Observed Interannual Variability of Near-surface Salinity in the Bay of Bengal

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Salinity is an important physical property of ocean water that plays crucial role in determining the thermohaline circulation and vertical mixing [Pierce et al. 1995]. The Bay of Bengal (BoB) is a unique tropical basin which receives large amount of fresh water flux (excess precipitation over evaporation, river discharge). This large fresh water influx into the Bay leads to water in surface layer less saline thereby maintains strong haline stratification causing formation of barrier layer, which influence significantly in maintaining warmer sea surface temperature (SST) and play crucial role in precipitation over BoB [Shenoi et al., 2002; Rao and Sivakumar, 2003].

In spite of its major role in controlling thermodynamic behavior of oceans, salinity measurements were sparse until recent induction of Argo floats. Present density status of salinity profiles obtained by Argo floats give an opportunity to understand the variability in salinity structure of oceans on better temporal and spatial resolution.

Here we present an analysis of Argo gridded data, following the method of Kessler and McCreary [1993], in the Bay of Bengal (BoB) during the years 2004 – 2009. The data clearly shows large year-to-year variability in the near-surface salinity during winter monsoon season (December – February) in the BoB. The anomalous low (high) saline water observed in the northern BoB during the winter 2006-07 (2007-08). The precipitation data from Global Precipitation Climatology Project (GPCP) and near-surface circulation are used to interpret salinity variability. The observed interannual variability of salinity in the BoB is mostly associated with year-to-year variability of precipitation either locally or in the Ganges-Brahmaputra catchment, which is redistributed by near-surface circulation.

References

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