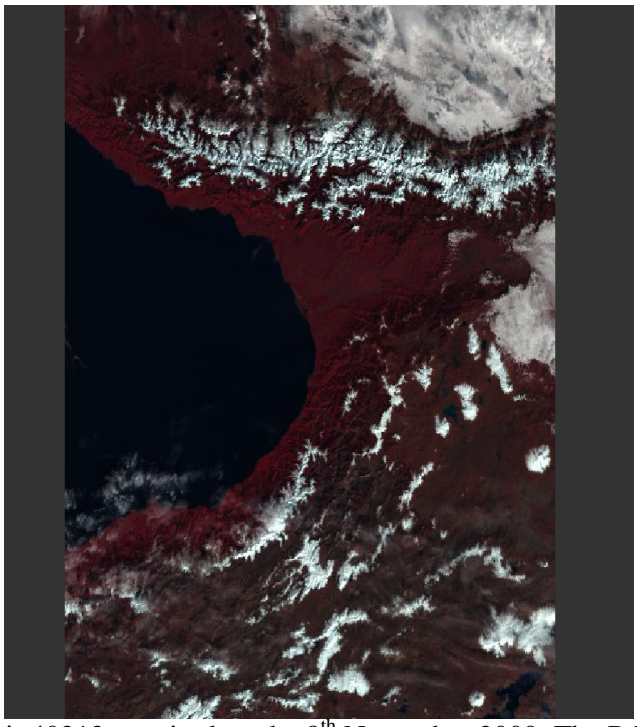
ENVISAT - AATSR

CYCLIC REPORT #84

	START	END
DATE	2ND NOVEMBER 2009	7TH DECEMBER 2009
TIME	21:59:29	21:59:29
ORBIT #	40135	40635



Shown is an image from orbit 40212 acquired on the 8th November 2009. The RGB combination image of 1.6, 0.87 and 0.55 micron channels shows the eastern part of the Black Sea, where it borders with Georgia, Turkey to the south and Russia to the north. The Caucasus Mountains to the north of the Black Sea are quite visible by their snow covered slopes. This mountain range includes Mount Elbrus which rises to a height of 18,506 feet above sea level.

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

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AATSR CYCLIC REPORT # 84

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 cycle, which consists of 501 complete orbits over the course of 35 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: 84

Cycle Start: 2nd November 2009, 21:59:29 Orbit #: 40135

Cycle End: 7th December 2009, 21:59:29 Orbit #: 40635

The main activities during the cycle have been as follows:

- **ENVISAT Orbit Control Manoeuvre (OCM)**

  Notofication was received on 4th November regarding the planned execution of a Orbit Control Manoeuvre (OCM) from 7-8 December 2009, between 2200h to 0700h. The exact unavailability period will be provided in the next Cyclic Report.

- **Acquisition failure at PDHS-E (ESRIN)**

  - Due to a failure on the KA Antenna (Artemis) caused by a thunderstorm during the night of 9 November 2009, the following Envisat HR (High Rate) and LR (Low Rate) data have not been acquired:

    Orbits: 40224 (partial), 40225, 40226, 40228 (partial) and 40229.

    The anomaly on the KA Antenna has been fixed and PDHS-E (ESRIN) was back to nominal operation from the 9th November 2009 PM.

  - Failure on the KA Antenna (Artemis) on the 25th November 2009 prevented the acquisition of ENVISAT HR (High Rate) and LR (Low Rate) during the following period: 25th November 2011h – 26th November 0700h, from orbits 40462 to 40470.

- **Software upgrade at PDHS-E (ESRIN) - operations resumed**

  A major software upgrade related to the archive facility at PDHS-E (ESRIN) took place between the 23rd and 24th November. The following unavailability of the PDHS-E services was expected:

  ENVISAT NRT processing and dissemination: 23rd November 09:00 – 17:00 CET

  ENVISAT on request processing and dissemination: 23rd November 09:00 – 24th November 09:00 CET.

  All processing and dissemination activities resumed normal operations on 24th November.

- **AATSR L2P Processor update**

  An updated version of the AATSR L2P processor was introduced on Thursday, 5th November, starting with products from absolute orbit number 40171 inclusive. This version of the processor changes the order of two records in the metadata (FR_Revision_History and FR_Last_revision_date are swapped), and no changes are introduced in the L2P products themselves.

- **Collision Avoidance Manoeuver**

  Following a warning issued by the US' Joint Space Operations Center, an Envisat emergency collision avoidance manoeuvre was successfully executed on 4 November, from 07:51 to 09:32 UTC.

  The manoeuvre was needed to achieve a safe separation between Envisat and an unknown (not yet classified) object.

  During the manoeuvre all instruments have been kept in operation, no impacts are foreseen on data quality

3 SOFTWARE & AUX FILE VERSION CONFIGURATION

3.1 Software Version

AATSR IPF for Level 1 and Level 2: Version 6.02L02

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)

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_AXNIEC20070223_102348_20010308_120446_20120801_235959
ATS_GC1_AXVIEC20070720_093834_20020301_000000_20200101_000000
ATS_INS_AXVIEC20070720_094014_20020301_000000_20200101_000000
See below for VC1 files
ATS_LST_AXVIEC20070720_094144_20020301_000001_20200101_000000
ATS_PC1_AXVIEC20070720_094312_20020301_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 VISIBILE CALIBRATION FILES

3.2.1.1 VC1 File Availability

The daily reflectance channel calibration files were available for all dates during this cycle.

