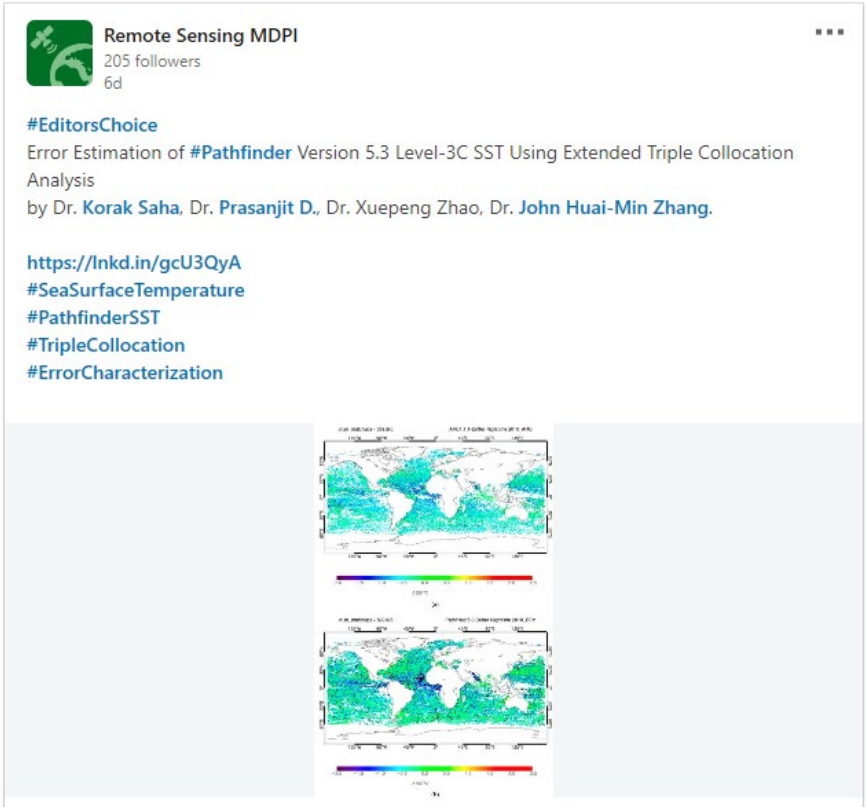
Weekly Report

SCSB/CISESS
Cooperative Research Program Division (CoRP)
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

Submitted by: Hugo Berbery
Prepared by: Debra Baker
Date of Submission: 9/25/2020

Awards and Recognition

Pathfinder Article is Editor's Choice: CISESS Scientist Korak Saha had his article featured as "Editor's Choice" by *the Remote Sensing* journal in a Linked-In posting on 9/18/2020.



The article is called "Error Estimation of Pathfinder Version 5.3 Level-3C SST Using Extended Triple Collocation Analysis" and was published in *Remote Sensing* in February 2020. The full article is at https://doi.org/10.3390/rs12040590.

(POC: Korak Saha, korak.saha@noaa.gov, Funding: NCEI)

Publications

STAR Releases the Reprocessed Suomi NPP Satellite Observations: The JPSS/SNPP reprocessing project was initiated at STAR in 2015. Its goal was to reprocess all the JPSS/SNPP instruments through their life-cycle using the most recently updated and unified calibration algorithms to generate consistent SDRs. The project was mostly conducted by the CISESS/STAR reprocessing working group, with collaborations with STAR instrument CAL/VAL teams and ICVS team. With several year's effort, 5 years of the SNPP SDR data during the period from its launch time to the present for the SNPP instruments including ATMS, CrIS, VIIRS, and OMPS have been reprocessed using their baseline calibration algorithms. The reprocessing allows scientists to quantify the SDR quality in the time dimension, which opens the opportunity for the SDRs to be used in a variety of environmental applications such as development of climate data records, identifying NWP model errors, improving climate reanalyses as input datasets, and supporting satellite Cal/Val and GSICS programs as references.

