

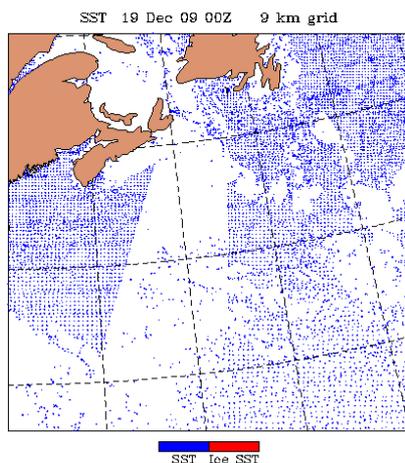
# LETTER No 2

**February 2011**

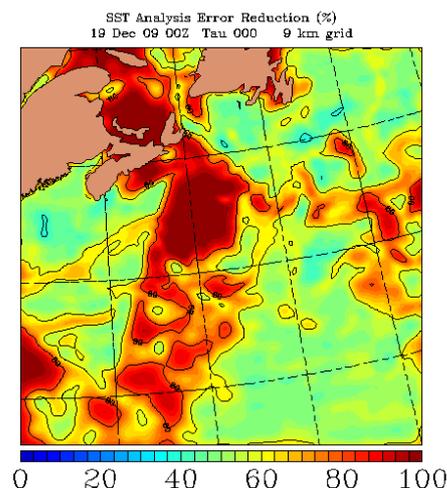
**GHRSSST proposal for CEOS-SST-VC +++ Inhomogeneities: real or sampling artefact? +++ SQUAM developments +++ Brazilian SST activities +++ Publication highlights +++ GHRSSST web-site under development**

**GHRSSST proposal to serve as CEOS-SST-VC:** The Committee on Earth Observation Satellites (CEOS) coordinates civil space-borne observations of the Earth. Following consultation with the GHRSSST Science Team and CEOS members, a CEOS Virtual Constellation (VC) for Sea Surface Temperature has been initially proposed, to be built on and implemented through the existing GHRSSST activities. The initial proposal will be presented to the CEOS Strategic Implementation Team (SIT) in Tokyo in March 2011. In anticipation of the March endorsement, Ken Casey and Craig Donlon will prepare the full proposal and Implementation Plan, for discussion with the Advisory Council at the GHRSSST XII in Edinburgh (June 2011) before presentation to CEOS SIT for final approval. For further information on how to get involved please contact Craig Donlon and Ken Casey.

**Inhomogeneities: real or sampling artefact?** Dick Reynolds and Dudley Chelton stressed at the NASA-SST meeting the need to distinguish between real small scale inhomogeneities, and the inhomogeneities introduced artificially by non-uniform sampling in time and space. This issue becomes increasingly important with increasing resolution. It is known to the GHRSSST data producers, and one quick solution is to interpret the data together with a map indicating data voids (see, e.g., Fig.1).



**Figure 1.** Example for a data coverage map (from NRL Coupled Ocean DA (NCODA)).



**Figure 2.** Map of SST analysis error reduction (from NRL Coupled Ocean DA (NCODA)).

However, a simple map of data coverage in the current analysis does not give all information. For instance, in the area where there is a data void in today's analysis, there might have been an observation the previous day. Hence, the error estimates for some of the L4 producers take into account the previous

and current information, including the error variances of the observations and background, and the correlations.

Therefore, e.g. Jim Cummings suggests using normalized analysis error fields; see Fig. 2 for an example.

The Inter Comparison Technical Advisory Group (IC-TAG) is addressing this issue in their development of user guidance on the various L4 products and are continuing research on L4 error determination and comparison metrics, with two papers in preparation. SST map (L4) users need to be aware about the possible pitfalls of mis-interpreting small scale inhomogeneities caused by changes in resolution and sampling.

**SST Quality Monitor (SQUAM) developments:** Sasha Ignatov and Prasanjit Dash worked with many of you to add L4 analyses to SQUAM ("L4-SQUAM")

<http://www.star.nesdis.noaa.gov/sod/sst/squam/L4/>.

Currently L4-SQUAM monitors the following L4 products for self- and cross-consistency, in near-real time: two daily Reynolds products (AVHRR and AVHRR+AMSR-E based); two RTG (low and high resolution); NAVO K10; NESDIS POES-GOES Blended; NASA JPL G1SST; UKMO OSTIA; Canadian Met Service CMC0.2; ODYSSEA; GMPE. Adding remaining L4 data (BoM GAMSSA, JPL MUR, RSS Blended Products, and NRL NCODA) is under way.

Consistent validation of all L4s against uniformly quality controlled in situ data, available from the in situ Quality Monitor (iQuam) <http://www.star.nesdis.noaa.gov/sod/sst/iquam/>, is also reported.

