ENVISAT - AATSR

CYCLIC REPORT #102

	START	END
DATE	25TH APRIL 2011	25TH MAY 2011
TIME	22:01:44	22:02:15
ORBIT #	47860	48291

This subset from a Level 1B product acquired on 16 May 2011 shows Madagascar; the high rainfall region in the east can be clearly differentiated. This RGB image is composed of data from the 1.6, 0.87 and 0.55 micron channels for the nadir view.

prepared by/*préparé par* AATSR IDEAS and QWG team
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A P P R O V A L

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C H A N G E R E C O R D

ISSUE: 1 REVISION: 0

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AATSR CYCLIC REPORT # 102

1 INTRODUCTION

The AATSR Cyclic Report is distributed by the AATSR IDEAS team to keep the AATSR community informed of any modification regarding instrument performances, the data production chain and the results of calibration and validation campaigns at the end of each Envisat 2010+ cycle, which consists of 431 complete orbits over the course of 30 days.

This document is available online at: http://earth.esa.int/pcs/envisat/aatsr/reports/cyclic/

1.1 Acronyms and Abbreviations

AATSR	Advanced Along Track Scanning Radiometer
APC	Antenna Pointing Controller
CR	Cyclic Report
DDS	Data Dissemination System
DMOP	Detailed Mission Operation Plan
DMS	Data Management System
EN-UNA-YYYY/#	Envisat Unavailability (plus year and number)
ESOC	European Space Operation Centre
HSM	High Speed Multiplexer
IDEAS	Instrument Data quality Evaluation and Analysis Service
IECF	Instrument Engineering and Calibration Facilities
IPF	Instrument Processing Facilities
LUT	Look Up Table
MPS	Mission Planning Schedule
NRT	Near Real Time
OCM	Orbit Control Manoeuvre
OBDH	On-board Data Handling
PDS	Payload Data Segment
PMC	Payload Management Computer
RAL	Rutherford Appleton Laboratory
SPR	Software Problem Reporting
SSR	Solid State Recorder
SW	Software
VISCAL	Visible Calibration

The AATSR list of acronyms and abbreviations is available at the following site:
http://envisat.esa.int/dataproducts/aatsr/CNTR5.htm#eph.aatsr.glossary

2 SUMMARY

Cyclic Report: 102

Cycle Start: 25th April 2011, 22:01:44 Orbit #: 47860

Cycle End: 25th May 2011, 22:02:15 Orbit #: 48291

The main activities during the cycle have been as follows:

- **ESRIN downtimes and delays**
  - 07 May 2011: There was a planned power outage at ESRIN from 09:00 to 19:30 CET.
- **Kiruna downtimes and delays**
  - 27 April 2011: Envisat NRT processing was delayed; resolved same day.
  - 16 May 2011: System problems arose affecting Envisat NRT production and distribution and continued until the end of the cycle; not yet resolved.
- **Unavailabilities**

There was one Artemis unavailability affecting Envisat NRT data during the cycle:

- 23 May 2011 21:09:19 to 24 May 2011 00:31:45z

- **Envisat anomaly/unavailability**

26 April 2011: An anomaly occurred on-board Envisat, due to a High Speed Multiplexer (HSM) problem, which caused AATSR data to be interrupted between orbits 47869 and 47895. To resolve this problem there had to be the following AATSR unavailability to reset the HSM switch:

- **AATSR unavailability**
  - 28 April 2011 09:51:00 to 09:53:00z

AATSR data returned to normal after the HSM switch was reset; efforts to recover the affected orbits from 26 to 28 April 2011 are continuing.

- **AATSR Blackbody Crossover Test**

An AATSR Blackbody Crossover Test was initiated on

- 25 May 2011 10:46:03z

and continued until 27 May 2011 (11:12:11z). Scientific data for the affected orbits (48284 – 48313) are not optimally calibrated as a result.

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3 SOFTWARE & AUX FILE VERSION CONFIGURATION

3.1 Software Version

AATSR IPF for Level 1 and Level 2: Version 6.03

AATSR L2P Processor: Version 1.5.

3.2 Auxiliary Files

AATSR processing uses the following auxiliary files:

- Browse Product Lookup Data (ATS_BRW_AX)
- L1b Characterisation Data (ATS_CH1_AX)
- Cloud Lookup Table Data (ATS_CL1_AX)
- General Calibration Data (ATS_GC1_AX)
- AATSR Instrument Data (ATS_INS_AX)
- Visible Calibration Coefficients Data (ATS_VC1_AX)
- L1b Processing Configuration Data (ATS_PC1_AX)
- L2 Processing Configuration Data (ATS_PC2_AX)
- SST Retrieval Coefficients Data (ATS_SST_AX)
- LST Land Surface Temperature Coefficients Data (ATS_LST_AX)

Because the PC1 file contains the orbit period, two versions now need to be maintained after the mission extension orbit manoeuvres.

The latest filename for each auxiliary file in use in the PDS is as follows:

Product name
ATS_BRW_AXVIEC20020123_072338_20020101_000000_20200101_000000
ATS_CH1_AXVIEC20070720_093530_20020301_000000_20200101_000000
ATS_CL1_AXVIEC20101015_104659_20020301_000000_20200101_000000
ATS_GC1_AXVIEC20070720_093834_20020301_000000_20200101_000000
ATS_INS_AXVIEC20070720_094014_20020301_000000_20200101_000000
See below for VC1 files
ATS_LST_AXVIEC20101018_094830_20020301_000001_20200101_000000
ATS_PC1_AXVIEC20101015_101827_20020301_000000_20101021_235959
ATS_PC1_AXVIEC20101015_100604_20101022_000000_20200101_000000
ATS_PC2_AXVIEC20020123_074151_20020101_000000_20200101_000000
ATS_SST_AXVIEC20051205_102103_20020101_000000_20200101_000000

Table 3-1 Latest auxiliary files currently in use by the PDS

3.2.1 STATUS OF DAILY VISIBLE CALIBRATION FILES

3.2.1.1 VC1 File Availability

The following daily reflectance channel calibration files were not available during this cycle:

Date	Validity range		Comments
	From	To	
28/04/2011	26/04/2011	03/05/2011	None
07/05/2011	05/05/2011	12/05/2011	None

Table 3-2 Unavailable VC1 files

3.2.2 STATUS OF OTHER AUXILIARY FILES

No auxiliary files changed during this cycle.

4 PDS STATUS

4.1 Instrument Unavailability

The following AATSR data were not available due to instrument unavailabilities during the cycle:

UTC Start	UTC Stop	Reason	Reference	Planned
28/04/2011 09:51:00	28/04/2011 09:53:00	To reset HSM switch	EN-UNA-2011/0070	Yes

Table 4-1 Instrument unavailability for cycle 102

4.2 L0 Data Acquisition and L1B Processing Status

Week		Orbit		Availability (s)			Availability (%)		
#	Dates	Start	Stop	Inst Unav	L0 gaps	L1 gaps	Instrument	L0	L1
1	25/04/2011 22:01	47860	47946	120	165696	0	99.98%	68.01%	68.01%
2	01/05/2011 21:41	47946	48032	0	1645	0	100.00%	99.68%	99.68%
3	07/05/2011 21:21	48032	48119	0	136	0	100.00%	99.97%	99.97%
4	13/05/2011 22:42	48119	48205	0	0	0	100.00%	100.00%	100.00%
5	19/05/2011 22:22	48205	48291	0	10284	0	100.00%	98.02%	98.02%

Table 4-2 Instrument and data unavailability weekly summary for cycle 102

The instrument was available for 99.995% of the time during the cycle.
The L0 data were available for 93.14% of the time during the cycle.
The L1B data were available for 93.14% of the time during the cycle.

