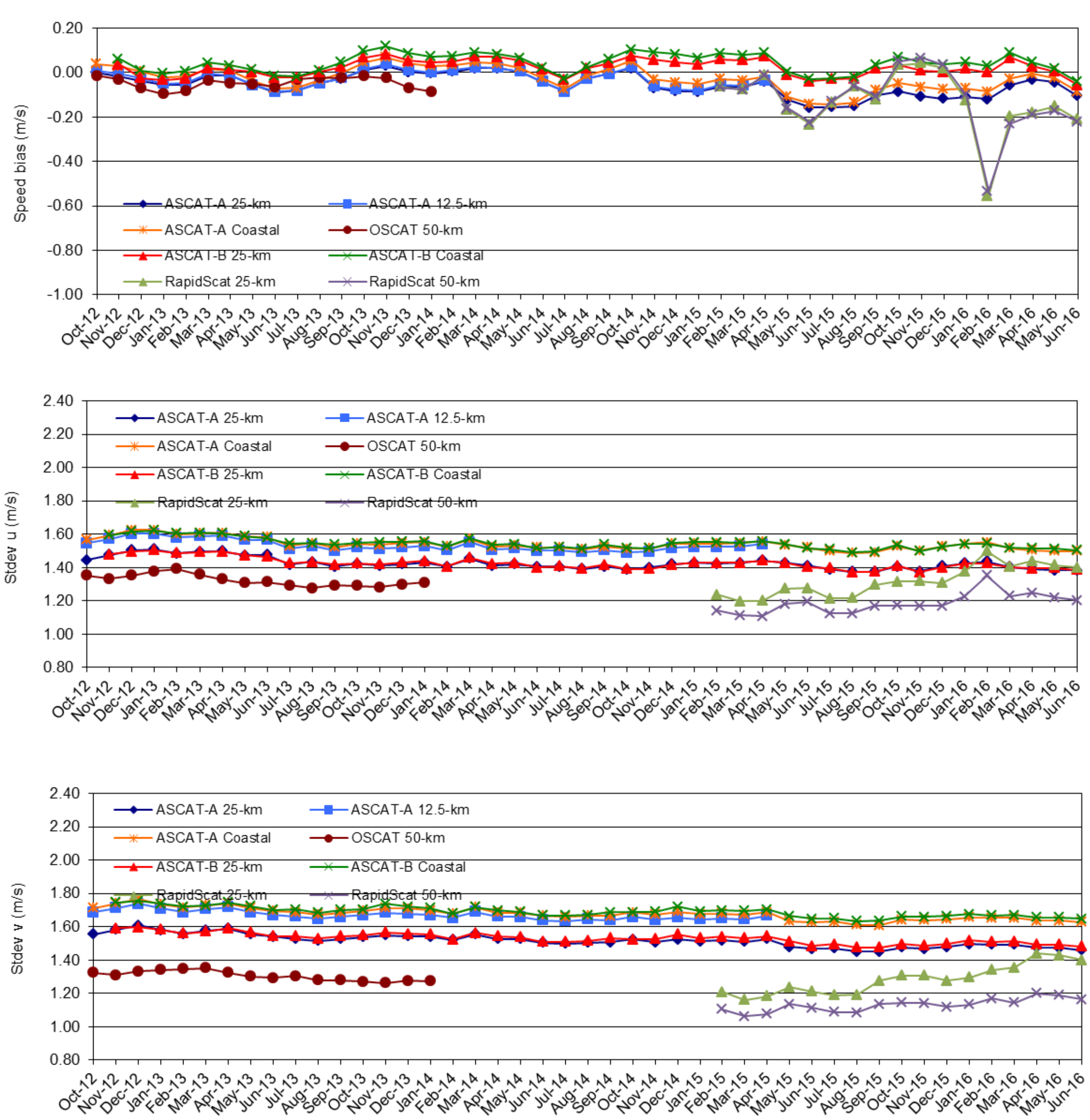


Figure 59 : Comparison of scatterometer winds against ECMWF NWP forecast winds (monthly averages). For each product, the wind speed bias (scatterometer minus ECMWF, top), wind *u* component standard deviation (middle) and wind *v* component standard deviation (bottom) are shown

5.4.2 Comparison with buoys

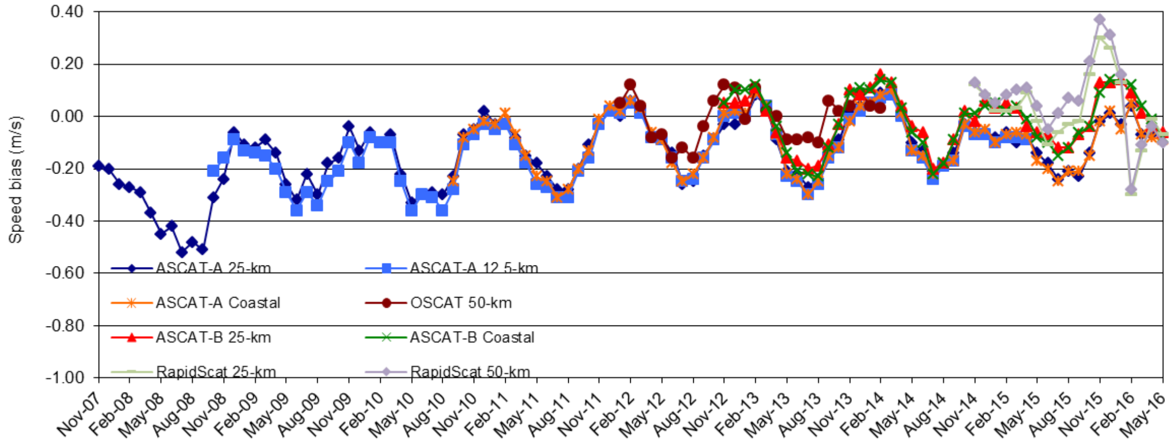
We compare the scatterometer winds with wind data from moored buoys on a monthly basis. The buoy data of approximately 150 buoys spread over the oceans (most of them in the tropical oceans and near Europe and North America) are retrieved from the ECMWF MARS archive and collocated with scatterometer winds. 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.

