



Use of ACSPO VIIRS SST in OSTIA

Emma Fiedler, Simon Good



Introduction

OSTIA is the Met Office Operational SST and Ice Analysis

- L4 (gap-free analysis), global, daily
- Foundation SST (uses all nighttime observations and daytime observations only when wind speed $>6 \text{ m s}^{-1}$)
- $1/20^\circ$ grid resolution
- Optimal Interpolation type assimilation scheme
- Validates well against other analyses (compared to independent near-surface Argo observations)

Introduction

Data types currently assimilated in OSTIA:

- NOAA-18 and 19 AVHRR
- MetOp-A AVHRR
- SEVIRI
- GOES-E
- In situ (ships, drifters, moored buoys)

OSTIA performs a bias-correction of satellite data to a reference dataset of all in situ data and a high-quality subset of MetOp-A AVHRR.

We are actively testing new data types for inclusion in OSTIA, including ACSPO VIIRS L3U.

VIIRS in OSTIA

Owing to data storage and processing limitations, it is not possible for us to use VIIRS L2P, so L3 product is very useful.

A control OSTIA run, and a run including VIIRS L3U were conducted, for a test month of March 2015.

The VIIRS data were subsampled to around 1,000,000 observations per day, giving a similar number of observations to the other data types to avoid swamping the analysis.

Other data is also subsampled as at the moment we have no need for data at a higher spatial resolution than our grid size ($1/20^\circ$).

VIIRS in OSTIA

Similar to the other satellite data types, the observation error variance for ACSPO VIIRS used in the analysis is taken from the SSES standard deviation estimate.

The SSES bias estimate was removed from the observation before the analysis bias correction using the reference dataset was applied.



Met Office

Results

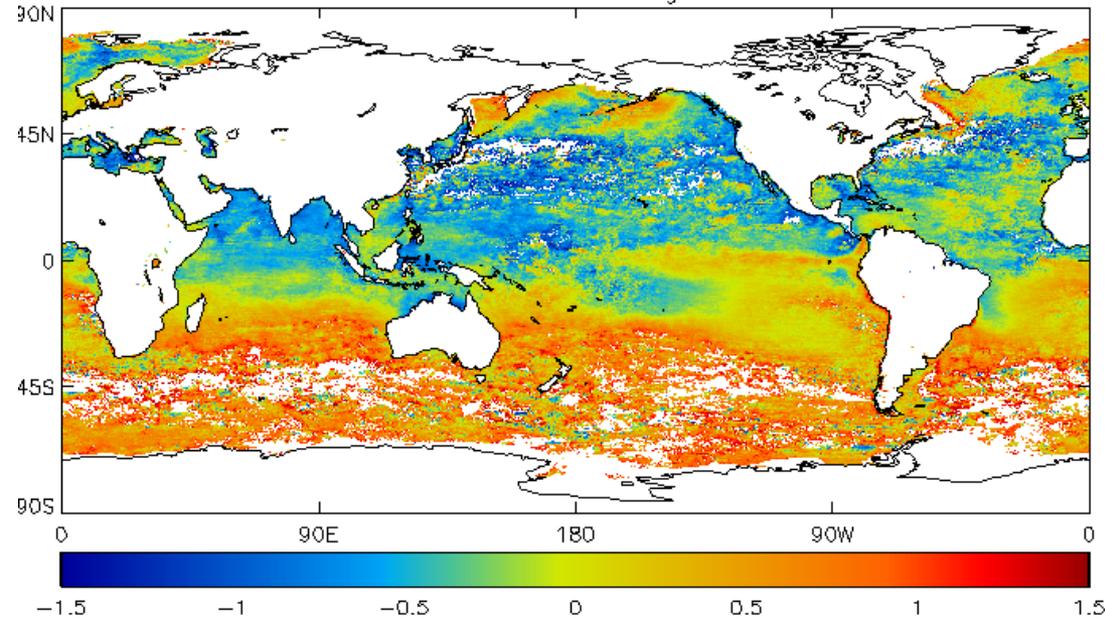
Hmm...

Observations look like latitudes have been switched around, with lots of observations rejected in mid-latitudes.

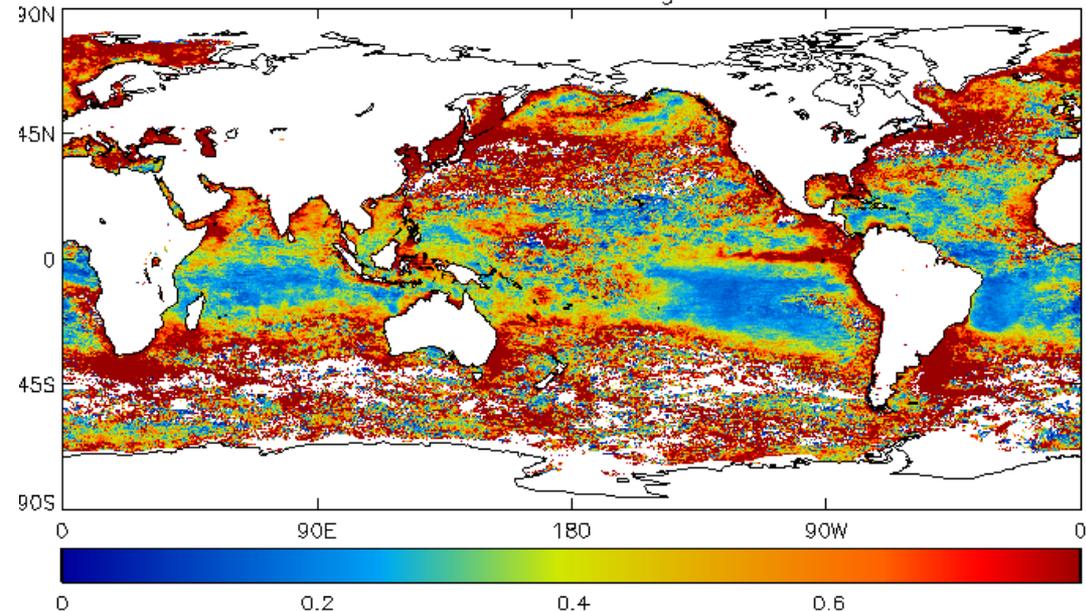
~75% of observations fail the background check, and the dataset does not improve the analysis (obviously...)

Means for March 2015, for $\frac{1}{4}$ degree grid boxes

VIIRSGLOBAL obs-bg bias



VIIRSGLOBAL obs-bg rms



Next steps

- The latitude problem is being investigated – looks like this is due to a stack overflow error.
- A run investigating the effect of not using the VIIRS SSES bias will also be conducted, and daily plots of the analysis bias correction for VIIRS will be produced for both runs. It is hoped that these results will demonstrate that the application of the SSES bias will result in less work being done by the analysis bias correction.
- We would plan to include VIIRS in OSTIA at the next operational change (early 2016), pending successful testing.



Met Office

Questions?
emma.fiedler@metoffice.gov.uk

