



Distinguishing Terrestrial Organic Carbon in Marginal Sediments of East China Sea and Northern South China Sea

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Knowledge about the sources, transport pathways and behavior of terrestrial organic carbon in continental margins adjoining to large rivers has improved in recent decades, but uncertainties and complications still exist with human-influenced coastal regions in densely populated wet tropics and subtropics. In these regions, the monsoon and other episodic weather events exert strong climatic control on mineral and particulate organic matter delivery to the marginal seas. Here we investigate elemental (TOC, TN and bromine-Br) and stable carbon isotopic ($\delta^{13}\text{C}$) compositions of organic matter (OM) in surface sediments and short cores collected from active (SW Taiwan) and passive margin (East China Sea) settings to understand the sources of OM that buried in these settings. We used sedimentary bromine to total organic carbon (Br/TOC) ratios to apportion terrigenous from marine organic matter, and find that Br/TOC may serve as an additional, reliable proxy for sedimentary provenance in both settings. Variations in Br/TOC are consistent with other provenance indicators in responding to short-lived terrigenous inputs. Because diagenetic alteration of Br is insignificant on shorter time scales, applying Br/TOC ratios as a proxy to identify organic matter source along with carbon isotope mixing models may provide additional constraints on the quantity and transformation of terrigenous organics in continental margins. We apply this combination of approaches to land-derived organic matter in different depositional environments of East Asian marginal seas.