The following L0 data were missing from this cycle (not including instrument unavailabilities):

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
26/04/2011 11:52	26/04/2011 13:30	5874	47868	47868
26/04/2011 13:59	26/04/2011 20:04	21880	47869	47870
26/04/2011 19:56	27/04/2011 06:48	39176	47873	47873
27/04/2011 06:40	27/04/2011 21:07	52009	47879	47880
27/04/2011 20:59	28/04/2011 06:12	33153	47888	47888
28/04/2011 06:04	28/04/2011 09:51	13604	47893	47894
04/05/2011 18:29	04/05/2011 18:56	1645	47987	47987
09/05/2011 07:09	09/05/2011 07:11	136	48052	48052
23/05/2011 20:10	23/05/2011 23:02	10284	48261	48261

Table 4-3 ATS_NL__0P missing data during cycle 102

Data missing at L0 are also missing at L1B; there were no additional L1B unavailabilities this cycle.

4.2.1 ORBITS AFFECTED BY POOR DATA QUALITY

The information reported in Section 4.2 does not consider the quality of the data, only whether or not it is available.

During this cycle, the following orbits contained frames suffering from bad/missing telemetry:

- 47987 (04 May 2011)
- 48047 (08 May 2011)
- 48050,51 (09 May 2011)
- 48284-48313 (25-27 May 2011) Due to the Blackbody Crossover test, the data for these orbits will not be optimally calibrated

4.3 L0 and L1B Backlog Processing Status

There is no update available on the status of backlog processing.

5 DATA QUALITY CONTROL

5.1 Monitoring of Instrument Parameters

5.1.1 JITTER

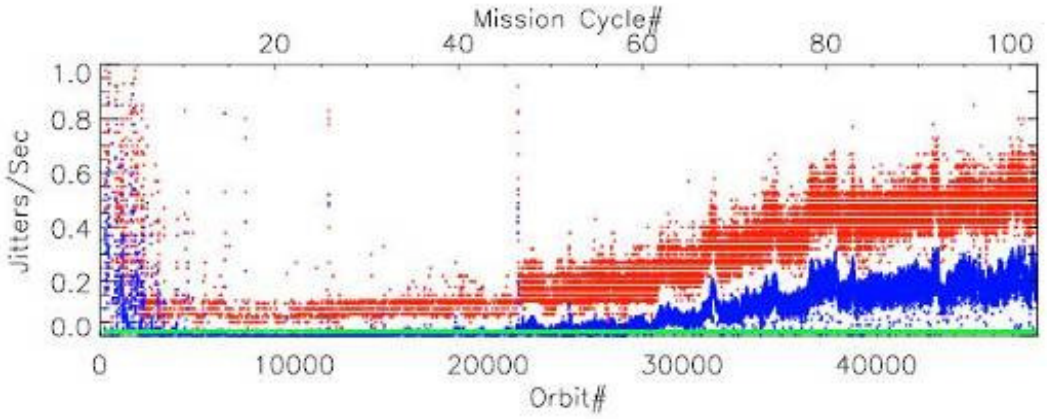

Figure 5-1 Jitter trend from mission start

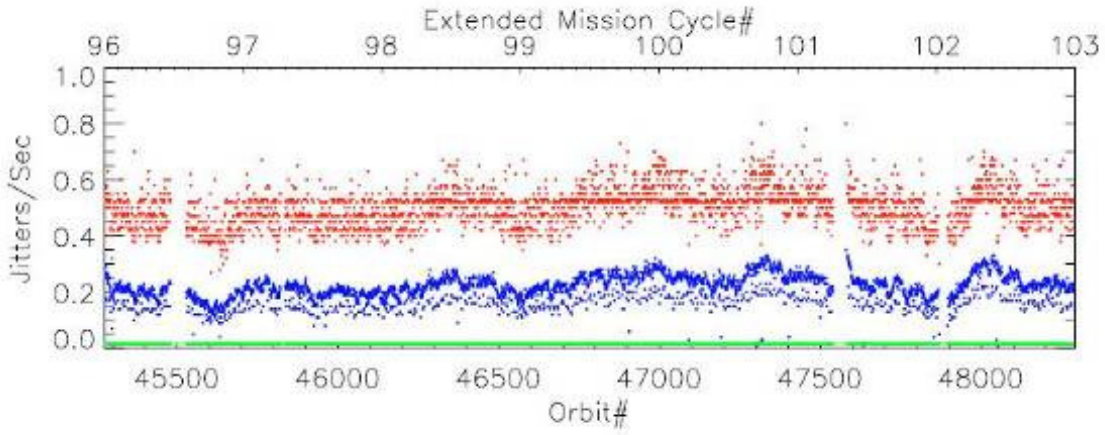

Figure 5-2 Jitter trend covering the mission extension

The plots show the jitter-trend since the start of the mission and since the recent mission extension, against both orbit-number and cycle-number. The mean jitter-rate (per-orbit) is shown in blue and the maximum rate per orbit in red. The green horizontal line shows the nominal mean jitter-level achieved for much of the mission.

The jitter plot for the extended mission shows little change with respect to mean jitter-rate over this cycle compared to recent cycles.

5.1.2 SENSOR TEMPERATURE

The detector temperature plots for Cycle 102 can be found at:
http://www.aatsrops.rl.ac.uk/EDSX/CyclePlots/DetTemps102.pdf

Detector temperatures have been nominal throughout this cycle.

5.1.3 VISCAL

NRT calibration quality for the AATSR reflectance channels has been maintained throughout the cycle. The list of "orbital" VC1 files delivered for this cycle can be found at:
http://www.aatsrops.rl.ac.uk/EDSX/CyclePlots/VC1-102.txt

5.1.4 NE∆T

Information on the NE∆T is not available for this cycle.

5.2 User Rejections

There were no user rejections during this cycle.

5.3 Software Problem Reporting

This section describes the new and open SPRs, their potential impact on the data quality, and any SPRs that have been closed.

5.3.1 EXISTING SPRS THAT ARE STILL OPEN

The following SPRs are still open:

Wrong REF_DOC in MPH of AATSR products
NA-PR-10-05334
As a result of the AMALFI-2 pilot project, it has been discovered that the REF_DOC field in the MPH of AATSR products is different from the product specification name.
1) The REF_DOC should follow “AA-BB-CCC-DD-EEEE_V/I”, 23 characters where AA-BB-CCC-DD-EEEE is the ESA standard document number and V/I is the volume/issue.
2) The referenced product spec is still 3/K. whilst the one applicable, and also referenced in the SRN of 6.03 is 4/A.

AATSR Child Products contain insufficient number of ADS records
NA-PR-08-03912
The number of ADS records present in AATSR child products is insufficient for processing of the entire product. Users are currently advised to order products of at least 1 granule longer to obtain all required ADS records. Excluding the SQADS and the scan pixel x and y ADS, the DPM requires that for AATSR full resolution products, the number of records in the ADS shall be one greater than the number of

MDS granules in the product. Child products are currently produced with a number of ADS records equal to the number of MDS granules in the product. In the case of the SQADS, this is sampled only every 512 rows, rather then every 32, so in order to provide coverage for every granule in a child product, the number of SQADS records strictly required depends on the length of the child product and where the child product starts in relation to the 512 record boundaries. Parent products by definition start on a 512 record boundary, but child products need not. If we define a product segment of 512 consecutive rows (=16 granules) as a frame, then the number of SQADS records required in the child product is equal to the number of frames overlapped by the child product. For the case of the Scan Pixel x and y ADS, the records represent instrument scans, not image rows. There is no simple algorithm to define the number of records from the parent product that should be included in the child product.

