The EUMETSAT Network of Satellite Application Facilities

OSI SAF Ocean and Sea Ice

OSI SAF CDOP2

—

HALF-YEARLY OPERATIONS REPORT

—

2nd Half 2013

—

January 2014

–

version 1_0

Prepared by DMI, IFREMER, KNMI, Meteo-France and MET Norway.

Table of contents

1 Introduction

1.1 Scope of the document

The present report covers from 1st of July to 31th December 2013.

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

SS1 is the Production Sub-system 1, involving M-F/CMS, MET Norway and DMI, under M-F/CMS responsibility. It concerns SST and Radiative Fluxes products.

SS2 is the Production Sub-system 2 which involves MET Norway and DMI, under MET Norway responsibility. It concerns the Sea Ice products.

SS3 is KNMI. It concerns the Wind products.

1.2 Products characteristics

The characteristics of the current products are specified in the Service Specification Document [AD-1] available on the OSI SAF Web Site at:
http://www.osi-saf.org/biblio/bibliotheque.php?safosi_session_id=66f6d7af18b0c709ce734bb91423da64

1.3 Reference and applicable documents

1.3.1 Applicable documents

[AD-1] : Service Specification Document, SESP.

1.3.2 Reference documents

[RD-1] : Surface Solar Irradiance Product User manual.
[RD-2] : Downward Longwave Irradiance Product User manual.
[RD-3] : Atlantic Sea Surface Temperature Product User manual.
[RD-3] : North Atlantic Regional Sea Surface Temperature Product User manual.
[RD-4] : OSI SAF Sea Ice Product User Manual.
[RD-5] : SeaWinds Wind Product User Manual.
[RD-6] : ASCAT Wind Product User Manual.
[RD-7] : Low Earth Orbiter Sea Surface Temperature Product User Manual.
[RD-8] : Low Resolution Sea Ice Drift Product User's Manual.

1.4 Definitions, acronyms and abbreviations

AHL	Atlantic High Latitude
AMS	American Meteorological Society
ASCAT	Advanced SCATterometer
ATL	Atlantic low and mid latitude
AVHRR	Advanced Very High Resolution Radiometer
BUFR	Binary Universal Format Representation
CDOP	Continuous Development and Operations Phase
CMS	Centre de Météorologie Spatiale
DLI	Downward Long wave Irradiance
DMI	Danish Meteorological Institute
DMSP	Defense Meteorological Satellite Program
ECMWF	European Centre for Medium range Weather Forecasts
EPS	European Polar System
FAQ	Frequently Asked Question
FTP	File Transfer Protocol
GLB	Global oceans
GOES	Geostationary Operational Environmental Satellite
GOES-E	GOES-East, nominal GOES at 75°W
GRIB	GRIdded Binary format
GTS	Global Transmission System
HIRLAM	High Resolution Limited Area Model
HL	High Latitude
HRIT	High Rate Information Transmission
IFREMER	Institut Français de Recherche pour l'Exploitation de la MER
IOP	Initial Operational Phase
KNMI	Koninklijk Nederlands Meteorologisch Instituut
LEO	Low Earth Orbiter
LML	Low and Mid Latitude
MAP	Merged Atlantic Product

MET	Nominal Meteosat at 0°longitude
MET Norway	Norwegian Meteorological Institute
Metop	METeorological OPerational Satellite
M-F	Météo-France
MGR	Meta-GRanule
MSG	Meteosat Second Generation
NAR	Northern Atlantic and Regional
NCEP	National Centre for Environmental Prediction
NESDIS	National Environmental Satellite, Data and Information Service
NetCDF	Network Common Data Form
NMS	National Meteorological Service
NOAA	National Oceanic and Atmospheric Administration
NPP	NPOESS Preparatory Project
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NRT	Near Real-Time
NWP	Numerical Weather Prediction
OSI SAF	Ocean and Sea Ice SAF
QC	Quality Control
R&D	Research and Development
RMDCN	Regional Meteorological Data Communication Network
RMS	Root-Mean-Squared
SAF	Satellite Application Facility
Std Dev	Standard deviation
SEVIRI	Spinning Enhanced Visible and Infra-Red Imager
SMHI	Swedish Meteorological and Hydrological Institute
SSI	Surface Short wave Irradiance
SSMI	Special Sensor Microwave Imager
SSMIS	Special Sensor Microwave Imager and Sounder
SST	Sea Surface Temperature
TBC	To Be Confirmed
TBD	To Be Defined
UMARF	Unified Meteorological Archive & Retrieval Facility
WMO	World Meteorological Organisation
WWW	World Wide Web

table 1 : Definitions, acronyms and abbreviations.

2 OSI SAF products availability and timeliness

As indicated in the table 1, extracted from the Service Specification Document [AD-2], 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.

In section 2.1 the above specifications are matched with the measured availability on the local FTP servers. In section 2.2 the above specifications are matched with the measured availability via EUMETCast.

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

2.1 Availability on FTP servers

The following table indicates the percentage of the products that have been made available within the specified time on the local FTP servers.

Percentage of OSI SAF products available on the FTP servers within the specified time over 2nd half 2013																						
Month	ASCAT-A 25 km Wind	ASCAT-A 12.5 km Wind	ASCAT-A Coastal Wind	ASCAT-B 25 km Wind	ASCAT-B Coastal Wind	OSCAT 50 km Wind	GLB SST	NAR SST	AHL SST	MGR SST	METEOSAT SST	GOES-E SST	AHL DLI	AHL SSI	METEOSAT DLI	GOES-E DLI	METEOSAT SSI	GOES-E SSI	GBL Sea Ice Concentration	GBL Sea Ice Edge	GBL Sea Ice Type	GBL Low Res. Sea Ice Drift
July 2013	100	100	99.9	99.9	99.9	94.4	98,4	99,2	100	98,5	99,1	98,8	100	93,5	99,5	99,4	99,5	99,4	100	100	100	NaN
Aug. 2013	100	100	99.6	100	99.8	96.9	96,8	96,8	100	96,5	95,6	96,9	100	100	99,9	100	99,9	100	100	100	98.4	NaN
Sept. 2013	100	100	98.5	100	99.8	96.5	93,3	94,2	98,3	94,7	94,9	94,2	96.7	86.7	94,2	93,9	94,2	93,9	96.7	96.7	96.7	NaN
Oct. 2013	100	100	99.7	100	99.9	92.1	100	97,6	100	98,6	98,3	98,4	100	93,5	99,0	97,6	99,0	97,6	100	100	100	100
Nov. 2013	100	100	99.8	100	99.8	98.2	100	100	100	99,0	99,7	99,6	96.7	90,0	99,6	99,7	99,6	99,7	98.4	98.4	100	100
Dec. 2013	100	100	99.6	99.9	99.8	95.1	100	99,2	100	99,9	100	100	96.8	96.8	100	100	100	100	100	100	100	100

table 2 : **Percentage of OSI SAF products available on the FTP servers within the specified time over 2nd half 2013. (*) indicates uncertain numbers, see explanation in section 3.**

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

Comments :

The availability of the OSCAT 50 km winds is systematically lower than the availability of the ASCAT wind products. This is due to delays in the level 0 and level 1 processing which occur from time to time and which are outside the scope of the OSI SAF.

The GBL Low Res. Sea Ice Drift for the southern hemisphere (SH) was made operational in 2013 and the percentage of the products available on the ftp was not made available before October 2013. The availability of sea ice drift products (for both NH and SH) is therefore not obtainable for July – September in this report (NH ice drift is not delivered in the summer months).

The availability of AHL Flux products on the FTP server indicates some irregularities with values well below 95% for some of the months, while the corresponding availability on EUMETCast show no irregularities. The reason for this is not known yet, and we will have to look more closely into the logging system for these statistics. The distribution monitoring has not reported any anomalies during this period either, so we need to look more closely into this.

See anomaly details in section 3.

2.2 Availability via EUMETCast

The following table indicates the percentage of the products that have been delivered within the specified time :

Percentage of OSI SAF products available via EUMETCast within the specified time over 2nd half 2013																						
Month	ASCAT-A 25 km Wind	ASCAT-A 12.5 km Wind	ASCAT-A Coastal Wind	ASCAT-B 25 km Wind	ASCAT-B Coastal Wind	OSCAT 50 km Wind	GLB SST	NAR SST	AHL SST	MGR SST	METEOSAT SST	GOES-E SST	AHL DLI	AHL SSI	METEOSAT DLI	GOES-E DLI	METEOSAT SSI	GOES-E SSI	GBL Sea Ice Concentration	GBL Sea Ice Edge	GBL Sea Ice Type	GBL Low Res. Sea Ice Drift
July 2013	100	100	99.9	99.9	99.9	94.4	100	100	100	99,9	100	100	100	100	100	100	100	100	79,1	79,1	75,8	NaN
Aug. 2013	100	100	99.6	100	99.8	96.9	100	100	100	96,5	97,6	100	100	100	100	100	100	100	67,7	67,7	67,7	NaN
Sept. 2013	100	100	98.5	100	99.8	96.5	98,3	99,2	98,3	98,4	100	100	100	100	100	100	100	100	63,3	63,3	63,3	NaN
Oct. 2013	100	100	99.7	100	99.9	92.1	100	100	100	98,8	99,2	99,2	100	100	99,2	99,2	99,2	99,2	75,8	75,8	75,8	71,0
Nov. 2013	100	100	99.8	100	99.8	98.2	100	99,2	100	99,1	100	100	100	100	100	100	100	100	96,7	95,0	95,0	93,3
Dec. 2013	100	100	99.6	99.9	99.8	95.1	100	99,2	100	99,9	100	100	96,8	96,8	100	100	100	100	87,1	87,1	87,1	87,1

table 3 : **Percentage of OSI SAF products delivered via EUMETCast within the specified time over 2nd half 2013. (*) indicates uncertain numbers, see explanation in section 3.**

Comments :

The GBL Low Res. Sea Ice Drift for the southern hemisphere (SH) was made operational in 2013 and the percentage of the products available on EUMETCast was not made available before October 2013. The availability of sea ice drift products (for both NH and SH) is therefore not obtainable for July – September in this report (NH ice drift is not delivered in the summer months).

Almost all the sea ice products show values below 95% for the EUMETCast timeliness, while all values are above 95% for the FTP timeliness. Both timelinesses are 5 hours. When looking closer at the logs for the EUMETCast dissemination, all products for this period were actually within 15 minutes after the timeliness of 5 hours, and also indicates that most of the products have been sent to the EUMETCast upload server within the timeliness. Unfortunately, the upload times to the EUMETCast server are not kept for more than 2 months (this will now be changed). The monitoring system at MET Norway monitors that the files have been sent in time, and therefore these low numbers have not been discovered before this report was written.

3 Main anomalies, corrective and preventive measures

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

3.1 At SS1

In August 2013, some OSISAF DLI products (both MSG and GOES) have been impacted by wrong models the 24 and 25th., respectively hourly DLI at 16 and 17 UTC, and hourly from 10 to 17 UTC. Daily DLI have been also impacted. As these data have been finally declared as unusable, and in order to prevent any future use, they have been removed from the archive both at EDC (in GRIB format) and IFREMER (In NetCDF format) site.

3.2 At SS2

16.11.2013 - Missing Southern Hemisphere sea ice products

The OSI SAF Southern Hemisphere sea ice concentration and sea ice edge products were not distributed to the OSI SAF FTP server as expected on 16th November (time stamp 15-11-2013), due to an internal mistake. The EUMETCast distribution was done as expected. The missing files were uploaded to the FTP server the same day and the users were notified.

14.08.2013 - Degraded OSI SAF sea ice products

The sea ice products distributed this day had a large area/sector with missing data. This is due to a SSMIS data outage at NOAA the day before. The data stream from NOAA returned to nominal and the users were notified.

3.3 At SS3

OSCAT data have been unavailable from 29 August, 0:00 until 29 August, 22:00 UTC sensing time due to problems with the raw data processing.

OSCAT data have been unavailable and delayed from 21 September, 18:00 until 23 September, 8:00 UTC sensing time due to problems with the raw data processing.

OSCAT data have been unavailable and delayed from 1 October, 8:00 until 2 October, 22:00 UTC sensing time.

The Metop-B ASCAT data have been unavailable on 29 October, between 6:31 and 10:51 UTC sensing time.

Metop-A ASCAT data have been unavailable on 12 November from 11:42 to 16:48 UTC due to a satellite anomaly.

OSCAT data have been unavailable from 28 November, 5:00 until 3 December, 1:00 UTC sensing time due to problems with the data exchange between ISRO, EUMETSAT and the reception station in Svalbard.

4 Main events and modifications, maintenance activities

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

4.1 At SS1

On 2013-07-04, the LEO SST products in NetCDF, have been put in GDS V2.0 format, both on EUMETCast and on the IFREMER FTP server. Note that on this ftp server, data in GDS V2.0 format are available since the beginning of the test period, so since the 2013/06/04. This change has been requested by the GRHSST community ; it's main impact is the compression mode which is internal instead of external with bzip. The modification is based on the GDSV2 document available on the GHRSST web site : https://www.ghrsst.org/documents/q/category/gds-documents/operational/GDS20r5.pdf Any future update of the GDS format will be found in this directory.

On 2013-11-20, S-NPP NAR SST have superseded NOAA-19 NAR SST products in both GRIB2 and NetCDF format. Since this date, NAR SST products are processed with S-NPP and Metop-A data.

4.2 At SS2

24.09.2013 - stopped distribution of superseded SST and Flux products

Stopped distribution of some superseded SST and Flux products to the OSI SAF High Latitude FTP server ftp://osisaf.met.no. The users were notified in advance. The affected products were the old 10km resolution High Latitude SST, SSI and DLI products that have been replace by the 5km resolution Atlantic High Latitude products.

24.09.2013 - stopped distribution of superseded sea ice formats/products

Stopped distribution of some superseded sea ice formats/products to the OSI SAF Sea High Latitude FTP server ftp://osisaf.met.no. The users were notified in advance.

4.3 At SS3

Historic OSCAT data are available from the EUMETSAT Data Centre as of 18 September 2013.

Central storage servers at KNMI were replaced on 2 December.

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 METEOSAT and GOES-E satellite, currently METEOSAT-09 and GOES-12.

Hourly SST values are required to have the following accuracy when compared to night time buoy measurements (see PRD) :

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

For LEO SST, according to GHRSST-PP project, for IR derived products, the normalized Proximity Confidence Value scale fixes 6 values : 0: unprocessed, 1: cloudy, 2: bad, 3: suspect, 4: acceptable, 5: excellent. 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.

For GEO SST, similar to the LEO SST, for IR derived products, the normalized quality level scale shows 6 values. A quality level is provided at pixel level, with increasing reliability from 2 (="bad") to 5 (="excellent"). 0 means unprocessed and 1 means cloudy. Users are recommended to use quality levels 3 to 5 for quantitative applications.

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

5.1.1 METEOSAT SST quality

The following maps indicate the locations of buoys for each month.

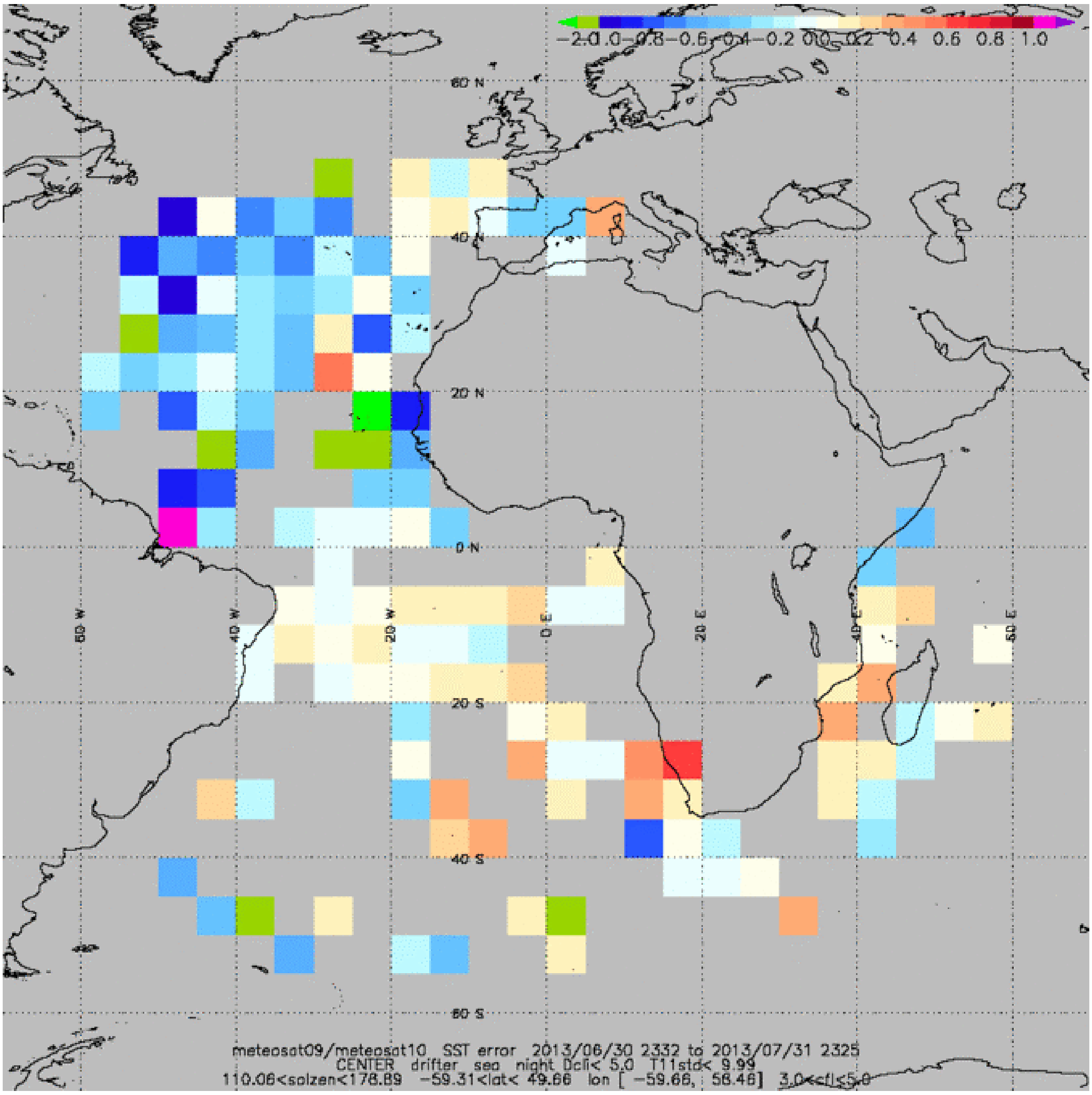


Figure 1 : Location of buoys for METEOSAT SST validation in JULY 2013, for 3,4,5 quality indexes and by night.

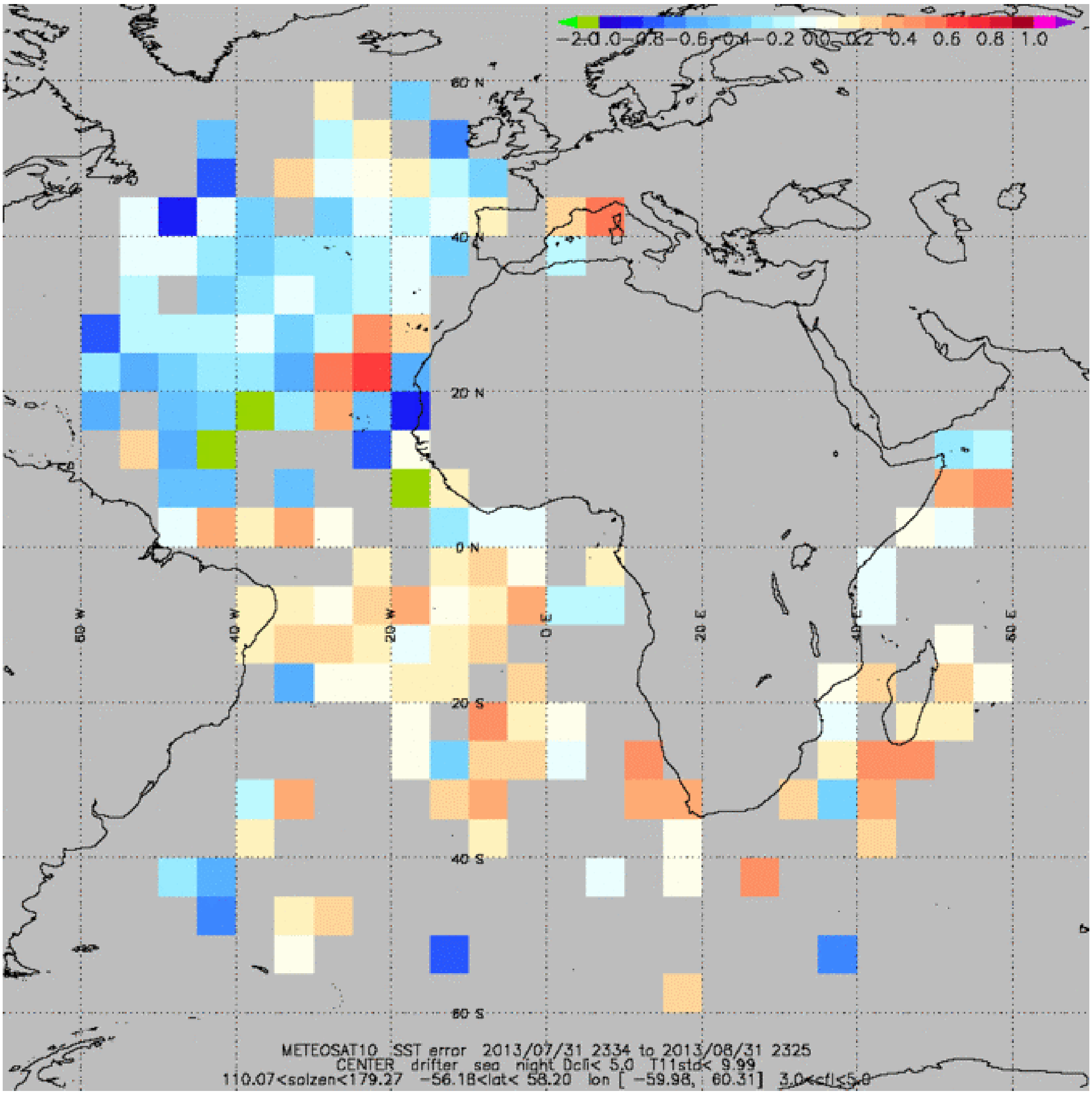


Figure 2 : Location of buoys for METEOSAT SST validation in AUGUST 2013, for 3,4,5 quality indexes and by night.

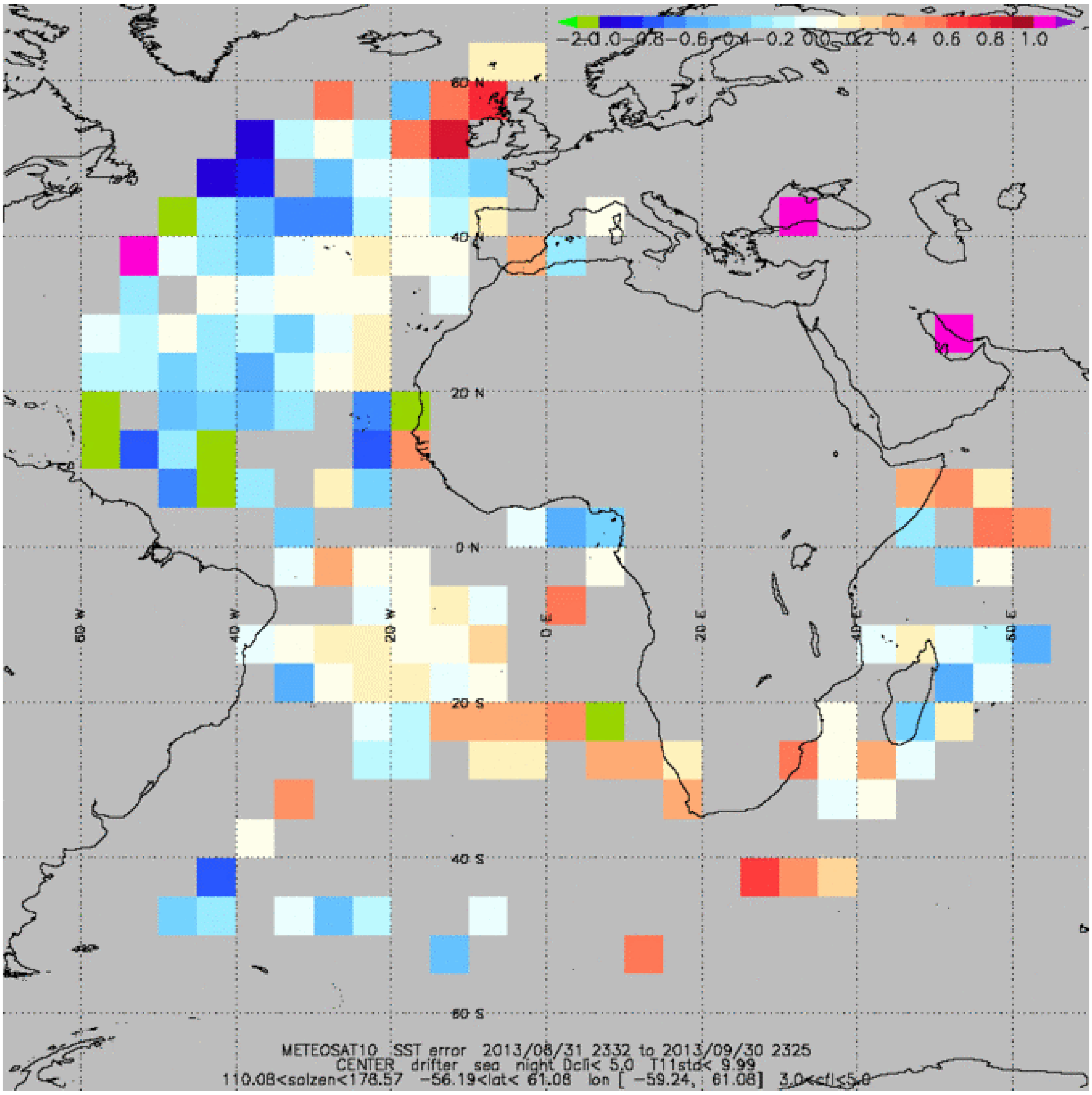


Figure 3 : Location of buoys for METEOSAT SST validation in SEPTEMBER 2013, for 3,4,5 quality indexes and by night.

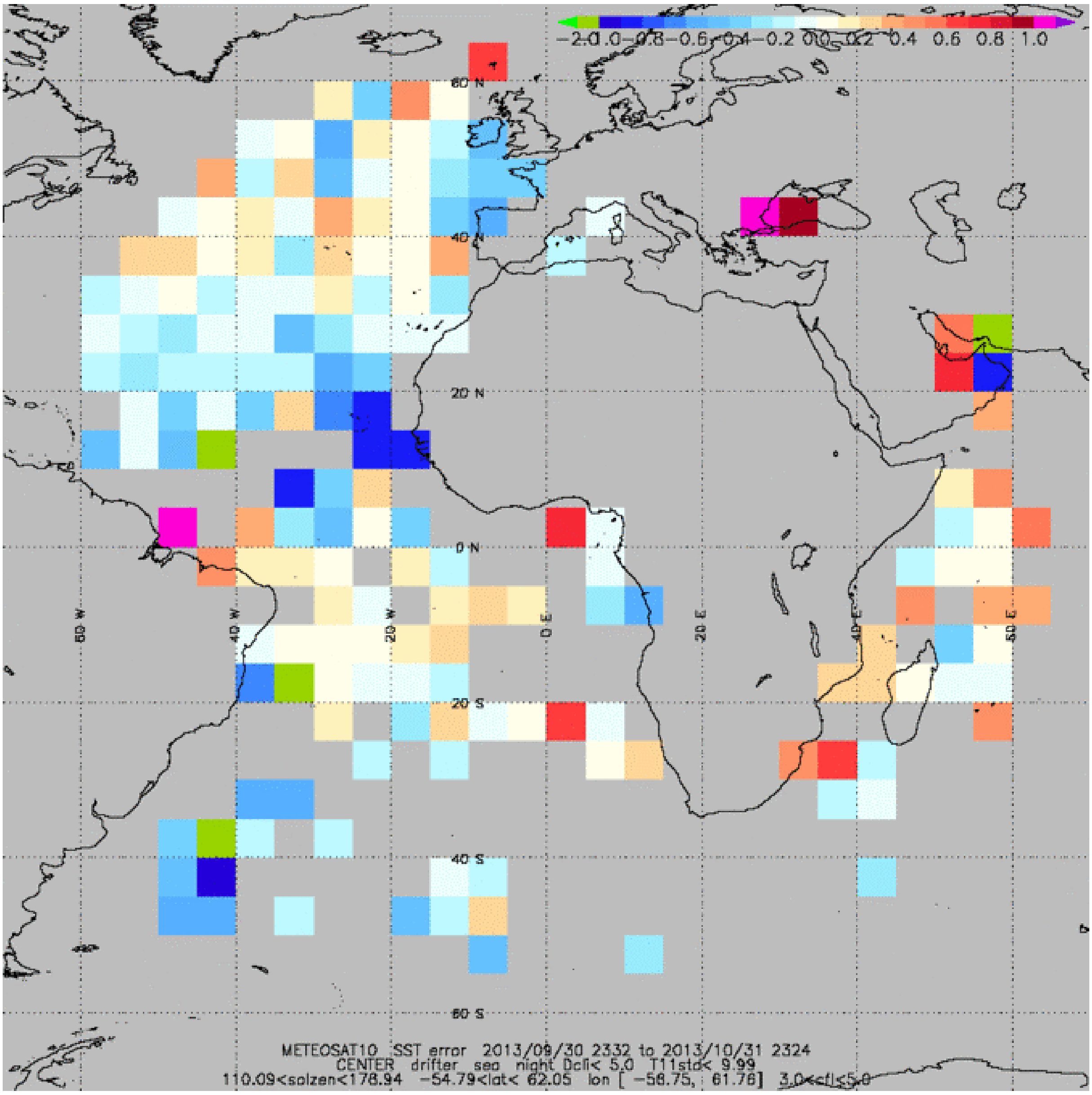


Figure 4 : Location of buoys for METEOSAT SST validation in OCTOBER 2013, for 3,4,5 quality indexes and by night.

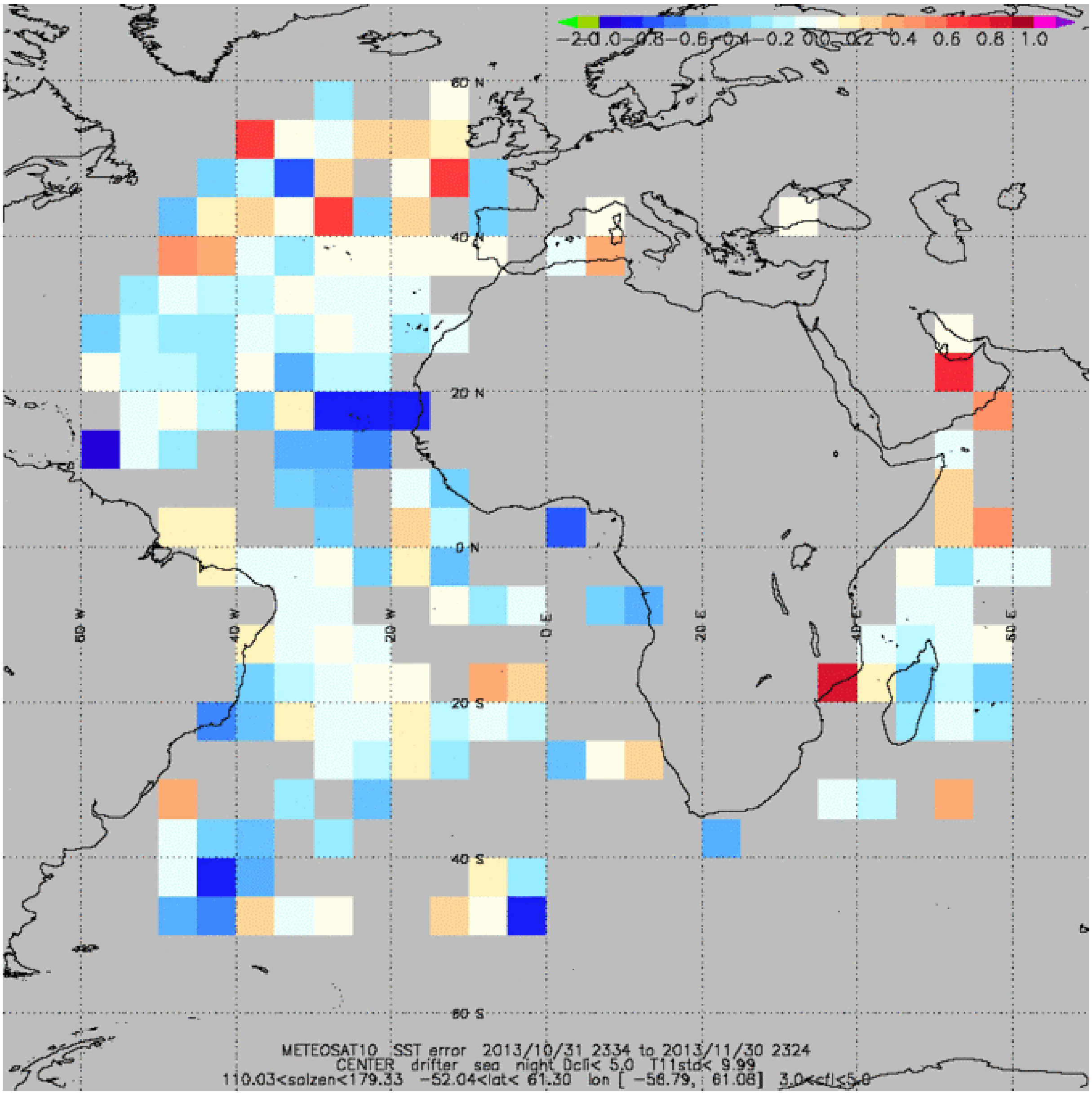


Figure 5 : Location of buoys for METEOSAT SST validation in NOVEMBER 2013, for 3,4,5 quality indexes and by night.

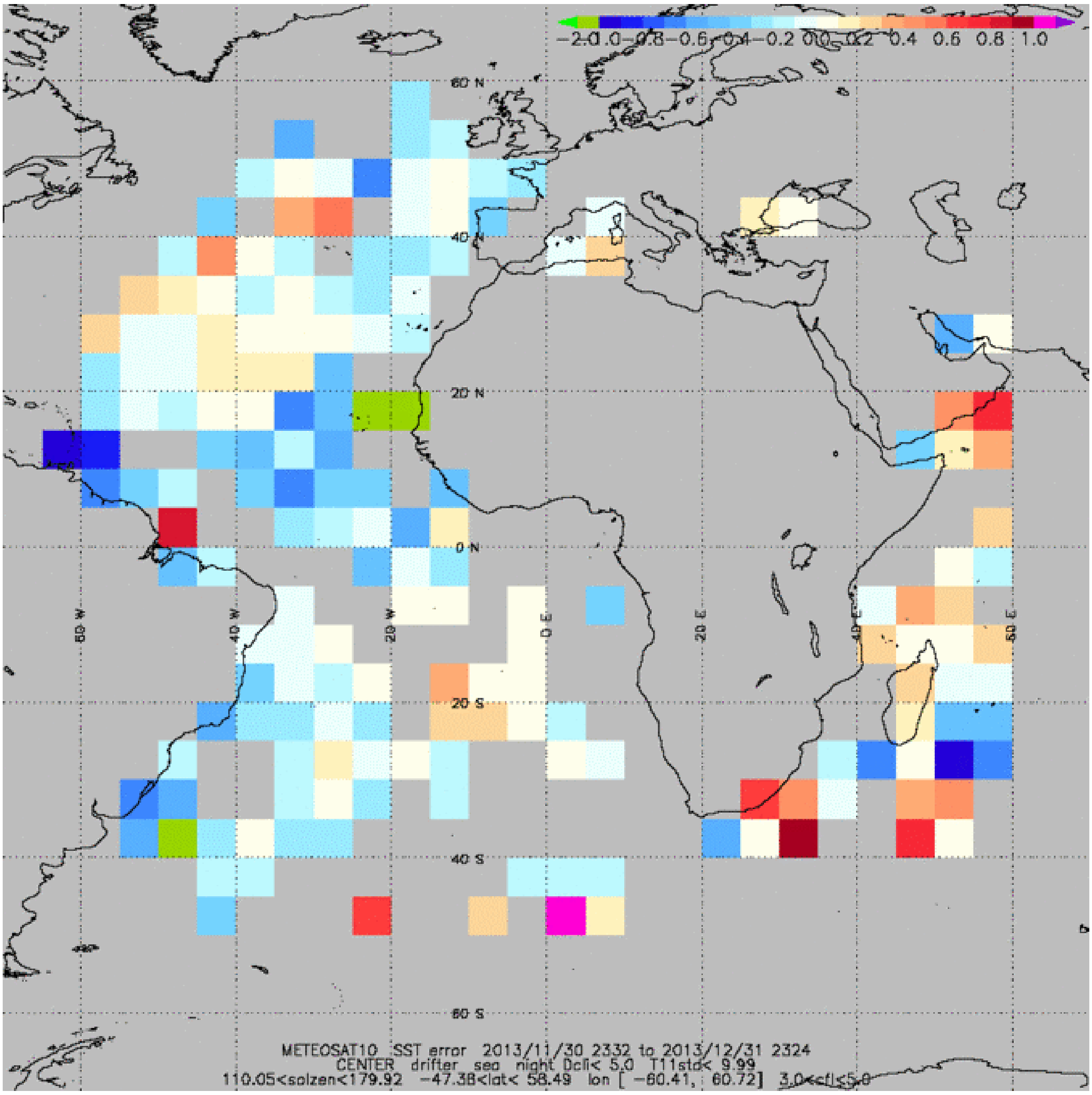


Figure 6 : Location of buoys for METEOSAT SST validation in DECEMBER 2013, for 3,4,5 quality indexes and by night.

The following table provides the METEOSAT-derived SST quality results over the reporting period. METEOSAT SST quality results over 2nd half 2013.

METEOSAT SST quality results over 2nd half 2013							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	9912	-0,170	0,5	66,00	0,64	1,0	36,00
Aug. 2013	14522	-0,100	0,5	80,00	0,62	1,0	38,00
Sept. 2013	16373	-0,160	0,5	68,00	0,66	1,0	34,00
Oct. 2013	21239	-0,100	0,5	80,00	0,61	1,0	39,00
Nov. 2013	14306	-0,110	0,5	78,00	0,56	1,0	44,00
Dec. 2013	15452	-0,070	0,5	86,00	0,58	1,0	42,00

table 4 : METEOSAT SST quality results over 2nd half 2013, for 3, 4, 5 quality indexes and by night.

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

Comments : Quality results are good and quite stable.

The following graphs illustrate the evolution of METEOSAT-derived SST quality results over the past 6 months.

