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Improvement in ocean model surface initial forcing for the Bay of Bengal

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Abstract

The Bay of Bengal (BOB) basin has complex dynamic nature. The Bay is forced by semi annually reversing wind, heavy precipitation and enormous river discharges. The wind forcing generated Kelvin and Rossby waves play major role in BOB circulation, heat, nutrients and water mass transport. In spite of so many studies, the proper knowledge regarding BOB's thermodynamic variability subjected to various atmospheric forcing and transient phenomenon like tropical cyclones remain still incomplete. The reason is the lack of data quality and its use in the high resolution model simulation. However, the assimilation of the satellite derived data with ocean model output can be higher quality product that can surely help to identify short scale dynamics and improve forecast. To achieve this result, satellite derived sea surface height, salinity and temperature have been assimilated with high resolution regional ocean modeling systems (ROMS) climatological simulation. The quality of the assimilated data has been investigated through root mean square error and correlation analysis with available satellite and in-situ data set, which has come out to be reasonably good, and the data are capable of identifying short scale spatial features of the BOB. This methodology to prepare the assimilated data can be used to prepare the synoptic initial condition of ocean models for the better forecast.

Abstract

Tarumay Ghoshal is presently pursuing his PhD in the field of data assimilation and ocean modeling at Centre for Oceans, Rivers, Atmosphere and Land Sciences, Indian Institute of Technology Kharagpur, India. His research interest is to improve the data quality and set up a model for good forecast and hindcast for the Bay of Bengal region. He has completed M.Sc in Exploration Geophysics in the same institute in 2009. He was appointed as supervisor in Fugro India for seismic data processing quality check while serving in the Director General of Hydrocarbons, Under Ministry of Petroleum and Natural Gas, Government of India. During that tenure, He was also involved in maintaining geophysical data repository.