ENVISAT - AATSR

CYCLIC REPORT #106

	START	END
DATE	23RD AUGUST 2011	22ND SEPTEMBER 2011
TIME	22:03:29	22:03:48
ORBIT #	49584	50015

During Cycle 106, Envisat completed its 50,000th orbit. Here are two scenes from AATSR for orbit 50,000. Left: Sahara desert at night (Red: 3.7 µm, Green: 11 µm, Blue: 12 µm); right: Mediterranean sea (false colour image from 11 µm nadir view data).

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AATSR CYCLIC REPORT # 106

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
GOSTA	Global Ocean Surface Temperature Atlas
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: 106

Cycle Start: 23rd August 2011, 22:03:29 Orbit #: 49584

Cycle End: 22nd September 2011, 22:03:48 Orbit #: 50015

The main activities during the cycle have been as follows:

- **ESRIN downtimes and delays**
  - 31 August 2011: NRT dissemination delay.
  - 12 September 2011: Urgent maintenance activity
  - 14 September 2011: Network downtime
  - 21-23 September 2011: NRT dissemination delay

- **Kiruna downtimes and delays**
  NRT Processing problems were experienced at Kiruna on the following dates:
  - 23-25 August 2011
  - 29-30 August 2011
  - 31 August – 01 September 2011
  - 02-05 September 2011
  - 14-15 September 2011
  - 21-23 September 2011

  Network maintenance took place on:
  - 20 September 2011 21:20 UTC to 21 September 2011 03:00 UTC

- **Unavailabilities**
  There were no unavailabilities affecting Envisat NRT data during the cycle.

- **Significant data disruption 20-22 September 2011**
  Due to ground-station problems and maintenance, there was significant data loss and corruption over the period 20-22 September 2011. See Section 4: PDS Status for full details

- **AATSR auxiliary files on the ESA website**
  The current operational auxiliary files for AATSR are now available for download from the ESA website: http://earth.eo.esa.int/services/auxiliary_data/aatsr/

- **Planned AATSR outgassing**
  An AATSR outgassing is planned for 07 to 10 October 2011. No infrared data will be available during this time, and the reflectance channels will be affected by poor calibration.

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

All daily reflectance channel calibration files were available during this cycle, with one extended-range validity file also available:

Date	Validity range		Comments
	From	To	
25/08/2011	23/08/2011	24/09/2011	Extended-range validity file

Table 3-2 Extended-range validity VC1 file

This reporting period, issues with the IECF resulted in several orbital files being delayed in dissemination. They were disseminated in time for consolidated processing. This appears to be an ongoing issue which is under investigation.

3.2.2 STATUS OF OTHER AUXILIARY FILES

No auxiliary files changed during this cycle.

4 PDS STATUS

4.1 Instrument Unavailability

There were no data unavailabilities due to instrument unavailabilities during the cycle.

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	23-Aug-2011 22:03:29	49584	49670	0	0	0	100.00%	100.00%	100.00%
2	29-Aug-2011 21:43:30	49670	49756	0	0	0	100.00%	100.00%	100.00%
3	04-Sep-2011 21:23:31	49756	49843	0	0	0	100.00%	100.00%	100.00%
4	10-Sep-2011 22:43:46	49843	49929	0	0	0	100.00%	100.00%	100.00%
5	16-Sep-2011 22:23:47	49929	50015	0	65160	9808	100.00%	87.43%	85.53%

Table 4-1 Instrument and data unavailability weekly summary for Cycle 106

The instrument was available for 100.00% of the time during the cycle.
The L0 data were available for 97.49% of the time during the cycle.
The L1b data were available for 97.11% of the time during the cycle.

The following L0 data were missing from this cycle:

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
20-Sep-2011 07:39:15	20-Sep-2011 07:39:46	31	49977	49977
20-Sep-2011 10:24:57	20-Sep-2011 13:05:52	9655	49979	49979
21-Sep-2011 09:50:55	21-Sep-2011 11:26:37	5742	49993	49994
22-Sep-2011 06:28:56	22-Sep-2011 09:07:02	9486	50005	50006
22-Sep-2011 09:13:53	22-Sep-2011 10:46:14	5541	50007	50008
22-Sep-2011 10:52:46	22-Sep-2011 12:26:36	5630	50008	50009
22-Sep-2011 12:28:07	22-Sep-2011 14:03:33	5726	50009	50009
22-Sep-2011 14:03:43	22-Sep-2011 15:43:34	5991	50010	50010
22-Sep-2011 15:45:04	22-Sep-2011 17:23:04	5880	50011	50011
22-Sep-2011 17:24:44	22-Sep-2011 19:02:44	5880	50012	50013
22-Sep-2011 19:03:11	22-Sep-2011 20:36:29	5598	50013	50014

