

REVISED CALCAREOUS NANNOFOSSIL BIOZONATION OF THE OLIGOCENE GULF OF MEXICO

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Abstract

The purpose of my research is to enhance the resolution of nannofossil biozonation in the Oligocene by incorporating non-traditional bioevents (e.g., changes in abundance, coccolith size fluctuations) and previously undocumented traditional bioevents (i.e., first and last occurrences) into existing biozonation schemes for the Gulf of Mexico. Diversity of Oligocene nannofossil assemblages is relatively low and, as a result, existing Oligocene biozonation schemes are of lower resolution than those for the rest of the Cenozoic. Biostratigraphic improvements are generally achieved through analysis of previously recognized bioevents, but may also be attained through determination of additional traditional and non-traditional bioevents. The development of high resolution biozonation schemes contributes to the stratigraphic precision and overall safety of deepwater drilling operations, particularly in situations where nannofossil biostratigraphy may be used to predict penetration of high- or low-pressure intervals (e.g., the overpressured Oligocene Frio Formation sand in the Gulf of Mexico) where casing points need to be accurately determined. In order to create the enhanced biozonation scheme, I will conduct biostratigraphic analysis on samples from the Deep Sea Drilling Project Site 540 located in the eastern Gulf of Mexico from which I will collect biostratigraphic and biometric data. Statistical analyses will be performed on the data using the paleontological statistics program PAST. The efforts of this research will culminate in creation of an enhanced biostratigraphic scheme for the Gulf of Mexico that utilizes both traditional and nontraditional bioevents, which will allow for a much higher resolution stratigraphic analysis than existing nannofossil zonation schemes provide.

AAPG Search and Discovery Article #90249 © 2016 AAPG Foundation 2015 Grants-in-Aid Projects