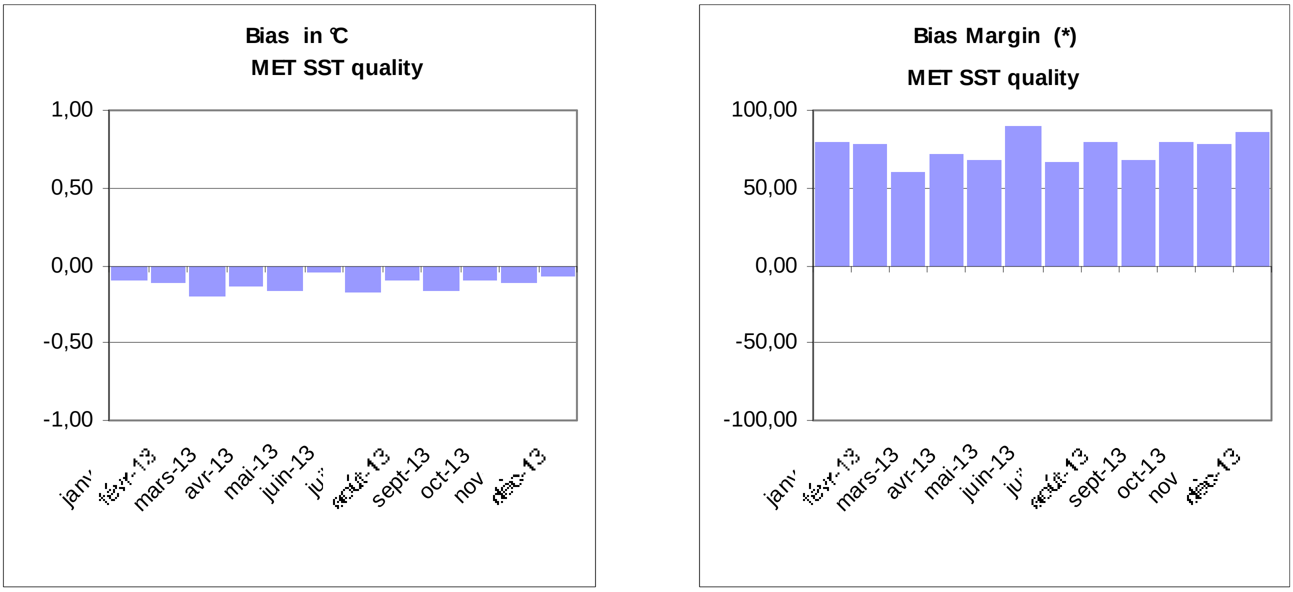
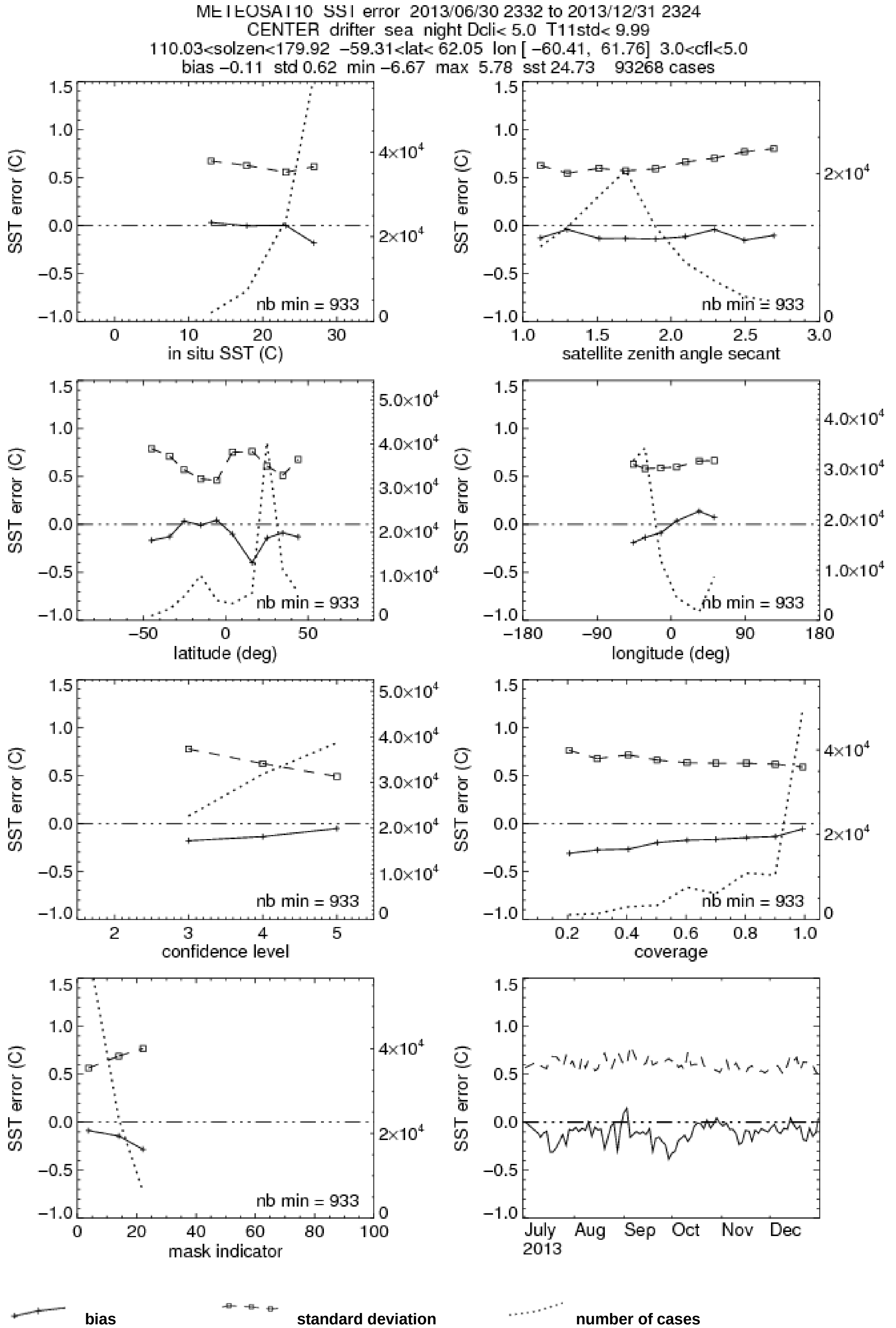


Figure 7 : Left: METEOSAT SST Bias. Right : METEOSAT SST Bias Margin

Figure 8 : Left: METEOSAT SST Standard deviation. Right : METEOSAT SST Standard deviation Margin.



last figure (bottom left) : bias and std.

Figure 9 : Complementary validation statistics on METEOSAT SST.

5.1.2 GOES-E SST quality

The following maps indicate the location of buoys for each month.

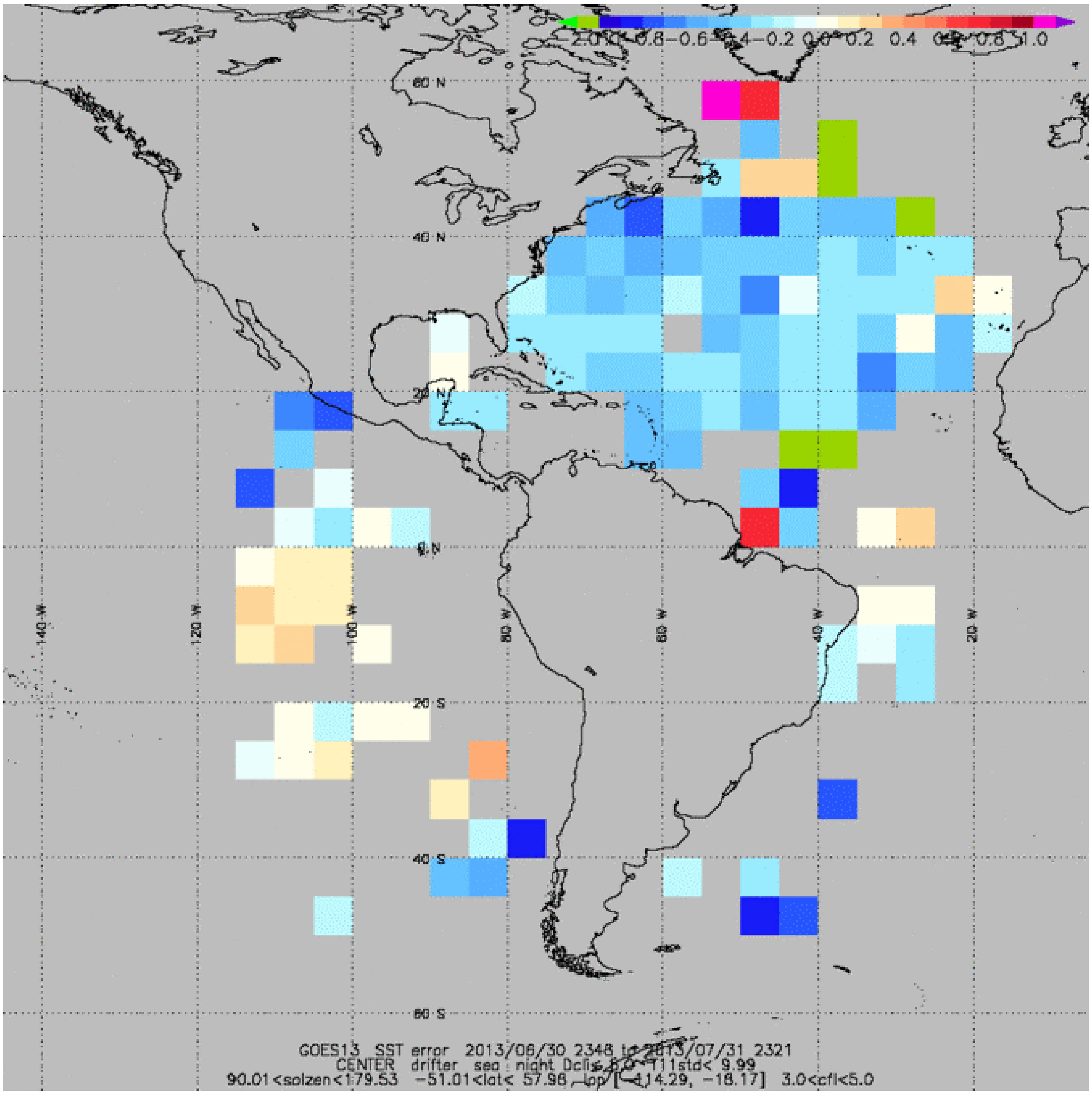


Figure 10 : Location of buoys for GOES-E SST validation in JULY 2013, for 3,4,5 quality indexes and by night.

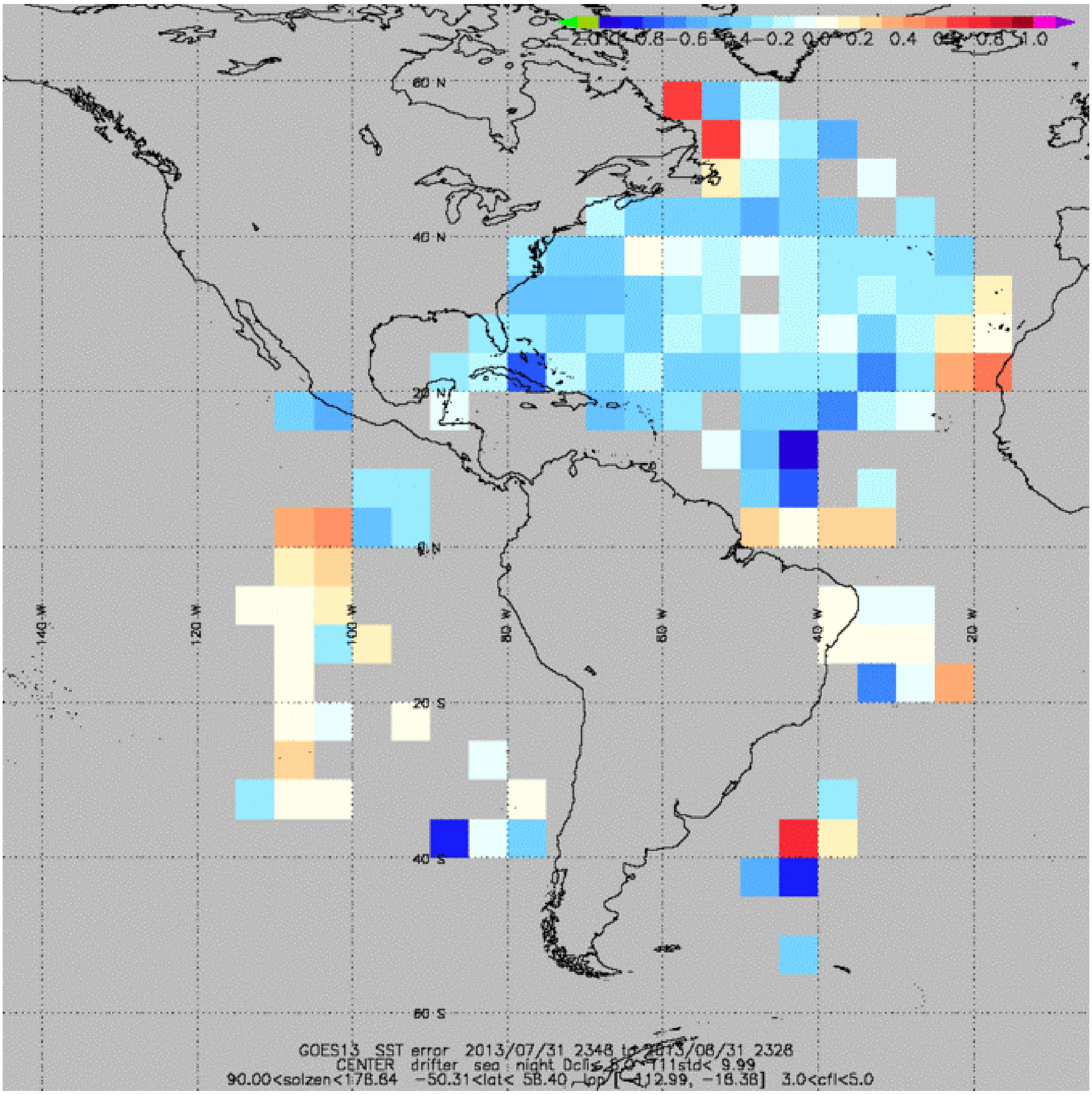


Figure 11 : Location of buoys for GOES-E SST validation in AUGUST 2013, for 3,4,5 quality indexes and by night.

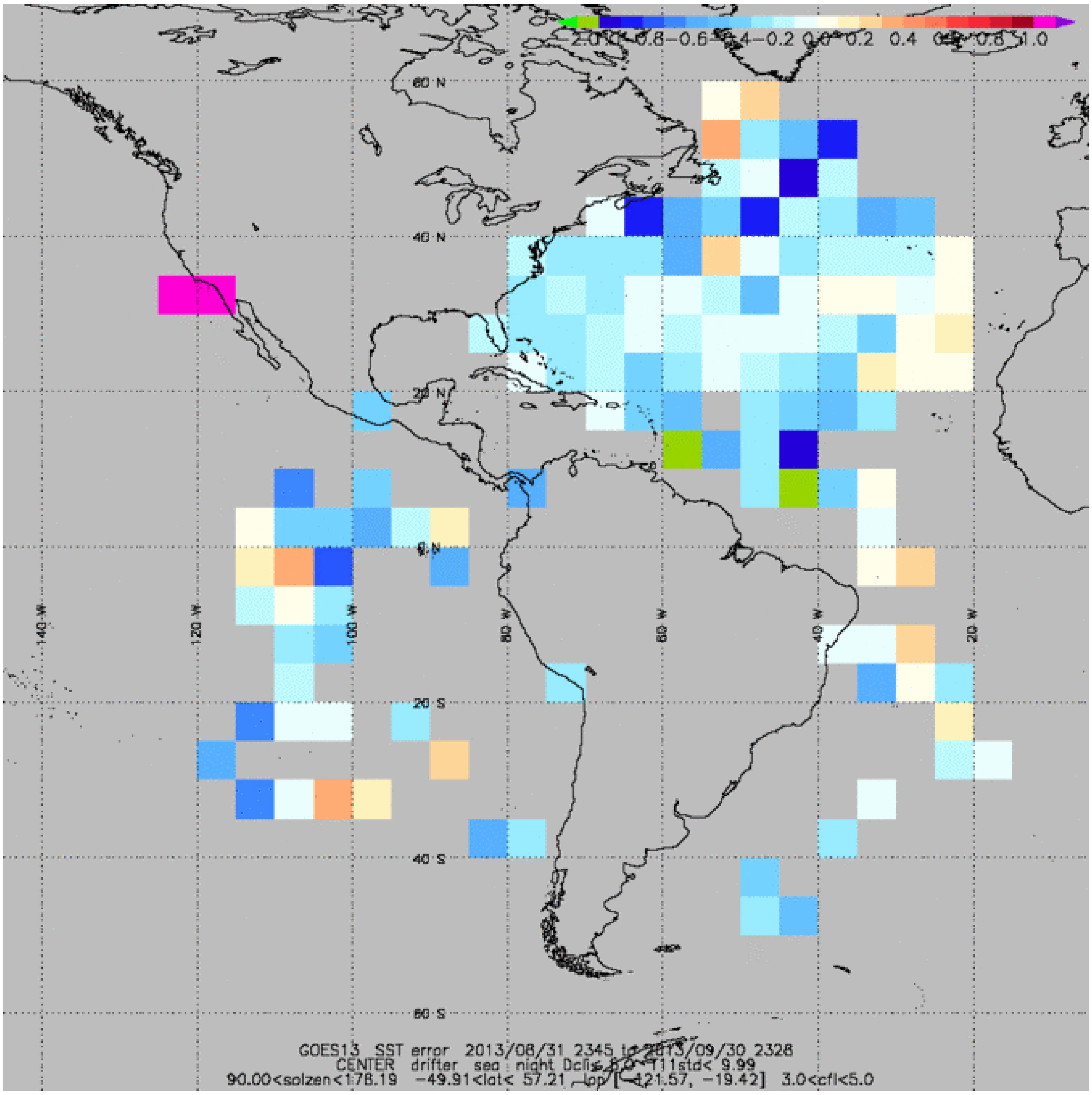


Figure 12 : Location of buoys for GOES-E ST validation in SEPTEMBER 2013, for 3,4,5 quality indexes and by night.

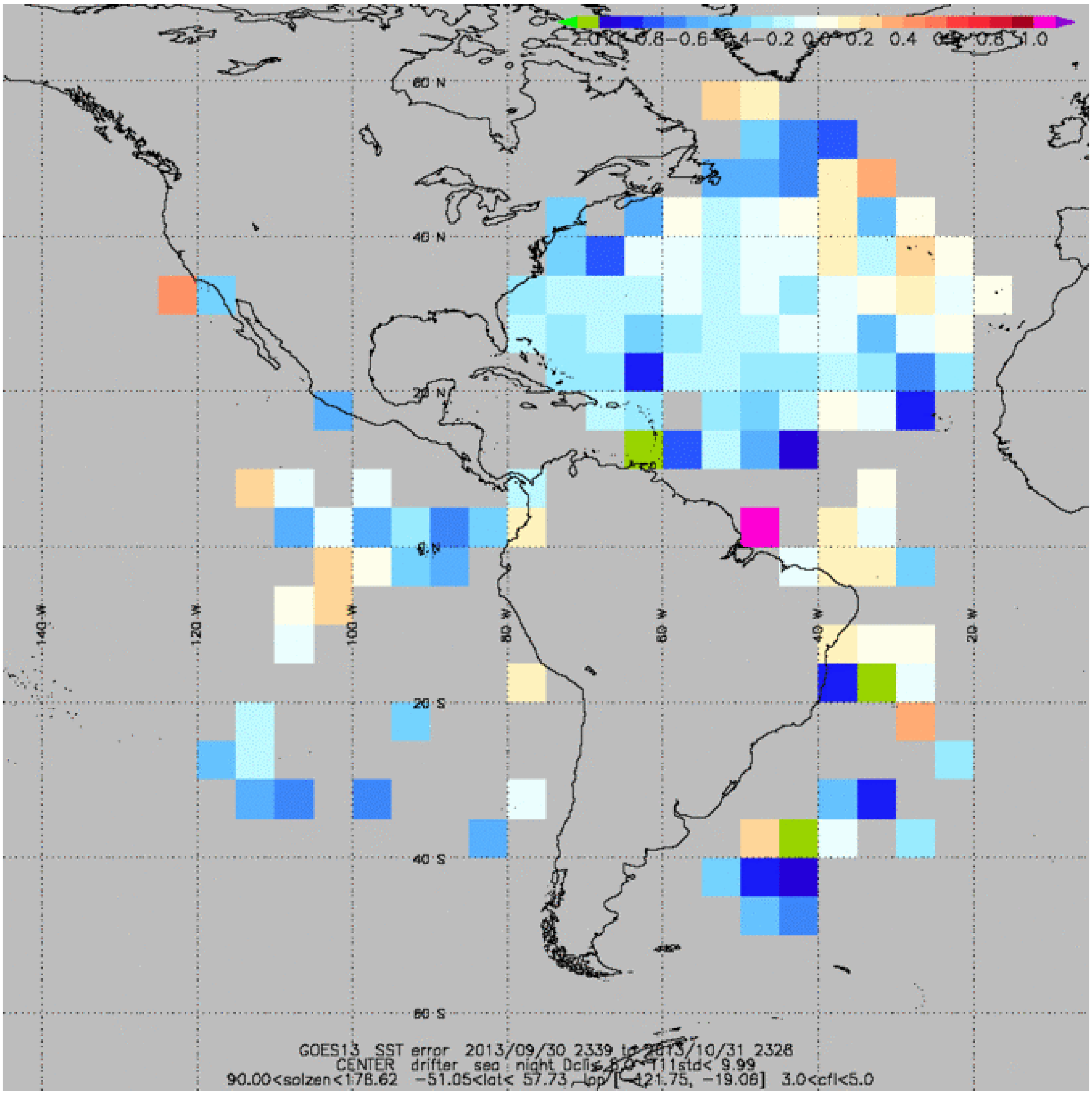


Figure 13 : Location of buoys for GOES-E ST validation in OCTOBER 2013, for 3,4,5 quality indexes and by night.

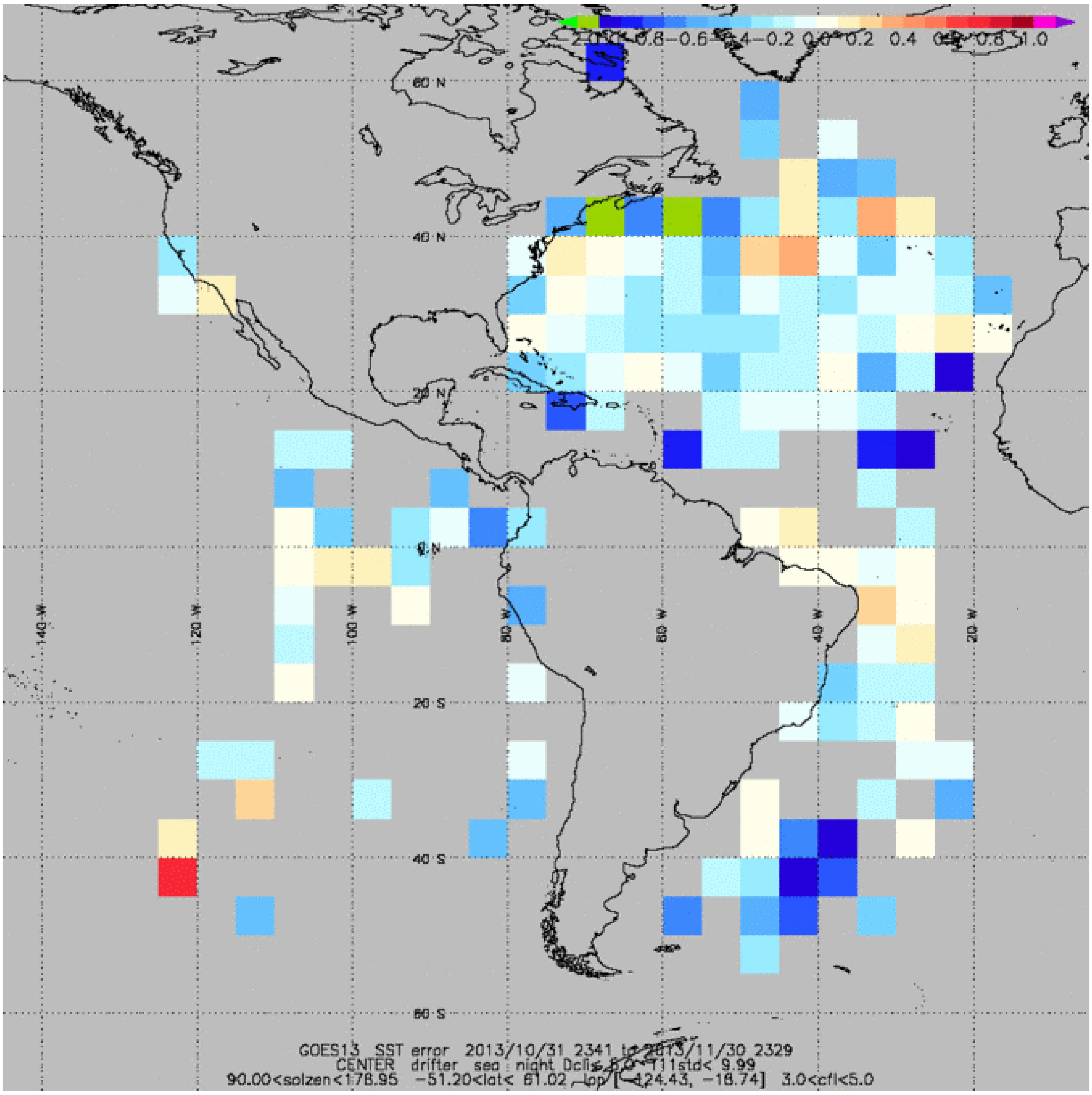


Figure 14 : Location of buoys for GOES-E ST validation in NOVEMBER 2013, for 3,4,5 quality indexes and by night.

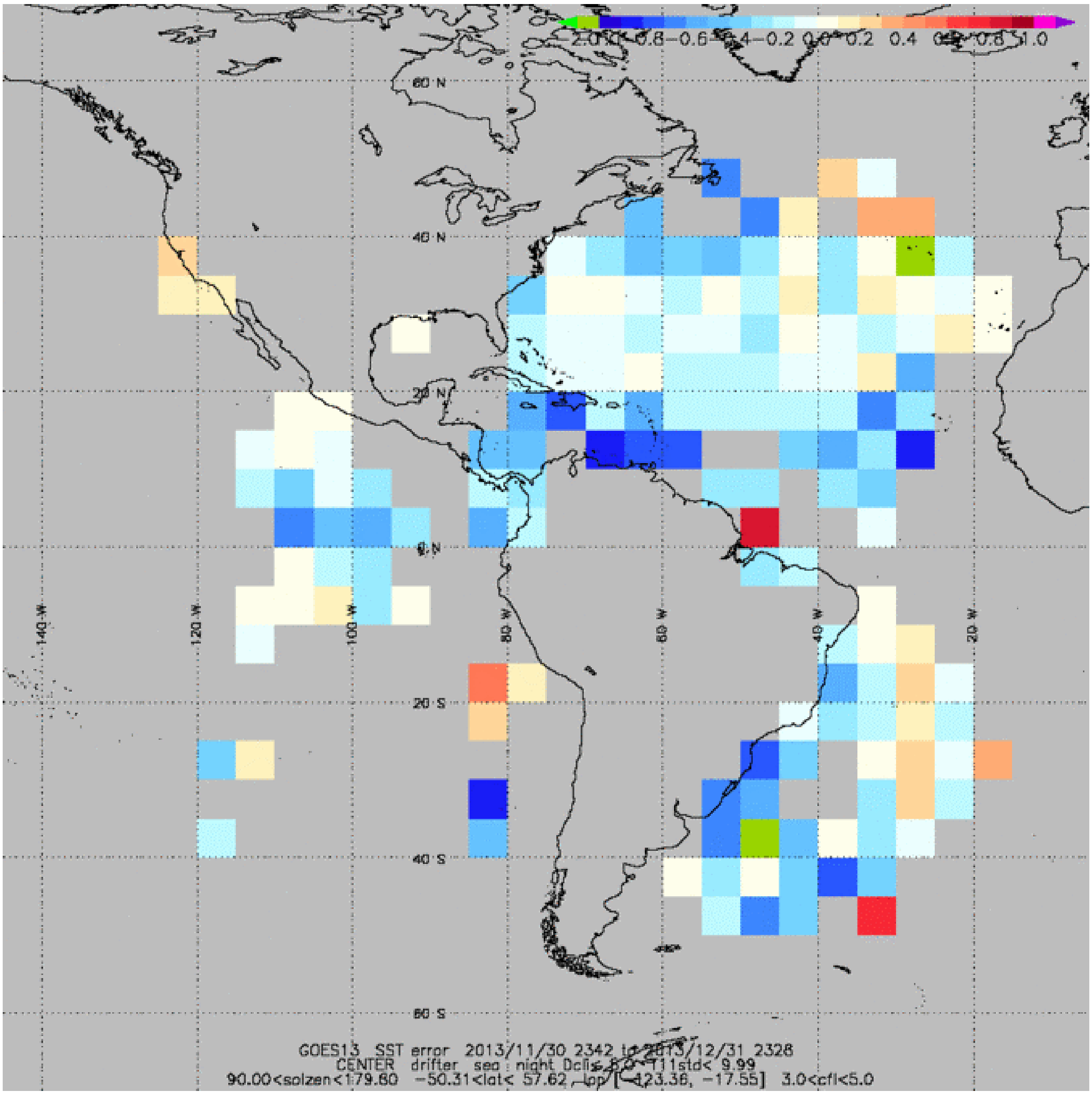


Figure 15 : Location of buoys for GOES-E ST validation in DECEMBER 2013, for 3,4,5 quality indexes and by night.

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

GOES-E SST quality results 2nd half 2013							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	17358	-0,270	0,5	46,00	0,5	1,0	50,00
Aug. 2013	22350	-0,210	0,5	58,00	0,48	1,0	52,00
Sept. 2013	21298	-0,110	0,5	78,00	0,61	1,0	39,00
Oct. 2013	24871	-0,170	0,5	66,00	0,5	1,0	50,00
Nov. 2013	16136	-0,130	0,5	74,00	0,49	1,0	51,00
Dec. 2013	21389	-0,110	0,5	78,00	0,51	1,0	49,00

table 5 : GOES-E SST quality results over 2nd half 2013, for 3, 4, 5 quality indexes and by night.

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

Comments : Quality results are good and quite stable.

The following graphs illustrate the evolution of GOES-E-derived SST quality results over the past 6 months.

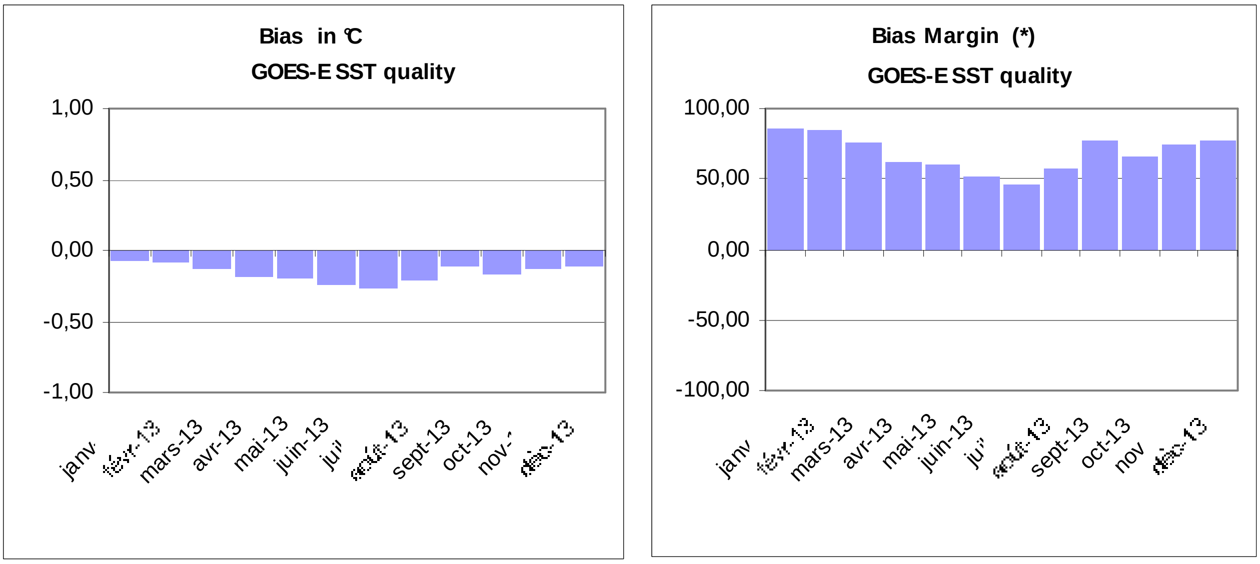


Figure 16 : Left: Goes-E SST Bias. Right: Goes-E SST Bias Margin.

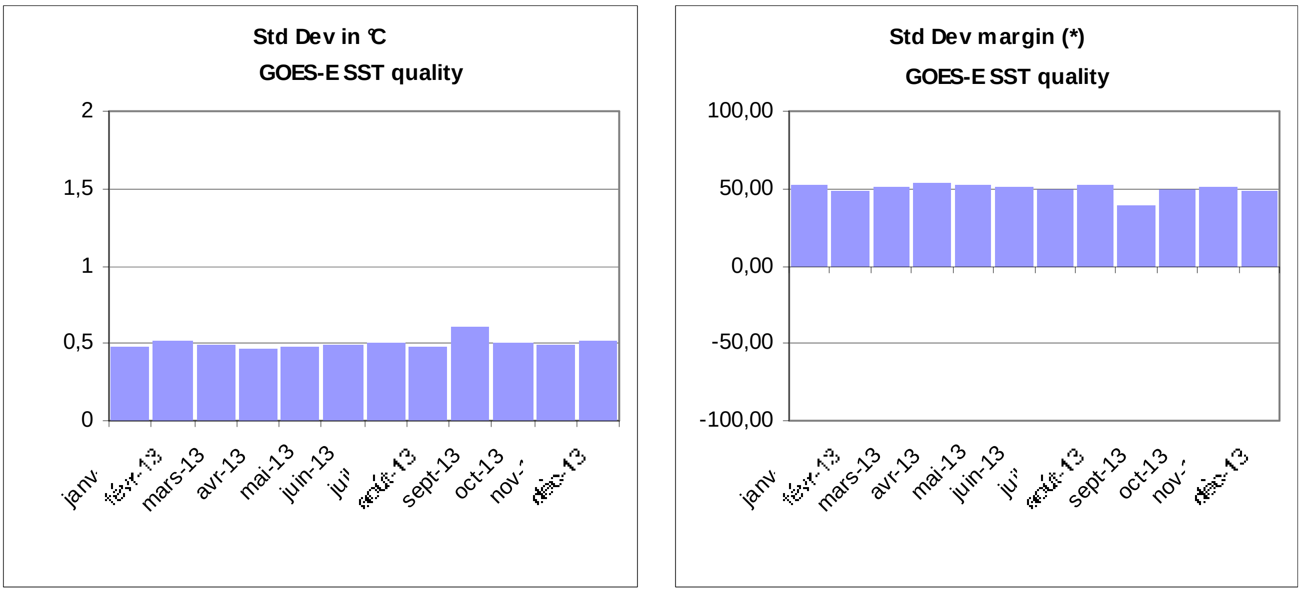
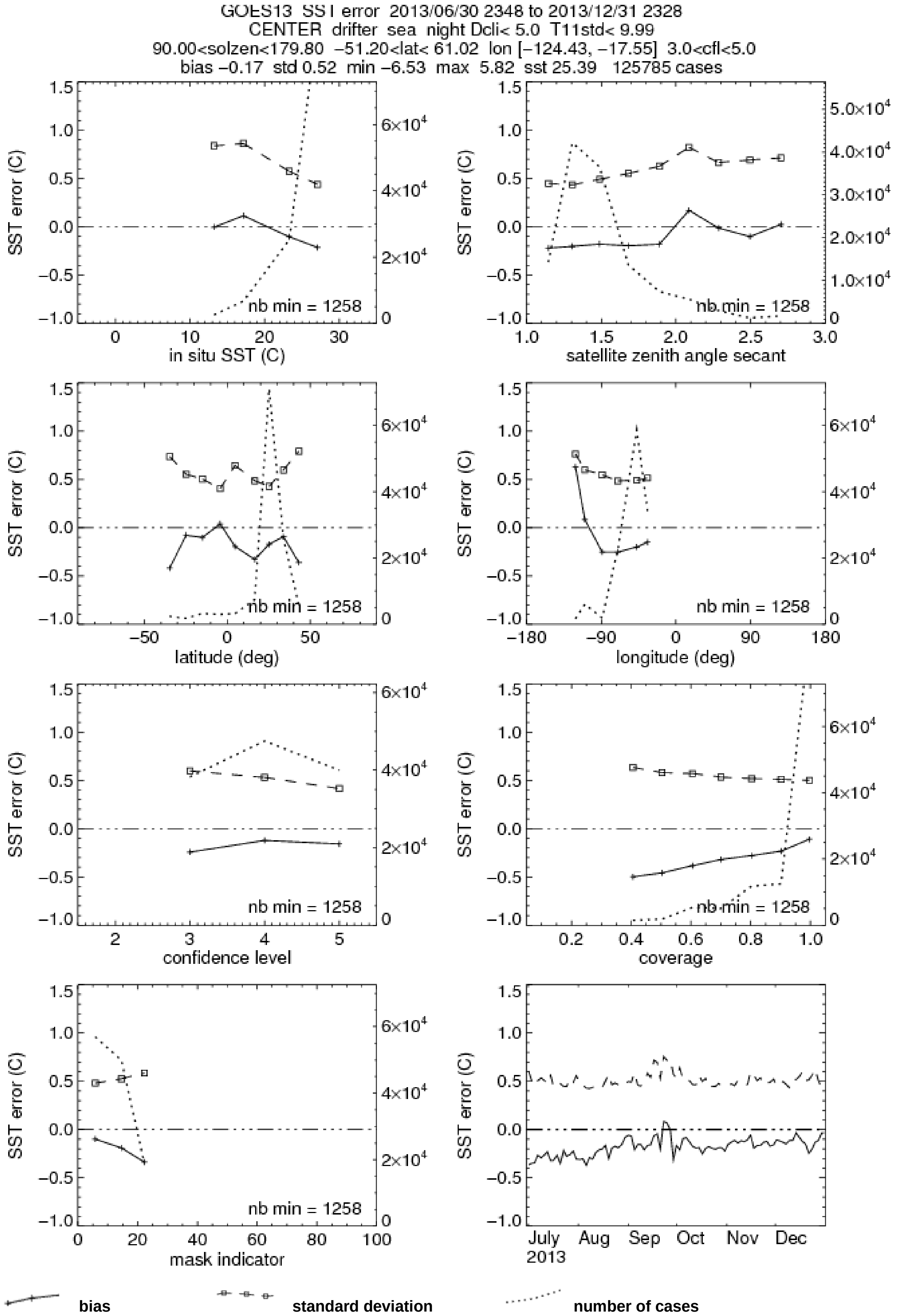


Figure 17 : Left: Goes-E SST Standard deviation. Right Goes-E SST Standard deviation Margin.



last figure (bottom left) : bias and std.

Figure 18 : Complementary validation statistics on GOES-E SST.

5.1.3 NAR SST quality

The operational NAR SST processing relies on two satellite data sources : Metop/AVHRR for the morning orbit, NOAA/AVHRR for afternoon orbit up to November 2013 and NPP/AVHRR for afternoon orbit after this date. Currently Metop-A and NPP are used. NOAA19 was definitely replaced by NPP on 20th November 2013.

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 NOAA/NPP and Metop satellite. Compiled results are also provided in the first part of this section.

5.1.3.1 NAR Compiled SST quality

The following table provides NAR Metop-NOAA/NPP compiled SST quality results over the reporting period.

NAR compiled SST quality results over 2nd half 2013							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	1300	-0,090	0,5	82,00	0,4	0,8	50,00
Aug. 2013	1918	-0,140	0,5	72,00	0,45	0,8	43,75
Sept. 2013	2132	-0,090	0,5	82,00	0,46	0,8	42,50
Oct. 2013	2900	-0,140	0,5	72,00	0,41	0,8	48,75
Nov. 2013	1865	-0,130	0,5	74,00	0,43	0,8	46,25
Dec. 2013	1954	-0,150	0,5	70,00	0,38	0,8	52,50

table 6 : **Quality results for NAR compiled SST over 2nd half 2013, for 3, 4, 5 quality indexes and by night.**

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

Comments : Quality results are good and quite stable.

The following graphs illustrate the evolution of NAR SST quality results over the past 6 months :

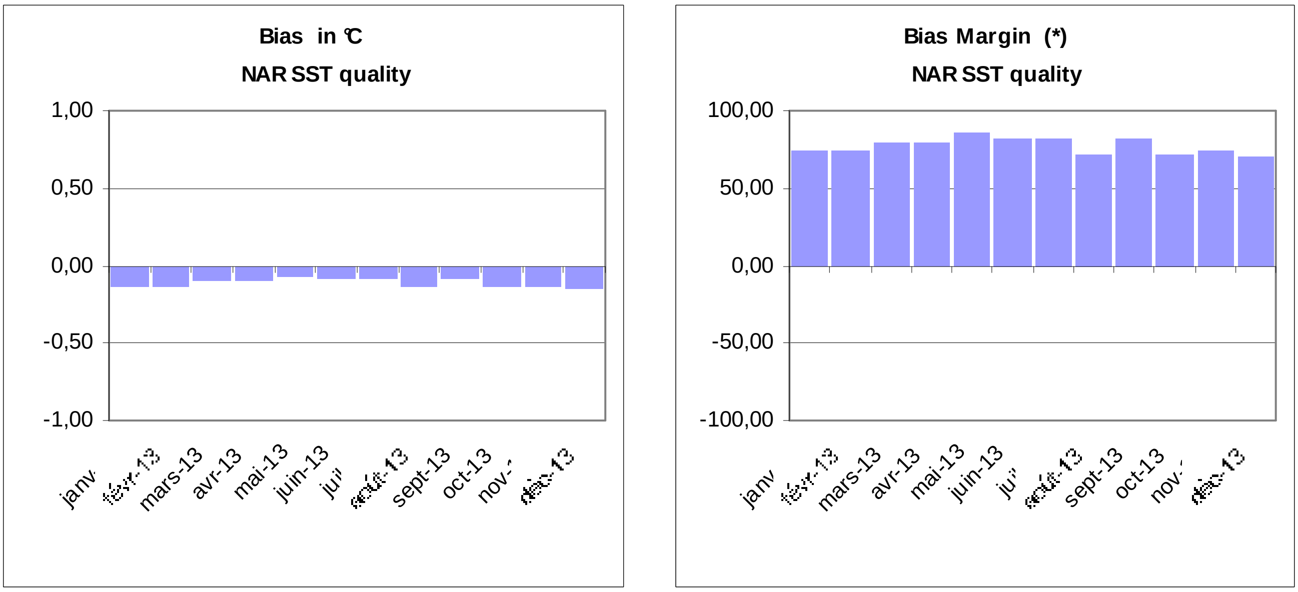


Figure 19 : Left: NAR SST Bias. Right: NAR SST Bias Margin.

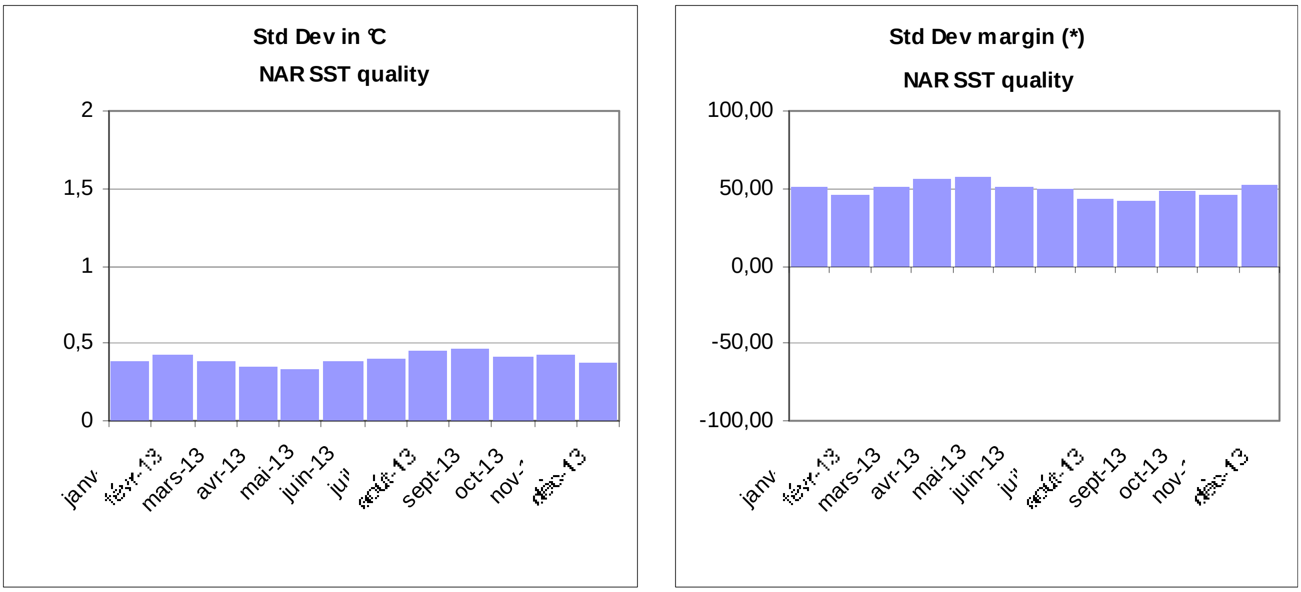


Figure 20 : Left: NAR SST Standard deviation. Right: NAR SST Standard deviation Margin.

