Half-Yearly Operations Report

1st half 2018

Version : 1.1

Date : 30/10/2018

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Document Change record

Document version	Date	Author	Change description
1.0	12/09/2018	CH	First version
1.1	30/10/2018	CH	Updated after Operation Review n° 14 in October 2018 (see review report for answer to RIDs)

Table of contents

1. Introduction

1.1. Scope of the document

The present report covers from 1st January of 30th June 2018.

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

- Low and Mid latitude (LML) Centre (Sub-System 1, SS1), under M-F responsibility, processes and distributes the SST and Radiative Fluxes products covering LML, North Atlantic Regional (NAR) and Global areas. Ifremer contributes to the products distribution and archiving,
- High Latitude (HL) Centre (Sub-System 2, SS2), under MET Norway responsibility with the co-operation of DMI, processes and distributes the Global Sea Ice products, the High Latitude SST and the High Latitude Radiative Fluxes,
- Wind Centre (Sub-System 3, SS3), under KNMI responsibility, processes and distributes the Wind products.

1.2. Products characteristics

The characteristics of the current products are specified in the Service Specification Document [AD.1] available on http://osi-saf.eumetsat.int, the OSI SAF web site.

Three values are usually available for accuracy requirements, for each product:
- The threshold accuracy is the minimum acceptable
- The target (or breakthrough) accuracy is the desired performance level
- The optimal accuracy

In this report, the product performance is compared to the target accuracy. If the values do not meet the target accuracy but are compliant to the threshold accuracy, it is considered useful to distribute the product anyway.

According to OSI-SS-GEN-101 in SeSp [AD.1], operational OSI SAF products accuracy should be better than the value specified as threshold accuracy in the products tables when input satellite data are available with the nominal level of quality (on monthly basis).

1.3. Applicable documents

[AD.1] OSI SAF
CDOP 3 Service Specification (SeSp)
SAF/OSI/CDOP3/MF/MGT/PL/003, version 1.5, 24 May 2018

1.4. Reference documents

[RD.1] ASCAT Wind Product User Manual
OSI-102, OSI-102-b, OSI-103 (discontinued), OSI-104, 0SI-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] ScatSat-1 wind Product User Manual
OSI-112-a, OSI-112-b
SAF/OSI/CDOP2/KNMI/TEC/MA/287

[RD.4] ASCAT L2 winds Data Record Product User Manual
OSI-150-a, OSI-150-b
SAF/OSI/CDOP2/KNMI/TEC/MA/238

[RD.5] Reprocessed SeaWinds L2 winds Product User Manual
OSI-151-a, OSI-151-b
SAF/OSI/CDOP2/KNMI/TEC/MA/220

[RD.6] ERS L2 winds Data Record Product User Manual
OSI-152
SAF/OSI/CDOP2/KNMI/TEC/MA/279

[RD.7] Oceansat-2 L2 winds Data Record Product User Manual
OSI-153-a, OSI-153-b
SAF/OSI/CDOP3/KNMI/TEC/MA/297

[RD.8] Low Earth Orbiter Sea Surface Temperature Product User Manual
OSI-201-b, OSI-202-b, OSI-204-b, OSI-208-b
SAF/OSI/CDOP3/MF/TEC/MA/127

[RD.9] Atlantic High Latitude L3 Sea Surface Temperature Product User Manual
OSI-203
SAF/OSI/CDOP/met.no/TEC/MA/115

[RD.10]Geostationary Sea Surface Temperature Product User Manual
OSI-206-a, OSI-207-a, OSI-IO-SST
SAF/OSI/CDOP3/MF/TEC/MA/181

[RD.11]Atlantic High Latitude Radiative Fluxes Product User Manual
OSI-301, OSI-302
SAF/OSI/CDOP/met.no/TEC/MA/116

[RD.12]Geostationary Radiative Flux Product User Manual
OSI-303-a, OSI-304-a, OSI-305-a, OSI-306-a, OSI-IO-DLI, OSI-IO-SSI
SAF/OSI/CDOP3/MF/TEC/MA/182

[RD.13]Product User Manual for OSI SAF Global Sea Ice Concentration
OSI-401-b
SAF/OSI/CDOP3/DMI_MET/TEC/MA/204

[RD.14]Global Sea Ice Edge and Type Product User's Manual
OSI-402-c, OSI-403-c
SAF/OSI/CDOP2/MET-Norway/TEC/MA/205

[RD.15]50 Ghz Sea Ice Emissivity Product User Manual
OSI-404
SAF/OSI/CDOP3/DMI/TEC/MA/191

[RD.16]Low Resolution Sea Ice Drift Product User's Manual
OSI-405-c
SAF/OSI/CDOP/met.no/TEC/MA/128

[RD.17]Medium Resolution Sea Ice Drift Product User Manual
OSI-407
SAF/OSI/CDOP/DMI/TEC/MA/137

[RD.18]Global Sea Ice Concentration Reprocessing Product User Manual
OSI-409, OSI-409-a, OSI-430
SAF/OSI/CDOP3/MET-Norway/TEC/MA/138

[RD.19]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
SSMI	Special Sensor Microwave Imager
SSMIS	Special Sensor Microwave Imager and Sounder
SST/IST	Sea Surface Temperature/ sea Ice Surface Temperature
SST	Sea Surface Temperature
TBC	To Be Confirmed
TBD	To Be Defined
WMO	World Meteorological Organisation

Table 1: Definitions, acronyms and abbreviations

2. OSI SAF products availability and timeliness

As indicated in the Service Specification Document [AD-1], operational OSI SAF products are expected to be available for distribution within the specified time in more than **95%** of the cases where input satellite data are available with the nominal level of quality, on monthly basis.
Section 2.1 shows the measured availability on the OSI SAF 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. 2018	FEB. 2018	MAR. 2018	APR. 2018	MAY 2018	JUN. 2018
OSI-102	ASCAT-A 25 km Wind	99.8	99.9	99.9	99.6	99.9	99.9
OSI-102-b	ASCAT-B 25 km Wind	99.9	99.9	100	99.4	99.9	99.8
OSI-104	ASCAT-A Coastal Wind	99.9	99.8	100	99.5	100	99.7
OSI-104-b	ASCAT-B Coastal Wind	99.3	99.9	99.9	99.4	99.9	99.8
OSI-201-b	GBL SST	100	100	100	100.0	100.0	98.3
OSI-202-b	NAR SST	100	100	98.4	99.2	99.2	95.8
OSI-203	AHL SST/IST (L3)	100	100	100	96.7	100	100
OSI-204-b	MGR SST	100	99.2	100	99.9	99.3	100
OSI-205	SST/IST (L2)	100	95.7	100	100	100	99.9
OSI-206/-a	Meteosat SST	99.7	99.6	99.9	99.3	98.6	99.3
OSI-207-a	GOES-East SST	99.9	99.4	99.2	99.2	99.7	99.3
OSI-208-b	IASI SST	100	99.7	100	99.9	99.3	100
OSI-301	AHL DLI	100	100	100	96.7	100	100
OSI-302	AHL SSI	100	100	100	96.7	100	100
OSI-303/-a	Meteosat DLI - hourly	99.5	100	99.7	99.0	98.9	99.4
	Meteosat DLI - daily	100	100	100	100	93.5	100
OSI-304/-a	Meteosat SSI - hourly	99.5	100	99.7	99.0	98.9	99.4
	Meteosat SSI - daily	100	100	100	100	93.5	100
OSI-305-a	GOES-East DLI - hourly	98.7	96.3	96.1	99.4	92.6	96.1
	GOES-East DLI - daily	100	100	100	100	83.9	100
OSI-306-a	GOES-East SSI - hourly	98.7	96.3	96.1	99.4	92.6	96.1
	GOES-East SSI - daily	100	100	100	100	83.9	100
OSI-401-b	Global Sea Ice Concentration (SSMIS)	100	100	100	100	100	100
OSI-402-c	Global Sea Ice Edge	96.8	100	100	96.7	100	100
OSI-403-c	Global Sea Ice Type	96.8 [1)]	100	100	96.7	100	100
OSI-404	Global Sea Ice Emissivity	100	100	100	100	100	96.7
OSI-405-c	Low Res. Sea Ice Drift	96.8 [1)]	100 [1)]	100[1)]	96.7 [1)]	100	100
OSI-407	Medium Res. Sea Ice Drift	100	100	100	91.5	100	98.2
OSI-408	Global Sea Ice Concentration (AMSR-2)	100	100	100	100	100	96.7
OSI-430	Global Reproc Sea Ice Conc Updates	100	95.8	100	100	100	100

Table 2: Percentage of OSI SAF products available on the OSI SAF FTP servers within the specified time over 1st half 2018.

2.2. Availability via EUMETCast

Ref.	Product	JAN. 2018	FEB. 2018	MAR. 2018	APR. 2018	MAY 2018	JUN. 2018
OSI-102	ASCAT-A 25 km Wind	99.8	99.9	99.9	99.6	99.9	99.9
OSI-102-b	ASCAT-B 25 km Wind	99.9	99.9	100	99.4	99.9	99.8
OSI-104	ASCAT-A Coastal Wind	99.9	99.8	100	99.5	100.0	99.7
OSI-104-b	ASCAT-B Coastal Wind	99.3	99.9	99.9	99.4	99.9	99.8
OSI-201-b	GBL SST	98.4	100	100	100	96.8	100
OSI-202-b	NAR SST	100	100	98.4	100	96.8	100
OSI-203	AHL SST/IST (L3)	100	100	100	96.7	100	100
OSI-204-b	MGR SST	98.1	99.9	99.9	99.5	99.8	99.7
OSI-205	SST/IST (L2)	100	95.7	100	100	100	99.9
OSI-206/-a	Meteosat SST	100	100	99.9	98.9	99.7	99.6
OSI-207-a	GOES-East SST	99.4	100	99.0	98.6	99.3	99.2
OSI-208-b	IASI SST	99.9	100	100	99.5	99.7	99.7
OSI-301	AHL DLI	100	100	100	96.7	100	100
OSI-302	AHL SSI	100	100	100	96.7	100	100
OSI-303	Meteosat DLI - hourly	99.7	100	99.9	98.7	99.7	99.6
	Meteosat DLI - daily	100	100	100	100	100	100
OSI-304	Meteosat SSI - hourly	99.7	100	99.9	98.7	99.7	99.6
	Meteosat SSI - daily	100	100	100	100	100	100
OSI-305	GOES-East DLI - hourly	99.2	97.8	96.8	97.5	94.6	98.1
	GOES-East DLI - daily	100	100	96.8	100	93.5	100
OSI-306	GOES-East SSI - hourly	99.2	97.8	96.8	97.5	94.6	98.1
	GOES-East SSI - daily	100	100	96.8	100	93.5	100
OSI-401-b	Global Sea Ice Concentration (SSMIS)	100	100	100	100	100	100
OSI-402-b/c	Global Sea Ice Edge	100	100	100	96.7	100	100
OSI-403-b/c	Global Sea Ice Type	100	100	100	96.7	100	100
OSI-404	Global Sea Ice Emissivity	100	100	100	100	100	96.7
OSI-405-b/c	Low Res. Sea Ice Drift	100	100	100	96.7	100	100
OSI-407	Medium Res. Sea Ice Drift	100	100	100	91.5	100	98.2
OSI-408	Global Sea Ice Concentration (AMSR-2)	100	100	100	100	100	96.7

Table 3: Percentage of OSI SAF products delivered via EUMETCast within the specified time over 1st half 2018.

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 http://osi-saf.eumetsat.int.

3.1. At Low and Mid-Latitudes subsystem (Météo-France and Ifremer)

Date	Impacted products or services	Anomaly	Corrective and preventive measures
2018-01 and 2018-02 and 2018-03	GOES-East SST, SSI-DLI OSI-207-a, OSI-305-a, OSI-306-a	No input data from NOAA (through EUMETCast) • on 2018-01-06 from 0300 to 2018-01-07 0000 UTC • on 2018-01-28 from 1700 to 2018-01-29 0000 UTC • on 2018-02-16 from 1200 to 2018-02-17 1500 UTC • on2018-03-17 from 0200 to 2018-03-18 0100 UTC	Antenna for direct reception planned
2018-04-14	All LML products	Outage of the LML FTP server had an outage from 21:32 to 04:57 UTC	
2018-05	GOES-East SST, SSI-DLI OSI-207-a, OSI-305-a, OSI-306-a	No input data from NOAA (through EUMETCast) • on 2018-05-14 from 1000 to 2018-05-15 1600 UTC • on 2018-05-21 from 1500 to 2018-05-22 1900 UTC • on 2018-05-24 from 1200 to 2018-05-25 0700 UTC	Antenna for direct reception planned

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

Date	Impacted products or services	Anomaly	Corrective and preventive measures
2018-01-05	All HL products	The HL FTP server (MET Norway) had an outage due to problems during an internal upgrade (but not at the time when the timeliness is measured).	Users were informed.
2018-01-06	MR Sea Ice Drift OSI-407	Short disruption in the production of the product due to delayed input files.	Users were informed
2018-01-20	SSMIS Sea Ice Concentration OSI-401-b	Missing data in the gridded ice concentration field	Users were informed

Date	Impacted products or services	Anomaly	Corrective and preventive measures
2018-03-12	AMSR Sea Ice Concentration OSI-408	Due to a malfunction in the production machine data were missing in the products on 10 and 13 March.	Users were informed and the faulty machine was replaced
2018-04-12	All products made at MET Norway OSI-402,403,405,430, 203, 301,302	A severe outage of the production system at MET Norway made it necessary to rebuild the OSI SAF production system. Products for this day were delayed.	Users were informed.
2018-04-28	MR Sea Ice Drift OSI-407	Due to a technical error on product was not distributed. Moreover, in the beginning of April, some products were delayed. This explain the availability of only 91.5 % in April.	Users were informed and the product was redistributed. More checks will be implemented to catch such delay issues.
2018-06-13	Sea Ice Concentration OSI-401-b, OSI-408	One product for both SSMIS and AMSR sea ice concentration were not distributed automatically.	Users were informed and the products were distributed
2018-06-20	MR Sea Ice Drift OSI-407	Due to a technical issue one product was not generated.	Users were informed

Regarding footnote 1) in Table 3: The numbers marked with 1) are estimates. Due to a check in the production scripts for sea ice production at MET Norway that was activated by mistake, the sea ice production and distribution was activated three time in a row (one hour separated), instead of one. The time stamp on the files last distributed were therefore later than the timeliness, but the products were (probably) within timeliness at the first distribution.

3.3. At Wind subsystem (KNMI)

Date	Impacted products or services	Anomaly	Corrective and preventive measures

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 http://osi-saf.eumetsat.int.

4.1. At Low and Mid-Latitudes subsystem (Météo-France and Ifremer)

Date	Impacted products or services	Events and modifications, maintenance activities
2018-02-20	Meteosat SST, DLI, SSI OSI-206-a, OSI-303-a, OSI-304-a	Meteosat-11 replaces Meteosat-10 as input for SST and radiative fluxes
2018-02-22	GOES-East SST, OSI-207-a,	First tuning of the algorithm coefficients (GOES-16 SST pre-operational since December 2017)
2018-02-26	GOES-East DLI, SSI OSI-305-a, OSI-306-a	First tuning of the algorithm coefficients (GOES-16 DLI & SSI pre-operational since December 2017)
2018-04-10	All LML products distributed on Ifremer FTP server	Upgrade of the LML FTP server at Ifremer, with improved reliability and sustainability of its operational services, as well as improving their consistency and costsharing. This new large storage system extends the amount of online OSI SAF products by providing access to the complete OSI SAF archive. A backup FTP server is now also available, with a rolling archive of one week. HHTPS and Thredds are also available.
2018-06-07	GOES-East SST, DLI, SSI OSI-207-a, OSI-305-a, OSI-306-a	The GOES-16 interruptions issue is now solved thanks to the antenna installed in Météo-France Lannion and the capability to use the data received directly from the satellite and pre-processed in Météo-France Center for Satellite Meteorology. The GOES-16 data on EUMETCast are now used as backup.

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

Date	Impacted products or services	Events and modifications, maintenance activities
2018-04-05	SSMIS sea ice concentration OSI-401-b sea ice edge OSI-402-c sea ice type OSI-403-c	Discontinuation of GRIB and HDF5 format
2018-04-23	SSMIS sea ice concentration OSI-401-b	F17 used again (after interruption from 2016-11) F15 no longer used So F16, F17 and F18 are currently used “coastal_correction” flag added

Date	Impacted products or services	Events and modifications, maintenance activities
2018-01-10	FTP and HTTP	FTP and HTTP servers were moved to new infrastructure.

4.3. At Wind subsystem (KNMI)

Date	Impacted products or services	Events and modifications, maintenance activities
2018-06-19	5.7 km ASCAT wind product	Distributed as a demonstration product Available from Metop-A and Metop-B Using CMOD7 and contain stress-equivalent ECMWF background model winds as auxiliary data
2018-07	ScatSat Winds (OSI-112)	Waiting for SG approval to close the ORR and move to operational status.

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

Date	Impacted products	Release
2018-04-25	MSG/SEVIRI Sea Surface Temperature data record OSI-250 10.15770/EUM_SAF_OSI_0004	First release From Meteosat-8 and Meteosat-9 (2004-01-19 to 2012-12-31) Hourly and remapped onto a 0.05° regular grid GHRSST GDS v2 compliant

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.

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

- monthly mean difference (Mean difference req. in following tables) less than 0.5 K,
- monthly difference standard deviation (Std Dev req. in following tables) less than 1 K for the geostationary products (Meteosat and GOES-East SST), and 0.8 K for the polar ones (GBL, NAR, AHL, MGR and IASI SST).

Daytime statistics are also provided for information.

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

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

In the following maps, there are at least 5 matchups (satellite and in situ measurements) per box. Monthly maps of number of matchups in each box are available on the web site.

5.1.1. Meteosat SST (OSI-206, OSI-206-a) quality

The following maps indicate the mean night-time and day-time SST mean difference with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://osi-saf.eumetsat.int/lml/#qua_SST%Metop%20GBL%20SST_monthly%20map_monthly_Night%20time.

The operational SST retrieval from Meteosat and GOES-East updated chain validation report v1.1 (http://osi-saf.eumetsat.int/lml/#doc_SST) gives further details about the regional mean difference observed.

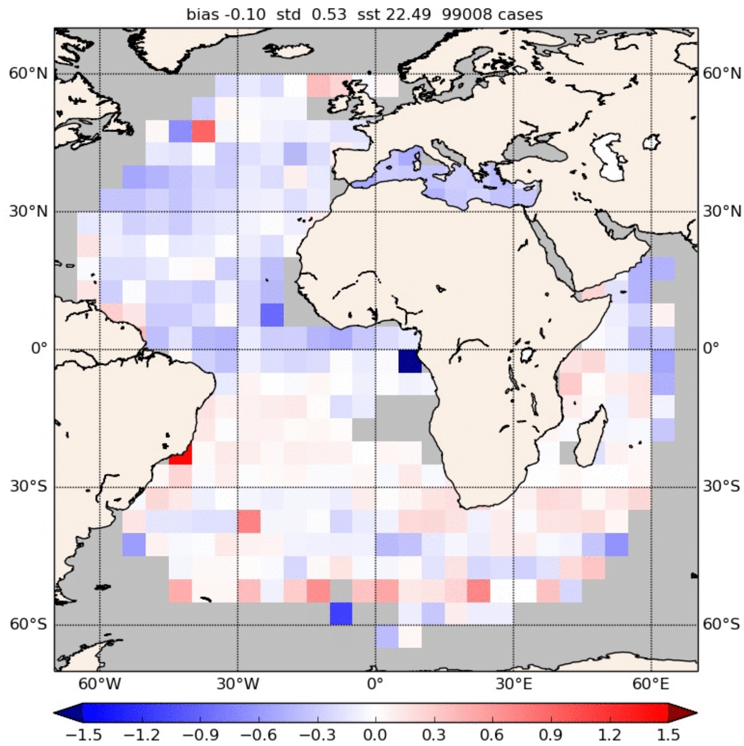


Figure 1: Mean Meteosat night-time SST mean difference with respect to buoys measurements for quality level 3,4,5

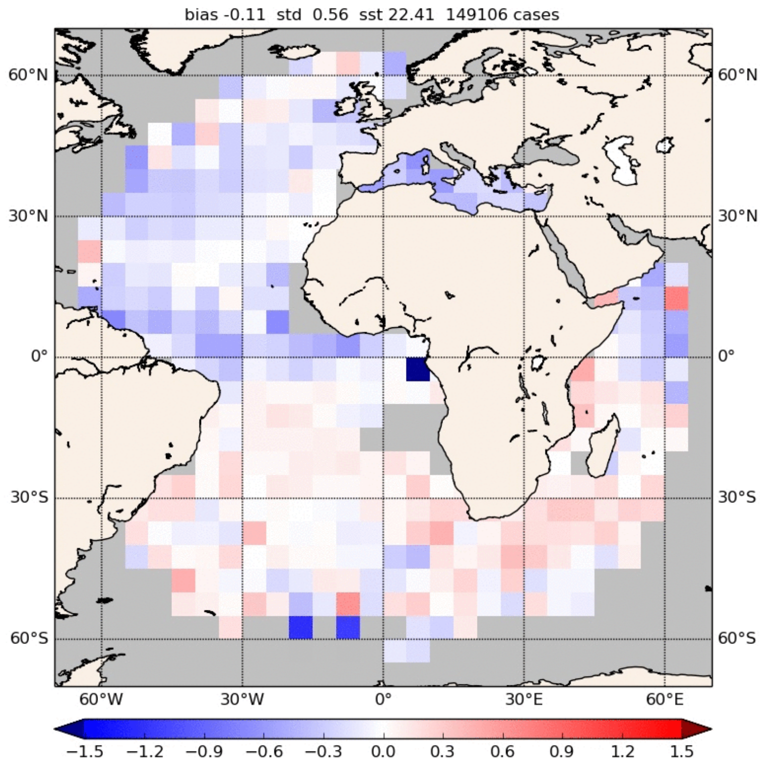


Figure 2: Mean Meteosat day-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

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

Meteosat night-time SST quality results over 1st half 2018							
Month	Number of cases	mean diff. °C	mean diff. req °C	mean diff. margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JAN. 2018	14781	-0.06	0.5	88	0.49	1	51
FEB. 2018	13923	-0.04	0.5	92	0.53	1	47
MAR. 2018	21512	-0.13	0.5	74	0.51	1	49
APR. 2018	21369	-0.07	0.5	86	0.52	1	48
MAY 2018	19287	-0.15	0.5	70	0.60	1	40
JUN. 2018	22654	-0.13	0.5	74	0.52	1	48
Meteosat day-time SST quality results over 1st half 2018							
JAN. 2018	24604	-0.05	0.5	90	0.48	1	52
FEB. 2018	20478	-0.01	0.5	98	0.53	1	47
MAR. 2018	28746	-0.08	0.5	84	0.47	1	53
APR. 2018	28489	0.06	0.5	88	0.46	1	54
MAY 2018	30439	-0.21	0.5	58	0.75	1	25
JUN. 2018	38944	-0.18	0.5	64	0.56	1	44
(*) Mean difference margin = 100 * (1 - (| mean difference / mean difference 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 2018, for 3, 4, 5 quality indexes.

Comments:
Overall statistics are good and within the requirement.

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

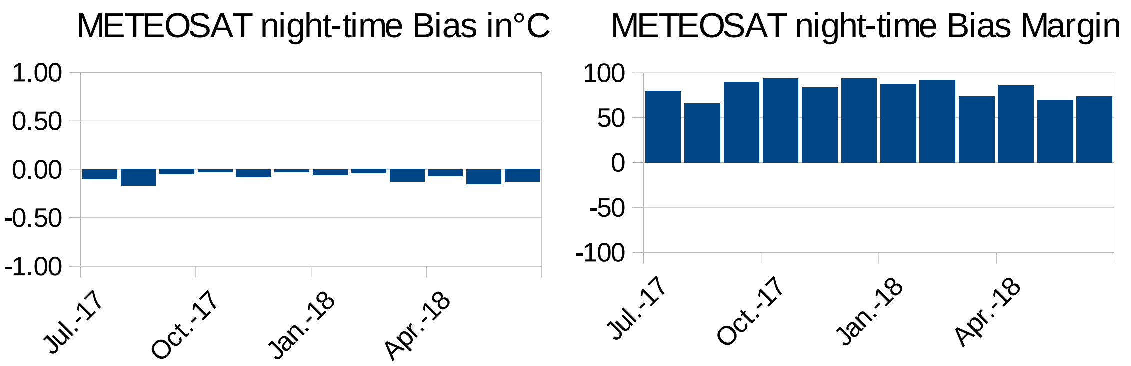


Figure 3: Left: Meteosat night-time SST mean difference.
Right Meteosat night-time SST mean difference margin.

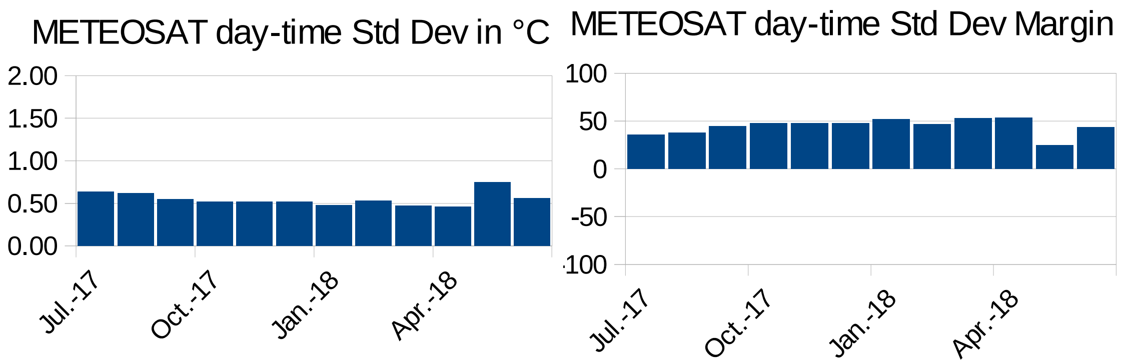


Figure 5: **Left: Meteosat day-time SST Standard deviation.**
Right Meteosat day-time SST Standard deviation Margin.

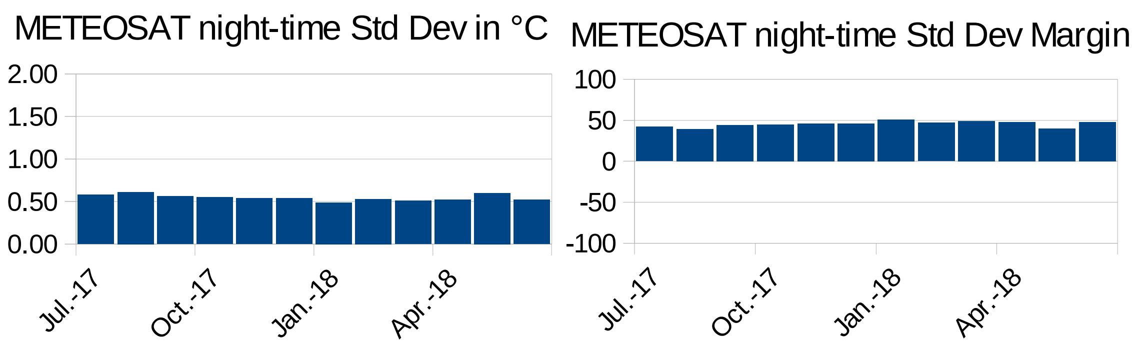


Figure 6: **Left: Meteosat night-time SST Standard deviation.**
Right Meteosat night-time SST Standard deviation Margin.

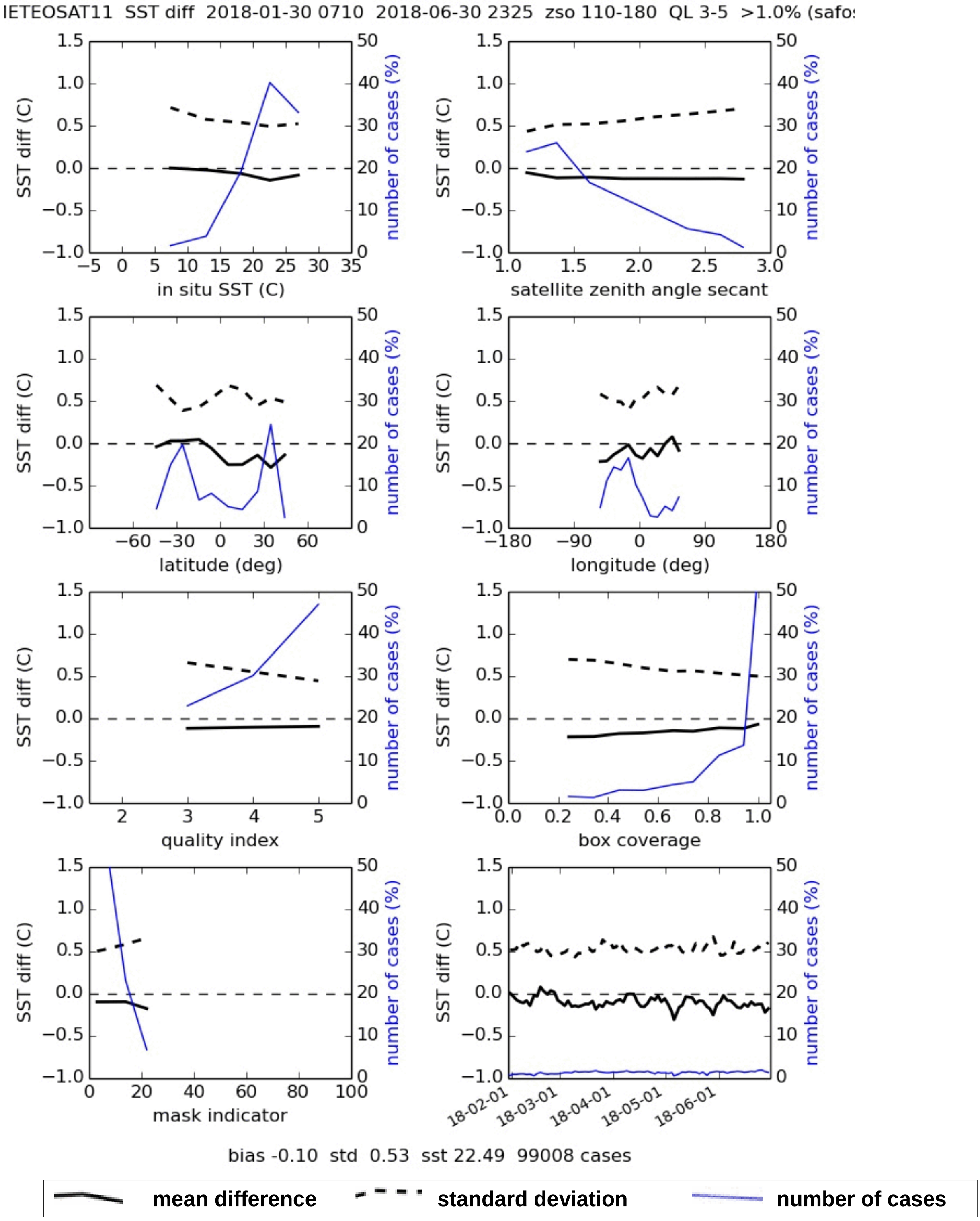


Figure 7: Complementary quality assessment statistics on Meteosat SST, night-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

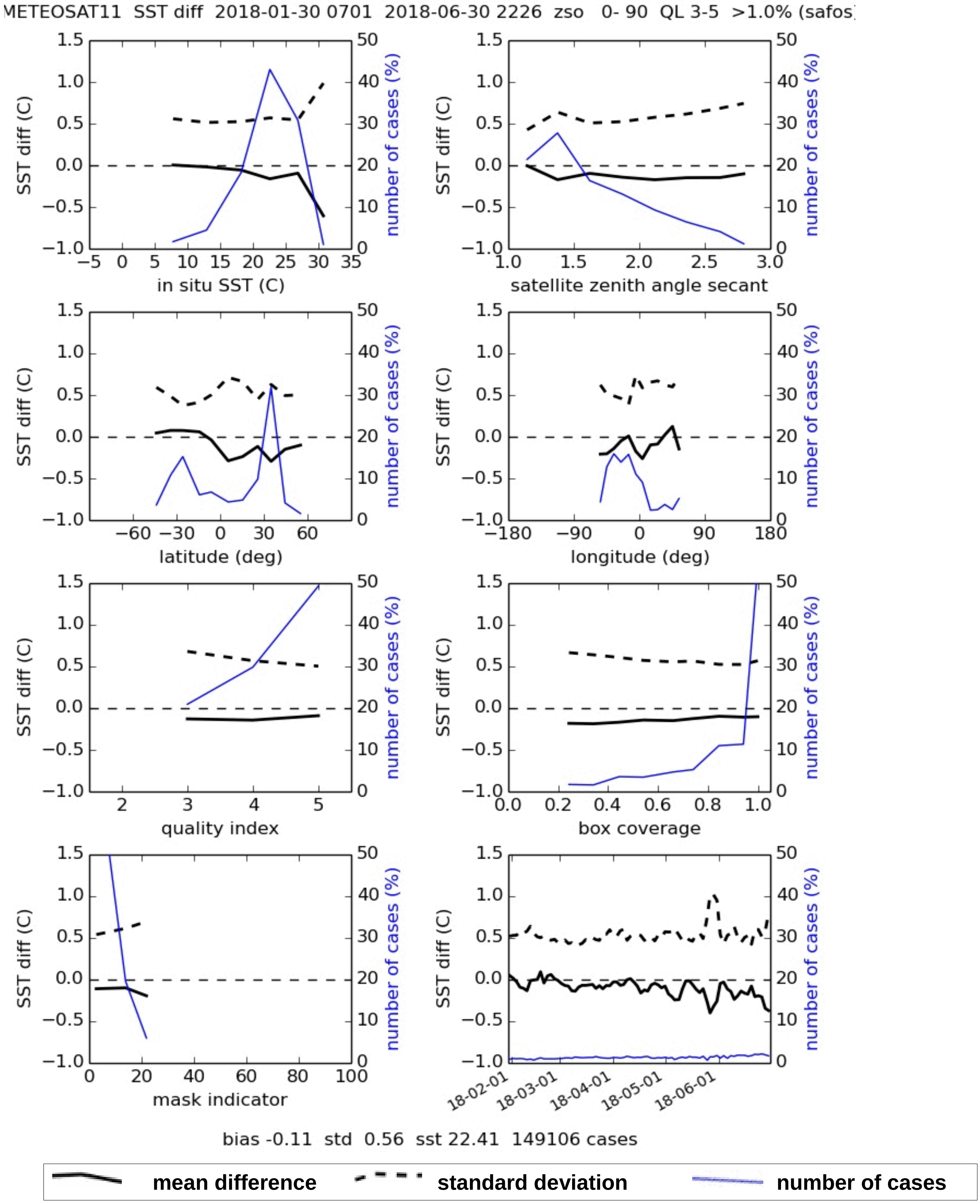


Figure 8: Complementary quality assessment statistics on Meteosat SST, day-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.2. GOES-East SST (OSI-207-a) quality

The following maps indicate the mean night-time SST mean difference with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://osi-saf.eumetsat.int/lml/#qua_SST%GOES-E%20SST_monthly%20map_monthly_Night%20time.

The operational SST retrieval from MSG/SEVIRI and GOES-East updated chain validation report v1.1 (http://osi-saf.eumetsat.int/lml/#doc_SST) gives further details about the regional mean differences observed.

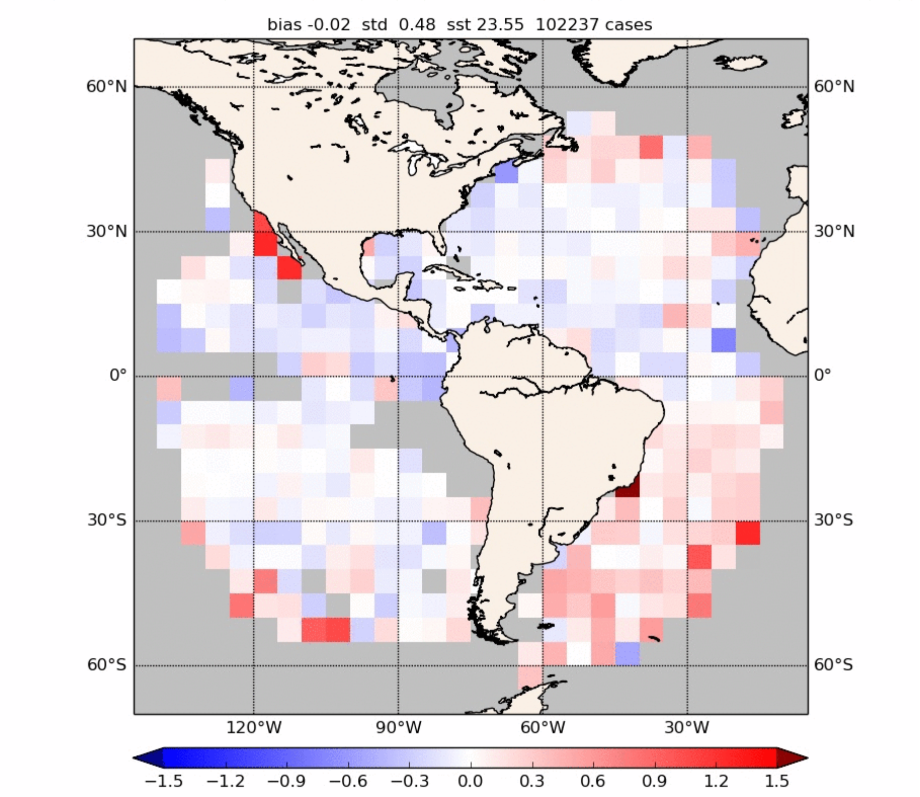


Figure 9: Mean GOES-East night-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

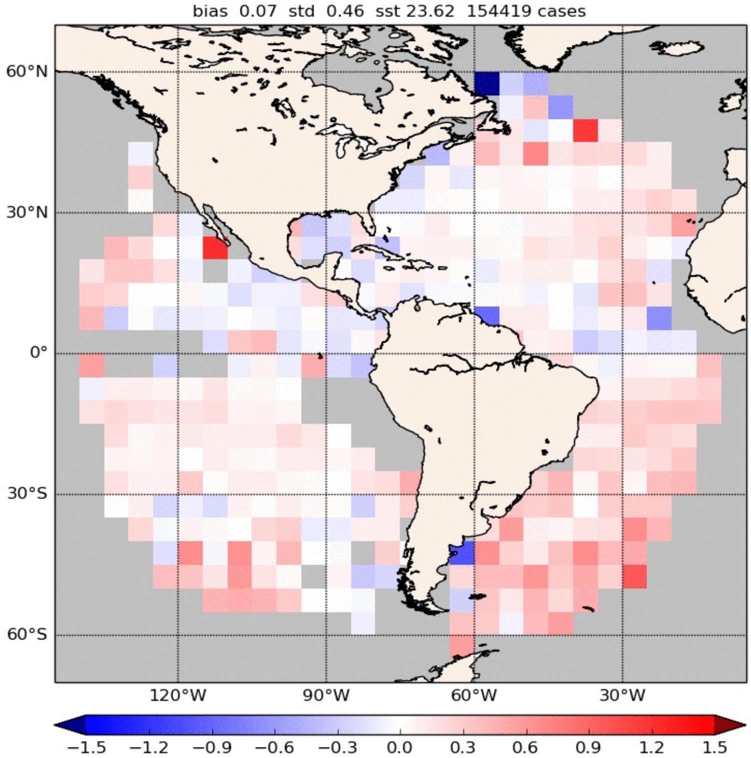


Figure 10: Mean GOES-East day-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

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

GOES-East night-time SST quality results 1st half 2018							
Month	Number of cases	mean diff. °C	mean diff. Req. °C	mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JAN. 2018	11943	-0.27	0.5	46	0.60	1	40
FEB. 2018	14119	0.00	0.5	100	0.41	1	59
MAR. 2018	20401	0.01	0.5	98	0.44	1	56
APR. 2018	18945	-0.03	0.5	94	0.49	1	51
MAY 2018	19385	-0.06	0.5	88	0.47	1	53
JUN. 2018	21121	0.00	0.5	100	0.53	1	47
Goes-East day-time SST quality results over 1st half 2018							
JAN. 2018	13163	-0.12	0.5	76	0.45	1	55
FEB. 2018	20014	0.11	0.5	78	0.40	1	60
MAR. 2018	28654	0.12	0.5	76	0.41	1	59
APR. 2018	28489	0.06	0.5	88	0.46	1	54
MAY 2018	31103	0.02	0.5	96	0.47	1	53
JUN. 2018	33755	0.06	0.5	88	0.51	1	49
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 fulfil the requirement.							

