

The EUMETSAT
Network of
Satellite Application
Facilities



OSI SAF

Ocean and Sea Ice

OSI SAF CDOP2

—

HALF-YEARLY OPERATIONS REPORT

—

2nd half 2012

—

Apr. 2013

—

version 1_1

Prepared by DMI, IFREMER, KNMI, Meteo-France and Met.no

Table of contents

1	Introduction	4
1.1	<i>Scope of the document</i>	4
1.2	<i>Products characteristics</i>	4
1.3	<i>Reference and applicable documents</i>	5
1.3.1	Applicable documents	5
1.3.2	Reference documents	5
1.4	<i>Definitions, acronyms and abbreviations.....</i>	5
2	OSI SAF products availability and timeliness.....	7
2.1	<i>Availability on FTP servers.....</i>	9
2.2	<i>Availability via EUMETCast.....</i>	12
3	Main anomalies, corrective and preventive measures.....	16
3.1	<i>At SS1</i>	16
3.2	<i>At SS2.....</i>	16
3.3	<i>At SS3.....</i>	17
4	Main events and modifications, maintenance activities	18
4.1	<i>At SS1</i>	18
4.2	<i>At SS2.....</i>	18
4.3	<i>At SS3.....</i>	18
5	OSI SAF products quality	19
5.1	<i>SST quality.....</i>	19
5.1.1	METEOSAT SST quality	19
5.1.2	GOES-E SST quality	28
5.1.3	NAR SST quality	36
5.1.4	GLB and MGR SST quality	50
5.1.5	AHL SST quality	55
5.2	<i>Radiative Fluxes quality</i>	57
5.2.1	DLI quality	57
5.2.2	SSI quality	59
5.3	<i>Sea Ice quality.....</i>	64
5.3.1	Validation results for the global sea ice concentration product	64
5.3.2	Validation results for the global sea ice edge product.....	73
5.3.3	Validation results for the global sea ice type product	78
5.3.4	Validation of the Low Resolution Sea Ice Drift product	79
5.4	<i>Global Wind quality</i>	81
5.4.1	Comparison with ECMWF model wind data	82
5.4.2	Buoy validations	87

6	Service and Product usage	89
6.1	<i>Statistics on the Web site and help desk.....</i>	<i>89</i>
6.1.1	Statistics on the central OSI SAF Web Site and help desk	89
6.1.2	Statistics on the OSI SAF Sea Ice Web portal and help desk	104
6.1.3	Statistics on the OSI SAF KNMI scatterometer web page and helpdesk	105
6.2	<i>Statistics on the FTP sites use</i>	<i>108</i>
6.2.1	Statistics on the SS1 ftp sites use	108
6.2.2	Statistics on the SS2 ftp site use.....	111
6.2.3	Statistics on the SS3 ftp site use.....	113
7	Training	114
8	Documentation update.....	115

1 Introduction

1.1 Scope of the document

The present report covers from the 1st of July to the 31th December 2012.

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.no and DMI, under M-F/CMS responsibility. It concerns SST and Radiative Fluxes products.

SS2 is the Production Sub-system 2 which involves met.no and DMI, under met.no 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.no	Norwegian Meteorological Institute
Metop	METeorological OPERational Satellite
M-F	Météo-France
MGR	Metagranule
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
SSM/I	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 2 nd half 2012																				
Month	ASCAT 25 km Wind	ASCAT 12.5 km Wind	ASCAT 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 Concentratio n	GBL Sea Ice Edge	GBL Sea Ice Type	GBL Low Res. Sea Ice Drift
July 2012	99.9	99.9	99.3	-	100	99.19	98.40	99.46	100	100	100	96.80	98.32	98.32	98.32	98.32	100	100	100	100
Aug. 2012	100	100	99.5	-	100	100	100	99.63	100	100	100	100	100	100	100	100	100	100	100	100
Sept. 2012	100	100	99.7	-	100	100	100	99.76	100	76.11	100	100	100	74.86	100	74.86	100	100	100	100
Oct. 2012	100	100	99.9	96.0	100	100	100	99.23	100	43.15	100	100	100	44.22	100	44.22	100	100	100	100
Nov. 2012	100	100	99.3	92.5	96.67	98.33	100	97.35	100	100	100	100	100	100	100	100	100	100	100	100
Dec. 2012	99.9	99.9	99.5	97.5	100	100	96.67	99.89	100	100	100	100	100	100	100	100	96.67	96.67	96.67	96.67

table 2 : Percentage of OSI SAF products available on the FTP servers within the specified time over 2nd half 2012.

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.

Comment : See anomaly details in section 3.

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 following graphs illustrate the evolution of the products availability over the past six months.

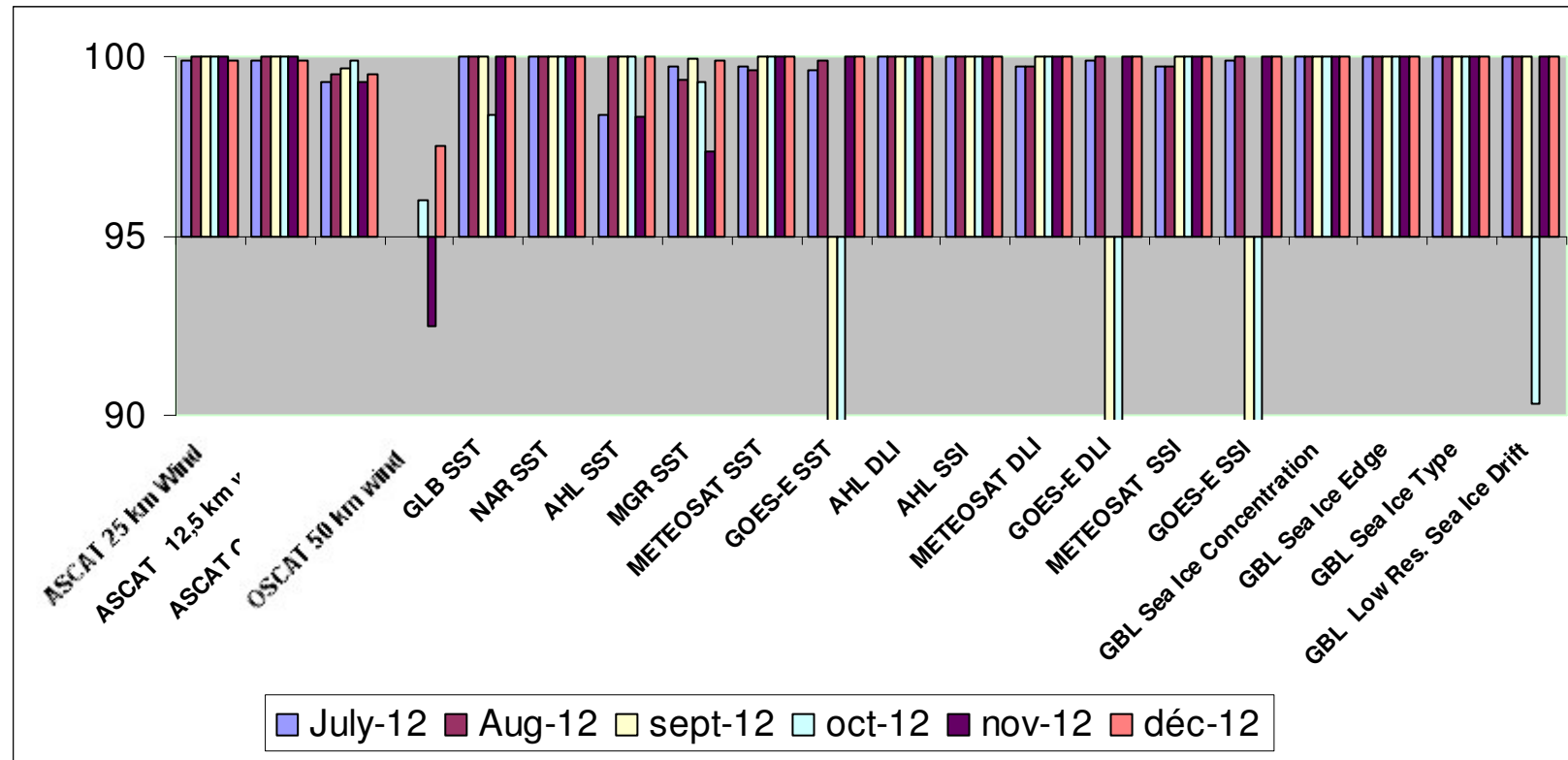


Figure 1 : Products availability on FTP servers for each product over the past six months.

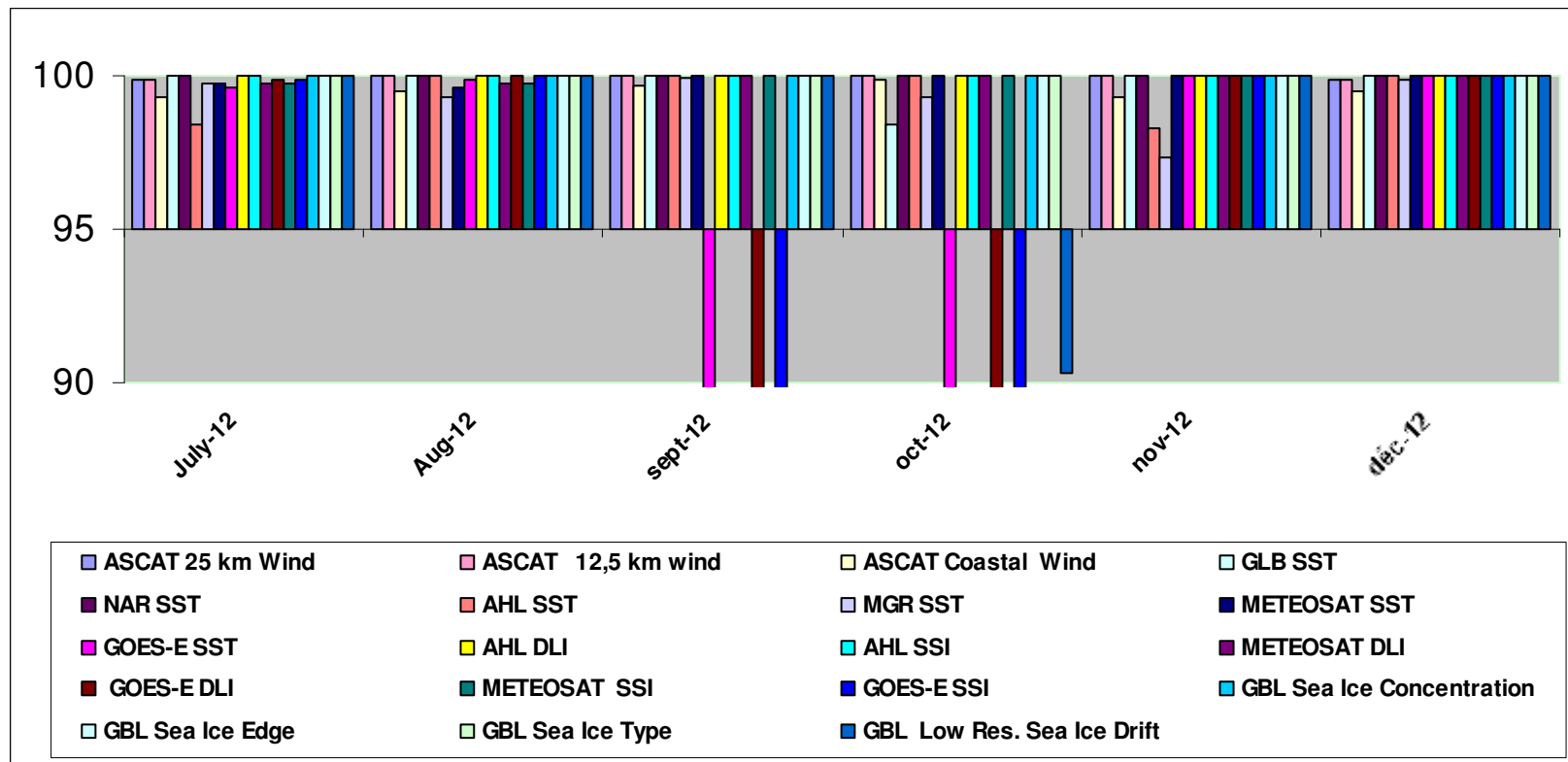


Figure 2 : Products availability on FTP servers over the past six months.

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 2 nd half 2012																				
Month	ASCAT 25 km Wind	ASCAT 12.5 km Wind	ASCAT 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 2012	99.9	99.9	99.3	-	100	100	98.40	99.74	99.73	99.60	100	100	99.74	99.87	99.74	99.87	100	100	100	100
Aug. 2012	100	100	99.5	-	100	100	100	99.33	99.60	99.87	100	100	99.74	100	99.74	100	100	100	100	100
Sept. 2012	100	100	99.7	-	100	100	100	99.96	100	76.39	100	100	100	76.53	100	76.53	100	100	100	100
Oct. 2012	100	100	99.9	96.0	98.39	100	100	99.27	100	43.15	100	100	100	43.35	100	43.35	100	100	100	90.32
Nov. 2012	100	100	99.3	92.5	100	100	98.30	97.36	100	100	100	100	100	100	100	100	100	100	100	100
Dec. 2012	99.9	99.9	99.5	97.5	100	100	100	99.89	100	100	100	100	100	100	100	100	100	100	100	100

table 3 : Percentage of OSI SAF products delivered via EUMETCast within the specified time over 2nd half 2012.

Comments:

See details in section 3.

The following graph illustrates the evolution of the products availability over the past six months.

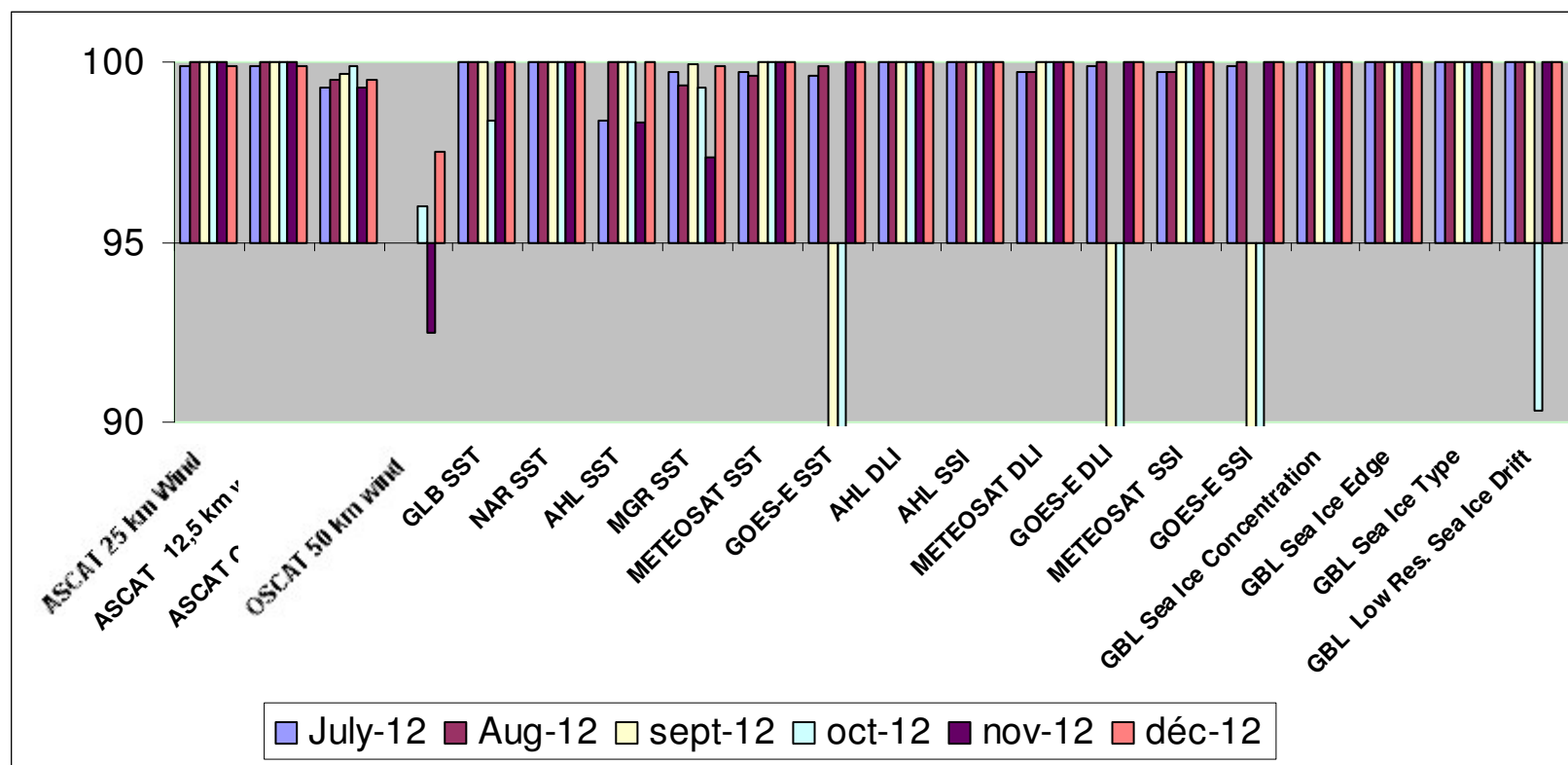


Figure 3 : Products availability via EUMETCast for each product over the past six months.

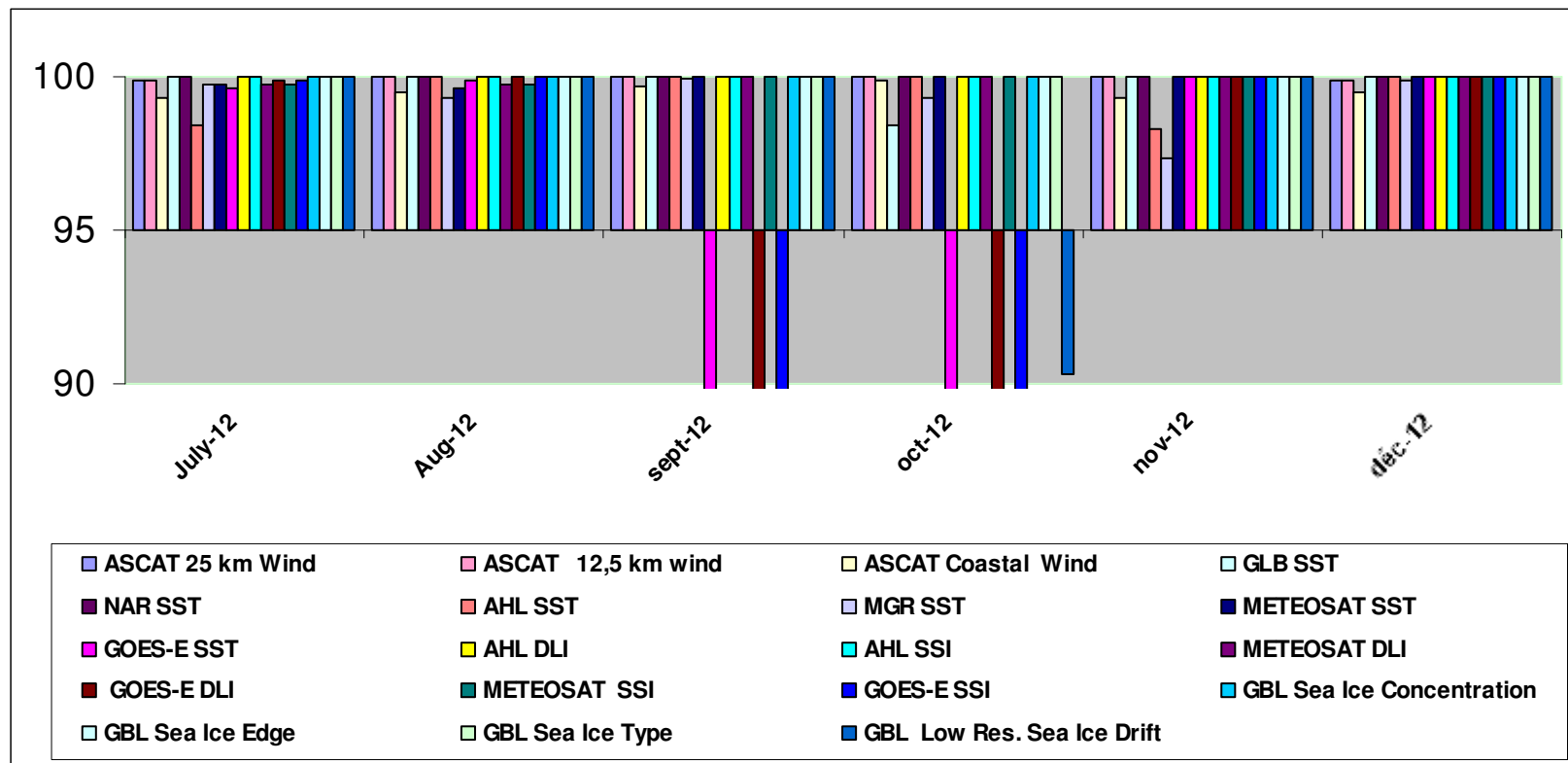


Figure 4 : Products availability via EUMETCast over the past six months.

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

On 31/08/2012 between 0100UTC and 0600UTC, due anomaly on METEOSAT-9 satellite, METEOSAT hourly products (SST, SSI, DLI) were not produced and corresponding compiled products were degraded.

Between 24/09/2012 and 18/10/2012, due to failure of imager on GOES-E satellite, GOES-E hourly SST, hourly and daily Fluxes (DLI, SSI) products were not produced.

Between 22/11/2012 at 1449UTC (sensing time) and 23/11/2012 at 0746UTC (sensing time), due to software configuration management issue, MGR SST were unavailable on both FTP server and EUMETCast. GLB and NAR SST were just delayed on FTP server. The main cause was due to the fact that the software have been unfortunately built and distributed in a dynamic way and netCdf4 library based instead of a static way and netCdf3 library based.

3.2 At SS2

20-09-2012 : AHL 12 hourly SST production failed to start at normal time. It was restarted at a later time, and users informed with service message 734.

27-11-2012 : Network outage at met.no, FTP and HTTP servers unavailable for several hours. Users informed with service message 758 and 759.

28-11-2012 : Degraded sea ice products due to data outage from NOAA ESPC, so missing SSMI data for several hours. Users were informed with service message 760.

10-12-2012 : Due to network problems at met.no, the OSI SAF AHL SST product were not available in time on the OSI SAF High Latitude FTP server on 8th and 9th December. The products were available in time on EUMETCast. Users were informed with service message 764.

14-12-2012/General in December : There has been some irregularities in the network at met.no, which has affected the FTP and HTTP servers. Central debugging at met.no has lead to improved performance. New hardware has been ordered to secure optimal delivery. The users were informed with service message 765. No users has contacted us concerning this issue.

3.3 At SS3

The product monitoring flag was raised more often than usual in the ASCAT wind products in June and July. This was due to issues in the ECMWF Sea Surface Temperature field which was used in the ice screening. As long as the appropriate flags are considered, the products can be used without restrictions. The problem was solved with the implementation of the Bayesian ice screening in the wind processing chain in September.

No OSCAT input data (and hence no winds) were available between 1 October, 15:00 and 4 October, 3:00 UTC sensing time due to a problem in the data processing at ISRO and EUMETSAT.

OSCAT data have been delayed from 2 to 4 November due to a data acquisition problem at Svalbard.

The ASCAT coastal wind product has been unavailable on 28 November, between 16:00 and 19:30 UTC sensing time due to a problem in the data connection between EUMETSAT and KNMI.

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

No modification or maintenance activity was reported.

4.2 At SS2

26.09.2012 - OSI SAF sea ice extent graphs

The OSI SAF Sea Ice Team announced daily updated sea ice extent graphs on the OSI SAF High Latitude web portal:

http://osisaf.met.no/p/ice_extent_graphs.php

Both daily, seasonal and monthly graphs are available for the Northern Hemisphere sea ice extent. More information about the graphs are available on the web site.

4.3 At SS3

On 18 September, AWDP version 2.1.01 was implemented in the operational chain. Bayesian ice screening is used now rather than ice screening based on the ECMWF model Sea Surface Temperature field.

The ASCAT coastal wind product is available on the GTS since 2 October.

On 30 October, the OSCAT wind product was upgraded: new MLE normalizations, correction for latitude dependent wind speed biases, inclusion of outer swath processing and introduction of NSCAT-3 Geophysical Model Function to correct biases at high wind speeds. Product status is operational now, OWDP version is 1_0_03.

Since 14 November, development status ASCAT 25-km and coastal wind products from Metop-B are available to the users.

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 SST, NAR SST and AHL SST).

Conventional bias and standard deviation are used in agreement with GHR SST recommendations. The quality of buoys used in the Match-up data base is monitored routinely on a best effort basis. The blacklisted buoys are accessible 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.

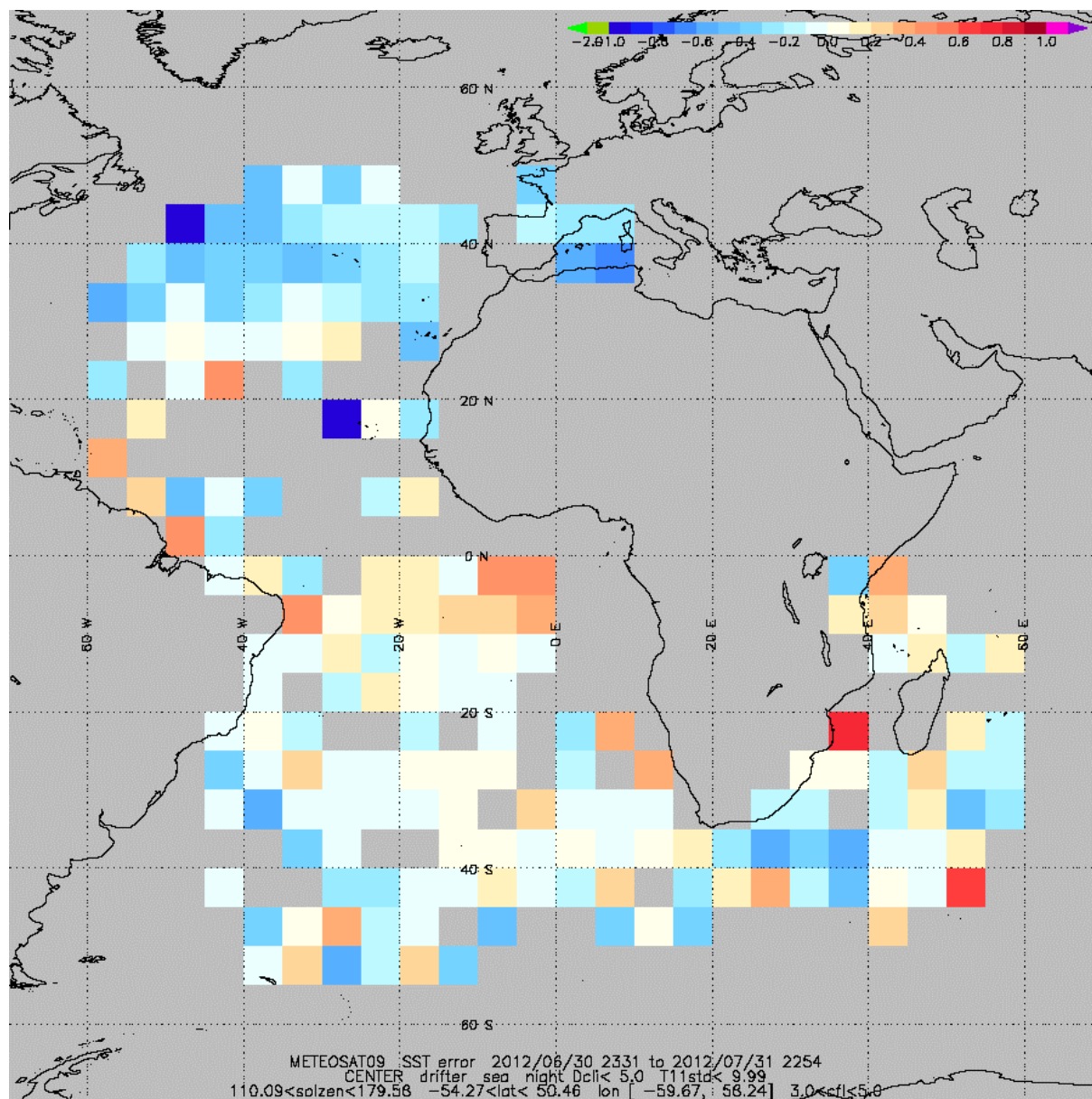


Figure 5 : Location of buoys for METEOSAT SST validation in JULY 2012, for 3,4,5 quality indexes and by night.

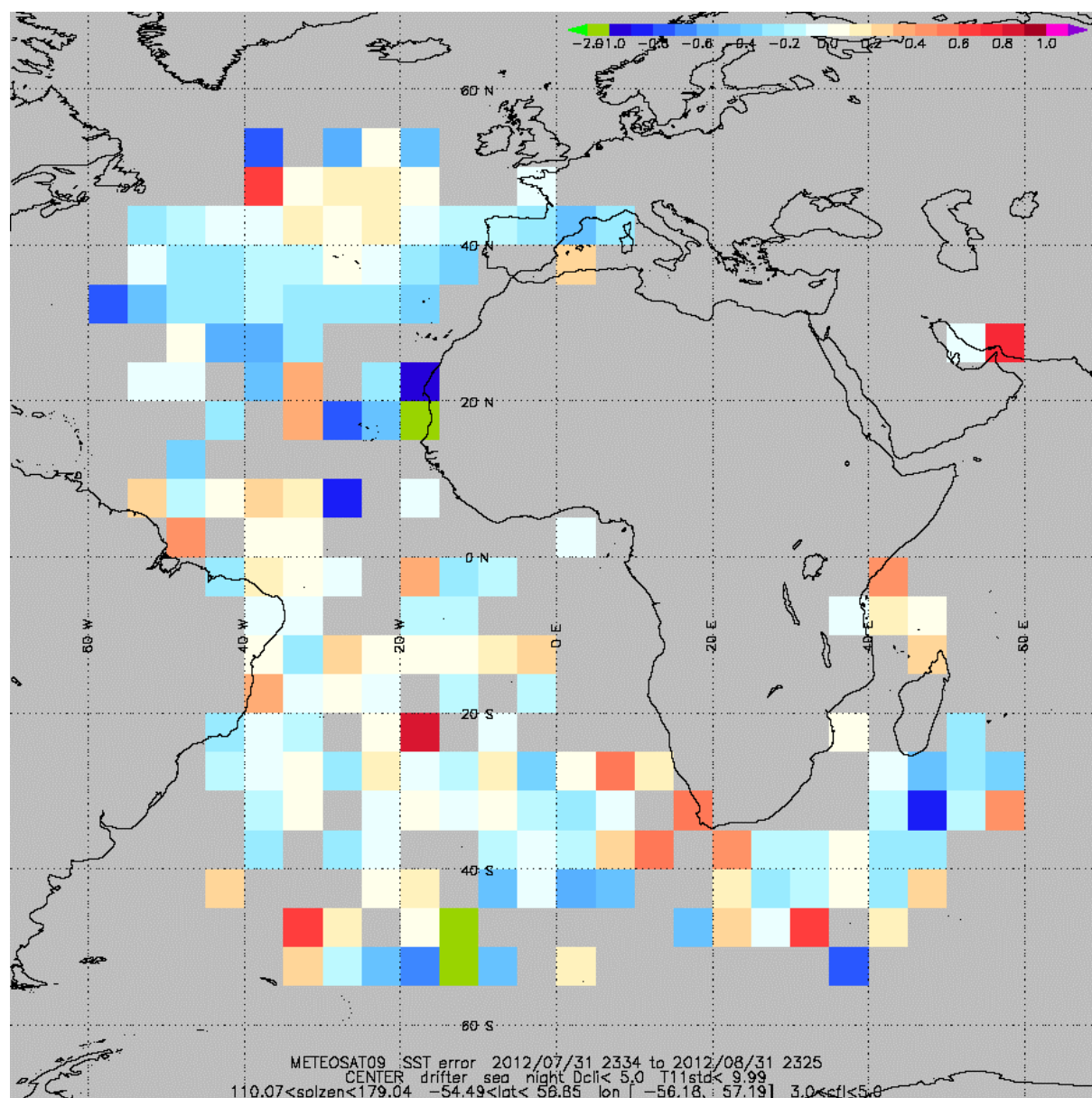


Figure 6 : Location of buoys for METEOSAT SST validation in AUGUST 2012, for 3,4,5 quality indexes and by night.

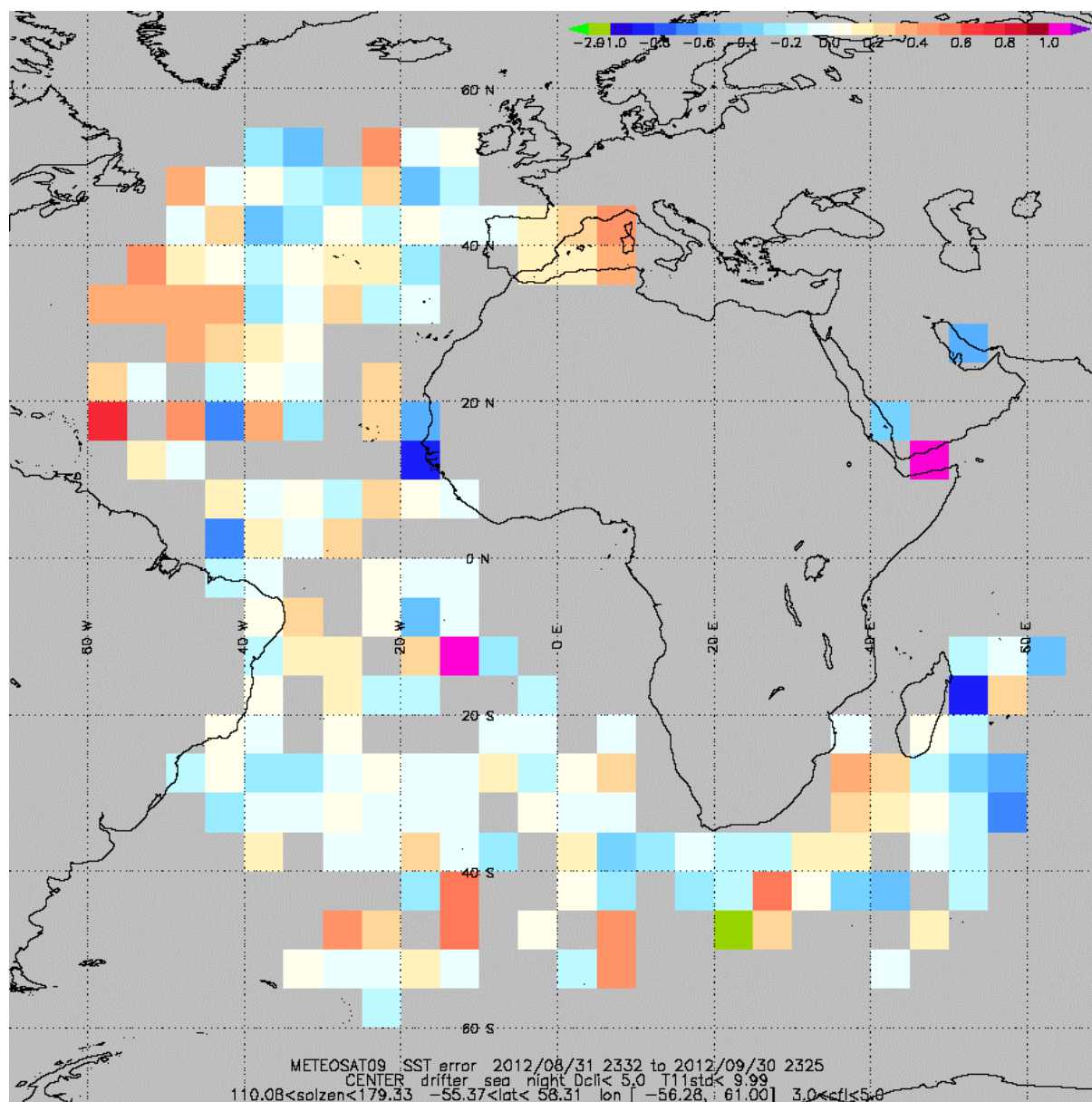


Figure 7 : Location of buoys for METEOSAT SST validation in SEPTEMBER 2012, for 3,4,5 quality indexes and by night.

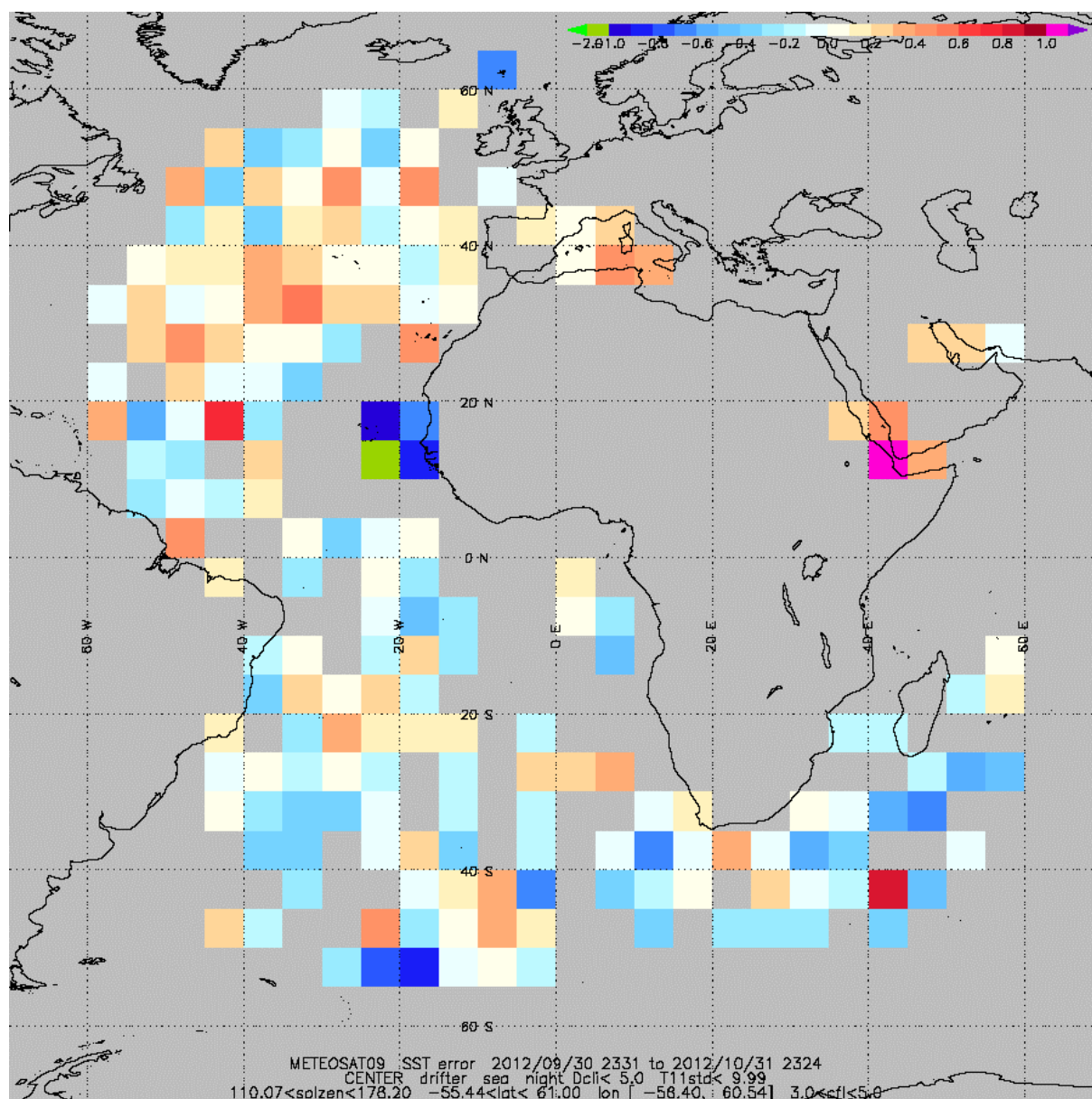


Figure 8 : Location of buoys for METEOSAT SST validation in OCTOBER 2012, for 3,4,5 quality indexes and by night.

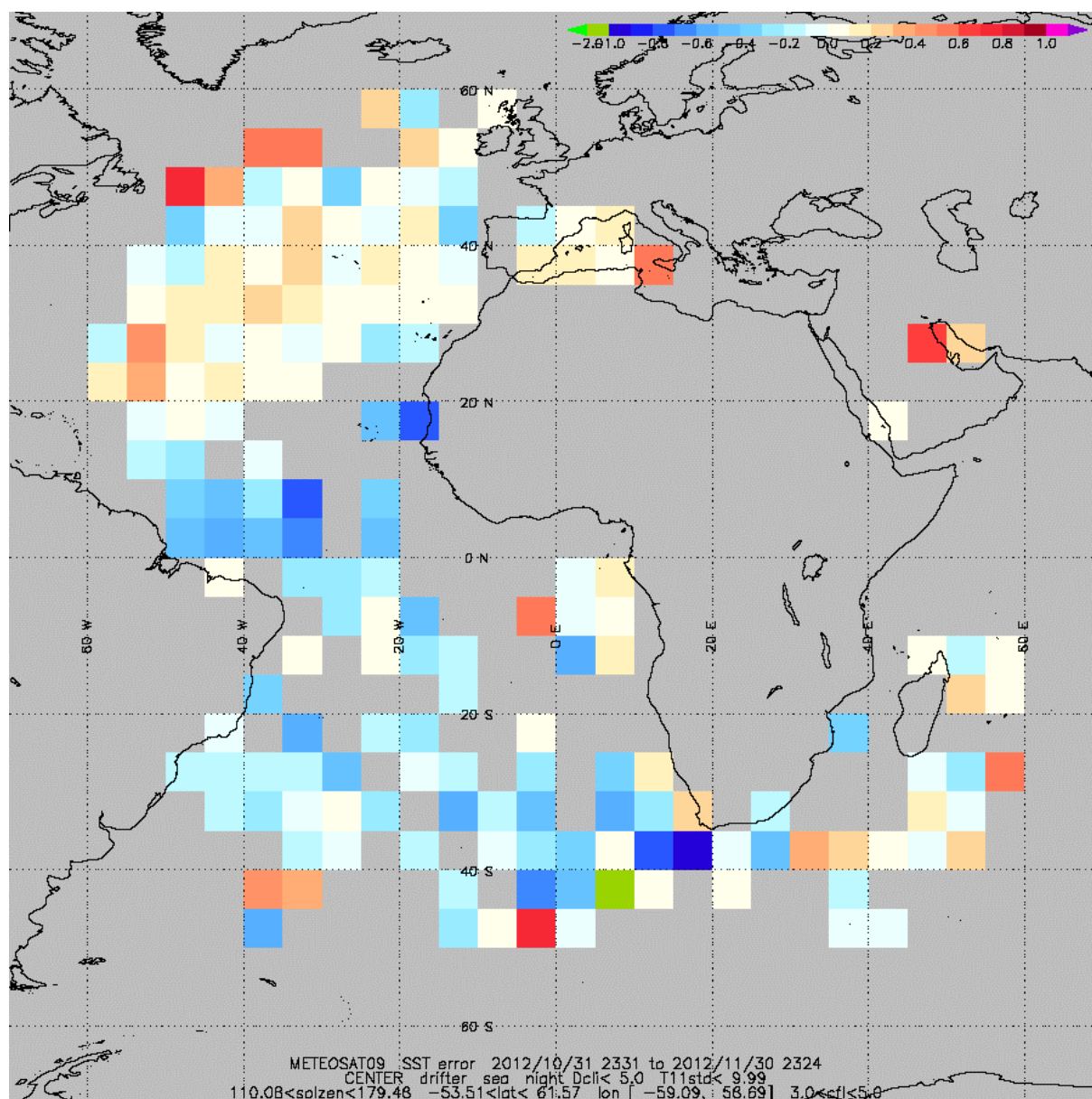


Figure 9 : Location of buoys for METEOSAT SST validation in NOVEMBER 2012, for 3,4,5 quality indexes and by night.