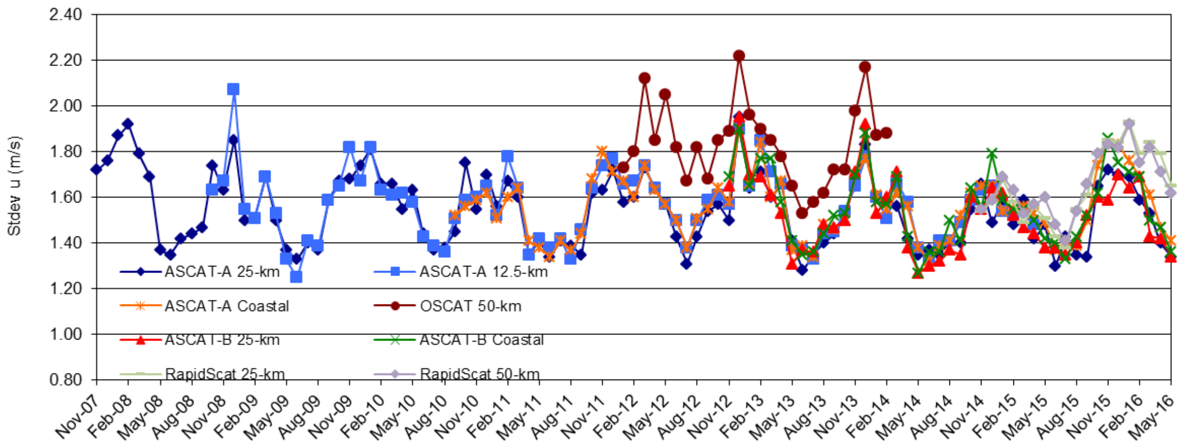
The figure below shows the monthly results of November 2007 to May 2016.

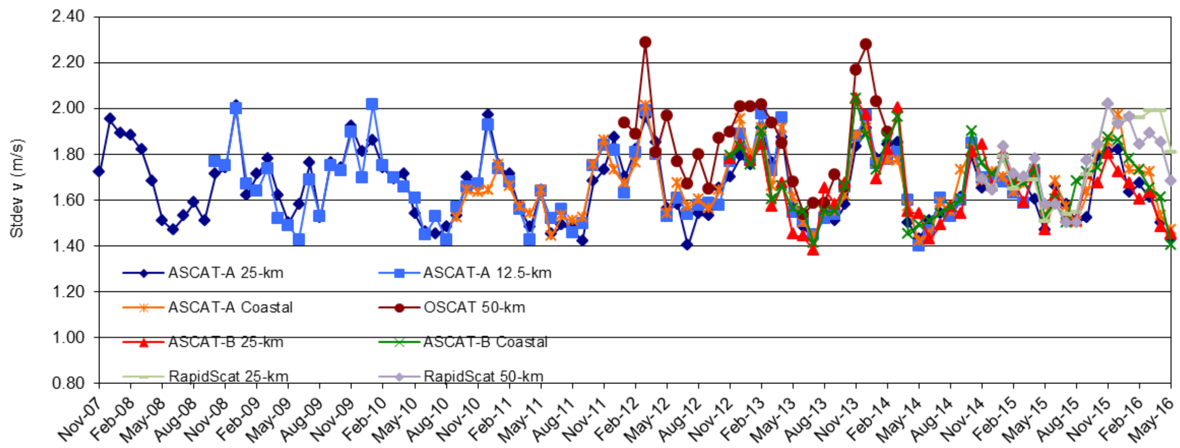
Note that the ASCAT winds before 20 November 2008 are real winds rather than neutral winds. Neutral scatterometer winds are known to be 0.2 m/s higher than real scatterometer winds.

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. Also the number of available buoys changes over time as is shown in the bottom plot. 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.







H

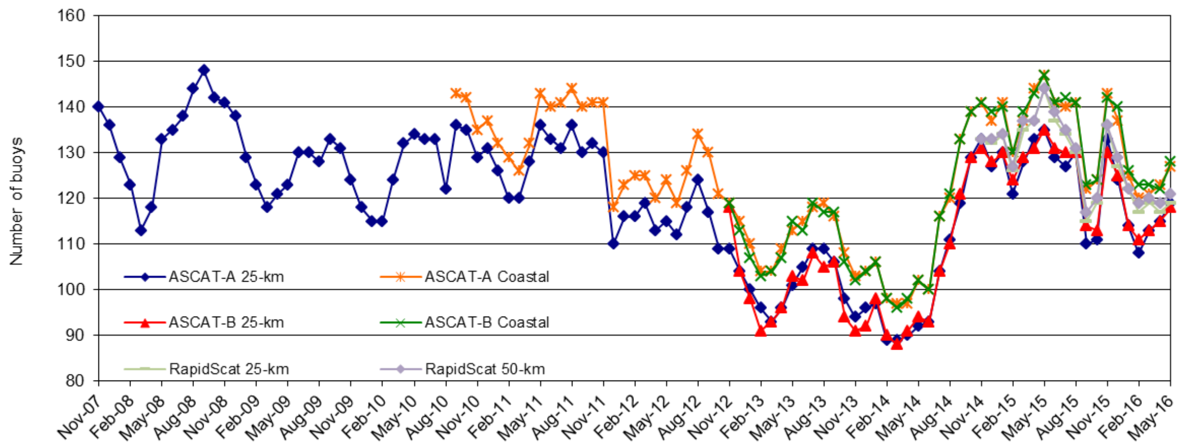


Figure 60 : Comparison of scatterometer winds against buoy winds (monthly averages). For each product, the wind speed bias (scatterometer minus buoy, top), wind *u* component standard deviation (2nd plot) and wind *v* component standard deviation (3rd plot) are shown. Also the number of buoys available for the comparisons is shown (bottom)

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 MF/CMS,
- a web site for SS1, http://www.osi-saf.org/lml/, managed by MF/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. 2016	1057	45856	16
FEB. 2016	1076	52202	13
MAR. 2016	1079	>33793	12
APR. 2016	1085	NA	7
MAY 2016	1095	NA	11
JUN. 2016	1098	NA	12

table 30 : Statistics on central OSI SAF Web site use over 1st half 2016.

The 22/03/2016, the central web site moved to a new host. The web statistics have not been recorded since that moment but should be registered again soon.

The following graph illustrates the evolution of external registered users on the central Web Site.