AATSR Consolidated Products

NA-PR-08-03952

The AATSR Flight Operations and Data Plan (FODP), PO-PL-ESA-AT-0152, Issue 2 Revision 5 dated 22 November 2001 defines the meaning of “consolidated” in Appendix B.1 as follows: “… time-ordered, no overlap nor data gap except when the instrument is not operated …”, and for Level 0 there should be sufficient overlap only so that the higher level products can be chopped “… ANX to ANX …”. The FODP is part of the high level agreement between ESA and Defra and so can be taken as the definitive requirement for AATSR products. We would like to enquire as to the current definition applied to consolidated products and ask that a change be proposed and the impact of such a change evaluated.

Update to AATSR Child product generation requirements

NA-PR-08-04015

The 'Child Product Generation Requirements' on pages 520-521 of the document 'PDS Technical Specification for Maintenance and Evolution' (PO-RF-CSF-GS-20437) currently reads:

"For time extraction, for each data set in the parent product, the time stamp of the DSRs shall be compared to that of the requested start time (t0) segment. The first DSR extracted from each data set to form the new child data set is the one with a time stamp immediately preceding or equal to t0. The last DSR extracted from each DS is the one immediately preceding t1."

To ensure that a sufficient number of Auxiliary Data Set Records are present in AATSR child products, the requirement should be changed to read as follows:

"For time extraction, for each data set in the parent product, the time stamp of the DSRs shall be compared to that of the requested start time (t0) segment. The first DSR extracted from each data set to form the new child data set is the one with a time stamp immediately preceding or equal to t0. The last DSR extracted from each DS is the one immediately preceding t1.

For AATSR data, the last ADS DSR extracted from each DS is the one whose time label is equal to or greater than t1 provided such a DSR exists, otherwise the last ADS DSR in the product."

5.3.2 NEW SPRS SINCE THE LAST CYCLIC REPORT

No new SPRs have been opened since the last Cyclic Report.

5.3.3 CLOSED SPRS

No SPRs have been closed since the last Cyclic Report.

5.4 Monthly Level 3 Products

The monthly Level 3 plots for February and March 2011 were previously unavailable, and are published here, along with the plots for May 2011. Please note that individual colour scales for each plot are not available, however the scheme used is given in Figure 5-3, and the data ranges of each plot are specified in the accompanying caption:

Figure 5-3 This is the colour scheme used for the following plots, running linearly from left to right with increasing magnitude.

5.4.1 FEBRUARY 2011

The following plots have been generated from the available Meteo products acquired for February 2011 (423 products from orbits 46654 to 47055). Figure 5-4, Figure 5-5, Figure 5-6 and Figure 5-7 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for February 2011.

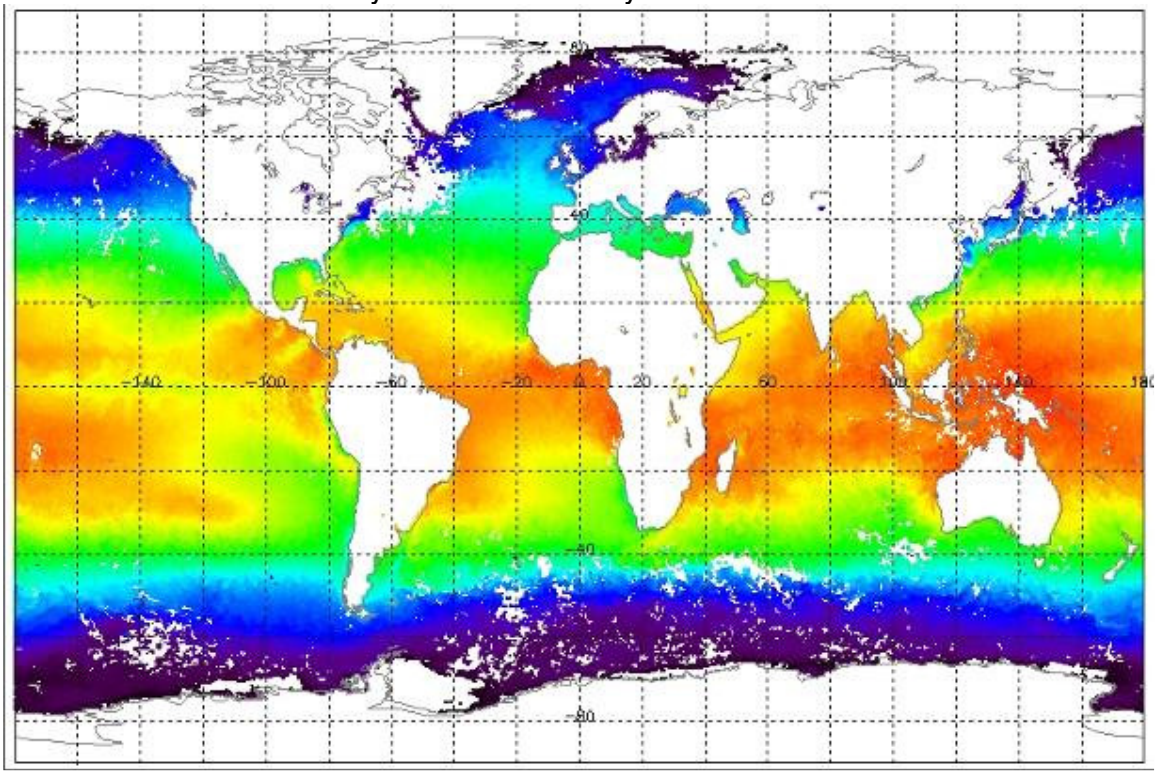

Figure 5-4 Monthly average Dual View SST, with a range of 270 - 305 Kelvin for February 2011

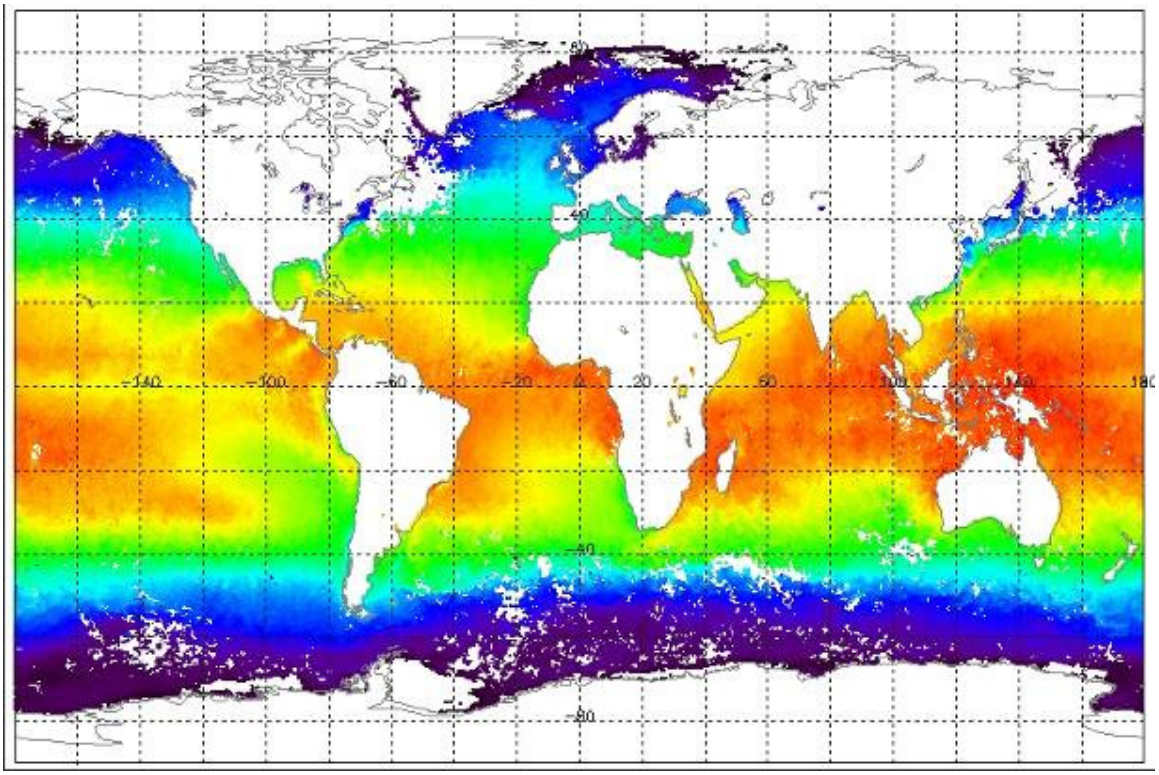

Figure 5-5 Monthly average Nadir SST, with a data range of 270 - 305 Kelvin for February 2011

