

Development of Multi-scale Circulation Model in the South China Sea

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A three dimensional ocean model has been applied to developing a multi-scale modeling system for the South China Sea (SCS) and the Coastal Ocean off Southern China (COSC). The objective is to develop an ocean modeling capability and pave the way for the development of an atmosphere-ocean-ecosystem forecasting/hindcasting system in the socially and economically active SCS. The high resolution COSC model (3km), SCS model (10km) and Pacific Ocean model (40km) developed by Rutgers University are nested together in the system to more accurately resolve complex multi-scale oceanic processes in the region. With high spatial and temporal resolutions of atmospheric forcing and with time- and space-dependent (x, y, z, t) forcing from larger scale being integrated into the regional domain by an efficient open boundary condition, the multi-scale modeling system is able to obtain realistic ocean circulation in the COSC and SCS. Combined with available data from measurements and remote sensing, characteristics of circulation and their variability controlled by the monsoonal atmospheric fluxes, Kuroshio intrusion and intrinsic dynamics in the SCS are investigated. The results of seasonal circulation and dynamic processes in the COSC and their interactions with current system in the SCS are presented.