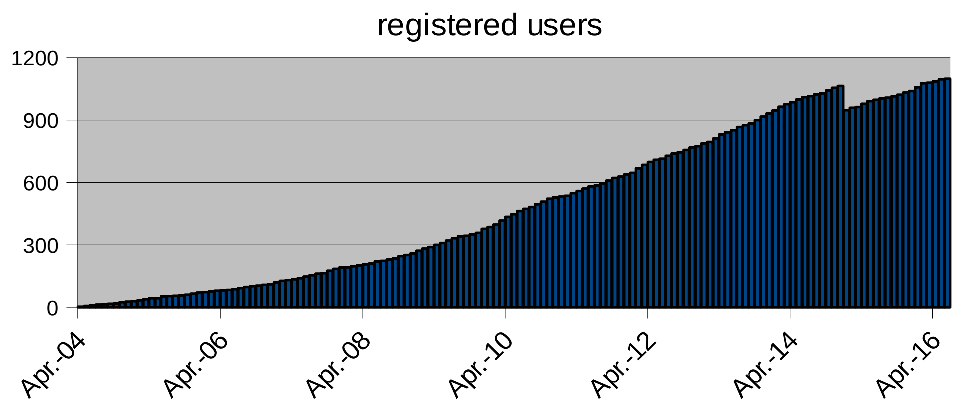


Figure 61 : Evolution of external registered users on the central Web Site from April 2004 to June 2016.

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
Algeria	Unité de Recherche en Energies Renouvelables en Milieu Saharien Adrar	URER-MS Adrar
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	University of Tasmania	ACE CRC
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	McGill University	McGill U.
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	Tongji 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
Croatia	Croatian Meteorological and Hydrological Service	CMHS
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
Ethiopia	Addis Ababa University	AAU
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 de la Recherche Scientifique	CNRS/MIO
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	kedge business school	kedge bs
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	Design & Data GmbH	
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	Ulm University of Applied Science	HSU
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	Center environment planning and technology	CEPT
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	Indonesian Agency for Meteorology Climatology and Geophysics	BMKG
Indonesia	Maxxima	AIS
Indonesia	Ministry of Marine Affairs and Fisheries	MMAF
Indonesia	Hasanuddin University	UNHAS
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	ENEL TRADE spa	ENEL TRADE
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	Kalkulo	
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	Instituto Geofisico del Peru	IGP
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	CESAm and Aveiro University	CESAM/UA
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
Portugal	University of Evora	MJC
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	Cape Peninsula University of Technology	CPUT
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 Africa	Total Exploration and Production South Africa	TEPSA
South Korea	Korea Environmental Science @ Technology Institute	KESTI
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
South Korea	Seoul National University	SNU
Spain	Basque Centre for Climate Change	BC3
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	Agencia Estatal de Meteorologia	AEMET
Spain	Instituto Nacional de Tecnica Aeroespacial	INTA
Spain	International Center for Numerical Methods in Engineering	CIMNE
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	University of Barcelona	UB
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 Cadiz	UCA
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	CGI	CGI
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	International Centre for Island Technology-Heriot Watt University	ICIT-HWU
United Kingdom	Lutra Consulting	LTC
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	Tullow Oil	
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 California, Berkeley	UC Berkeley
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 31 : List of Institutes registered on the central Web Site

Moreover 13 new individual users, i.e. persons independent from any institute, establishment or company, registered on the period.

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 to the OSI SAF (includes the requests made on the OSI SAF help desk on the central web site, the requests made to osi-saf.manager@meteo.fr, the requests made to scat@knmi.nl assigned to the OSI SAF, the requests made by email directly to OSI SAF team).

The requests are classified with the following categories :

- Anomaly in a product (ANOMALY),
- Product not available (UNAVAIL),
- Request for archived data (ARCHIVE),
- Request for information (INFO).

Reference	Date	subsystem	Category	Subject	Status
2016-102	05/01/16	WIND	UNAVAIL	Problem to get RapidScat winds files	Closed
email	06/01/16	LML	INFO	Inquiry on Planned change of METEOSAT and GOES-E SST product format	Closed
email	07/01/16	WIND	ARCHIVE	Access to ascat data products	Closed
2016-104	11/01/16	WIND	INFO	How to access ASCAT wind data on FTP server	Closed
160001	11/01/16	WIND	ARCHIVE	Request for archived ASCAT data	Closed
160002	11/01/16	WIND	ARCHIVE	Request for archived ASCAT data	Closed
email	11/01/16	HL	INFO	Ice files from EUMETCast and FTP	Closed
2016-107	13/01/16	WIND	ARCHIVE	Request for archived ASCAT data	Closed
2016-108	16/01/16	WIND	ARCHIVE	Question about EDC ordering	Fwd
2016-109	19/01/16	WIND	ARCHIVE	Request for archived data and advices	Closed
2016-110	19/01/16	WIND	INFO	Strong winds changing direction of 180 degrees	Closed
email	22/01/16	general	INFO	Inventory of available information	Closed
email	25/01/16	HL	INFO	About ice conc upgrade and date	Closed
email	26/01/16	WIND	INFO	How to subscribe ?	Closed
email	27/01/16	general	INFO	OSI SAF user workshop	Closed
2016-111	29/01/16	WIND	INFO	Request for archived ASCAT data	Closed
email	02/02/16	LML	INFO	SST on Indian Ocean ?	
email	05/02/16	LML	INFO	Planned switch from Metop-A SST to Metop-B SST, do not receive OSI SAF service message	Closed
2016-112	09/02/16	WIND	ANOMALY	Change in the mean RapidScat MLE value (and speed bias)	Closed
email	11/02/16	HL	INFO	Data close to north pole in ice products	Closed
2016-113	12/02/16	WIND	ANOMALY	Drop in mean speed bias for RapidScat	Closed
2016-114	15/02/16	WIND	ANOMALY	Derive in the RapidSCAT winds statistics	Closed
email	18/02/16	LML	INFO	Global attribute “platform” in NetCDF files	Closed
email	19/02/16	LML	INFO	Inquiry on Planned change of Metop SST product	Closed
2016-115	22/02/16	WIND	ARCHIVE	Request for archived ASCAT data	Closed
email	23/02/16	LML	INFO	Inquiry on specific time for planned change of Metop SST product	Closed
email	23/02/16	LML	INFO	Decoding SAF Sea Ice Grib files	Closed
2016-116	23/02/16	WIND	ANOMALY	Deterioration of the average Rapidscat wind speed	Closed
2016-117	24/02/16	WIND	INFO	Request for test data in BUFR	Closed
email	02/03/16	LML	UNAVAIL	Metop-A/SST stopped at 23/02/16	Closed
2016-118	03/03/16	WIND	ARCHIVE	ERS-1 and ERS-2 surface wind vectors	Closed
2016-119	03/03/16	WIND	ARCHIVE	Access to OSCAT wind products in netcdf	Closed
email	07/03/16	LML	ARCHIVE	Access to data	Closed
2016-120	10/03/16	WIND	ANOMALY	Still differences for RapidScat winds	Closed
email	11/03/16	LML	ARCHIVE	Access to data (before March 2015)	Closed
2016-121	12/03/16	LML	INFO	Discussion on ERS-2 and QuikSCAT winds comparison	Closed
email	14/03/16	LML	ANOMALY	Flipped images since switch from METOP-A to METOP-B	Closed
email	17/03/16	WIND LML	ARCHIVE	Access to data	Closed
email	18/03/16	HL	INFO	Where to set ice edge in ice concentration product	Closed