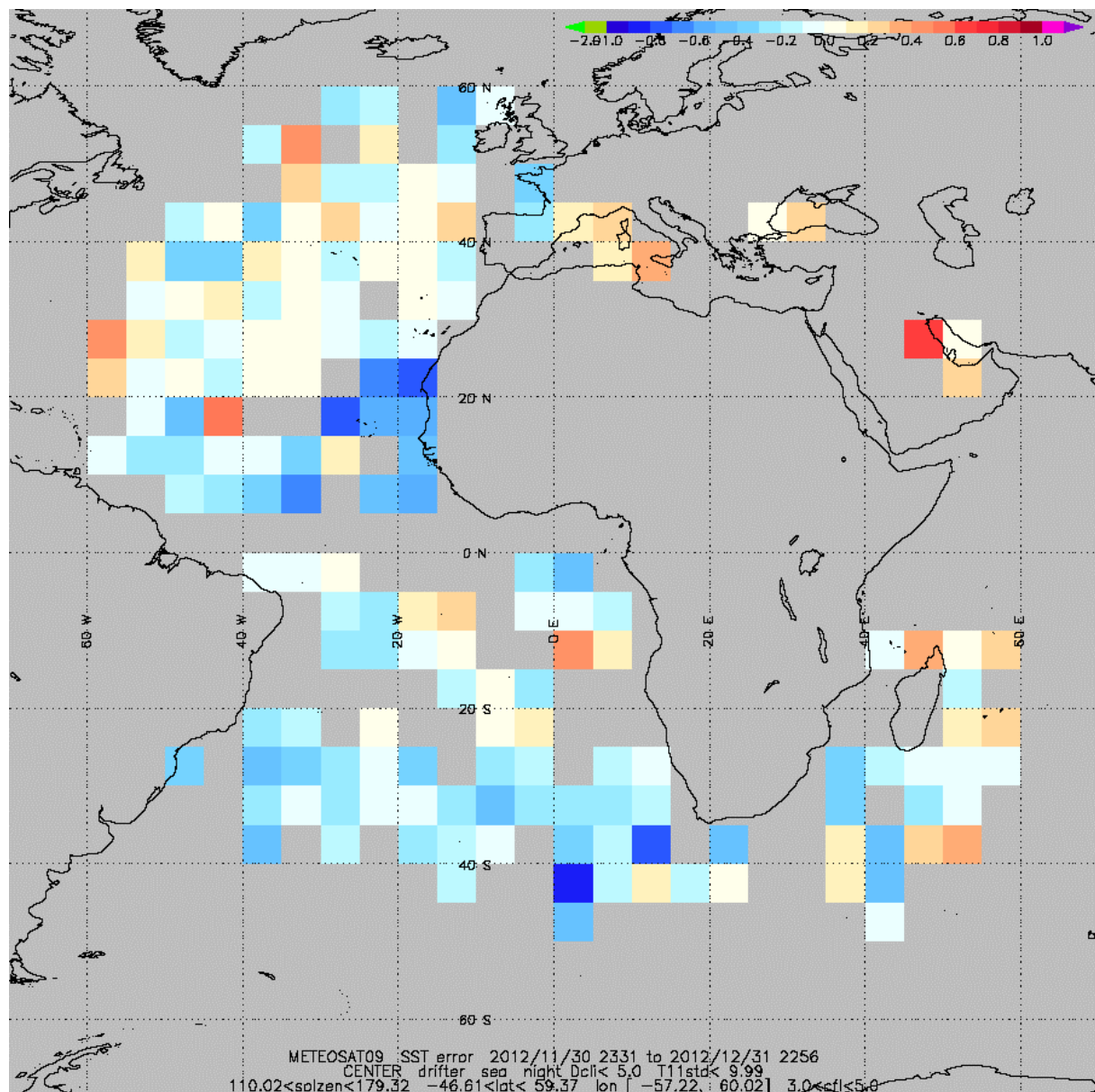


Figure 10 : Location of buoys for METEOSAT SST validation in DECEMBER 2012, for 3,4,5 quality indexes and by night.

The following table provides the METEOSAT-derived SST quality results over the reporting period. METEOSAT SST quality results over 2nd half 2012.

METEOSAT SST quality results over 2 nd half 2012							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
July 2012	10597	-0,090	0,5	82,00	0,56	1,0	44,00
Aug. 2012	12261	-0,130	0,5	74,00	0,62	1,0	38,00
Sept. 2012	12898	0,030	0,5	94,00	0,65	1,0	35,00
Oct. 2012	11289	0,010	0,5	98,00	0,64	1,0	36,00
Nov. 2012	9580	-0,040	0,5	92,00	0,57	1,0	43,00
Dec. 2012	13028	-0,100	0,5	80,00	0,52	1,0	48,00

table 4 : METEOSAT SST quality results over 2nd half 2012, 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.

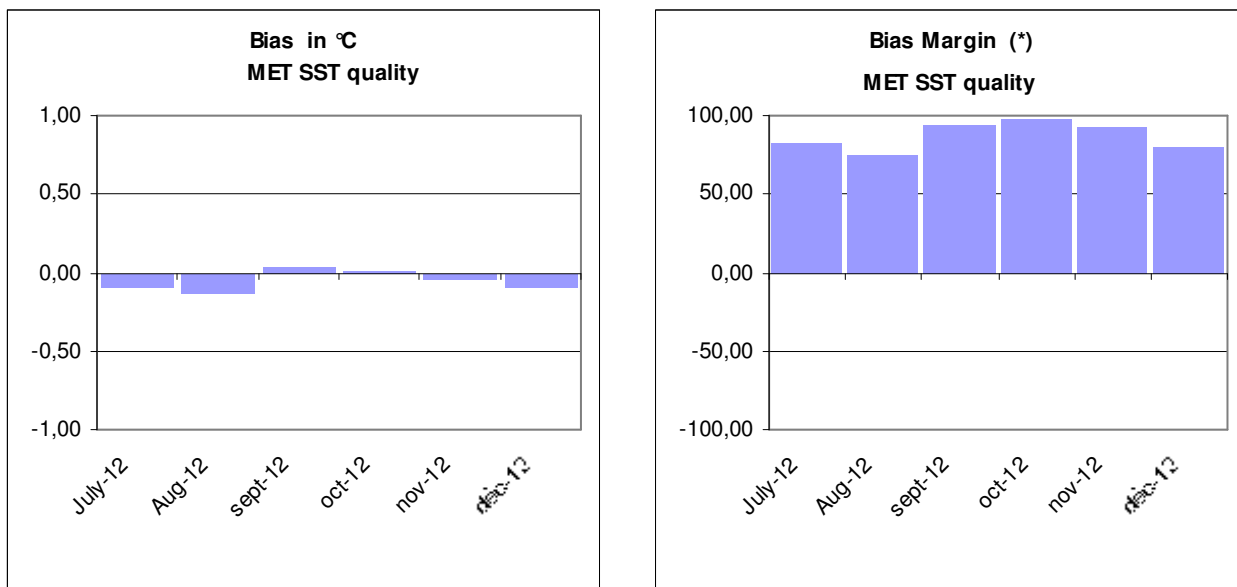


Figure 11 : Left: METEOSAT SST Bias. Right METEOSAT SST Bias Margin

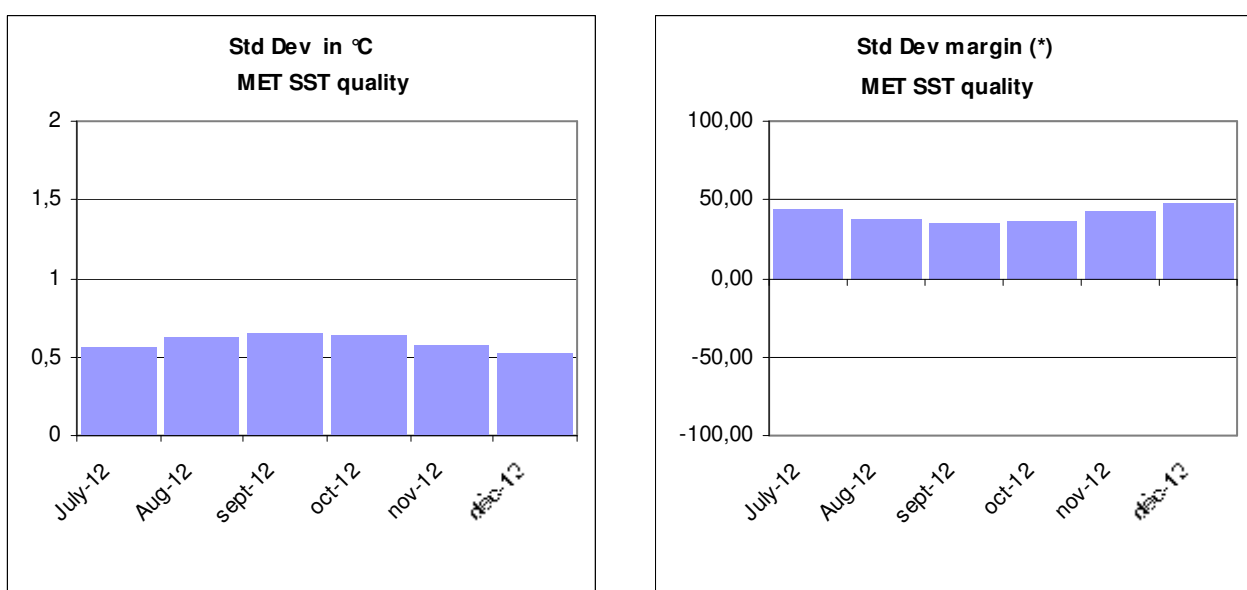
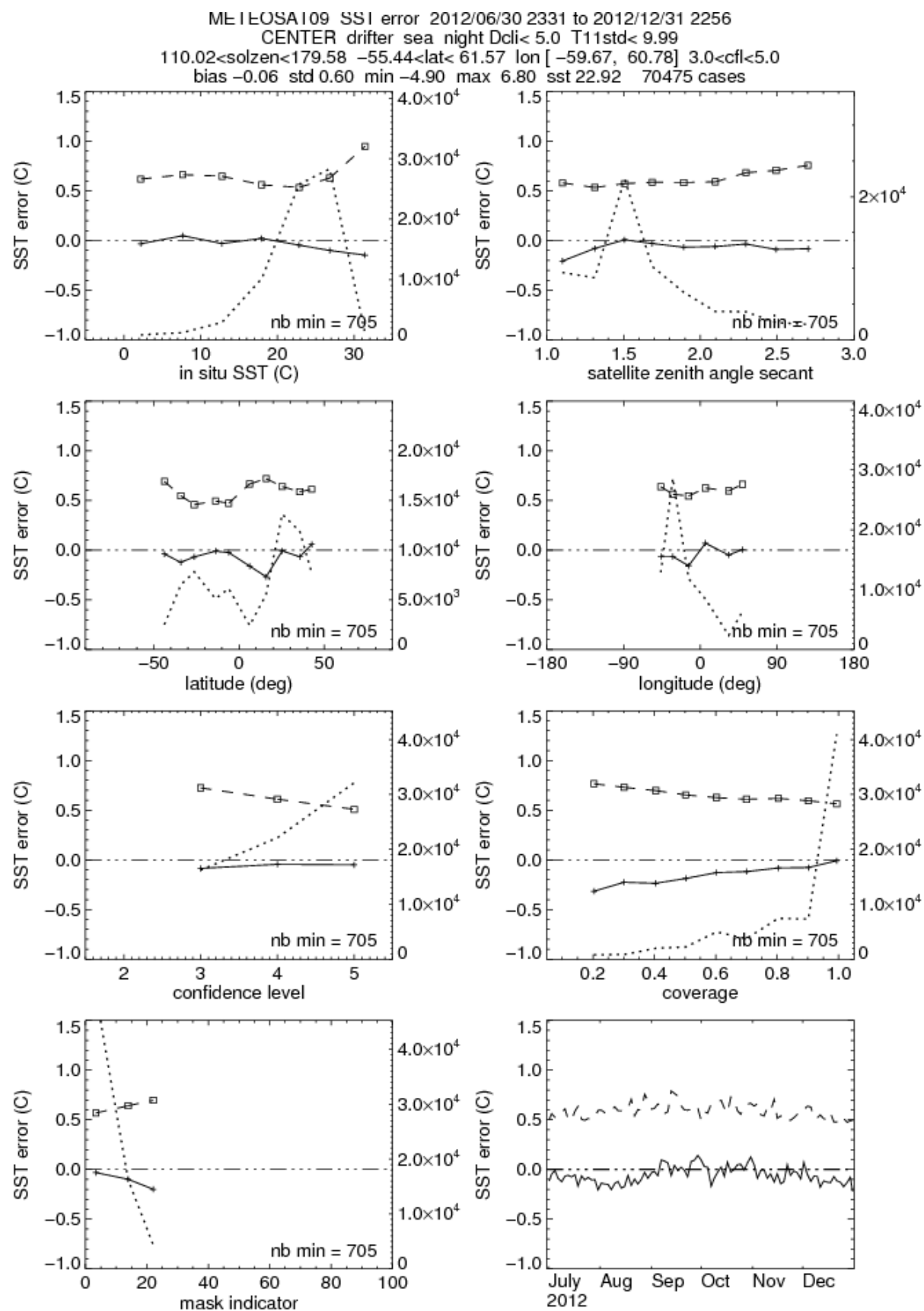


Figure 12 : Left: METEOSAT SST Standard deviation. Right METEOSAT SST Standard deviation Margin.

Complementary validation statistics on METEOSAT SST**Figure 13 : Complementary validation statistics on METEOSAT SST.**

5.1.2 GOES-E SST quality

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

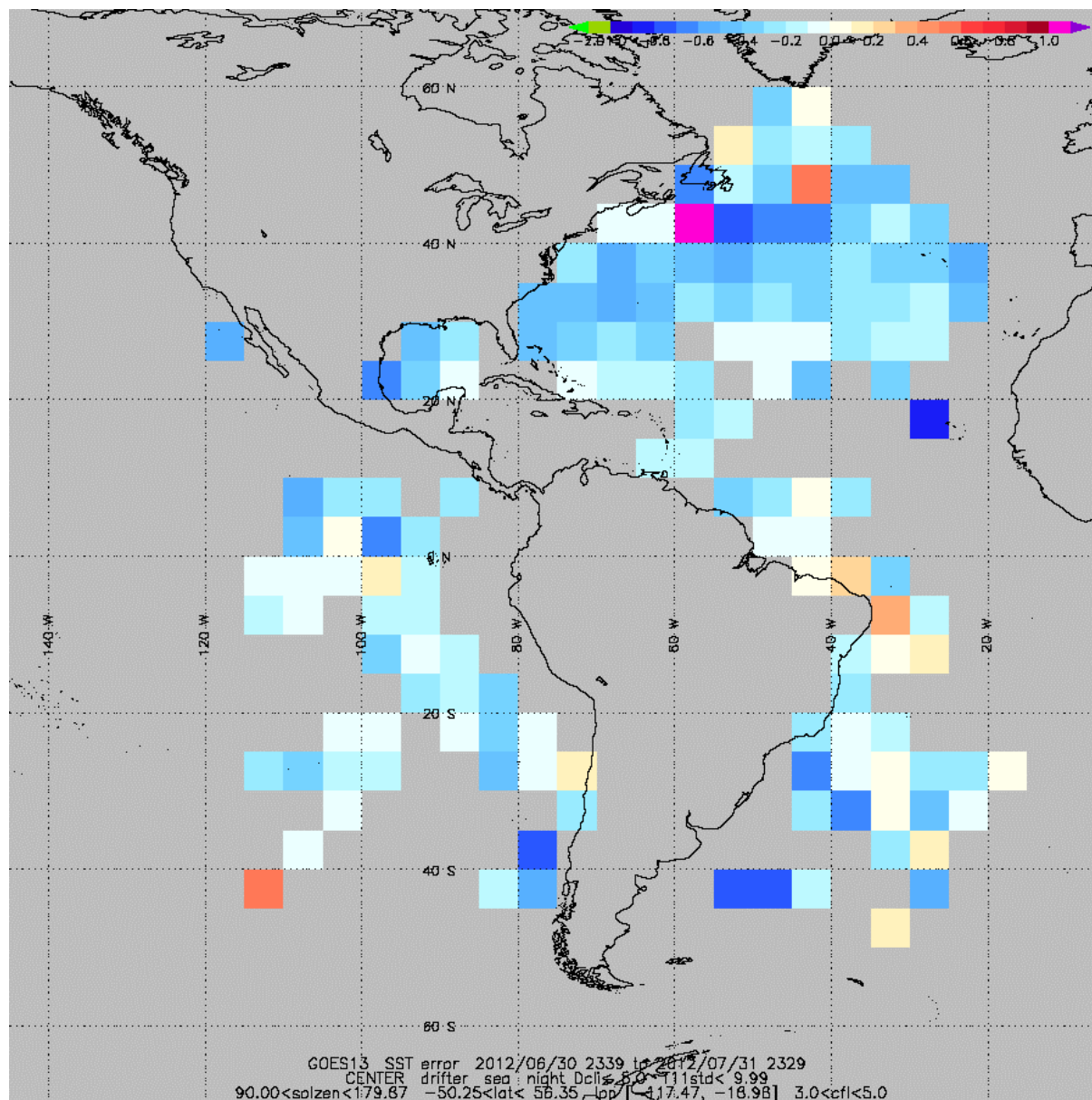


Figure 14 : Location of buoys for GOES-E SST validation in JULY 2012, for 3,4,5 quality indexes and by night.

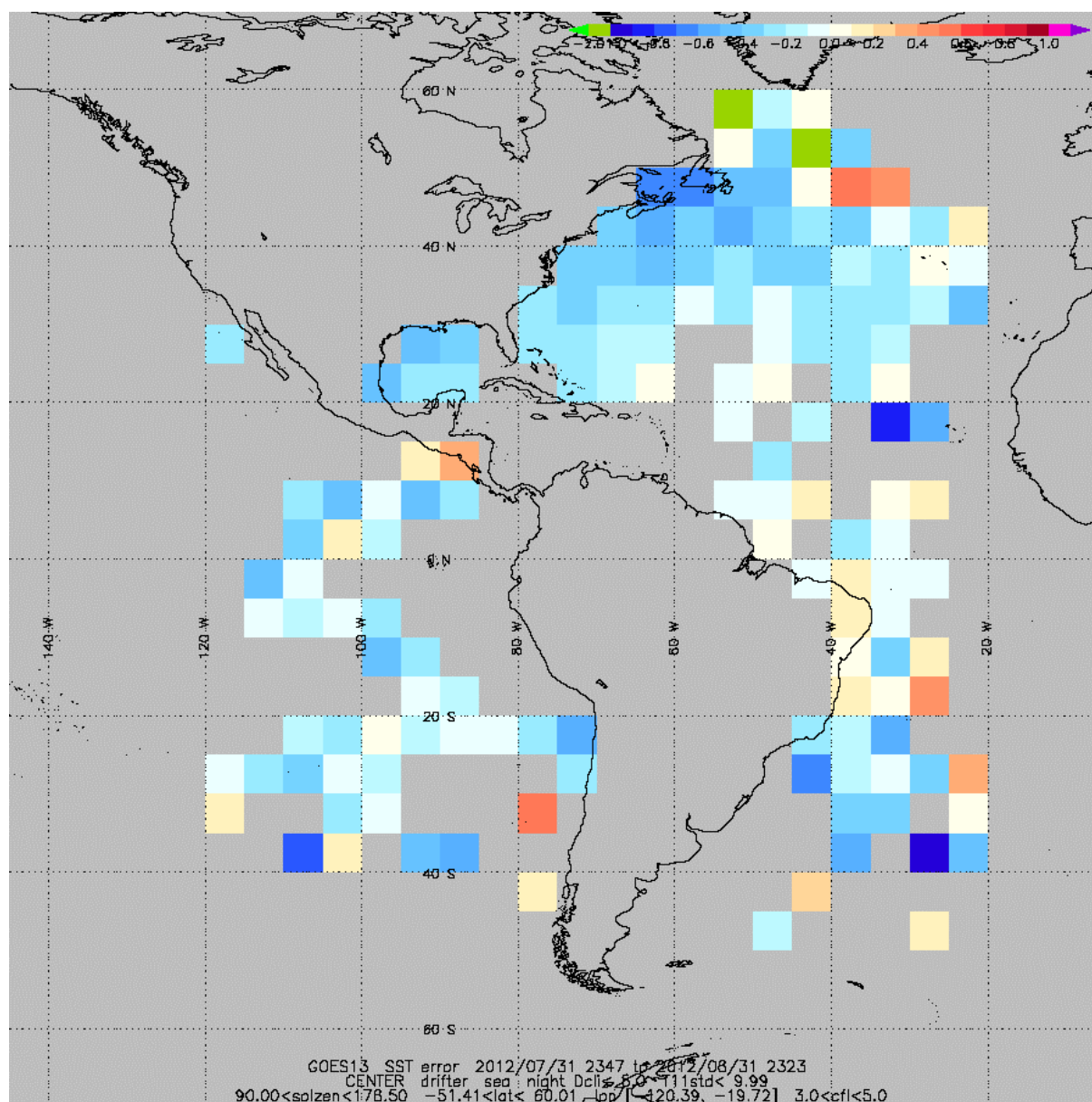


Figure 15 : Location of buoys for GOES-E SST validation in AUGUST 2012, for 3,4,5 quality indexes and by night.

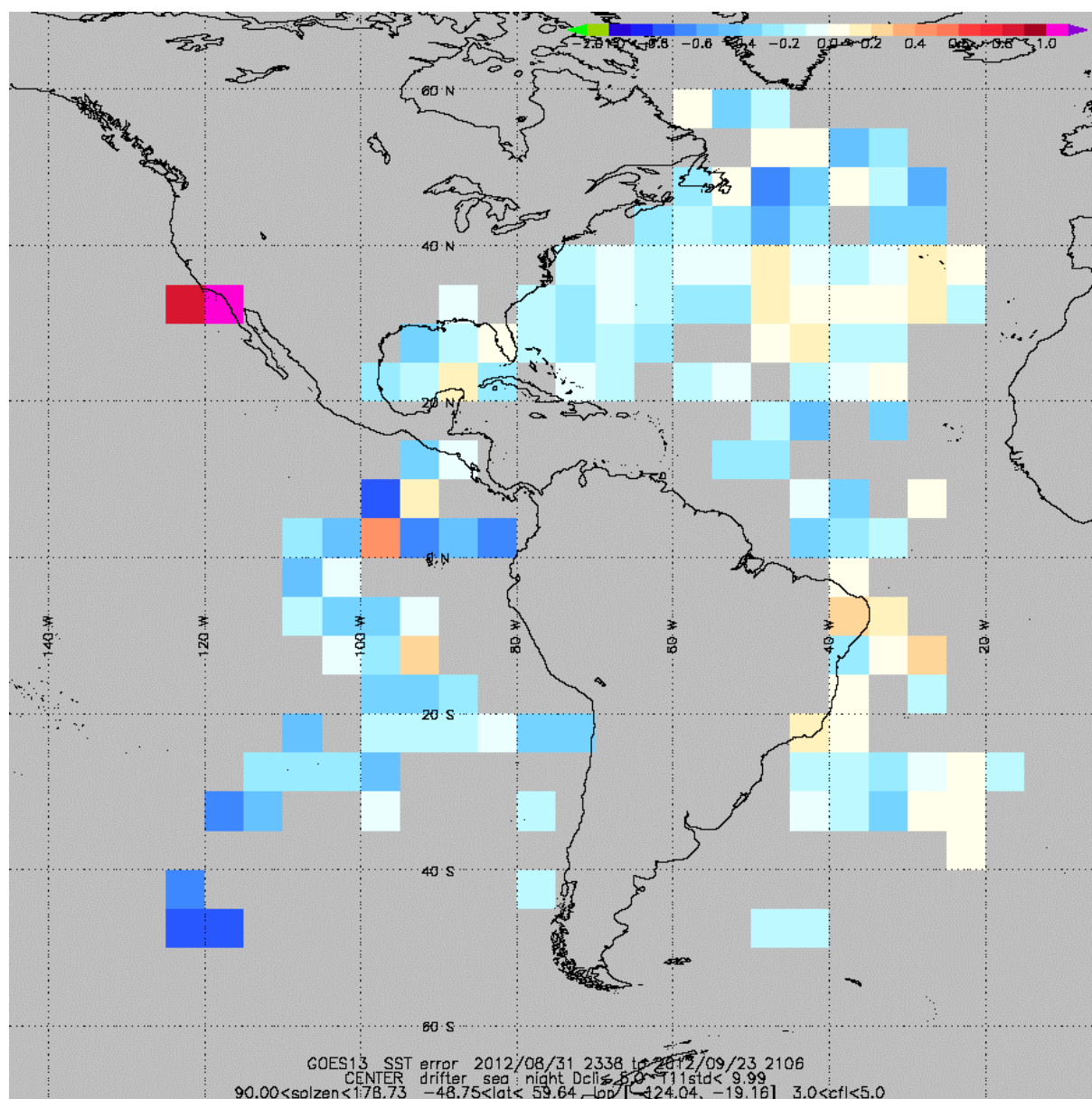


Figure 16 : Location of buoys for GOES-E ST validation in SEPTEMBER 2012, for 3,4,5 quality indexes and by night.

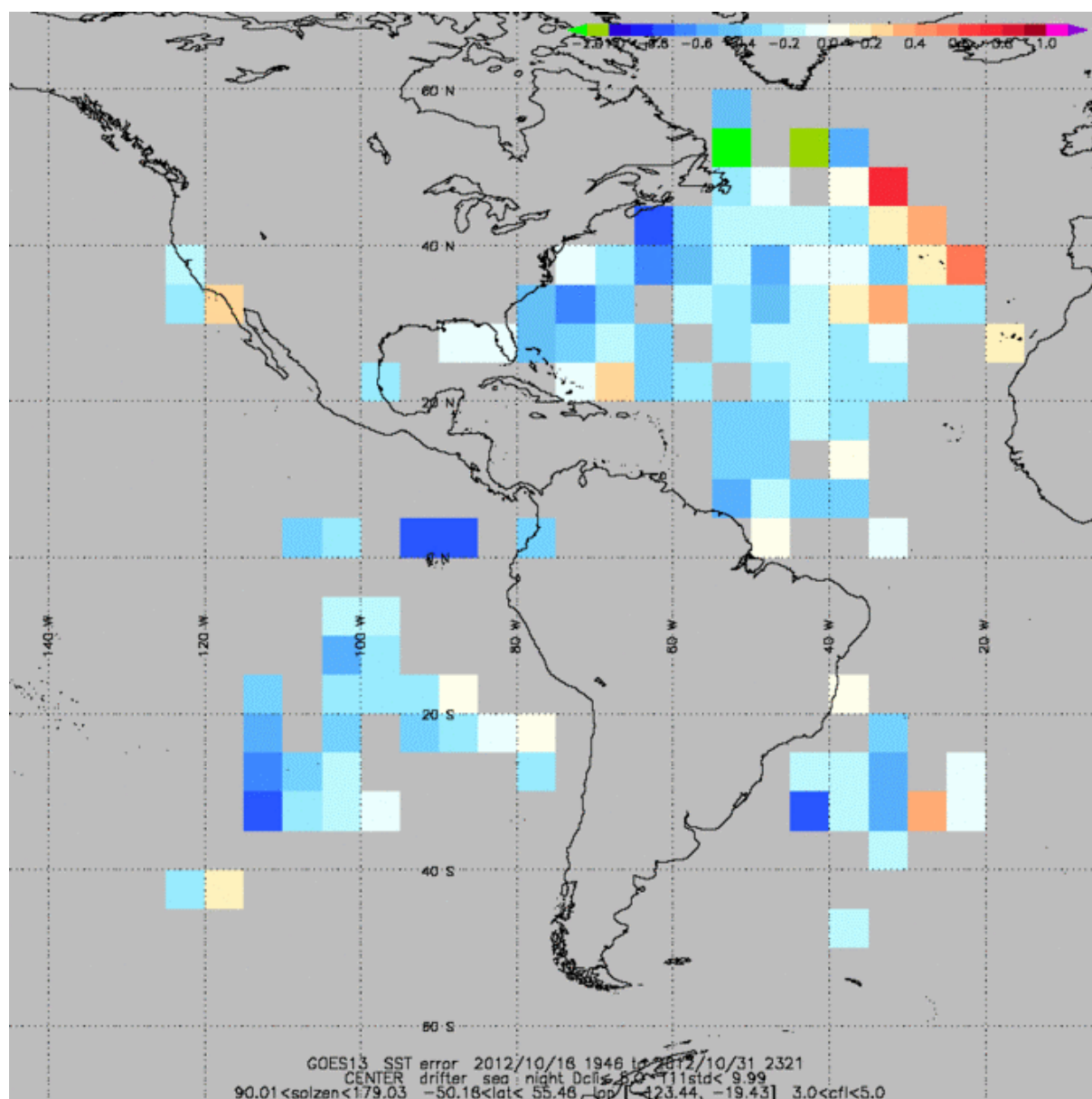


Figure 17 : Location of buoys for GOES-E ST validation in OCTOBER 2012, for 3,4,5 quality indexes and by night.

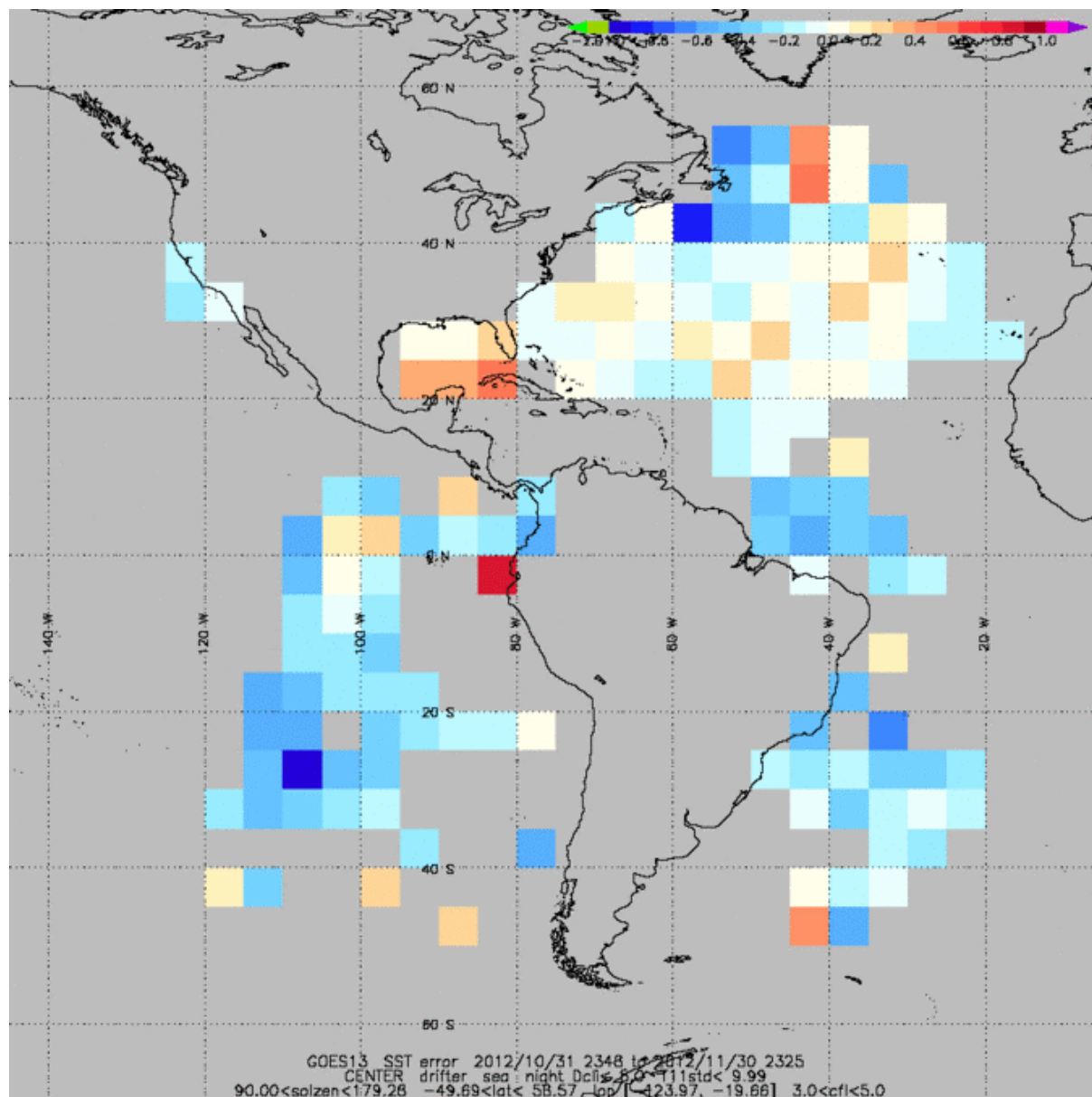


Figure 18 : Location of buoys for GOES-E ST validation in NOVEMBER 2012, for 3,4,5 quality indexes and by night.

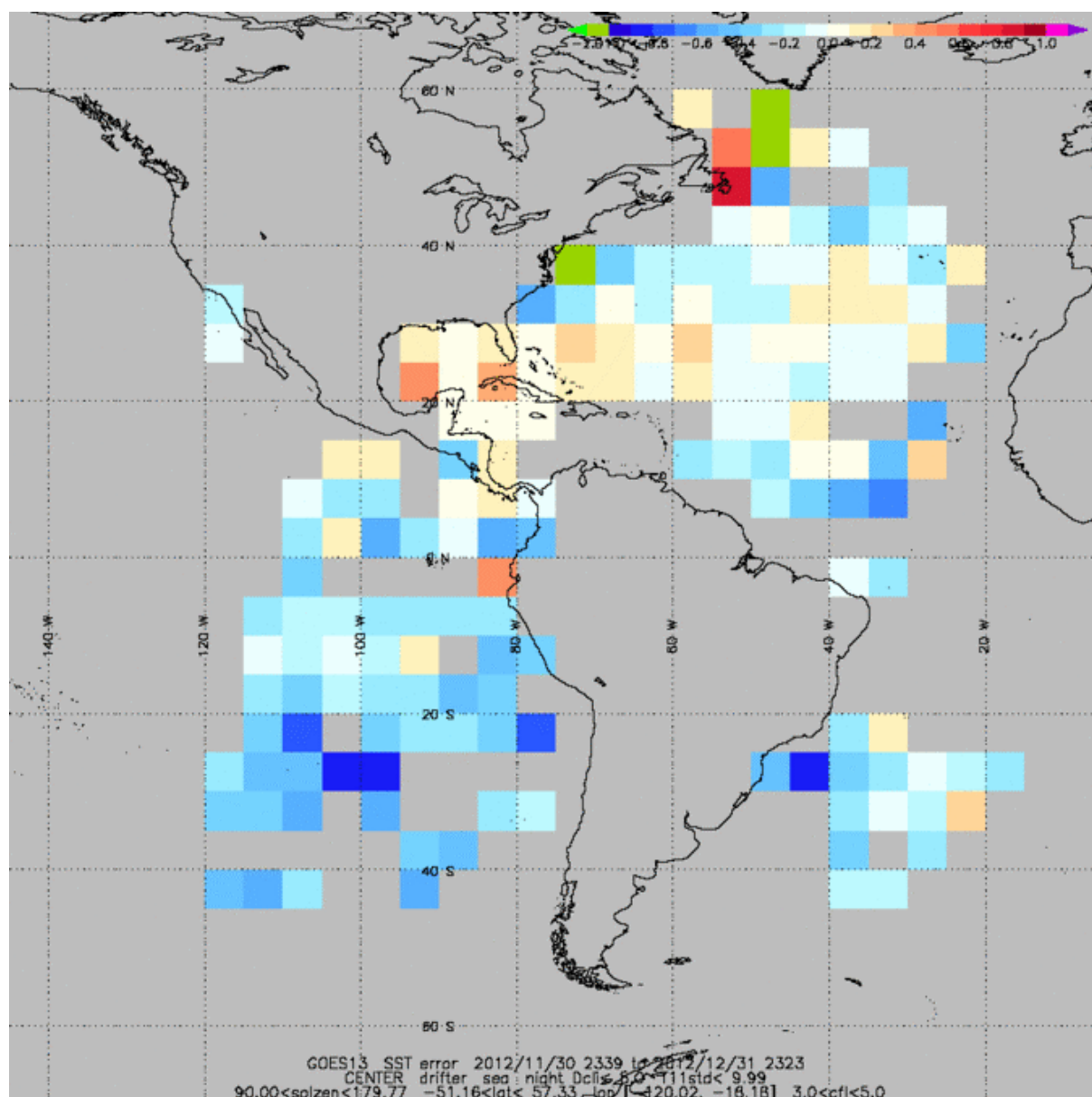


Figure 19 : Location of buoys for GOES-E ST validation in DECEMBER 2012, for 3,4,5 quality indexes and by night.

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

GOES-E SST quality results over 2 nd half 2012							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Req °C	Std Dev margin (*)
July 2012	18051	-0,270	0,5	46,00	0,52	1,0	48,00
Aug. 2012	18561	-0,230	0,5	54,00	0,52	1,0	48,00
Sept. 2012	14656	-0,130	0,5	74,00	0,56	1,0	44,00
Oct. 2012	5748	-0,220	0,5	56,00	0,68	1,0	32,00
Nov. 2012	12241	-0,120	0,5	76,00	0,55	1,0	45,00
Dec. 2012	14324	-0,110	0,5	78,00	0,48	1,0	52,00

table 5 : GOES-E SST quality results over 2nd half 2012, 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.

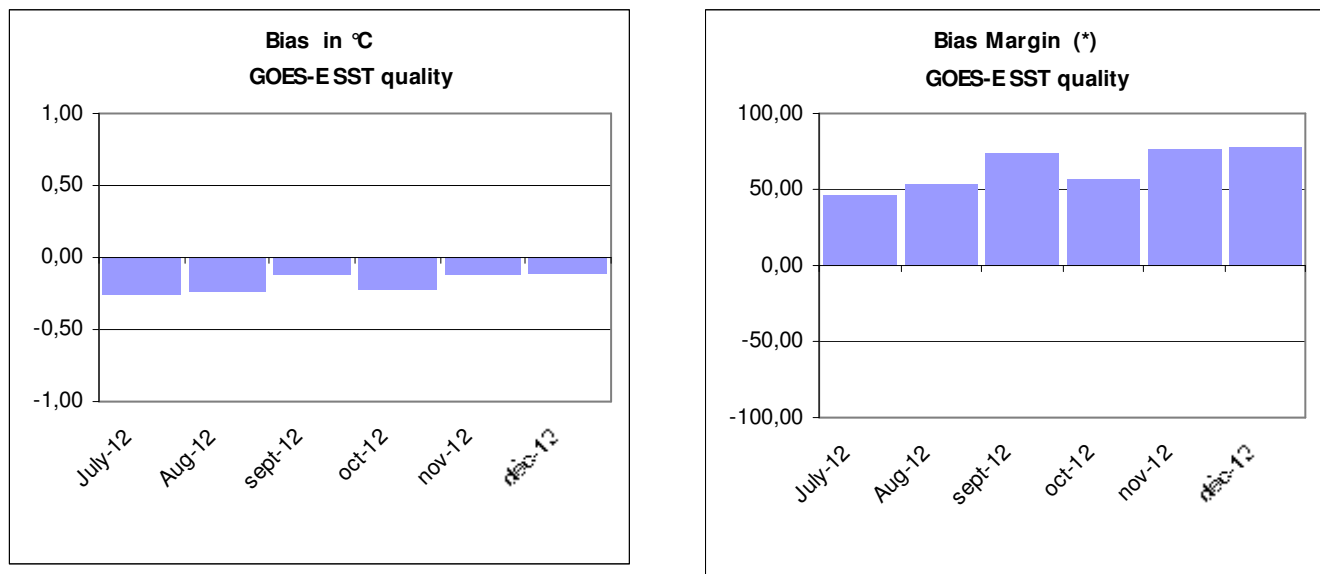


Figure 20 : Left: Goes-E SST Bias. Right: Goes-E SST Bias Margin.

