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Testing and Implementation of the Navy's Operational Circulation Model for the Mediterranean Sea

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The US Naval Oceanographic Office (NAVOCEANO) has the responsibility for running ocean models in support of Navy operations. NAVOCEANO delivers Navy-relevant global, regional, and coastal ocean forecast products on a 24 hour/7 day a week schedule. In 2011, NAVOCEANO implemented an operational version of the RNCOM (Regional Navy Coastal Ocean Model) for the Mediterranean Sea (MedSea), replacing an older variation of the Princeton Ocean Model originally set up for this area back in the mid-1990's. RNCOM is a gridded model that assimilates both satellite data and in situ profile data in near real time. This 3km MedSea RNCOM is nested within a lower resolution global NCOM in the Atlantic at the 12.5 degree West longitude. Before being accepted as a source of operational products, a Navy ocean model must pass a series of validation tests and then once in service, its skill is monitored by software and regional specialists. This presentation will provide a brief summary of the initial evaluation results. Because of the oceanographic peculiarities of this basin, the MedSea implementation posed a set of new problems for an RNCOM operation. One problem was the present Navy satellite altimetry model assimilation techniques do not improve Mediterranean NCOM forecasts, so it has been turned off, pending improvements. Another problem was that since most in-situ observations were profiling floats with short five-day profiling intervals, there was a problem with temporal aliasing when comparing these observations to the NCOM predictions. Because of the time and spatial correlations in the MedSea and in the model, the observation/model comparisons would give an unrealistically optimistic estimate of model accuracy of the Mediterranean's temperature/salinity structure. Careful pre-selection of profiles for comparison during the evaluation stage, based on spatial distribution and novelty, was used to minimize this effect. NAVOCEANO's operational customers are interested primarily in the detailed features of the vertical temperature profile, and secondarily in the current field — less so salinity, heat content, sea level, etc. The principal form of error in the temperature field is found to be errors in the modeled depth of the mixed layer. Overall model performance was found to be satisfactory for operational use.