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Interannual variability of salinity profiles from Argo in the Bay of Bengal

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Monthly, seasonal, and annual variations of salinity profiles over different sectors of the Bay of Bengal (BoB) are investigated using seven years of Argo data. The salinity profile analysis together with the analysis of variability in surface circulation and precipitation utilized to understand interannual and seasonal variability in salinity profiles over three sectors of BoB i.e., northern (NBoB), central (CBoB), and southern (SBoB). The influence of massive river outflow close to river mouths in producing the observed sea surface salinity minima in the coastal northern BoB during November-December is highlighted. Seasonal changes in salinity profiles are primarily caused by freshwater flux, mixing processes and advection. In general, NBoB remains fresher as compare to CBoB and SBoB throughout the year. Interannual variability of salinity structure was found to be maximum in NBoB, particularly in post-monsoon (ON) and winter (DJF) seasons, where the differences in surface salinity between the years were found to be up to 2 psu. CBoB shows minimum interannual variations in salinity profiles, except unusual decrease in surface salinity on two occasions. Analysis suggest crucial role of coastal currents, gyres and surface circulation in controlling seasonal and interannual variability in salinity profiles. Some unusual features observed in salinity profiles during pre-monsoon season of year 2009 in the SBoB, which is analyzed further with other data sets and discussed in detail.

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