3.2.2 STATUS OF OTHER AUXILIARY FILES

No auxiliary files changed during this cycle.

4 PDS STATUS

4.1 Instrument Unavailability

AATSR data were unavailable due to instrument unavailability at the following times during the cycle:

UTC Start	UTC Stop	Reason	Reference	Planned
07-Dec-2009 02:35:38	08-Dec-2009 06:47:01	OCM	EN-UNA-2009/0194	Yes

Table 4-1 Instrument unavailability during cycle 84

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	November 2, 2009	40135	40234	0	13140	0	100.00%	97.83%	97.83%
2	November 9, 2009	40235	40334	0	0	0	100.00%	100.00%	100.00%
3	November 16, 2009	40335	40435	0	0	0	100.00%	100.00%	100.00%
4	November 23, 2009	40436	40535	0	38967	0	100.00%	93.56%	93.56%
5	November 30, 2009	40536	40635	32101	0	0	94.69%	94.69%	94.69%

Table 4-2 Instrument and data unavailability weekly summary for cycle 84

The instrument was available for 98.94% of the time during the cycle.
The L0 data were available for 97.22% of the time during the cycle.
The L1b data were available for 97.22% of the time during the cycle.

The following L0 data was missing from this cycle:

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
08-Nov-2009 04:20:00	08-Nov-2009 04:44:00	1440	40210	40210
09-Nov-2009 02:38:00	09-Nov-2009 05:53:00	11700	40222	40225
25-Nov-2009 20:11:00	26-Nov-2009 07:00:27	38967	40462	40469

Table 4-3 ATS_NL__0P missing data during cycle 84

No L1 data was missing from this cycle that was not associated with the missing L0 data reported above.

4.2.1 ORBITS AFFECTED BY POOR DATA QUALITY

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

- 40131 (2nd Nov 2009)
- 40189 (6th Nov 2009)
- 40209 (8th Nov 2009)
- 40230 (9th Nov 2009)

- 40269, 40273 (12th Nov 2009)
- 40288 (13th Nov 2009)
- 40367, 40374 (19th Nov 2009)
- 40383 (20th Nov 2009)
- 40408 (21st Nov 2009)
- 40447 (24th Nov 2009)
- 40571 (3rd Dec 2009)

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

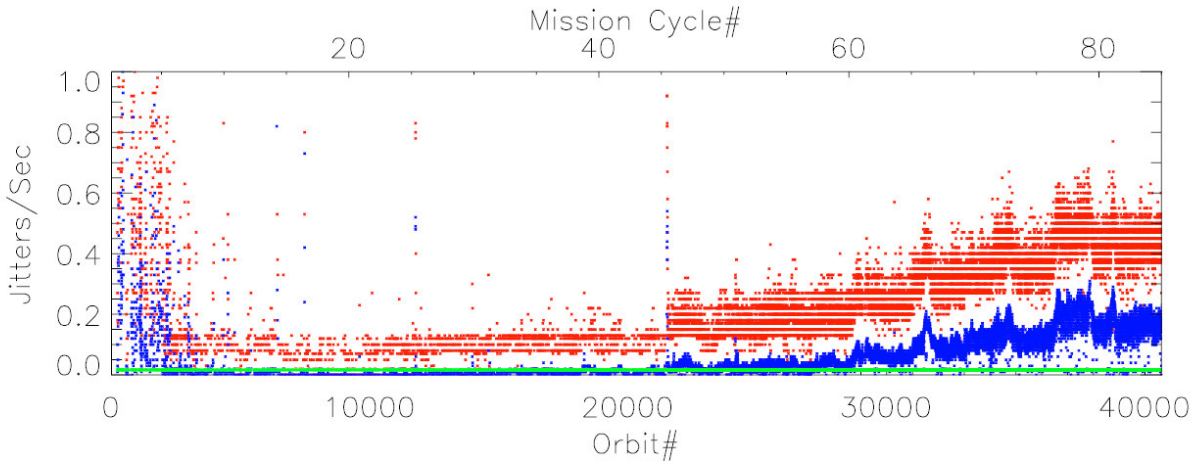

Figure 5-1 Jitter trend from mission start

The plot shows the jitter-trend since the start of the mission, 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 shows no significant rate-change with respect to the previous cycle.

5.1.2 SENSOR TEMPERATURE

The detector temperature plots for cycle 84 can be found at:
http://aatsr2.ag.rl.ac.uk/data2/aatsr2/EDS-X/CyclePlots/DetTemps84.pdf

While in measurement mode, all sensors maintained their nominal orbital and seasonal ranges in this cycle. The detector temperatures have remained nominal.

5.1.3 VISCAL

NRT calibration quality for AATSR reflectance channels has been maintained throughout this cycle.

In addition, the following set of “orbital” VC1 files was delivered:
http://aatsr2.ag.rl.ac.uk/data2/aatsr2/EDS-X/CyclePlots/VC1-84.txt

5.1.4 NE∆T

NE∆T results for Cycle 83 and 84 will be reported in the next Cyclic Report.

5.2 User Rejections

There were no user rejections during this cycle.

