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Project : **SST_CCI-Phase II**

Title : **SST CCI Climate Research Data Package**

Abstract : This document summarises the experimental SST data produced and used by the SST CCI project and describes where the data can be obtained.

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AMENDMENT RECORD

This document shall be amended by releasing a new edition of the document in its entirety. The Amendment Record Sheet below records the history and issue status of this document.

AMENDMENT RECORD SHEET

ISSUE	DATE	REASON FOR CHANGE
1	17 June 2015	Definitive issue for Phase-II reprocessing
2	18 August 2015	Amended following comments from ESA

RECORD OF CHANGES IN THIS ISSUE

Issue	Page/Sec.	Reason	Change
2	2.3	Review	Updated external access to EXP1.2 dataset
2	3	Review	Reference data now part of SIRDS deliverable
2	3.1.4	Review	Add contact address
2	3.1.9	Review	Corrected reference

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1. INTRODUCTION

1.1 Purpose and scope

This document summarises the experimental sea surface temperature (SST) dataset produced and used by the SST CCI project. This comprises level 2 pre-processed (L2P) products from AVHRR and ATSR sensors and level 3 uncollated (L3U) products from ATSR sensors from August 1991 to end-2013. The dataset builds upon the "long term" product released in Phase-I with the addition of post-2010 data and the experimental use of atmospheric correction smoothing for SST CCI level 2 products.

1.2 References

The following documents are referenced in this document:

ID	Title
RD.72	Rayner, N. A., et al. (2006), Improved analyses of changes and uncertainties in sea surface temperature measured in situ since the mid-nineteenth century: The HadSST2 dataset, Journal of Climate, 19(3), 446-469.
RD.87	GHRSST Science Team, cited 2010: The Recommended GHRSST Data Specification (GDS) Revision 2.0 Technical Specifications. [Available online at http://www.ghrsst.org/modules/documents/documents/GDS2.0_TechnicalSpecifications_v2.0.pdf.]
RD.171	CCI Phase 1 (SST) (2010), User Requirements Document, Reference SST_CCI-URD-UKMO-001; [Available online at http://www.esa-sst-cci.org/sites/default/files/documents/admin/public/SST_cci_URD_UKMO-001_Issue_2.pdf]
RD.325	ESA SST CCI Product User Guide (2013).
RD.326	Atkinson, C. P., N. A. Rayner, J. Robert-Jones, and R. O. Smith (2013), Assessing the quality of sea surface temperature observations from drifting buoys and ships on a platform-by-platform basis, J. Geophys. Res. Oceans, 118, doi:10.1002/jgrc.20257.

1.3 Acronyms

The following SST-specific acronyms are used in this report.

Acronym	Definition
(A)ATSR	(Advanced) Along-Track Scanning Radiometer
AMSR-E	Advanced Microwave Scanning Radiometer – Earth Observing System
ASCII	American Standard Code for Information Interchange
AVHRR	Advanced Very High Resolution Radiometer
CCI	Climate Change Initiative
CDR	Climate Data Record
CMC	Canadian Meteorological Center
COBE	Centennial *in situ* observation based estimates
ERSST	Extended Reconstruction SST
ESA	European Space Agency
GDS	GHRSST Data Processing Specification
GHRSST	Group for High-Resolution SST
GMPE	GHRSST Multi Product Ensemble
GTMBA	Global Tropical Moored Buoy Array
HadSST	The Met Office Hadley Centre dataset of gridded *in situ* temperature anomalies
HadISST	The Met Office Hadley Centre sea ice and sea surface temperature dataset
ICOADS	International Comprehensive Ocean-Atmosphere Data Set
ISAR	Inverse Synthetic-Aperture Radar
JMA	Japan Meteorological Agency
L2P	Level 2 Preprocessed data
L3U	Level 3 Uncollated data
L4	Level 4 data
M-AERI	Marine-Atmosphere Emitted Radiance Interferometer
MGDSST	Merged satellite and in situ data Global Daily SSTs in the global ocean
NetCDF	Network Common Data Format
NCDC	National Climate Data Center
NCEP	National Center for Environmental Prediction
NOAA	National Oceanic and Atmospheric Administration
NOCS	National Oceanographic Centre Southampton
OSTIA	Operational Sea Surface Temperature and Sea Ice Analysis
OI	Optimal Interpolation
PI	Principal Investigator
PIRATA	Prediction and Research Moored Array in the Atlantic
RAMA	Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction