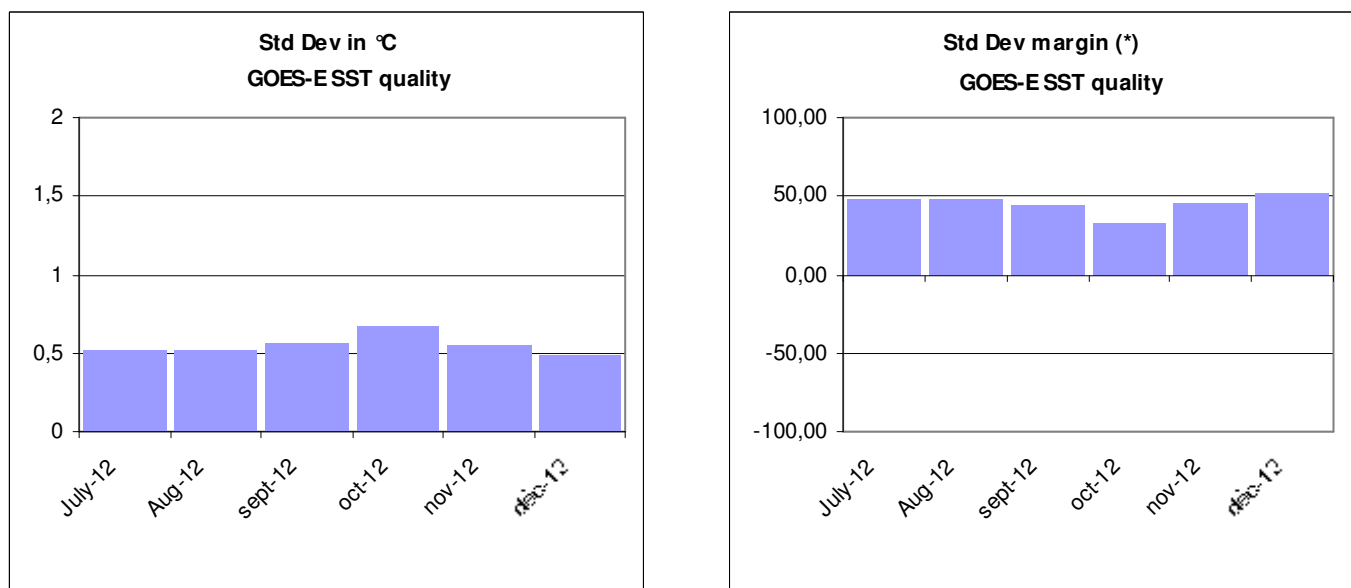
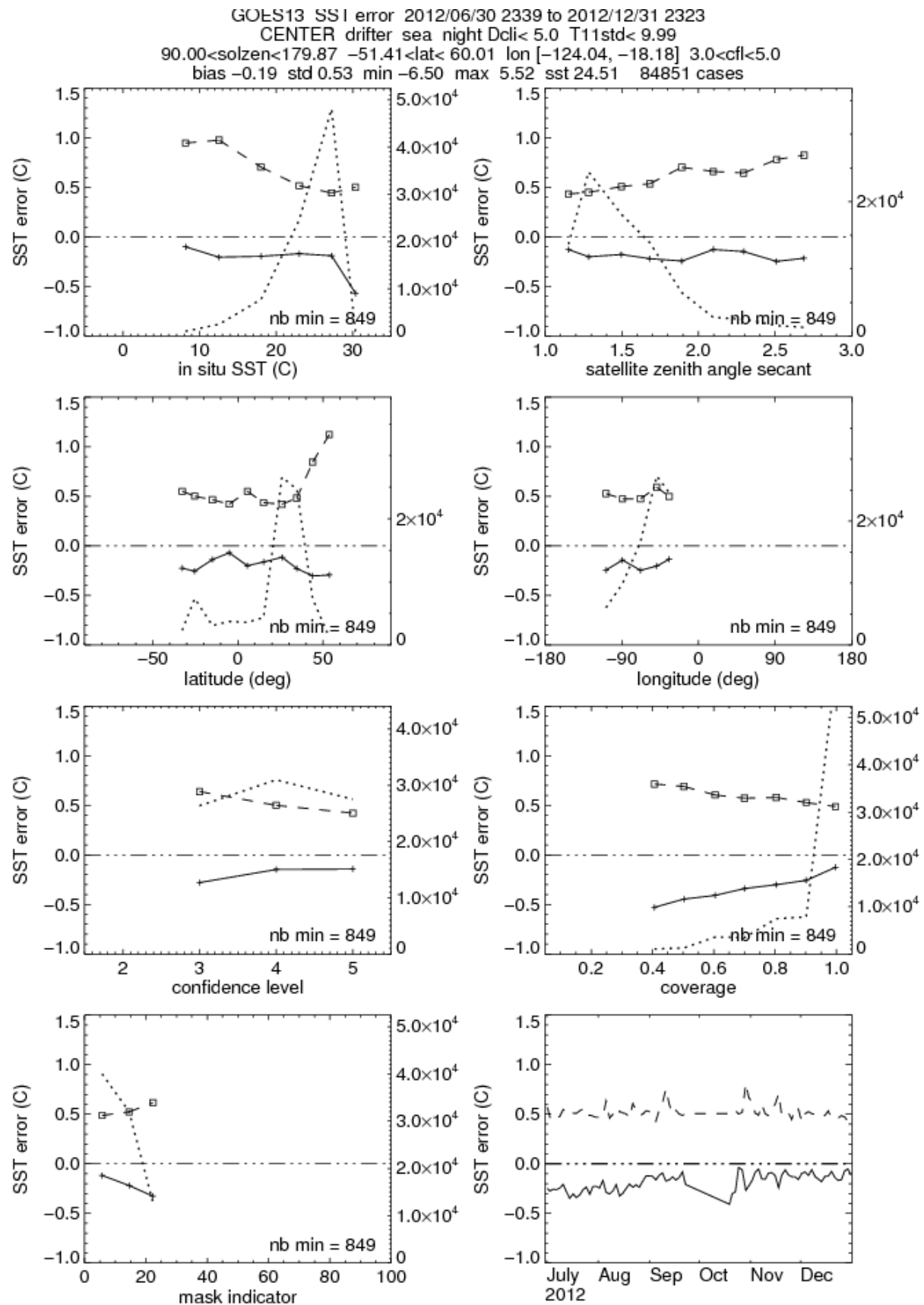


Figure 21 : Left: Goes-E SST Standard deviation. Right Goes-E SST Standard deviation Margin.

Complementary validation statistics on GOES-E SST**Figure 22 : 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 and NOAA/AVHRR for afternoon orbit. Currently Metop-A and NOAA-19 are used.

The comparison between NAR SST products and Match up data bases (MDB) gathering in situ (buoy) measurements is performed on a routine basis for each operational NOAA 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 compiled SST quality results over the reporting period.

NAR compiled SST quality results over 2 nd half 2012							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
July 2012	1038	-0,030	0,5	94,00	0,46	0,8	42,50
Aug. 2012	2083	-0,150	0,5	70,00	0,49	0,8	38,75
Sept. 2012	2630	-0,080	0,5	84,00	0,54	0,8	32,50
Oct. 2012	2429	-0,090	0,5	82,00	0,5	0,8	37,50
Nov. 2012	1691	-0,130	0,5	74,00	0,4	0,8	50,00
Dec. 2012	1884	-0,150	0,5	70,00	0,39	0,8	51,25

table 6 : **Quality results for NAR compiled SST over 2nd half 2012, 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.

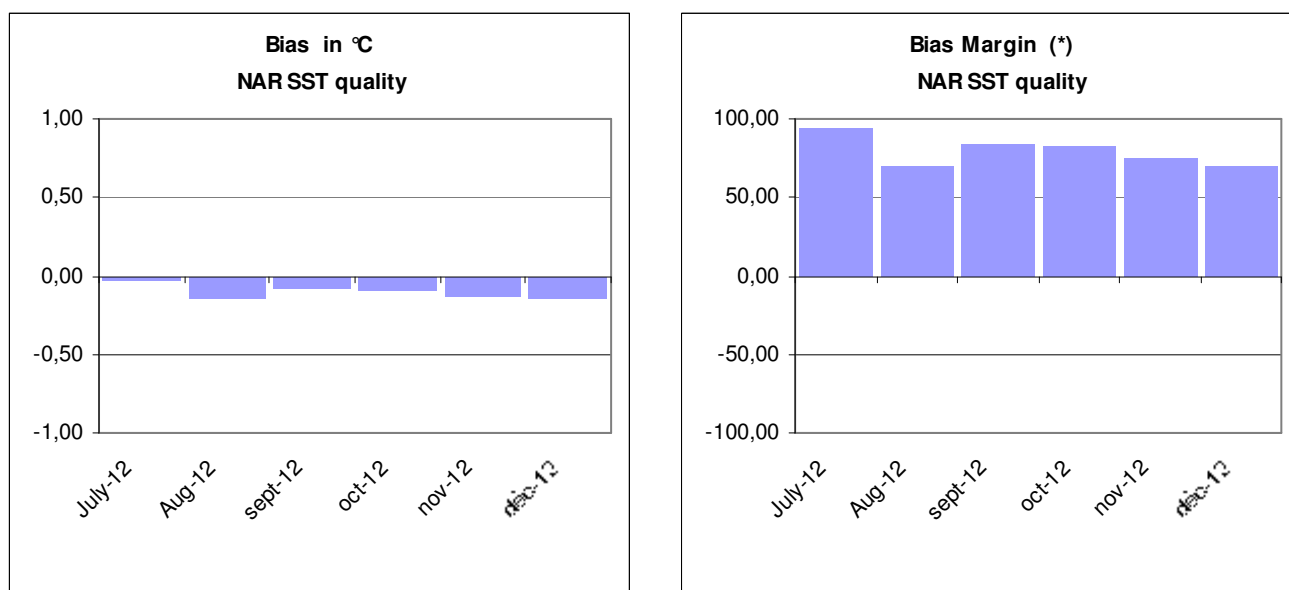


Figure 23 : Left: NAR SST Bias. Right: NAR SST Bias Margin.

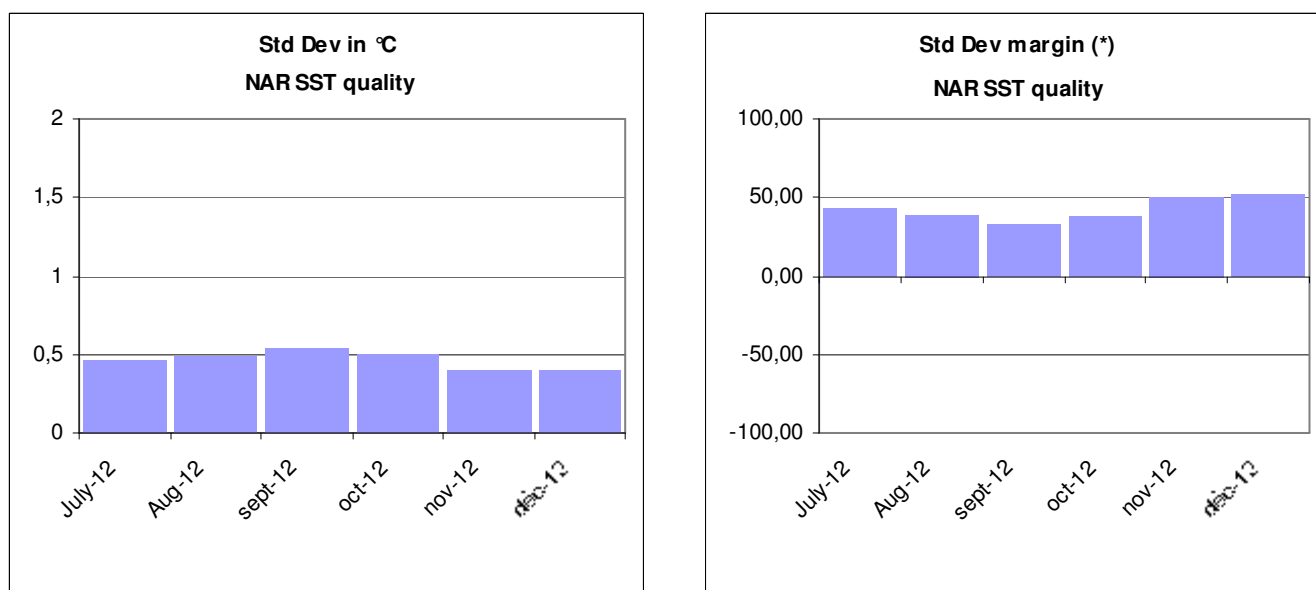


Figure 24 : Left: NAR SST Standard deviation. Right: NAR SST Standard deviation Margin.

5.1.3.2 NOAA-19 NAR SST quality

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

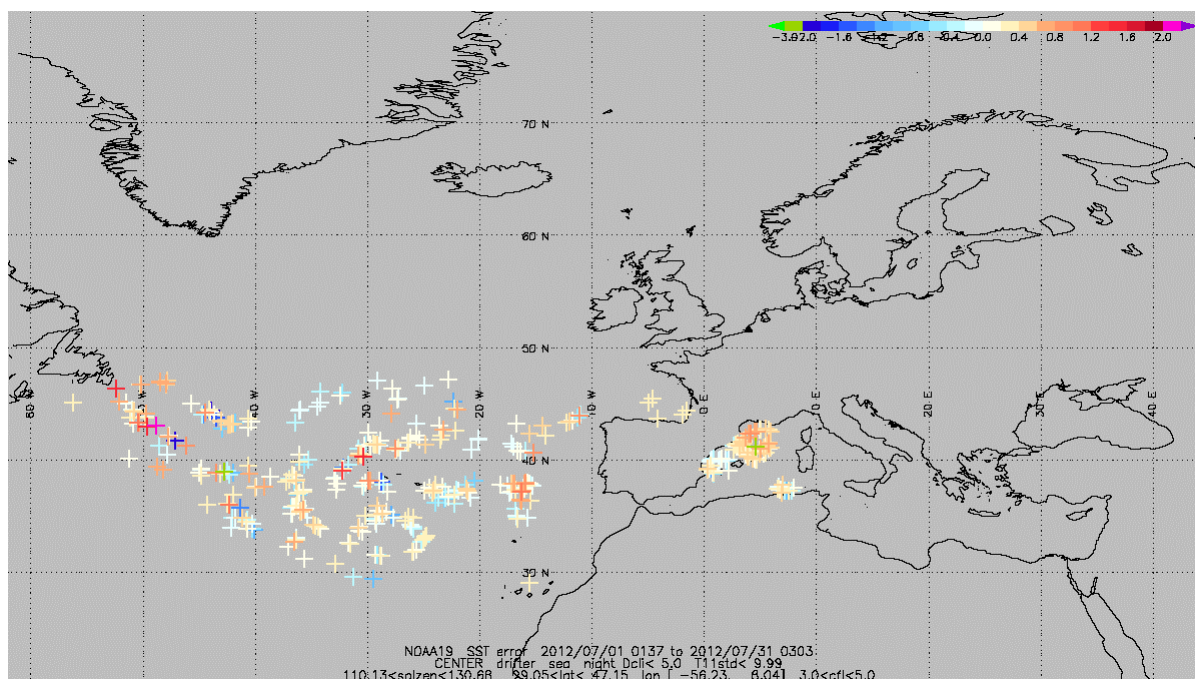


Figure 25 : Location of buoys for NOAA-19 NAR SST validation in JULY 2012, for 3, 4, 5 quality indexes and by night.

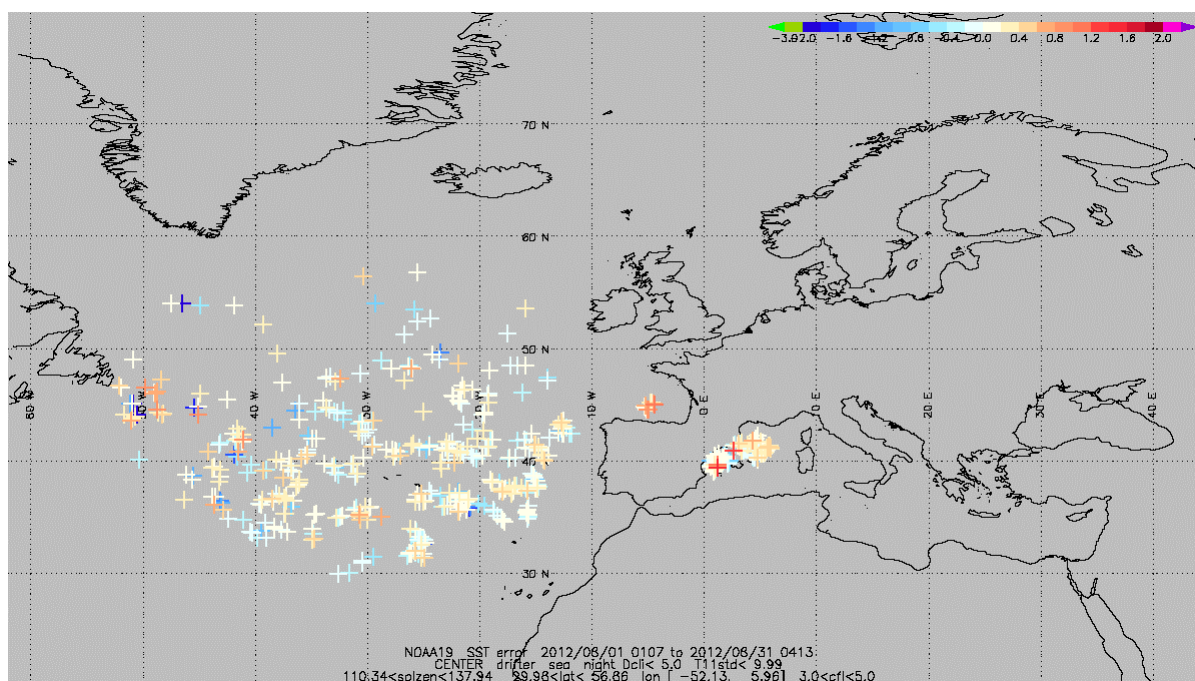


Figure 26 : Location of buoys for NOAA-19 NAR SST validation in AUGUST 2012, for 3, 4, 5 quality indexes and by night.

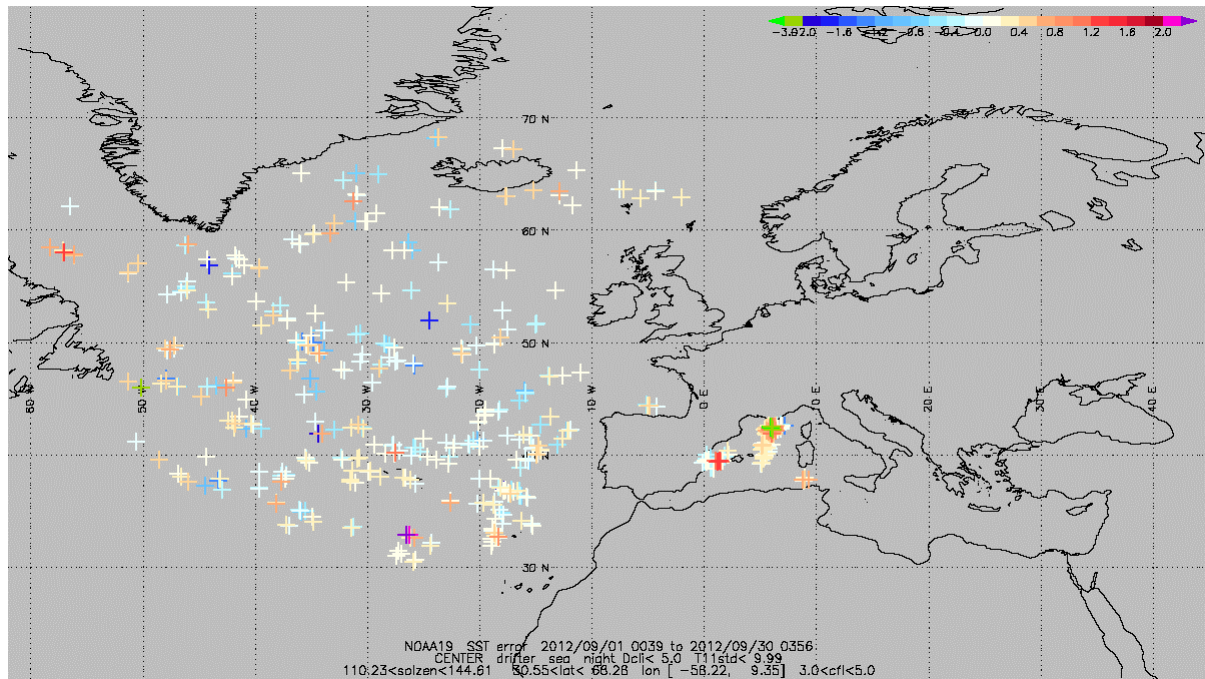


Figure 27 : Location of buoys for NOAA-19 NAR SST validation in SEPTEMBER 2012, for 3, 4, 5 quality indexes and by night.

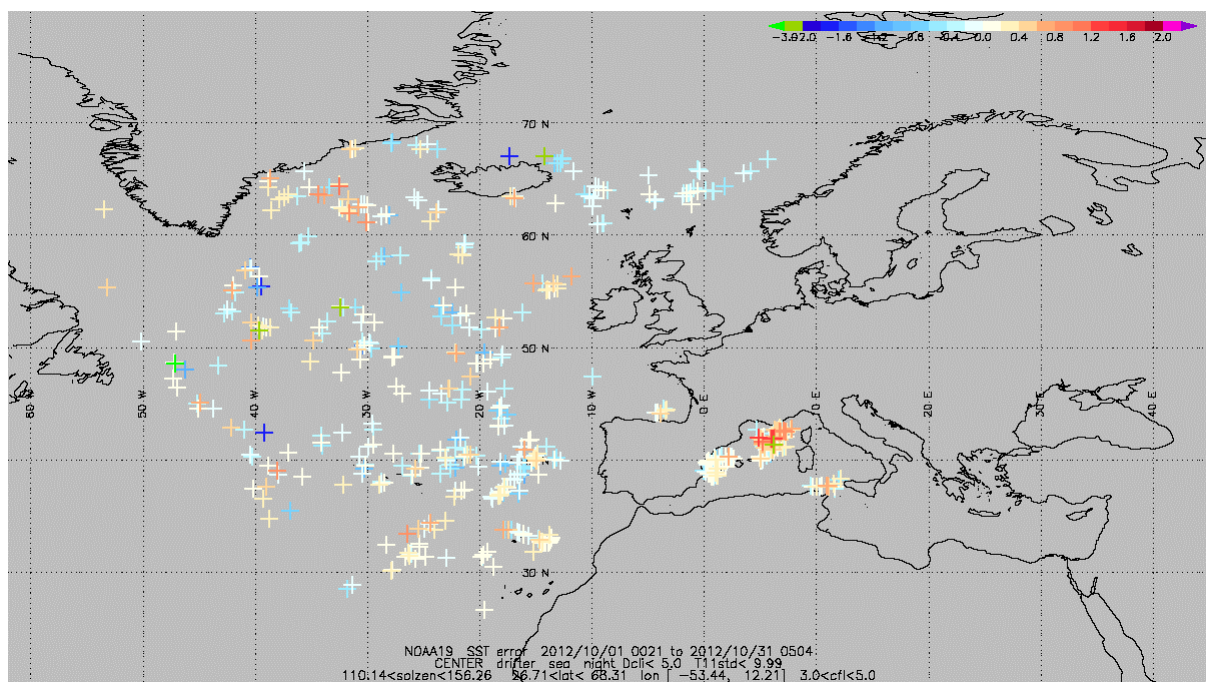


Figure 28 : Location of buoys for NOAA-19 NAR SST validation in OCTOBER 2012, for 3, 4, 5 quality indexes and by night.

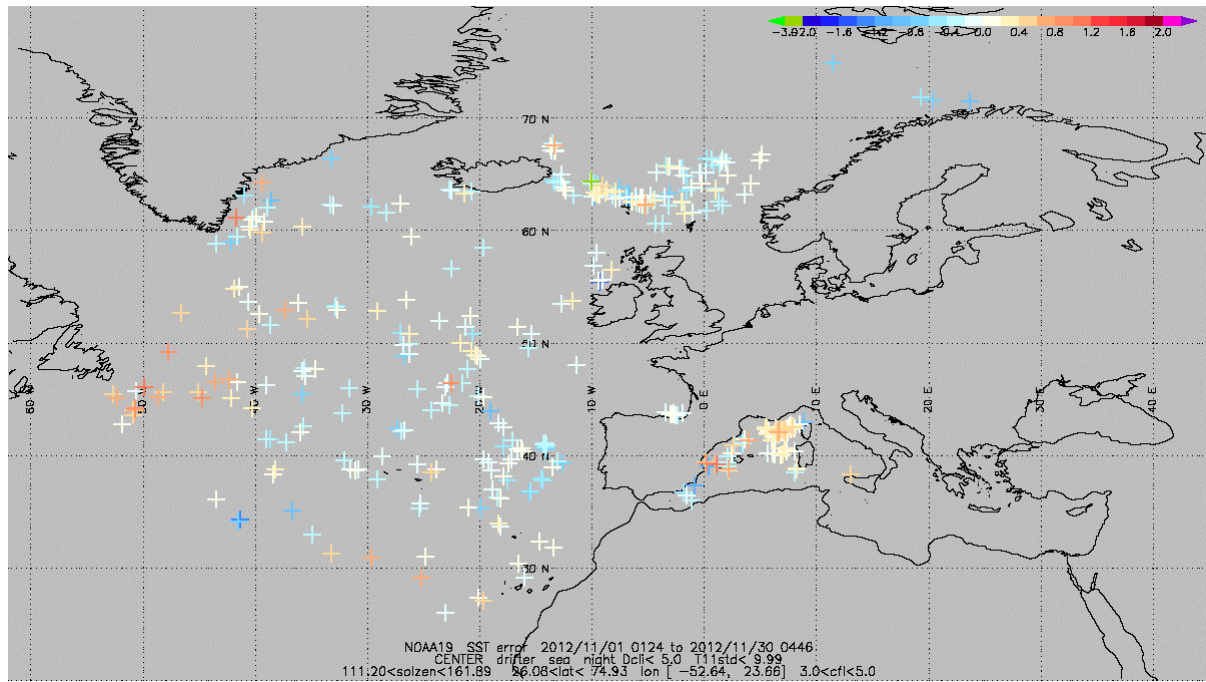


Figure 29 : Location of buoys for NOAA-19 NAR SST validation in NOVEMBER 2012, for 3, 4, 5 quality indexes and by night.

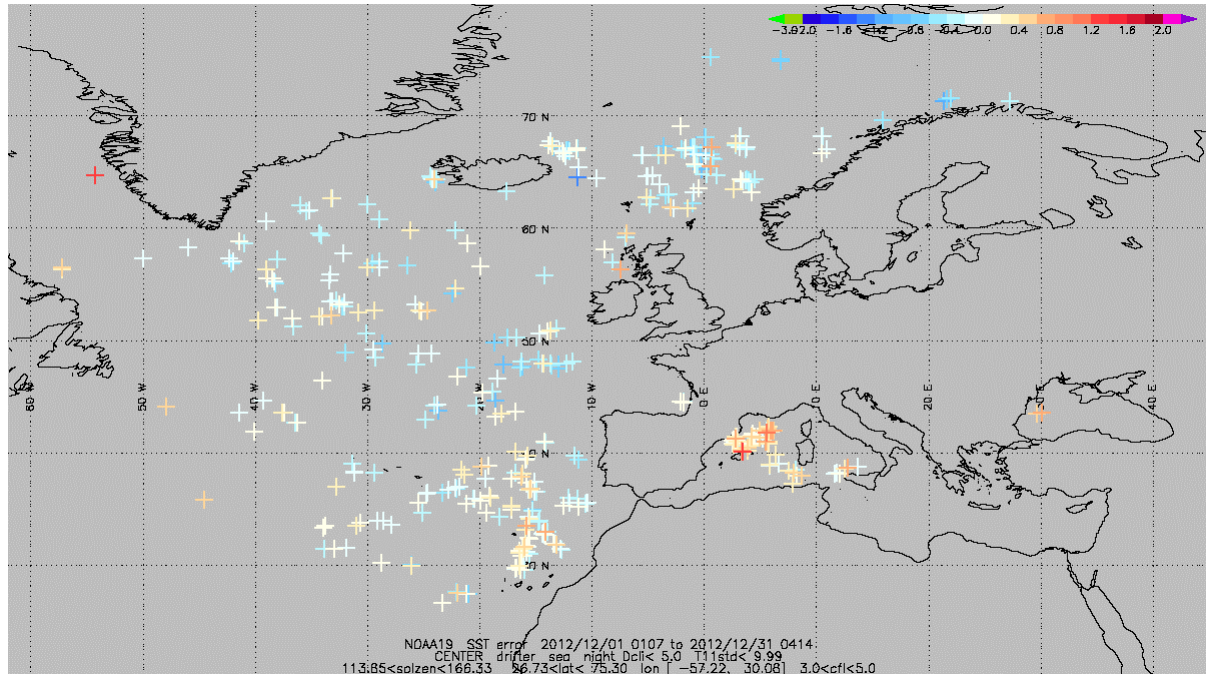


Figure 30 : Location of buoys for NOAA-19 NAR SST validation in DECEMBER 2012, for 3, 4, 5 quality indexes and by night.

The following table provides the NOAA-19-derived SST quality results over the reporting period.

NOAA-19 NAR SST quality results over 2 nd half 2012							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
July 2012	427	0,110	0,5	78	0,500	0,8	37,50
Aug. 2012	633	-0,020	0,5	96	0,440	0,8	45,00
Sept. 2012	622	0,050	0,5	90	0,550	0,8	31,25
Oct. 2012	643	-0,030	0,5	94	0,500	0,8	37,50
Nov. 2012	451	-0,080	0,5	84	0,400	0,8	50,00
Dec. 2012	464	-0,060	0,5	88	0,360	0,8	55,00

table 7 : Quality results for NOAA-19 NAR SST over 2nd half 2012, 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: Results are good and quite stable.

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

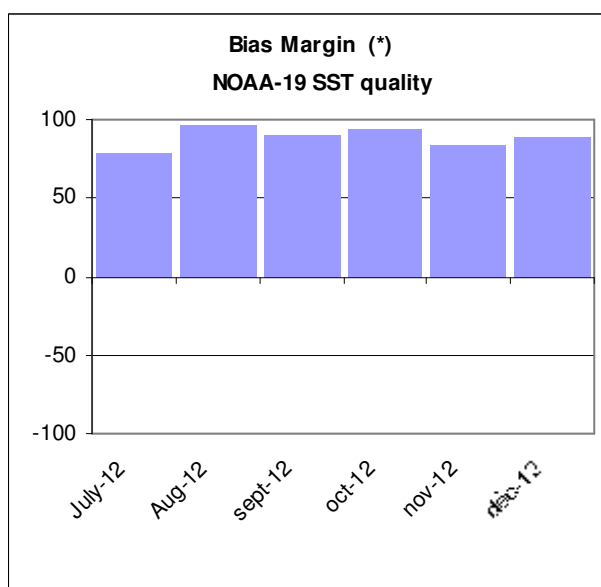
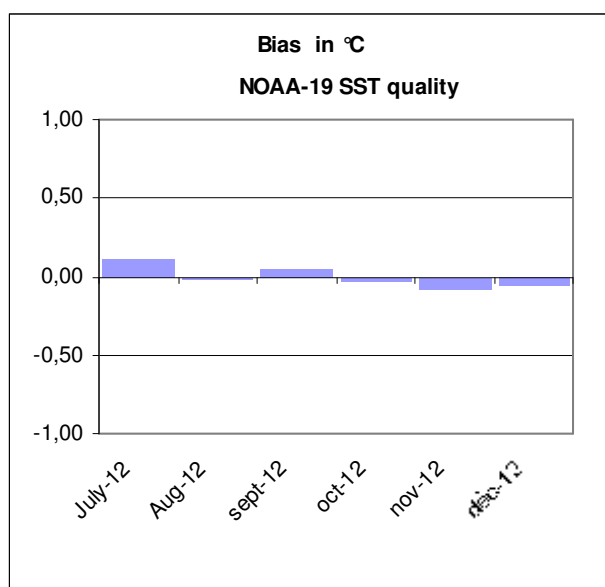


Figure 31 : Left: NOAA-19 NAR SST Bias. Right NOAA-19 NAR SST Bias Margin.

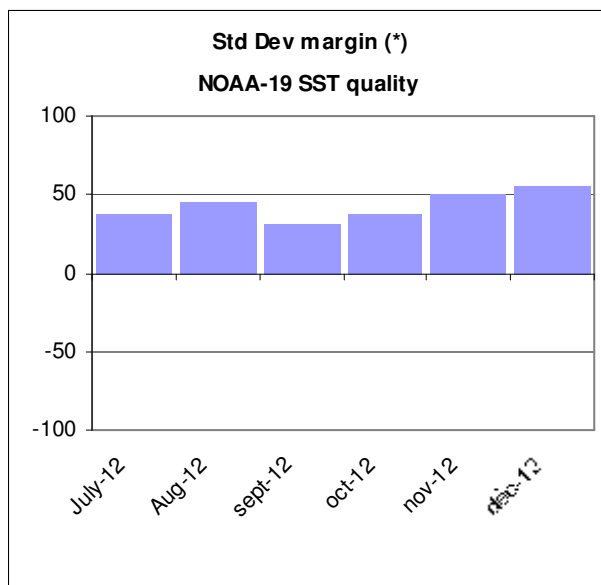
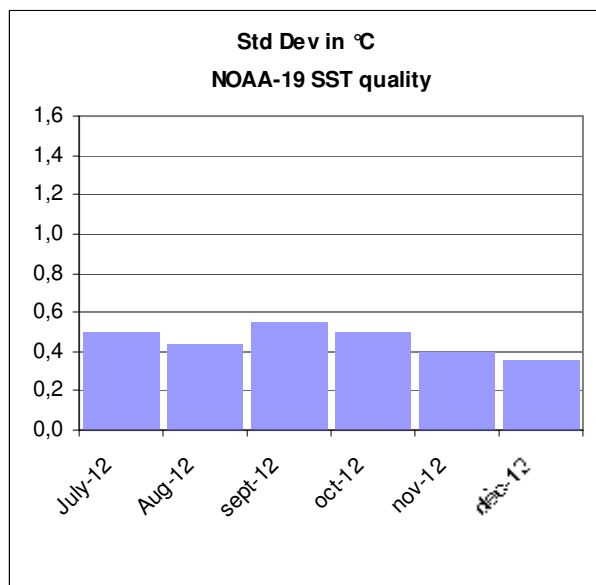
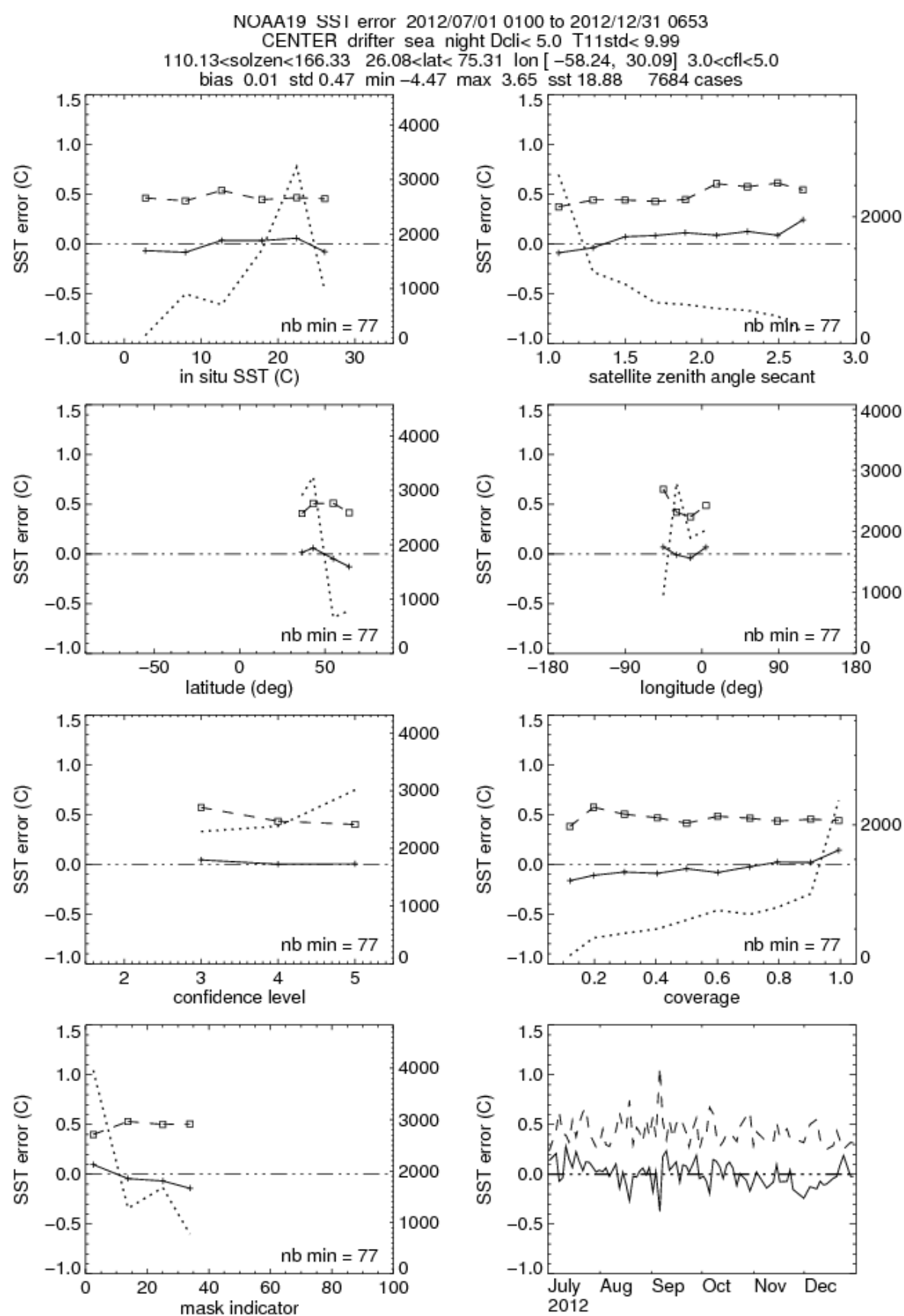


Figure 32 : Left: NOAA-19 NAR SST Standard deviation. Right NOAA-19 NAR SST Standard deviation Margin.

Complementary validation statistics on NOAA-19 NAR SST**Figure 33 : Complementary validation statistics on NOAA-19 NAR SST.**

5.1.3.3 Metop NAR SST quality

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

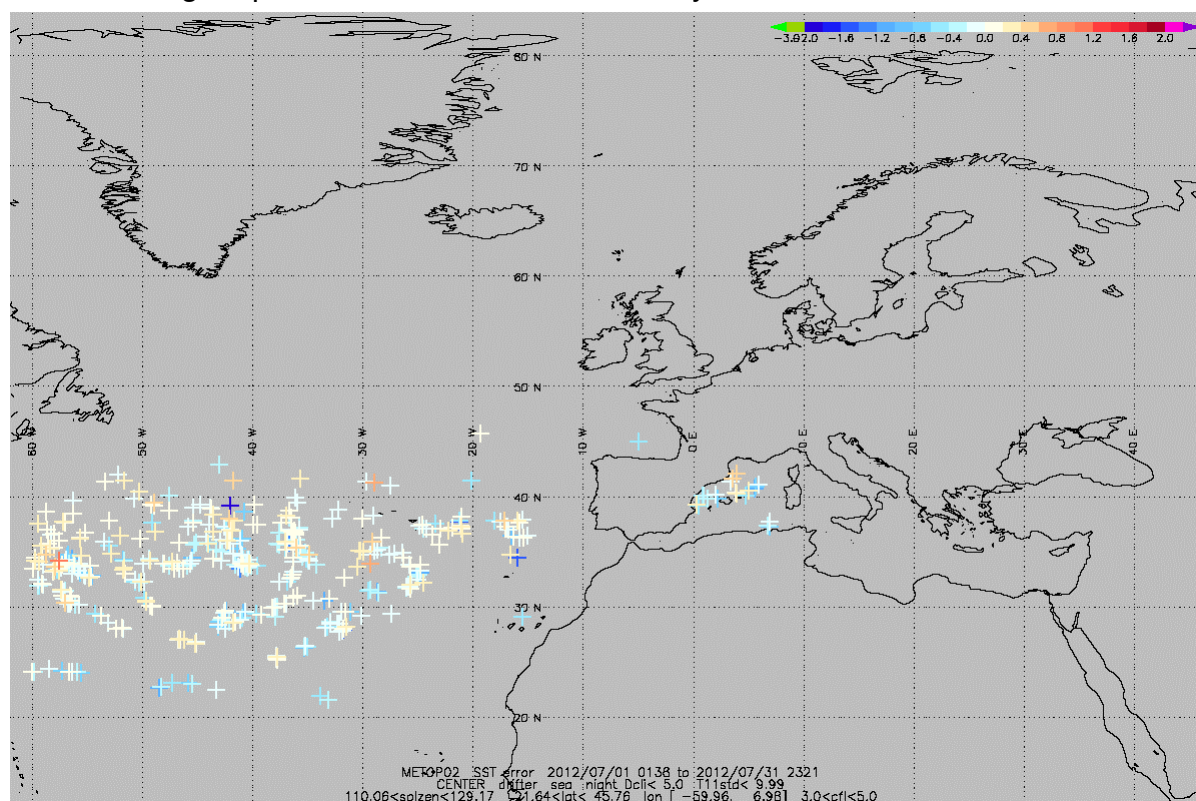


Figure 34 : Location of buoys for Metop-A NAR SST validation in JULY 2012, for 3, 4, 5 quality indexes and by night.

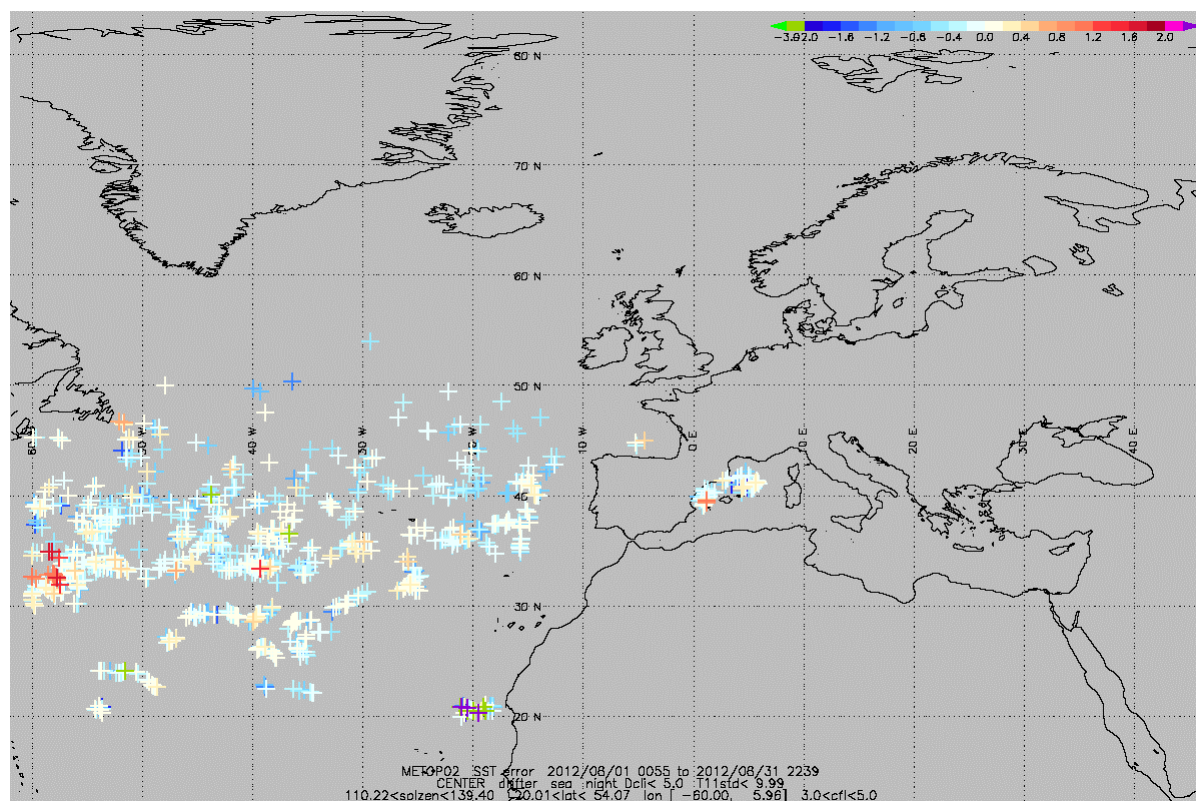


Figure 35 : Location of buoys for Metop-A NAR SST validation in AUGUST 2012, for 3, 4, 5 quality indexes and by night

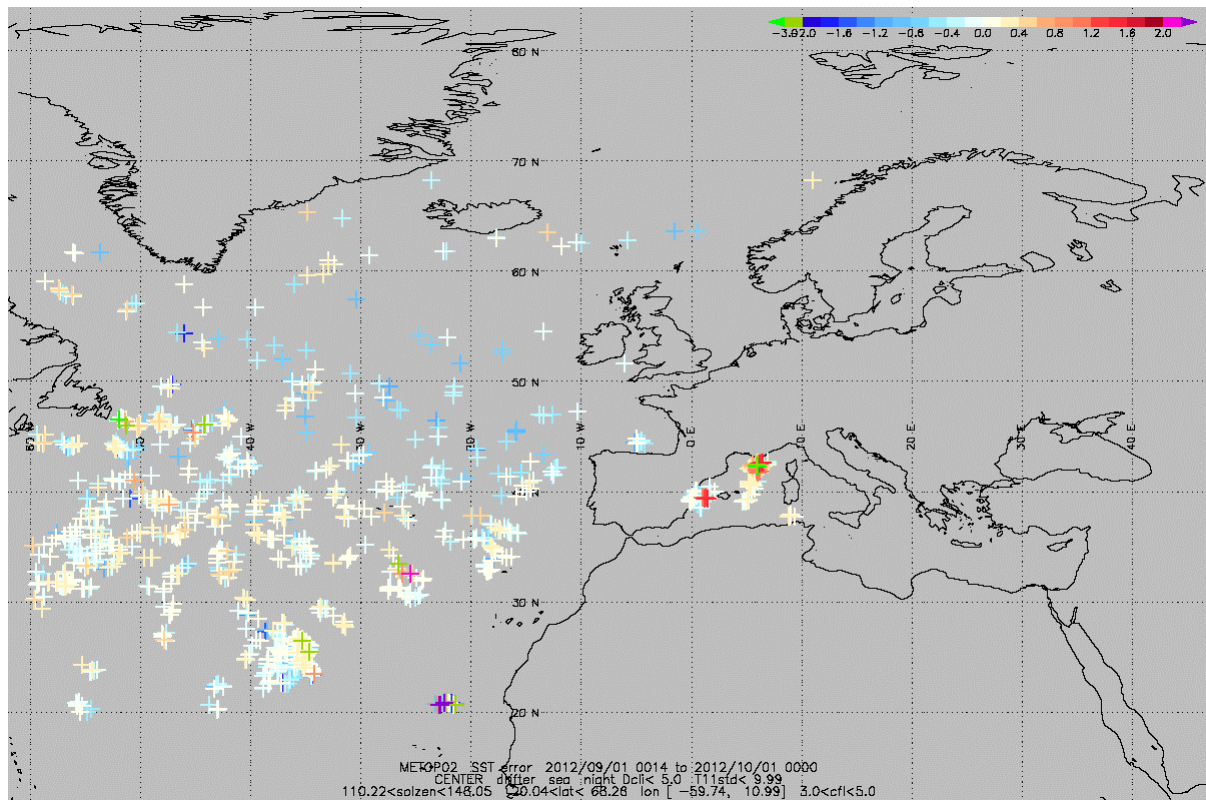


Figure 36 : Location of buoys for Metop-A NAR SST validation in SEPTEMBER 2012, for 3, 4, 5 quality indexes and by night.