5.3 Software Problem Reporting

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

5.3.1 EXISTING SPRS THAT ARE STILL OPEN

The following SPRs are still open:

Inconsistent values in AST Confidence word, 17 and 50km cells
NA-PR-07-02946
The AST confidence word may be incorrectly set for records where the nadir or dual view SST retrieval was invalid, indicating that the 3.7 micron channel was used (although this has no meaning in this instance). Although the wrongly set flags may be ignored as far as the 17km cell is concerned, they present a problem since they may propagate into the confidence word for the 50km cell. The problem does not occur for daytime (descending) arcs where the retrievals are valid for both views.
Note: this PR has been migrated to a new PR (IDEAS-PR-09-04805) on the current Linux IPF version. This will be further discussed at the next AATSR QWG in January 2010.

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.

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

The PR NA-PR-09-04210, which was raised to address the issue of small discrepancies noted between the SPH of the Linux products and the SPH of the operational AIX products, has been closed. This is because the difference is categorised and accepted, and the Linux processor is now operational.

5.4 Monthly Level 3 Product

The following plots have been generated from the available Meteo products acquired in October and November 2009. The October plots consist of 466 products taken from orbits 39663 to 40106. The November plots consist of 433 products taken from orbits 40107 to 40534. Figure 5-3, Figure 5-5, Figure 5-7 and Figure 5-9 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for October 2009. Figure 5-4, Figure 5-6, Figure 5-8 and Figure 5-10 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for November 2009. Please note we are not able to provide individual colour scales at this time, however the colouring scheme used is given in Figure 5-2 and the data ranges of each diagram are also given.

Figure 5-2 – This is the colour scheme used for the following plots, running linearly from left to right with increasing magnitude.

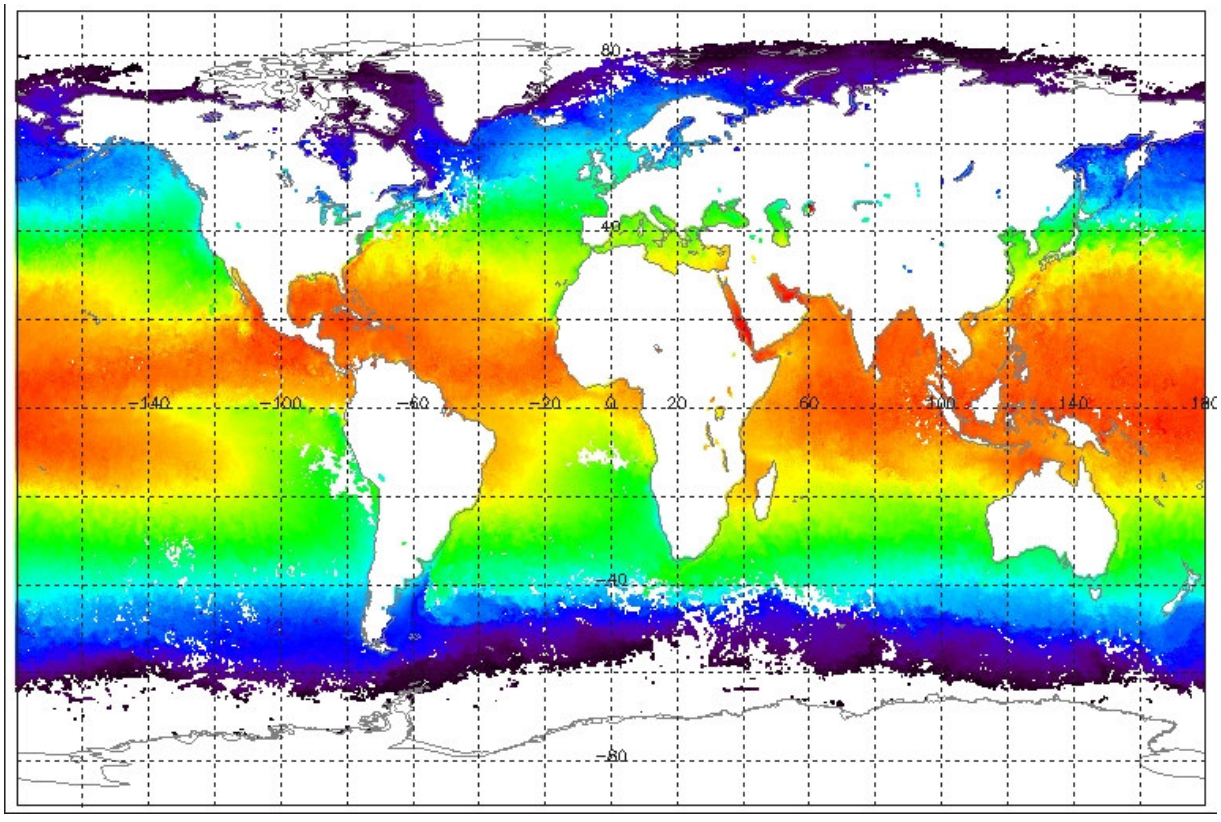

Figure 5-3 - This figure gives the monthly average Dual View SST, with a range of 270 - 305 Kelvin for October 2009.

