



Half-Yearly Operations Report

1st half 2017

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Prepared by Meteo-France, Ifremer, MET Norway, DMI and KNMI



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Document Change record

Document version	Date	Editor	Change description
1.0	31/08/2017	CH	First version
1.1	09/11/2017	CH	<p>Updated version after annual OSI SAF operations review (25/10/2017) :</p> <ul style="list-style-type: none"> • Update of dead links (due to web site update in April 2017) (RID 014) • Section “4. Main events and modifications, maintenance activities” updated : addition of the start of operations for the HL SST/IST (OSI-205) in January 2017 + addition of the update of sea ice edge, type and low resolution drift (OSI-402-c, OSI-403-c, OSI-405-c) operational since May 2017 (RID 016) • Table 9 updated with corrected values for Bias Req, Bias Margin, Std Dev Req and Std Dev margin. Comments updated also to mention threshold/target accuracy (RID 017). • Figure 56 added in section 5.3.1. Global sea ice concentration (OSI-408) quality. Comments updated (RID 020) • Ingestion (in EDC) percentage of OSI-102 in May 2017 corrected (RID 018)

1. Introduction

1.1. Scope of the document

The present report covers from 1st January to 30 June 2017.

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 (Subsystem 1, SS1), under MF 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 (Subsystem 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 (Subsystem 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. Applicable documents

[AD.1] OSI SAF
CDOP 3 Service Specification (SeSp)
SAF/OSI/CDOP3/MF/MGT/PL/003, version 1.0, 30 May 2017

1.4. Reference documents

[RD.1] ASCAT Wind Product User Manual
OSI-102, OSI-102-b, OSI-103 (discontinued), OSI-104, OSI-104-b
SAF/OSI/CDOP/KNMI/TEC/MA/126

[RD.2] RapidScat Wind Product User Manual
OSI-109 (discontinued)
SAF/OSI/CDOP2/KNMI/TEC/MA/227

[RD.3] ASCAT L2 winds Data Record Product User Manual
OSI-150-a, OSI-150-b
SAF/OSI/CDOP2/KNMI/TEC/MA/238

[RD.4] Reprocessed SeaWinds L2 winds Product User Manual
OSI-151-a, OSI-151-b
SAF/OSI/CDOP2/KNMI/TEC/MA/220

- [RD.16] ERS L2 winds Data Record Product User Manual
OSI-152
SAF/OSI/CDOP2/KNMI/TEC/MA/279
- [RD.5] Low Earth Orbiter Sea Surface Temperature Product User Manual
OSI-201-b, OSI-202-b, OSI-204-b, OSI-208-b
SAF/OSI/CDOP/M-F/TEC/MA/127
- [RD.6] Atlantic High Latitude L3 Sea Surface Temperature Product User Manual
OSI-203
SAF/OSI/CDOP/met.no/TEC/MA/115
- [RD.7] Geostationary Sea Surface Temperature Product User Manual
OSI-206, OSI-207
SAF/OSI/CDOP/M-F/TEC/MA/181
- [RD.8] Atlantic High Latitude Radiative Fluxes Product User Manual
OSI-301, OSI-302
SAF/OSI/CDOP/met.no/TEC/MA/116
- [RD.9] Geostationary Radiative Flux Product User Manual
OSI-303, OSI-304, OSI-305, OSI-306
SAF/OSI/CDOP/M-F/TEC/MA/182
- [RD.10] Product User Manual for OSI SAF Global Sea Ice Concentration
OSI-401-b
SAF/OSI/CDOP2/DMI_MET/TEC/MA/204
- [RD.11] Global Sea Ice Edge and Type Product User's Manual
OSI-402-b, OSI-403-b
SAF/OSI/CDOP2/MET-Norway/TEC/MA/205
- [RD.12] 50 Ghz Sea Ice Emissivity Product User Manual
OSI-404
SAF/OSI/CDOP/DMI/TEC/MA/191
- [RD.13] Low Resolution Sea Ice Drift Product User's Manual
OSI-405-b
SAF/OSI/CDOP/met.no/TEC/MA/128
- [RD.14] Medium Resolution Sea Ice Drift Product User Manual
OSI-407
SAF/OSI/CDOP/DMI/TEC/MA/137
- [RD.15] Global Sea Ice Concentration Reprocessing Product User Manual
OSI-409, OSI-409-a, OSI-430
SAF/OSI/CDOP/met.no/TEC/MA/138
- [RD.17] Global Sea Ice Concentration Climate Data Record Product User Manual
OSI-450
SAF/OSI/CDOP2/MET/TEC/MA/288

1.5. 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
CMEMS	Copernicus Marine Environment Monitoring Service
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
SSM/I	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.

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. 2017	FEB. 2017	MAR. 2017	APR. 2017	MAY 2017	JUN. 2017
OSI-102	ASCAT-A 25 km Wind	99.9	99.9	99.9	100	99.9	99.9
OSI-102-b	ASCAT-B 25 km Wind	99.9	99.9	99.7	100	100	100
OSI-104	ASCAT-A Coastal Wind	99.4	99.7	99.3	99.8	99.7	99.9
OSI-104-b	ASCAT-B Coastal Wind	99.6	99.8	99.5	99.8	99.8	99.8
OSI-201-b	GBL SST	100.0	100.0	100.0	98.3	100.0	100.0
OSI-202-b	NAR SST	98.4	100.0	100.0	100.0	97.6	100.0
OSI-203	AHL SST / NHL SSIST	100.0	100.0	100.0	100.0	100.0	100.0
OSI-204-b	MGR SST	99.3	100.0	99.8	99.6	98.9	100.0
OSI-205	L2 SSIST	99.9	99.7	96.6	99.9	97.6	100
OSI-206	METEOSAT SST	99.2	100.0	100.0	99.9	98.5	98.8
OSI-207	GOES-E SST	99.2	99.9	100.0	99.4	98.7	99.0
OSI-208-b	IASI SST	99.1	100.0	100.0	99.0	99.0	100.0
OSI-301	AHL DLI	100.0	100.0	100.0	100.0	100.0	100.0
OSI-302	AHL SSI	100.0	100.0	100.0	100.0	100.0	100.0
OSI-303	METEOSAT DLI - hourly	97.4	100.0	100.0	99.6	98.5	99.7
	METEOSAT DLI - daily	96.8	100.0	100.0	100.0	96.8	100.0
OSI-304	METEOSAT SSI - hourly	97.4	100.0	100.0	99.6	98.5	99.7
	METEOSAT SSI - daily	96.8	100.0	100.0	100.0	96.8	100.0
OSI-305	GOES-E DLI - hourly	97.4	99.6	99.7	98.1	98.3	98.1
	GOES-E DLI - daily	96.8	100.0	100.0	100.0	96.8	100.0
OSI-306	GOES-E SSI - hourly	97.4	99.6	99.7	98.1	98.3	98.1
	GOES-E SSI - daily	96.8	100.0	100.0	100.0	96.8	100.0
OSI-401-b	Global Sea Ice Concentration	96.8	100	100	100	100	100
OSI-402-b/c	Global Sea Ice Edge	100.0	100.0	100.0	100.0	96.7	100.0
OSI-403-b/c	Global Sea Ice Type	100.0	100.0	100.0	100.0	96.7	100.0
OSI-404	Global Sea Ice Emissivity	100	100	100	100	100	100
OSI-405-b/c	Low Res. Sea Ice Drift	100.0	100.0	100.0	100.0	96.7	100.0
OSI-407	Medium Res. Sea Ice Drift	95.2	92.9	98.4	100	93.3	100
OSI-408	Global AMSR Sea Ice Concentration	-	-	100	100	100	100

Table 2: Percentage of OSI SAF products available on the local FTP servers within the specified time over 1st half 2017.

2.2. Availability via EUMETCast

Ref.	Product	JAN. 2017	FEB. 2017	MAR. 2017	APR. 2017	MAY 2017	JUN. 2017
OSI-102	ASCAT-A 25 km Wind	99.9	99.9	99.9	100	99.9	99.9
OSI-102-b	ASCAT-B 25 km Wind	99.9	99.9	99.7	100	100	100
OSI-104	ASCAT-A Coastal Wind	99.4	99.7	99.3	99.8	99.7	99.9
OSI-104-b	ASCAT-B Coastal Wind	99.6	99.8	99.5	99.8	99.8	99.8
OSI-201-b	GBL SST	100	98.2	100	100	100	100
OSI-202-b	NAR SST	99.4	98.2	99.2	100	99.2	100
OSI-203	AHL SST / NHL SSIST	100.0	100.0	100.0	100.0	100.0	100.0
OSI-204-b	MGR SST	99.9	98.7	98.9	100	98.3	100
OSI-205	L2 SSIST	99.9	99.7	96.6	99.9	97.6	100
OSI-206	METEOSAT SST	99.6	98.8	98.9	99.4	99.7	97.5
OSI-207	GOES-E SST	99.7	98.7	98.9	99.7	99.9	97.8
OSI-208-b	IASI SST	99.6	98.8	99.5	100	98.4	98.6
OSI-301	AHL DLI	100.0	100.0	100.0	100.0	100.0	100.0
OSI-302	AHL SSI	100.0	100.0	100.0	100.0	100.0	100.0
OSI-303	METEOSAT DLI - hourly	99.9	98.8	99.1	99.9	99.6	100
	METEOSAT DLI - daily	100	100	100	100	100	100
OSI-304	METEOSAT SSI - hourly	100	98.8	98.8	99.9	99.6	99.9
	METEOSAT SSI - daily	100	100	100	100	100	100
OSI-305	GOES-E DLI - hourly	99.7	98.5	98.7	98.2	97.4	96.1
	GOES-E DLI - daily	100	100	100	100	100	100
OSI-306	GOES-E SSI - hourly	99.6	98.5	98.5	98.2	97.4	95.8
	GOES-E SSI - daily	100	100	100	100	100	100
OSI-401-b	Global Sea Ice Concentration	96.8	100	100	100	100	100
OSI-402-b/c	Global Sea Ice Edge	100.0	100.0	100.0	100.0	93.3	40.0
OSI-403-b/c	Global Sea Ice Type	100.0	100.0	100.0	100.0	93.3	40.0
OSI-404	Global Sea Ice Emissivity	100	100	100	100	100	100
OSI-405-b/c	Low Res. Sea Ice Drift	100.0	100.0	100.0	100.0	93.3	100.0
OSI-407	Medium Res. Sea Ice Drift	95.2	92.9	96.8	100	93.3	100
OSI-408	Global AMSR Sea Ice Concentration	-	-	100	100	100	100

Table 3: Percentage of OSI SAF products delivered via EUMETCast within the specified time over 1st half 2017.

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 Low and Mid-Latitudes subsystem (Météo-France and Ifremer)

None to report

3.2. At High Latitudes subsystem (MET Norway and DMI)

One day in March the MR Ice Drift was produced and pushed to the HL OSI SAF FTP but not to EUMETCast. This was due to a human error during and update and was corrected the same day.

One day in March the IST/SST (OSI-205) was shortly unavailable due to an anomaly in the processing system.

03.05.2017: Outage of OSI SAF FTP server at MET Norway due to network problem, product distribution was delayed. Users were informed.

30.05.2017: Upgrade of ice edge, type and LR drift production chains (OSI-402-c, 403-c, 405-c). This upgrade resulted in a longer production time for these products by ~12 minutes. For the FTP distribution the products are within requirement of 5 hours (OSI-402-c and OSI-403-c) and 6 hours (OSI-405-c). But due to an unfortunate setup for distribution to the EUMETCast upload server, the OSI-402-c and OSI-403-c products have delivered up to 4 minutes after timeliness of 5 hours.

3.3. At Wind subsystem (KNMI)

The ASCAT-A 25 km and coastal winds have been unavailable on 6 January between 9:54 and 15:15 UTC sensing time due to an anomaly in the KNMI EUMETCast reception station. The ASCAT-B 25 km and coastal winds have been unavailable on 6 January between 10:42 and 16:24 UTC sensing time for the same reason.

The ASCAT-A coastal winds have been unavailable and delayed on 25 January between 11:24 and 14:09 UTC sensing time due to a ground segment anomaly. The ASCAT-B coastal winds have been unavailable and delayed on 25 January between 12:18 and 14:30 UTC sensing time for the same reason.

The ASCAT-A 25 km and coastal winds have been unavailable on 8 February between 10:57 and 15:42 UTC sensing time due to an anomaly at KNMI. The ASCAT-B 25 km winds have been unavailable on 8 February between 11:42 and 16:39 UTC sensing time for the same reason.

The ASCAT-A 25 km and coastal winds have been unavailable on 18 March between 6:54 and 10:36 UTC sensing time due to an anomaly at KNMI. The ASCAT-B 25 km winds have been unavailable on 18 March between 7:42 and 11:21 UTC sensing time for the same reason.

The ASCAT-A 25 km and coastal winds have been unavailable between 13 May 22:36 and 14 May 3:24 UTC sensing time due to a ground segment anomaly. The ASCAT-B 25 km winds have been unavailable between 13 May 22:45 and 14 May 1:27 UTC sensing time for the same reason.

The ASCAT-A winds have been unavailable between 27 May 2:06 and 29 May 11:30 UTC sensing time due to an instrument anomaly.

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 Low and Mid-Latitudes subsystem (Météo-France and Ifremer)

12/01/2017 : First announcement about OSI SAF demonstration products over Indian Ocean (planned to be available mid-2017).

20/06/2017 : IASI SST product (OSI-208) updated : greater yield of useful retrievals (essentially of quality class 3) are now available at mid and high latitudes, two experimental fields (dust cloud index, "obs minus calc") have been added.

4.2. At High Latitudes subsystem (MET Norway and DMI)

Spurious ice in sea ice concentration product

The work from December 2016 on spurious ice in the ice concentration product was continued. A filtered version of the Sea Ice concentration was made available in test mode from the FTP and on 4 July the filtered Sea Ice concentration without spurious Ice was operational available on FTP and EUMETCast.

Unfortunately some issues with the grid was found in the filtered version. This was corrected on 12 July.

New products:

On 26 January, the High Latitude L2 Sea and Sea Ice Surface Temperature (OSI-205) was operational on FTP and EUMETCast.

On 16 March, the AMSR-2 Sea ice concentration (OSI-408) was operational on FTP and EUMETCast.

Updated products:

On 30 May, the updated sea ice edge, type and low resolution drift (OSI-402-c, OSI-403-c, OSI-405-c) were operational on FTP and EUMETCast.

For the EUMETCast distribution, the edge and type products are now also provided on NetCDF3 format, in addition to GRIB. GRIB distribution will be terminated by April 2018.

4.3. At Wind subsystem (KNMI)

None to report

4.4. Release of new data records and off-line products

12/05/2017 : New version of the Sea Ice Concentration Climate Data Record (OSI-450).

01/06/2017 : ERS Scatterometer L2 25 km winds data record (OSI-152) released.

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 GHRSSST-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%20Metop%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.

METEOSAT10 SST diff 2017-01-01 0001 2017-06-30 2325 zso 110-180 ql 3-5 n>5 (safos)

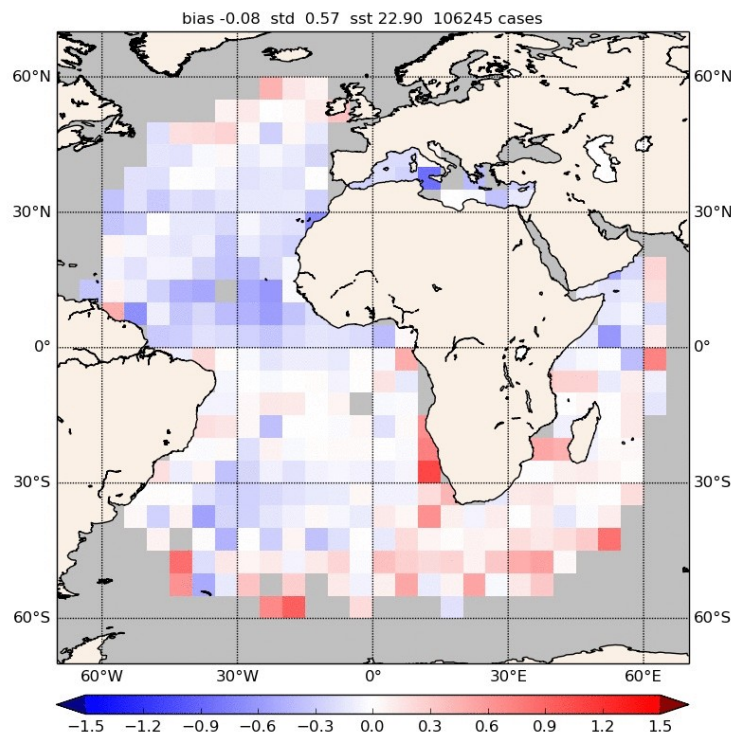


Figure 1: Mean METEOSAT night-time SST error with respect to buoys measurements for quality level 3,4,5

METEOSAT10 SST diff 2017-01-01 0250 2017-06-30 2208 zso 0- 90 ql 3-5 n>5 (safos)

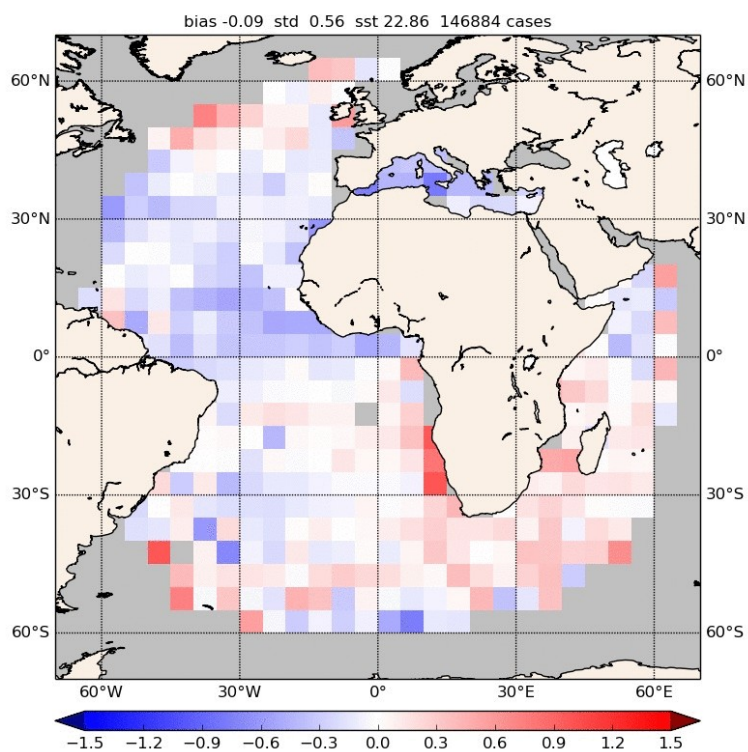


Figure 2: Mean METEOSAT day-time SST error with respect to buoys measurements for quality level 3,4,5

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

METEOSAT night-time SST quality results over 1st half 2017							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2017	14293	-0.06	0.5	88	0.54	1	46
FEB. 2017	14525	-0.13	0.5	74	0.54	1	46
MAR. 2017	19027	-0.08	0.5	84	0.55	1	45
APR. 2017	18851	-0.11	0.5	78	0.61	1	39
MAY 2017	19033	-0.02	0.5	96	0.57	1	43
JUN. 2017	18241	-0.08	0.5	84	0.54	1	46
METEOSAT day-time SST quality results over 1st half 2017							
JAN. 2017	21638	-0.03	0.5	94	0.52	1	48
FEB. 2017	19296	-0.09	0.5	82	0.48	1	52
MAR. 2017	24814	-0.05	0.5	90	0.54	1	46
APR. 2017	23722	-0.11	0.5	78	0.60	1	40
MAY 2017	25627	-0.05	0.5	90	0.56	1	44
JUN. 2017	29400	-0.17	0.5	66	0.59	1	41
(*) 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 2017, 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.

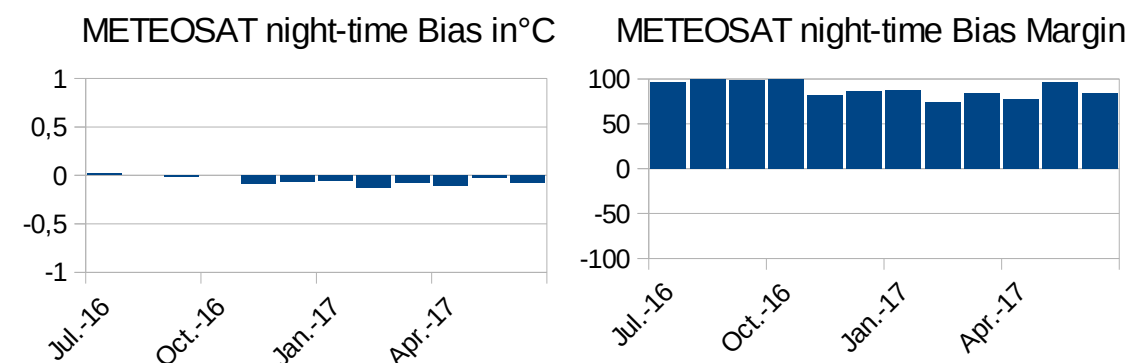


Figure 3: Left: METEOSAT night-time SST Bias. Right: METEOSAT night-time SST Bias Margin.

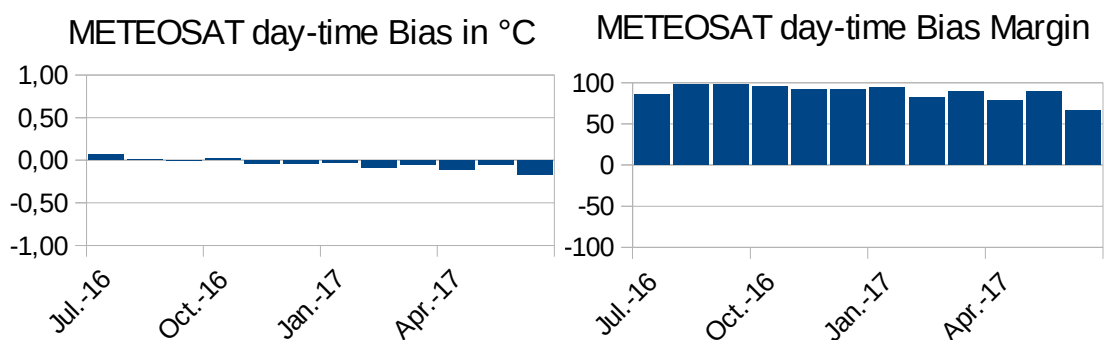


Figure 4: Left: METEOSAT day-time SST Bias.
Right METEOSAT day-time SST Bias Margin.

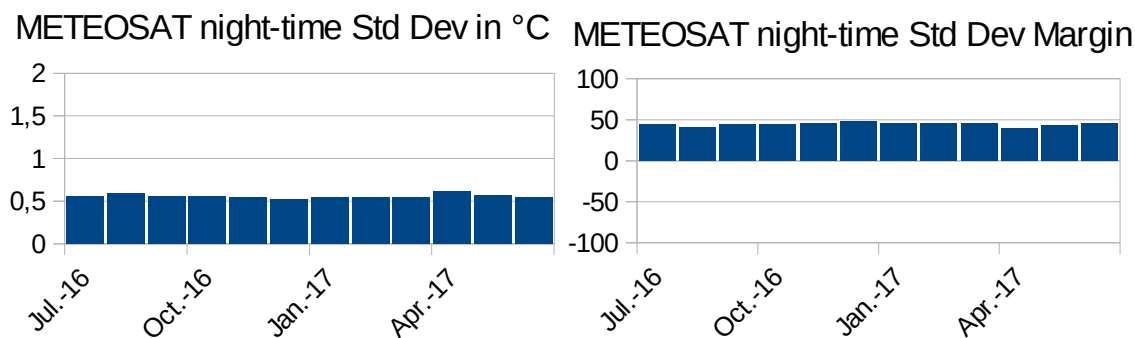


Figure 5: Left: METEOSAT night-time SST Standard deviation.
Right METEOSAT night-time SST Standard deviation Margin.

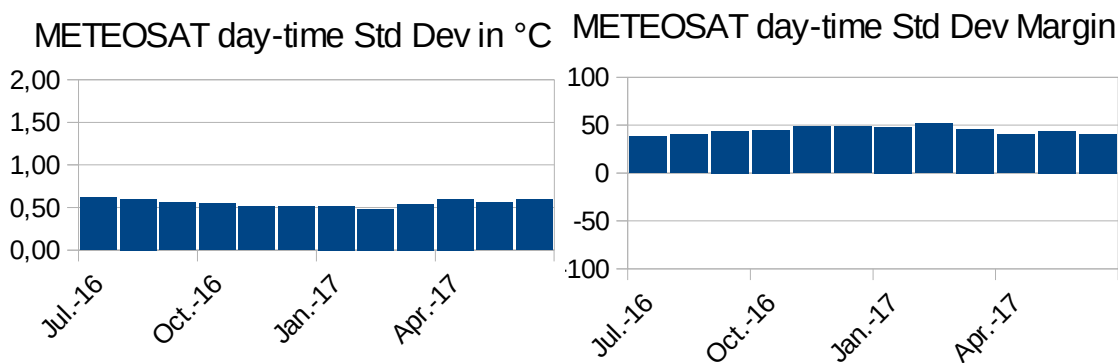


Figure 6: Left: METEOSAT day-time SST Standard deviation.
Right METEOSAT day-time SST Standard deviation Margin.

