

MANCINI, ERNEST A., Center for Sedimentary Basin Studies, Department of Geological Sciences, The University of Alabama, Box 870338, Tuscaloosa, Alabama 35487-0338, and T. MARKHAM PUCKETT, Center for Sedimentary Basin Studies, Department of Geological Sciences, The University of Alabama, Box 870338, Tuscaloosa, Alabama 35487-0338,

Integrated biostratigraphic and sequence stratigraphic approach for correlation and basin interpretation

Establishment of a stratigraphic framework based on an integrated biostratigraphic and sequence stratigraphic (transgressive-regressive (T-R) cycles) approach is fundamental to the correlation of strata and for the interpretation of the geologic history of a region. Planktonic foraminiferal biozones and T-R cycles are recognized in Upper Cretaceous strata of the northern Gulf of Mexico. T-R cycles include the T-R 4 (upper Albian to lower Cenomanian), T-R 5 (upper middle Cenomanian to upper Turonian), T-R 6 (middle Coniacian to middle Campanian), T-R 7 (middle to upper Campanian) and T-R 8 (lower to lower upper Maastrichtian) cycles. Cycle recognition is based on stratal geometries, nature of cycle boundaries, facies stacking patterns, and large-scale shifts in major facies belts. Cycles are controlled by the change in accommodation space resulting from stratigraphic base-level changes (eustatic and tectonic effects) and sediment supply and accumulation. T-R cycles are composed of aggrading and backstepping intervals of a transgressive phase (upward deepening section) and an infilling interval of a regressive phase (upward shallowing section), which are separated by a surface of maximum transgression. The aggrading interval marks the change from base-level fall and erosion to base-level rise and sediment accumulation. Transgressive events of the backstepping interval are widespread and provide regional correlation datums. Progradational events associated with the infilling interval represent major influxes of siliciclastic sediments and result in a loss of accommodation space. These Upper Cretaceous T-R cycles are correlated throughout the northern Gulf of Mexico.