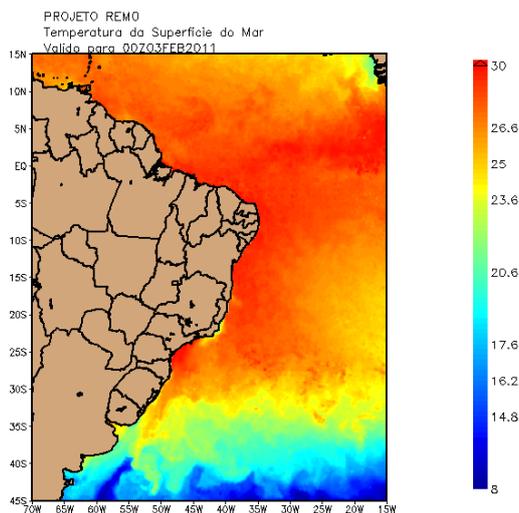
L4-SQUAM is a part of IC-TAG activities and is a useful addition to the GMPE. Its objective is to assist L4 developers as well as L4 users. Please let [Alex.Ignatov@noaa.gov](mailto:Alex.Ignatov@noaa.gov) know what L4-SQUAM can do to better help you, to test or improve L4 products, or facilitate their use.

**New RDAC ESACCI:** The new RDAC name ESACCI has been created for ESA's Climate Change Initiative on Sea Surface Temperature. The project will generate GHRSSST format products under the name ESACCI. The project is presently entering its algorithm development and selection phase. Please watch for the announcement of an opportunity to participate in this process. After implementation of selected algorithms in a processing chain, products will be distributed in GHRSSST format around the start of 2013. These will include ATSR and AVHRR SSTs for 1991 to 2010 at 0.05 deg resolution, and a version of the OSTIA SST-depth analysis using ESA SST CCI satellite inputs only. Demo products will include passive microwave SSTs with a new uncertainty model (derived with reference to AATSR), and Metop and SEVIRI products.

**Brazilian SST activities related to ocean forecasting in the South Atlantic:** REMO (Rede de Modelagem e Observação Oceanográfica) is a Brazilian network for Ocean Modelling, Observation and Forecasting, funded by National Petroleum Agency (ANP) and Petrobras ([www.rederemo.org](http://www.rederemo.org)). Besides, there is also participation of four Brazilian Universities and Navy. REMO is based on the ocean models HYCOM and ROMS and provides operational ocean forecasts, mainly for marine safety and oil spill applications. The Applied Meteorology Laboratory (LMA/UFRJ) is responsible for the remotely sensed product (SST and SSH). In particular, the L4 skin SST is daily produced. This is based on PO.DAAC product from AVHRR SST ([ftp://podaac.jpl.nasa.gov/near\\_real\\_time/sea\\_surface\\_temperature/avhrr\\_nav0\\_mcsst/data](ftp://podaac.jpl.nasa.gov/near_real_time/sea_surface_temperature/avhrr_nav0_mcsst/data)) and TMI SST ([ftp://ftp.ssmi.com/sst/daily/tmi\\_amsre](ftp://ftp.ssmi.com/sst/daily/tmi_amsre)). Developments are underway to use GOES12-13 data as well. The method to obtain the L4 SST field is based upon Barnes's approach. The SST fields are produced with the spatial resolution of 5.5km from 2002 up to now (Figure 3). The L4 product of LMA has been validated by

comparing to OSTIA and by comparing to in situ data from 8 PIRATA buoys (França G. F., Oliveira A. N., Ruivo B. C. Gaspar R. L., Dutra H., Paes R. and Sartori A. "Applying Barne's technique for daily SST (AVHRR and TRMM/microwave) images composition", 2011, in print).

Our Brazilian colleagues (Dr. Gutemberg França, Dr. Rosa Cristhyna Paes, B.Sc. Antônio do Nascimento Oliveira, M.Sc. Victor Bastos Daher and B.Sc. Bianca Couto Ruivo from LMA) expressed interest in collaborating with the GHRSSST groups IC-TAG, STVAL-WG, EARWiG and DV-WG. Their future plans include development of own L2 products, assimilation of SST into the REMO model, and research on the near surface profile. DAS-TAG already kindly offered advice for implementing the GDS2 and help for establishing the data transfer to the GDAC in order for REMO to become the Brazilian RDAC.



**Figure 3.** An example of SST field produced by REMO (Domain: 45°S – 15°N and 70°W – 15°W).



**Figure 4.** From left to right: Gutemberg França, Andrea Kaiser-Weiss, Antônio do Nascimento Oliveira, and Victor Bastos Daher.

On 24<sup>th</sup>-25<sup>th</sup> January, a Brazilian delegation visited the GHRSSST Project Office (Fig.4).

### Publication highlights:

1. Early on-line access is available to Ian Barton's paper accepted for publication by J Tech: Improving Satellite-Derived Sea Surface Temperature Accuracies Using Water Vapor Profile Data: <http://journals.ametsoc.org/doi/pdf/10.1175/2010JTECHA1502.1>
2. A PDF copy of the paper from Prasanjit Dash et al., The SST Quality Monitor (SQUAM), J.Tech-Oceans, **27**, 1899-1917, 2010, is available at: [http://www.star.nesdis.noaa.gov/sod/sst/squam/documents/NESDIS\\_SQUAM.pdf](http://www.star.nesdis.noaa.gov/sod/sst/squam/documents/NESDIS_SQUAM.pdf).

**The GHRSSST web-site is under development:** from 14<sup>th</sup> February 12 UTC onwards. Its operation will be continuous, but please inform the GHRSSST Project Office (GPO) about any edits you do from 14<sup>th</sup> February 2011 onwards to ensure they will be copied to the new site (under development), which will replace the current one in March.