Table 5: GOES-East SST quality results over 1st half 2018, for 3, 4, 5 quality indexes

Comments:
Overall statistics are good and within the requirement.

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

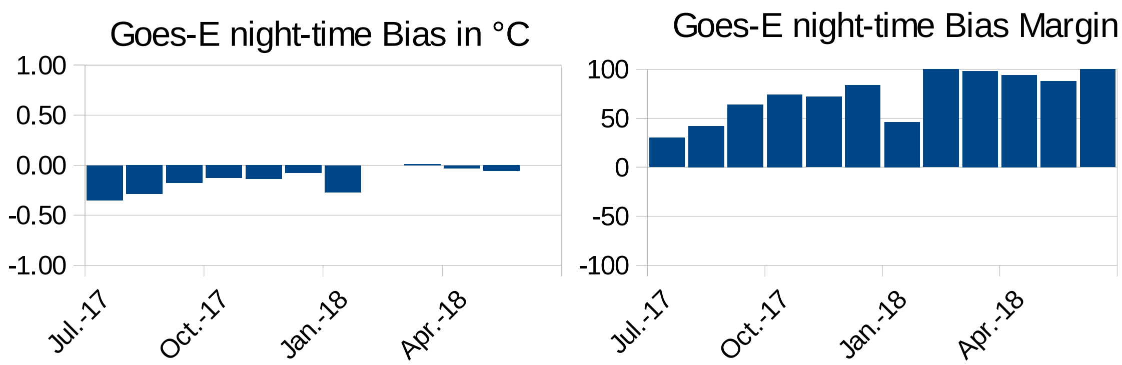


Figure 11: Left: Goes-East night-time SST mean difference.
Right: Goes-East night-time SST mean difference margin.

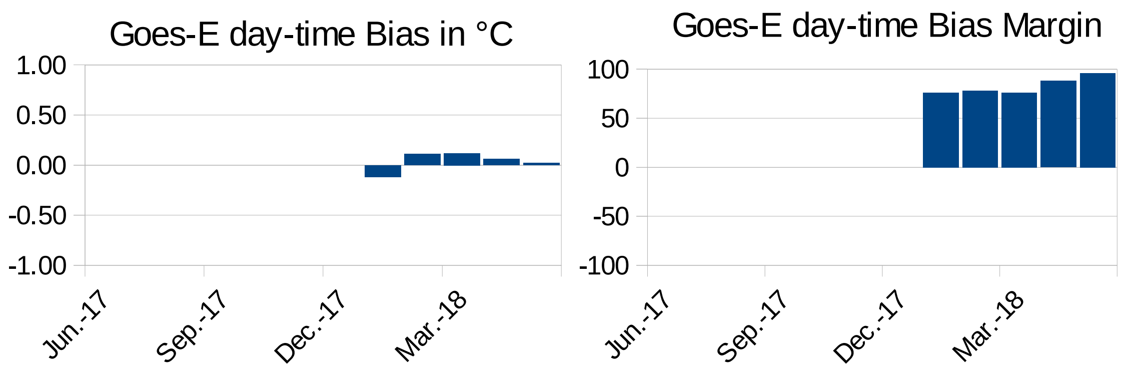
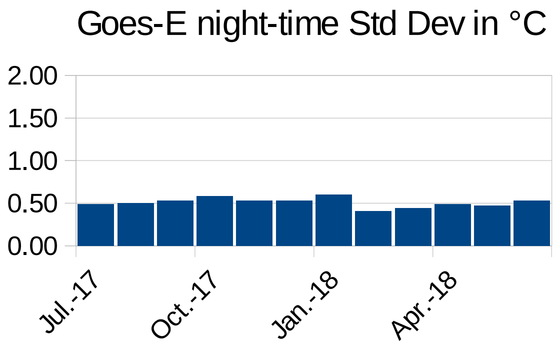


Figure 12: Left: Goes-East day-time SST mean difference.
Right: Goes-East day-time SST mean difference margin.



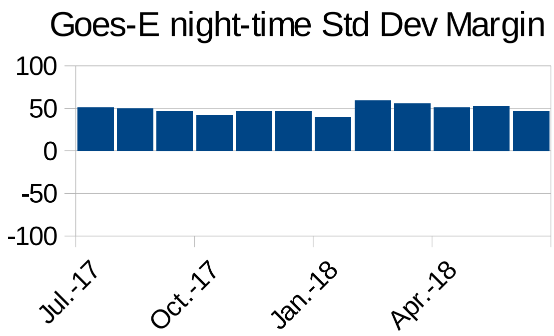
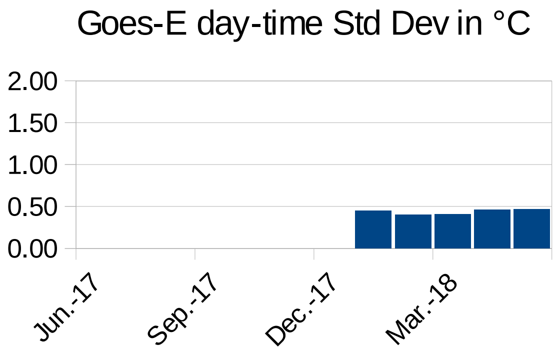


Figure 13: Left: Goes-East night-time SST standard deviation. Right Goes-East night-time SST standard deviation margin.



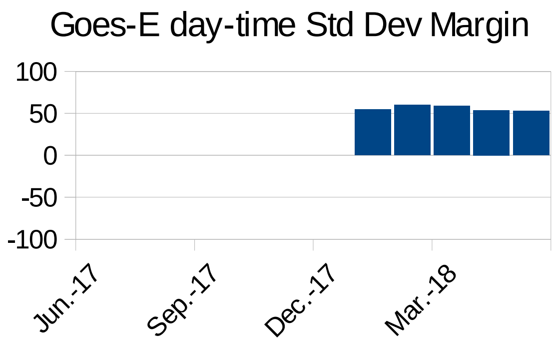


Figure 14: Left: Goes-East day-time SST standard deviation. Right Goes-East day-time SST standard deviation margin.

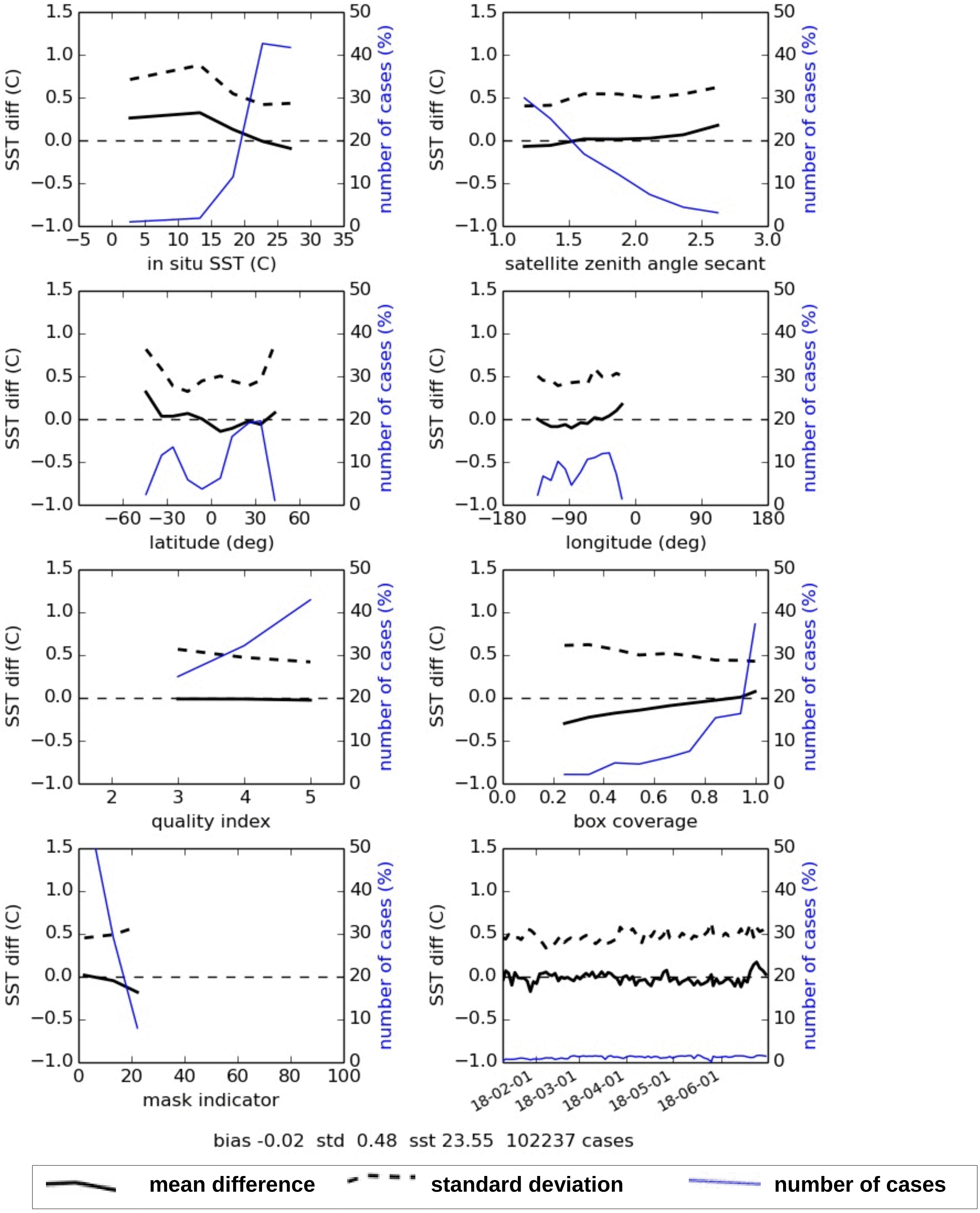


Figure 15: Complementary quality assessment statistics on GOES-East SST, night-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

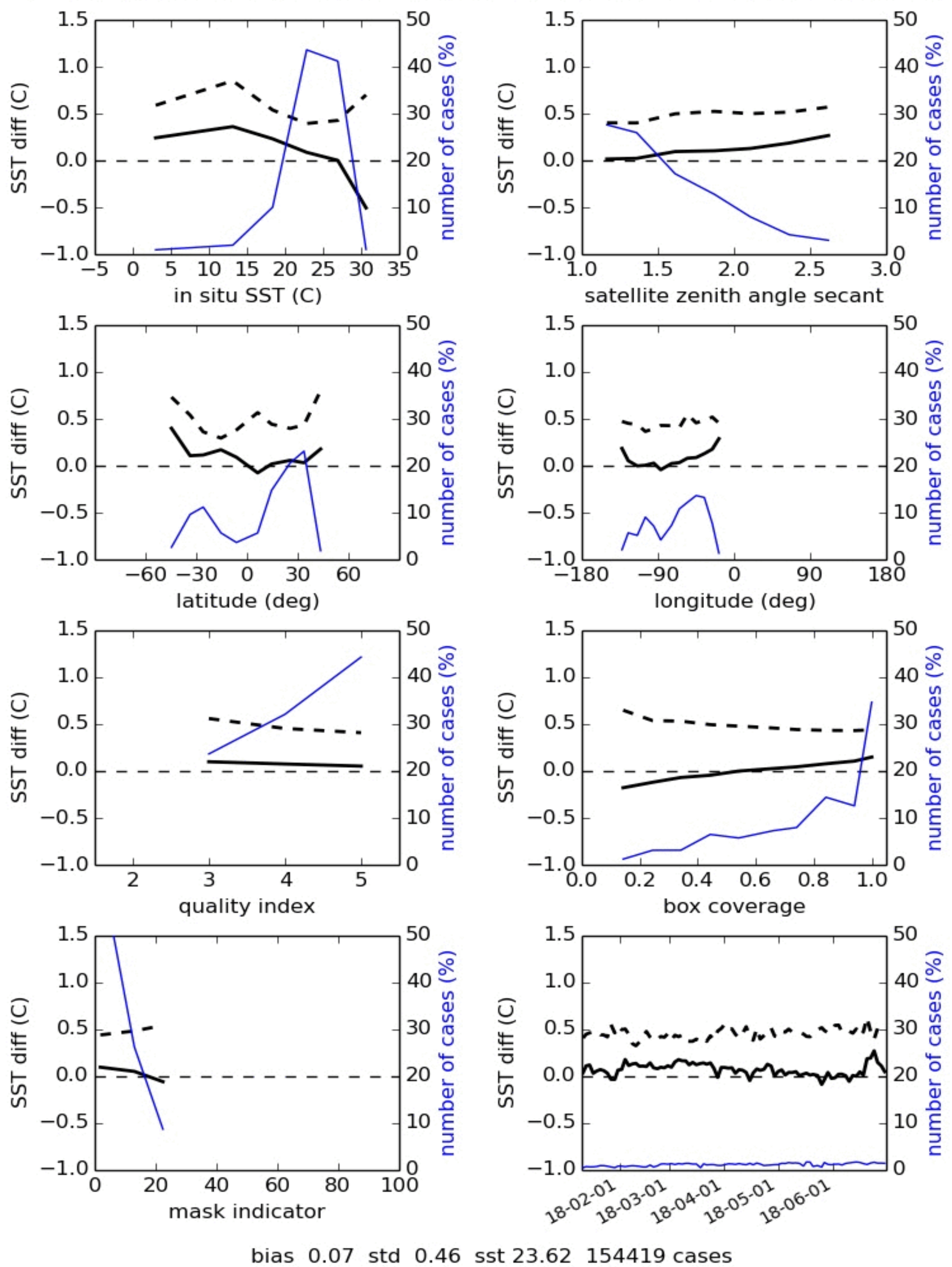


Figure 16: Complementary quality assessment statistics on GOES-East SST, day-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.3. Meteosat Indian Ocean SST (OSI-IO-SST) quality

Since 2016, Meteosat-8 is in position 41.5 east for the Indian Ocean Data Coverage (IODC). Sea Surface Temperature is processed as a demonstration product.

The following maps indicate the mean night-time and day-time SST mean difference with respect to buoys measurements for quality level 3,4,5 over the reporting period.

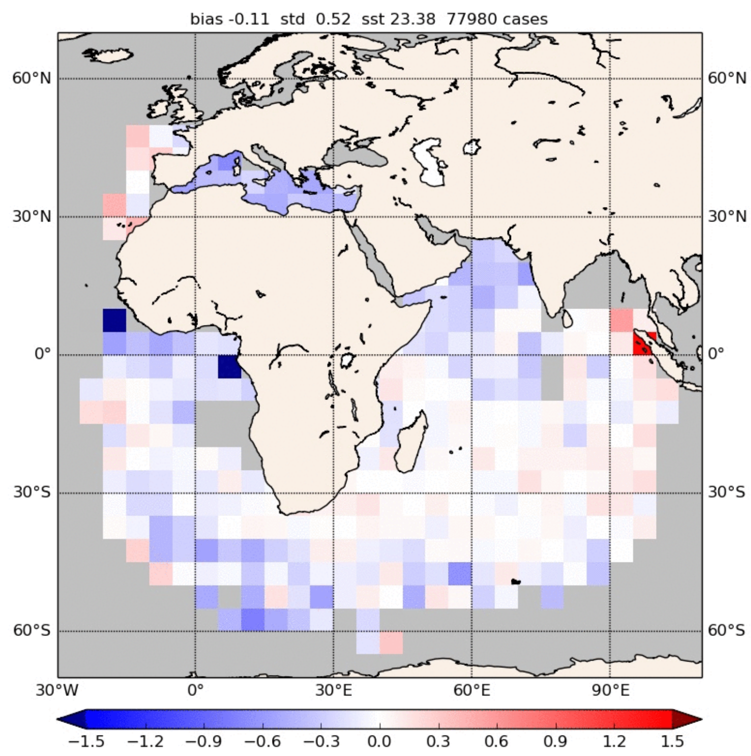


Figure 17: Mean Meteosat Indian Ocean night-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

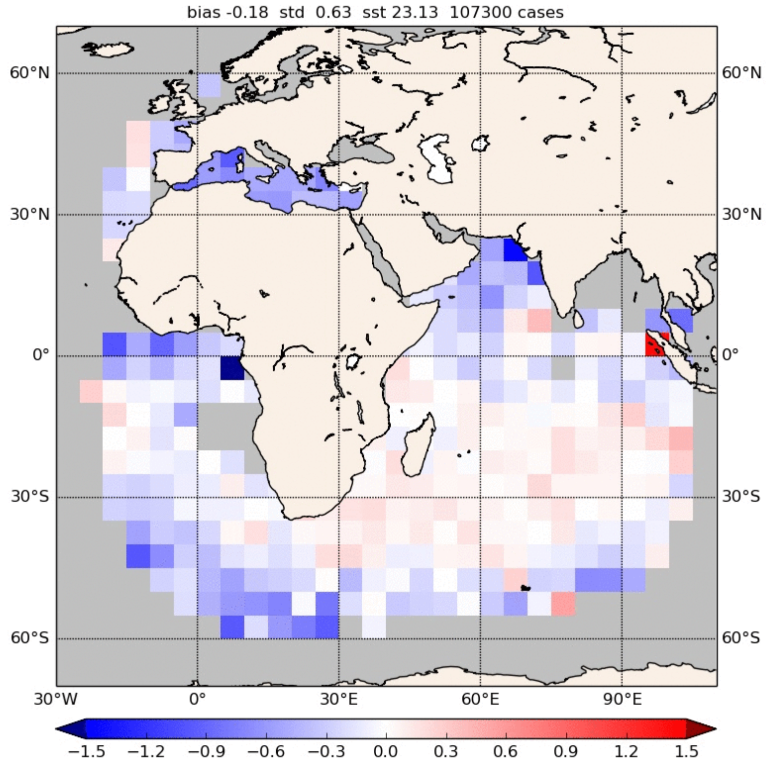


Figure 18: Mean Meteosat Indian Ocean day-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

The following table provides the Meteosat Indian Ocean-derived SST quality results over the reporting period.

Meteosat Indian Ocean night-time SST quality results over 1st half 2018							
Month	Number of cases	mean diff. °C	mean diff. req. °C	mean diff. margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JAN. 2018	8629	-0.09	0.5	82	0.48	1	52
FEB. 2018	8601	-0.16	0.5	68	0.52	1	48
MAR. 2018	12465	-0.11	0.5	78	0.50	1	50
APR. 2018	13460	-0.13	0.5	74	0.51	1	49
MAY 2018	16031	-0.11	0.5	78	0.59	1	41
JUN. 2018	18960	-0.09	0.5	82	0.52	1	48
Meteosat Indian Ocean day-time SST quality results over 1st half 2018							
JAN. 2018	17562	-0.09	0.5	82	0.48	1	52
FEB. 2018	14125	-0.20	0.5	60	0.52	1	48
MAR. 2018	16519	-0.07	0.5	86	0.49	1	51
APR. 2018	13250	-0.17	0.5	66	0.57	1	43
MAY 2018	18754	-0.26	0.5	48	0.90	1	10
JUN. 2018	24642	-0.28	0.5	44	0.71	1	29
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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: Meteosat Indian Ocean SST quality results over 1st half 2018, for 3, 4, 5 quality indexes.

Comments:
Overall statistics are good and within the requirement.

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

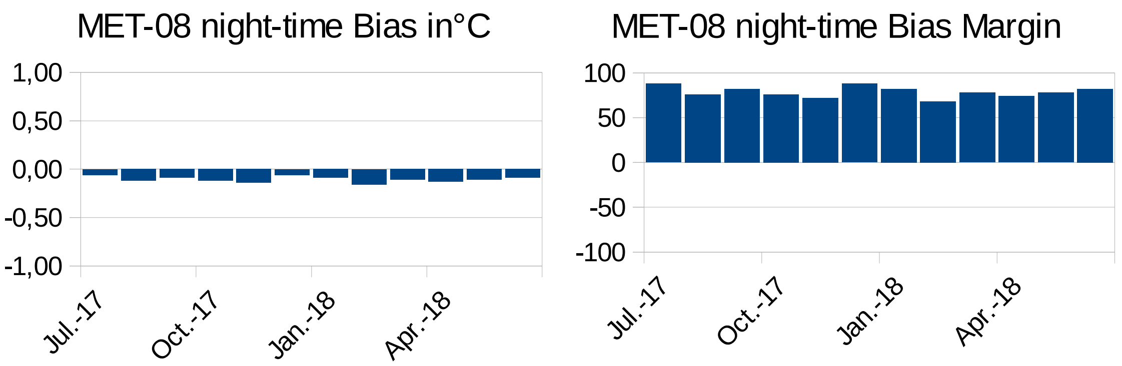


Figure 19: **Left: Meteosat Indian Ocean night-time SST mean difference.**
Right: Meteosat Indian Ocean night-time SST mean difference margin.

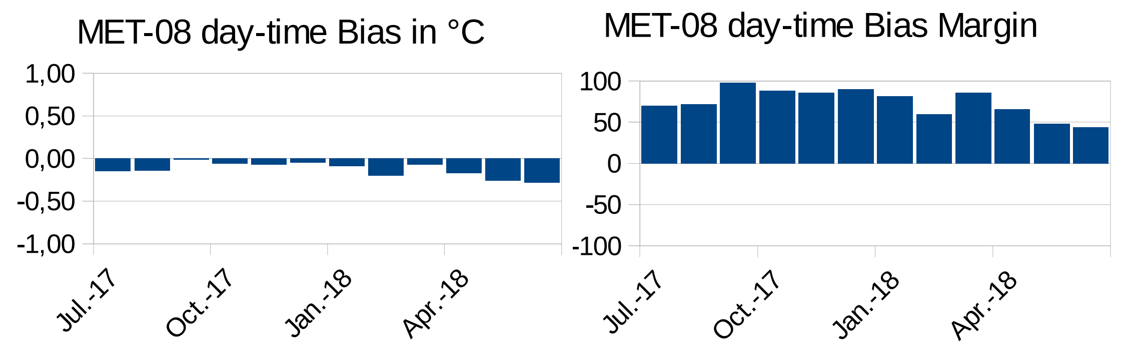


Figure 20: **Left: Meteosat Indian Ocean day-time SST mean difference.**
Right: Meteosat Indian Ocean day-time SST mean difference margin.

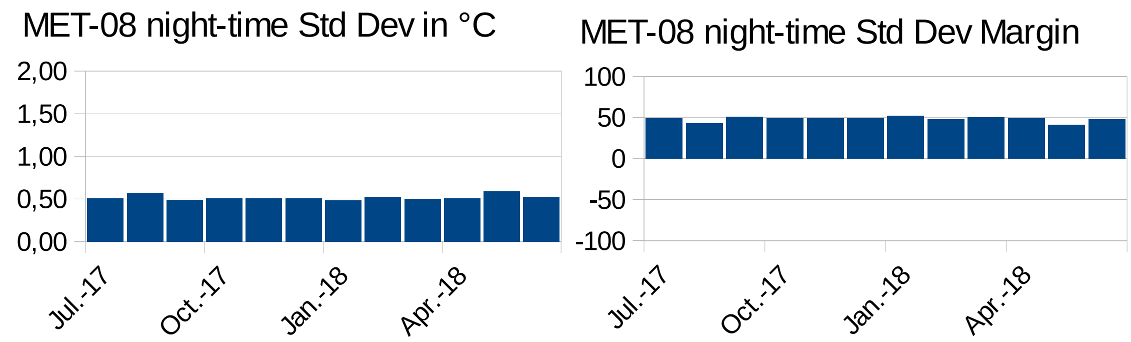


Figure 21: **Left: Meteosat Indian Ocean night-time SST Standard deviation. Right: Meteosat Indian Ocean night-time SST Standard deviation Margin.**

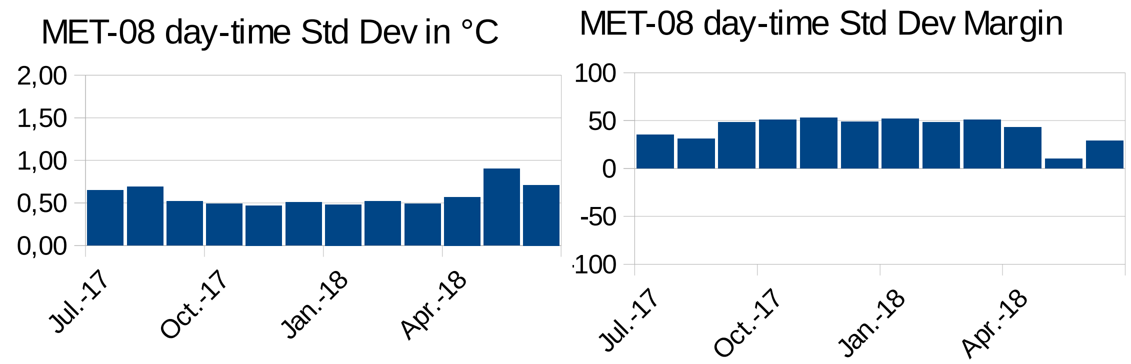


Figure 22: **Left: Meteosat Indian Ocean day-time SST Standard deviation. Right: Meteosat Indian Ocean day-time SST Standard deviation Margin.**

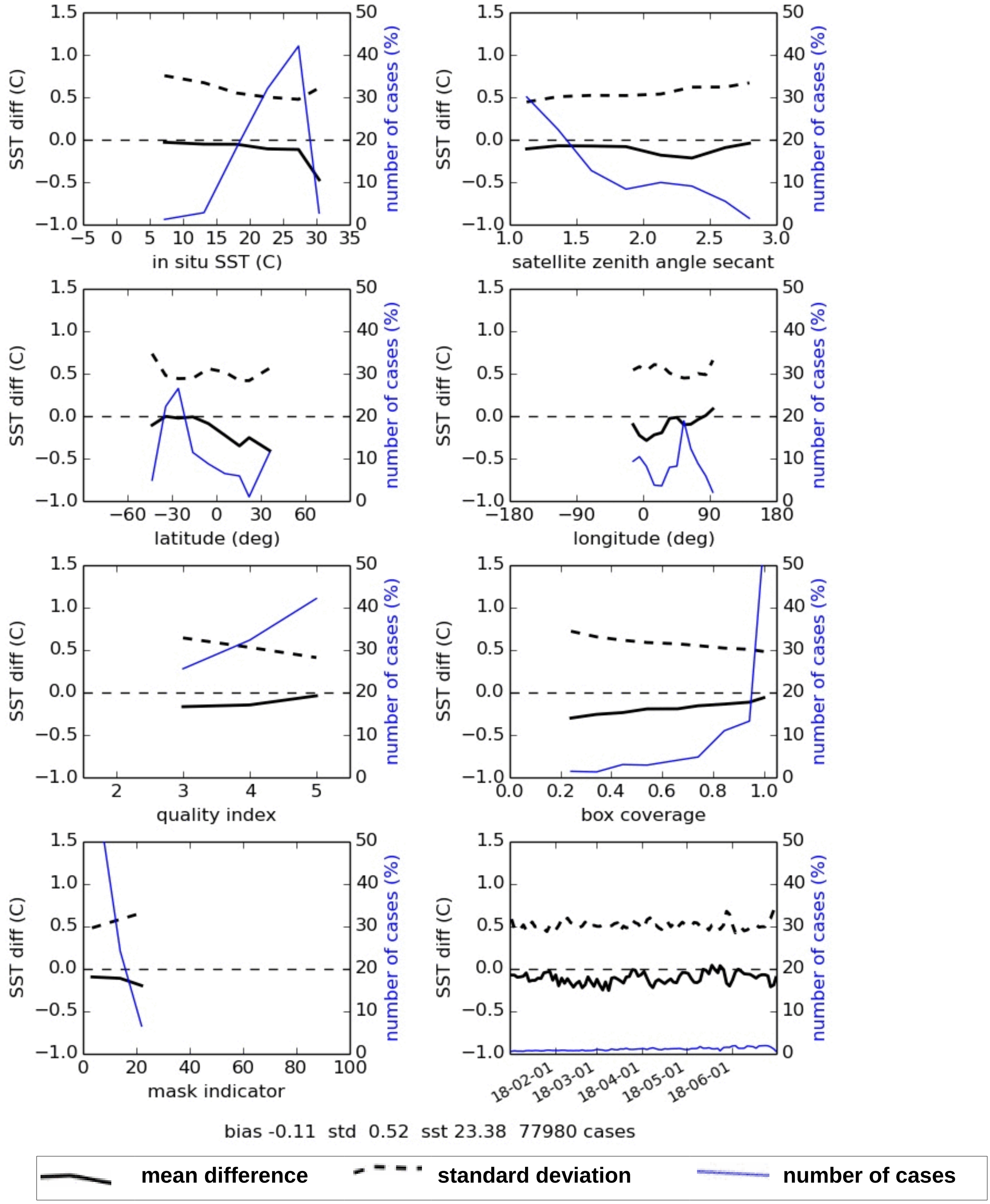


Figure 23: Complementary quality assessment statistics on Meteosat Indian Ocean SST, night-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

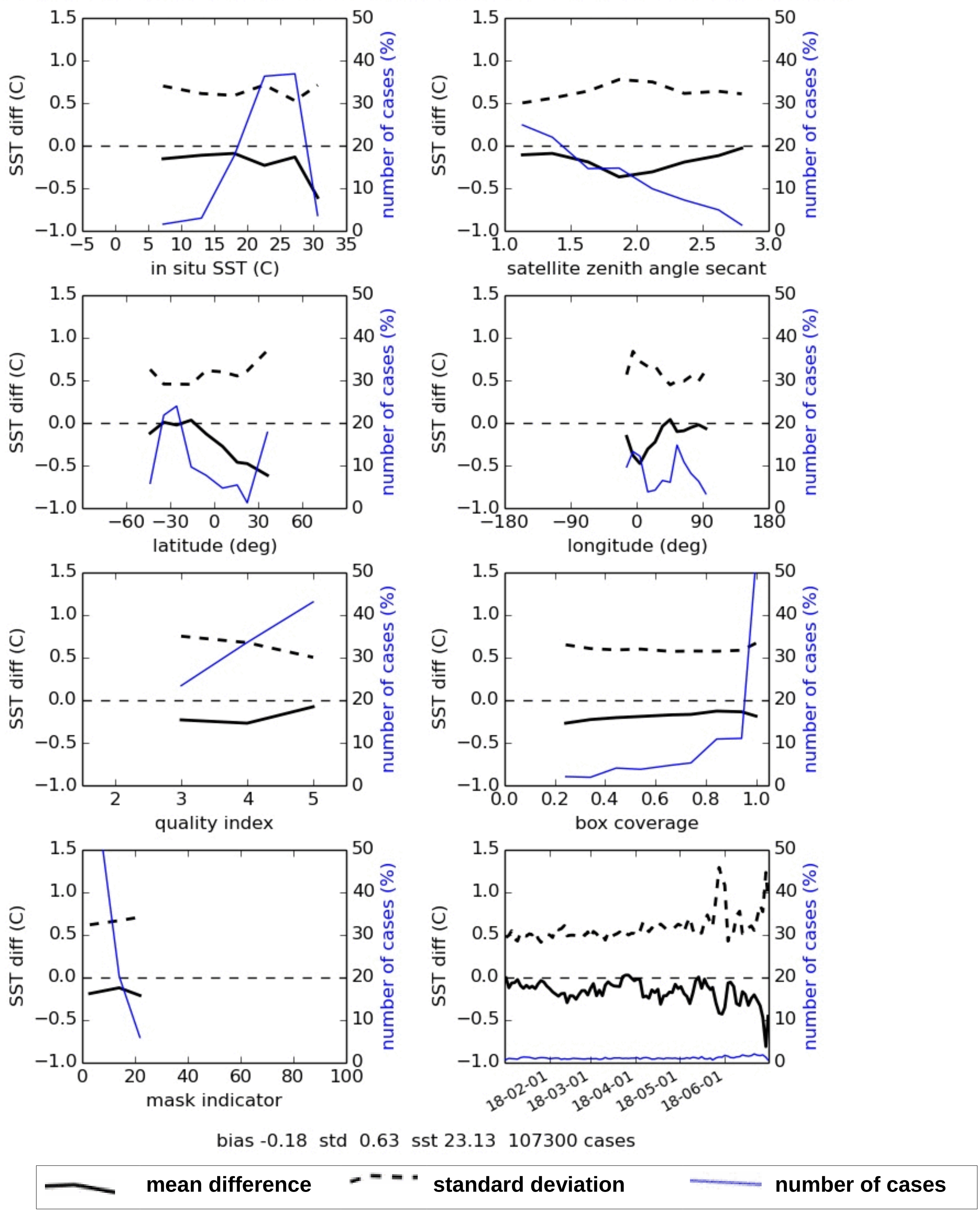


Figure 24: Complementary quality assessment statistics on Meteosat Indian Ocean SST, day-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

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

The operational NAR SST is processed with AVHRR and VIIRS data, separately. 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 Metop and S-NPP satellite. It is considered that if the accuracy requirements are met for both AVHRR and VIIRS separately, the accuracy requirements for OSI-202-b are fully met.

5.1.4.1. NPP NAR SST quality

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

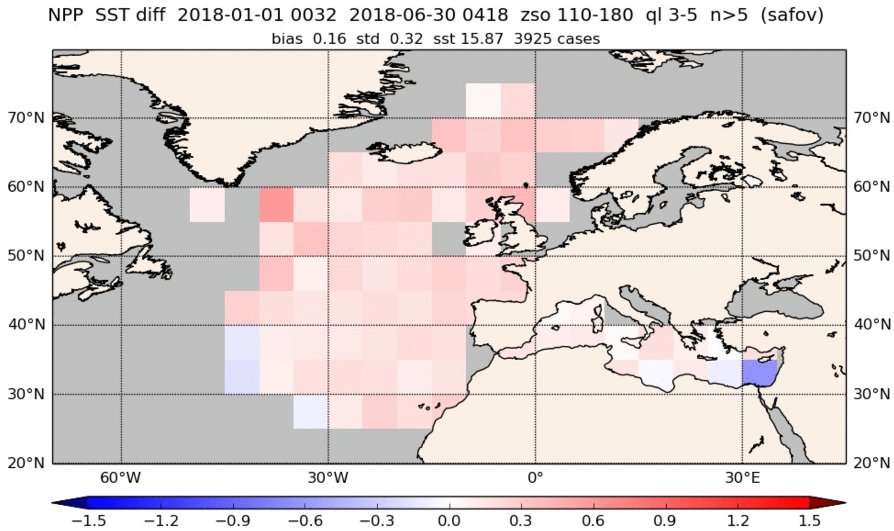


Figure 25: Mean NPP NAR night-time SST mean difference with respect to buoys measurements for quality level 3,4,5

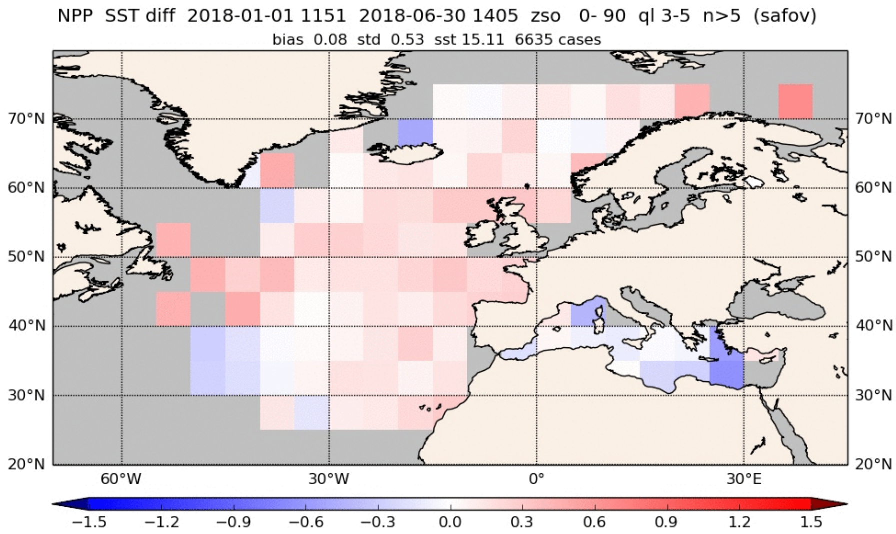


Figure 26: Mean NPP NAR day-time SST mean difference with respect to buoys measurements for quality level 3,4,5

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

NPP NAR night-time SST quality results over 1st half 2018							
Month	Number of cases	Mean diff. °C	Mean diff. req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JAN. 2018	618	0.24	0.5	52	0.32	0.8	60.00
FEB. 2018	567	0.22	0.5	56	0.33	0.8	58.75
MAR. 2018	541	0.21	0.5	58	0.25	0.8	68.75
APR. 2018	591	0.12	0.5	76	0.27	0.8	66.25
MAY 2018	612	0.05	0.5	90	0.41	0.8	48.75
JUN. 2018	1023	0.12	0.5	76	0.33	0.8	58.75
NPP NAR day-time SST quality results over 1st half 2018							
JAN. 2018	665	0.19	0.5	62	0.38	0.8	52.50
FEB. 2018	672	0.14	0.5	72	0.40	0.8	50.00
MAR. 2018	803	0.14	0.5	72	0.42	0.8	47.50
APR. 2018	1047	0.05	0.5	90	0.49	0.8	38.75
MAY 2018	1505	-0.05	0.5	90	0.74	0.8	7.50
JUN. 2018	1958	0.08	0.5	84	0.57	0.8	28.75
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 NPP NAR SST over 1st half 2018, for 3, 4, 5 quality indexes

Comments:
Overall statistics are good and within the requirement.