Reference	Date	subsystem	Category	Subject	Status
2016-122	21/03/16	WIND	INFO	Request on explanation about flags on ASCAT winds	Closed
2016-123	28/03/16	WIND	INFO	Availability period of ERS-2 data	Closed
2016-201	07/04/16	WIND	INFO	Change subscription to scat winds informations	Closed
2016-202	11/04/16	WIND	ANOMALY	End of RapidScat winds anomaly	Closed
160003	11/04/16	HL	ANOMALY	Problems in sea ice products due to F17/SSMIS problems	Closed
email	18/04/16	HL	INFO	Clarification of service message	Closed
email	21/04/16	HL	INFO	Explanation on how interpolation is done when data are missing, which might lead to spatial discontinuities.	Closed
email	26/04/16	HL	INFO	Problems with F17 data	Closed
2016-203	28/04/16	WIND	INFO	Access to data	Closed
2016-204	07/05/16	WIND	INFO	Low bias in the ASCAT-A data for stronger winds?	Closed
email	10/05/16	HL	UNAVAIL	Unable to access HL FTP server (pb on user side)	Closed
email	10/05/16	HL	INFO	Downloading data	Closed
2016-205	11/05/16	WIND	INFO	Request on explanation about flags	Closed
2016-206	11/05/16	WIND	INFO	Access to data on FTP server	Closed
2016-207	17/05/16	WIND	INFO	Thank you message for work on Rapidscat winds	Closed
160004	17/05/16	LML	ARCHIVE	Request for access to Ifremer FTP server	Closed
2016-208	20/05/16	WIND	INFO	Access to data on FTP server	Closed
2016-209	22/05/16	WIND	INFO	Access to data on FTP server	
email	27/05/16	HL	ANOMALY	New and old Ice Concentration maps	Closed
email	30/05/16	HL	INFO	Representation of projection in GRIB	Closed
2016-210	01/06/16	WIND	INFO	Request for information on the change on 29/03/16 on ASCAT-A data	Closed
email	03/06/16	HL	INFO	Upgrade of ice concentration product	Closed
email	04/06/16	HL	INFO	Difference between SST products	Closed
email	06/06/16	HL	ANOMALY	Spurious ice in coastal zone in the new ice concentration product	Closed
email	09/06/16	HL	INFO	Ice concentration GRIB files changed file name convention	Closed
160005	14/06/16	HL	UNAVAIL	Problem on access to HL THREDDS server	Closed
email	16/06/16	HL	INFO	Quicklooks not updated	Closed
email	20/06/16	HL	ANOMALY	Spurious ice in Baltic Sea and Gulf of St Lawrence	Closed
2016-212	21/06/16	WIND	ARCHIVE	Access to archived data	Closed
email	23/06/16	HL	INFO	Best way to download data in bulk	Closed
email	29/06/16	HL	INFO	Comparison of ice drift data	Closed
2016-213	29/06/16	WIND	INFO	Problem to get data on FTP server	Closed

table 32 : Status of User requests made to the OSI SAF

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

reference	Date	subject	status
300033082	22/06/16	How to convert the GRIB files to NetCDF	Closed

table 33 : Status of requests from EUMETSAT Help Desk.

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

Usage of the OSI SAF Sea Ice Web portal by country (top 10) over 1st half 2016 (pages views, including some spiders)	
Countries	**JAN. 2016 to JUL. 2016**
China (.cn)	122921
Commercial (.com)	102989
Network (.net)	27526
European country (.eu)	17957
Norway (.no)	5843
Germany (.de)	4309
International (.int)	2705
Sweden (.se)	2481
France (.se)	2342
Others/Commercial	9823

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

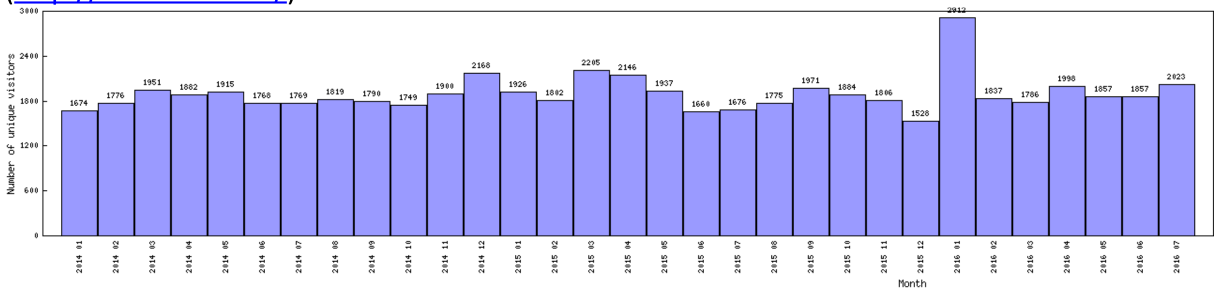


Figure 62 : Evolution of visitors on the HL OSI SAF Sea Ice portal from Jan 2014 to June 2016 (http://osisaf.met.no)

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 2016. Only external sessions (from outside KNMI) are counted.

