REGIONAL FORECASTING SYSTEM
FOR THE PHYSICAL, CHEMICAL AND BIOLOGICAL VARIABILITIES
OF THEBLACK SEA

S. BESIKTEPE

Institute of Marine Sciences, Middle East Technical University, 33731 Erdemli, Mersin, TURKEY
Emails: sukru@ims.metu.edu.tr

ABSTRACT

Black Sea Forecasting System to predict the physical and biogeochemical variabilities of the Black Sea have been developed within the context of the NATO SfP-ODBMS Black Sea project. The system consists of 3-d physical and biochemical models and assimilation scheme. The system has been calibrated and validated and prepared ready for real-time applications.

The Harvard Ocean Prediction System was used to carry out the data driven simulations of physical-biogeochemical variabilities. The system consists of coupled dynamical models, statistical models, initialization procedures, data assimilation schemes, and various visualization and post-processing tools.

The coupled physical/ecosystem model domain covers the entire Black Sea at a resolution of 9 km in latitude and longitude. The size of the resulting horizontal grid is 130 by 74 grid points. The model uses 28 non-uniformly spaced depth levels and realistic bottom topography.

The synoptic basin scale biogeochemical data was not available. Instead, the biogeochemical data were generally collected in a limited area within the basin. Due to this limitation, we applied the coupled model to the areas where the data was available. The two examples of the forecasting with coupled physical, biogeochemical model are presented.

The results show that the model is able to generate and maintain the 3-d structures of the physical and biogeochemical fields. Model results are partially validated using observations. The size, structure and evolution of the main currents and eddies in simulation compare favorably to in situ observations and remotely sensed satellite measurements.