

**Claudia R. Benitez-Nelson**

College of Arts & Sciences Distinguished Professor  
Marine Science Program & Department of Earth and Ocean Sciences,  
University of South Carolina

**“Elemental Stoichiometry and the Composition and Flux of Suspended and Sinking Material in a Coastal Marine Ecosystem”**

**Abstract** Elemental stoichiometry has been used to understand processes ranging from nutrient limitation to ancient ocean redox state. The variety of mechanisms proposed to explain the observed variability in particulate C:N:P ratios throughout the ocean has led to the general conclusion that there is no single optimal N:P ratio of marine phytoplankton. Rather, phytoplankton C:N:P ratios are both higher and lower than the canonical Redfield (106:16:1) depending on species specific nutrient stress and overall growth conditions. What is missing from this general view of particulate C:N:P ratios is how these ratios change as a function of time and with increasing depth at specific locations, as even seemingly small changes in nutrient ratios can influence the amount of total carbon ultimately sequestered in the deep ocean. The goal of this seminar is to explore the biogeochemistry and temporal (16 year) and depth-dependent (0-1400 m) changes in the elemental ratios (C:N:P) of sinking and suspended organic matter collected from the Cariaco Basin, Venezuela, a continental margin characterized by significant seasonal and interannual changes in nutrient availability, primary production, and plankton composition. Results demonstrate that large scale shifts in plankton biogeochemistry have driven intriguing changes in element stoichiometry, food web structure, and the composition of suspended and sinking material in a coastal margin setting that is a combination of trends observed in open ocean settings.