IETEOSAT10 SST diff 2017-01-01 0001 2017-06-30 2325 zso 110-180 QL 3-5 >1.0% (safo:

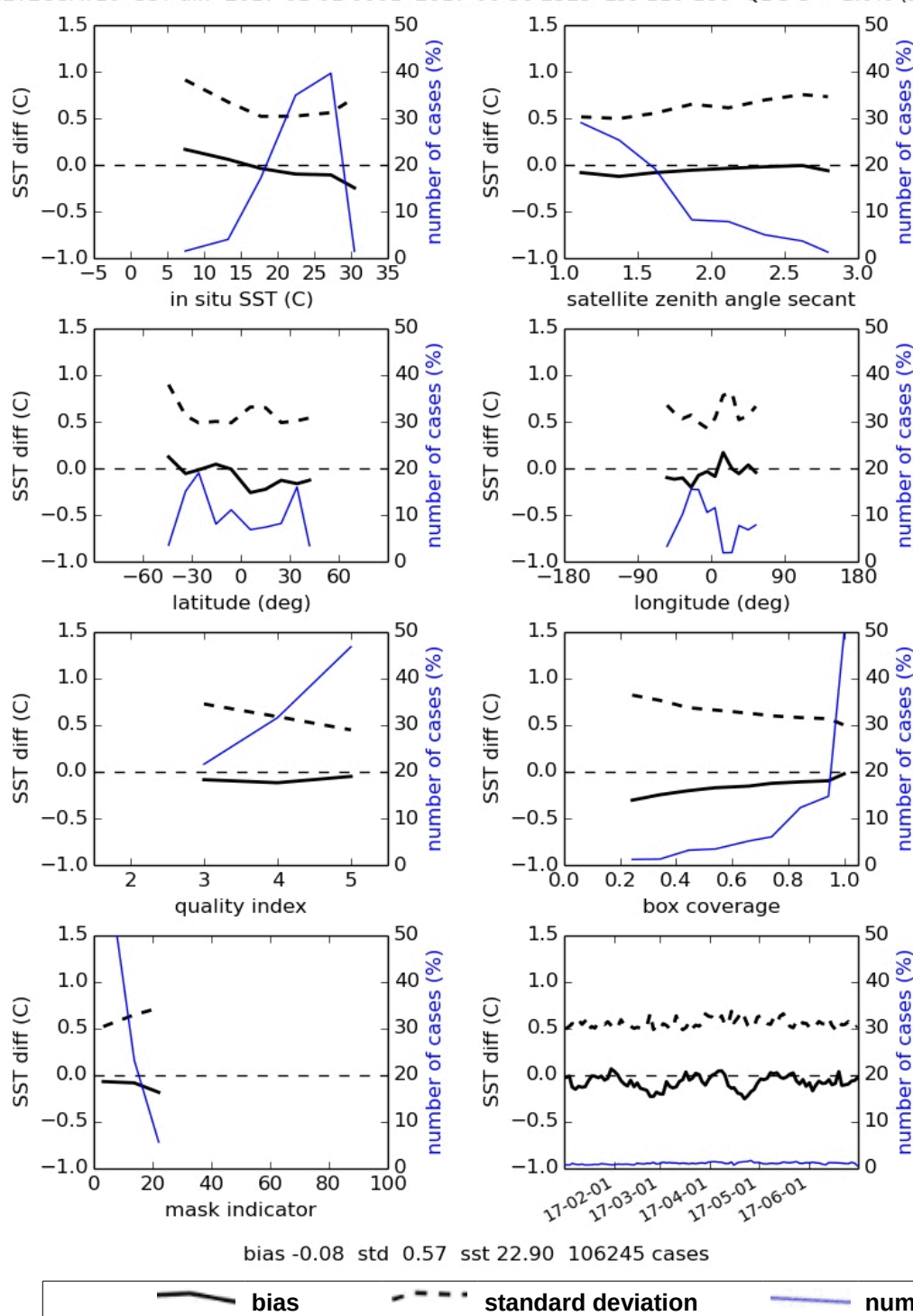


Figure 7: Complementary quality assessment statistics on METEOSAT SST, night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

METEOSAT10 SST diff 2017-01-01 0250 2017-06-30 2208 zso 0- 90 QL 3-5 >1.0% (safos)

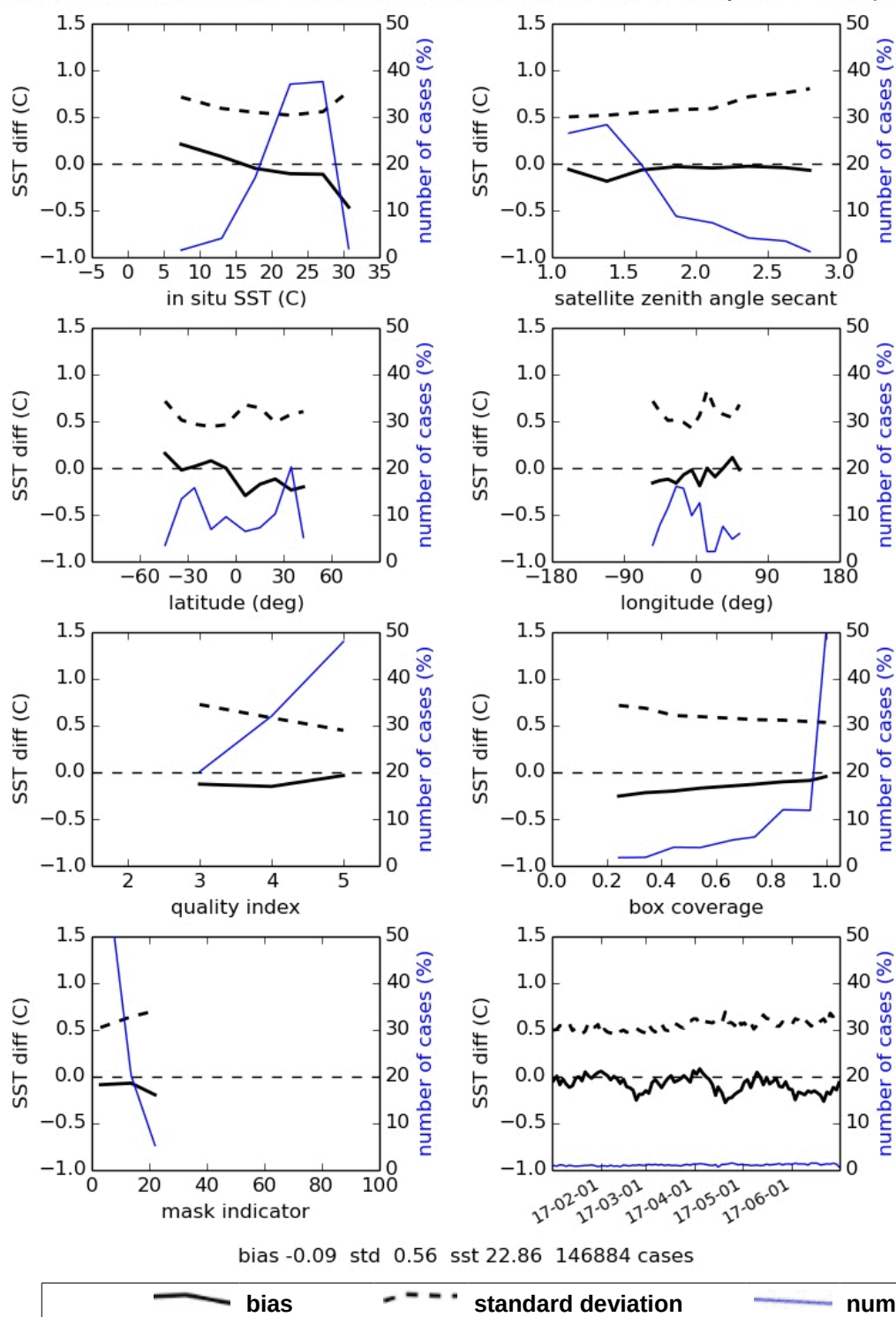


Figure 8: Complementary quality assessment statistics on METEOSAT SST, day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

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/lml/#qua_SST%GOES-E%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/biblio/docs/ss1_geo_sst_val_rep_1_1.pdf) gives further details about the regional bias observed.

GOES13 SST diff 2017-01-01 0002 2017-06-30 2255 zso 110-180 ql 3-5 n>5 (safos)

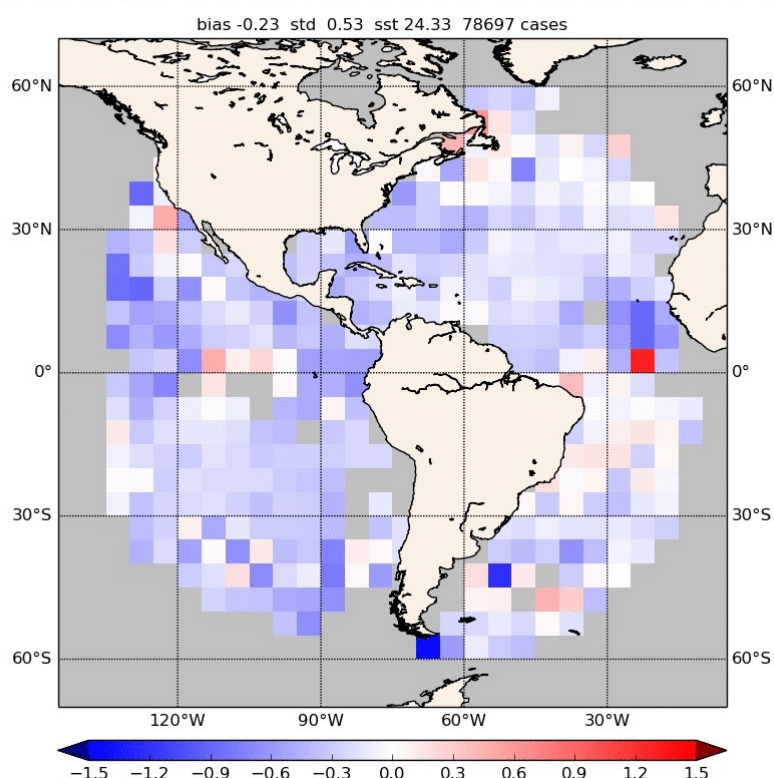


Figure 9: Mean GOES-E night-time SST error with respect to buoys measurements for quality level 3,4,5

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

GOES-E night-time SST quality results 1st half 2017							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2017	16008	-0.15	0.5	70	0.51	1	49
FEB. 2017	15719	-0.18	0.5	64	0.51	1	49
MAR. 2017	15105	-0.21	0.5	58	0.53	1	47
APR. 2017	11237	-0.31	0.5	38	0.58	1	42
MAY 2017	9638	-0.32	0.5	36	0.52	1	48
JUN. 2017	10067	-0.28	0.5	44	0.52	1	48

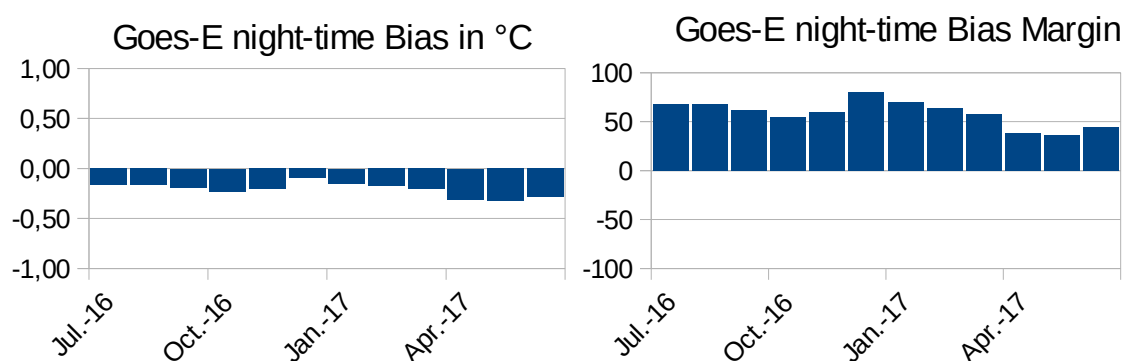
(*) Bias Margin = $100 * (1 - (|Bias / Bias Req|))$
(**) Std Dev margin = $100 * (1 - (Std Dev / Std Dev Req))$
100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.

Table 5: GOES-E SST quality results over 1st half 2017, for 3, 4, 5 quality indexes

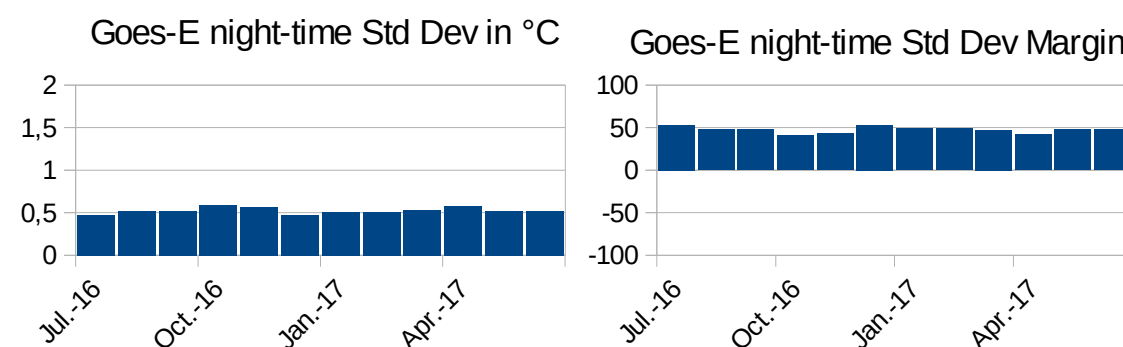
Comments :

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



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

GOES13 SST diff 2017-01-01 0002 2017-06-30 2255 zso 110-180 QL 3-5 >1.0% (safos)

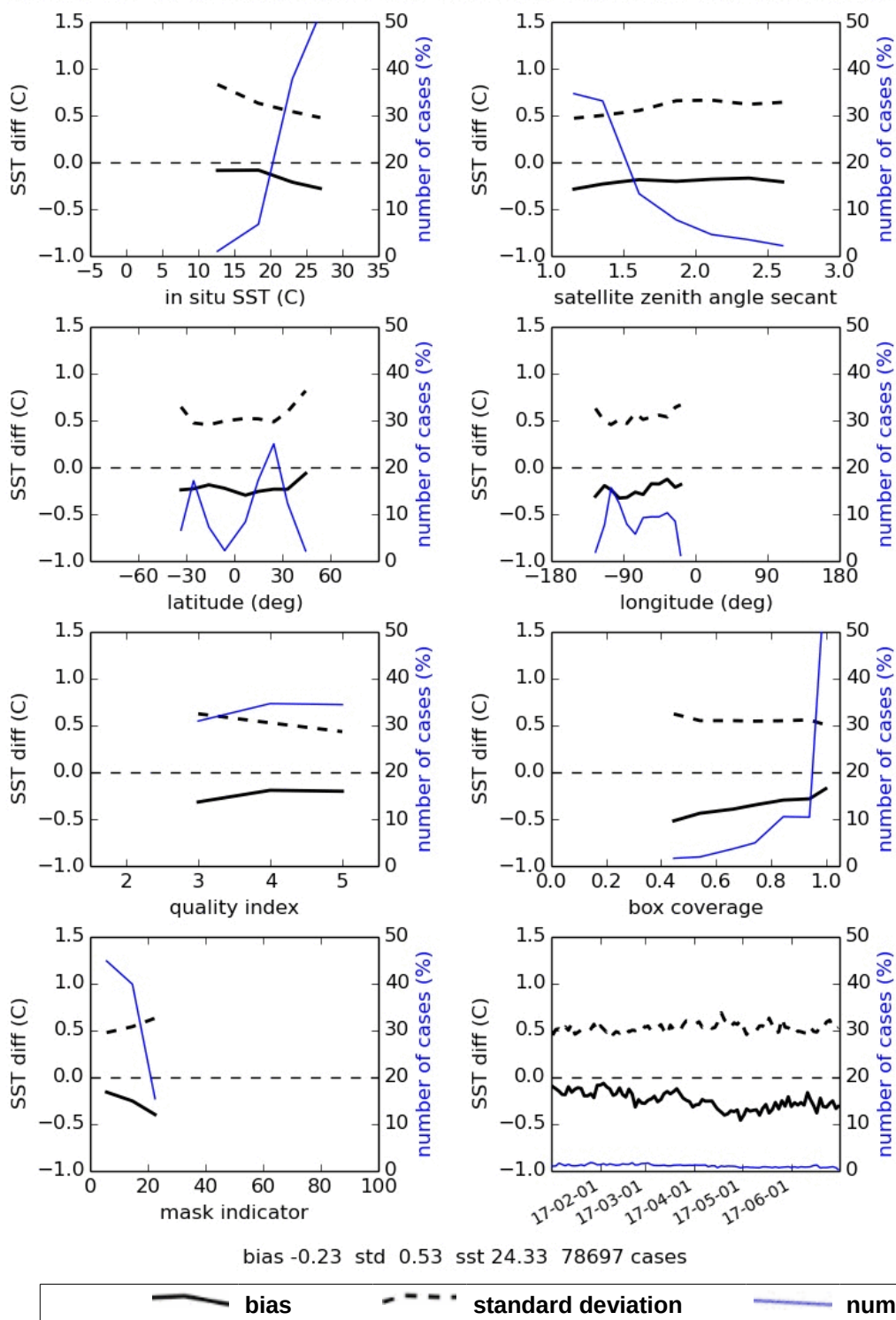


Figure 12: Complementary quality assessment statistics on GOES-E SST, night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.3. NAR SST (OSI-202-b) quality

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

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

5.1.3.1. NPP NAR SST quality

The following maps indicate the mean night-time and day-time SST error with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://www.osi-saf.org/lm/#qua_SST%SNPP%20NAR%20SST_monthly%20map_monthly_Night%20time.

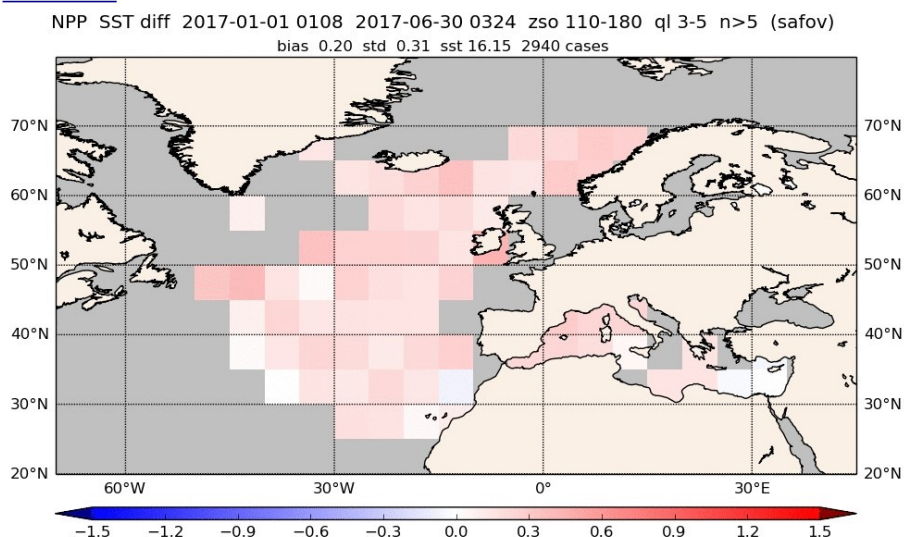


Figure 13: Mean NPP NAR night-time SST error with respect to buoys measurements for quality level 3,4,5

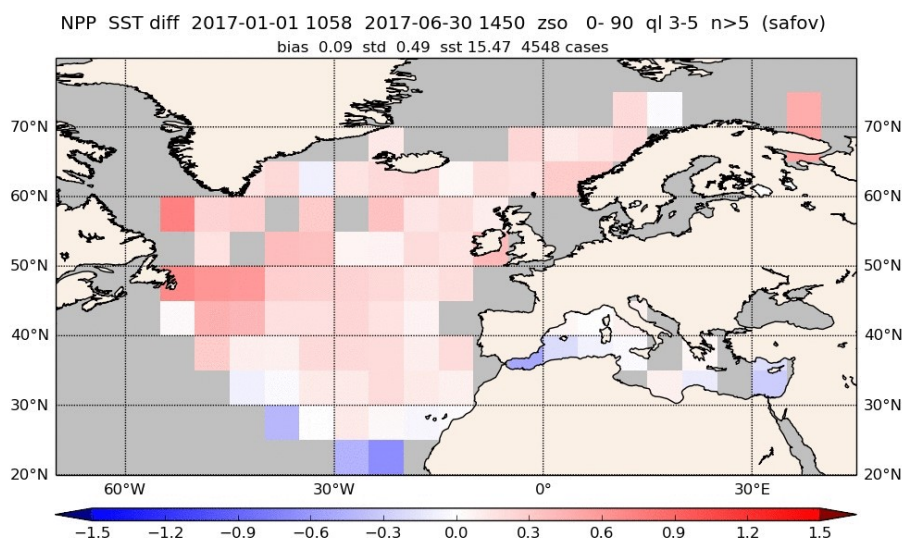


Figure 14: Mean NPP NAR day-time SST error with respect to buoys measurements for quality level 3,4,5

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

NPP NAR <u>night-time</u> SST quality results over 1st half 2017							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2017	353	0.22	0.5	56	0.24	0.8	70.00
FEB. 2017	424	0.19	0.5	62	0.24	0.8	70.00
MAR. 2017	748	0.23	0.5	54	0.29	0.8	63.75
APR. 2017	522	0.17	0.5	66	0.33	0.8	58.75
MAY 2017	405	0.16	0.5	68	0.40	0.8	50.00
JUN. 2017	488	0.18	0.5	64	0.29	0.8	63.75
NPP NAR <u>day-time</u> SST quality results over 1st half 2017							
JAN. 2017	378	0.25	0.5	50	0.35	0.8	56.25
FEB. 2017	450	0.13	0.5	74	0.38	0.8	52.50
MAR. 2017	861	0.08	0.5	84	0.51	0.8	36.25
APR. 2017	679	0.06	0.5	88	0.48	0.8	40.00
MAY 2017	902	0.09	0.5	82	0.47	0.8	41.25
JUN. 2017	1275	0.06	0.5	88	0.54	0.8	32.50
(*) Bias Margin = $100 * (1 - (|Bias / Bias Req|))$							
(**) Std Dev margin = $100 * (1 - (Std Dev / Std Dev Req))$							
100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

Table 6: Quality results for NPP NAR SST over 1st half 2017, 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.

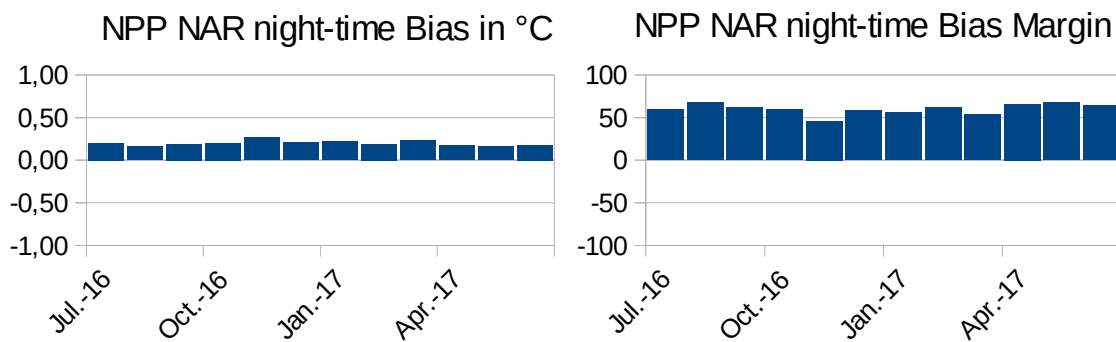


Figure 15: Left: NPP NAR night-time SST Bias.
Right : NPP NAR night-time SST Bias Margin.

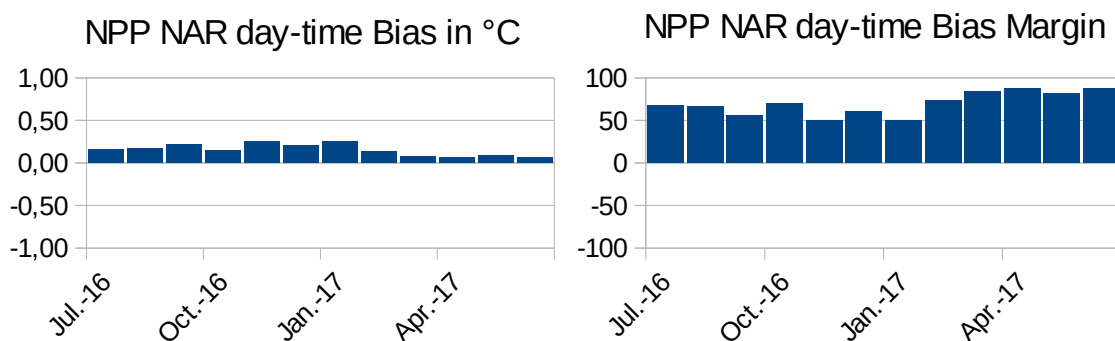


Figure 16: Left: NPP NAR day-time SST Bias.
Right : NPP NAR day-time SST Bias Margin.

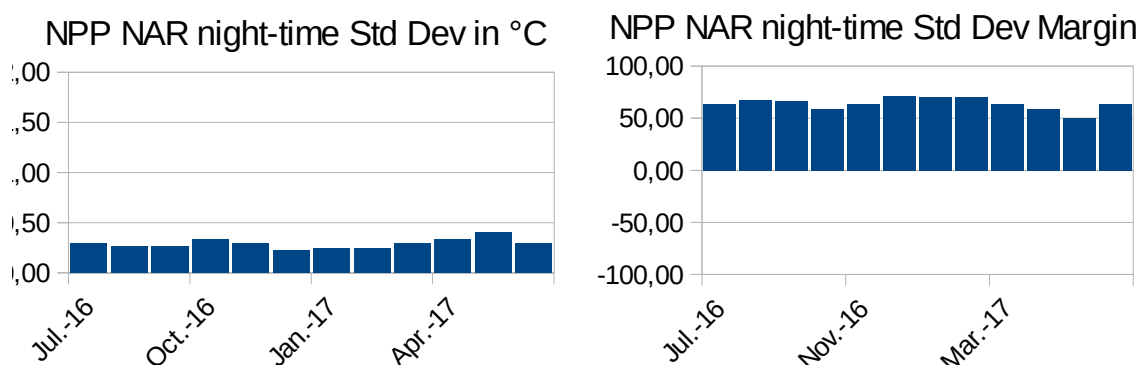


Figure 17: Left: NPP NAR night-time SST Standard deviation.
Right : NPP NAR night-time SST Standard deviation Margin.

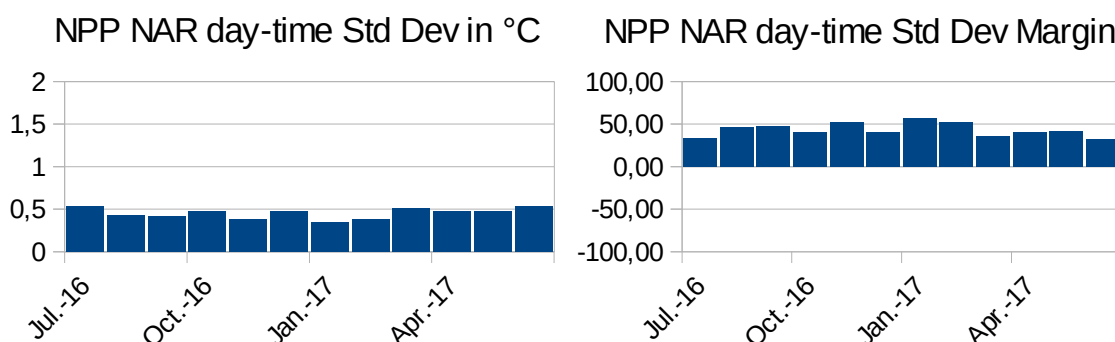


Figure 18: Left: NPP NAR day-time SST Standard deviation.
Right : NPP NAR day-time SST Standard deviation Margin.

