

Sullivan, Morgan D. (California State University, Chico) and Raymond Sullivan*
(San Francisco State University, CA)

TECTONIC CONTROLS ON SEDIMENTATION IN THE EARLY TERTIARY DEPOSITS OF THE SACRAMENTO BASIN

The early Tertiary strata of the Sacramento Basin total more than 2000 meters (6500 feet) in thickness and consist predominantly of alternating units of shallow marine sandstones and bathyal marine mudstones. The observed cyclic pattern of sedimentation is interpreted as a series of unconformity bounded depositional sequences that can be broadly correlated to global sea level events. Times of lowstand in sea level are marked by cutting of submarine canyons and development of incised valleys on the shelf. Lowstand deposits are dominated by fluvial and estuarine valley-fill on the shelf and canyon-fill on the slope. Transgressive to highstand systems tracts are composed of marine shales and sandy-rich turbidite deposits. Sediment distribution was strongly influenced by regional tectonism on the Stockton arch and Carquinez high, as well as activity along several local north-south normal faults. Marked stratigraphic changes occurred in the vicinity of these structures. The middle Eocene succession best illustrates the control of tectonics on sedimentation. The Domengine Formation is comprised of fluvial and estuarine sandstones that were deposited within an incised or structural confined valley. The depocenter of the middle Eocene incised valley deposits closely followed the trend of older Tertiary submarine canyons. The vertical stacking of these different age incised systems suggests throughout the early Tertiary a strong structural control that focused erosion and deposition in the same region. The overlying Nortonville Shales and turbiditic sandstones of the Markley Formation represent rapid subsidence within the Sacramento Basin during late middle Eocene times.