5.1.3.2 NOAA-19/NPP NAR SST quality

The following maps indicate the locations of buoys for each month.

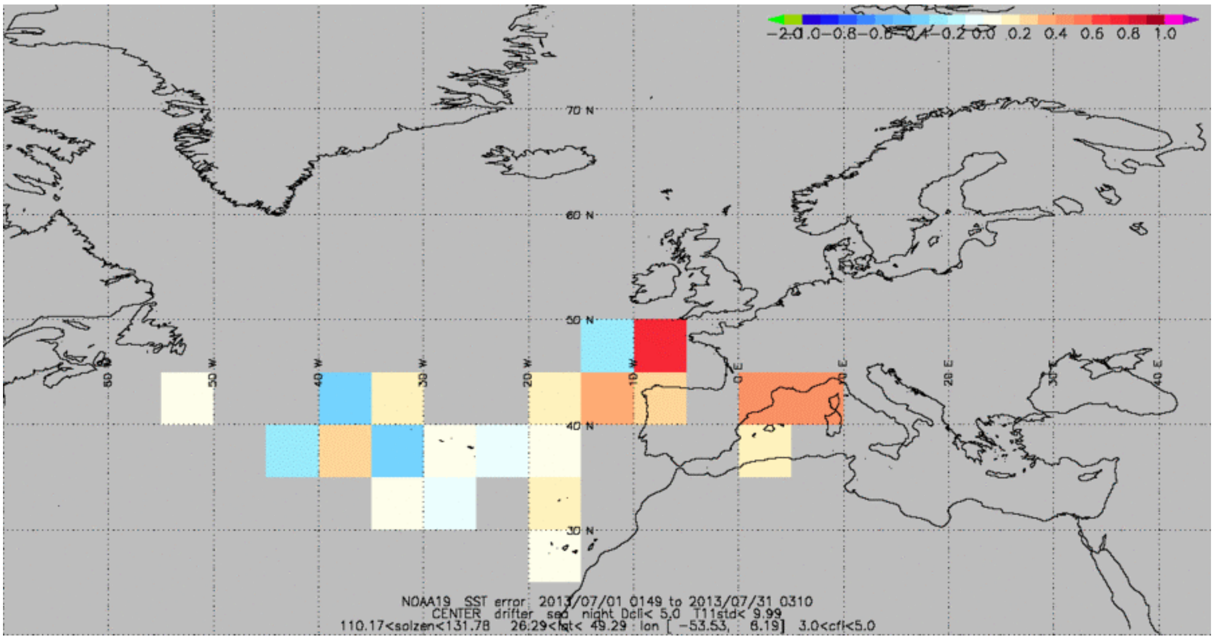


Figure 21 : Location of buoys for NOAA-19 NAR SST validation in JULY 2013, for 3, 4, 5 quality indexes and by night.

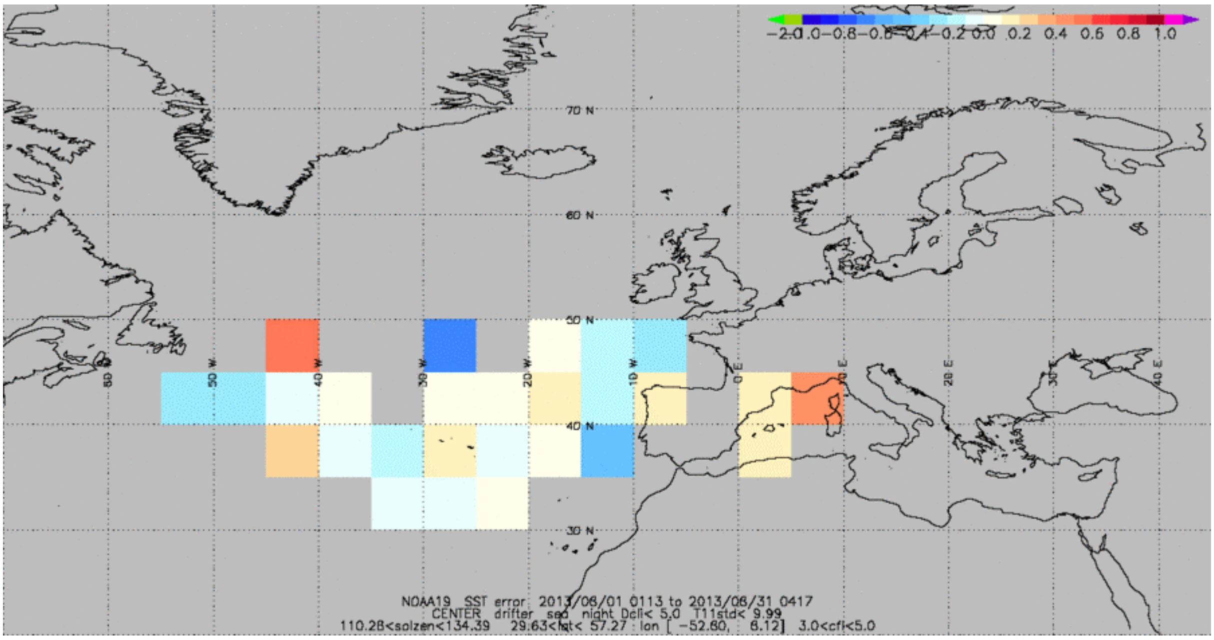


Figure 22 : Location of buoys for NOAA-19 NAR SST validation in AUGUST 2013, for 3, 4, 5 quality indexes and by night.

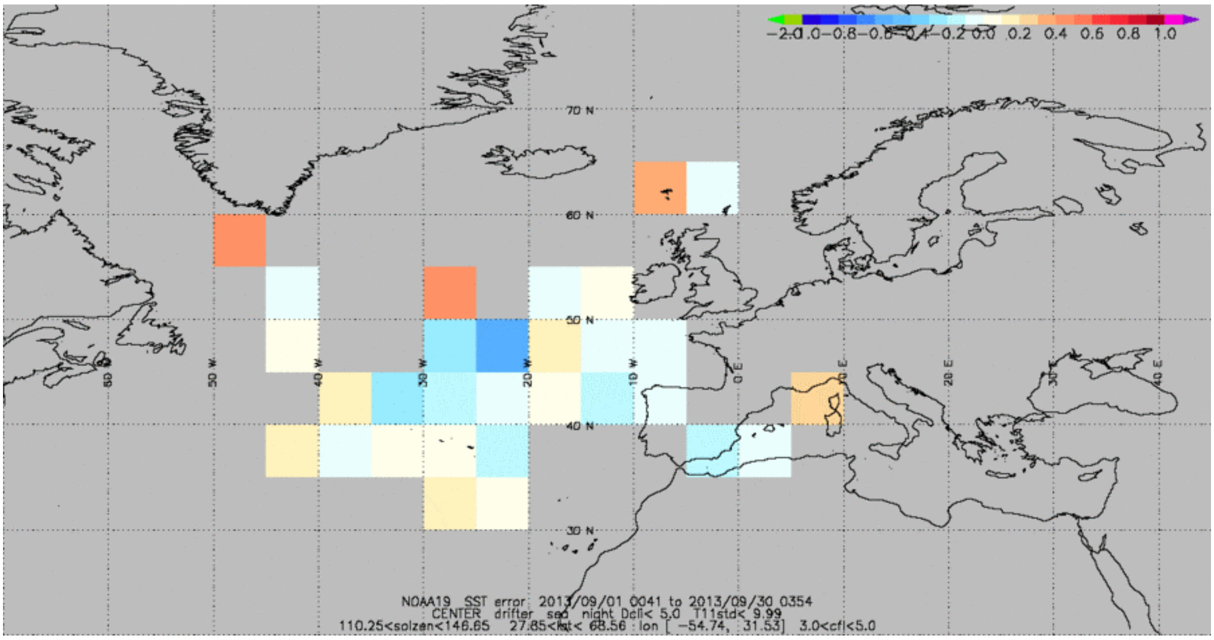


Figure 23 : Location of buoys for NOAA-19 NAR SST validation in SEPTEMBER 2013, for 3, 4, 5 quality indexes and by night.

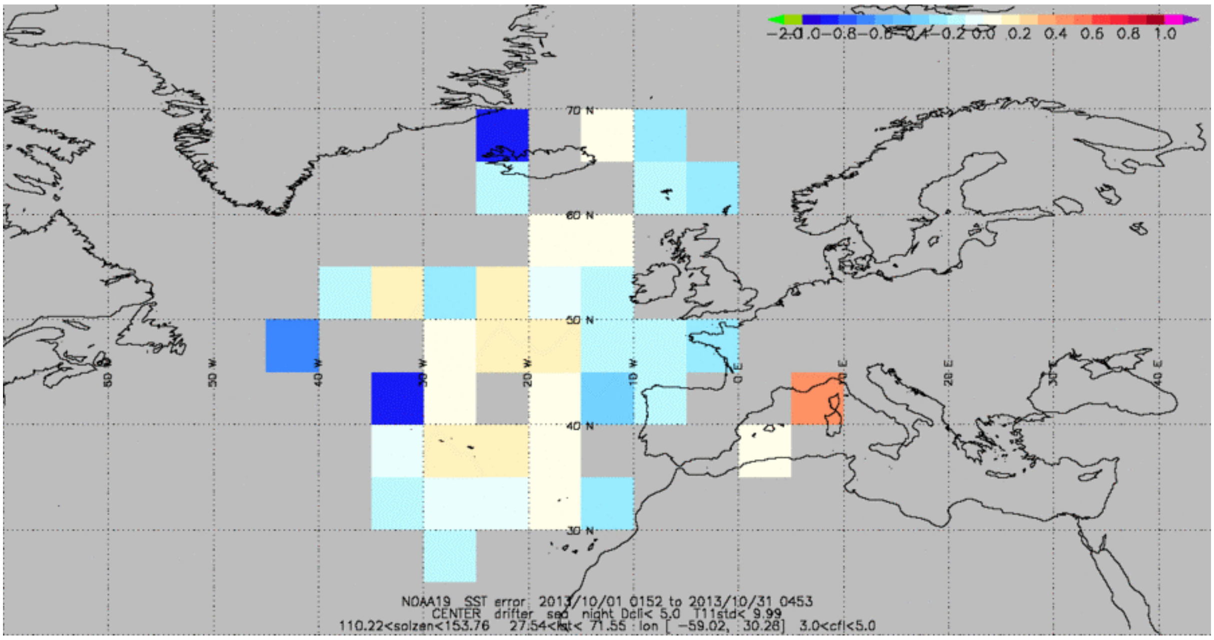


Figure 24 : Location of buoys for NOAA-19 NAR SST validation in OCTOBER 2013, for 3, 4, 5 quality indexes and by night.

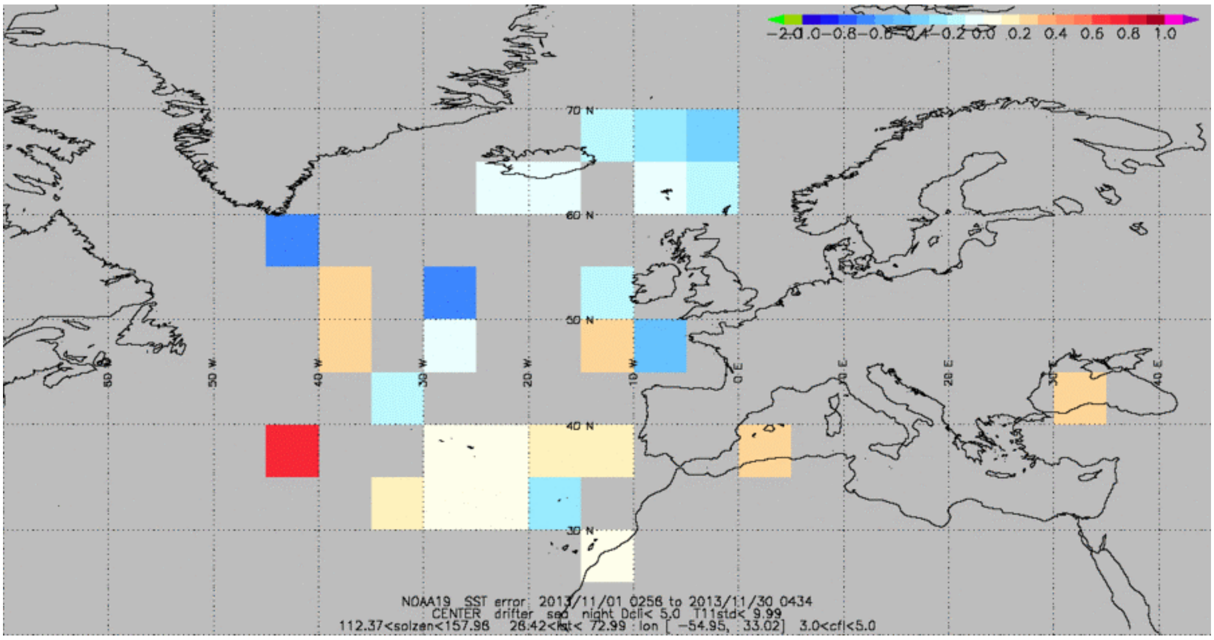


Figure 25 : Location of buoys for NOAA-19 NAR SST validation in NOVEMBER 2013, for 3, 4, 5 quality indexes and by night.

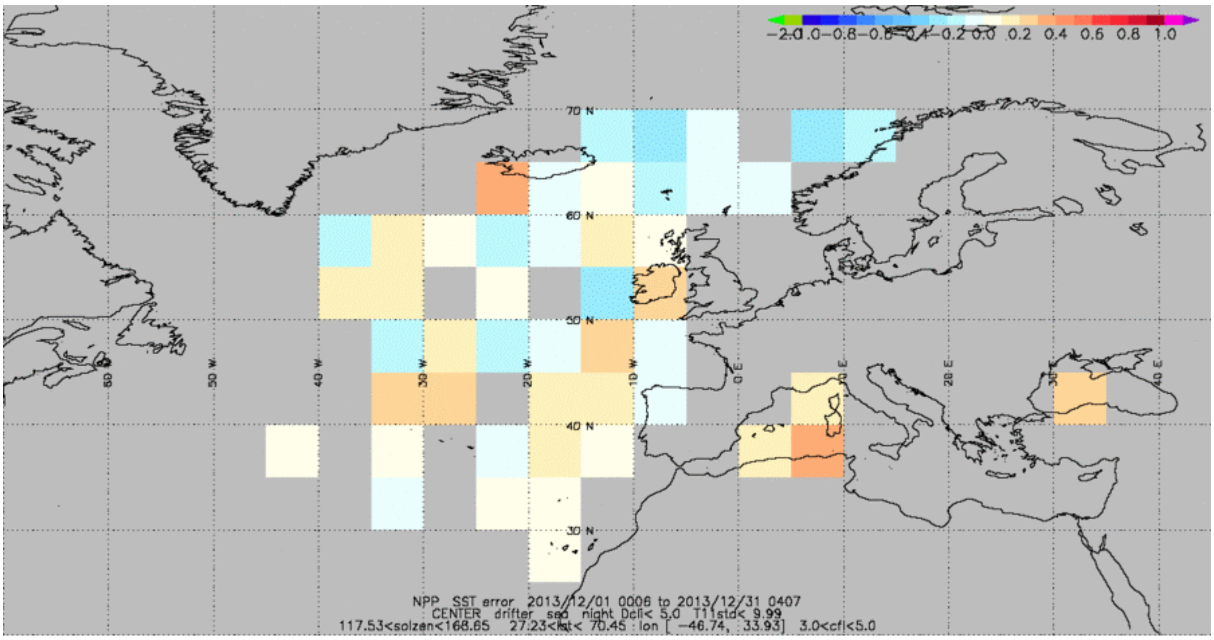


Figure 26 : Location of buoys for NPP NAR SST validation in DECEMBER 2013, for 3, 4, 5 quality indexes and by night.

The following table provides the NOAA-19/NPP-derived SST quality results over the reporting period :

NOAA-19/NPP NAR SST quality results over 2nd half 2013							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	238	0,090	0,5	82	0,470	0,8	41,25
Aug. 2013	357	0,050	0,5	90	0,490	0,8	38,75
Sept. 2013	442	0,010	0,5	98	0,490	0,8	38,75
Oct. 2013	540	-0,050	0,5	90	0,410	0,8	48,75
Nov. 2013	405	-0,041	0,5	92	0,500	0,8	37,50
Dec. 2013	692	0,010	0,5	98	0,320	0,8	60,00

table 7 : **Quality results for NOAA-19/NPP NAR SST over 2nd half 2013, for 3, 4, 5 quality indexes and by night.**

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

Comments: Quality results are good.

The following graphs illustrate the evolution of NOAA-19/NPP NAR SST quality results over the past 6 months.

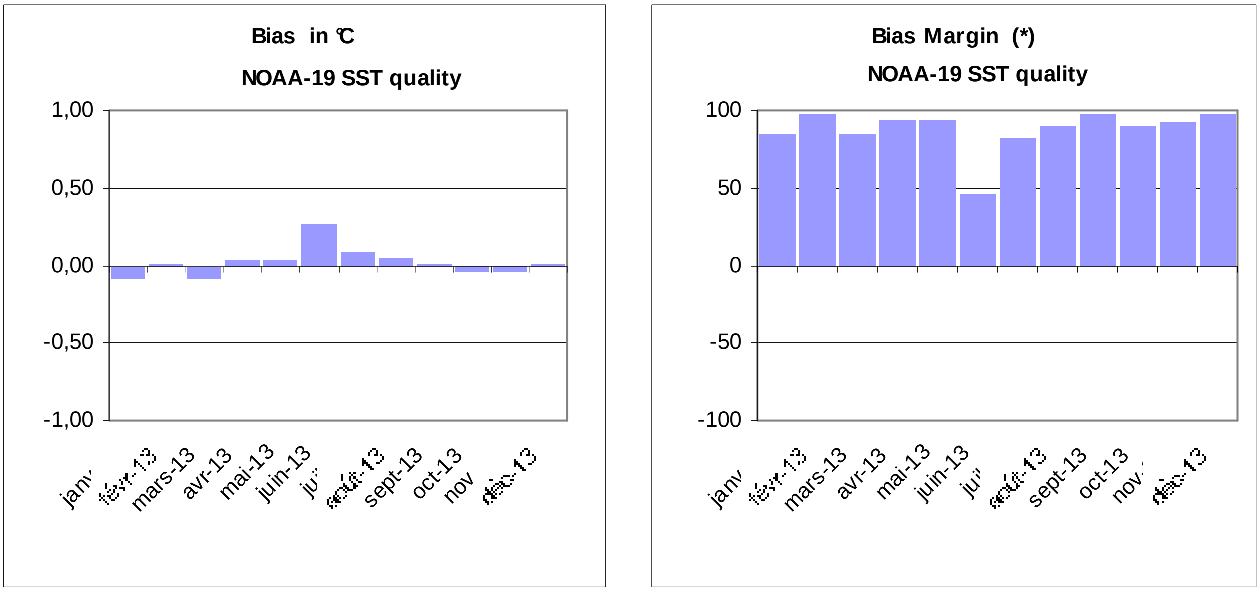
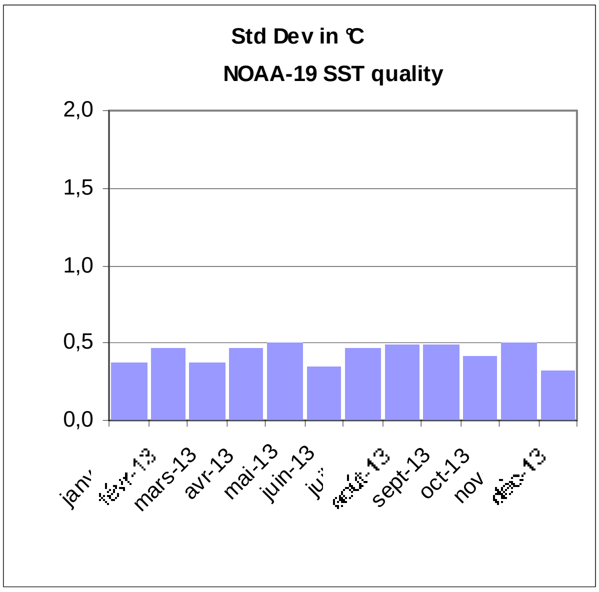


Figure 27 : **Left: NOAA-19/NPP NAR SST Bias. Right: NOAA-19/NPP NAR SST Bias Margin.**



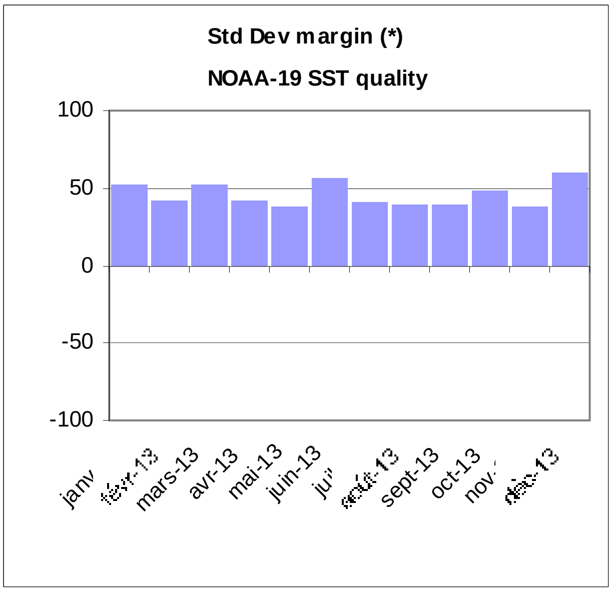
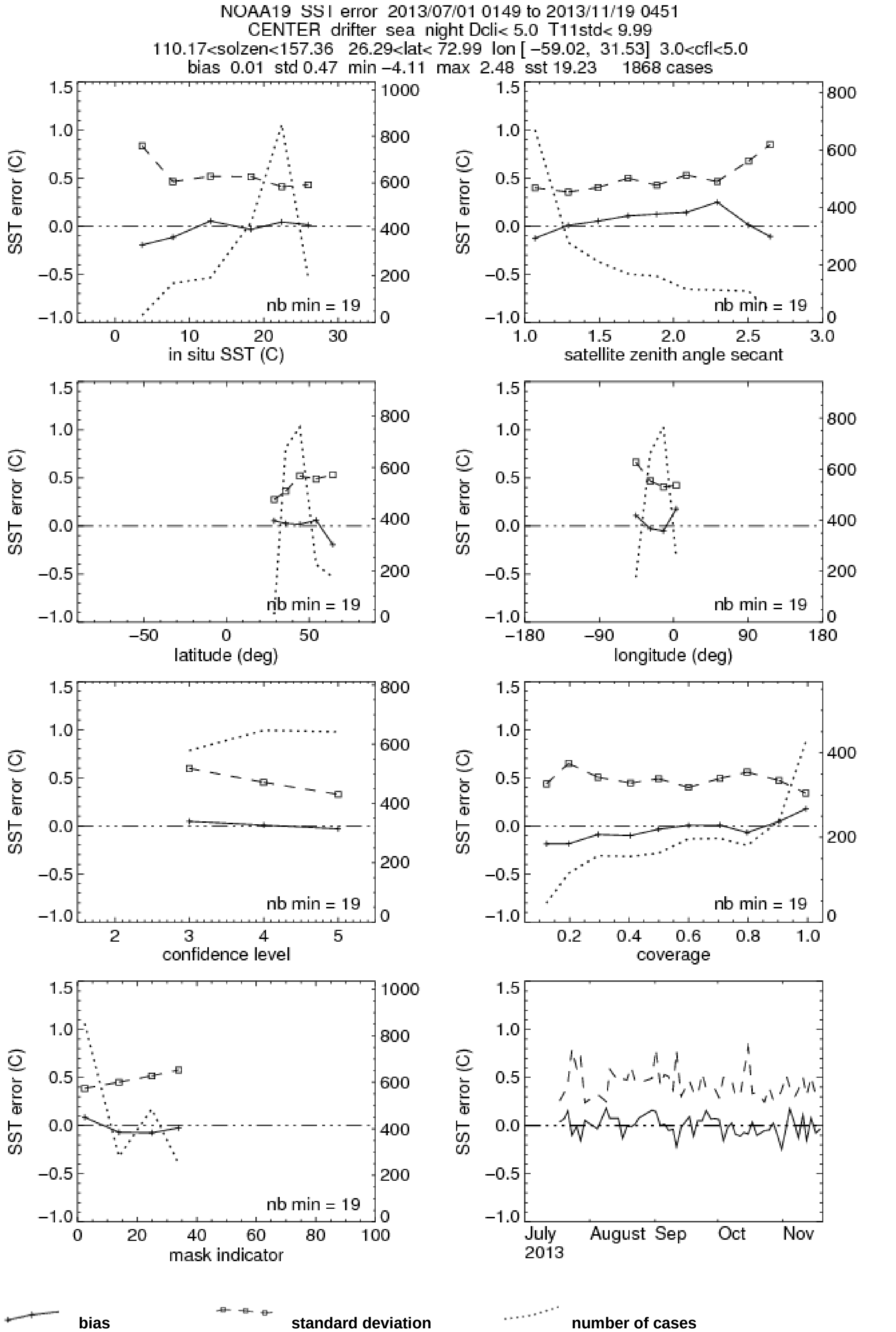
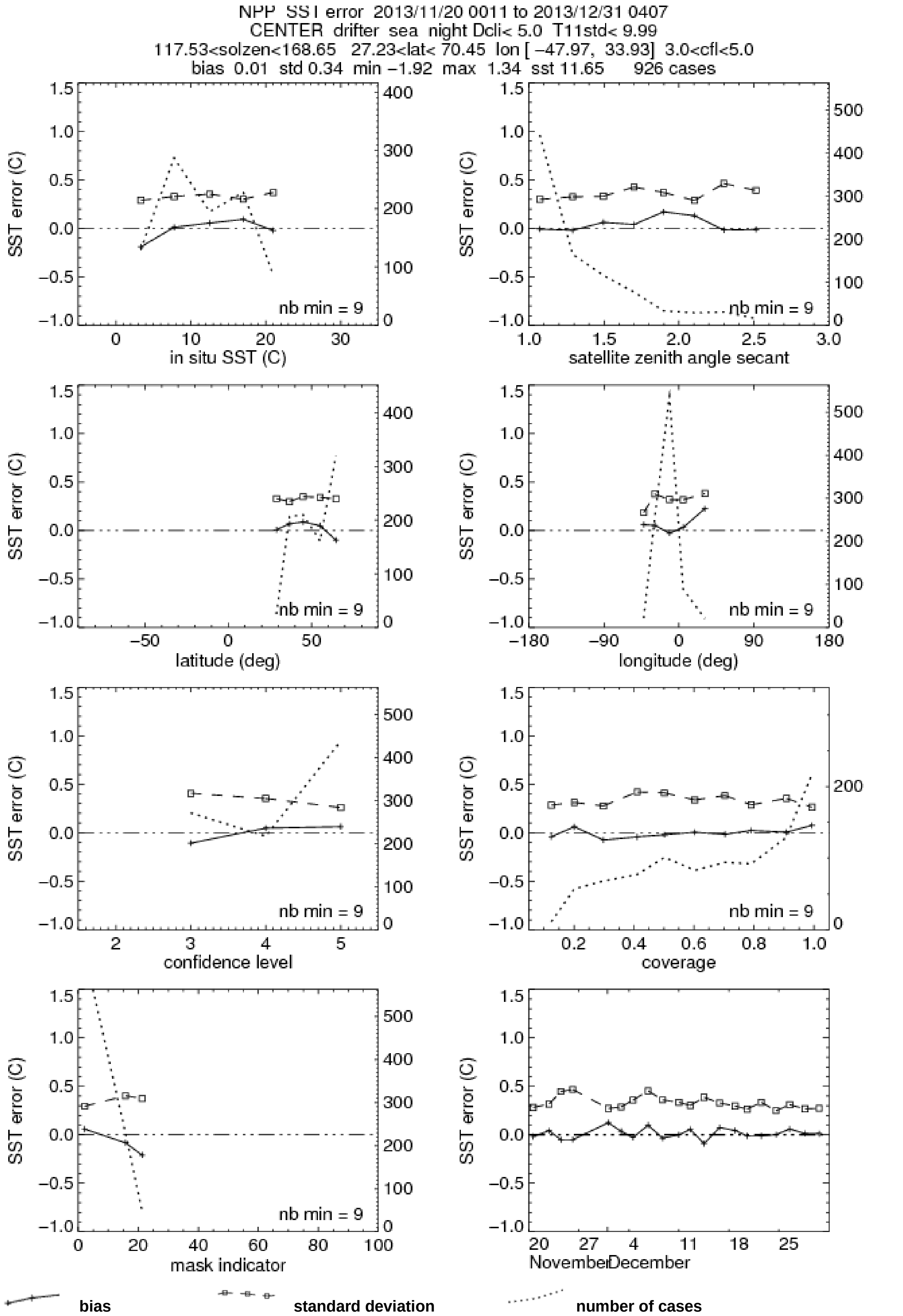


Figure 28 : Left: NOAA-19/NPP NAR SST Standard deviation. Right NOAA-19/NPP NAR SST Standard deviation Margin.



last figure (bottom left) : bias and std.

Figure 29 : Complementary validation statistics on NOAA-19 NAR SST.



last figure (bottom left) : bias and std.

Figure 30 : Complementary validation statistics on NPP NAR SST.

5.1.3.3 Metop NAR SST quality

The following maps indicate the locations of buoys for each month.

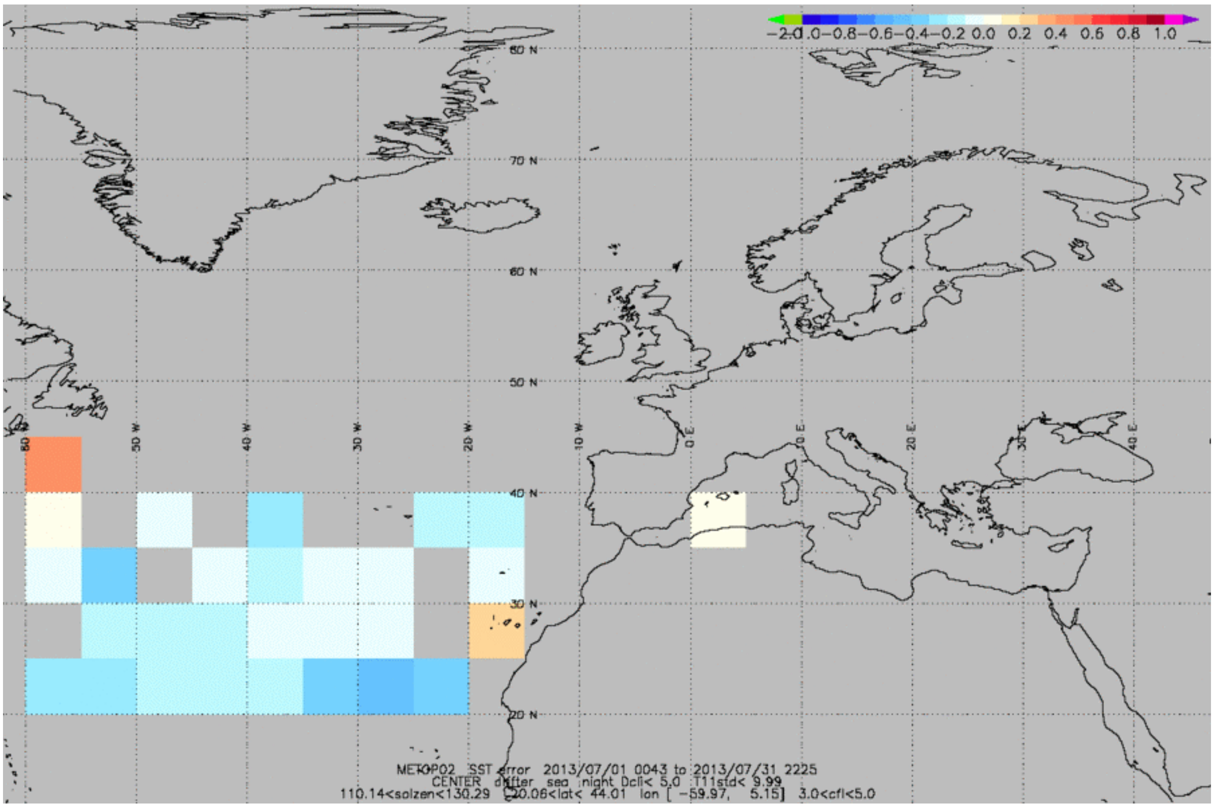


Figure 31 : Location of buoys for Metop-A NAR SST validation in JULY 2013, for 3, 4, 5 quality indexes and by night.

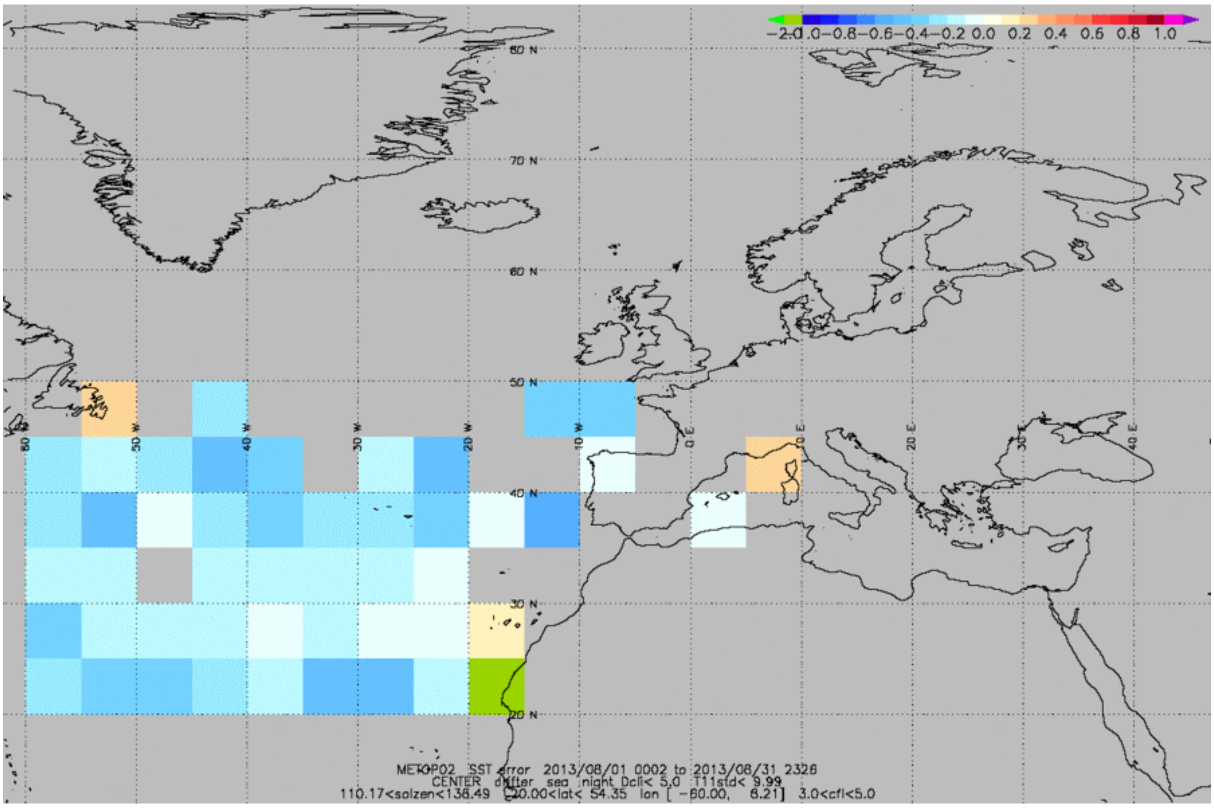


Figure 32 : Location of buoys for Metop-A NAR SST validation in AUGUST 2013, for 3, 4, 5 quality indexes and by night

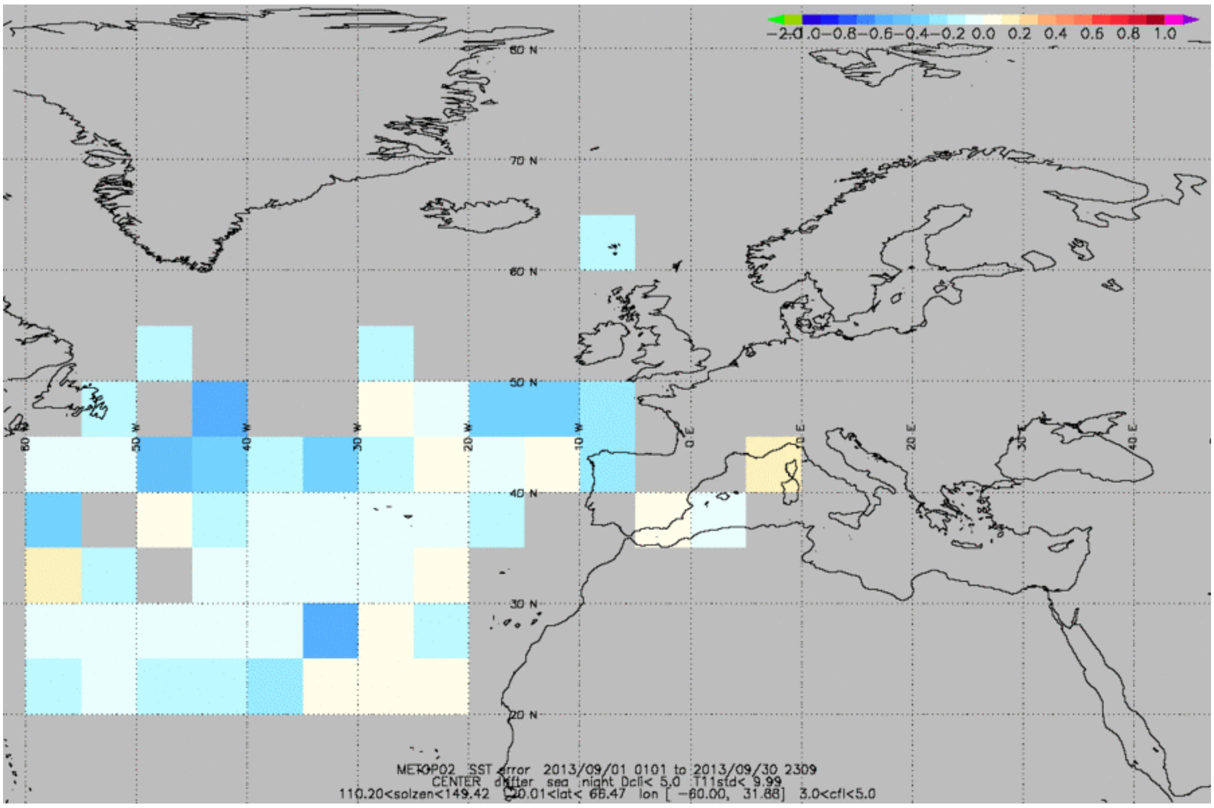


Figure 33 : **Location of buoys for Metop-A NAR SST validation in SEPTEMBER 2013, for 3, 4, 5 quality indexes and by night.**

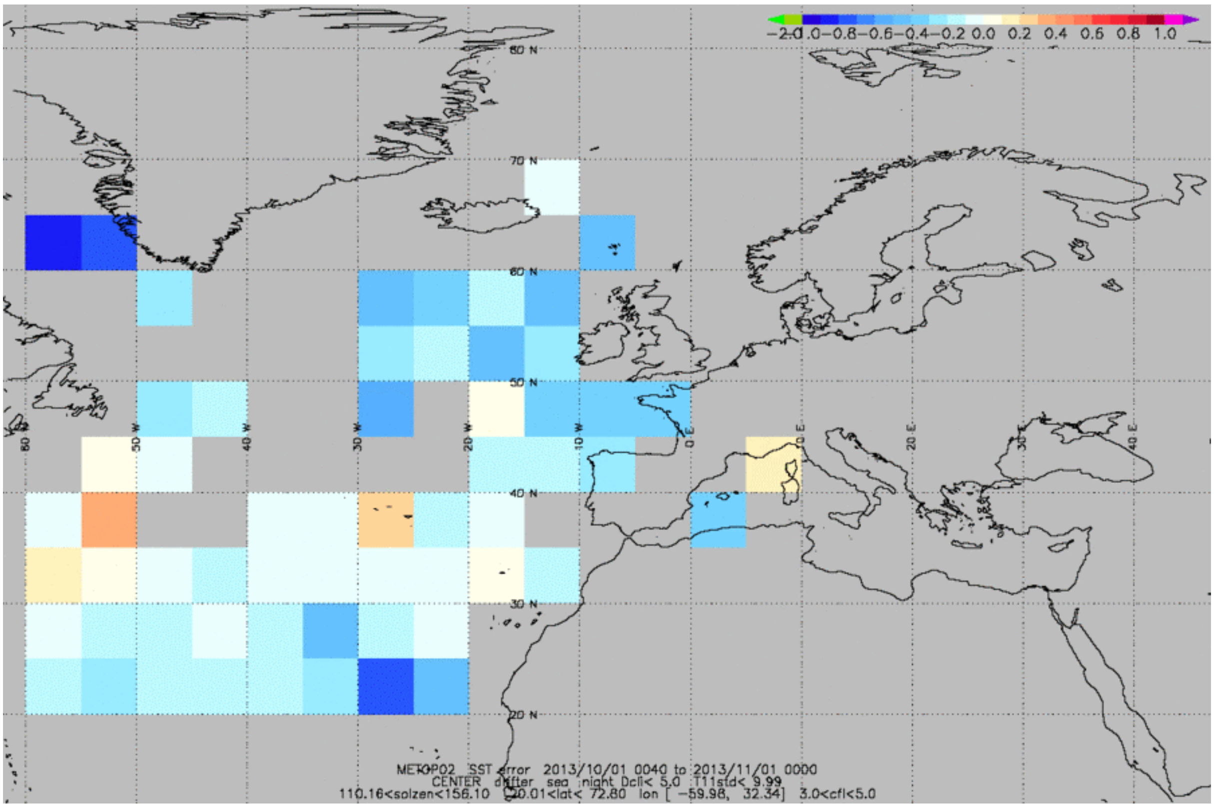


Figure 34 : **Location of buoys for Metop-A NAR SST validation in OCTOBER 2013, for 3, 4, 5 quality indexes and by night.**

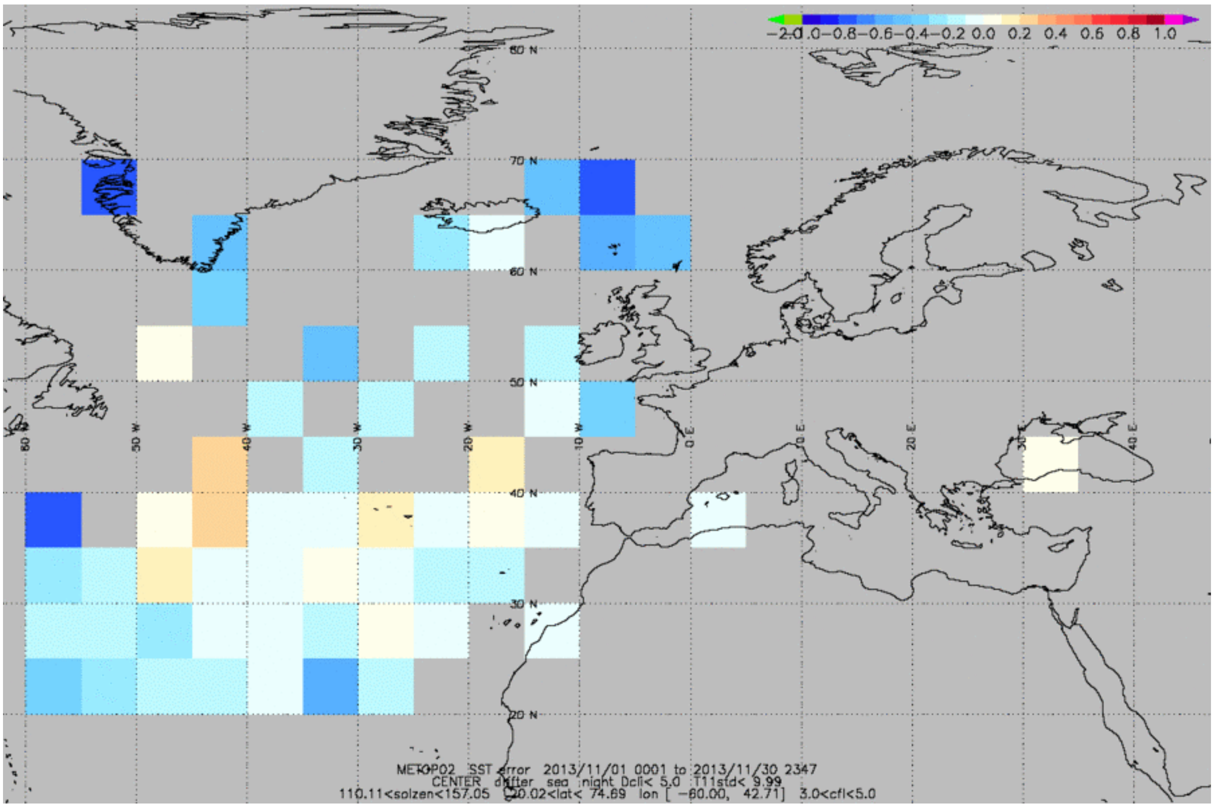


Figure 35 : Location of buoys for Metop-A NAR SST validation in NOVEMBER 2013, for 3, 4, 5 quality indexes and by night.

