

Conduction and Performance Evaluation of High-resolution Regional Ocean Model in Yeosu-Gwangyang Bay using MOM6

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We have recently established a Coastal Ocean Model in Yeosu-Gwangyang Bay (YG_MOM6) using the new hybrid vertical coordinate configuration (Z^* and isopycnal) of MOM6, released by GFDL. The open boundary conditions for temperature, salinity, and sea surface height were obtained from the MOHID model operated by KIOST at the southern and eastern boundaries. Freshwater flow from the northern river border was also prescribed. YG_MOM6 has a horizontal resolution of approximately 100 m, while the MOHID resolution is approximately 300 m, which provides open boundary conditions and simulates tides.

Stability tests were conducted for both Z^* and hybrid vertical grid systems, which confirmed that YG_MOM6 operates stably. Tide levels simulated by the MOHID and YG_MOM6 were compared with observed levels at the Gwangyang Tide Observatory, located within the YG_MOM6 domain. YG_MOM6 simulates tides closer to the observed levels than its parent model, MOHID. It is believed that this improvement in performance is due to the higher horizontal resolution of YG_MOM6.

Future work will involve careful verification of YG_MOM6 through comparisons with water temperature, salinity, and current observation data. We are also developing a data assimilation system to assimilate Coastal Acoustic Tomography (CAT) data into YG_MOM6 using the Ensemble Kalman filter (EnKF).