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

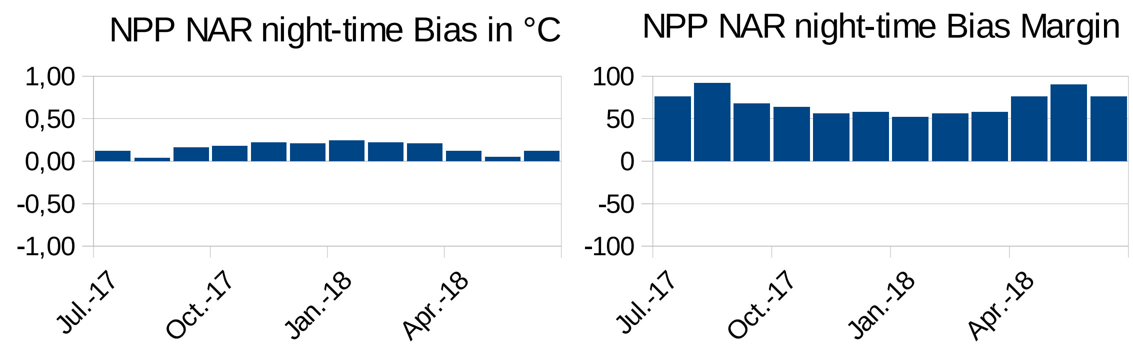


**Figure 27: Left: NPP NAR night-time SST mean difference.
Right: NPP NAR night-time SST mean difference margin.**

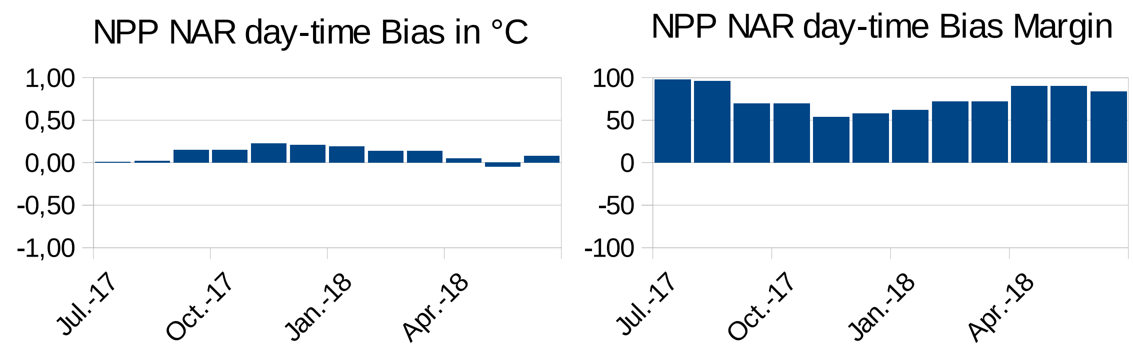


**Figure 28: Left: NPP NAR day-time SST mean difference.
Right: NPP NAR day-time SST mean difference margin.**

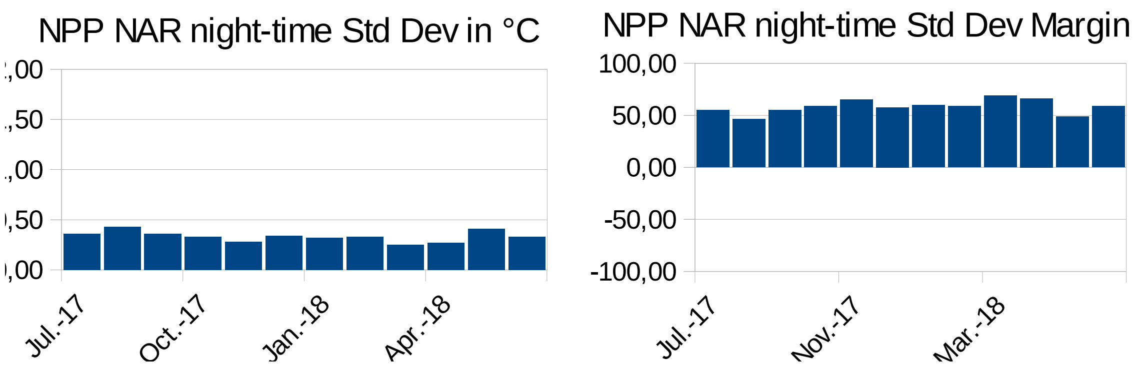
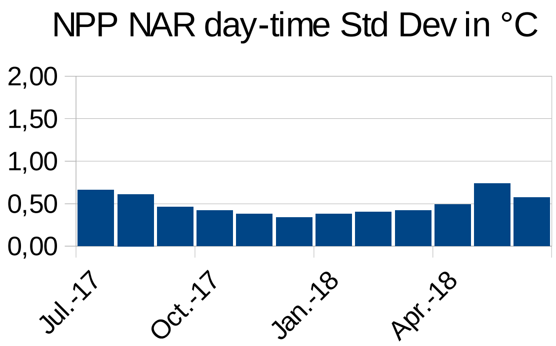


**Figure 29: Left: NPP NAR night-time SST Standard deviation.
Right: NPP NAR night-time SST Standard deviation margin.**



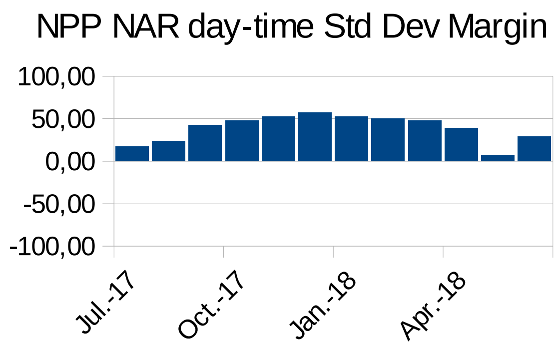


Figure 30: Left: NPP NAR day-time SST Standard deviation.
Right: NPP NAR day-time SST Standard deviation margin.

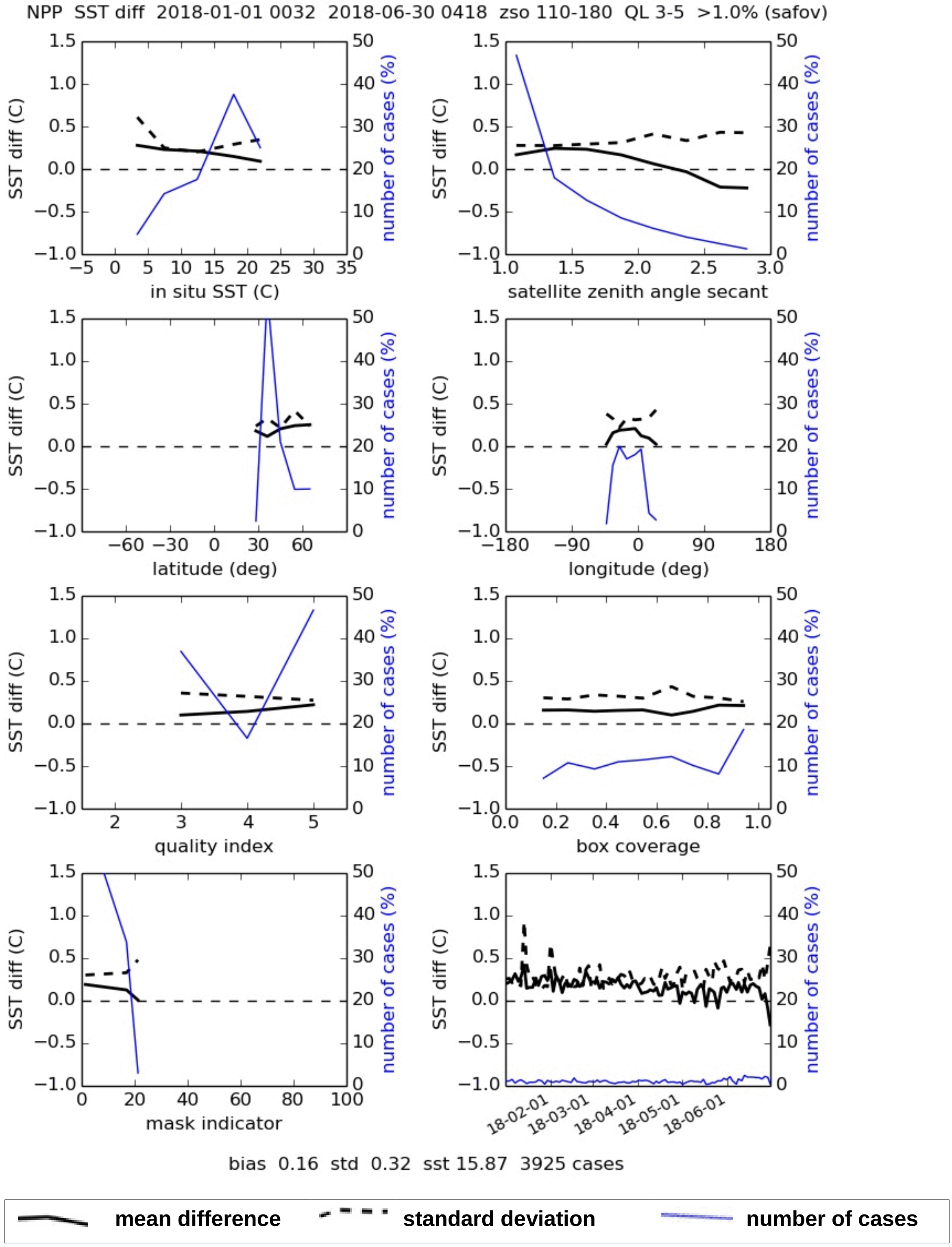


Figure 31: Complementary quality assessment statistics on NPP NAR SST night-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

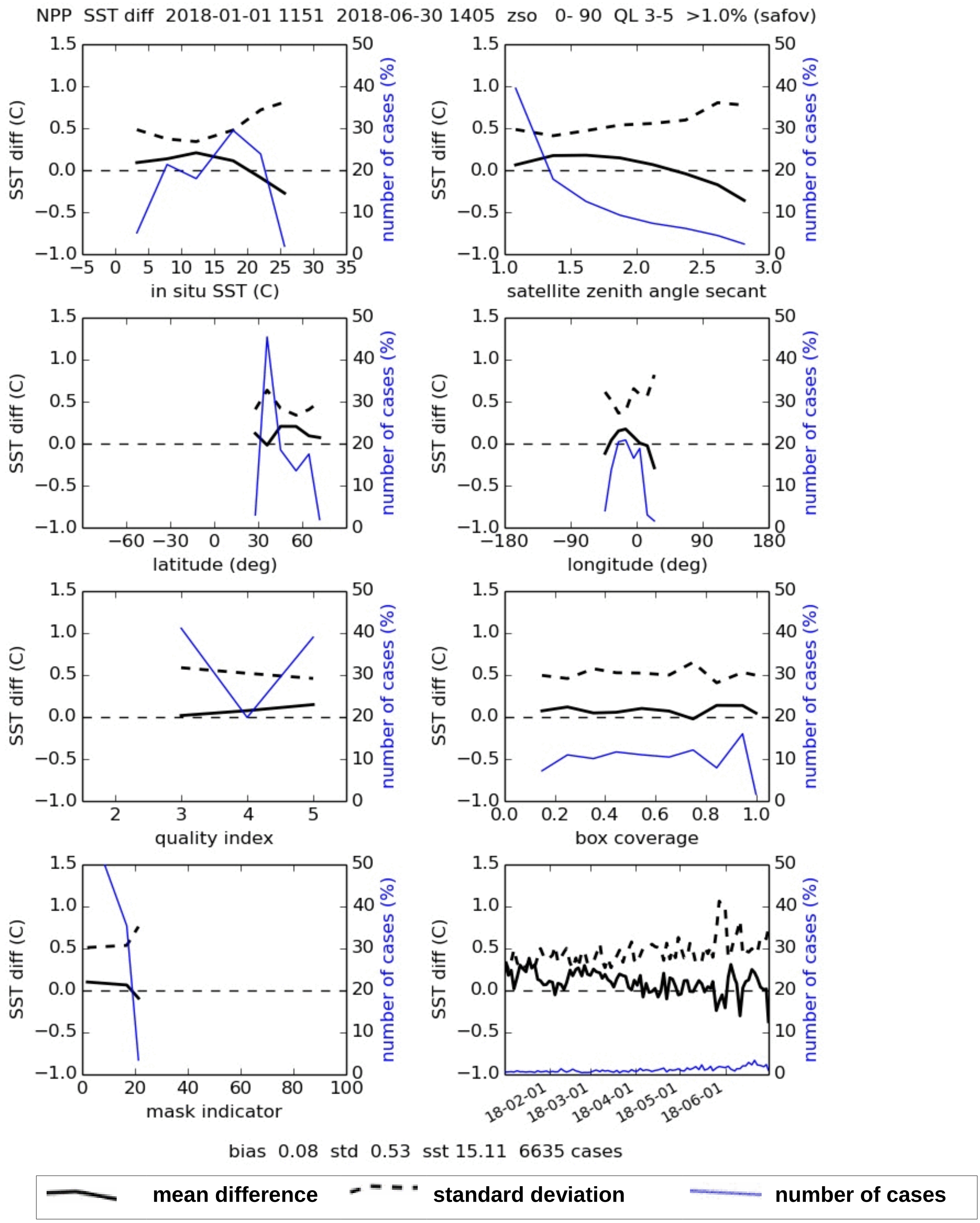


Figure 32: Complementary quality assessment statistics on NPP NAR SST day-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.4.2. Metop NAR SST quality

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

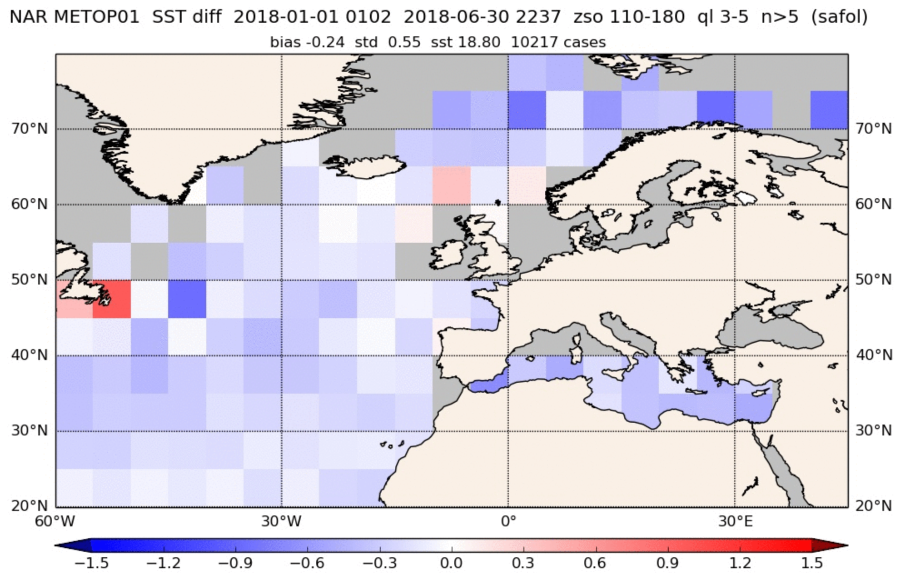


Figure 33: Mean Metop-B NAR night-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

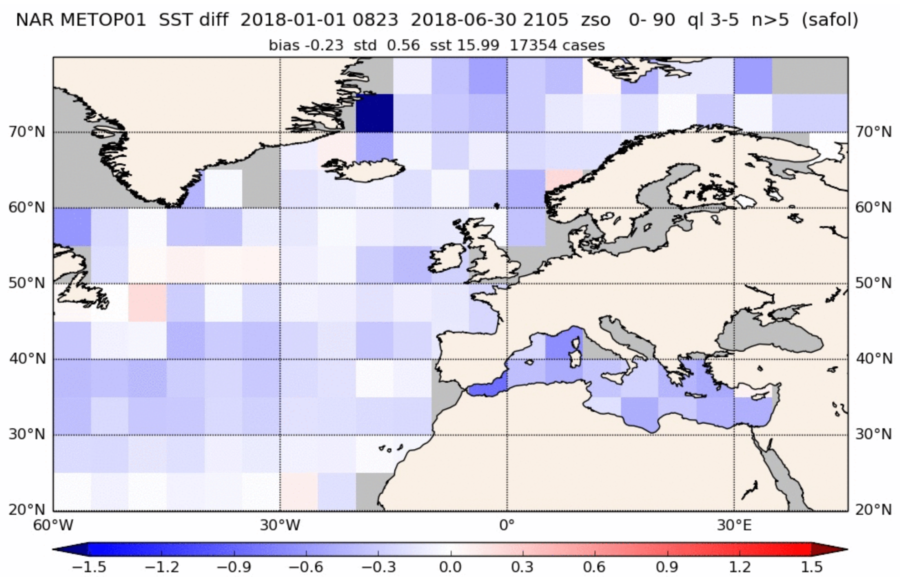


Figure 34: Mean Metop-B NAR day-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

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

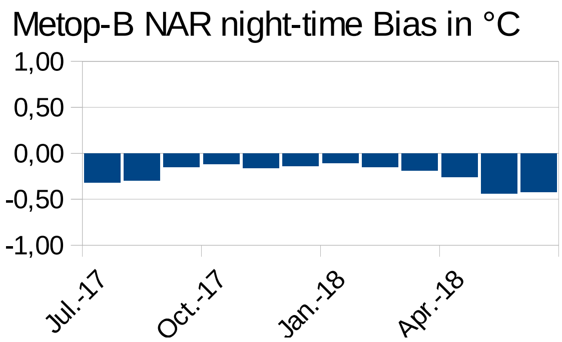
Metop-B NAR night-time SST quality results over 1st half 2018							
Month	Number of cases	Mean diff. °C	Mean diff. req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JAN. 2018	2092	-0.11	0.5	78	0.58	0.8	27.50
FEB. 2018	1762	-0.15	0.5	70	0.52	0.8	35.00
MAR. 2018	1793	-0.19	0.5	62	0.48	0.8	40.00
APR. 2018	1835	-0.26	0.5	48	0.49	0.8	38.75
MAY 2018	1603	-0.44	0.5	12	0.62	0.8	22.50
JUN. 2018	1132	-0.42	0.5	16	0.50	0.8	37.50
Metop-B NAR day-time SST quality results over 1st half 2018							
JAN. 2018	1820	0.00	0.5	100	0.48	0.8	40.00
FEB. 2018	2007	-0.09	0.5	82	0.51	0.8	36.25
MAR. 2018	2466	-0.18	0.5	64	0.52	0.8	35.00
APR. 2018	2914	-0.23	0.5	54	0.50	0.8	37.50
MAY 2018	4123	-0.37	0.5	26	0.67	0.8	16.25
JUN. 2018	4057	-0.33	0.5	34	0.56	0.8	30.00

(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 Metop-B NAR SST over 1st half 2018, for 3, 4, 5 quality indexes

Comments:
Overall statistics are good and within the requirement.

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



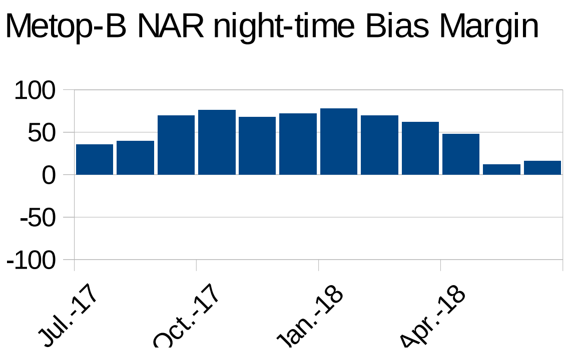


Figure 35: Left: Metop-B NAR night-time SST mean difference.
Right: Metop-B NAR night-time SST mean difference margin.

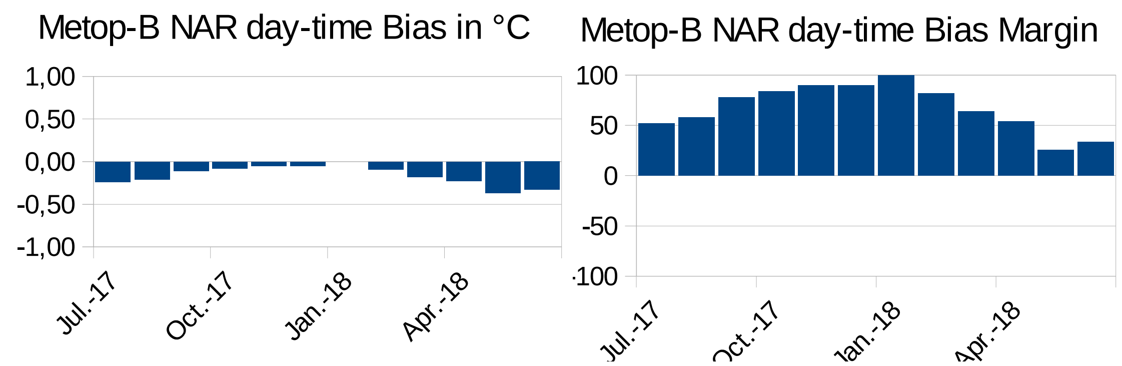


Figure 36: Left: Metop-B NAR day-time SST mean difference.
Right: Metop-B NAR day-time SST mean difference margin.

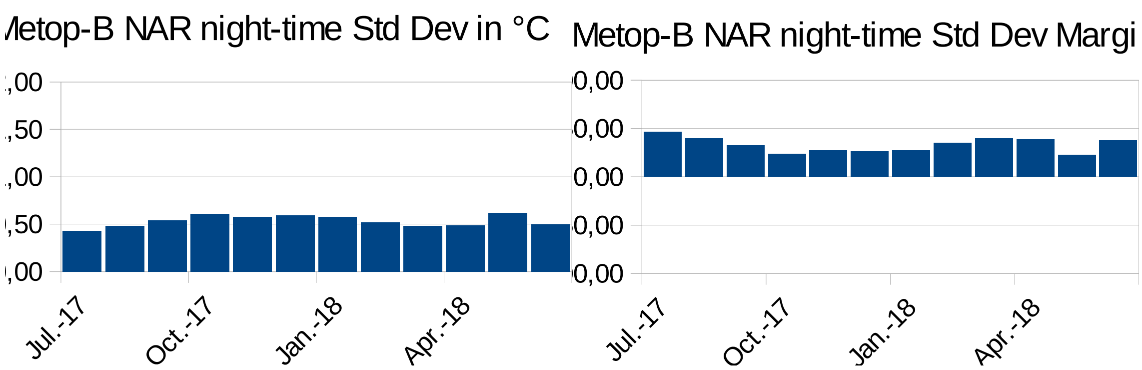


Figure 37: Left: Metop-B NAR night-time SST Standard deviation.
Right: Metop-B NAR night-time SST Standard deviation margin.

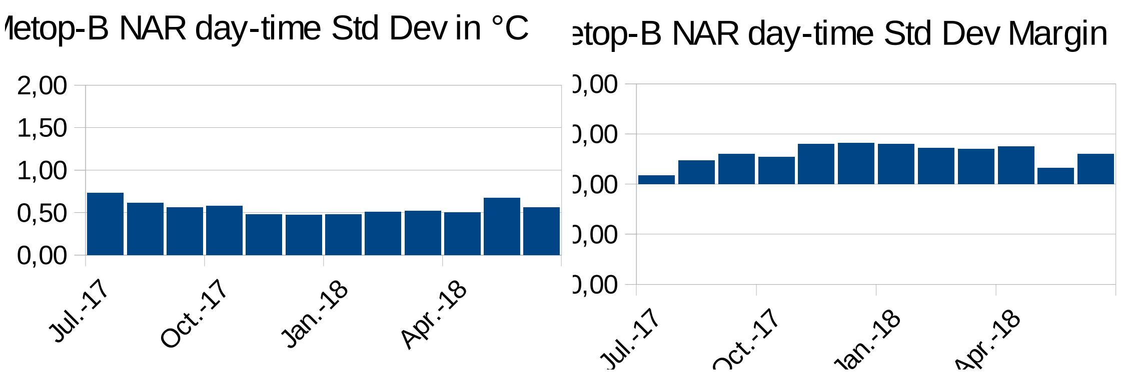


Figure 38: Left: Metop-B NAR day-time SST Standard deviation.
Right: Metop-B NAR day-time SST Standard deviation margin.

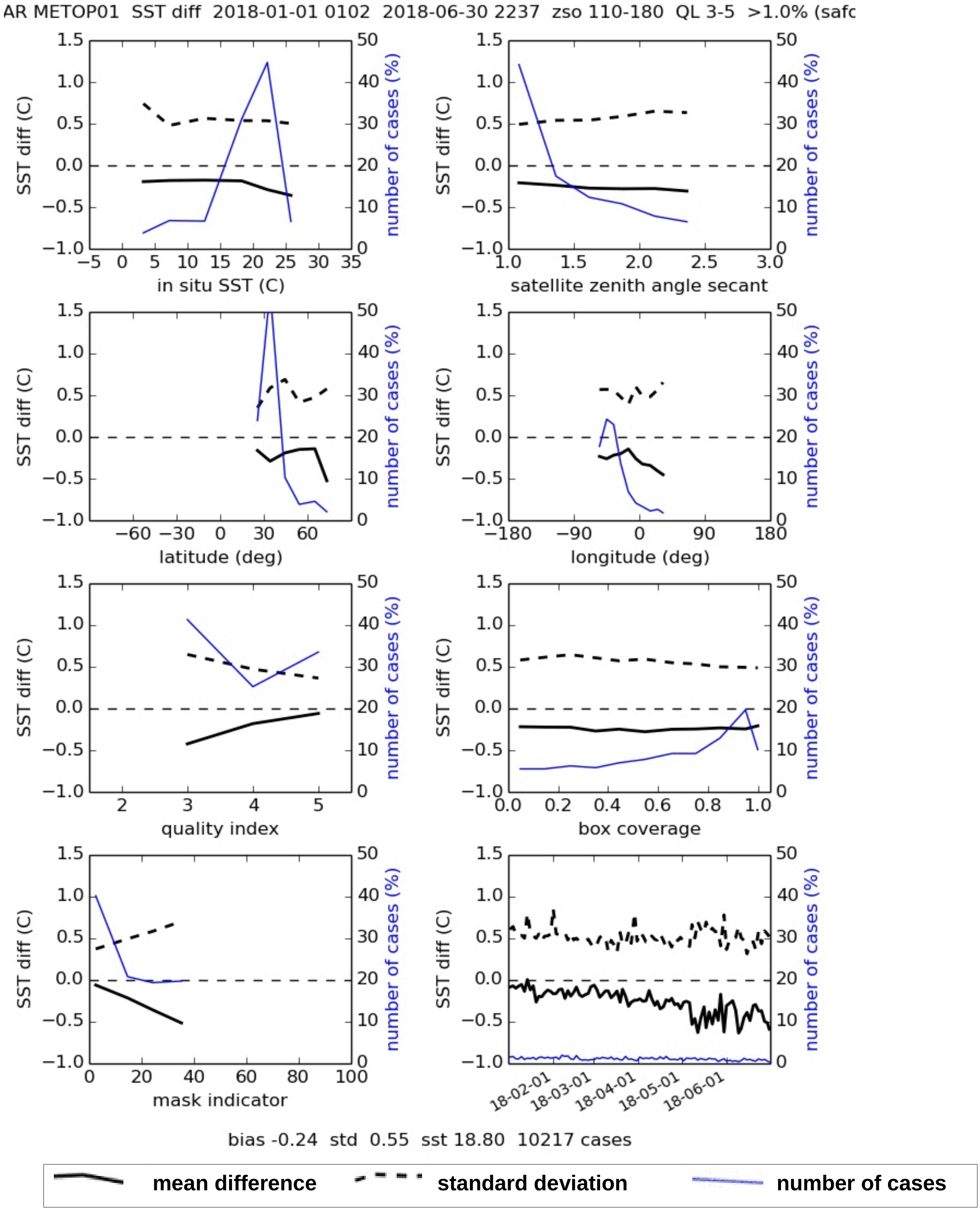


Figure 39: Complementary quality assessment statistics on Metop NAR SST night-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

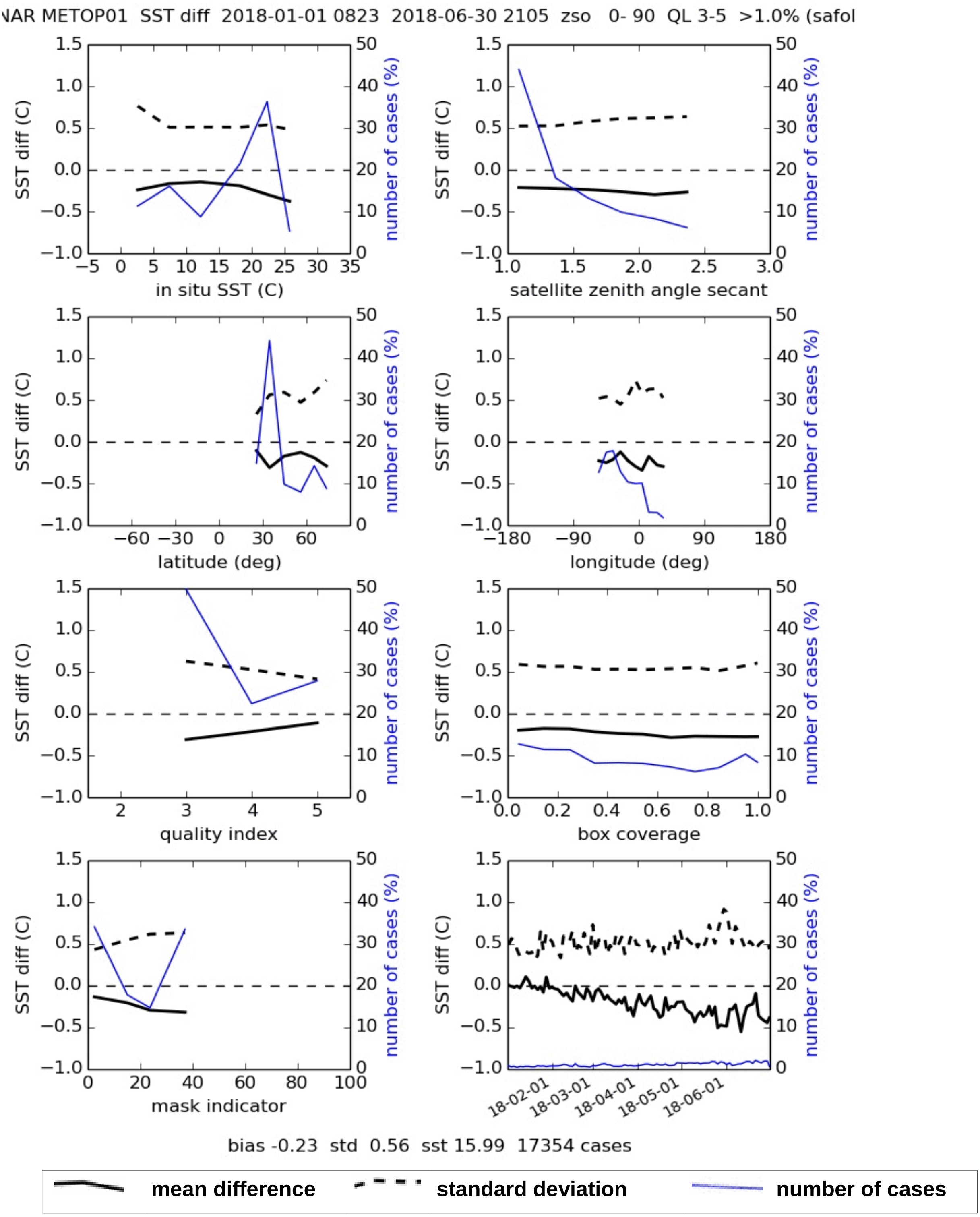


Figure 40: Complementary quality assessment statistics on Metop NAR SST day-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.5. 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 mean difference with respect to buoys measurements for quality level 3,4,5 over the reporting period. Monthly maps are available on http://osi-saf.eumetsat.int/lml/#qua_SST%Metop%20GBL%20SST_monthly%20map_monthly_Night%20time.

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

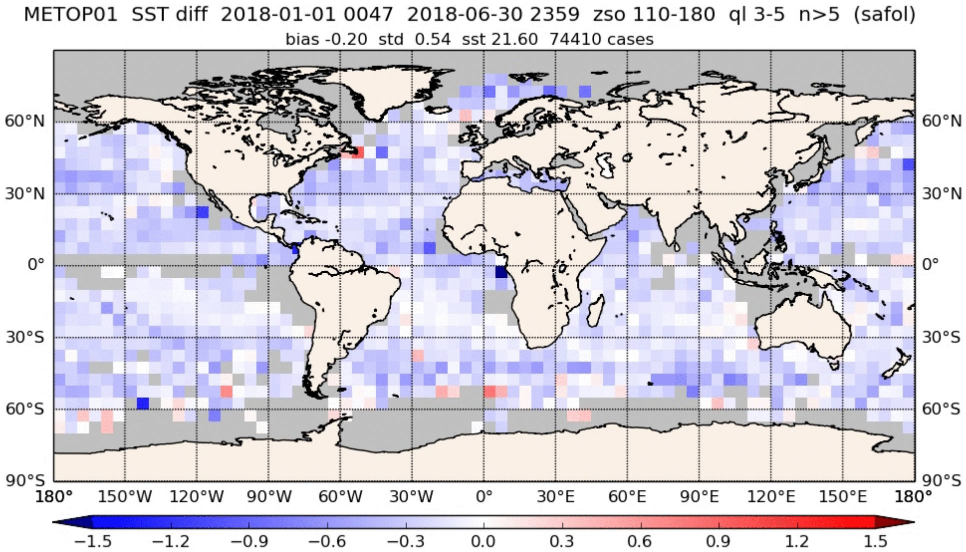


Figure 41: Mean Metop-B night-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

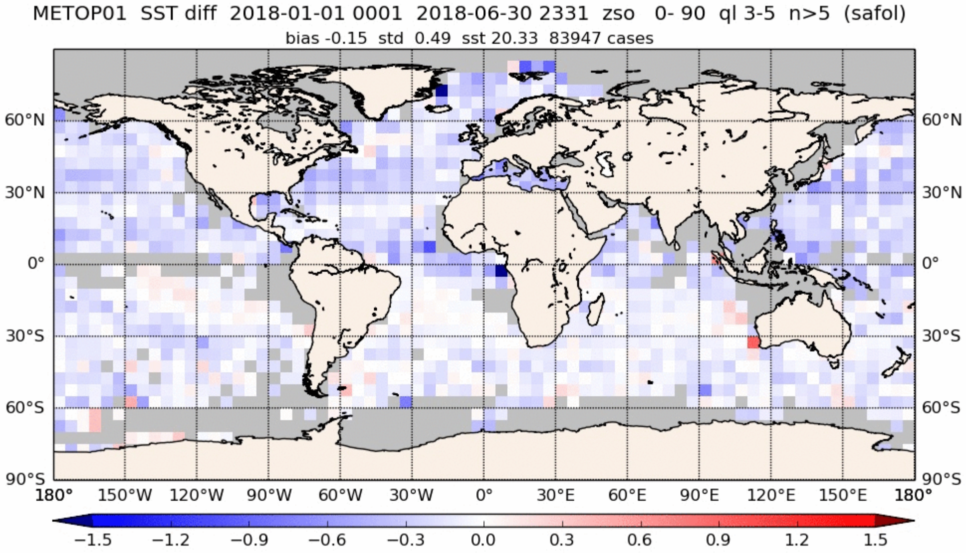


Figure 42: Mean Metop-B day-time SST mean differencemean difference with respect to buoys measurements for quality level 3,4,5

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 2018							
Month	Number of cases	Mean difference °C	Mean difference Req °C	Mean difference Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (**)
JAN. 2018	12141	-0.21	0.5	58	0.52	0.8	35.00
FEB. 2018	11812	-0.22	0.5	56	0.54	0.8	32.50
MAR. 2018	13207	-0.20	0.5	60	0.56	0.8	30.00
APR. 2018	13155	-0.20	0.5	60	0.53	0.8	33.75
MAY 2018	12925	-0.21	0.5	58	0.55	0.8	31.25
JUN. 2018	11046	-0.19	0.5	62	0.52	0.8	35.00
Global Metop-B day-time SST quality results over 1st half 2018							
JAN. 2018	13163	-0.12	0.5	76	0.45	0.8	43.75
FEB. 2018	12165	-0.12	0.5	76	0.44	0.8	45.00
MAR. 2018	13923	-0.13	0.5	74	0.46	0.8	42.50
APR. 2018	14214	-0.15	0.5	70	0.47	0.8	41.25
MAY 2018	15918	-0.20	0.5	60	0.57	0.8	28.75
JUN. 2018	14585	-0.18	0.5	64	0.53	0.8	33.75

Table 9: Quality results for global METOP SST over 1st half 2018, for 3,4,5 quality indexes

Comments:
Overall statistics are good and within the requirement.

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

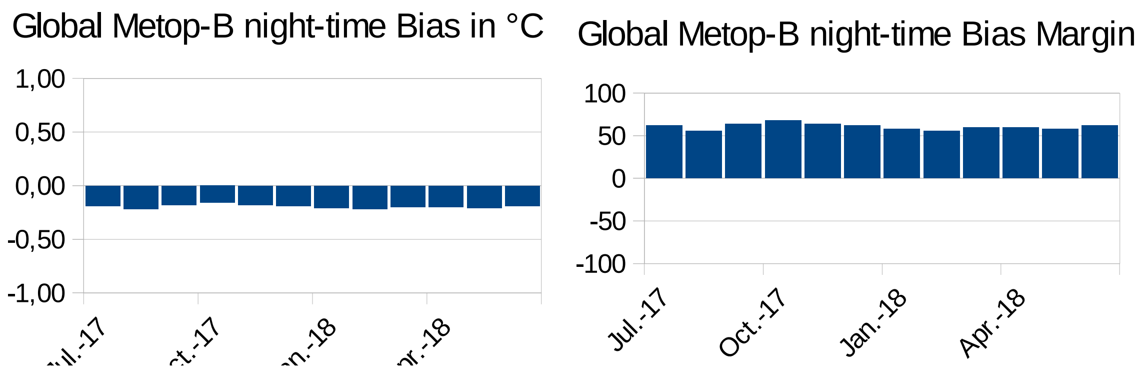


Figure 43: Left: global Metop-B night-time SST mean difference.
Right: global Metop-B night-time SST mean difference margin.