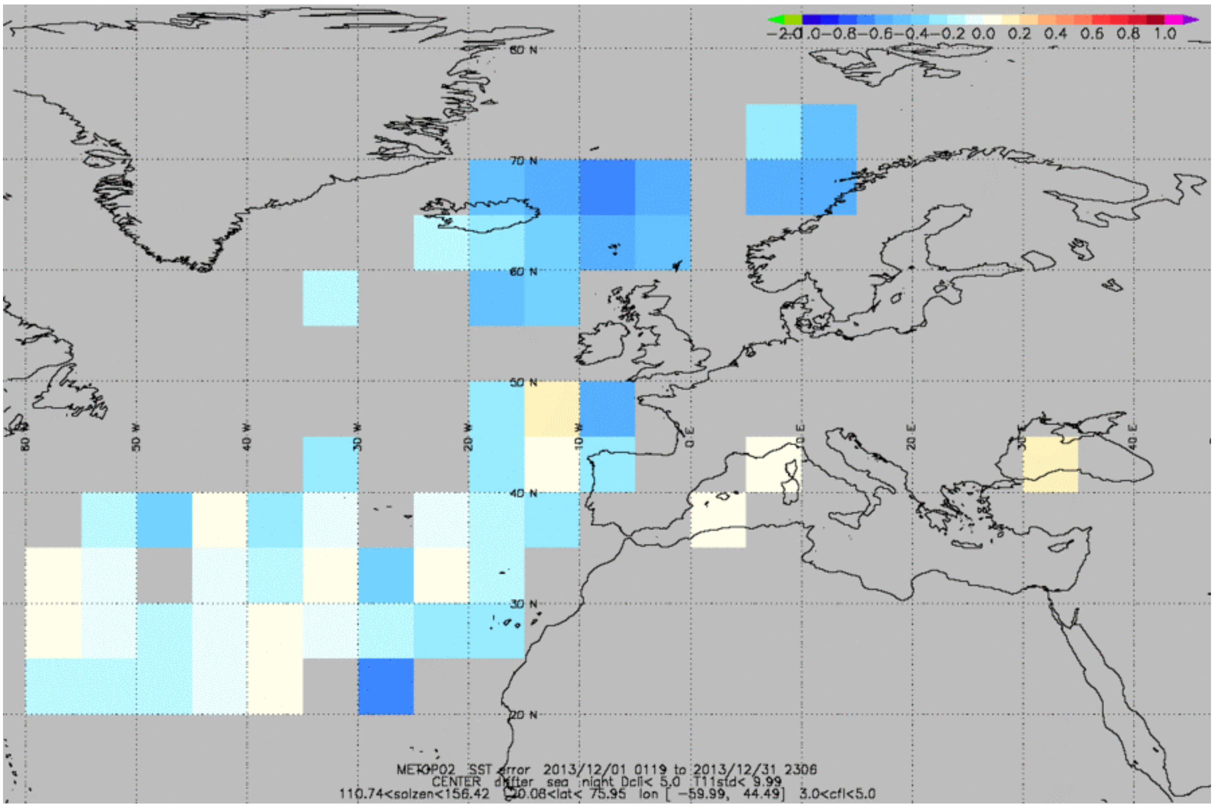


Figure 36 : Location of buoys for Metop-A NAR SST validation in DECEMBER 2013, for 3, 4, 5 quality indexes and by night.

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

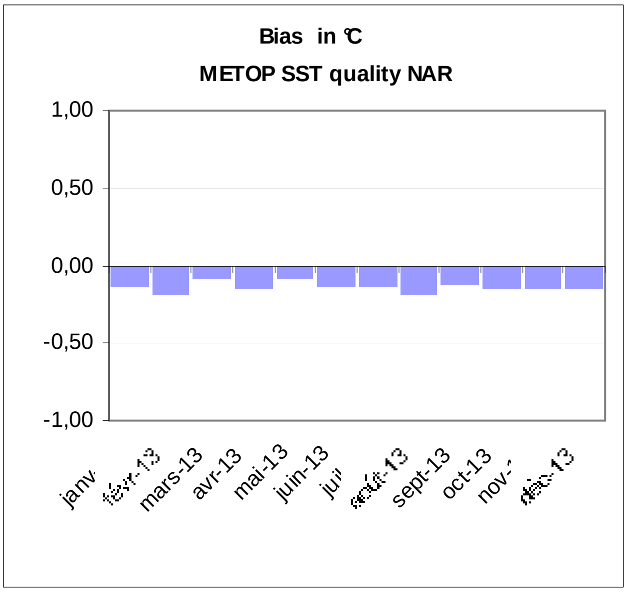
Metop-A NAR SST quality results over 2nd half 2013							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	1017	-0,130	0,5	74,00	0,36	0,8	55,00
Aug. 2013	1436	-0,190	0,5	62,00	0,42	0,8	47,50
Sept. 2013	1463	-0,120	0,5	76,00	0,41	0,8	48,75
Oct. 2013	1975	-0,150	0,5	70,00	0,38	0,8	52,50
Nov. 2013	1146	-0,150	0,5	70,00	0,41	0,8	48,75
Dec. 2013	1214	-0,150	0,5	70,00	0,36	0,8	55,00

table 8 : **Quality results for Metop-A NAR SST over 2nd half 2013, for 3, 4, 5 quality indexes and by night.**

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

Comments : Quality results are good and quite stable.

The following graphs illustrate the evolution of Metop-A NAR SST quality results over the past 6 months.



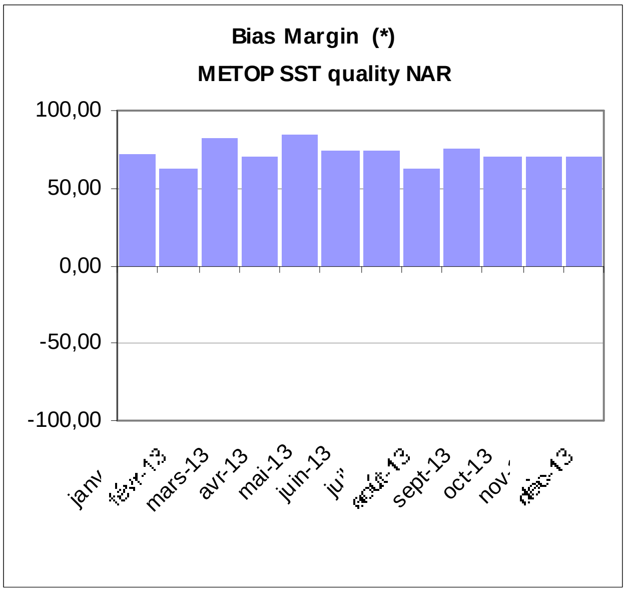


Figure 37 : **Left: Metop-A NAR SST Bias. Right: Metop-A NAR SST Bias Margin.**

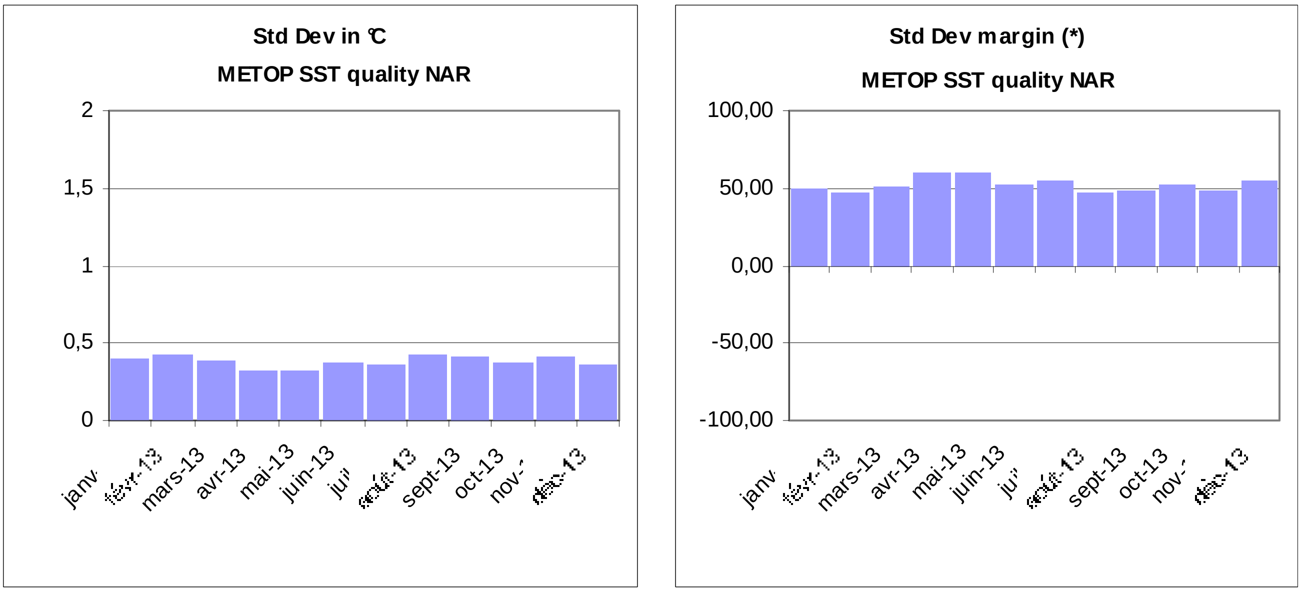
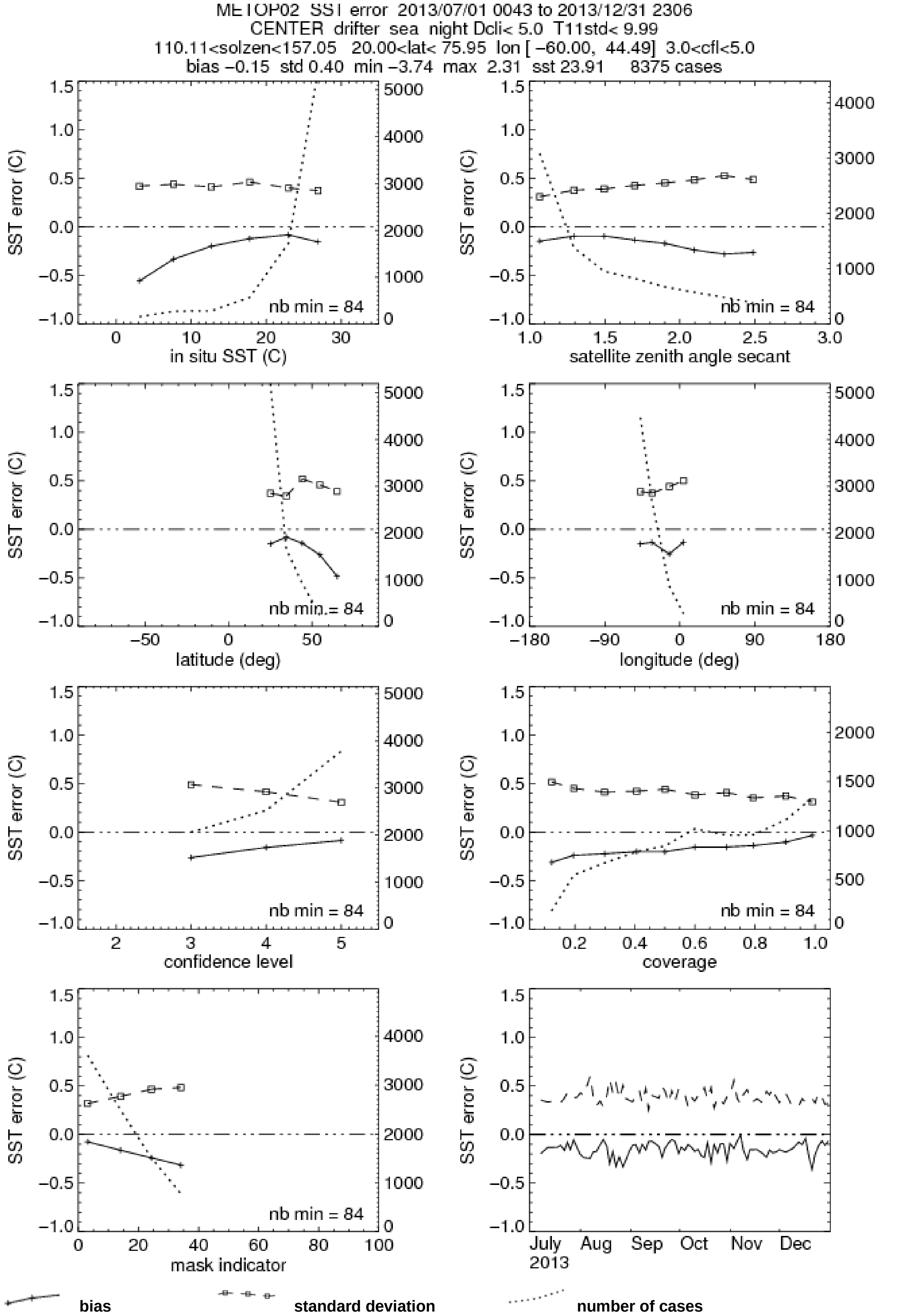


Figure 38 : Left: Metop-A NAR SST Standard deviation. Right: Metop-A NAR SST Standard deviation Margin.



last figure (bottom left) : bias and std.

Figure 39 : Complementary validation statistics on Metop NAR SST.

5.1.4 GLB and MGR SST quality

The OSI SAF SST products on global coverage (GLB SST and MGR SST) are based on Metop/AVHRR data, currently Metop-A.

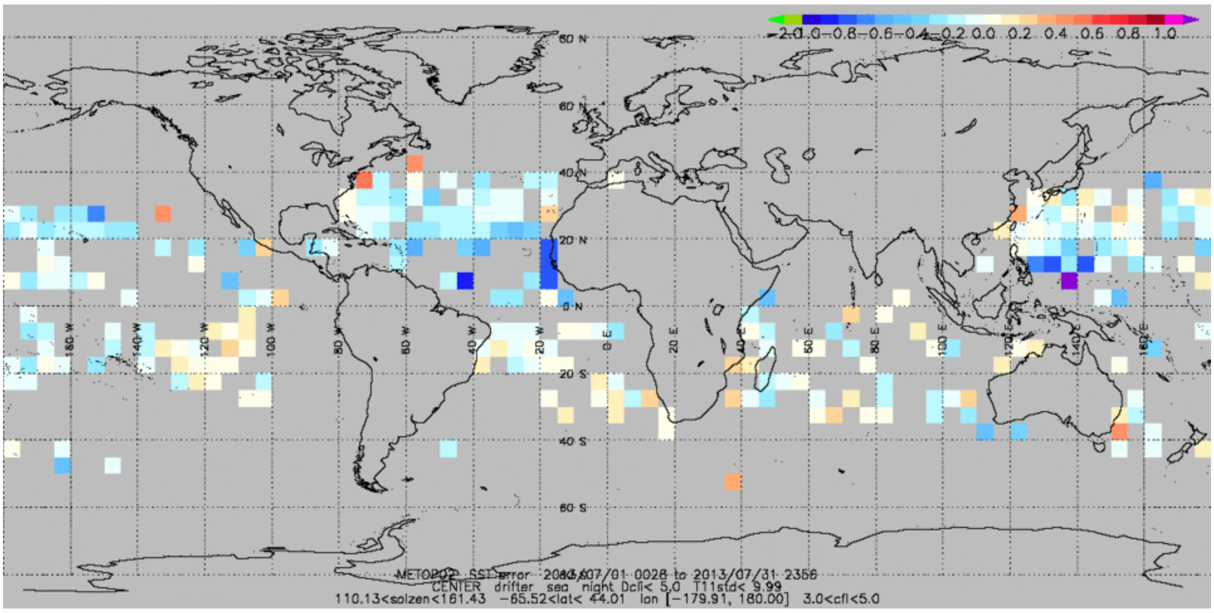


Figure 40 : Location of buoys for global Metop-A SST validation in JULY 2013, for 3, 4, 5 quality indexes and by night.

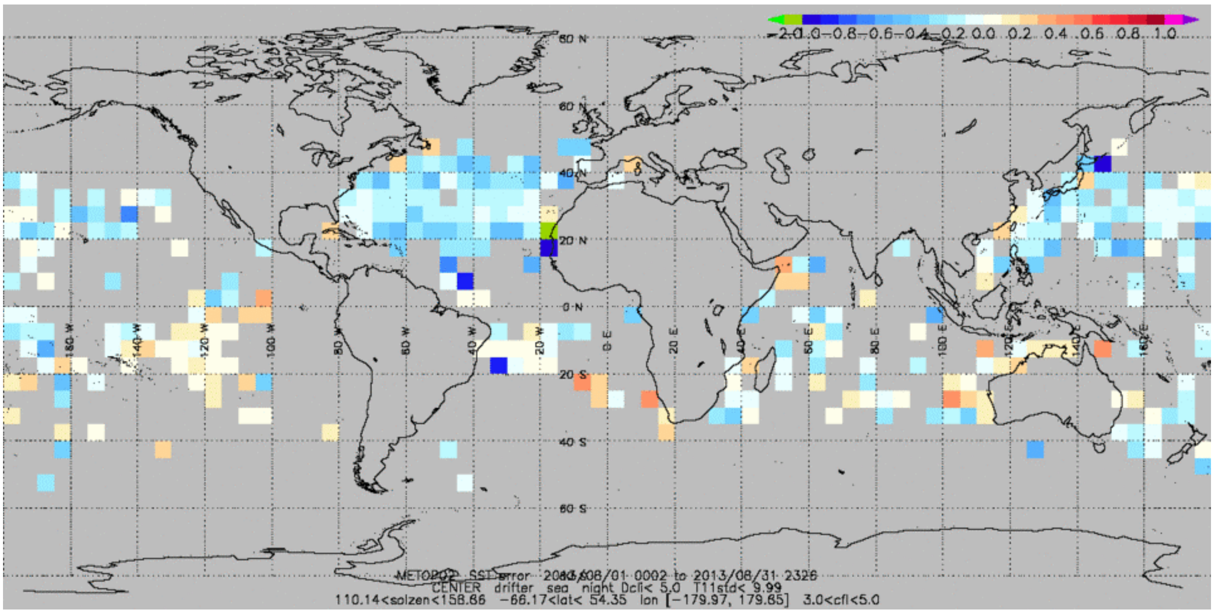


Figure 41 : Location of buoys for global Metop-A SST validation in AUGUST 2013, for 3, 4, 5 quality indexes and by night.

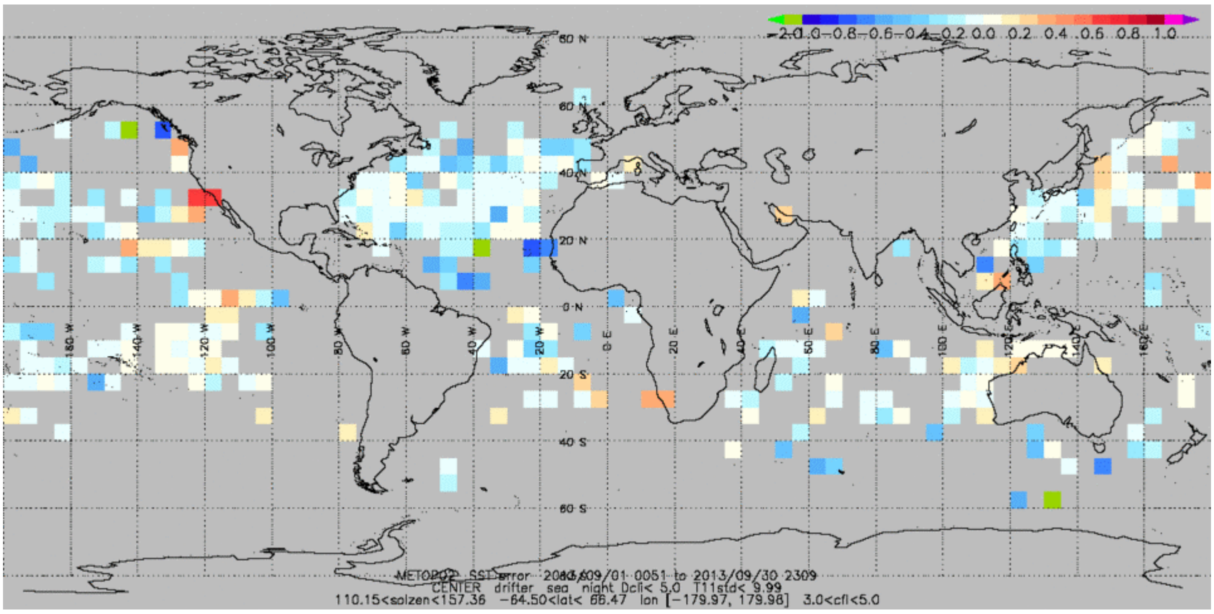


Figure 42 : Location of buoys for global Metop-A SST validation in SEPTEMBER 2013, for 3, 4, 5 quality indexes and by night.

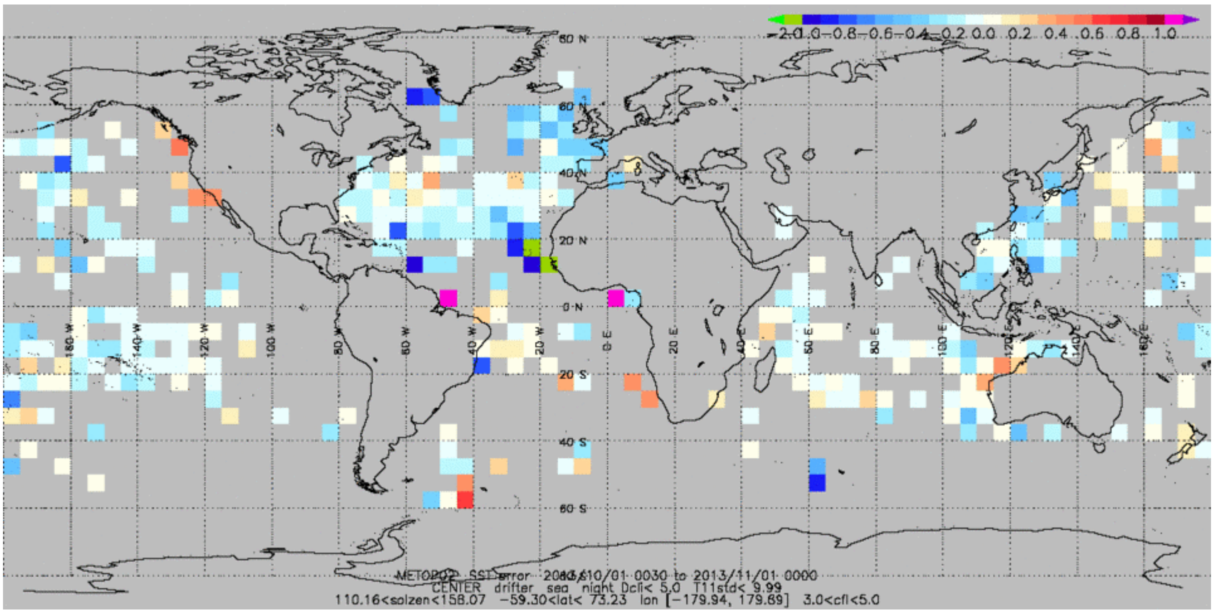


Figure 43 : Location of buoys for global Metop-A SST validation in OCTOBER 2013, for 3, 4, 5 quality indexes and by night.

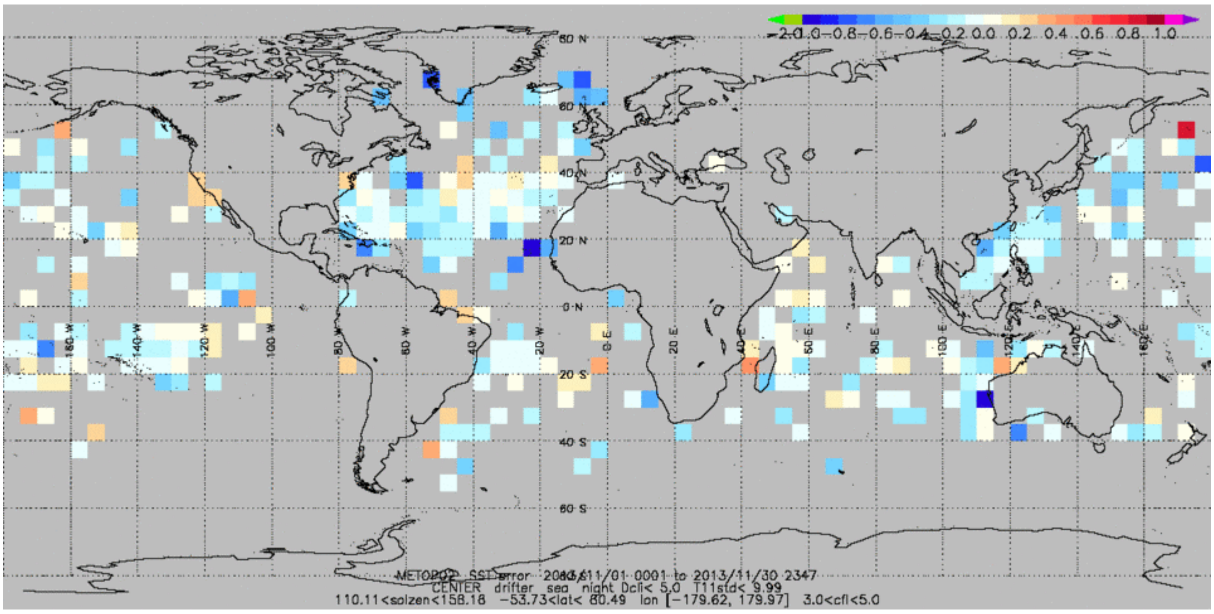


Figure 44 : Location of buoys for global Metop-A SST validation in NOVEMBER 2013, for 3, 4, 5 quality indexes and by night.

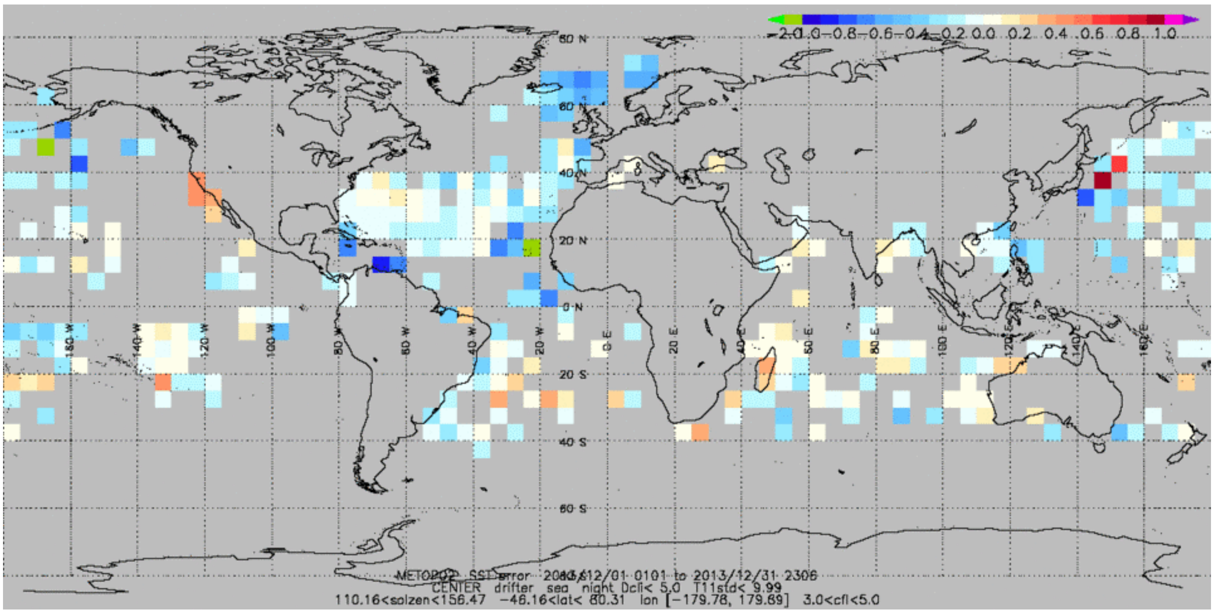


Figure 45 : Location of buoys for global Metop-A SST validation in DECEMBER 2013, for 3, 4, 5 quality indexes and by night.

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

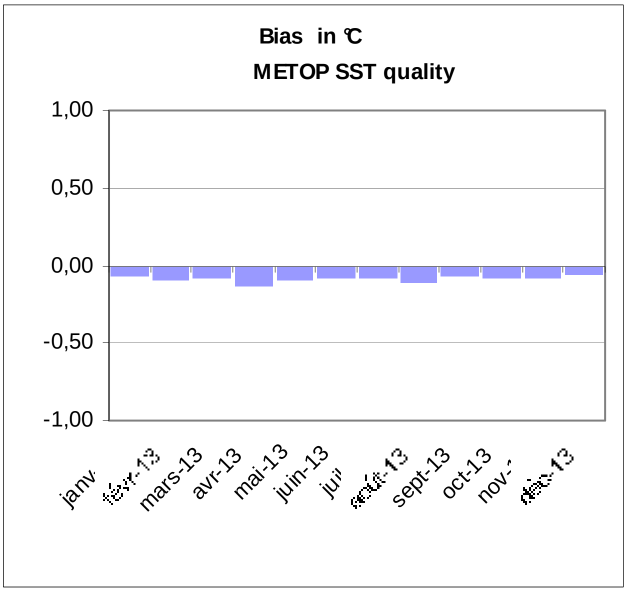
Global Metop-A SST quality results over 2nd half 2013							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
July 2013	4455	-0,080	0,5	84,00	0,43	0,8	46,25
Aug. 2013	5500	-0,110	0,5	78,00	0,43	0,8	46,25
Sept. 2013	5732	-0,070	0,5	86,00	0,43	0,8	46,25
Oct. 2013	6342	-0,080	0,5	84,00	0,43	0,8	46,25
Nov. 2013	4863	-0,090	0,5	82,00	0,42	0,8	47,50
Dec. 2013	5077	-0,060	0,5	88,00	0,44	0,8	45,00

table 9 : **Quality results for global METOP SST over 2nd half 2013, for 3,4,5 quality indexes and by night.**

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

Comments : Quality results still good and stable.

The following graphs illustrate the evolution of global METOP SST quality results over the past 6 months.



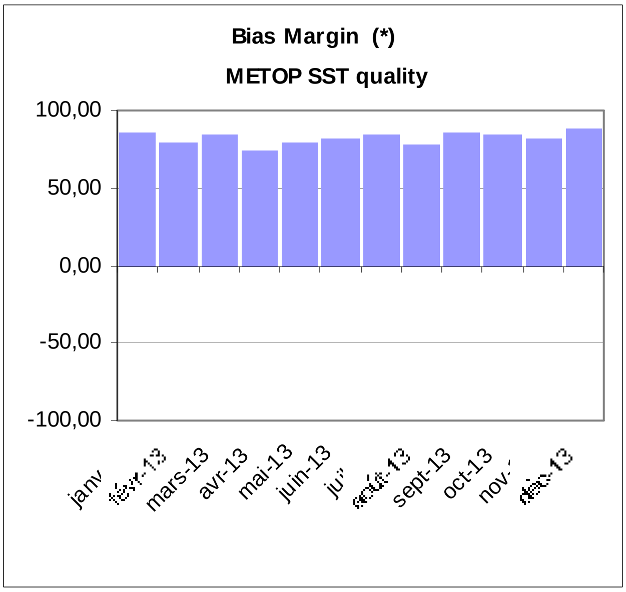
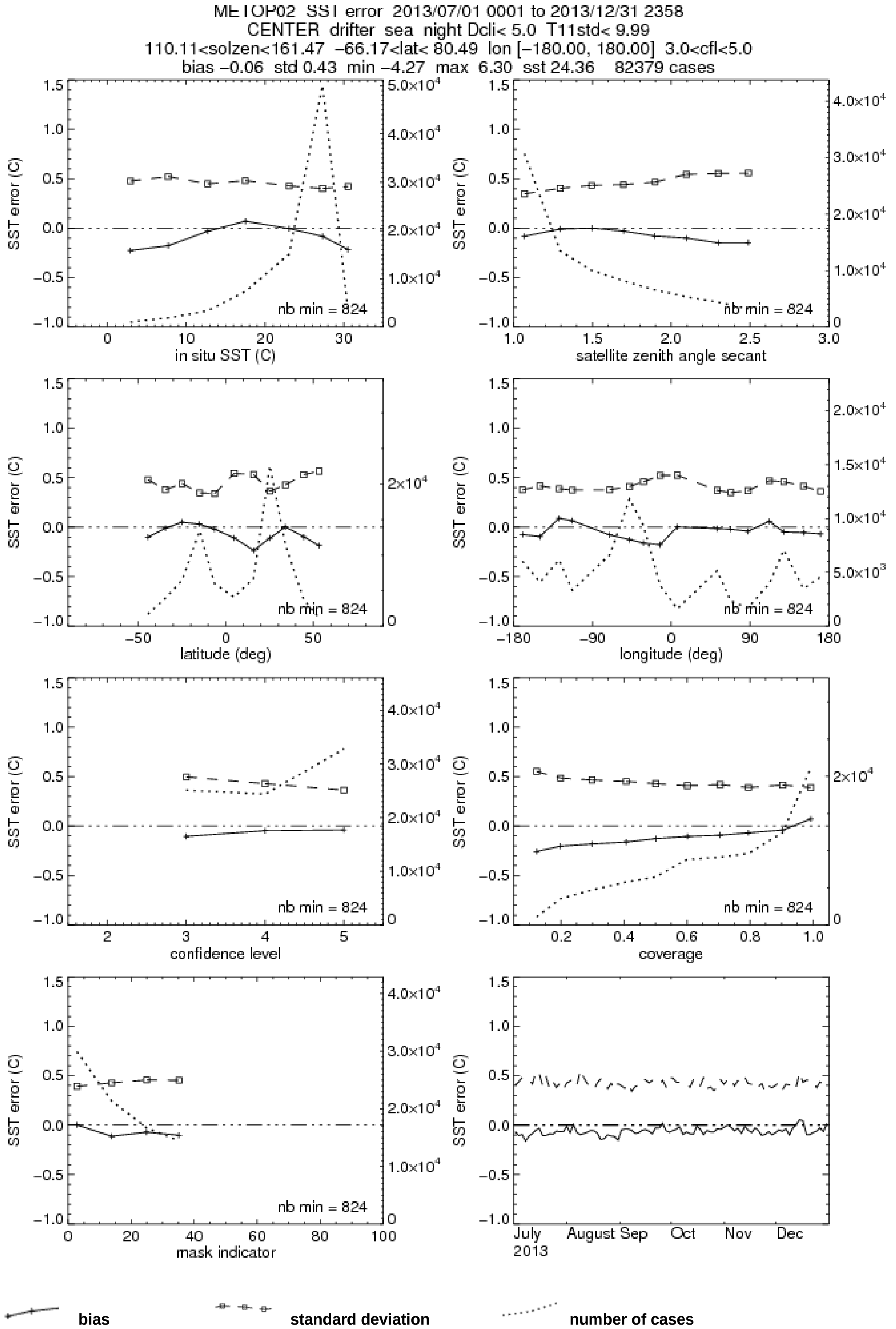


Figure 46 : **Left: global Metop-A SST Bias. Right: global Metop-A SST Bias Margin.**

Figure 47 : Left: global Metop-A SST Standard deviation. Right: global Metop-A SST Standard deviation Margin.



last figure (bottom left) : bias and std.

Figure 48 : Complementary validation statistics on Metop GLB SST.

