Linking Dissolved Organic Matter Composition Data to Reaction-Transport Models of Sediment Diagenesis

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Reaction-transport (RT) models for dissolved organic carbon (DOC) and dissolved organic nitrogen (DON) cycling in marine sediments have provided important information on the bulk reactivity of DOC and DON in marine sediment pore waters, and the role sediments may play as sources of refractory DOM (dissolved organic matter, i.e., both DOC and DON) to the oceans. The application of such models to sediment pore water profiles of Δ^{14}C-DOC have also provided insights into the role sediments play as a source of *pre-aged,* refractory DOC to the oceans.

However these models have been limited in number and scope because of the complexity of the composition and cycling of sediment pore water DOM. Furthermore, as currently formulated our models are also only C- (and N-) based models in which DOC and DON production and consumption are not directly linked to specific terminal processes, such as sulfate reduction and methanogenesis in strictly anoxic sediments.

In this talk we will take advantage of recent work examining pore water DOC and DON at the molecular level to expand and improve sediment DOM RT models. Specifically, we will incorporate into the models peptide production and deamination as sources of both labile and refractory DOM, and we will explicilty link DOM cycling to terminal respiratory processes. We will carry this out using data from past (and recent) work in the anoxic sediments of Santa Barbara Basin (California Borderlands region).