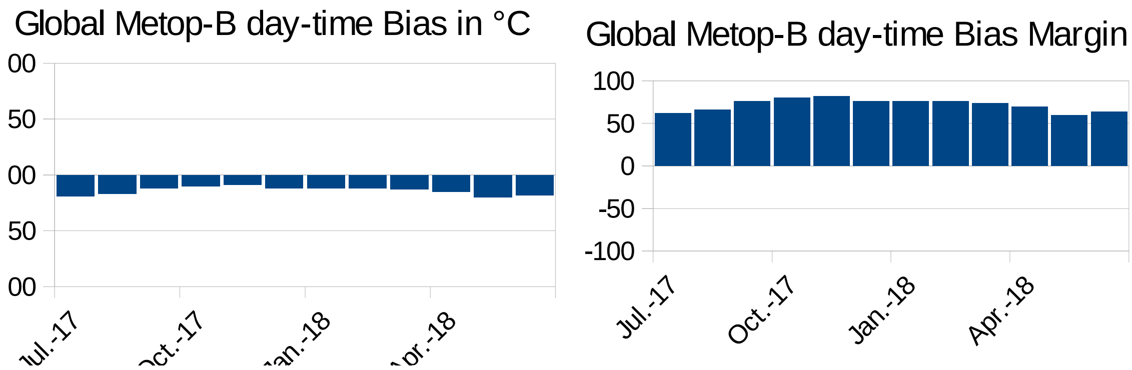


Figure 44: **Left: global Metop-B day-time SST mean difference.**
Right: global Metop-B day-time SST mean difference margin.

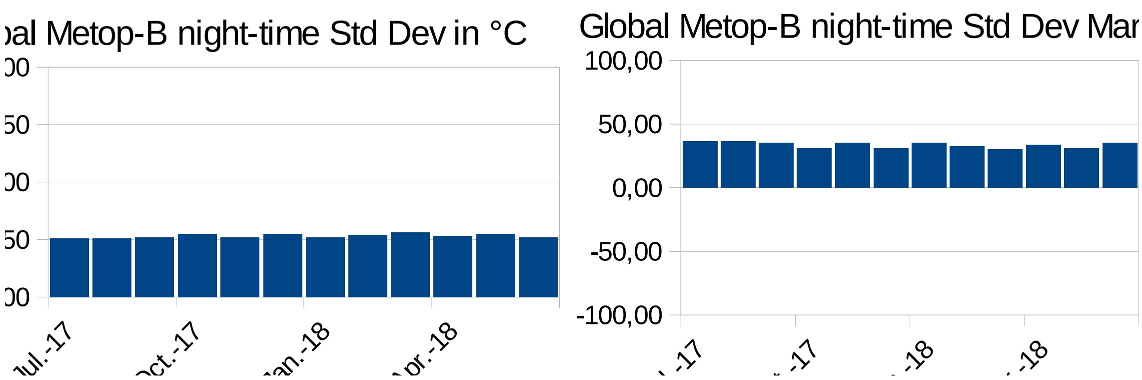


Figure 45: **Left: global Metop-B night-time SST Standard deviation.**
Right: global Metop-B night-time SST Standard deviation Margin.

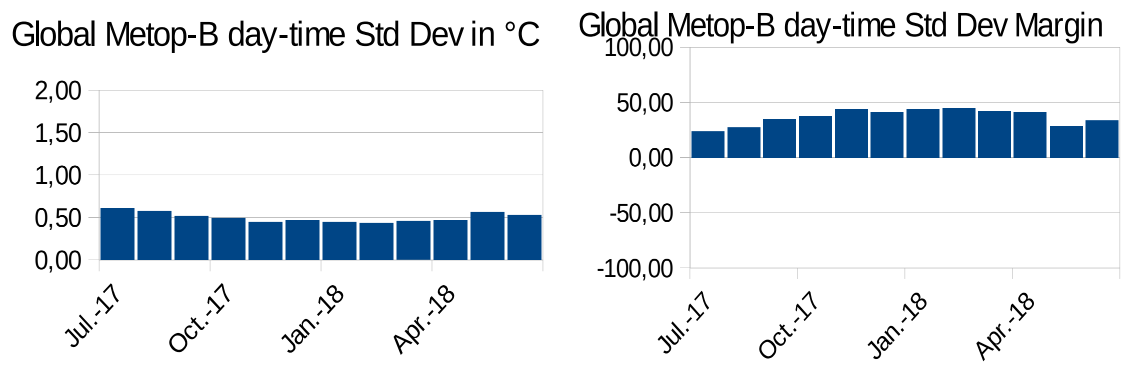


Figure 46: **Left: global Metop-B day-time SST Standard deviation.**
Right: global Metop-B day-time SST Standard deviation Margin.

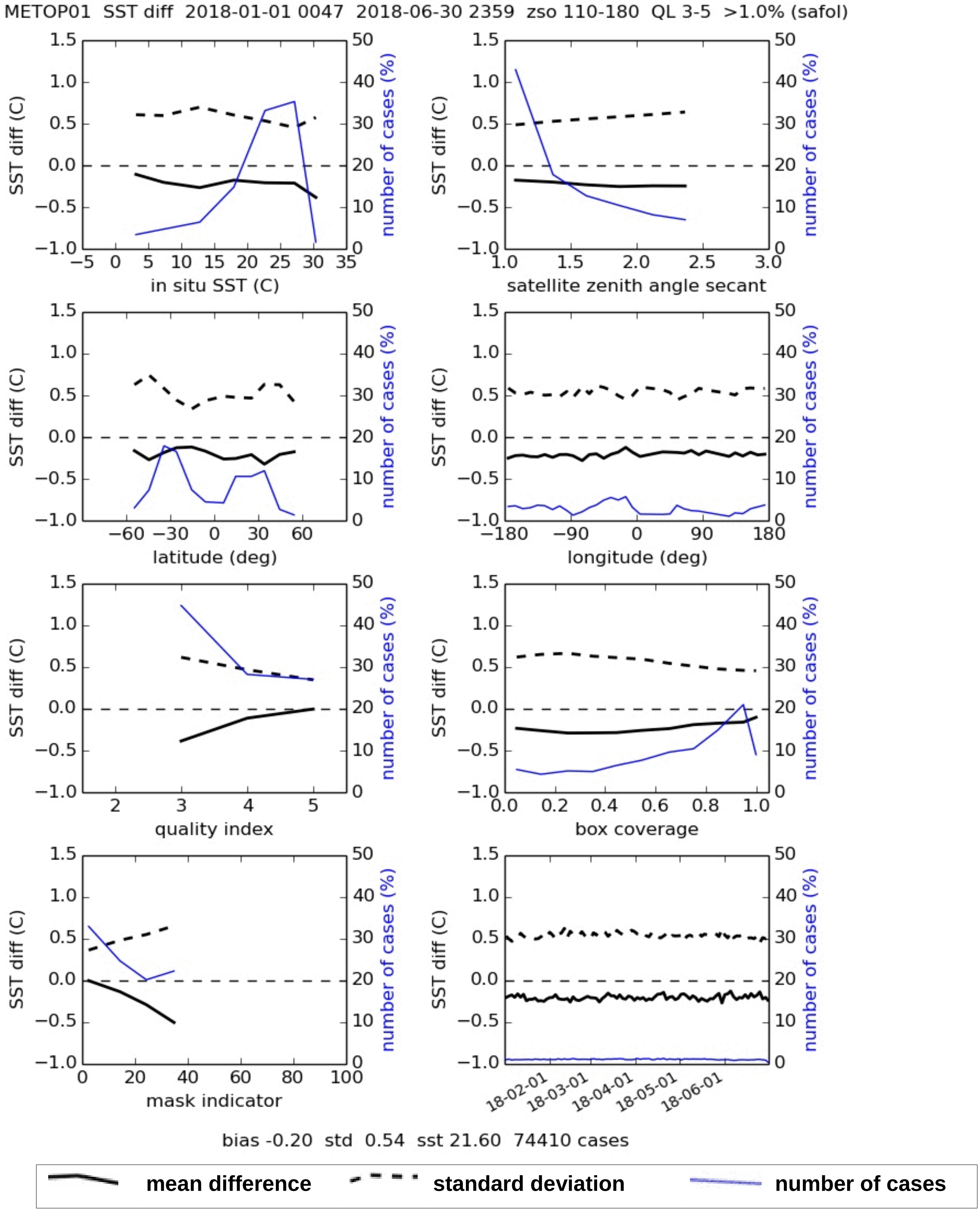


Figure 47: Complementary quality assessment statistics on Metop GBL SST night-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

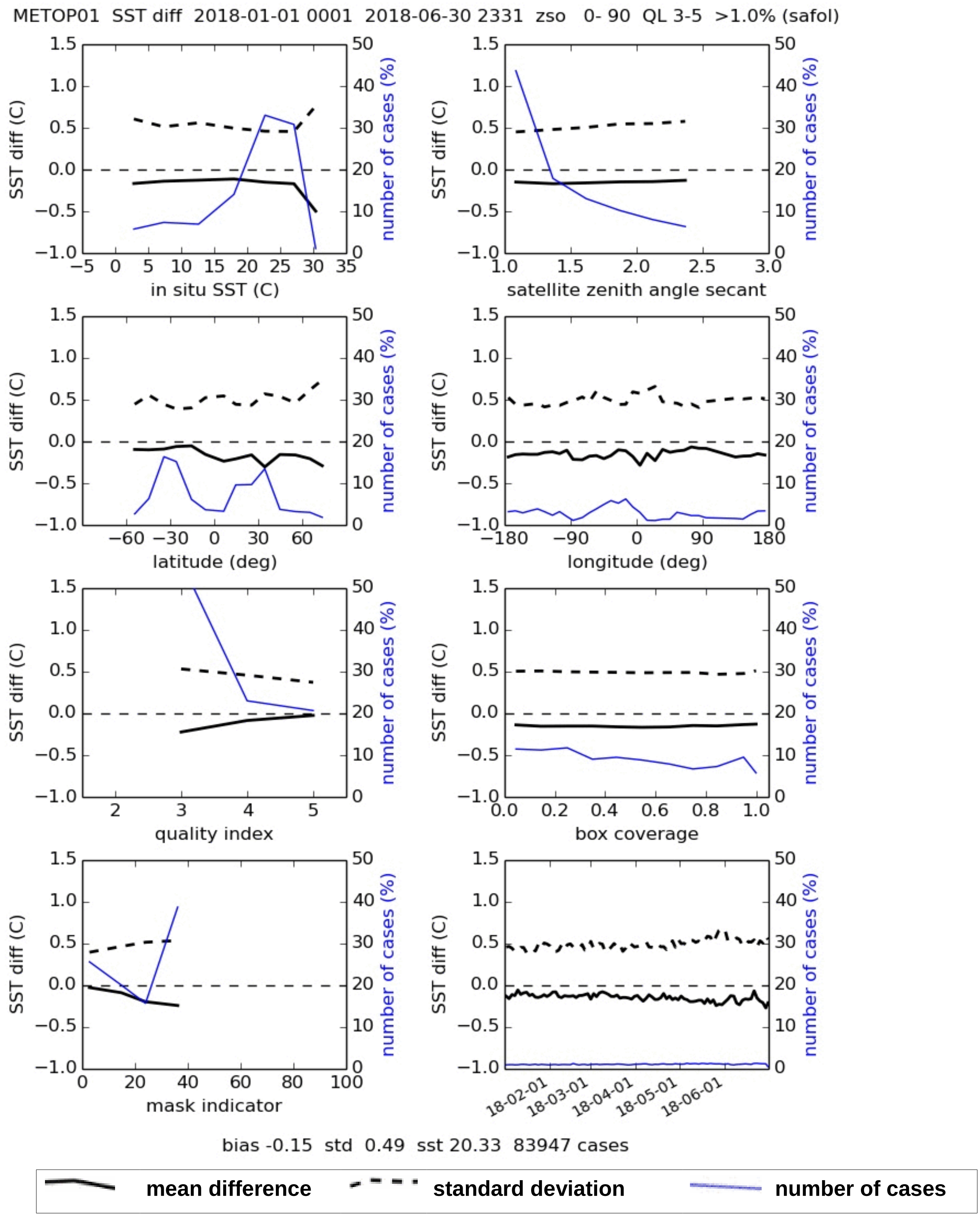


Figure 48: Complementary quality assessment statistics on Metop GBL SST day-time: dependence of the mean difference, standard deviation and number of matchups as a function of in situ SST (a), satellite zenith angle secant (b), latitude (c), longitude (d), confidence level (e), and time (f)

5.1.6. 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 mean differences (Std) and mean differences are calculated for monthly averages for day-time (SST and IST) and night-time (SST only). Only best quality data (ql 5) are used. Daytime is defined for data with sun-zenith angles smaller than 90 degrees and night-time 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.
Buoy data used for the SST validation is from the Copernicus Marine Environment Monitoring Service (In Situ TAC). Buoy data used for the IST validation is from the DMI GTS.

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 the higher certainty in IR radiometers, measuring the ice surface skin temperature, compared to the conventional buoy temperature measurements (also discussed in the ATBD for OSI-205). Only validation results for OSI-205 vs. traditional buoy data (air temperatures) are subject to the quality assessment requirements. An example of validation results for OSI-205 IST vs. in-situ IR radiometer data is shown for reference (see Comments).

Validation results for SST and IST data from OSI-205 that was not reported in the previous HYR is added here. Since we have not received any SH reference data from the OSI SAF VS/AS project with the Australian Antarctic Division, at University of Tasmania, SH validation statistics for IST are reported for the period July 2017 to December 2017 instead based on comparison with limited number of in-situ drifter data. IST SH validation statistics for the period January to June 2018 is not reported due to lack of data for comparison. OSI-205 SST/IST SH quality assessment will be conducted if and when reference data is available.

The following tables provide the monthly mean quality results over the reporting period and figures show graphs of comparison results for the half-year reporting periods.

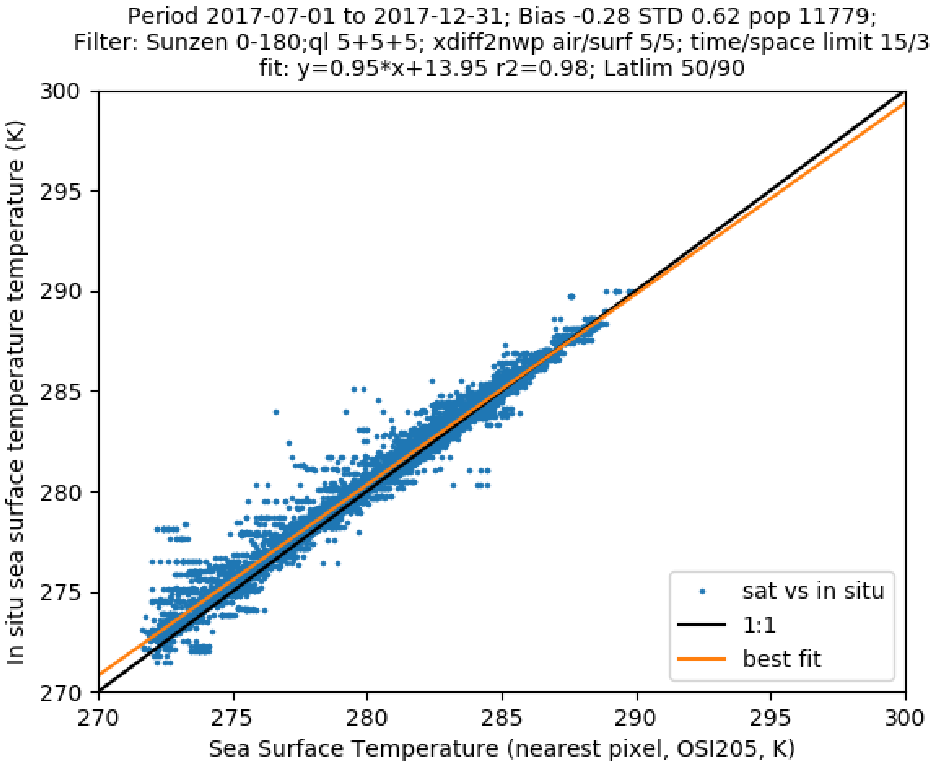


Figure 49: JUL. to DEC. 2017 OSI-205 HL SST Northern Hemisphere validation (ql 5) against in-situ drifting buoys.

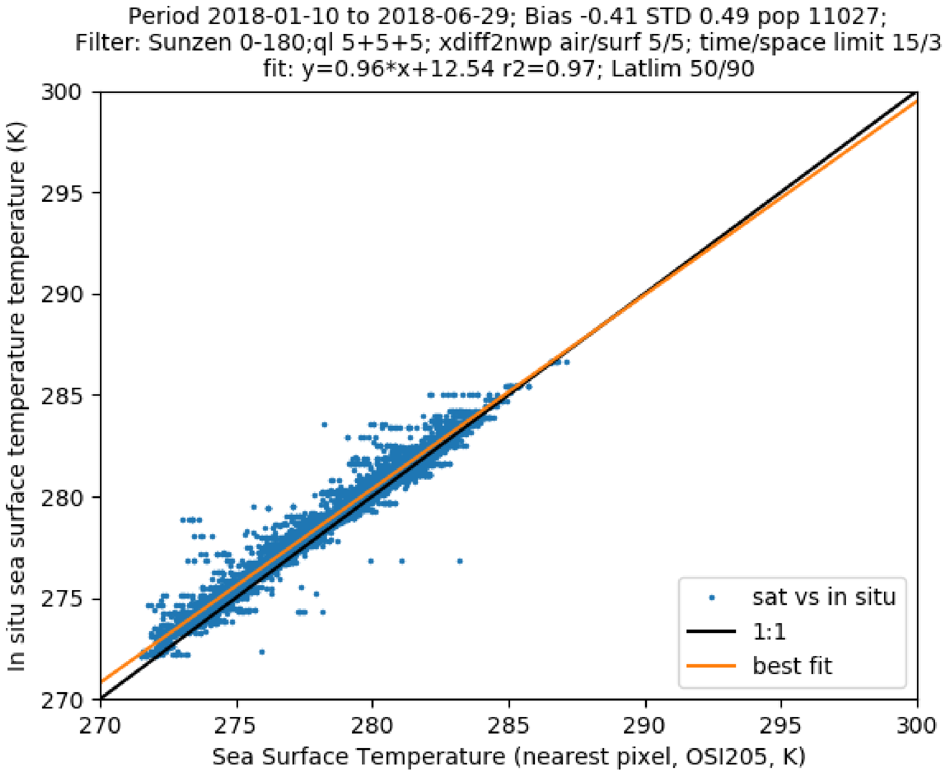


Figure 50: JAN. to JUN. 2018 OSI-205 HL SST Northern Hemisphere validation (ql 5) against in-situ drifting buoys.

OSI-205 SST NH quality results over 2nd half of 2017 and 1st half 2018, night-time							
Month	Number of cases	Mean diff. °C	Mean diff. req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JUL. 2017	NA	NA	0.7	NA	NA	1.0	NA
AUG. 2017	NA	NA	0.7	NA	NA	1.0	NA
SEP. 2017	178	-0.21	0.7	70.0	0.40	1.0	60.0
OCT. 2017	987	-0.26	0.7	62.9	0.47	1.0	53.0
NOV. 2017	858	-0.28	0.7	60.0	0.44	1.0	56.0
DEC. 2017	1013	-0.33	0.7	52.9	0.39	1.0	61.0
JAN. 2018	784	-0.33	0.7	52.9	0.41	1.0	59.0
FEB. 2018	460	-0.52	0.7	25.7	0.45	1.0	55.0
MAR. 2018	234	-0.61	0.7	12.9	0.44	1.0	56.0
APR. 2018	NA	NA	0.7	NA	NA	1.0	NA
MAY 2018	NA	NA	0.7	NA	NA	1.0	NA
JUN. 2018	NA	NA	0.7	NA	NA	1.0	NA
OSI-205 SST NH quality results over 2nd half of 2017 and 1st half 2018, day-time							
Month	Number of cases	Mean diff. °C	Mean diff. req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JUL. 2017	557	-0.36	0.7	48.6	1.06*	1.0	-6.0
AUG. 2017	902	-0.28	0.7	60.0	0.88	1.0	12.0
SEP. 2017	2644	-0.24	0.7	65.7	0.65	1.0	35.0
OCT. 2017	1475	-0.33	0.7	52.9	0.54	1.0	46.0
NOV. 2017	458	-0.36	0.7	48.6	0.43	1.0	57.0
DEC. 2017	121	-0.35	0.7	50.0	0.34	1.0	66.0
JAN. 2018	97	-0.38	0.7	45.7	0.41	1.0	59.0
FEB. 2018	440	-0.38	0.7	45.7	0.41	1.0	59.0
MAR. 2018	783	-0.53	0.7	24.3	0.36	1.0	64.0
APR. 2018	1408	-0.49	0.7	30.0	0.36	1.0	64.0
MAY 2018	3616	-0.39	0.7	44.3	0.53	1.0	47.0
JUN. 2018	1780	-0.27	0.7	61.4	0.55	1.0	45.0
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 fulfil the requirement.							

Table 10: Quality results for OSI-205 HL SST in Northern Hemisphere over July 2017 to June 2018, for quality level 5 (best qualities), by night and by day.

Comments:

The validation results for OSI-205 HL SST for the last half year (January to June 2018) and the previous reporting period (July to December 2017, not reported in last HYR) show that mean differences and standard deviations are usually within target requirements. Only exception is July 2017 (*) day-time data that is slightly outside the target requirement on standard deviation, due to a few outliers.

An automatic routine will be developed for further quality control and inspection of extreme outliers.

Due to sparse or no qualified night-time data in the spring and summer months, there are no statistics reported for July and August 2017, and April to June 2018.

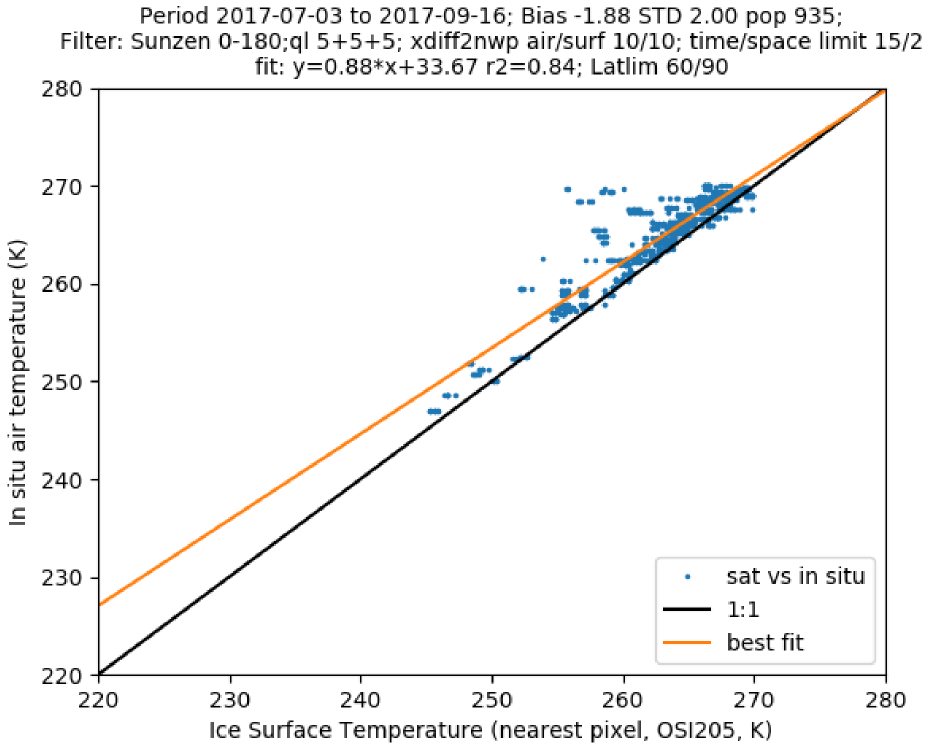


Figure 51: JUL. to DEC. 2017 OSI-205 HL IST Northern Hemisphere validation (ql 5) against in-situ drifting buoys measurements from the DMI GTS.

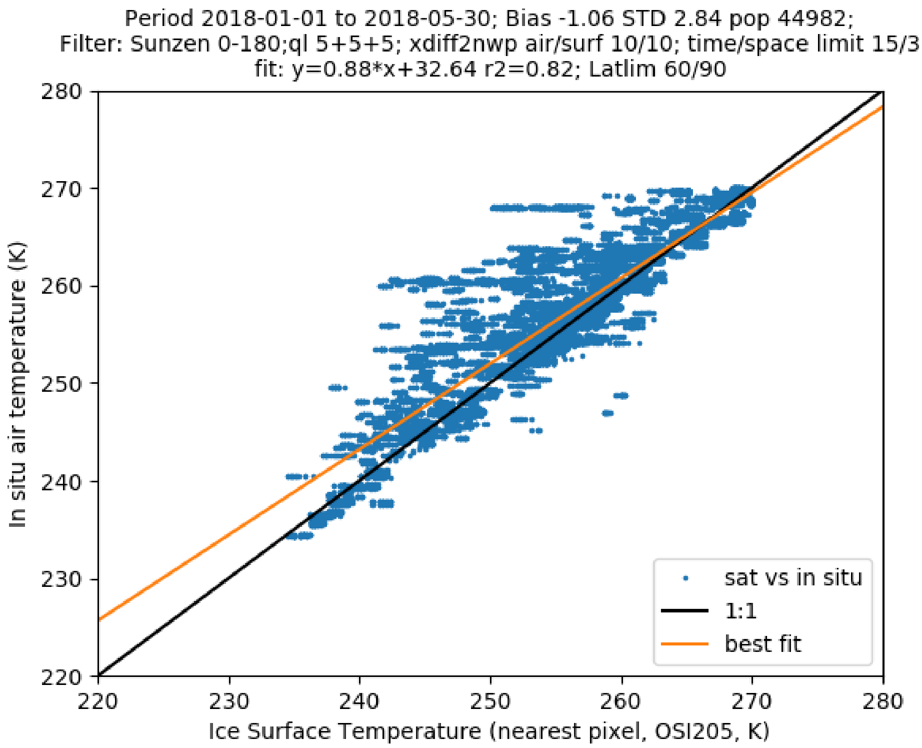


Figure 52: JAN. to JUN. 2018 OSI-205 monthly mean IST mean difference and bias with respect to conventional buoys measurements from the DMI GTS. Only data with for quality level 5 are shown.

OSI-205 IST quality results over 2nd half of 2017 and 1st half 2018, day-time							
Month	Number of cases	Mean diff. °C	Mean diff. req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JUL. 2017	NA	NA	3.5	NA	NA	3.0	NA
AUG. 2017	38	-4.92*	3.5	-40.6	4.23*	3.0	-41.0
SEP. 2017	761	-2.19	3.5	37.4	2.63	3.0	12.3
OCT. 2017	417	-1.44	3.5	58.9	1.50	3.0	50.0
NOV 2017	NA	NA	3.5	NA	NA	3.0	NA
DEC. 2017	NA	NA	3.5	NA	NA	3.0	NA
JAN. 2018	NA	NA	3.5	NA	NA	3.0	NA
FEB. 2018	33	-1.03	3.5	70.6	0.25	3.0	91.7
MAR. 2018	12206	-0.87	3.5	75.1	2.27	3.0	24.3
APR. 2018	23564	-1.18	3.5	66.3	3.15*	3.0	-5.0
MAY 2018	8961	-1.01	3.5	71.1	2.68	3.0	10.7
JUN. 2018	218	-0.77	3.5	78.0	1.70	3.0	43.3
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 OSI-205 Metop AVHRR IST over July 2017 to June 2018, for quality level 5 (best qualities), day-time.

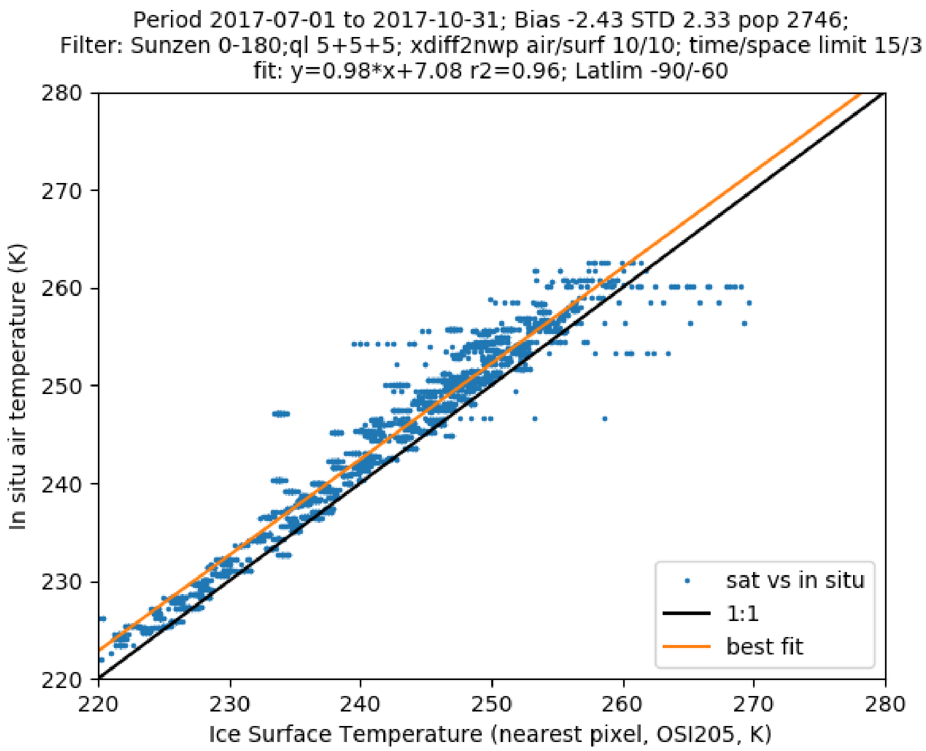


Figure 53: JUL. to DEC. 2017 OSI-205 IST Southern Hemisphere validation (ql 5) against in-situ drifting buoys measurements from the DMI GTS.

OSI-205 IST SH quality results over 2nd half of 2017, day-time							
Month	Number of cases	Mean diff. °C	Mean diff. Req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev Req. °C	Std Dev margin (**)
JUL. 2017	NA	NA	3.5	NA	NA	3.0	NA
AUG. 2017	NA	NA	3.5	NA	NA	3.0	NA
SEP. 2017	117	-1.39	3.5	60.3	1.83	3.0	39.0
OCT. 2017	2629	-2.47	3.5	29.4	2.34	3.0	22.0
NOV. 2017	NA	NA	3.5	NA	NA	3.0	NA
DEC. 2017	NA	NA	3.5	NA	NA	3.0	NA
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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: JUL. to DEC. 2017 quality results for OSI-205 Metop AVHRR IST in Southern Hemisphere for quality level 5 (best quality, day-time).

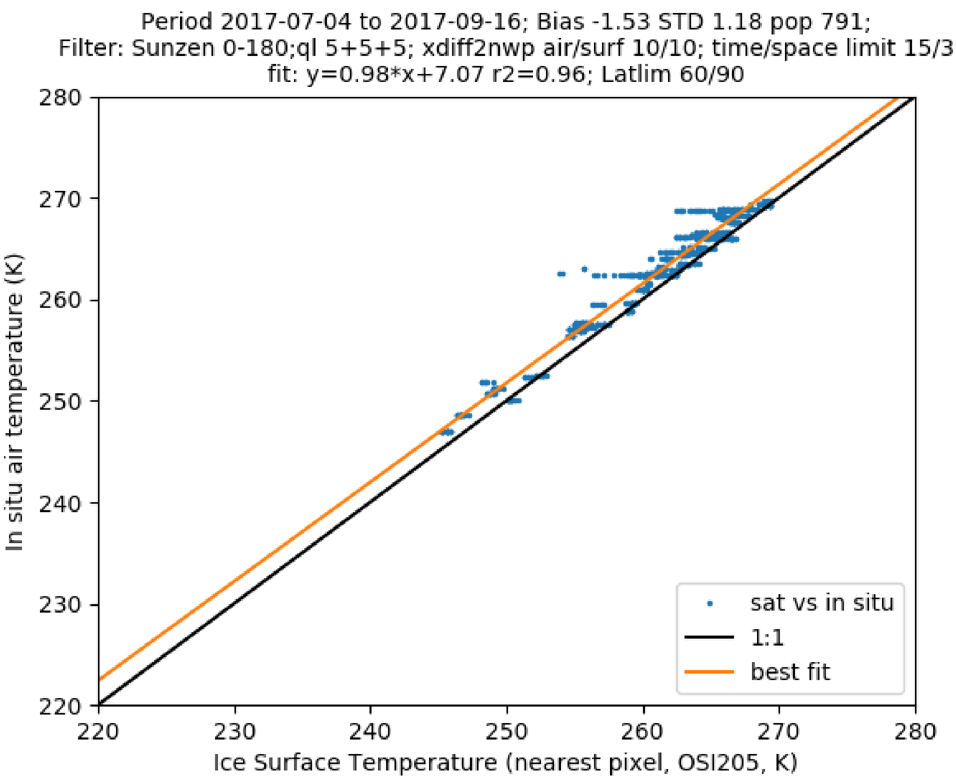


Figure 54: JUL. to DEC. 2017 OSI-205 IST Northern Hemisphere validation (ql 5) against in-situ IR radiometer measurements from PROMICE.

OSI-205 IST NH quality results over 2nd half of 2017, day-time							
Month	Number of cases	Mean diff. °C	Mean diff. °C	Mean diff. margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JUL. 2017	136	-0.61	-1.5	59.3	0.65	2.0	67.5
AUG. 2017	315	-1.41	-1.5	6.0	0.88	2.0	56.0
SEP. 2017	340	-2.01*	-1.5	-34.0	1.34	2.0	33.0
OCT. 2017	NA	NA	-1.5	NA	NA	2.0	NA
NOV. 2017	NA	NA	-1.5	NA	NA	2.0	NA
DEC. 2017	NA	NA	-1.5	NA	NA	2.0	NA
(*) Mean difference Margin = 100 * (1 - (| Mean difference / Mean difference 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: Quality results for OSI-205 Metop AVHRR IST validated against in-situ IR radiometers over JUL. to DEC. 2017, for quality level 5 (best qualitiy, day-time).

Comments:
Table 11 show Northern Hemisphere validation results for OSI-205 IST for the last half year (January to June 2018) and the previous reporting period (July to December 2017, not reported in last HYR). Validation is using best quality level 5 data only thus no night-time data is evaluated. Mean difference and standard deviations are usually within target requirements. Only exceptions (*) are August 2017, due to sparse data, and April 2018, that is that is slightly outside the target requirement on standard deviation, due to a few outliers.
Table 12 show quality results for OSI-205 IST on Southern Hemisphere compared to in-situ drifter data in 2nd half-year of 2017. In-situ drifter data for this reporting period, 1st half-year of 2018, has not been processed. Results are available for September and October 2017 only, when using best quality data (quality level 5) in the validation and due to a limited amount of buoys available. Mean differences and standard deviations are within target requirements.

Table 13 is included for reference, to show quality results for OSI-205 NH IST compared to in-situ IR radiometer measurements from the PROMICE program (stations on Greenland Ice Sheet). Quality results are shown for those three months where best quality data was available (quality level 5, day-time); Mean differences and standard deviations lie within those target requirements adherent to the validation against IR radiometers, except for mean difference in September 2017 that is slightly above, due to a few outliers. Results are better than when comparing OSI-205 IST with in-situ drifters, due to the IR radiometers measuring the actual ice surface skin temperature, as well as the that fact that there is less cloudcover over the Greenland ice sheet than over the Arctic ocean.

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. 2017 to JUN. 2018, night-time							
Month	Number of cases	Mean diff. °C	Mean diff. Req °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JUL. 2017	275	0.03	0.5	94.5	0.66	0.8	17.4
AUG. 2017	234	-0.11	0.5	78.0	0.76	0.8	4.9
SEP. 2017	292	-0.22	0.5	56.2	0.87	0.8	-8.9
OCT. 2017	239	-0.43	0.5	13.8	0.85	0.8	-6.8
NOV. 2017	299	-0.38	0.5	23.6	0.76	0.8	5.1
DEC. 2017	293	-0.58	0.5	-15.6	0.70	0.8	12.4
JAN. 2018	213	-0.29	0.5	41.5	0.68	0.8	15.2
FEB. 2018	219	-0.15	0.5	71.0	0.75	0.8	5.9
MAR. 2018	244	-0.24	0.5	52.6	0.78	0.8	2.4
APR. 2018	303	-0.29	0.5	42.2	0.66	0.8	18.0
MAY 2018	428	-0.21	0.5	58.3	0.75	0.8	6.4
JUN. 2018	486	0.01	0.5	99.1	0.77	0.8	3.9
OSI-203 AHL AVHRR SST quality results over JUL. 2017 to JUN. 2018, day-time							
Month	Number of cases	Mean diff. °C	Mean diff. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JUL. 2017	771	0.13	0.5	72.7	0.74	0.8	6.9
AUG. 2017	812	-0.04	0.5	90.5	0.78	0.8	2.9
SEP. 2017	941	-0.08	0.5	84.5	0.71	0.8	11.4
OCT. 2017	912	-0.47	0.5	6.5	0.89	0.8	-11.2
NOV. 2017	1175	-0.48	0.5	3.8	0.71	0.8	10.8
DEC. 2017	1161	-0.48	0.5	3.2	0.76	0.8	4.7
JAN. 2018	967	-0.38	0.5	23.6	0.76	0.8	4.5
FEB. 2018	758	-0.24	0.5	52.1	0.78	0.8	2.2
MAR. 2018	664	-0.25	0.5	49.7	0.82	0.8	-2.7
APR. 2018	613	-0.27	0.5	46.9	0.61	0.8	24.9
MAY 2018	768	-0.15	0.5	69.3	0.67	0.8	16.2
JUN. 2018	801	0.09	0.5	81.1	0.62	0.8	22.1
(*) Mean differences Margin = 100 * (1 - (| Mean differences / Mean differences 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 fulfil the requirement.							

Table 14: Quality results for OSI-203AHL AVHRR SST over JUL. 2017 to JUN. 2018, for 3,4,5 quality indexes, by night and by day.

Comments:

The OSI-203 product is performing as usual. The night-time and daytime validation results are within requirements both for mean difference and standard deviation for all months, except slightly outside the standard deviation requirement in March 2018 at daytime.

