ENVISAT - AATSR

CYCLIC REPORT #76

	START	END
DATE	26 JAN 2009	02 MAR 2009
TIME	21:59:29	21:59:29
ORBIT #	36127	36627

2nd of March, 2009 – RGB combination of nadir 1.6, 0.87 and 0.67 µm channels showing the English Channel, including the coasts of England and France

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A P P R O V A L

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TABLE OF CONTENTS

AATSR CYCLIC REPORT # 76

1 INTRODUCTION

The AATSR Cyclic Report is distributed by the AATSR DPQC 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
DPQC	Data Product Quality Control
EN-UNA-YYYY/#	Envisat Unavailability (plus year and number)
ESOC	European Space Operation Centre
HSM	High Speed Multiplexer
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 in the following site:
http://envisat.esa.int/dataproducts/aatsr/CNTR5.htm#eph.aatsr.glossary

2 SUMMARY

Cyclic Report: 76

Cycle Start: 26 Jan 2009, 21:59:29 Orbit #: 36127

Cycle End: 02 Mar 2009, 21:59:29 Orbit #: 36627

The main activities during the cycle have been as follows:

- **L0 Processor and IPF Version:**

  L0 Processor – no change (5.22)

  Level 1b & Level 2 processor – no change (6.01)

- **Envisat Orbit Control Manoeuvre:**

  An Envisat Orbit Control Manoeuvre (OCM) took place from 25 - 27 January 2009 and the following precise instrument unavailability period has been registered for AATSR: 26-Jan-2009 23:44 to 27-Jan-2009 06:49 UTC.

- **Envisat in Yaw Steering Mode:**

  Envisat switched automatically in Yaw Steering Mode (YSM) from 15th February 2009 03:38:34 to 16th February 2009 13:09:00, due to an anomaly which affected Star Tracker 3. The anomaly was caused by an unexpected bright object, different from the original programmed star, which the star tracker had been pointing to.

  The Yaw Steering Mode implies a slight degradation of the general attitude stability, which does not substantially affect instrument data quality. Products acquired during YSM were therefore archived and distributed nominally.

- **Envisat NRT impact at PDHS-K (Kiruna):**

  Due to software maintenance at PDHS-K (KIRUNA) on Monday 16th February, notification was received that some impacts may be observed to the Envisat NRT operations.

- **Updated L2P Processor:**

  An updated version of the L2P processor for AATSR was implemented on 26 February 2009. Consequently, all products from orbit 36565 onwards have been processed with the new software. This new version of the processor updates the formatting of the xml files associated with the L2P product. No change has been made to the content of the L2P product itself.

3 SOFTWARE & AUX FILE VERSION CONFIGURATION

3.1 Software Version

AATSR IPF for Level 1 and Level 2: Version 6.01

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, except for the following:

- 4th February 2009

The orbital VC1 files continued to be generated from the available L0 data.

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
26-Jan-2009 23:44:56	27-Jan-2009 06:49:56	Envisat OCM	EN-UNA-2009/0015	Yes

Table 4-1 Instrument unavailability during cycle 76

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	January 26, 2009	36127	36226	25500	0	0	95.78%	95.78%	95.78%
2	February 2, 2009	36227	36326	0	30998	0	100.00%	94.87%	94.87%
3	February 9, 2009	36327	36427	0	3931	0	100.00%	99.35%	99.35%
4	February 16, 2009	36428	36527	0	0	0	100.00%	100.00%	100.00%
5	February 23, 2009	36528	36627	0	0	0	100.00%	100.00%	100.00%

Table 4-2 Instrument and data unavailability weekly summary for cycle 76

The instrument was available for 96.16% of the time during the cycle.
The L0 data were available for 98.00% of the time during the cycle.
The L1b data were available for 98.00% 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
07-Feb-2009 20:10:35	08-Feb-2009 01:30:48	19213	36298	36299
08-Feb-2009 02:48:48	08-Feb-2009 06:05:13	11785	36300	36303
13-Feb-2009 17:49:49	13-Feb-2009 18:55:20	3931	36381	36382

Table 4-3 ATS_NL__0P missing data during cycle 76

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:

- 36147 (28th January)
- 36176 (30th January)
- 36196 (31st January)

- 36281 (6th February)
- 36293, 36294 (8th February)
- 36324 (9th February)
- 36335 (10th February)
- 36406 (15th February)
- 36464 (19th February)
- 36482 (20th February)
- 36605, 36606 (1st March)