Table 4-2 ATS_NL__0P missing data during Cycle 106

Data missing at L0 are also missing at L1B. The following L1B data were additionally missing from this cycle:

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
20-Sep-2011 07:41:22	20-Sep-2011 08:43:04	3702	49977	49978
20-Sep-2011 08:43:11	20-Sep-2011 10:24:57	6106	49978	49979

Table 4-3 ATS_TOA_1P missing data during Cycle 106

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:

- 49569 (23/08/2011)
- 49977 (20/09/2011)
- 49991-49993 (21/09/2011)
- 50005, 50007-50014 (22/09/2011)

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

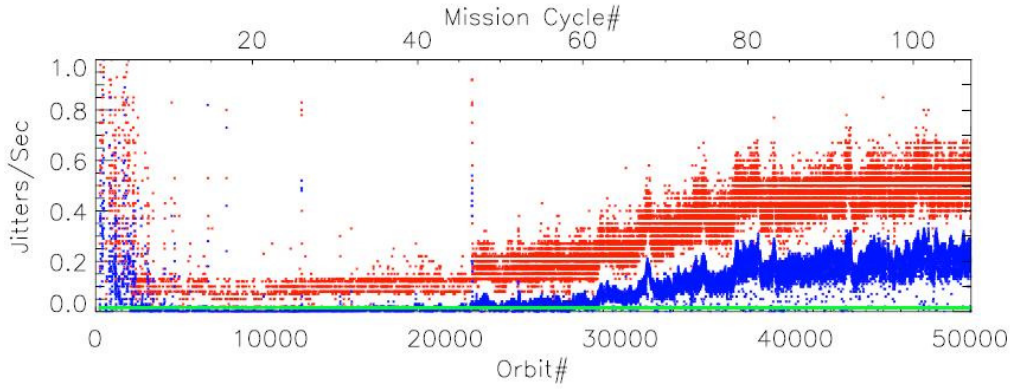

Figure 5-1 Jitter trend from mission start

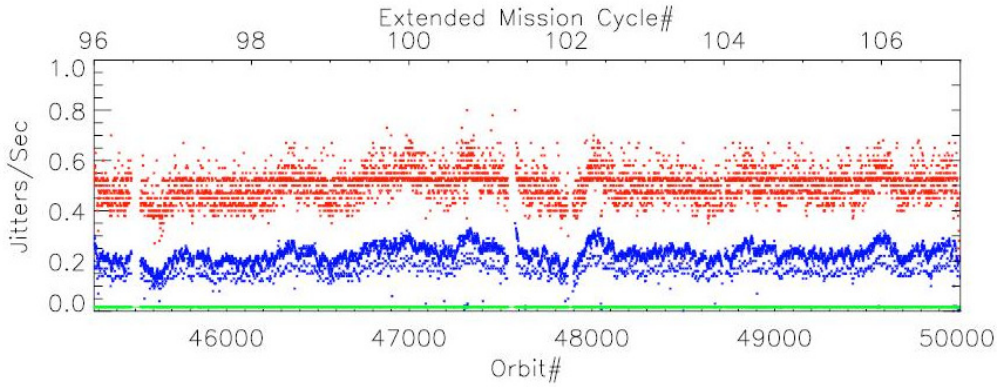

Figure 5-2 Jitter trend since the mission extension

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 no significant change in the mean jitter-rate variation over this cycle compared to that in recent cycles.

5.1.2 SENSOR TEMPERATURE

The detector temperature plots for Cycle 106 can be found at:
http://www.aatsrops.rl.ac.uk/EDSX/CyclePlots/DetTemps106.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/VC-106.txt

5.1.4 NE∆T

Information on the NE∆T is shown in Table 5-1. Figure 5-3 shows the trend since launch.

	Hot BB		Cold BB	
	T = 301.57K		T = 262.45K	
	Count	**NE∆T (mK)**	**Count**	**NE∆T (mK)**
12µm	1.57	32.9	1.19	34.6
11µm	1.53	31.1	1.13	33.9
3.7µm	2.50	31.5	1.21	76.2

Table 5-1 NE∆T information for 22 September 2011 (Cycle 106)

