Geophysical Research Abstracts, Vol. 9, 05706, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-05706

A new ensemble ocean forecasting method driven by surface wind distributions from a Bayesian hierarchical model: Forecast uncertainty sensitivities

A. Bonazzi (1), N. Pinardi (1,2), R. Milliff (3), L. Berliner (4), C. Wikle (5)

(1) University of Bologna, Bologna, Italy, (2) INGV, Bologna, Italy, (3) NorthWest Research Associates, CoRA Division, Boulder, CO, USA, (4) Ohio State University, Columbus, OH, USA, (5) University of Missouri, Columbia, MO, USA

A new methodology is being devised for ensemble ocean forecasting using distributions of the surface wind field derived from a Bayesian Hierarchical Model (BHM). Members of the BHM wind posterior distribution force the ocean model during the assimilation of in situ and satellite ocean observations, to create ensemble initial conditions. The initial condition spread is consistent with error properties of the observations, and with uncertainty in the assimilation model. The ensemble analysis period is 14 days, and a 10-day ocean forecast is generated from each perturbed initial condition. Ensemble ocean forecast sensitivity experiments are performed for a period that includes a deep water formation (DWF) event and the evolution of a large eddy in the western Mediterranean Sea (February 2005). Maximum ocean uncertainties are associated with the eddy field evolution and with the DWF event. Sensitivities to: a) QuikSCAT winds; b) temporal separation from initial conditions; and c) the ocean preconditioning will be quantified. The new ensemble prediction method is efficient, practical, and generalizable. Its salient feature is the appropriate concentration of uncertainty in the ocean mesoscale.