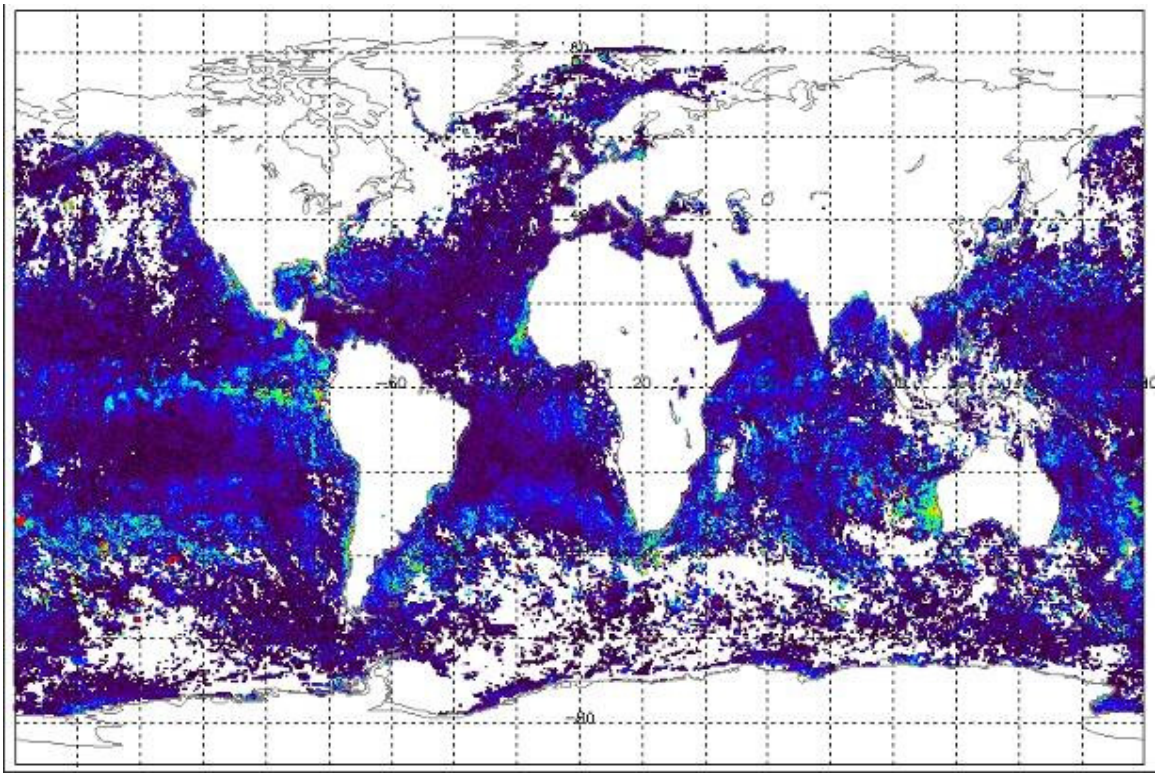

Figure 5-6 Standard deviation of the monthly average SST with a colour key range of 0 to 2.0 K, and a maximum value of 8.3 K for February 2011

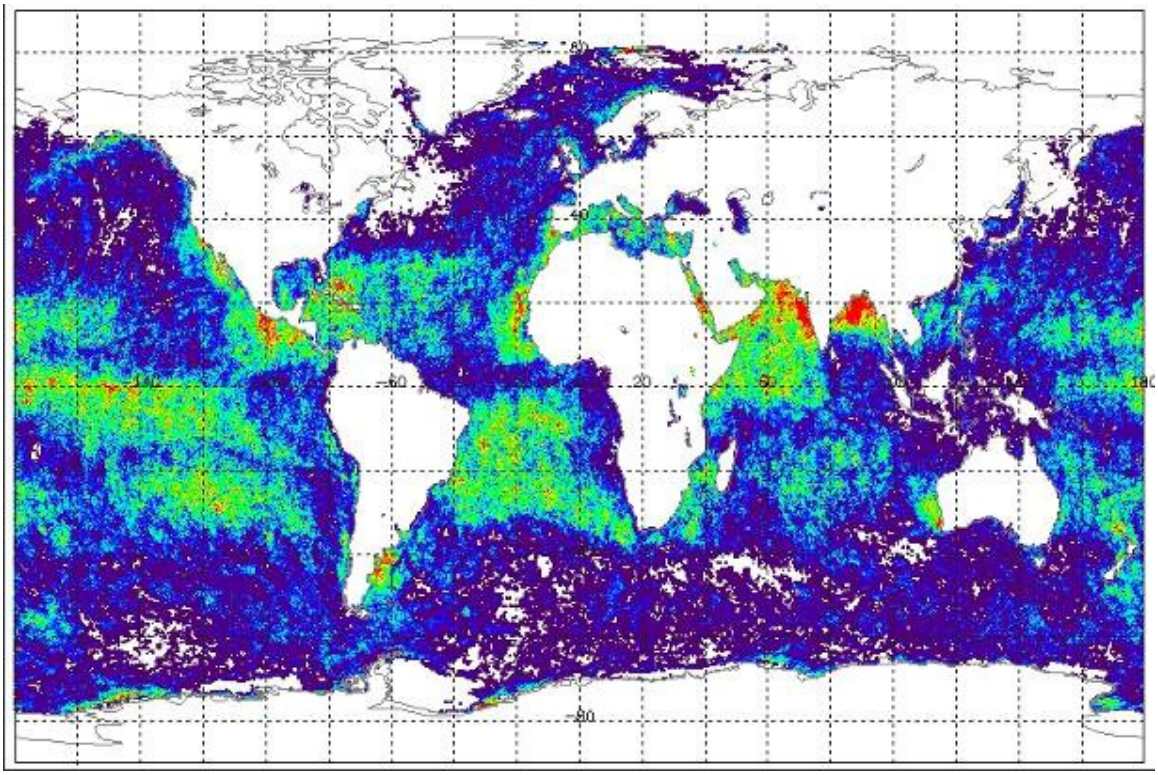

Figure 5-7 Number of contributory orbits to the calculation of the SST, with a colour key range of 0 to 10, and a maximum value of 25, for February 2011

5.4.2 MARCH 2011

The following plots have been generated from the available Meteo products acquired for March 2011 (498 products from orbits 47056 to 47501). Figure 5-8, Figure 5-9, Figure 5-10 and Figure 5-11 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for March 2011.

