Coupled Ocean Circulation and Wind-Wave Models with Data Assimilation Using Altimeter Statistics

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A coupled ocean wave-circulation model has been developed and applied for numerical experiment for wind waves and circulation of the South China Sea under the IOEPAS project (Integrated Ocean Environment Prediction and Assimilation System). The modeling system consists of a three-dimensional circulation model, South East Asia Ocean Model (SEAOM) [1] and a wave model [2]. Recently, two new interface components, the bottom module [3] and nesting module [4], have been developed within the ocean modeling system. The bottom module feeds back bottom wave stress to the circulation model and the nesting module allows SEAOM to prognostically compute nested variables in any specified subregion of a larger model domain. This system will provide the means to forecast littoral circulation and surface waves while allowing for the appropriate coupling of the circulation and wave models. Data assimilation capabilities is integrated into the system to provide means of handling open boundary conditions for coupling with larger scale models, data for initializing the model, and surface forcing of different types.

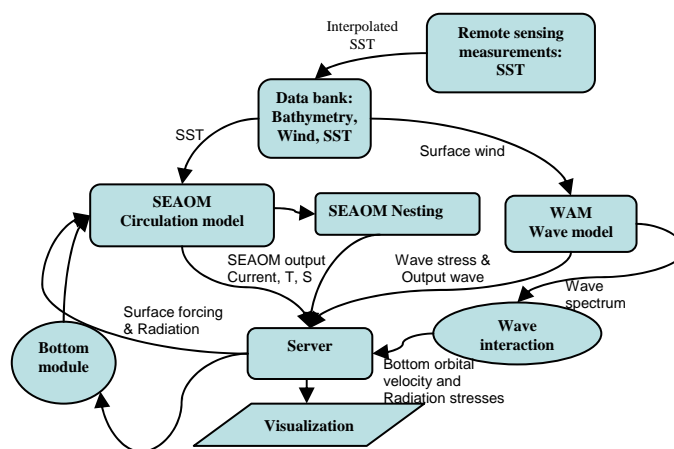Keywords: ocean circulation; wave-wind; coupled model; forecast; data assimilation.

Fig.1 Coupled modeling system

References

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[3] Mathisen, P.P., Madsen, O.S. Waves and currents over a fixed rippled bed: III. Bottom and apparent roughness for spectral waves and currents, *J. Geophys. Research*, 104(C8):18,447-18,461 (1999).

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