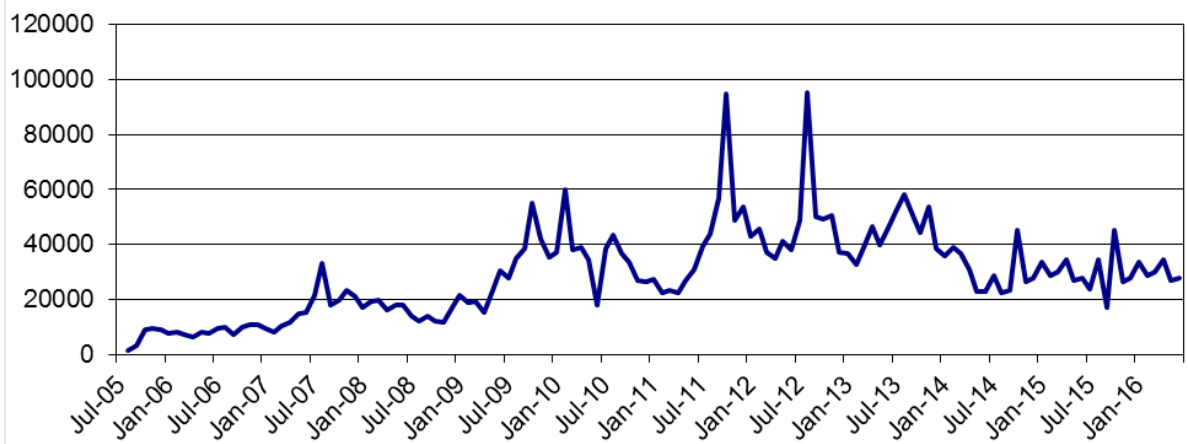


Figure 63 : **Number of page views on KNMI scatterometer website per month**

The total number of OSI SAF helpdesk inquiries at scat@knmi in this half year was 33. 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.

Entity	Shortened name	Country
National Taiwan University		Taiwan
Florida State University		U.S.A.
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
Fleet Numerical Meteorology and Oceanography Center, US Navy		U.S.A.
Shanghai Ocean University		China
Marine forecast station of Xiamen		China
Jiangsu Meteorological Bureau of China		China
Geological Survey of Denmark and Greenland		Denmark
Universidad Nacional Del Noroeste		Argentina
Institute of Meteorological Sciences, Hainan Province		China
27 independent users (not affiliated to an organization)		

table 34 : 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 2016													
		JAN. 2016		FEB. 2016		MAR. 2016		APR. 2016		MAY 2016		JUN. 2016	
		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		1	x	2	x	0	x	0	x	0	x	1	x
SSI MAP +LML		0	x	0	x	0	x	3423	x	0	x	0	x
DLI MAP +LML		0	x	0	x	0	x	26729	x	0	x	1	x
OSI-201	GBL SST	62	293	44	323	162	227	79	297	5	392	0	475
OSI-202	NAR SST	685	669	1122	760	223	1289	655	1696	665	1468	472	686
OSI-204	MGR SST	413485	103052	544337	68613	503424	81770	1343420	104286	490885	258658	834340	171368
OSI-206	METEOSAT SST	50358	4611	25874	3674	26517	989	41067	7110	48316	6400	27534	4777
OSI-207	GOES-E SST	15496	3922	4961	2500	3627	482	3303	3268	3567	4581	2667	2748
OSI-208	IASI SST	35439	28198	36094	21803	15195	22527	62422	32669	29498	74612	28390	32000
OSI-303	METEOSAT DLI	3889	x	29	x	38	x	14050	x	45998	x	59	x
OSI-304	METEOSAT SSI	19239	x	17696	x	6133	x	5735	x	6713	x	12342	x
OSI-305	GOES-E DLI	830	x	53	x	69	x	56	x	40	x	86	x
OSI-306	GOES-E SSI	6204	x	4302	x	6345	x	3497	x	4107	x	3852	x

table 35 : Number of OSI SAF products downloaded from Ifremer FTP server and PO.DAAC server over 1st half 2016

Note : PO.DAAC statistics about the NAR SST product is the sum of NOAA-17, NOAA-18, NOAA-19 and Metop-A and Metop-B NAR SST products.

6.2.2 Statistics on the SS2 ftp site use

Sea Ice products are available on MET Norway FTP server. For OSI-401, 402 and 403 the numbers include for each product area in NetCDF, GRIB and HDF5 format, and for OSI-203, 301 and 302 on GRIB and HDF5.

Number of Sea Ice products downloaded on High Latitude FTP server over 1st half 2016													
		JAN. 2016		FEB. 2016		MAR. 2016		APR. 2016		MAY 2016		JUN. 2016	
		HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS
OSI-401	Global Sea Ice Concentration	23510		30632		21450		6722		16253		41673	
OSI-402	Global Sea Ice Edge	3857		3301		4130		6147		3545		9639	
OSI-403	Global Sea Ice Type	4091		10421		11354		3313		18068		36292	
OSI-404	Global Sea Ice Emissivity	759		439		211		320		229		115	
OSI-405	Low resolution Sea Ice Drift	5312		17641		16048		7355		6970		10959	
OSI-407	Medium resolution Sea Ice Drift	1811		1261		228		352		1643		862	
OSI-409	Reprocessed Ice Concentration	79507		170317		106247		170509		127663		104870	
Downloaded SST, DLI and SSI over the OSI SAF High Latitude FTP server													
OSI-203	AHL SST	351		456		463		592		566		550	
OSI-301	AHL DLI	64		66		10		2		73		0	
OSI-302	AHL SSI	62		66		10		3		78		0	

table 36 : Number of OSI SAF products downloaded from OSI SAF Sea Ice FTP server over 1st half 2016.

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.