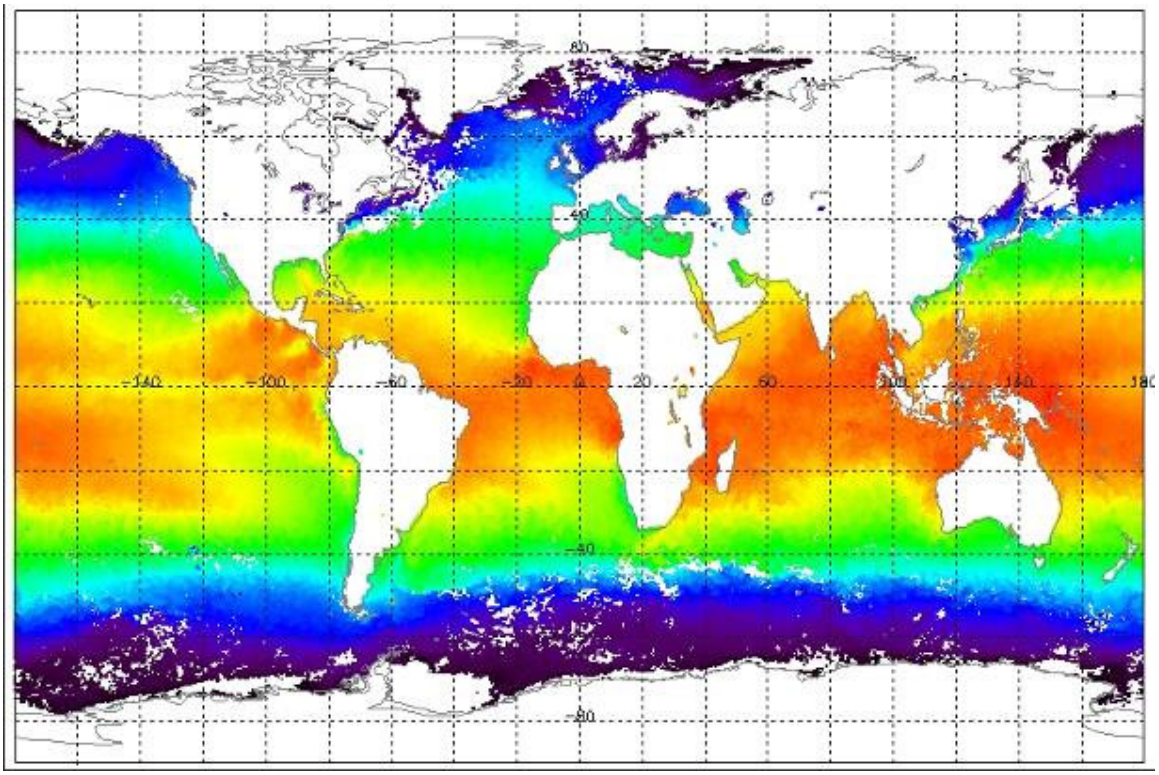

Figure 5-8 Monthly average Dual View SST, with a range of 270 - 305 Kelvin for March 2011

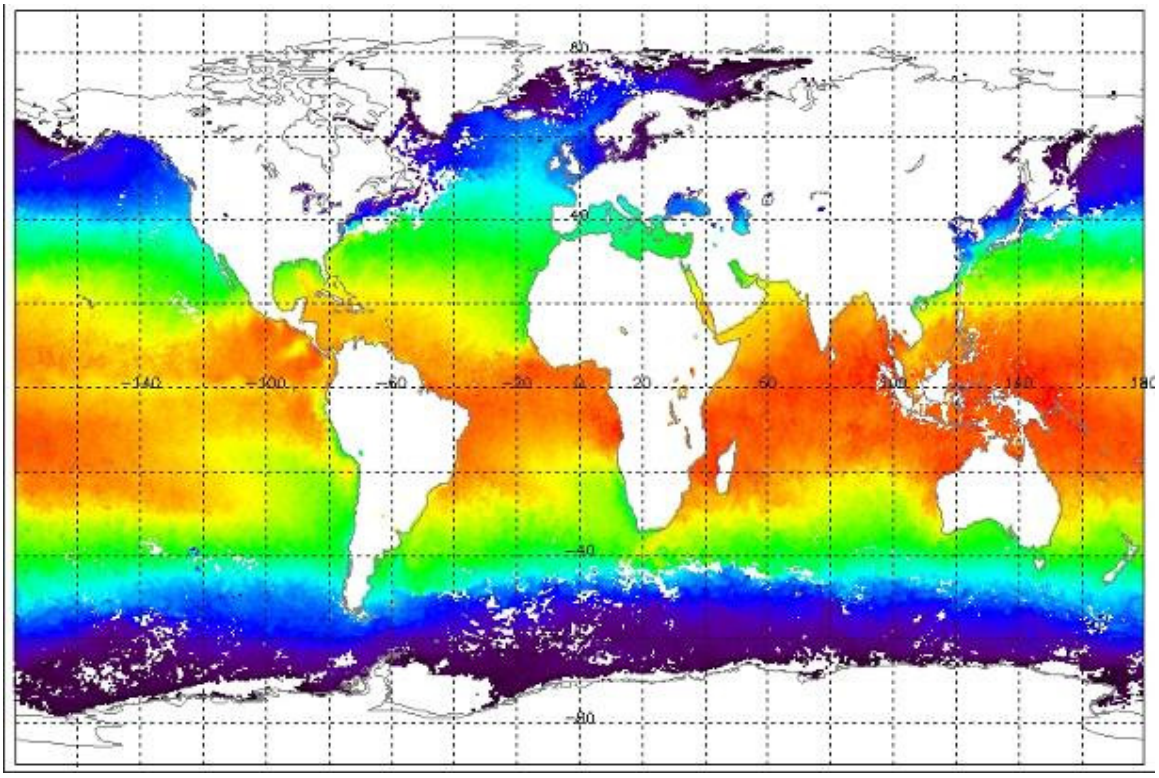

Figure 5-9 Monthly average Nadir SST, with a data range of 270 - 305 Kelvin for March 2011

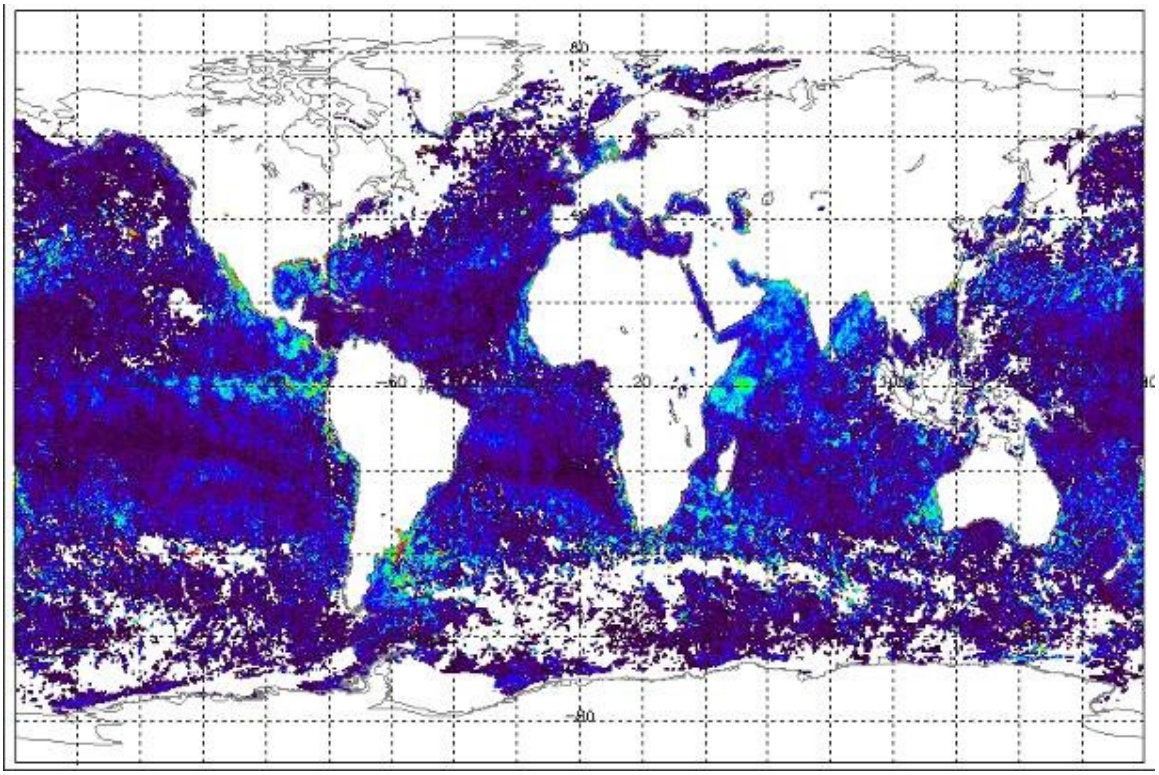

Figure 5-10 Standard deviation of the monthly average SST with a colour key range of 0 to 2.0 K, and a maximum value of 7.6 K for March 2011

