

Sedimentary Record of Regional Tectonic Events in the Mahogany Oil Shale Zone of the Lacustrine Green River Formation (Eocene), in Colorado and Utah

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Abstract

Laterally extensive syndepositional deformation features were investigated in the lacustrine Green River Formation (Eocene) across the Piceance Creek and Uinta Basins (Colorado and Utah, USA), specifically in the Mahogany Oil Shale Zone. This is an extensive stratigraphic marker interval that contains several organic-rich shale beds. Deformation structures are characterized by horizons with pervasive sedimentary injection features, sheared, brecciated and folded layers, as well as extensive mass-transport deposits. The style of deformation was governed by the rheological properties of the sediment. Their great lateral extent and confinement to a thin (20–30 m), well-defined stratigraphic interval indicates regional tectonic events ~49 Myr ago, which caused dewatering, hydrofracturing and lake-floor instability and slumping of low energy, profundal lacustrine deposits in different areas of the basins.

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