Designing Optimal Sampling Networks, Fixed and Adaptive for Ocean Forecast Modeling

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LONG TERM GOAL

The overall long term goal is to develop innovative, practical and efficient methodologies for the design of fixed and adaptive oceanic platforms, eulerian and lagrangian, such as fixed moorings, profiling moorings, gliders, drifters, AUVs.

OBJECTIVES

The main objective is to develop this methodology for the Gulf of Maine/Georges Bank (GM/GB) region where an integrated model system has been developed at the University of Massachusetts at Dartmouth centered around the Finite-Volume Coastal Ocean circulation Model (FVCOM).

APPROACH

The technical approach will be to test the available data assimilation packages, i.e. Reduced Rank Kalman Filter (RRKF); Ensemble Kalman Filter (EnKF); Ensemble Square Root Kalman Filter (EnSRF) and the Ensemble Transform Kalman Filter (ETKF) in the idealized test-cases outlined in the report. Successively, the filters will be adapted to FVCOM in the GM/GB configuration for coastal circulation prediction and adaptive sampling studies.

WORK COMPLETED

The grant started on **January 1, 2006.** Postdoctoral Associate Dr. Jun Wei has joined the group on **September 1, 2006.** The idealized tests completed are discussed in the main report.

RESULTS

Same as above

IMPACTS/ APPLICATIONS

The potential future impacts of adaptive sampling in an oceanographic context, where they are still non-existent, will be comparable to the enormous impacts it has had in meteorology.

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RELATED PROJECTS

None

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HONORS

Membership of the American Geophysical Union, May 2006