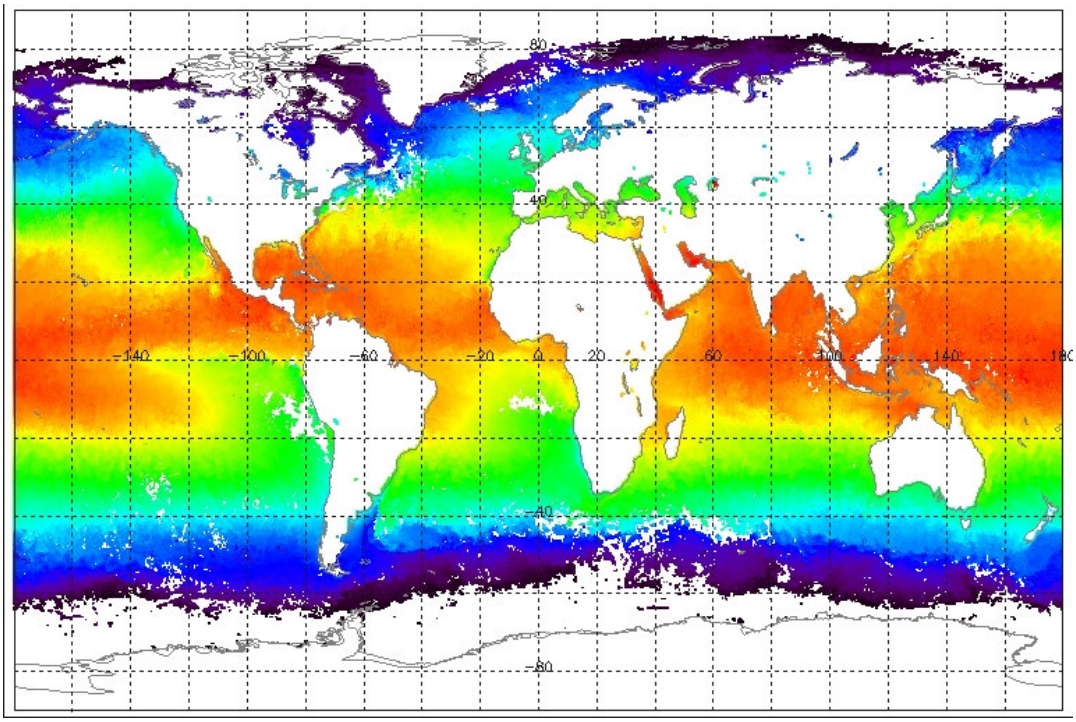

Figure 5-4 - This figure gives the monthly average Dual View SST, with a range of 270 - 305 Kelvin for November 2009

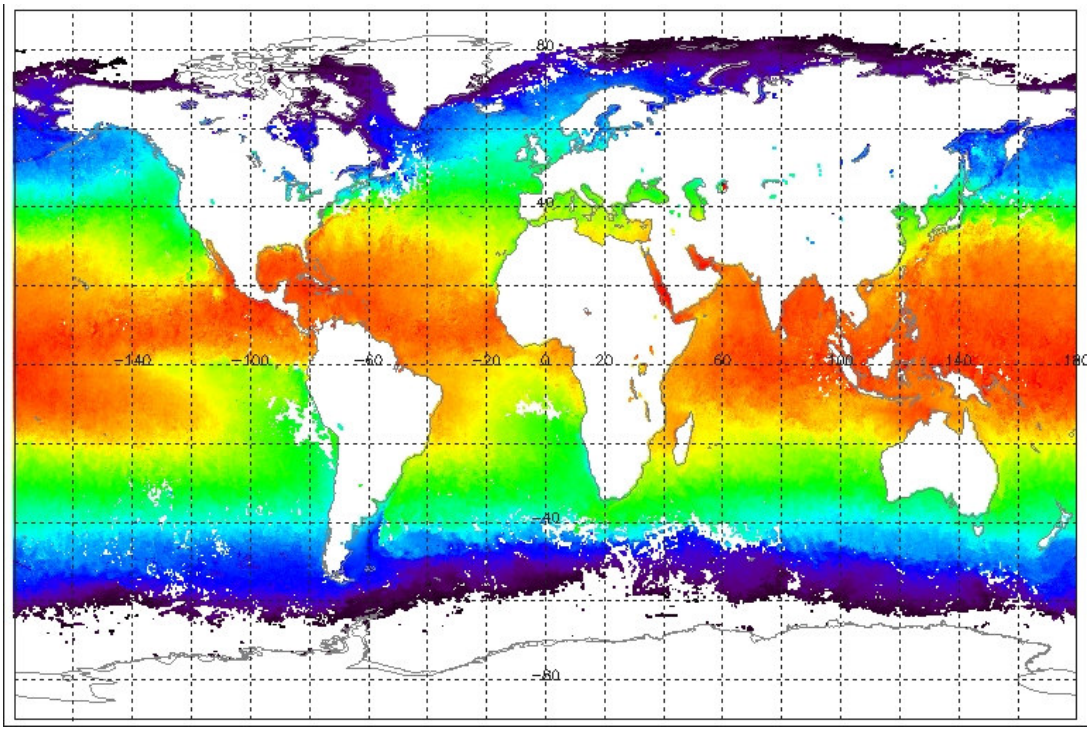

Figure 5-5 - This figure gives the monthly average Nadir SST, with a data range of 270 - 305 Kelvin for October 2009.

