

Subsurface Sequence Stratigraphic Analysis of the Eocene-Lower Oligocene of Alabama

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South Alabama contains world-class outcrops of Eocene and Oligocene strata that have been the object of intense scrutiny over the past 50 years. Despite such thorough examination, these outcrops have failed to assuage controversy as to the physical nature of the Eocene/Oligocene (E/O) boundary in this region. Some workers have made this faunal boundary coincident with a sequence boundary, while others place it within a stratigraphically condensed section during a relative sea level highstand. This problem is exacerbated by the fact that because outcrops in Alabama are limited in areal extent, large-scale stratal patterns such as onlap and downlap have not been used to place constraints on this matter.

A grid of wireline logs (SP and resistivity) has been assembled and digitized in the area of interest to examine the nature of the E/O boundary on a seismic scale. The log

data are calibrated to lithology and biostratigraphy using two stratigraphic test cores. In these cores the Eocene/Oligocene boundary, defined using multiple biostratigraphic events, occurs in a relatively fine-grained interval bounded by unconformities. These unconformities are interpreted as sequence boundaries amalgamated with transgressive surfaces of erosion.

To address the physical nature of the E/O boundary on a regional scale, transgressive-regressive (T-R) cycles reflected in the wireline logs are currently being analyzed and correlated. Mapping T-R cycles into the subsurface of Alabama provides information that was unavailable to earlier field-based workers. In addition, such mapping may clear up other areas of contention, such as the number of cycles in the middle Eocene Lisbon Formation.