

MIXED LAYER VARIABILITY ALONG THE EAST COAST OF SRI LANKA DURING NOVEMBER 2014 AND 2015

Akila Harishchandra^{1*}, S.U. P Jinadasa¹ and K. Arulananthan¹

¹National Institute of Oceanography and Marine Science, National Aquatic Resources Research and Development Agency, Crow Island, Colombo 15.

akila.uor@gmail.com

The open ocean where salinity, temperature, and density are almost vertically uniform is called as the mixed layer. It transfers mass, momentum and energy into the sub surface layers, hence make a source for almost all ocean motions. By using collected Conductivity Temperature and Depth (CTD) profiles by the ship board CTD of R/V Samudrikka, Mixed Layer Depth (MLD) was calculated for oceanic area adjacent to East coast Sri Lanka during 2014 and 2015. Resulted Sea Surface Salinity (SSS) map of the survey area showed low salinity (27 PSU) water mass floated at the top 15m of the near shore area. Calculated MLD was shallow (<15m) at this low saline water mass, vice versa. SSS was significantly positive correlated ($p<0.05$, $r=0.824$) with the MLD distribution. Wind stress (WS) was ranged between 0.015Nm^{-2} to 0.045Nm^{-2} during the whole survey area, it has impacted on the MLD significantly positive manner ($P<0.05$, $r=0.715$). Sea Surface Height (SSH) which the last parameter analyzed for this study was varied between 1.05m at the near shore area and 0.55m at off shore sampling area. It was significantly but negatively ($P<0.05$, $r=-0.797$) impacted on the MLD distribution over the sampling period. Low saline water mass floats on the sea surface, thus could make a possible barrier for surface turbulences to mix the ocean water, hence the mixed layer tends to shoal. The resulted shallow MLD in this study was associated with the near shore low salinity water mass, following the above mechanism. Simultaneously, Surface floating low saline water increase the SSH and shoal MLD, hence SSH was negatively correlated with MLD. WS is a general factor which contributes to deepen the MLD (higher WS deepen the MLD, vice versa) as seen in this study. This study concludes that the observed low saline water mass at the east coast of Sri Lanka attributes to the fresh water tongue which has been transported by East India Coastal Currents (EICC) and it hugged the East coast of Sri Lanka during November 2014 and 2015. Furthermore, the MLD of the associated ocean area tends to shoal simultaneously. More studies using in-situ and model observations are suggested to understand the climatology of MLD of Indian Ocean around Sri Lanka.

Keywords: *Conductivity Temperature and Depth (CTD), Sea Surface Salinity (SSS), Wind stress (WS), Mixed Layer Depth (MLD), Sri Lanka*