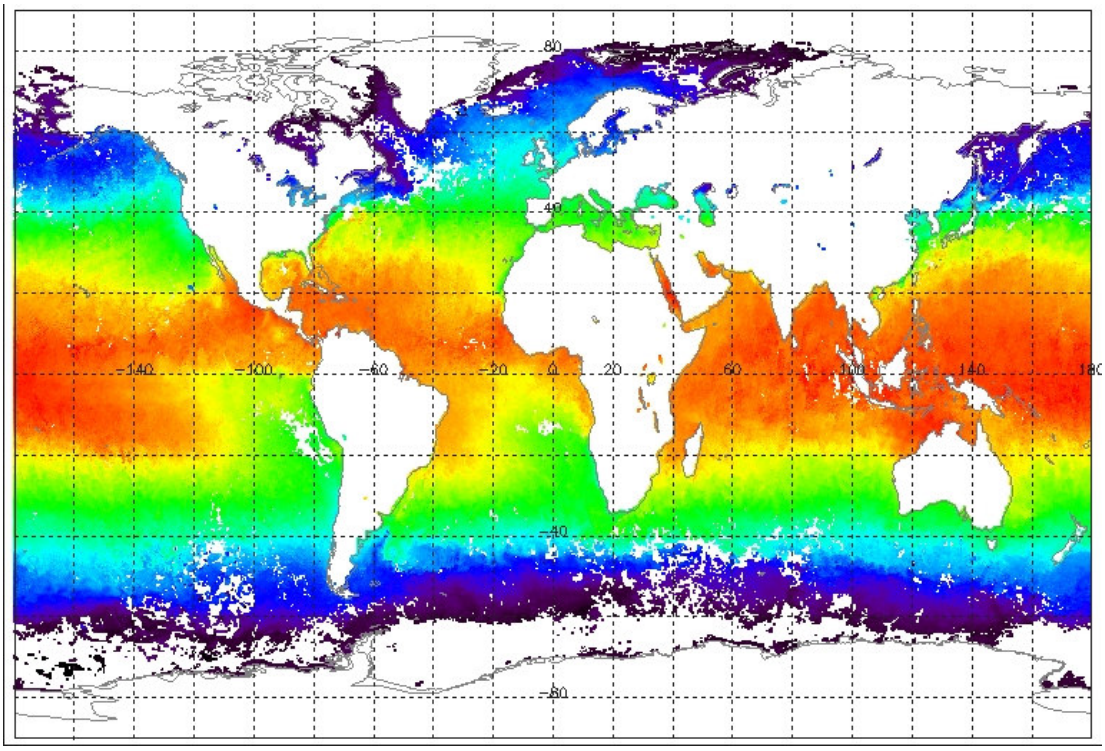

Figure 5-6 This figure gives the monthly average Nadir SST, with a data range of 270 - 305 Kelvin for November 2009.

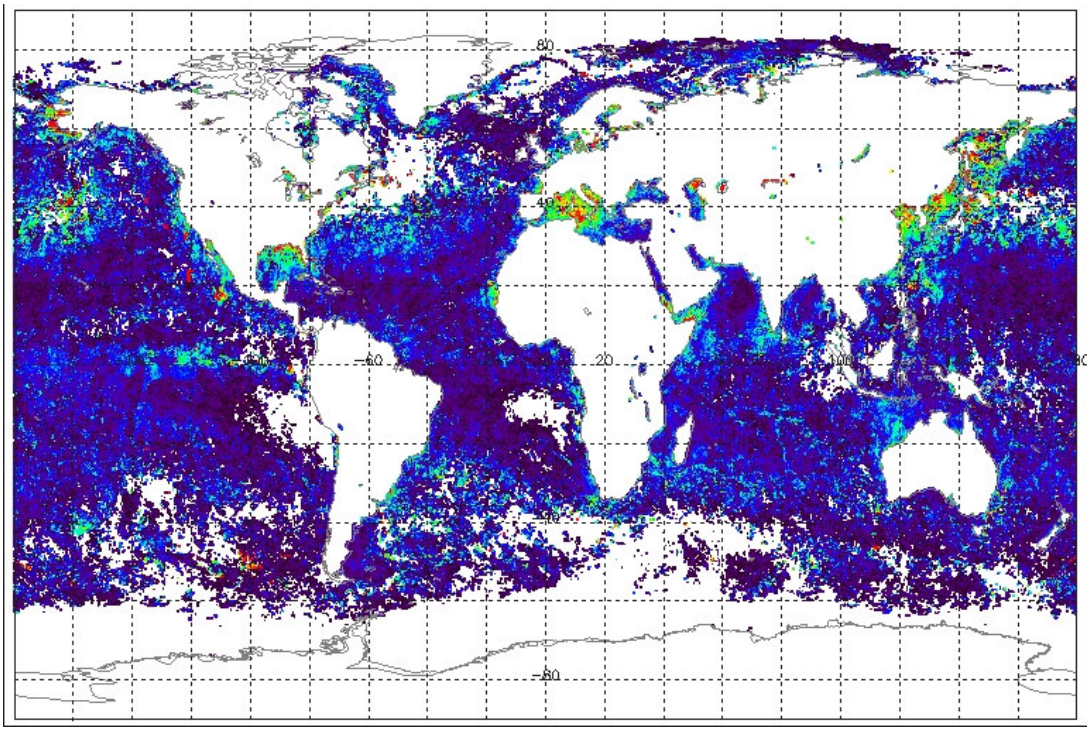

Figure 5-7 - The standard deviation of the monthly average in SST with a data range of 0 to 2 Kelvin for October 2009.