5.1.5 AHL SST quality

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

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

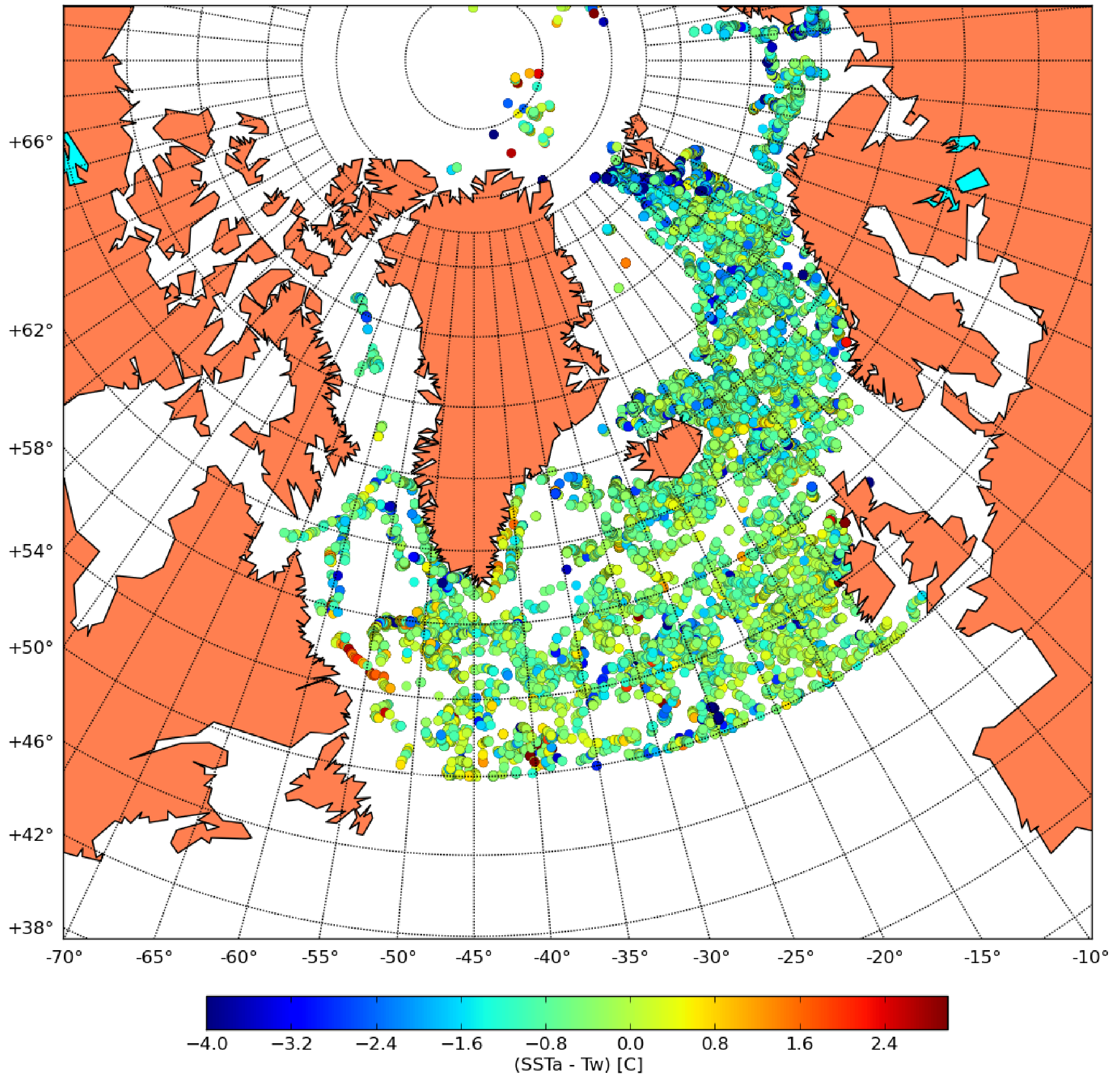


Figure 49 : Location of buoys for AHL SST validation in July to December 2013, for 3, 4, 5 quality indexes and by night.

AHL AVHRR SST quality results over 2nd half 2013, nighttime							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	1381	-0.37	0.50	26.08	0.95	0.80	-18.34
Aug. 2013	2105	-0.52	0.50	-3.31	0.85	0.80	-6.30
Sept. 2013	2543	-0.49	0.50	1.30	0.80	0.80	-0.21
Oct. 2013	2370	-0.75	0.50	-50.44	0.75	0.80	6.57
Nov. 2013	1925	-0.52	0.50	-3.58	0.66	0.80	17.36
Dec. 2013	1676	-0.46	0.50	7.54	0.61	0.80	23.63
AHL AVHRR SST quality results over 2nd half 2013, daytime							
Month	Number of cases	Bias ℃	Bias Req ℃	Bias Margin (*)	Std Dev ℃	Std Dev Req ℃	Std Dev margin (*)
July 2013	1199	-0.07	0.50	85.84	0.65	0.80	18.63
Aug. 2013	1773	-0.22	0.50	56.94	0.58	0.80	27.45
Sept. 2013	2222	-0.31	0.50	37.05	0.62	0.80	22.94
Oct. 2013	1910	-0.54	0.50	-8.50	0.64	0.80	19.46
Nov. 2013	1862	-0.53	0.50	-5.33	0.63	0.80	21.03
Dec. 2013	1710	-0.57	0.50	-14.95	0.59	0.80	25.67

table 10 : **Quality results for AHL AVHRR SST over 2nd half 2013, for 3,4,5 quality indexes, by night and by day.**

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

Comments : The night time results are for the AHL 12 hourly product centered at 00UTC. The results show in general a cold bias, and below the requirement for three of the months. The standard deviation is also higher than the requirement for three of the months.

The day time product (centered at 12 UTC) shows slightly better results with general less negative bias and lower standard deviation. . Also the products shows a general cold bias. Cloud and ice masks are usually less accurate at nighttime, and undetected clouds will lead to a cold bias in the SST products.

5.2 Radiative Fluxes quality

5.2.1 DLI quality

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

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

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

5.2.1.1 METEOSAT and GOES-E DLI quality

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

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

Geostationary METEOSAT & GOES-E DLI quality results over 2nd half 2013								
Month	Number of cases	Mean DLI in Wm^{-2}	Bias in %	Bias Req In %	Bias Marg in %(*)	Std Dev In %	Std Dev Req In %	Std Dev margin (*) in %
July 2013	5774	375,60	-0,636	5	87,27	4,16	10	58,39
Aug. 2013	5900	366,51	-1,468	5	70,64	**11,60**	10	-15,96
Sept. 2013	4558	349,55	-0,538	5	89,24	4,54	10	54,63
Oct. 2013	3803	324,51	-1,340	5	73,19	5,16	10	48,41
Nov. 2013	5695	285,74	-2,940	5	41,21	6,35	10	36,48
Dec. 2013	5076	265,70	-4,396	5	12,08	8,46	10	15,43

table 11 : Geostationary DLI quality results over 2nd half 2013.

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

Comments : Std dev is out of requirements in August due to some bad quality of data, corrupted by bad models data (see anomaly section 3. for details).

The following graphs illustrate the evolution of Geostationary DLI quality over the past 6 months :

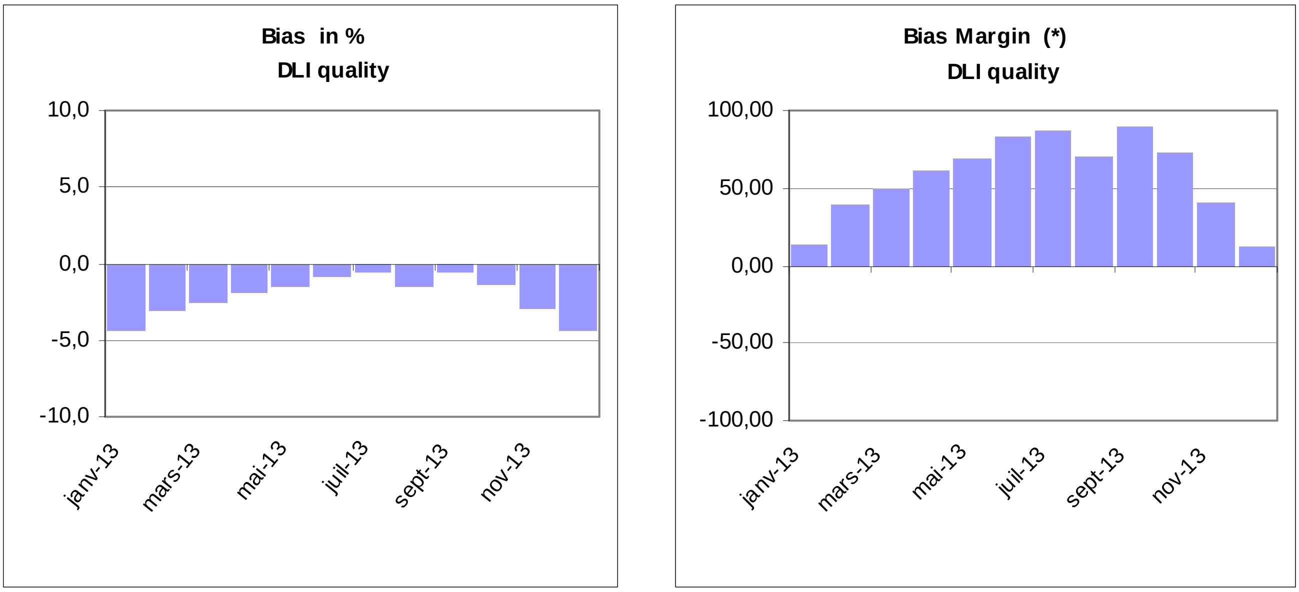


Figure 50 : Left: Geostationary DLI Bias. Right Geostationary DLI Bias Margin .

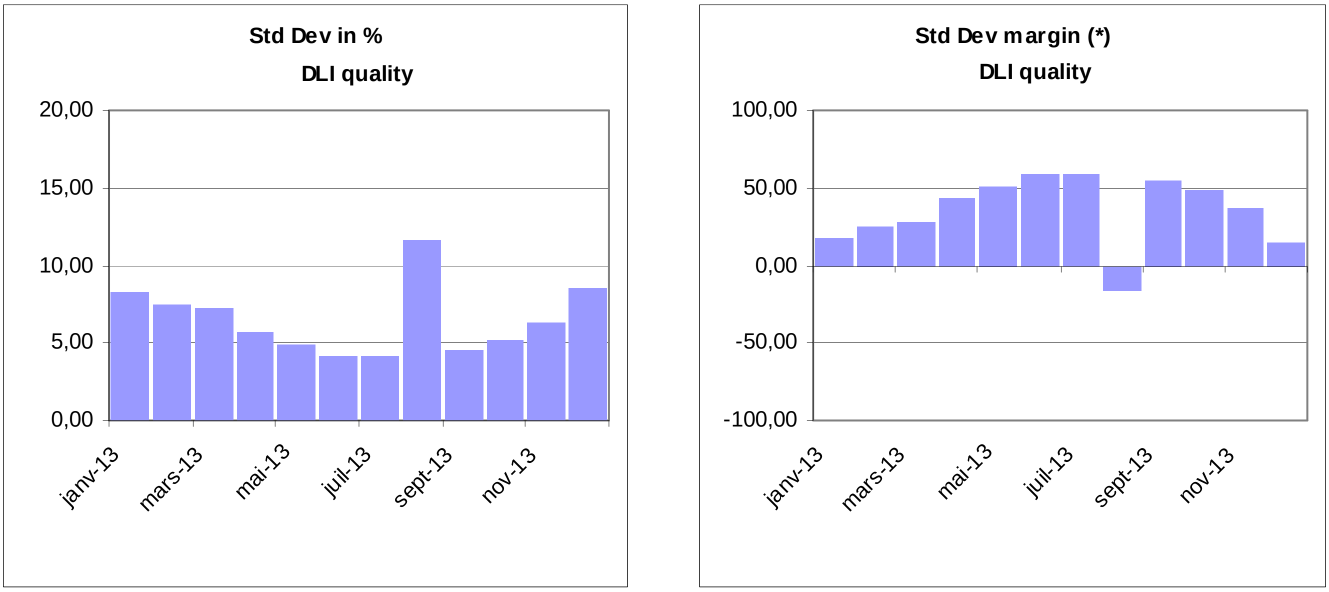


Figure 51 : Left: Geostationary DLI Standard deviation. Right DLI Geostationary Standard deviation Margin.

5.2.1.2 AHL DLI quality

The pyrgeometer stations used for validation of the AHL DLI product are are selected stations from Table 1. Specifically the following stations are currently used.

- Annex A Ekofisk
- Annex B Jan Mayen
- Annex C Bjørnøya
- *Annex D* Hopen

These stations are briefly described at http://nowcasting.met.no/validering/flukser/. A map illustrating the locations is provided in figure 53 : where the stations used for SSI validation is also shown.

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

AHL DLI quality results over 2nd half 2013								
Month	Number of cases	Mean DLI in Wm^{-2}	Bias in %	Bias Req In %	Bias Marg in %(*)	Std Dev In %	Std Dev Req In %	Std Dev margin (*) in %
July 2013	102	334.69	6.69	5.0	-33.8	3.12	10.0	68.8
Aug. 2013	112	335.14	6.68	5.0	-33.6	2.86	10.0	71.4
Sept. 2013	120	320.79	4.23	5.0	15.4	3.58	10.0	64.2
Oct. 2013	107	293.42	1.79	5.0	64.2	4.11	10.0	58.9
Nov. 2013	119	276.50	1.47	5.0	70.6	4.92	10.0	50.8
Dec. 2013	116	274.08	2.07	5.0	58.6	5.24	10.0	47.6

table 12 : AHL DLI quality results over 2nd half 2013.

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

Comments : The requirement was not met in July and August. The reason for this is attributed to the cloudmask results which are used as input data. Cloud masking may be difficult during summer and it is noted that the poor performance is caused by the results at the Arctic stations where cloud masking is especially difficult. The requirement is met at all times for the only purely maritime station being used, the station at Ekofisk in the North Sea.

A number of new stations are becoming available in Norway. These are currently undergoing an evaluation to determine whether and how to use them. Since the last report, instruments has been changed at Jan Mayen. A number of new stations are becoming available in Norway. These are currently undergoing an evaluation to determine whether and how to use them. Furthermore, access to data from SMHI and FMI has been achieved since the last report and evaluation of these data are ongoing.

5.2.2 SSI quality

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

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

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

The visible channel calibration of GOES-13 and METEOSAT-10 , which is used in the OSI SAF processing scheme for SSI products, has been updated on October 9th 2013 (see Annex A).

5.2.2.1 METEOSAT and GOES-E SSI quality

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

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

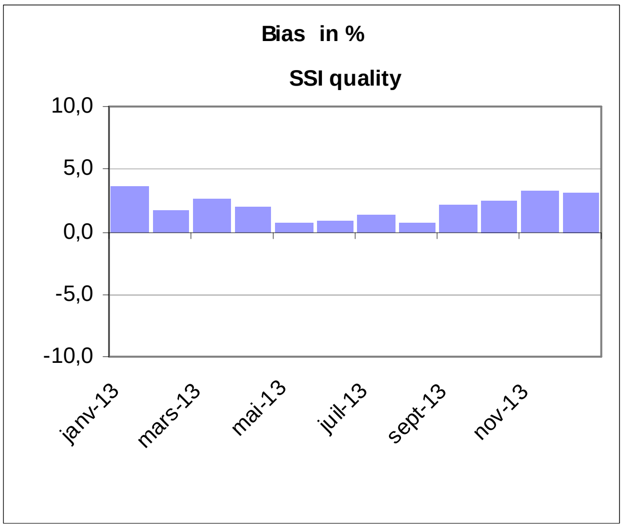
Geostationary METEOSAT & GOES-E SSI quality results over 2nd half 2013										
Month	Number of cases	Mean SSI in Wm^{-2}	Bias in Wm^{-2}	Bias in %	Bias Req in %	Bias Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev Req in %	Std Dev margin (*) in %
July 2013	7642	494,17	6,69	1,35	10	86,46	83,11	16,82	30	43,94
Aug. 2013	8173	475,91	3,77	0,79	10	92,08	81,50	17,13	30	42,92
Sept. 2013	6636	443,31	9,62	2,17	10	78,30	75,32	16,99	30	43,37
Oct. 2013	4556	374,96	9,20	2,45	10	75,46	78,30	20,88	30	30,39
Nov. 2013	5641	337,79	10,86	3,22	10	67,85	77,58	22,97	30	23,44
Dec. 2013	4972	305,3	9,72	3,18	10	68,16	81,71	26,76	30	10,79

table 13 : Geostationary SSI quality results over 2nd half 2013.

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

Comments : Results are within specifications.

The following graphs illustrate the evolution of Geostationary SSI quality over the past 6 months :



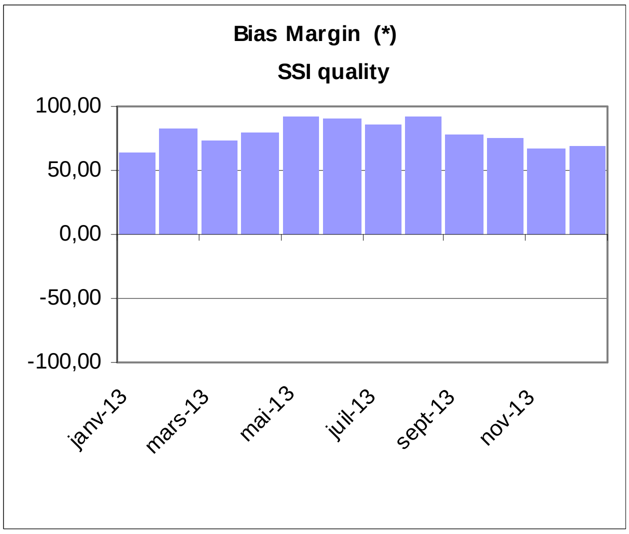
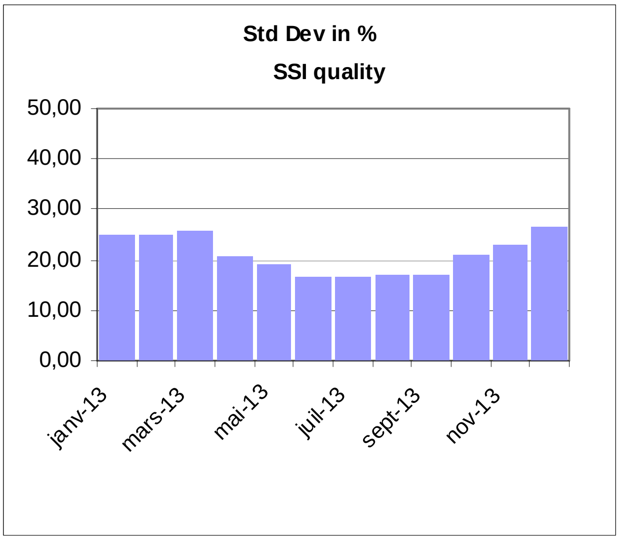


Figure 52 : Left: Geostationary SSI Bias. Right Geostationary SSI Bias Margin.



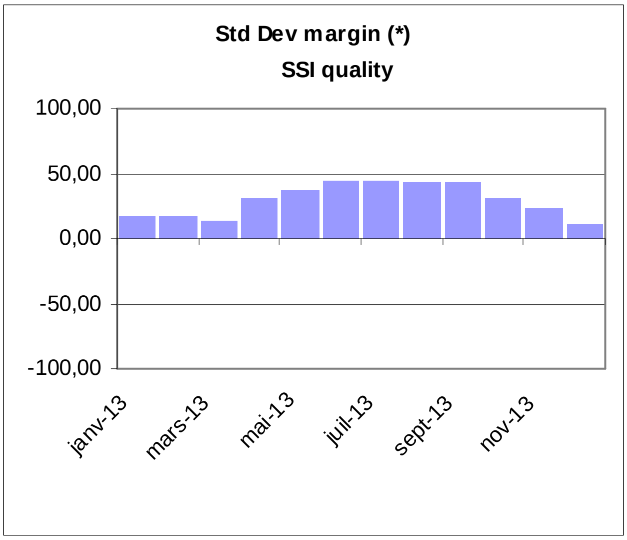


Figure 53 : Left: Geostationary SSI Standard deviation. Right Geostationary SSI Standard deviation Margin.

5.2.2.2 AHL SSI quality

The pyranometer stations used for validation of the AHL SSI product are selected stations from the following table. Basically the same stations as for DLI validation is used along with a number of stations from the agricultural station network on the Norwegian mainland. The following table provides the AHL SSI quality results over the reporting period.

Station	StId	Latitude	Longitude	Status
Tjøtta	76530	65.83°N	12.43°E	In use
Vågønes	82260	67.28°N	14.47°E	Not used currently
Holt	90400	69.67°N	18.93°E	Not used currently
Apelsvoll	11500	60.70°N	10.87°E	In use, under examination due to shadow effects.
Løken	23500	61.12°N	9.07°E	Not used currently
Landvik	38140	58.33°N	8.52°E	In use
Særheim	44300	58.78°N	5.68°E	In use
Fureneset	56420	61.30°N	5.05°E	In use
Kvithamar	69150	63.50°N	10.87°E	Not used currently
Jan_Mayen	99950	70.93°N	-8.67°E	In use, Arctic station with snow on ground much of the year, volcanic ash deteriorates instruments in periods.
Bjørnøya	99710	74.52°N	19.02°E	In use, Arctic station with snow on ground much of the year.
Hopen	99720	76.50°N	25.07°E	In use, Arctic station with snow on ground much of the year.
Ekofisk	76920	56.50°N	3.2°E	In use, shadow effects at certain directions.

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

Locations of these stations are provided in the illustration below (figure 53). The map illustrates whether stations are used for SSI or DLI validation. As readily can be seen, the map contains more stations than actually used (see the list above). The reason for this is that some stations have characteristics which makes them unsuitable for validation of daily SSI due to e.g. shadow effects or other surrounding characteristics. Furthermore, some of the stations listed are briefly described at : http://nowcasting.met.no/validering/flukser//flukser/.

The stations used in this validation is owned and operated by the Norwegian Meteorological Institute, University of Bergen, Geophysical Institute *and* Bioforsk.

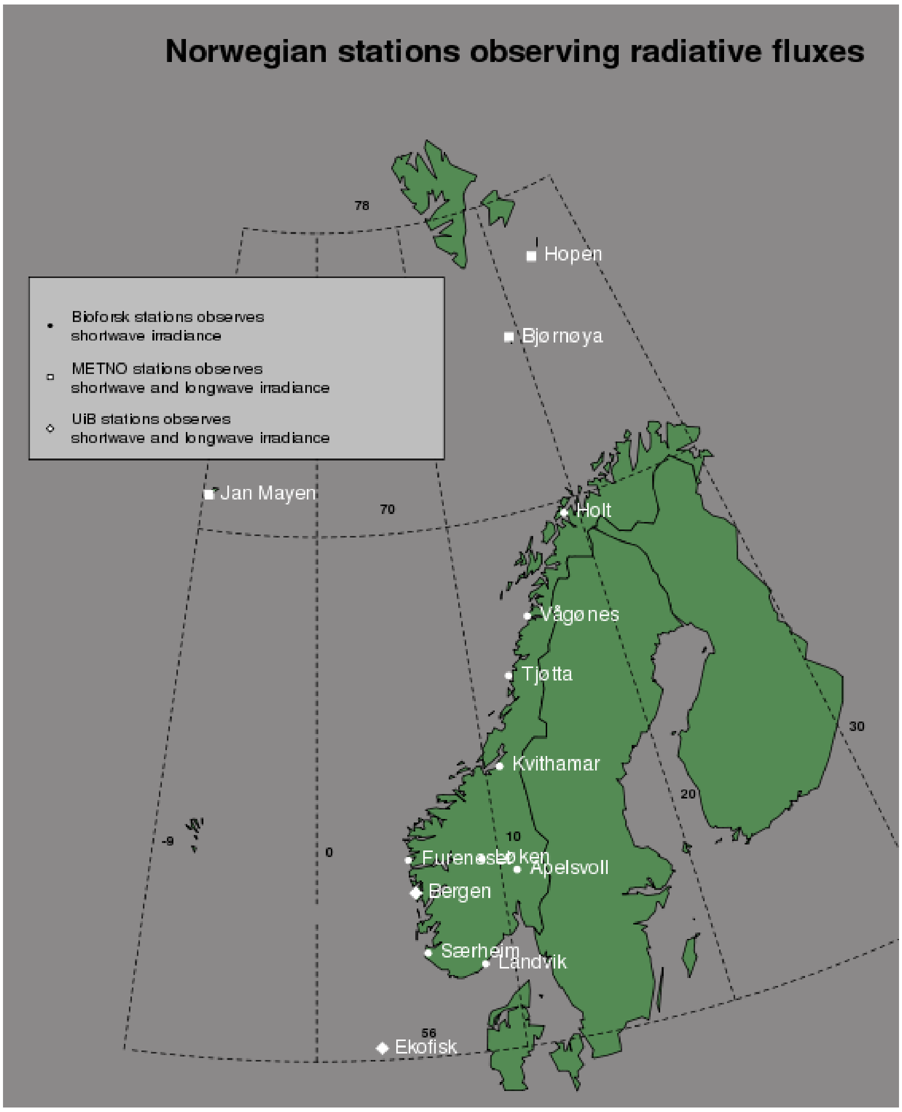


Figure 54 : Map of stations available for validation purposes of AHL radiative fluxes. Only a subset of these stations are used due to station characteristics when validation satellite remote sensing products.

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

AHL SSI quality results over 2nd half 2013										
Month	Number of cases	Mean SSI in Wm^{-2}	Bias in Wm^{-2}	Bias in %	Bias Req in %	Bias Marg in %(*)	Std Dev in Wm^{-2}	Std Dev in %	Std Dev Req in %	Std Dev margin (*) in %
July 2013	269	203.78	1.89	5.17	10.0	48.3	37.82	19.60	30.0	34.67
Aug. 2013	271	158.15	5.87	6.21	10.0	37.9	24.72	16.27	30.0	45.77
Sept. 2013	251	91.65	-1.48	6.90	10.0	31	16.72	18.64	30.0	37.87
Oct. 2013	253	42.19	-2.96	8.01	10.0	19.9	8.63	25.11	30.0	16.3
Nov. 2013	261	19.70	-0.46	14.73	10.0	-47.3	12.10	51.16	30.0	-70.53
Dec. 2013	261	6.47	0.63	4.07	10.0	59.3	4.56	29.38	30.0	2.07

table 15 : AHL SSI quality results over 2nd half 2013.

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

Comments : The following stations were used in the validation for the second period of 2013: 11500, 23500, 38140, 44300, 56420, 69150, 76530, 76920, 99710. Compared to the last report, the Arctic stations Jan Mayen, and Hopen were not used this time. The reason for this is the earlier reported shadow effects at Hopen, and installation of new instruments at Jan Mayen.

Validation results meets the requirements in July, August, September and October, but fails in November. The main reason is that snow started to accumulate on ground at the Norwegian mainland in October and this drastically affects the results for several of the stations.

As before, a major concern currently is that the station at Ekofisk is scheduled for removal when a new oil rig arrives in 2013, work is ongoing to continue measurements, but no decision is made. As of early 2014, the old platform is still on site and observations are available for validation purposes. A number of new stations are becoming available in Norway. These are currently undergoing an evaluation to determine whether and how to use them. Furthermore, access to data from SMHI and FMI has been achieved since the last report and evaluation of these data are ongoing.

5.3 Sea Ice quality

5.3.1 Validation results for the global sea ice concentration product

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. The ice charts are primarily based on SAR (Radarsat and Envisat) data, together with AVHRR and MODIS data in several cases. The validation results are shown separatedly for the three different sets of ice charts.

For the validation 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 biweekly validation at the Southern Hemisphere the concentration product is required to have a bias and standard deviation less than 15% ice concentration on an annual basis.

For each ice chart concentration level the deviation between ice chart concentration and OSISAF ice concentration is calculated. Afterwards deviations are grouped into categories, i.e. ±10% and ±20%. Furthermore the bias and standard deviation is calculated for each concentration level. The bias and standard deviation are reported for ice (> 0% ice concentration), for water (0% ice concentration) and for both ice and water as a total.

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 is shown below.

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

table 16 : Error codes for the manual registration

For the Northern Hemisphere, these validation results are given for the Greenland area. This area is the area covered by the bi-weekly DMI ice analysis 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.

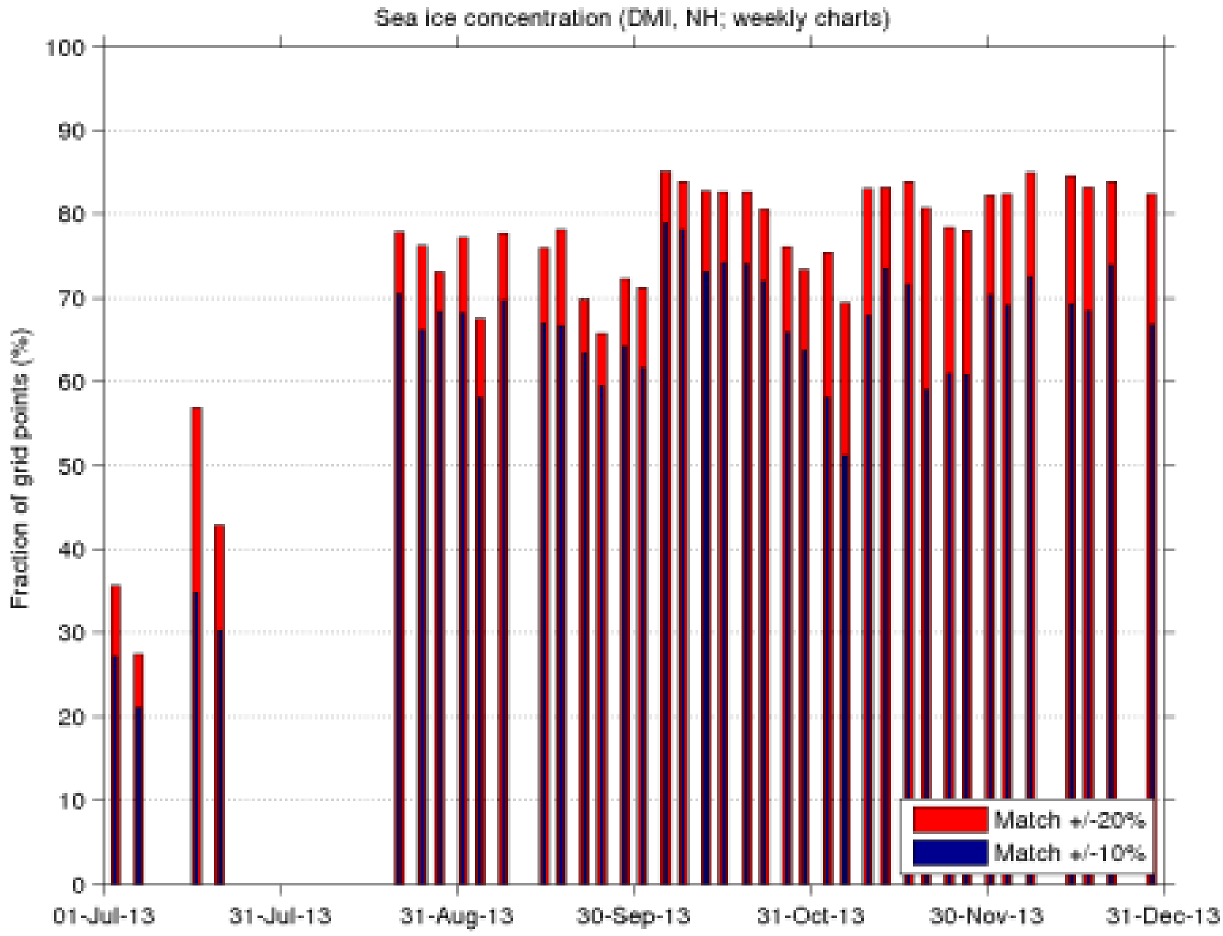


Figure 55 : Comparison between the ice concentrations from the biweekly DMI ice analysis and the OSI SAF concentration product, for the waters surrounding Greenland. 'Match +/- 10 %' corresponds to those grid points where concentration deviates within the range of +/-10 % and likewise for +/-20 %.

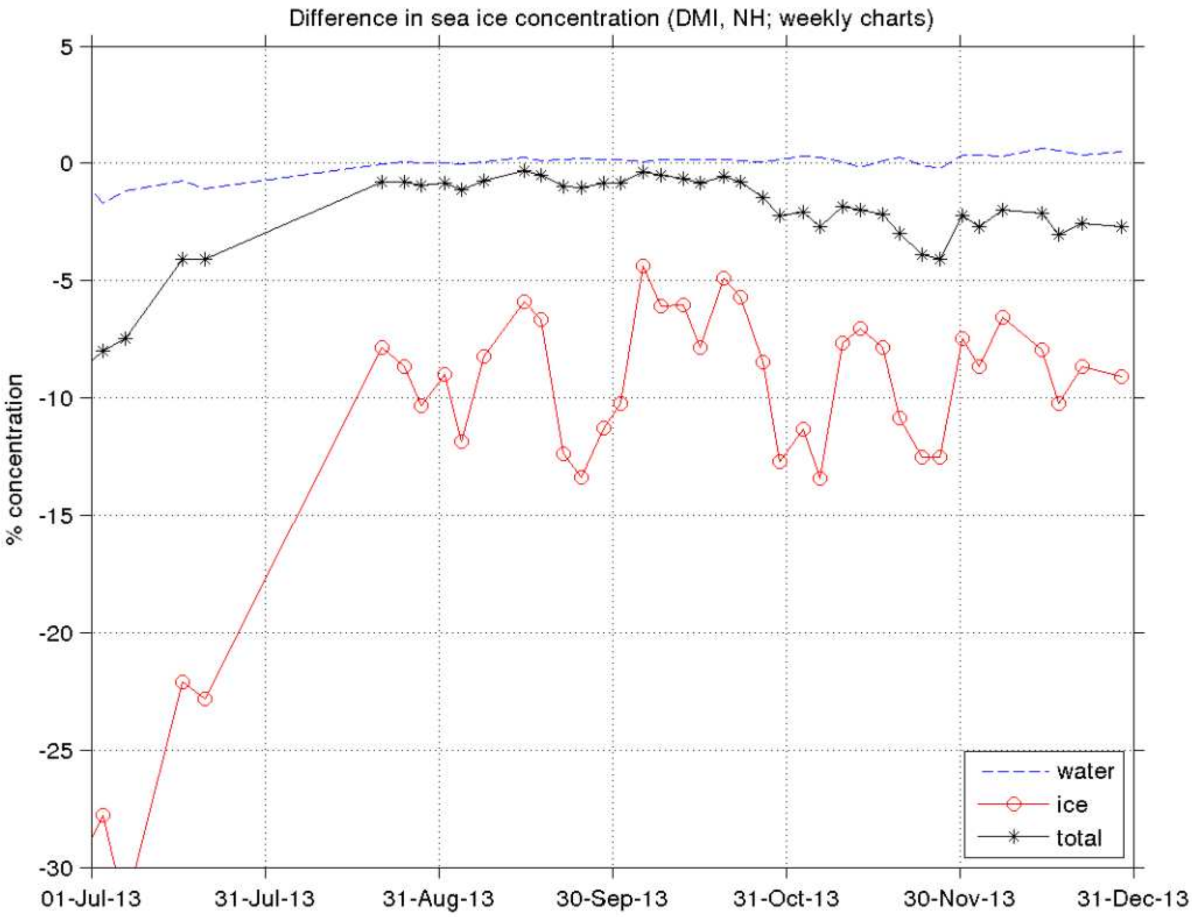


Figure 56 : The difference between the ice concentrations from the biweekly DMI ice analysis and OSI SAF concentration product for three categories : water, ice and total. The total difference is the difference between the ice analysis and sea ice concentration product within the area covered by the ice analysis including both ice and water. When the difference is below zero, the OSI SAF sea ice concentration has a lower estimate than the ice analysis. For the waters surrounding Greenland.

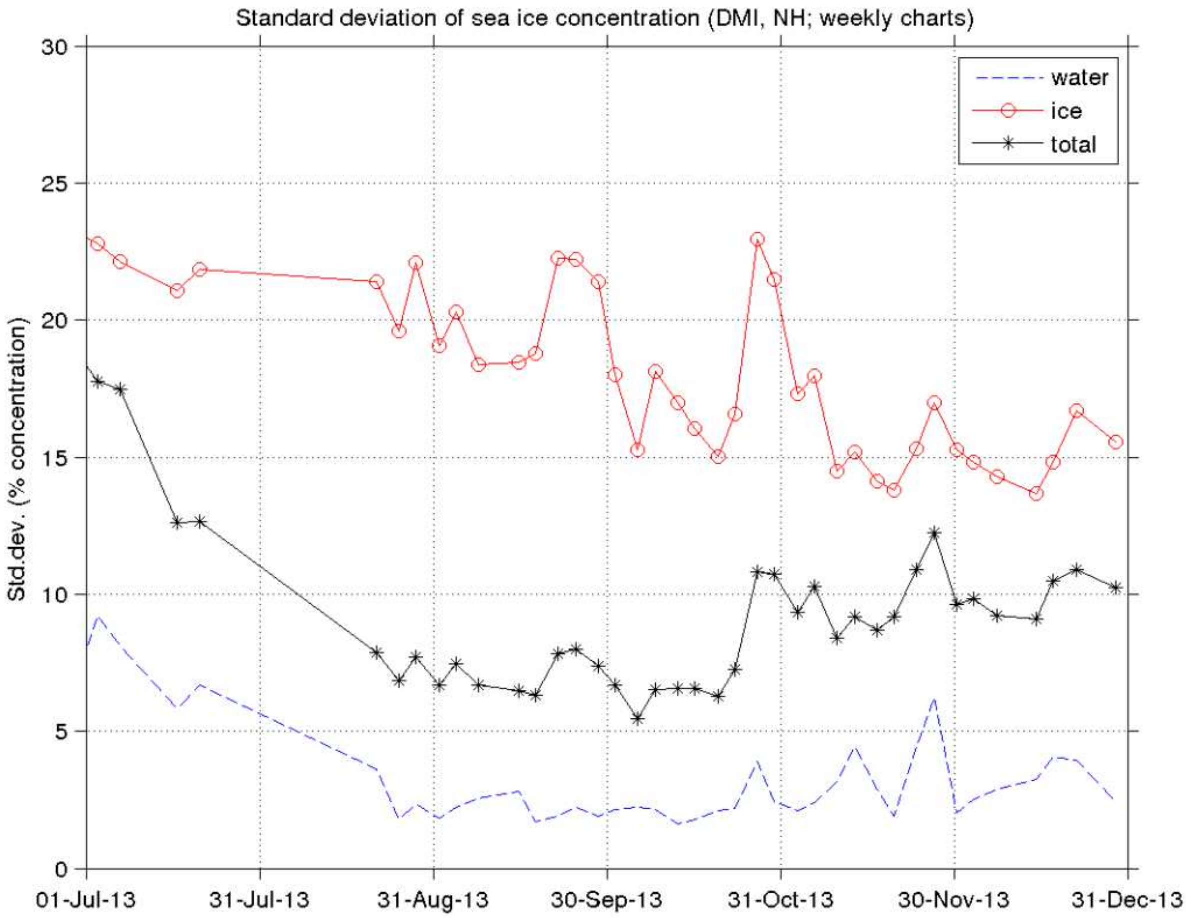


Figure 57 : **The standard deviation of the difference in ice concentrations from the biweekly DMI ice analysis and OSI SAF sea ice concentration product for three categories : water, ice and total. For the waters surrounding Greenland.**

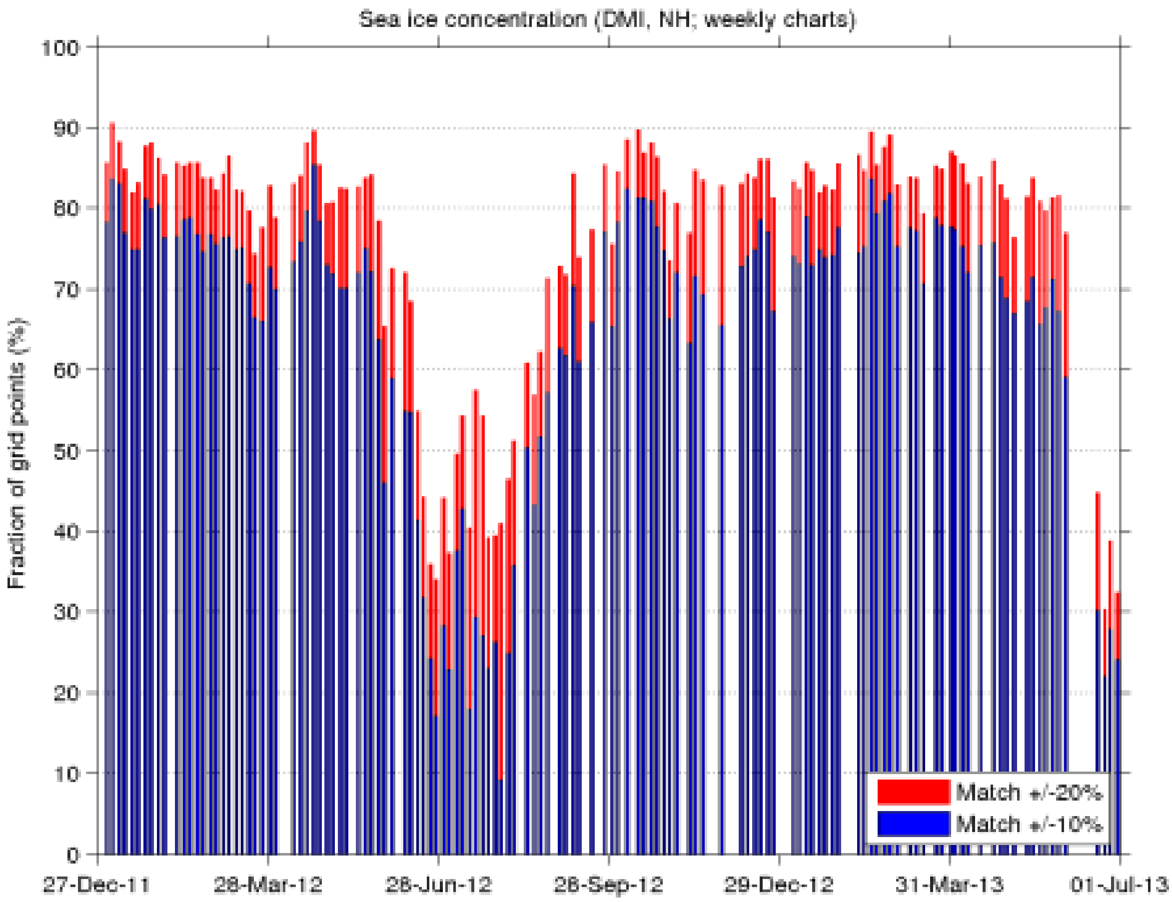


Figure 58 : Multi-year variability over the period 2011-2013. Comparison between ice concentrations from the biweekly DMI ice analysis and the OSI SAF concentration product, for the waters surrounding Greenland. 'Match +/-10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%.

