NUTRIENTS AND OCEAN HISTORY: A FOCUS ON PHOSPHORUS

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Phosphorus is a limiting nutrient for biological productivity, making its marine geochemical cycle of interest to oceanographers, sedimentary geologists, and paleoceanographers. Many aspects of its oceanic cycle are reasonably well-understood, including the input of dissolved reactive phosphorus to the ocean and its internal recycling by primary productivity, particle transport, and particle regeneration. Fundamental questions remain about the net export of reactive phosphorus from the ocean, including the quantitative importance of various burial sinks and the factors influencing the variations in these sinks through time. Phosphorus sedimentary geochemistry is fascinating, with diagenetic transformations significantly influencing phosphorus burial in marine sediments. The efficiency of phosphorus retention in sediments during these transformations is a key unknown. The role of bottom water oxygenation in influencing the balance between phosphorus burial and phosphorus regeneration to the water column is controversial. Other sedimentary processes, such as the dissolution of calcium carbonate, may also influence the efficiency of phosphorus retention. Using evidence from open ocean and continental margin sediments, Dr. Delaney's talk will examine questions relating to the sedimentary geochemistry of phosphorus and phosphorus accumulation rates through time. Dr. Delaney has sailed on ODP Legs 130 and 167, as well as three other oceanographic cruises. She is currently the editor of the journal Paleoceanography.