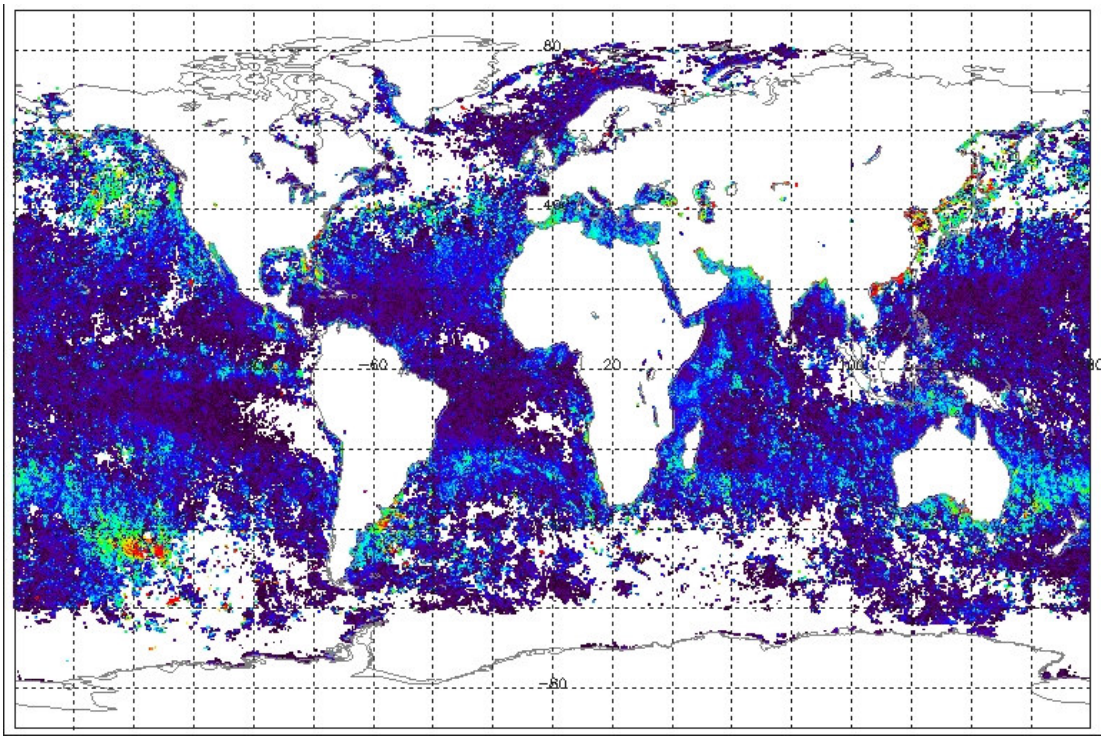

Figure 5-8 The standard deviation of the monthly average in SST with a data range of 0 to 2 Kelvin for November 2009

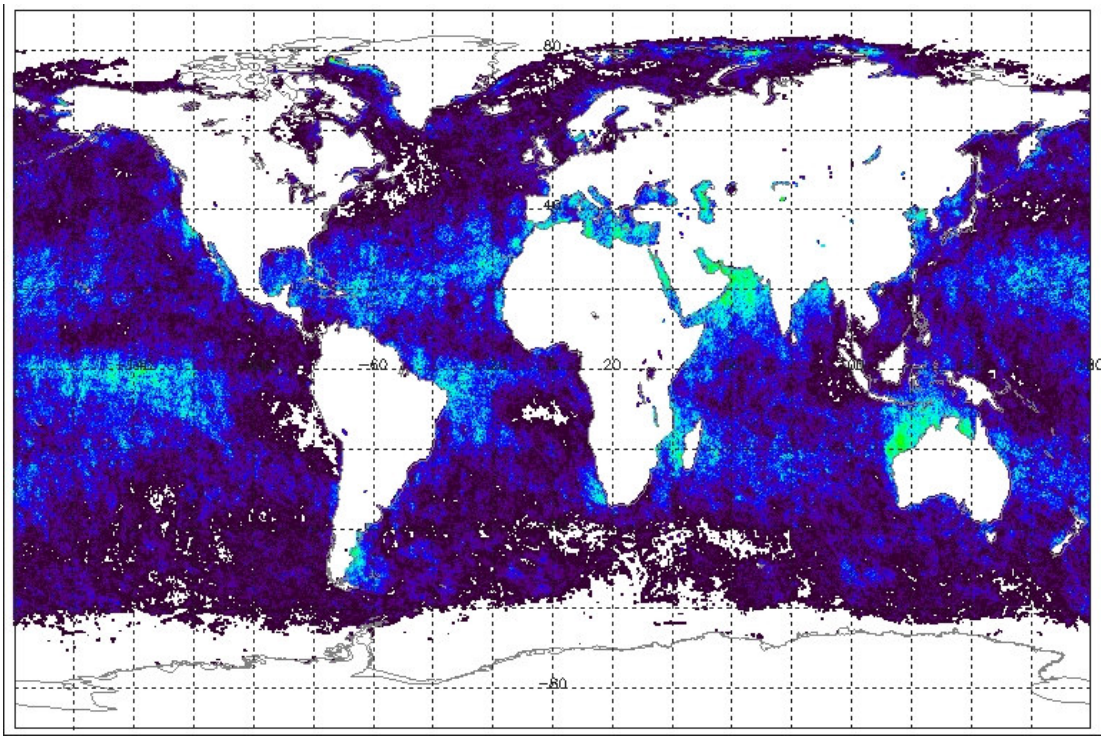

Figure 5-9 – The number of contributory orbits to the calculation of the SST, with a range of 0 to 20 for October 2009

