USE OF HIGH RESOLUTION SST DATA FOR OPERATIONAL APPLICATIONS

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ABSTRACT

Accurate high resolution specification of sea surface temperature (SST) is important for regional weather forecasting studies and coastal ocean applications. Recent studies have shown that the use of coarse resolution SST products such as from the real-time global (RTG) SST analysis or other coarse resolution once-a-day products do not properly portray the diurnal variability of fluxes of heat and moisture from the ocean that drive the formation of low level clouds and precipitation over the ocean. High resolution regional coverage of accurate SST variability is also important for hurricane and tropical storm intensity forecasts and verification of ocean circulation models. In previous work, weather model forecasts were improved using high resolution SST data produced with a polar orbiting data compositing technique, which provided spatially continuous, accurate, high-resolution SST fields using data from the Moderate-resolution Imaging Spectrometer (MODIS) on NASA's Terra and Aqua satellites. The compositing technique generated four daily maps of SST using data from the previous days to augment and fill in for clouds and missing data in the current days / times MODIS orbital swath. The forecast impact was limited in some situations however, due to composite product inaccuracies brought about by data latency during periods of long-term cloud cover.

Recent research has developed an enhanced SST composite product for regional weather applications. The enhancements come from several changes to the compositing process. First, AMSR-E SST data is added to the compositing process to reduce the latency of the MODIS only product due to prolonged cloud cover. Second, the source of the real time data has been switched from direct broadcast ground stations to the GHRSST L2P data stream available from the Physical Oceanography DAAC at JPL. The near real time L2P data stream allows for the use of all Terra and Aqua passes, and a pixel-based cloud detection and error estimation. Third, the compositing scheme incorporates a more sophisticated latency and error weighting scheme applied to each data set and time. The enhanced SST composite product has been integrated into NASA's Short Term Prediction and Research Transition (SPoRT) program (Jedlovec et al. 2006) and distributed to the NWS, other government agencies, and the public for use in regional weather forecast applications. This paper describes the data set and provides examples on its impact on weather forecasting applications.