

Interactions Between Rift Tectonism and Sedimentation, Cretaceous Chihuahua Trough

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Syn-depositional faults and oblique-to-basin-margin rotation have both influenced sedimentation in the Aptian and Albian strata Of the Chihuahua trough. Regionally, the trough fill increases from 120 m at the margin of the formation to over 3 km in the trough interior. This thickening is abrupt and occurs over 30 km. Depositional environments range from medial alluvial fans through distal shelves and represent a transgression as tectonism waned and eustatic sea level rose. Four formations were deposited during the waning stages of this Jurassic to Cretaceous extensional basin. Three observed syn-depositional faults die out in the Finlay formation, but have increased displacement in underlying sediments. Two of the faults are antithetic and dip toward the basin margin, whereas one is synthetic. Eustatically influenced stratigraphy, including both parasequences and sequence boundaries cross the faults and are offset with little apparent thickening or thinning.

Rotation causes most of the thickening within the study area. One easily correlated formation bounded above and below by transgressive surfaces thickens from 375 m on the northern side to 437m on the southern side. Rotation of the lower part of the formation results in a 7-degree dip when the structural dip of the top of the formation is flattened. Most of this thickening occurs in shelf mudstones, which are rotated and truncated sequence boundaries and then buried by coastal and fluvial sandstones. . For example, the thickness of one shale bed varies from 18 m on the side to 70 m within 2 km.