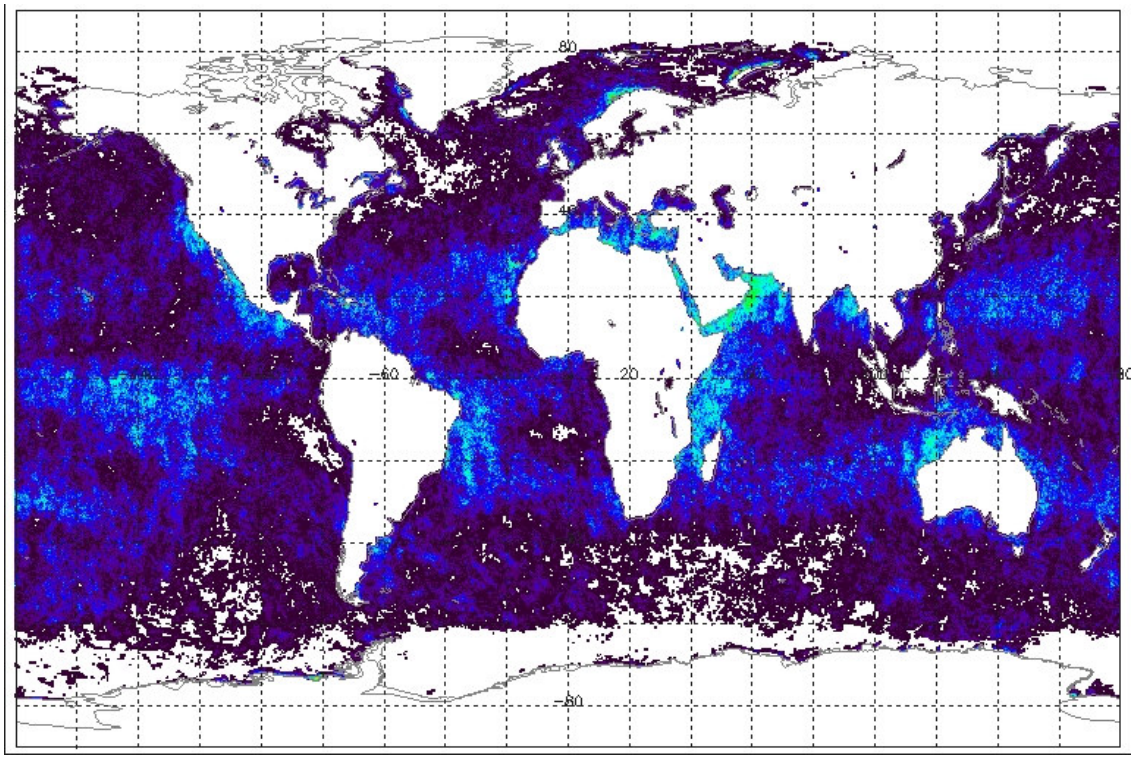

Figure 5-10 - The number of contributory orbits to the calculation of the SST, with a range of 0 to 20 for November 2009

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

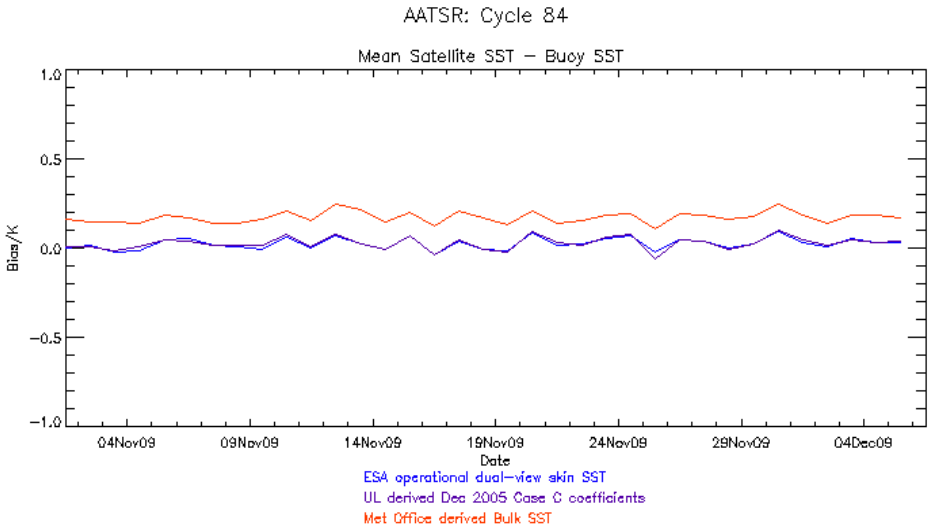

Figure 6-1 - Comparison of daily mean difference between 10´ AATSR SST values and in situ drifting buoy SST for Cycle 84. Data provided by the Met Office.

