



## **Estimation of Mixed Layer Depth through reconstructed 3-D ocean temperature data and its long-term variability**

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The oceanic mixed layer plays a critical role in transferring heat and momentum from the atmosphere to ocean. Conventionally, mixed layer depth (MLD) has been estimated with the temperature and the density difference using in-situ profiling data such as an Argo-floating. However, the gridded Argo field data, most widely used, has a coarse spatial resolution (>1 degree) and uncertainty due to the horizontal gradient in the spatial density of the Argo-floating. Thus, the multi-linear algorithm, which could infer the subsurface structure of density as a function of temperature and salinity only using surface data, was employed in this research with satellite-derived high spatial and temporal resolution data. Through the estimated profiles of temperature and salinity, the MLD was estimated using temperature threshold method. The estimated MLDs were verified with MLDs calculated by Argo profiles. In addition, spatio-temporal properties of MLD in the region were investigated in this research.