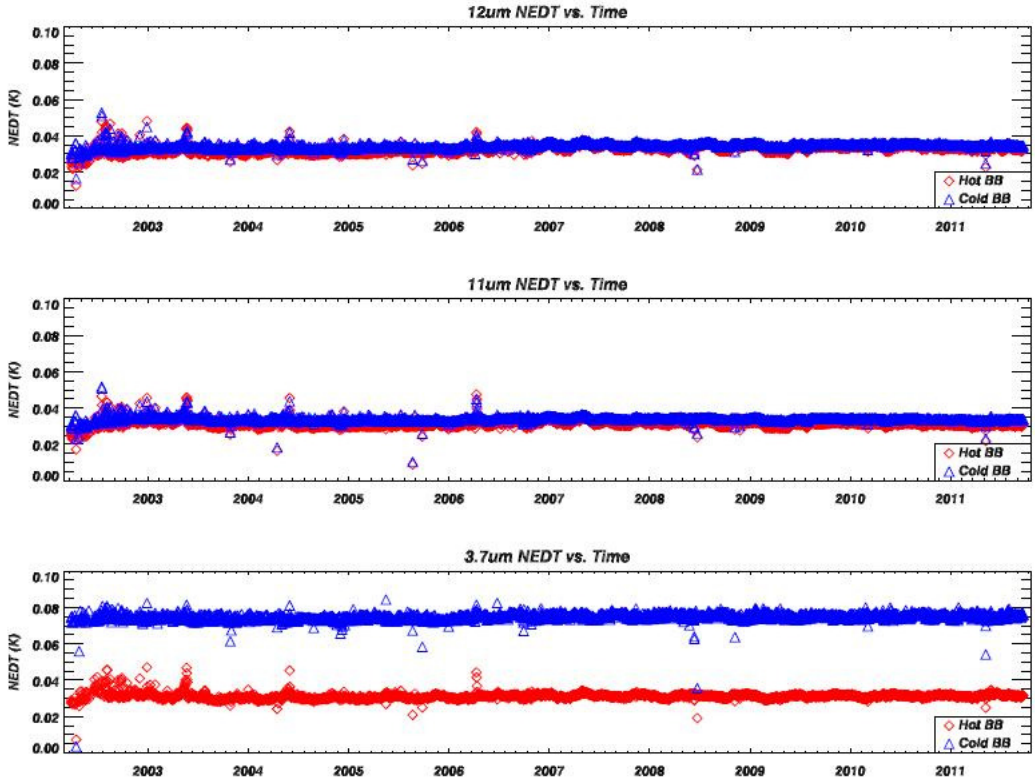

Figure 5-3 Time series of NE∆T since launch

5.2 User Rejection

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."

Processing of L1/L2 fails with product ATS_NL__0PNPDE20100515_214836_000061722089_00272_42911_1524.N1
IDEAS-PR-10-05411
The problem does not occur in prototype, but in PDGS operational chain and in Gamme validation platform. Processing the following L0 product to L1 and L2 fails ATS_NL__0PNPDE20100515_214836_000061722089_00272_42911_1524.N1.
Please consider that same error occurs also IN GAMME test environment.
19.08.2010 -Feedback from ELCA:"There is just a debug option that has to be removed from the optimization options while building AATSR IPF. When building the IPF with the correct options this error does not occur and the processing completes and generates L1/L2 products."

AATSR MPH OSV field does not agree with SPH auxiliary filename
IDEAS-PR-11-05568
We are noticing that, on occasion, the OSV source field in the MPH does not agree with the auxiliary data file name given in the SPH. For example: (1) in product ATS_TOA_1PRUPA20110527_222624_000065273103_00029_48319_8139.N1, the MPH gives the OSV source as "FR", while the SPH reports that the file used was actually an FPO file (AUX_FPO_AXVPDS20110528_102115_20110527_190825_20110606_212212); (2) in product ATS_TOA_1PNPDE20110526_021402_000066813103_00003_48293_4416.N1, the MPH gives the OSV source as "FP", while the SPH reports that the file used was actually an FRO file (AUX_FRO_AXVPDS20110528_102115_20110524_221000_20110527_005000). Note that this does not always happen, but seems to be related to when files are processed using a non-anticipated file type, but not in every instance. ELCA's analysis: "The solution is to compute in output product's MPH the OSV value based on the orbit file passed in the job order instead of using the L0 MPH's value."

5.3.2 NEW SPRS SINCE THE LAST CYCLIC REPORT

The following SPR has been opened since the last Cyclic Report:

AATSR: Reduce the logging noise by removing the warning on jitter
IDEAS-PR-11-05587
The requirement is that the scan jitter warnings are disabled (this information is present in the products themselves, and we are aware and monitoring jitter levels

from the operational data anyway). There are numerous warnings of this type, even in the logs from a successful processing run, so they prevent the log from being easily read to diagnose any problems.
We see this also useful for PDGS, since the logging size will reduce.
It is agreed that this change shall be included in the IPF version for the reprocessing.

5.3.3 CLOSED SPRS

No SPRs have been closed since the last Cyclic Report.