During cycle 84, there were 1734 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of -0.004 K, standard deviation 0.25 K, and a mean (dual-view bulk SST minus buoy SST) of +0.139 K, standard deviation 0.24 K. A total of 1529 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.069 K, standard deviation 0.29 K, and a mean (dual-view bulk SST minus buoy SST) of +0.214 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.

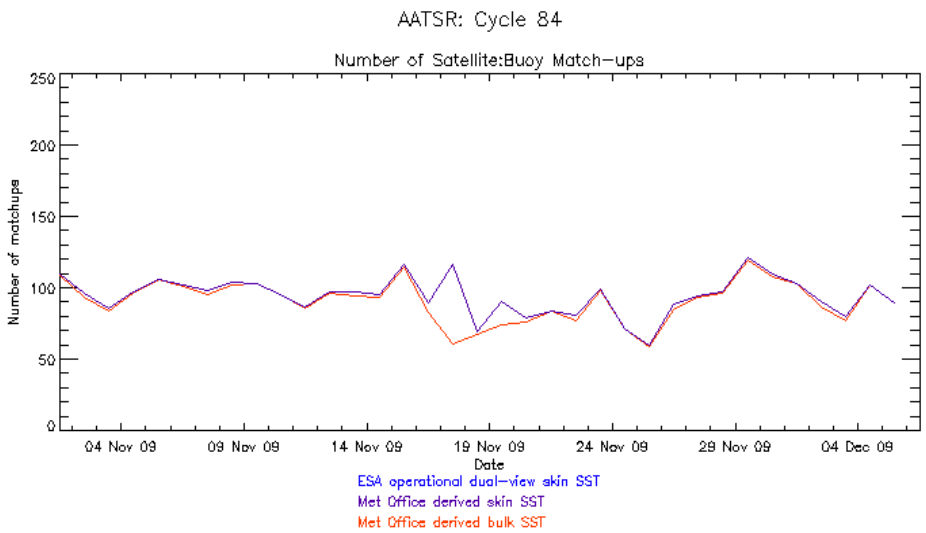

Figure 6-2 - Plot of daily number of match-ups between 10´ AATSR SST values and in situ buoy SST for Cycle 84. Data provided by the Met Office.

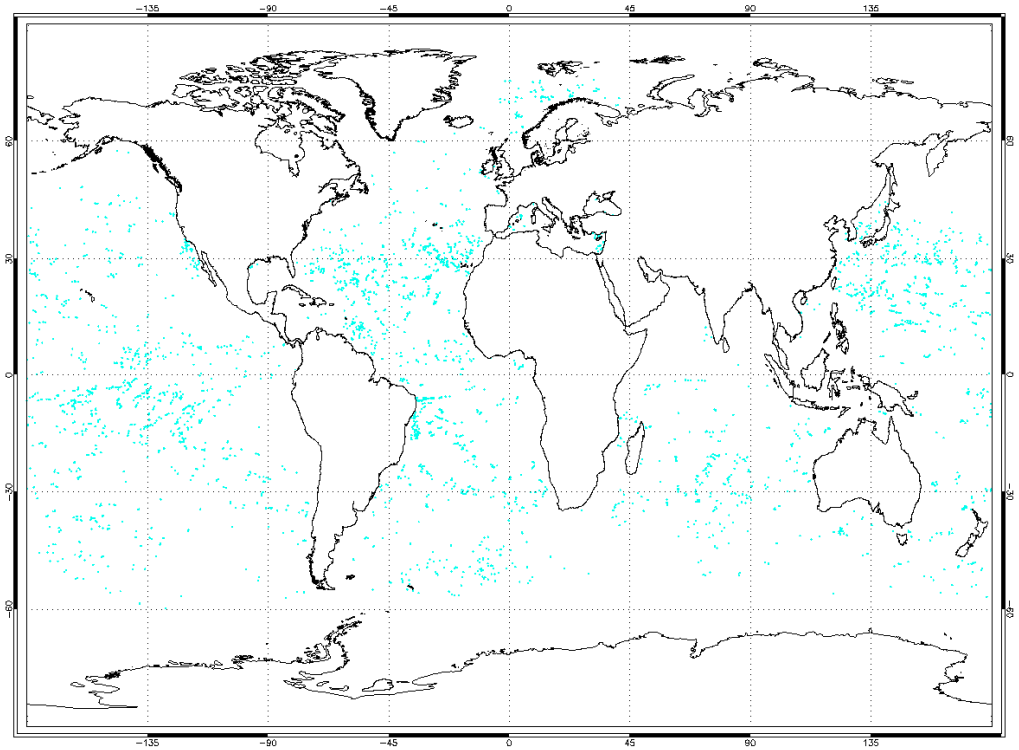

Figure 6-3 - Map showing global distribution of match-ups between 10´ AATSR SST values and in situ buoy SST for Cycle 84. The cyan dots indicate a match-up to a drifting buoy. Data provided by the Met Office.

7 DISCLAIMERS

No new disclaimers have been issued during this cycle.