

Seismically induced soft-sediment deformation structures in the Eocene lacustrine Green River Formation (Wyoming, Utah, Colorado, USA) – a preliminary study

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Abstract

Pervasive horizons of various kinds of soft-sediment deformation structures were identified in the lacustrine sediments of the Eocene Green River Formation, USA. These features are present in a variety of sediments deposited in paludal (coal, sand) to profundal (oil shale) environments. Deformation is represented by brittle and plastic behavior, as well as sediment injection, and the deformed layers are confined by undeformed beds with similar thickness and lithology to the deformed ones. Based on the (1) tectonic setting of the subbasins; (2) the sedimentary environment and sedimentological characteristics of the successions in which the deformed layers occur; (3) their lateral extent; (4) their recurrence at different stratigraphic levels; and (5) their similarity to those described as seismically induced deformation structures in other areas and reproduced experimentally, we interpret these features as having developed as a result of increased pore pressure and vertical or horizontal stresses induced by seismic activity.