

Assimilation of satellite total surface current velocities in global ocean forecasting systems

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Accurate forecasting of ocean surface velocity is important for various applications such as shipping, search and rescue, offshore oil and gas operations, and also for coupled ocean/atmosphere/sea-ice/wave forecasting. Observations of ocean velocities are currently limited and are not routinely assimilated in global operational ocean forecasting systems. Proposed satellite missions designed to observe ocean surface velocities, such as Sea surface Kinematics Multiscale monitoring (SKIM), may provide new opportunities for assimilation of currents into these global forecasting systems in the future.

The ESA Assimilation of Total Surface Current Velocity (A-TSCV) project focuses on the design, implementation and reporting on the impact of synthetic SKIM total surface current velocity assimilation. The project will use observing system simulation experiments (OSSEs) to test the assimilation methodology and provide feedback on the observation requirements for future satellite missions. Synthetic observations are being generated for all standard data types (sea surface temperature, sea-ice concentration, sea level anomaly and profiles of temperature and salinity) as well as the new observations expected from SKIM-like satellite missions. A high-resolution nature run is being used to generate these synthetic observations. Two operational global ocean forecasting systems are being developed to assimilate these data in a set of coordinated OSSEs: the FOAM system run at the Met Office and the Mercator Ocean system. We will present an overview of the project, the design of the experiments and the data assimilation developments being made to effectively assimilate the surface velocity data into these systems.