Role of authigenic Fe-mineral formation in the delivery of carbon to marine sediments

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The concept of "recalcitrance" of natural organic matter (NOM) in soils and sediments is under intense scrutiny at present. One leading hypothesis invokes mineral-NOM associations as a central mechanism for increasing the residence time of carbon in soils and sediments. The goal of this presentation is to describe the chemical forms of particulate carbon delivered to marine sediments underlying oceanographic features with intense mineral formation. As part of the US GEOTRACES Eastern Pacific Zonal Transect cruise, marine particles were collected by *in situ* filtration, shipboard filtration, and sediment coring along a transect from the Peruvian Coast to the central South Pacific. The transect crossed two major oceanographic features hosting strong geochemical gradients where iron-bearing mineral formation was observed: (1) the Peruvian Oxygen Minimum Zone (OMZ); and (2) the East Pacific Rise mid-ocean ridge hydrothermal plume at 15ºS. Bulk carbon X-ray absorption near edge structure (XANES) spectra were collected for 16 sediment samples. The morphology and carbon chemistry of individual sediment particles were described using scanning transmission X-ray microscopy and carbon XANES. Complementary data describing the bulk chemical composition of particles, as well as particle-specific mineralogy will be used to determine whether iron-bearing minerals such as oxyhydroxides and secondary phyllosilicates affect the chemistry and delivery of carbon to marine sediments underlying OMZ and hydrothermal plumes.