

## Validation of a long-term tide-resolving oceanic simulation around the coastal areas, Japan

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In order to evaluate ocean renewal energy potential in Japan coastal ocean, we are conducting an oceanic simulation using an ocean general circulation model with horizontal 3km grid and 46 vertical layers for the period from 2002 to present. Targeted ocean renewal energy includes electric power generation using oceanic geostrophic and tidal currents, and temperature difference. Our simulation product of the oceanic condition will be utilized mainly for feasibility design of possible power plants rather than engineering design of the actual ones. Evaluation of uncertainty involved in the estimate of the energy potential is crucial for considering possible risks associated with planning the development of the power plants. We evaluate two types of the uncertainty related with natural variability and limitations of modeling. The former one could be represented to a considerable extent by a long-term simulation covering a wide range of phenomena with various time scales. The latter one is due to the limitations of model resolution, accuracy of model schemes, and quality of external forcing, etc. We present the model validation results using various kinds of reference data obtained by field observations and simulated by other ocean models, and discuss the uncertainty involved in the simulation.

Keywords: Ocean general circulation simulation, tide, temperature, ocean renewal energy