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

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

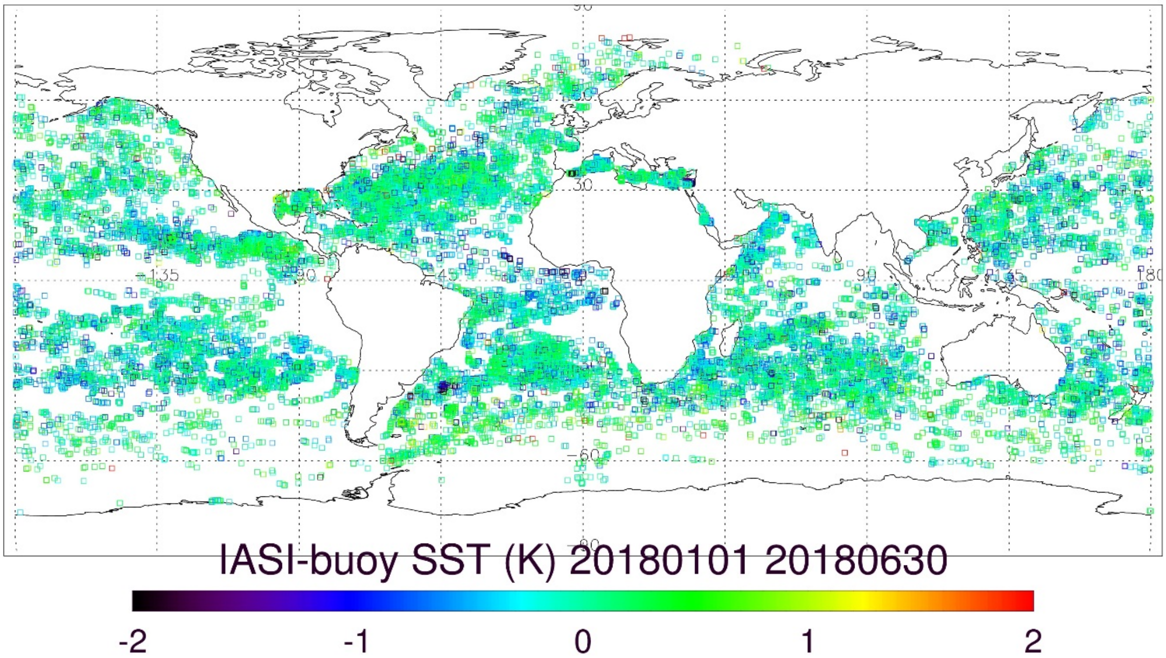


Figure 55: Mean Metop-B IASI night-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 from JAN. 2018 to JUN. 2018

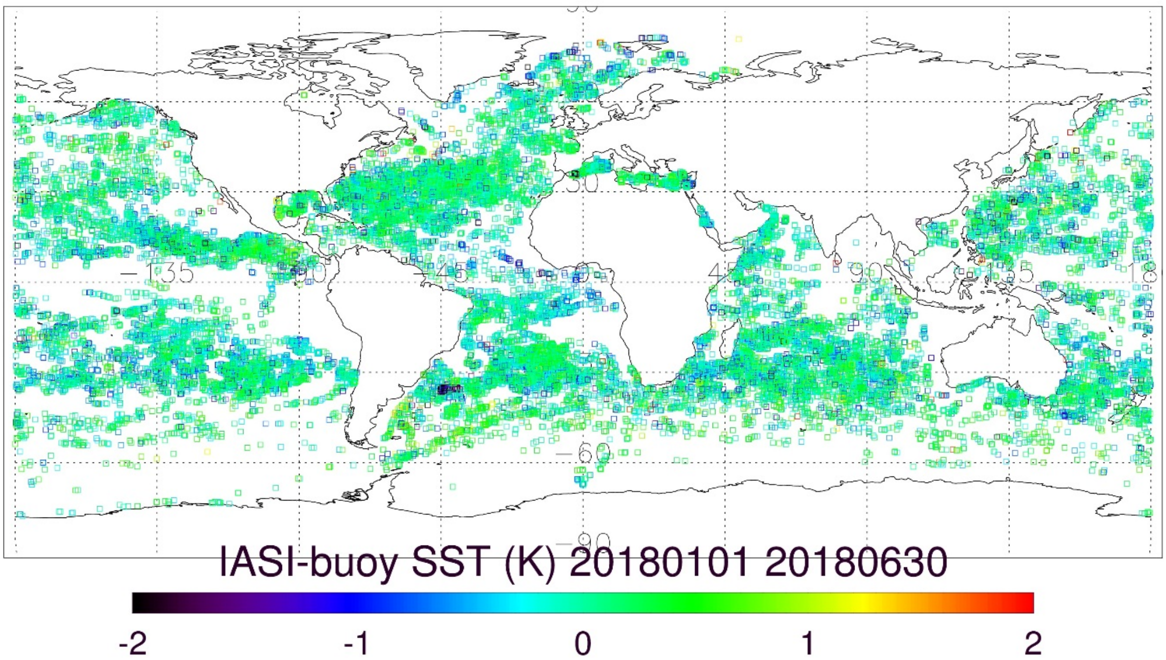


Figure 56: Mean Metop-B IASI day-time SST minus drifting buoy SST for Quality Levels 3, 4 and 5 from JAN. 2018 to JUN. 2018

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

Global Metop-B IASI night-time SST quality results over 1st half 2018							
Month	Number of cases	Mean diff. °C	Mean diff. req. °C	Mean diff. Margin (*)	Std Dev °C	Std Dev req. °C	Std Dev margin (**)
JAN. 2018	4374	-0.01	0.5	98	0.54	0.8	33
FEB. 2018	3896	0.0	0.5	100	0.52	0.8	35
MAR. 2018	4291	-0.18	0.5	68	0.50	0.8	38
APR. 2018	4489	-0.21	0.5	71	0.50	0.8	38
MAY 2018	4792	-0.24	0.5	74	0.56	0.8	30
JUN. 2018	4248	-0.20	0.5	70	0.50	0.8	38
Global Metop-B IASI day-time SST quality results over 1st half 2018							
JAN. 2018	4378	0.09	0.5	59	0.48	0.8	40
FEB. 2018	4059	0.08	0.5	58	0.49	0.8	39
MAR. 2018	4613	-0.10	0.5	60	0.48	0.8	40
APR. 2018	4770	-0.17	0.5	66	0.48	0.8	40
MAY 2018	5136	-0.17	0.5	66	0.54	0.8	33
JUN. 2018	4222	-0.14	0.5	64	0.49	0.8	39
(*) Mean difference margin = 100 * (1 - (| Mean difference / Mean difference req.|)) (**) Std Dev margin = 100 * (1 - (Std Dev / Std Dev Req)) 100 refers then to a perfect product, 0 to a quality just as required. without margin. A negative result indicates that the product quality does not fulfill the requirement.							

Table 15: Quality results for global Metop-B IASI SST over 1st half 2018, for Quality Levels 3, 4 and 5

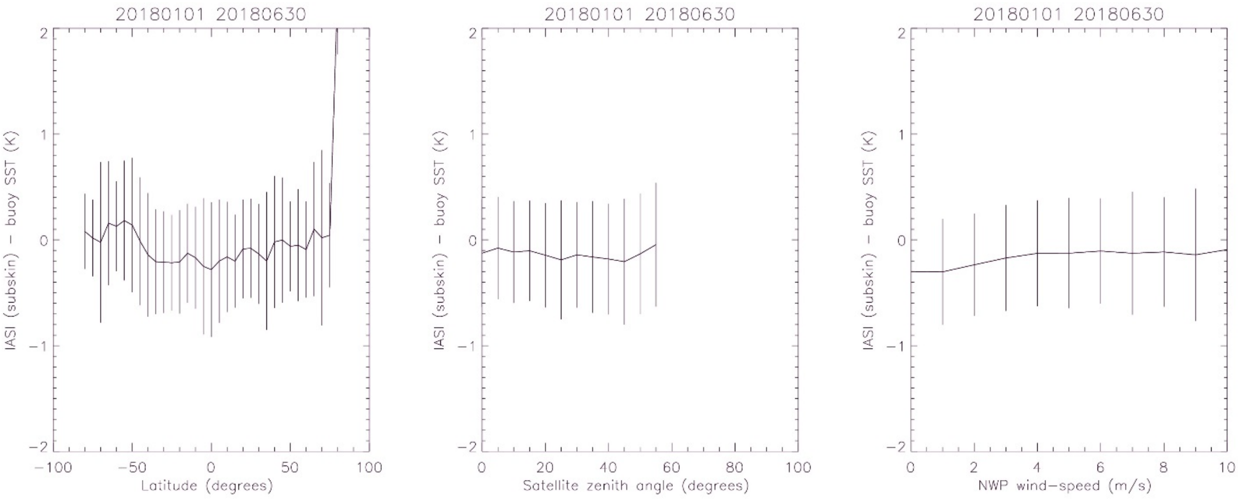


Figure 57: Mean Metop-B IASI night-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5, JUL. 2017 to JUN. 2018

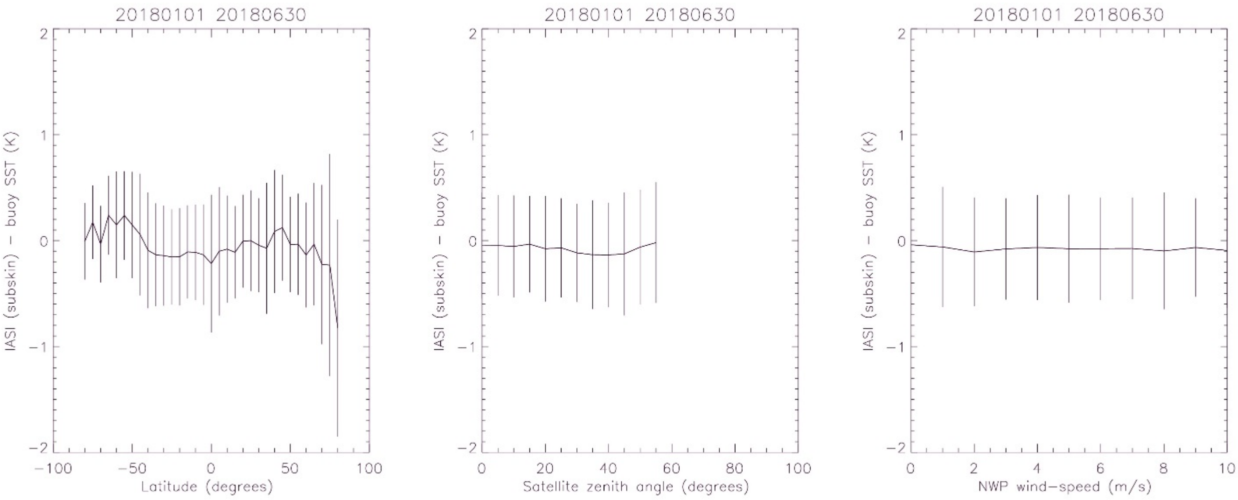


Figure 58: Mean Metop-B IASI day-time SST minus drifting buoy SST analyses for Quality Levels 3, 4 and 5, JUL. 2017 to JUN. 2018

Comments:

All statistics are performing well and within the requirements. For the period 1st January to 30th June 2018, then global mean difference (day-time IASI minus drifting buoy) is -0.08K with standard deviation of 0.51K (n=27178), and for night-time the mean difference is -0.14K with standard deviation of 0.53K (n=26090). The day-time and night-time mean differences have overall both changed by around -0.15K with the implementation of the IASI PPF v4.4 on 7th March 2018, it is planned to address these within the Sensor Specific Error Statistics (SSES) fields.

5.2. Radiative Fluxes quality

5.2.1. DLI quality

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

- monthly relative mean difference 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-East 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://osi-saf.eumetsat.int/lml/img/flx_map_stations_2b.gif

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

Geostationary Meteosat & GOES-East DLI quality results over 1st half 2018										
Month	Number of cases	Mean DLI in Wm^{-2}	Mean diff. in Wm^{-2}	Mean diff. in %	Mean diff. req. in %	Mean diff. Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev req. in %	Std Dev margin (**) in %
JUL. 2017	5090	377.33	-2.59	-0.69	5.0	86.27	18.75	4.97	10.0	50.31
AUG. 2017	5107	367.64	-2.18	-0.59	5.0	88.14	18.60	5.06	10.0	49.41
SEP. 2017	4248	347.88	-3.61	-1.04	5.0	79.25	17.83	5.13	10.0	48.75
OCT. 2017	4444	320.33	-3.10	-0.97	5.0	80.64	17.08	5.33	10.0	46.68
NOV. 2017	4222	290.74	-4.43	-1.52	5.0	69.53	18.46	6.35	10.0	36.51
DEC. 2017	4016	269.65	-4.60	-1.71	5.0	65.88	19.41	7.20	10.0	28.02
JAN. 2018	5808	274.78	-6.77	-2.46	5.0	50.72	23.41	8.52	10.0	14.80
FEB. 2018	5316	268.16	-4.24	-1.58	5.0	68.38	18.04	6.73	10.0	32.73
MAR. 2018	5796	281.41	-3.90	-1.39	5.0	72.28	15.04	5.34	10.0	46.55
APR. 2018	5656	303.66	-2.05	-0.68	5.0	86.50	13.88	4.57	10.0	54.29
MAY 2018	4757	344.73	-0.60	-0.17	5.0	96.52	13.83	4.01	10.0	59.88
JUN. 2018	4214	367.95	-1.93	-0.52	5.0	89.51	14.47	3.93	10.0	60.67
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 16: Geostationary DLI quality results over 1st half 2018.

Comments:
Overall statistics are good and within the requirement.

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

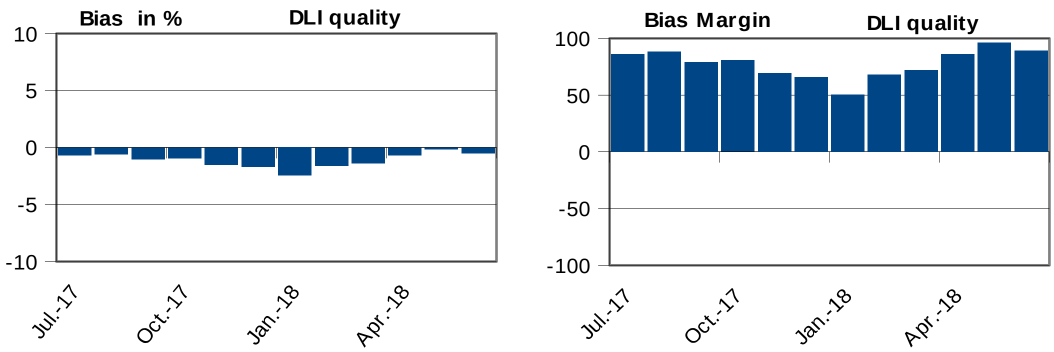


Figure 59: Left : Geostationary DLI mean difference.
Right : Geostationary DLI mean difference margin.

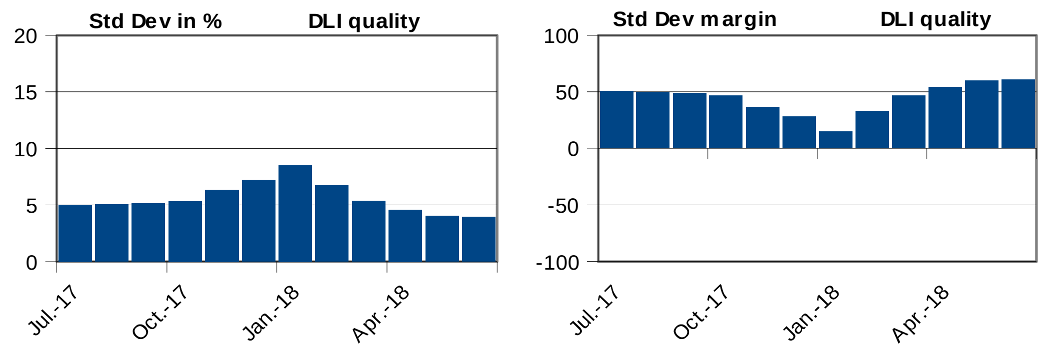


Figure 60: Left : Geostationary DLI standard deviation.
Right : Geostationary DLI standard deviation margin.

5.2.1.2. Meteosat Indian Ocean DLI (OSI-IO-DLI) quality

Since 2016, Meteosat-8 is in position 41.5 east for the Indian Ocean Data Coverage (IODC). Downward Long wave Irradiance is processed as a demonstration product.

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

Geostationary Meteosat Indian Ocean DLI quality results over 1st half 2018										
Month	Number of cases	Mean DLI in Wm^{-2}	Mean diff. in Wm^{-2}	Mean diff. in %	Mean diff. req. in %	Mean diff. margin in % (*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev req. In %	Std Dev margin (**) in %
JUL. 2017	2148	354.78	2.19	0.62	5.0	87.65	12.56	3.54	10.0	64.60
AUG. 2017	1387	351.01	3.51	1.00	5.0	80.00	14.32	4.08	10.0	59.20
SEP. 2017	648	337.11	2.81	0.83	5.0	83.33	14.11	4.19	10.0	58.14
OCT. 2017	736	331.79	-2.08	-0.63	5.0	87.46	18.19	5.48	10.0	45.18
NOV. 2017	1319	304.85	-8.84	-2.90	5.0	42.00	24.28	7.96	10.0	20.35
DEC. 2017	706	309.30	-9.12	-2.95	5.0	41.03	22.15	7.16	10.0	28.39
JAN. 2018	2231	304.09	-12.50	-4.11	5.0	17.79	24.78	8.15	10.0	18.51
FEB. 2018	2014	258.32	-4.89	-1.89	5.0	62.14	19.79	7.66	10.0	23.39
MAR. 2018	2225	286.06	-6.20	-2.17	5.0	56.65	17.50	6.12	10.0	38.82
APR. 2018	2133	314.95	-1.64	-0.52	5.0	89.59	13.84	4.39	10.0	56.06
MAY 2018	1450	318.69	6.78	2.13	5.0	57.45	12.06	3.78	10.0	62.16
JUN. 2018	662	351.97	2.49	0.71	5.0	85.85	13.61	3.87	10.0	61.33
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 17: Meteosat Indian Ocean DLI quality results over 1st half 2018.

Comments:
Overall statistics are good and within the requirement.

The following graphs illustrate the evolution of Meteosat Indian Ocean DLI quality over the past 12 months.

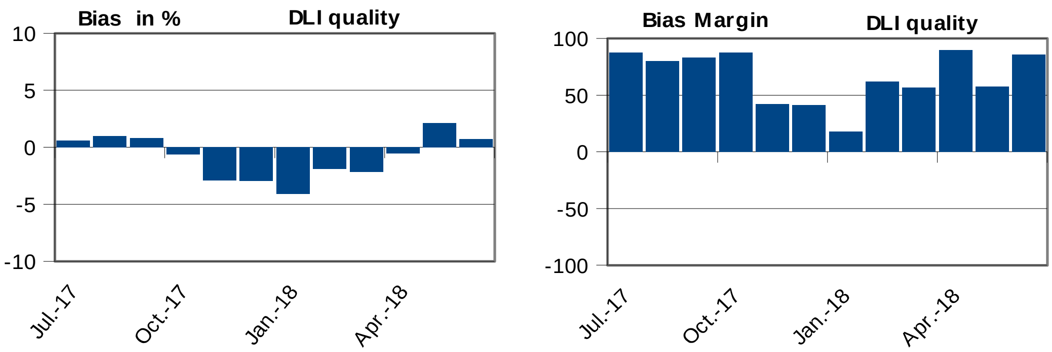
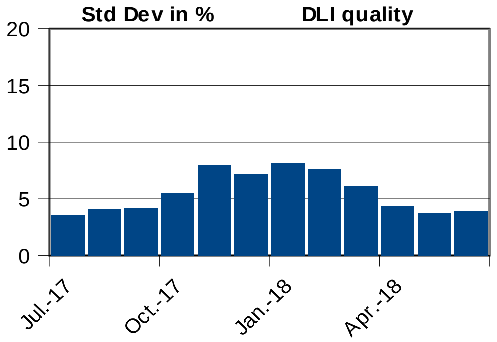


Figure 61: Left : Meteosat Indian Ocean DLI mean difference.
Right : Meteosat Indian Ocean DLI mean difference margin.



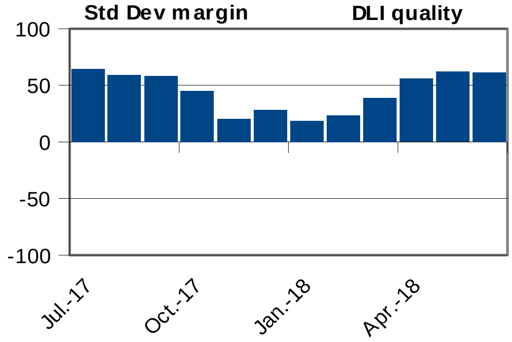


Figure 62: Left : Meteosat Indian Ocean DLI standard deviation.
Right : Meteosat Indian Ocean DLI standard deviation margin.

5.2.1.3. AHL DLI (OSI-301) quality

The pyrgeometer stations used for quality assessment of the AHL DLI product are selected stations from Table 21.

These stations are briefly described at http://nowcasting.met.no/validering/flukser/. More information on the stations is provided in 5.2.2.3.

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

AHL DLI quality results over JUL. 2017 to JUN. 2018										
Month	Number of cases	Mean DLI in Wm^{-2}	Mean diff. in Wm^{-2}	Mean diff. in %	Mean diff. req. In %	Mean diff. Marg in %(*)	Std Dev in Wm^{-2}	Std Dev In %	Std Dev req. In %	Std Dev margin (**) in %
JUL. 2017	90	324.2	-8.18	5.82	5.0	-16,4	11.99	3.71	10.0	62,9
AUG. 2017	104	326.4	-6.84	5.25	5.0	-5	13.80	4.25	10.0	57,5
SEP. 2017	116	331.2	-12.06	5.29	5.0	-5,8	13.39	4.06	10.0	59,4
OCT. 2017	124	309.9	-6.92	3.94	5.0	21,2	15.87	5.13	10.0	48,7
NOV. 2017	120	284.1	1.55	2.18	5.0	56,4	13.84	4.86	10.0	51,4
DEC. 2017	120	282.0	-6.21	2.52	5.0	49,6	16.63	5.93	10.0	40,7
JAN. 2018	429	277.52	-8.20	3.01	5.0	39.8	17.97	6.56	10.0	34,4
FEB. 2018	386	257.62	-1.93	2.04	5.0	59.2	16.18	6.42	10.0	35,8
MAR. 2018	423	253.95	3.83	1.77	5.0	64.6	16.85	6.70	10.0	33
APR. 2018	387	286.62	1.57	4.37	5.0	12.6	16.52	5.83	10.0	41,7
MAY 2018	399	305.51	8.87	5.68	5.0	-13.6	15.99	5.28	10.0	47,2
JUN. 2018	375	323.22	7.58	5.79	5.0	-15.8	12.49	3.86	10.0	61,4
(*) Mean difference margin = 100 * (1 - (| mean difference / mean difference 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 18: AHL DLI quality results over JUL. 2017 to JUN. 2018.

Comments:
Validation targets are not met for the relative mean difference in May and June. The reason for this is primarily results at stations Sodankylä, Jokionen and Hamburg-Fuhlsbuettel. If these are excluded results are within target.

5.2.2. SSI quality

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

- monthly relative mean difference 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-East SSI (OSI-306) quality

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

Geostationary Meteosat & GOES-East SSI quality results over 1st half 2018										
Month	Number of cases	Mean SSI in Wm^{-2}	Mean diff. in Wm^{-2}	Mean diff. in %	Mean diff. Req in %	Mean diff. Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev Req in %	Std Dev margin (**) in %
JUL. 2017	7367	469.84	-0.32	-0.07	10.0	99.32	77.96	16.59	30.0	44.69
AUG. 2017	6914	455.61	-0.32	-0.07	10.0	99.30	81.84	17.96	30.0	40.12
SEP. 2017	5817	418.94	11.35	2.71	10.0	72.91	74.84	17.86	30.0	40.45
OCT. 2017	5436	392.00	11.22	2.86	10.0	71.38	70.00	17.86	30.0	40.48
NOV. 2017	4516	339.25	12.93	3.81	10.0	61.89	77.56	22.86	30.0	23.79
DEC. 2017	3942	296.80	-0.56	-0.19	10.0	98.11	73.15	24.65	30.0	17.85
JAN. 2018	5096	301.09	1.38	0.46	10.0	95.42	69.60	23.12	30.0	22.95
FEB. 2018	5293	342.36	-6.24	-1.82	10.0	81.77	82.10	23.98	30.0	20.06
MAR. 2018	6712	374.06	6.34	1.69	10.0	83.05	82.25	21.99	30.0	26.71
APR. 2018	7177	428.24	11.98	2.80	10.0	72.03	89.65	20.93	30.0	30.22
MAY 2018	7249	453.90	-2.30	-0.51	10.0	94.93	83.85	18.47	30.0	38.42
JUN. 2018	6731	473.43	-1.88	-0.40	10.0	96.03	76.97	16.26	30.0	45.81
(*) Mean difference margin = 100 * (1 - (| mean difference / mean difference 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 19: Geostationary SSI quality results over 1st half 2018.

Comments:
Overall statistics are good and within the requirement.

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

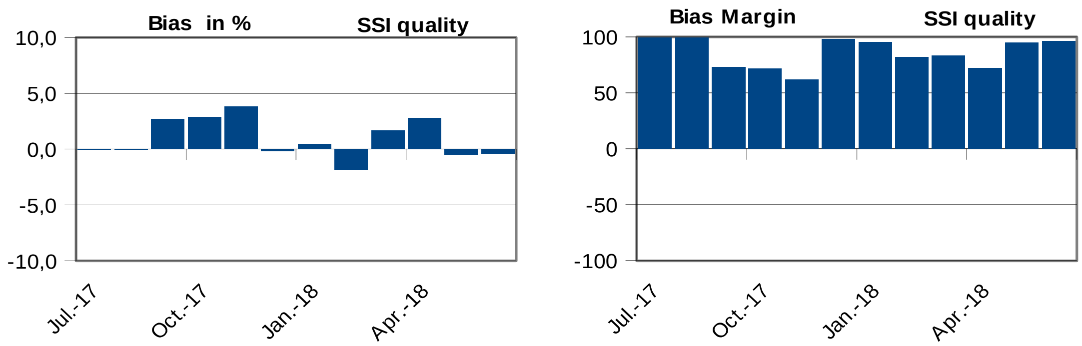


Figure 63: **Left: Geostationary SSI mean difference.**
Right Geostationary SSI mean difference margin.

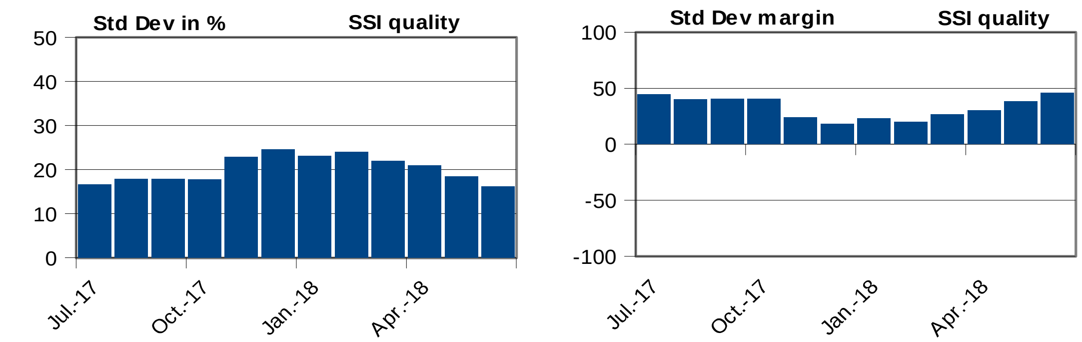


Figure 64: **Left: Geostationary SSI Standard deviation.**
Right Geostationary SSI Standard deviation margin.

5.2.2.2. *Meteosat Indian Ocean SSI (OSI-IO-SSI)*

Surface Solar Irradiance from Meteosat-8 (in position 41.5 east) is processed as a demonstration product since 2016.

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

Meteosat Indian Ocean SSI quality results over 1st half 2018										
Month	Number of cases	Mean SSI in Wm^{-2}	Mean diff. in Wm^{-2}	Mean diff. in %	Mean diff. req. in %	Mean diff. margin in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev req. in %	Std Dev margin (**) in %
JUL. 2017	4972	461.42	-5.70	-1.24	10.0	87.65	65.55	14.21	30.0	52.65
AUG. 2017	4692	444.71	-5.73	-1.29	10.0	87.12	64.60	14.53	30.0	51.58
SEP. 2017	4039	393.36	-3.77	-0.96	10.0	90.42	66.27	16.85	30.0	43.84
OCT. 2017	3640	370.05	3.48	0.94	10.0	90.60	59.92	16.19	30.0	46.03
NOV. 2017	2678	310.86	3.60	1.16	10.0	88.42	67.69	21.78	30.0	27.42
DEC. 2017	1983	263.87	7.23	2.74	10.0	72.60	62.83	23.81	30.0	20.63
JAN. 2018	2872	258.93	8.81	3.40	10.0	65.98	57.59	22.24	30.0	25.86
FEB. 2018	3120	325.93	6.80	2.09	10.0	79.14	62.14	19.07	30.0	36.45
MAR. 2018	3991	344.85	3.92	1.14	10.0	88.63	66.24	19.21	30.0	35.97
APR. 2018	4404	421.10	7.32	1.74	10.0	82.62	62.80	14.91	30.0	50.29
MAY 2018	4394	464.26	-8.74	-1.88	10.0	81.17	72.21	15.55	30.0	48.15
JUN. 2018	3583	466.69	-5.83	-1.25	10.0	87.51	72.75	15.59	30.0	48.04
(*) Mean difference margin = 100 * (1 - (|mean difference / mean difference 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 20: Meteosat Indian Ocean SSI quality results over 1st half 2018.

Comments:
Overall statistics are good and within the requirement.

The following graphs illustrate the evolution of Meteosat Indian Ocean SSI quality over the past 12 months.

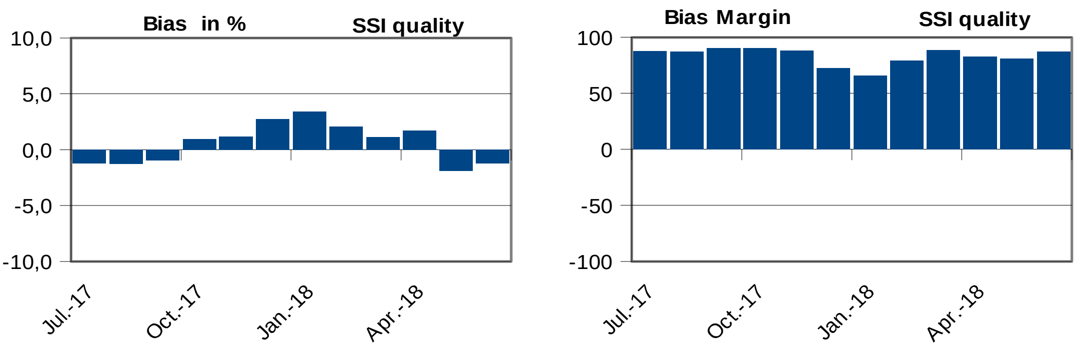
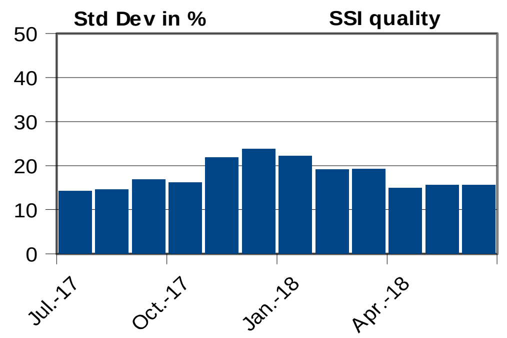


Figure 65: Left: Meteosat Indian Ocean SSI mean difference.
Right: Meteosat Indian Ocean y SSI mean difference margin.



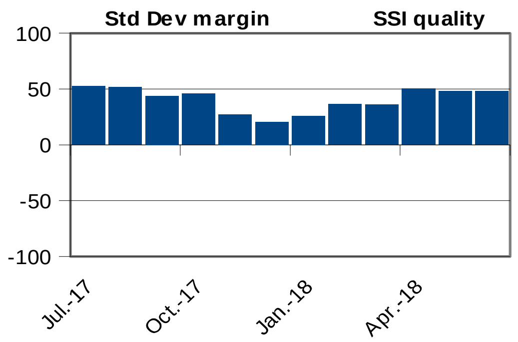


Figure 66: Left: Meteosat Indian Ocean SSI Standard deviation.
Right: Meteosat Indian Ocean SSI Standard deviation margin.

5.2.2.3. AHL SSI (OSI-302) quality

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

Station	StId	Latitude	Longitude		Status
Apelsvoll	11500	60.70°N	10.87°E	SSI	In use, under examination due to shadow effects.
Løken	23500	61.12°N	9.07°E	SSI	Not used currently
Landvik	38140	58.33°N	8.52°E	SSI	In use
Særheim	44300	58.78°N	5.68°E	SSI	In use
Fureneset	56420	61.30°N	5.05°E	SSI	In use
Tjøtta	76530	65.83°N	12.43°E	SSI	In use
Ekofisk	76920	56.50°N	3.2°E	SSI, DLI	The station was closed due to change platforms in the position. Instrumentation is recovered and work in progress to remount equipment.
Holt	90400	69.67°N	18.93°E	SSI	Not used currently
Bjørnøya	99710	74.52°N	19.02°E	SSI, DLI	In use, Arctic station with snow on ground much of the year.
Hopen	99720	76.51°N	25.01°E	SSI, DLI	In use, Arctic station with snow on ground much of the year. Strong shadow effect by mountains.
Jan_Mayen	99950	70.93°N	-8.67°E	SSI, DLI	In use, Arctic station with snow on ground much of the year, volcanic ash deteriorates instruments in periods.
Schleswig	10035	54.53°N	9.55°E	SSI, DLI	In use
Hamburg-Fuhlsbuettel	10147	53.63°N	9.99°E	SSI, DLI	In use
Jokioinen	1201	60.81°N	23.501°E	SSI, DLI	In use. DLI was added to this station during the spring of 2016.

Station	StId	Latitude	Longitude		Status
Sodankylä	7501	67.37°N	26.63°E	SSI, DLI	In use, temporarily disabled for SSI validation. Problems likely to be connected with snow on ground.
Kiruna	02045	67.85°N	20.41°E	SSI, DLI	Only DLI used so far.
Visby	02091	57.68°N	18.35°E	SSI, DLI	Only DLI used so far.
Svenska Högarna	02492	59.45°N	19.51°E	SSI, DLI	Only DLI used so far.

Table 21: Validation stations that are currently used for AHL radiative fluxes quality assessment.

The stations used in this validation are owned and operated by the Norwegian Meteorological Institute, University of Bergen, Geophysical Institute, Bioforsk, Finnish Meteorological Institute (FMI), Swedish Meteorological Institute (SMHI) and Deutscher Wetterdienst (DWD). Data from DWD and SMHI are extracted from WMO GTS, data from the other sources are received by email or through other direct connections. More stations are being considered for inclusion.

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

The pyranometer stations used for validation of the AHL SSI product are selected stations from table 21. There are some differences in the stations used for SSI validation compared to DLI. The reason for this is partly the observation programme at stations, but also that SSI validation is more sensitive to station characteristics than DLI.
The following stations are currently used:

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

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

AHL SSI quality results over JUL. 2017 to JUN. 2018										
Month	Number of cases	Mean SSI in Wm^{-2}	Mean diff. in Wm^{-2}	Mean diff. in %	Mean diff. req. in %	Mean diff. Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev req. in %	Std Dev margin (**) in %
JUL. 2017	231	180.9	-38.54	20.66	10.0	-106.6	28.65	16.23	30.0	45.9
AUG. 2017	234	119.2	-19.28	20.50	10.0	-105	24.76	21.0	30.0	30
SEP. 2017	232	65.1	-7.73	12.65	10.0	-26.5	16.71	29.54	30.0	1.53
OCT. 2017	241	27.0	-6.00	19.87	10.0	-98.7	12.37	38.02	30.0	-26.73
NOV. 2017	233	7.1	-1.61	8.71	10.0	12.9	9.31	53.72	30.0	-79.07
DEC. 2017	240	2.3	NA	NA	10.0	NA	NA	NA	30.0	NA
JAN. 2018	429	9.74	-3.70	69.45	10.0	-594.5	10.93	91.90	30.0	-206.33
FEB. 2018	386	32.28	-13.20	38.13	10.0	-281.3	18.27	53.92	30.0	-79.73
MAR. 2018	423	89.95	-38.18	42.78	10.0	-327.8	30.61	34.61	30.0	-15.37
APR. 2018	387	149.79	-50.21	32.41	10.0	-224.1	36.18	24.65	30.0	17.83
MAY 2018	399	235.92	-52.77	21.65	10.0	-116.5	41.23	18.84	30.0	37.2
JUN. 2018	375	225.98	-52.66	23.08	10.0	-130.8	37.04	17.00	30.0	43.33
(*) Mean difference Margin = 100 * (1 - (| mean difference / mean difference 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 22: AHL SSI quality results over JUL. 2017 to JUN. 2018

Comments:
Validation targets are not met for the relative mean difference at all this period, while the target is met for the standard deviation in April through June. Concerning the available validation stations, very few of the agricultural stations on the Norwegian mainland were available this time. These stations are located closer to the Atlantic ocean and generally provides better results than the stations from the Baltic Sea and Germany received through email and GTS. However, given the validation results at the Arctic stations as well, this period shows a large overestimation compared to observations. This overestimation is larger the further south and inland the stations are located. This might indicate a structural bias due to e.g. water vapour (consistent with the previous validation report and switch of NWP input). Given the relatively OK performance in the standard deviation, the algorithm will be tuned to modify the bias.

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 originates from the operational ice charting divisions at DMI, MET Norway and National Ice Center (NIC). The ice charts are primarily based on SAR (Radarsat and Sentinel-1) data, together with AVHRR and MODIS data in several cases. The quality assessment results are shown separately for the three different sets of ice charts.

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

For each ice chart concentration level the deviation between ice chart concentration and OSI SAF ice concentration is calculated. Afterwards deviations are grouped into categories, i.e. ±10% and ±20%. Furthermore the bias and standard deviation are calculated and reported for ice (100% ice concentration) and 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 23: Error codes for the manual registration

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

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

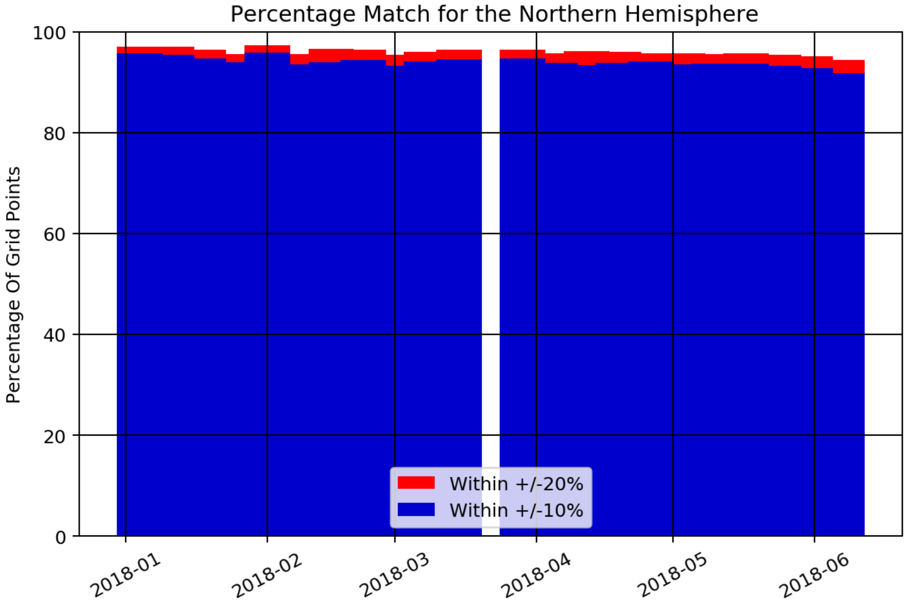


Figure 67: Comparison of ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. Northern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%.

