



Improved surface wind analyses for air-sea interaction studies and applications

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New cross-calibrated, multi-platform (CCMP) ocean surface wind data sets are now available at the Physical Oceanography Distributed Active Archive Center. These data support wide-ranging research and applications related to air-sea interactions. The Level 3.0 data set has global ocean coverage (within 78S-78N) with 25-kilometer resolution. These data are available every 6 hours beginning in July 1987. An enhanced variational analysis method (VAM) combines multiple input data sources to create the Level 3.0 data set. Level 3.5 data sets are 5-day and monthly time averages of the Level 3.0 wind components and the corresponding pseudo-stress components. The VAM performs quality control and optimally combines wind observations from several individual satellite microwave radiometer and scatterometer sensors along with available conventional ship and buoy wind observations and (ECMWF) analyses. The Level 2.5 data sets assign wind directions from the Level 3.0 data set to the individual microwave radiometer data sets.

The VAM analyses fits the wind observations used very closely. The VAM analyses compare very well with withheld WindSat observations. Compared to conventional analyses and reanalyses, the CCMP winds are significantly different in some synoptic cases, result in different storm statistics, and provide enhanced high-spatial resolution time averages of ocean surface wind. For example, the CCMP winds sometimes depict storms in different locations or reveal entirely new closed wind circulations. In a statistical sense, the net impact of assimilating satellite surface winds in the VAM is generally to increase the maximum vorticity and wind speed relative to the ECMWF background. As an example of the use of CCMP time averaged data sets, tropical streamline analyses of the monthly averaged VAM analyses reveal the evolution of the El Niño - Southern Oscillation in high spatial resolution.