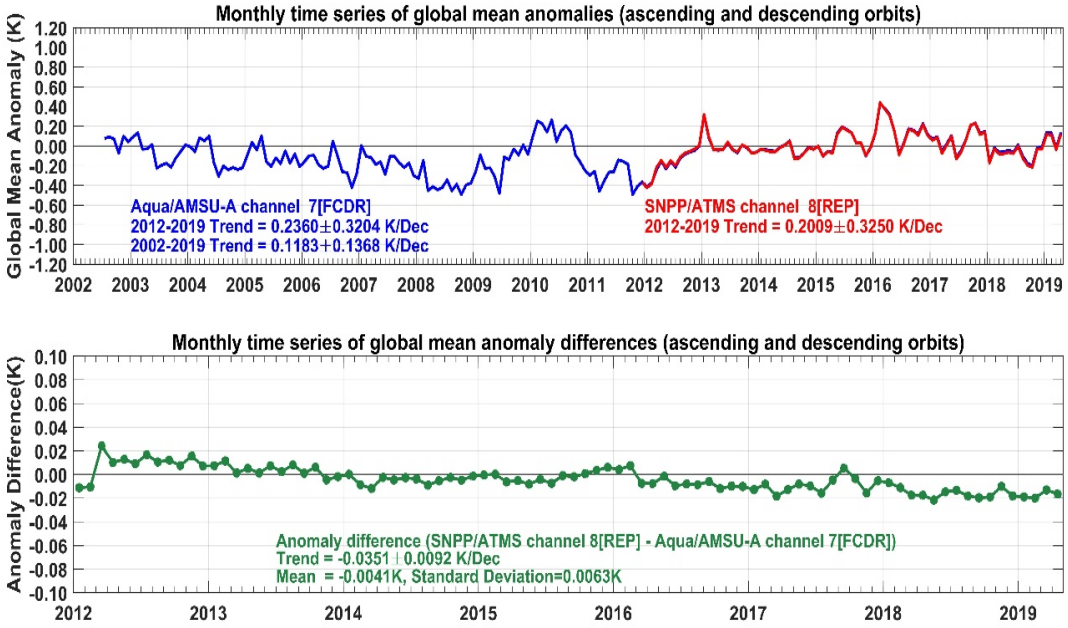


***Figure**: Monthly global mean brightness temperature (T_b) anomaly time series for AMSU-A channel 7 onboard Aqua (blue, top) versus ATMS channel 8 onboard SNPP (red, top) and their difference time series (green, bottom). The AMSU-A and ATMS data are from June 2002 and December 2011 to December 2018, respectively. The AMSU-A anomaly time series are overlaid by ATMS during their overlapping period. Amplified scale of temperature is used in the bottom panel to show detailed features in the anomaly difference time series. Both ATMS and AMSU-A data are from limb-adjusted scan positions of 29-68 and averaged over ascending and descending orbits. The plots suggest that both the Aqua/AMSU-A and SNPP/ATMS data achieve a radiometric stability of 0.004K/Year, satisfying the measurement requirement for climate change detection. Uncertainties in trends represent 95% confidence intervals with autocorrelation adjustments.*

Zou, Cheng-zhi, Lihang, Zhou, **Lin, Lin**, Ninghai Sun, **Yong Chen***, Lawrence E. Flynn, **Bin Zhang**, Changyong Cao, Flavio Iturbide-Sanchez , Trevor Beck, Banghua Yan, Satya Kalluri, **Yan Bai**, **Slawomir Blonski***, Taeyoung Choi, Murty Divakarla, Yalong Gu, Xianjun Hao , Wei Li, Ding Liang, Jianguo Niu, **Xi Shao**, **Larrabee Strow**, David C. Tobin, Denis Tremblay, **Sirish Uprety**, **Wenhui Wang**, **Hui Xu**, **Hu Yang** and Mitchell D. Goldberg, 2020: The Reprocessed Suomi NPP Satellite Observations. *Remote Sens*., **12**, 2891, https://doi.org/10.3390/rs12182891 [*worked on the project while they were at CICS/CISESS].