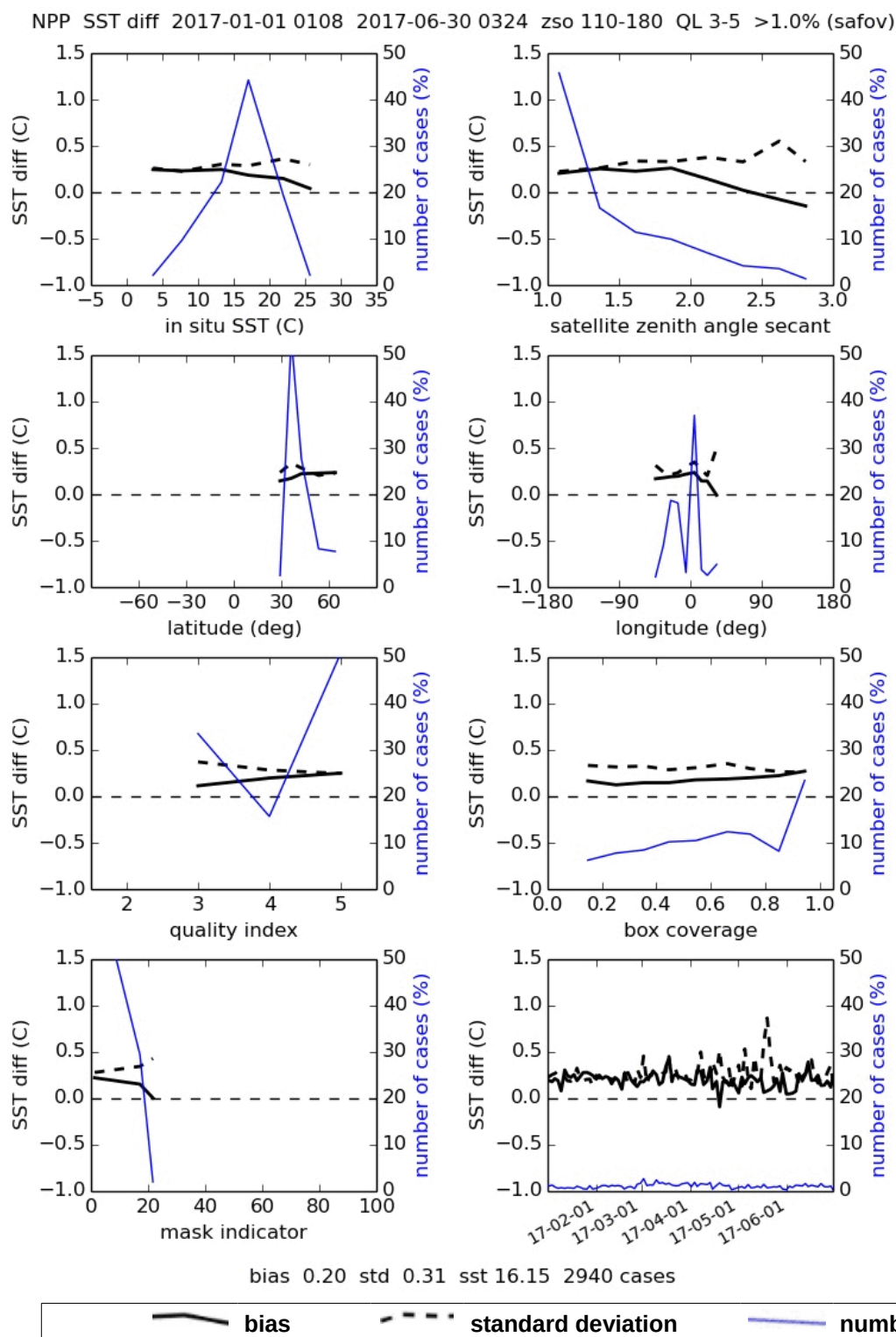


Figure 19: Complementary quality assessment statistics on NPP NAR SST night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

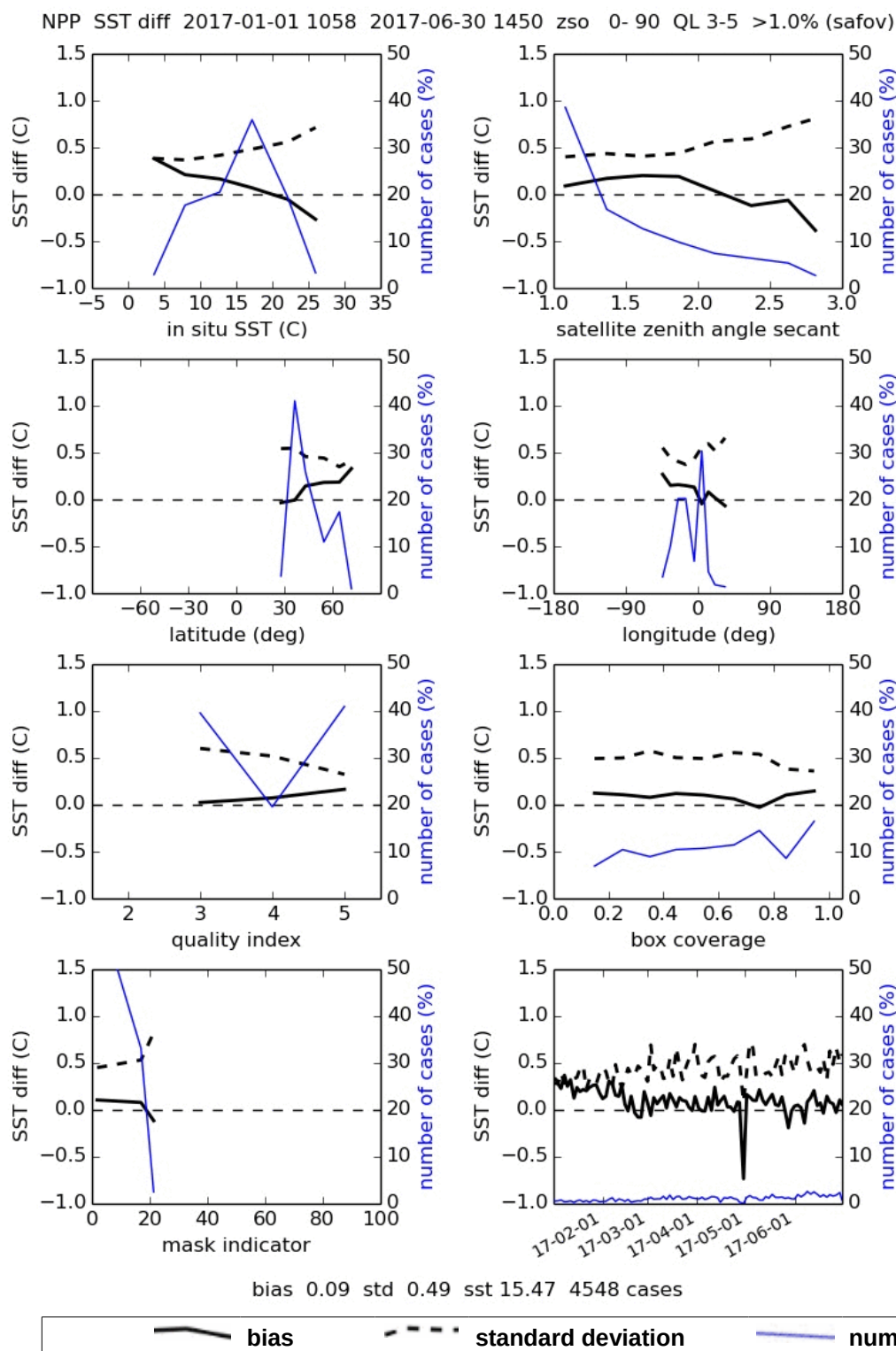


Figure 20: Complementary quality assessment statistics on NPP NAR SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

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

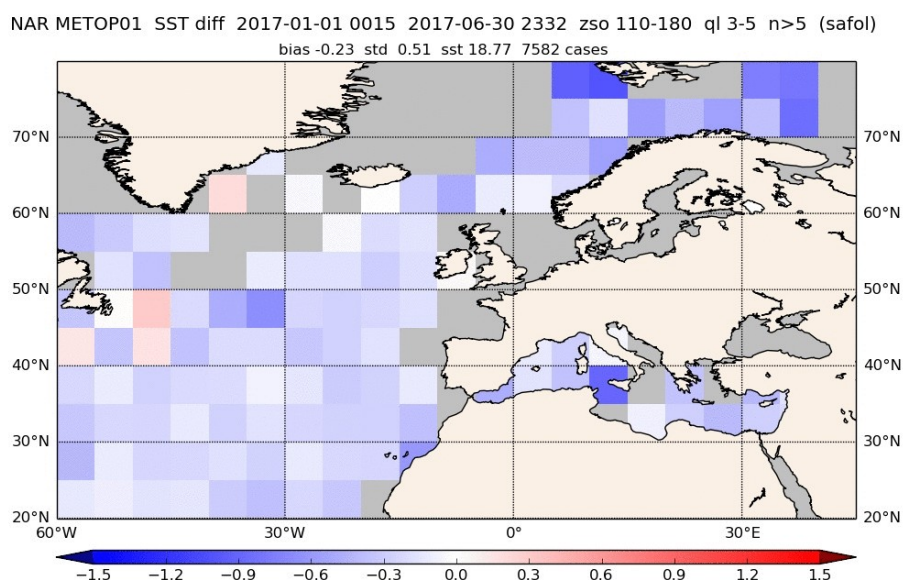


Figure 21: Mean Metop-B NAR night-time SST error with respect to buoys measurements for quality level 3,4,5

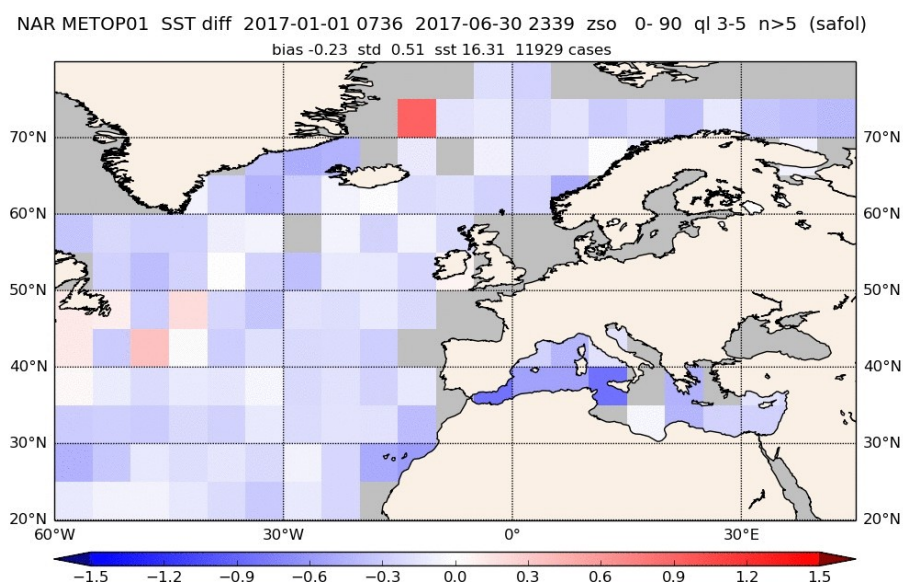


Figure 22: Mean Metop-B NAR day-time SST error with respect to buoys measurements for quality level 3,4,5

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

Metop-B NAR <u>night-time</u> SST quality results over 1st half 2017							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2017	1545	-0.13	0.5	74	0.46	0.8	42.50
FEB. 2017	1355	-0.20	0.5	60	0.49	0.8	38.75
MAR. 2017	1597	-0.18	0.5	64	0.52	0.8	35.00
APR. 2017	1225	-0.29	0.5	42	0.56	0.8	30.00
MAY 2017	957	-0.34	0.5	32	0.49	0.8	38.75
JUN. 2017	872	-0.34	0.5	32	0.41	0.8	48.75
Metop-B NAR <u>day-time</u> SST quality results over 1st half 2017							
JAN. 2017	1391	-0.06	0.5	88	0.42	0.8	47.50
FEB. 2017	1453	-0.12	0.5	76	0.44	0.8	45.00
MAR. 2017	2006	-0.17	0.5	66	0.45	0.8	43.75
APR. 2017	1930	-0.22	0.5	56	0.52	0.8	35.00
MAY 2017	2103	-0.30	0.5	40	0.50	0.8	37.50
JUN. 2017	3018	-0.35	0.5	30	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 7: Quality results for Metop-B NAR SST over 1st half 2017, for 3, 4, 5 quality indexes

Comments :
Overall quality results are good and quite stable.

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

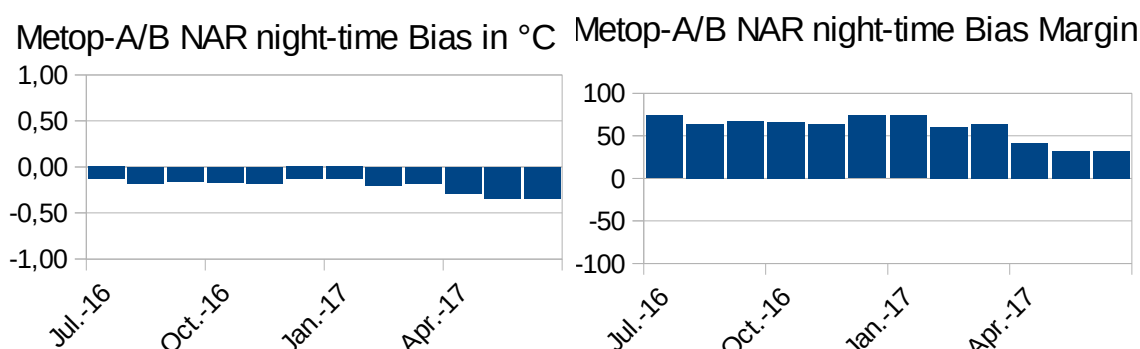


Figure 23: Left: Metop-B NAR night-time SST Bias. Right: Metop-B NAR night-time SST Bias Margin.

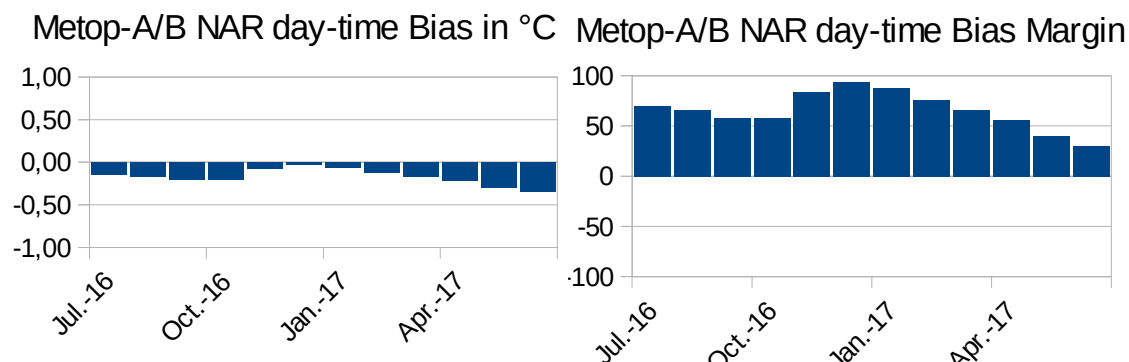


Figure 24: Left: Metop-B NAR day-time SST Bias.
Right: Metop-B NAR day-time SST Bias Margin.

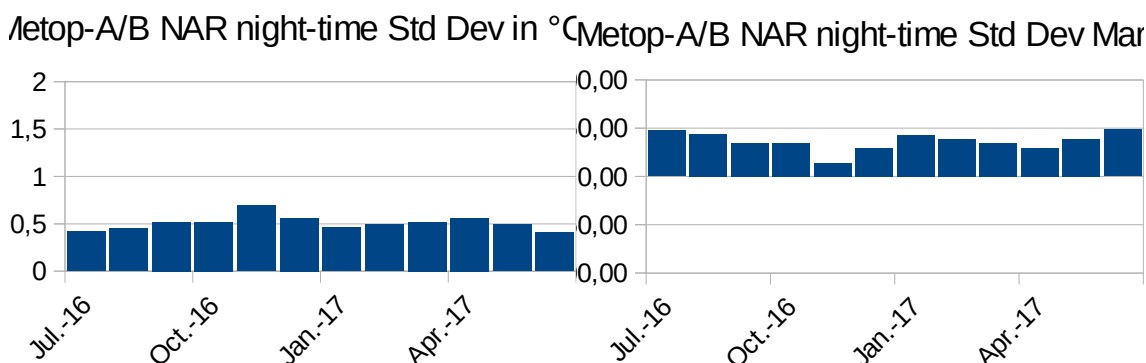


Figure 25: Left: Metop-B NAR night-time SST Standard deviation.
Right: Metop-B NAR night-time SST Standard deviation Margin.

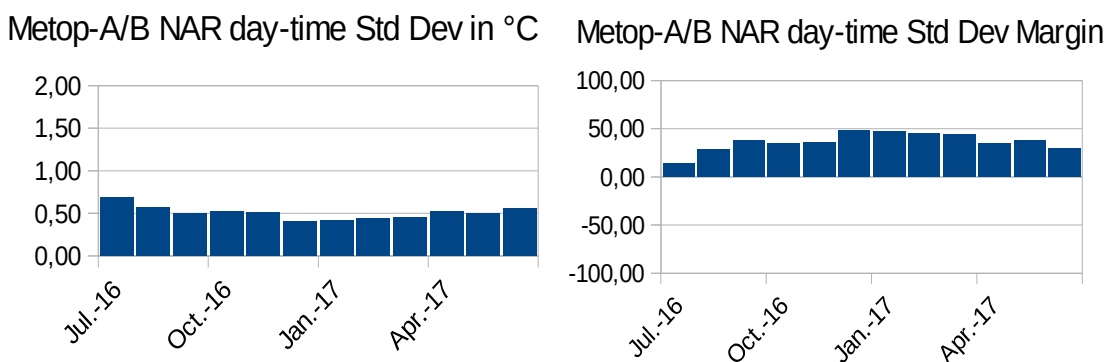


Figure 26: Left: Metop-B NAR day-time SST Standard deviation.
Right: Metop-B NAR day-time SST Standard deviation Margin.

AR METOP01 SST diff 2017-01-01 0015 2017-06-30 2332 zso 110-180 QL 3-5 >1.0% (safc)

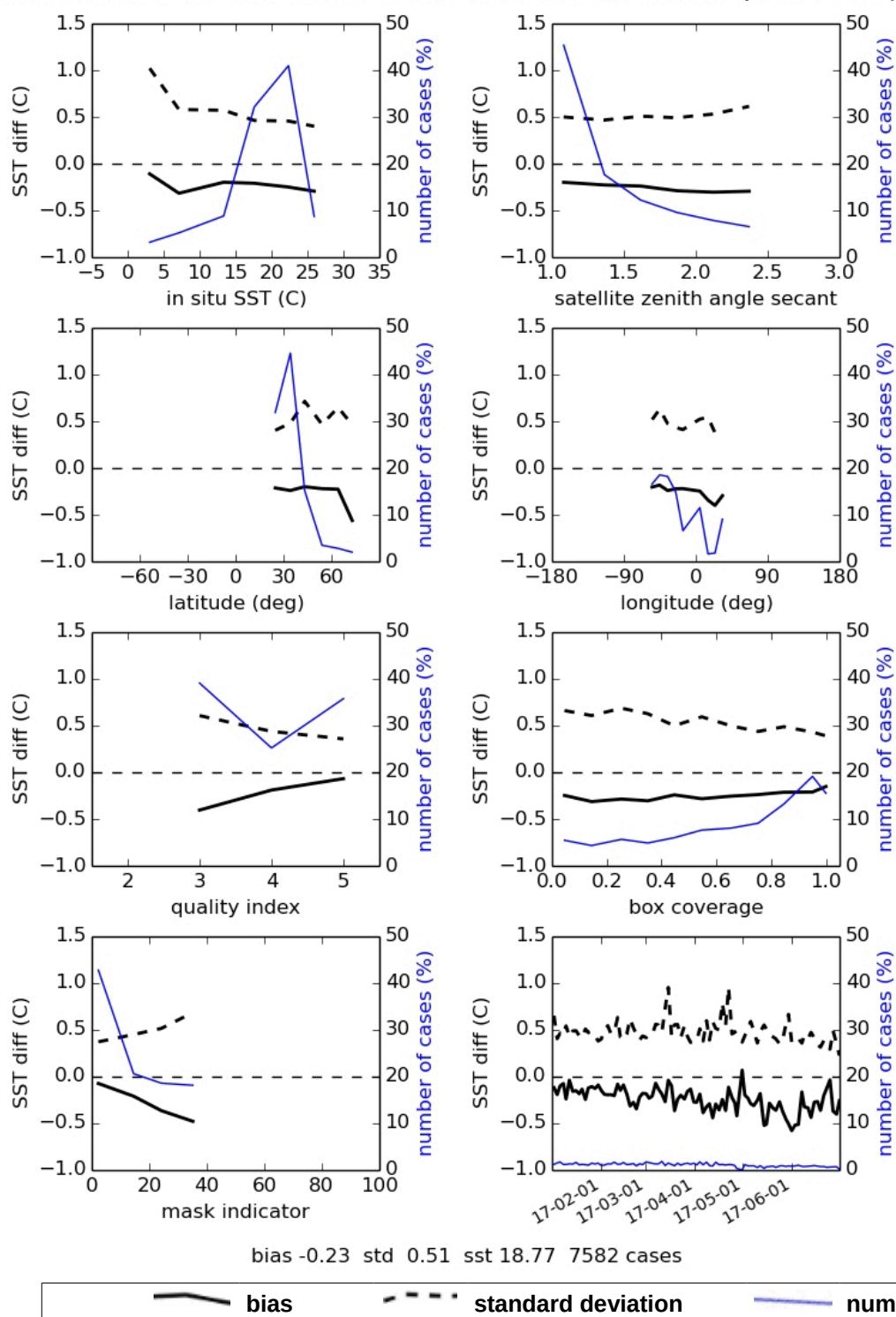


Figure 27: Complementary quality assessment statistics on Metop NAR SST night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

VAR METOP01 SST diff 2017-01-01 0736 2017-06-30 2339 zso 0- 90 QL 3-5 >1.0% (safol

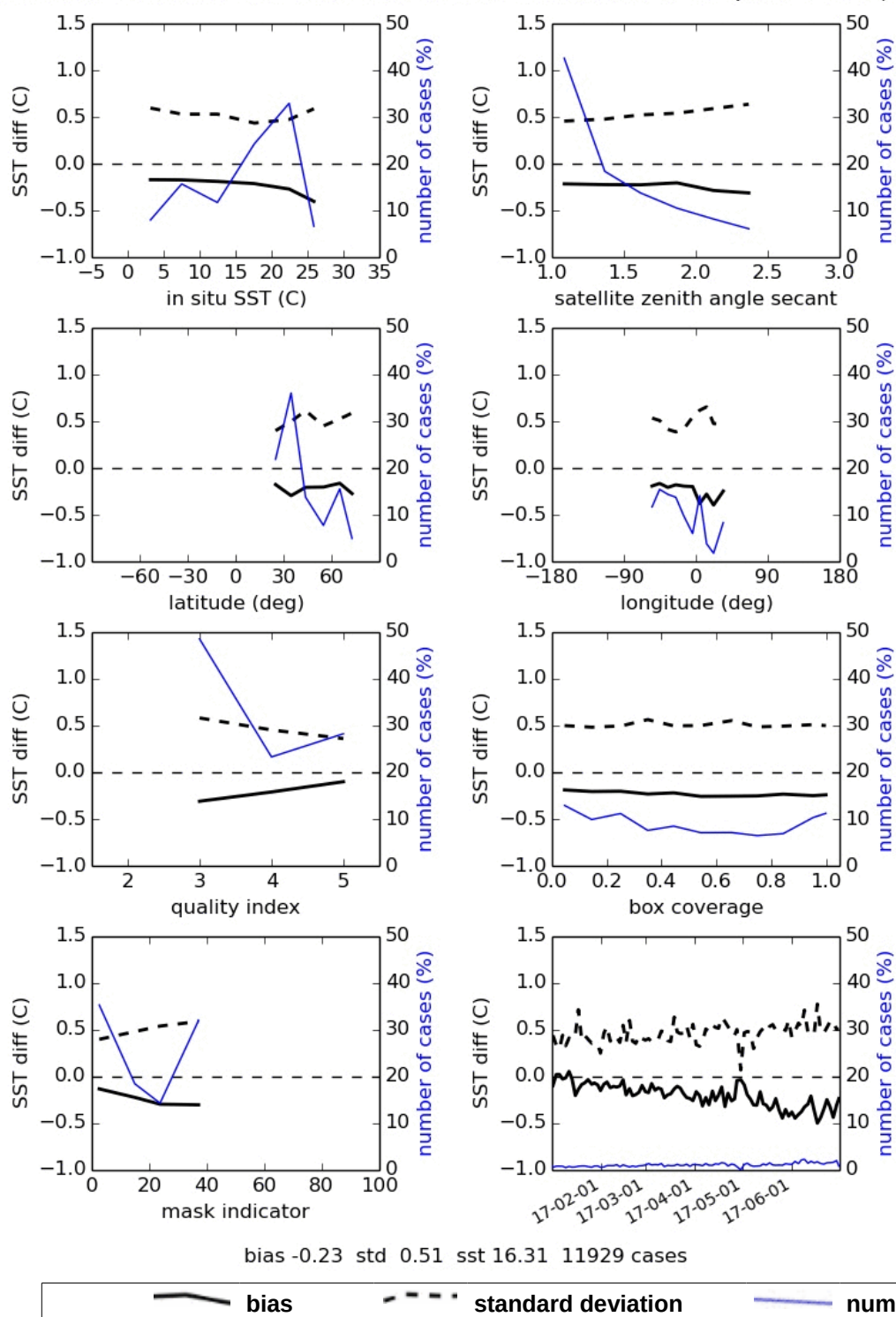


Figure 28: Complementary quality assessment statistics on Metop NAR SST day-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

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

The Metop/AVHRR SST validation report, available on www.osi-saf.org, gives further details about the regional bias observed and their origin.

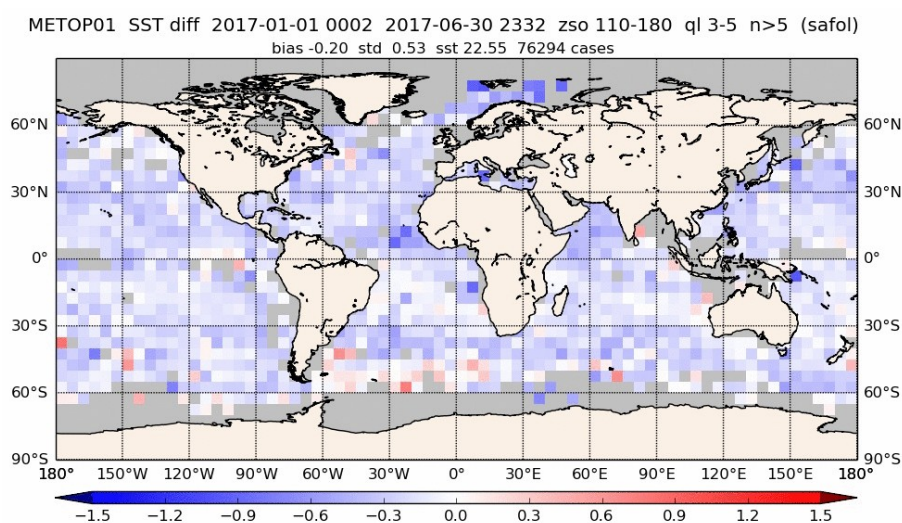


Figure 29: Mean Metop-B night-time SST error with respect to buoys measurements for quality level 3,4,5

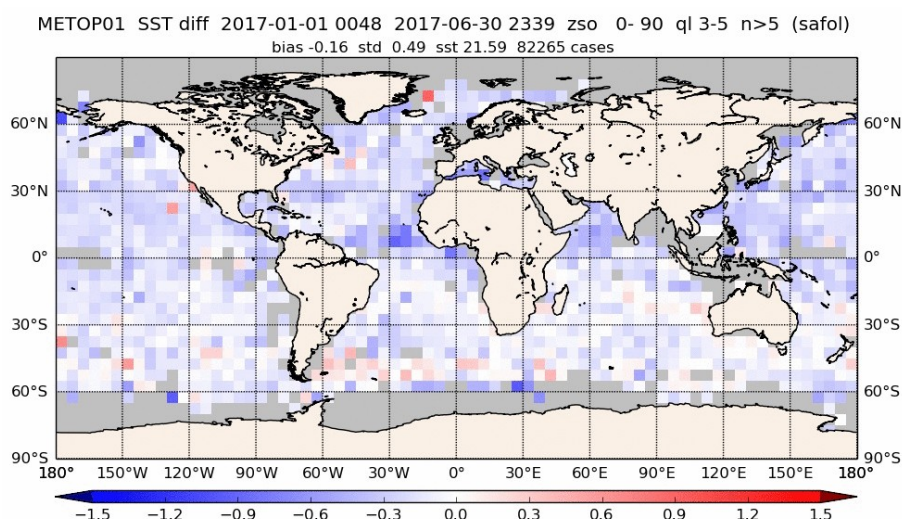


Figure 30: Mean Metop-B day-time SST error with respect to buoys measurements for quality level 3,4,5

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

Global Metop-B night-time SST quality results over 1st half 2017							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2017	12452	-0.20	0.5	60	0.51	0.8	36.25
FEB. 2017	12181	-0.21	0.5	58	0.53	0.8	33.75
MAR. 2017	14495	-0.22	0.5	56	0.55	0.8	31.25
APR. 2017	12803	-0.21	0.5	58	0.56	0.8	30.00
MAY 2017	12687	-0.19	0.5	62	0.52	0.8	35.00
JUN. 2017	11575	-0.17	0.5	66	0.50	0.8	37.50
Global Metop-B day-time SST quality results over 1st half 2017							
JAN. 2017	13121	-0.15	0.5	70	0.47	0.8	41.25
FEB. 2017	12517	-0.15	0.5	70	0.44	0.8	45.00
MAR. 2017	14874	-0.15	0.5	70	0.48	0.8	40.00
APR. 2017	13281	-0.17	0.5	66	0.50	0.8	37.50
MAY 2017	13859	-0.14	0.5	72	0.50	0.8	37.50
JUN. 2017	14515	-0.19	0.5	62	0.54	0.8	32.50
(*) Bias Margin = $100 * (1 - (|Bias / Bias Req|))$							
(**) Std Dev margin = $100 * (1 - (Std Dev / Std Dev Req))$							
100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

Table 8: Quality results for global METOP SST over 1st half 2017, for 3,4,5 quality indexes

Comments :

Overall quality results are good and quite stable.

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

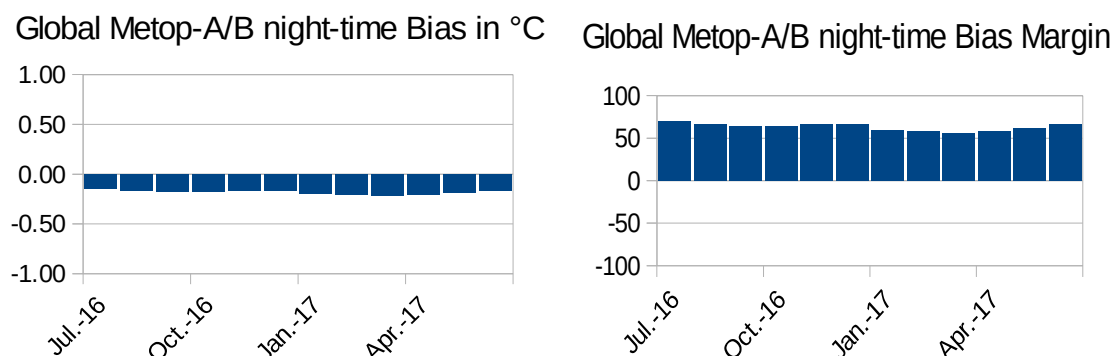


Figure 31: Left : global Metop-B night-time SST Bias. Right : global Metop-B night-time SST Bias Margin.