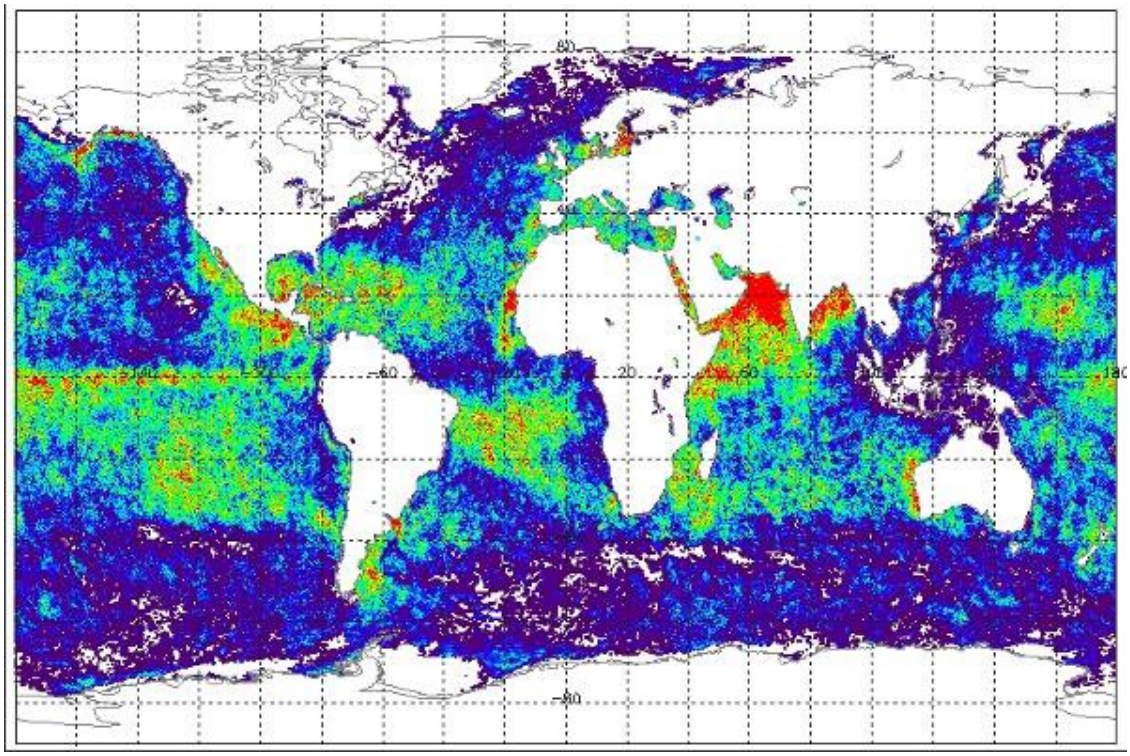

Figure 5-11 Number of contributory orbits to the calculation of the SST, with a colour key range of 0 to 10, and a maximum value of 16, for March 2011

5.4.3 MAY 2011

The following plots have been generated from the available Meteo products acquired for May 2011 (493 products from orbits 47933 to 48377). Figure 5-12, Figure 5-13, Figure 5-14 and Figure 5-15 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for May 2011.

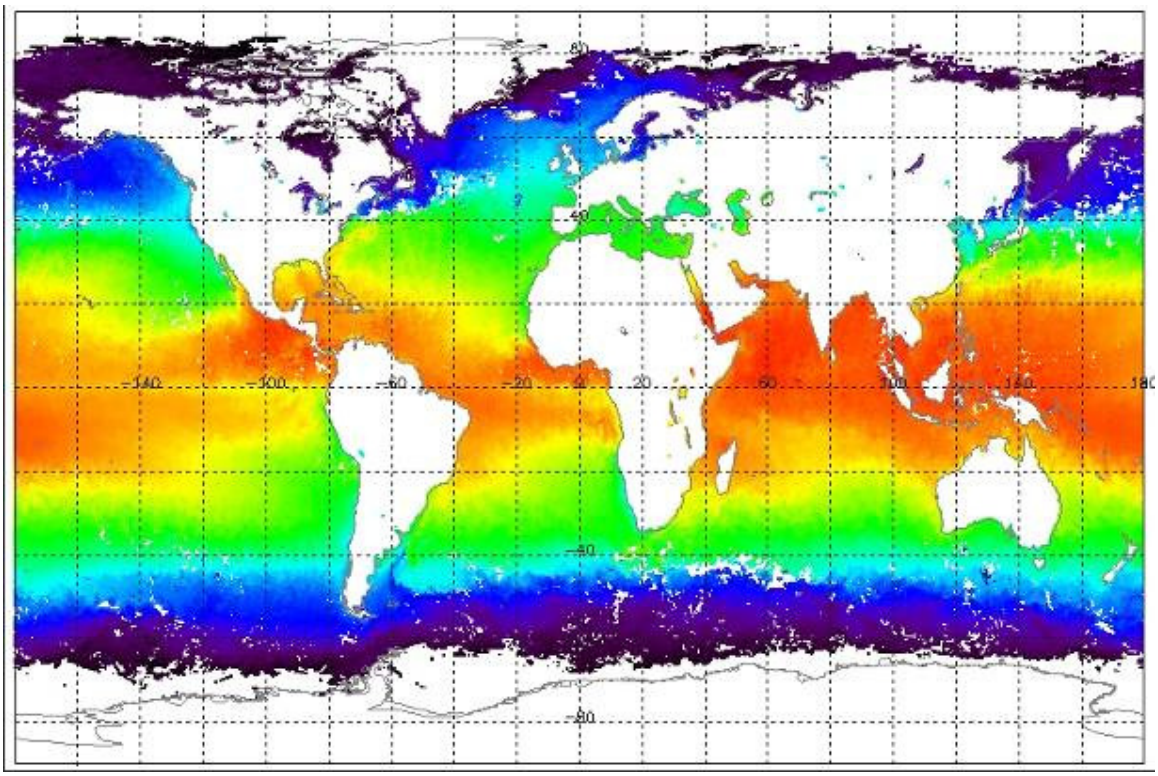

Figure 5-12 Monthly average Dual View SST, with a range of 270 - 305 Kelvin for May 2011