(POC: Lin Lin, linlin@umd.edu, Funding: JSTAR)

AMSU-A Climate Data Records: A paper summarizing the current AMSU-A sensor calibration and satellite intercalibration was published in *Remote Sensing.* The paper describes the various methods employed to develop a homogeneous time series of AMSU-A brightness temperature (e.g., Fundamental Climate Data Record – FCDR) at window channels 23.8, 31.4, 50.3 and 89.0 GHz across six satellites (NOAA-15, -16, -17, -18, -19 and MetOp-A) for the period 1998 to present. Substantial improvement to the data has been accomplished, as shown in the figure below. The data are also used as input to generate Thematic CDR's (TCDR) for products such as total precipitable water and land surface temperature. The same methodology is being used to extend the time series with current satellite data, but will require a change in the reference satellite, most likely MetOp-A.

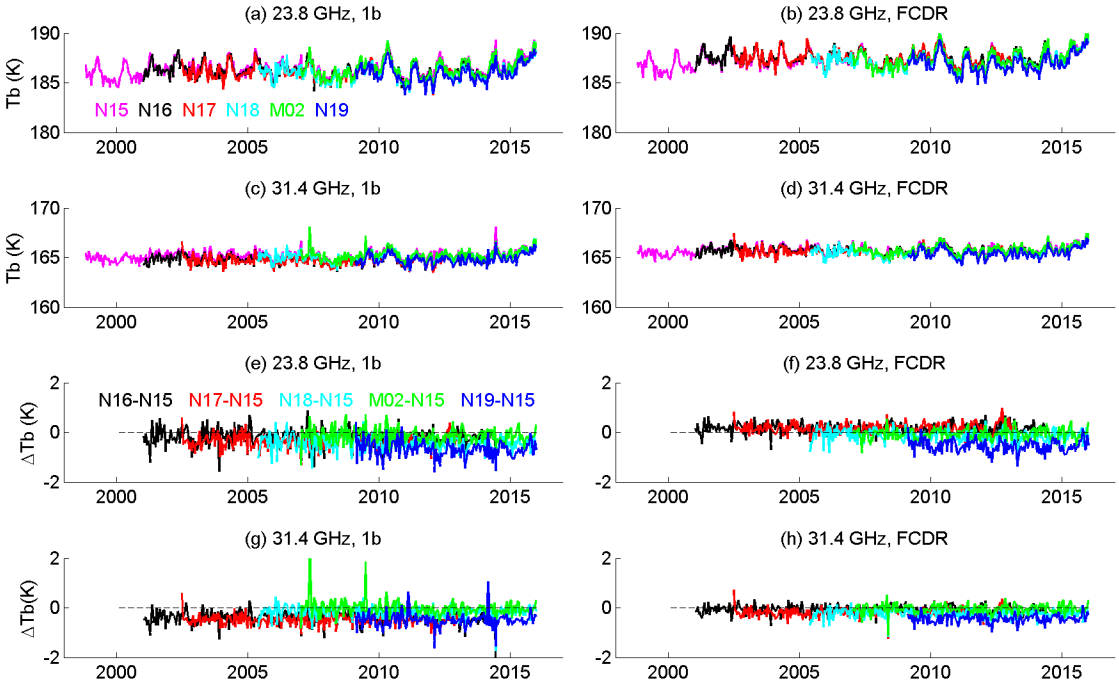


Figure: *Tropical ocean mean Tb (**a**–**d**) and DTb (**e**–**h**) for 23.8 and 30.4 GHz channels. Left panels display the values of 1b before inter-satellite calibration, while the right panels are FCDRs after inter-satellite calibration.*

Yang, W., **H. Meng**, **R. Ferraro** and Y. Chen, 2020: Inter-Calibration of AMSU-A Window Channels. *Remote Sens*., **12**, 2988, https://doi.org/10.3390/rs12182988.

(*POC: Ralph Ferraro/Huan Meng, Funding: NCEI/CDR program and PDRA)*