5.4 Monthly Level 3 Products

The following plots have been generated from the available Meteo products acquired for August 2011. These consist of 480 products from orbits 49254 to 49699. Figure 5-5, Figure 5-6, Figure 5-7 and Figure 5-8 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for August 2011. Figure 5-9 and Figure 5-10 show anomalies of the monthly averages from an SST climatology. Please note that individual colour scales for each plot are not available, however the scheme used is given in Figure 5-4, and the data ranges of each plot are specified in the accompanying caption.

Figure 5-4 This is the colour scheme used for the following plots, running linearly from left to right with increasing magnitude

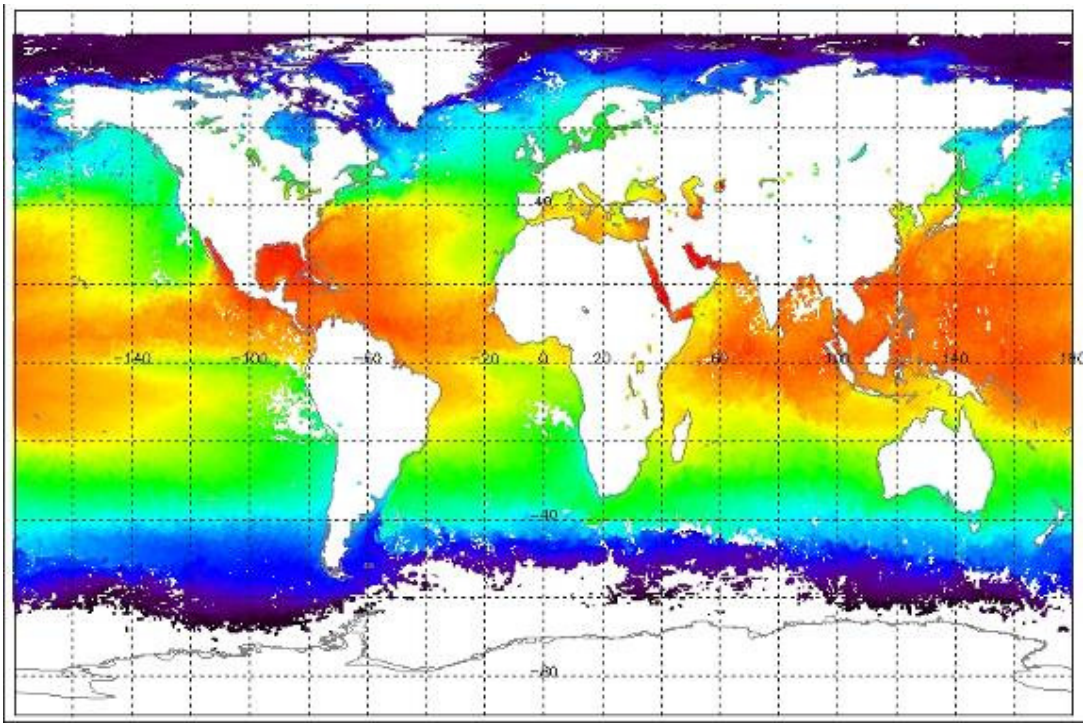

Figure 5-5 Monthly average Dual View SST, with a data range of 270 - 305 Kelvin for August 2011

