



Interannual sea level variability along the west coast of India

Iyyappan Suresh (1), Jérôme Vialard (2), Matthieu Lengaigne (2,3), Takeshi Izumo (2,3), Vallivattathillam Parvathi (1), and Pillathu Moolayil Muraleedharan (1)

(1) CSIR-National Institute of Oceanography, Physical Oceanography, Dona Paula, India (isuresh@nio.org), (2)

LOCEAN-IPSL, Sorbonne Université (UPMC, Univ Paris 06)-CNRS-IRD-MNHN, Paris, France

, (3) Indo-French Cell for Water Sciences, IISc-NIO-IITM-IRD Joint International Laboratory, CSIR-NIO, Goa, India

The interannual sea level anomalies (SLA), and the related thermocline variations, along the west coast of India (WCI) strongly impact the fisheries, the ecosystems, and potentially the monsoon rainfall. Here we investigate the mechanisms driving the WCI interannual SLA using a linear continuously stratified ocean model, which realistically simulates the leading northern Indian Ocean SLA mode associated with the Indian Ocean Dipole (IOD). During a typical positive IOD event, easterly wind anomalies near Sri Lanka in late summer and fall force downwelling coastal Kelvin waves, which induce positive WCI SLA within days. Meanwhile, equatorial easterlies force upwelling Kelvin waves that travel to WCI through the Bay of Bengal coastal waveguide. Part of this opposite signal also transits slowly through the Bay of Bengal interior as Rossby waves, eventually yielding negative SLA along the WCI in the following winter and spring. The WCI SLA thus shifts from positive in fall to negative in winter during positive IOD events.