Number of OSI SAF products downloaded on KNMI FTP server over 1st half 2016													
		JAN. 2016		FEB. 2016		MAR. 2016		APR. 2016		MAY 2016		JUN. 2016	
		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	22 per file (BUFR), 22 per file (NetCDF)	79178	22 per file (BUFR), 22 per file (NetCDF)	230545	22 per file (BUFR), 22 per file (NetCDF)	172191	20 per file (BUFR), 24 per file (NetCDF)	168462	20 per file (BUFR), 24 per file (NetCDF)	65916	20 per file (BUFR), 24 per file (NetCDF)	24571
OSI-102-b	ASCAT-B 25km	20 per file (BUFR), 15 per file (NetCDF)	27862	20 per file (BUFR), 15 per file (NetCDF)	64125	20 per file (BUFR), 15 per file (NetCDF)	82636	20 per file (BUFR), 24 per file (NetCDF)	72674	20 per file (BUFR), 24 per file (NetCDF)	86253	20 per file (BUFR), 24 per file (NetCDF)	55286
OSI-103	ASCAT-A 12.5km	-	128886		187515		82495		133211		21820		60102
OSI-104	ASCAT-A Coastal	20 per file (BUFR), 22 per file (NetCDF)	183502	20 per file (BUFR), 22 per file (NetCDF)	308847	20 per file (BUFR), 22 per file (NetCDF)	129121	20 per file (BUFR), 24 per file (NetCDF)	226547	20 per file (BUFR), 24 per file (NetCDF)	127731	20 per file (BUFR), 24 per file (NetCDF)	180863
OSI-104-b	ASCAT-B Coastal	20 per file (BUFR), 30 per file (NetCDF)	84972	20 per file (BUFR), 30 per file (NetCDF)	94482	20 per file (BUFR), 30 per file (NetCDF)	27394	20 per file (BUFR), 30 per file (NetCDF)	59591	20 per file (BUFR), 30 per file (NetCDF)	15031	20 per file (BUFR), 30 per file (NetCDF)	84157
OSI-109-a	RapidScat 25 km Wind 2 hours	16 per file (BUFR), 13 per file (NetCDF)	-	16 per file (BUFR), 13 per file (NetCDF)	-	16 per file (BUFR), 13 per file (NetCDF)	-	15 per file (BUFR), 13 per file (NetCDF)	-	15 per file (BUFR), 13 per file (NetCDF)	-	15 per file (BUFR), 13 per file (NetCDF)	-
OSI-109-b	RapidScat 50 km Wind 2 hours	10 per file (BUFR), 10 per file (NetCDF)	-	10 per file (BUFR), 10 per file (NetCDF)	-	10 per file (BUFR), 10 per file (NetCDF)	-	10 per file (BUFR), 12 per file (NetCDF)	-	10 per file (BUFR), 12 per file (NetCDF)	-	10 per file (BUFR), 12 per file (NetCDF)	-
OSI-109-c	RapidScat 25 km Wind 3 hours	16 per file (BUFR), 13 per file (NetCDF)	-	16 per file (BUFR), 13 per file (NetCDF)	-	16 per file (BUFR), 13 per file (NetCDF)	-	14 per file (BUFR), 12 per file (NetCDF)	-	14 per file (BUFR), 12 per file (NetCDF)	-	14 per file (BUFR), 12 per file (NetCDF)	-
OSI-109-d	RapidScat 50 km Wind 3 hours	10 per file (BUFR), 13 per file (NetCDF)	-	10 per file (BUFR), 13 per file (NetCDF)	-	10 per file (BUFR), 13 per file (NetCDF)	-	9 per file (BUFR), 12 per file (NetCDF)	-	9 per file (BUFR), 12 per file (NetCDF)	-	9 per file (BUFR), 12 per file (NetCDF)	-

table 37 : Number of OSI SAF products downloaded from KNMI FTP server and PO.DAAC server over 1st half 2016

We also provided archived OSCAT data to one user during the reporting period.

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 27 July 2016.

Albania	3	Gabon	1	Nigeria	5
Algéria	4	Gambia	2	Norway	4
Angola	3	Germany	94	Oman	2
Argentina	1	Ghana	9	Peru	1
Armenia	1	Greece	13	Poland	11
Australia	1	Guinea	2	Portugal	5
Austria	18	Guinea-Bissau	3	Qatar	3
Azerbaijan	3	Hungary	8	Reunion	1
Bahrain	1	Iceland	1	Romania	5
Belgium	9	India	1	Russian Federation	7
Benin	3	Iran, Islamic Republic Of	4	Rwanda	5
Bosnia And Herzegovina	1	Iraq	1	San Marino	1
Botswana	6	Ireland	5	Sao Tome And Principe	2
Brazil	36	Isle Of Man	1	Saudi Arabia	4
Bulgaria	1	Israel	8	Senegal	7
Burkina Faso	3	Italy	248	Serbia	3
Burundi	2	Jordan	1	Seychelles	2
Cameroon	3	Kazakhstan	3	Sierra Leone	2
Canada	3	Kenya	12	Slovakia	4
Cape Verde	2	Korea, Republic Of	1	Slovenia	1
Central African Republic	2	Kuwait	2	Somalia	1
Chad	2	Kyrgyzstan	1	South Africa	17
China	2	Latvia	1	Spain	40
Comoros	2	Lebanon	3	Sudan	3
Congo	2	Lesotho	3	Swaziland	3
Congo, The Democratic Republic Of The	5	Liberia	2	Sweden	3
Côte D'Ivoire	5	Libyan Arab Jamahiriya	1	Switzerland	11
Croatia	2	Lithuania	2	Syrian Arab Republic	1
Cuba	1	Luxembourg	1	Tajikistan	1
Cyprus	1	Macedonia, The Former Yugoslav Republic Of	2	Tanzania, United Republic Of	4
Czech Republic	15	Madagascar	5	Togo	2
Denmark	6	Malawi	3	Tunisia	2
Djibouti	2	Mali	2	Turkey	6
Dominican Republic	1	Malta	2	Turkmenistan	1
Ecuador	0	Martinique	1	Uganda	3
Egypt	4	Mauritania	3	Ukraine	2
El Salvador	1	Mauritius	7	United Arab Emirates	5
Equatorial Guinea	2	Moldova, Republic Of	1	United Kingdom	116
Eritrea	2	Morocco	4	United States	6
Estonia	3	Mozambique	5	Uzbekistan	1
Ethiopia	6	Namibia	6	Viet Nam	1
Finland	4	Netherlands	24	Zambia	3
France	52	Niger	7	Zimbabwe	4

table 38 : Overall number of EUMETCast users by country at 27 July 2016

Comments : A slight increase of users in several african states is noteworthy.

6.3.2 Users and retrievals from EUMETSAT Data Center

Orders Summary over the 1st half 2016

The table below lists the persons who download data from the EUMETSAT Data Center (EDC) 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. 2016	FEB. 2016	MAR. 2016	APR. 2016	MAY 2016	JUN. 2016
blaze0925	3	8				
nuvemroxa	362					
sdljustin	22223					
ajfg70	3					
AU_KALJ	35					
kerkmann	2					
jankanak	162	3724				
Nadia_SAL	219					
agerturk	98					
fromano	169					
trygveas	20211		2694			
abukuse		52100				
huelin		413				
SonsolesR		332				
charleswei		10542		1276		
benedicto				61		
MarcosMC				21		
mjcosta				201		
hproe				8		
vincentMic				22893		
SYS_ANON					12	
georgiosn					85	
ipelajic					359	
whu_wk					42	
NOTTS_PHYS					358	
bfildier					15234	
zhaomy					81	
dataiyang					1228	
sergioss					27	
vilfri					84	
mawenlong					662	354

table 39 : Volume of data downloaded (in MB) by users and by month from EDC over 1st half 2016

Ingestion Summary over the 1st half 2016

The next tables list the received percentage of OSI SAF products by month over the period. In red, there was clearly an outage of products as well under the OSI SAF monthly target performance of 95%. In orange, the performance even below the target remains acceptable.

