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MISST: The Multi-Sensor Improved Sea Surface Temperature Project

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Abstract

Sea surface temperature (SST) measurements are vital to global weather prediction, climate change studies, fisheries management, and a wide range of other applications. Measurements are taken by several satellites carrying infrared and microwave radiometers, moored buoys, drifting buoys, and ships. Collecting all these measurements together and producing global maps of SST has been a difficult endeavor due in part to different data formats, data location and accessibility, and lack of measurement error estimates. The need for a uniform approach to SST measurements and estimation of measurement errors resulted in the formation of the international Global Ocean Data Assimilation Experiment (GODAE) High Resolution SST Pilot Project (GHRSSST-PP). Projects were developed in Japan, Europe, and Australia. Simultaneously, in the United States, the Multi-sensor Improved SST (MISST) project was initiated. Five years later, the MISST project has produced satellite SST data from nine satellites in an identical format with ancillary information and estimates of measurement error. Use of these data in global SST analyses has been improved through research into modeling of the ocean surface skin layer and upper ocean diurnal heating. These data and research results have been used by several groups within MISST to produce high-resolution global maps of SSTs, which have been shown to improve tropical cyclone prediction. Additionally, the new SSTs are now used operationally for marine weather warnings and forecasts.

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