4.3 L0 and L1b Backlog Processing Status

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

5 DATA QUALITY CONTROL

5.1 Monitoring of Instrument Parameters

5.1.1 JITTER

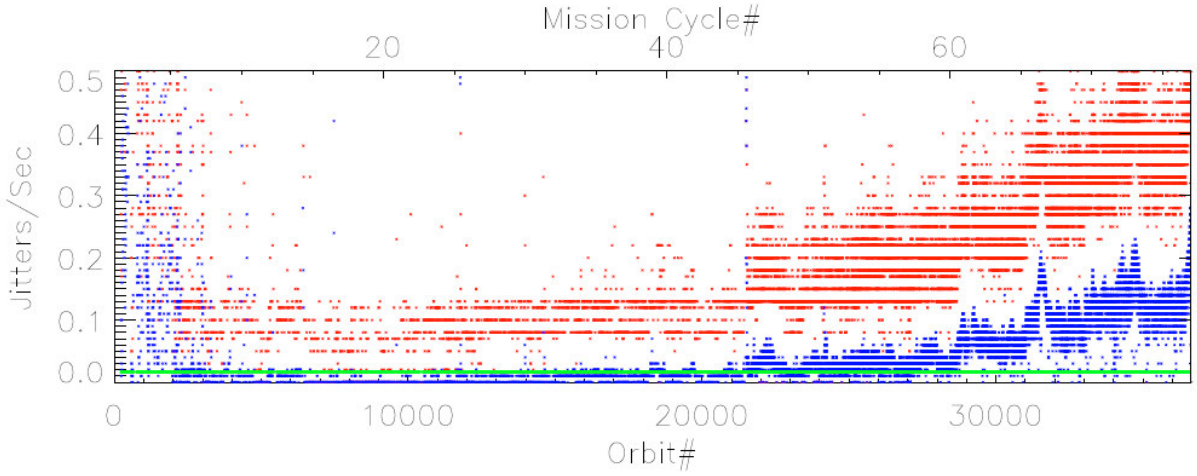

Figure 5.1 Jitter trend from mission start

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 plot shows significant deterioration towards the end of the cycle.

5.1.2 SENSOR TEMPERATURE

The detector temperature plots for cycle 76 can be found at:

http://aatsr2.ag.rl.ac.uk/data2/aatsr2/EDS-X/CyclePlots/DetTemps76.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/VC1-76.txt

5.1.4 NE∆T

This information will be included 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.

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 Auxilliary 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 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 Product

The following plots have been generated from the available meteo products acquired in February. This consists of 436 orbits from 36199 to 36597. Figures Figure 5.3, Figure 5.4, Figure 5.5, Figure 5.6 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for February 2009. Please note we are not able to provide absolute 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.