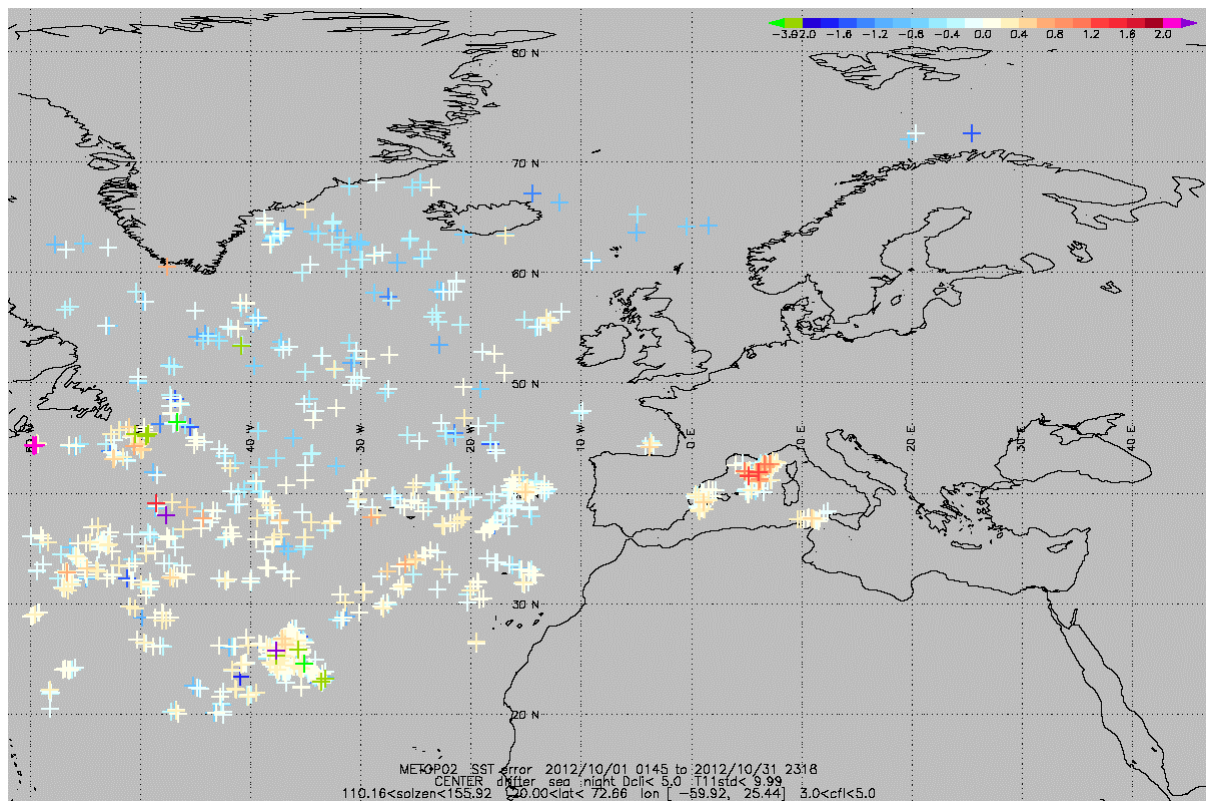


Figure 37 : Location of buoys for Metop-A NAR SST validation in OCTOBER 2012, for 3, 4, 5 quality indexes and by night.

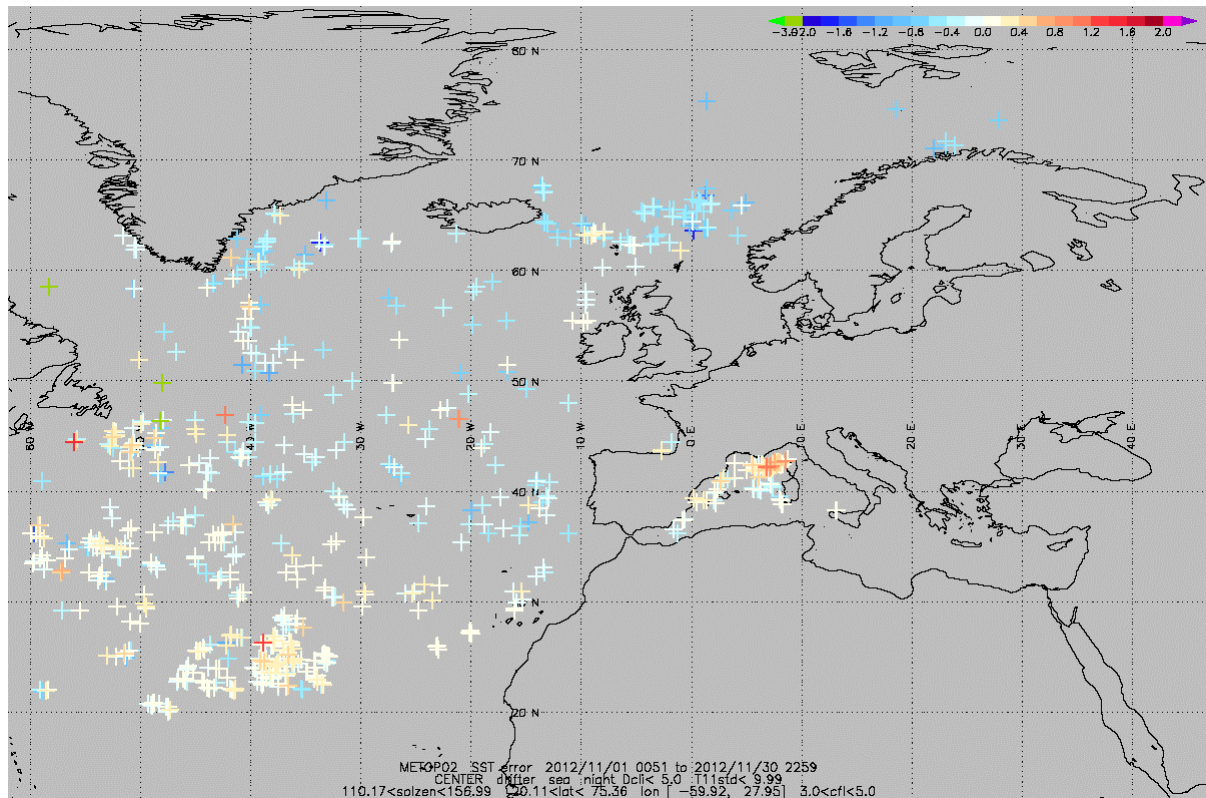


Figure 38 : Location of buoys for Metop-A NAR SST validation in NOVEMBER 2012, for 3, 4, 5 quality indexes and by night.

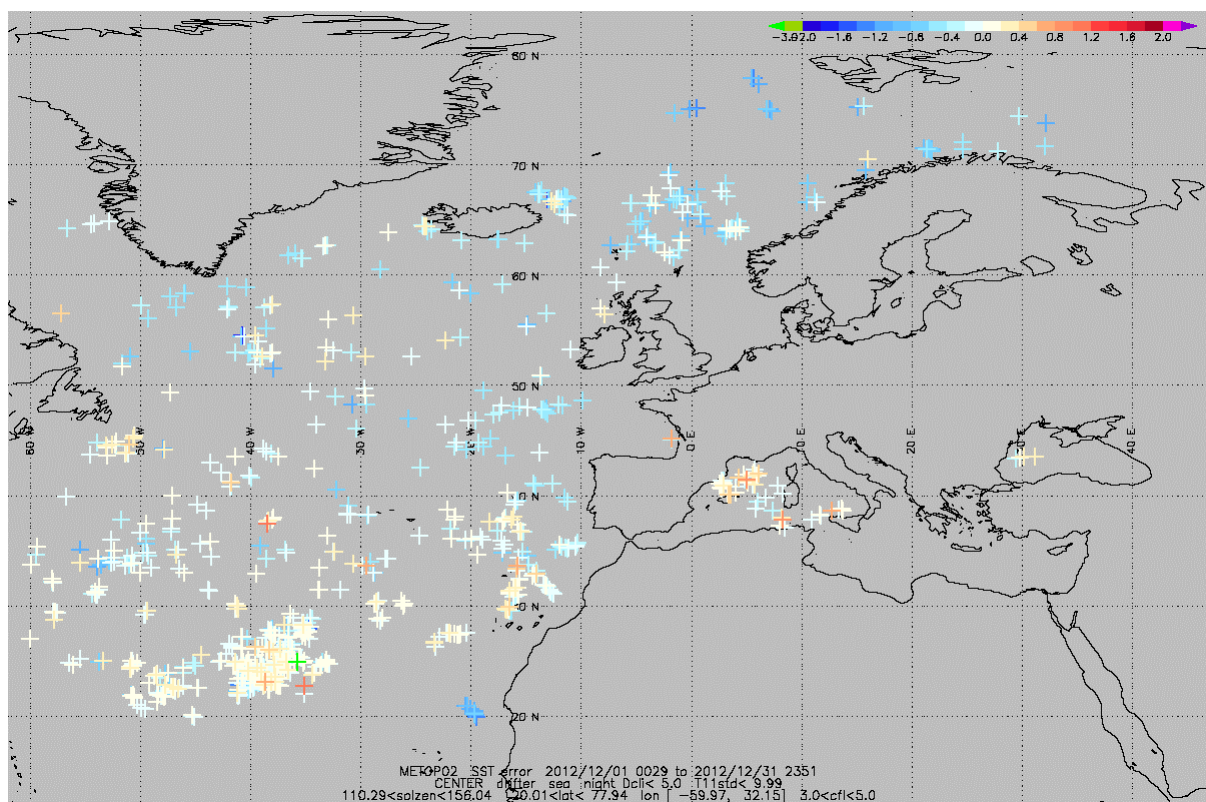


Figure 39 : Location of buoys for Metop-A NAR SST validation in DECEMBER 2012, for 3, 4, 5 quality indexes and by night.

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

Metop-A NAR SST quality results over 2 nd half 2012							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
July 2012	455	-0,120	0,5	76,00	0,36	0,8	55,00
Aug. 2012	1063	-0,240	0,5	52,00	0,52	0,8	35,00
Sept. 2012	1579	-0,150	0,5	70,00	0,51	0,8	36,25
Oct. 2012	1299	-0,110	0,5	78,00	0,51	0,8	36,25
Nov. 2012	894	-0,140	0,5	72,00	0,41	0,8	48,75
Dec. 2012	1008	-0,190	0,5	62,00	0,4	0,8	50,00

table 8 : Quality results for Metop-A NAR SST over 2nd half 2012, 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.

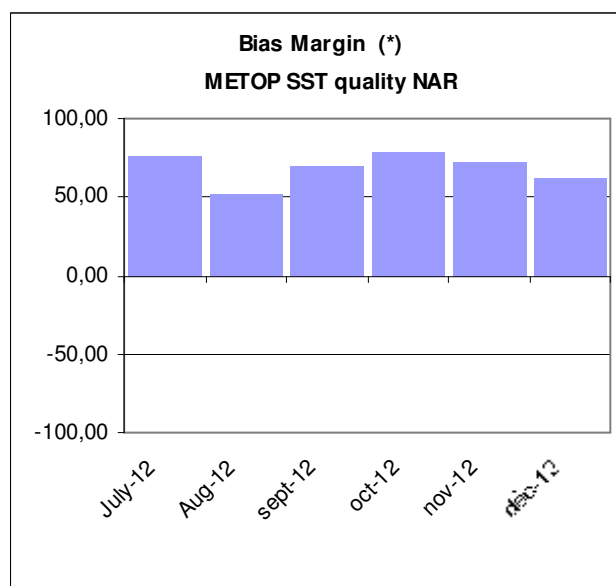
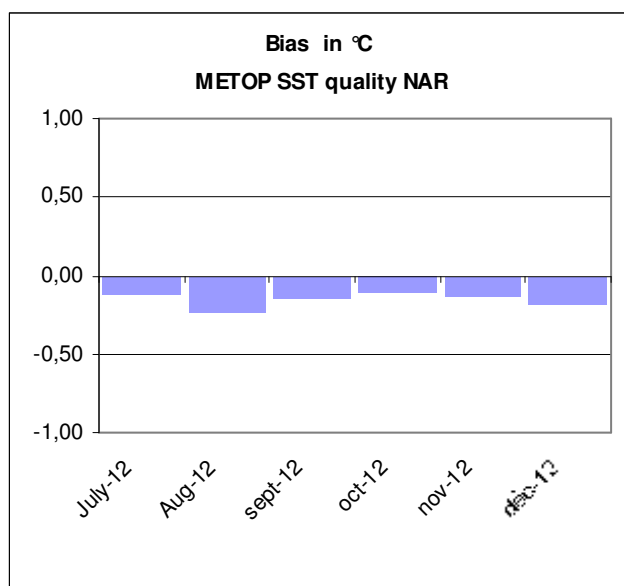


Figure 40 : Left: Metop-A NAR SST Bias. Right: Metop-A NAR SST Bias Margin.

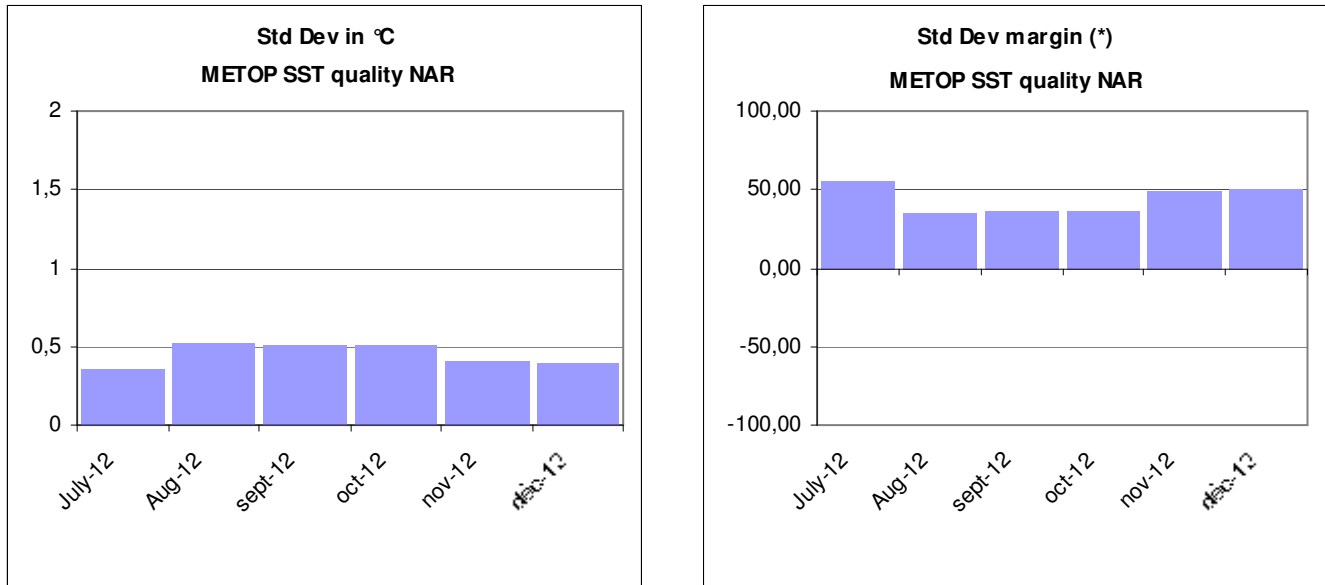
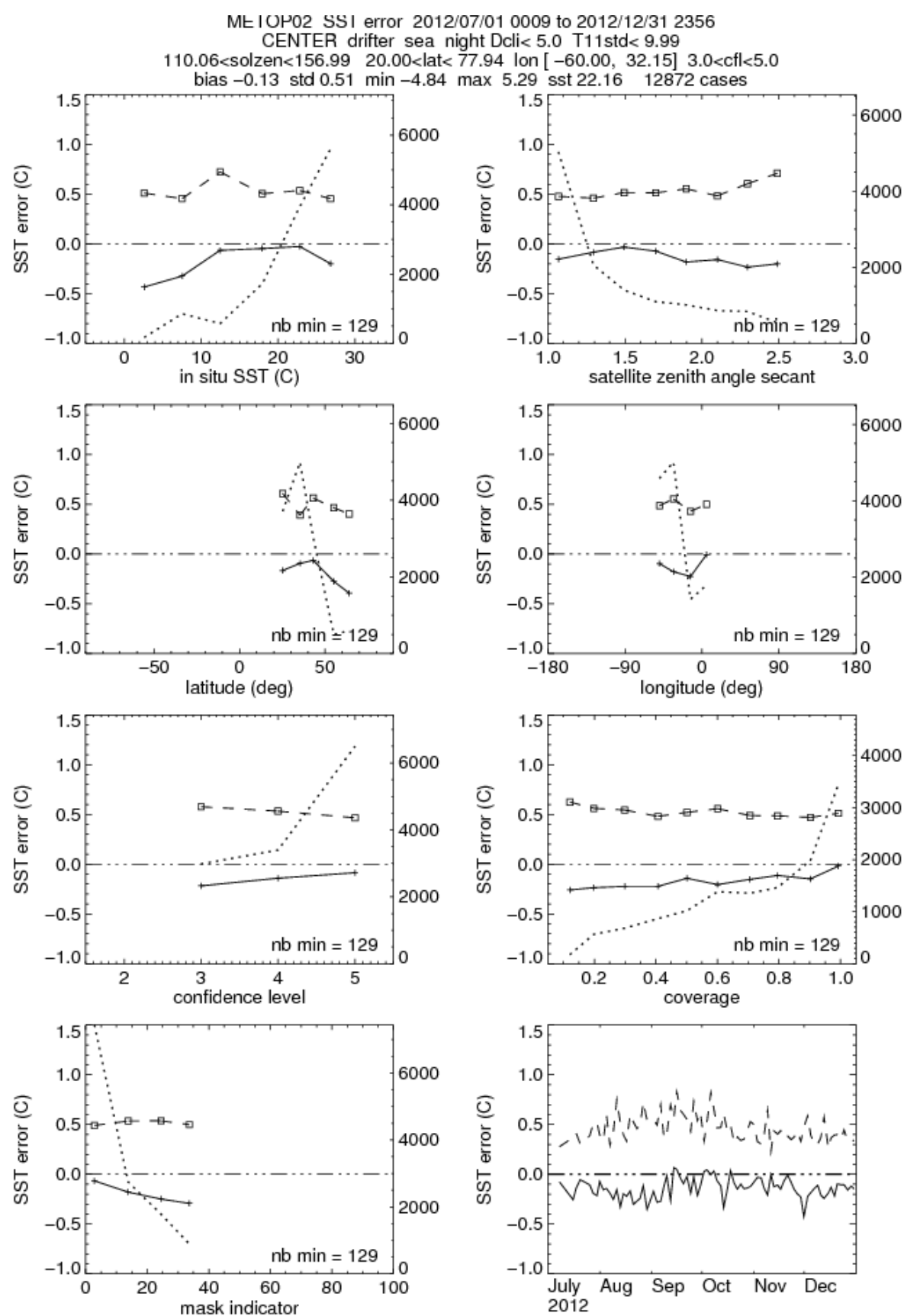


Figure 41 : Left: Metop-A NAR SST Standard deviation. Right: Metop-A NAR SST Standard deviation Margin.

Complementary validation statistics on Metop NAR SST**Figure 42 : 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.

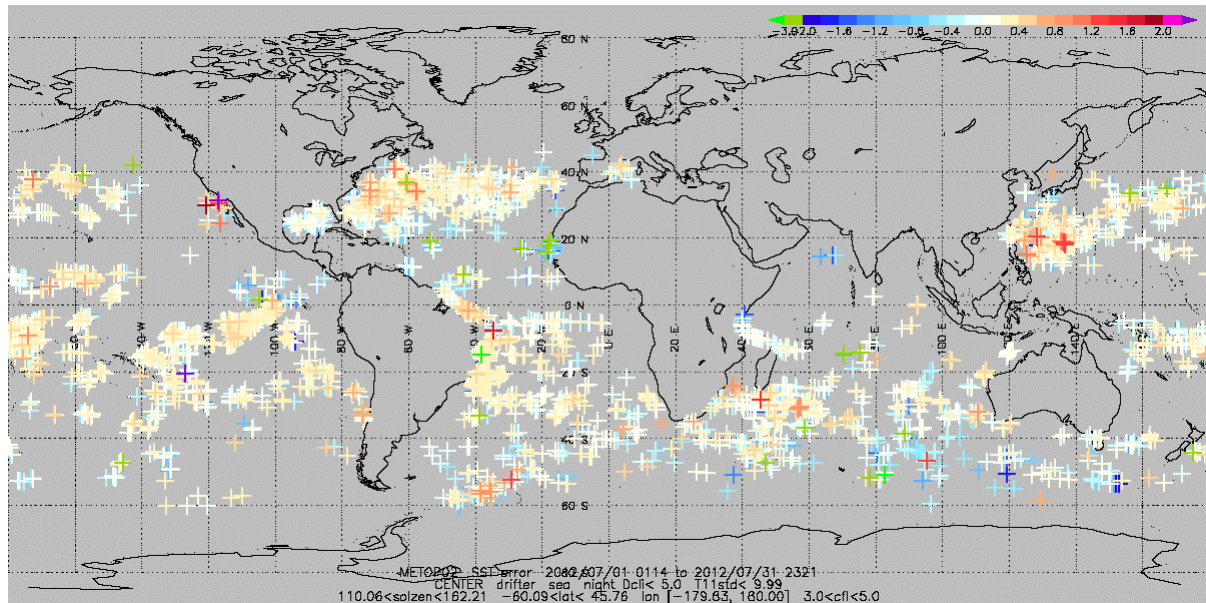


Figure 43 : Location of buoys for global Metop-A SST validation in JULY 2012, for 3, 4, 5 quality indexes and by night.

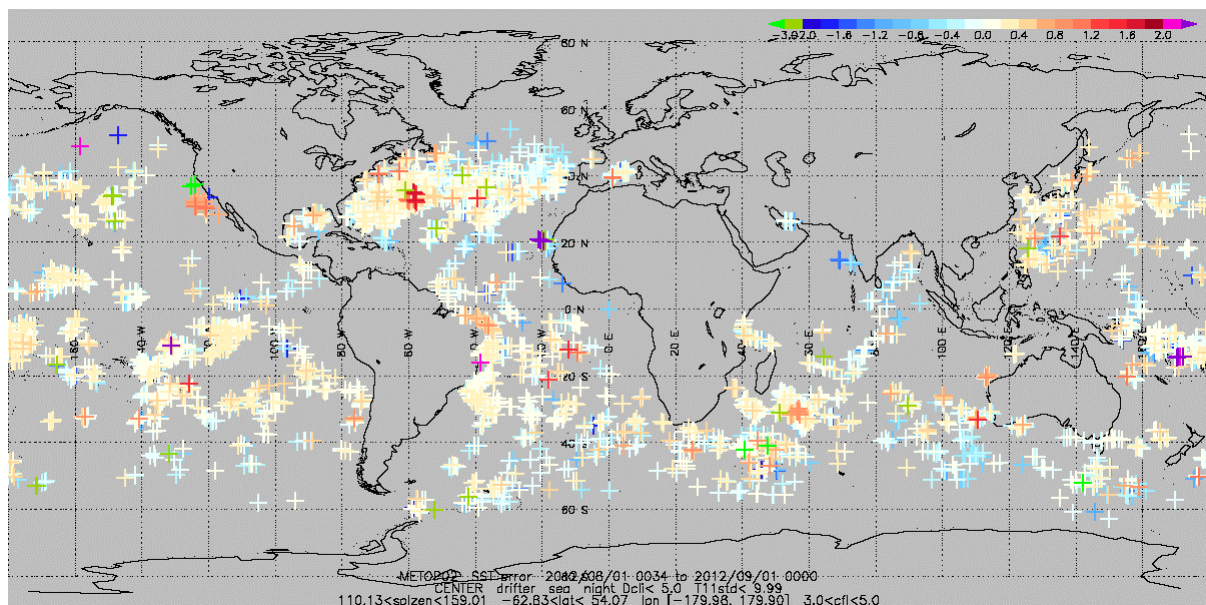


Figure 44 : Location of buoys for global Metop-A SST validation in AUGUST 2012, for 3, 4, 5 quality indexes and by night.

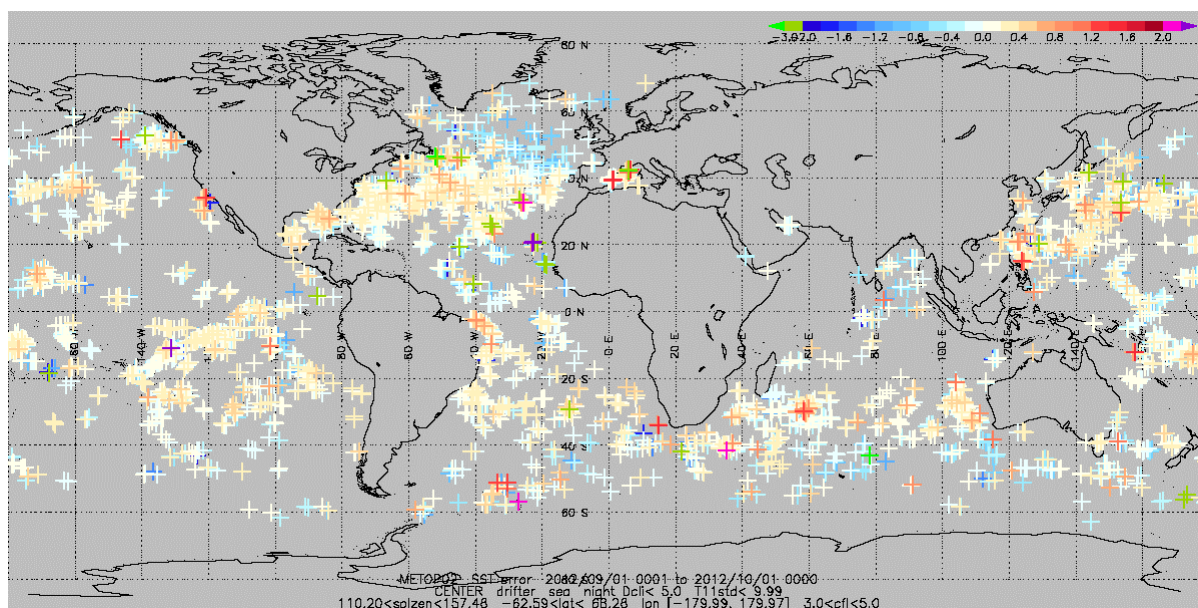


Figure 45 : Location of buoys for global Metop-A SST validation in SEPTEMBER 2012, for 3, 4, 5 quality indexes and by night.

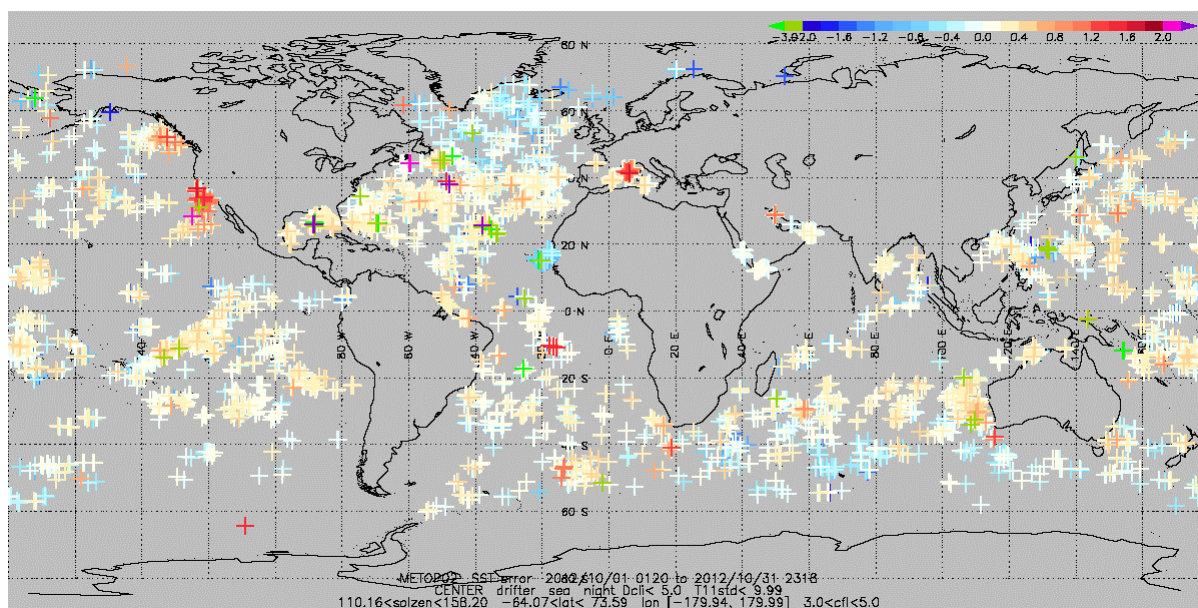


Figure 46 : Location of buoys for global Metop-A SST validation in OCTOBER 2012, for 3, 4, 5 quality indexes and by night.

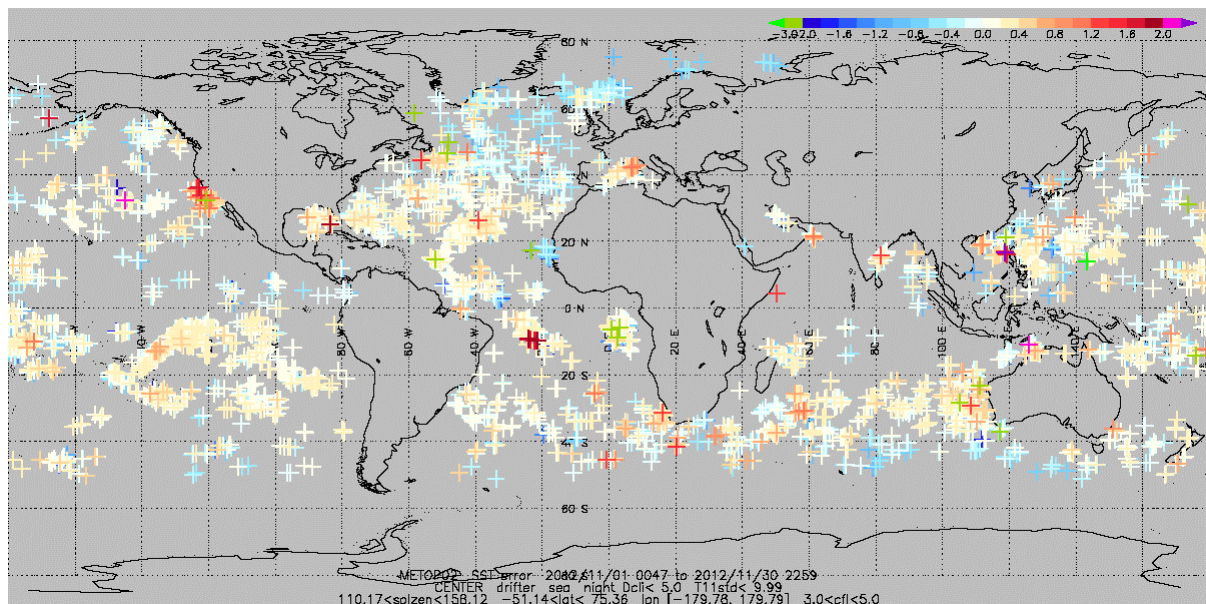


Figure 47 : Location of buoys for global Metop-A SST validation in NOVEMBER 2012, for 3, 4, 5 quality indexes and by night.

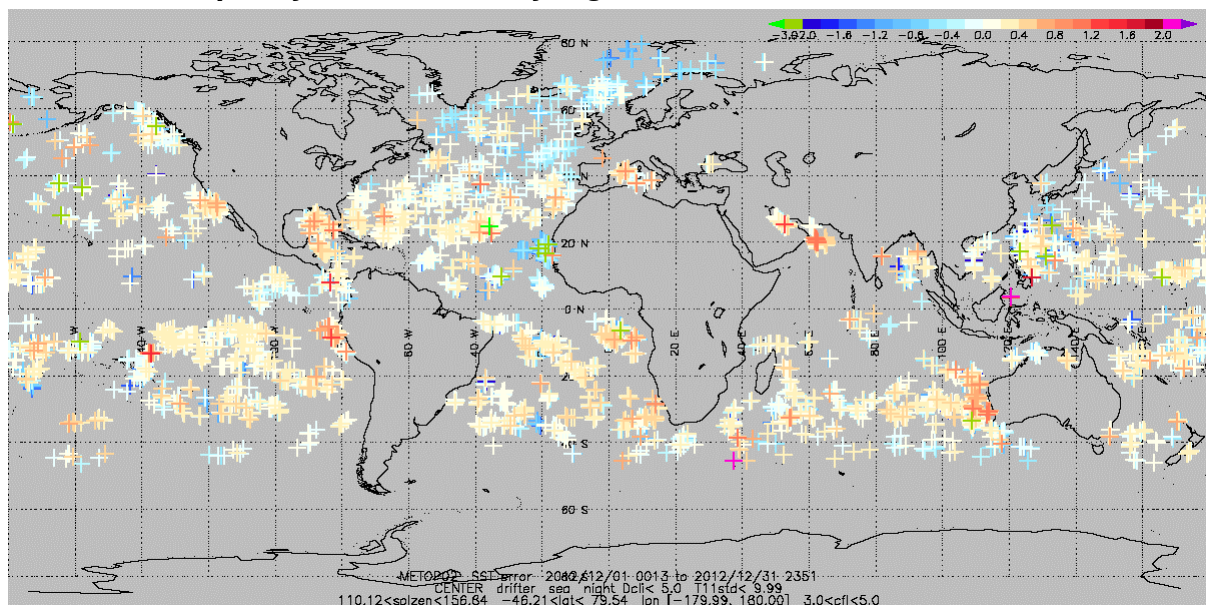


Figure 48 : Location of buoys for global Metop-A SST validation in DECEMBER 2012, for 3, 4, 5 quality indexes and by night.

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

global Metop-A SST quality results over 2 nd half 2012								
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Req °C	Dev	Std Dev margin (*)
July 2012	4370	-0,080	0,5	84,00	0,44	0,8		45,00
Aug. 2012	5148	-0,120	0,5	76,00	0,49	0,8		38,75
Sept. 2012	5775	-0,090	0,5	82,00	0,45	0,8		43,75
Oct. 2012	5763	-0,070	0,5	86,00	0,48	0,8		40,00
Nov. 2012	5080	-0,070	0,5	86,00	0,43	0,8		46,25
Dec. 2012	5266	-0,090	0,5	82,00	0,44	0,8		45,00

table 9 : Quality results for global METOP SST over 2nd half 2012, 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 global METOP SST quality results over the past 6 months.

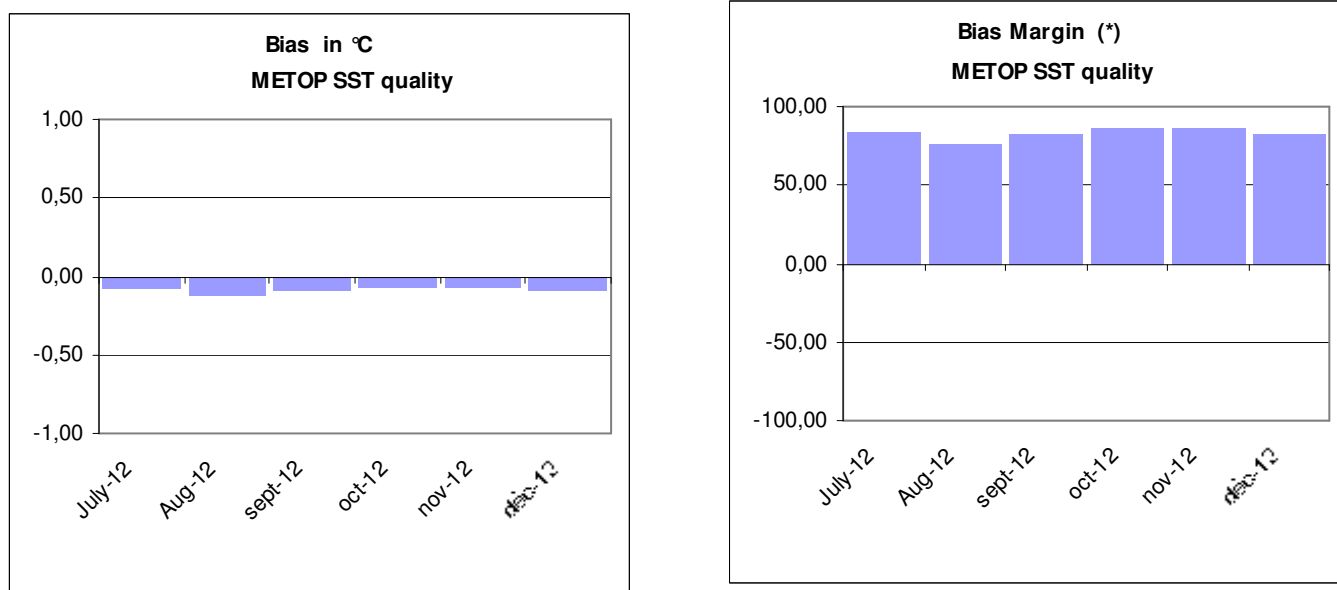


Figure 49 : Left: global Metop-A SST Bias. Right: global Metop-A SST Bias Margin.

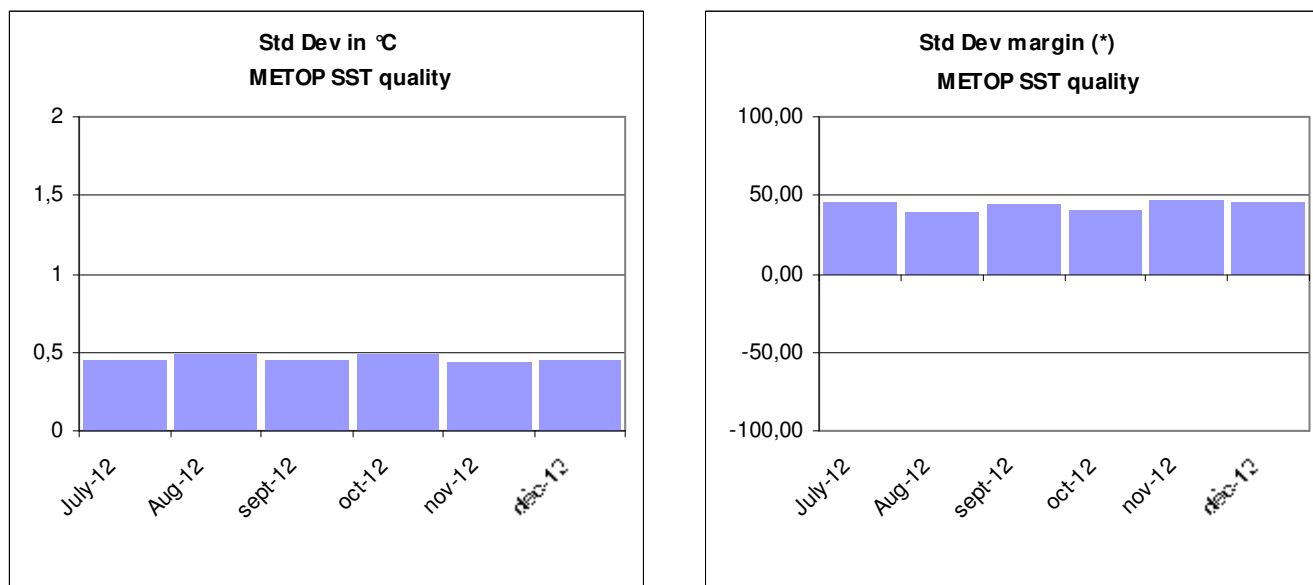
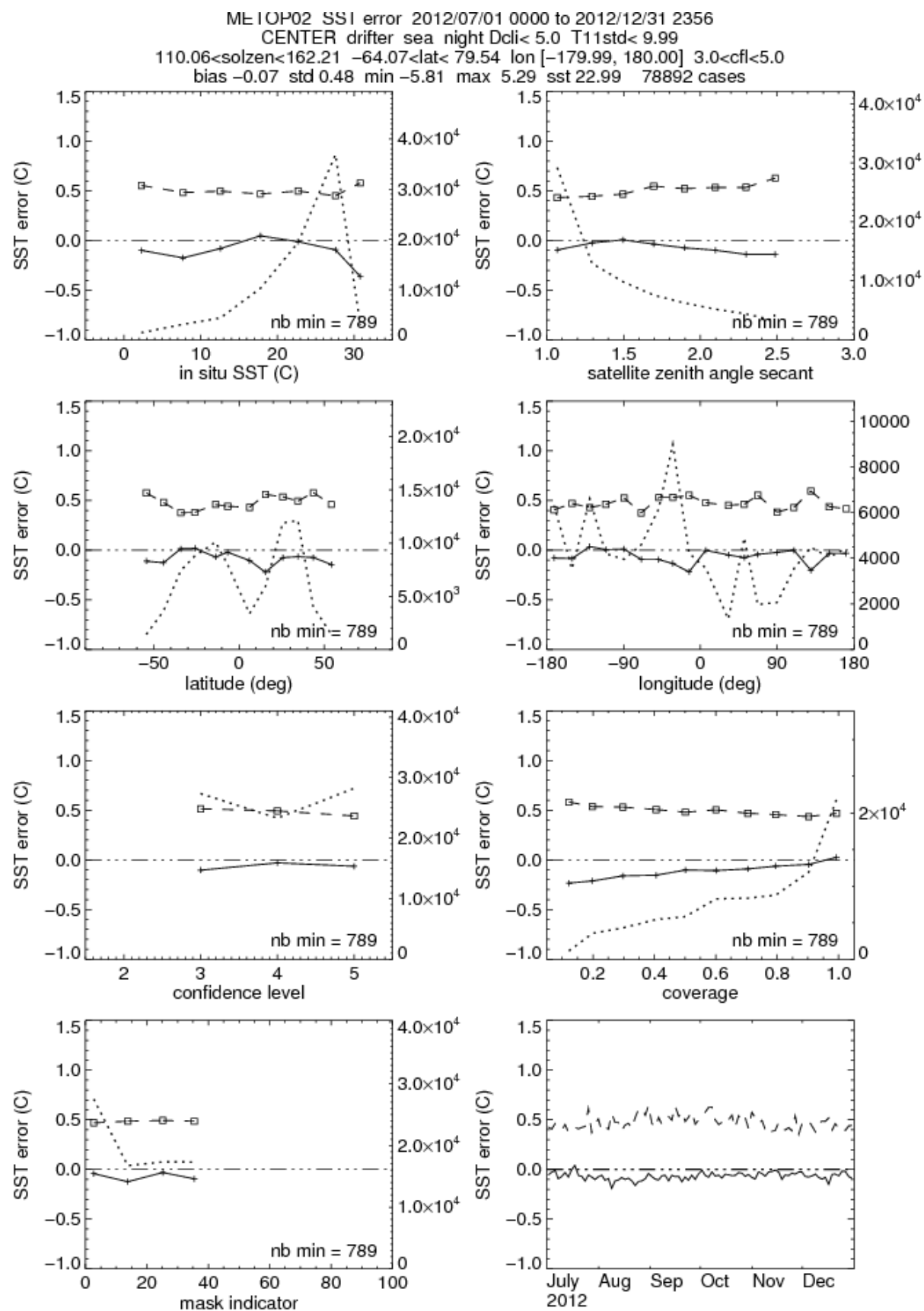


Figure 50 : Left: global Metop-A SST Standard deviation. Right: global Metop-A SST Standard deviation Margin.