Acronym	Definition
SEVIRI	Spinning Enhanced Visible and Infrared Imager
SIRDS	SST_cci Independent Reference Data Set
SISTeR	Scanning Infrared Sea Surface Temperature Radiometer
SST	Sea Surface Temperature
STFC	Science and Technology Facilities Council
TAO/TRITON	Tropical Atmosphere Ocean/Triangle Trans-Ocean Buoy Network project
TMI	Tropical Rainfall Measuring Mission (TRMM) Microwave Imager

1.4 Document structure

At the beginning of the document is a quick start guide to finding data in the SST CCI online archive.

The remainder of this document has the structure summarised below.

Section 2 The SST CCI data.

Section 3 SST data from external sources.

2. SST CCI DATA

The SST CCI project has produced and experimental SST dataset from two series of satellite instruments: ATSR and AVHRR. The dataset is intended to be a stable, low-bias SST dataset starting during 1991 and continuing to the end of 2013. However, it makes use of experimental atmospheric correction smoothing and has not been validated for climate uses.

Each file contains two sets of SSTs. The first set provides a measure of the temperature of the skin of the water at the time it was observed; the second set are estimates of the temperature at 20 cm depth and at either 1030 h or 2230 h local time (provision of data at 20 cm depth was one of the requirements revealed by the user requirements gathering exercise [RD.171]). They have uncertainty estimates that have been broken down into different components and a total uncertainty for each SST value.

The SST data are suitable for many uses, such as the study of temporal and spatial variability and comparison to or initialisation of numerical models. Owing to the orbital drift of some satellites, the 20 cm SSTs are better suited to the study of long term SST change than the skin SSTs as they have been adjusted so that they all represent the same point in the diurnal cycle

2.1 AVHRR data

Data from the AVHRR series of sensors is provided in L2P format (satellite swath). AVHRR products are generated using an optimal estimation retrieval incorporating atmospheric correction smoothing (smoothed-OE). This is intended to reduce the influence of radiometric noise in the final products (i.e. lower uncorrelated uncertainties).

2.2 ATSR data

Data from the ATSR series of sensors is provided in both L2P and L3U formats. ATSR products are generated using the ARC linear SST retrieval algorithm which has been proved to be both stable and low-bias. The L2P products are new to the experimental data release and include generalised atmospheric correction smoothing to reduce the effects of radiometric noise in the 1 km resolution L2P products. The ATSR L3U products do not include atmospheric correction smoothing and the grid cell averaging already performs a similar role.

2.3 Data location

The EXP1.2 data, being an experimental release, are not formally archived. Although intended primarily for internal research and development, they can be made available to any interested parties. Please contact science.leader@esa-SST-cci.org to discuss any interest in access.

3. SST DATA FROM EXTERNAL SOURCES

The SST CCI project has made use of various data products sourced from outside the project. These are characterised as either 'reference data' or 'comparison data'. Reference data are point observations or gridded versions of point observations (such as from drifting buoys) and have been used for development, testing or validation of the SST CCI products. Comparison data are all gridded (in many cases with data gaps infilled) products that are being used to determine how consistent the SST CCI data are with other products. Comparisons are also performed in the framework of a 'GMPE' (GHRSST Multi-product Ensemble), which is a combination of level 4 products.

All reference data is now included as part of the SST CCI Independent Reference Data Set (SIRDS), that will be publicly available with the full long-term dataset release. Reference data will be documented in the SIRDS deliverable.

Where permission has been granted the project has placed the comparison, reference and GMPE data on the internet for download from the same place as the SST CCI products (http://badc.nerc.ac.uk/view/neodc.nerc.ac.uk__ATOM__DE_6b503ac8-d294-11e2-8d19-00163e251233). All the data that are available from this webpage are provided under the Creative Commons Attribution 3.0 licence (http://creativecommons.org/licenses/by/3.0/). This allows free use of the data provided an acknowledgment to the data creators is given. Where permission has not been granted for the project to distribute data, we instead provide links to the data in this document.

The following sections summarise the data and indicates how to obtain them and where to find further information. Where data are provided from the SST CCI webpages information on data format and how to acknowledge the data is also provided.

