

Monsoon and ENSO regulated biological pump in the South China Sea based on long-term sediment trap mooring

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Ocean Margins play a key role in the marine carbon cycle. South China Sea (SCS) is among the biggest marginal seas in the world, the marine environment and upper ocean biological processes are largely controlled by East Asia monsoon and El Nino event. In this presentation we will discuss the seasonal and inter-annually variation of the biological pump at the five locations in the northern South China Sea based on multi-year observation of biological pump by time series sediment traps since 1987 up to now. Generally, the monthly averaged biogenic flux (CaCO₃, Opal and POC) in the northern SCS exhibits strong seasonality with prominent peak in winter during northeastern monsoon period, attributed to a positive response of diatom growth to increased nutrient supply from the subsurface as a result of enhanced vertical mixing. On the contrary, strong stratification and the southwest monsoon induced basin-scale anti-cyclonic circulation resulted in low productivity in summer. On the other hand, higher biogenic fluxes could also induced by upwelling/meso-scale eddy and short-term events such as the Asian dust storms. The inter-annually variation of the biological pump in SCS was controlled by ENSO induced oceanographic variability in northern SCS, the most distinct consequences was low diatom and biogenic fluxes was observed during ENSO dominant period. Our results will compared with the previous reports on monsoon derived biological pump in the Arabian Sea and Bay of Bengal based on sediment traps by German and Indian scientists.