

Preservation of Total Organic Carbon in the Santa Barbara Basin: The Anoxia Hypothesis Challenge

Cathleen Zeleski

California State University, Long Beach

Department of Geological Sciences

Long Beach, California

cathzeleski@aol.com

This study will investigate primary factors affecting the preservation of total organic carbon in anoxic and oxic environments. The Quaternary sedimentary sequence of the Santa Barbara Basin presents a unique opportunity for testing the anoxia hypothesis with respect to the preservation of total organic carbon. A continuous sequence of late Quaternary, laminated and non-laminated silty clay from Ocean Drilling Program Site 893 (576.5 m water depth) has produced high resolution proxy data recording paleoclimatic and paleoceanographic changes (e.g., facies, stable isotope, chemical composition, and C/N ratios). This study correlates these proxy data with total organic carbon composition to determine interrelationships that will help to explain factors affecting the preservation of organic carbon. New piston cores were obtained by the Marion Dufresne Summer 2002 expedition from a central/deep (569 m) and marginal/shallow (481 m) location in the Santa Barbara Basin. I will use these samples for a high resolution study that will measure and compare the percent of total organic carbon, C/N ratios and grain size in the two cores. The two data sets are from more consistently anoxic (deep core) and more consistently oxygenated (shallow core) settings that will help to determine relative significance of local environmental versus regional oceanographic/climatic variation in the preservation of organic matter.