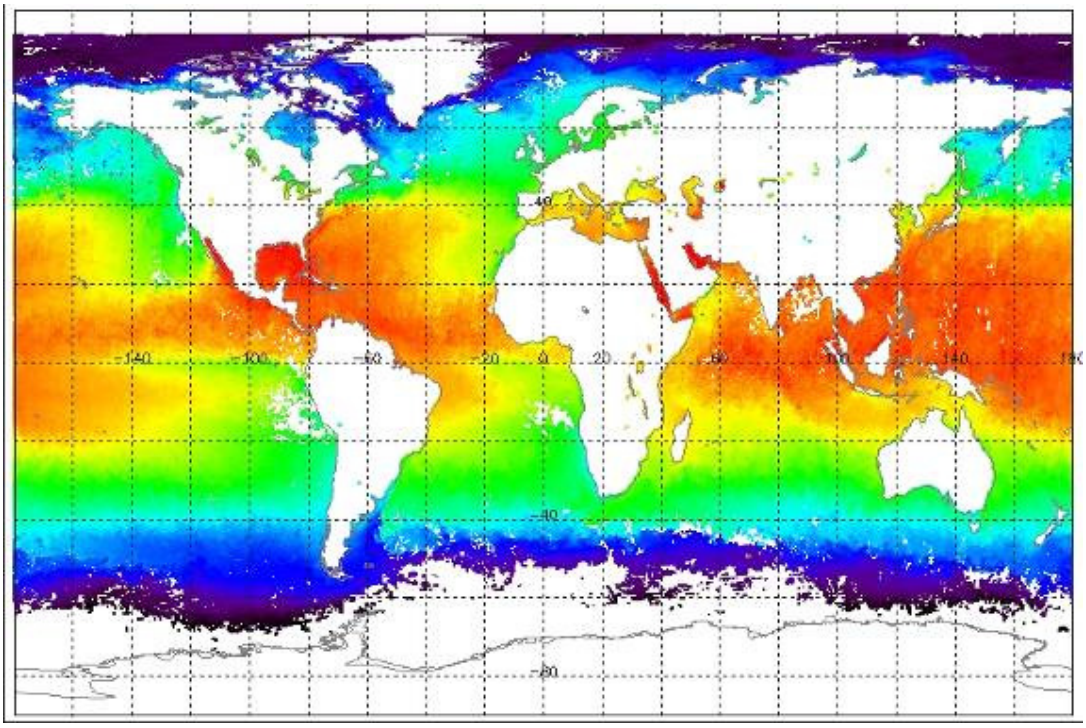

Figure 5-6 Monthly average Nadir View SST, with a data range of 270 – 305 Kelvin for August 2011

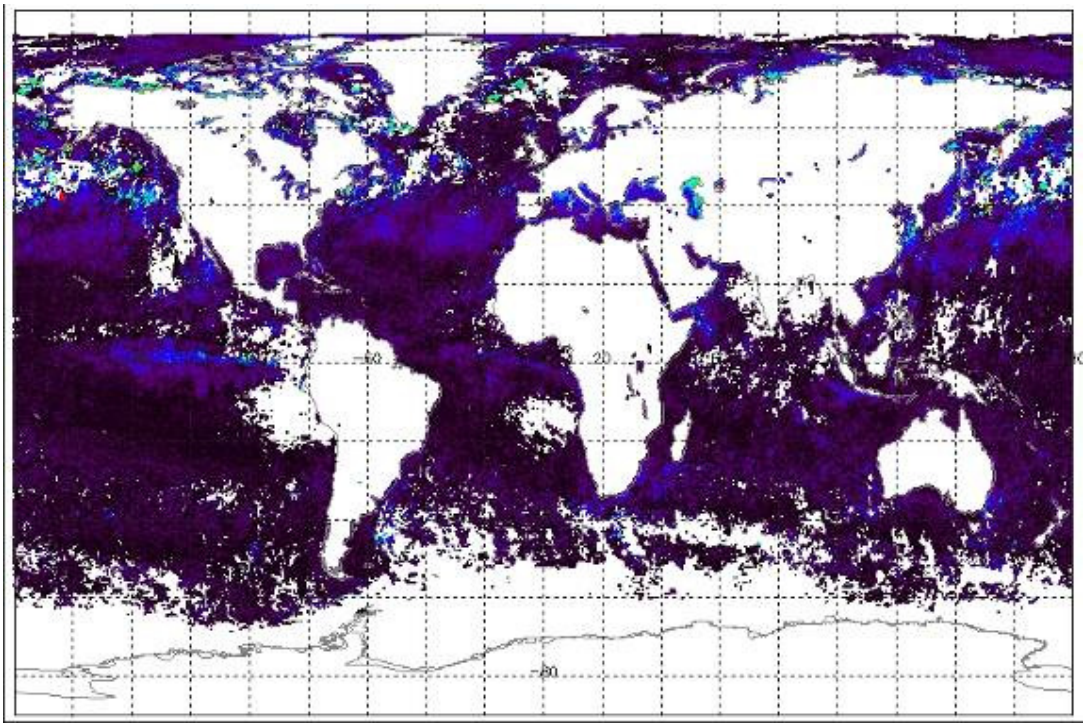

Figure 5-7 Standard deviation of the monthly average SST with a colour key range of 0 to 5 K, and a maximum value of 12 K for August 2011

