The South China Sea Guangdong-Hongkong-Macao Greater Bay Area Oceanographic Analysis and Forecasting System

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Abstract

The complex and ever-changing dynamic marine environment, continuously marine ecological degradation, and frequent marine hazards pose enormous challenges to the comprehensive development of the Guangdong-Hongkong-Macao Greater Bay Area (GHM-GBA). To address these challenges, we had established a high-resolution oceanographic analysis and forecasting system for the South China Sea (SCS) GHM-GBA by employing the state-of-the-art ROMS model. More than 20 years daily averaged marine environmental analysis data sets for the SCS had been constructed. The system has been operating on Tianhe-2 supercomputing platform routinely, and providing daily 5-day forecast products of dynamical environmental variables (sea water temperature, salinity, velocity, and water level). Leveraging this infrastructure, we are establishing a new data-knowledge coupled regional oceanographic big model, serving to power a oceanic digital twin for the GBA, and providing scientific decision-making support for marine ecosystem management and sustainable development of the GBA.