Complementary validation statistics on Metop GLB SST**Figure 51 : 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 figure shows the location of the drifting buoys used in the AHL SST validation.

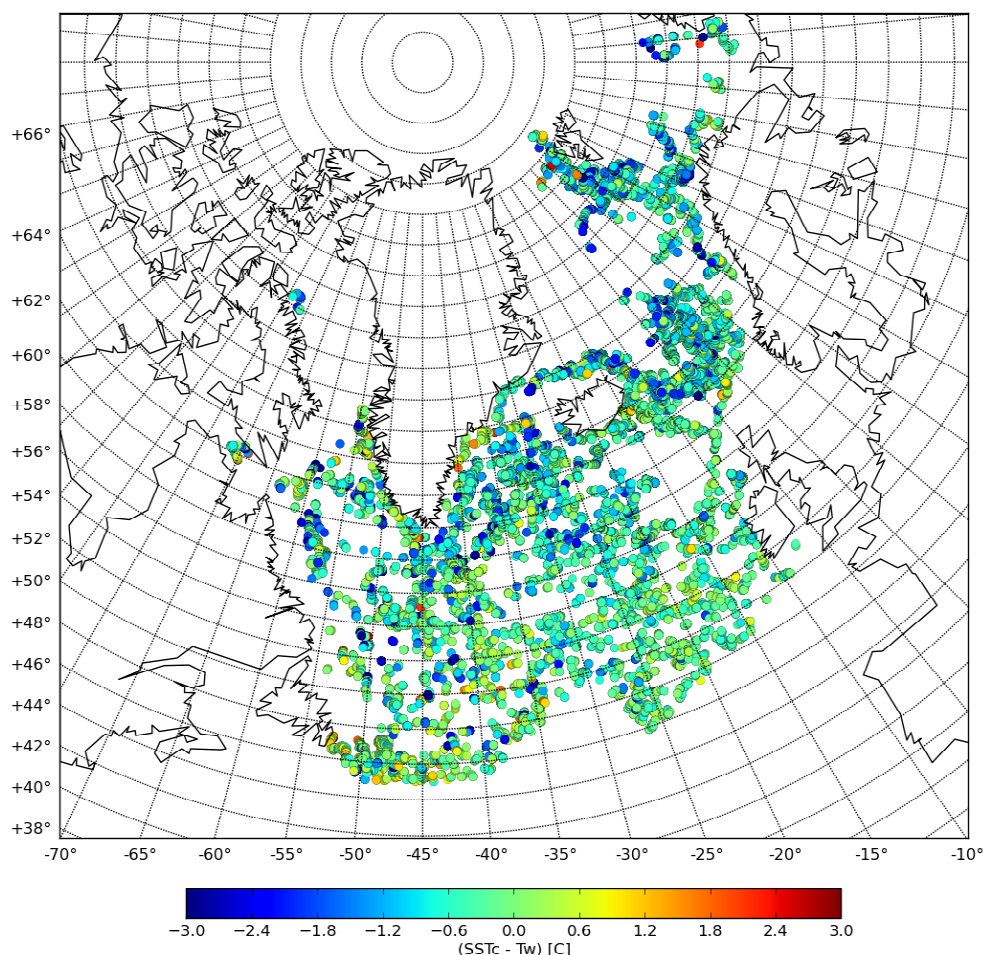


Figure 52 : Location of buoys for AHL SST validation in July to December 2012, for 3, 4, 5 quality indexes and by night.

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

AHL AVHRR SST quality results over 2012, nighttime product							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
Jan. 2012	386	-0.61	0.5	-21.4	0.71	0.8	11.7
Feb. 2012	552	-0.51	0.5	-1.9	0.73	0.8	8.2
Mar. 2012	643	-0.38	0.5	24.3	0.71	0.8	11.7
Apr. 2012	422	-0.58	0.5	-15.0	0.73	0.8	9
May 2012	383	-0.42	0.5	15.8	0.96	0.8	-19.7
June 2012	624	-0.64	0.5	-28.6	0.77	0.8	3.3
July 2012	806	-0.53	0.5	-5.5	1.04	0.8	-29.7
Aug. 2012	1147	-0.66	0.5	-32.4	0.99	0.8	-24.2
Sept. 2012	1595	-0.62	0.5	-24.3	0.86	0.8	-8
Oct. 2012	1683	-0.64	0.5	-28.5	0.79	0.8	1.4
Nov. 2012	1539	-0.54	0.5	-7.1	0.69	0.8	13.9
Dec. 2012	1588	-0.58	0.5	-16	0.65	0.8	19.3
AHL AVHRR SST quality results over 2012, daytime product							
Month	Number of cases	Bias °C	Bias Req °C	Bias Margin (*)	Std Dev °C	Std Dev Req °C	Std Dev margin (*)
Jan. 2012	440	-0.68	0.5	-35.6	0.74	0.8	7.5
Feb. 2012	446	-0.39	0.5	21.4	0.74	0.8	7.4
Mar. 2012	346	-0.17	0.5	66.7	0.54	0.8	33.1
Apr. 2012	410	-0.37	0.5	26.1	0.58	0.8	28.1
May 2012	538	-0.17	0.5	65.8	0.75	0.8	6.8
June 2012	731	-0.26	0.5	48.9	0.67	0.8	16.8
July 2012	1203	-0.20	0.5	60.3	0.73	0.8	8.7
Aug. 2012	1267	-0.29	0.5	41.6	0.71	0.8	11.4
Sept. 2012	1783	-0.22	0.5	56.6	0.61	0.8	24.4
Oct. 2012	1389	-0.36	0.5	28.6	0.64	0.8	19.5
Nov. 2012	1299	-0.45	0.5	10.6	0.63	0.8	20.8
Dec. 2012	1687	-0.55	0.5	-9	0.65	0.8	18.3

table 10 : Quality results for AHL AVHRR SST over 2012, for 3,4,5 quality indexes, for nighttime and daytime products.

(*)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: For the AHL SST product, results for the whole of 2012 are shown. This is because the selection of observations to be used for the validation have been improved. Previously too many observations were used due to a too large time window between observation time and satellite product time.

For comparison, results are split between the nighttime product (centered at 00 UTC) and the daytime product (centered at 12 UTC). The daytime product is usually within specifications (except bias in January and December). For nighttime there are several months where the product is outside requirement, especially for the bias. There is a significant negative bias. When only quality index 4 and 5 are used in the comparison (not shown), the bias is within requirements for all months and for 10 of 12 months for std.dev.

We expect that the source of the bias is linked to cloud and ice masking, and more effort will be spent on this issue to improve the AHL SST product.

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 2 nd half 2012								
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 2012	2435	387.56	0.049	5	99.02	4.06	10	59.44
Aug. 2012	5319	369.42	-0.160	5	96.81	4.55	10	54.50
Sept. 2012	4072	344.82	-0.406	5	91.88	4.96	10	50.44
Oct. 2012	2720	311.03	-3.225	5	35.50	5.99	10	40.07
Nov. 2012	5099	283.89	-2.962	5	40.75	6.57	10	34.34
Dec. 2012	4518	283.3	-3.745	5	25.10	7.55	10	24.50

table 11 : Geostationary DLI quality results over 2nd half 2012.

(*)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 stable for the first three months. Results are less good for the end of the year but always compatible with requirements.

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

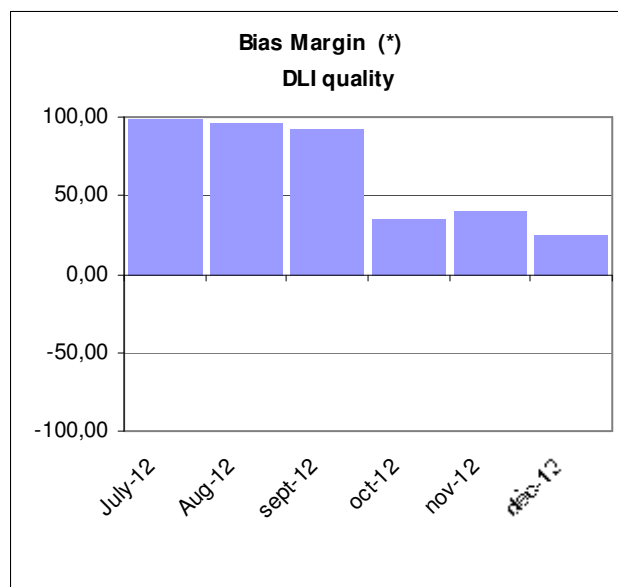
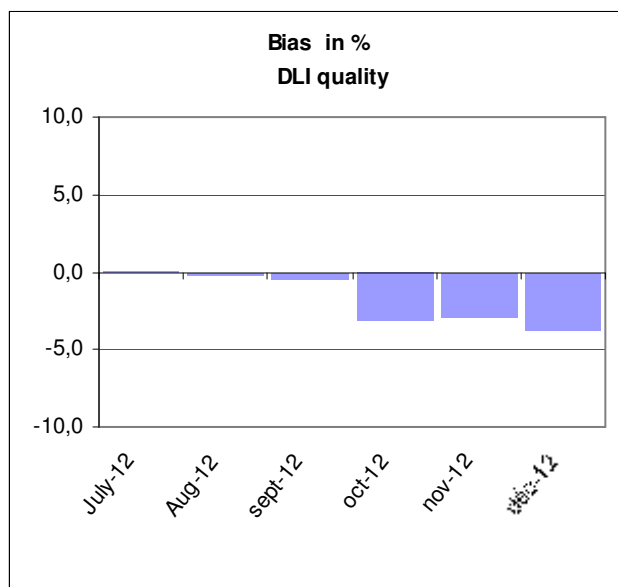


Figure 53 : Left: Geostationary DLI Bias. Right Geostationary DLI Bias Margin .

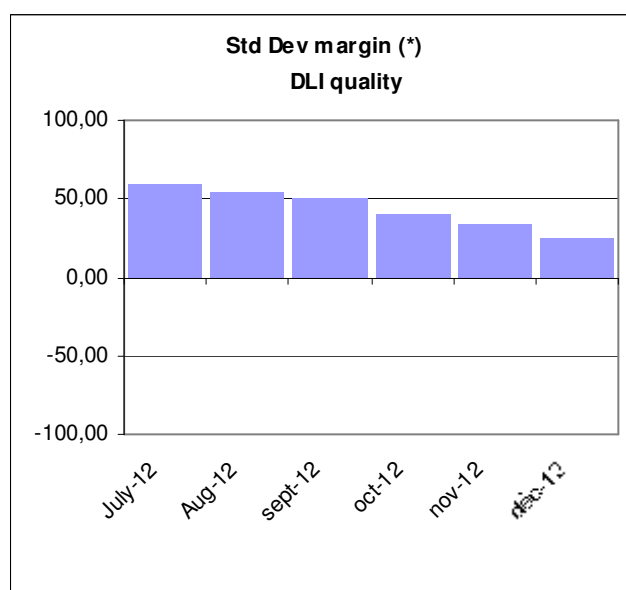
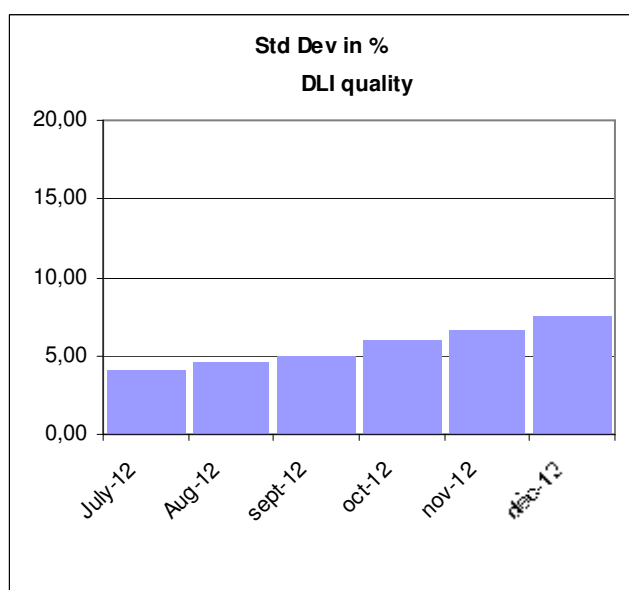


Figure 54 : Left: Geostationary DLI Standard deviation. Right DLI Geostationary Standard deviation Margin.

5.2.1.2 AHL DLI quality

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

0Ekofisk
1Jan Mayen
2Bjørnøya
3Hopen

These stations are briefly described at <http://dokipy.met.no/projects/iaoos-norway/radflux.html>. A map illustrating the locations is provided in Figure 1 where the stations used for SSI validation is also shown. More information on the stations is provided in chapter section.

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

AHL DLI quality results over 2 nd half 2012										
Month	Number of cases	Mean DLI in Wm ⁻²	Bias in Wm ⁻²	Bias in %	Bias Req In %	Bias Margin in %(*)	Std Dev in Wm ⁻²	Std Dev In %	Std Dev Req In %	Std Dev margin (*) in %
July 2012	124	326.65	17.81	5.54	5.0	-10.8	10.71	3.27	10.0	67.3
Aug. 2012	124	328.61	15.14	6.16	5.0	-23.2	10.88	3.32	10.0	66.8
Sept. 2012	120	317.31	7.15	4.06	5.0	18.8	10.51	3.33	10.0	66.7
Oct. 2012	105	297.98	5.58	3.64	5.0	27.2	15.72	5.31	10.0	46.9
Nov. 2012	119	288.50	2.06	1.85	5.0	63.0	14.93	5.21	10.0	47.9
Dec. 2012	120	273.30	-4.99	2.78	5.0	44.4	13.82	5.09	10.0	49.1

table 12 : AHL DLI quality results over 2nd half 2012.

(*)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.

5.2.2 SSI quality

SSI products are constituted of the geostationary products (METEOSAT SSI and GOES-E SSI) and polar ones (AHL SSI).

SSI values are required to have the following accuracy when compared to land pyranometer measurements :

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

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

5.2.2.1 METEOSAT 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 2 nd half 2012										
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 2012	1532	499.61	-3.62	-0.72	10	92.75	80.14	16.04	30	46.53
Aug. 2012	7859	469.44	2.06	0.44	10	95.61	75.26	16.03	30	46.56
Sept. 2012	5997	433.86	17.69	4.08	10	59.23	84.08	19.38	30	35.40
Oct. 2012	4643	372.3	11.85	3.18	10	68.17	70.73	19.00	30	36.67
Nov. 2012	5315	348.72	19.72	5.65	10	43.45	75.93	21.77	30	27.42
Dec. 2012	4865	312.26	12.26	3.93	10	60.74	83.06	26.60	30	11.33

table 13 : Geostationary SSI quality results over 2nd half 2012.

(*)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 for the first three months but less good for the end of the year.

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

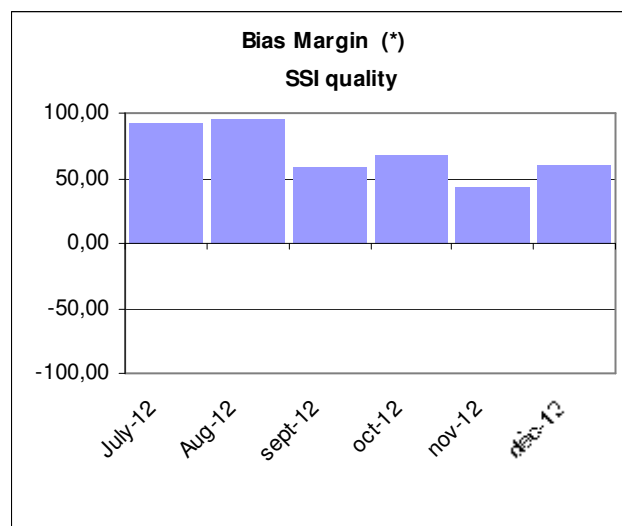
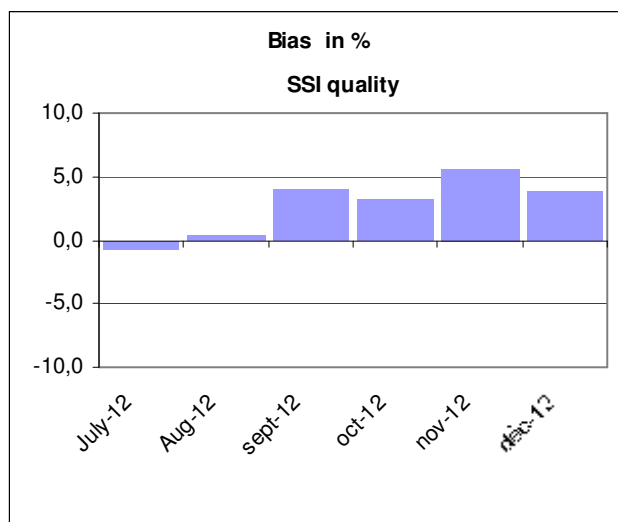


Figure 55 : Left: Geostationary SSI Bias. Right Geostationary SSI Bias Margin.

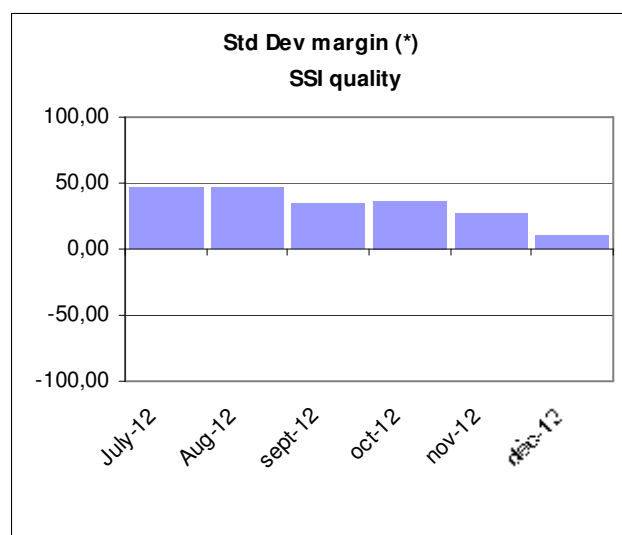
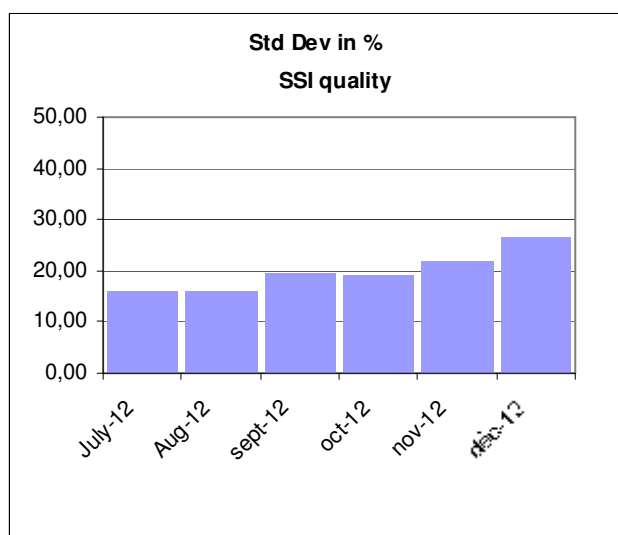


Figure 56 : Left: Geostationary SSI Standard deviation. Right Geostationary SSI Standard deviation Margin.

5.2.2.2 AHL SSI quality

The pyranometer stations used for validation of the AHL SSI product are shown in the following table.

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 validation.**

Locations of these stations are provided in the illustration below (Figure 1). 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://dokipy.met.no/projects/iaoos-norway/radflux.html>. The stations used in this validation is owned and operated by the [Norwegian Meteorological Institute](#), [University of Bergen, Geophysical Institute](#) and [Bioforsk](#)

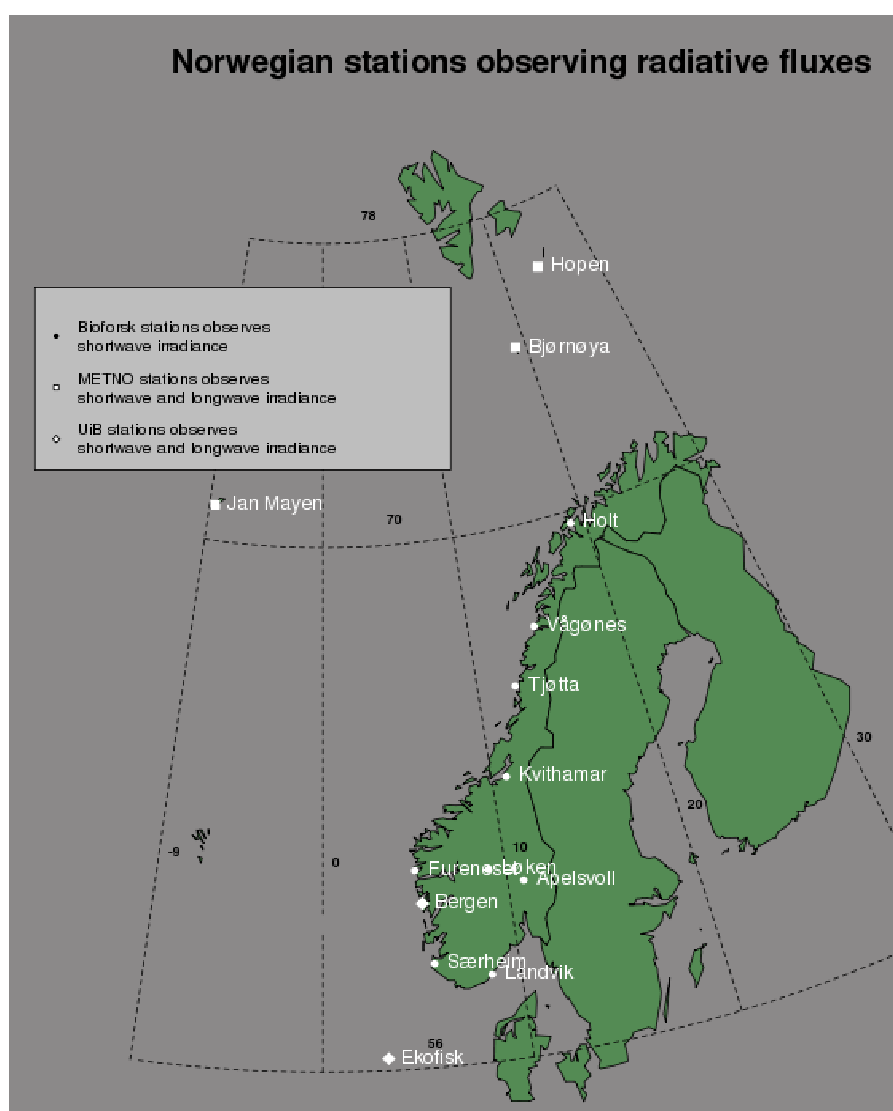


Figure 57 : List of stations available for validation purposes of AHL radiative fluxes. Only a subset of these stations are used due to station characteristics when validation satellite remote sensing products.

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

AHL SSI quality results over 2 nd half 2012										
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 2012	248	170.82	2.75	8.24	10.0	17.6	25.55	15.04	30.0	49.87
Aug. 2012	248	139.09	-0.48	6.49	10.0	35.1	19.88	14.75	30.0	50.83
Sept. 2012	240	77.62	0.72	5.48	10.0	45.2	12.04	16.13	30.0	46.23
Oct. 2012	228	35.09	-1.82	12.97	10.0	-29.7	9.05	32.411	30.0	-8.04
Nov. 2012	234	10.11	1.09	10.95	10.0	-9.5	5.90	41.98	30.0	-39.93
Dec. 2012	237	3.91	-0.37	4.11	10.0	58.9	4.34	48.85	30.0	-62.83

table 15 : AHL SSI quality results over 2nd half 2012.

(*)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: Validation results meets the requirements until October. The main reason why requirements not are met in October is that snow starts to accumulate on ground and drastically affects the results for several of the stations. Due to the issues concerning the station at Hopen mentioned in earlier reports, this station is excluded from this validation. The reason is that shadow effects cause overestimation of satellite estimates compared to observations. A correction factor to compensate for this effect has to be found before data can be used in validation.

As before, a major concern currently is that the station at Ekofisk is scheduled for `forosisaf_qr_qr12_h2_draft_a_metno_v2.doc` removal when a new oil rig arrives in 2013, work is ongoing to continue measurements, but no decision is made.

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.no 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 separately for the three different sets of ice charts.

For the weekly validation at the Northern Hemisphere the concentration product is required to have a bias and standard deviation less than 10% ice concentration on an annual basis. For the weekly 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. $\pm 10\%$ and $\pm 20\%$. Furthermore the bias and standard deviation is calculated for each concentration level. The bias and standard deviation are reported for ice ($> 0\%$ ice concentration), for water (0% ice concentration) 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

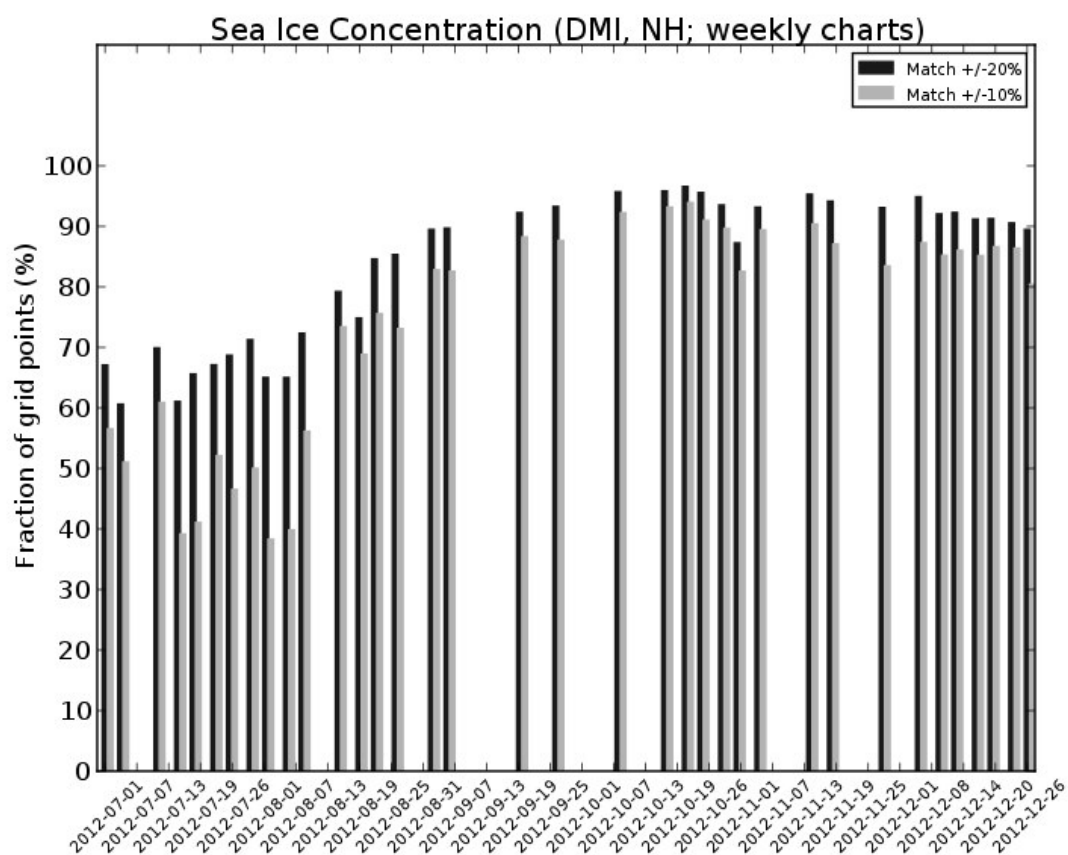


Figure 58 : Comparison between the ice concentrations from the weekly DMI ice analysis and the OSI SAF concentration product. 'Match +/- 10 %' corresponds to those grid points where concentration deviates within the range of +/-10 % and likewise for +/-20 %. For the Greenland area.

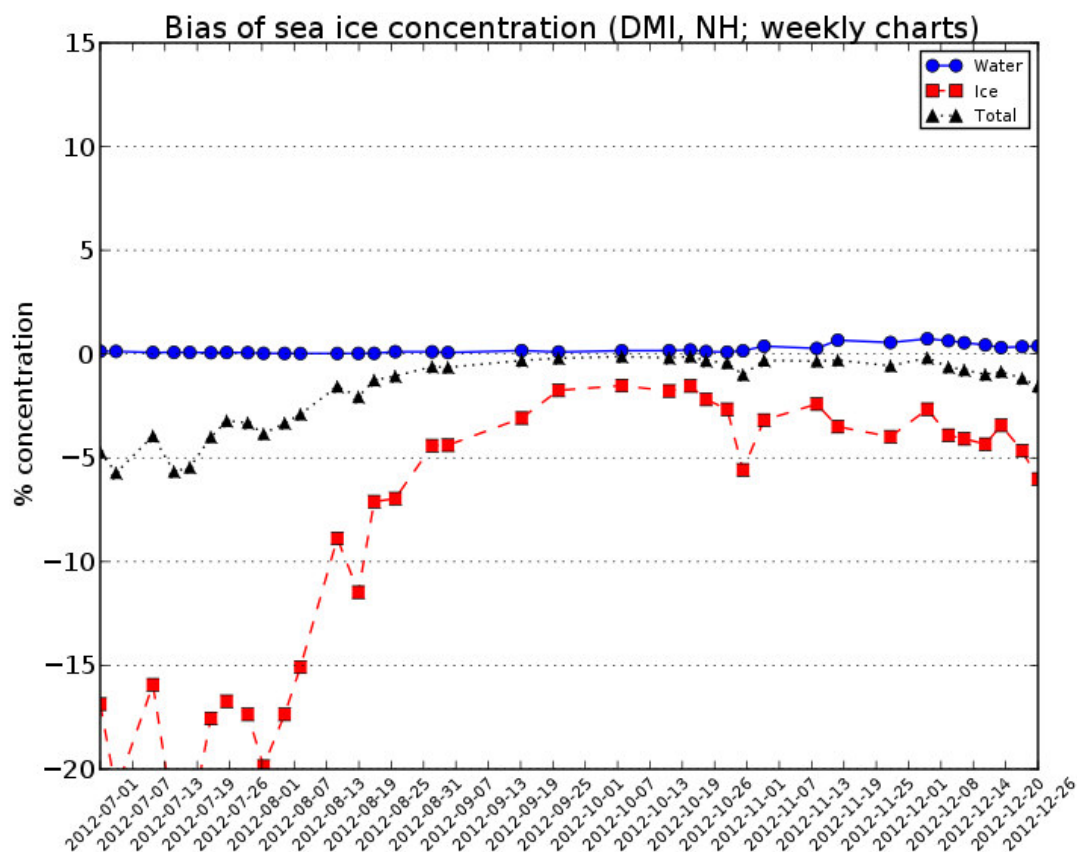


Figure 59 : The bias of ice concentration for three categories: water, ice and total. When bias is below zero the OSI SAF sea ice concentration tends to underestimate. From comparing with the weekly DMI ice analysis for the Greenland area.

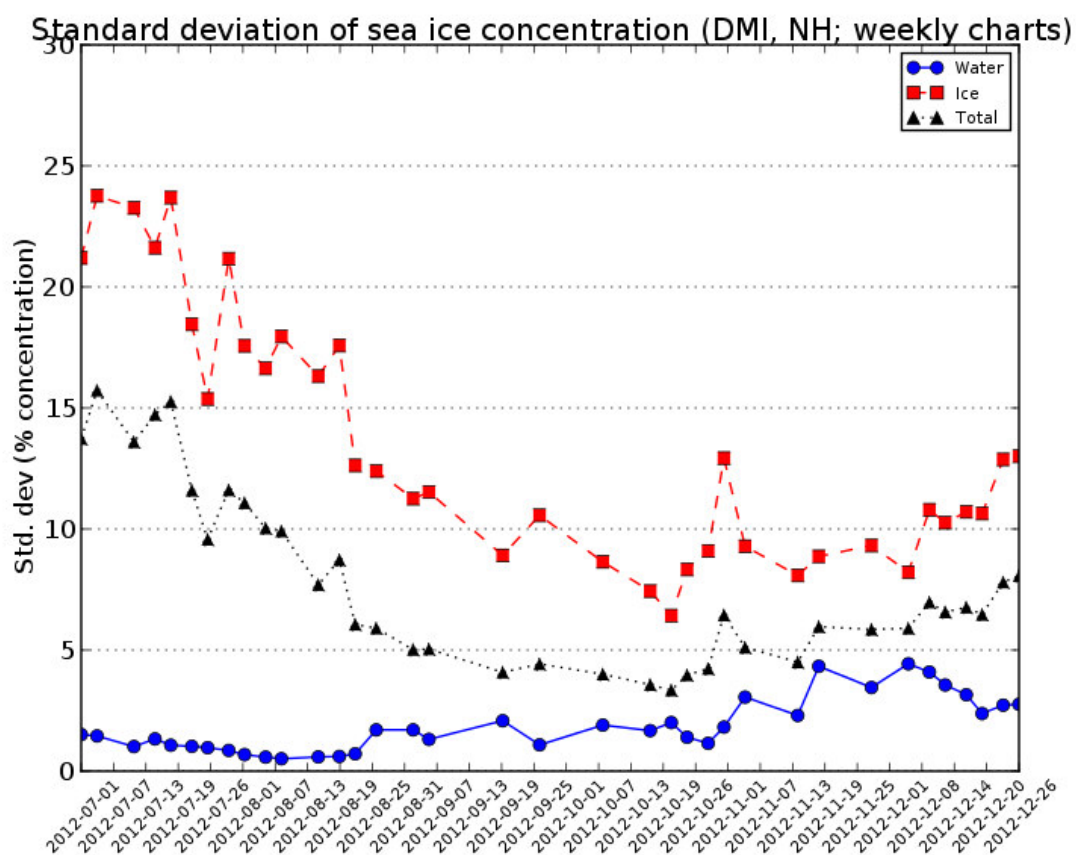


Figure 60 : The standard deviation of sea ice concentration for three categories: water, ice and total. From comparing with the weekly DMI ice analysis for the Greenland area.

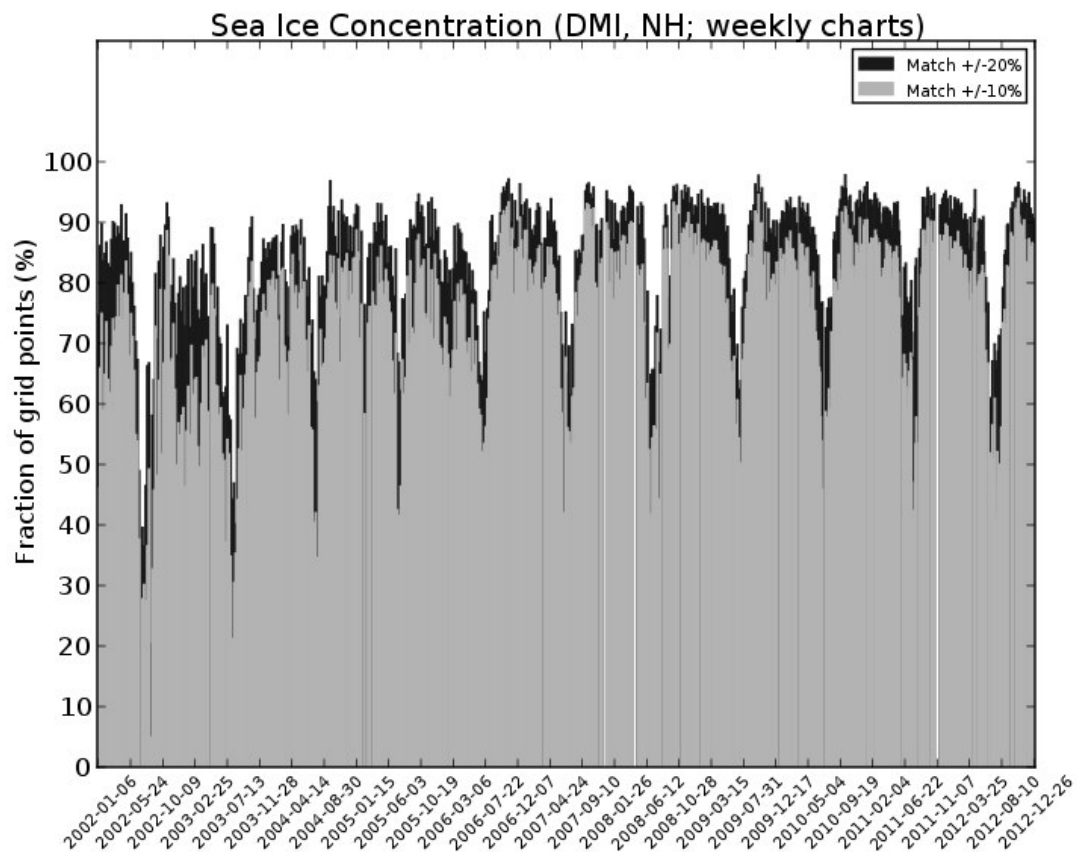


Figure 61 : Multi year variability, quality of ice concentration product for the validation period of 2002-2012 for the Greenland area.

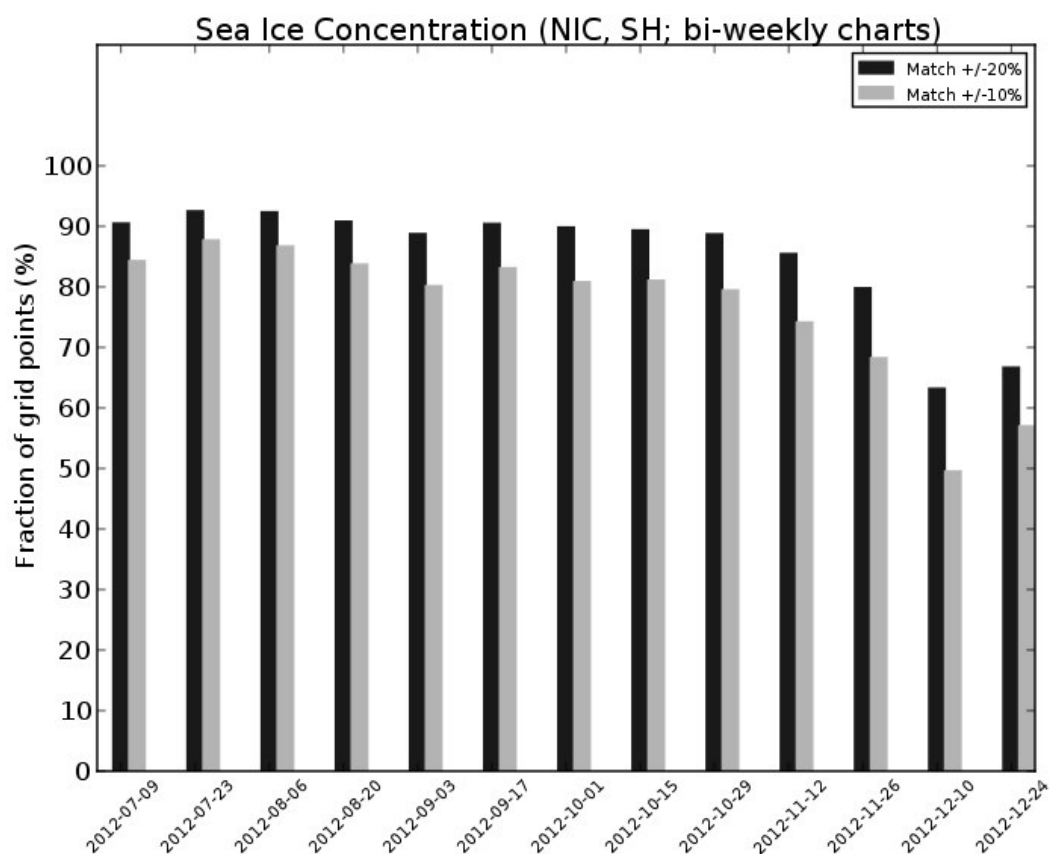


Figure 62 : Comparison between ice concentrations from the bi-weekly NIC ice analysis and the OSI SAF concentration product for the Southern Hemisphere. 'Match +/- 10 %' corresponds to those grid points where concentration deviates within the range of +/-10 % and likewise for +/-20 % .

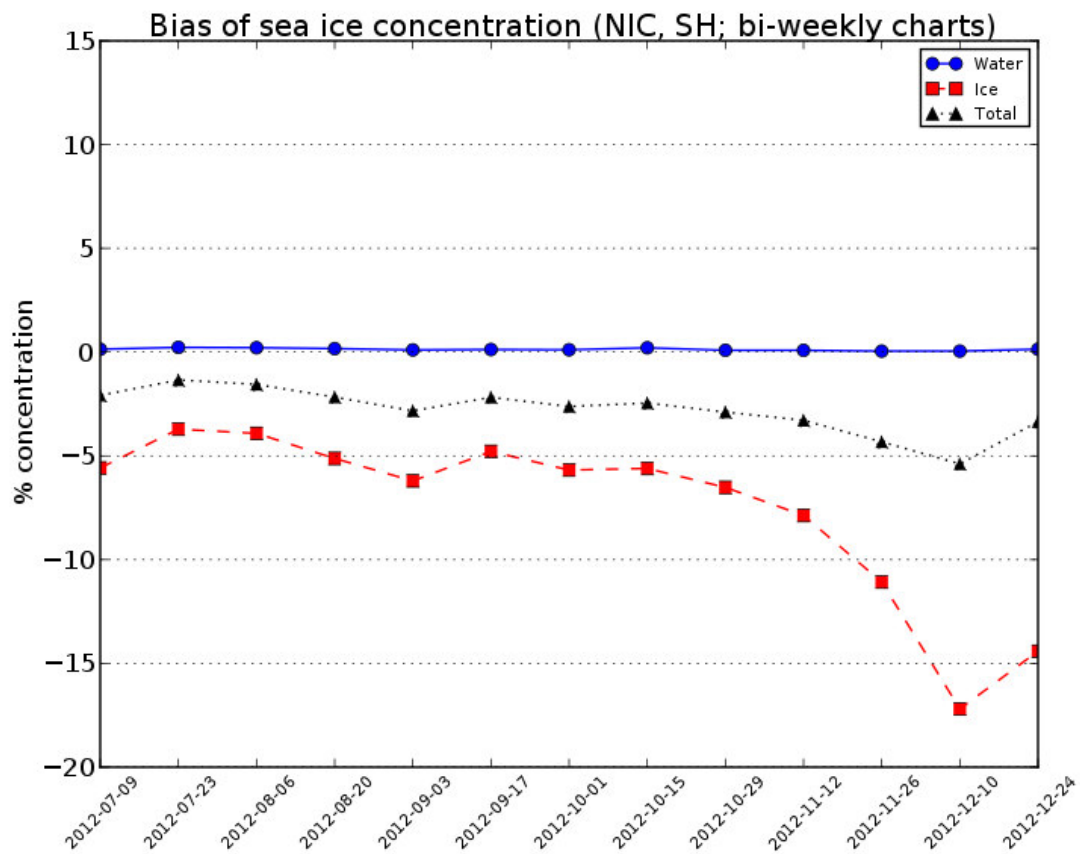


Figure 63 : The bias of ice concentration for three categories: water, ice and total. When bias is below zero the OSI SAF ice concentration tends to underestimate. From comparing with bi-weekly NIC ice analysis for the Southern Hemisphere.