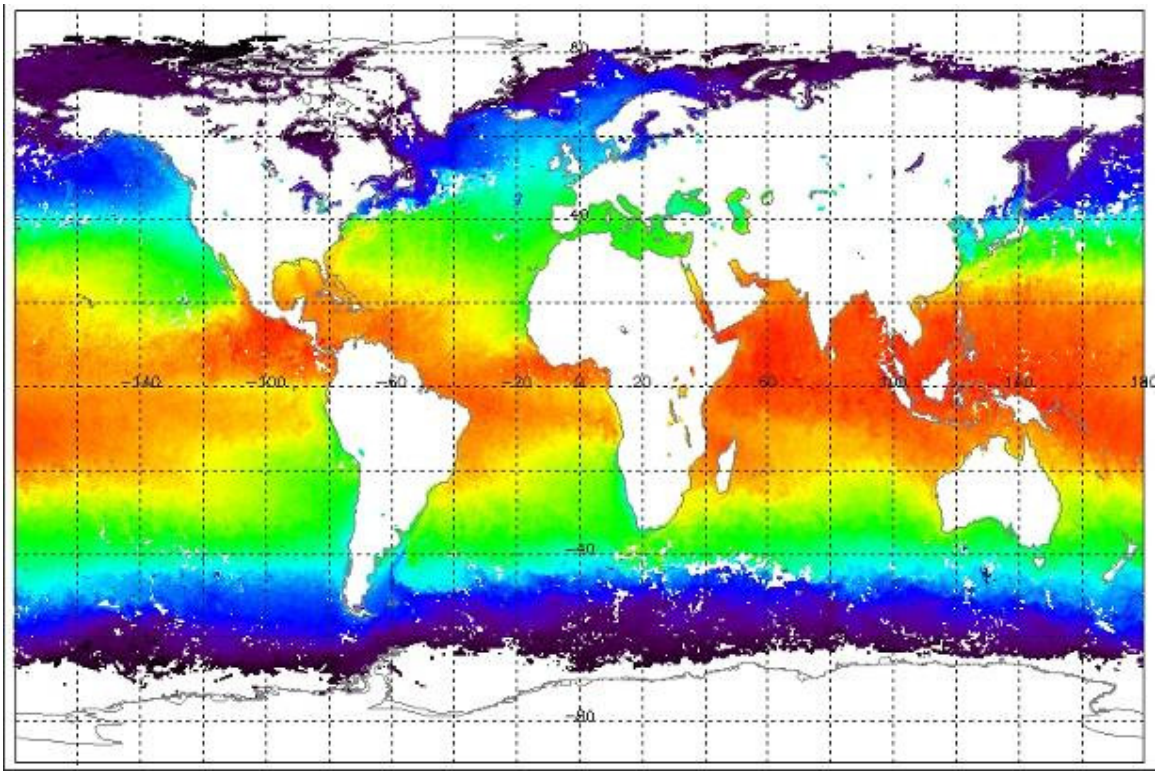

Figure 5-13 Monthly average Nadir SST, with a data range of 270 - 305 Kelvin for May 2011

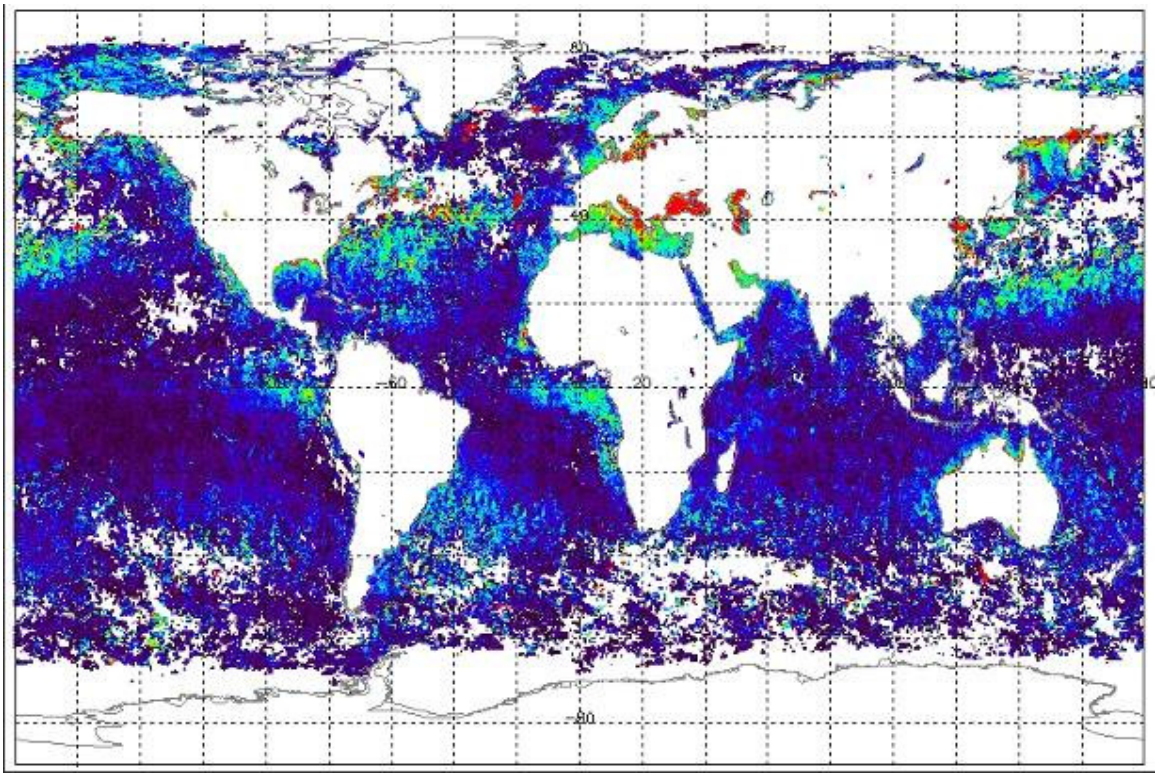

Figure 5-14 Standard deviation of the monthly average SST with a colour key range of 0 to 2.0 K, and a maximum value of 7.5 K for May 2011

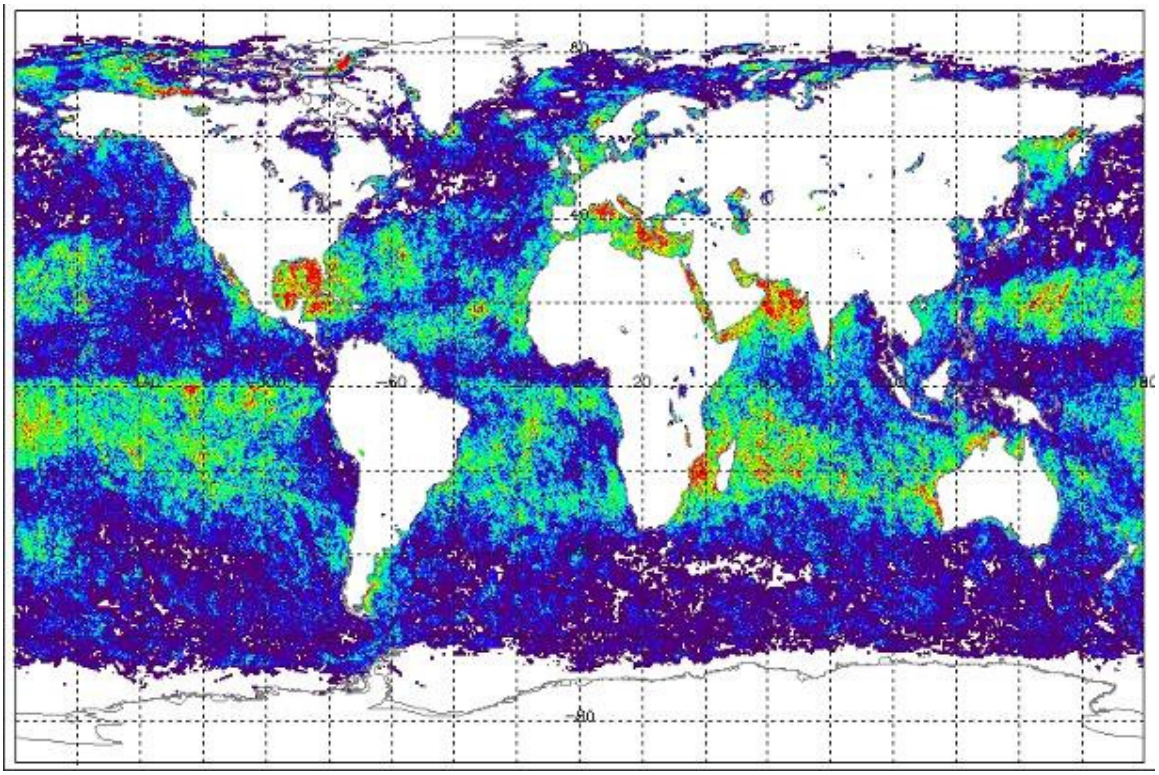

Figure 5-15 Number of contributory orbits to the calculation of the SST, with a colour key range of 0 to 10, and a maximum value of 24, for May 2011

6 CALIBRATION/VALIDATION ACTIVITIES & RESULTS

6.1 Calibration

No calibration results were reported during this cycle.