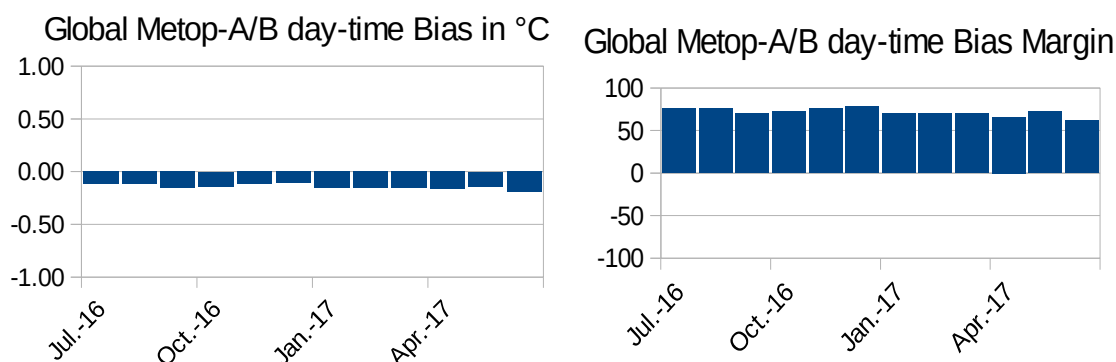


Figure 32: Left : global Metop-B day-time SST Bias.
Right : global Metop-B day-time SST Bias Margin.

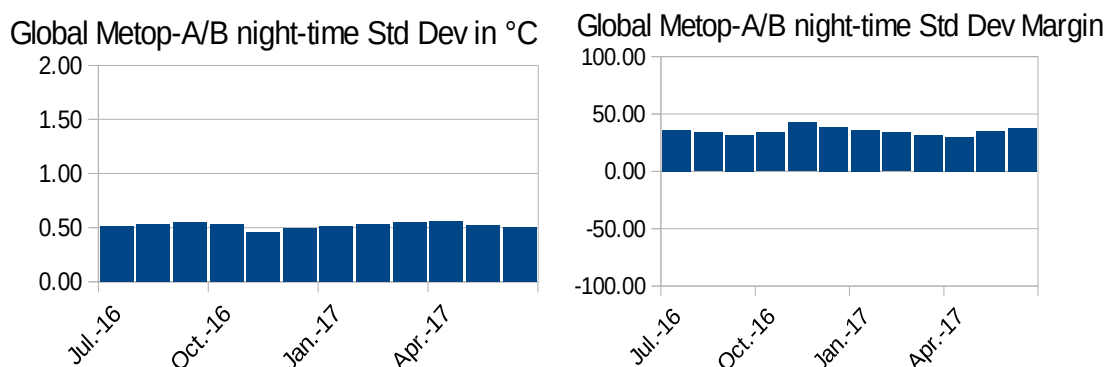


Figure 33: Left: global Metop-B night-time SST Standard deviation.
Right: global Metop-B night-time SST Standard deviation Margin.

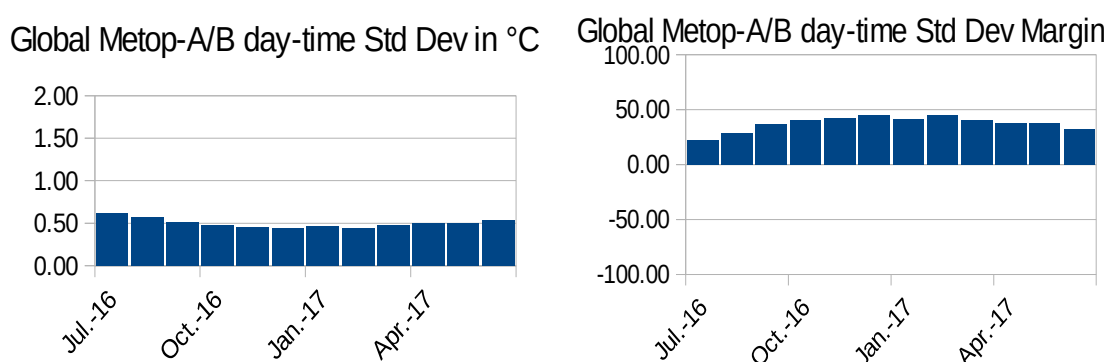


Figure 34: Left: global Metop-B day-time SST Standard deviation.
Right: global Metop-B day-time SST Standard deviation Margin.

METOP01 SST diff 2017-01-01 0002 2017-06-30 2332 zso 110-180 QL 3-5 >1.0% (safol)

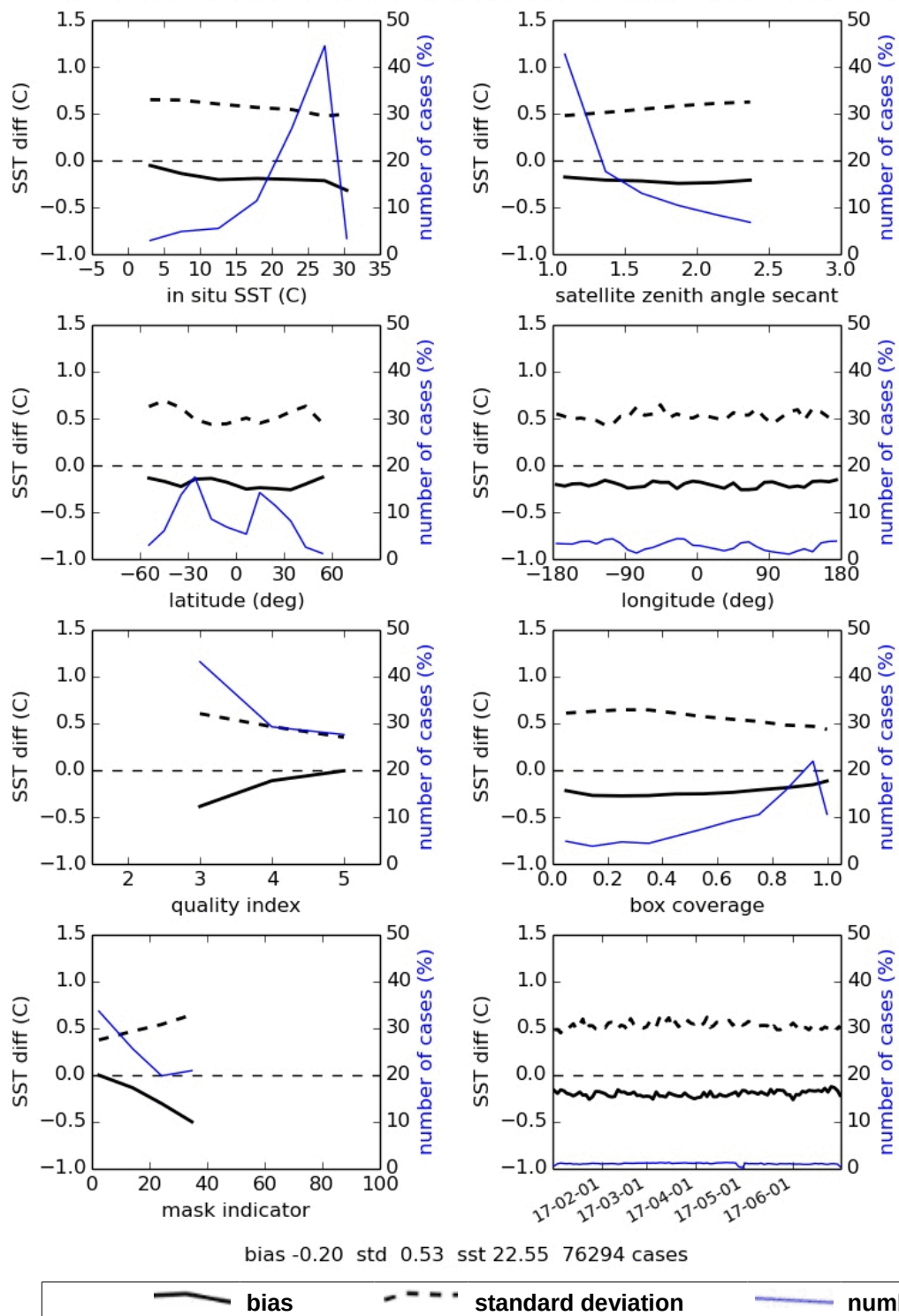
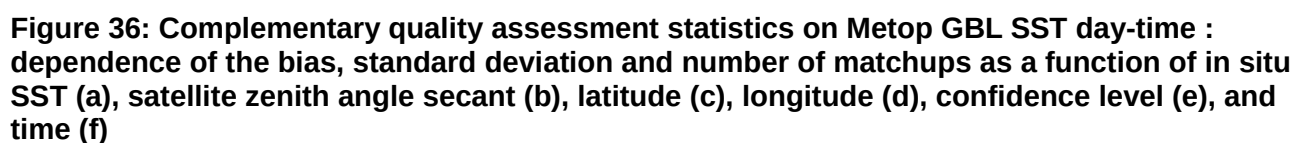


Figure 35: Complementary quality assessment statistics on Metop GBL SST night-time : dependence of the bias, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)



5.1.5. AHL SST (OSI-203) and HL SST/IST (OSI-205) quality

HL SST/IST (OSI-205)

The Level 2 HL SST/IST (OSI-205) is derived from polar satellites data, currently from Metop-A. The OSI-205 is a high latitude SST and global ice surface temperature (IST) and marginal ice zone surface temperature product.

Conventional measures as Standard Deviation of errors (Std) and bias are calculated for monthly averages for both day- and nighttime (table values) and all day (graph). Where quality levels 4 and 5 are included in the data that are stratified by day and night data and only best quality data (ql 5) are used in the all-day-quality graph. Daytime is defined for data with sun-zenith angles smaller than 90 degrees and nighttime data is defined for sun-zenith angles greater than 110 degrees. In situ observations and the centre of the OSI-205 level-2 pixel must be within 3 km of each other and observation times must be within 15 minutes.

The IST accuracy requirements are split into two on the Product Requirement Document: Namely, for in situ IR radiometers, and for traditional in situ buoy data. The reason for this is discussed in the ATBD for OSI-205. Here only validation results for OSI-205 vs traditional buoy data (air temperatures) are shown.

SST data from OSI-205 will be added at the next HYR reporting for the full period of OSI-205 operation. Also validation for the Southern Hemisphere will be presented at the next HYR reporting. Here we anticipate to have established a connection to SH ice surface temperature data through the OSI SAF VS/AS project with The Australian Antarctic Division, at University of Tasmania.

The following table and figure provide the monthly mean quality results over the reporting period.

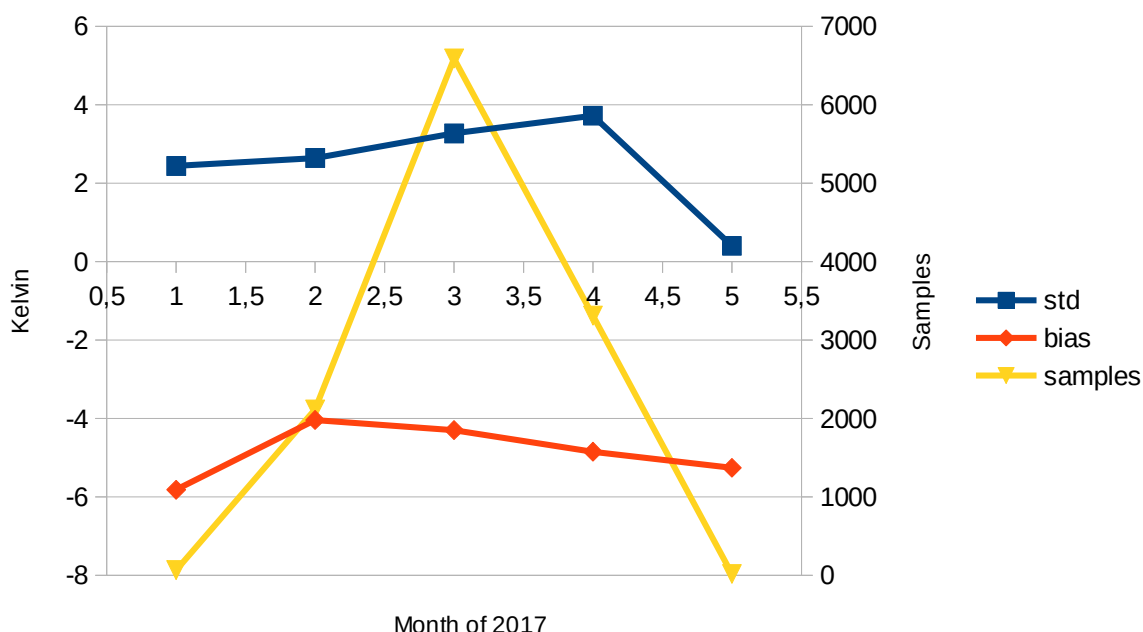


Figure 37: JAN. 2017 to JUN. 2017 OSI-205 monthly mean IST error and bias with respect to conventional buoys measurements from the DMI GTS. Only data with for quality level 5 are shown

OSI-205 IST quality results over JAN. 2017 to JUN. 2017, night-time							
Month	Number of cases	Bias °C	Bias Req. °C	Bias Margin (*)	Std Dev °C	Std Dev Req. °C	Std Dev margin (**)
JAN. 2017	474	-7.46	-3.5	-149	5.21	3.0	-30
FEB. 2017	480	-4.78	-3.5	-59	4.35	3.0	-9
MAR. 2017	25	-1.20	-3.5	60	1.11	3.0	72
APR. 2017	-	-	-3.5	-	-	3.0	-
MAY 2017	-	-	-3.5	-	-	3.0	-
JUN. 2017	-	-	-3.5	-	-	3.0	-
OSI-205 IST quality results over JAN. 2017 to JUN. 2017, day-time							
Month	Number of cases	Bias °C	Bias Req. °C	Bias Margin (*)	Std Dev °C	Std Dev Req. °C	Std Dev margin (**)
JAN. 2017	93	-3.64	-3.5	-21	2.99	3.0	25
FEB. 2017	1002	-5.43	-3.5	-81	4.30	3.0	-7
MAR. 2017	4818	-5.24	-3.5	-75	3.76	3.0	6
APR. 2017	9228	-4.70	-3.5	-57	3.40	3.0	15
MAY 2017	4335	-4.78	-3.5	-59	3.83	3.0	4
JUN. 2017	20	-4.22	-3.5	-41	2.12	3.0	47
(*) 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 OSI-205 Metop AVHRR IST over JAN. 2017 to JUN. 2017, for quality levels 4 and 5 (acceptable and best qualities), by night and by day.

Comments :

The validation results show that the Std is not within target requirements, it is however for the most part with the threshold requirements of 4.0. The threshold requirements for bias is 4.5. The validation results show thus satisfactory product performance for Std, but the product biases do not comply with the requirements. This is partly caused by the missing quality control (qc) on the in situ observations (see below), but also to a large extent on non-detected clouds. However, the latter is apparently not reflected in the bias values for night and day in the table. By the next HYR reporting (HYR2_2017) we will comments on the effect of applying an anticipated thorough qc on the in situ observations. This will also enable us the evaluate the effect of non detected clouds.

The validation results presented above must be interpreted with caution, because the quality control (qc) of the in situ measurements are not applied. The only qc applied here is that in situ observations must be within 10 K of the NW'P field provided with the OSI-205 product. This will remove major outliers. We anticipate that a thorough qc on the in situ observations will be applied before the next HYR reporting and this will hopefully result in validation statistics that will fulfil the quality requirements.

It is worth noting that the OSI-205 algorithm seems to perform well with reliable in situ observations and correct cloud mask information, as evident in figure XX(38). Here the bias is -2.72 K and the Std is 2.07 K for a single WMO buoy (WMO-ID 48731), which is well inside the product requirements.

fit: $y=1.07*x-14.23$ $R^2=0.95$; Sunzen 0.00 - 180.00; Period 2017-01-01 to 2017-06-29
bias -2.72 std 2.07 population 1296; ql 4+5 nwpfilt air/surf 10/10 time/space limit 15/3

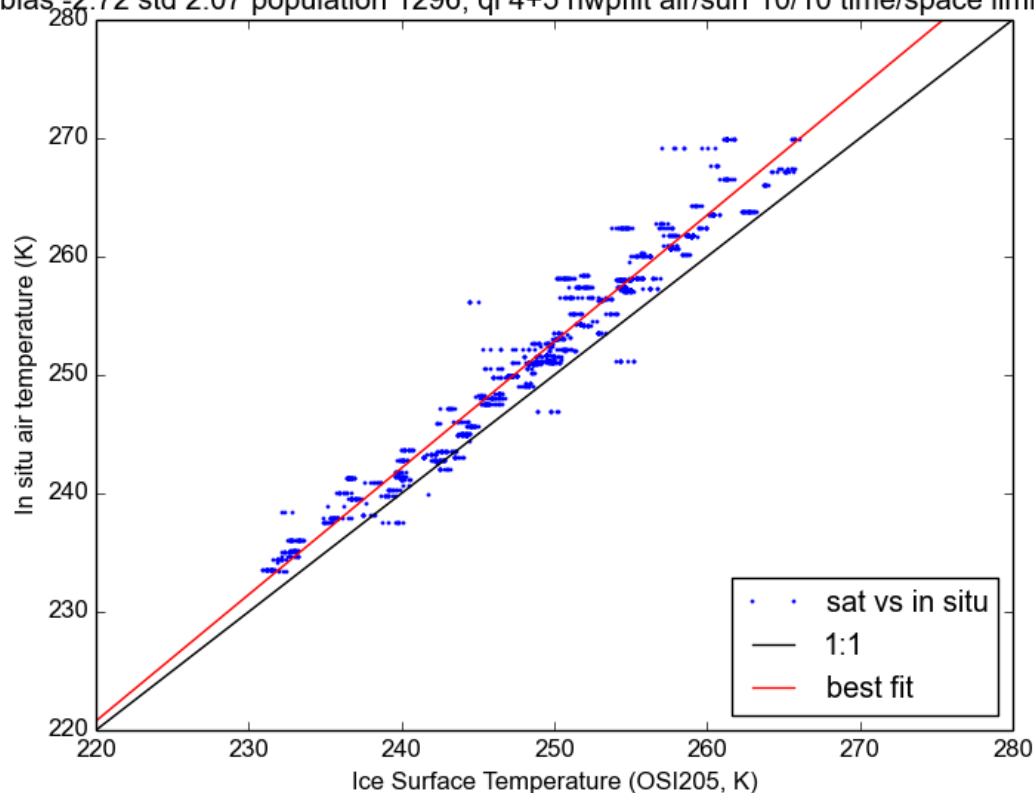


Figure 38: OSI-205 validation (ql 4+5) against a single WMO buoy, showing bias of -2.72 K and a standard error of 2.07 K.

AHL SST (OSI-203)

The Level 3 Atlantic High Latitude Sea Surface Temperature (AHL SST, OSI-203) is derived from polar satellites data, currently AVHRR on NOAA-18, NOAA-19 and Metop-A.

The following table provides the OSI-203 SST quality results over the reporting period.

OSI-203 AHL AVHRR SST quality results over JUL. 2016 to JUN. 2017, night-time							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JUL. 2016	128	-0.07	0.5	85.5	0.73	0.8	9.3
AUG. 2016	191	-0.17	0.5	65.7	0.65	0.8	18.5
SEP. 2016	148	-0.29	0.5	42.8	0.73	0.8	9.0
OCT. 2016	206	-0.38	0.5	24.1	0.82	0.8	-2.3
NOV. 2016	51	-0.81	0.5	-61.8	0.71	0.8	10.7
DEC. 2016	40	-0.35	0.5	30.1	0.59	0.8	25.8
JAN. 2017	173	-0.36	0.5	27.9	0.77	0.8	3.5
FEB. 2017	150	-0.27	0.5	46.3	0.67	0.8	16.2
MAR. 2017	162	-0.20	0.5	60.9	0.60	0.8	24.9
APR. 2017	133	-0.30	0.5	40.4	0.84	0.8	-5.0
MAY 2017	175	-0.03	0.5	93.7	0.44	0.8	44.2
JUN. 2017	93	-0.22	0.5	56.5	0.58	0.8	26.9
OSI-203 AHL AVHRR SST quality results over JUL. 2016 to JUN. 2017, day-time							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JUL. 2016	586	-0.04	0.5	92.3	0.86	0.8	-8.0
AUG. 2016	753	-0.14	0.5	70.5	0.83	0.8	-3.3
SEP. 2016	698	-0.19	0.5	61.2	0.74	0.8	8.1
OCT. 2016	704	-0.40	0.5	19.6	0.81	0.8	-1.2
NOV. 2016	140	-0.77	0.5	-53.2	0.88	0.8	-10.1
DEC. 2016	109	-0.41	0.5	18.5	0.58	0.8	27.2
JAN. 2017	260	-0.22	0.5	56.5	0.70	0.8	12.7
FEB. 2017	491	-0.22	0.5	55.5	0.63	0.8	21.5
MAR. 2017	629	-0.25	0.5	49.6	0.59	0.8	26.1
APR. 2017	529	-0.22	0.5	55.8	0.60	0.8	24.7
MAY 2017	517	-0.05	0.5	90.9	0.66	0.8	16.9
JUN. 2017	596	0.06	0.5	88.5	0.56	0.8	30.1
(*) 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 10: Quality results for OSI-203AHL AVHRR SST over JUL. 2016 to JUN. 2017, for 3,4,5 quality indexes, by night and by day.

Comments :

The validation results for OSI-203 show the usual behaviour for OSI-203; the bias and standard deviations are usually within requirements. Only in April is the night time bias outside requirement.

5.1.6. IASI SST (OSI-208-b) quality

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

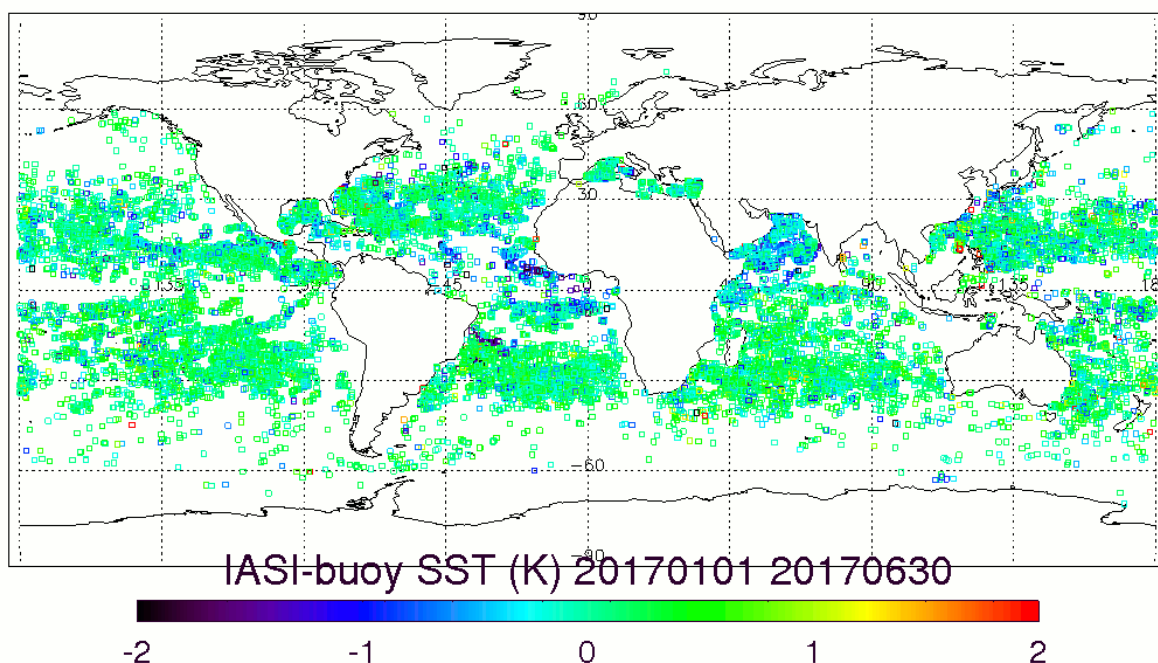


Figure 39: Mean Metop-B IASI night-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 from JAN. 2017 to JUN. 2017

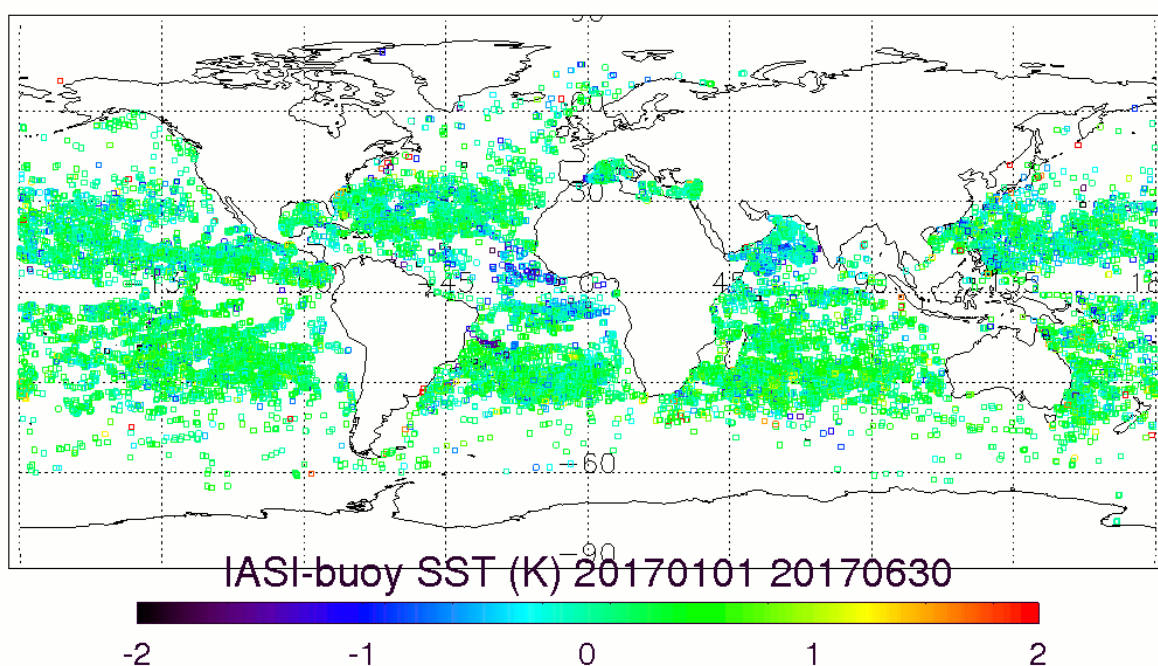


Figure 40: Mean Metop-B IASI day-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 from JAN. 2017 to JUN. 2017

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

Global Metop-B IASI <u>night-time</u> SST quality results over 1st half 2017							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2017	3336	0.05	0.5	90	0.40	0.8	50
FEB. 2017	2860	0.05	0.5	90	0.41	0.8	49
MAR. 2017	3559	0.02	0.5	96	0.44	0.8	45
APR. 2017	2845	-0.04	0.5	92	0.52	0.8	35
MAY 2017	2835	0.0	0.5	100	0.47	0.8	41
JUN. 2017	3510	0.0	0.5	100	0.48	0.8	40
Global Metop-B IASI <u>day-time</u> SST quality results over 1st half 2017							
JAN. 2017	3487	0.16	0.5	68	0.37	0.8	54
FEB. 2017	3126	0.15	0.5	70	0.37	0.8	54
MAR. 2017	3924	0.12	0.5	76	0.39	0.8	51
APR. 2017	2999	0.06	0.5	88	0.46	0.8	43
MAY 2017	3153	0.09	0.5	82	0.43	0.8	46
JUN. 2017	3647	0.06	0.5	88	0.50	0.8	38