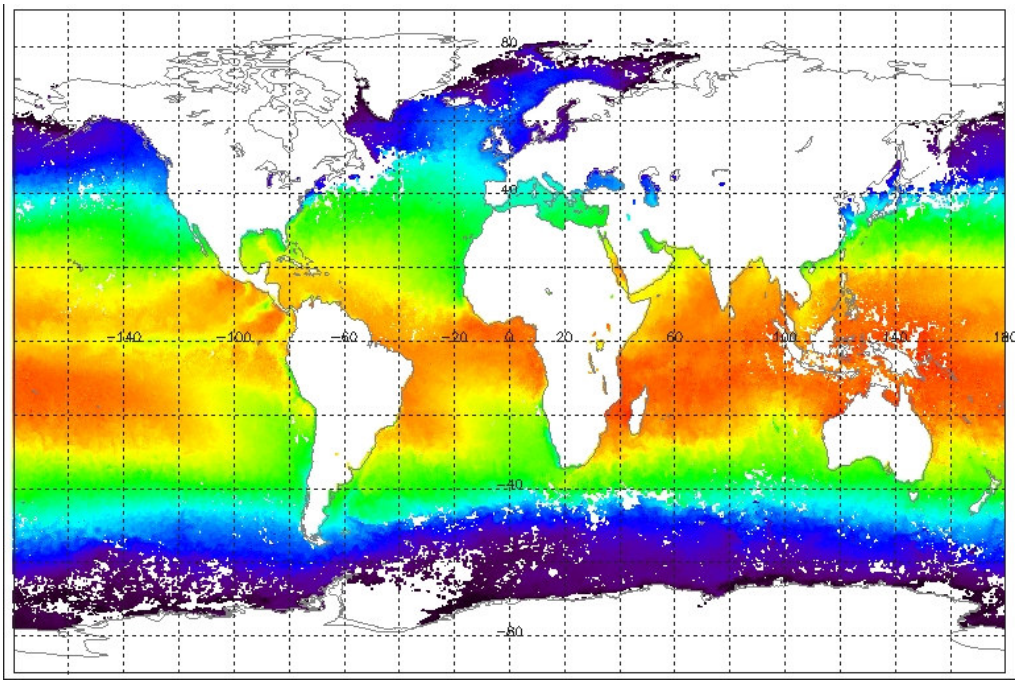

Figure 5.3 - This figure gives the monthly average Dual View SST, with a range of 270 - 305 Kelvin for February 2009.

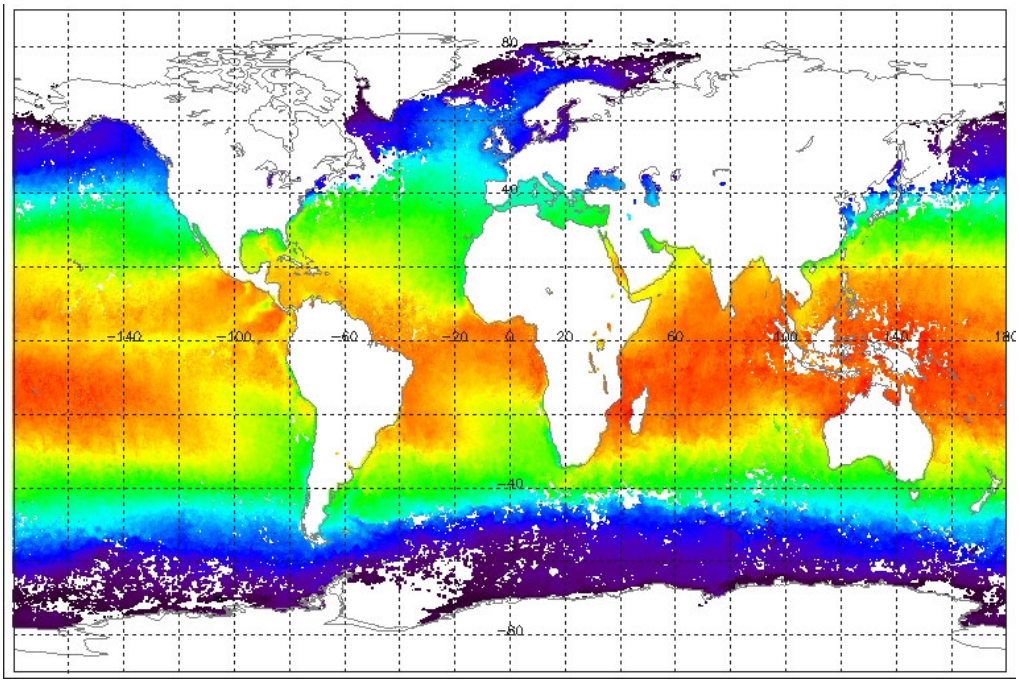

Figure 5.4 - This figure gives the monthly average Nadir SST, with a data range of 270 - 305 Kelvin for February 2009.

