HOW ACCURATE ARE QUIKSCAT WIND MAPS? A METRIC FOR EVALUATION

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High resolution wind products from QuikSCAT have the potential to improve analyses and modeling of atmosphere/ocean interaction, particularly on smaller scales and in coastal regions. There are numerous QuikSCAT and blended products available, but how accurate are these products and what is their real resolution? The accuracy of the wind products has two components: the accuracy of the original data and the efficiency of the mapping algorithm. The accuracy of the original data collocated to match in situ observations can be quite different than the accuracy of the data that have been interpolated to a fixed spatial and temporal grid, as required for many applications, such as forcing an ocean model. Here we present a simple metric for evaluating winds and wind products by comparison with anemometer winds. A group of five anemometers deployed on buoys in the Aegean Sea are used to evaluate QuikSCAT wind maps. The Aegean Sea is a particularly challenging region for mapping, as the numerous islands in this region both give rise to highly variable winds and interfere with the radar returns. Comparisons with the buoy winds are used to establish a baseline for the evaluation of the accuracy of gridded products with varying temporal resolution and spatial smoothing. Because temporal and spatial smoothing of fields can improve anemometer correlations at the expense of reducing amplitudes, we use a Taylor diagram, which incorporates both correlation and magnitudes to give a single number: the error as a fraction of signal variance, or "normalized error." We combine the Taylor diagram with vector correlations, so that errors in wind speed and direction are included. Although point comparisons are not optimal for evaluating derived fields, such as wind divergence or wind stress curl, the Taylor diagram and anemometer comparisons can also be used to evaluate the accuracy of fields that have been smoothed or blended to improve derived fields.