



Impact of SWOT Data in a global high-resolution analysis and forecasting system

A first attempt was made to quantify the impact of the assimilation of Surface Water Ocean Topography (SWOT) swath altimeter data in a global $1/12^\circ$ high resolution analysis and forecasting system through a series of Observing System Simulation Experiments (OSSEs). The impact of assimilating data from SWOT and three nadir altimeters was quantified by estimating analysis and forecast error variances for sea surface height (SSH). Wave-number spectra and coherence analyses of SSH errors were also computed. SWOT data will significantly improve the quality of ocean analyses and forecasts. Adding SWOT observations to those of three nadir altimeters globally reduces the variance of SSH and surface velocities in analyses and forecasts by about 30 and 20%, respectively. Improvements are greater in high-latitude regions where space/time coverage of SWOT is much denser. The combination of SWOT data with data from three nadir altimeters provides a better resolution of wavelengths between 50 and 200 km with a more than 40% improvement outside tropical regions with respect to data from three nadir altimeters alone. In this study, we assimilate the SWOT data into our global forecasting system. We show that the results are comparable to those of OSSEs, with a gain in forecast quality.

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