

Latest results and publications

Various improvements have been made to the SST retrievals:

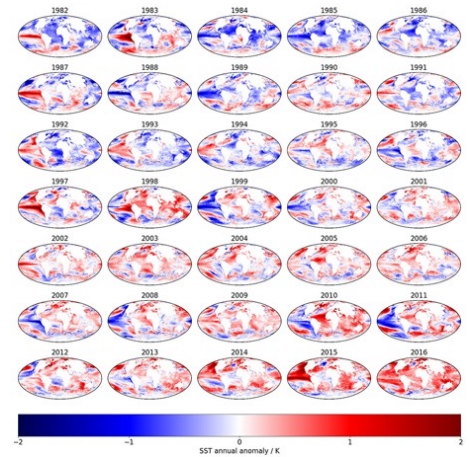
- Improvements to retrieval process should bring greater stability to NOAA AVHRR SSTs
- Prior to Metop-A AVHRR and SLSTR, NOAA AVHRRs dominate although the ATSR-series SSTs play an important anchoring role through the 1990s to 2012
- New techniques anchor NOAA AVHRRs to in situ observations. Unlike v2, CDR v3 is not maximally independent of in situ data - a trade-off against the better expected accuracy.
- ATSRs, Metop AVHRRs and SLSTRs still give SSTs based on physics and independent of in situ data. These data become increasingly important through the 1990s to the present

Products are based on a greater mean density of SST observations

- New data streams and extended exploitation of some missions will increase observation density. This should reduce overall SST uncertainty in the CCI analysis.

Smaller errors from desert dust

- A known problem with v2 was contamination of the SST record by dust aerosol events, particularly from the Sahara.
- Post-hoc improvements to stability and accuracy in desert dust regions have been developed for v2 and are available only through the surftemp.net access route.
- Improvements developed for v3 have reduced their impact significantly at a more fundamental level, by improved retrieval techniques including bias-aware optimal estimation methods [1], a fundamental development within SST CCI, for the AVHRR series in particular.



Temperature trends in the SST CCI climate data record [2].

Product updates and status

The current SST CCI climate data record is v2 [3], which covered 1981 to 2016 and which continues to be routinely extended by compatible data created for the Copernicus Climate Change Service. A seamless, convenient access (at user-defined resolution) to the combined CCI/C3S record has been created at surftemp.net

The v3 upgrade is presently ~50% generated and will cover 1980 to 2020, the extensions at both ends being a firm request from the modelling community. The full dataset is anticipated to be complete by January 2022, and will be assessed and first tried out by a set of early adopters (see below). **Data will be available to early-adopters in late 2021.**

Public access to the SST CCI v3 Climate Data Record (CDR) is planned for Q3 of 2022

The forms of data will follow the same strategy as for v2: Level 4, daily gap-filled; Level 3C – best SSTs from a given satellite daily; Level 3U – all SSTs from a given orbit (all on a 0.05 degree grid). Level 2 – all SSTs from a given orbit at sensor resolution. A 30-year SST climatology

International profile

Six SST CCI publications have citations within the recent IPCC 6th assessment report.

Material has been proposed to the COP 26 green zone via the UK Space4Climate network (TBD).

SST CCI continues to participate and provide leadership in the key observations community, the Group for High Resolution Sea Surface Temperature.

Plans for the Climate Assessment

The climate assessment report will be revised by end May 2022 and will include an updated comparison of the SST CCI products to other climate SST data sets. It will also include assessments of the products' utility provided by early adopters.

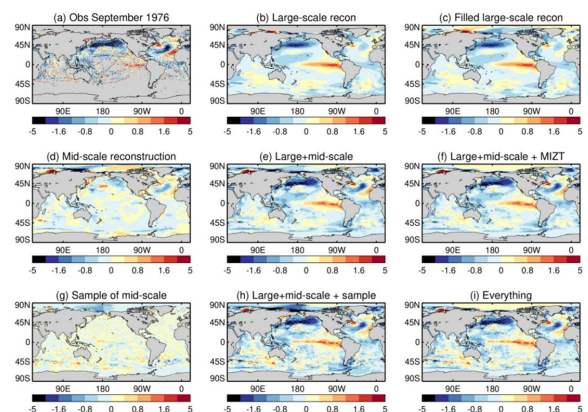
We have a number of early adopters already agreed and are in the process of recruiting more. Contact nick.rayner@metoffice.gov.uk to sign up for early access.

A dedicated user case study will utilize the SST CCI AVHRR retrievals to improve the historical reconstruction in the HadISST data set that runs from 1850 onwards.

Through this work we will enable use of the SST CCI products to a wider number of applications.

References

1. Merchant et al., Remote Sensing of Environment, 2020, 10.1016/j.rse.2019.111590.
2. Bulgin et al., Nature Sci. Rep., 2020, 10.1038/s41598-020-64785-9.
3. Merchant et al., Nature Scientific Data, 2019, 10.1038/s41597-019-0236-x (in the top 2% for attention across all journals).



Reconstructing complete sea-surface temperature anomaly for September 1976 HadISST.2.3.0.c