

NOAA Operational Geostationary Sea Surface Temperature Product Suite

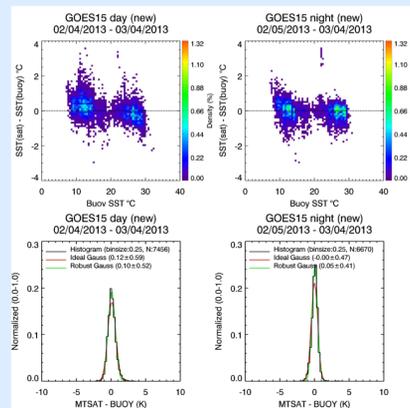
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NOAA's Office of Satellite Data Processing and Distribution (OSPO) generates operational SST retrievals from GOES-15 and 13 satellites as well as from the Japanese Multi-function Transport Satellite (MTSAT-2) and the European Meteosat Second Generation (MSG-3) satellite. The satellites are situated at longitudes 135° W, 75° W, 0° and 140° E respectively, making it possible to acquire high temporal SST retrievals with Advanced Very High Resolution Radiometer (AVHRR) SST - like quality for most of the tropical mid-latitudes (excluding 60 to 80 degrees East longitude). The operational data products include regional hourly and 3-hourly hemispheric imagery, 24 hour merged composites, SST Level 2 preprocessed (L2P) products (GOES-SST every 1/2 hour for each hemisphere, MTSAT-2 SST L2P full disk every hour, MSG-3 SST L2P full disk every fifteen minutes), and a match-up data file for each product. Global daily SST analyses at 11-km (0.1°) and 5-km (0.05°) resolution are derived from combined day & night and nighttime-only operational NOAA satellite products (NOAA-19, MetOp-A, GOES-E/W, MTSAT-2 and MSG-3 SSTs).

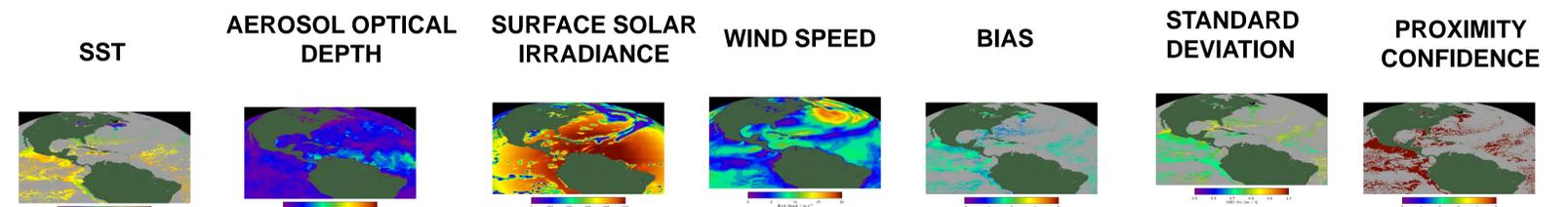
Retrieval Algorithms

The derivations for each satellite consist of two steps:

- 1) Cloud detection using a Bayesian Probabilistic Cloud Mask
- 2) Application of a Physically-based SST retrieval