Standard deviation of sea ice concentration (NIC, SH; bi-weekly charts)

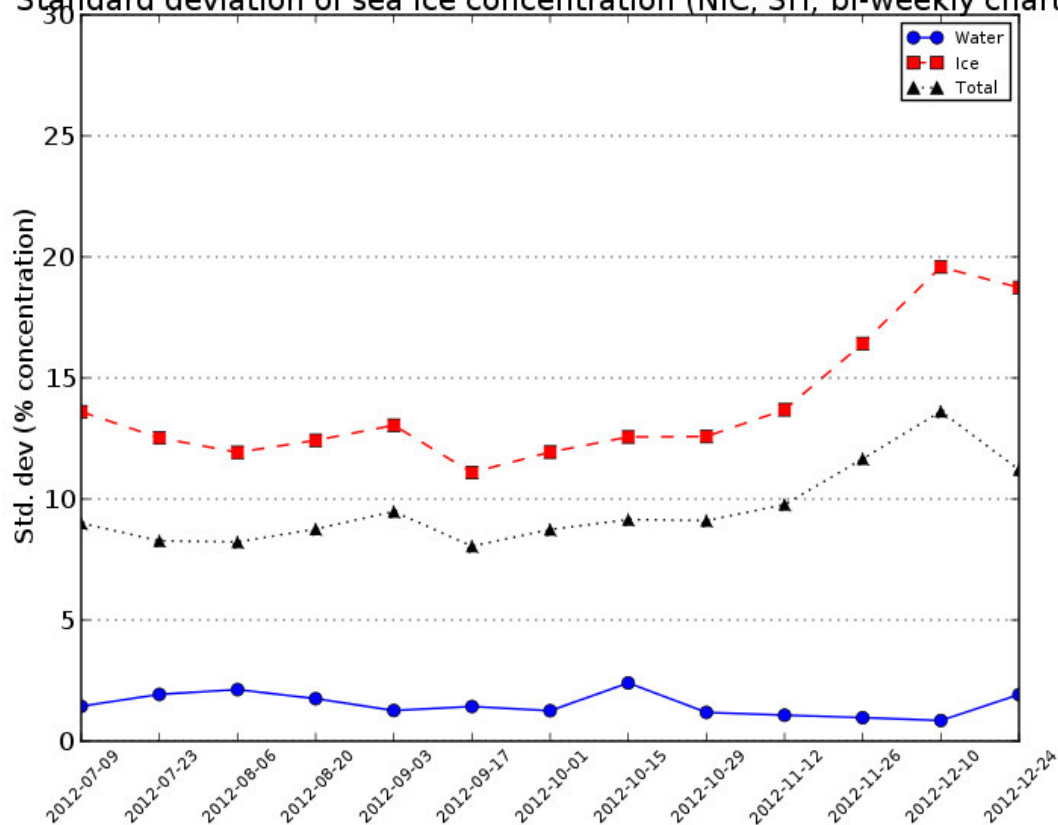


Figure 64 : The standard deviation of ice concentration for three categories: water, ice and total. From comparing with bi-weekly NIC ice analysis for the Southern Hemisphere.

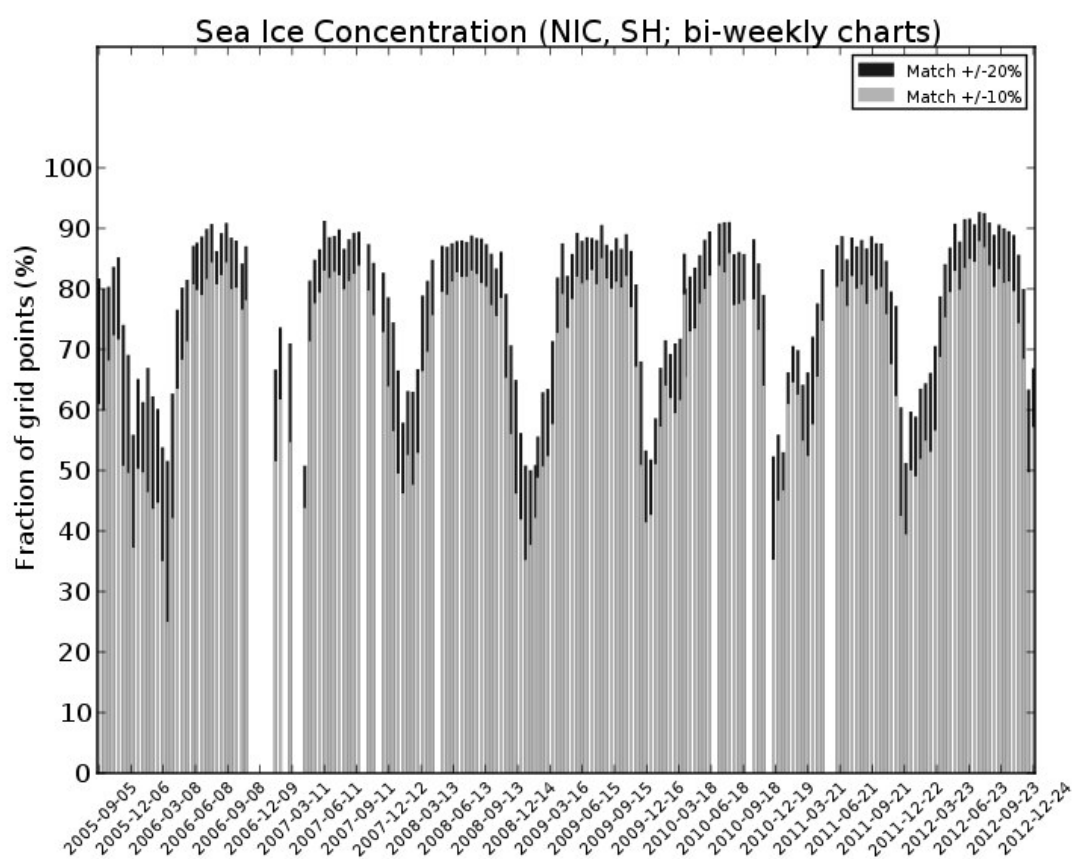


Figure 65 : Multi year variability, quality of ice concentration product for the validation period of 2005-2012 for the Southern Hemisphere.

		Concentration product				
Year	Month	+/- 10%	+/- 20%	Bias	Stdev	Num obs
2012	JUL	56.17	71.95	-11.39	14.55	157153
2012	AUG	65.69	76.80	-9.19	14.50	169870
2012	SEPT	76.24	85.73	-2.47	13.95	116061
2012	OCT	86.63	93.72	-0.78	9.34	153279
2012	NOV	87.35	94.05	-2.05	8.76	158460
2012	DEC	71.15	82.46	-3.97	15.03	125692

table 17 : Monthly validation results from comparing the OSI SAF sea ice concentration product to met.no ice service analysis for the Svalbard area. From JULY 2012 to DECEMBER 2012.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2012	JUL	84.49	15.12	0.37	0.02	0.00	0.00
2012	AUG	91.58	8.32	0.09	0.00	0.00	0.00
2012	SEP	94.50	5.48	0.02	0.00	0.00	0.00
2012	OCT	94.15	5.69	0.15	0.01	0.00	0.00
2012	NOV	89.74	9.87	0.38	0.01	0.00	0.00
2012	DEC	84.36	14.66	0.95	0.03	0.00	0.00

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

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2012	JUL	66.05	31.96	1.98	0.01	0.00	0.00
2012	AUG	65.08	32.35	2.56	0.01	0.00	0.00
2012	SEP	64.24	32.79	2.97	0.01	0.00	0.00
2012	OCT	59.21	36.55	4.23	0.01	0.00	0.00
2012	NOV	61.08	35.37	3.54	0.01	0.00	0.00
2012	DEC	71.98	25.95	2.06	0.01	0.00	0.00

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

Comments: The normal seasonal pattern of increased agreement between OSI SAF ice concentration and ice charts during the arctic freeze-up and decreased agreement during the antarctic melting season can be observed.

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.

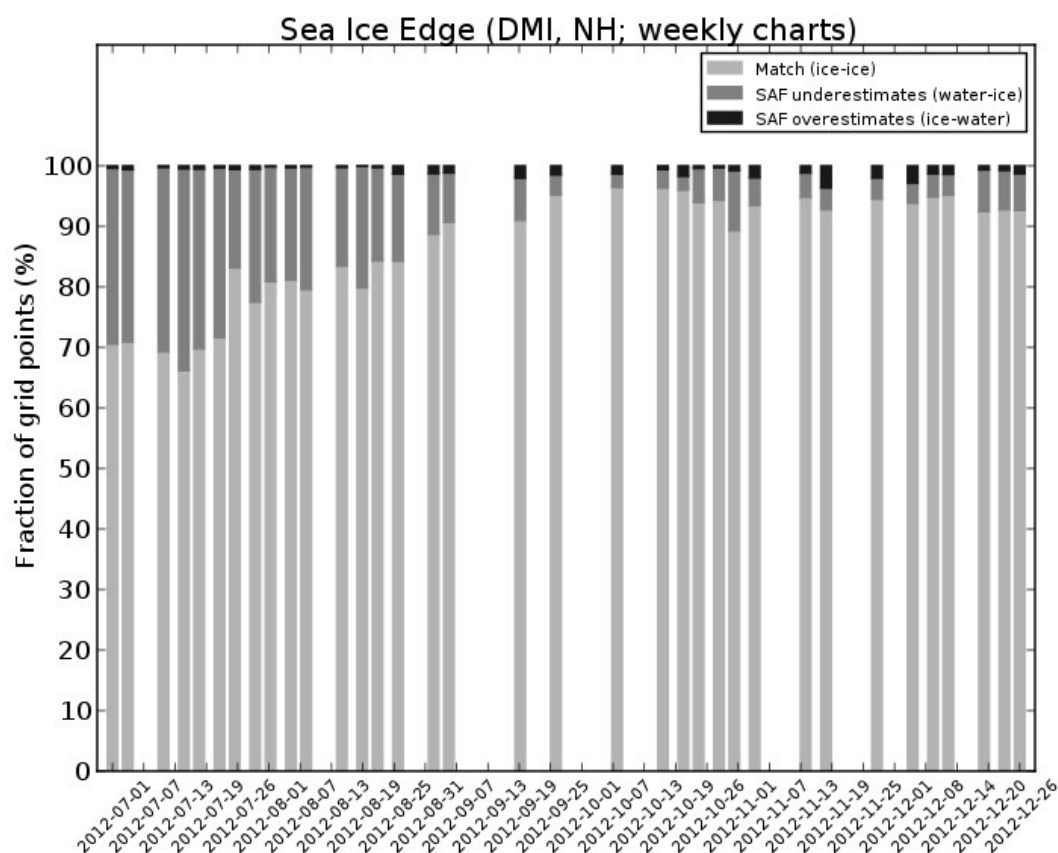


Figure 66 : Comparison between the weekly DMI ice analysis and the OSI SAF sea ice edge product. 'SAF underestimates' means grid points where the OSI SAF product indicated water and the DMI ice analysis indicated ice and vice versa for the 'SAF overestimates' category. For the Greenland area.

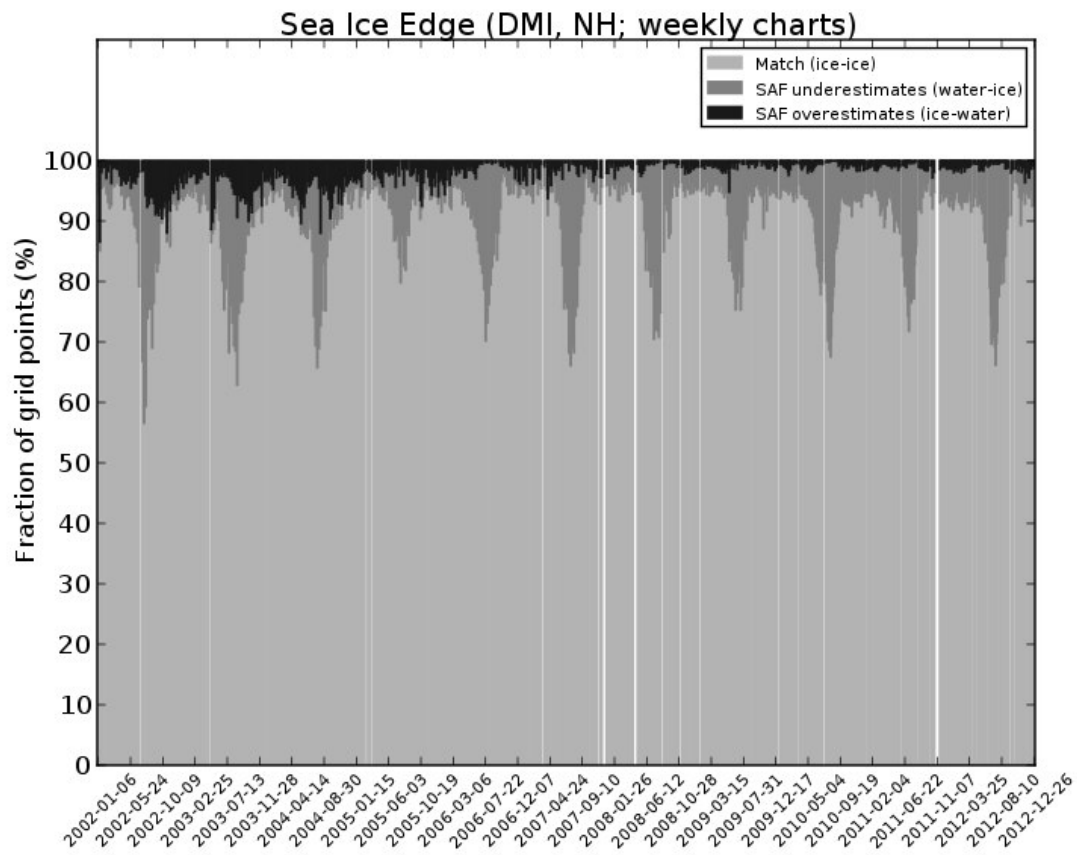


Figure 67 : Multi-year variability, quality of ice edge product for the validation period of 2002-2012, for the Greenland area.

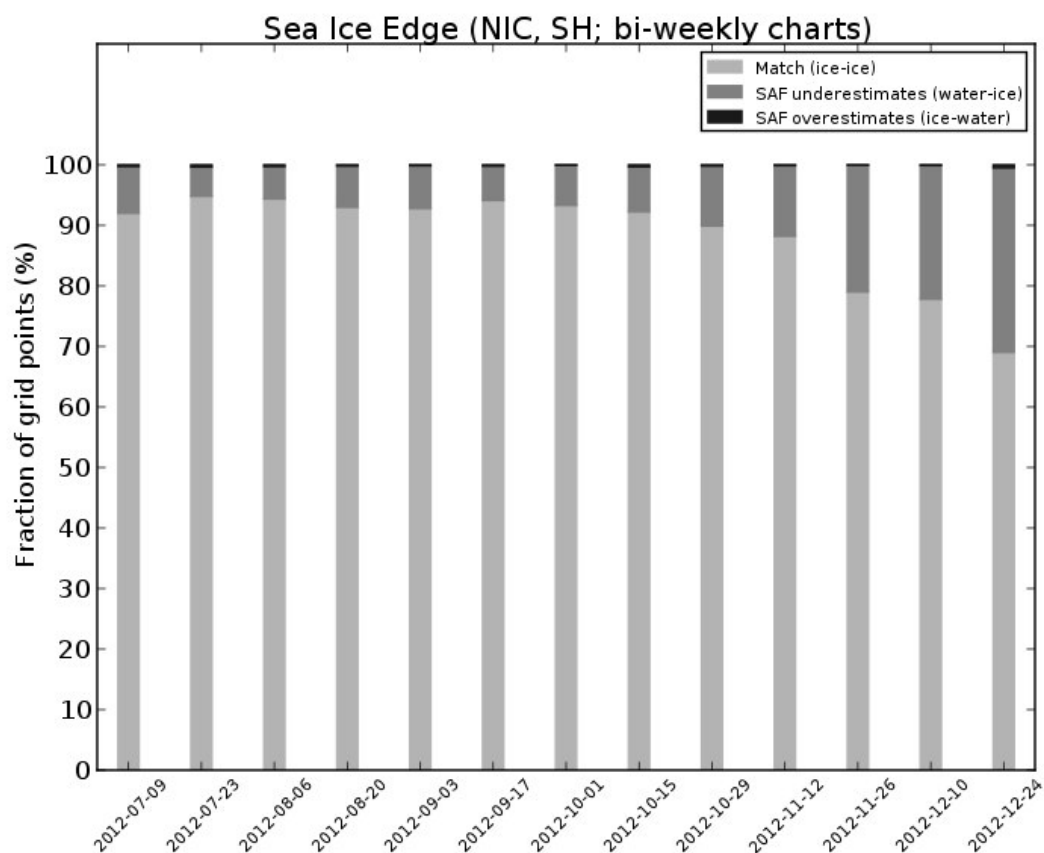


Figure 68 : Comparison between the bi-weekly NIC ice analysis and the OSI SAF sea ice edge product for the Southern Hemisphere. 'SAF underestimates' means grid points where the OSI SAF product indicated water and the NIC ice analysis indicated ice and vice versa for the 'SAF overestimates' category.

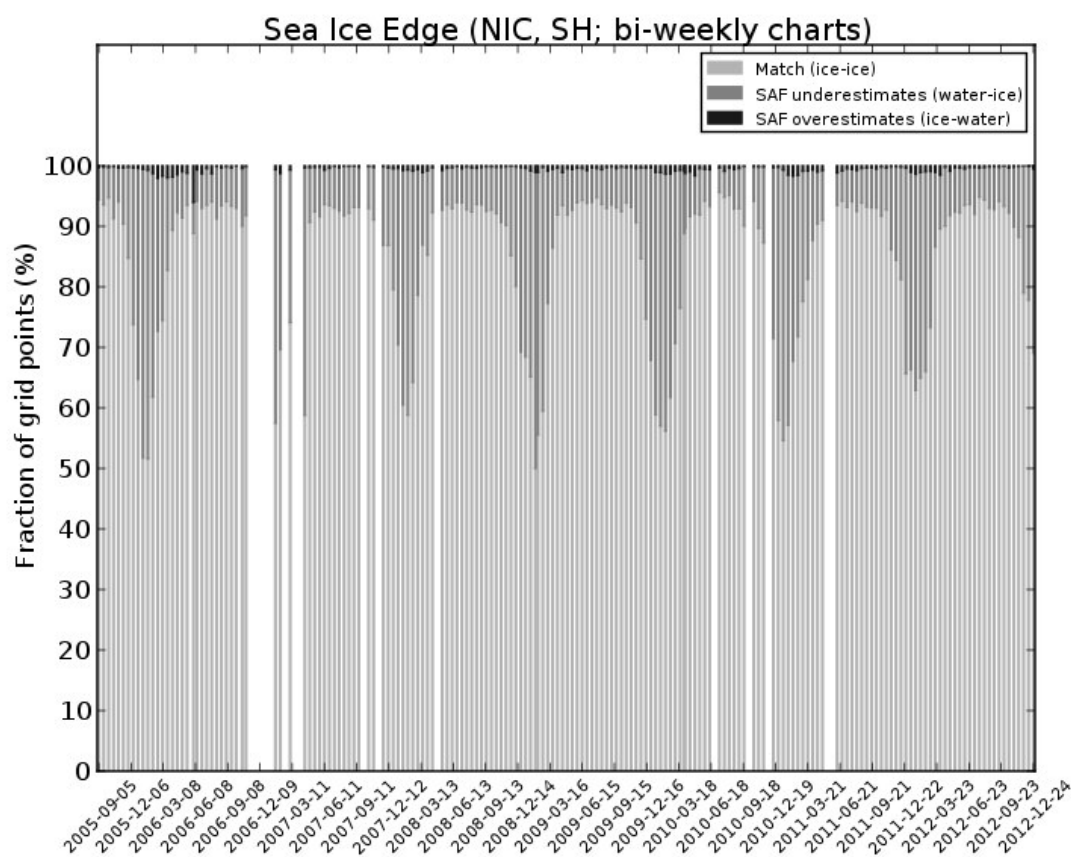


Figure 69 : Multi year variability, quality of ice edge product for the validation period of 2005-2012 for the Southern Hemisphere.

		Edge product				Num obs
Year	Month	Correct (%)	SAF lower (%)	SAF higher (%)	Mean edge diff (km)	
2012	JUL	95.37	3.19	1.44	14.54	157153
2012	AUG	93.45	5.25	1.3	17.3	169870
2012	SEPT	94.84	2.86	2.3	12.33	116061
2012	OCT	97.77	0.82	1.41	9.96	153279
2012	NOV	97.48	1.23	1.29	10.12	158460
2012	DEC	95.29	3.35	1.35	13.51	125692

table 20 : Monthly validation results from comparing OSI SAF sea ice products to met.no ice service analysis for the Svalbard area, from JULY 2012 to DECEMBER 2012. Mean edge diff is the mean difference in distance between the ice edges in the OSI SAF edge product and met.no ice chart.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2012	JUL	87.62	2.10	4.74	4.24	1.31	0.00
2012	AUG	93.31	1.01	2.85	2.19	0.64	0.00
2012	SEP	96.64	0.54	1.43	1.09	0.30	0.00
2012	OCT	96.11	0.96	1.40	1.08	0.45	0.00
2012	NOV	95.81	1.12	1.59	1.12	0.36	0.00
2012	DEC	94.38	1.46	2.13	1.59	0.44	0.00

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

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2012	JUL	90.91	2.45	3.41	2.70	0.53	0.00
2012	AUG	89.49	2.60	4.00	3.31	0.61	0.00
2012	SEP	87.06	3.00	4.90	4.26	0.78	0.00
2012	OCT	84.75	3.46	5.44	5.26	1.09	0.00
2012	NOV	83.99	3.46	5.18	5.66	1.71	0.00
2012	DEC	86.26	3.03	3.56	4.78	2.37	0.00

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

Comments: The normal seasonal pattern of increased agreement between OSI SAF ice edge and ice charts during the arctic freeze-up and decreased agreement during the antarctic melting season can be observed.

5.3.3 Validation results for the global sea ice type product

At present there is no routine validation of the ice type product, as there exist no validation data source. The tables below contains the results of the manual monitoring, as described in the ice concentration section.

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2012	JUL	85.44	0.26	0.40	13.61	0.29	0.00
2012	AUG	90.66	0.34	0.45	8.30	0.25	0.00
2012	SEP	95.56	0.39	0.67	3.32	0.07	0.00
2012	OCT	97.87	0.67	0.86	0.48	0.11	0.00
2012	NOV	97.64	0.72	1.13	0.42	0.08	0.00
2012	DEC	94.01	1.09	4.15	0.66	0.09	0.00

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

Year	Month	Code=5	code=4	code=3	code=2	code=1	Unprocessed
2012	JUL	68.49	0.28	30.84	0.30	0.08	0.00
2012	AUG	64.78	0.30	34.47	0.36	0.09	0.00
2012	SEP	62.31	0.28	36.94	0.36	0.10	0.00
2012	OCT	63.65	0.33	35.41	0.46	0.15	0.00
2012	NOV	68.77	0.39	30.05	0.55	0.25	0.00
2012	DEC	80.29	0.44	18.32	0.52	0.43	0.00

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

5.3.4 Validation of the Low Resolution Sea Ice Drift product

As of December 2009, the Low Resolution Sea Ice Drift product (LRSID, OSI-405) is processed and distributed with "pre-operational" status. Only the Northern Hemisphere is covered. From March 2013 the Southern Hemisphere will be covered also.

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 (those of the iABP). GPS positions are very precise (< 50 m) while those obtained by Argos have worse accuracy (approx. 350 m for 'high quality' records) and are thus not used in this report.

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

Reported statistics

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

The Low Resolution Sea Ice Drift product comprises several single-sensor (e.g. SSM/I F15 or ASCAT Metop-A) and a merged (or multi-sensor) products that are all processed and distributed on a daily basis. The 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 $\sigma()$ the standard deviation of the error $\varepsilon(X) = X_{\text{prod}} - X_{\text{ref}}$. Columns α , β and ρ are respectively the slope and intercept of the regression line between Prod and Ref data pairs and the Pearson correlation coefficient. N is the number of collocation data pairs.

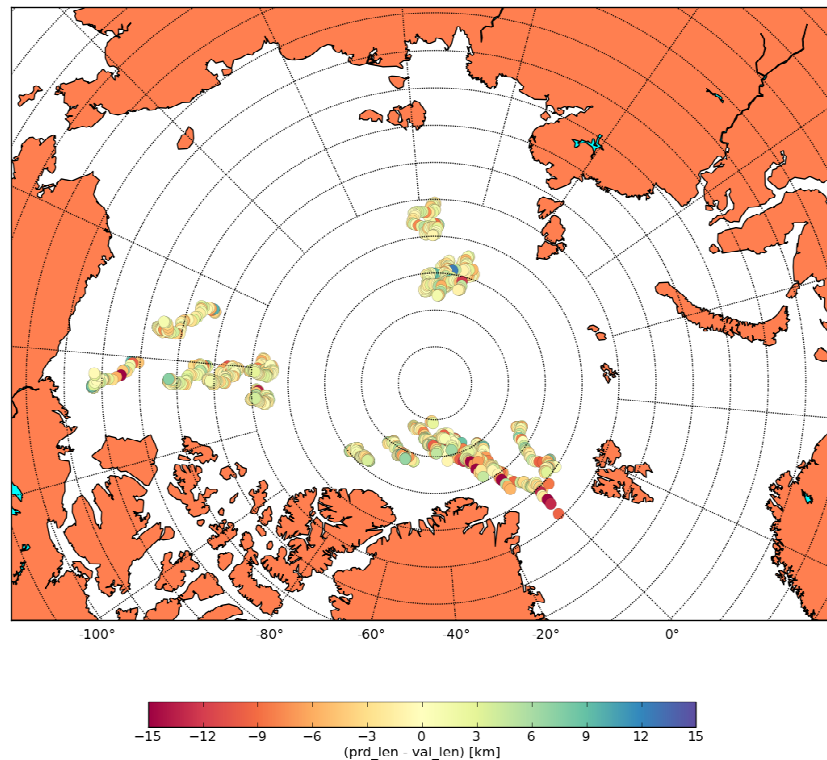


Figure 70 : Location of GPS drifters for the validation period (OCT-DEC). The shade of each symbol represents the bias (prod-ref) in drift length (km over 2 days).

Year	Month	b(X) [km]	b(Y) [km]	$\sigma(X)$ [km]	$\sigma(Y)$ [km]	α	β [km]	ρ	N
2012	JUL	NA	NA	NA	NA	NA	NA	NA	NA
2012	AUG	NA	NA	NA	NA	NA	NA	NA	NA
2012	SEPT	NA	NA	NA	NA	NA	NA	NA	NA
2012	OCT	-1.213	-0.104	3.184	3.830	0.93	-0.17	0.92	85
2012	NOV	+0.582	-0.460	4.284	3.826	0.94	+0.24	0.96	116
2012	DEC	-0.098	-0.084	4.100	3.577	0.91	+0.18	0.94	133

table 25 : Validation results for the LRSID (multi-oi) product (NH) for JUL-DEC 2012.

Year	Month	b(X) [km]	b(Y) [km]	$\sigma(X)$ [km]	$\sigma(Y)$ [km]	α	β [km]	ρ	N
2012	JUL	NA	NA	NA	NA	NA	NA	NA	NA
2012	AUG	NA	NA	NA	NA	NA	NA	NA	NA
2012	SEPT	NA	NA	NA	NA	NA	NA	NA	NA
2012	OCT	-2.121	+0.711	4.763	6.409	1.00	-0.68	0.84	57
2012	NOV	+0.300	-0.858	5.989	4.651	0.96	-0.16	0.93	102
2012	DEC	-0.037	+0.305	4.127	4.449	0.93	+0.28	0.91	120

table 26 : Validation results for the LRSID (ssmi-f15) product (NH) for JUL-DEC 2012.

Comments: No ice drift vectors are retrieving during the first three months, so no validation results available. For the last three months, these validation statistics are similar to those obtained for this period of year in previous years, and below the nominal thresholds.

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.

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.

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

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.

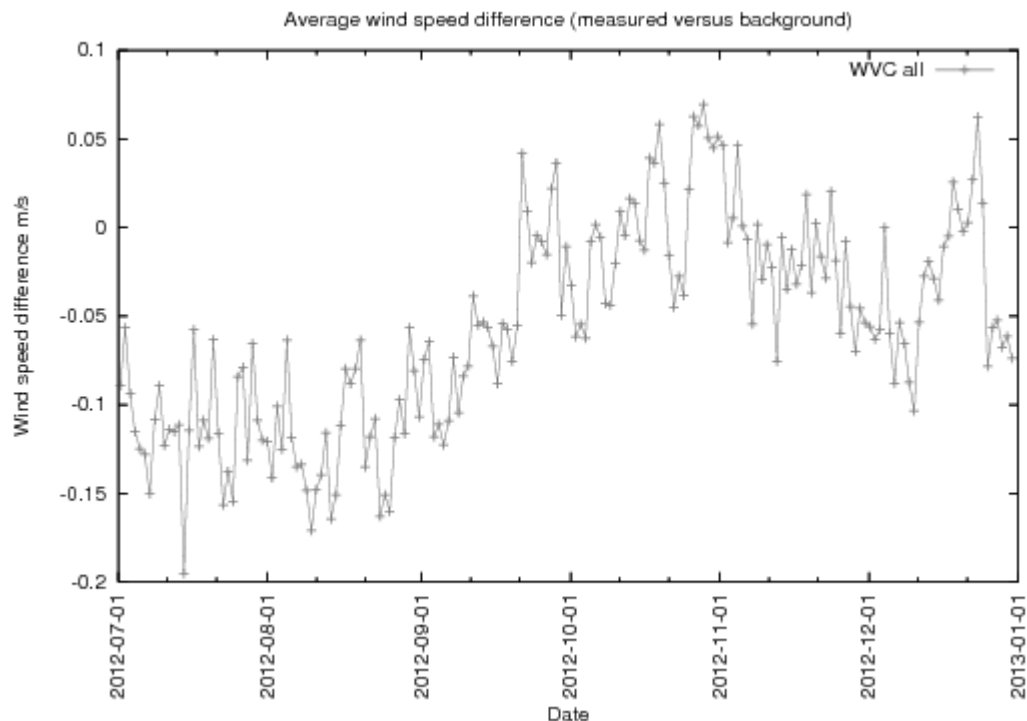


Figure 71 : Average ASCAT 25-km wind speed difference (bias) with the reference ECMWF NWP forecast winds. Data are averaged over a one day period.

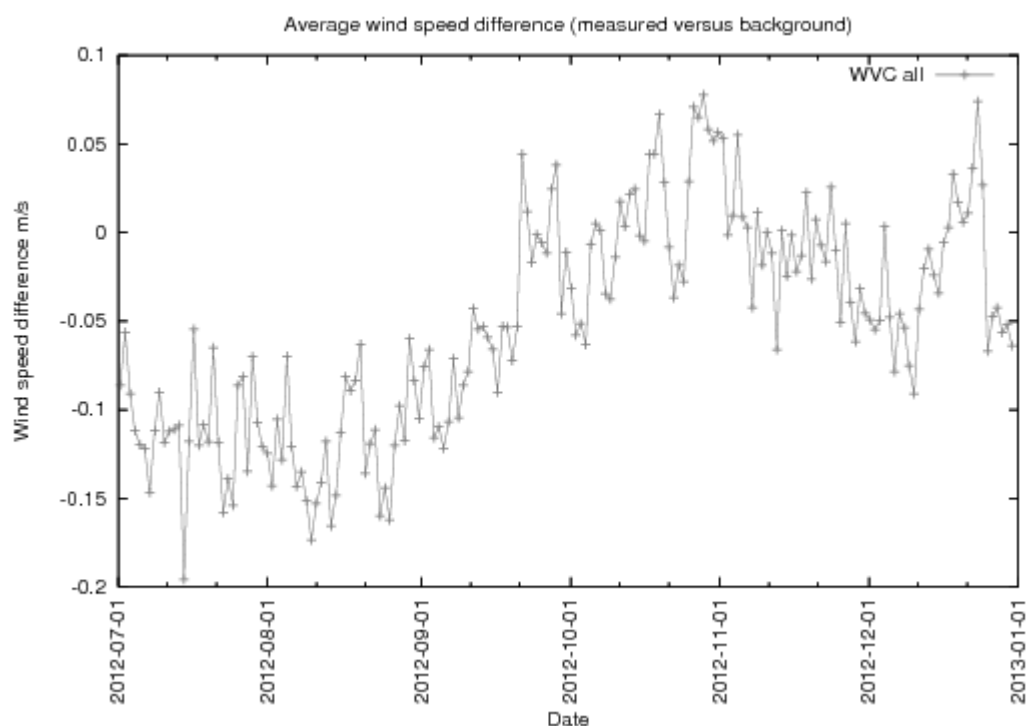


Figure 72 : Average ASCAT 12.5-km wind speed difference (bias) with the reference ECMWF NWP forecast winds. Data are averaged over a one day period.

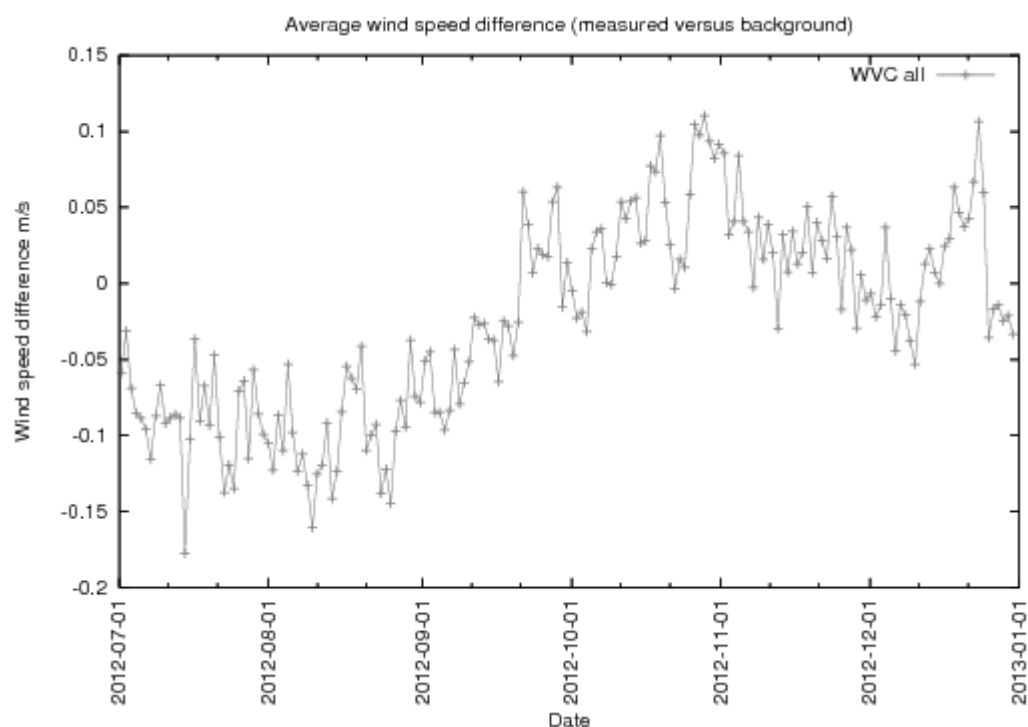


Figure 73 : Average ASCAT Coastal wind speed difference (bias) with the reference ECMWF NWP forecast winds. Data are averaged over a one day period.

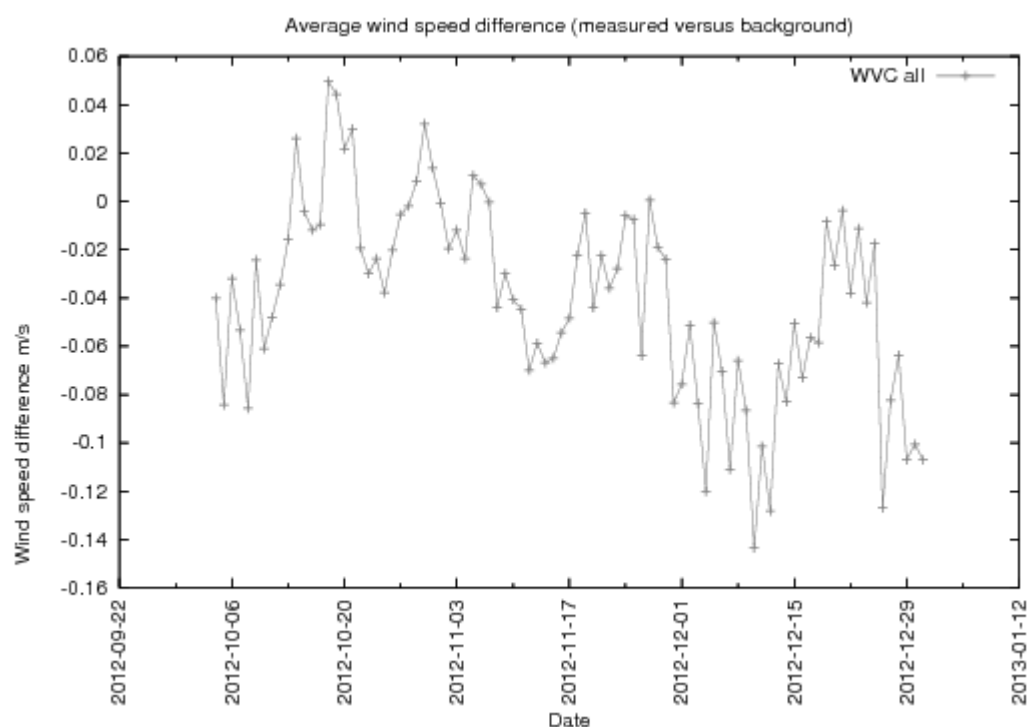
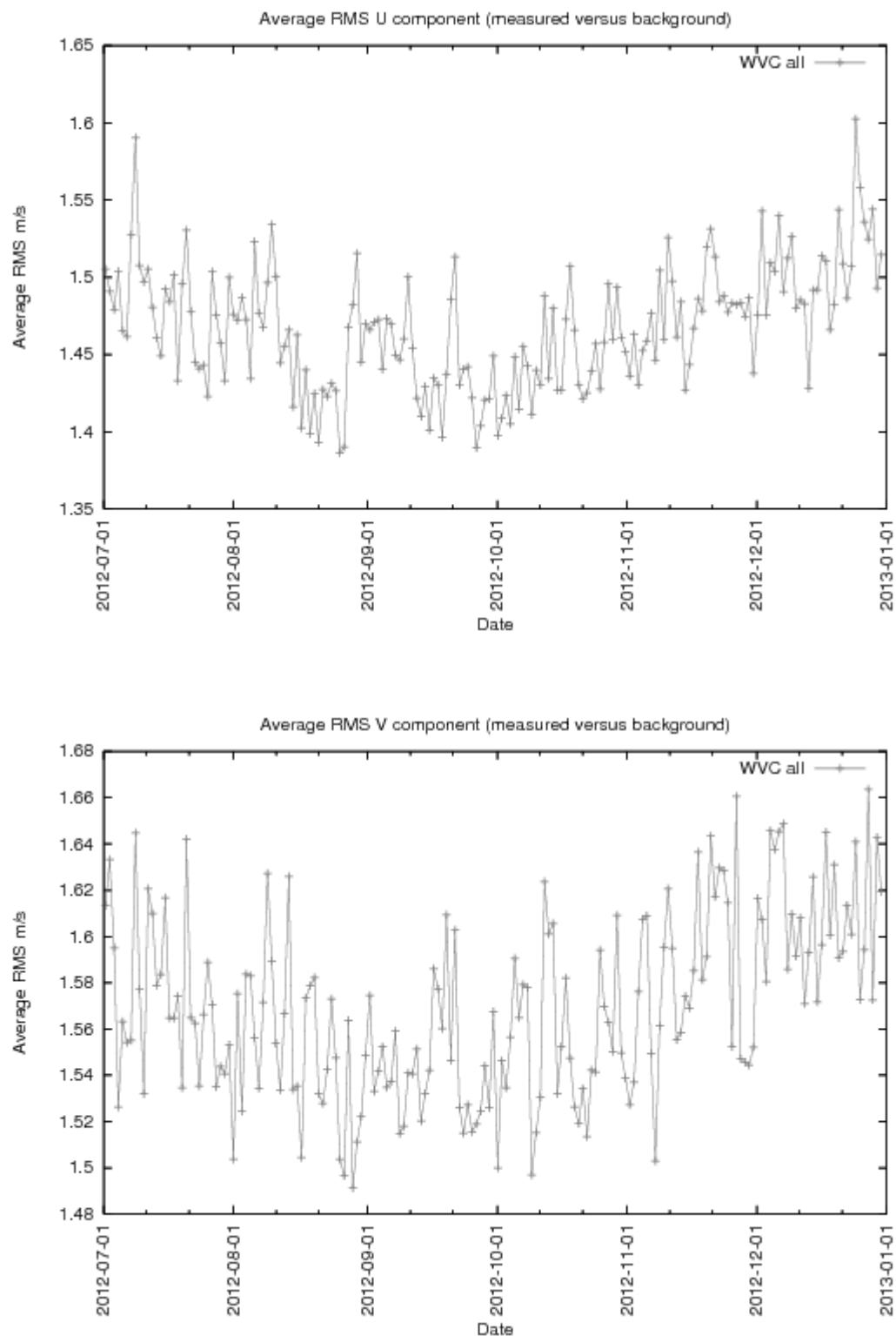


Figure 74 : Average OSCAT 50-km wind speed difference (bias) with the reference ECMWF NWP forecast winds. Data are averaged over a one day period. Data are shown as of beginning of October.