All data provided from the SST CCI webpages are in NetCDF format. As this is a common format they are readable using many different tools. See RD.325 for details.

3.1 Comparison data

The comparison data sets are used to assess the consistency of SST CCI products with other similar products. For example trends in the different products are being compared.

Most of the comparison datasets use statistical methods to infill data gaps such as optimal interpolation. They vary considerably in their spatial and temporal resolution. Below is a list of the comparison datasets followed by sections that provide details of each:

- AVHRR Pathfinder v5.2 (Section 3.1.1).
- COBE SST (Section 3.1.2).
- ERSST v3b (Section 3.1.3).
- Gridded version of the reference data (Section 3.1.4).
- HadISST v1 (Section 3.1.5).
- Kaplan extended v2 (Section 3.1.6).
- MyOcean OSTIA reanalysis (Section 3.1.7).
- NOAA OI SST analysis v2 (Section 3.1.8).
- NOAA OI 0.25 degree AVHRR (Section 3.1.9).

- NOAA OI 0.25 degree AVHRR+AMSR-E (Section 3.1.10).
- NOCS surface flux dataset v2.0 (Section 3.1.11).

3.1.1 AVHRR Pathfinder v5.2

Brief description	The Pathfinder dataset is a reprocessing of AVHRR series data using a consistent algorithm. It is a long term, global SST dataset. Day and night data are collated to give twice daily SST fields.
Produced by	NODC.
Time span of data	1981 – 2011.
Spatial grid	4 km.
Frequency of data	Twice daily (day/night).
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/AVHRR_Pathfinder
Source of data (alternative download location)	ftp.nodc.noaa.gov/pub/data.nodc/pathfinder/Version5.2
Where to find information about the data	http://www.nodc.noaa.gov/SatelliteData/pathfinder4km/
Citation to use if using the data	As defined at http://www.nodc.noaa.gov/SatelliteData/pathfinder4km/, use of these data should be acknowledged using the text: "These data were provided by GHRSST and the US National Oceanographic Data Center. This project was supported in part by a grant from the NOAA Climate Data Record (CDR) Program for satellites". and cite Casey, K.S., T.B. Brandon, P. Cornillon, and R. Evans (2010). "The Past, Present and Future of the AVHRR Pathfinder SST Program", in Oceanography from Space: Revisited, eds. V. Barale, J.F.R. Gower, and L. Alberotanza, Springer. DOI: 10.1007/978-90-481-8681-5_16.

Data file format and description	NetCDF format following the specifications described in [RD.87]. This specification is very similar to that used for the SST CCI products for level 3 data. An example filename is: 19811220152842-NODC-L3C_GHRSST-SSTskin-AVHRR_Pathfinder-PFV5.2_NOAA07_G_1981354_day-v02.0-fv01.0.nc. The first eight digits provide the date (four digits for the year followed by two digits each for the month and the day). Later in the filename this information is repeated in the form YYYYDDD (four digits for year and three digits for the day of the year). This is followed by either _day or _night, which reveals which of the two daily SST collations is in the file. Key variables in the NetCDF files are: • *sea_surface_temperature* The SST data array. • *lat* The latitudes of the SSTs. • *lon* The longitudes of the SSTs. • *quality_level* An indicator of the quality of each SST between 1 (bad) to 5 (best quality); the *pathfinder_quality_level* variable provides the original quality flags produced by the Pathfinder project. • *l2p_flags* Information such as whether a location is over land, ice etc.

3.1.2 COBE SST

Brief description	Optimally interpolated in situ data. Daily analyses are formed from quality controlled observations from the seven days centred on the date being analysed. Monthly averages of the data are made available.
Produced by	JMA.
Time span of data	January 1981 – June 2013
Spatial grid	1° regular latitude longitude grid.
Frequency of data	Monthly.
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/COBE-SST
Source of data (alternative download location)	http://ds.data.jma.go.jp/tcc/tcc/products/elnino/cobesst/cobe-sst.html
Where to find information about the data	http://ds.data.jma.go.jp/tcc/tcc/products/elnino/cobesst_doc.html
Citation to use if using the data	Ishii, M., A. Shouji, S. Sugimoto, and T. Matsumoto, 2005: Objective Analyses of Sea-Surface Temperature and Marine Meteorological Variables for the 20th Century using ICOADS and the Kobe Collection. Int. J. Climatol., 25, 865-879.
Data file format and description	The COBE-SST files have been converted to NetCDF from the original GRIB format. The filenames have the form sstYYYYMM.nc where YYYY is the year and MM is the month. The key variables in the files are: • *WTMP* The SST data array. • *latitude* The latitudes of the SSTs. • *longitude* The longitudes of the SSTs.

