SEASONAL AND SPATIAL VARIATION OF THERMOCLINE AND HALOCLINE IN THE INDIAN OCEAN AROUND SRI LANKA

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Sri Lanka is located in the northern Indian Ocean and low saline Bay of Bengal located on its eastern side and relatively high saline Arabian Sea located on its western side. Waters around the island also experiences strong reversal currents forced by monsoons.

This study presents the seasonal and spatial variability of themocline, halocline and Mixed Layer Depth (MLD) around Sri Lanka waters based on salinity and temperature profiles derived from Array for Real-time Geostrophic Oceanography (ARGO) floats and Conductivity Temperature Density (CTD) profiles from World Ocean Experiment (WOCE) cruises. The surface salinity in the Bay of Bengal ranges from 31 to 35.5 with low salinity during October to December. During the Northeast Monsoon (NEM), October to February, there is a deep MLD extending to 80-100 m with the surface temperature about 27°C. During the Southwest Monsoon (SWM), June-September depth of the MLD is decreased to less than 50 m. During SWM, MLD is small compared to NEM in the entire region, whereas depth is less than 40 m in the mid Arabian Sea. The spatial and seasonal thermocline gradient is also estimated based on temperature difference between the surface mixed layer and deep layer (just below thermocline). The thermocline gradient is large during NEM compared to SWM for the entire region.

The steric height in the Bay of Bengal near the Sri Lanka waters ranges from 0.3 m to 0.7 m with maximum levels in December-January and lowest in July-August. The steric height towards the equator is small and it is only 0.10 - 0.15 m.