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New Canadian RDAC: The Canadian Meteorological Centre (CMC) has become a GHRSSST Regional Data Assembly Centre (RDAC) in anticipation of contributing the CMC global L4 product in 2011. The analysis is currently undergoing pre-operational testing at CMC. This product has been a member of the GHRSSST Multi-Product Ensemble since April, 2008.

GDS2.0 amendments: The GDS2.0 released on 1st October is in testing and in implementation now, e.g., at the Australian RDAC (ABOM), OSI-SAF, MyOcean, and several others. Any issues arising during implementation and solutions suggested by the DAS-TAG are collected at the GHRSSST web page under Documents /GDS documents /GDS2_Amendments_tracker*.xls for further reference and for inclusion into GDS2.1.

Envisat extension orbit: The Envisat orbit was lowered by 17.4 km and the orbit inclination is allowed to drift. The manoeuvres (22.-28. October) have been successful, and will allow the mission to operate for another 3 years. Initial verification of the products has not highlighted any change in AATSR data quality.

Requirements for Argo: GHRSSST confirms the interest in the Argo near-surface measurements (unpumped temperature data). The scientific interest for a vertical resolution of 10 cm in the first 3m and 50 cm below (to 10m) has been stated (see the GHRSSST web page under Documents/Argo_and_DBCP/GHRSSST_reply2feedback_Argo_16Sept.pdf).

DBC-P-GHRSSST Pilot Project: Drifting buoys have been upgraded by Metocean to meet the GHRSSST specifications for accuracy and resolution (with respect to temperature, location, and time). The first 6 buoys out of a batch of 59 have been deployed by E-SURFMAR in the

North Atlantic. Additional 30 buoys will be deployed in the Indian Ocean during the first months of 2011.

ERNESST meeting: The European Research Network for Estimation from Space of Surface Temperature (ERNESST) met as a side event at the Eumetsat annual conference in Cordoba, Spain. The meeting notes are available at www.ernesst.eu. As well as members interested in sea surface temperature, attendees included people working on lake, ice and land surface temperature. It was identified that consistent surface temperature retrieval across the boundaries of these regimes could be a useful focus of collaboration between these different communities.

NASA SST meeting: US-based SST related science has been discussed in Seattle, on 8th-10th November (see <http://depts.washington.edu/uwconf/sst2010>), and general recommendations have been derived. Among other needs for developing community consensus on best practises, GHRSSST was called for to develop the communication with the users, and to establish user-friendly standards in the documentations.

GHRSSST DVWG, HL-TAG & ST-VAL

workshop: 28th February-1st March 2011, at the University of Colorado in Boulder. The objective of this meeting is to discuss the key scientific issues overlapping these groups. www.ghrsst.org/Joint-DVWG,-HL-TAG-and-ST-VAL-Workshop-2011

GHRSSST XII Science Team meeting:

27th June-1st July 2011 at the University of Edinburgh, Scotland. This annual Science team meeting will give special emphasis on facilitating the exchange between data users and producers. www.ghrsst.org/GHRSSST-XII.html

New data products from JPL

A daily, global Sea Surface Temperature (SST) data set is produced at 1-km (known as the ultra-high resolution) by the JPL OurOcean team. Based on the level 2 preprocessed (L2P) data products from the Group for High Resolution Sea Surface Temperature (GHRSSST), the input SST data include infrared (IR) sensors (e.g., AVHRR, METOP, MODIS, AATSR) with a spatial resolution of 1 km, the Geostationary Satellites (GOES, MTSAT, SEVIRI/MSG) with a spatial resolution of 5 km, and microwave sensors (e.g., AMSR-E, TMI) with a spatial resolution of 25 km. The in-situ SST measurements from ships, moorings, surface drifters, and profiling floats are also used. The goal is to combine these multi-satellite SST observations and in situ measurements into a global optimal estimate of SST at the highest possible spatial resolution in near real-time (less than 24 hours behind real-time).

In order to combine all the available SST data sets at various spatial resolutions, we have developed a multi-scale two-dimensional variational (2DVAR) blending algorithm. This 2DVAR algorithm is characterized by inhomogeneous and anisotropic background error covariances, which are of particular importance for coastal oceans (Chao *et al.*, 2009).

In addition to the gap-free G1SST data, we also provide a data void mask that shows those locations there are no satellite or in situ measurements during a 24-hour period (Figure 1). We provide images for the global ocean as well as selected regions. Users can also generate on-demand images with the appropriate color scale over any region of interests by specifying the starting and ending longitudes and latitudes.

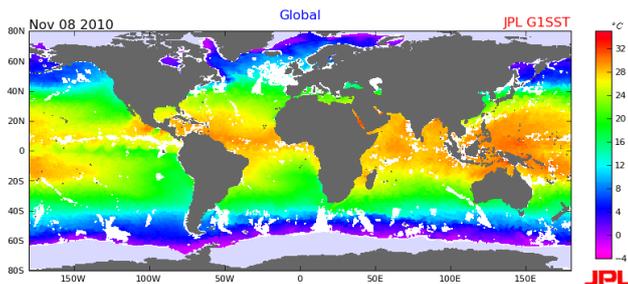


Figure 1. The blended L4 SST image from the data-void masked G1SST data product on Nov. 8, 2010.

G1SST can be visualized using the Google Earth API. The Google Earth Plug-in and its JavaScript API let users

embed G1SST images within Google Earth and visualize through a web interface. Users can also download the G1SST KML files that can be visualized by the standard Google Earth software (<http://earth.google.com/>). The digital data are stored in the netCDF format following the Climate and Forecast (CF) Metadata Convention and can be downloaded from the OpenDAP (<http://www.opendap.org/>) and THREDDS (<http://www.unidata.ucar.edu/projects/THREDDS/>) server.

The G1SST data are produced daily in near real-time: yesterday's image and data are usually available in the morning PST/PDT-USA/Canada. The version 1.0 G1SST data product started from September 1, 2008. The version 2.0 G1SST data product started from May 1, 2009, and includes more input data (e.g., METOP, AATSR, and In-Situ). The Google Earth API interface and the OpenDAP/THREDDS data server are also implemented during the development of the version 2 G1SST. The G1SST data can also be obtained from the Global Data Assembly Center at JPL PO.DAAC: <http://podaac.jpl.nasa.gov/>.

G1SST is validated against independent in situ measurements in real-time. On the daily basis, we are withdrawing 20% of the in situ SST measurements from the blending process, and use them as independent data for validation. We are publishing the daily statistics: G1SST consistently shows a cold bias in the range of -0.05° and -0.1° and the RMS error on the order of 0.5° . We are also providing the G1SST data to the NOAA The SST Quality Monitor (SQUAM) in real-time for independent evaluation and validation studies.

Future improvements of G1SST are planned in the coming years and include cold bias correction, diurnal cycle correction, a better representation of the input data error, and more advanced error covariances. There are also plans to produce a longer time series of G1SST prior to September 2008.

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Reference

Chao, Y., Z. Li, J. D. Farrara, and P. Huang: Blended sea surface temperatures from multiple satellites and in-situ observations for coastal oceans. *Journal of Atmospheric and Oceanic Technology*, Vol. 26, No. 7, 1435-1446, 10.1175/2009JTECHO592.1, 2009.