Numerical Simulation of Surface Circulation Features Over the Bay of Bengal using Regional Ocean Modeling System

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The numerical simulation of circulation features over Bay of Bengal (BOB) has been investigated using Regional Ocean Modeling System (ROMS). The terrain following ROMS has been setup for the BOB basin (4˚N-24˚N and 76˚E-100˚E) with higher resolution both in horizontal (10 km X 10 km) and vertical (32 vertical levels). The volume averaged kinetic energy shows that there is a consistency of the model after three years of interannual run. The model validation was done by comparing the model output with the recent Real-time Geostrophic Oceanography (ARGO) datasets. The simulation of circulation shows that East India Coastal Current (EICC) is not continuous for all the months. This EICC is north ward during the winter season with maximum in strength during the months of March and April due to the intensification of two anti-cyclonic eddies in the eastern coast. The EICC is totally disturbed during summer due to formation of both cyclonic and anti-cyclonic eddies in the west coast of the BOB, although there is strong south west wind flows over it. During the fall season, EICC changes its direction to southward being influenced by the formation of cyclonic eddies. This model is capable to detect the meso-scale eddies in the BOB and their life cycle. The simulation of average free sea surface height (SSH) shows its ability to detect the upwelling and downwelling zones in the BOB. The circulation pattern shows the formation of eddies not only due to the coastal current, but the influences of Malacca strait flow and reflected Rossby wave from the eastern coast of the basin are also prominent.

Keywords: Bay of Bengal; ROMS; Rossby wave; Eddies.

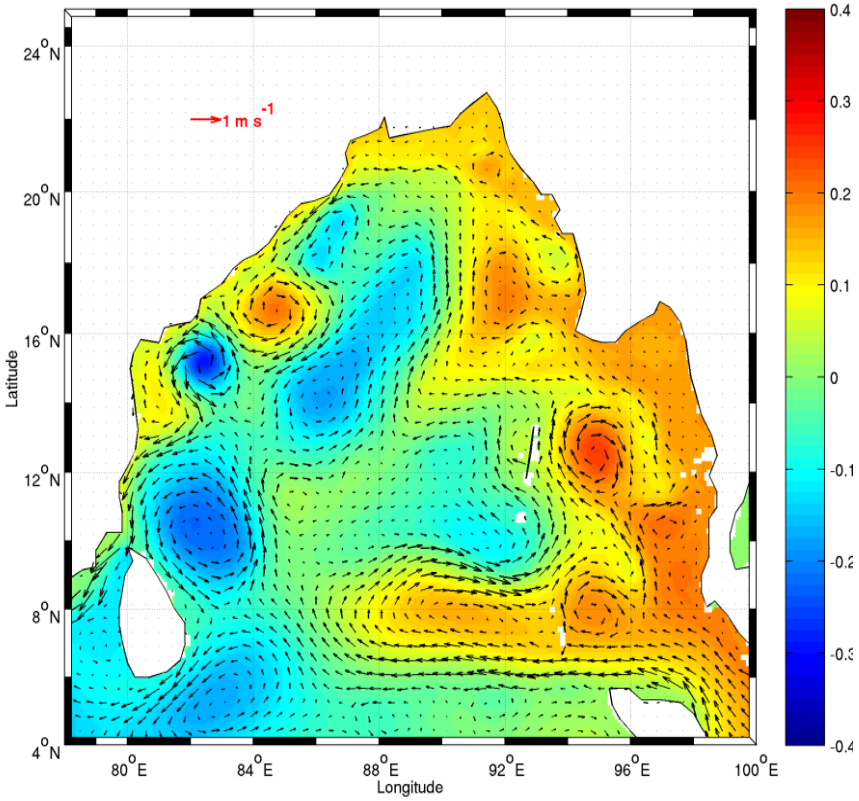

Fig 1: SSH (in m) with surface current (ms^{-1}) for November Climatology from ROMS output

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