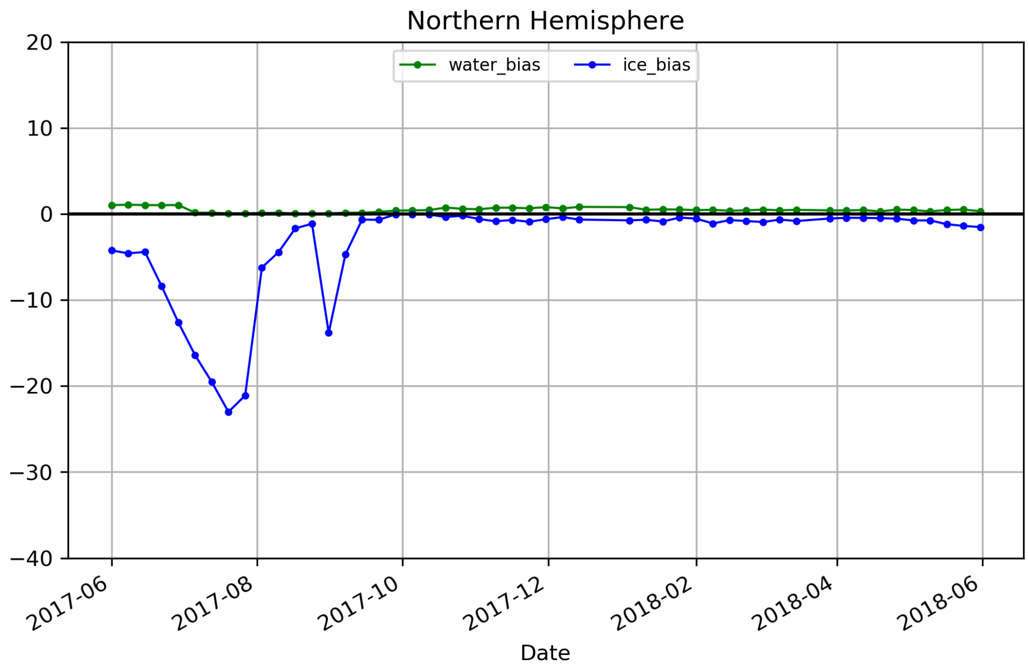


Figure 68: Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for two categories: water and ice. Northern hemisphere.

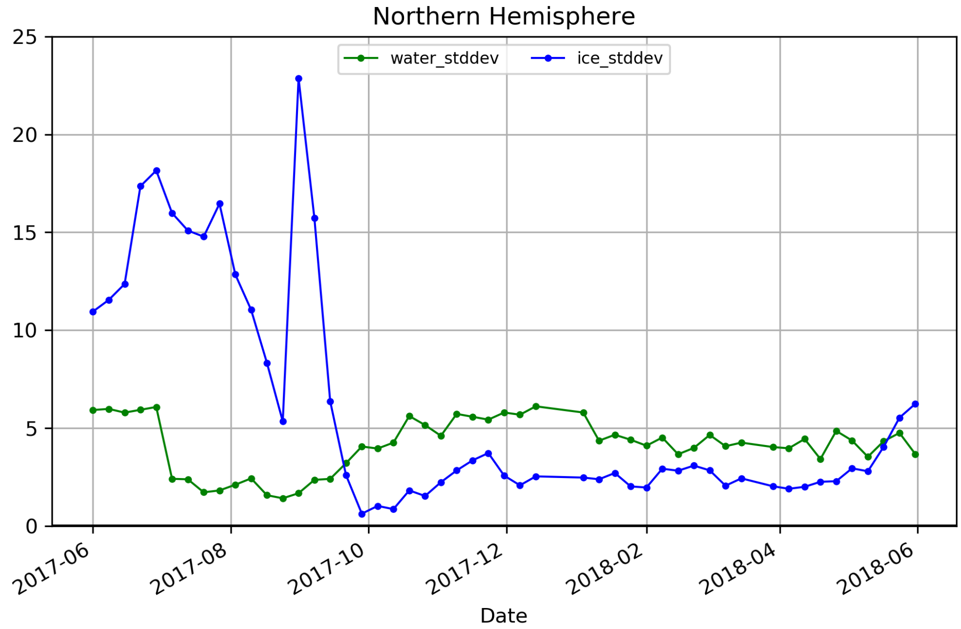


Figure 69: Standard deviation of the difference in ice concentrations from the Greenland overview charts made by DMI and OSI SAF concentration product for two categories: water and ice. Northern hemisphere.

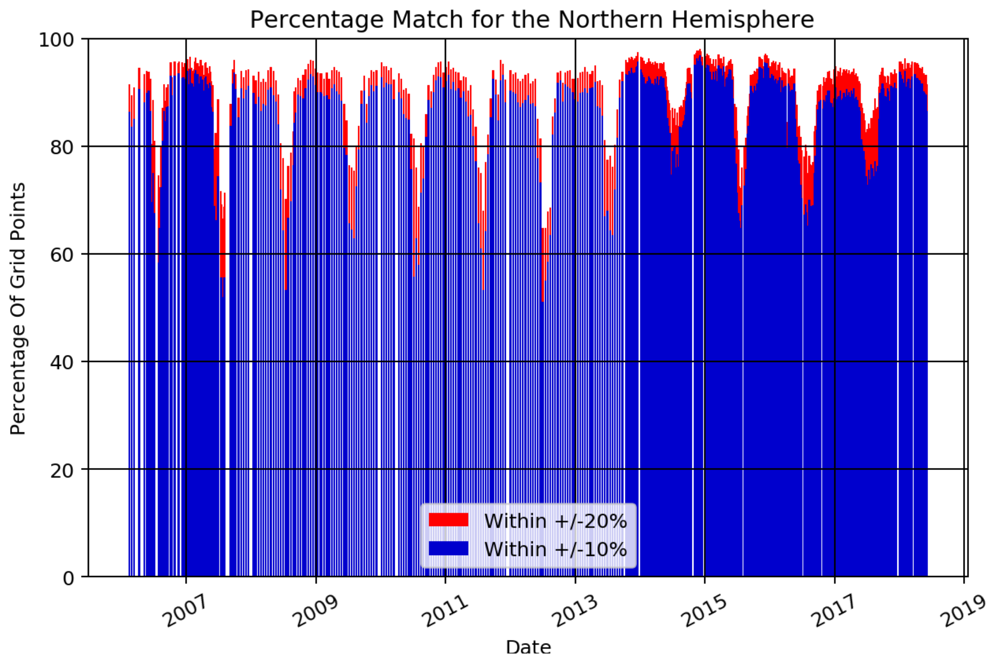


Figure 70: Multiyear variability. Comparison between ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Northern hemisphere.

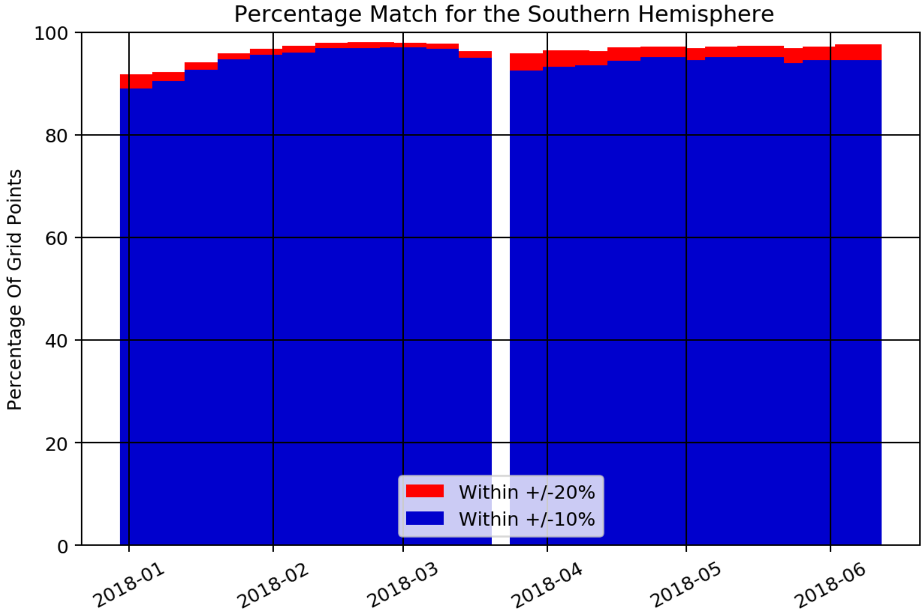


Figure 71: Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/-10%, and likewise for +/-20%. Southern hemisphere.

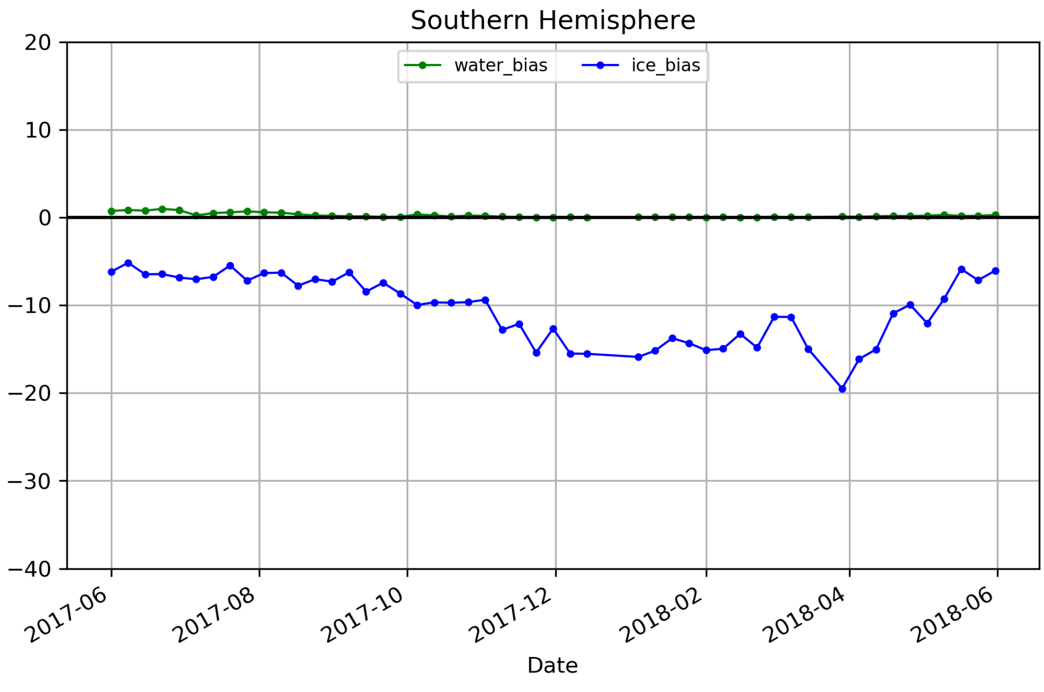


Figure 72: Difference between the ice concentrations from the NIC ice analysis and OSI SAF concentration product for two categories: water and ice. Southern hemisphere.

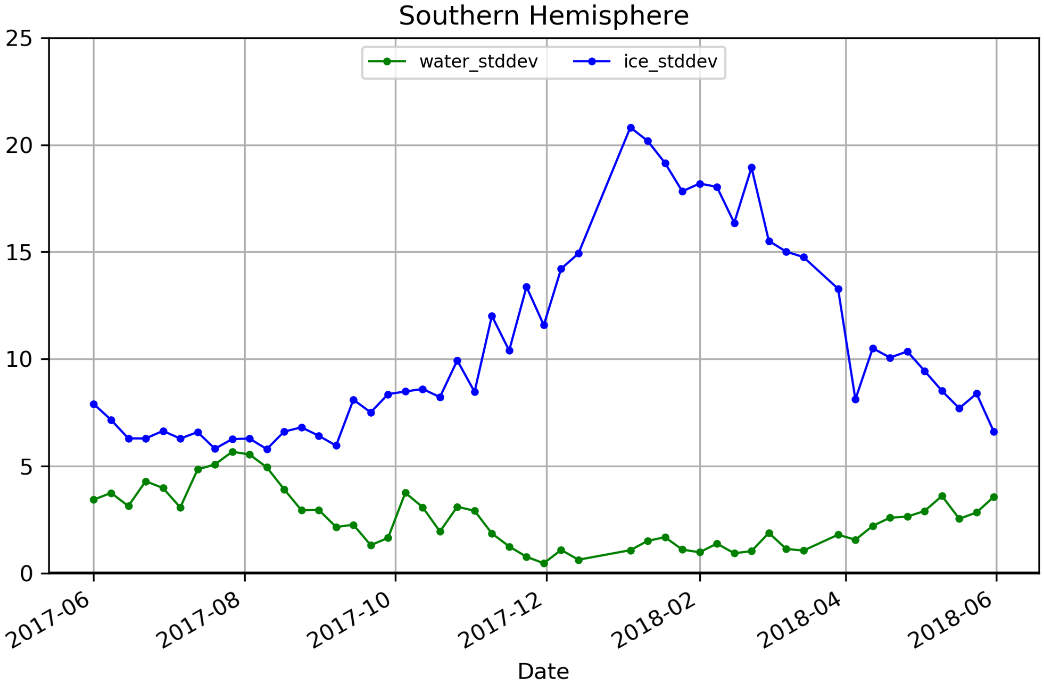


Figure 73: Standard deviation of the difference in ice concentrations from the NIC ice analysis and OSI SAF concentration product for twohree categories: water, and ice. Southern hemisphere.

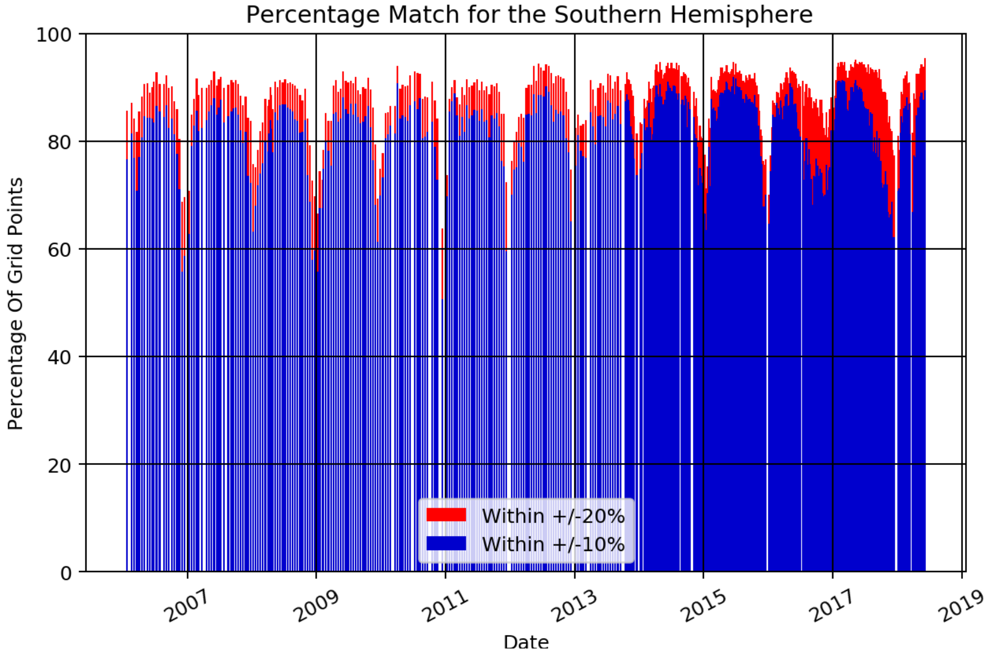


Figure 74: Multiyear variability. Comparison between ice concentrations from the NIC ice analysis and the OSI SAF concentration product. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%. Southern hemisphere.

Concentration product					
Month	+/- 10% [%]	+/- 20% [%]	Bias [%]	Stdev [%]	Num obs
JUL. 2017	89.9	91.7	-4.2	13.6	312269
AUG. 2017	91.6	93.1	-2.9	9.5	241282
SEP. 2017	96.4	97.2	-1.3	6.5	386873
OCT. 2017	98.4	98.9	-0.6	4.2	171818
NOV. 2017	97.8	98.6	-0.9	4.4	195725
DEC. 2017	97.2	98.1	-1.1	5.1	250950
JAN. 2018	96.6	97.7	-1.5	6.1	283966
FEB. 2018	97.1	97.9	-1.3	6.1	292168
MAR. 2018	96.3	97.3	-1.6	6.8	303520
APR. 2018	96.5	97.6	-1.4	6.3	296816
MAY 2018	95.3	96.3	-1.7	7.1	352512
JUN. 2018	93.6	94.7	-2.3	8.2	462608

Table 24: 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. 2017 to JUN. 2018. 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 as Code 0-5: 0 -> not processed, no input data; 1 -> computation failed; 2 -> processed but to be used with care; 3 -> nominal processing, acceptable quality; 4 -> nominal processing, good quality; 5 -> nominal processing, excellent quality'. 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. 2018	79.16	20.84	0.00	0.00	0.00	0.00
FEB. 2018	76.94	23.06	0.00	0.00	0.00	0.00
MAR. 2018	77.15	22.85	0.00	0.00	0.00	0.00
APR. 2018	82.76	17.24	0.00	0.00	0.00	0.00
MAY 2018	80.54	19.46	0.00	0.00	0.00	0.00
JUN. 2018	78.88	21.12	0.00	0.00	0.00	0.00

Table 25: 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. 2018	89.37	10.63	0.00	0.00	0.00	0.00
FEB. 2018	93.58	6.42	0.00	0.00	0.00	0.00
MAR. 2018	91.11	8.89	0.00	0.00	0.00	0.00
APR. 2018	86.96	13.04	0.00	0.00	0.00	0.00
MAY 2018	81.19	18.81	0.00	0.00	0.00	0.00
JUN. 2018	77.73	22.27	0.00	0.00	0.00	0.00

Table 26: Statistics for sea ice concentration confidence levels, Code 0-5, Southern Hemisphere.

Comments:
Figure 69 and Figure 73 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 the NIC ice analysis for SH, respectively. Tables of statistics for confidence levels show that both the NH and SH product quality is good and rather stable.
Average yearly std. dev. for the period JAN. 2018 – JUN. 2018 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.

Average yearly standard deviation		
	Avg. std.dev. Ice	Avg. std.dev. Water
Northern hemisphere	5.28	4.09
Southern hemisphere	10.87	2.41

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.

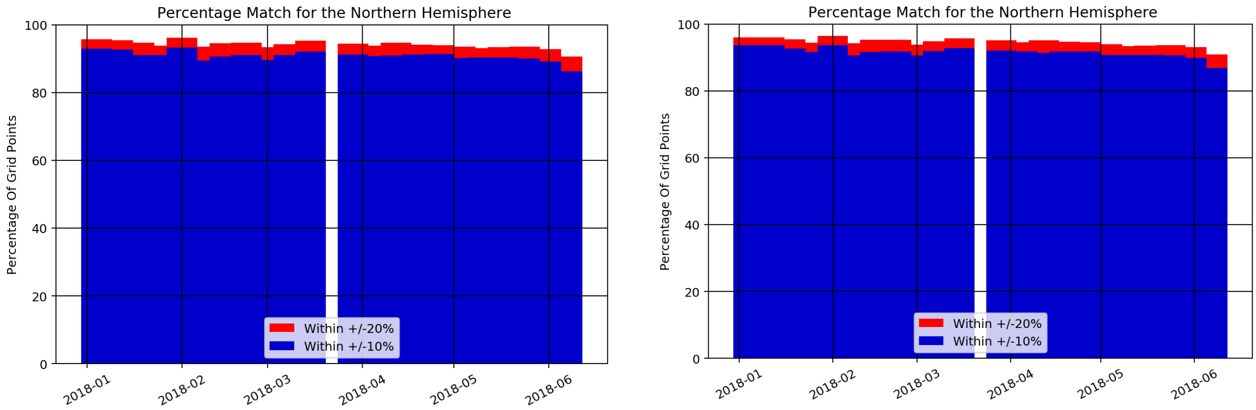


Figure 75: Comparison of ice concentrations from the Greenland overview charts made by DMI and the OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right. Northern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%

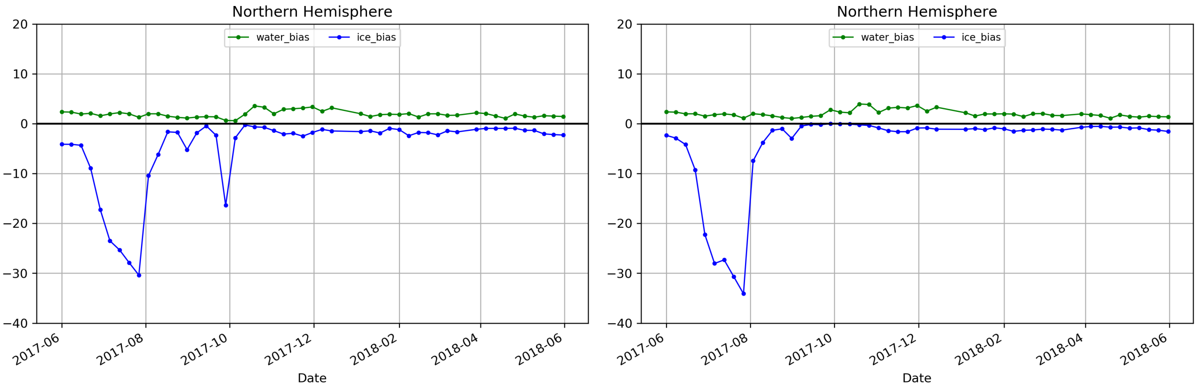


Figure 76: Difference between ice concentrations from the Greenland overview charts made by DMI and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and ice. Northern Hemisphere

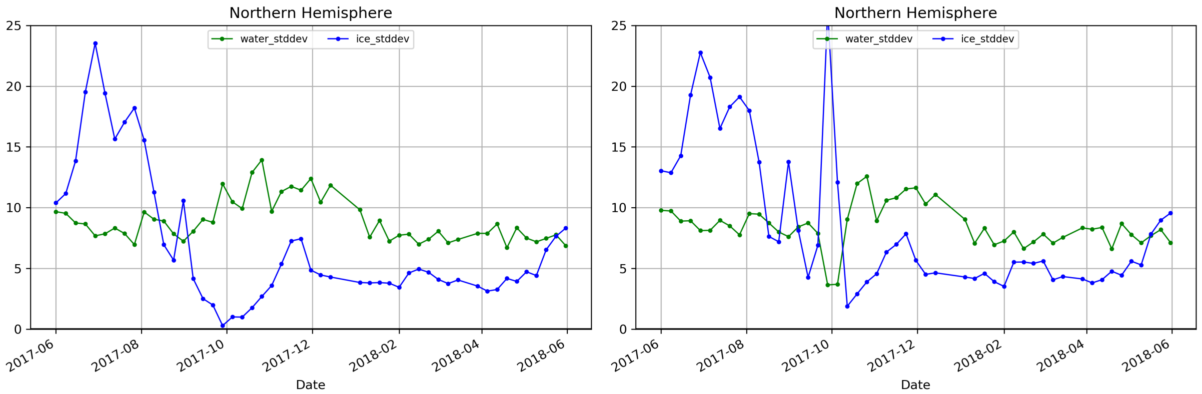


Figure 77: Standard deviation of the difference in ice concentrations from the Greenland overview charts made by DMI and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and ice. Northern hemisphere.

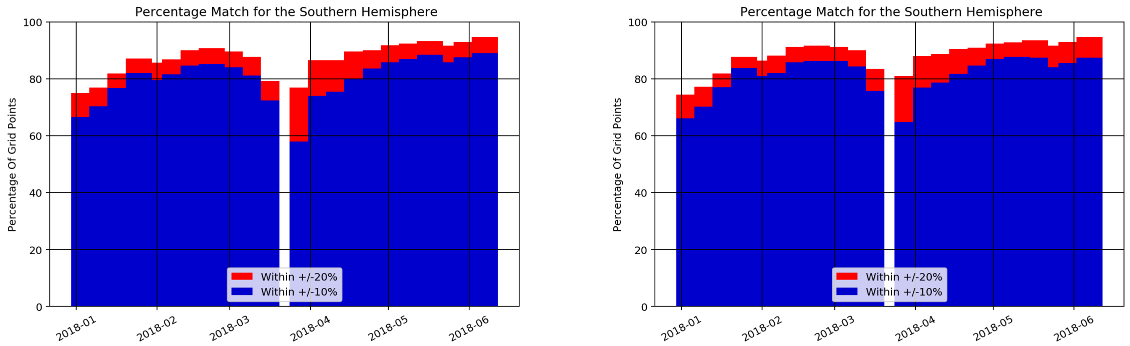


Figure 78: Comparison of ice concentrations from the NIC ice analysis and the OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right. Southern hemisphere. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%

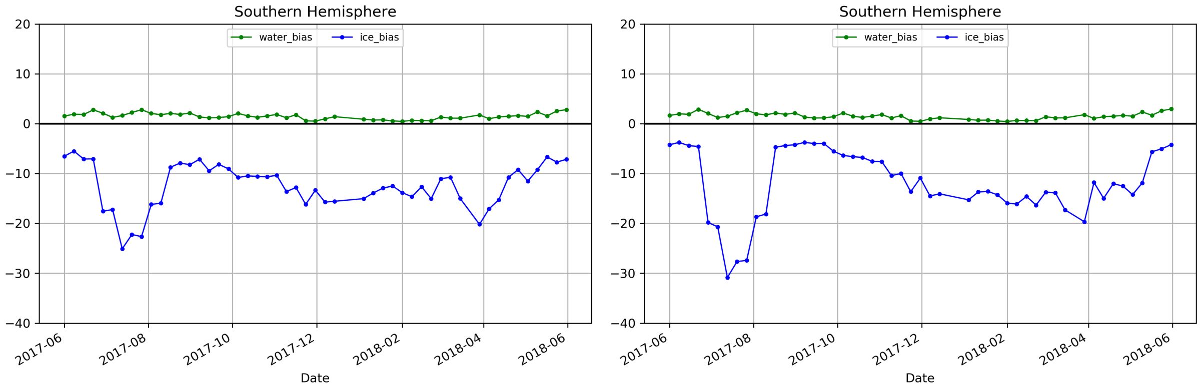


Figure 79: Difference between ice concentrations from the NIC ice analysis and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and ice. Southern Hemisphere

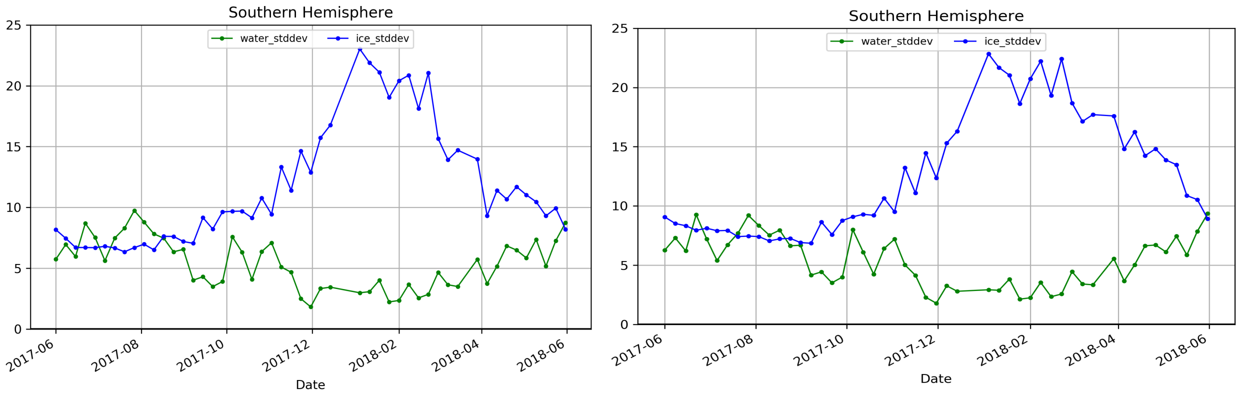


Figure 80: Standard deviation of the difference in ice concentrations from the NIC ice analysis and OSI SAF AMSR-2 concentration product based on OSHD algorithm to the left and based on TUD algorithm to the right for two categories: water and, ice. Southern hemisphere.

Comments:
Figure 72 and Figure 75 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 can be seen in table just below. On average the standard deviation is within target accuracy of 10% and 15% for the NH and SH hemisphere products, respectively.

Average yearly standard deviation		
	Average std.dev. Ice	Average std.dev. Water
OSHD algorithm NH	7.98	8.57
TUD algorithm NH	6.21	9.03
OSHD algorithm SH	12.05	5.28
TUD algorithm SH	12.93	5.26

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

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

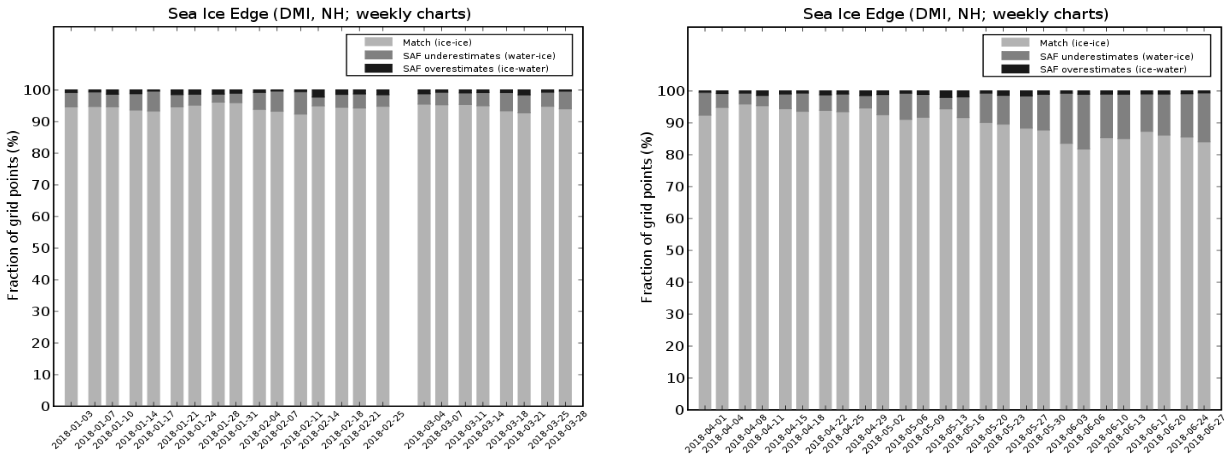


Figure 81: Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.

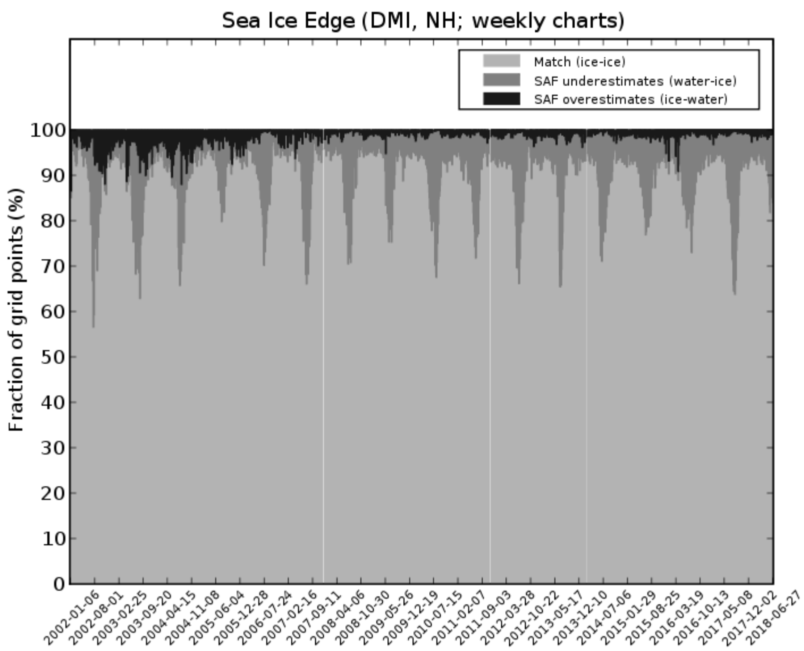


Figure 82: Multiyear variability. Comparison between the Greenland overview charts made by DMI and the OSI SAF sea ice edge product. Northern hemisphere. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.

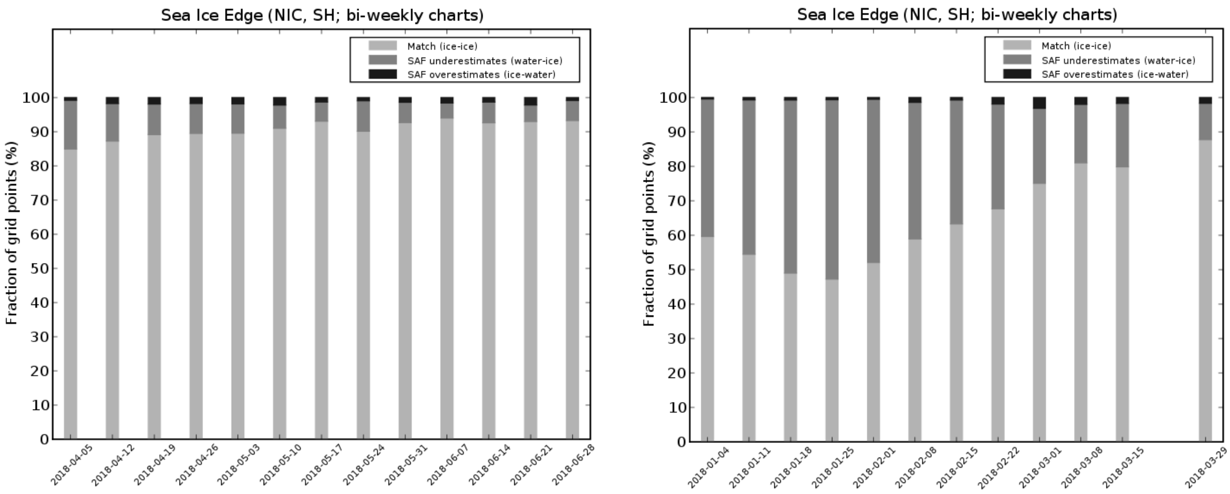


Figure 83: Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

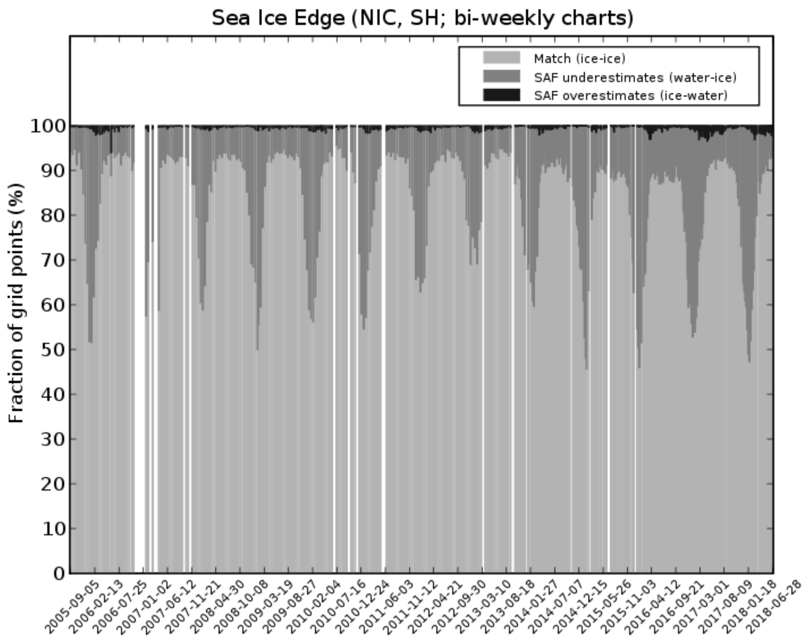


Figure 84: Multiyear variability. Comparison between the NIC ice analysis and the OSI SAF sea ice edge product. Southern hemisphere. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

Month	Correct (%)	SAF lower (%)	SAF higher (%)	Mean edge diff (km)	Num obs
JUL. 2017	94.30	5.52	0.18	41.34	476651
AUG. 2017	97.27	2.50	0.24	42.70	391196
SEP. 2017	98.34	1.38	0.28	34.95	471673
OCT. 2017	99.19	0.43	0.38	11.53	245529
NOV. 2017	98.47	0.67	0.86	9.75	295609
DEC. 2017	98.39	0.89	0.72	11.61	302934
JAN. 2018	97.82	1.02	1.16	10.43	511057
FEB. 2018	97.76	0.80	1.45	9.23	495197
MAR. 2018	98.09	1.10	0.81	10.44	594587
APR. 2018	98.31	1.08	0.61	11.54	613606
MAY 2018	97.80	1.04	1.17	13.09	619844
JUN. 2018	97.77	1.43	0.80	23.59	699951

Table 27: Monthly quality assessment results from comparing OSI SAF sea ice products to MET Norway ice service analysis for the Svalbard area, from JUL. 2017 to JUN. 2018. 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. 2018	79.48	4.60	12.22	3.06	0.63	53.83
FEB. 2018	76.35	7.06	11.85	3.86	0.88	53.86
MAR. 2018	76.24	6.29	12.56	4.11	0.79	53.85
APR. 2018	77.97	7.77	9.99	3.50	0.79	53.64
MAY 2018	78.61	6.91	10.32	3.41	0.74	53.23
JUN. 2018	79.69	3.79	10.19	5.20	1.13	52.07

Table 28: 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. 2018	93.51	1.43	1.54	2.22	1.30	22.38
FEB. 2018	97.18	0.59	0.79	0.95	0.48	22.37
MAR. 2018	95.18	0.57	1.74	1.90	0.61	22.36
APR. 2018	90.99	0.93	3.77	3.54	0.77	22.38
MAY 2018	85.50	4.37	5.71	3.73	0.69	22.40
JUN. 2018	78.48	6.75	9.12	4.83	0.83	22.41

Table 29: Statistics for sea ice edge confidence levels, Code 0-5, Southern Hemisphere.

Comments:
In Table 27, the OSI SAF ice edge product is compared with navigational ice charts from the Svalbard region (MET Norway ice service). The yearly averaged edge difference for the 12 months is 19.2 km and the target accuracy requirement of 20 km edge difference is therefore met despite the high values in summer months 2017 (this was discussed in previous report). As previous years, the monthly differences are well 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 shown in Figure 83 and 84 compared with the National Ice Center ice charts and show no differences for 2018 so far relative to previous years. The "mean edge difference" analysis for the Southern Hemisphere is still not yet in place due to technical constraints.

