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# High resolution modeling of the South China Sea during the Fall and Winter of 2006-7

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The forecasts of a nested high resolution circulation model covering the South China Sea (SCS) are used to predict the circulation in the SCS through the transition from the Southwest monsoon to the Northeast monsoon during the fall and winter of 2006-2007. The modeling system is built around a version of the Princeton Ocean Model (POM) used at the Naval Oceanographic Office (NAVOCEANO). This version of POM uses a modified pressure gradient scheme which remains accurate in the presence of steep bathymetry, and the model's bathymetry is only slightly smoothed. The horizontal resolution of the model domain is $1/36^o$, and there are 47 sigma levels in the vertical. Meteorological forcing was derived from $1/5^o$ resolution forecasts provided by the Fleet Numerical Meteorology and Oceanography Center (FNMOC). The domain extends southward from the Taiwan Strait to $1^o$ N latitude and includes the Celebes Sea. Boundary conditions are supplied by a $1/8^o$global model run operationally at NAVOCEANO. The modeling system includes an optimal interpolation type of data assimilation system. While there are only minimal numbers of CTDs or BTs available for assimilation in the SCS, satellite derived sea-surface temperatures and synthetic CTDs are assimilated daily. The veracity of the modeling system is examined by comparing forecasts with drifter tracks and with temperature/salinity profiles. For example, two surface drifters entered the SCS through the Luzon Strait during this time period and provided long tracks. These tracks were especially useful for observing the flow into the SCS through the Luzon Strait which continued southward by the Vietnamese coast. The Office has deployed temperature-salinity profiling floats south of Taiwan. One drifted southwest well into the SCS. In addition to providing deep temperature-salinity profiles, this float also provided additional "bounce cycles". A bounce cycle provides seven consecutive shallow temperature profiles at

2-hour intervals. The bounce cycles are used to provide a limited testing of the ability of the modeling system to forecast internal tides.