GOES-SST Level 2 Pre-processed Sea Surface Temperature Products



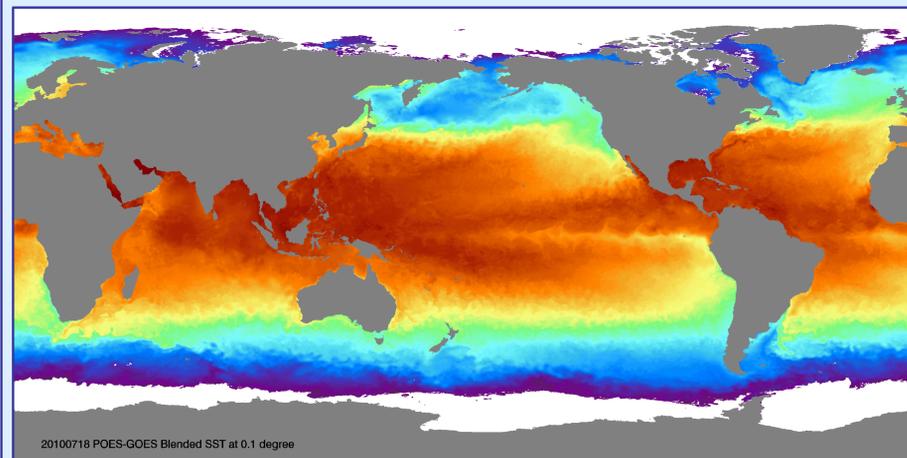
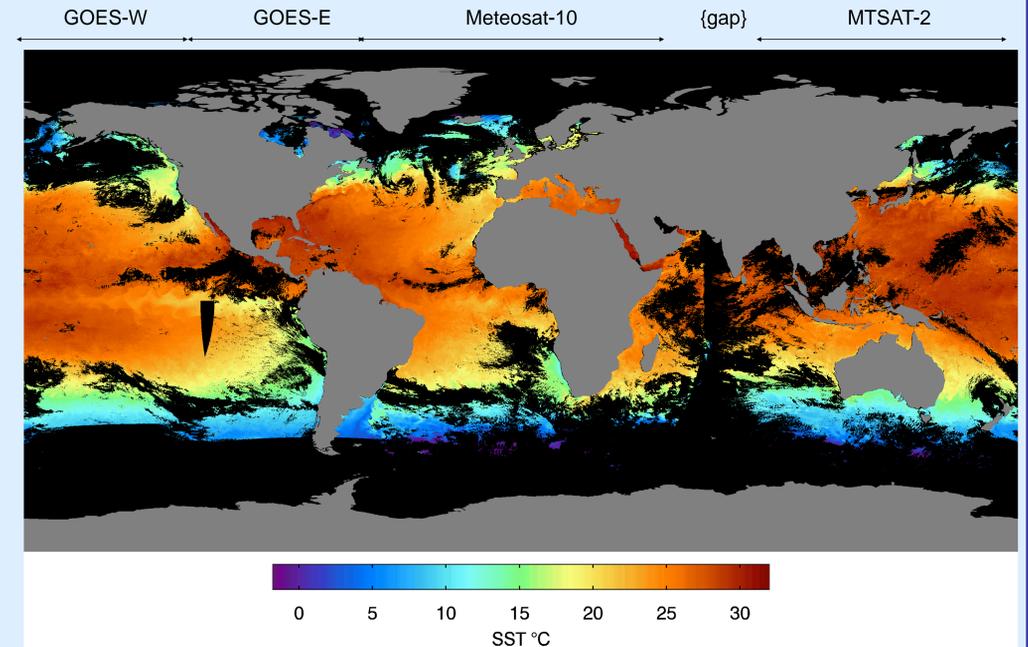
Level-2 preprocessed – SST retrievals are put into a standard format and ancillary information is added, including environmental conditions and retrieval errors. The current GOES-SSTL2P product is generated every 1/2 hour for GOES-E & W, N & S sectors and the netCDF product file has 22 parameters for each pixel: **SST**, time, latitude, longitude, satellite zenith angle, **aerosol optical depth**, **surface solar irradiance**, **wind speed**, Uncertainty estimates (**bias and S.D.**), **Proximity Confidence Value**, QC flags (including cloud and land), Ice concentration, Deviation from analysis SST, Temporal coincidences of ancillary data c.f. SST observation, Source codes for ancillary data, Probability of clear-sky (Bayesian cloud mask). Similar SST Level-2P products are produced for MTSAT and MSG.

Validation

All SST retrievals are validated in relation to the drifting and fixed buoys and the Reynolds OISST analysis. An automated validation system exists to quality control the SST retrievals and uses the operational match up file as an input to calculate the number of matches, maximum bias, mean bias on daily, weekly, and monthly timescales. An SST reprocessing system for quality control is part of the validation system to test and regenerate all SST products when a retrieval error is discovered or a new component of the algorithm requires testing.

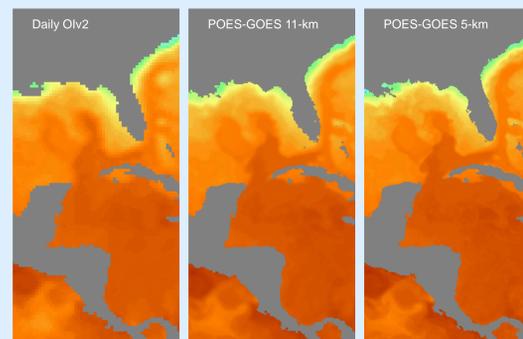
Geostationary SST product coverage

The image is a 24 hour merged composite of the Operational geostationary SST products generated by NOAA. This Image consists of GOES-W (15), GOES-E (13), MSG, a gap, and MTSAT-2 data.



20100718 POES-GOES Blended SST at 0.1 degree
11 km global multi-SST analysis (NOAA-19, MetOp-A, GOES-E/W, MTSAT-2 and MSG SSTs)

Global Geo-Polar SST Analysis Products



Comparison of Geo-Polar SSTs with Reynolds Daily-OI