5.3.4. Global sea ice type (OSI-403-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 [km²]	Mean MYI coverage [km²]
JUL. 2017	NA	NA
AUG. 2017	NA	NA
SEP. 2017	NA	NA
OCT. 2017	94821	2189050
NOV. 2017	85541	2231136
DEC. 2017	60428	1989851
JAN. 2018	66193	1775249
FEB. 2018	122466	1434066
MAR. 2018	57414	1804740
APR. 2018	46046	1297505
MAY 2018	63696	1094630
JUN. 2018	NA	NA

Table 30: 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. 2018	90.82	1.21	6.97	0.86	0.13	53.83
FEB. 2018	87.40	1.88	9.50	1.08	0.14	53.86
MAR. 2018	87.04	1.83	9.80	1.18	0.14	53.85
APR. 2018	88.36	2.34	8.00	1.13	0.17	53.64
MAY 2018	82.57	1.11	3.29	12.88	0.15	52.95
JUN. 2018	78.34	0.29	0.33	20.82	0.21	52.07

Table 31: Statistics for sea ice type confidence levels, Northern Hemisphere.

Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
JAN. 2018	92.50	0.34	0.39	6.51	0.26	22.38
FEB. 2018	95.85	0.17	0.20	3.68	0.10	22.37
MAR. 2018	93.79	0.14	0.19	5.77	0.11	22.36
APR. 2018	89.41	0.12	0.19	10.16	0.12	22.38
MAY 2018	82.72	0.15	0.23	16.79	0.11	22.40
JUN. 2018	75.55	0.18	0.27	23.88	0.12	22.41

Table 32: Statistics for sea ice type confidence levels, Southern Hemisphere.

Comments:
In Table 30, the mid-column represents the monthly standard deviations of the daily MYI coverage variability. All months, except February, have values well below the requirement of 100.000 km2. However, several times during February 2018 the Arctic sea ice was exposed to warm air which caused the ice type to be misinterpreted by the algorithm. Periods of warm air over the ice caused temporary drops in the multiyear ice coverage which was restored after some days. This resulted in the higher variability for February.

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 surface emissivity (which is the same at these two frequencies) at an incidence angle at 50 degrees. The product emissivity is covers all incidence angles from nadir to 60 degrees but the validation product is derived from measurements 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 on the southern hemisphere giving a positive bias. The northern hemisphere has a negative bias. The mean annual bias on the northern hemisphere is -0.0195 and on the southern hemisphere it is 0.199. There is no clear seasonal cycle neither on the northern nor southern hemisphere.

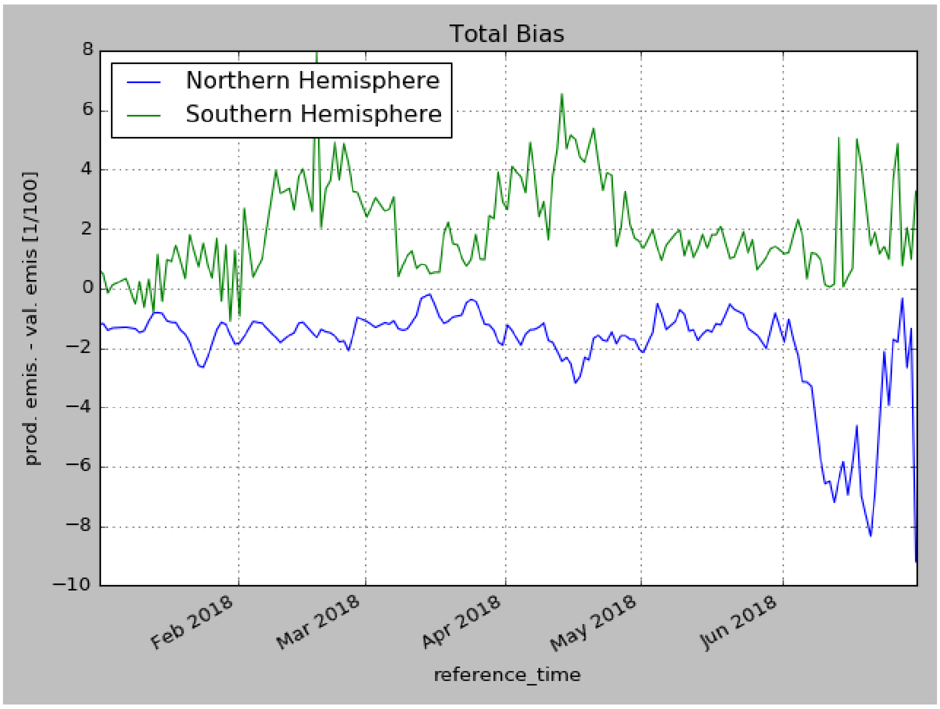


Figure 85: The mean hemispheric difference between the OSI SAF operational product and the validation product derived from NWP and SSMIS data. The y-axis unit is in hundreds (1/100)

Comments:
The standard deviation of the differences between the product emissivity and the validation reference (total standard deviation) is shown for the northern and southern hemispheres in figure 78. On the northern hemisphere the total standard deviation is on average 0.0557 and on the southern hemisphere it is 0.0915.

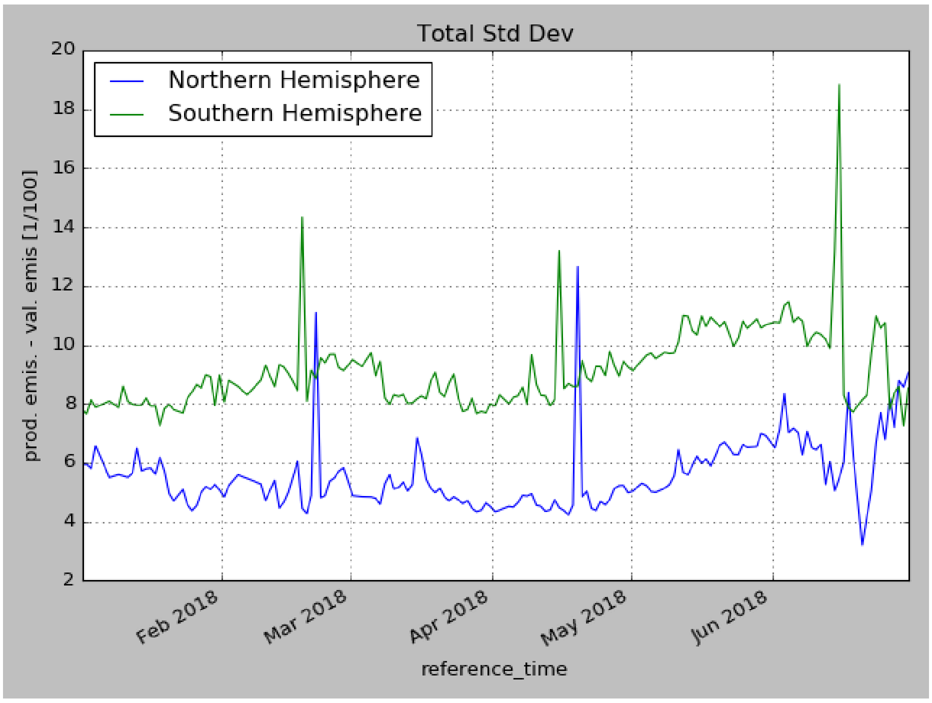


Figure 86: The standard deviation of the difference between the OSI SAF operational product and the validation product for the northern and southern hemispheres. The y-axis unit is in hundreds (1/100)

Comments:
The table below is summarising the half-yearly mean bias and standard deviation for both hemispheres. Both the northern and southern hemisphere are within threshold accuracy.

	Bias	STD	Target accuracy	Threshold accuracy
NH	-0.0195	0.0557	0.05	0.15
SH	0.0199	0.0915	0.05	0.15

5.3.6. Low resolution sea ice drift (OSI-405-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 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 σ() the standard deviation of the $\varepsilon(X) = X_{prod} - X_{ref}$. Columns α, β and ρ are respectively the slope and intercept of the regression line between Prod and Ref data pairs and the Pearson correlation coefficient. N is the number of collocation data pairs.

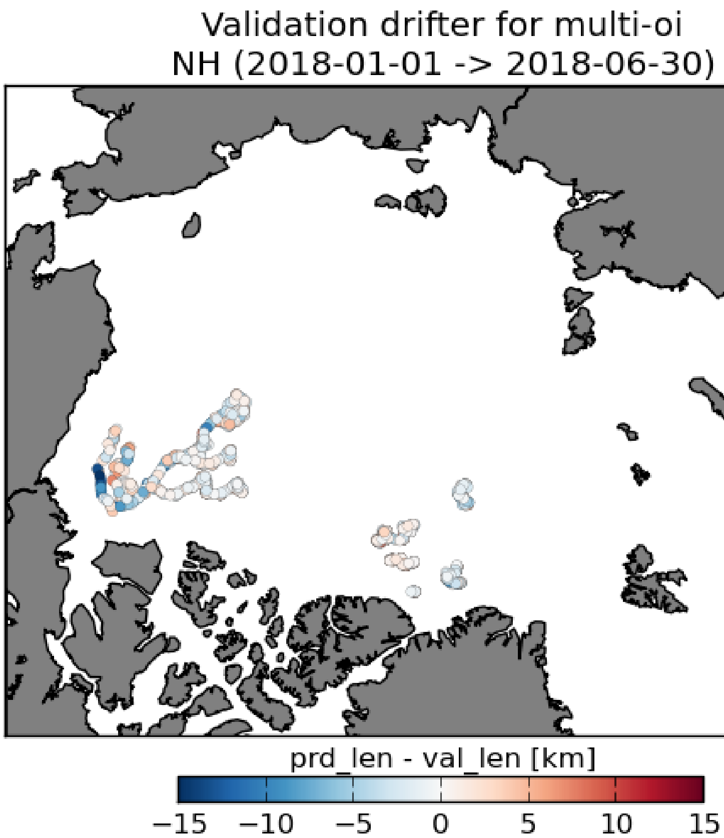


Figure 87: Location of GPS drifters for the quality assessment period (JAN. 2018 to JUN. 2018). The shade of each symbol represents the mean difference (prod-ref) in drift length (km over 2 days).

Month	b(X) [km]	b(Y) [km]	σ(X) [km]	σ(Y) [km]	α	β[km]	ρ	N
JUL. 2017	-0,1	0,75	5,94	6,28	0,73	0,45	0,85	127
AUG. 2017	-0,56	1,92	9,26	8,07	0,7	1,35	0,76	52
SEP. 2017	-0,48	1	5,73	4,94	0,88	0,55	0,94	116
OCT. 2017	0,41	-0,37	2,68	2,65	0,94	0,1	0,97	142
NOV. 2017	-0,47	-0,24	2,5	3,75	0,93	-0,4	0,96	175
DEC. 2017	-1,09	-3,19	3,55	10,57	0,6	-1,67	0,85	30
JAN. 2018	0,24	0,29	1,63	1,96	0,95	0,34	0,98	173
FEB. 2018	-0,04	-0,59	3,05	3,36	0,93	-0,45	0,98	148
MAR. 2018	-0,06	0,39	1,72	1,74	0,93	0,18	0,99	149
APR. 2018	0,12	0,03	1,2	1,4	0,95	0,07	0,98	124
MAY 2018	-0,01	0,39	2,16	2,72	0,92	-0,1	0,97	294
JUN. 2018	0,05	-0,31	4,24	4,33	0,87	-0,24	0,93	277
Last 12 months	-0.057	+0.096	3.643	4.004	0.89	-0.030	0.94	1807

Table 33: Quality assessment results for the LRSID (multi-oi) product (NH) for JUL. 2017 to JUN. 2018.

Month	b(X) [km]	b(Y) [km]	σ(X) [km]	σ(Y) [km]	α	β[km]	ρ	N
JUL. 2017	NA	NA	NA	NA	NA	NA	NA	0
AUG. 2017	NA	NA	NA	NA	NA	NA	NA	0
SEP. 2017	NA	NA	NA	NA	NA	NA	NA	0
OCT. 2017	0,57	0,16	4,84	4,1	0,95	0,39	0,94	111
NOV. 2017	0,06	0,44	4,01	3,92	0,99	0,24	0,95	138
DEC. 2017	-1	-2,26	4,96	8,49	0,82	-1,41	0,88	30
JAN. 2018	-0,04	-0,01	3,67	4,15	0,99	0	0,93	105
FEB. 2018	-0,16	-0,71	3,89	4,51	0,96	-0,54	0,95	124
MAR. 2018	0,01	0,33	2,63	3,33	0,94	0,19	0,96	146
APR. 2018	0,03	-0,05	2,81	2,64	0,97	-0,02	0,92	115
MAY 2018	NA	NA	NA	NA	NA	NA	NA	0
JUN. 2018	NA	NA	NA	NA	NA	NA	NA	0
Last 12 months	-0.038	-0.095	3.248	3.717	0.97	-0.073	0.95	769

Table 34: Quality assessment results for the LRSID (SSMIS-F18) product (NH) for JUL. 2017 to JUN. 2018.

Comments:
The quality assessment of LRSID product OSI-405-c shows expected behaviour in the last 12 months, with nominal statistics, except for DEC 2017 for which only few validation data were available to us (only 30 matchups during one month). The DEC 2017 maps were assessed visually and the quality seemed the same as in earlier 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 mean difference 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 35 below, show selected mean difference statistics against drifting buoys. Bias (x-bias, y-bias) and standard deviation of mean differences (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.

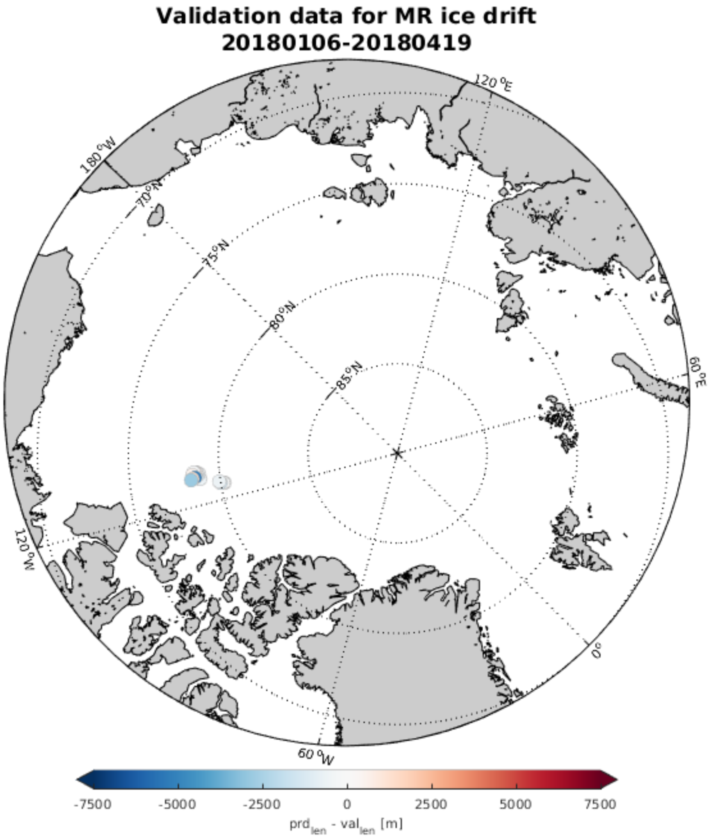


Figure 88: Location of GPS drifters for the quality assessment period (JAN. 2018 to JUN. 2018). The shade of each symbol represents the difference (prod-ref) in drift length in meters

Month	b(X) [m]	b(Y) [m]	σ(X) [m]	σ(Y) [m]	α	β [m]	ρ	N
JUL. 2017	43	-137	499	483	1.02	48	0.994	208
AUG. 2017	NA	NA	NA	NA	NA	NA	NA	NA
SEP. 2017	745	1593	0	471	1.09	-1112	0.997	24
OCT. 2017	-70	175	328	382	0.58	32	0.906	40
NOV. 2017	502	-43	711	706	1.04	175	0.989	220
DEC. 2017	54	82	698	780	1.00	-65	0.971	256
JAN. 2018	-332	1312	834	1268	1.07	-606	0.966	84
FEB. 2018	NA	NA	NA	NA	NA	NA	NA	NA
MAR. 2018	-133	369	759	728	1.00	-120	0.970	336
APR. 2018	-808	214	1389	897	0.94	354	0.906	208
MAY 2018	NA	NA	NA	NA	NA	NA	NA	NA
JUN. 2018	NA	NA	NA	NA	NA	NA	NA	NA
Last 12 months	-67	223	918	855	1.02	-77	0.974	1376

Table 35: MR sea ice drift product (OSI-407) performance, JUL. 2017 to JUN. 2018

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 2018. In February, May and June there were no match-ups with qualified buoy data, thus no validation statistics. The months that have match-ups show good correlation with buoy drift. Match-ups were found with 8 individual buoys during this period, hereof one buoy (ID 48791) were drifting in the Beaufort Gyre. Remaining 7 buoys where supposedly grounded (based on visual inspection of the buoy locations) and disqualified from the validation data:

- Buoy ID 48507 supposedly grounded in Canadian Archipelago.
- Buoy ID 48510 supposedly stock in landfast ice in Northeast Greenland.
- Buoy ID 48633 supposedly grounded north of Alaska.
- Buoy ID 48642 supposedly grounded north of Alaska.
- Buoy ID 48726 supposedly grounded at Bering Strait.
- Buoy ID 48769 supposedly grounded in Canadian Archipelago.
- Buoy ID 48770 supposedly stock In landfast ice northeast of Greenland (since 20170809-).

For next validation report, a test production setup will test whether higher production frequency and extending the summer mode (Visible AVHRR channel-2) into September and October will give more and better results. Also, the OSI SAF in-situ dataset database will provide more buoy data for match-up with OSI-407 in next validation report.

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 January 2017 to June 2018. 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) in most cases when they are compared to buoy winds. Note that local small scale wind variations, which are resolved by the buoys but not by the scatterometer, contribute to the standard deviations. The scatterometer errors are therefore smaller than what is shown in the plots as we know from triple collocation analysis. 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/.

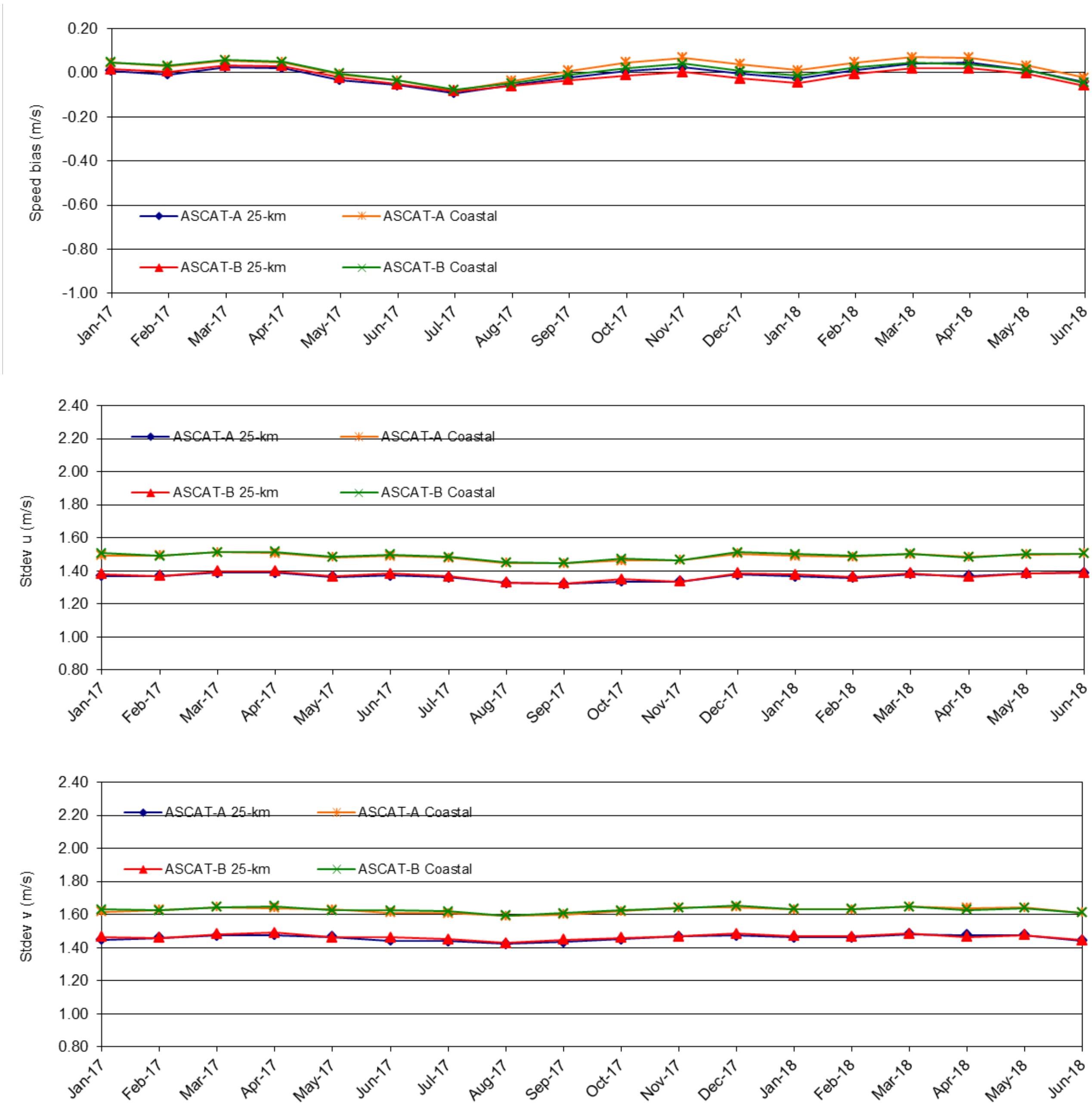


Figure 89: Comparison of scatterometer winds against ECMWF NWP forecast winds (monthly averages). For each product, the wind speed bias (scatterometer minus ECMWF, top), wind u component standard deviation (middle) and wind v component standard deviation (bottom) are shown.

5.4.2. Comparison with buoys

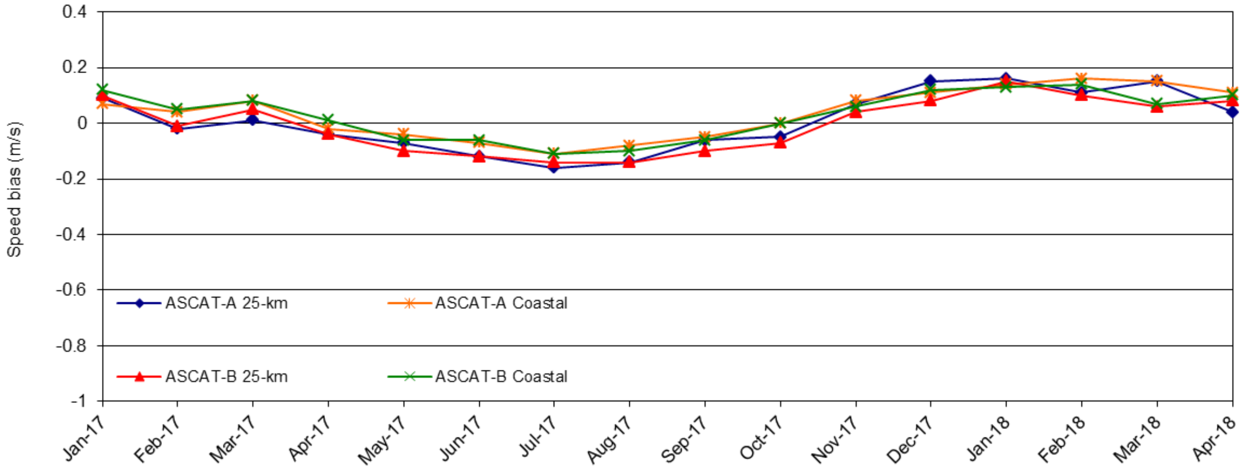
We compare the scatterometer winds with wind data from moored buoys on a monthly basis. The buoy data of approximately 150 buoys spread over the oceans (most of them in the tropical oceans and near Europe and North America) are retrieved from the ECMWF MARS archive and collocated with scatterometer winds.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

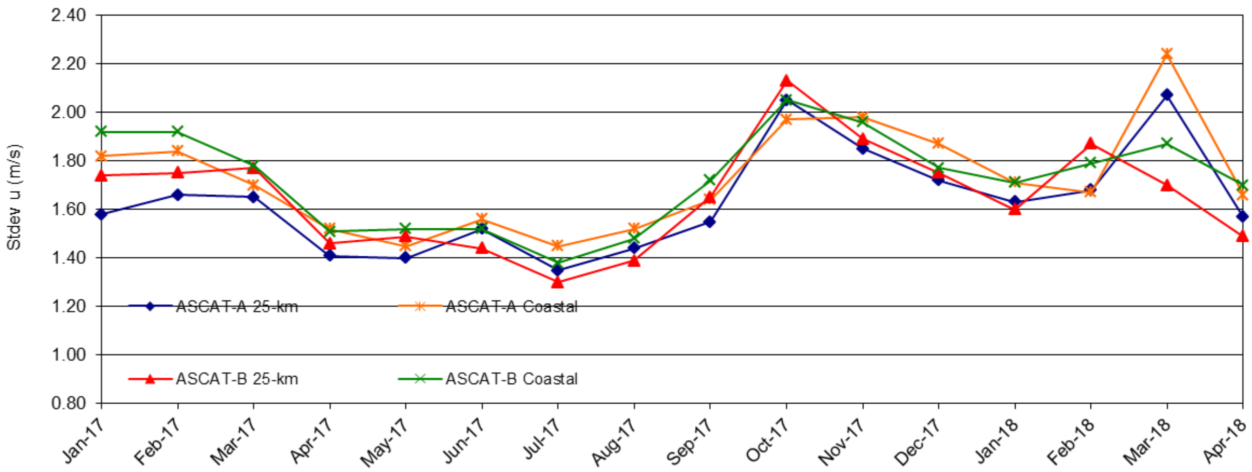
exchanges of heat and water vapor including the molecular constraints in the interface, J. Atmos. Sci., vol. 36, 1979.

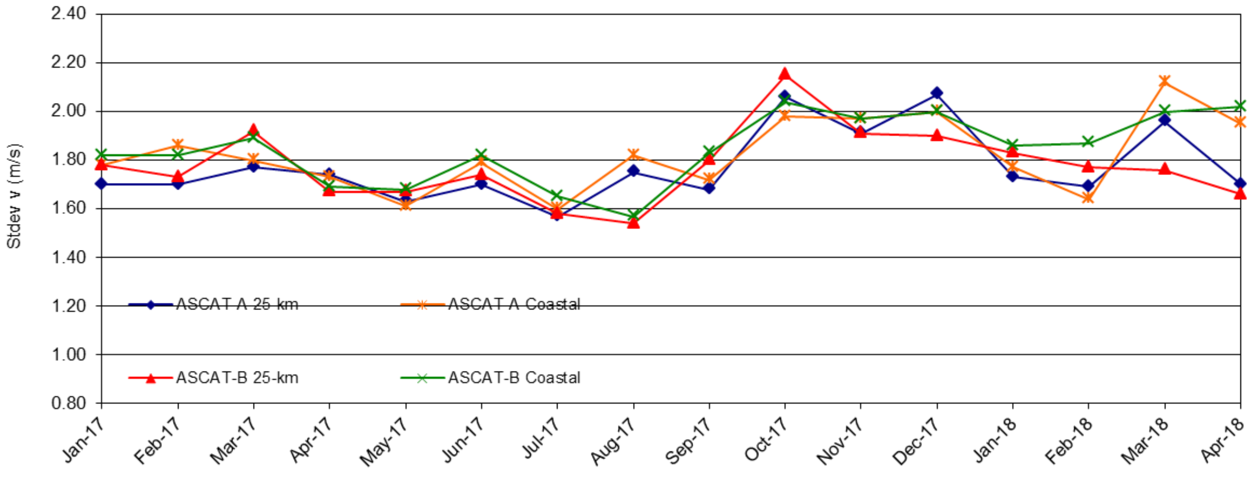
The figure below shows the monthly results of January 2017 to April 2018.

Note 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.







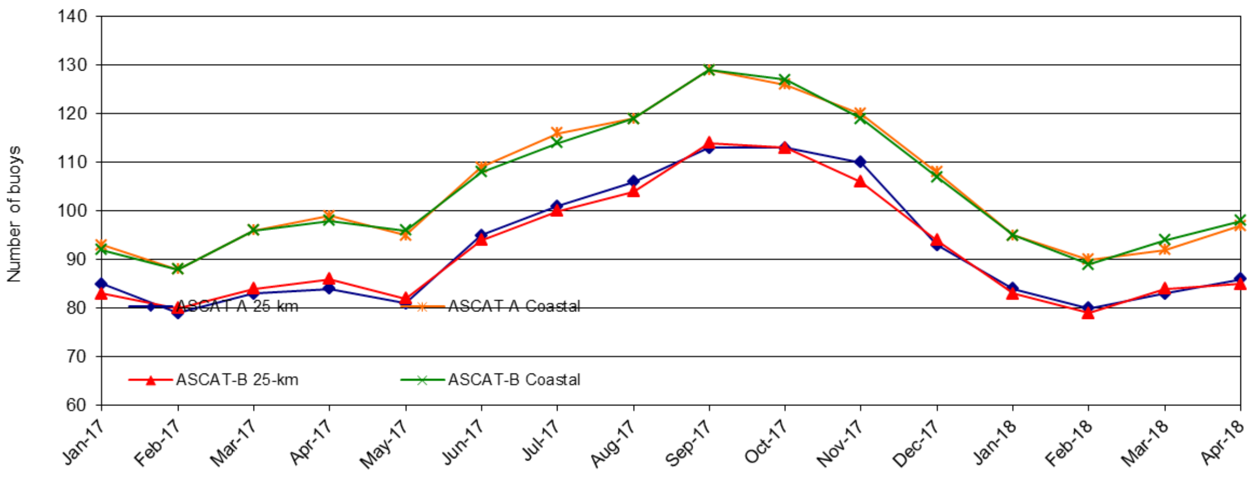


Figure 90: Comparison of scatterometer winds against buoy winds (monthly averages). For each product, the wind speed bias (scatterometer minus buoy, top), wind u component standard deviation (2nd plot) and wind v component standard deviation (3rd plot) are shown. Also the number of buoys available for 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, http://osi-saf.eumetsat.int, managed by MF/CMS,
- a web site for SS1, http://osi-saf.eumetsat.int/lml/, managed by MF/CMS,
- a web site for SS2, http://osisaf.met.no/, managed by MET Norway,
- a web site for SS3, http://www.knmi.nl/scatterometer/osisaf/, managed by KNMI.

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

6.1.1. Statistics on the central OSI SAF web site and help desk

6.1.1.1. Statistics on the registered users

Statistics on the central Web site use			
Month	Registered users	Pages	User requests
JAN. 2018	1247	1194	16
FEB. 2018	1265	1011	16
MAR. 2018	1282	1016	14
APR. 2018	1295	1103	13
MAY 2018	1315	1169	17
JUN. 2018	1334	1159	17

Table 36: Statistics on central OSI SAF web site use over 1st half 2018.

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

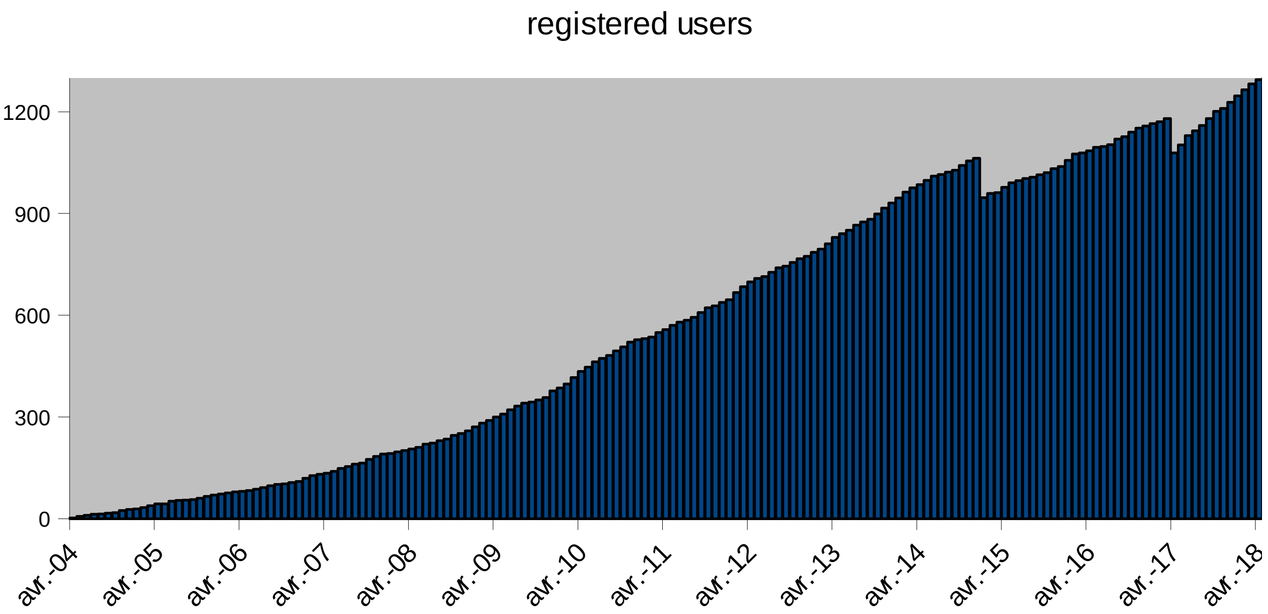


Figure 91: Evolution of external registered users on the central Web Site from April 2004 to JUN. 2018.

The following table lists the institutions or companies the new registered users (over 1st half 2018) are from.

Country	Institution, establishment or company
Algeria	Centre de développement des énergies renouvelables
Algeria	Agency of Meteorology Climatology and Geophysics
Argentina	Servicio Meteorologico Nacional - Servicio de Hidrografia Naval
Australia	Bureau of Meteorology
Belgium	Signal and Image Center
Brazil	Universidade de são paulo
Brazil	Instituto Nacional de Pesquisas Espaciais
Bulgaria	National Institute of Meteorology and Hydrology
Canada	University of Toronto
China	Shanghai Ocean University
China	Nanjing University of Information Science & Technology
China	Northeastern University
China	Sichuan University
China	Chinese Academy of Sciences
China	Polar research institute of China
China	National Marine Environmental Forecasting Center
Denmark	University of Copenhagen
France	Mercator Ocean
France	Centre National d'Etudes Spatiales
France	Service Hydrographique et Océanographique de la Marine
France	Service Hydrographique et Océanographique de la Marine
Germany	Zentrum für Sonnenenergie- und Wasserstoff-Forschung

Country	Institution, establishment or company
Germany	European Organisation for the Exploitation of Meteorological Satellites
Germany	Institut für Energie- und Klimaforschung
Greece	Hellenic National Meteorological Service
Greece	National Observatory of Athens
India	Naval Physical & Oceanographic Laboratory
India	Indian Space Research Organisation
India	Pandit Deendayal Petroleum University
Ireland	National University of Ireland Galway
Italy	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sos
Italy	Sapienza Università di Roma
Japan	Japan Meteorological Agency
Japan	University of Tokyo
Maroc	Direction de la Météorologie Nationale du Maroc DMN
Norway	University of Bergen
Philippines	National Meteorological Services of the Republic of the Philippines)
Portugal	Universidade de Lisboa
Portugal	Instituto Dom Luiz
Russia	Marine Hydrophysical Institute
Russia	Russian State Hydrometeorological University
Russia	Lomonosov Moscow State University
Russia	State Oceanographic Institute, Russian Federation
Russia	Arctic and Antarctic Research Institute
Samoa	National Oceanic and Atmospheric Administration
South Africa	University of Cape Towm
South Africa	University of Cape Towm
Spain	Consejo Superior de Investigaciones y Ciencias
Spain	Scripps Institution of Oceanography
Spain	Universidad de las Islas Baleares
Sudan	University of Bergen
Switzerland	WMO/World Climate Research Programme
UK	Scottish Association for Marine Science (SAMS)
UK	Met Office
UK	Meteorological Service of New Zealand
UK	University of York
UK	University of Reading
UK	Institute for environmental analytics
UK	University of St Andrews
UK	University of Edinburgh
UK	National Oceanography Centre, Southampton
United States	Northeastern University, Boston
United States	Texas A&M University
United States	Joint Typhoon Warning Center
United States	NOAA/National Climatic Data Center
United States	University of Wisconsin
United States	Florida State University
United States	University Corporation for Atmospheric Research
United States	University of Maryland, College Park

Table 37: List of Institutes registered on the central Web Site

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

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

Usage of the OSI SAF central Web Site by country (top 10) over 1st half 2018 (pages views)						
Countries	JAN. 2018	FEB. 2018	MAR. 2018	APR. 2018	MAY 2018	JUN. 2018
USA	385	322	354	357	348	323
China	288	195	274	397	292	364
France	192	221	144	175	229	236
United Kingdom	86	77	76	65	81	31
Russia	63	53	35	52	32	52
Japan	35	34	27	25	44	56
Spain	30	35	49	30	22	32
Finland	35	29	49	12	3	6
Germany	20	20	19	18	23	29
Italy	45	20	16	17	14	11

Table 38: Usage of the OSI SAF central Web Site by country (top 10) over 1st half 2018

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

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

The requests are classified with the following categories:
Anomaly in a product (ANOMALY),
Product not available (UNAVAIL),
Request for archived data (ARCHIVE),
Request for information (INFO).

