

Validation of the Pathfinder version 5.3 L3C Sea Surface Temperature with global drifter data



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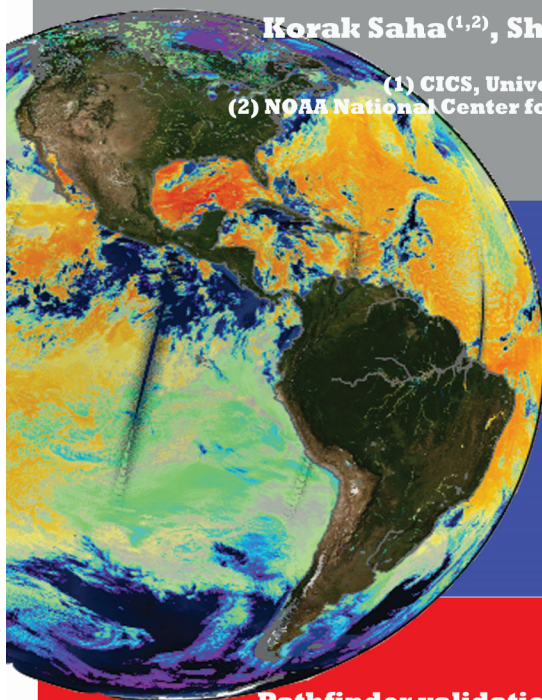
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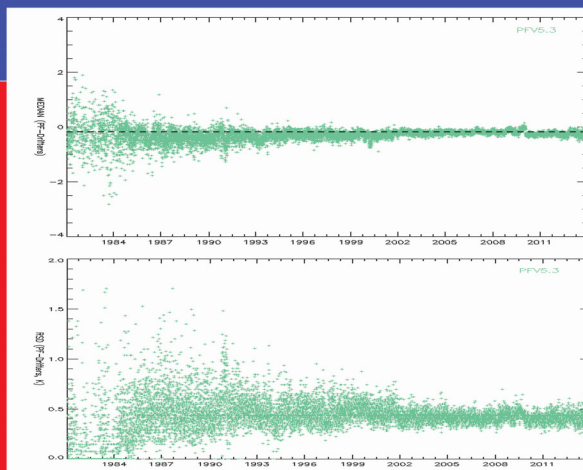
The AVHRR Pathfinder Version 5.3 (PFV5.3) Level-3 Collated (L3C) Sea Surface Temperature (SST) data set is a collection of global, twice-daily (Day/Night) 4km SST data of 33 years (1981-2014) produced by the NOAA National Centers for Environmental Information (NCEI). SST is generated with measurements combined from a single instrument into a space-time grid. In this process multiple passes/scenes of data are combined. PFV5.3 was computed with data from the AVHRR instruments on board NOAA's polar orbiting satellite series using the updated SeaDAS (version 6.4) system.



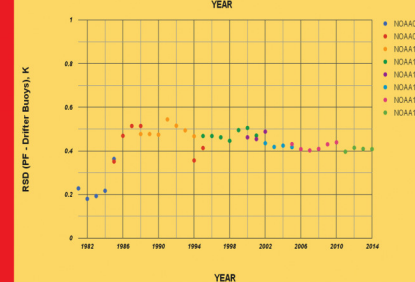
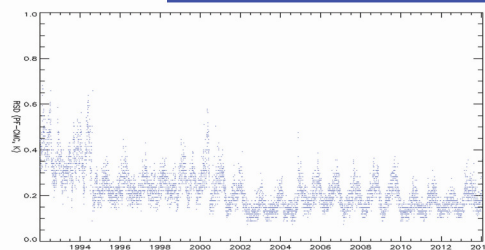
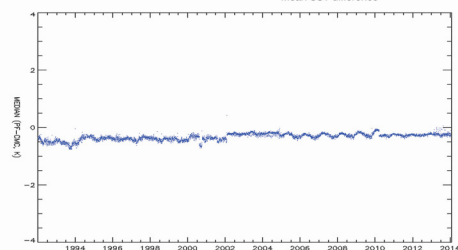
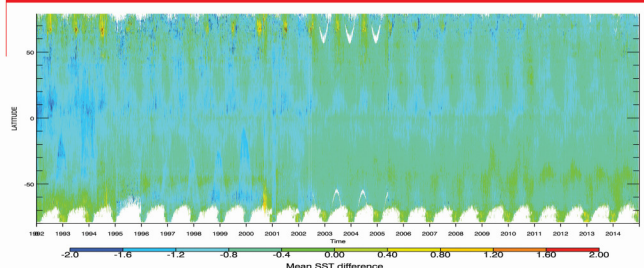
Pathfinder validation with Drifter buoys:

A Matchup dataset between PFV5.3 with global drifting buoys from iQuam2 are generated for QF=4 and 5.

The global mean and standard deviation of SST differences (PFV5.3 - drifting buoy), is of the order of ~ 0.2 K, and ~ 0.5 K respectively.



PFV5.3 is also compared with an independent Canadian Meteorological Centre (CMC) Level-4 SST. A timeseries of PFV5.3-CMC and Hovmuller of zonal average for 24 years are generated. Mean and Standard deviation of the difference field are ~ 0.2 K and ~ 0.3 K respectively.



Conclusions:

1. The ~ 0.2 K mean difference corresponds to bulk-skin SST differences
2. AVHRR-3 sensors (post NOAA-16) SSTs are more stable
3. Instabilities in pre NOAA-16 can be attributed to suboptimal sensor calibration, and uncertainty in regression coefficients.

Future Work:

- (a) Update the regression coefficients with a latitudinal band table instead of the wet/dry coefficients
- (b) Generate the regression coefficients on daily basis rather than current monthly format
- (c) Intercomparison of other Level-3 long term dataset (ARC, ACSPO RAN etc.)