3.1.3 ERSST v3b

Brief description	Version 3b of the Extended Reconstructed Sea Surface Temperature (ERSST) dataset. Reconstructions of SSTs are formed from in situ data only; anomalies from the 1971-2000 average are also provided.
Produced by	NCDC.
Time span of data	January 1854 – June 2013.
Spatial grid	2° regular latitude longitude grid.
Frequency of data	Monthly.
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/COBE-SST
Source of data (alternative download location)	ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v3b/netcdf
Where to find information about the data	http://www.ncdc.noaa.gov/ersst/
Citation to use if using the data	Smith, T.M., R. W. Reynolds, T. C. Peterson, and J. Lawrimore, 2008: Improvements to NOAA's historical merged land-ocean surface temperature analysis (1880-2006). J. Climate, 21, 2283-2296.
Data file format and description	NetCDF data files with names of the form ersst.YYYYMM.nc, where YYYY is the year and MM is the month. With the files the key variables are: • *sst* The SST data. • *err* Standard deviation of errors in the SST data. • *anom* SST anomalies relative to the 1971-2000 climatology from Xue, Y., T. M. Smith, and R. W. Reynolds, 2003: Interdecadal changes of 30-yr SST normals during 1871-2000. J. Climate, 16, 1601-1612. • *lat* Latitudes of the data points. • *lon* Longitudes of the data points.

3.1.4 Gridded version of the reference data

Brief description	A gridded version of the reference data set excluding radiometer measurements. It includes ship and buoy SST data that have been quality controlled using the methods described in RD.326 and near-surface observations from Argo floats. The observations have been gridded according to the methods described in RD.72 and are presented on a monthly grid of anomalies relative to a 1961-1990 average.
Produced by	The ESA SST CCI project.
Time span of data	1991 – 2010.
Spatial grid	5° regular latitude longitude grid.
Frequency of data	Monthly.
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/gridded_reference_data

Source of data (alternative download location)	None.
Where to find information about the data	Contact science.leader@esa-SST-cci.org if more information is required.
Citation to use if using the data	See details of how to reference SST CCI data in RD.325.
Data file format and description	The data are in a single NetCDF format file. The key variables in the file are: • *sst_anomalies* SST anomalies relative to the 1961-1990 average. • *latitude* Latitudes of the grid points. • *longitude* Longitudes of the grid points. • *time* Time points in units of hours since midnight on 01 January 1970.

3.1.5 HadISST v1

Brief description	Reconstructed SST fields from in situ and AVHRR satellite data. The reconstruction method is a two stage reduced-space optimal interpolation. Following this local detail is restored by superimposing observations back onto the reconstructions.
Produced by	Met Office Hadley Centre.
Time span of data	1870 – present.
Spatial grid	1° regular latitude longitude grid.
Frequency of data	Monthly.
Location of data at NEODC	Not available – see source of data below.
Source of data (alternative download location)	http://www-hc/~hadobs/www.hadobs.org/hadisst/data/download.html
Where to find information about the data	http://www-hc/~hadobs/www.hadobs.org/hadisst/
Citation to use if using the data	Rayner, N. A.; Parker, D. E.; Horton, E. B.; Folland, C. K.; Alexander, L. V.; Rowell, D. P.; Kent, E. C.; Kaplan, A. (2003) Global analyses of sea surface temperature, sea ice, and night marine air temperature since the late nineteenth century J. Geophys. Res.Vol. 108, No. D14, 4407 10.1029/2002JD002670
Data file format and description	See originator's website.

3.1.6 Kaplan extended v2

Brief description	Empirical orthogonal functions are used to interpolate in situ observations (before 1981) and to reproject NCEP OI data (combinations of in situ and satellite data) (1981 onwards).
Produced by	Alexey Kaplan (Columbia University; http://rainbow.ldeo.columbia.edu/~alexeyk/).
Time span of data	January 1856 – June 2013.
Spatial grid	5° regular latitude longitude grid.

