S3T2

Satellite and in situ SST reprocessing and harmonization at NOAA

Alexander Ignatov[1], Boris Petrenko[1,2], Xinjia Zhou[1,3], John Stroup[1,4], Feng Xu[1,2,5], Prasanjit Dash[1,3], Xingming Liang[1,3], Kai He[1,2], Yury Kihai[1,2]

1 NOAA STAR, USA; Alex.Ignatov@noaa.gov; 1-301-683-3379

2 GST, Inc, NCWCP, College Park, MD 20740, USA

3 CIRA, Ft Collins, CO 80523, USA

4 SGT, Inc, NCWCP, College Park, MD 20740, USA

5 Fudan University, China

NOAA is responsible for satellite sea surface temperature (SST) products from several platforms and sensors, including AVHRR onboard NOAA and Metop satellites (1981-pr) and VIIRS onboard S-NPP (2011-pr) and four future JPSS satellites, J1-4 (scheduled for launch from 2017-2026). The NOAA enterprise SST system, Advanced Clear-Sky Processor for Ocean (ACSPO), is consistently used to process data from various platforms and sensors. All ACSPO SST products are routinely validated against uniformly quality controlled in situ SSTs, provided by another NOAA system, in situ SST Quality Monitor (iQuam; www.star.nesdis.noaa.gov/sod/sst/iquam/).

In addition to operational products, two satellite reprocessing (or "Reanalysis", RAN) efforts are currently underway. The AVHRR RAN version 1 (RAN1) reprocessed data from seven AVHRRs (onboard NOAA-15 to -19, and Metop-A and -B) from 2002-pr. The VIIRS RAN1 reprocessed data of S-NPP from 2012-pr.

In situ data in iQuam have been also reprocessed, and the new version 2 (iQuam2) generated. The iQuam time series have been extended to cover the full satellite SST era from 1981-pr (from 1991-pr in iQuam1) using ICOADS v2.50. Several new data types have been added, including ARGO floats, IMOS ships, GHRSST high-resolution drifters, and Coral Reef Watch buoys.

In RAN1, the AVHRR and in situ SSTs have been harmonized using rolling recalculation of the regression coefficients in the SST algorithm. Work is underway to improve the AVHRR calibration, which is expected to minimize the need for rolling anchoring of its SSTs to in situ data. The VIIRS radiances were found quite stable and therefore static VIIRS SST coefficients have been used in the operations and in RAN1. Work is underway to explore improvements to the time series using dynamic coefficients. The satellite and in situ SSTs are routinely inter-compared in the NOAA SST Quality Monitor (SQUAM; www.star.nesdis.noaa.gov/sod/sst/squam/) system.

This presentation discusses these reprocessing and harmonization efforts, and future work towards periodic reprocessing of the geostationary ACSPO SST from the two close AHI and ABI sensors (onboard the Japan Himawari-8 satellite launched in Oct 2014, and next-generation US geostationary satellite GOES-R to be launched in Oct 2016) and harmonization with in situ iQuam SST.

Oral

- **Integrating In-situ / satellite data sources**