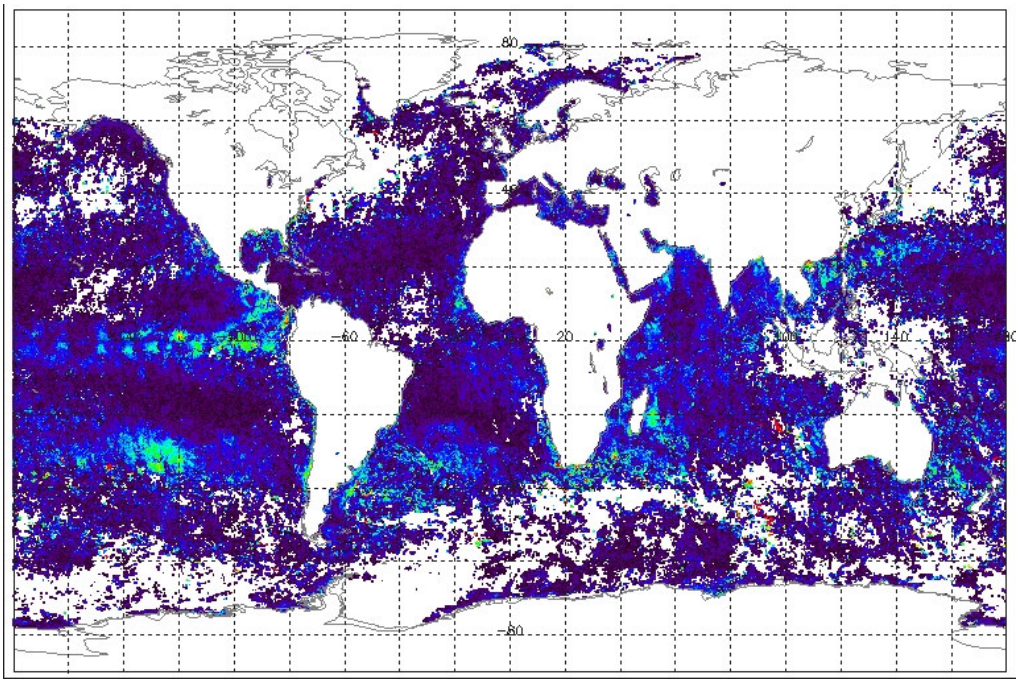

Figure 5.5 - The standard deviation of the monthly average in SST with a data range of 0 to 2 Kelvin for February 2009.

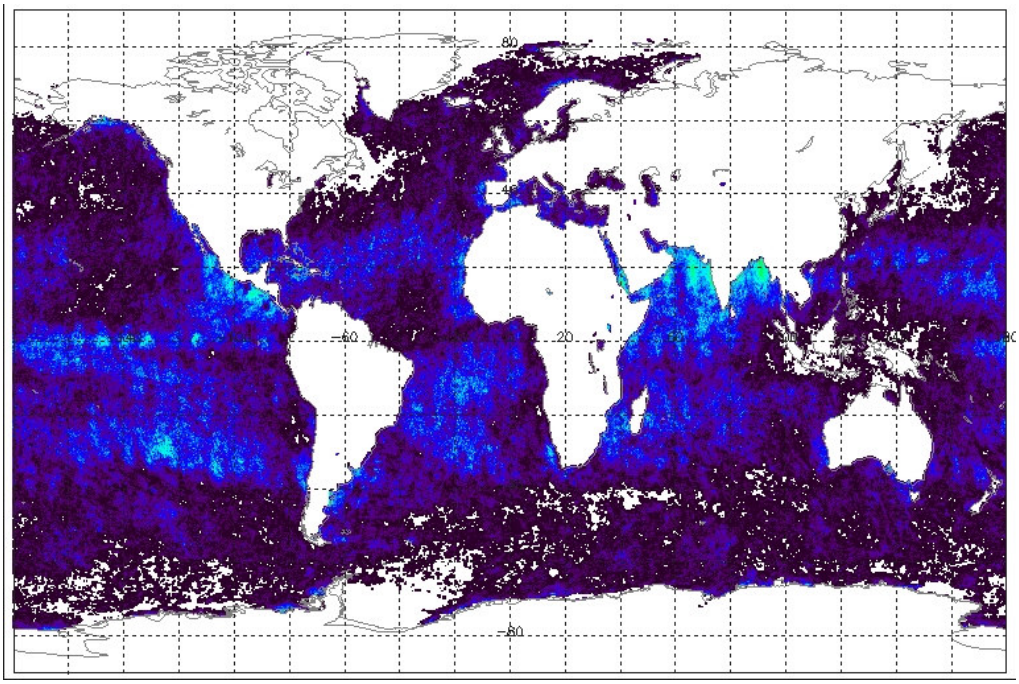

Figure 5.6 – The number of contributory orbits to the calculation of the SST, with a range of 0 to 24 for February 2009.

6 CALIBRATION/VALIDATION ACTIVITIES & RESULTS

6.1 Calibration

No additional calibration results were reported during this cycle.

6.2 Validation

A monthly mean global dual-view SST plot for Cycle 76 composed from ATS_AR__2P 10' data is shown below in Figure 6.1. The monthly mean contains day time and night time data.