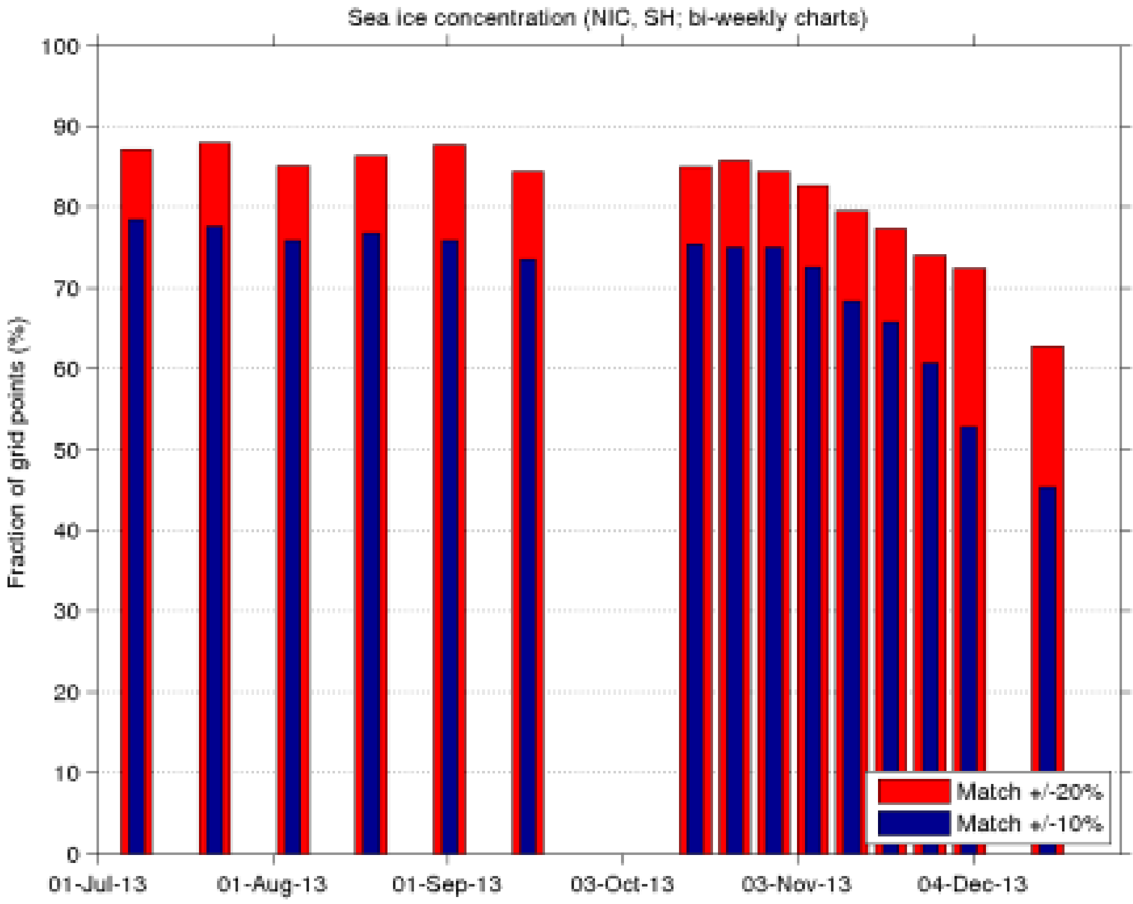


Figure 59 : Comparison between ice concentrations from the biweekly NIC ice analysis and the OSI SAF concentration product for the waters surrounding Antarctica. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/-10%, and likewise for +/-20%.

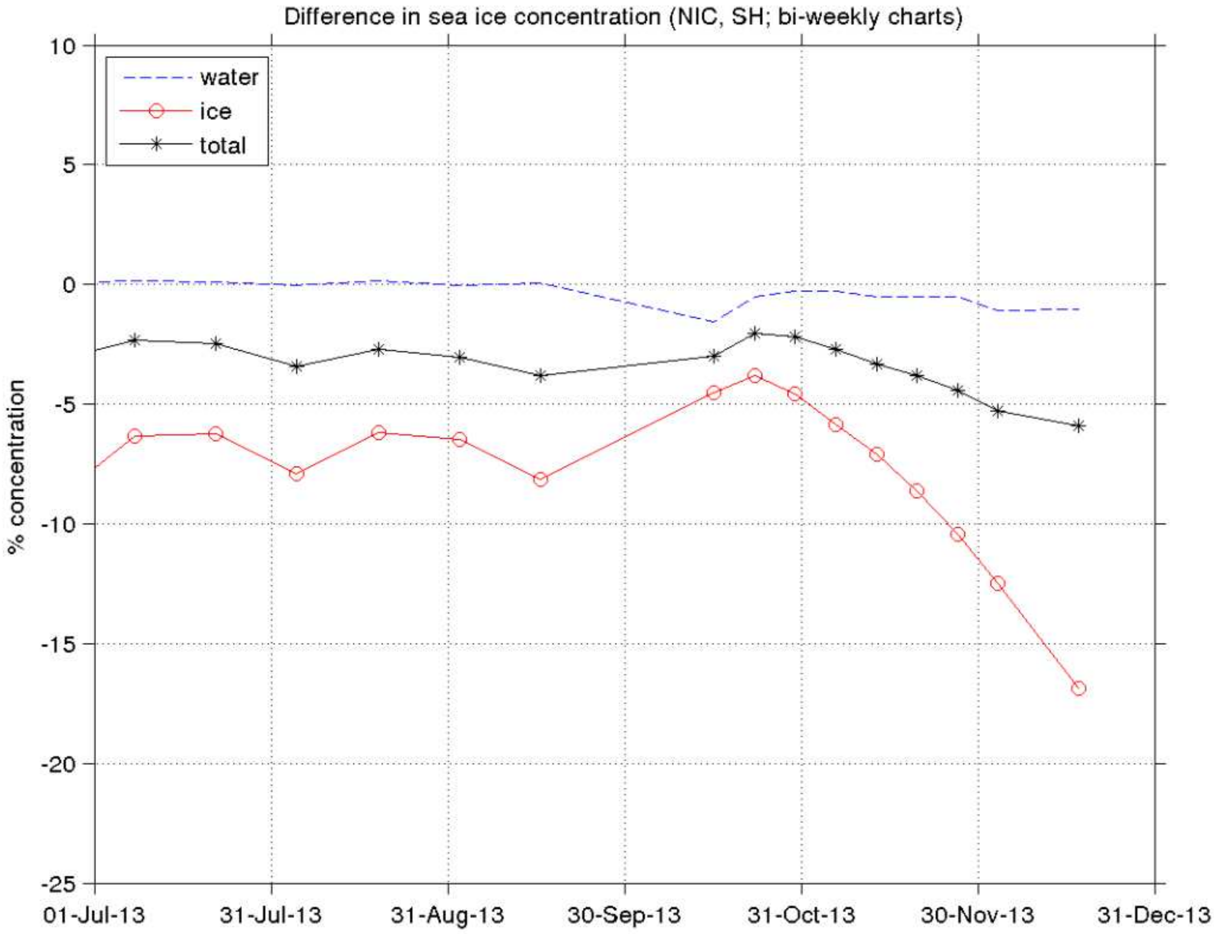


Figure 60 : **The difference between the ice concentrations from the biweekly NIC ice analysis and OSI SAF concentration product for three categories: water, ice and total. The total difference is the difference between the ice analysis and sea ice concentration product within the area covered by the ice analysis including both ice and water. When the difference is below zero, the OSI SAF sea ice concentration has a lower estimate than the ice analysis. For the waters surrounding Antarctica.**

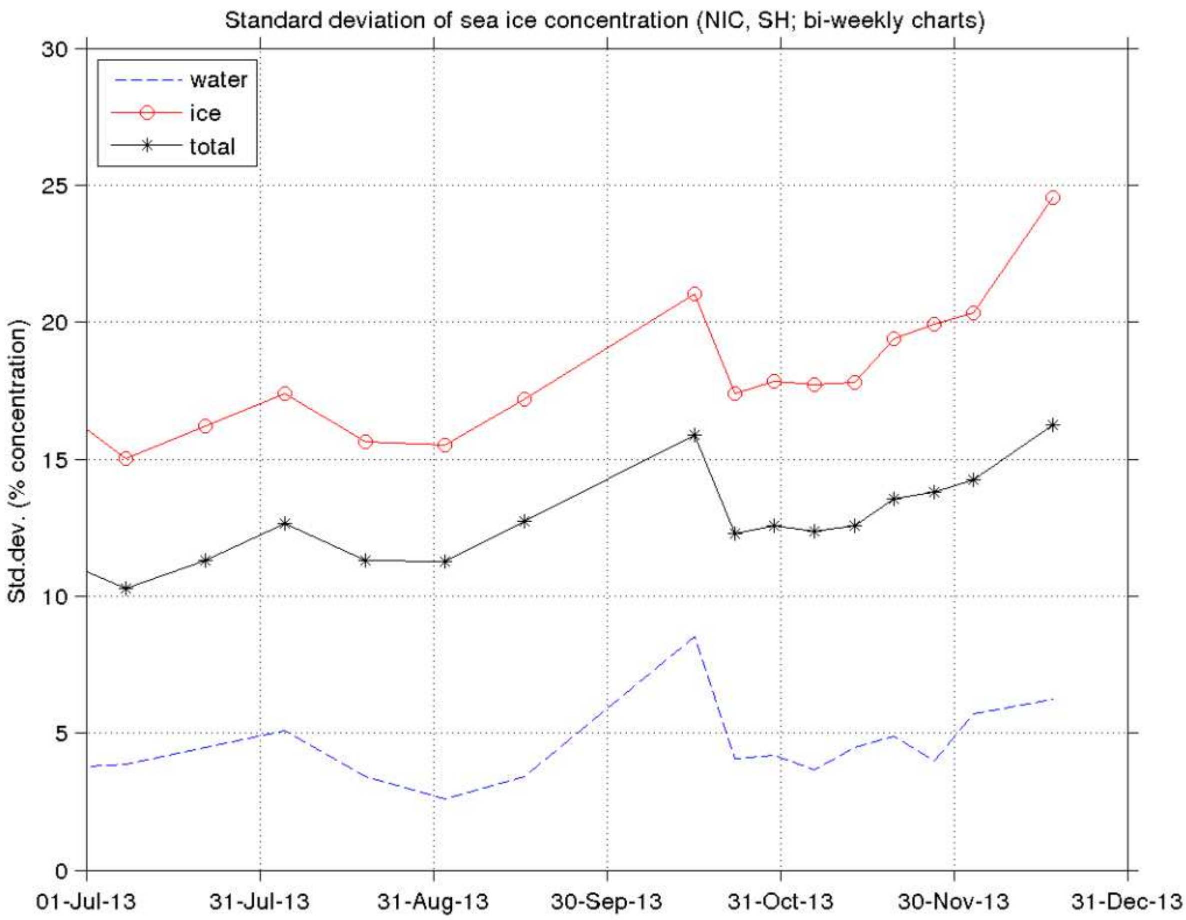


Figure 61 : The standard deviation of the difference in ice concentrations from the biweekly NIC ice analysis and OSI SAF concentration product for three categories: water, ice and total. For the waters surrounding Antarctica.

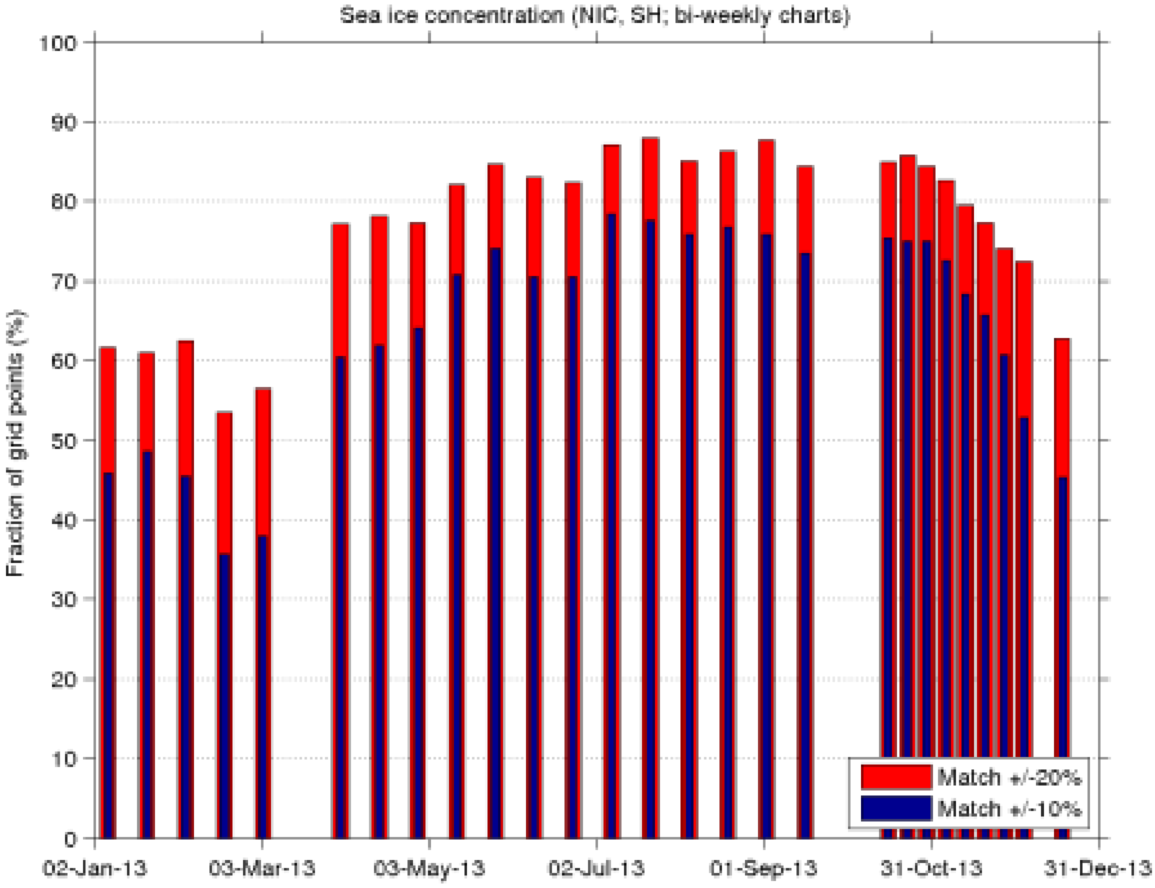


Figure 62 : Annual variability in 2013. Comparison between ice concentrations from the biweekly NIC ice analysis and the OSI SAF concentration product, for the waters surrounding Antarctica. 'Match +/- 10%' corresponds to those grid points where concentrations are within the range of +/- 10%, and likewise for +/-20%.

		Concentration product				
Year	Month	+/- 10%	+/- 20%	Bias	Stdev	Num obs
2013	JAN	76.67	89.04	-4.55	11.15	140979
2013	FEB	82.09	91.85	-3.70	10.06	153444
2013	MAR	81.66	90.66	-4.34	10.80	167652
2013	APR	78.02	89.42	-4.80	11.24	190404
2013	MAY	70.97	86.25	-5.73	11.77	212581
2013	JUN	62.48	78.77	-8.60	14.34	182558
2013	JUL	63.27	73.66	-9.84	14.48	48465
2013	AUG	82.54	91.14	-2.91	10.23	68440
2013	SEPT	77.83	87.84	-3.72	11.77	56448
2013	OCT	85.27	94.08	-1.19	8.77	89485
2013	NOV	79.95	90.46	-3.89	10.57	118420
2013	DEC	76.42	90.03	-4.80	10.59	134500

table 17 : Monthly validation results from comparing the OSI SAF sea ice concentration product to MET Norway ice service analysis for the Svalbard area. From JANUARY 2013 to DECEMBER 2013.

Comments : The validation of the sea ice concentration product against the MET Norway ice charts shows usual validation results, with increased uncertainty during the summer months. The yearly averaged standard deviation is 11.3%, which is a bit above the requirement of 10.0%. Since the validation data are only collected along the ice edge where the ice concentration is varying the most, we can expect that the standard deviation of ice concentration product in total is below the requirement.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2013	JUL	38.56	6.16	0.48	0.01	0.00	54.79
2013	AUG	38.71	6.08	0.47	0.01	0.00	54.73
2013	SEP	39.05	5.86	0.44	0.01	0.00	54.63
2013	OCT	39.38	5.62	0.42	0.01	0.00	54.57
2013	NOV	39.52	5.49	0.40	0.01	0.00	54.58
2013	DEC	39.52	5.45	0.40	0.01	0.00	54.62

table 18 : Statistics for sea ice concentration confidence levels, Northern Hemisphere.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2013	JUL	66.91	10.23	0.27	0.00	0.00	22.59
2013	AUG	65.67	11.37	0.36	0.00	0.00	22.59
2013	SEP	64.69	12.26	0.46	0.00	0.00	22.59
2013	OCT	63.15	13.63	0.61	0.00	0.00	22.60
2013	NOV	61.60	15.10	0.69	0.00	0.00	22.60
2013	DEC	61.33	15.37	0.69	0.00	0.00	22.60

table 19 : Statistics for sea ice concentration confidence levels, Southern Hemisphere.

Comments : Tables 18 and 19 show the normal seasonal pattern of increased agreement between OSI SAF ice concentration product and ice analysis ice concentration in the Arctic freeze-up season and a decrease in the Antarctic melting season.

5.3.2 Validation results for the global sea ice edge product

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

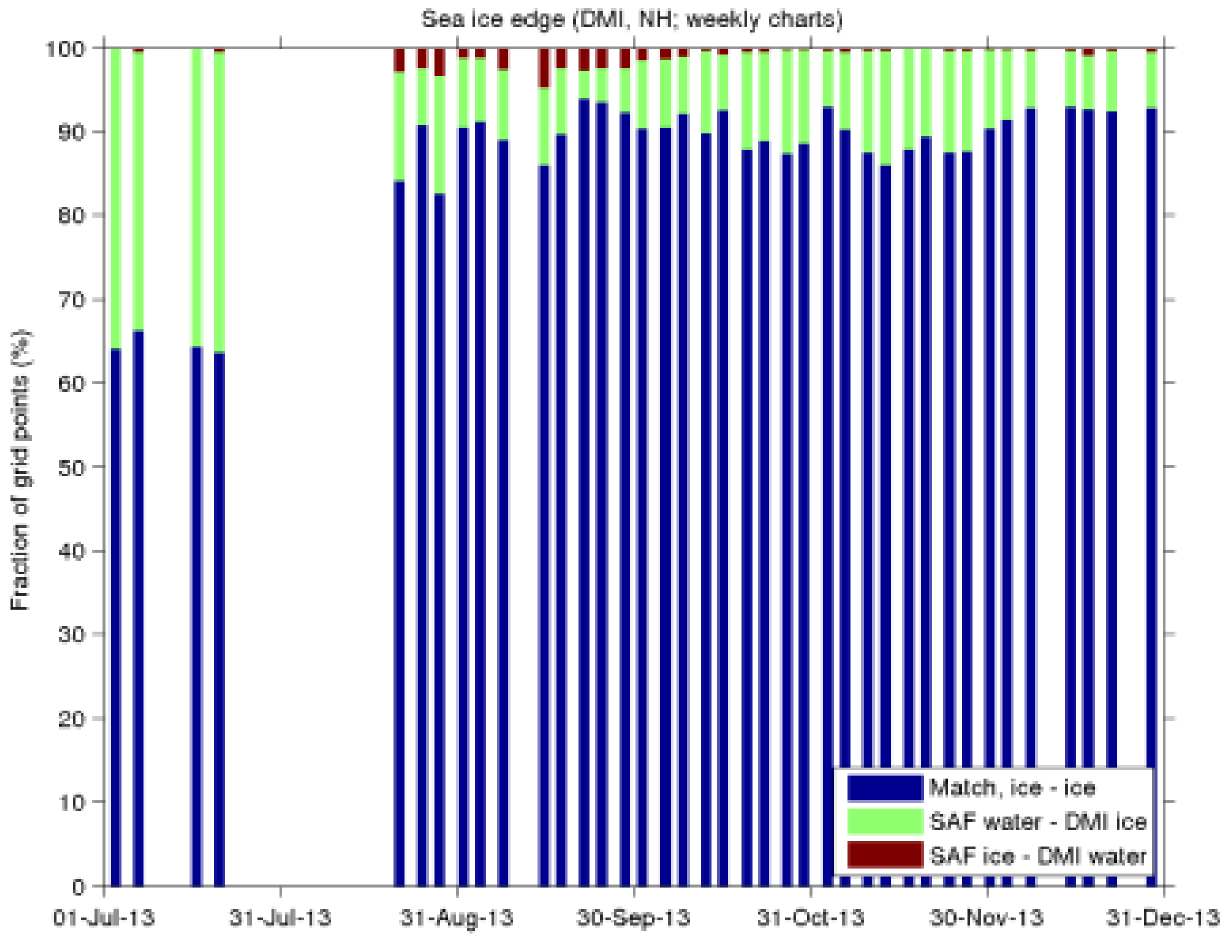


Figure 63 : Comparison between the biweekly DMI ice analysis and the OSI SAF sea ice edge product, for the waters surrounding Greenland. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.

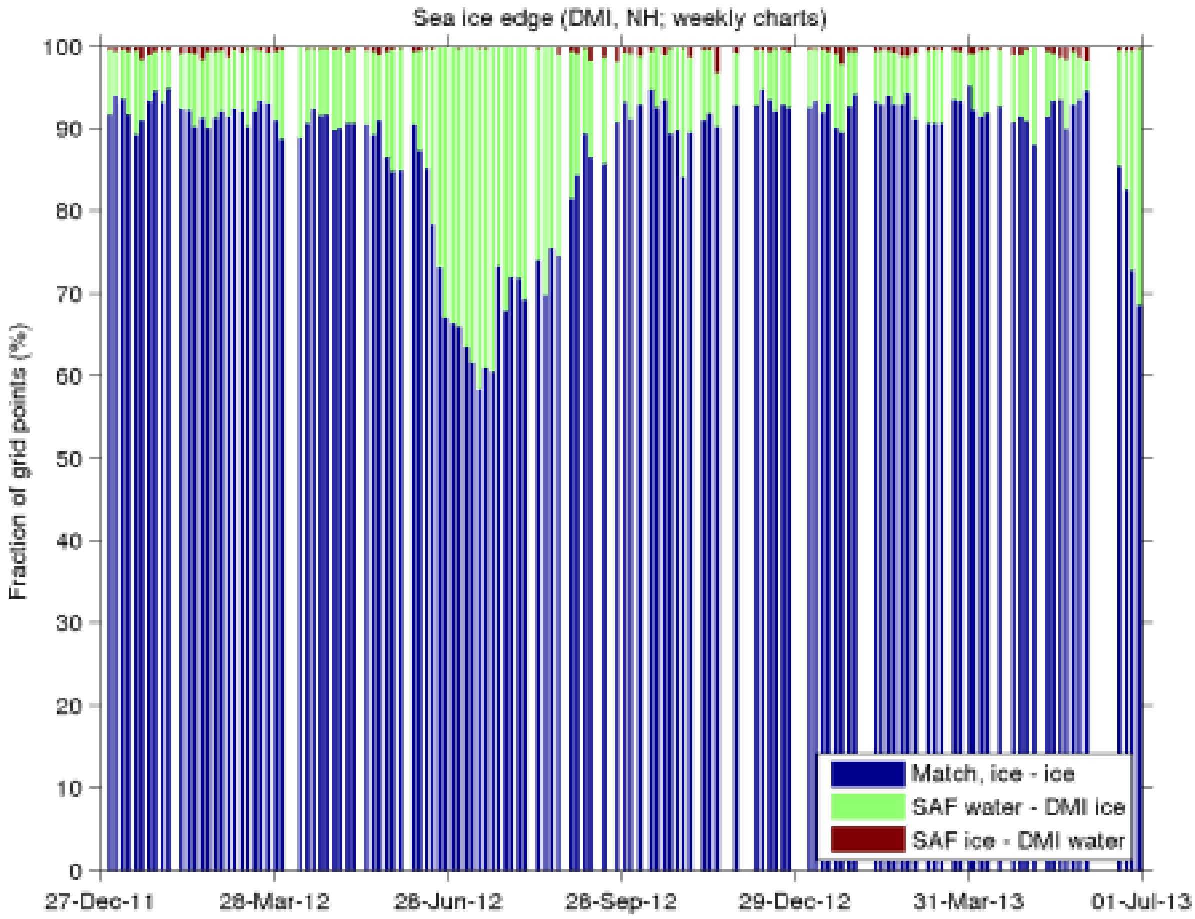


Figure 64 : **Multi-year variability over the period 2011-2013. Comparison between the biweekly DMI ice analysis and the OSI SAF sea ice edge product, for the waters surrounding Greenland. 'SAF water – DMI ice' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF ice – DMI water' category.product for the validation.**

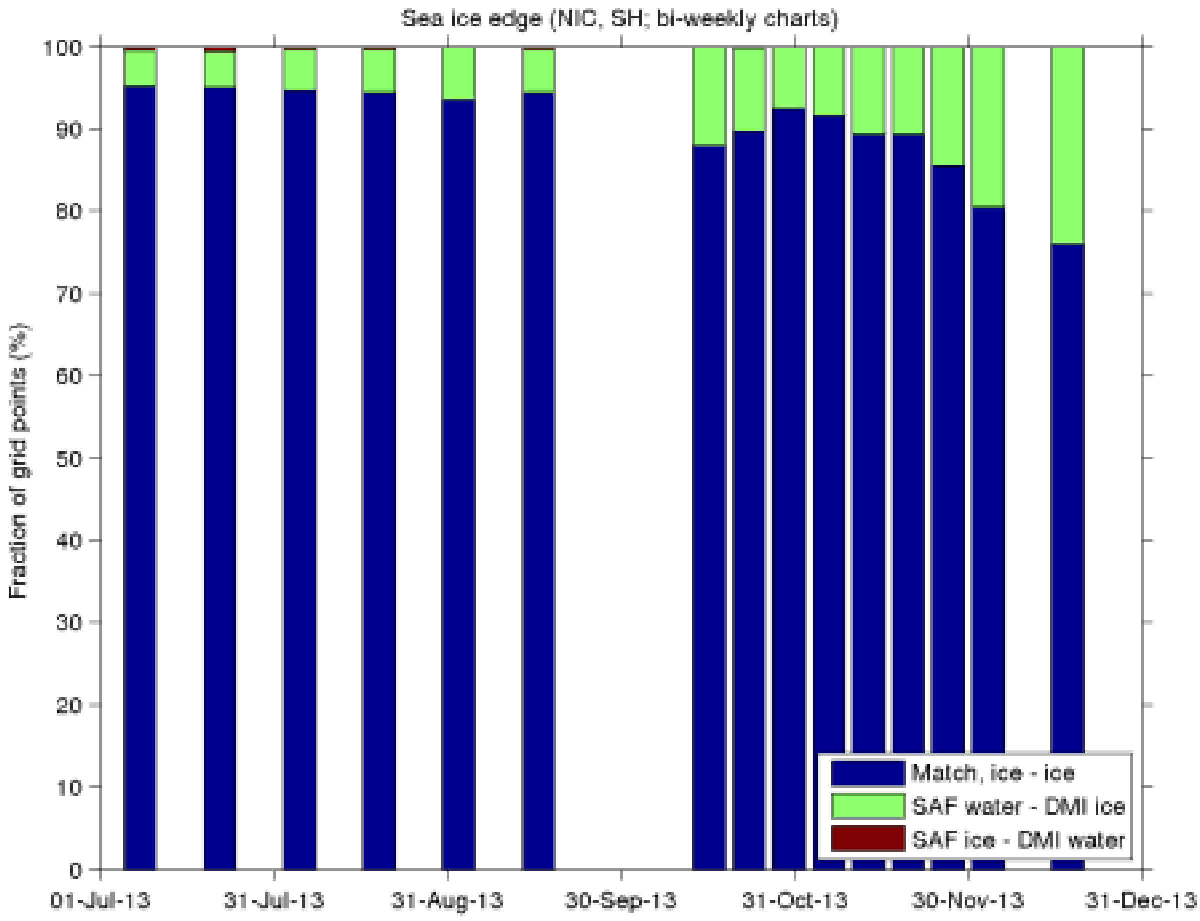


Figure 65 : Comparison between the biweekly NIC ice analysis and the OSI SAF sea ice edge product, for the waters surrounding Antarctica. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

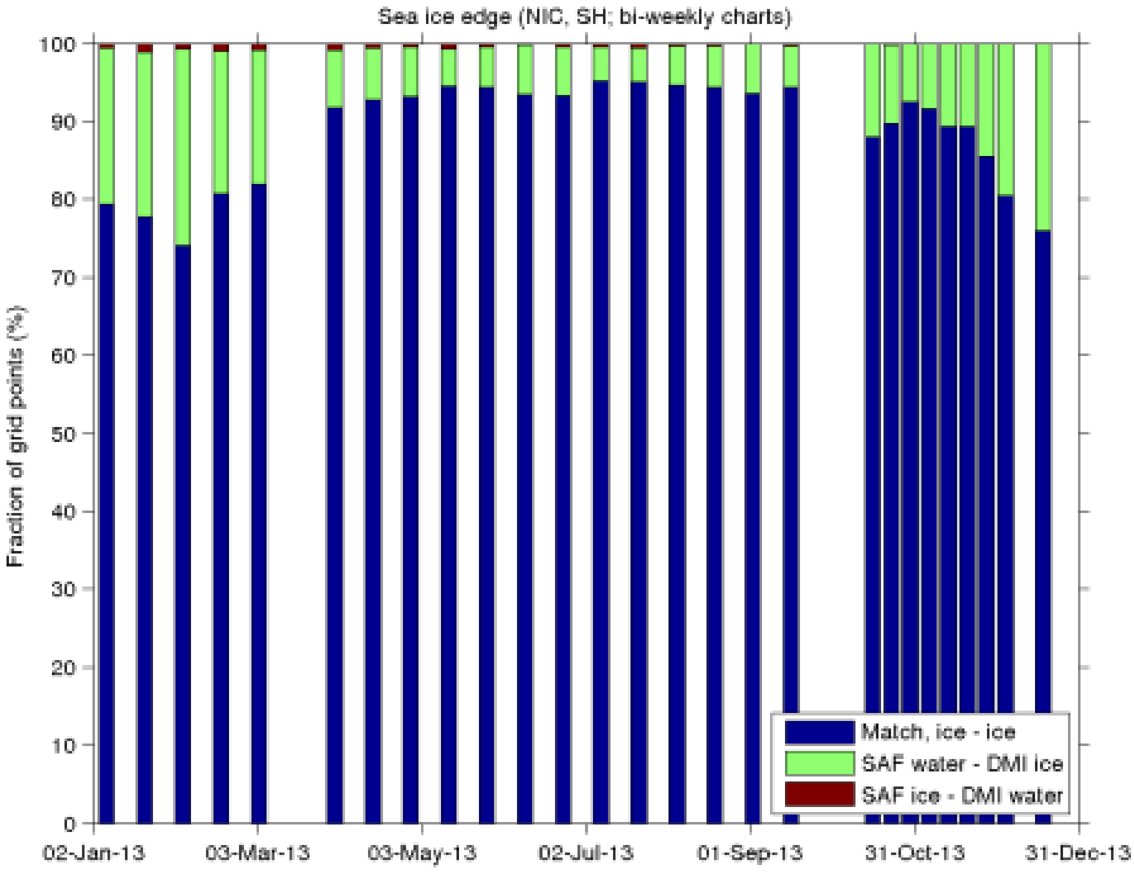


Figure 66 : Annual variability in 2013. Comparison between the biweekly NIC ice analysis and the OSI SAF sea ice edge product, for the waters surrounding Antarctica. 'SAF water – NIC ice' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF ice – NIC water' category.

		Edge product				
Year	Month	Correct (%)	SAF lower (%)	SAF higher (%)	Mean edge diff (km)	Num obs
2013	JAN	95.96	2.91	1.13	22.10	140979
2013	FEB	97.06	1.92	1.01	14.58	153444
2013	MAR	96.93	2.41	0.66	15.48	167652
2013	APR	97.29	2.08	0.63	14.08	190404
2013	MAY	96.04	1.96	2.01	14.38	212581
2013	JUN	94.15	4.44	1.41	23.64	182558
2013	JUL	94.04	3.88	2.08	32.70	48549
2013	AUG	95.67	2.17	2.15	31.47	69264
2013	SEP	96.08	1.03	2.89	12.01	57017
2013	OCT	97.25	0.97	1.77	10.13	89760
2013	NOV	96.65	1.83	1.52	16.78	119293
2013	DEC	96.91	2.01	1.08	12.92	135342

table 20 : Monthly validation results from comparing OSI SAF sea ice products to MET Norway ice service analysis for the Svalbard area, from JANUARY 2013 to DECEMBER 2013. Mean edge diff is the mean difference in distance between the ice edges in the OSI SAF edge product and MET Norway ice chart.

Comments: The validation of the sea ice edge product against the MET Norway ice charts shows usual validation results, with increased uncertainty during the summer months. The yearly averaged mean edge difference is 18.3km, which is below the requirement of 20.0km.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2013	JUL	42.02	0.77	1.40	1.15	0.32	54.35
2013	AUG	42.08	0.76	1.40	1.15	0.31	54.31
2013	SEP	42.25	0.74	1.36	1.12	0.31	54.22
2013	OCT	42.39	0.72	1.33	1.09	0.30	54.17
2013	NOV	42.46	0.71	1.30	1.06	0.29	54.18
2013	DEC	42.47	0.70	1.28	1.04	0.29	54.22

table 21 : Statistics for sea ice edge confidence levels, Northern Hemisphere.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2013	JUL	71.90	1.19	1.87	1.88	0.67	22.49
2013	AUG	71.51	1.32	2.02	1.99	0.66	22.49
2013	SEP	70.99	1.46	2.23	2.15	0.67	22.50
2013	OCT	70.32	1.60	2.45	2.41	0.72	22.50
2013	NOV	69.60	1.77	2.61	2.69	0.83	22.50
2013	DEC	69.17	1.87	2.70	2.85	0.91	22.51

table 22 : Statistics for sea ice edge confidence levels, Southern Hemisphere.

Comments : Tables show the normal seasonal pattern of increased agreement between OSI SAF ice edge product and ice analysis ice edge in the Arctic freeze-up season and a decrease in the Antarctic melting season.

5.3.3 Validation results for the global sea ice type product

The sea ice type validation is done as a monitoring of the monthly variation of the multi year area coverage, as presented in the table below.

Year	Month	Std dev wrt running mean	Mean MYI coverage
2013	JAN	44,130 km2	1,522,927 km2
2013	FEB	32,352 km2	1,672,007 km2
2013	MAR	57,858 km2	1,540,154 km2
2013	APR	36,481 km2	1,631,290 km2
2013	MAY	116,099 km2	1,263,525 km2
2013	JUN	NA	NA
2013	JUL	NA	NA
2013	AUG	NA	NA
2013	SEP	NA	NA
2013	OCT	37,348 km2	2,973,675 km2
2013	NOV	53,669 km2	2,888,604 km2
2013	DEC	51,471 km2	2,532,260 km2

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

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2013	JUL	N.A	N.A	N.A	N.A	N.A	N.A
2013	AUG	N.A	N.A	N.A	N.A	N.A	N.A
2013	SEP	N.A	N.A	N.A	N.A	N.A	N.A
2013	OCT	N.A	N.A	N.A	N.A	N.A	N.A
2013	NOV	N.A	N.A	N.A	N.A	N.A	N.A
2013	DEC	N.A	N.A	N.A	N.A	N.A	N.A

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

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2013	JUL	N.A	N.A	N.A	N.A	N.A	N.A
2013	AUG	N.A	N.A	N.A	N.A	N.A	N.A
2013	SEP	N.A	N.A	N.A	N.A	N.A	N.A
2013	OCT	N.A	N.A	N.A	N.A	N.A	N.A
2013	NOV	N.A	N.A	N.A	N.A	N.A	N.A
2013	DEC	N.A	N.A	N.A	N.A	N.A	N.A

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

DMI is not able to provide tables 24 and 25 at this moment. An update will be done asap.

5.3.4 Validation of the low resolution sea ice drift product

Validation dataset

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

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

Reported statistics

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

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

Validation statistics

In the following tables, validation statistics for the Northern Hemisphere (NH) products using multi-sensor (multi-oi) and SSM/I only (ssmi-f15) are reported upon. In those tables, X (Y) are the X and Y components of the drift vectors. b() is the bias and σ() the standard deviation of the error $\varepsilon(X) = X_{prod} - X_{ref}$. 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.

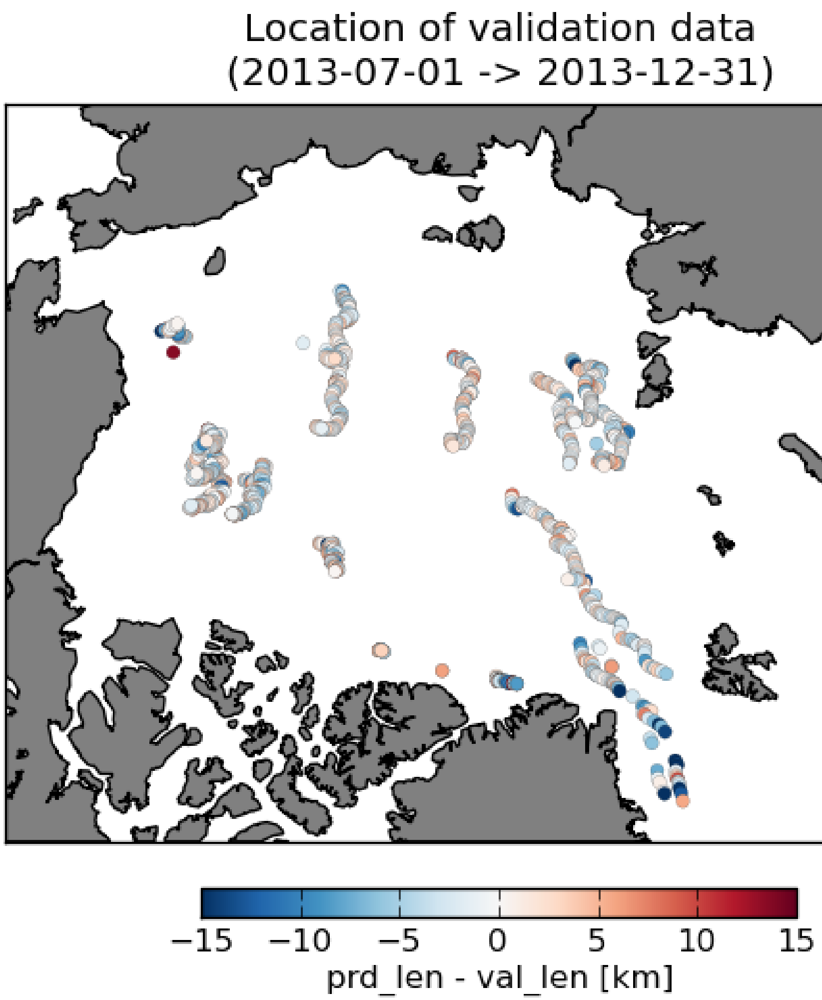


Figure 67 : **Location of GPS drifters for the validation period (OCT-DEC). The shade of each symbol represents the bias (prod-ref) in drift length (km over 2 days).**

Year	Month	b(X) [km]	b(Y) [km]	σ(X) [km]	σ(Y) [km]	α	β[km]	ρ	N
2013	JAN	+0.480	-0.013	2.850	3.018	0.96	+0.00	0.98	314
2013	FEB	+0.357	-0.234	2.776	2.720	0.98	+0.06	0.95	255
2013	MAR	-0.114	+0.221	4.723	4.231	0.97	+0.05	0.96	216
2013	APR	-0.051	-0.209	2.866	3.660	0.93	-0.10	0.96	258
2013	MAY	-	-	-	-	-	-	-	0
2013	JUN	-	-	-	-	-	-	-	0
2013	JUL	--	--	--	--	--	--	--	0
2013	AUG	--	--	--	--	--	--	--	0
2013	SEP	--	--	--	--	--	--	--	0
2013	OCT	-0.548	-0.596	3.769	3.968	0.95	-0.295	0.96	450
2013	NOV	-0.113	-0.625	3.943	4.974	0.90	+0.237	0.95	424
2013	DEC	+0.265	-0.205	3.170	3.071	0.95	+0.025	0.97	335

table 26 : **Validation results for the LRSID (multi-oi) product (NH) for JAN-DEC 2013.**

Year	Month	b(X) [km]	b(Y) [km]	σ(X) [km]	σ(Y) [km]	α	β[km]	ρ	N
2013	JAN	+0.637	-0.257	3.101	3.213	0.97	+0.00	0.97	308
2013	FEB	+0.799	+0.089	4.148	3.991	0.94	+0.47	0.86	238
2013	MAR	-0.114	+0.221	4.723	4.231	0.97	+0.05	0.96	216
2013	APR	+0.058	+0.016	3.792	3.400	0.95	-0.02	0.95	214
2013	MAY	-	-	-	-	-	-	-	0
2013	JUN	-	-	-	-	-	-	-	0
2013	JUL	--	--	--	--	--	--	--	0
2013	AUG	--	--	--	--	--	--	--	0
2013	SEP	--	--	--	--	--	--	--	0
2013	OCT	-0.411	-0.522	4.437	4.203	0.97	-0.281	0.95	406
2013	NOV	-0.133	-0.107	4.161	3.690	0.95	+0.132	0.96	389
2013	DEC	+0.200	-0.077	2.976	3.398	0.96	+0.054	0.96	327

table 27 : Validation results for the LRSID (ssmi-f17) product (NH) for JAN-DEC 2013.

Comments : The monthly validation statistics are in line with those of previous periods, and meet the requirements.

5.4 Global Wind quality

The wind products are required to have an accuracy of better than 2.0 m/s in wind component RMS 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 validation and in the difference statistics. Such effects cause seasonal oscillations that appear mainly in the wind speed bias plots against both model winds and buoy winds. For more background information we refer to: Hans Hersbach (2010) *Comparison of C-band scatterometer CMOD5.N equivalent neutral winds with ECMWF*, J. Atmos. Oceanic Technol., **27**, 721–736.

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

5.4.1 Comparison with ECMWF model wind data

The figure below shows the monthly results of October 2012 to December 2013. 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 User Requirements Document (bias less than 0.5 m/s and RMS accuracy better than 2 m/s) when they are compared to ECMWF forecast winds.

