

Maximum Flooding Surfaces, a New Application for Correlation and Mapping in the Pacific Coast Miocene

Walter W. Wornardt Jr.¹

¹Microstrat LLC, Houston, Texas

Abstract

In 1990, Dr. Peter R. Vail and Dr. Walter W. Wornardt Jr. published their methodology, Well-log Sequence Stratigraphy. This methodology has been applied to the Monterey strata using age-significant species of diatoms. Barron's Standard Pacific Coast Miocene Correlation Chart was used as our standard of reference for numerical age and correlation of the Pacific Coast. Gradstein's standard numerical age dated Third Order Global Cycle Chart was attached to Barron's Correlation Chart in time. The numerical ages of the Third Order Miocene Depositional Cycles and Maximum Flooding Surfaces of Gradstein were included. The diatom species uniquely associated by numerical age to a specific MFS were annotated on the chart at their age level in Ma. For instance: The TOR 1 (10.53 Ma) MFS, in the TOR 1, (11.78 Ma) Third Order Sequence Cycle, in the middle Miocene is characterized by LO *D. hustedtii* ss (10.00 Ma); FO *L. reinholdii* (10.00 Ma); FO *T. minutissima* (10.10 Ma); FO *D. dimorphs* (10.10 Ma); LO *D. diamorpha* (10.51 Ma); LO *C. vetustissimus* (10.70 Ma); and LO *Mediaria splendida* (11.00 Ma). Additional MFS are defined from Early to Late Miocene, AQ 1- Me 2. The associated assemblage was used identify each MFS and its numerical age. The MFS will provide a time-stratigraphic level of correlation, a timeline, on well-logs and especially 2D or 3D seismic profiles. It is a mapping horizon used to construct: structural contour, isochors, isopach, paleo-water depth, and correlation points between wells, predict the age of sediments ahead of the drill bit, the amount of time missing, and identify repeated sections.