Frequency of data	Monthly.
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/Kaplan_extended
Source of data (alternative download location)	http://iridl.ldeo.columbia.edu/SOURCES/.KAPLAN/.EXTENDED/.v2/.ssta/
Where to find information about the data	http://iridl.ldeo.columbia.edu/SOURCES/.KAPLAN/.EXTENDED/.dataset_documentation.html
Citation to use if using the data	Kaplan, A., M. Cane, Y. Kushnir, A. Clement, M. Blumenthal, and B. Rajagopalan, Analyses of global sea surface temperature 1856-1991, Journal of Geophysical Research, 103, 18,567-18,589, 1998 R. W. Reynolds, T. M. Smith. Improved global sea surface temperature analyses.. J. Climate 7, 1994
Data file format and description	A single NetCDF file contains all the data. Key variables are: • *ssta* SST anomalies relative to 1951-1980. • *X* Longitudes of the grid points. • *Y* Latitudes of the grid points. • *T* Date, in months since 1 January 1960.
Data file format and description	Two files are provided. expected_ssta_total.cdf contains the expected values from the combination of the large scale and mid scale SST reconstructions. ensemble_ssta_total_20mem.cdf contains an ensemble of 20 realisations of the SST, created by drawing samples from the posterior distribution of the mid scale reconstruction combined with the expected values from the large scale reconstructions. Further data describing the mid scale reconstruction are available from the originator website. Both files are NetCDF format and have the following key variables: • *ssta* SST anomaly relative to the 1961-1990 average. • *X* Longitudes of the SSTs. • *Y* Latitudes of the SSTs. • *T* Time of the SSTs in months relative to 1 January 1960. • *IMEM* Ensemble member (ensemble_ssta_total_20mem.cdf only).

3.1.7 MyOcean OSTIA reanalysis

Brief description	In situ and satellite (ATSR and AVHRR) data are combined and infilled using optimal interpolation to give daily estimates of foundation SST. The analysis is performed using the Met Office Operation Sea Surface Temperature and Sea Ice (OSTIA) system.
Produced by	Met Office.
Time span of data	1985 – 2007 .
Spatial grid	0.05° regular latitude longitude grid.
Frequency of data	Daily.
Location of data at NEODC	Not available in its original form. It can be obtained in its original form from the source below.

Source of data (alternative download location)	http://www.myocean.eu/web/69-myocean-interactive-catalogue.php/?option=com_csw&view=details&product_id=SST_GLO_SST_L4_REP_OBSERVATIONS_010_011
Where to find information about the data	As above.
Citation to use if using the data	Roberts-Jones, J., E. Fiedler and M. Martin, 2012: Daily, global, high resolution SST and sea-ice reanalysis for 1985-2007 using the OSTIA system, J. Climate, 25, 6215-6232, doi:10.1175/JCLI-D-11-00648.1.
Data file format and description	The data are in NetCDF format and follow the GHRSST data specification. See originator's website for more information.

3.1.8 NOAA OI SST analysis v2

Brief description	Weekly optimum interpolation analysis of in situ and satellite SSTs. Satellite data are adjusted for biases prior to the analysis.
Produced by	NOAA.
Time span of data	1981 – present.
Spatial grid	1° regular latitude longitude grid.
Frequency of data	Weekly and monthly data are available.
Location of data at NEODC	Not available – see source of data below.
Source of data (alternative download location)	http://www.esrl.noaa.gov/psd/data/gridded/data.noaa.oisst.v2.html (for NetCDF format data).
Where to find information about the data	http://www.emc.ncep.noaa.gov/research/cmb/sst_analysis/
Citation to use if using the data	See originator's website.
Data file format and description	See originator's website.

