

Preliminary results: Distributions of POC fluxes in the North Equatorial Currents of the Pacific Ocean

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Thorium-234 (^{234}Th ; half-life = 24.1 days) has been used as an excellent tracer for estimating particle fluxes, including particulate organic carbon (POC) and trace elements, in the upper ocean. In this study, the distributions of total and particulate phases of ^{234}Th ($^{234}\text{Th}_t$ and $^{234}\text{Th}_p$), POC, and other oceanographic parameters (temperature, salinity, and chlorophyll-*a*) were investigated in the North Equatorial Currents (NEC) during September 21–27, 2024. The study region, located within 13.5°N and $134\text{--}157^\circ\text{E}$, is interconnected with the Kuroshio Current and Mindanao Current. Measurements were conducted in the upper 500 m of the water column. The calculated Th fluxes at a depth of 100 m ranged from 1730 to 2850 $\text{dpm m}^{-2} \text{d}^{-1}$, comparable to fluxes observed in other open-ocean regions. A subsurface chlorophyll maximum (SCM) layer was observed at depths of 125–150 m, indicating oligotrophic conditions in the study area. Notably, the activity of $^{234}\text{Th}_p$ was elevated within the SCM layer compared to other depths. These findings highlight the importance of understanding biogeochemical cycles in the NEC, which plays a crucial role in regional and global carbon and nutrient cycling.