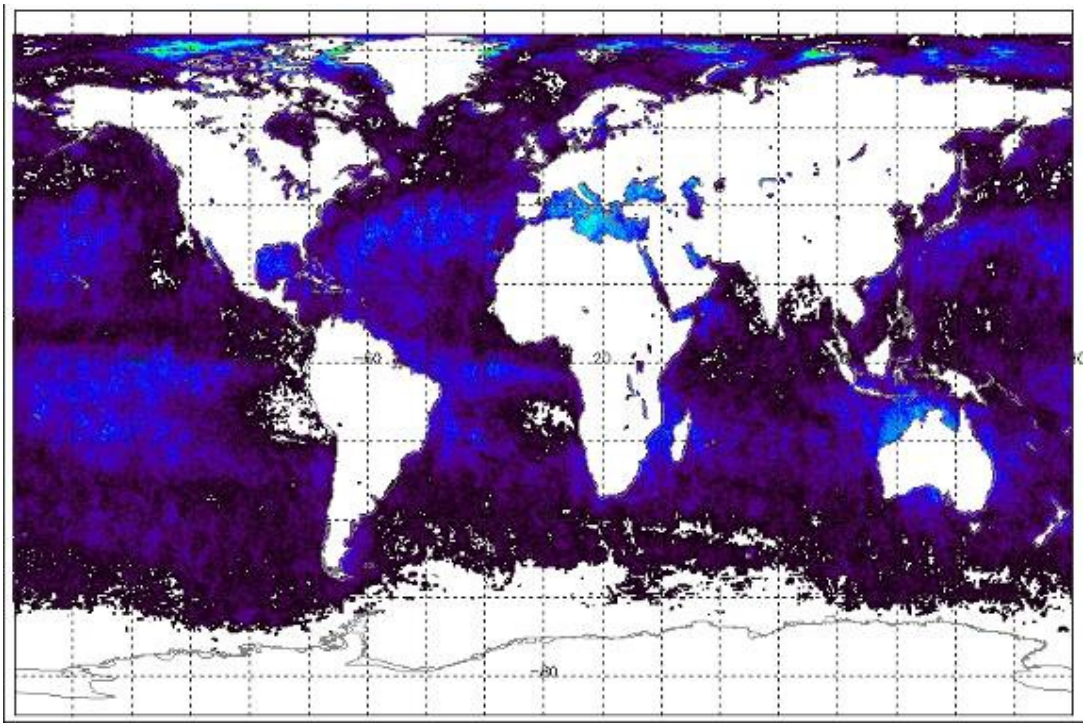

Figure 5-8 Number of contributory orbits to the calculation of the SST, with a colour key range of 0 to 34 (maximum value), for August 2011

Monthly SST anomaly maps, referenced to the GOSTA climatology dataset, are now being produced (beginning at Cycle 106). Figure 5-9 and Figure 5-10 display the SST anomalies for dual- and nadir-view SSTs for August 2011, respectively. The anomaly scale runs from -10 K (blue) to +10 K (red).