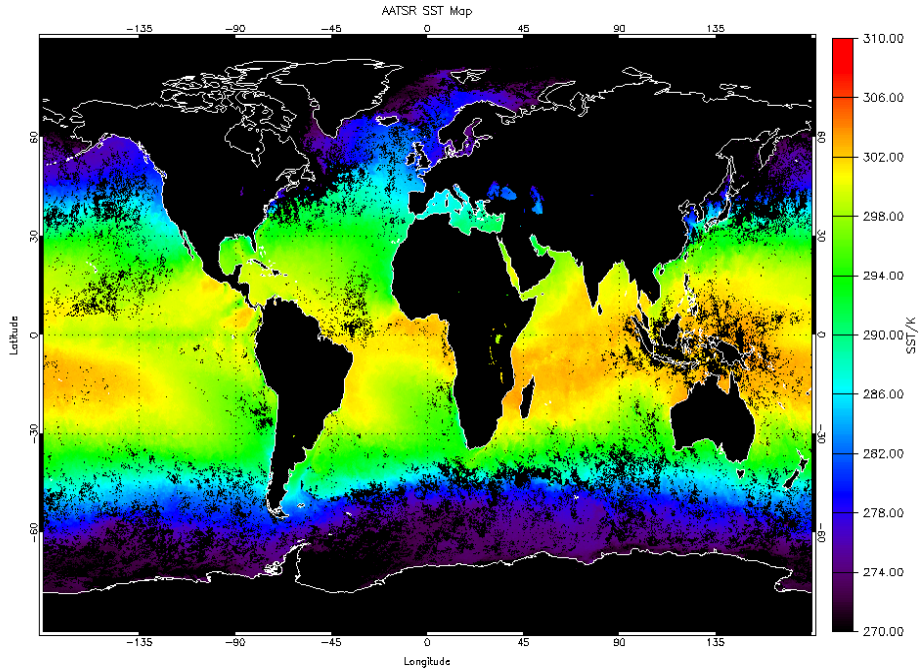

Figure 6.1: Monthly Global Average dual-view SST for Cycle 76

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 76 being shown in Figure 6.2. The updated SST coefficients released in December 2005 were used in the AATSR SST retrievals.

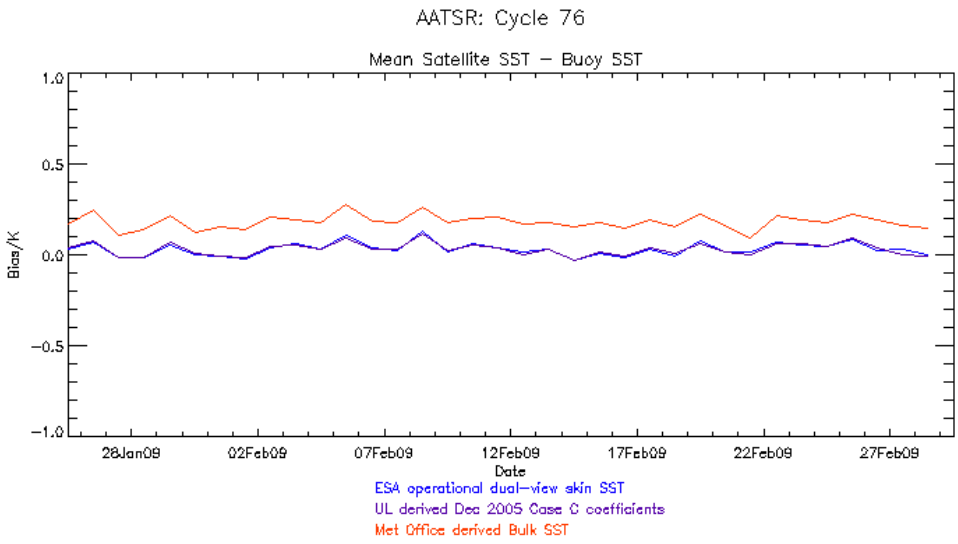

Figure 6.2: Comparison of daily mean difference between 10´ AATSR SST values and in situ buoy SST for Cycle 76. Data provided by the Met Office.

During cycle 76, there were 1738 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of -0.006 K, standard deviation 0.25 K, and a mean (dual-view bulk SST minus buoy SST) of +0.143 K, standard deviation 0.23 K. A total of 1503 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.070 K, standard deviation 0.27 K, and a mean (dual-view bulk SST minus buoy SST) of +0.223 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.