6.2 Validation

6.2.1 CYCLE 102

The Met Office has validated the AATSR dual-view SST data using the global network of *in situ* drifting buoy SST data, the results for Cycle 102 being shown in Figure 6-1. The updated SST coefficients released in December 2005 were used in the AATSR SST retrievals.

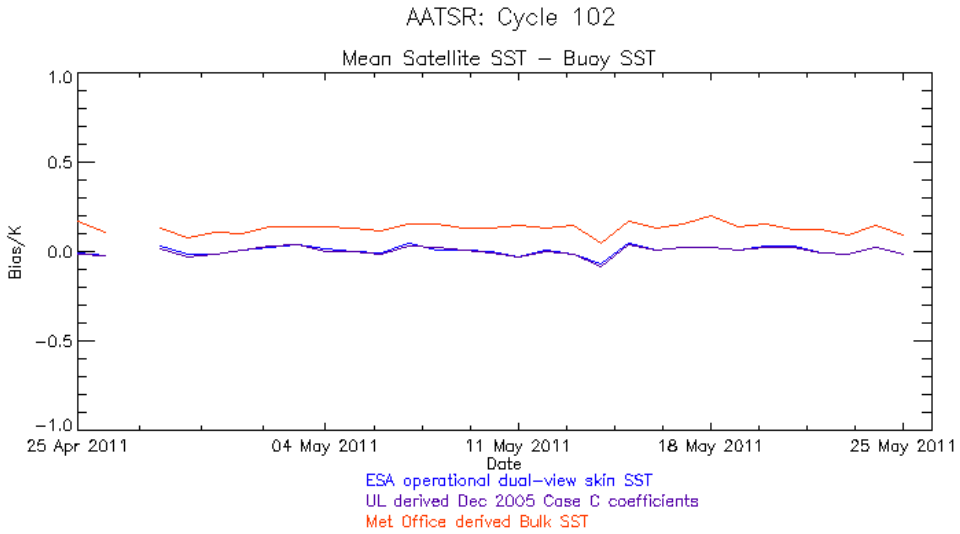

Figure 6-1 Comparison of daily mean difference between 10´ AATSR SST values and *in situ* drifting buoy SST for Cycle 102. Data provided by the Met Office

During cycle 102, there were 1440 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of -0.03 K, standard deviation 0.24 K, and a mean (dual-view depth SST minus buoy SST) of +0.09 K, standard deviation 0.22 K. A total of 1387 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.03 K, standard deviation 0.29 K, and a mean (dual-view depth SST minus buoy SST) of +0.16 K, standard deviation 0.28 K. As these data are comparisons of a single point buoy measurement against a much larger spatially averaged value they are not a true indicator of AATSR's accuracy and are used to show consistency of data quality between cycles.

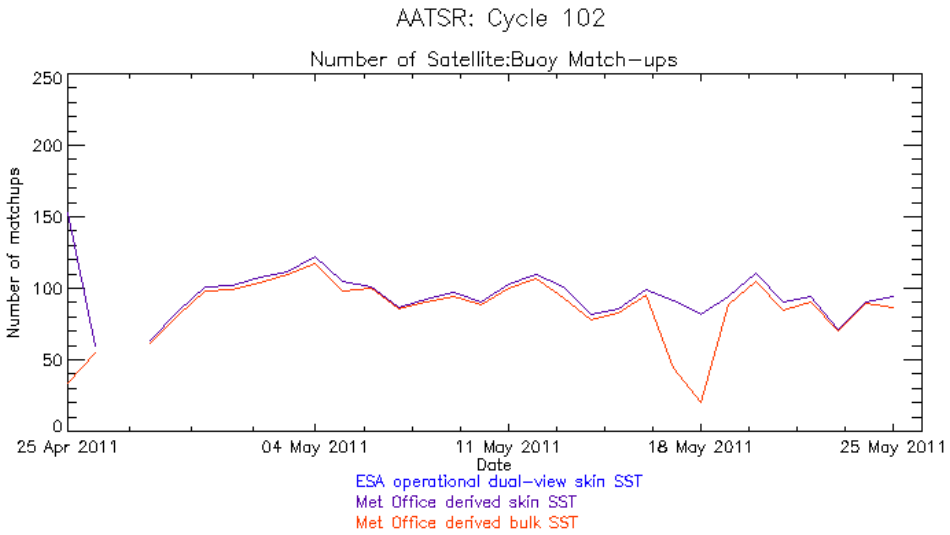

Figure 6-2 Plot of daily number of match-ups between 10´ AATSR SST values and *in situ* buoy SST for Cycle 102. Data provided by the Met Office

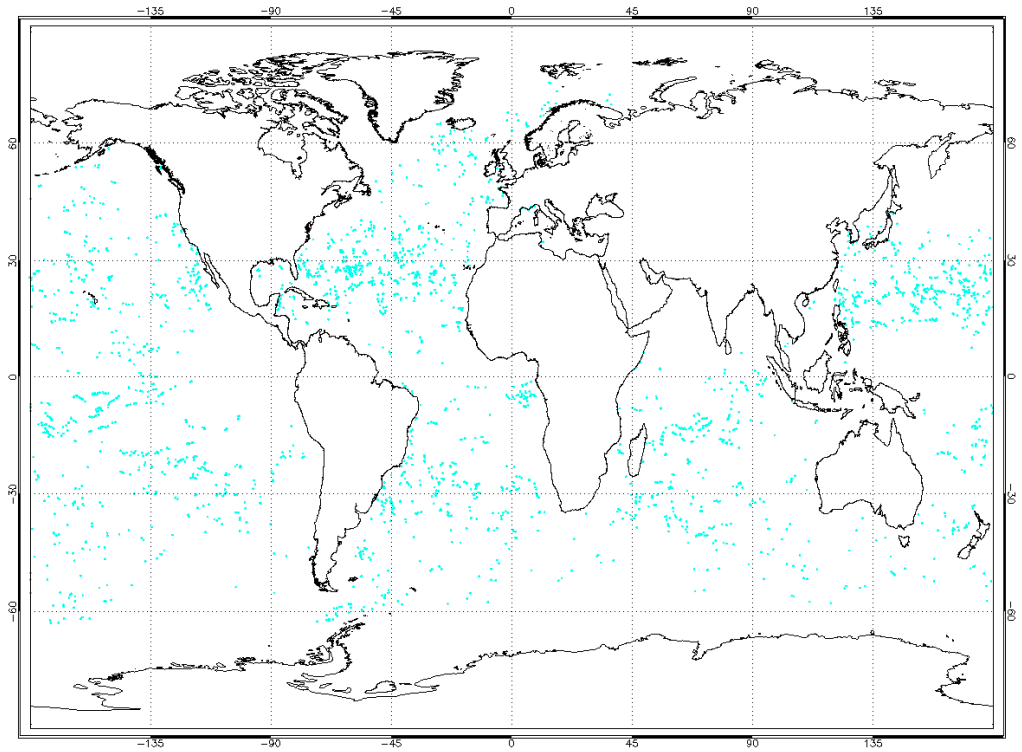

Figure 6-3 Map showing global distribution of match-ups between 10´ AATSR SST values and *in situ* buoy SST for Cycle 102. The cyan dots indicate a match-up to a drifting buoy. Data provided by the Met Office

7 DISCLAIMERS

No new disclaimers have been issued during this cycle.