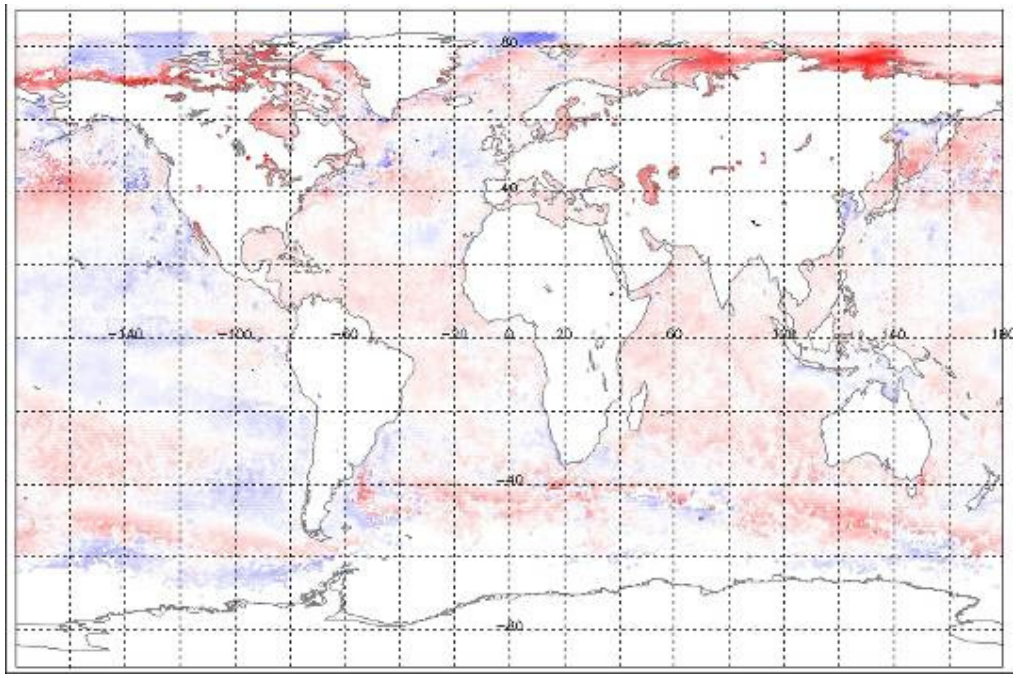

Figure 5-9 Anomaly map of Dual View SST for August 2011

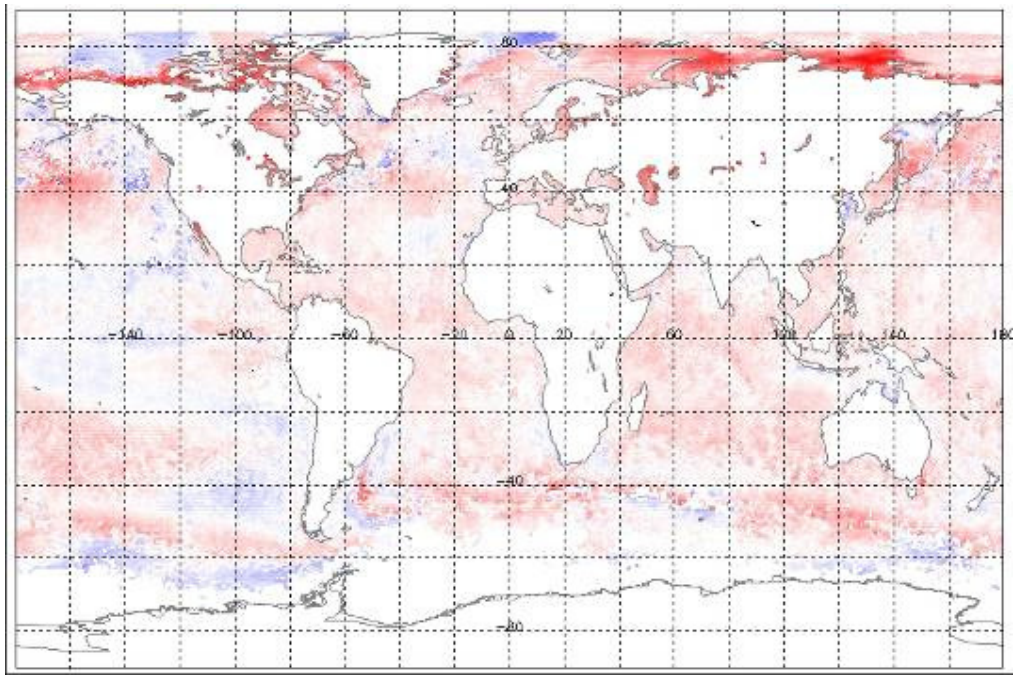

Figure 5-10 Anomaly map of Nadir View SST for August 2011

6 CALIBRATION/VALIDATION ACTIVITIES & RESULTS

6.1 Calibration

No calibration results were reported during this cycle.

6.2 Validation

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 106 being shown in Figure 6-1. The updated SST coefficients released in December 2005 were used in the AATSR SST retrievals.

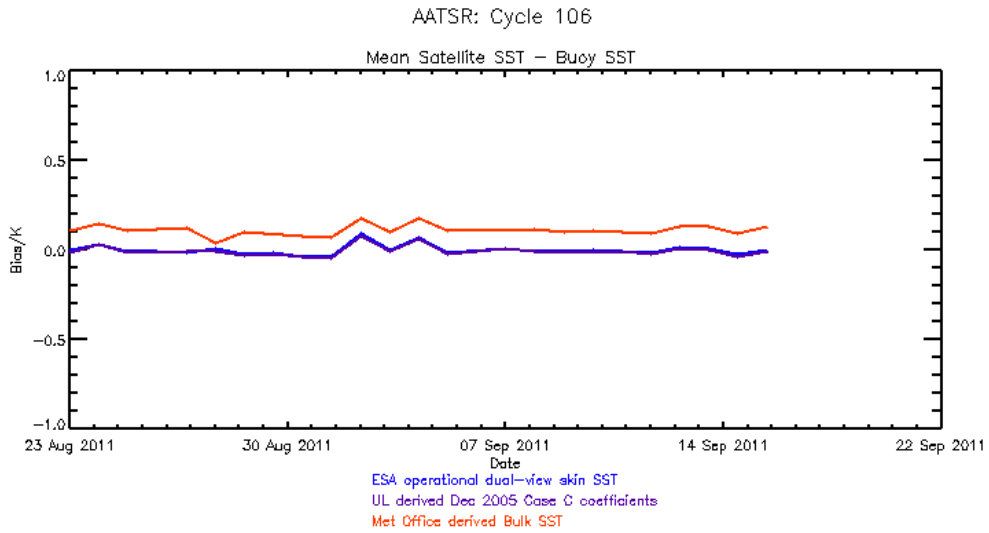

Figure 6-1 Comparison of daily mean difference between 10´ AATSR SST values and *in situ* drifting buoy SST for Cycle 106. Data provided by the Met Office

During cycle 106, there were 1313 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of -0.05 K, standard deviation 0.26 K, and a mean (dual-view depth SST minus buoy SST) of +0.07 K, standard deviation 0.24 K. A total of 1211 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.04 K, standard deviation 0.27 K, and a mean (dual-view depth SST minus buoy SST) of +0.16 K, standard deviation 0.27 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.

