

Satellite sea surface temperatures
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Sea surface temperature (SST) is one of the most important variables related to the global ocean-atmosphere system. It is a key indicator for climate change and is widely applied to studies of upper ocean processes, to air-sea heat exchange, and as a boundary condition for numerical weather prediction. The importance of SST to accurate weather forecasting of both severe events and daily weather has been increasingly recognized over the past several years. Multiple operational SST products are currently available and are in widespread use. Despite the well-established state of SST measurements, there are still significant weaknesses in the existing operational SST products which do not take full advantage of the numerous satellites and different sensors now available.

Infrared retrievals of SST are available from several different radiometers carried on both geostationary and polar-orbiting satellites, while microwave retrievals are available from only polar-orbiting satellites. Blending data from different sensors requires a more rigorous bias and error characterization than is necessary when only including data from a single sensor type. Therefore, creating a high-quality multi-sensor SST requires careful inter-calibration of different satellite sensors, calculation of sensor-specific observation errors that consider environmental variables, location of observation, and sensor calibration problems; and development of techniques for relating and combining measurements at different spatial resolutions and times of the day.