Tracing Pathways of Organic Matter Transport in the Modern South China Sea

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The South China Sea, one of the largest marginal seas bordering the Pacific, exhibits marked, large-scale spatial gradients in clay mineralogy as a consequence of diverse sources of terrigenous material emanating from Taiwan, the Chinese mainland, and the Phillipines. Strong contrasts in smectite, kaolinite, chlorite, and illite assemblages, enables phyllosilicate composition to serve as an excellent provenance indicator (Liu *et al*., 2010 [2]). Stable carbon and radiocarbon isotopic compositions can be used to constrain different sources of organic matter (e.g., marine phytoplankon, soils, and eroding rocks). Given that organic matter exhibits a strong affinity for phyllosilicates, with sorption to mineral surfaces and other interactions influencing organic matter transport and stability (Keil & Mayer, 2014 [1]), we hypothesize that coupled investigations of organic matter and clay mineral composition will yield key insights into factors controlling source and fate of organic matter in the modern ocean.

Here, we present preliminary results from an investigation of stable carbon and radiocarbon isotopic compositions of bulk organic matter intercepted by time-series sediment traps deployed at two locations in the South China Sea, and evaluate these measurements in the context of hydrographic, sedimentological and clay mineralogical information. In particular, carbon isotopic fingerprints are used to provide initial insights into source-to-sink transport processes and organic matter cycling in the South China Sea.

[1] Keil, R. & Mayer, L. 2014: Mineral Matrices and Organic Matter, *in* Turekian, H. ed., Treatise on Geochemistry (Second Edition): Oxford, Elsevier, 337-359. [2] Liu, Z., Li, X., Colin, C. & Ge, H. 2010: A high-resolution clay mineralogical record in the northern South China Sea since the Last Glacial Maximium, and its time series provenance analysis, Chinese Science Bulletin, 55, 4058-4068.