Id.	Product name	JAN.	FEB.	MAR.	APR.	MAY	JUN.
OSI-401	Global Sea Ice Concentration (DMSP-F17/18)	100	100	100	100	77.4	0
OSI-404	Global Sea Ice Emissivity (DMSP-F17/18)	100	100	100	73.3	100	100
OSI-305	Daily Downward Longwave Irradiance (GOES-13)	100	100	100	100	100	100
OSI-306	Daily Surface Solar Irradiance (GOES-13)	100	100	100	100	100	100
OSI-305	Hourly Downward Longwave Irradiance (GOES-13)	99.1	100	100	100	100	100
OSI-306	Hourly Surface Solar Irradiance (GOES-13)	99.1	100	100	100	100	100
OSI-207	Hourly Sea Surface Temperature (GOES-13)	99.1	99.8	99.7	100	99.8	100
OSI-207	Hourly Sea Surface Temperature (GOES-13) NetCDF	-	-	-	-	-	79.1
OSI-102-b	ASCAT 25km Wind (Metop-B)	100	100	100	100	100	100
OSI-104-b	ASCAT 12.5km Coastal Wind (Metop-B)	99.7	100	100	100	100	99.2
OSI-102	ASCAT 25km Wind (Metop-A)	100	100	100	100	100	100
OSI-104	ASCAT 12.5km Coastal Wind (Metop-A)	100	100	99.7	100	100	99.0
OSI-201	Global Sea Surface Temperature (Metop-A/B)	100	100	100	100	100	100
OSI-201	Global Sea Surface Temperature (Metop-B) NetCDF	-	-	-	-	-	NA
OSI-202	NAR Sea Surface Temperature (Metop-A/B)	100	79.3	100	100	100	100
OSI-202	NAR Sea Surface Temperature (Metop-B) NetCDF	-	-	-	-	-	78.3
OSI-405	Global Low Resolution Sea Ice Drift	100	100	100	100	100	100
OSI-301	AHL Downward Longwave Irradiance (Multi Mission)	100	100	100	100	100	100
OSI-407	Global Sea Ice Drift (Multi Mission)	100	58.6	100	100	100	100
OSI-402	Global Sea Ice Edge (Multi Mission)	100	100	100	100	100	100
OSI-403	Global Sea Ice Type (Multi Mission)	100	100	100	100	100	100
OSI-302	AHL Surface Solar Irradiance (Multi Mission)	100	100	100	100	100	100
OSI-203	AHL Sea Surface Temperature (Multi Mission)	100	100	100	100	100	100
OSI-303	Daily Downward Longwave Irradiance (MSG)	100	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)	100	99.8	100	100	100	100
OSI-304	Hourly Surface Solar Irradiance (MSG)	100	100	100	100	100	100
OSI-206	Hourly Sea Surface Temperature (MSG)	100	99.8	100	100	99.8	100
OSI-206	Hourly Sea Surface Temperature (MSG) NetCDF	-	-	-	-	-	79.0
OSI-202	NAR Sea Surface Temperature (NPP)	100	100	100	100	100	100
OSI-202	NAR Sea Surface Temperature (NPP) NetCDF	-	-	-	-	-	78.3
OSI-109-c	RapidScat 25 km winds	-	-	-	61.8	95.2	85.2
OSI-109-d	RapidScat 50 km winds	-	-	-	61.5	95.2	85.2

table 40 : Percentage of received OSI SAF products in EDC in 1st half 2016

Comments :

- The Global Sea Ice Concentration (OSI-401-b) was upgraded in May 2016. Due to an invalid parameter in the metadata file, the product is not ingested since 24/05/2016
- The Global Sea Ice Emissivity (OSI-404) ingestion is 73.3 % in April 2016. The product was temporary turned off from 13/04/2016 to 20/04/2016 due to problem on F17/SSMIS and switch to F18.
- NAR SST (OSI-202) ingestion is 79.3 % in February 2016. From 23 to 29 February, the GBL SST (OSI-201) was sent with a tag refering to the NAR SST in its metadata. GBL

SST was sent again with the right metadata at the beginning of March, nothing was done for the NAR SST. The issue on NAR SST ingestion might be a side effect of the wrong GBL SST metadata.

- Due to an errror in the metadata file, the product Medium Resolution Sea Ice Drift (OSI-407) was not ingested properly in February 2016.
- GBL SST (OSI-201-b), NAR SST (OSI-202-b), MSG SST (OSI-206) and GOES-E SST (OSI-207) are ingested in NetCDF (on top of GRIB) since June 2016
- IASI SST (OSI-208) is not yet ingested in EDC : waiting for informations from EDC team on how to implement the ingestion of the IASI SST (OSI-CDOP2- SG06-11 and OSI-CDOP2-SG07-23).
- The theoretical number of ISS RapidScat files (RapidScat 25km and 50 winds, OSI-109-c and OSI-109-d) is never reached because of the relatively large number of outages due to Space Station events.

Following data records should be ingested in EDC :

- SeaWinds L2 25 km winds data record (OSI-151-a),
- SeaWinds L2 50 km winds data record (OSI-151-b),
- ASCATL2 25 km winds datarecord (OSI-150-a),
- ASCAT L2 12.5 km winds data record (OSI-150-b),
- Global reprocessed Sea Ice Concentration (Datarecord) (OSI-409),
- Global reprocessed Sea Ice Concentration (Datarecord) (OSI-409-a).

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).

