

HIGH RESOLUTION BASIN AND STRUCTURAL ANALYSIS OF OLIGOCENE-MIOCENE STRATIGRAPHY, HORSE SPRING RIDGE AND UPPER LIME WASH, LAKE MEAD DOMAIN, NEVADA, USA

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ABSTRACT

The Lake Mead domain is located in the eastern portion of the central Basin and Range Province, which is bounded by the Colorado Plateau to the east, the Black Mountains to the south, the Las Vegas Valley to the west, and the Mormon Mountains to the north. Structurally, the domain is characterized by two opposite-sense of movement strike-slip fault systems, the sinistral Lake Mead fault system and the dextral Las Vegas Valley shear zone, as well as normal faults and contractional structures. Stratigraphically, the domain is characterized by the largely pre-extensional late Oligocene-early Miocene Rainbow Gardens Formation and the syn-extensional middle Miocene Horse Spring Formation. Geochronology and tephrochronology from numerous tuffs gives ages from 24 to 17 Ma on the Rainbow Gardens Formation. A new study on the Rainbow Gardens Formation, at both the Horse Spring Ridge and Upper Lime Wash locations (eastern Lake Mead domain) based on stratigraphic and provenance analyses indicates an abrupt change in sedimentation, hypothesized to either be related to a nearby faulting event or is simply related to erosion from a paleotopographic high. This project will test the hypothesis that this abrupt change in sedimentation is related to faulting and that the on-set of extension began at ~19 Ma instead of ~17 Ma, a substantial change in the interpretation of the domain. This hypothesis has implications for understanding the timing of extension, and the processes that drove extension. I will utilize detailed lithofacies mapping, kinematic and facies analysis, and tephrochronology in the study.

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