(*) 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: Quality results for global Metop-B IASI SST over 1st half 2017, for Quality Levels 3, 4 and 5

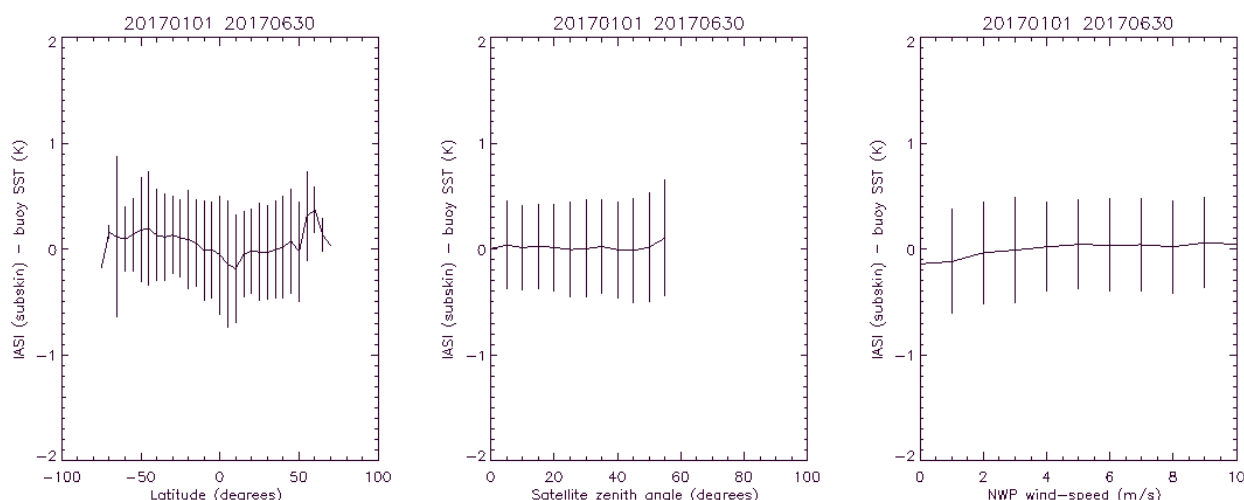


Figure 41: Mean Metop-B IASI night-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5, JUL. 2016 to JUN. 2017

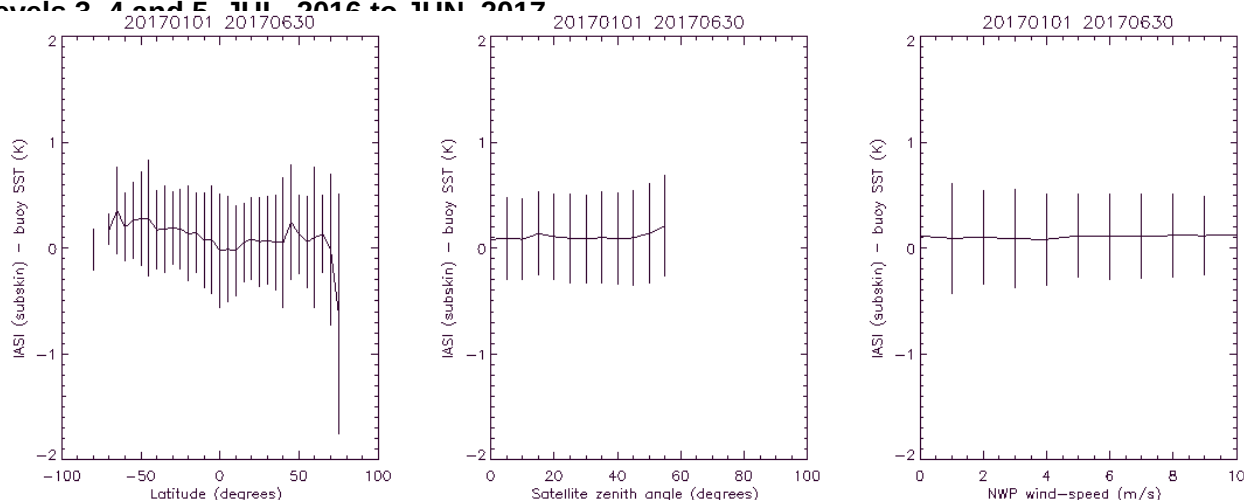


Figure 42: Mean Metop-B IASI day-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5, JUL. 2016 to JUN. 2017

Comments :

All statistics are performing well and within the requirements. For the period 1st January to 30th June 2017, then global mean night-time IASI minus drifting buoy bias is 0.01K with standard deviation of 0.45K (n=19119), and for day-time the mean bias is 0.11K with standard deviation of 0.42K (n=20571).

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/lml/img/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 2017										
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 (**)
JUL. 2016	4271	377.06	0.31	0.08	5	98.36	15.75	4.18	10	58.20
AUG. 2016	5149	373.24	-1.13	-0.30	5	93.94	15.49	4.15	10	58.50
SEP. 2016	4315	354.07	-1.73	-0.49	5	90.23	14.83	4.19	10	58.12
OCT. 2016	3730	323.29	-3.08	-0.95	5	80.95	20.97	6.49	10	35.14
NOV. 2016	4235	292.89	-4.84	-1.65	5	66.95	29.62	10.11	10	-1.13
DEC. 2016	4418	272.25	-9.32	-3.42	5	31.53	21.17	7.78	10	22.24
JAN. 2017	4149	278.32	-12.31	-4.42	5	11.54	22.24	7.99	10	20.09
FEB. 2017	4020	288.89	-7.39	-2.56	5	48.84	20.13	6.97	10	30.32
MAR. 2017	5158	296.30	-4.92	-1.66	5	66.79	18.69	6.31	10	36.92
APR. 2017	3972	314.76	-1.96	-0.62	5	87.55	17.16	5.45	10	45.48
MAY 2017	5220	309.39	-1.99	-0.64	5	87.14	16.49	5.33	10	46.70
JUN. 2017	4050	357.36	-1.63	-0.46	5	90.88	17.85	4.99	10	50.05

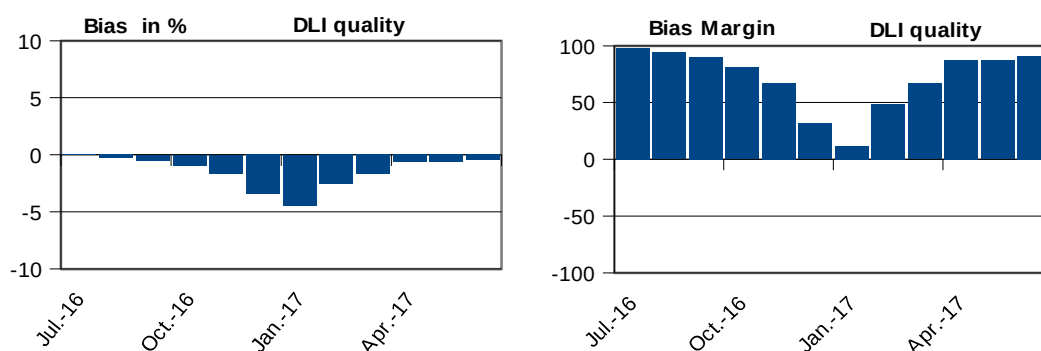
(*) Bias Margin = $100 * (1 - (|Bias / Bias Req|))$
(**) Std Dev margin = $100 * (1 - (Std Dev / Std Dev Req))$
100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.

Table 12: Geostationary DLI quality results over 1st half 2017.

Comments :

The negative DLI bias observed in January 2017 is typical of winter conditions. The formation of inversion layers during clear nights reduced the air temperature at 2 m compared to the atmospheric upper layer temperatures. The DLI algorithm only uses the 2m temperature, leading to an underestimation in such conditions. However, the DLI results are within the expected margins.

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



**Figure 43: Left : Geostationary DLI bias.
Right : Geostationary DLI bias Margin.**

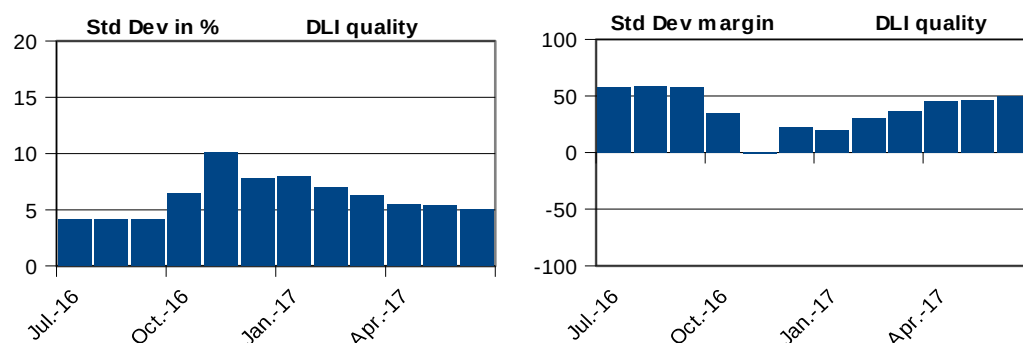


Figure 44: Left : Geostationary DLI standard deviation.
Right : DLI Geostationary standard deviation Margin.

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/lml/img/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 2017										
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. 2016	7100	489.07	-0.39	-0.08	10	99.20	86.07	17.60	30	41.33
AUG. 2016	7295	478.20	2.92	0.61	10	93.89	81.91	17.13	30	42.90
SEP. 2016	6214	446.67	9.56	2.14	10	78.60	83.59	18.71	30	37.62
OCT. 2016	5383	400.79	14.42	3.60	10	64.02	78.58	19.61	30	34.65
NOV. 2016	5134	350.85	13.45	3.83	10	61.66	75.3	21.46	30	28.46
DEC. 2016	4485	322.54	5.90	1.83	10	81.71	76.05	23.58	30	21.41
JAN. 2017	4475	311.73	7.60	2.44	10	75.62	81.19	26.04	30	13.18
FEB. 2017	4781	344.89	10.90	3.16	10	68.40	81.21	23.55	30	21.51
MAR. 2017	6134	383.93	9.59	2.50	10	75.02	82.27	21.43	30	28.57
APR. 2017	5580	452.24	8.74	1.93	10	80.67	75.16	16.62	30	44.60
MAY 2017	6279	444.35	8.03	1.81	10	81.93	73.89	16.63	30	44.57
JUN. 2017	6720	497.20	-0.90	-0.18	10	98.19	74.38	14.96	30	50.13

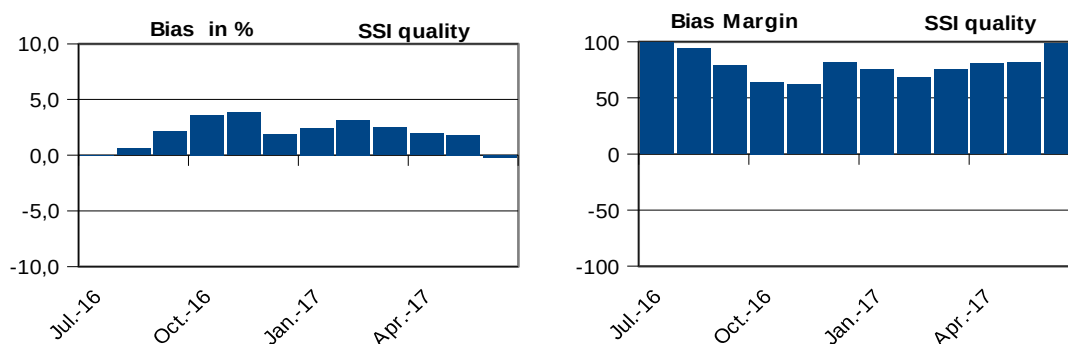
(*) Bias Margin = $100 * (1 - (|Bias / Bias Req|))$
(**) Std Dev margin = $100 * (1 - (Std Dev / Std Dev Req))$
100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.

Table 13: Geostationary SSI quality results over 1st half 2017.

Comments :

The SSI results are within the expected margins.

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



**Figure 45: Left: Geostationary SSI Bias.
Right Geostationary SSI Bias Margin.**

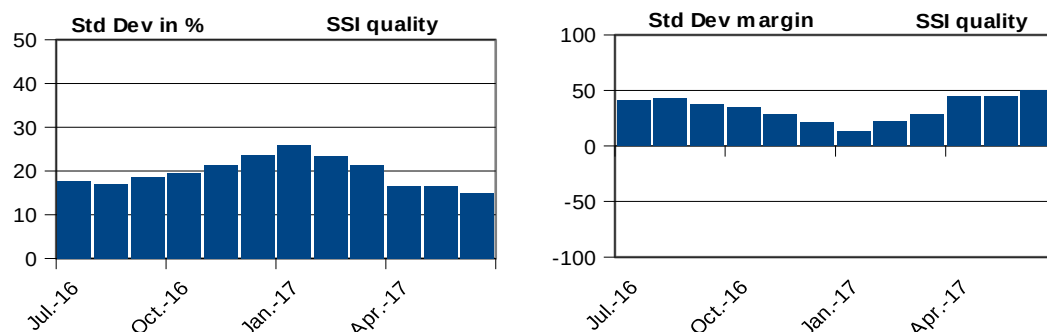


Figure 46: Left: Geostationary SSI Standard deviation.
Right: Geostationary SSI Standard deviation Margin.

5.3. Sea Ice quality

5.3.1. Global sea ice concentration (OSI-401-b) 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 originate 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. $\pm 10\%$ and $\pm 20\%$. 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). 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 14: 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-arktisk/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.

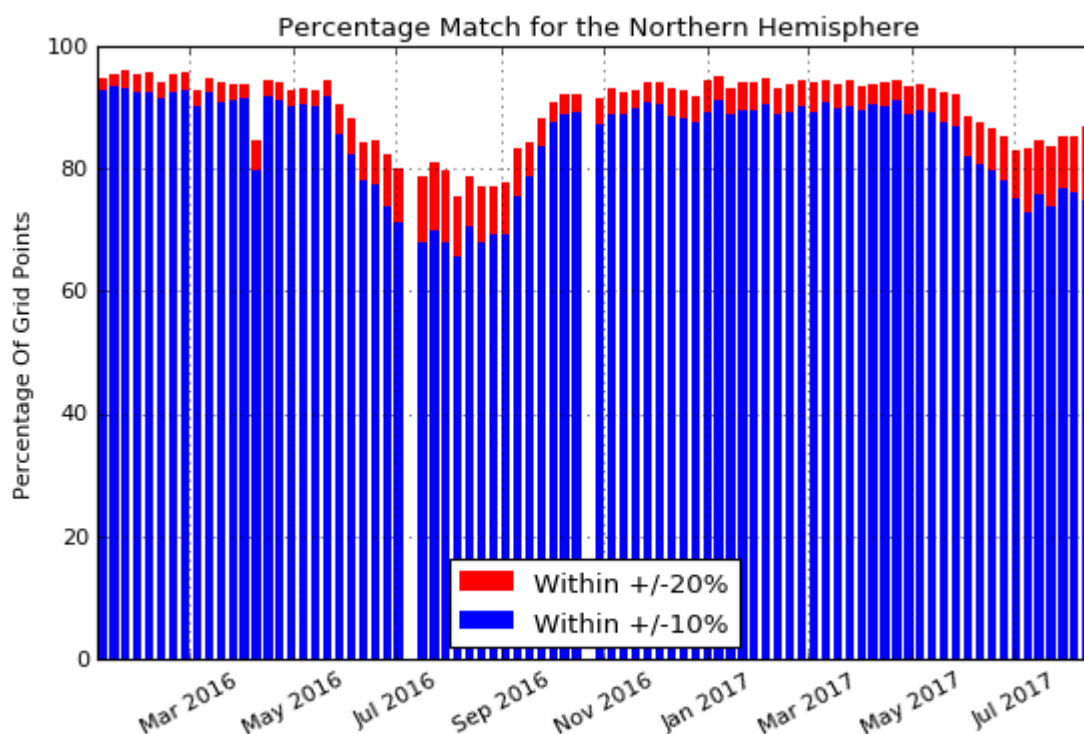


Figure 47: Comparison of ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. Northern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%.

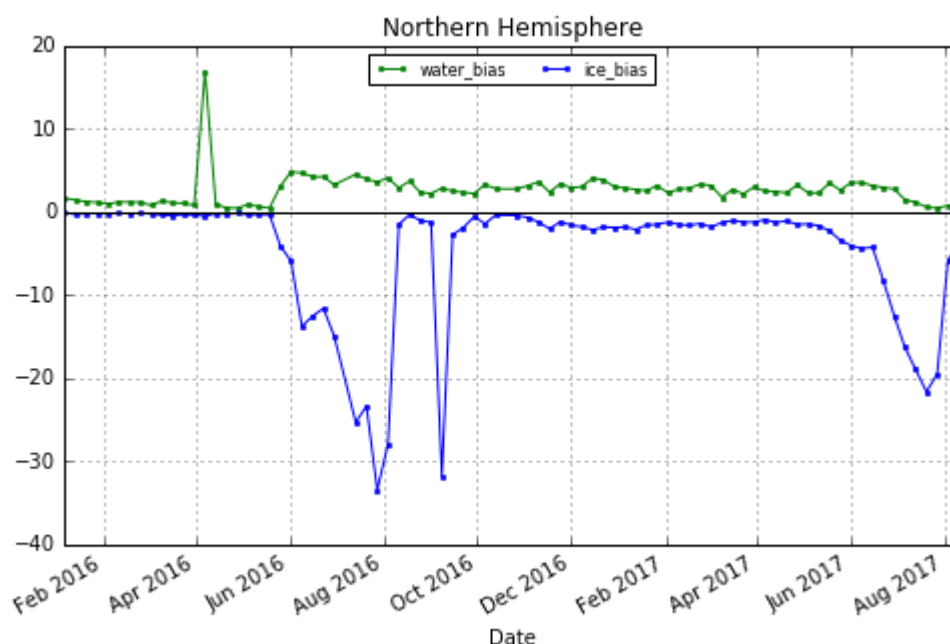


Figure 48: Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for two categories: water, ice. Northern hemisphere.

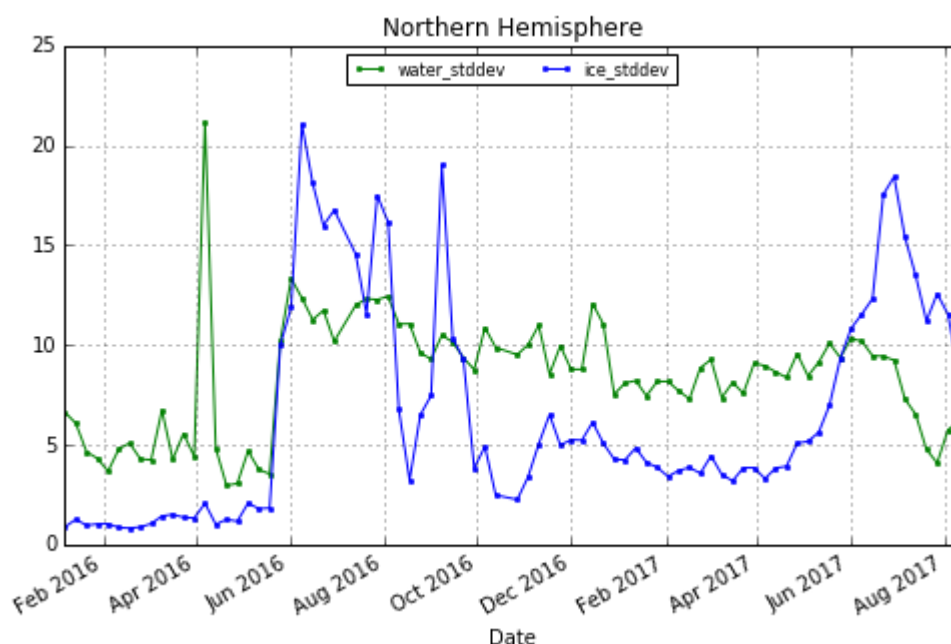


Figure 49: Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for two categories: water, ice. Northern hemisphere.

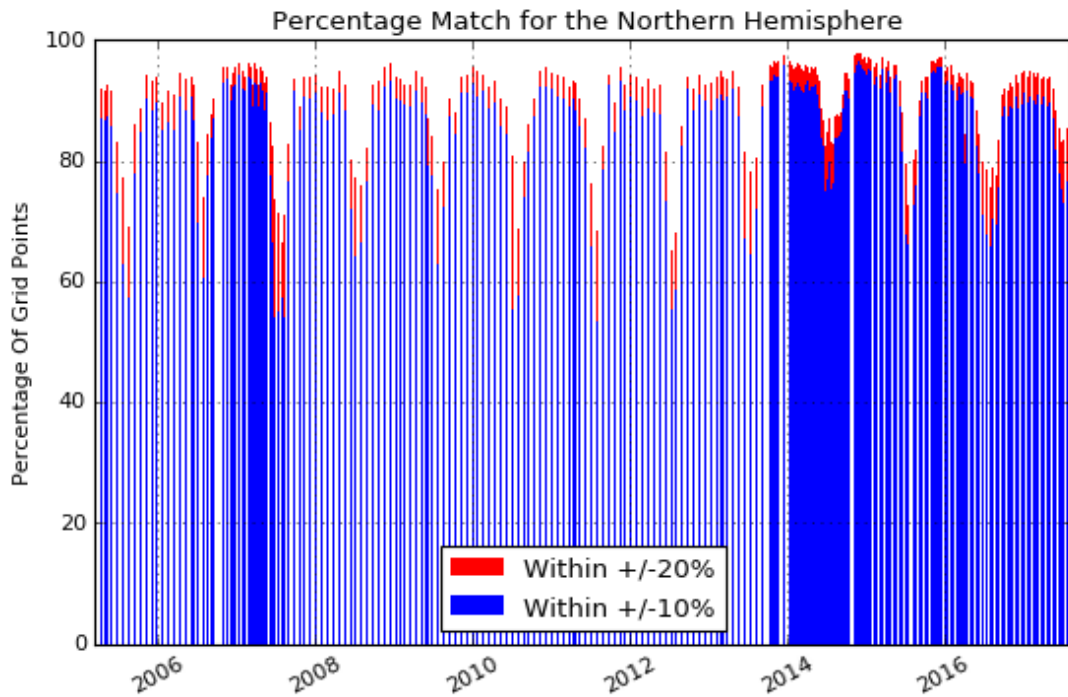


Figure 50:

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.

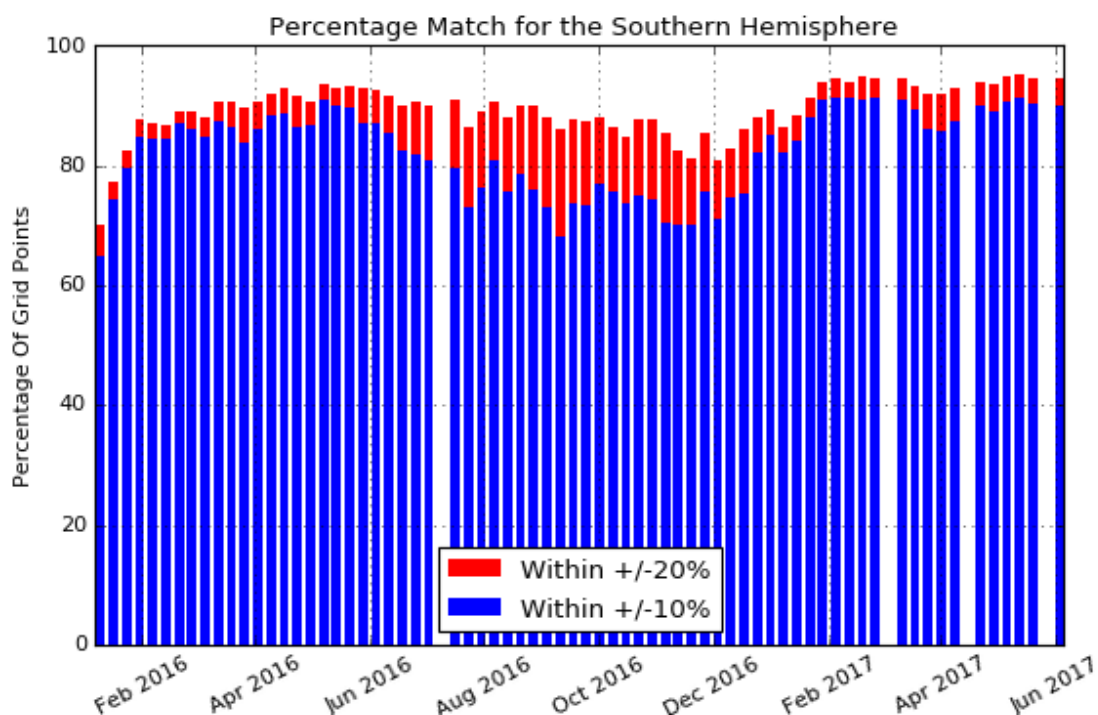


Figure 51: Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/-10%, and likewise for +/-20%. Southern hemisphere.

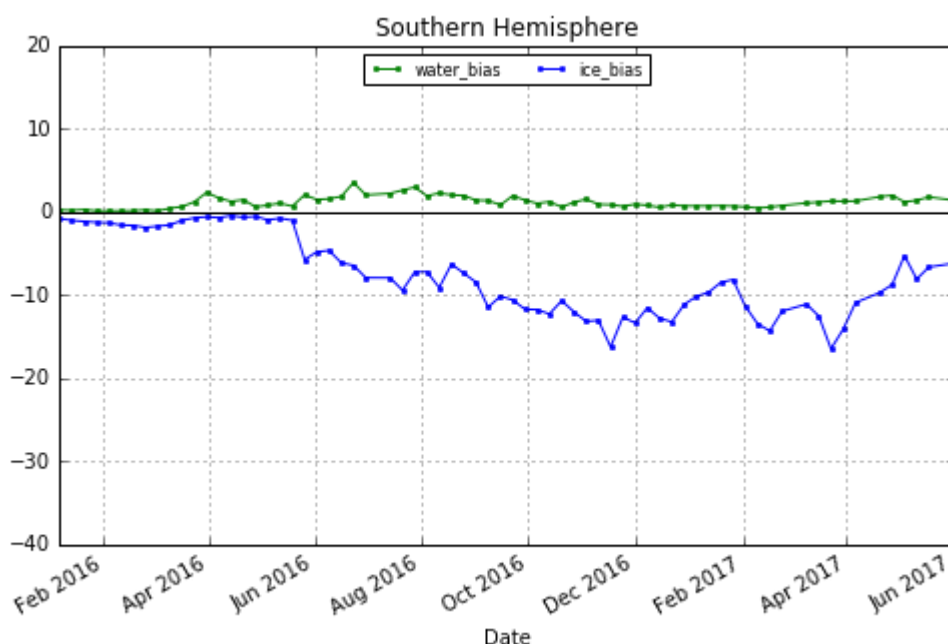


Figure 52: Difference between the ice concentrations from the NIC ice analysis and OSI SAF concentration product for two categories: water, ice. Southern hemisphere.

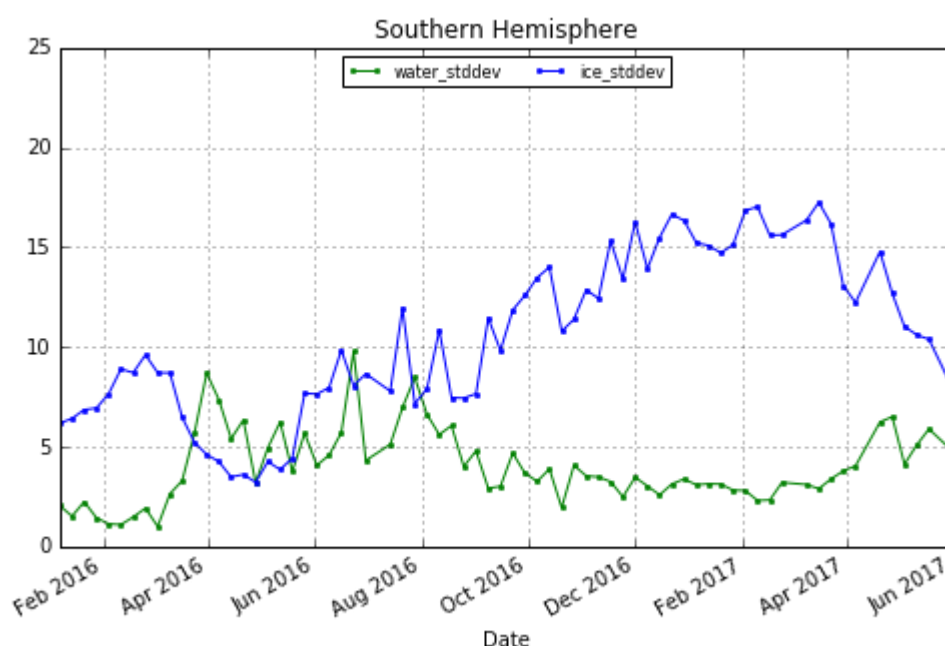


Figure 53: Standard deviation of the difference in ice concentrations from the NIC ice analysis and OSI SAF concentration product for two categories: water, ice. Southern hemisphere.