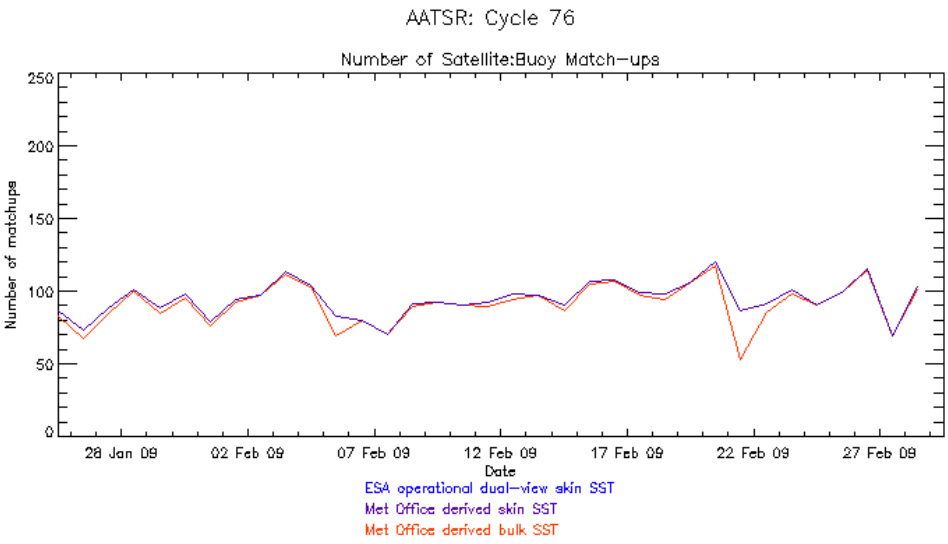

Figure 6.3: Plot of daily number of match-ups between 10´ AATSR SST values and in situ buoy SST for Cycle 76. Data provided by the Met Office.

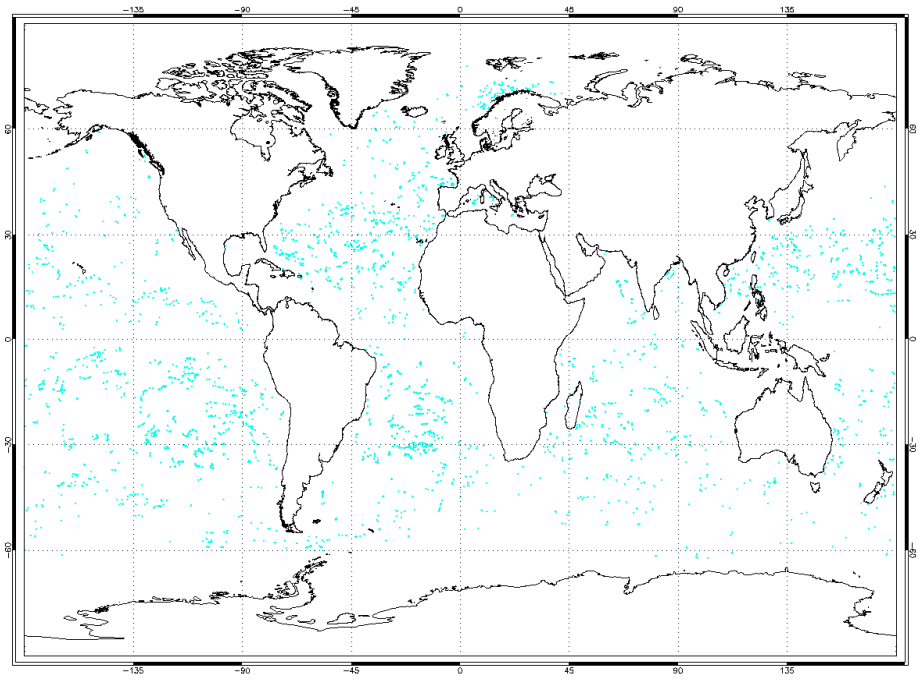

Figure 6.4: Map showing global distribution of match-ups between 10´ AATSR SST values and in situ buoy SST for Cycle 76. The red dots indicate a match-ups to a moored buoy; the cyan dots indicate a match-up to a drifting buoy. Data provided by the Met Office.

A complete update on the status of the instrument validation can be found in Section 1.6.2 of Cyclic Report 28.

7 DISCLAIMERS

No new disclaimers have been issued during this cycle.