Name of the document		Reference	Version	Date
OSI SAF CDOP2 Service Specification Document	SeSp	SAF/OSI/CDOP2/M-F/MGT/PL/2-003	2.7	Mar. 2016
OSI SAF CDOP2 Product Requirements Document	PRD	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	3.4	Mar. 2016
OSI SAF CDOP-2 Status Report n°9	SR09	SAF/OSI/CDOP2/M-F/TEC/RP/2-049	1.0	Apr. 2016
OSI SAF CDOP2 Master Schedule	MSch	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	1.7	3 May 2016
OSI SAF CDOP2 Service Specification Document	SeSp	SAF/OSI/CDOP2/M-F/MGT/PL/2-003	2.8	3 May 2016
OSI SAF CDOP2 Product Requirements Document	PRD	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	3.5	3 May 2016

table 41 : Top-level documentation update

Name of the document		Reference	Version	Date
ASCAT-A anomalies in September and October 2014	RP	SAF/OSI/CDOP2/KNMI/TEC/RP/236	1.0	Nov. 2015
Low Earth Orbiter Sea Surface Temperature Product User Manual (OSI-201-b, OSI-202-b, OSI-204-b, OSI-208-b)	RP	SAF/OSI/CDOP2/MF/SCI/RP/127	3.1	Dec. 2015
Validation report for OSI SAF Metop/AVHRR SST (OSI-201-b, OSI-202-b and OSI-204-b)	RP	SAF/OSI/CDOP2/MF/SCI/RP/234	1.1	Dec. 2015
Global SIC Climate Data Record (OSI-450) System Requirement Document	TN	SAF/OSI/CDOP2/MET/TEC/TN/233	1.1	Dec. 2015
Engineering test report for OSI SAF products based on MSG4	RP	SAF/OSI/CDOP2/MF/TEC/RP/235	1.0	Jan. 2016
ASCAT L2 winds data record Product User Manual (OSI-150)	MA	SAF/OSI/CDOP2/KNMI/TEC/MA/238	1.1	Jan. 2016
ASCAT L2 winds data record validation report (OSI-150)	RP	SAF/OSI/CDOP2/KNMI/TEC/RP/239	1.1	Jan. 2016
Global Sea Ice Concentration Datarecord Justifications of Requirements OSI-450	TN	SAF/OSI/CDOP2/DMI/TEC/TN/241	1.1	Dec. 2015
NHL L3 SST/IST Justification of Requirements OSI-203-a	TN	SAF/OSI/CDOP2/MET/TEC/TN/245	1.1	Dec. 2015
Global Sea Ice Edge and Type ATBD (OSI-402-c, OSI-403-c)	ATBD	SAF/OSI/CDOP2/MET/SCI/MA/208	2.1	Jan. 2016
Global Sea Ice Concentration PUM (OSI-401-b)	PUM	SAF/OSI/CDOP2/DMI_MET/TEC/MA/204	1.2	Jan. 2016
Global sea ice concentration SVR (OSI-401-b)	SVR	SAF/OSI/CDOP2/DMI/SCI/RP/225	1.1	Jan. 2016

Name of the document		Reference	Version	Date
High Latitudes L2 Sea and Sea Ice Surface Temperature Validation Report	SVR	SAF/OSI/CDOP2/DMI/SCI/RP/247	1.1	Feb. 2016
OSI SAF AMSR-2 Sea Ice Concentration (OSI-408) Algorithm Theoretical Basis Document	ATBD	SAF/OSI/CDOP2/DMI/SCI/MA/248	1.1	Feb. 2016
SeaWinds wind Climate Data Record PUM	PUM	SAF/OSI/CDOP2/KNMI/TEC/MA/220	1.4	Feb. 2016
RapidScat wind Product User Manual (OSI-109-a, OSI-109-b, OSI-109-c, OSI-109-d)	PUM	SAF/OSI/CDOP2/KNMI/TEC/MA/227	1.2	Feb. 2016
SeaWinds wind Climate Data Record validation report validation report	SVR	SAF/OSI/CDOP2/KNMI/TEC/RP/221	1.4	Feb. 2016
ATBD for the OSI SAF High Latitude surface radiative fluxes products (OSI-301-b and OSI-302-b)	ATBD	SAF/OSI/CDOP2/MET/SCI/MA/255	1.0	Mar. 2016
ATBD for the OSI SAF Sea and Ice Surface Temperature (OSI-205-b)	ATBD	SAF/OSI/CDOP2/DMI/SCI/MA/223	1.2	Mar. 2016
ATBD for the OSI SAF Sea and Ice Surface Temperature Processing Chain (OSI-203-b)	ATBD	SAF/OSI/CDOP2/MET/SCI/MA/222	1.2	Mar. 2016
ATBD for MSG reprocessing of Sea Surface Temperature (OSI-250)	ATBD	SAF/OSI/CDOP2/M-F/SCI/MA/256	1.0	Mar. 2016
ASCAT Wind Product User Manual (OSI-102, OSI-102-b, OSI-103, OSI-104, OSI-104-b)	ATBD	SAF/OSI/CDOP/KNMI/TEC/MA/126	1.14	Mar. 2016
Cooperation on assessing the impact of different sigma0 re-sampling on OSI SAF sea ice products using ASCAT data (FA CAF_OSI_15_01)	RP	SAF/OSI/CDOP2/MET-Norway/SCI/RP/249	1.1	Mar. 2016
Geostationary Sea Surface Temperature Product User Manual (OSI-206, OSI-207)	PUM	SAF/OSI/CDOP2/M-F/TEC/MA/181	1.4	Apr. 2016
Global Sea Ice Concentration PUM (OSI-401-b)	PUM	SAF/OSI/CDOP2/DMI_MET/TEC/MA/204	1.3	Apr. 2016
Global Sea Ice Concentration ATBD (OSI-401-b)	PUM	SAF/OSI/CDOP2/DMI/SCI/MA/189	1.5	Apr. 2016
AMSR2 Sea Ice Concentration Product Regression Test Report (OSI-408)	RP	SAF/OSI/CDOP2/DMI/TEC/RP/266	1.0	4 May 2016
Algorithm Theoretical Basis Document for the OSI SAF wind products	ATBD	SAF/OSI/CDOP2/KNMI/SCI/MA/197	1.3	Jun. 2016
ASCAT L2 winds data record Product User Manual (OSI-150-a, OSI-150-b)	MA	SAF/OSI/CDOP2/KNMI/TEC/MA/238	1.2	Jul. 2016
ASCAT L2 winds data record validation report (OSI-150-a, OSI-150-b)	RP	SAF/OSI/CDOP2/KNMI/TEC/RP/239	1.2	Jul. 2016
Low Earth Orbiter Sea Surface Temperature Product User Manual (OSI-201-b, OSI-202-b, OSI-204-b, OSI-208-b)	RP	SAF/OSI/CDOP2/MF/SCI/RP/127	3.2	Jul. 2016
Geostationary Sea Surface Temperature Product User Manual (OSI-206, OSI-207)	PUM	SAF/OSI/CDOP2/M-F/TEC/MA/181	1.5	Jul. 2016
AMSR2 Sea Ice Concentration Product Regression Test Report (OSI-408)	RP	SAF/OSI/CDOP2/DMI/TEC/RP/266	1.1	Aug. 2016

table 42 : Sub-systems documentation