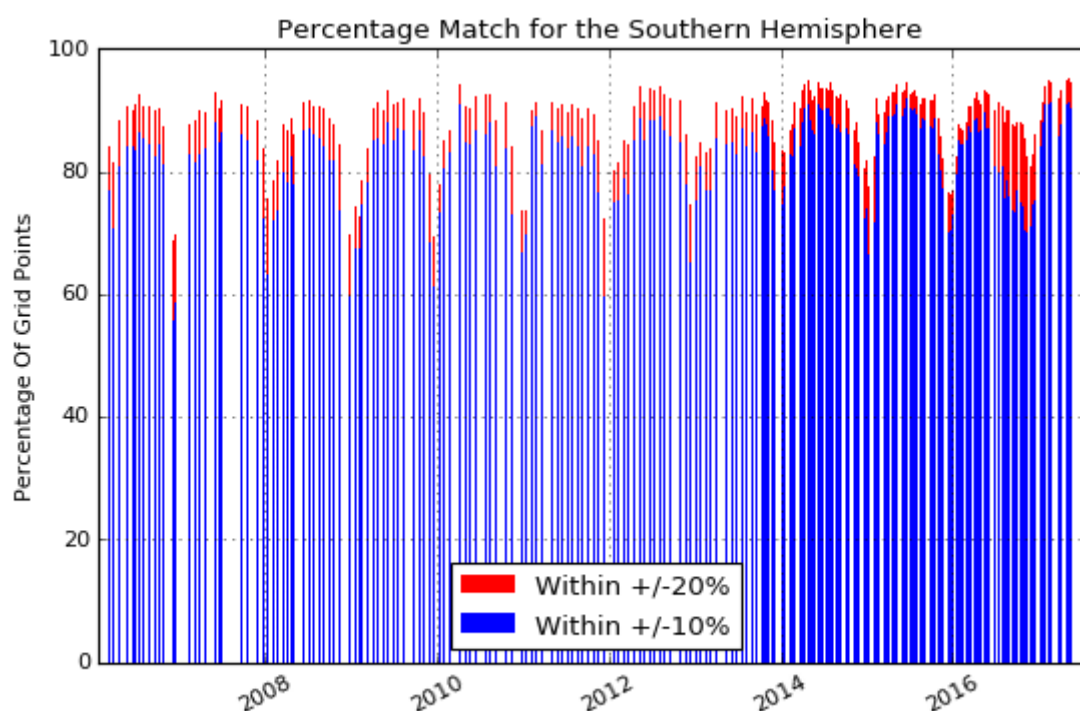


Figure 54: Multiyear variability. Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Southern hemisphere.

Month	+/- 10% [%]	+/- 20% [%]	Bias [%]	Stdev [%]	Num obs
JUL. 2016	.	.	.	.	.
AUG. 2016	.	.	.	.	.
SEP. 2016					
OCT. 2016					
NOV. 2016	90.8	92.4	3.6	15.9	151087
DEC. 2016	84.9	87.1	6.2	21.2	100111
JAN. 2017	84.0	86.3	6.6	21.6	92117
FEB. 2017	86.7	88.7	4.8	19.5	72338
MAR. 2017	83.7	86.2	6.8	21.6	120732
APR. 2017	84.9	87.4	5.4	19.2	126119
MAY 2017	87.8	90.0	4.8	17.9	964985
JUN. 2017	89.3	91.2	3.8	17.0	164985

Table 15: 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. 2016 to JUN. 2017. 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. 2017	73.47	26.53	0.00	0.00	0.00	1.97
FEB. 2017	75.05	24.95	0.00	0.00	0.00	1.97
MAR. 2017	76.19	23.81	0.00	0.00	0.00	1.97
APR. 2017	77.17	22.83	0.00	0.00	0.00	1.97
MAY 2017	77.01	22.99	0.00	0.00	0.00	1.97
JUN. 2017	76.60	23.40	0.00	0.00	0.00	1.97

Table 16: 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. 2017	71.93	28.07	0.00	0.00	0.00	0.00
FEB. 2017	72.94	27.06	0.00	0.00	0.00	0.00
MAR. 2017	72.95	27.05	0.00	0.00	0.00	0.00
APR. 2017	72.03	27.97	0.00	0.00	0.00	0.00
MAY 2017	70.46	29.54	0.00	0.00	0.00	0.00
JUN. 2017	68.93	31.07	0.00	0.00	0.00	0.00

Table 17: Statistics for sea ice concentration confidence levels, Code 0-5, Southern Hemisphere.

Comments :

Figure 50 and Figure 52 provide 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.

Average yearly std. dev. for the period JAN. 2017 – JUN. 2017 can be seen in table just below. The average yearly std. Dev. is below 10% and 15% for the NH and SH hemisphere products, respectively, and thus fulfill the service specifications.

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

Average yearly standard deviation		
	Average std.dev. Ice	Average std.dev. Water
Northern Hemisphere	6.6	8.1
Southern Hemisphere	10.6	4.9

5.3.2. Global sea ice concentration (OSI-408) quality

The OSI-408 Global Sea Ice concentration is based on AMSR-2 data. Two ice concentration fields are computed: the primary on which is computed with the OSI SAF Hybrid Dynamic (OSHD) algorithm similar to the SSMIS Sea Ice Concentration (OSI-401-b) and a second which is computed using the Technical University of Denmark (TUD) algorithm which utilizes the high frequency channels. It is validated against ice charts as described under the previous section on Global SSMIS Sea Ice Concentration.

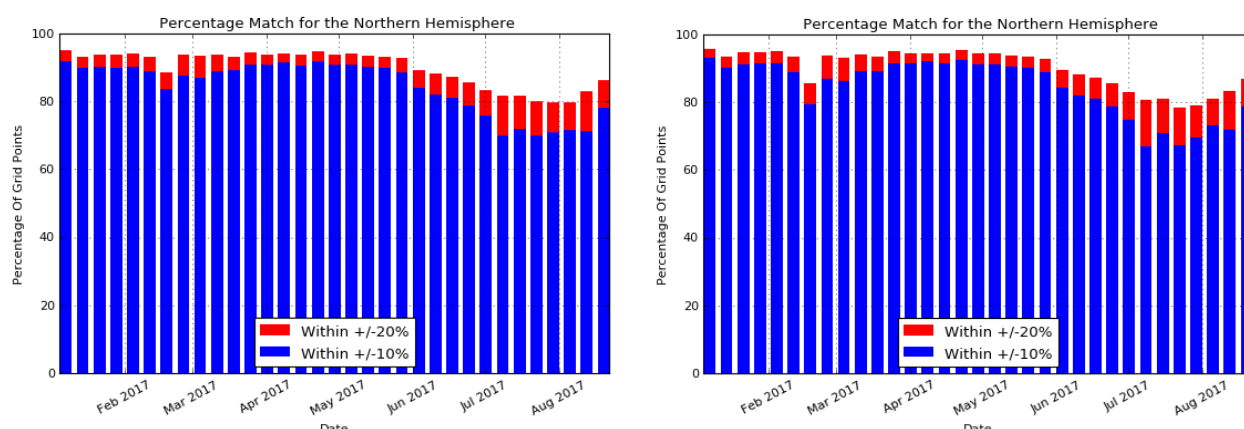


Figure 55: Comparison of ice concentrations from the Greenland overview charts made by DMI and the OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right. Northern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%

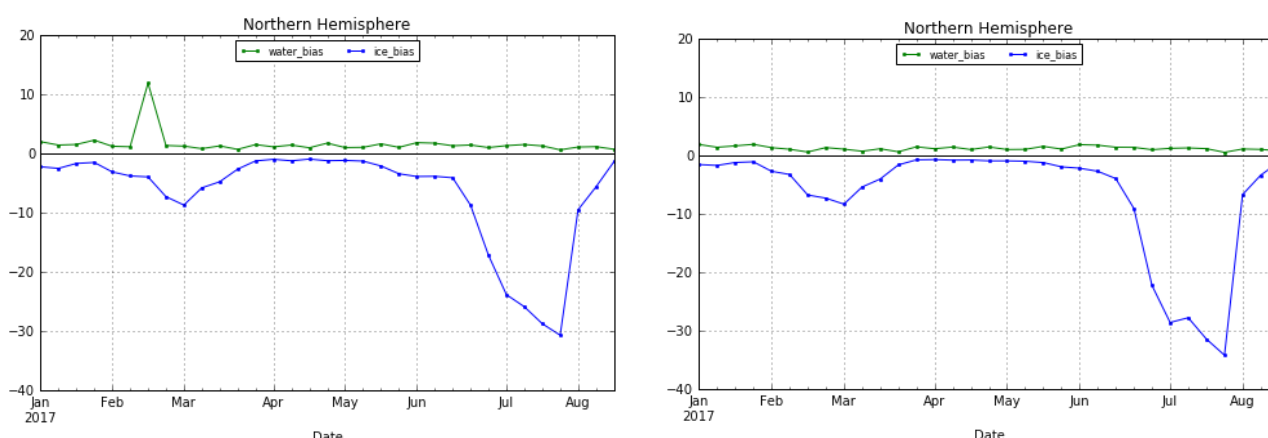


Figure 56: Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and ice. Northern Hemisphere

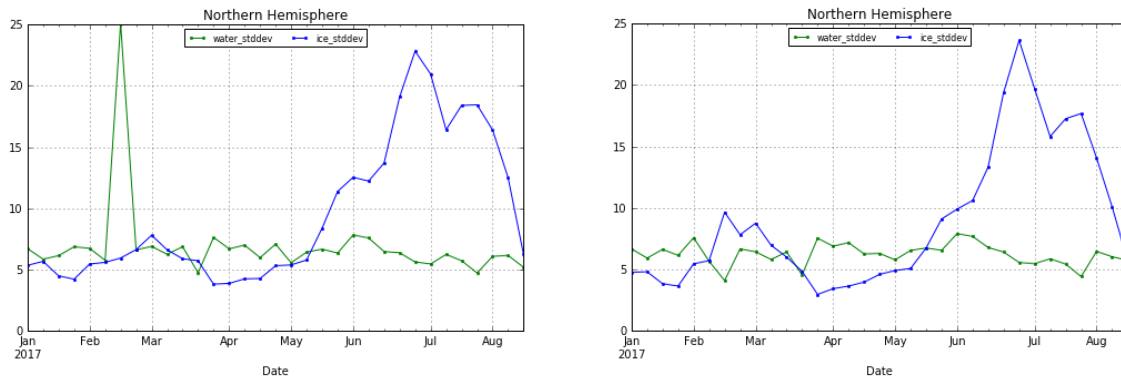


Figure 57: Standard deviation of the difference in ice concentrations from the Greenland overview charts made by DMI and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and, ice. Northern hemisphere.

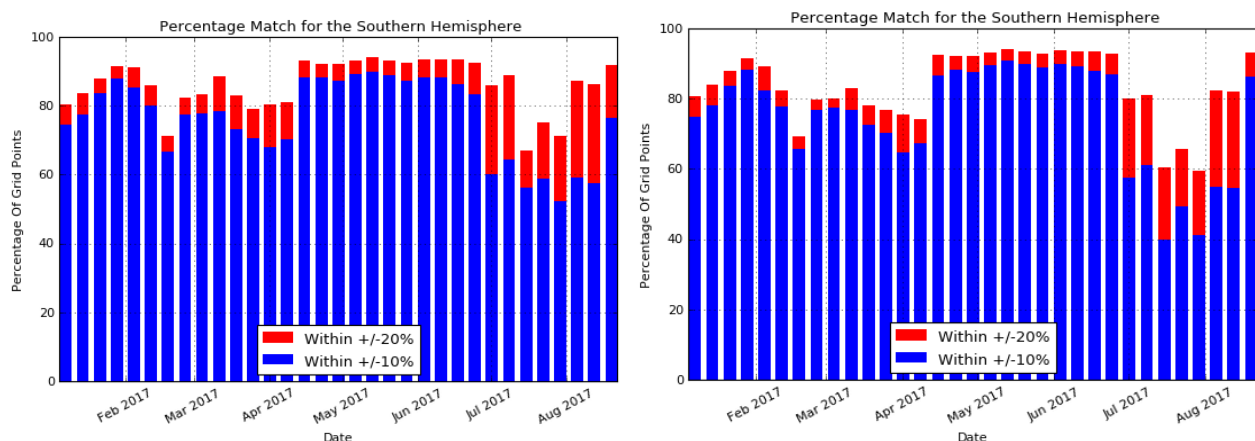


Figure 58: Comparison of ice concentrations from the NIC ice analysis and the OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right. Southern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%

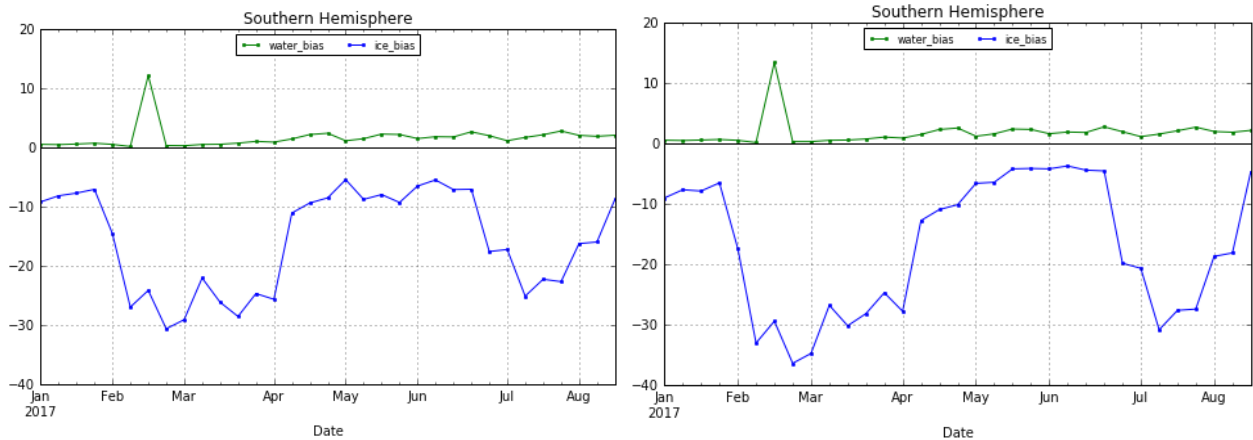


Figure 59: Difference between ice concentrations from the NIC ice analysis and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and ice. Southern Hemisphere

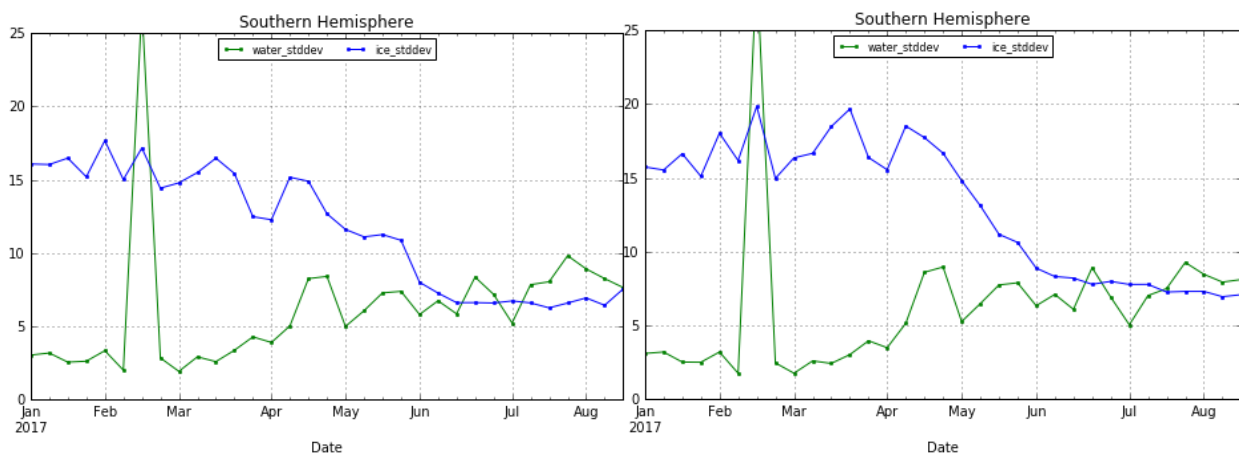


Figure 60: Standard deviation of the difference in ice concentrations from the NIC ice analysis and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and, ice. Southern hemisphere.

Comments:

Data are missing one day in February due to an AMSR-2 Inclination Adjustment Maneuver. This affects the standard deviation since the level1 decoder gave large values in place of this missing data, whereas it should have been removed. This issue was corrected before the data was operational available in March 2017.

It can be seen that the standard deviation is slightly higher for the TUD algorithm than for the OSHD algorithm. This was however expected since this utilizes the higher frequencies and is more susceptible to atmospheric noise.

The average standard deviation can be seen in table 56. On average the standard deviation is within the target accuracy of 10% and 15% for the Northern and Southern Hemisphere

respectively.

Average yearly standard deviation		
	Mean Std.dev. Ice	Mean Std.dev. Water
OSHD algorithm NH	9.45	6.9
TUD algorithm NH	8.91	6.25
OSHD algorithm SH	11.66	6.13
TUD algorithm NH	13.05	6.18

5.3.3. Global sea ice edge (OSI-402-b/c) quality

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

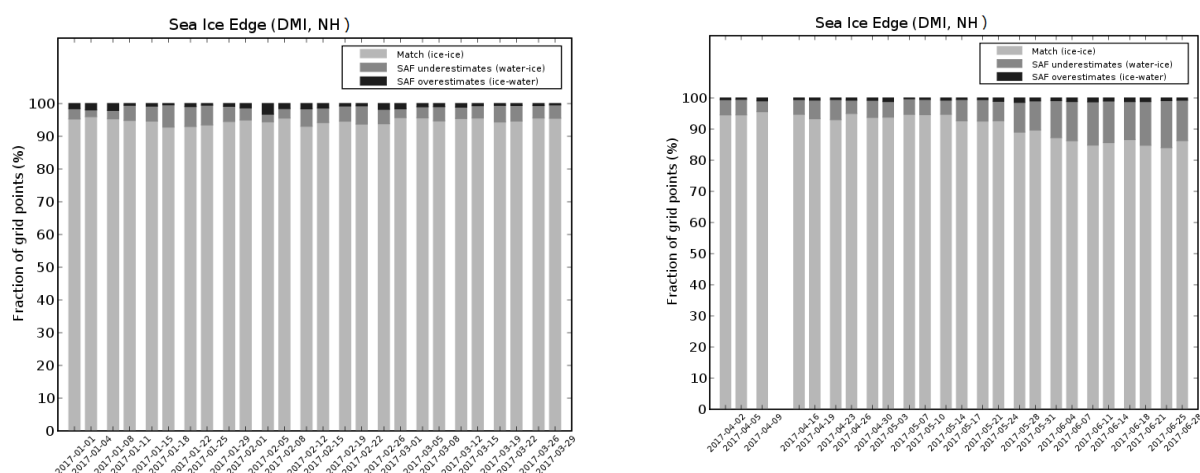


Figure 61: Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.

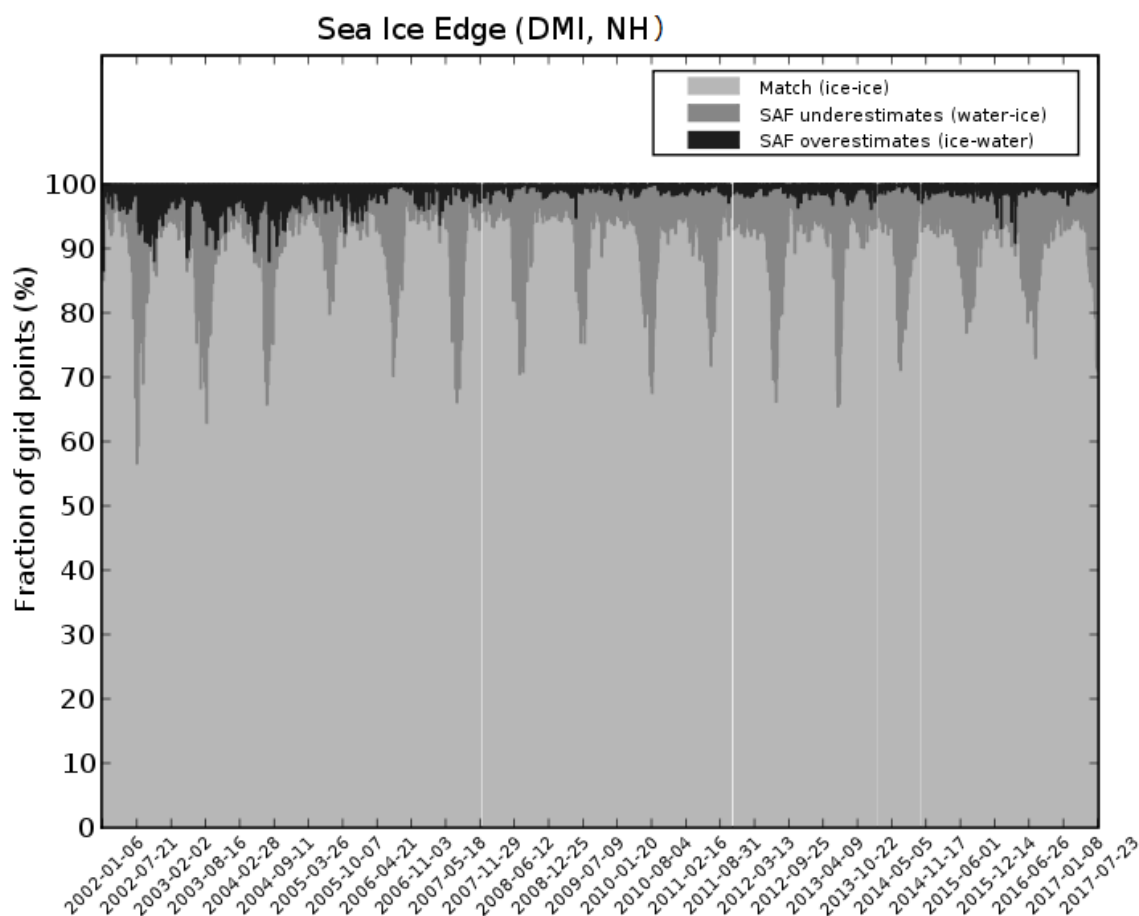


Figure 62: Multiyear variability. Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.

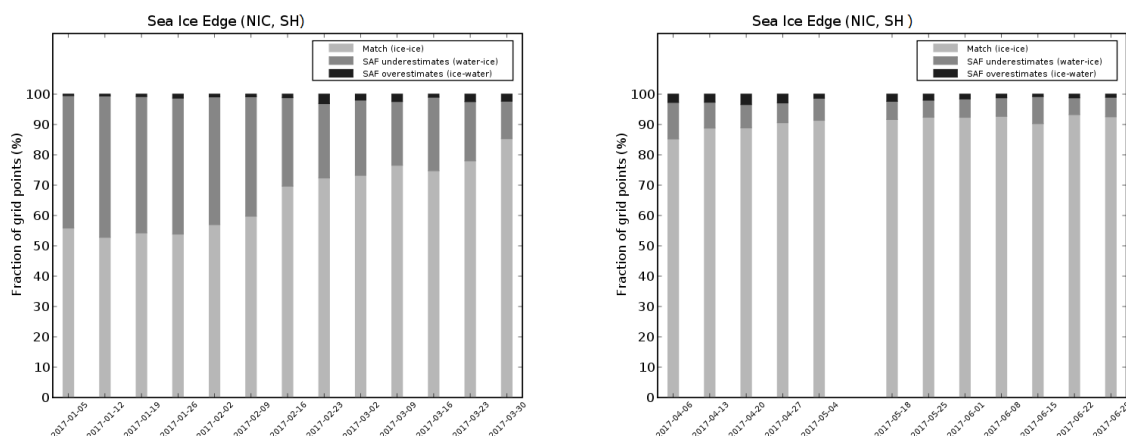


Figure 63: Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

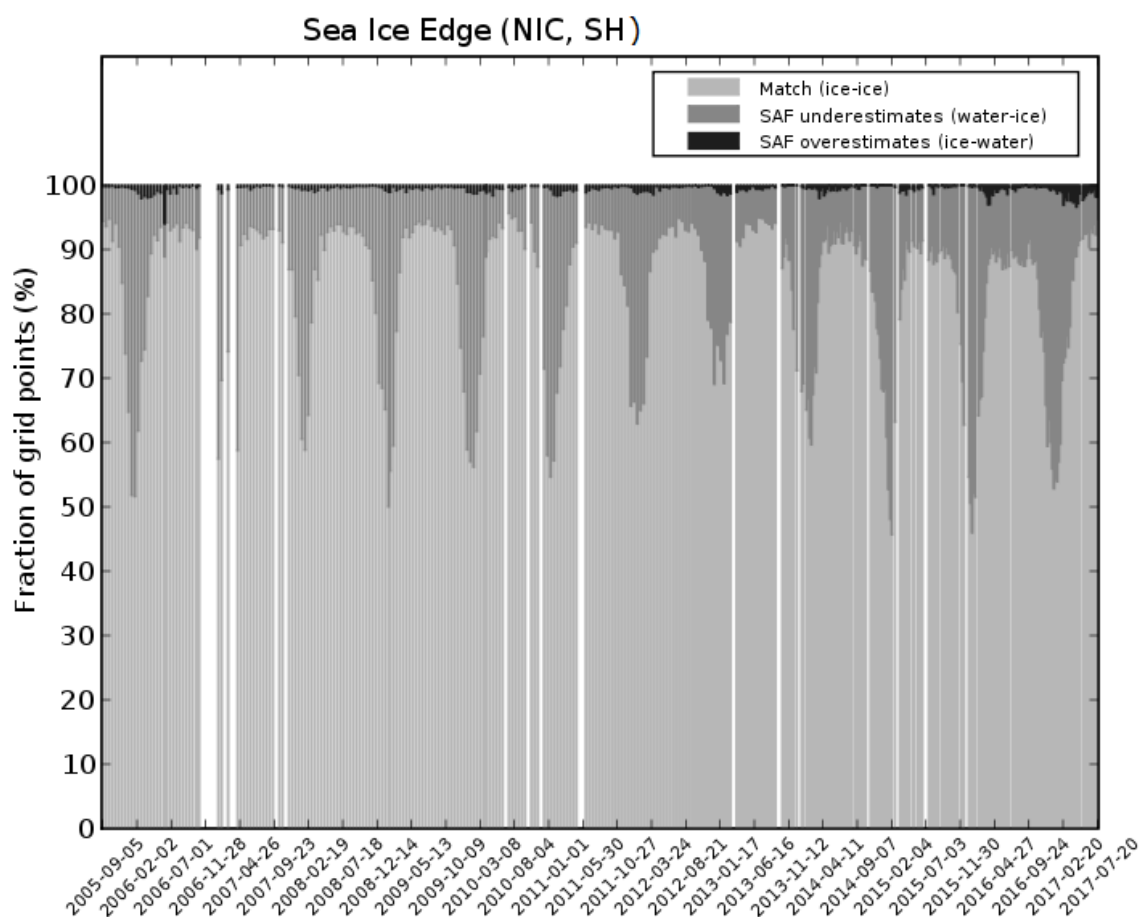


Figure 64: Multiyear variability. Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category

Month	Correct (%)	SAF lower (%)	SAF higher (%)	Mean edge diff (km)	Num obs
JUL. 2016	95.87	3.49	0.64	20.93	74479
AUG. 2016	97.24	2.31	0.45	33.82	67857
SEP. 2016	94.87	1.58	3.55	22.82	76774
OCT. 2016	98.34	0.57	1.10	11.20	60526
NOV. 2016	98.80	0.70	0.50	10.71	57375
DEC. 2016	97.48	1.79	0.73	13.95	305436
JAN. 2017	97.22	1.98	0.79	14.39	226386
FEB. 2017	97.46	1.44	1.10	10.76	201022
MAR. 2017	98.01	1.13	0.87	12.95	354146
APR. 2017	98.16	1.14	0.70	13.62	358311
MAY 2017	97.73	1.54	0.73	16.40	252766
JUN. 2017	96.62	2.67	0.71	29.02	414302

Table 18: Monthly quality assessment results from comparing OSI SAF sea ice products to MET Norway ice service analysis for the Svalbard area, from JUL. 2016 to JUN. 2017. 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. 2017	86.90	3.93	4.86	3.51	0.80	53.89
FEB. 2017	87.79	3.25	4.62	3.54	0.81	53.87
MAR. 2017	88.31	2.98	4.43	3.48	0.81	53.87
APR. 2017	88.92	2.75	4.22	3.33	0.78	53.81
MAY 2017	88.91	2.73	4.22	3.35	0.79	53.65
JUN. 2017	87.60	3.06	4.86	3.59	0.88	53.38

Table 19: 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. 2017	95.58	0.55	1.06	1.80	1.01	22.40
FEB. 2017	96.43	0.45	0.90	1.44	0.79	22.39
MAR. 2017	96.49	0.42	0.98	1.40	0.70	22.38
APR. 2017	95.82	0.57	1.29	1.64	0.69	22.38
MAY 2017	94.56	0.86	1.87	2.03	0.69	22.38
JUN. 2017	92.10	1.86	2.90	2.41	0.69	22.39

Table 20: Statistics for sea ice edge confidence levels, Code 0-5, Southern Hemisphere.