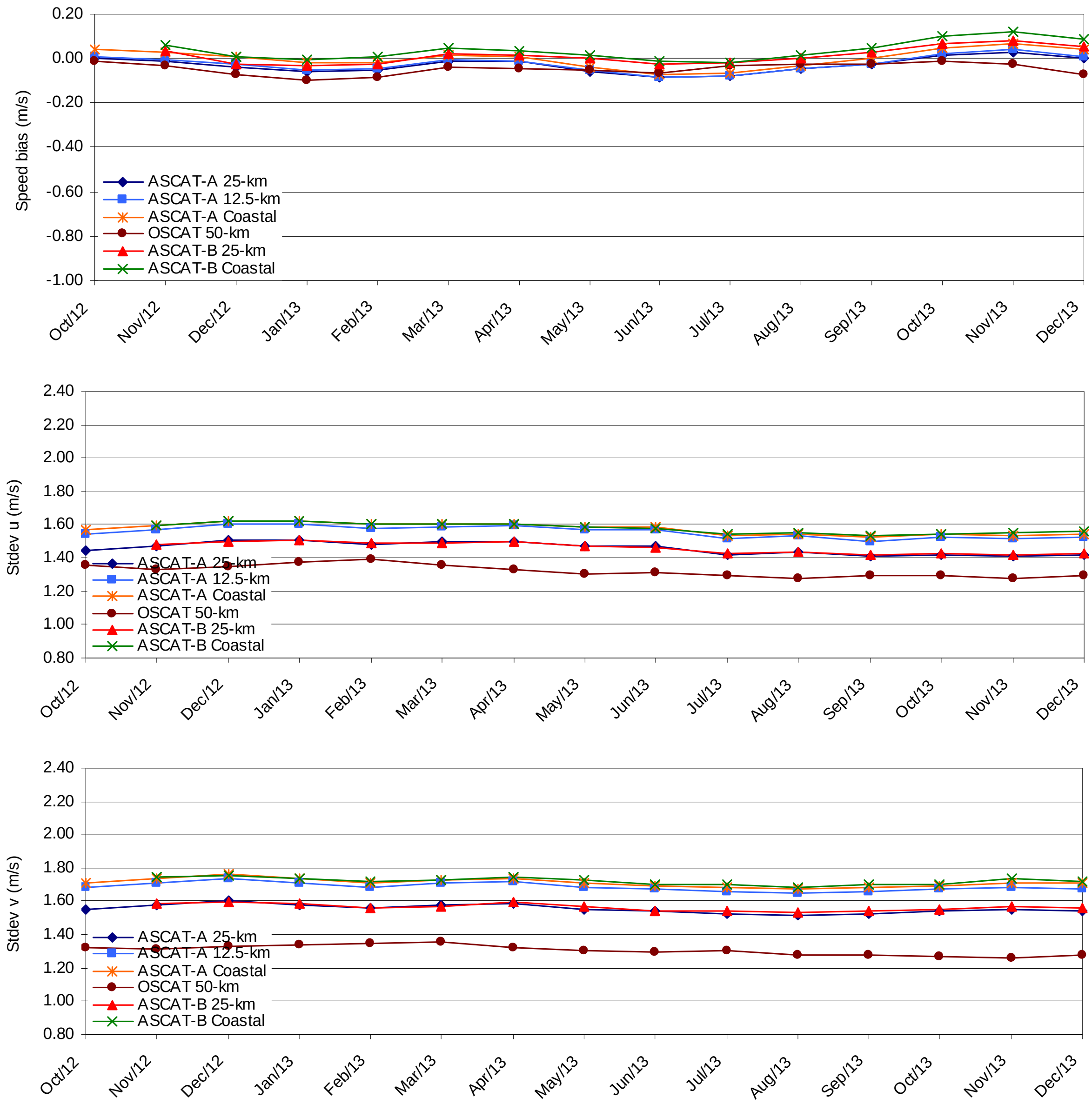


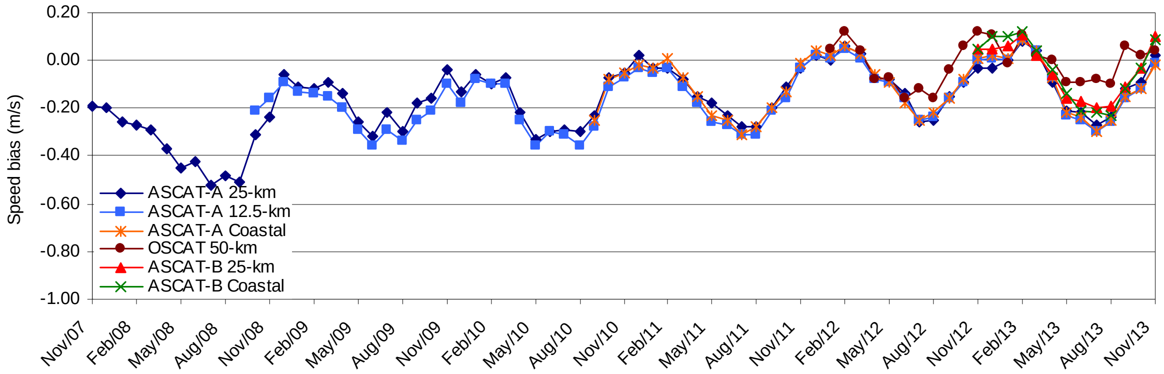
Figure 68 : Comparison of scatterometer winds against ECMWF NWP forecast winds (monthly averages). For each product, the wind speed bias (scatterometer minus ECMWF, top), wind *u* component standard deviation (middle) and wind *v* component standard deviation (bottom) are shown.

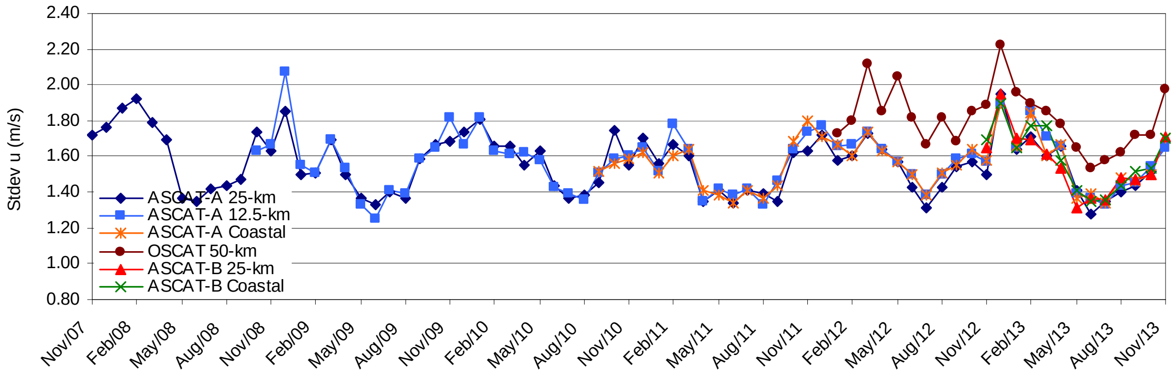
5.4.2 Buoy validations

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

The figure below shows the monthly results of November 2007 to December 2013. Note that the ASCAT winds before 20 November 2008 are real winds rather than neutral winds. Neutral scatterometer winds are known to be 0.2 m/s higher than real scatterometer winds.

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





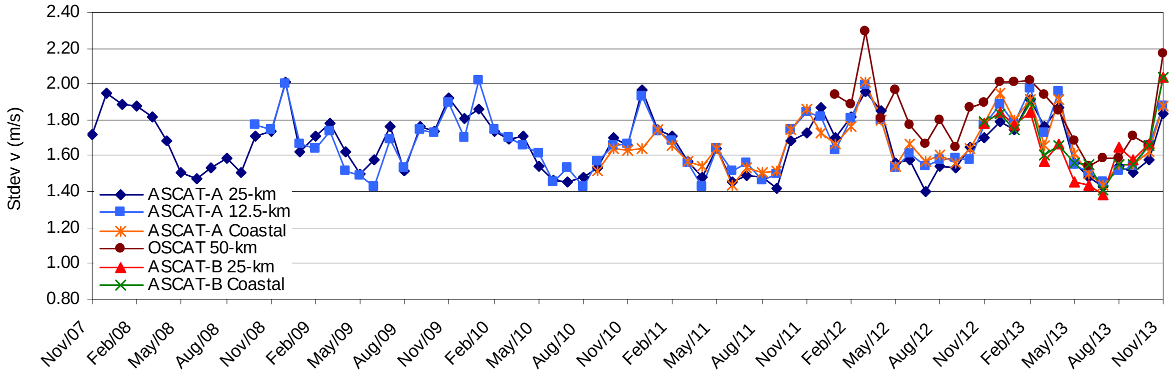


Figure 69 : Comparison of scatterometer winds against buoy winds (monthly averages). For each product, the wind speed bias (scatterometer minus buoy, top), wind *u* component standard deviation (middle) and wind *v* component standard deviation (bottom) are shown.

6 Service and Product usage

6.1 Statistics on the Web site and help desk

The OSI SAF offers to the users a central Web Site, www.osi-saf.org , managed by M-F/CMS, a local page for SS2, http://saf.met.no/, managed by MET Norway, and dedicated to the Sea Ice, and a local page for SS3, http://www.knmi.nl/scatterometer/osisaf/, managed by KNMI and dedicated to the OSI SAF scatterometer winds.

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

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	Sessions	User requests
July 2013	866	7366	3
Aug. 2013	875	6247	2
Sept. 2013	883	5574	3
Oct. 2013	899	6639	1
Nov. 2013	916	6328	3
Dec.2013	931	4754	2

table 28 : **Statistics on central OSI SAF Web site use over 2nd half 2013.**

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

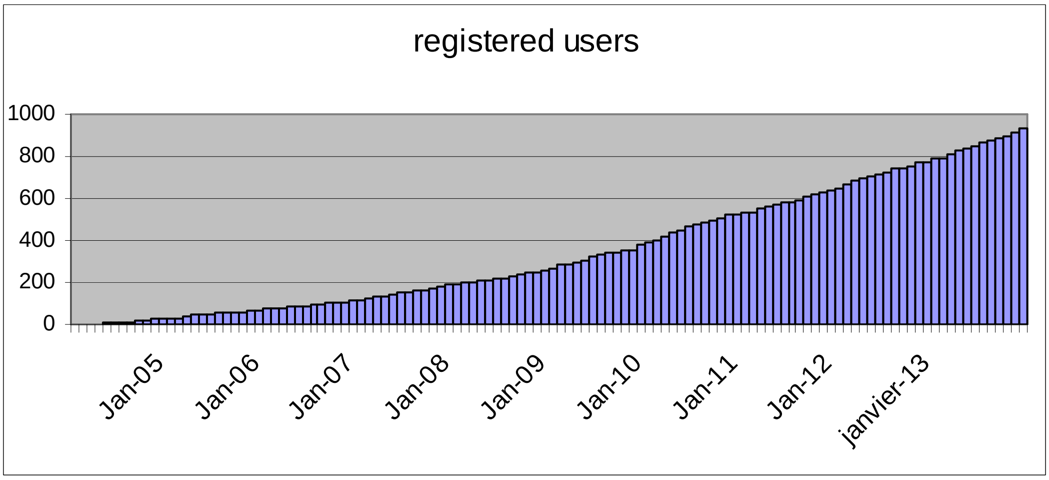


Figure 70 : **Evolution of external registered users on the central Web Site from April 2004 to December 2013.**

Comment : The number of registered users increases regularly.

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

Country	Institution, establishment or company	Acronym
Argentina	AgriSatelital	AgS
Australia	Bureau of Meteorology	BOM
Australia	Griffith University	Griff
Australia	James Cook University	University of Windsor
Australia	Tidetech LTD	Tidetech
Australia	University Of New South Wales	UNSW
Australia	eMarine Information Infrastructure (eMII), Integrated Marine Observing System (IMOS)	eMII
Belgium	Signal and Image Center	SIC
Belgium	Institut Royal Météorologique de Belgique	IRMB
Belgium	Université catholique de Louvain	UCL/TECLIM
Belgium	Université de Liège	UL
Brazil	Admiral Paulo Moreira Marine Research Institute	IEAPM
Brazil	Centro de Previsao de Tempo e Estudos Climáticos	CPTEC/INPE
Brazil	Fugro Brasil	FGB
Brazil	Instituto de Ciências Atmosféricas, Universidade Federal de Alagoas	UFAL/ICAT
Brazil	Instituto Nacional de Pesquisas Espaciais	INPE
Brazil	Universidade de Brasília - Instituto de Geociências	UNB-IG
Brazil	Universidade de São Paulo	USP
Brazil	Universidade Federal de Alagoas	UFAL
Brazil	Universitade Federal do Rio de Janeiro	LAMCE/COPPE/UFRJ
Brazil	Universidade Federal do Espírito Santo	UFES
Bulgaria	National Institute of Meteorology and Hydrology	NIMH
Canada	Canadian Ice Service	CIS
Canada	Canadian Meteorological Centre	CMC
Canada	Centre for Earth Observation Science	CEOS
Canada	Data Assimilation and Satellite Meteorology, Meteorological Research Branch Environment Canada	ARMA/MRB
Canada	Fisheries and Oceans Canada	DFO/IML/MPO
Canada	Institut National de la Recherche Scientifique	INRS
Canada	Institut de Recherche et de Développement en Agroenvironnement	IRDA
Canada	JASCO Research Ltd	JASCO
Canada	Memorial University of Newfoundland	MUN
Canada	University of Waterloo	UW
Canada	University of Windsor	UWD
Chile	Centro de Estudios Avanzados en Zonas Aridas	CEAZA
Chile	Centro i-mar, Universidad de Los Lagos	I-MAR
Chile	Universidad Catolica de la Santisima Concepcion	UCSC
Chile	Universidad de Chile	U Chile
China	anhuigongyedaxue	ahut
China	Chinese Academy of Meteorological Sciences	CAMS
China	Chinese Academy of Sciences	IOCAS
China	Dalian Maritime University	DMU
China	Fujian Meteorological Observatory	MS
China	HK Observatory	HKO
China	Institute of Oceanology, Chinese Academy of Sciences	IOCAS
China	Institute of Remote Sensing Applications of Chinese Academy of Sciences	IRSA/CAS
China	Nanjing University of Information Science and Technology	NUIST

China	National Marine and Environmental Forecasting Center	NMEFC
China	National Ocean Data Information Service	NODIS
China	National Ocean Technology Center	NOCT
China	National Satellite Meteorological Center	NSMC
China	National Satellite Ocean Application Service	NSOAS
China	Ocean Remote Sensing Institute	ORSI
China	Ocean University of China	OUC
China	Second Institute of Oceanography	SOI
China	Shandong Meteorology Bureau	SDMB
China	Shanghai Ocean University	SHOU
China	South China Sea Institute of Oceanology, Chinese Academy of Sciences	SCSIO, CAS
China	Third Institute Oceanography	TIO/SOA
China	Tianjin University	TJU
China	Zhejiang Ocean University	ZOU
Croatia	Rudjer Boskovic Institute	IRB/ZIMO
Denmark	Aarhus University - Department of Bioscience	BIOS
Denmark	Danish Defense Acquisition and Logistics Organization	DALO
Denmark	Danish Meteorological Institute	DMI
Denmark	Royal Danish Administration of Navigation and Hydrography	RDANH
Denmark	Technical University of Denmark, Risø	DTU
Denmark	University of Copenhagen	UoC
El Savador	University of El Savador	UES
Estonia	Estonian Meteorological and Hydrological Institute	EMHI
Estonia	Tallinn University of Technology	TUT
Faroe Islands	Faroe Marine Research Institute	FAMRI
Finland	Finnish Institute of Marine Research	FIMR
Finland	Finnish Meteorological Institute	FMI
Finland	Valtion Teknillinen Tutkimuskeskus	VTT
France	ACRI-ST Brest	ACRI-ST
France	ACRI-ST sophia-antipolis	ACRI-ST
France	African Monitoring of the Environment for Sustainable Development	AMESD
France	Centre de Localisation Satellite	CLS
France	Centre de Soutien Météorologique aux Forces armées	CISMF
France	Centre National de la Recherche Scientifique	CNRS-LOB
France	Centre National de la Recherche Scientifique	CNRS/LOCEAN
France	Centre National d'Etudes Spatiales	CNES
France	CNRS Laboratoire d'Etudes en Géophysique et Océanographie Spatiales	LEGOS/CNRS
France	Creocean	Creocean
France	Ecole Nationale Supérieure des Mines de Paris	Mines Paris Tech
France	Ecole Nationale des Télécommunication de Bretagne	ENSTB
France	Ecole Nationale Supérieure des Techniques Avancées de Bretagne	ENSTA-Bretagne
France	Institut de Recherche pour le Développement	IRD
France	Institut Français de Recherché pour l'Exploitation de la MER	IFREMER
France	Institut National de la Recherche Agronomique	INRA
France	Institut National de l'Energie Solaire	INES
France	Institut Universitaire Européen de la Mer	IUEM
France	KiloWattsol	KiloWattsol
France	Laboratoire de Météorologie Dynamique	LMD
France	Laboratoire d'Océanographie et du Climat : Expérimentation et Approches Numériques	LOCEAN
France	Telespazio France	TelespazioFrance
France	Laboratoire de Physique des Océans, Université de Bretagne occidentale	LPO

France	Mercator Ocean	Mercator Ocean
France	Météo-Portugal	M-F
France	Météo-Portugal / Centre National de la Recherche Météorologique	M-F/CNRM
France	Museum National d'Histoire Naturelle de Paris	MNHN Paris
France	Observatoire français des Tornades et des Orages Violents	KERAUNOS
France	Service Hydrographique et Océanographique de la Marine	SHOM
France	Tecsol	TECSOL
France	TELECOM Bretagne	TB
France	Université de Bretagne Occidentale	UBO
France	Université de Corse, UMR SPE CNRS 6134	UC
Germany	Alfred Wegener Institute for Polar and Marine Research	AWI
Germany	Bundesamt für Seeschifffahrt und Hydrographie	BSH
Germany	Center for Integrated Climate System Analysis and Prediction	CLISAP
Germany	Deutscher Wetterdienst	DWD
Germany	Deutsches Luft- und Raumfahrtzentrum	DLR
Germany	Deutsches Museum	DM
Germany	Drift and Noise Polar Services	DNPS
Germany	Energy & Meteo Systems GmbH.	EMSYS
Germany	EUMETSAT	EUMETSAT
Germany	FastOpt GmbH	FastOpt
Germany	Flottenkommando Abt GeoInfoD	Flottenkdo GeoInfoD
Germany	Freie Universität Berlin	FUB
Germany	German Aerospace Center	DLR
Germany	Institute of Physics – University of Oldenburg	Uni OL
Germany	Institute for Atmospheric and Environmental Sciences	IAU
Germany	Institute for Environmental Physics Uni. Heidelberg	IUP-HD
Germany	Institute for environmental physics, University of Bremen	IUP, Uni B
Germany	Leibniz Institut fur Meereswissenschaften	IFM-GEOMAR
Germany	Leibniz Institute for Baltic Sea Research Warnemünde	IOW
Germany	Max-Planck-Institute for Meteorology	MPI-M
Germany	O.A.Sys – Ocean Atmosphere Systems GmbH	OASYS
Germany	TU Dresden	TU DD
Greece	Hellenic National Meteorological Service	HNMS
Greece	National Observatory of Athens	NOA
Iceland	Icelandic Meteorological Office	IMO
Iceland	University of Iceland, Institute of Geosciences	UofI
India	ANDHRA UNIVERSITY	AU
India	Bharathiar University	BU
India	Centre for Mathematical Modelling and Computer Simulation	CSIR C-MMACS
India	CONSOLIDATED ENERGY CONSULTANTS LTD	CECL
India	Indian Institute of Technology Delhi	IITD
India	India Meteorological Department	IMD
India	Indian National Centre for Ocean Information	INCOIS
India	Indian Navy	IN
India	Indian Space Research Organization	ISRO
India	Ministry of Earth Sciences	MOES
India	Nansen Environmental Research Centre	NERCI
India	National Centre for Medium Range Weather Forecasting	NCMRWF
India	National Institute of Ocean Technology	NIOT
India	National Institute of Technology Karnataka	NITK
India	Naval Physical and Oceanographic Laboratory	NPOL
India	National Remote Sensing Centre	NRSC

India	Oceanic Sciences Divisions, MOG , Indian Space Applications Centre	ISRO
India	South Asia Strategic Forum	SASFOR
India	The Energy and Resources Institute	TERI
India	University of Pune	UP
Indonesia	Bureau of Meteorology, Climatology and Geophysic Region IV Makassar	BMCGR
Indonesia	Ministry of Marine Affairs and Fisheries	MMAF
Indonesia	Vertex	Mr
Israel	Bar Ilan University	BIU
Israel	Israel Meteorological Service	IMS
Israel	The Hebrew University	HUJI
Italy	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	ENEA
Italy	Centro Nazionale di Meteorologia e Climatologia Aeronautic	CNMCA
Italy	EC- Joint Research Centre	EC-JRC
Italy	Epson Meteo Center	EMC
Italy	ESA	ESA/ESRIN
Italy	Fondazione imc – onlus , International Marine Centre	IMC
Italy	Institute of Marine Science – CNR	ISMAR-CNR
Italy	Instituto di BioMeteorologia – Consiglio Nazionale delle Ricerche	IBIMET-CNR
Italy	Instituto Nazionale di Geofisica e Vulcanologia	INGV
Italy	Instituto Scienze dell'Atmosfera e del Clima – Consiglio Nazionale delle Ricerche	ISAC – CNR
Italy	Instituto Superiore per la Ricerca e la Protezione Ambientale	ISRPA
Italy	Italian Space Agency	ASI
Italy	NATO Undersea Research Centre	NURC
Italy	Politecnico di Torino	DITIC POLITO
Italy	Universita degli Studi di Bari	USB
Italy	university of bologna	DISTA
Iran	Atmospheric Science and Meteorological Research Center	ASMERC
Japan	Center for Atmospheric and Oceanic Studies	CAOS
Japan	Hydrospheric Atmospheric Research Center	HyARC
Japan	Japan Aerospace Exploration Agency	JAXA
Japan	Japan Agency for Marine-Earth Science and Technology	JAMSTEC
Japan	Japan Meteorological Agency	JMA
Japan	Meteorological Research Institute	MRI
Japan	Tokai University	Tokai U
Japan	Weathernews	WNI
Kenya	Jomo Kenyatta University of Agriculture and Technology	JKUAT
South Korea	Korea Meteorological Administration	KMA
South Korea	Korea Ocean Research and Development Institute	KORDI
South Korea	Korea Ocean Satellite Center	KOSC
South Korea	Jeju National University	JNU
South Korea	PKNU	MF
Lithuania	Institute of Aerial Geodesy	AGI
Lithuania	Lithuanian Hydrometeorological Service	LHMS
Lithuania	University of Vilnius	VU
Malaysia	Malaysian Remote Sensing Agency	MRSA
Marocco	University Ibn Tofail	UIT
Mauritius	Mauritius Oceanography Institute	MOI
Mexico	Facultad de Ciencias Marinas, Universidad Autónoma de Baja California	FCM/UABC
Mexico	Instituto Oceanografico del Pacifico	IOP
Netherlands	Bureau Waardenburg bv	BuWa
Netherlands	Delft University of Technology	TU Delft

Netherlands	Deltares	Deltares
Netherlands	Meteo Consult on behalf of MeteoGroup Ltd.	Meteo Consult
Netherlands	National Aerospace Laboratory	NLR
Netherlands	Nidera	Nidera
Netherlands	Rijksinstituut voor Kust en Zee	RIKZ
Netherlands	Royal Netherlands Meteorological Institute	KNMI
Netherlands	WaterInsight	WaterInsight
Niger	African Centre of Meteorological Applications for Development	ACMAD
Nigeria	African Centre of Meteorological Applications for Development	ACMAD
Norway	Institute of Marine Research	IMR
Norway	MyOcean SIW TAC	MyOcean SIW TAC
Norway	Nansen Environmental and Remote Sensing Center	NERSC
Norway	Norge Handelshoyskole	NHH
Norway	Norsk Polarinstitutt	NP
Norway	Norwegian Defense Research Establishment	FFI
Norway	Norwegian Meteorological Institute	Met.no
Norway	StormGeo AS	StormGeo
Norway	The University Centre in Svalbard	UNIS
Norway	University of Bergen	UiB
Norway	Uni Research AS	URAS
Peru	Instituto del Mar del Peru	IMARPE
Peru	Servicio Nacional de Meteorologia e Hidrologia	SENAMHI
Peru	Universidad Nacional Mayor de San Marcos	UNMSM
Philippines	Marine Science Institute, University of the Philippines	UP-MSI
Poland	Institute of Geophysics, University of Warsaw	IGF UW
Poland	Institute of Meteorology and Water Management	IMWM
Poland	Maritime Academy Gdynia	AM/KN
Poland	Media Fm	Media Fm
Poland	PRH BOBREK	Korn
Poland	University of Gdansk, Institute of Oceanography	UG/IO
Portugal	Centro de Estudos do Ambiente e do Mar – Univ Aveiro	CESAM
Portugal	Instituto de Investigação das Pescas e do Mar	IPIMAR
Portugal	Instituto de Meteorologia	IM
Portugal	Instituto Politécnico de Viana do Castelo	IPVC
Portugal	Laboratório Nacional de Energia e Geologia	LNEG
Portugal	Museu Nacional de Historia Natural	MNHN
Portugal	National Remote Sensing Centre	NRSC
Portugal	Universidade de Lisboa	CGUL
Portugal	Universitade dos Acores	UAC
Romania	National Meteorological Administration	NMA
Romania	University of Bucharest	UB
Russia	V.I.Il`ichev Pacific Oceanological Institute	VIIPOI
Russia	Atlantic Research institute of Marine fisheries and oceanography	AtlantNIRO
Russia	Geophysical Center of Russian Academy of Sciences	GC RAS
Russia	Russia HycroMetCenter	RHMC
Russia	Kaliningrad State Technical University	KLGTU – KSTU
Russia	Murmansk Marine Biological Institute	MMBI
Russia	Nansen International Environmental and Remote Sensing Center	NIERSC
Russia	Russia State Hydrometeorological University	RSHU
Russia	Shirshov Institute of Oceanology RAS	SIO RAS
Russia	SRC PLANETA Roshydromet	PLANETA
Russia	State research Center Planeta	SRC

Russia	V.I.Il`ichev Pacific Oceanological Institute	POI FEB RAS
Scotland	University of Edinburgh	Edin-Univ
Senegal	Centre de Recherches Océanographiques de Dakar-Thiaroye	CRODT
Senegal	Ecole Supérieure Polytechnique de Dakar	ESP/UCAD
Singapore	Terra Weather Pte. Ltd.	TERRAWX
Slovenia	Slovenian Environment Agency	SEA
South Africa	Kaytad Fishing Company	KFC
South Africa	Marine and Coastal Management	MCM
South Africa	South African Weather Service-Cape Town Regional Office	SAWS
Spain	Basque Meteorology Agency	EUSKALMET
Spain	Fundacion Centro de Estudios Ambientales del Mediterraneo	CEAM
Spain	Isocero.com	ISOCERO
Spain	Instituto Català de Ciències del Clima	IC3
Spain	Instituto de Ciències del Mar	ICM
Spain	Instituto d'Estudis Espacials de Catalunya	IEEC
Spain	Instituto Canario de Ciencias Marinas	ICCM
Spain	Instituto de Hidráulica Ambiental de Cantabria – Universidad de Cantabria	IH
Spain	Instituto Español de Oceanografia	IEO
Spain	Instituto Mediterraneo de Estudios Avanzados	IMEDEA (CSIC-UIB)
Spain	Instituto Nacional de Meteorologia	INM
Spain	Instituto Nacional de Pesquisas Espaciais	INPE
Spain	Instituto Nacional de Tecnica Aeroespacial	INTA
Spain	MeteoGalicia – Departamento de Climatología y Observación	Meteogalicia
Spain	MINISTERIO DEFENSA – ARMADA ESPAÑOLA	MDEF/ESP NAVY – IHM
Spain	Museo Nacional de Ciencias Naturales – Consejo Superior de Investigaciones Cientificas	MNCN-CSIC
Spain	Starlab Barcelona sl.	STARLAB BA
Spain	Universidad Autonoma de Madrid	UAM
Spain	Universidad de Las Palmas de Gran Canaria	ULPGC
Spain	Universidad de Oviedo	UdO
Spain	Universidad Politécnica de Madrid	UPM
Spain	Universidad de Valencia	UV
Spain	Universidad de Valladolid	LATUV
Spain	University of Jaén	UJA
Spain	University of Vigo	CACTI
Spain	Vortex	VORTEX
Sweden	Chalmers University of Technology	CHALMERS
Sweden	Department of Earth Science, Uppsala University	DES-UU
Sweden	Stockholm University	SU
Sweden	Swedish Meteorological and Hydrological Institute	SMHI
Switzerland	Tecnavia S.A.	Tecnavia S.A.
Switzerland	World Meteorological Organization	WMO
Taiwan	Taiwan Ocean Research Institute	TORI
Taiwan	Fisheries Research Institute	FRI
Taiwan	Institute of Amos Physics, NCU ,Taiwan	ATM/NCU
Taiwan	National Central University	NCU/TAIWAN
Taiwan	Taiwan Ocean Research Institute	TORI
Taiwan	Taiwan Typhoon and Flood Research Institute	TTFRI
Turkey	Istanbul Technical University	YE
Turkey	Türkish State Meteorological Services	TSMS
Ukraine	Marine Hydrophysical Institute	MHI
Ukraine	World Data Center for Geoinformatics and Sustainable Development	WDCGSD

United Kingdom	Asgard Consulting Limited	Asgard
United Kingdom	Department of Zoology, University of Oxford	UOO
United Kingdom	ECMWF	ECMWF
United Kingdom	ExactEarth Europe Ltd	EEE
United Kingdom	Flag Officer Sea Training - Hydrography and Meteorology	FOST HM
United Kingdom	Flasse Consulting Ltd	FCL
United Kingdom	GL Noble Denton	GLND
United Kingdom	Imperial College of London	ICL
United Kingdom	National Oceanography Centre, Southampton	NOCS
United Kingdom	National Renewable Energy Centre	NAREC
United Kingdom	Plymouth Marine Laboratory	PML
United Kingdom	Terradat	TDAT
United Kingdom	Telespazio VEGA	VEGA
United Kingdom	The Scottish Association for Marine Science	SAMS
United Kingdom	UK Met Office	UKMO
United Kingdom	University of East Anglia	UEA
United Kingdom	University of Leicester	UoL
United Kingdom	University of Plymouth	UOP
United Kingdom	University of Southampton	UoS
United Kingdom	Weatherquest Ltd	Weatherquest
Uruguay	DIRECCIÃ“N NACIONAL DE RECURSOS ACUÃ□TICOS	DNRA
USA	Alaska Department Of Fish and Game	ADFG
USA	Applied Weather Technology	AWT
USA	Atmospheric and Environmental Research	AER
USA	AWS Truepower	AWS
USA	Berkeley Earth Surface Temperature	BEST
USA	Center for Ocean-Atmosphere Prediction Studies	COAPS
USA	Clemson University	CU
USA	Colorado State University	CSU
USA	Cooperative Institute for Meteorological Studies	CIMSS
USA	Cooperative Institute for Research Environmental Sciences	CIRES
USA	Darmouth College	Dartmouth College
USA	Dept. of Environmental Conservation , Skagit Valley College	SVC
USA	Earth & Space Research	ESR
USA	Haskell Indian Nations University	INU
USA	International Pacific Research Institute - Univ. of Hawaii	IPRC
USA	Jet Propulsion Laboratory	JPL
USA	Joint Typhoon Warning Center	JTWC
USA	Locheed martin Corporation	LMCO
USA	NASA Langley Research Center, Affiliation Analytical Services and Materials, Inc.	NASA LaRC
USA	National Oceanic and Atmospheric Administration	NOAA/NESDIS
USA	Naval Postgraduate School	NPS
USA	Roffer's Ocean Fishing Forecasting Service	ROFFS
USA	Scripps Institution of Oceanography	SIO
USA	Stanford Research Institute International	SRI
USA	Starpath School of Navigation	Starpath
USA	Texas A&M University	TAMU
USA	Texas Commission on Environmental Quality	TCEQ
USA	Tuskegee University	TU
USA	United States Navy	USN
USA	University at Albany-SUNY	UAlbany
USA	University of Maryland	UMCP

USA	University of Miami	RSMAS MPO
USA	University of South Carolina	USC
USA	University of South Florida	USF
USA	University of Washington	UW
USA	Weather Routing Inc.	WRI
USA	Woods Hole Oceanographic Institution	WHOI
Venezuela	Escuela de Ingeniería Eléctrica Universidad	EIEU
Vietnam	Vietnam National Center for Hydro-Meteorological Forecast	NCHMF

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

Moreover are registered 18 individual users, i.e. persons independent from any institute, establishment or company.

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

The following graph illustrates the evolution of sessions on the OSI SAF central Web Site.

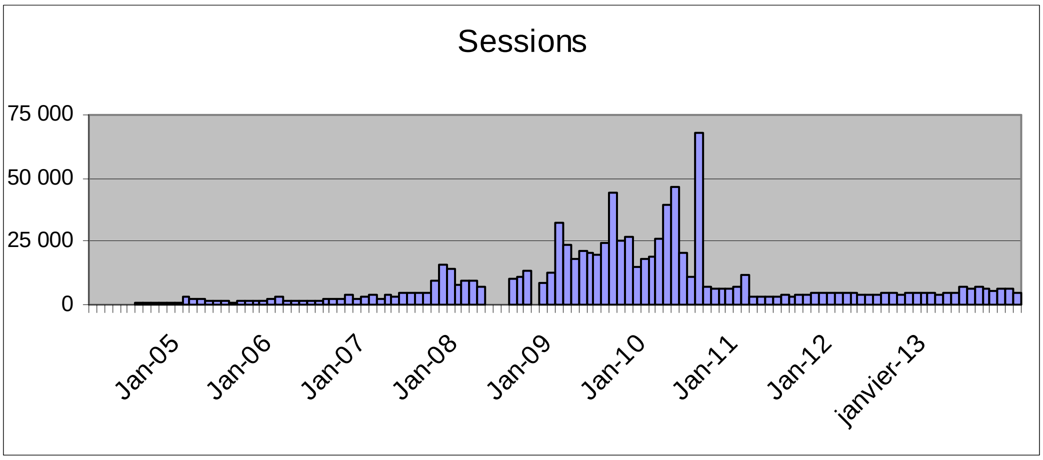


Figure 71 : Evolution of sessions on the central OSI SAF Web Site from April 2004 to December 2013.

Comment : The number of sessions have increased in July and October.

The following figures illustrate the usage of the OSI SAF central Web Site by country and by month :

Domains/Countries		Pages	Hits	Bandwidth
France	fr	16480	17684	114.40 MB
Unknown	ip	14475	17486	131.15 MB
Network	net	4260	5418	13.88 MB
Japan	jp	2469	2753	2.35 MB
Commercial	com	2277	2665	5.88 MB
Italy	it	1232	1454	1.60 MB
Netherlands	nl	1136	1441	4.60 MB
International	int	709	975	872.82 KB
Sweden	se	585	697	319.60 KB
Germany	de	548	753	418.78 KB
Others		5727	7429	16.68 MB

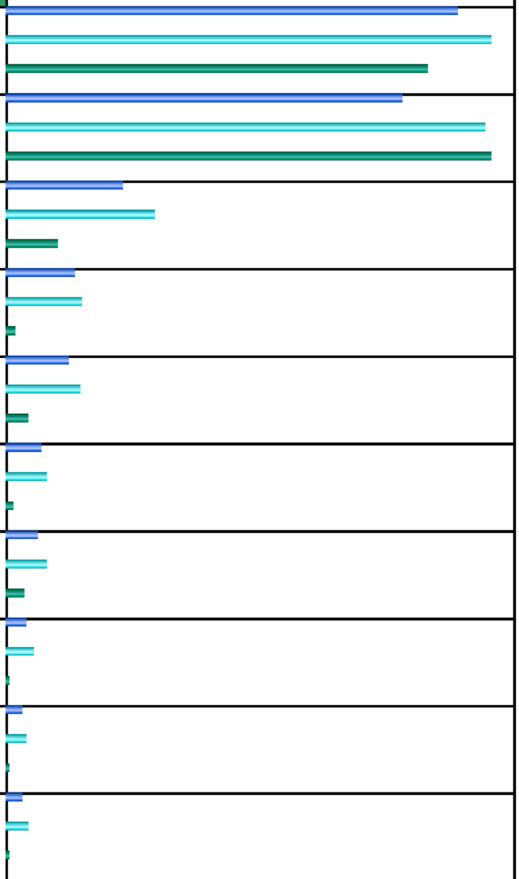


Figure 72 : Usage of the OSI SAF central Web Site by country in JULY 2013.

Domains/Countries		Pages	Hits	Bandwidth
France	fr	13684	14604	124.68 MB
Unknown	ip	11323	14057	72.28 MB
Network	net	5388	7353	5.50 MB
Commercial	com	3532	4333	11.48 MB
International	int	1175	1343	962.72 KB
Netherlands	nl	961	1233	4.52 MB
Germany	de	926	1275	716.94 KB
Japan	jp	844	919	1.35 MB
Italy	it	776	893	1.25 MB
USA Educational	edu	626	786	6.65 MB
Others		7286	9794	14.24 MB

Figure 73 : Usage of the OSI SAF central Web Site by country in AUGUST 2013.

Domains/Countries		Pages	Hits	Bandwidth
France	fr	16747	18103	128.10 MB
Unknown	ip	8604	10701	45.14 MB
Network	net	3851	5404	8.70 MB
Commercial	com	2169	2644	3.04 MB
Netherlands	nl	1328	1637	4.89 MB
Germany	de	1245	1771	1.19 MB
Japan	jp	1182	1285	1.70 MB
International	int	975	1384	672.87 KB
Norway	no	737	1042	458.18 KB
Greece	gr	642	878	8.25 MB
Others		6568	8696	15.57 MB

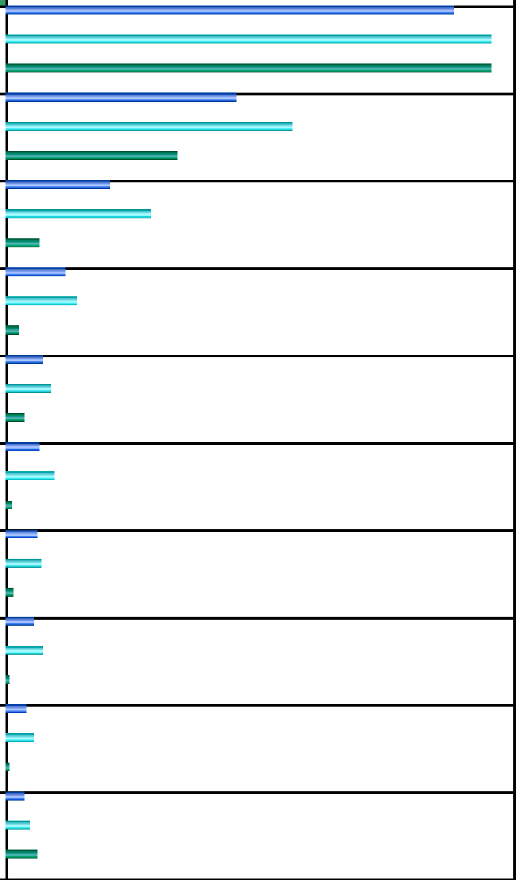


Figure 74 : Usage of the OSI SAF central Web Site by country in SEPTEMBER 2013.

Domains/Countries		Pages	Hits	Bandwidth
France	fr	16956	18238	164.12 MB
Unknown	ip	9936	12624	32.56 MB
Network	net	5288	7081	26.68 MB
Commercial	com	1810	2217	3.08 MB
Netherlands	nl	1613	1973	5.16 MB
International	int	1220	1642	854.77 KB
Sweden	se	1191	1619	999.25 KB
Greece	gr	1091	1435	2.14 MB
Japan	jp	987	1177	2.53 MB
Belgium	be	896	1227	546.92 KB
Others		7840	10188	24.01 MB

Figure 75 : Usage of the OSI SAF central Web Site by country in OCTOBER 2013.

Domains/Countries		Pages	Hits	Bandwidth	
France	fr	17764	19175	143.89 MB	
Unknown	ip	9762	12236	14.73 MB	
Network	net	3628	4859	10.17 MB	
Germany	de	1766	2344	1.26 MB	
Netherlands	nl	1368	1668	5.06 MB	
Greece	gr	1178	1512	1.46 MB	
Commercial	com	1152	1367	2.46 MB	
Sweden	se	924	1200	497.98 KB	
International	int	821	1143	599.11 KB	
Belgium	be	663	898	1.46 MB	
Others		7038	9249	17.96 MB	

Figure 76 : Usage of the OSI SAF central Web Site by country in NOVEMBER 2013.

Domains/Countries		Pages	Hits	Bandwidth
France	fr	13907	14996	146.28 MB
Unknown	ip	7660	9861	25.84 MB
Network	net	2270	3109	9.95 MB
Germany	de	1314	1712	941.03 KB
Commercial	com	1139	1354	4.89 MB
Netherlands	nl	948	1131	4.73 MB
Greece	gr	786	993	767.82 KB
USA Government	gov	733	839	525.95 KB
Sweden	se	596	853	358.58 KB
Japan	jp	571	649	435.52 KB
Others		6785	8693	22.79 MB

Figure 77 : Usage of the OSI SAF central Web Site by country in DECEMBER 2013.

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

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

Reference	Date	Subject	Status
130011	03/07/2013	User report on anomaly with Sea Ice concentration data	Closed
130012	16/07/2013	Request for archive of satellite images in Alaska region	Closed
130013	17/07/2013	Request of information on Metop MGR SST product	Closed
130014	13/08/2013	Request for archive of Wind data	Closed
130015	29/08/2013	Request for archive of ASCAT 12.5 km wind	Closed
130016	09/09/2013	User report on problem with IFREMER ftp access	Closed
130017	13/09/2013	Request of information on Sea Ice edge products	Closed
130018	16/09/2013	Request of information on ASCAT wind products	Closed
130019	14/10/2013	Request for archive of ASCAT wind data	Closed
130020	04/11/2013	Request for archive of Wind data	Closed
130021	08/11/2013	Request for IFREMER ftp access rights	Closed
130022	15/11/2013	Request for IFREMER ftp access rights	Closed
130023	05/12/2013	User report on problem with IFREMER ftp rights	Closed
130024	10/12/2013	Request for archive of ASCAT 25 km wind	Closed

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

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

reference	Date	subject	status
300024008	07/11/2013	User report on problem with Sea Ice drift data	Closed

table 31 : Status of requests from EUMETSAT Help Desk.