**Figure 75 : ASCAT 25-km wind component (U direction: top and V direction: bottom)
RMS differences of scatterometer winds versus the ECMWF forecast winds.**

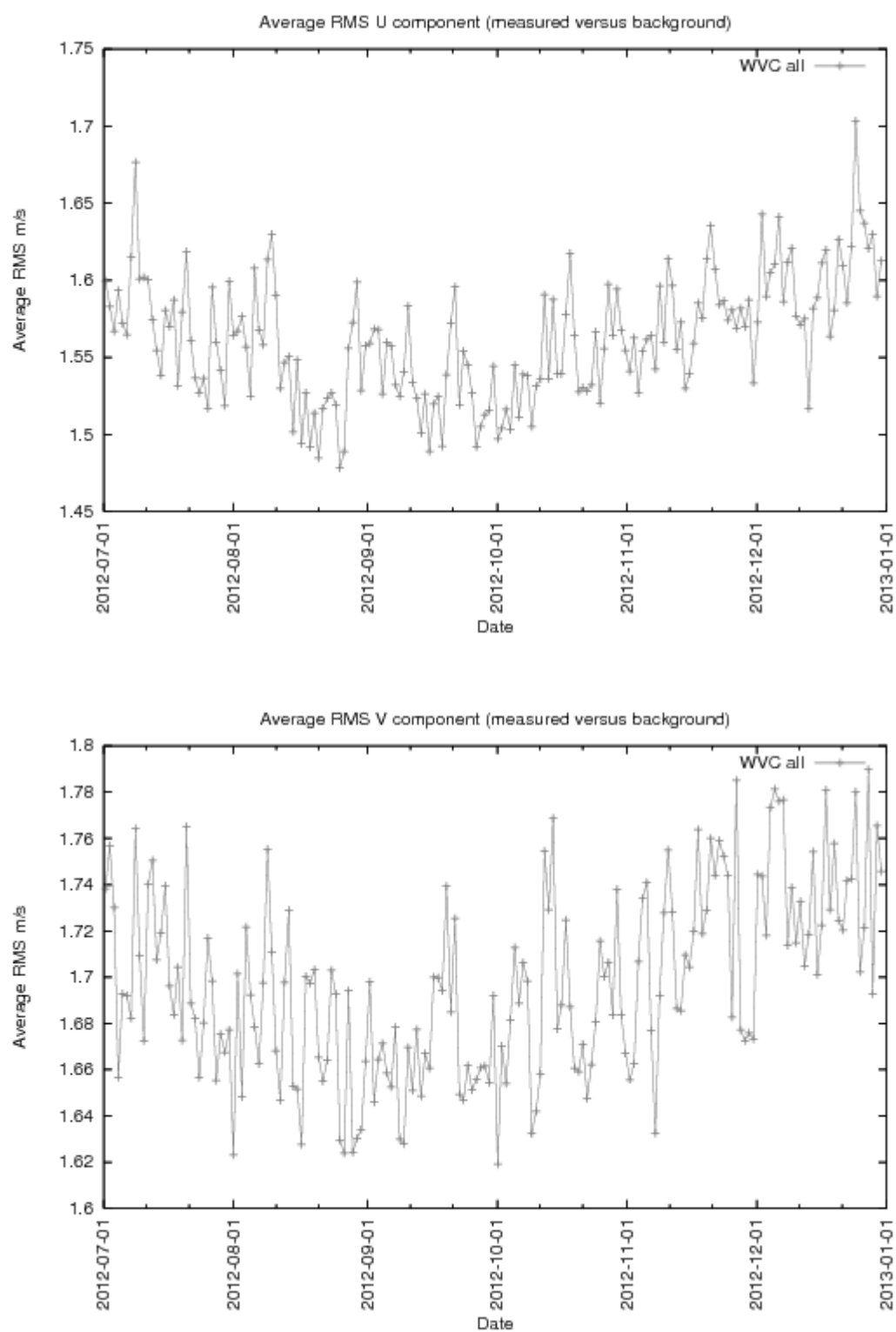
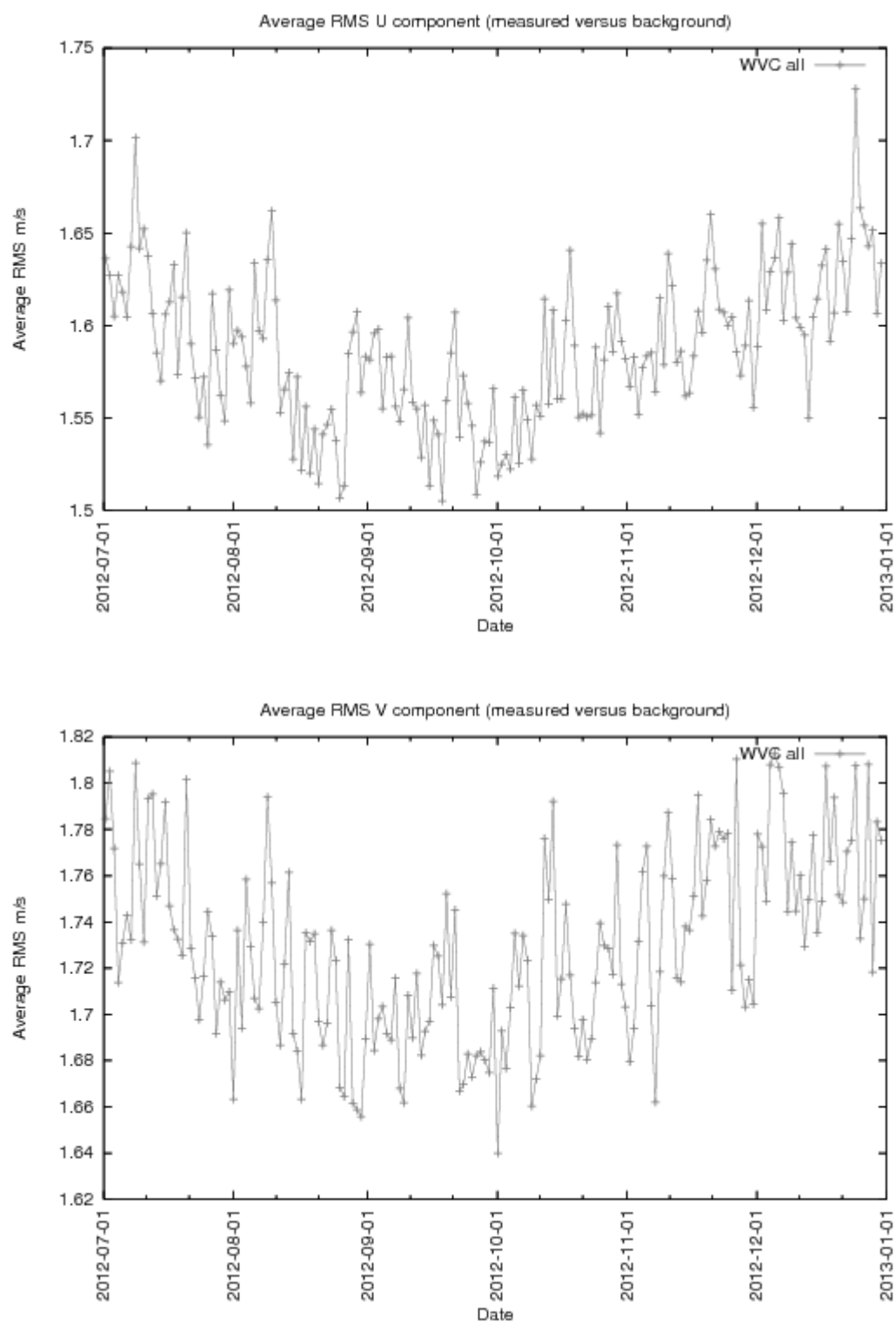
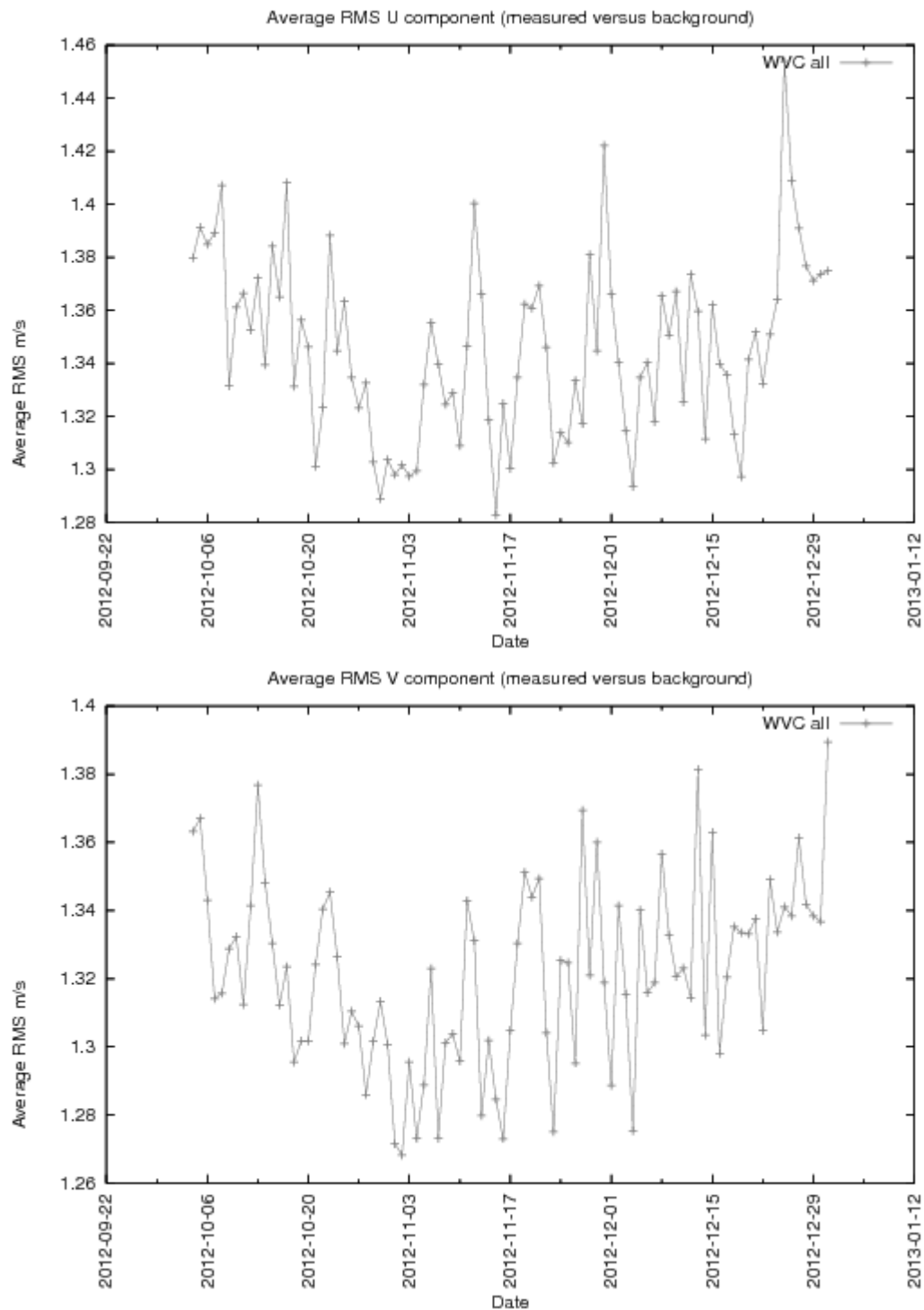


Figure 76 : ASCAT 12.5-km wind component (U direction: top and V direction: bottom) RMS differences of scatterometer winds versus the ECMWF forecast winds.



**Figure 77 : ASCAT Coastal wind component (U direction: top and V direction: bottom)
RMS differences of scatterometer winds versus the ECMWF forecast winds.**



**Figure 78 : OSCAT 50-km wind component (U direction: top and V direction: bottom)
RMS differences of scatterometer winds versus the ECMWF forecast winds.
Data are shown as of beginning of October.**

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 2012. 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.

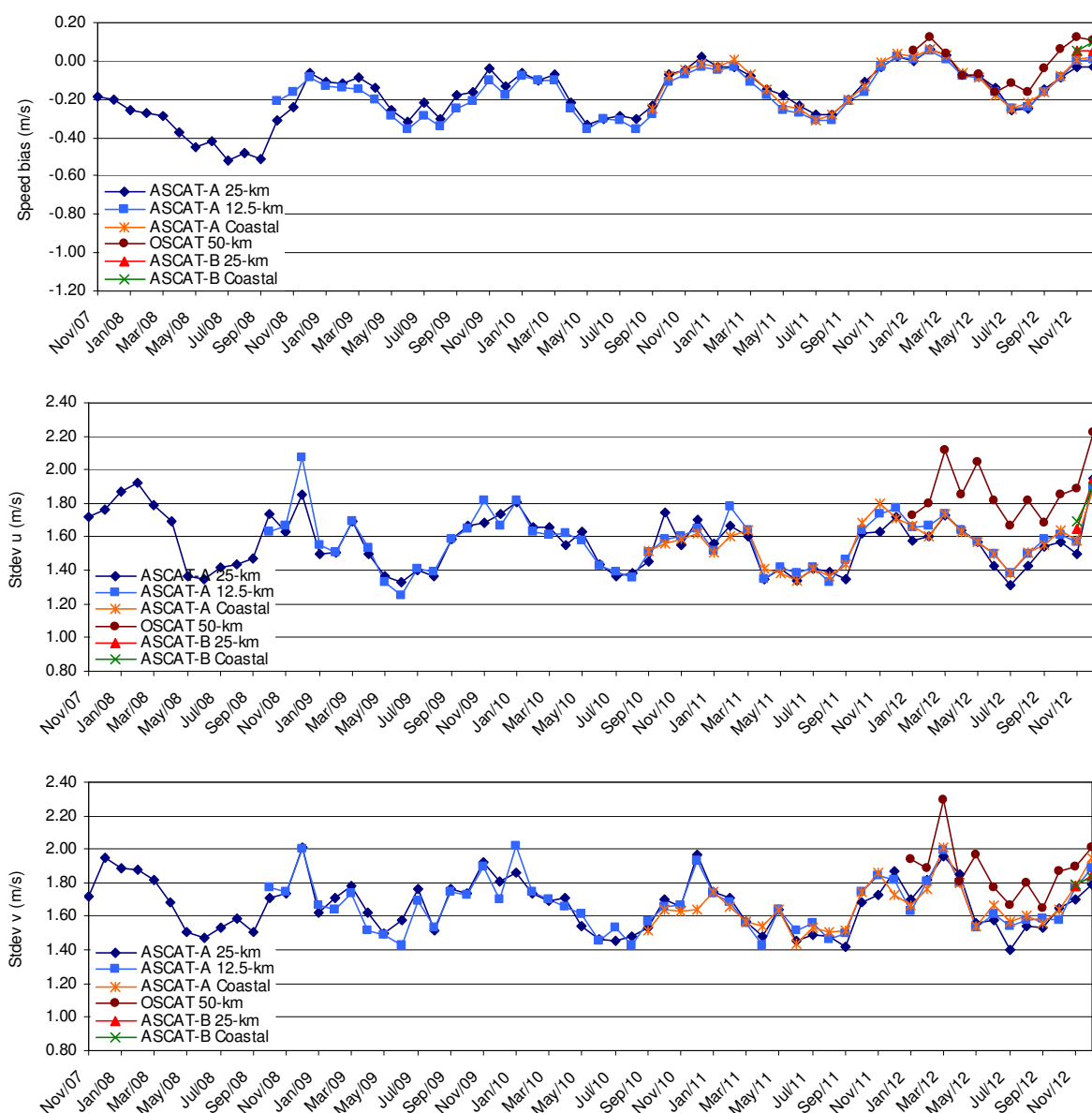


Figure 79 : Comparison of scatterometer winds against buoy winds (monthly averages). For each product, the wind speed bias (top), wind u component standard deviation (middle) and wind v component standard deviation (bottom) are shown. ASCAT-B products are still in development status.

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.no, 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.no 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
July 2012	727	4487
Aug. 2012	740	4988
Sept. 2012	745	3958
Oct. 2012	756	4995
Nov. 2012	767	4912
Dec. 2012	774	5028

table 27 : Statistics on central OSI SAF Web site use over 2nd half 2012.

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

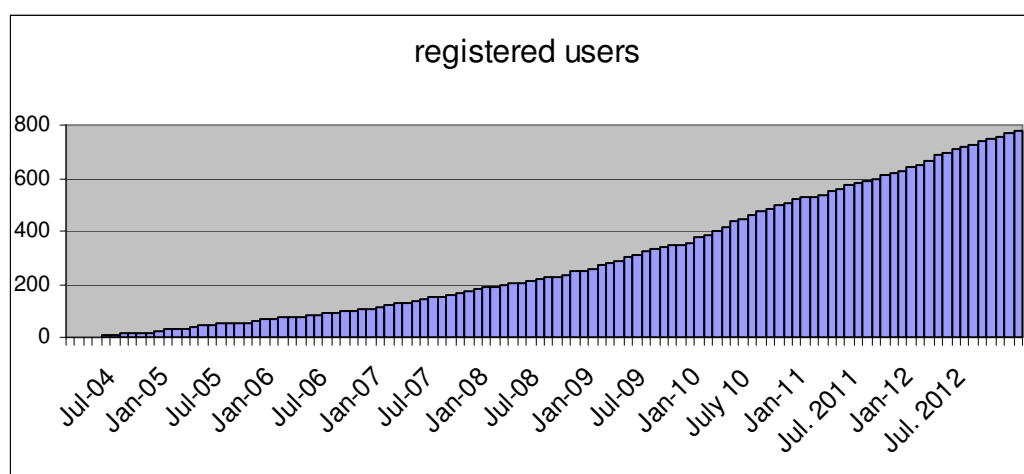


Figure 80 : Evolution of external registered users on the central Web Site from April 2004 to DECEMBER 2012.

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	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	Université catholique de Louvain	UCL/TECLIM
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	Universidade Federal do Rio de Janeiro	LAMCE/COPPE/UFRJ
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	ARMA/MRB
Canada	Environment Canada	DFO/IML/MPO
Canada	Fisheries and Oceans Canada	DFO/IML/MPO
Canada	JASCO Research Ltd	JASCO
Canada	Memorial University of Newfoundland	MUN
Canada	University of Waterloo	UW
Canada	University of Windsor	UWD
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	anhui gongyedaxue	ahut
China	Chinese Academy of Sciences	IOCAS
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	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	South China Sea Institute of Oceanology, Chinese Academy of Sciences	SCSIO, CAS
China	third institute oceanography	TIO/SOA

Croatia	Rudjer Boskovic Institute	IRB/ZIMO
Denmark	Aarhus University - Department of Bioscience	BIOS
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
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
USA	Roffer's Ocean Fishing Forecasting Service	ROFFS
USA	University of Miami	RSMAS MPO
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 meteorologique aux 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 Geophysique et Oceanographie Spatiales	LEGOS/CNRS
France	Creocean	Creocean
France	ecole nationale des telecommunication de bretagne	ENSTB
France	Ecole Nationale Supérieure des Techniques Avancées de Bretagne	ENSTA-Bretagne
France	Institut de Recherche pour le Développement	IRD - US02
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 Physique des Océans, Université de Bretagne occidentale	LPO
France	Laboratoire d'oceanographie et du climat: experimentation et approches numeriques	LOCEAN
France	Mercator Ocean	Mercator Ocean
France	Météo-France	M-F
France	Météo-France / 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	TELECOM Bretagne	TB
France	Université de Corse, UMR SPE CNRS 6134	UC
France	Institut de Recherche pour le Développement	IRD
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	CIISAP
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	Institut 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 für 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	CONSOLIDATED ENERGY CONSULTANTS LTD	CECL
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	National Remote Sensing Centre	NRSC
India	Oceanic Sciences Divisions, MOG , Indian Space Applications Centre	ISRO
India	South Asia Strategic Forum	SASFOR
India	University of Pune	UP
Indonesia	Vertex	Mr
Israel	Bar Ilan University	BIU
Italy	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	ENEA
Italy	Centro Nazionale di Meteorologia e Climatologia Aeronautica	CNMCA
Italy	EC- Joint Research Centre	EC-JRC
Italy	ESA	ESA/ESRIN
Italy	fondazione imc - onlus , international marine centre	IMC
Italy	Institute of Marine Science - CNR	ISMAR-CNR
Italy	Istituto di BioMeteorologia - Consiglio Nazionale delle Ricerche	IBIMET-CNR
Italy	Istituto Nazionale di Geofisica e Vulcanologia	INGV
Italy	Istituto Scienze dell'Atmosfera e del Clima - Consiglio Nazionale delle Ricerche	ISAC - CNR
Italy	Istituto Superiore per la ricerca e la protezione ambientale	ISPRA
Italy	Italian Space Agency	ASI
Italy	NATO Undersea Research Centre	NURC
Italy	Politecnico di Torino	DITIC POLITICO
Italy	Università degli Studi di Bari	USB
Italy	university of bologna	DISTA
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	Jeju National University	JNU
Lithuania	Institute of Aerial Geodesy	AGI
Lithuania	Lithuanian hydrometeorological service	LHMS
Lithuania	University of Vilnius	VU
Marocco	University Ibn Tofail	UIT
Mauritius	Mauritius Oceanography Institute	MOI
Mexico	Facultad de Ciencias Marinas, Universidad Autónoma de Baja California	FCM/UABC
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
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	The University Centre in Svalbard	UNIS
Peru	Instituto del Mar del Peru	IMARPE
Peru	Servicio Nacional de Meteorología e Hidrología	SENAMHI
Peru	Universidad Nacional Mayor de San Marcos	UNMSM
Philippines	Marine Science Institute, University of the Philippines	UPMSI
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	Universidade dos Acores	UAC
South Korea	PKNU	MF
Romania	National Meteorological Administration	NMA
Romania	University of Bucharest	UB
Russia	V.I.Ilichev Pacific Oceanological Institute	
Russia	Atlantic Research institute of Marine fisheries and oceanography	AtlantNIRO
Russia	Geophysical Center of Russian Academy of Sciences	GC RAS
Russia	Hydrometcenter of Russia	RHMC
Russia	Kaliningrad State Technical University	KLGTU - KSTU
Russia	Murmansk Marine Biological Institute	MMBI
Russia	Nansen International Environmental and Remote Sensing Center	NIERSC
Russia	Shirshov Institute of Oceanology RAS	SIO RAS
Russia	SRC PLANETA Roshydromet	planeta
Russia	State research Center Planeta	SRC
Russia	V.I.Ilichev 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	Institut Català de Ciències del Clima	IC3
Spain	Institut de Ciències del Mar	ICM
Spain	Institut 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 Oceanography	IEO
Spain	Instituto Mediterraneo de Estudios Avanzados	IMEDEA (CSIC-UIB)
Spain	Instituto Nacional de Meteorología	INM
Spain	Instituto Nacional de Pesquisas Espaciais	INPE
Spain	Instituto Nacional de Técnica 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 Científicas	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
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 Atmos Physics, NCU ,Taiwan	ATM/NCU
Taiwan	Taiwan Ocean Research Institute	TORI
Taiwan	National Central University	NCU/TAIWAN
Turkey	Türkish State Meteorological Services	TSMS
United Kingdom	Asgard Consulting Limited	Asgard
United Kingdom	Department of Zoology, University of Oxford	UOO
United Kingdom	ECMWF	ECMWF
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	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	DIRECCIÓN NACIONAL DE RECURSOS ACUÁTICOS	DNRA
USA	Alaska Department Of Fish and Game	ADFG
USA	Applied Weather Technology	AWT
USA	Atmospheric and Environmental Research	AER
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	Dartmouth 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	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	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	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 28 : List of Institutes registered on the central Web Site

Moreover are registered 14 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.

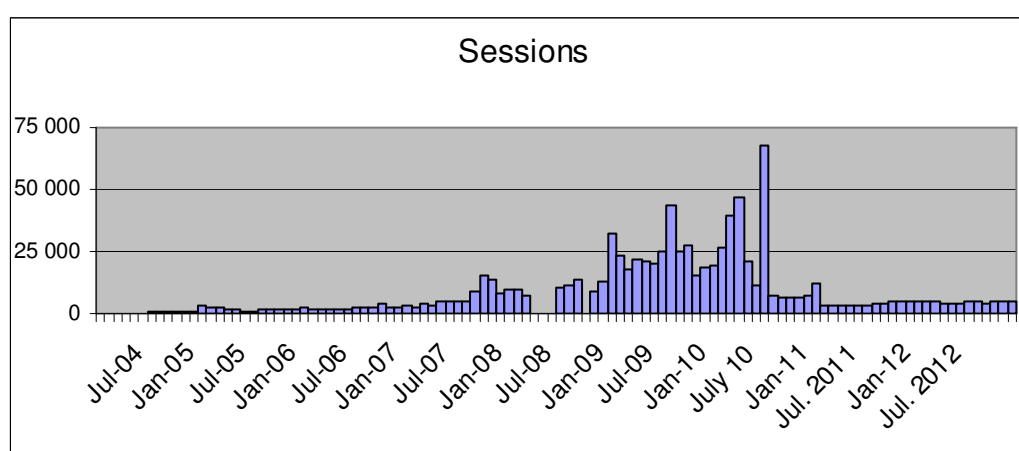


Figure 81 : Evolution of sessions on the central OSI SAF Web Site from April 2004 to DECEMBER 2012.

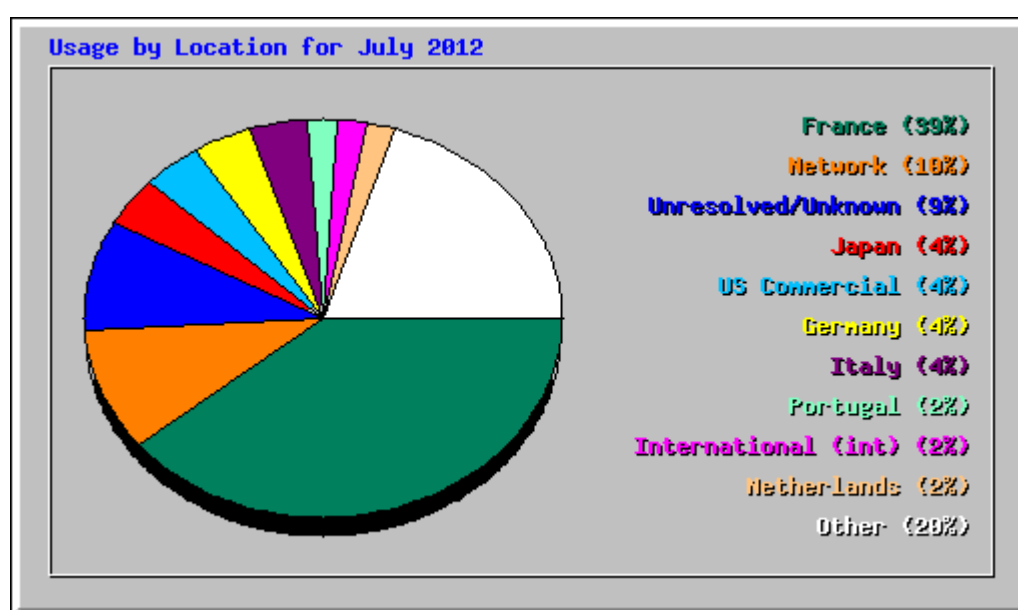


Figure 82 : Usage of the OSI SAF central Web Site by country in JULY 2012.

Top 30 of 69 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	20437	39.17%	19280	38.35%	123029	21.93%	0	0.00%	0	0.00%	France
2	5102	9.78%	5076	10.10%	46816	8.34%	0	0.00%	0	0.00%	Network
3	4657	8.93%	4610	9.17%	60624	10.81%	0	0.00%	0	0.00%	Unresolved/Unknown
4	2330	4.47%	2329	4.63%	9071	1.62%	0	0.00%	0	0.00%	Japan
5	2000	3.83%	1995	3.97%	35675	6.36%	0	0.00%	0	0.00%	US Commercial
6	1999	3.83%	1876	3.73%	10868	1.94%	0	0.00%	0	0.00%	Germany
7	1969	3.77%	1933	3.84%	70689	12.60%	0	0.00%	0	0.00%	Italy
8	1138	2.18%	1093	2.17%	14871	2.65%	0	0.00%	0	0.00%	Portugal
9	1056	2.02%	966	1.92%	26406	4.71%	0	0.00%	0	0.00%	International (int)
10	994	1.90%	981	1.95%	11506	2.05%	0	0.00%	0	0.00%	Netherlands
11	986	1.89%	961	1.91%	4576	0.82%	0	0.00%	0	0.00%	Australia
12	918	1.76%	918	1.83%	9774	1.74%	0	0.00%	0	0.00%	United Kingdom
13	692	1.33%	663	1.32%	10436	1.86%	0	0.00%	0	0.00%	China
14	540	1.03%	527	1.05%	3748	0.67%	0	0.00%	0	0.00%	US Educational
15	531	1.02%	529	1.05%	3470	0.62%	0	0.00%	0	0.00%	Norway
16	501	0.96%	453	0.90%	2047	0.36%	0	0.00%	0	0.00%	Greece
17	421	0.81%	409	0.81%	2481	0.44%	0	0.00%	0	0.00%	Denmark
18	416	0.80%	394	0.78%	3497	0.62%	0	0.00%	0	0.00%	Switzerland
19	404	0.77%	399	0.79%	3366	0.60%	0	0.00%	0	0.00%	Korea (South)
20	340	0.65%	340	0.68%	5458	0.97%	0	0.00%	0	0.00%	Canada
21	336	0.64%	336	0.67%	67477	12.03%	0	0.00%	0	0.00%	Finland
22	321	0.62%	321	0.64%	2390	0.43%	0	0.00%	0	0.00%	Poland
23	305	0.58%	305	0.61%	2479	0.44%	0	0.00%	0	0.00%	Brazil
24	270	0.52%	270	0.54%	1438	0.26%	0	0.00%	0	0.00%	Estonia
25	230	0.44%	230	0.46%	2501	0.45%	0	0.00%	0	0.00%	Spain
26	225	0.43%	225	0.45%	1738	0.31%	0	0.00%	0	0.00%	Lithuania
27	221	0.42%	221	0.44%	1529	0.27%	0	0.00%	0	0.00%	India
28	203	0.39%	203	0.40%	1871	0.33%	0	0.00%	0	0.00%	Slovenia
29	193	0.37%	193	0.38%	2570	0.46%	0	0.00%	0	0.00%	South Africa
30	169	0.32%	169	0.34%	635	0.11%	0	0.00%	0	0.00%	Non-Profit Organization

table 29 : Usage of the OSI SAF central Web Site by country in JULY 2012

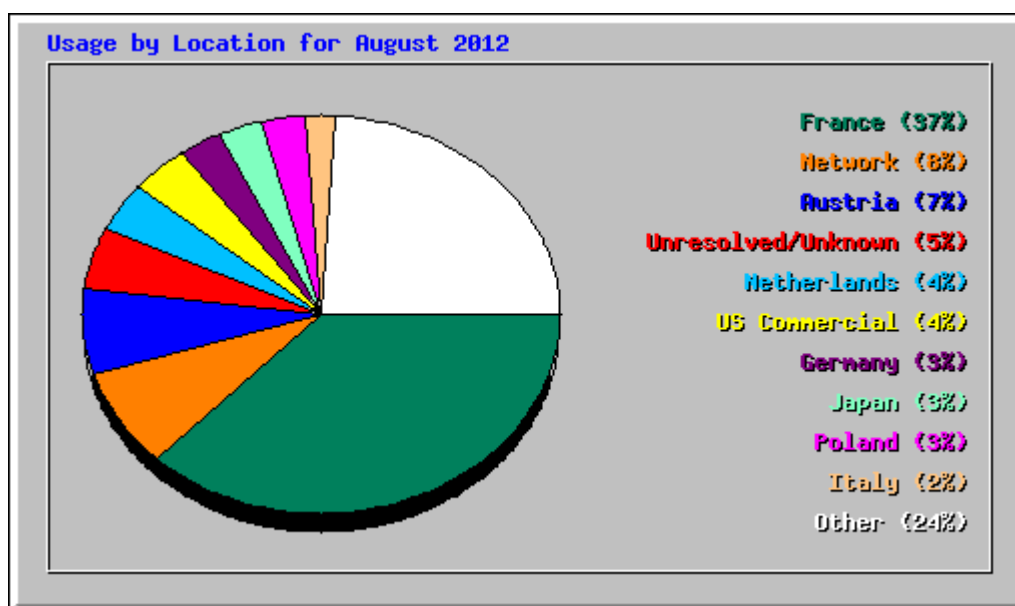


Figure 83 : Usage of the OSI SAF central Web Site by country in AUGUST 2012.

Top 30 of 69 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	27178	36.87%	24290	36.12%	221257	29.90%	0	0.00%	0	0.00%	France
2	5935	8.05%	5878	8.74%	52137	7.05%	0	0.00%	0	0.00%	Network
3	5325	7.22%	2737	4.07%	60311	8.15%	0	0.00%	0	0.00%	Austria
4	4051	5.50%	4021	5.98%	49874	6.74%	0	0.00%	0	0.00%	Unresolved/Unknown
5	3183	4.32%	3068	4.56%	25810	3.49%	0	0.00%	0	0.00%	Netherlands
6	3177	4.31%	3117	4.63%	27091	3.66%	0	0.00%	0	0.00%	US Commercial
7	2468	3.35%	2392	3.56%	24691	3.34%	0	0.00%	0	0.00%	Germany
8	2180	2.96%	2180	3.24%	11241	1.52%	0	0.00%	0	0.00%	Japan
9	1902	2.58%	1886	2.80%	18282	2.47%	0	0.00%	0	0.00%	Poland
10	1755	2.38%	1755	2.61%	50777	6.86%	0	0.00%	0	0.00%	Italy
11	1589	2.16%	1584	2.36%	25060	3.39%	0	0.00%	0	0.00%	Slovenia
12	1516	2.06%	1369	2.04%	51817	7.00%	0	0.00%	0	0.00%	International (int)
13	1392	1.89%	1366	2.03%	7748	1.05%	0	0.00%	0	0.00%	Australia
14	1152	1.56%	1152	1.71%	16723	2.26%	0	0.00%	0	0.00%	Norway
15	1142	1.55%	1110	1.65%	12386	1.67%	0	0.00%	0	0.00%	China
16	864	1.17%	795	1.18%	13866	1.87%	0	0.00%	0	0.00%	United Kingdom
17	652	0.88%	650	0.97%	11215	1.52%	0	0.00%	0	0.00%	Denmark
18	626	0.85%	592	0.88%	3517	0.48%	0	0.00%	0	0.00%	Sweden
19	605	0.82%	605	0.90%	2494	0.34%	0	0.00%	0	0.00%	United States
20	577	0.78%	533	0.79%	3002	0.41%	0	0.00%	0	0.00%	Portugal
21	492	0.67%	490	0.73%	6016	0.81%	0	0.00%	0	0.00%	US Government
22	409	0.55%	409	0.61%	2365	0.32%	0	0.00%	0	0.00%	Finland
23	397	0.54%	393	0.58%	5718	0.77%	0	0.00%	0	0.00%	Canada
24	387	0.52%	387	0.58%	3222	0.44%	0	0.00%	0	0.00%	Russian Federation

25	347	0.47%	347	0.52%	3175	0.43%	0	0.00%	0	0.00%	Switzerland
26	327	0.44%	282	0.42%	1625	0.22%	0	0.00%	0	0.00%	Argentina
27	280	0.38%	280	0.42%	1705	0.23%	0	0.00%	0	0.00%	Spain
28	253	0.34%	253	0.38%	1458	0.20%	0	0.00%	0	0.00%	US Educational
29	252	0.34%	228	0.34%	1366	0.18%	0	0.00%	0	0.00%	Croatia (Hrvatska)
30	250	0.34%	226	0.34%	2741	0.37%	0	0.00%	0	0.00%	Greece

table 30 : Usage of the OSI SAF central Web Site by country in AUGUST 2012

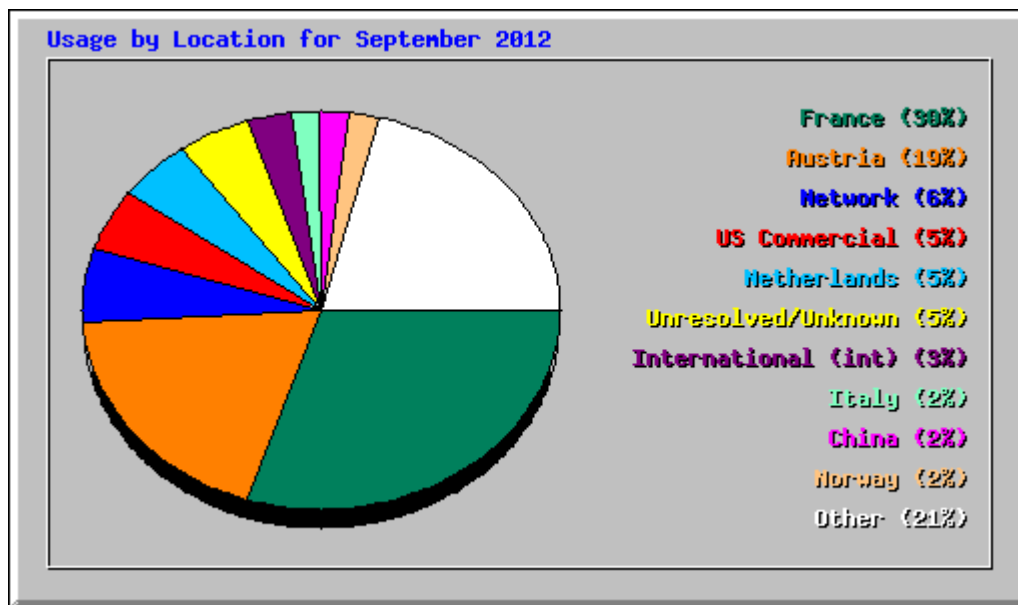


Figure 84 : Usage of the OSI SAF central Web Site by country in SEPTEMBER 2012.

Top 30 of 61 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	19317	30.46%	17512	31.90%	107085	17.96%	0	0.00%	0	0.00%	France
2	11997	18.92%	6059	11.04%	133715	22.42%	0	0.00%	0	0.00%	Austria
3	3780	5.96%	3748	6.83%	58844	9.87%	0	0.00%	0	0.00%	Network
4	3458	5.45%	3419	6.23%	24794	4.16%	0	0.00%	0	0.00%	US Commercial
5	3003	4.74%	2949	5.37%	24862	4.17%	0	0.00%	0	0.00%	Netherlands
6	2889	4.56%	2867	5.22%	38142	6.40%	0	0.00%	0	0.00%	Unresolved/Unknown
7	1888	2.98%	1800	3.28%	14314	2.40%	0	0.00%	0	0.00%	International (int)
8	1550	2.44%	1516	2.76%	72539	12.16%	0	0.00%	0	0.00%	Italy
9	1217	1.92%	1129	2.06%	11849	1.99%	0	0.00%	0	0.00%	China
10	1164	1.84%	1129	2.06%	7989	1.34%	0	0.00%	0	0.00%	Norway
11	1163	1.83%	1149	2.09%	7116	1.19%	0	0.00%	0	0.00%	Germany
12	939	1.48%	939	1.71%	4245	0.71%	0	0.00%	0	0.00%	Japan
13	784	1.24%	782	1.42%	5146	0.86%	0	0.00%	0	0.00%	Denmark
14	750	1.18%	699	1.27%	5732	0.96%	0	0.00%	0	0.00%	Portugal
15	629	0.99%	627	1.14%	2657	0.45%	0	0.00%	0	0.00%	United States
16	585	0.92%	585	1.07%	2576	0.43%	0	0.00%	0	0.00%	Australia

17	583	0.92%	505	0.92%	2502	0.42%	0	0.00%	0	0.00%	Switzerland
18	514	0.81%	514	0.94%	13270	2.23%	0	0.00%	0	0.00%	Spain
19	482	0.76%	477	0.87%	4345	0.73%	0	0.00%	0	0.00%	United Kingdom
20	475	0.75%	442	0.81%	1975	0.33%	0	0.00%	0	0.00%	Greece
21	467	0.74%	467	0.85%	4017	0.67%	0	0.00%	0	0.00%	Belgium
22	452	0.71%	452	0.82%	2569	0.43%	0	0.00%	0	0.00%	Brazil
23	389	0.61%	389	0.71%	2114	0.35%	0	0.00%	0	0.00%	Finland
24	386	0.61%	379	0.69%	2343	0.39%	0	0.00%	0	0.00%	Sweden
25	377	0.59%	347	0.63%	3612	0.61%	0	0.00%	0	0.00%	Romania
26	371	0.59%	362	0.66%	2165	0.36%	0	0.00%	0	0.00%	Poland
27	360	0.57%	347	0.63%	2379	0.40%	0	0.00%	0	0.00%	Czech Republic
28	297	0.47%	285	0.52%	1595	0.27%	0	0.00%	0	0.00%	Bulgaria
29	263	0.41%	263	0.48%	1616	0.27%	0	0.00%	0	0.00%	Canada
30	247	0.39%	247	0.45%	1098	0.18%	0	0.00%	0	0.00%	Slovenia

table 31 : Usage of the OSI SAF central Web Site by country in SEPTEMBER 2012

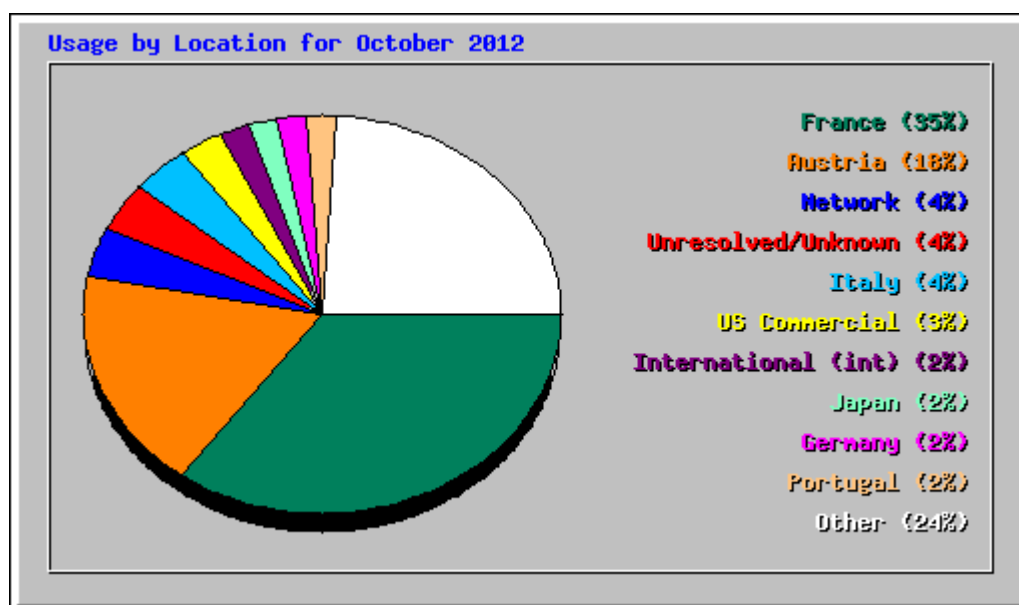


Figure 85 : Usage of the OSI SAF central Web Site by country in OCTOBER 2012.