Comments :

The yearly averaged edge difference is 17.5 km (average of recent 12 monthly values) and the target accuracy requirement of 20 km edge difference is hence met. The monthly differences are below the yearly requirement all months except the summer months of June to September, 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.

5.3.4. Global sea ice type (OSI-403-b/c) 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 (st 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 [km ²]	Mean MYI coverage [km ²]
JUL. 2016	-	-
AUG. 2016	-	-
SEP. 2016	-	-
OCT. 2016	161636	2630767
NOV. 2016	99443	1828339
DEC. 2016	103466	1887107
JAN. 2017	95455	1758280
FEB. 2017	112321	2018437
MAR. 2017	113447	2419011
APR. 2017	52417	2538049
MAY 2017	62751	2433190
JUN. 2017	-	-

Table 21: Monitoring of NH sea ice type quality by comparing the multi year coverage with the 11-days running mean

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2017	89.31	1.50	7.98	1.08	0.13	53.89
FEB. 2017	87.94	1.77	8.92	1.24	0.12	53.87
MAR. 2017	86.85	2.15	9.43	1.43	0.13	53.87
APR. 2017	85.27	3.00	9.80	1.80	0.13	53.81
MAY 2017	83.53	3.05	8.88	4.40	0.14	53.65
JUN. 2017	82.68	2.61	7.48	7.07	0.16	53.38

Table 22: Statistics for sea ice type confidence levels, Northern Hemisphere.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2017	93.48	0.24	0.29	5.80	0.19	22.40
FEB. 2017	94.61	0.20	0.26	4.77	0.15	22.39
MAR. 2017	94.79	0.18	0.25	4.64	0.14	22.38
APR. 2017	93.65	0.17	0.24	5.81	0.13	22.38
MAY 2017	91.51	0.17	0.24	7.97	0.12	22.38
JUN. 2017	89.00	0.17	0.25	10.47	0.12	22.39

Table 23: Statistics for sea ice type confidence levels, Southern Hemisphere.

Comments :

In table 21 is seen in the mid-column the monthly standard deviations of the daily MYI coverage variability. The winter months October 2016 to March 2017 all show relatively high standard deviations with October, December, February and March all having values *not* below the requirement of 100.000 km². The months in the end of 2016 were discussed in previous report.

Again in mid-February 2017 a strong Warm Air Intrusion through the Fram Strait influenced the physical properties of the ice surface in such a way that large areas of MYI was misinterpreted as FYI. From February and through March the sea ice type showed an increasing trend of the area of MYI with MYI stretching far into the Beaufort Sea. This increase in MYI ice coverage into the Beaufort Sea seems to be unrealistic and is in conflict with observations from research vessel in the same region in the same period.

From May 2017 an upgraded algorithm of sea ice edge and type including AMSR-2 data was released as OSI-402-c and OSI-403-c, respectively. A monitoring of these pre-operational ice type product over a longer test period has shown generally lower standard deviations than the previous version.

5.3.5. Sea ice emissivity (OSI-404) quality

The near 50 GHz sea ice emissivity product is compared to the 50.3 GHz and 52.8 GHz vertical polarized emissivity (which is the same at these two frequencies) at an incidence angle at 50 degrees. The validation emissivity product is derived from NWP data and SSMIS satellite data. Both the OSI SAF product and the validation products cover the entire northern and southern hemisphere sea ice cover, including all ice types and seasons. The total bias plot in figure 58 is the difference between the hemispheric OSI SAF product and the validation product. The OSI SAF operational emissivity is higher than the validation product giving a positive bias. The mean annual bias on the northern hemisphere is -0.014 and on the southern hemisphere it is 0.009. There is no clear seasonal cycle neither on the northern nor southern hemisphere. The spikes in March and May 2017 are coincident on both the northern and southern hemisphere thus ruling out that it is due a geophysical reason.

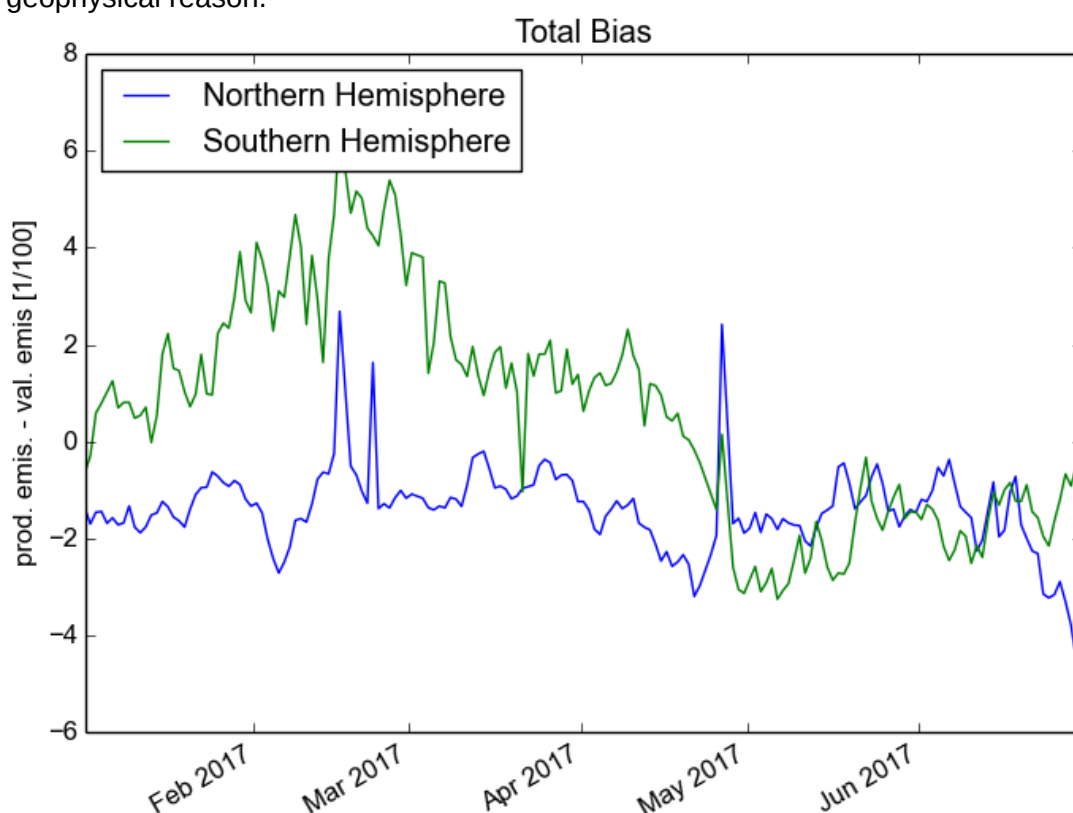


Figure 65: The mean hemispheric difference between the OSI SAF operational product and the validation product derived from NWP and SSMIS data. The y-axis unit is in hundreds (1/100)

The standard deviation of the difference between the OSI SAF product and the validation product is shown in figure 59. On both hemispheres there is a clear seasonal cycle. The northern hemisphere has values near 0.05 during winter and 0.06-0.07 during summer and an annual mean of 0.057. The southern hemisphere has values near 0.11 during Austral summer and 0.08 during Austral winter and an annual mean of 0.09. The spikes in March and May 2017 are coincident on both hemispheres which means that the explanation for that is not geophysical.

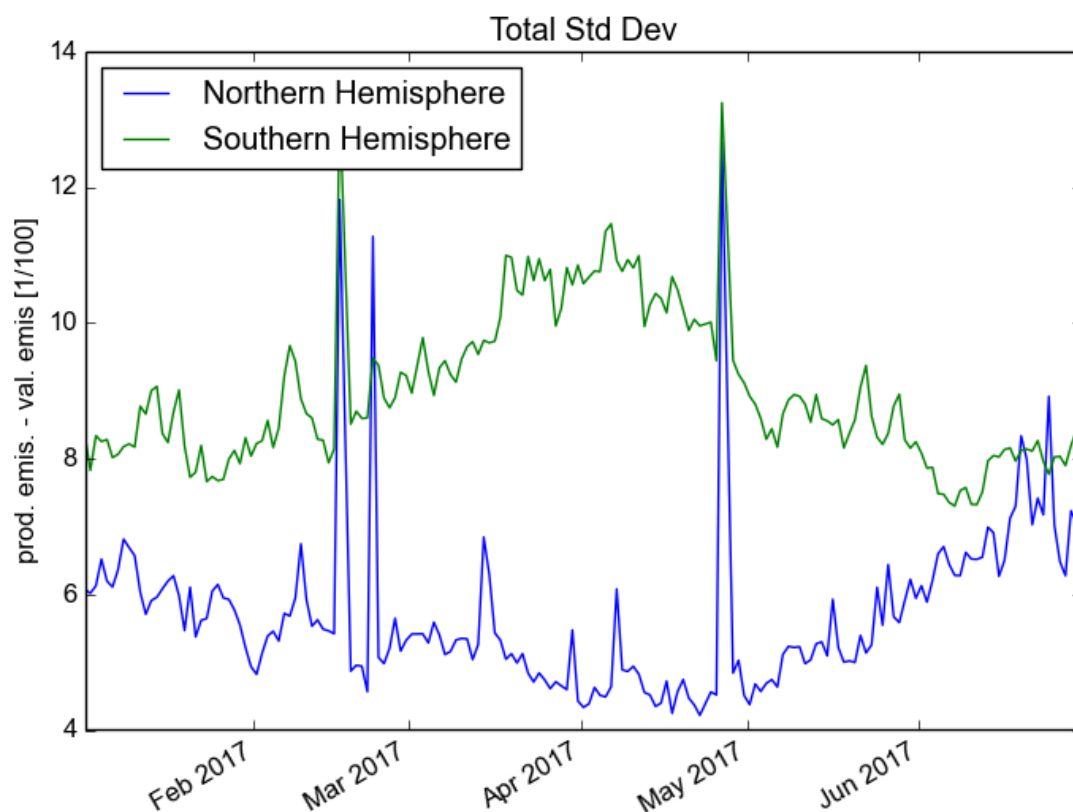


Figure 66: The standard deviation of the difference between the OSI SAF operational product and the validation product for the northern and southern hemispheres. The y-axis unit is in hundreds (1/100)

The standard deviation of the difference between the OSI SAF product and the validation product is the measure on which the product is evaluated according to the SeSp. The target requirement is 0.10 on the northern hemisphere and 0.15 on the southern hemisphere. First half of 2017 is within both targets compared to the annual mean. This is summarized in table 26.

	Bias	STD	Target
NH	-0.014	0.057	0.10
SH	0.009	0.09	0.15

Tableau 24: Summarising the numbers in the text

5.3.6. Low resolution sea ice drift (OSI-405-b/c) 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 accuracy is challenged during the summer melt period (from 1st May to 30th September in the Arctic).

The Low Resolution Sea Ice Drift product comprises several single-sensor (e.g. SSMIS F18 or AMSR2 GW1 or ASCAT Metop-B) 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 $\sigma()$ the standard deviation of the $\varepsilon(X) = X_{\text{prod}} - X_{\text{ref}}$. Columns α , β and ρ are respectively the slope and intercept of the regression line between Prod and Ref data pairs and the Pearson correlation coefficient. N is the number of collocation data pairs.

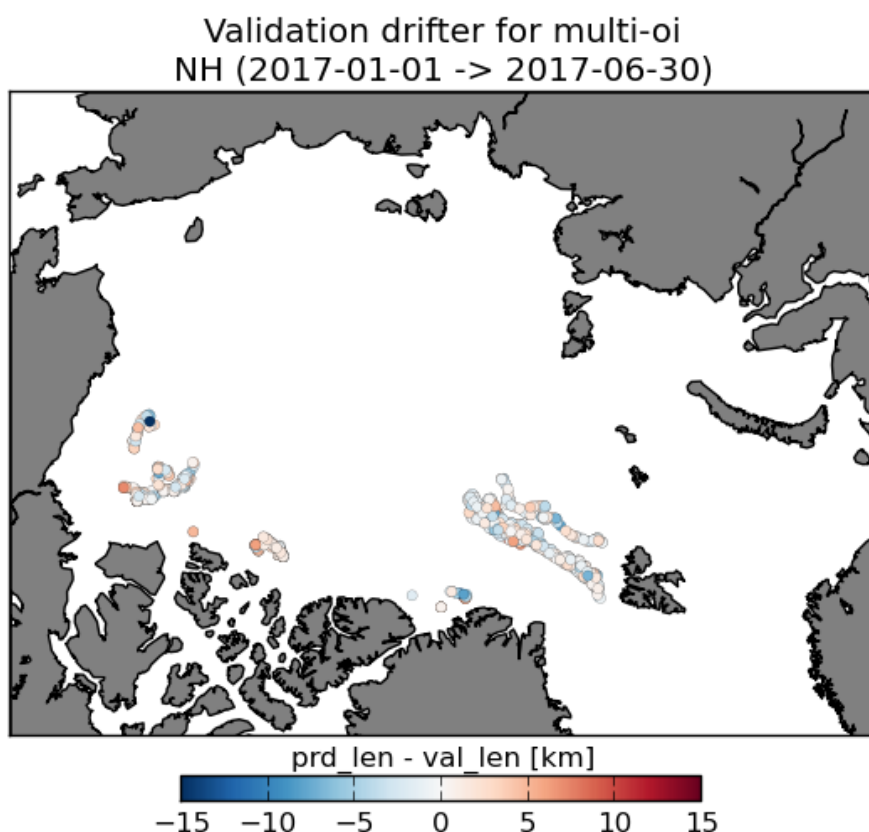


Figure 67: Location of GPS drifters for the quality assessment period (JAN. 2017 to JUN. 2017). The shade of each symbol represents the bias (prod-ref) in drift length (km over 2 days).

Month	b(X) [km]	b(Y) [km]	$\sigma(X)$ [km]	$\sigma(Y)$ [km]	α	β [km]	ρ	N
JUL. 2016	--	--	--	--	--	--	--	0
AUG. 2016	--	--	--	--	--	--	--	0
SEP. 2016	--	--	--	--	--	--	--	0
OCT. 2016	0,39	-0,33	5,1	4,61	0,88	0,21	0,94	379
NOV. 2016	-0,41	-0,51	3,84	4,41	0,9	-0,41	0,96	385
DEC. 2016	0,1	-0,95	3,17	4,82	0,88	-0,18	0,96	335
JAN. 2017	-0,38	0,14	2,39	2,07	0,97	0,14	0,98	258
FEB. 2017	0,24	0,24	1,75	1,71	0,98	0,29	0,99	219
MAR. 2017	-0,32	-0,05	2,34	2,1	0,94	0,42	0,98	251
APR. 2017	0,2	-0,15	1,71	1,83	0,98	0,08	0,98	231
MAY 2017	1,06	-1,38	3,72	2,44	0,96	-0,34	0,94	26
JUN. 2017	-0,58	-1,27	4,09	4,23	0,9	-0,71	0,93	140
Last 12 months	-0.051	-0.378	3.416	3.666	0.9	0.04	0.96	2247

Table 25: Quality assessment results for the LRSID (multi-oi) product (NH) for JUL. 2016 to JUN. 2017.

Month	b(X) [km]	b(Y) [km]	$\sigma(X)$ [km]	$\sigma(Y)$ [km]	α	β [km]	ρ	N
JUL. 2016	--	--	--	--	--	--	--	0
AUG. 2016	--	--	--	--	--	--	--	0
SEP. 2016	--	--	--	--	--	--	--	0
OCT. 2016	--	--	--	--	--	--	--	0
NOV. 2016	0,55	-0,58	4,92	4,78	0,89	0,14	0,94	310
DEC. 2016	0,23	-0,18	4,92	4,52	0,93	-0,02	0,94	340
JAN. 2017	0,28	-0,47	4,7	4,83	0,91	0,06	0,93	295
FEB. 2017	-0,54	-0,08	3,42	3,62	0,96	-0,03	0,96	218
MAR. 2017	0,33	0,22	3,5	3	0,97	0,34	0,96	215
APR. 2017	-0,37	-0,23	3,69	3,53	0,93	0,34	0,95	243
MAY 2017	0,53	-0,3	3,29	3,37	1,02	0,05	0,93	215
JUN. 2017	--	--	--	--	--	--	--	0
Last 12 months	+0.159	-0.280	4.252	4.138	0.93	0.147	0.95	1852

Table 26: Quality assessment results for the LRSID (SSMIS-F17) product (NH) for JUL. 2016 to JUN. 2017.

Comments :

The validation results for OSI-405 are nominal and withing target accuracy. The limited number of matchups (26) for May 2017 is due to the switch from OSI-405-b to OSI-405-c in late May 2017 (during the first 25 days of May the operational product was OSI-405-b, that had no summer coverage). Next HYR will hold the first full 6 months with OSI-405-c as the operational service. We note there are generally less GPS data available for download than in previous years.

5.3.7. 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

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

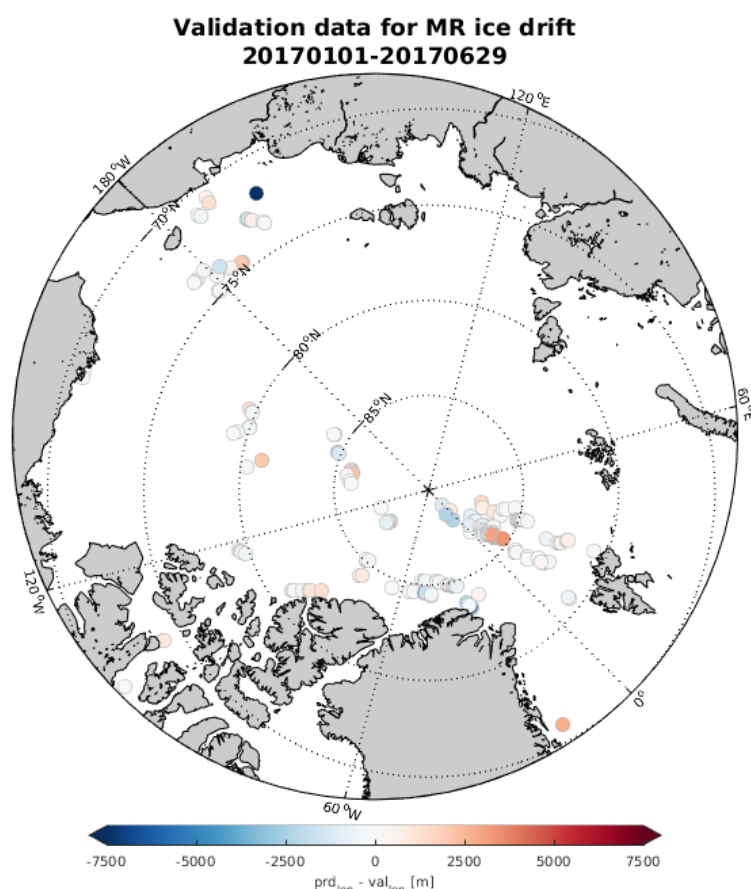


Figure 68: Location of GPS drifters for the quality assessment period (JAN. 2017 to JUN. 2017). The shade of each symbol represents the difference (prod-ref) in drift length in meters

Month	b(X) [m]	b(Y) [m]	$\sigma(X)$ [m]	$\sigma(Y)$ [m]	α	β [m]	ρ	N
JUL. 2016	549	-659	1148	1380	0.99	56	0.86	101
AUG. 2016	-144	596	673	368	0.88	-190	0.97	20
SEP. 2016	-	-	-	-	-	-	-	-
OCT. 2016	-	-	-	-	-	-	-	-
NOV. 2016	58	675	820	430	0.97	-361	0.97	82
DEC. 2016	-245	-193	818	1351	0.94	258	0.97	309
JAN. 2017	-57	-75	1694	1200	0.93	107	0.928	1032
FEB. 2017	102	26	767	761	0.98	-50	0.986	700
MAR. 2017	69	251	855	710	0.96	-222	0.984	1236
APR. 2017	-154	229	877	908	0.97	-84	0.961	242
MAY 2017	-69	-220	1019	544	1.14	187	0.989	80
JUN. 2017	-276	484	891	1277	1.01	-110	0.960	404
Last 12 months	-20	78	1111	1061	0.97	-34	0.968	4706

Table 27: MR sea ice drift product (OSI-407) performance, JUL. 2016 to JUN. 2017

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 for first half year of 2017. All months show good correlation with buoy drift. A limited number of extreme outliers has been disqualified from the validation data, based on visual inspection of the buoy locations;

- Bouy ID 26495 supposedly grounded in an Iceland fjord on 20170114.
- Bouy ID 48796 supposedly grounded in the Canadian Archipelago on 20170114 and 20170409.
- Bouy ID 48726 supposedly grounded on the shore close to Bering Strait from 20170510 - 20170511.
- Bouy ID 48770 supposedly stock in landfast ice north of Greenland on 20170518.

Higher std in January 2017 is to some extent due to deviating and suspicious measurements from buoy ID 48513, but visual inspection and quality control did not give a reason for excluding these measurements from the validation data.

As mentioned in last HYR-report; In September and October 2016 there was no validation data match-up, thus no validation statistics, due to a limited number of match-ups with individual bouys. A test production setup is under its way, testing whether higher production frequency and extending the summer mode (Visible AVHRR channel-2) into September and October will give more and better results.

The product requirement target accuracy of 2 km on yearly standard deviation is met.

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

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 2017. 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/>.

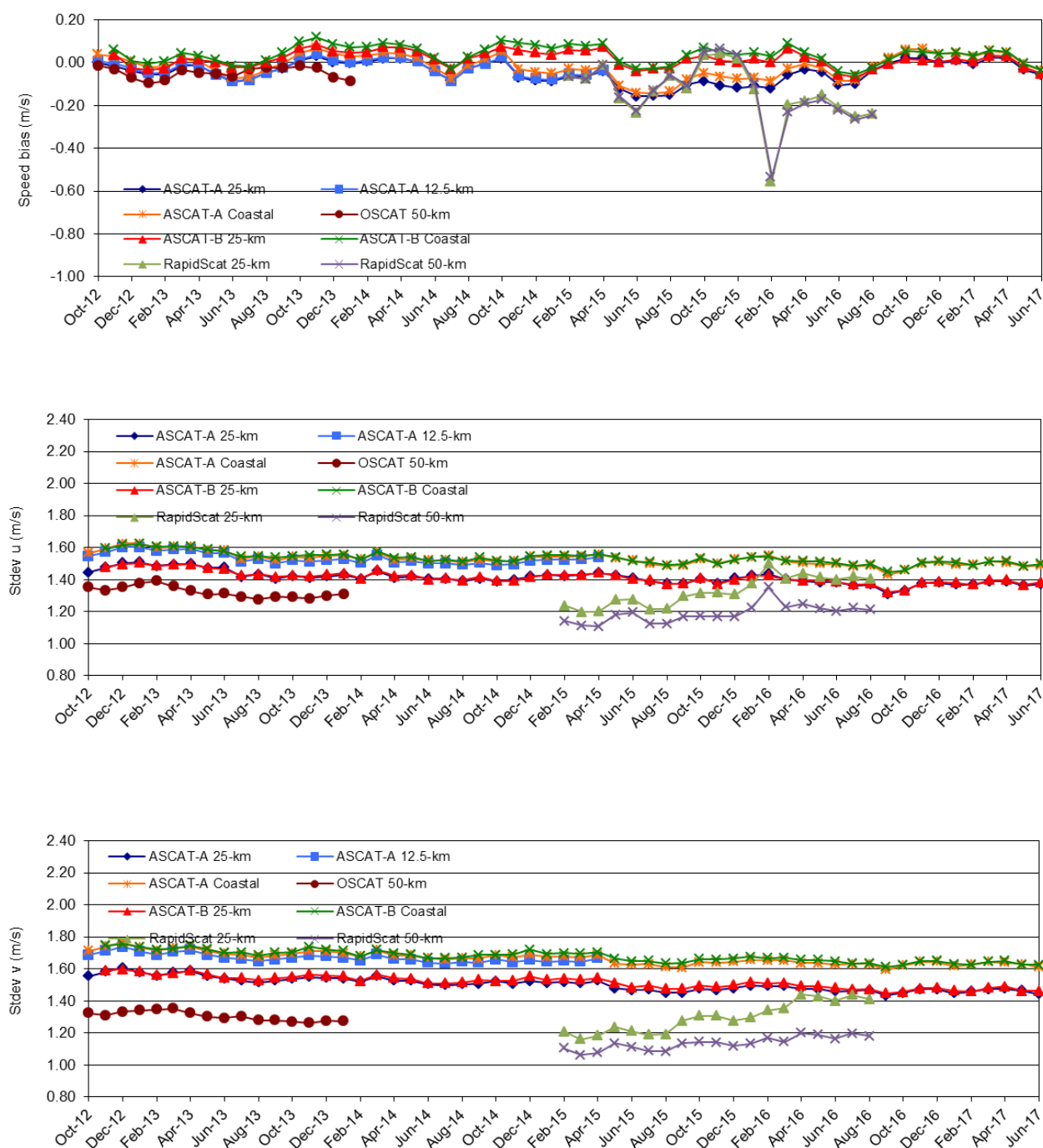


Figure 69: Comparison of scatterometer winds against ECMWF NWP forecast winds (monthly averages). For each product, the wind speed bias (scatterometer minus ECMWF, top), wind u component standard deviation (middle) and wind v component standard deviation (bottom) are shown.