3.1.9 NOAA OI 0.25° AVHRR SST analysis

Brief description	Optimum interpolation analysis of in situ data and AVHRR satellite data. Satellite data are bias adjusted using the in situ data as the reference.
Produced by	NOAA NCDC.
Time span of data	1981 – present.
Spatial grid	0.25° regular latitude longitude grid.
Frequency of data	Daily.
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/DailyOI-AVHRR
Source of data (alternative download location)	http://www.ncdc.noaa.gov/cdr/operationalcdrs.html (data in GHRSST data specification format are also available; see http://www.nodc.noaa.gov/SatelliteData/ghrsst/)

Where to find information about the data	http://www.ncdc.noaa.gov/oa/climate/research/sst/oi-daily-information.php
Citation to use if using the data	From http://www1.ncdc.noaa.gov/pub/data/sds/cdr/use_stmts/CDR_Fair_Use_Stmt_Sea_Surface_Temperature_Optimum_Interpolation.pdf the acknowledgement or citation to use is Acknowledgement Request: The OISST CDR used in this study was acquired from NOAA's National Climatic Data Center (http://www.ncdc.noaa.gov). This CDR was originally developed by Richard Reynolds and colleagues for the NOAA's CDR Program. Citation Request: Reynolds, R. W., T. M. Smith, C. Liu, D. B. Chelton, K. S. Casey and M. G. Schlax, 2007: Daily High-Resolution-Blended Analyses for Sea Surface Temperature. *J. Climate*, **20**, 5473–5496. doi:10.1175/2007JCLI1824.1 Reynolds, R.W. 2009. What's new in version 2. Available online at http://www.ncdc.noaa.gov/oa/climate/research/sst/papers/oisst_daily_v02r00_version2-features.pdf.
Data file format and description	NetCDF format with key variables: • *sst* The SST data. • *anom* SST anomalies. • *err* Error standard deviation of the SSTs. • *lat* Latitudes of the grid points. • *lon* Longitudes of the grid points.

3.1.10 NOAA OI 0.25 degree AVHRR+AMSR-E SST analysis

Brief description	Optimum interpolation analysis of in situ data, and AVHRR and AMSR-E satellite data. Satellite data are bias adjusted using the in situ data as the reference.
Produced by	NOAA NCDC.
Time span of data	2002 – 2011.
Spatial grid	0.25° regular latitude longitude grid.
Frequency of data	Daily.
Location of data at NEODC	http://neodc.nerc.ac.uk/browse/neodc/esacci_sst/data/comparison/DailyOI-AVHRR+AMSRE
Source of data (alternative download location)	http://www.ncdc.noaa.gov/cdr/operationalcdrs.html (data in GHRSST data specification format are also available; see http://www.nodc.noaa.gov/SatelliteData/ghrsst/)
Where to find information about the data	http://www.ncdc.noaa.gov/oa/climate/research/sst/oi-daily-information.php

Citation to use if using the data	From http://www1.ncdc.noaa.gov/pub/data/sds/cdr/use_stmts/CDR_Fair_Use_Stmt_Sea_Surface_Temperature_Optimum_Interpolation.pdf the acknowledgement or citation to use is Acknowledgement Request: The OISST CDR used in this study was acquired from NOAA's National Climatic Data Center (http://www.ncdc.noaa.gov). This CDR was originally developed by Richard Reynolds and colleagues for the NOAA's CDR Program. Citation Request: Reynolds, R. W., T. M. Smith, C. Liu, D. B. Chelton, K. S. Casey and M. G. Schlax, 2007: Daily High-Resolution-Blended Analyses for Sea Surface Temperature. *J. Climate*, **20**, 5473–5496. doi:10.1175/2007JCLI1824.1 Reynolds, R.W. 2009. What's new in version 2. Available online at http://www.ncdc.noaa.gov/oa/climate/research/sst/papers/oisst_daily_v02r00_version2-features.pdf.
Data file format and description	NetCDF format with key variables: • *sst* The SST data. • *anom* SST anomalies. • *err* Error standard deviation of the SSTs. • *lat* Latitudes of the grid points. • *lon* Longitudes of the grid points.

3.1.11 NOCS surface flux dataset v2.0

Brief description	Optimally interpolated dataset of SST and other surface variables based on in situ data.
Produced by	NOCS.
Time span of data	1973 – 2011.
Spatial grid	1° regular latitude longitude grid.
Frequency of data	Monthly.
Location of data at NEODC	Not available – see source of data below.
Source of data (alternative download location)	http://rda.ucar.edu/datasets/ds260.3/
Where to find information about the data	http://www.noc.soton.ac.uk/ooc/CLIMATOLOGY/noc2.php
Citation to use if using the data	See originator's website.
Data file format and description	See originator's website.