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

The following graph illustrates the evolution of sessions on the HL OSI SAF Sea Ice portal (http://saf.met.no/).

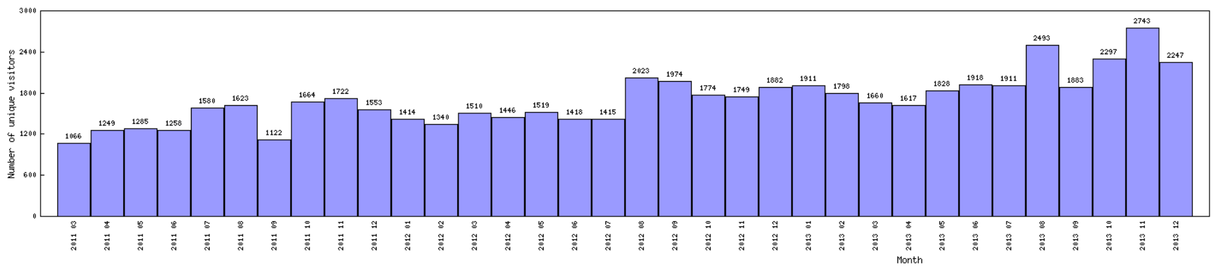


Figure 78 : Evolution of sessions and visitors on the HL OSI SAF Sea Ice portal from MARCH 2011 to DECEMBER 2013 (http://osisaf.met.no).

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 December 2013. Only external sessions (from outside KNMI) are counted.

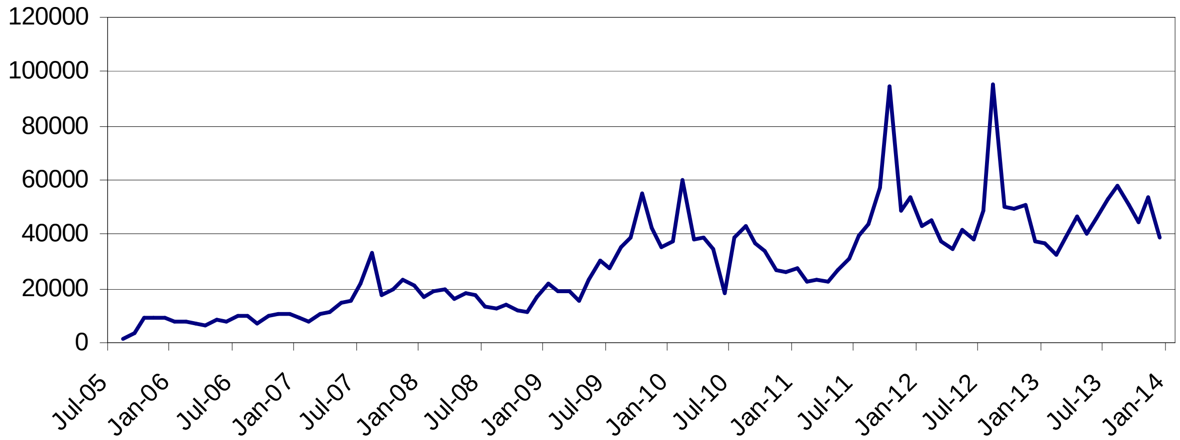


Figure 79 : Number of page views on KNMI scatterometer website per month.

At scat@knmi.nl, 117 Emails from 28 different addresses were received in the period Jun-Sep 2013, requesting wind data, processing software, and other support. For Oct-Dec 2013 an additional 154 Emails from 36 different addresses were received. This includes requests in the OSI SAF, the NWP SAF, and the EARS project. The total number of enquiries in this half year was 122, and 51 of them were identified as OSI SAF enquiries. All requests were acknowledged or answered within three working days.

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

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

Entity	Shortened name	Country
PO.DAAC Data Engineering Team		U.S.A.
ECMWF		U.K.
Satellite Observing Systems		U.K.
Météo France	M-F	France
School of Marine Science and Technology, Tokai University		Japan
Northwest Research Associates		U.S.A.
University of Washington		U.S.A.
Naval Hydrographic Service, Ministry of Defence		Argentina
Swedish Meteorological and Hydrological Institute	SMHI	Sweden
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

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

table 32 : List of registered Wind users at KNMI.

6.2 Statistics on the FTP sites use

6.2.1 Statistics on the SS1 ftp sites use

SST and Fluxes products are available on IFREMER FTP server. Most of 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.

6.2.1.1 Statistics on the IFREMER FTP server use

Number of OSI SAF products downloaded on IFREMER FTP server over 2nd half 2013						
	July 2013	Aug. 2013	Sept. 2013	Oct. 2013	Nov. 2013	Dec.2013
SST MAP +LML	5319	2380	3	0	0	2
SSI MAP +LML	171	155	0	0	0	0
DLI MAP +LML	165	43	0	0	1	0
METEOSAT SST	5946	4619	6315	8859	20767	5758
GOES-E SST	2108	2408	3086	2119	2711	3173
METEOSAT SSI	2	0	0	13	123	125
GOES-E SSI	31	26	25	34	152	156
METEOSAT DLI	719	24639	11084	2375	5876	3107
GOES-E DLI	0	0	0	84	3125	951
NARSST	1443	300	1132	1468	1207	709
MGR SST	270874	161212	126250	135865	172709	136600
GBL SST	279	82	58	50	81	80

table 33 : **Number of OSI SAF products downloaded on IFREMER FTP server over 2nd half 2013.**

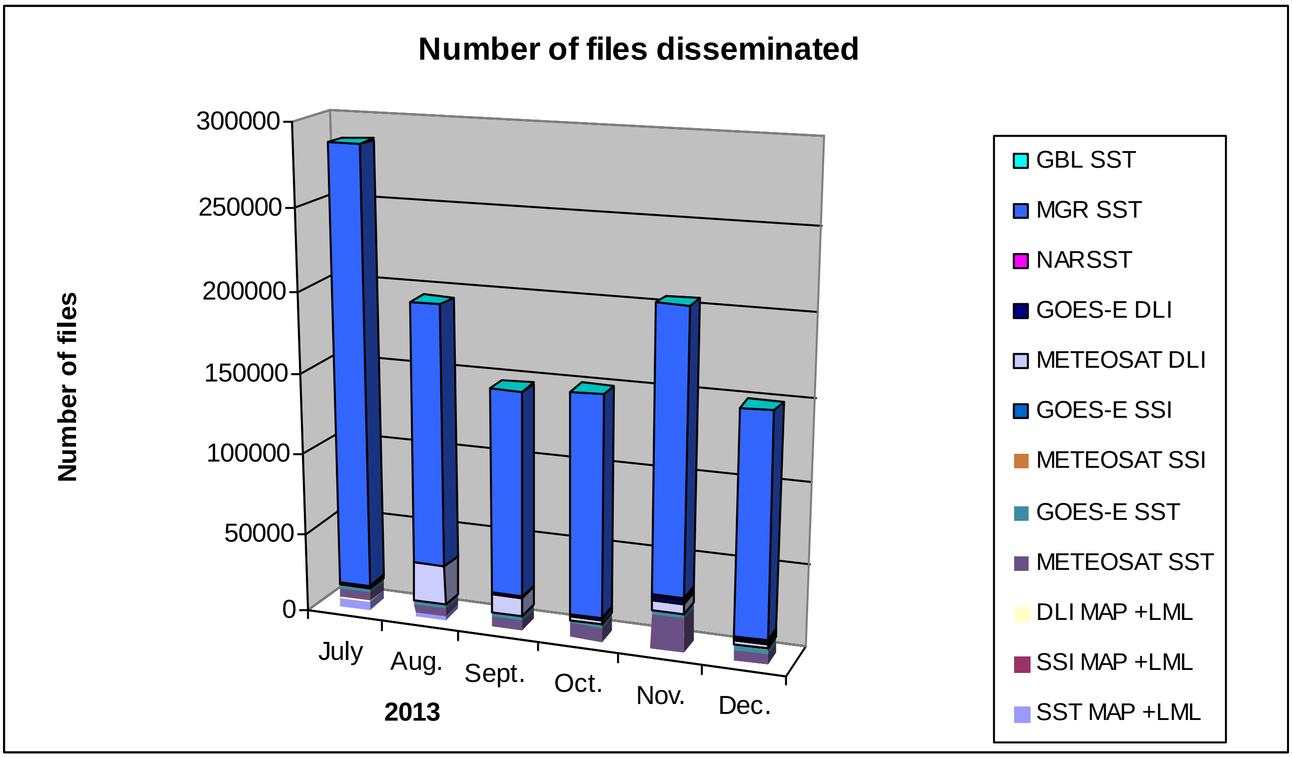


Figure 80 : **Number of OSI SAF products downloaded on IFREMER FTP server over 2nd half 2013.**

Volume of data downloaded by country (in Mb)						
	July 2013	Aug. 2013	Sept. 2013	Oct. 2013	Nov. 2013	Dec.2013
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A
N.A	N.A	N.A	N.A	N.A	N.A	N.A

table 34 : Volume of Data downloaded by country (in Mb) from IFREMER ftp server over 2nd half 2013.

IFREMER is not able to provide table 34 and figure 81 at this moment. An update will be done.

Figure 81 : Volume of Data downloaded by country (in Mb) from IFREMER ftp server over 2nd half 2013.

6.2.1.2 Statistics on the PODAAC FTP server use

Currently NAR SST, GLB SST, MGR SST and METEOSAT SST are archived at the PODAAC.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	90	2887,2	1238477
GLB SST	85	20,6	3640
NOAA-17 NAR SST	4	0	4
NOAA-18 NAR SST	61	0	114
NOAA-19 NAR SST	66	0	4932
Metop-A NAR SST	69	0	4066
METEOSAT SST	43	0	63
Total	418	2908	1 251 296

table 35 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in JULY 2013.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	88	302,1	239910
GLB SST	95	0,1	7104
NOAA-17 NAR SST	0	0	0
NOAA-18 NAR SST	25	0	35
NOAA-19 NAR SST	90	0	2553
Metop-A NAR SST	114	0	1764
METEOSAT SST	29	0	57
Total	441	302	251 423

table 36 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in AUGUST 2013.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	70	0,5	3517
GLB SST	87	0,7	3408
NOAA-17 NAR SST			
NOAA-18 NAR SST	43	0	570
NOAA-19 NAR SST	107	0	2757
Metop-A NAR SST	63	0	1212
METEOSAT SST	45	0	426
Total	415	1,2	11 890

table 37 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in SEPTEMBER 2013.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	125	6,1	9351
GLB SST	140	23,3	3201
NOAA-17 NAR SST	10	0	10
NOAA-18 NAR SST	33	0	50
NOAA-19 NAR SST	89	0	1905
Metop-A NAR SST	85	0	1456
METEOSAT SST	39	0	63
Total	521	29	16 036

table 38 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in OCTOBER 2013.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	154	0	3072
GLB SST	159	10,9	2809
NOAA-17 NAR SST	10	0	11
NOAA-18 NAR SST	72	0	122
NOAA-19 NAR SST	111	2,1	1151
Metop-A NAR SST	131	2,9	1108
METEOSAT SST	47	0	64
Total	684	16	8 337

table 39 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in NOVEMBER 2013.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	65	0,8	1971
GLB SST	81	5,1	1557
NOAA-17 NAR SST	5	0	5
NOAA-18 NAR SST	40	0	159
NOAA-19 NAR SST	67	2,1	1068
Metop-A NAR SST	71	2,8	1371
METEOSAT SST	42	0	157
Total	371	11	6 288

table 40 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in DECEMBER 2013.

6.2.2 Statistics on the SS2 ftp site use

The number of downloads of Sea Ice products from the OSI SAF Sea Ice FTP server are given in table below. The numbers include the ice concentration, ice edge and ice type product for each product area in GRIB and HDF5 format.

Month	Operational				Reprocessed Ice Conc
	Ice Conc	Ice Drift	Ice Edge	Ice Type	
July 2013	9408	3206	6541	7592	5476
Aug. 2013	35541	3042	6180	25645	109951
Sept. 2013	18602	1641	5754	12057	30853
Oct. 2013	51929	11128	9911	5717	78640
Nov. 2013	7388	5082	4942	14123	90972
Dec. 2013	17387	4792	6449	7235	58375

table 41 : Number of products downloaded from OSI SAF Sea Ice FTP server (ftp://osisaf.met.no).

The next figure shows the downloads sorted on domains.

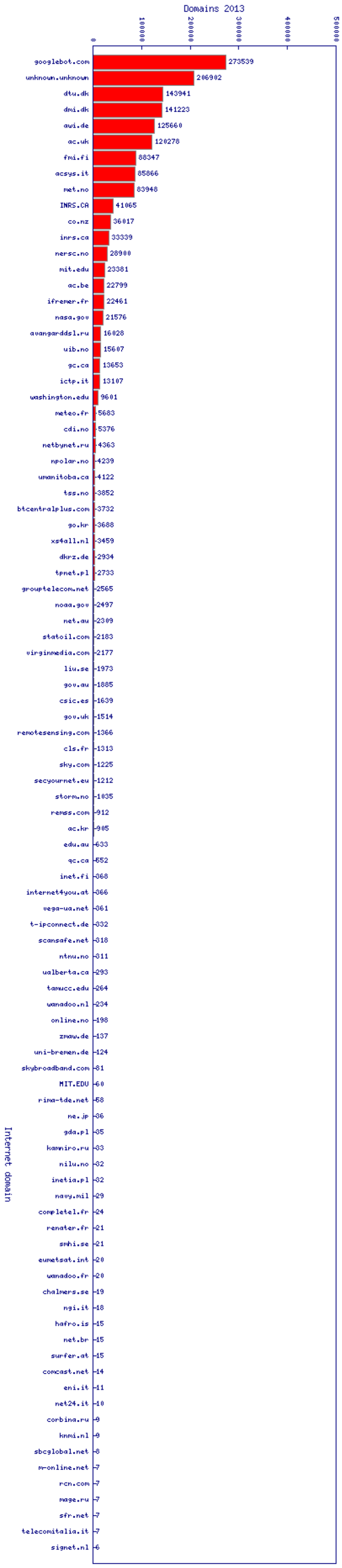

Domains 2013
0
100000
200000
300000
400000
500000
Internet domain
googlebot.com 273539
unknown.unknown 206982
dtu.dk 143941
dmi.dk 141223
awi.de 125660
ac.uk 120278
fmi.fi 88347
acsys.it 85866
met.no 83948
INRS.CA 41065
co.nz 36017
inrs.ca 33339
nersc.no 28900
mit.edu 23381
ac.be 22799
ifremer.fr 22461
nasa.gov 21576
avangarddsl.ru 16028
uib.no 15607
gc.ca 13653
ictp.it 13107
washington.edu 9601
meteo.fr 5683
cdi.no 5376
netbynet.ru 4363
npolar.no 4239
umanitoba.ca 4122
tss.no 3852
btcentralplus.com 3732
go.kr 3688
xs4all.nl 3459
dkrz.de 2934
tpnet.pl 2733
grouptelecom.net 2565
noaa.gov 2497
net.au 2309
statoil.com 2183
virginmedia.com 2177
liu.se 1973
gov.au 1885
csic.es 1639
gov.uk 1514
remotesensing.com 1366
cls.fr 1313
sky.com 1225
secyournet.eu 1212
storm.no 1035
remss.com 912
ac.kr 905
edu.au 633
qc.ca 552
inet.fi 368
internet4you.at 366
vega-ua.net 361
t-ipconnect.de 332
scansafe.net 318
ntnu.no 311
ualberta.ca 293
tamucc.edu 264
wanadoo.nl 234
online.no 198
zmaw.de 137
uni-bremen.de 124
skybroadband.com 81
MIT.EDU 60
rima-tde.net 58
ne.jp 36
gda.pl 35
kamniro.ru 33
nilu.no 32
inetia.pl 32
navy.mil 29
completel.fr 24
renater.fr 21
smhi.se 21
eumetsat.int 20
wanadoo.fr 20
chalmers.se 19
ngi.it 18
hafro.is 15
net.br 15
surfer.at 15
comcast.net 14
eni.it 11
net24.it 10
corbina.ru 9
knmi.nl 9
sbcglobal.net 8
m-online.net 7
rcn.com 7
mage.ru 7
sfr.net 7
teleconitalia.it 7
signet.nl 6

Figure 82 : FTP downloads of sea ice products (> 5) sorted on domains for JANUARY to DECEMBER 2013.

6.2.3 Statistics on the SS3 ftp site use

KNMI keeps statistics of the retrieval of wind products of its FTP server. The table below shows the number of downloads per product file in near-real time. Note that the BUFR products are also disseminated through EUMETCast.

We also receive statistics from PO.DAAC on the number of downloads of the historic ASCAT wind products in NetCDF format from their archive, these statistics are also shown in the table. Since PO.DAAC contains the complete archive of ASCAT data since the beginning of their dissemination, we assume that most of these users are using the data for climate studies.

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

OSI SAF product	Number of downloads per file on KNMI FTP (BUFR	Number of downloads per file on KNMI FTP (NetCDF)	Number of downloads from PO.DAAC archive
ASCAT-A 25km	22	35	440,344 files by 187 users (Jul-Sep) 479,971 files by 177 users (Oct-Dec)
ASCAT-A 12.5km	20	35	320,897 files by 281 users (Jul-Sep) 374,642 files by 338 users (Oct-Dec)
ASCAT-A Coastal	10	19	190,434 files by 150 users (Jul-Sep) 102,779 files by 131 users (Oct-Dec)
ASCAT-B 25km	19	25	93,621 files by 85 users (Jul-Sep) 73,496 files by 60 users (Oct-Dec)
ASCAT-B Coastal	13	12	66,309 files by 70 users (Jul-Sep) 30,188 files by 41 users (Oct-Dec)
OSCAT 50km	15	27	

table 42 : Statistics of the OSI SAF products downloaded on the KNMI FTP server and from PO.DAAC.

6.3 Statistics from EUMETSAT central facilities

6.3.1 Users from EUMETCast

Here below the list of the OSI SAF users identified by EUMETSAT for the distribution by EUMETCast. The table 43 shows the overall number of OSI SAF users by country at 13 August 2013. In clear green, the countries with the greatest numbers of users.

Country	EUMETCast users	Country	EUMETCast users
Algeria	3	Iran, Islamic Republic Of	2
Angola	2	Iraq	1
Argentina	1	Ireland	6
Armenia	1	Isle Of Man	1
Austria	17	Israel	6
Bahrain	1	Italy	243
Belgium	8	Jordan	1
Benin	1	Kazakhstan	1
Bosnia And Herzegovina	1	Kenya	9
Botswana	3	Kuwait	1
Brazil	37	Latvia	1
Bulgaria	1	Lebanon	2
Burkina Faso	2	Lesotho	2
Burundi	2	Liberia	2
Cameroon	2	Libyan Arab Jamahiriya	1
Canada	1	Lithuania	1
Cape Verde	2	Luxembourg	1
Central African Republic	2	Macedonia	1
Chad	3	Madagascar	3
China	2	Malawi	2
Comoros	2	Mali	2
Congo	2	Malta	2
Democratic Republic Of The Congo	4	Martinique	1
Cote D'Ivoire	4	Mauritania	2
Croatia	2	Mauritius	7
Cyprus	1	Moldova, Republic Of	1
Czech Republic	13	Morocco	4
Denmark	4	Mozambique	4
Djibouti	2	Namibia	5
Dominican Republic	1	Netherlands	27
Egypt	3	Niger	6
El Salvador	1	Nigeria	3
Equatorial Guinea	2	Norway	4
Eritrea	2	Oman	1
Estonia	3	Peru	1
Ethiopia	5	Poland	8
Finland	5	Portugal	5
France	45	Qatar	2
Gabon	2	Reunion	1
Gambia	2	Romania	4
Germany	90	Russian Federation	5

Ghana	6	Rwanda	5
Greece	9	San Marino	1
Guinea	2	Sao Tome & Principe	2
Guinea-Bissau	2	Saudi Arabia	2
Haiti	1	Senegal	6
Hungary	6	Serbia	3
Iceland	1	Seychelles	2
India	1	Sierra Leone	2

Country	EUMETCast users
Slovakia	4
Slovenia	1
Somalia	1
South Africa	20
Spain	43
Sudan	3
Swaziland	2
Sweden	3
Switzerland	12
Syrian Arab Republic	1
Tanzania, United Republic Of	3
Togo	2
Tunisia	2
Turkey	4
Uganda	3
Ukraine	2
United Arab Emirates	5
United Kingdom	115
United States	6
Uzbekistan	1
Viet Nam	1
Yemen	1
Zambia	2
Zimbabwe	2

table 43 : Overall number of EUMETCast users by country at 13 August 2013.

6.3.2 Users and retrievals from UMARF

Orders Summary over the 2nd half 2013

The table 44 below lists the persons who download data from the EUMETSAT Data Center and the volume of the downloaded data in megabytes (MB) by month. In yellow, the users who have downloaded more than 1GB of data at least during a month.

User ID	July	August	September	October	November	December	TOTAL(MB)
mockorange		3567					**3567**
cyn713		51					**51**
juliafiga		13022	5572				**18594**
meadowdog			279			36	**315**
guifayin			4				**4**
thomas2			766				**766**
tic168			790		1494	1442	**3726**
YESUBABUV			1852				**1852**
TSMS_arc			32				**32**
amokrane			10491				**10491**
benedicto			360				**360**
UBIMET			14				**14**
aliercan					25132		**25132**
knownwhat					2469		**2469**
user_tpz						47	**47**
jumpingcc						994	**994**
transvalor						318	**318**
vallgren						13656	**13656**
TOTAL (MB)		**16640**	**20160**		**29095**	**16493**	**82388**

table 44 : Volume of data downloaded (in MB) by users and by month from UMARF over 2nd half 2013.

Ingestion Summary over the 2nd half 2013

The next tables list the expected and real received volume of OSI SAF products data as well as the received and missing percentage of data by month over the period. Expected values are calculated using the number of days in the month, and not taking into account if all the orbits/slots were produced or if they had the quality required for producing the related SAF products. Therefore these expected values and the derived percentages are just informative and they should not be taken as the real performance of the SAF ingestion.

If values are highlight in red, there was clearly an outage of products as well under the OSI SAF monthly target performance of 95% and if they are highlight in orange, the performance even below the target remains acceptable. Please note that due to some SAF products use a delayed (good 30 min delay) start- and end-sensing time to their relevant Level 0 product, some derived SAF products are shown in the following month, while their Level 0 product is shown in the month the product was received. This causes this more than 100% received columns (highlight in blue).

July 2013					
Products	**Expected**	**Received**	**% Received**	**Missing**	**% Missing**
Global Sea Ice Concentration (DMSP-F17)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (GOES-13)	744	744	100.00%	0	0.00%
ASCAT 25km Wind (Metop-B)	441	439	99.55%	2	0.45%
ASCAT 12.5km Coastal Wind (Metop-B)	441	440	99.77%	1	0.23%
ASCAT 12.5km Wind (Metop-A)	440	441	100.23%	-1	-0.23%
ASCAT 25km Wind (Metop-A)	440	441	100.23%	-1	-0.23%
ASCAT 12.5km Coastal Wind (Metop-A)	440	441	100.23%	-1	-0.23%
Global Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
NAR Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
AHL Downward Longwave Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
Global Sea Ice Drift (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Edge (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Type (Multi Mission)	62	62	100.00%	0	0.00%
AHL Surface Solar Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
AHL Sea Surface Temperature (Multi Mission)	62	60	96.77%	2	3.23%
Daily Downward Longwave Irradiance (MSG)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (MSG)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (MSG)	744	744	100.00%	0	0.00%
NAR Sea Surface Temperature (NOAA-19)	62	62	100.00%	0	0.00%
TOTAL	7348	7346	99.97%	2	0.03%

table 45 : **Expected and real received (plus % received/missing) volume of OSI SAF products data in JULY 2013.**

August 2013					
Products	**Expected**	**Received**	**% Received**	**Missing**	**% Missing**
Global Sea Ice Concentration (DMSP-F17)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (GOES-13)	744	744	100.00%	0	0.00%
ASCAT 25km Wind (Metop-B)	440	439	99.77%	1	0.23%
ASCAT 12.5km Coastal Wind (Metop-B)	440	440	100.00%	0	0.00%
ASCAT 12.5km Wind (Metop-A)	441	440	99.77%	1	0.23%
ASCAT 25km Wind (Metop-A)	441	440	99.77%	1	0.23%
ASCAT 12.5km Coastal Wind (Metop-A)	441	440	99.77%	1	0.23%
Global Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
NAR Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
AHL Downward Longwave Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
Global Sea Ice Drift (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Edge (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Type (Multi Mission)	62	62	100.00%	0	0.00%
AHL Surface Solar Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
AHL Sea Surface Temperature (Multi Mission)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (MSG)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (MSG)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (MSG)	744	726	97.58%	18	2.42%
NAR Sea Surface Temperature (NOAA-19)	62	62	100.00%	0	0.00%
TOTAL	7349	7327	99.70%	22	0.30%

table 46 : **Expected and real received (plus % received/missing) volume of OSI SAF products data in AUGUST 2013.**

September 2013

Products	Expected	Received	% Received	Missing	% Missing
Global Sea Ice Concentration (DMSP-F17)	60	60	100.00%	0	0.00%
Daily Downward Longwave Irradiance (GOES-13)	30	30	100.00%	0	0.00%
Daily Surface Solar Irradiance (GOES-13)	30	30	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (GOES-13)	720	717	99.58%	3	0.42%
Hourly Surface Solar Irradiance (GOES-13)	720	717	99.58%	3	0.42%
Hourly Sea Surface Temperature (GOES-13)	720	717	99.58%	3	0.42%
ASCAT 25km Wind (Metop-B)	426	427	100.23%	-1	-0.23%
ASCAT 12.5km Coastal Wind (Metop-B)	426	427	100.23%	-1	-0.23%
ASCAT 12.5km Wind (Metop-A)	426	426	100.00%	0	0.00%
ASCAT 25km Wind (Metop-A)	426	426	100.00%	0	0.00%
ASCAT 12.5km Coastal Wind (Metop-A)	426	426	100.00%	0	0.00%
Global Sea Surface Temperature (Metop-A)	60	60	100.00%	0	0.00%
NAR Sea Surface Temperature (Metop-A)	60	60	100.00%	0	0.00%
AHL Downward Longwave Irradiance (Multi Mission)	30	30	100.00%	0	0.00%
Global Sea Ice Drift (Multi Mission)	60	60	100.00%	0	0.00%
Global Sea Ice Edge (Multi Mission)	60	60	100.00%	0	0.00%
Global Sea Ice Type (Multi Mission)	60	60	100.00%	0	0.00%
AHL Surface Solar Irradiance (Multi Mission)	30	30	100.00%	0	0.00%
AHL Sea Surface Temperature (Multi Mission)	60	60	100.00%	0	0.00%
Daily Downward Longwave Irradiance (MSG)	30	30	100.00%	0	0.00%
Daily Surface Solar Irradiance (MSG)	30	30	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (MSG)	720	720	100.00%	0	0.00%
Hourly Surface Solar Irradiance (MSG)	720	720	100.00%	0	0.00%
Hourly Sea Surface Temperature (MSG)	720	719	99.86%	1	0.14%
NAR Sea Surface Temperature (NOAA-19)	60	59	98.33%	1	1.67%
TOTAL	7110	7101	99.87%	9	0.13%

table 47 : **Expected and real received (plus % received/missing) volume of OSI SAF products data in SEPTEMBER 2013.**

October 2013					
Products	**Expected**	**Received**	**% Received**	**Missing**	**% Missing**
Global Sea Ice Concentration (DMSP-F17)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (GOES-13)	744	743	99.87%	1	0.13%
ASCAT 25km Wind (Metop-B)	438	436	99.54%	2	0.46%
ASCAT 12.5km Coastal Wind (Metop-B)	438	436	99.54%	2	0.46%
ASCAT 12.5km Wind (Metop-A)	440	439	99.77%	1	0.23%
ASCAT 25km Wind (Metop-A)	440	440	100.00%	0	0.00%
ASCAT 12.5km Coastal Wind (Metop-A)	440	439	99.77%	1	0.23%
Global Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
NAR Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
AHL Downward Longwave Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
Global Sea Ice Drift (Multi Mission)	62	58	93.55%	4	6.45%
Global Sea Ice Edge (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Type (Multi Mission)	62	62	100.00%	0	0.00%
AHL Surface Solar Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
AHL Sea Surface Temperature (Multi Mission)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (MSG)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (MSG)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (MSG)	744	744	100.00%	0	0.00%
NAR Sea Surface Temperature (NOAA-19)	62	62	100.00%	0	0.00%
TOTAL	7342	7331	99.85%	11	0.15%

table 48 : **Expected and real received (plus % received/missing) volume of OSI SAF products data in OCTOBER 2013.**

November 2013					
Products	**Expected**	**Received**	**% Received**	**Missing**	**% Missing**
Global Sea Ice Concentration (DMSP-F17)	60	60	100.00%	0	0.00%
Daily Downward Longwave Irradiance (GOES-13)	30	30	100.00%	0	0.00%
Daily Surface Solar Irradiance (GOES-13)	30	30	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (GOES-13)	720	719	99.86%	1	0.14%
Hourly Surface Solar Irradiance (GOES-13)	720	719	99.86%	1	0.14%
Hourly Sea Surface Temperature (GOES-13)	720	718	99.72%	2	0.28%
ASCAT 25km Wind (Metop-B)	426	426	100.00%	0	0.00%
ASCAT 12.5km Coastal Wind (Metop-B)	426	426	100.00%	0	0.00%
ASCAT 12.5km Wind (Metop-A)	424	423	99.76%	1	0.24%
ASCAT 25km Wind (Metop-A)	424	423	99.76%	1	0.24%
ASCAT 12.5km Coastal Wind (Metop-A)	424	423	99.76%	1	0.24%
Global Sea Surface Temperature (Metop-A)	60	60	100.00%	0	0.00%
NAR Sea Surface Temperature (Metop-A)	60	60	100.00%	0	0.00%
AHL Downward Longwave Irradiance (Multi Mission)	30	30	100.00%	0	0.00%
Global Sea Ice Drift (Multi Mission)	60	60	100.00%	0	0.00%
Global Sea Ice Edge (Multi Mission)	60	60	100.00%	0	0.00%
Global Sea Ice Type (Multi Mission)	60	60	100.00%	0	0.00%
AHL Surface Solar Irradiance (Multi Mission)	30	30	100.00%	0	0.00%
AHL Sea Surface Temperature (Multi Mission)	60	60	100.00%	0	0.00%
Daily Downward Longwave Irradiance (MSG)	30	30	100.00%	0	0.00%
Daily Surface Solar Irradiance (MSG)	30	30	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (MSG)	720	719	99.86%	1	0.14%
Hourly Surface Solar Irradiance (MSG)	720	719	99.86%	1	0.14%
Hourly Sea Surface Temperature (MSG)	720	719	99.86%	1	0.14%
NAR Sea Surface Temperature (NOAA-19/NPP)	60	60	100.00%	0	0.00%
TOTAL	7104	7094	99.86%	10	0.14%

table 49 : **Expected and real received (plus % received/missing) volume of OSI SAF products data in NOVEMBER 2013.**

December 2013					
Products	**Expected**	**Received**	**% Received**	**Missing**	**% Missing**
Global Sea Ice Concentration (DMSP-F17)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (GOES-13)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (GOES-13)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (GOES-13)	744	744	100.00%	0	0.00%
ASCAT 25km Wind (Metop-B)	441	441	100.00%	0	0.00%
ASCAT 12.5km Coastal Wind (Metop-B)	441	441	100.00%	0	0.00%
ASCAT 12.5km Wind (Metop-A)	440	440	100.00%	0	0.00%
ASCAT 25km Wind (Metop-A)	440	440	100.00%	0	0.00%
ASCAT 12.5km Coastal Wind (Metop-A)	440	440	100.00%	0	0.00%
Global Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
NAR Sea Surface Temperature (Metop-A)	62	62	100.00%	0	0.00%
AHL Downward Longwave Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
Global Sea Ice Drift (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Edge (Multi Mission)	62	62	100.00%	0	0.00%
Global Sea Ice Type (Multi Mission)	62	62	100.00%	0	0.00%
AHL Surface Solar Irradiance (Multi Mission)	31	31	100.00%	0	0.00%
AHL Sea Surface Temperature (Multi Mission)	62	62	100.00%	0	0.00%
Daily Downward Longwave Irradiance (MSG)	31	31	100.00%	0	0.00%
Daily Surface Solar Irradiance (MSG)	31	31	100.00%	0	0.00%
Hourly Downward Longwave Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Surface Solar Irradiance (MSG)	744	744	100.00%	0	0.00%
Hourly Sea Surface Temperature (MSG)	744	744	100.00%	0	0.00%
NAR Sea Surface Temperature (NPP)	62	61	98.39%	1	1.61%
TOTAL	7348	7347	99.99%	1	0.01%

table 50 : Expected and real received (plus % received/missing) volume of OSI SAF products data in DECEMBER 2013.

7 Training

Marine Forecasting Course, EUMETRAIN, lecture 1 on scatterometry, Nov 2013, http://eumetrain.org/courses/marine_forecasting_2013.html
by Ad Stoffelen.

Pilot course on the use of satellite winds and wave data for marine safety forecasting in African waters, SAWS, Pretoria, 9-13 Dec 2013,
http://training.eumetsat.int/enrol/index.php?id=196,
http://training.eumetsat.int/course/view.php?id=196
by Ad Stoffelen.

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 (www.osi-saf.org).

Name of the Document	Reference	Latest versions	date
OSI SAF Half-Yearly Operations Report for 1st half 2013	SAF/CDOP2/M-F/TEC/RP/331	1.0	July 2013
EUMETSAT - OSISAF Joint Operations Procedure	EUM/OPS/ICD/04/0201	7.0	September 2013
50GHz Sea Ice Emissivity Product User Manual	SAF/OSI/CDOP2/DMI/TEC/MA/191	1.3	September 2013
Geostationary Sea Surface Temperature Product User Manual	SAF/OSI/CDOP/M-F/TEC/MA/181	1.3	October 2013
Low Earth Orbiter Sea Surface Temperature Product User Manual	SAF/OSI/CDOP/M-F/TEC/MA/127	2.5	October 2013
Status Report n°4, for CDOP2 SG03	SAF/OSI/CDOP2/M-F/MGT/RP/2-014	1.0	October 2013
OSI SAF CDOP2 Project Plan	SAF/OSI/CDOP2/M-F/MGT/PL/2-005	1.1	November 2013
OSI SAF CDOP2 Master Schedule	SAF/OSI/CDOP2/M-F/MGT/PL/2-007	1.0	November 2013
OSI SAF CDOP-2 Product Requirement Document	SAF/OSI/CDOP2/M-F/MGT/PL/2-001	2.3	November 2013
OSI SAF CDOP-2 Service Specification Document	SAF/OSI/CDOP2/M-F/MGT/PL/2-003	2.1	December 2013
Minutes of the 4th CDOP2 Steering Group meeting	SAF/OSI/CDOP2/M-F/MGT/RP/2-104	1.0	December 2013

table 51 : Documentation updates.

Recent publications

Lin, W., M. Portabella, A. Stoffelen and A. Verhoef, *On the characteristics of ASCAT wind direction ambiguities,* Atmospheric Measurement Techniques, 2013, 6, 1053-1060, doi:10.5194/amt-6-1053-2013.

S. Marullo, R. Santoleri, D. Ciani, P. Le Borgne, S. Péré, N. Pinardi, M. Tonani, G. Nardone, 2014. *Combining model and geostationary satellite data to reconstruct hourly SST field over the Mediterranean Sea*, Remote Sensing of Environment, 146, 11-23.

Annex A : VISIBLE Calibration Update

The visible channel calibration of GOES-13 and METEOSAT-10 , which is used in the OSI SAF processing scheme, has been updated on October 9th 2013.

GOES-13 post-launch calibration at time t, R_{post} , is obtained from the pre-launch calibration, R_{pre}, by the following equation:

$$R_{post} = R_{pre}\, a \exp[\, b\, (t - t_0)\,]$$

With *a* *calibration correction at reference time* t_0

b radiometer drift

NOAA NESDIS deliver monthly values of a and b coefficients. The OSI SAF processing scheme has been updated with the values of September 2013.

At the EUMETSAT Conference 2013 in Vienna, Sébastien Wagner (EUMETSAT) has shown that the operational calibration of SEVIRI channel 0.6µm is underestimated by 7 to 8% for METEOSAT-8 and METEOSAT-9, compared to a more accurate method using MODIS AQUA as reference. A similar underestimation exists for METEOSAT-10. A corrective factor of 1.07 has been entered into the OSI SAF processing scheme.

The impact of these changes on the Surface Solar Irradiance product has been checked.

The SSI difference between GOES and METEOSAT is monitored on the common area centred at 37.5W. Then mean difference (figure 1 top) clearly shows a better agreement between GOES and METEOSAT after the calibration update.

The calibration update will impact the validation results on the long term (at least one year). For the last quarter of 2013, it is masked by the monthly variations induced by actual seasonal variations and changes in available stations, as shown on figure 2 top.

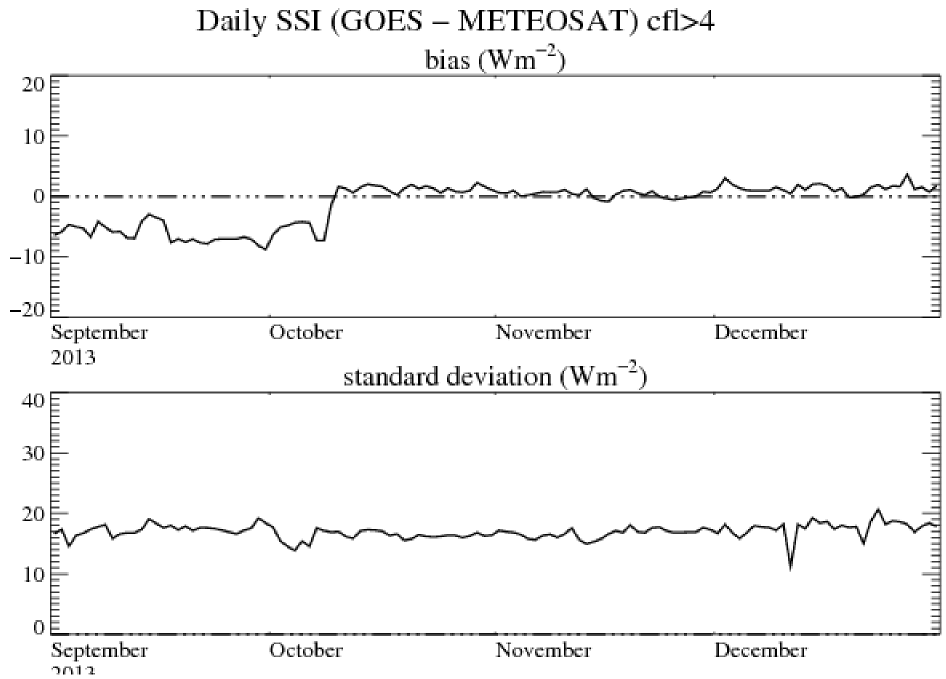


Figure 1 : Monitoring of GOES minus METOSAT daily SSI

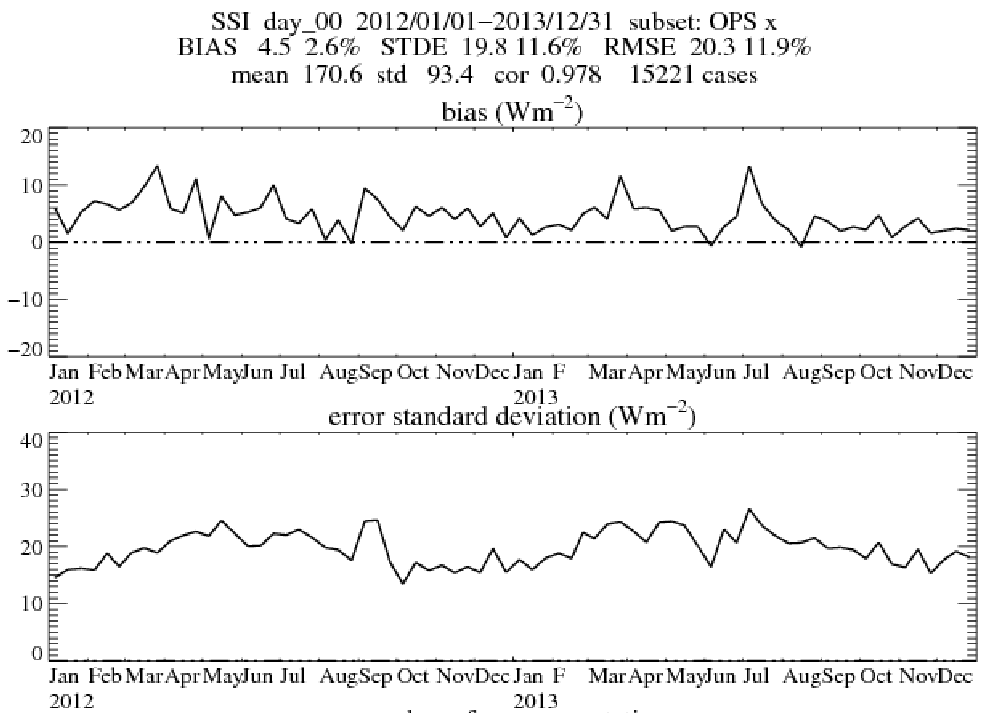


Figure 2 : Validation results of the daily SSI in 2012 and 2013.