5.4.2. Comparison with buoys

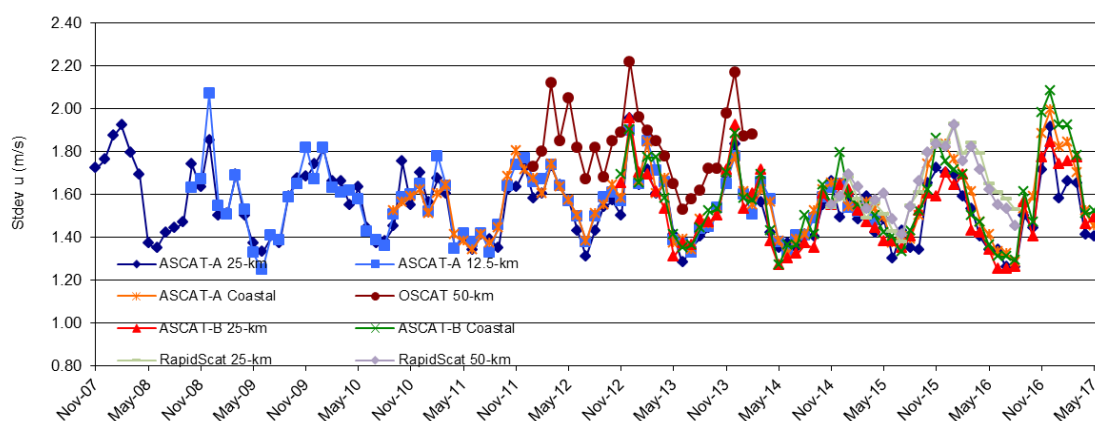
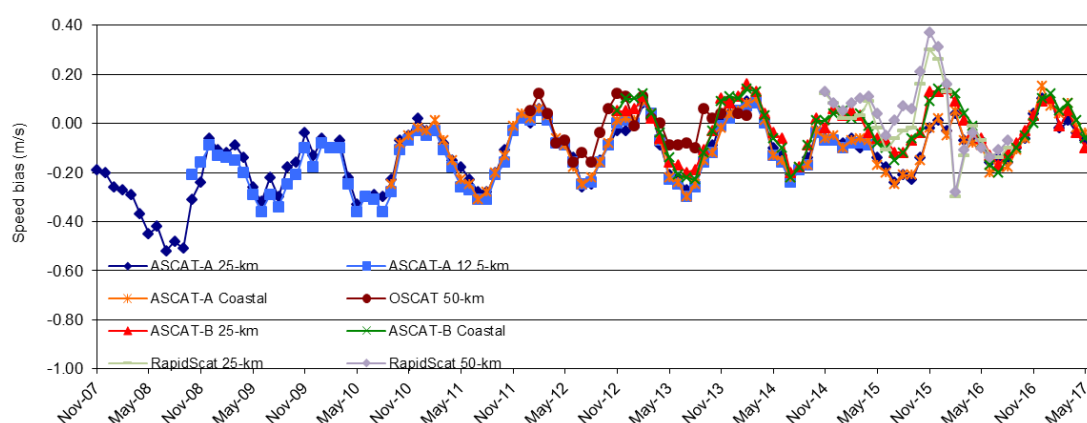
We compare the scatterometer winds with wind data from moored buoys on a monthly basis. The buoy data of approximately 150 buoys spread over the oceans (most of them in the tropical oceans and near Europe and North America) are retrieved from the ECMWF MARS archive and collocated with scatterometer winds. 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 June 2017.

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.



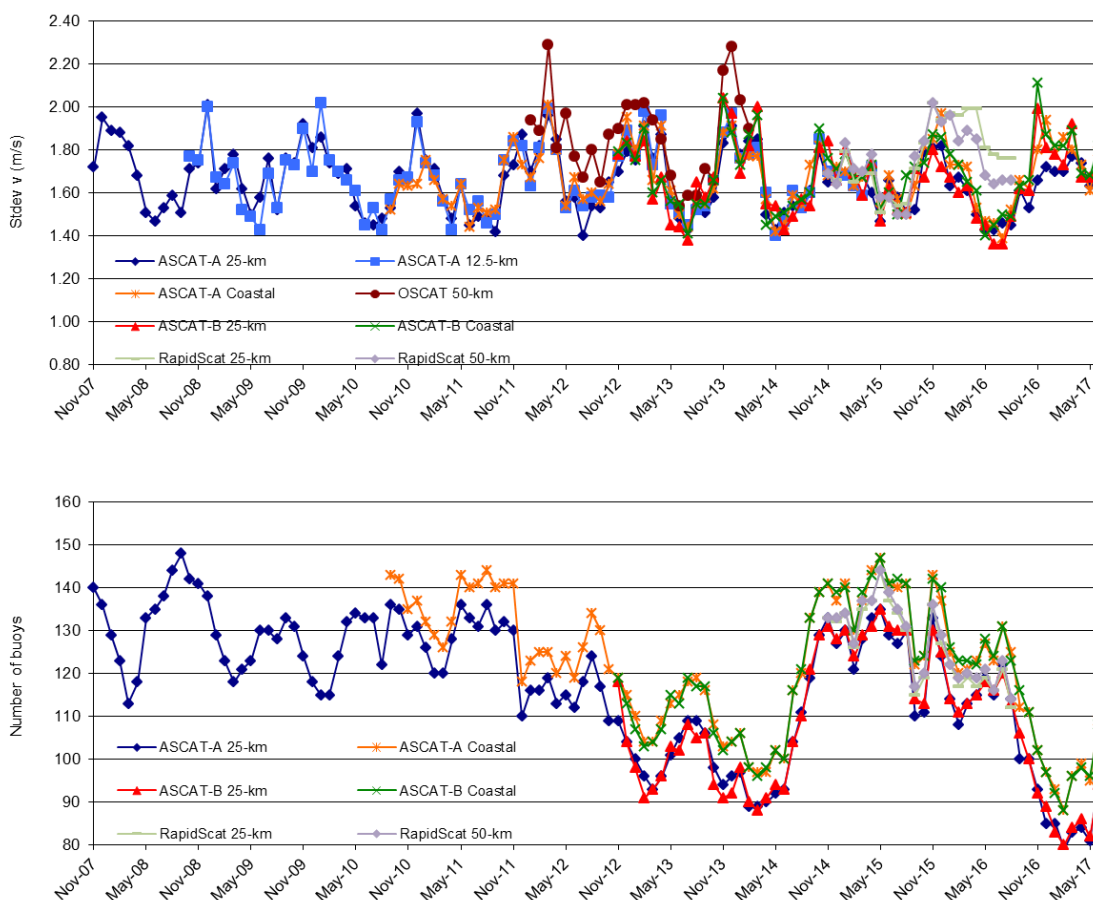


Figure 70: Comparison of scatterometer winds against buoy winds (monthly averages). For each product, the wind speed bias (scatterometer minus buoy, top), wind u component standard deviation (2nd plot) and wind v component standard deviation (3rd plot) are shown. Also the number of buoys available for 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
JAN. 2017		NA
FEB. 2017		NA
MAR. 2017		NA
APR. 2017	1079	NA
MAY 2017	1102	NA
JUN. 2017	1130	NA

Table 28: Statistics on central OSI SAF web site use over 1st half 2017.

The following graph illustrates the evolution of external registered users on the central web site.

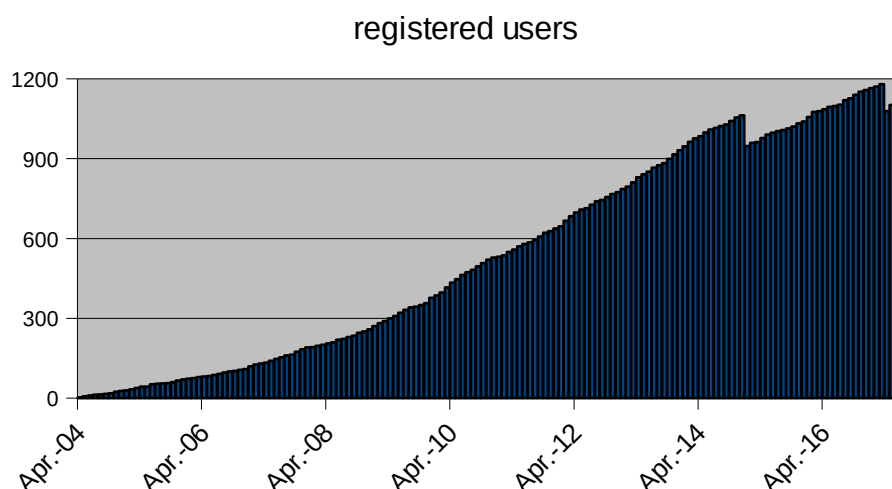


Figure 71: Evolution of external registered users on the central Web Site from April 2004 to JUN. 2017.

Comments : In December 2014, a first cleaning of the registered user was done (143 accounts with error feedback on their email were removed). In April 2017, a new cleaning was implemented.

On 23/03/2017, the web site www.osi-saf.org was unavailable.

After a review period from 24/01/2017 to 15/02/2017, the web site was refactored on 10-11/04/2017.

6.1.1.2. 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), Request for archived data (ARCHIVE),
Product not available (UNAVAIL), Request for information (INFO).

Reference	Date	subsystem	Category	Subject	Status
email	19/01/17	LML	INFO	Hourly and daily radiative fluxes over Europe. Which satellite ?	closed
email	20/01/17	general	INFO	Information on the visiting scientist program	closed
email	20/01/17	LML	ARCHIVE	Download of 1 year of radiative fluxes data from Ifremer FTP server	closed
email	26/01/17	LML	INFO	How to read NetCDF files	closed
email	30/01/17	LML	INFO	How to compare the radiative fluxes data with in situ measurements.	closed
email	01-2017	HL	Anomaly	Access to FTP server outage	closed
email	01-2017	HL	Info	Comment on low ice extent in Arctic	closed
170001	01/02/17	LML	ARCHIVE	How to get Meteosat SST	closed
email	03/02/17	HL	UNAVAIL	Problem to access to MET FTP server	closed
email	06/02/17	LML	UNAVAIL	GRIB dissemination of MSG SST stopped	closed
email	07/02/17	LML	INFO	SST around the Netherlands	closed
email	13/02/17	LML	UNAVAIL	Problem to access to Ifremer FTP server	closed
email	16/02/17	LML	INFO	Daily SSI retrieval	closed
email	28/02/17	HL	INFO	How to read SICO from HDF5 files	closed
email	02-2017	HL	Info	How to use ice concentration product, finding nearest neighbor	closed
email	02-2017	GHL	Archive	How to get access to data archive from Russia	closed
email	02-2017	HL	Archive	How to get access to detailed information on ice edge	closed
YouTube	02-2017	HL	Info	Comment on animation of change in Arctic ice extent on YouTube	closed
email	03/03/17	HL	INFO	Difference between SSMIS and AMSR-2 sea ice concentration	closed
email	09/03/17	WIND	INFO	Acknowledgment of OSI SAF products	closed
phone	14/03/17	LML	INFO	Free tool to open NetCDF ?	closed
email	15/03/17	LML	INFO	Access to radiative fluxes data, resolution ?	closed
email	22/03/17	LML	INFO	Access to L1/L2 data used for L3C MET	closed

Reference	Date	subsystem	Category	Subject	Status
				SST	
email	23/03/17	LML	INFO	Information about MET SSI	closed
170002	27/03/17	LML	ARCHIVE	Login/password to access FTP server	closed
email	03-2017	HL	Info	How to read ice conc data in GMT software	closed
email	03-2017	HL	Info	Timeliness of ice concentration product	closed
email	03-2017	HL	Info	Reading L3 SST GRIB files	closed
email	03-2017	HL	Anomaly	Question from CMEMS on sea ice concentration spurious ice	closed
Twitter	03-2017	HL	Info	Climate change comment based on OSI SAF data	closed
#3	27/04/17	general	INFO	Problem with review mode when writing a service message	closed
email	04-2017	HL	Info	Definition of ice edge product	closed
email	04-2017	HL	Info	Interview about potential sea ice satellite monitoring gap from PMW data	closed
email	04-2017	HL	Info	Info on available ice conc CDRs	closed
email	04-2017	HL	Info	Linking to OSI SAF products from Inspire Geoportal and GeoNorway portal	closed
email	04/05/17	HL	INFO	Request about the service message about unavailability of products	closed
#4	29/05/17	HL	INFO	Access to sea ice concentration and type data via FTP	closed
#5	02/06/17	general	INFO	Duplicate user account on the web site	closed
email	15/06/17	HL	INFO	Geolocation problem when opening Sea ice concentration product with Panoply	closed
email	27/06/17	HL	INFO	Request for OSI SAF product requirements document	closed
email	06-2017	HL	Archive	Access to archive of LR ice drift product	closed
email	06-2017	HL	Archive	Bug in attribute in product attribute in some archived ice conc files	closed

Table 29: 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
300036044	24/03/17	Access to archived ASCAT coastal winds	closed

Table 30: Status of requests from EUMETSAT Help Desk

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

Due to an upgrade of the operating system at MET, the system for analyzing the logs for the traffic on osisaf.met.no is not working. This is being fixed, but will not be in place for this HYR report.

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 2017. Only external sessions (from outside KNMI) are counted.

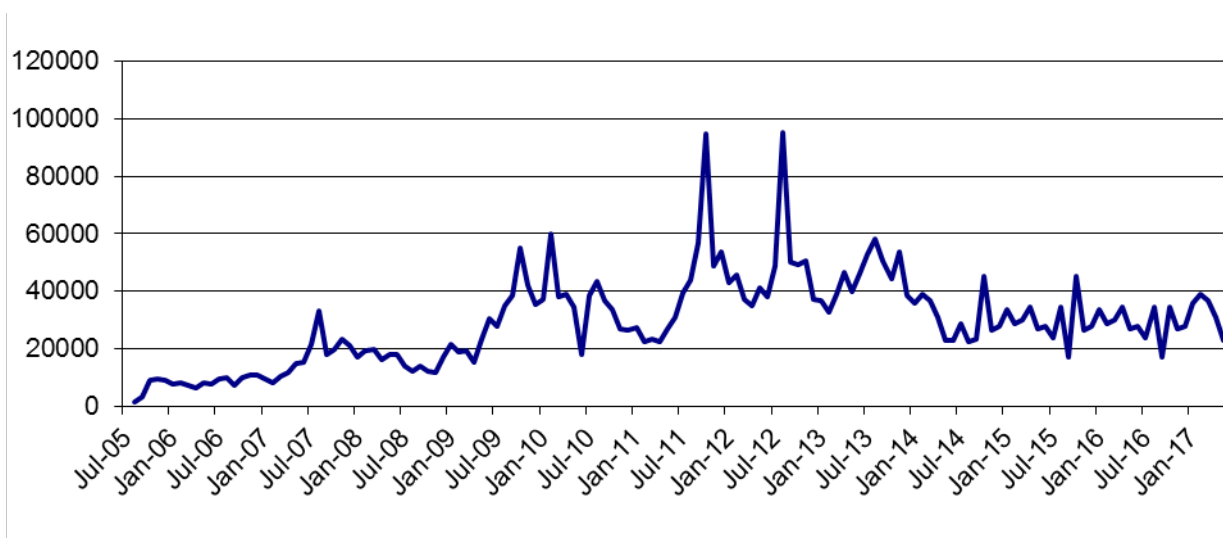


Figure 72: Number of page views on KNMI scatterometer website per month

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

The total number of OSI SAF helpdesk inquiries at scat@knmi in this half year was 30. All requests were acknowledged or answered within three working days. 21 were categorized as 'info', 8 as 'archive' and 1 as 'unavailable'.

6.2. Statistics on the FTP sites use

6.2.1. Statistics on the LML subsystem 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.

		JAN. 2017		FEB. 2017		MAR. 2017		APR. 2017		MAY 2017		JUN. 2017	
		Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC	Ifremer FTP	PO.DAAC
SST MAP +LML		0	x	1	x	0	x	0	x	1	x	0	x
SSI MAP +LML		0	x	0	x	0	x	0	x	0	x	0	x
DLI MAP +LML		0	x	0	x	0	x	0	x	0	x	3	x
OSI-201/-b	GBL SST	0	14546	2	1652	2	234	0	19	0	2232	0	1278
OSI-202/-b	NAR SST	0	1357	9	5289	731	339	0	3	4335	9053	5159	2742
OSI-204/-b	MGR SST	324499	95255	415947	234509	437861	54533	503527	3277	384719	66408	355072	49105
OSI-206	METEOSAT SST	26859	5573	8624	11148	40542	2063	46004	75	37194	52793	73487	1301
OSI-207	GOES-E SST	1454	3428	1294	8402	1446	1802	1369	0	1543	2303	1365	1077
OSI-208/-b	IASI SST	48426	28270	53243	58242	59200	13228	47287	1857	55032	44880	56928	32941
OSI-303	METEOSAT DLI	66	x	62	x	472	x	59	x	1915	x	60	x
OSI-304	METEOSAT SSI	64607	x	39998	x	121356	x	71959	x	62322	x	92823	x
OSI-305	GOES-E DLI	81	x	68	x	88	x	1150	x	61	x	62	x
OSI-306	GOES-E SSI	48524	x	6996	x	25685	x	14427	x	34453	x	46453	x

Table 31: Number of OSI SAF products downloaded from Ifremer FTP server and PO.DAAC server over 1st half 2017.

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

6.2.2. Statistics on the HL subsystem and CMEMS FTP site use

Sea Ice, SST and Flux products are available on MET Norway FTP server. Some products are also made available through Copernicus CMEMS, and statistics are kindly made available for these products.

Numbers for January and February are missing, due to failing archiving procedure for the FTP logs during this period.

		JAN. 2017		FEB. 2017		MAR. 2017		APR. 2017		MAY 2017		JUN. 2017	
		HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS
Downloaded sea ice products													
OSI-401	Global Sea Ice Concentration		2444		2455	11497	2580	58082	2945	32555	3859	37225	1656
OSI-402	Global Sea Ice Edge		124		116	27602	126	2760	242	5874	1363	3303	245
OSI-403	Global Sea Ice Type		192		301	20947	171	2652	577	37915	1185	13374	254
OSI-404	Global Sea Ice Emissivity		x		x	170	x	418	x	716	x	1061	x
OSI-405	Low resolution Sea Ice Drift		1995		1491	30642	1734	7974	1954	32777	1765	31395	802
OSI-407	Medium resolution Sea Ice Drift		x		x	5345	x	253	x	2394	x	10021	x
OSI-408	AMSR-2 Sea Ice Conc	NA	x	NA	x	1314	x	227	X	206	X	477	x
OSI-409/ OSI-409-a	Reprocessed Ice Concentration		7927		5739	15131	11	262725	5	35241	48	239975	4
OSI-430	Continuous Reproc Ice Concentration v1p2					4826	20	5282	1	5308	1	7650	0
OSI-450	Reprocessed Ice Concentration v2.0	NA	x	NA	x	NA	x	NA	x	45952	x	119838	x
Downloaded SST, DLI and SSI over the OSI SAF High Latitude FTP server													
OSI-203	AHL SST		x		x	451	x	269	x	601	x	352	x
OSI-301	AHL DLI		x		x	12	x	1	x	105	x	14	x
OSI-302	AHL SSI		x		x	15	x	0	x	17	x	0	x

Table 32: Number of OSI SAF products downloaded from OSI SAF Sea Ice FTP server over 1st half 2017

6.2.3. Statistics on the WIND subsystem 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.

		JAN. 2017		FEB. 2017		MAR. 2017		APR. 2017		MAY 2017		JUN. 2017	
		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	25 per file (BUFR), 21 per file (NetCDF)	43565	25 per file (BUFR), 21 per file (NetCDF)	1143957	25 per file (BUFR), 21 per file (NetCDF)	21770	20 per file (BUFR), 18 per file (NetCDF)	1879	20 per file (BUFR), 18 per file (NetCDF)	92600	20 per file (BUFR), 18 per file (NetCDF)	35636
OSI-102-b	ASCAT-B 25km	20 per file (BUFR), 15 per file (NetCDF)	64735	20 per file (BUFR), 15 per file (NetCDF)	311071	20 per file (BUFR), 15 per file (NetCDF)	39674	20 per file (BUFR), 16 per file (NetCDF)	763	20 per file (BUFR), 16 per file (NetCDF)	65346	20 per file (BUFR), 16 per file (NetCDF)	36033
OSI-103	ASCAT-A 12.5km	N/A	189147	N/A	593543	N/A	6073	N/A	5781	N/A	619	N/A	68132
OSI-104	ASCAT-A Coastal	30 per file (BUFR), 35 per file (NetCDF)	236693	30 per file (BUFR), 35 per file (NetCDF)	795403	30 per file (BUFR), 35 per file (NetCDF)	93826	25 per file (BUFR), 30 per file (NetCDF)	1639	25 per file (BUFR), 30 per file (NetCDF)	125952	25 per file (BUFR), 30 per file (NetCDF)	169023
OSI-104-b	ASCAT-B Coastal	35 per file (BUFR), 40 per file (NetCDF)	68711	35 per file (BUFR), 40 per file (NetCDF)	338982	35 per file (BUFR), 40 per file (NetCDF)	59827	35 per file (BUFR), 40 per file (NetCDF)	988	35 per file (BUFR), 40 per file (NetCDF)	62968	35 per file (BUFR), 40 per file (NetCDF)	69217

Table 33: Number of OSI SAF products downloaded from KNMI FTP server and PO.DAAC server over 1st half 2017

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 34 shows the overall number of OSI SAF users by country at 28/07/2017.

Albania	3	Greece	13	Poland	11
Algeria	4	Guinea	2	Portugal	5
Angola	3	Guinea-Bissau	3	Oman	3
Armenia	1	Hungary	8	Reunion	1
Austria	19	Iceland	1	Romania	5
Azerbaijan	3	India	2	Russian Federation	6
Bahrain	1	Iran, Islamic Republic Of	21	Rwanda	5
Belgium	9	Iraq	1	San Marino	1
Benin	5	Ireland	5	Sao Tome And Principe	2
Bosnia And Herzegovina	1	Isle Of Man	1	Saudi Arabia	4
Botswana	6	Israel	8	Senegal	8
Brazil	4	Italy	256	Serbia	3
Bulgaria	2	Jordan	1	Sevchelles	2
Burkina Faso	3	Kazakhstan	4	Sierra Leone	2
Burundi	2	Kenya	12	Slovakia	4
Cameroon	3	Korea, Republic Of	1	Slovenia	1
Canada	2	Kuwait	1	Somalia	1
Cape Verde	2	Kyrgyzstan	1	South Africa	19
Central African Republic	2	Latvia	1	South Sudan	1
Chad	2	Lebanon	3	Spain	43
China	3	Lesotho	4	Sudan	3
Comoros	2	Liberia	2	Swaziland	3
Congo	2	Libyan Arab Jamahiriya	1	Sweden	3
Congo, The Democratic Republic Of The	5	Lithuania	2	Switzerland	11
Cote D'Ivoire	5	Luxembourg	1	Syrian Arab Republic	1
Croatia	2	Macedonia, The Former Yugoslav Republic Of	2	Tajikistan	1
Cyprus	1	Madagascar	6	Tanzania, United Republic Of	5
Czech Republic	16	Malawi	3	Togo	3
Denmark	6	Mali	3	Tunisia	2
Djibouti	2	Malta	2	Turkey	6
Egypt	4	Mauritania	3	Turkmenistan	1
Equatorial Guinea	2	Mauritius	7	Uganda	4
Eritrea	2	Moldova, Republic Of	1	Ukraine	2
Estonia	3	Morocco	4	United Arab Emirates	4
Ethiopia	6	Mozambique	5	United Kingdom	117
Finland	4	Namibia	6	United States	3
France	52	Netherlands	27	Uzbekistan	1
Gabon	1	Niger	7	Viet Nam	1
Gambia	3	Nigeria	6	Yemen	1
Germany	97	Norway	4	Zambia	3
Ghana	10	Oman	2	Zimbabwe	4

Table 34: Overall number of EUMETCast users by country at 28/07/2017

6.3.2. Users and retrievals from EUMETSAT Data Center

Orders Summary over the 1st half 2017

The table below lists the products downloaded from the EUMETSAT Data Center (EDC), the volume of the downloaded data in megabytes (MB) and the number of files over the 1st half 2017.

	Item	Volume in MB	Number of files
OSI-401 series	F-17_OSICOGB_OPE	1	1
OSI-305 (daily)	GOES-13_OSIDDLI_OPE	2594	616
OSI-306 (daily)	GOES-13_OSIDSSI_OPE	5510	522
OSI-305 (hourly)	GOES-13_OSIHDLI_OPE	303578	26388
OSI-306 (hourly)	GOES-13_OSIHSSI_OPE	77086	11460
OSI-207	GOES-13_OSIHSST_OPE	17	24
OSI-207 (NetCDF)	GOES-13_OSIHSSTN_OPE	19250	2972
OSI-109 series	ISS_ORSW025_OPE	1114	1820
OSI-102-b	M01_OAS025_OPE	863	620
OSI-104-b	M01_OASWC12_OPE	23588	3425
OSI-201-b	M01_OSSTGLB_OPE	37	2
OSI-103	M02_OAS012_OPE	11386	3316
OSI-102	M02_OAS025_OPE	4358	2293
OSI-103 ?	M02_OASW012_OPE	23335	2588
OSI-104	M02_OASWC12_OPE	73871	20991
OSI-401 series	MML_OSICOGB_OPE	2547	708
OSI-405 series	MML_OSIDRGB_OPE	3186	4560
OSI-402 series	MML_OSIEDGB_OPE	1	5
OSI-403 series	MML_OSITYGB_OPE	17	17
OSI-203	MML_OSSTAHL_OPE	368	906
OSI-303 (hourly)	MSG1_OSIHDLI_OPE	14878	151
OSI-304 (hourly)	MSG1_OSIHSSI_OPE	8870	151
OSI-303 (daily)	MSG2_OSIDDLI_OPE	2723	1
OSI-304 (daily)	MSG2_OSIDSSI_OPE	4502	31
OSI-303 (hourly)	MSG2_OSIHDLI_OPE	28683	47
OSI-303 (daily)	MSG3_OSIDDLI_OPE	5617	613
OSI-304 (daily)	MSG3_OSIDSSI_OPE	5376	510
OSI-303 (hourly)	MSG3_OSIHDLI_OPE	86299	10905
OSI-304 (hourly)	MSG3_OSIHSSI_OPE	477901	73122
OSI-206 (NetCDF)	MSG3_OSIHSSTN_OPE	33750	2976

Table 35: Volume of data downloaded (in MB) by products from EDC over 1st half 2017

Ingestion Summary over the 1st half 2017

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.

	Product	JAN. 2017	FEB. 2017	MAR. 2017	APR. 2017	MAY 2017	JUN. 2017
OSI-404	Global Sea Ice Emissivity (DMSP-F18)	100	100	100	100	96.7	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)	99.8	100	100	99.5	100	100
OSI-306	Hourly Surface Solar Irradiance (GOES-13)	100	100	100	99.5	100	100
OSI-207	Hourly Sea Surface Temperature (GOES-13)	100	99.8	100	99.5	100	99.5
OSI-408	Sea Ice Concentration (AMSR-2)	-	-	-	100	100	100
OSI-102-b	ASCAT 25km Wind (Metop-B)	100	100	100	100	100	100
OSI-104-b	ASCAT 12.5km Coastal Wind (Metop-B)	100	100	99.5	100	99.7	100
OSI-102	ASCAT 25km Wind (Metop-A)	99.7	99.7	100	100	92.6	100
OSI-104	ASCAT 12.5km Coastal Wind (Metop-A)	99.7	100	99.7	100	92.6	100
OSI-201-b	Global Sea Surface Temperature (Metop-B)	100	100	100	100	100	100
OSI-202-b	NAR Sea Surface Temperature (Metop-B)	100	100	100	100	100	100
OSI-407	Global Sea Ice Drift (Multi Mission)	100	100	98.38	98.3	96.7	100
OSI-205	SST/IST L2	100	100	100	100	100	100
OSI-301	AHL Downward Longwave Irradiance (Multi Mission)	100	100	100	100	100	100
OSI-401	Global Sea Ice Concentration (DMSP-18)	100	100	100	100	100	100
OSI-405	Global Low Resolution Sea Ice Drift	100	100	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)	99.8	100	100	99.5	99.7	100
OSI-304	Hourly Surface Solar Irradiance (MSG)	99.8	100	100	99.5	99.7	99.8
OSI-206	Hourly Sea Surface Temperature (MSG)	100	100	99.8	99.4	100	99.4
OSI-202-b	NAR Sea Surface Temperature (NPP)	100	100	100	100	100	100

Table 36: Percentage of received OSI SAF products in EDC in 1st half 2017

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	Latest version	date
Algorithm Theoretical Basis Document for the OSI SAF wind products	SAF/OSI/CDOP2/KNMI/SCI/MA/197	1.4	Feb. 2017
ERS L2 winds Data Record validation report OSI-152	SAF/OSI/CDOP2/KNMI/TEC/RP/278	1.1	Feb. 2017
ERS L2 winds Data Record Product User Manual OSI-152	SAF/OSI/CDOP2/KNMI/TEC/MA/279	1.1	Feb. 2017
Global Sea Ice Concentration Reprocessing Product User Manual OSI-409, OSI-409-a, OSI-430	SAF/OSI/CDOP3/MET-Norway/TEC/MA/138	2.5	18/05/2017
OSI SAF High Latitudes L2 Sea and Sea Ice Surface Temperature PUM OSI-205	SAF/OSI/CDOP3/DMI/TEC/MA/246	1.1	23/05/2017
OSI SAF Validation Report for Global Sea Ice Concentration OSI-401-b	SAF/OSI/CDOP2/DMI/SCI/RP/225	1.2	18/04/2017
OSI SAF Product User Manual for Global Sea Ice Concentration OSI-401-b	SAF/OSI/CDOP3/DMI_MET/TEC/MA/204	1.5	10/05/2017

Table 37: Documentation updates