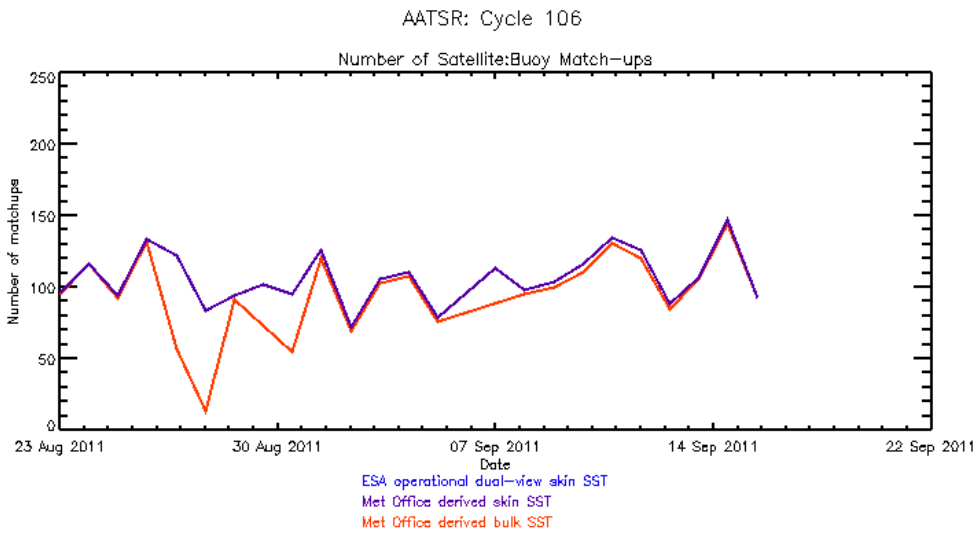

Figure 6-2 Plot of daily number of match-ups between 10´ AATSR SST values and *in situ* buoy SST for Cycle 106. Data provided by the Met Office

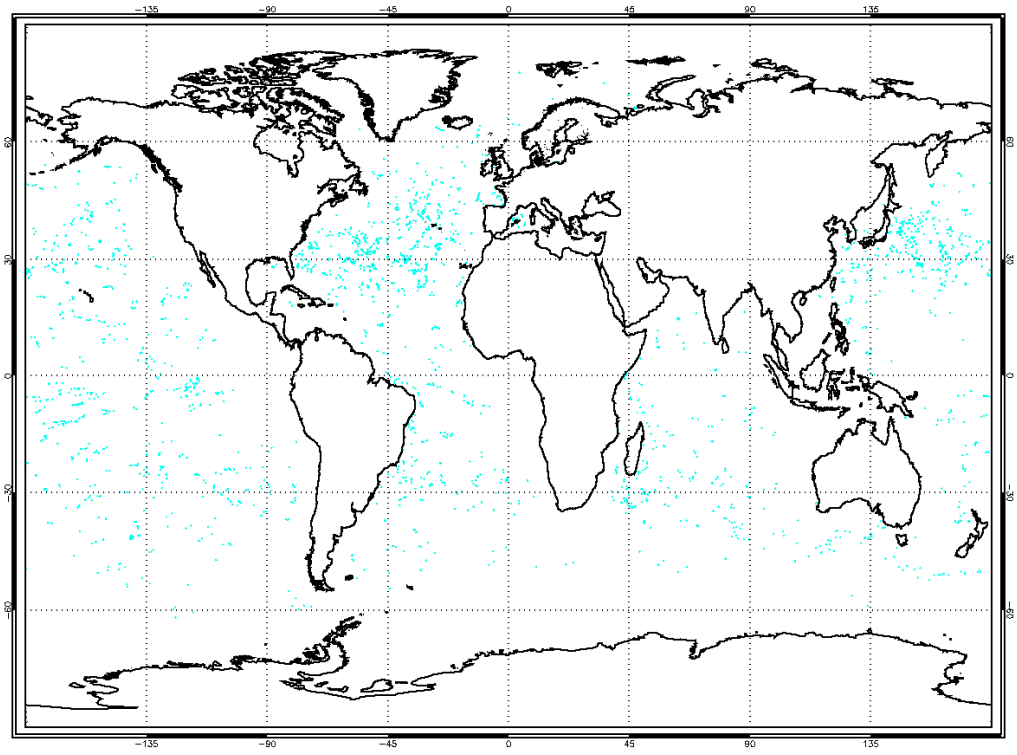

Figure 6-3 Map showing global distribution of match-ups between 10´ AATSR SST values and *in situ* buoy SST for Cycle 106. The cyan dots indicate a match-up to a drifting buoy. Data provided by the Met Office

7 DISCLAIMERS

No new disclaimers have been issued during this cycle.