Reference	Date	subsystem	Category	Subject	Status
email	03.01	general	INFO	How to be informed of changes ?	Closed
email	04.01	general	INFO	Difference of volume between old files (externally compressed) and recent files (internally compressed) ?	Closed
2018-101	04.01	WIND	INFO	Credentials to access FTP server	Closed
2018-102	04.01	WIND	INFO	Credentials to access FTP server	Closed
2018-103	04.01	WIND	INFO	Forecaster discussion on ASCAT wind products	Closed
2018-104	04.01	WIND	INFO	Access to ASCAT-6.25 products	Closed
#47	08.01	LML	UNAVAIL	Some archived products missing	Closed
2018-105	11.01	WIND	INFO	Credentials to access FTP server	Closed
2018-106	12.01	WIND	INFO	Sigma-0 data in BUFR ?	Closed
2018-107	15.01	WIND	INFO	BUFR, GRIB-API and HDF5 libraries	Closed
2018-108	16.01	WIND	ARCHIVE	Wind data	Closed
email	16.01	WIND	INFO	License for wind software	Closed
2018-109	17.01	WIND	INFO	ScatSat data and the BUFR reading software	Closed
2018-110	22.01	WIND	INFO	Credentials to access FTP server	Closed
2018-111	25.01	WIND	ARCHIVE	Wind data	Closed
2018-112	30.01	WIND	UNAVAIL	ScatSat outages	Closed
email	02.02	HL	INFO	How to filter out false ice in the Baltic in OSI-450	Closed
2018-113	02.02	WIND	INFO	Credentials to access FTP server	Closed
#48	05.02	general	INFO	Monthly SST on a specific area	Closed
2018-114	05.02	WIND	INFO	Decoding BUFR	Closed
email	06.02	HL	INFO	Filtered/non-filtered SSMIS SICO	Closed
email	06.02	HL	ARCHIVE	Missing ice type file in product archive	Closed
2018-115	11.02	WIND	INFO	Ambiguity removal errors	Closed
email	12.02	HL	INFO	About filters in OSI-401-b and OSI-408	Closed
2018-116	12.02	WIND	UNAVAIL	ScatSat outages	Closed
2018-117	13.02	WIND	INFO	Subscription to service messages	Closed
2018-118	14.02	WIND	INFO	Winds on a specific point → CMEMS	Closed
2018-119	14.02	WIND	INFO	ScatSat outages + Subscription to service messages	Closed
2018-120	15.02	WIND	INFO	Projection information	Closed
email	26.02	general	INFO	Snow product → LSA SAF	Closed
email	28.02	HL	INFO	When will OSI-430-b be available	Closed
email	28.02	HL	INFO	Can you see traces after ferries in SST products?	Closed
email	01.03	LML	INFO	Problems to access FTP server	Closed
email	03.03	LML	INFO	Need to use SST quality_level >= 3	Closed
email	06.03	HL	INFO	Where to set threshold between water and ice in OSI-450 compared to 409	Closed
2018-121	06.03	WIND	INFO	Reprocessed Oceansat-2 data	Closed
2018-122	07.03	WIND	INFO	How to process HY-2A L0 data	Closed
2018-123	07.03	WIND	INFO	Credentials to access FTP server	Closed
2018-124	12.03	WIND	INFO	Credentials to access FTP server	Closed

Reference	Date	subsystem	Category	Subject	Status
email	19.03	LML	UNAVAIL	IASI SST not produced because input was late	Closed
email	19.03	HL	UNAVAIL	SICO received late via EUMETCast sometimes	Closed
2018-125	22.03	WIND	INFO	Credentials to access FTP server	Closed
email	23.03	HL	INFO	Where to find high resolution ice information around Åland Islands	Closed
2018-126	28.03	WIND	INFO	Scatterometer visualisation web pages unavailable	Closed
2018-127	28.03	WIND	INFO	Discussion on GFS winds	Closed
2018-128	30.03	WIND	INFO	Credentials to access FTP server	Closed
#49	03.04	HL	INFO	Land mask file, with area scale factor for each grid cell	Closed
email	04.04	HL	INFO	Information about grid cell size in polar stereographic ice product	Closed
email	10.04	HL	INFO	Ice chart for baltic sea	Closed
2018-201	11.04	WIND	INFO	Different wind solutions in the BUFR	Closed
email	13.04	HL	INFO	Information about grid cell size in lambert azimuthal ice product	Closed
2018-202	14.04	WIND	UNAVAIL	ScatSat outage	Closed
300039385	18.04	WIND	INFO	MetOp-B ASCAT wind products on GTS ?	Closed
email	20.04	LML	ARCHIVE	SSI from 2000 to 2018 on a specific area	Closed
email	24.04	general	ANOMALY	Errormean difference when writing a helpdesk request	Closed
#51	25.04	LML	INFO	Credentials to access FTP server	Closed
email	27.04	LML	ANOMALY	Problem in one SST granule (download problem)	Closed
2018-203	30.04	WIND	INFO	Credentials to access FTP server	Closed
2018-204	30.04	WIND	INFO	GMF CMOF7 publication	Closed
2018-205	03.05	WIND	INFO	CMEMS and buoys	Closed
2018-206	04.05	WIND	ARCHIVE	Metop-A ASCAT winds	Closed
email	08.05	HL	INFO	Questions about OSI-205	Closed
email	08.05	LML	UNAVAIL	Meteosat SST missing (temporary switch to an other Meteosat)	Closed
#52	14.05	LML	INFO	Credentials to access FTP server	Closed
2018-207	17.05	WIND	INFO	Credentials to access ScatSat winds	Closed
2018-208	19.05	WIND	UNAVAIL	ScatSat outage	Closed
2018-209	21.05	WIND	INFO	Discussion on plots	Closed
2018-210	23.05	WIND	INFO	Credentials to access ScatSat winds	Closed
2018-211	23.05	WIND	INFO	Problem with this installation of AWDP	Closed
email	24.05	HL	INFO	Where to find extension of OSI-409-a	Closed
email	28-05	HL	INFO	Question about SST situation west of Svalbard	Closed
2018-212	29.05	WIND	INFO	How to adapt BUFR reader	Closed
2018-213	29.05	WIND	ARCHIVE	2 days of ScatSat-1 winds	Closed

Reference	Date	subsystem	Category	Subject	Status
2018-214	30.05	WIND	ARCHIVE	ScatSat-1 winds	Closed
2018-215	30.05	WIND	INFO	Question on sigma0 assimilation	Closed
2018-216	31.05	WIND	INFO	Use scatterometter over land	Closed
2018-217	04.06	WIND	INFO	Credentials to access ScatSat winds	Closed
2018-218	04.06	WIND	INFO	Test software for CFOSAT winds	Closed
2018-219	06.06	WIND	INFO	Visualisation of one case	Closed
2018-220	08.06	WIND	UNAVAIL	ScatSat outage	Closed
2018-221	08.06	WIND	INFO	Detailed information on CMOD7	Closed
2018-222	11.06	WIND	INFO	Comment on wind quicklooks	Closed
#53 2018-223	12.06	WIND	ARCHIVE	Request for archived data (provided by FTP)	Closed
2018-224	13.06	WIND	INFO	Access to 5.7 km ASCAT winds	Closed
2018-225	13.06	WIND	INFO	Access to 5.7 km ASCAT winds	Closed
2018-226	15.06	WIND	INFO	Operational status of 5.7 km ASCAT winds ?	Closed
2018-227	15.06	WIND	INFO	5.7 km ASCAT winds for a year back in time ?	Closed
2018-228	15.06	WIND	INFO	Access to 5.7 km ASCAT winds	Closed
email	18-06	HL	INFO	How to calculate area of polar stereographic grid cell	Closed
2018-229	19.06	WIND	INFO	Credentials to access FTP server	Closed
2018-230	20.06	WIND	INFO	Credentials to access FTP server	Closed
2018-231	21.06	WIND	INFO	Credentials to access FTP server	Closed
2018-232	25.06	WIND	INFO	Access to 5.7 km ASCAT winds	Closed

Table 39: Status of User requests made to the OSI SAF

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

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

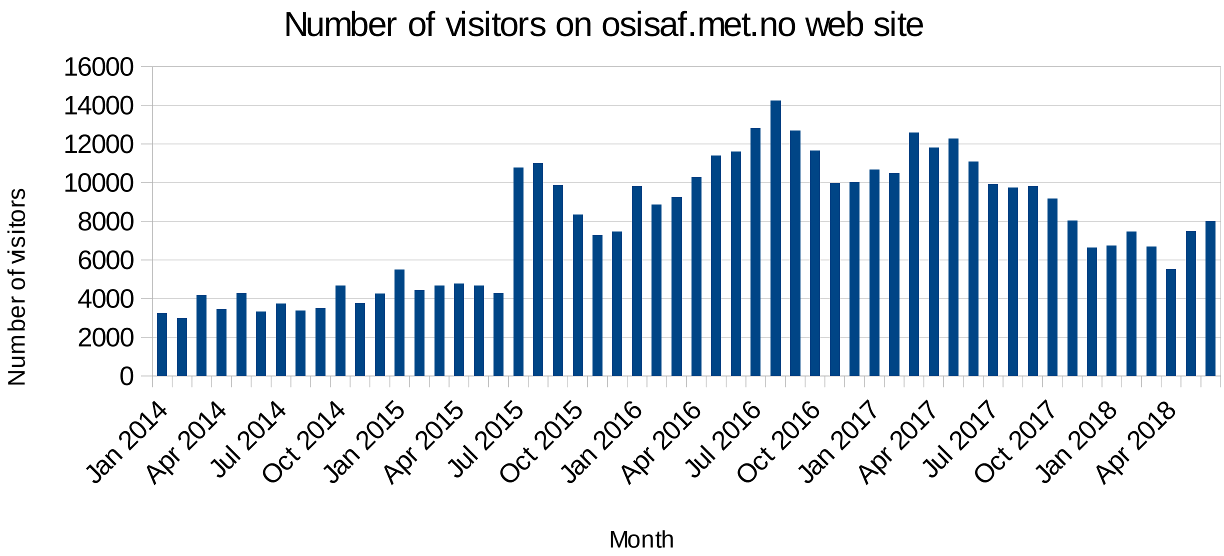


Figure 92: Evolution of visitors on the HL OSI SAF Sea Ice portal from JAN. 2014 to JUN. 2018 (http://osisaf.met.no)

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

The following graph illustrates the evolution of page views on the KNMI scatterometer web pages, which are partly devoted to the OSI SAF wind products, from August 2005 to June 2018. Only external sessions (from outside KNMI) are counted.

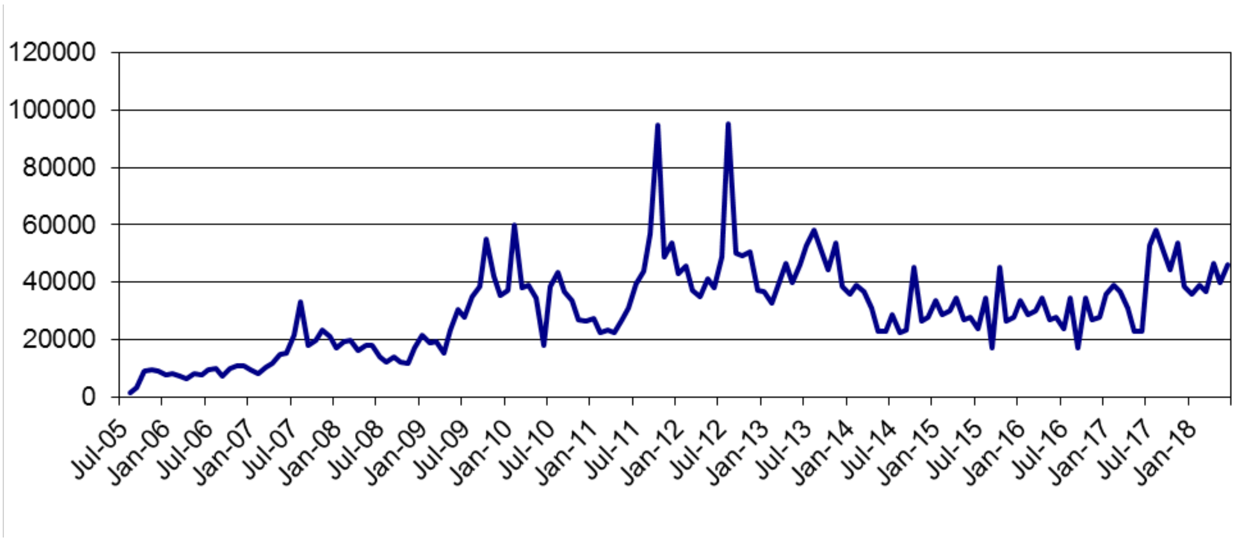


Figure 93: Number of page views on KNMI scatterometer website per month

The total number of OSI SAF helpdesk inquiries at scat@knmi in this half year was 58. All requests were acknowledged or answered within three working days. 47 were categorized as ‘info’, 6 as ‘archive’ and 5 as ‘unavailable’, in the latter category all requests were referring to ScatSat-1 development status products.

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

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

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

Weatherguy.com		U.S.A.
Marine Data Literacy		U.S.A.
Hong Kong University of Science and Technology		Hong Kong
Environmental Agency of the Republic of Slovenia		Slovenia
Fisheries and Sea Research Institute		Portugal
National Meteorological Center		China
National Oceanography Centre, Southampton		U.K.
National Taiwan University		Taiwan
Florida State University		U.S.A.
Marine and Coastal Management		South Africa
Gent University		Belgium
Department of Meteorology		Sri-Lanka
Gwangju Institute of Science & Technology		South Korea
University of Hamburg		Germany
University of Las Palmas de Gran Canaria		Spain
The Third Institute of Oceanography		China
South China Sea Institute of Oceanology		China
Environmental Research Institute, University College Cork		Ireland
Shan dong meteorologic bureau		China
RPS MetOcean Pty Ltd		Australia
APL-UW		China
Korea Ocean Research and Development Institute		Korea
XMU		China
Collecte Localisation Satellites	CLS	France
Instituto de Meteorologia		Portugal
ISRO - NRSC		India
ACMAD		Niger
UTL-Technical University of Lisbon		Portugal
Bureau of Meteorology		Australia
CPTEC - INPE		Brazil
StormGeo AS		Norway
Vienna University of Technology (TU Wien)		Austria
NSOAS		China
Deutscher Wetterdienst	DWD	Germany
Far-Eastern Centre for Reception and Processing of Satellite Data		Russia
Roshydromet		Russia
Sorbonne Universities		France
Brazilian Navy		Brazil
Hofstra University		U.S.A.
University of Tehran		Iran
Finnish Meteorological Institute	FMI	Finland
Stretch Space Ltd.		U.K.
Korea Institute of Ocean Science and Technology		South Korea
National Satellite Meteorological Center	NSMC	China
Irvin & Johnson Holding Company		South Africa
Fleet Numerical Meteorology and Oceanography Center, US Navy		U.S.A.
Shanghai Ocean University		China

Marine forecast station of Xiamen		China
Jiangsu Meteorological Bureau of China		China
Geological Survey of Denmark and Greenland		Denmark
Universidad Nacional Del Noroeste		Argentina
Institute of Meteorological Sciences, Hainan Province		China
Deltares		Netherlands
Icelandic Meteorological Office		Iceland
State Oceanic Administration		China
Hellenic National Meteorological Service		Greece
EWE		Germany
National University of Defense Technology		China
Beijing Piesat Information Technology		China
Climatempo		Brazil
Direction de la Météorologie Nationale		Morocco
OceanDataLab		France
University of Malta		Malta
National University of Ireland Galway	NUIG	Ireland
Iranian National Institute for Oceanography and Atmospheric Science		Iran
Meteorological Department Curacao		Curacao
31 independent users (not affiliated to an organization)		

Table 40: List of registered wind users at KNMI

6.2. Statistics on the OSI SAF FTP servers 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. 2018		FEB. 2018		MAR. 2018		APR. 2018		MAY 2018		JUN. 2018	
		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		30476	x	0	x	0	x	0	x	1	x	0	x
SSI MAP +LML		29617	x	2	x	0	x	0	x	5	x	0	x
DLI MAP +LML		71039	x	1	x	0	x	1	x	41104	x	4017	x
OSI-201/-b	GBL SST	9575	170	5503	114	10333	412	6865	921	12814	522	6480	97
OSI-202/-b	NAR SST	4526	7625	2274	295	3525	412	8195	17205	3823	21749	598	2806
OSI-204/-b	MGR SST	224396	28304	308095	14442	246005	26048	218058	36488	221818	21412	262062	27071
OSI-206/-a	Meteosat SST	109261	21914	65644	138	150692	56118	227514	1437	126958	1435	105954	1689
OSI-207/-a	GOES-East SST	1371	531	1272	24	1351	1	1501	0	1340	1	1380	3
OSI-IO-SST	Meteosat-8 SST	13531	4	9858	24	10846	1	10393	771	37629	121	18111	980
OSI-208/-b	IASI SST	53199	9209	39791	14681	43268	12480	44128	12665	56312	6980	90634	12699
OSI-250	Meteosat SST Data Record	0	x	0	x	0	x	0	x	3	x	0	x
OSI-303/-a	Meteosat DLI	84023	x	201699	x	312085	x	68612	x	66877	x	53700	x
OSI-304/-a	Meteosat SSI	84023	x	201699	x	312085	x	68612	x	66877	x	53700	x
OSI-305/-a	GOES-East DLI	9277	x	115008	x	432636	x	12587	x	13416	x	27805	x
OSI-306/-a	GOES-East SSI	9277	x	115008	x	432636	x	12587	x	13416	x	27805	x
OSI-IO-DLI	Meteosat-8 DLI	776	x	1165	x	24853	x	9719	x	4878	x	2581	x
OSI-IO-SSI	Meteosat-8 SSI	776	x	1165	x	24853	x	9719	x	4878	x	2581	x

Table 41: Number of OSI SAF products downloaded from Ifremer FTP server and PO.DAAC server over 1st half 2018.

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.

		JAN. 2018		FEB. 2018		MAR. 2018		APR. 2018		MAY 2018		JUN. 2018	
		HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS	HL FTP	CMEMS
Downloaded sea ice products													
OSI-401 series	Global Sea Ice Concentration (SSMIS)	NA (1)	1882	68611	3657	76703	18107	19333	1836	22624	NA (2)	32302	NA (2)
OSI-402 series	Global Sea Ice Edge	NA (1)	433	8281	2318	3375	3170	1558	249	10618	NA (2)	1378	NA (2)
OSI-403 series	Global Sea Ice Type	NA (1)	233	30649	2265	22311	3169	53597	1919	58752	NA (2)	2901	NA (2)
OSI-404 series	Global Sea Ice Emissivity	NA (1)	x	1042	x	23	x	38	x	48	x	9	x
OSI-405 series	Low resolution Sea Ice Drift	NA (1)	807	3807	760	20351	3744	30037	797	23106	NA (2)	11681	NA (2)
OSI-407 series	Medium resolution Sea Ice Drift	NA (1)	x	127	x	2722	x	146	x	153	x	3104	x
OSI-408 series	Global Sea Ice Concentration (AMSR-2)	NA (1)	x	2604	x	987	x	1343	x	4140	x	1280	x
OSI-409	Reprocessed Ice Concentration	NA (1)	2	54113	185232	48302	1155	31833	32697	71167		46328	
OSI-430	Continuous Reproc Ice Concentration v1p2	NA (1)	1	9699	16267	4239	496	6373	80	947		3257	
OSI-450	Reprocessed Ice Concentration v2.0	NA (1)	x	27396	x	88383	x	23689	x	2334	x	25621	x
Downloaded SST, DLI and SSI over the OSI SAF High Latitude FTP server													
OSI-203 series	AHL SST	NA (1)	x	232	x	346	x	412	x	584	x	567	x
OSI-205 series	L2 SST/IST	NA (1)	x	1405	x	12644	x	25144	x	309	x	3	x
OSI-301 series	AHL DLI	NA (1)	x	2	x	21	x	103	x	4	x	6	x
OSI-302 series	AHL SSI	NA (1)	x	19	x	0	x	3	x	45	x	78	x

Table 42: Number of OSI SAF products downloaded from OSI SAF Sea Ice FTP server over 1st half 2018

(1): Complete FTP statistics for January is not available, because the FTP server was moved in January and it took several days before the logging of FTP traffic was working properly.

(2): The CMEMS distribution center was moved in May 2018, and standard reports from CMEMS on data use has changed in format. OSI SAF has reported the need for more details in these reports and we hope to continue reporting use from CMEMS in the next HYR.

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. 2018		FEB. 2018		MAR. 2018		APR. 2018		MAY 2018		JUN. 2018	
		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), 20 per file (NetCDF)	64469	25 per file (BUFR), 20 per file (NetCDF)	115922	25 per file (BUFR), 20 per file (NetCDF)	67155	25 per file (BUFR), 20 per file (NetCDF)	324312	25 per file (BUFR), 20 per file (NetCDF)	20079	25 per file (BUFR), 20 per file (NetCDF)	37119
OSI-102-b	ASCAT-B 25km	22 per file (BUFR), 15 per file (NetCDF)	28345	22 per file (BUFR), 15 per file (NetCDF)	23493	22 per file (BUFR), 15 per file (NetCDF)	54780	22 per file (BUFR), 15 per file (NetCDF)	17327	22 per file (BUFR), 15 per file (NetCDF)	17654	22 per file (BUFR), 15 per file (NetCDF)	22254
OSI-103	ASCAT-A 12.5km												
OSI-104	ASCAT-A Coastal	20 per file (BUFR), 37 per file (NetCDF)	19159	20 per file (BUFR), 37 per file (NetCDF)	28211	20 per file (BUFR), 37 per file (NetCDF)	42588	20 per file (BUFR), 37 per file (NetCDF)	18907	20 per file (BUFR), 37 per file (NetCDF)	26698	20 per file (BUFR), 37 per file (NetCDF)	56983
OSI-104-b	ASCAT-B Coastal	18 per file (BUFR), 40 per file (NetCDF)	10060	18 per file (BUFR), 40 per file (NetCDF)	9146	18 per file (BUFR), 40 per file (NetCDF)	19464	18 per file (BUFR), 40 per file (NetCDF)	9456	18 per file (BUFR), 40 per file (NetCDF)	15045	18 per file (BUFR), 40 per file (NetCDF)	12583

Table 43: Number of OSI SAF products downloaded from KNMI FTP server and PO.DAAC server over 1st half 2018

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 below shows the overall number of OSI SAF users by country on 12 September 2018.

Albania	4	Greece	13	Poland	11
Algeria	4	Guinea	2	Portugal	5
Angola	3	Guinea-Bissau	3	Qatar	3
Armenia	1	Hungary	9	Reunion	2
Austria	20	Iceland	1	Romania	6
Azerbaijan	3	India	2	Russian Federation	7
Bahrain	1	Iran, Islamic Republic Of	32	Rwanda	5
Belgium	9	Iraq	1	San Marino	1
Benin	4	Ireland	5	Sao Tome And Principe	2
Bosnia And Herzegovina	1	Isle Of Man	1	Saudi Arabia	3
Botswana	6	Israel	7	Senegal	8
Brazil	5	Italy	278	Serbia	2
Bulgaria	3	Jordan	2	Seychelles	2
Burkina Faso	4	Kazakhstan	4	Sierra Leone	2
Burundi	2	Kenya	12	Slovakia	3
Cameroon	4	Korea, Republic Of	1	Slovenia	1
Canada	2	Kuwait	3	Somalia	1
Cape Verde	2	Kyrgyzstan	1	South Africa	18
Central African Republic	2	Latvia	1	South Sudan	1
Chad	3	Lebanon	3	Spain	44
China	3	Lesotho	4	Sudan	3
Comoros	2	Liberia	2	Swaziland	3
Congo	3	Libyan Arab Jamahiriya	1	Sweden	3
Congo, The Democratic Republic Of The	5	Lithuania	2	Switzerland	11
Cote D'Ivoire	6	Luxembourg	1	Syrian Arab Republic	1
Croatia	2	Macedonia (Former Yugoslav Republic)	2	Tajikistan	1
Cyprus	1	Madagascar	6	Tanzania, United Republic Of	5
Czech Republic	17	Malawi	4	Togo	4
Denmark	7	Mali	3	Tunisia	2
Djibouti	2	Malta	2	Turkey	6
Egypt	4	Mauritania	4	Turkmenistan	1
Equatorial Guinea	2	Mauritius	7	Uganda	4
Eritrea	2	Moldova, Republic Of	1	Ukraine	2
Estonia	3	Morocco	4	United Arab Emirates	7
Ethiopia	7	Mozambique	5	United Kingdom	126
Finland	5	Namibia	6	United States	4
France	60	Netherlands	26	Uzbekistan	1
Gabon	2	Niger	7	Venezuela, Bolivarian Republic Of	1
Gambia	3	Nigeria	6	Viet Nam	1
Germany	101	Norway	5	Yemen	1
Ghana	10	Oman	4	Zambia	4
				Zimbabwe	4

Table 44: Overall number of EUMETCast users by country on 12 September 2018.

6.3.2. Users and retrievals from EUMETSAT Data Center

Orders Summary over the 1st half 2018

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 2018**.

Product series	Item	Volume in MB	Number of files
OSI-152	ERS2_OR1ERW025_OPE	6	16
OSI-305, OSI-306 (daily)	GOES-13_ODDLISSI_OPE	2073	176
OSI-305, OSI-306 (hourly)	GOES-13_OHDLISSI_OPE	16625	2103
OSI-305 (daily)	GOES-13_OSIDDLI_OPE	3917	4792
OSI-306 (daily)	GOES-13_OSIDSSI_OPE	323	4472
OSI-305 (hourly)	GOES-13_OSIHDLI_OPE	277	24
OSI-306 (hourly)	GOES-13_OSIHSSI_OPE	165	24
OSI-207	GOES-13_OSIHSST_OPE	997	278
OSI-207 (NetCDF4)	GOES-13_OSIHSSTN_OPE	144	24
OSI-109-c	ISS__OPE	11466	1881
OSI-102-b	M01_OAS025_OPE	12731	7685
OSI-104-b	M01_OASWC12_OPE	165770	26687
OSI-201-b	M01_OSSTGLB_OPE	838	23
OSI-201-b (NetCDF4)	M01_OSSTGLBN_OPE	28812	745
OSI-103	M02_OAS012_OPE	14593	4118
OSI-102	M02_OAS025_OPE	12316	7251
OSI-102 ?	M02_OASW025_OPE	170	213
OSI-104	M02_OASWC12_OPE	152285	22420
OSI-150-a	M02_OR1ASW025_OPE	10875	12913
OSI-202	M02_OSSTNAR_OPE	15	3
OSI-301	MML_ODLIAHL_OPE	1	2
OSI-401	MML_OSICOGB_OPE	276	76
OSI-403	MML_OSITYGB_OPE	6	118
OSI-303 (daily)	MSG1_OSIDDLI_OPE	25990	22
OSI-304 (daily)	MSG1_OSIDSSI_OPE	16911	66
OSI-304 (hourly)	MSG1_OSIHSSI_OPE	11891	567
OSI-303 (daily)	MSG2_OSIDDLI_OPE	25990	484
OSI-304 (daily)	MSG2_OSIDSSI_OPE	16911	1452
OSI-304 (hourly)	MSG2_OSIHSSI_OPE	50692	11532

Product series	Item	Volume in MB	Number of files
OSI-303, OSI-304 (daily)	MSG3_ODDLISSI_OPE	11074	899
OSI-303, OSI-304 (hourly)	MSG3_OHDLISSI_OPE	102399	11905
OSI-303 (daily)	MSG3_OSIDDLI_OPE	26224	1781
OSI-304 (daily)	MSG3_OSIDSSI_OPE	17246	5291
OSI-303 (hourly)	MSG3_OSIHDLI_OPE	9783	849
OSI-304 (hourly)	MSG3_OSIHSSI_OPE	107378	25007
OSI-206	MSG3_OSIHSST_OPE	1418	278
OSI-206 (NetCDF4)	MSG3_OSIHSSTN_OPE	528	48
OSI-303, OSI-304 (daily)	MSG4_ODDLISSI_OPE	2213	33
OSI-303, OSI-304 (hourly)	MSG4_OHDLISSI_OPE	7242	839
Old OSI-202 (NAR SST in 7 areas)	N18_OSSTMOCC_OPE	1	1

Table 45: Volume of data downloaded (in MB) by products from EDC over 1st half 2017

Ingestion Summary over the 1st half 2018

The next table lists 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%.

There might be some differences between disseminated values over EUMETCast and the data ingested in the EDC. We assume it is due to how the availability is calculated in both cases. In the EUMETCast case, the statistics are calculated depending on the number of inputs received, while in UMARF the number of expected products is static (it is considered a theoretical number of expected products).

		JAN. 2018	FEB. 2018	MAR. 2018	APR. 2018	MAY 2018	JUN. 2018
OSI-404	Global Sea Ice Emissivity (DMSP-F18)	100	100	100	100	100	100
OSI-305	Daily Downward Longwave Irradiance (GOES-16)	100	100	100	100	100	100
OSI-306	Daily Surface Solar Irradiance (GOES-16)	100	100	100	100	100	100
OSI-305	Hourly Downward Longwave Irradiance (GOES-16)	96.3	98.9	96.3	100	92.4	99.7
OSI-306	Hourly Surface Solar Irradiance (GOES-16)	96.3	98.9	96.3	100	92.4	99.7
OSI-207	Hourly Sea Surface Temperature (GOES-16)	95.9	98.0	95.9	98.8	90.9	99.4
OSI-408	Sea Ice Concentration (AMSR-2)	100	98.2	100	100	100	100

		JAN. 2018	FEB. 2018	MAR. 2018	APR. 2018	MAY 2018	JUN. 2018
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	99.7	100	100	100	100
OSI-102	ASCAT 25km Wind (Metop-A)	100	100	100	100	99.3	100
OSI-104	ASCAT 12.5km Coastal Wind (Metop-A)	100	100	100	100	100	100
OSI-201-b	Global Sea Surface Temperature (Metop-B)	100	98.2	100	100	100	100
OSI-202-b	NAR Sea Surface Temperature (Metop-B)	100	100	100	100	100	98.3
OSI-407	Global Sea Ice Drift (Multi Mission)	96.7	96.4	96.7	96.6	98.3	95.0
OSI-205	SST/IST L2	100	100	100	100	100	100
OSI-301	AHL Downward Longwave Irradiance (Multi Mission)	100	100	100	100	90.3	100
OSI-401	Global Sea Ice Concentration (DMSP-18)	100	100	100	100	100	100
OSI-405	Global Low Resolution Sea Ice Drift	100	92.8	100	100	100	100
OSI-402	Global Sea Ice Edge (Multi Mission)	100	100	100	96.6	100	100
OSI-403	Global Sea Ice Type (Multi Mission)	100	100	100	96.6	100	100
OSI-302	AHL Surface Solar Irradiance (Multi Mission)	100	100	100	93.3	90.3	100
OSI-203	AHL Sea Surface Temperature (Multi Mission)	100	100	100	98.3	100	100
OSI-303	Daily Downward Longwave Irradiance (MSG)	100	78.5	100	100	100	100
OSI-304	Daily Surface Solar Irradiance (MSG)	100	78.5	100	100	100	100
OSI-303	Hourly Downward Longwave Irradiance (MSG)	100	77.6	100	99.8	98.6	99.7
OSI-304	Hourly Surface Solar Irradiance (MSG)	100	77.6	100	99.8	98.6	99.7
OSI-206	Hourly Sea Surface Temperature (MSG)	100	78.5	100	99.7	98.5	99.8
OSI-202-b	NAR Sea Surface Temperature (NPP)	100	100	100	100	100	100

Table 46: Percentage of received OSI SAF products in EDC in 1st half 2018

Note : The figures for March and June take into account the re-ingestion of missing products.

id	product	APNM	status	comment
OSI-150-a	Metop-A ASCAT L2 25 km winds data record	OR1ASW025	OK	Ingestion finished on the 2016-10-05
OSI-150-b	Metop-A ASCAT L2 12.5 km winds data record	OR1ASWC12	OK	Ingestion finished on the 2016-09-23
OSI-151-a	SeaWinds L2 25 km winds	OR1SWW025	OK	Ingestion finished on the 2016-

id	product	APNM	status	comment
	data record			12-21
OSI-151-b	SeaWinds L2 50 km winds data record	OR1SWW050	OK	Ingestion finished on the 2016-12-21
OSI-152	ERS L2 25 km winds data record	OR1ERW025	OK	Ingestion finished on the 2017-08-22
OSI-153-a	Oceansat-2 L2 25 km winds data record	OR1OSW025	NOK	Configuration in UMARF is still on-going.
OSI-153-b	Oceansat-2 L2 50 km winds data record	OR1OSW050	NOK	Configuration in UMARF is still on-going.
OSI-250	MSG/SEVIRI Sea Surface Temperature data record	OR1HSST	NOK	Configuration in UMARF on-going.
OSI-409	Global Sea Ice Concentration data record (SSMR/SSMI)	OR1SICOGB	OK	Ingestion finished on the 2018-06-06
OSI-409-a	Global Sea Ice Concentration data record (SSMI/SSMIS)	OR2SICOGB	OK	
OSI-450	Global Sea Ice Concentration data record (SMMR/SSMI/SSMIS)	OR2017SICOGB	OK	

Table 47: OSI SAF Data records ingestion status in EDC in June 2018

7. Training

Ad Stoffelen has participated in on-line training (March/April) and in face-to-face wind and wave training of mainly south-European meteorologists at IPMA (Lisbon) from 4-8 June.

8. 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 (http://osi-saf.eumetsat.int).

Title	-	Reference	Latest version	date
Status of the CDOP 3 Funding Release Plan	FRP	-	0.3	25/06/2018
CDOP 3 Product Requirement Document	PRD	SAF/OSI/CDOP3/MF/MGT/PL/2-001	1.3	26/07/2018
CDOP 3 Project Plan	PP	SAF/OSI/CDOP3/MF/MGT/PL/3-005	1.1	20/11/2017
CDOP 3 Master Schedule	MSch	SAF/OSI/CDOP3/MF/MGT/PL/3-007	1.2	21/08/2018
CDOP 3 Configuration Management Plan	CMP	SAF/OSI/CDOP3/MF/MGT/PL/3-009	1.0	28/04/2017
Service Specification	SeSp	SAF/OSI/CDOP3/MF/MGT/PL/003	1.6	26/07/2018
Joint Operation Procedures and Interface Control Document	JOP/ OICD	EUM/OPS/ICD/04/0201	8E	21/04/2017

Table 48: Top-level documentation updates

Name of the Document		Reference	Latest version	date
The level 2 sea ice concentration (OSI-410) requirements	OSI-410	SAF/OSI/CDOP3/MET-DMI/TEC/TN/314	1.0	12/01/2018
Algorithm Theoretical Basis Document for MSG/SEVIRI Sea Surface Temperature data record	OSI-250	SAF/OSI/CDOP2/MF/SCI/MA/256	1.3	26/01/2018
OSI SAF Geostationary Radiative Fluxes Product User Manual	OSI-303-a, OSI-304-a, OSI-305-a, OSI-306-a, OSI-IO-DLI, OSI-IO-SSI	SAF/OSI/CDOP3/MF/TEC/MA/182	1.7	08/02/2018
OSI SAF Geostationary Sea Surface Temperature Product User Manual	OSI-206-a, OSI-207-a, OSI-IO-SST	SAF/OSI/CDOP3/MF/TEC/MA/181	1.8	08/02/2018
OSI SAF System Verification and Validation Plan for the EPS-SG subsystem	OSI-201-e, OSI-202-e, OSI-203-e, OSI-204-e, OSI-205-e, OSI-208-e, OSI-401-e, OSI-402-e, OSI-403-e, OSI-404-e, OSI-405-e, OSI-410-e, OSI-102-e, OSI-102-f, OSI-104-e, OSI-104-f, OSI-130-a	SAF/OSI/CDOP3/MF/TEC/PL/317	1.0	12/03/2018
OSI SAF Algorithm Theoretical Basis Document for Medium Resolution Sea Ice Drift Product	OSI-407-a	SAF/OSI/CDOP3/DMI/SCI/MA/132	2.2.1	03/2018
OSI SAF Validation and Monitoring Document for Medium Resolution Sea Ice Drift	OSI-407-a	SAF/OSI/CDOP3/DMI/TEC/RP/119	1.3.1	03/2018
OSI SAF Medium Resolution Sea Ice Drift Product User Manual	OSI-407-a	SAF/OSI/CDOP3/DMI/TEC/MA/137	1.5.1	03/2018
OSI SAF Data tree on LML FTP server (Ifremer eftp1 server)	-	SAF/OSI/CDOP3/MF/TEC/TN/323	1.0	16/04/2018
OSI SAF Procédures d'exploitation Ifremer-Météo-France	-	SAF/OSI/CDOP3/MF/TEC/ICD/325	1.0	16/04/2018
MSG/SEVIRI Sea Surface Temperature data record Product User Manual	OSI-250	SAF/OSI/CDOP3/MF/TEC/MA/309	1.0	23/04/2018
MSG/SEVIRI Sea Surface Temperature data record Scientific Validation Report	OSI-250	SAF/OSI/CDOP3/MF/SCI/RP/310	1.0	23/04/2018

Name of the Document		Reference	Latest version	date
OSI-SAF MR ice drift and Ice surface temperature performance from Metop-A and Metop-B AVHRR	OSI-407 series, OSI-205 series	SAF/OSI/CDOP3/DMI/SCI/RP/311	1.1	24/04/2018
Product Users Manual for the 50GHz sea ice emissivity	OSI-404-a	SAF/OSI/CDOP3/DMI/TEC/MA/191	1.6	01/05/2018
Validation of the 50 GHz sea ice emissivity product	OSI-404-a	SAF/OSI/CDOP3/DMI/TEC/RP/190	1.6	01/05/2018
Algorithm theoretical basis document for the 50GHz sea ice emissivity model	OSI-404-a	SAF/OSI/CDOP3/DMI/SCI/MA/139	2.2	01/05/2018
OSI SAF Algorithm Theoretical Basis Document for the wind products	OSI-	SAF/OSI/CDOP2/KNMI/SCI/MA/197	1.6	15/05/2018
OSI SAF ASCAT Wind Product User Manual	OSI-102, OSI-102-b, OSI-104, OSI-104-b	SAF/OSI/CDOP/KNMI/TEC/MA/126	1.15	15/05/2018
OSI SAF ASCAT wind validation report	OSI-	SAF/OSI/CDOP3/KNMI/TEC/RP/326	1.0	16/05/2018
OSI SAF System and Component Requirement Document for the EPS-SG subsystem	OSI-201-e, OSI-202-e, OSI-203-e, OSI-204-e, OSI-205-e, OSI-208-e, OSI-401-e, OSI-402-e, OSI-403-e, OSI-404-e, OSI-405-e, OSI-410-e, OSI-102-e, OSI-102-f, OSI-104-e, OSI-104-f, OSI-130-a	SAF/OSI/CDOP3/MF/TEC/TN/316	1.1	22/05/2018
OSI SAF ScatSat-1 wind Product User Manual	OSI-112-a, OSI-112-b	SAF/OSI/CDOP2/KNMI/TEC/MA/287	1.3	06/2018
OSI SAF ScatSat-1 wind validation report	OSI-112-a, OSI-112-b	SAF/OSI/CDOP3/KNMI/TEC/RP/324	1.0	06/2018
Identification of possible improvement in Low and Mid Latitude Sea Surface Temperature retrieval by Chris Merchant OSI_VS18_01	OSI-20x	SAF/OSI/CDOP3/MF/SCI/RP/327	1.0	25/05/2018
Cooperation on development, implementation and validation of the PPS processor for MetImage cloud products - Cloud meeting Minutes	OSI-20x	SAF/OSI/CDOP3/MGT/RP/330	1.0	20/07/2018

Table 49: Subsystems documentation updates

9. Recent publications

9.1. Peer review papers written by OSI SAF users

About OSI SAF SIC CDR

François Massonnet, Martin Vancoppenolle, Hugues Goosse, David Docquier, Thierry Fichefet & Edward Blanchard-Wrigglesworth: **Arctic sea-ice change tied to its mean state through thermodynamic processes**, Nature Climate Change, 2018. https://www.nature.com/articles/s41558-018-0204-z

Uotila, P., Goosse, H., Haines, K. et al. Clim Dyn (2018). An assessment of ten ocean reanalyses in the polar regions. https://doi.org/10.1007/s00382-018-4242-z

About OSI SAF LR sea ice drift (SH coverage !)

Schlosser, E., Haumann, F. A., and Raphael, M. N.: **Atmospheric influences on the anomalous 2016 Antarctic sea ice decay**, The Cryosphere, 12, 1103-1119, https://doi.org/10.5194/tc-12-1103-2018, 2018

9.2. Articles on web sites, blogs

Image of the Week – The Gap, the Bridge, and the Game-changer, EGU (European Geosciences union) Blogs, Cryospheric Sciences, 09/02/2018, Thomas Lavergne