



Vertical Structure and Interannual Variation of North Equatorial Current/Undercurrent System in the Tropical Northwest Pacific Ocean

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The structure and variation of North Equatorial Current/Undercurrent (NEC/NEUC) in the Tropical Northwest Pacific Ocean (TNWP) are investigated using seven years ADCP/RCM mooring system from POSEIDON project, together with Data Assimilation System of KIOST (DASK), which is newly produced by KIOST Earth System Model (KIOST-ESM). This study presents newly discovered interannual variation of NEUC and its interaction with the upper zonal currents. The derived geostrophic current and velocity output of DASK closely model the features of NEC/NEUC system in terms of structure and interannual variation, resembling observational data. Three well-defined NEUC cores are detected beneath NEC, centered around 9°N, 12.5°N, and 17.5°N. The NEUC cores tend to deepen northward, which closely follow the neutral density surface around 26.5-27.5 γ^n . Low-pass filtered zonal current (cut-off 14 months) at 134.7°E, 17.2°N mooring station confirms that NEUC develops during decaying phase of ENSO (i.e., normal condition) and tends to weaken during La Niña and cold phase of PDO associated with strengthening NEC. The result indicates the significant impact of the upper-layer circulation on the evolution of NEUC. Present study confirms that the atmospheric pattern indirectly reduces the intermediate eastward flow by strengthens the wind-driven NEC.