Top 30 of 71 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	24489	35.39%	21477	36.35%	136373	21.17%	0	0.00%	0	0.00%	France
2	12389	17.90%	6263	10.60%	139471	21.65%	0	0.00%	0	0.00%	Austria
3	3010	4.35%	2996	5.07%	34194	5.31%	0	0.00%	0	0.00%	Network
4	2746	3.97%	2689	4.55%	19479	3.02%	0	0.00%	0	0.00%	Unresolved/Unknown
5	2525	3.65%	2507	4.24%	87007	13.51%	0	0.00%	0	0.00%	Italy
6	2267	3.28%	2252	3.81%	43788	6.80%	0	0.00%	0	0.00%	US Commercial
7	1612	2.33%	1441	2.44%	22619	3.51%	0	0.00%	0	0.00%	International (int)
8	1468	2.12%	1431	2.42%	9776	1.52%	0	0.00%	0	0.00%	Japan
9	1412	2.04%	1382	2.34%	9064	1.41%	0	0.00%	0	0.00%	Germany

10	1341	1.94%	1269	2.15%	8103	1.26%	0	0.00%	0	0.00%	Portugal
11	1212	1.75%	1212	2.05%	12676	1.97%	0	0.00%	0	0.00%	Netherlands
12	1185	1.71%	1181	2.00%	10471	1.63%	0	0.00%	0	0.00%	Norway
13	1151	1.66%	1054	1.78%	7093	1.10%	0	0.00%	0	0.00%	Australia
14	946	1.37%	933	1.58%	5718	0.89%	0	0.00%	0	0.00%	Spain
15	878	1.27%	878	1.49%	6625	1.03%	0	0.00%	0	0.00%	Dominican Republic
16	628	0.91%	628	1.06%	6543	1.02%	0	0.00%	0	0.00%	United Kingdom
17	625	0.90%	625	1.06%	3606	0.56%	0	0.00%	0	0.00%	Brazil
18	604	0.87%	602	1.02%	8143	1.26%	0	0.00%	0	0.00%	United States
19	557	0.80%	526	0.89%	1745	0.27%	0	0.00%	0	0.00%	Turkey
20	546	0.79%	542	0.92%	6846	1.06%	0	0.00%	0	0.00%	China
21	484	0.70%	483	0.82%	3796	0.59%	0	0.00%	0	0.00%	Denmark
22	466	0.67%	393	0.67%	1549	0.24%	0	0.00%	0	0.00%	Sweden
23	465	0.67%	465	0.79%	2859	0.44%	0	0.00%	0	0.00%	Poland
24	454	0.66%	454	0.77%	3765	0.58%	0	0.00%	0	0.00%	US Educational
25	425	0.61%	424	0.72%	3389	0.53%	0	0.00%	0	0.00%	Switzerland
26	413	0.60%	382	0.65%	2921	0.45%	0	0.00%	0	0.00%	Korea (South)
27	375	0.54%	374	0.63%	7088	1.10%	0	0.00%	0	0.00%	Slovenia
28	350	0.51%	350	0.59%	2102	0.33%	0	0.00%	0	0.00%	Croatia (Hrvatska)
29	328	0.47%	328	0.56%	1050	0.16%	0	0.00%	0	0.00%	Estonia
30	309	0.45%	309	0.52%	1316	0.20%	0	0.00%	0	0.00%	US Military

table 32 : Usage of the OSI SAF central Web Site by country in OCTOBER 2012

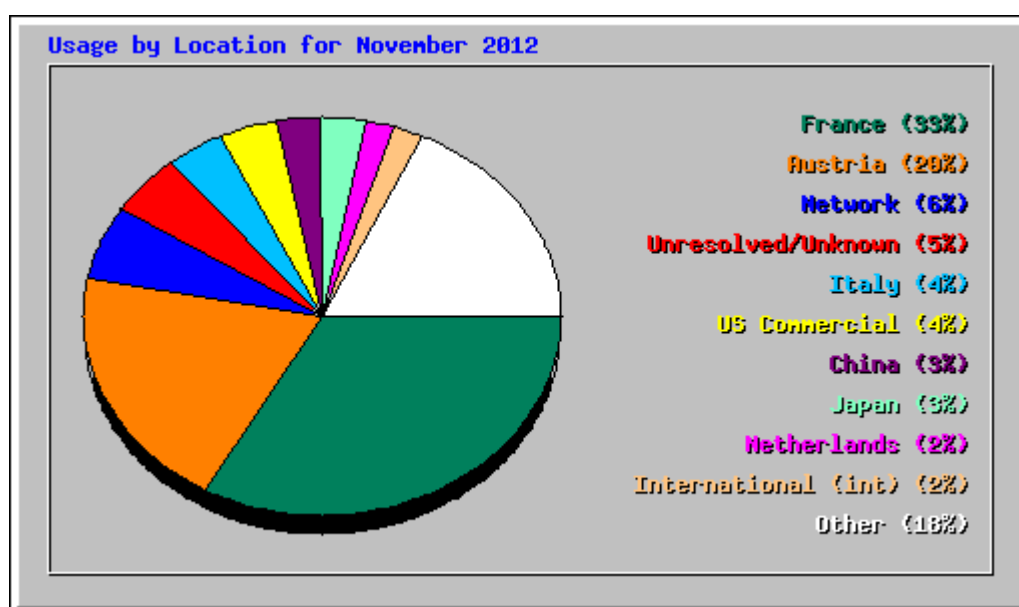


Figure 86 : Usage of the OSI SAF central Web Site by country in NOVEMBER 2012.

Top 30 of 63 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	20975	33.05%	18591	34.26%	112974	19.43%	0	0.00%	0	0.00%	France
2	12439	19.60%	6446	11.88%	138049	23.74%	0	0.00%	0	0.00%	Austria

3	3988	6.28%	3934	7.25%	36501	6.28%	0	0.00%	0	0.00%	Network
4	3148	4.96%	3008	5.54%	34463	5.93%	0	0.00%	0	0.00%	Unresolved/Unknown
5	2708	4.27%	2665	4.91%	80402	13.83%	0	0.00%	0	0.00%	Italy
6	2417	3.81%	2343	4.32%	14411	2.48%	0	0.00%	0	0.00%	US Commercial
7	1690	2.66%	1621	2.99%	12709	2.19%	0	0.00%	0	0.00%	China
8	1589	2.50%	1572	2.90%	5659	0.97%	0	0.00%	0	0.00%	Japan
9	1491	2.35%	1428	2.63%	11781	2.03%	0	0.00%	0	0.00%	Netherlands
10	1407	2.22%	1376	2.54%	11894	2.05%	0	0.00%	0	0.00%	International (int)
11	1166	1.84%	1151	2.12%	9717	1.67%	0	0.00%	0	0.00%	Germany
12	905	1.43%	905	1.67%	4591	0.79%	0	0.00%	0	0.00%	Norway
13	667	1.05%	641	1.18%	26019	4.47%	0	0.00%	0	0.00%	Australia
14	647	1.02%	643	1.18%	4003	0.69%	0	0.00%	0	0.00%	Brazil
15	627	0.99%	626	1.15%	2282	0.39%	0	0.00%	0	0.00%	India
16	618	0.97%	602	1.11%	11563	1.99%	0	0.00%	0	0.00%	United Kingdom
17	590	0.93%	570	1.05%	4041	0.69%	0	0.00%	0	0.00%	Poland
18	521	0.82%	519	0.96%	2889	0.50%	0	0.00%	0	0.00%	Spain
19	462	0.73%	427	0.79%	4527	0.78%	0	0.00%	0	0.00%	Canada
20	403	0.64%	391	0.72%	8360	1.44%	0	0.00%	0	0.00%	Denmark
21	355	0.56%	355	0.65%	2978	0.51%	0	0.00%	0	0.00%	Portugal
22	347	0.55%	319	0.59%	1974	0.34%	0	0.00%	0	0.00%	Greece
23	323	0.51%	311	0.57%	1912	0.33%	0	0.00%	0	0.00%	Switzerland
24	318	0.50%	316	0.58%	3347	0.58%	0	0.00%	0	0.00%	Slovenia
25	272	0.43%	269	0.50%	2359	0.41%	0	0.00%	0	0.00%	Russian Federation
26	267	0.42%	267	0.49%	2892	0.50%	0	0.00%	0	0.00%	United States
27	245	0.39%	245	0.45%	1514	0.26%	0	0.00%	0	0.00%	Korea (South)
28	209	0.33%	208	0.38%	3731	0.64%	0	0.00%	0	0.00%	US Government
29	206	0.32%	206	0.38%	2121	0.36%	0	0.00%	0	0.00%	Great Britain (UK)
30	192	0.30%	179	0.33%	917	0.16%	0	0.00%	0	0.00%	Sweden

table 33 : Usage of the OSI SAF central Web Site by country in NOVEMBER 2012

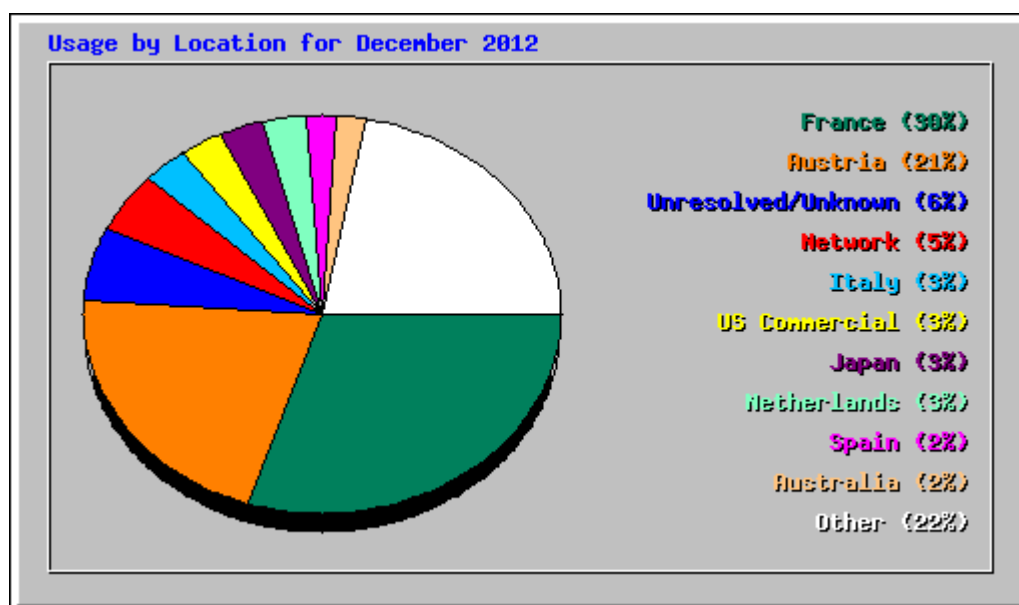


Figure 87 : Usage of the OSI SAF central Web Site by country in DECEMBER 2012.

Top 30 of 68 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	18302	30.36%	16505	31.88%	144802	23.97%	0	0.00%	0	0.00%	France
2	12626	20.94%	6450	12.46%	141121	23.37%	0	0.00%	0	0.00%	Austria
3	3449	5.72%	3418	6.60%	29689	4.92%	0	0.00%	0	0.00%	Unresolved/Unknown
4	2995	4.97%	2991	5.78%	42592	7.05%	0	0.00%	0	0.00%	Network
5	2062	3.42%	2058	3.98%	70133	11.61%	0	0.00%	0	0.00%	Italy
6	2048	3.40%	2027	3.92%	10718	1.77%	0	0.00%	0	0.00%	US Commercial
7	1769	2.93%	1727	3.34%	7978	1.32%	0	0.00%	0	0.00%	Japan
8	1691	2.80%	1633	3.15%	11106	1.84%	0	0.00%	0	0.00%	Netherlands
9	1198	1.99%	1196	2.31%	18522	3.07%	0	0.00%	0	0.00%	Spain
10	1130	1.87%	1096	2.12%	4030	0.67%	0	0.00%	0	0.00%	Australia
11	1045	1.73%	995	1.92%	19014	3.15%	0	0.00%	0	0.00%	China
12	1042	1.73%	1035	2.00%	5895	0.98%	0	0.00%	0	0.00%	Germany
13	792	1.31%	779	1.50%	5848	0.97%	0	0.00%	0	0.00%	Switzerland
14	732	1.21%	730	1.41%	3879	0.64%	0	0.00%	0	0.00%	Brazil
15	697	1.16%	684	1.32%	5422	0.90%	0	0.00%	0	0.00%	Poland
16	694	1.15%	689	1.33%	3673	0.61%	0	0.00%	0	0.00%	Russian Federation
17	681	1.13%	670	1.29%	5532	0.92%	0	0.00%	0	0.00%	United States
18	650	1.08%	650	1.26%	2415	0.40%	0	0.00%	0	0.00%	Norway
19	533	0.88%	508	0.98%	3151	0.52%	0	0.00%	0	0.00%	United Kingdom
20	496	0.82%	493	0.95%	2452	0.41%	0	0.00%	0	0.00%	Turkey
21	466	0.77%	420	0.81%	2736	0.45%	0	0.00%	0	0.00%	International (int)
22	460	0.76%	460	0.89%	5397	0.89%	0	0.00%	0	0.00%	Bulgaria
23	408	0.68%	385	0.74%	25928	4.29%	0	0.00%	0	0.00%	Canada
24	359	0.60%	359	0.69%	4134	0.68%	0	0.00%	0	0.00%	US Educational
25	344	0.57%	343	0.66%	2879	0.48%	0	0.00%	0	0.00%	Portugal
26	336	0.56%	336	0.65%	1597	0.26%	0	0.00%	0	0.00%	Slovenia
27	268	0.44%	268	0.52%	1790	0.30%	0	0.00%	0	0.00%	Denmark
28	212	0.35%	197	0.38%	1600	0.26%	0	0.00%	0	0.00%	Sweden
29	183	0.30%	183	0.35%	1205	0.20%	0	0.00%	0	0.00%	Finland
30	178	0.30%	177	0.34%	898	0.15%	0	0.00%	0	0.00%	Romania

table 34 : Usage of the OSI SAF central Web Site by country in DECEMBER 2012

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
120012	17/07/2012	Data not available in NRT on IFREMER FTP server	
120013	17/07/2012	Data not available in NRT on IFREMER FTP server	
120014	18/07/2012	Request for archived ASCAT wind product	Closed
120015	02/08/2012	Request for archived METEOSAT SST product	Closed
120016	02/08/2012	Request for archived NAR SST product	Closed
120017	09/08/2012	Request for archived SEVIRI SST product	Closed

120018	21/08/2012	Request of information on SST algorithm	Closed
120019	30/08/2012	Problems with NAR SST projection in GRIB	Closed by reference to SG
120020	05/09/2012	Request for archive of wind 12.5km and coastal product data in the Chinese Yellow Sea	Forwarded to EUMETSAT help
120021	18/09/2012	User report on problem with Sea Ice Concentration Grid.	Closed by reference to 120022
120022	21/09/2012	User report on problem with Sea Ice Concentration Grid.	Closed
120023	11/10/2012	User report on problem with ASCAT wind 25km product	Closed
120024	17/10/2012	Request for archived SEVIRI SST product	Closed
120025	29/10/2012	Request of information on ASCAT product resolution	Closed
120026	30/11/2012	Request for archived ASCAT wind product	Closed
120027	07/12/2012	Request of information on Sea Ice product	Closed
120028	10/12/2012	Request of information on Sea Ice product	Closed
120029	10/12/2012	User report on problem with ASCAT wind 25km product	Closed
120030	10/12/2012	User report on problem with ASCAT wind 25km product	Closed
120031	13/12/2012	Request for archived ASCAT wind product	Closed
120032	13/12/2012	User report on problem with SAF OSI file processing	Acknowledged

table 35 : 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
300019076	06/08/2012	User report on problem for using ASCAT product in BUFR	Closed
300019462	21/09/2012	User report on problem for using Sea Ice products	Closed

table 36 : 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>).

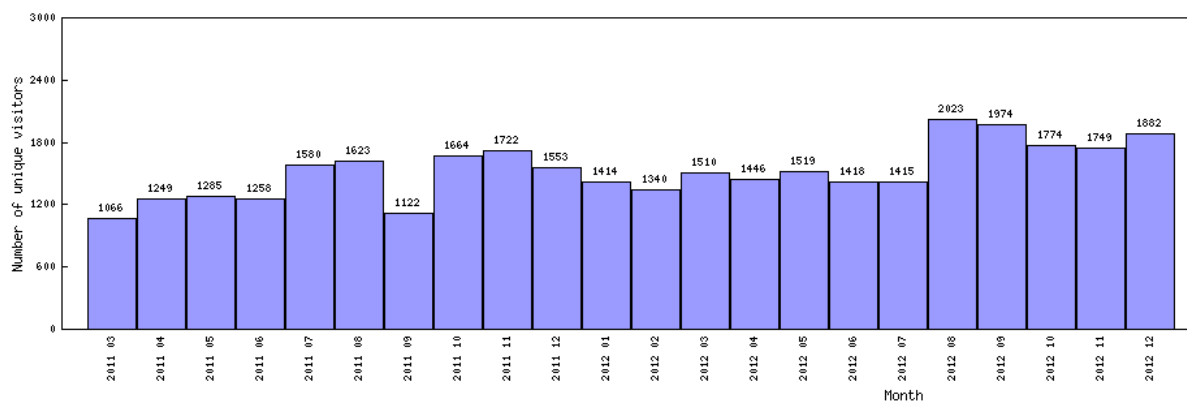


Figure 88 : Evolution of number of unique visitors on the HL OSI SAF Sea Ice portal from MARCH 2011 to DECEMBER 2012 (<http://osisaf.met.no>).

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 2012. Only external sessions (from outside KNMI) are counted.

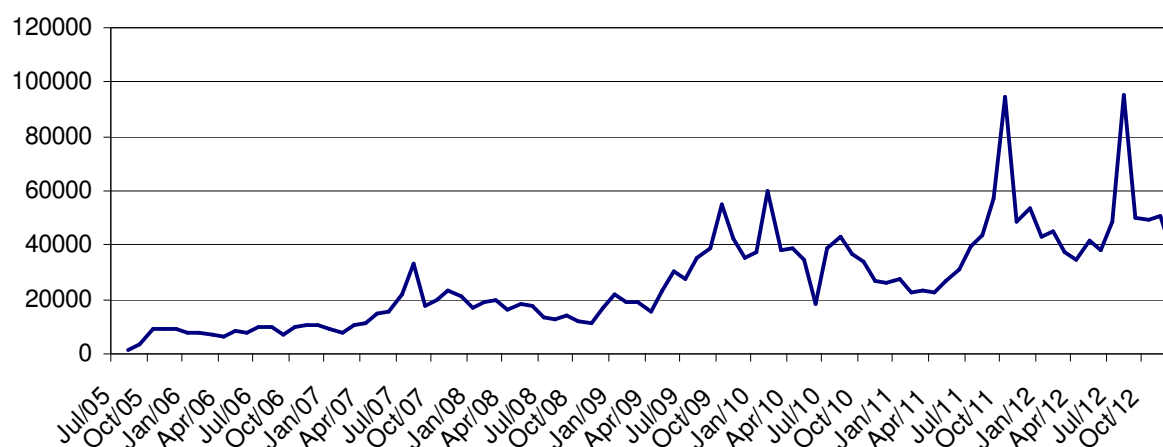


Figure 89 : Number of page views on KNMI scatterometer website per month.

At scat@knmi.nl, 78 Emails from 26 different addresses were received in the period Jul-Sep 2012, requesting wind data, processing software, and other support. For Oct-Dec 2012 an additional 110 Emails from 41 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 95, and 69 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

Entity	Shortened name	Country
NOAA/NESDIS		U.S.A.
MetService		New Zealand
UAE Met. Department		United Arab Emirates
The Ohio State University, Dept. of Electrical Eng.		U.S.A.
University of Wisconsin-Madison		U.S.A.
BYU Center for Remote Sensing, Brigham Young University		U.S.A.
Woods Hole Oceanographic Institution		U.S.A.
Remote Sensing Systems		U.S.A.
Institute of Low Temperature Science, Hokkaido University		Japan
Center for Atmospheric and Oceanic Studies, Tohoku University		Japan
Naval Research Laboratory	NRL	U.S.A.
ComSine Ltd		U.K.
Met Office		U.K.
Meteorology and Oceanography Group, Space Applications Centre, ISRO		India
Numerical Prediction Division, Japan Meteorological Agency		Japan
The First Institute of Oceanography	FIO	China
PO.DAAC Data Engineering Team		U.S.A.
ECMWF		U.K.
Satellite Observing Systems		U.K.
Météo France	M-F	France
School of Marine Science and Technology, Tokai University		Japan
Northwest Research Associates		U.S.A.
University of Washington		U.S.A.
Naval Hydrographic Service, Ministry of Defence		Argentina
Swedish Meteorological and Hydrological Institute	SMHI	Sweden
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		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

Entity	Shortened name	Country
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		Ecuador
Leibniz Institute for Baltic Sea Research		Germany
Nansen Environmental and Remote Sensing Center		Norway
UNMSM		Peru
Centro de Estudos do Ambiente e do Mar		Portugal
Andhra University, Visakhapatnam		India
Unidad de Tecnología Marina (UTM – CSIC)		Spain
MyOcean Sea Ice Wind TAC (Ifremer)		France
Jeju National University		Korea
Weather Data Marine Ltd.		U.K.
Admiral Paulo Moreira Marine Research Institute		Brazil
IMEDEA (UIB-CSIC)		Spain
Hong Kong Observatory		Hong Kong
Observatoire Midi-Pyrenees		France
Tidetech		Australia
Weatherguy.com		U.S.A.
Marine Data Literacy		U.S.A.
Hong Kong University of Science and Technology		Hong Kong
Environmental Agency of the Republic of Slovenia		Slovenia
Fisheries and Sea Research Institute		Portugal
National Meteorological Center		China
National Oceanography Centre, Southampton		U.K.
National Taiwan University		Taiwan
Florida State University		U.S.A.
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
20 independent users (not affiliated to an organization)		

table 37 : 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 2 nd half 2012						
	July 2012	Aug. 2012	Sept. 2012	Oct. 2012	Nov. 2012	Dec. 2012
SST MAP +LML	1169	771	1586	3625	3151	1159
SSI MAP +LML	7224	33	13	23	18	102
DLI MAP +LML	2229	678	9	2	120	263
METEOSAT SST	3891	3876	3651	11390	3926	3843
GOES-E SST	1361	1340	1033	604	1399	1409
METEOSAT SSI	0	1	0	0	0	0
GOES-E SSI	32	38	26	13	37	7
METEOSAT DLI	0	0	0	0	0	0
GOES-E DLI	0	0	0	0	0	0
NARSST	4101	2440	1926	8997	3408	4958
MGR SST	254598	380428	262326	315063	256640	272767
GBL SST	3470	712	591	900	619	457

table 38 : Number of OSI SAF products downloaded on IFREMER FTP server over 2nd half 2012.

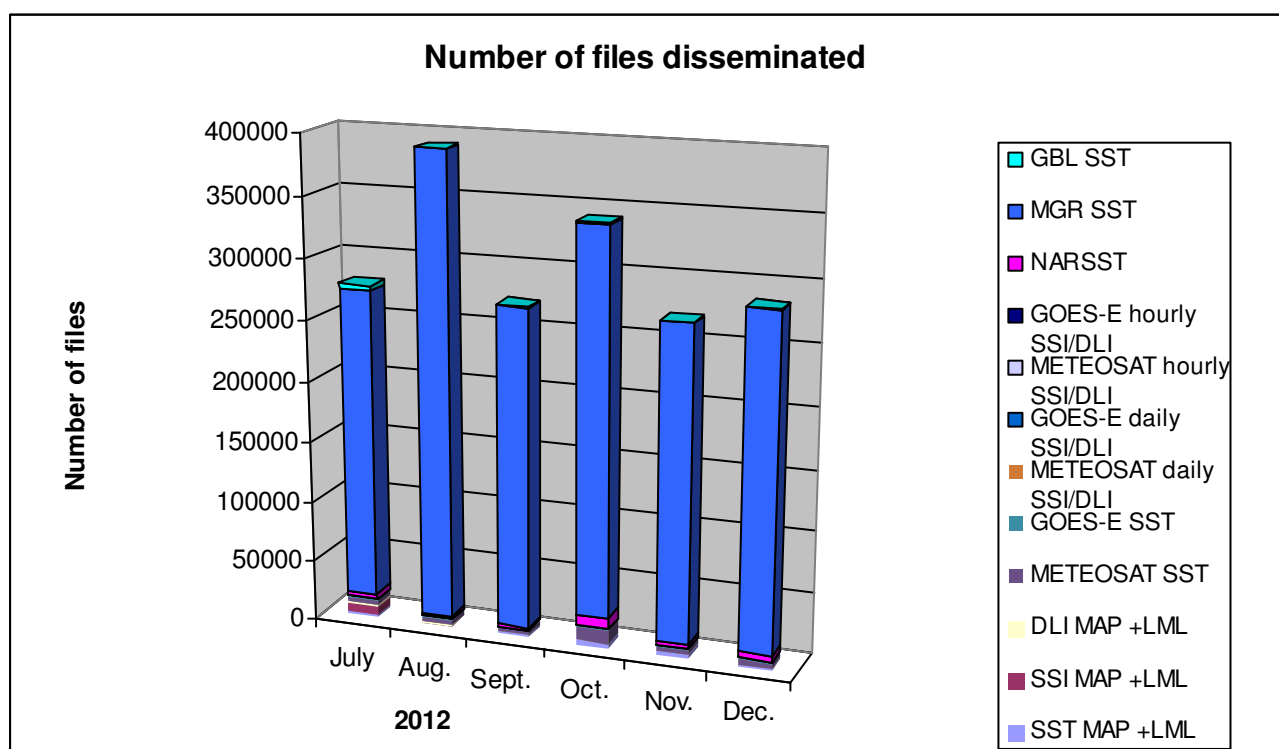


Figure 90 : Number of OSI SAF products downloaded on IFREMER FTP server over 2nd half 2012.

Volume of data downloaded by country (in Mb)						
	July 2012	Aug. 2012	Sept. 2012	Oct. 2012	Nov. 2012	Dec. 2012
Denmark	42977	43489	42230	3297	0	0
Italy	5652	4833	4188	5161	3594	3727
France	2990	2427	4291	1853	6820	1464
Netherlands	0	0	0	0	0	0
Spain	930	286	0	0	0	0
Russian Federation	1393	0	0	0	0	0
Belgium	4301	4884	4690	3871	3441	3420
Poland	0	0	0	0	0	0
Inconnu	2488	4301	4721	5857	3052	3410
Network	41083	7619	0	0	0	89
Commercial	13609	1208	207	302	432	2560
Others	1967	42	18	15	100	197

table 39 : Volume of Data downloaded by country (in Mb) from IFREMER ftp server over 2nd half 2012.

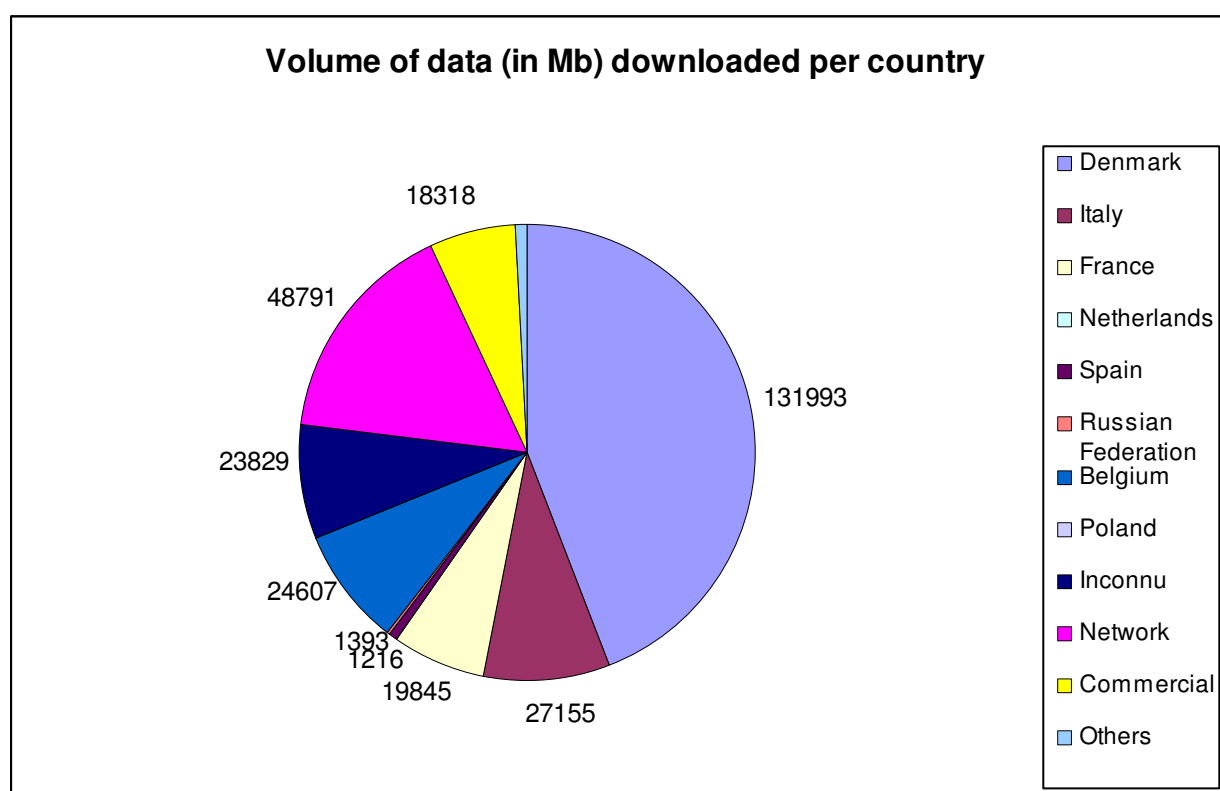


Figure 91 : Volume of Data downloaded by country (in Mb) from IFREMER ftp server over 2nd half 2012.

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	127	44.4	40040
GLB SST	137	0.1	494
NOAA-17 NAR SST	10	0	11
NOAA-18 NAR SST	16	0.9	217
NOAA-19 NAR SST	58	3.2	1091
Metop-A NAR SST	85	3.5	1205
METEOSAT SST	9	0.1	170
Total		52.2	43228

table 40 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in JULY 2012.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	149	77,8	41605
GLB SST	210	3,3	891
NOAA-17 NAR SST	0	0	0
NOAA-18 NAR SST	42	0	51
NOAA-19 NAR SST	129	0	770
Metop-A NAR SST	80	0	97
METEOSAT SST	35	0	56
Total		81,1	43470

table 41 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in AUGUST 2012.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	260	48,2	30792
GLB SST	291	0,1	1568
NOAA-17 NAR SST	1	0	2
NOAA-18 NAR SST	39	0	335
NOAA-19 NAR SST	178	0,1	15337
Metop-A NAR SST	89	0	210
METEOSAT SST	30	0	134
Total		48,4	48378

table 42 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in SEPTEMBER 2012.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	85	45.5	32113
GLB SST	114	16.4	9270
NOAA-17 NAR SST	0	0	0
NOAA-18 NAR SST	20	0	24
NOAA-19 NAR SST	58	1.3	447
Metop-A NAR SST	109	0	2963
METEOSAT SST	43	0	57
Total		63.2	44874

table 43 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in OCTOBER 2012.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	85	78,9	40531
GLB SST	96	0,1	347
NOAA-17 NAR SST			
NOAA-18 NAR SST	9	0,1	11
NOAA-19 NAR SST	58	0	1452
Metop-A NAR SST	62	0	114
METEOSAT SST	42	0	154
Total		79,1	42609

table 44 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in NOVEMBER 2012.

OSI SAF product	Number of Users	GB	Number of files
MGR SST	90	82,5	40471
GLB SST	83	2,7	2652
NOAA-17 NAR SST			
NOAA-18 NAR SST	61	0	110
NOAA-19 NAR SST	54	0,1	6098
Metop-A NAR SST	72	0	924
METEOSAT SST	50	0,1	123
Total		85,4	50378

table 45 : Statistics of the OSI SAF products downloaded on the PODAAC FTP server in DECEMBER 2012.

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 the 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 2012	7408	1903	2638	3309	28755
Aug. 2012	30015	2388	3302	10836	23775
Sept. 2012	11922	3236	6206	5760	10448
Oct. 2012	15882	1551	5480	10158	13670
Nov. 2012	18824	1017	3885	14425	43051
Dec. 2012	13898	1597	5093	7016	49200

table 46 : Number of products downloaded from OSI SAF Sea Ice FTP server (ftp://osisaf.met.no).

The next figure shows the downloads sorted on domains.

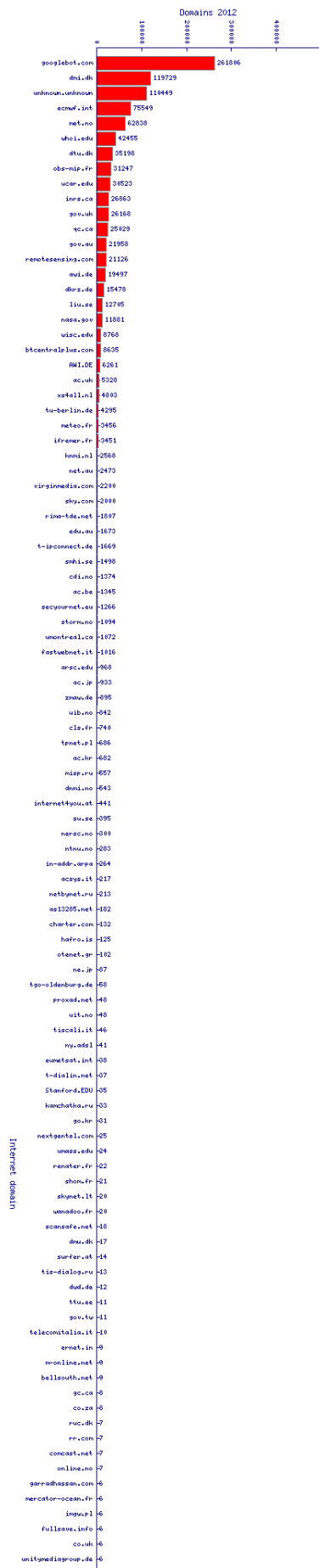


Figure 92 : FTP downloads of sea ice products (more than 5) sorted on domains for January to December 2012.

6.2.3 Statistics on the SS3 ftp site use

KNMI keeps statistics of the retrieval of wind products of its FTP server. It appears that the 25-km and 12.5-km ASCAT products were retrieved routinely by approximately 40 users and the ASCAT coastal products by approximately 20 users. The OSCAT 50-km products are routinely retrieved by approximately 20 users. This includes both BUFR and NetCDF formats. Note that the BUFR products are also disseminated through EUMETCast.

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

We also receive statistics from PO.DAAC on the number of downloads of the ASCAT wind products in NetCDF format from their archive.

During the 3rd quarter of 2012:

154,548 ASCAT 25-km data files have been retrieved by 591 users.

257,791 ASCAT 12.5-km data files have been retrieved by 576 users.

70,056 ASCAT coastal data files have been retrieved by 312 users.

During the 4th quarter of 2012:

267,576 ASCAT 25-km data files have been retrieved by 192 users.

315,595 ASCAT 12.5-km data files have been retrieved by 311 users.

106,923 ASCAT coastal data files have been retrieved by 170 users.

7 Training

No training activity was carried out during the reporting period.

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
Extended optimal estimation techniques for Sea surface temperature from the Spinning Enhanced Visible and Infra-Red Imager (SEVIRI)	Osi_vs12_01	7	Sept. 2012
OCEANSAT-II Wind Product User Manual	SAF/OSI/CDOP2/KNMI/TEC/MA/140	1.2	Sept. 2012
EUMETSAT - OSI SAF JOP / OICD	EUM/OPS/ICD/04/0201	6	Sept. 2012
Quarterly Report on 4th Quarter of 2011	SAF/OSI/M-F/TEC/RP/314	1.1	July 2012
ASCAT Product Manual	SAF/OSI/CDOP/KNMI/TEC/MA/126	1.12	August 2012
Quarterly Report on 1st Quarter of 2012	SAF/OSI/CDOP-2/M-F/TEC/RP/331	1.1	August 2012
Quarterly Report on 2nd Quarter of 2012	SAF/OSI/CDOP2/M-F/TEC/RP/332	1.0	August 2012
Quarterly Report on 3rd Quarter of 2012	SAF/OSI/CDOP2/M-F/TEC/RP/323	1.0	October 2012
OSI SAF CDOP-2 Product Requirement Document	SAF/OSI/CDOP2/M-F/MGT/PL/001	2.1	October 2012

table 47 : Documentation updates.

Recent publications

Anderson, C., Figa, J., Bonekamp, H., Wilson, J., Verspeek, J., Stoffelen, A. and Portabella, M., *Validation of Backscatter Measurements from the Advanced Scatterometer on MetOp-A*, J. Atm. Oceanic Technol., 2012, 29, 77-88.

Belmonte, M. and Stoffelen, A., *New Bayesian algorithm for sea ice detection with QuikSCAT*, IEEE Transactions on Geoscience and Remote Sensing, I, 2011, 49, 6, 1894-1901, doi:10.1109/TGRS.2010.2101608.

Belmonte, M., Verspeek, J., Verhoef, A. and Stoffelen, A., *Bayesian sea ice detection with the Advanced Scatterometer*, IEEE Transactions on Geoscience and Remote Sensing, 2012, 50, 7, 2649-2657, doi:10.1109/TGRS.2011.2182356.

Bi, L., Jung, J.A., Morgan, M.C. and Le Marshall, J.F., 2010, *Assessment of Assimilating ASCAT Surface Wind Retrievals in the NCEP Global Data Assimilation System*, Monthly Weather Review, accepted after minor revision.

Le Borgne, P., Legendre, G. and Péré, S., *Comparison of MSG/SEVIRI and drifting buoy derived diurnal warming estimates*, Remote Sensing of Environment, Volume 124, 2012, pages 622 – 626.

Le Borgne, P., Roquet, H. and Merchant, C.J., *Estimation of Sea Surface Temperature from the Spinning Enhanced Visible and Infrared Imager, improved using numerical weather prediction*, Remote Sensing of Environment, Volume 115, Issue 1, 17 January 2011, Pages 55-65, ISSN 0034-4257, DOI: 10.1016/j.rse.2010.08.004.

Cailleau et al. 2010 *A method of correction of radiative flux to force a regional forecasting system : application to IBI area*, MERCATOR/ CORIOLIS conference Toulouse, November 2010.

Clerici, M., Hoepffner, N., Diop, M., Ka, A., Kirugara, D. and Ndungu, J., 2009, 'SST derivation from MSG for PUMA Pilot Projects in Fisheries', International Journal of Remote Sensing, 30:8,1941-1959.

Donlon, C.J., Martin, M., Stark, J., Roberts-Jones, J. and Fiedler, E., *"The Operational Sea Surface Temperature and Sea Ice Analysis (OSTIA)"*, accepted, Remote sensing of Environment.

Eastwood, S., Le Borgne, P., Péré, S. and Poulter, D., 2010, *Diurnal variability in Sea Surface Temperature in the Arctic*, in publication, Remote sensing of Environment.

Ineichen, P., Barroso, C.S., Geiger, B., Hollmann, R., Marsouin, A. and Mueller, R., 2009, 'Satellite Application Facilities irradiance products: hourly time step comparison and validation over Europe', International Journal of Remote Sensing, 30: 21, 5549 5571.

Lavergne, T., Eastwood, S., Teffah, Z., Schyberg, H., and Breivik, L.-A. *"Sea ice motion from low resolution satellite sensors: an alternative method and its validation in the Arctic"*. J. Geophys. Res., doi:10.1029/2009JC005958, in press, 2010.

Lydersen, C., Freitas, C., Wiig, Ø., Bachmann, L., Heide-Jorgensen, M.P., Swift, R. and Kovacs, K.M., *Lost Highway Not Forgotten: Satellite Tracking of a Bowhead Whale (Balaena mysticetus) from the Critically Endangered Spitsbergen Stock*, ARCTIC, VOL. 65, NO. 1 (MARCH 2012) P. 76 – 86.

Massonnet, F., Fichefet, T., Goosse, H., Vancoppenolle, M., Mathiot, P. and König Beatty, C., *On the influence of model physics on simulations of Arctic and Antarctic sea ice*. The Cryosphere, 5, 687–699, published, 2011.

Merchant, C.J., Harris, A.R., Roquet, H. and Le Borgne, P., *Retrieval characteristics of non-linear sea surface temperature from the Advanced Very High Resolution Radiometer* Geophysical Research Letters, VOL. 36, L17604, doi:10.1029/2009GL039843, 2009.

Merchant C.J., Le Borgne, P., Roquet, H. and Marsouin, A., 2009, *Sea surface temperature from a geostationary satellite by optimal estimation*, Rem. Sens. Env., 113 (2), 445-457. DOI:10.1016/j.rse.2008.10.012.

Portabella, M. and Stoffelen, A.C.M., *On Scatterometer Ocean Stress*, J. Atm. Oceanic Technol., 2009, 26, 2, 368-382, doi:10.1175/2008JTECHO578.1.

Portabella, M., Stoffelen, A., Lin, W., Turiel, A., Verhoef, A., Verspeek, J. and Ballabrera-Poy, J., *Rain Effects on ASCAT-Retrieved Winds: Toward an Improved Quality Control*, IEEE Transactions on Geoscience and Remote Sensing, 2012, 50, 7, 2495-2506, doi:10.1109/TGRS.2012.2185933.

Portabella, M., Stoffelen, A., Verhoef, A. and Verspeek, J., *A new method for improving ASCAT wind quality control*, IEEE Gosci. Remote Sensing Letters, 2012, 9, 4, 579-583, doi:10.1109/LGRS.2011.2175435.

Rozman, P., Hölemann, J., Krumpen, T., Gerdes, R., Köberle, C., Lavergne, T., and Adams, S. *"Validating Satellite Derived and Modelled Sea Ice Drift in the Laptev Sea with In-Situ Measurements of Winter 2007/08"*, Journal of Polar Research, under review, 2011.

Tonboe, R. T. *The simulated sea ice thermal microwave emission at window and sounding frequencies*. Tellus 62A, 333-344, 2010.

Verhoef, A., Portabella, M. and Stoffelen, A., *High-resolution ASCAT scatterometer winds near the coast*, IEEE Transactions on Geoscience and Remote Sensing, 2012, 50, 7, 2481-2487, doi:10.1109/TGRS.2011.2175001.

Verspeek, J., Stoffelen, A., Verhoef, A. and Portabella, M., *Improved ASCAT Wind Retrieval Using NWP Ocean Calibration*, IEEE Transactions on Geoscience and Remote Sensing, 50, 2012, 7, 2488-2494, doi:10.1109/TGRS.2011.2180730.

Verspeek, J., Stoffelen, A., Portabella, M., Bonekamp, H., Anderson, C. and Figa-Saldana, J., *Validation and calibration of ASCAT using CMOD5.n*, IEEE Transactions on Geoscience and Remote Sensing, 2010, 48, 1, 386-395, doi:10.1109/TGRS.2009.2027896.

Vogelzang, J. and Stoffelen, A., *Structure functions for two-dimensional variational ambiguity removal*, submitted, IEEE Transactions on Geoscience and Remote Sensing, 2011.

Vogelzang, J. and Stoffelen, A., *Scatterometer wind vector products for application in meteorology and oceanography*, accepted, Journal of Sea Research, 2011.

Vogelzang, J. and Stoffelen, A., *NWP Model Error Structure Functions obtained from Scatterometer Winds*, IEEE Transactions on Geoscience and Remote Sensing, 2012, 50, 7, 2525-2533, doi:10.1109/TGRS.2011.2168407.

Vogelzang, J., Stoffelen, A., Verhoef, A. and Figa-Saldana, J., *On the quality of high-resolution scatterometer winds*, J. Geophys. Res., 2011, 116, doi:10.1029/2010JC006640.

Vogelzang, J., Stoffelen, A., Verhoef, A., De Vries, J. and Bonekamp, H., *Validation of two-dimensional variational ambiguity removal on SeaWinds scatterometer data*, J. Atm. Oceanic Technol., 7, 2009, 26, 1229-1245, doi:10.1175/2008JTECHA1232.1.