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Evidences of marine regression and Pangaea breakup: Triassic-Jurassic boundary from the Tethyan Salt Range, Pakistan.

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Sea-level reconstruction records during the Triassic-Jurassic boundary interval reveal an end-Triassic regression event recognized globally. Emergence of Triassic marine strata and onset of fluvial/continental Lower Jurassic sedimentation marks this interval throughout the European basins and is linked to the Central Atlantic Magmatic Province (CAMP) activity and Pangaea breakup. Furthermore, normal faults with horst and graben geometries are observed at this level on seismic sections in different regions on the eastern margin of the African Plate and are related to the Karoo rift system. However, the existing literature sheds no light on the abrupt facies dislocation, from the Triassic dolomites (Kingriali Formation) to Lower Jurassic fluvial/continental conglomerates/pebbly sandstones (Datta Formation) in the Tethyan Salt Range of Pakistan. Geological record in the region indicates marine regression and emergence under Greenhouse conditions and the thick laterite present at the boundary interval negates the possibility of glacial influence in this region. Sedimentological evidences reveal an undulatory surface and laterite at the base of the Datta Formation while thin evaporites occur at this level in the southwestern parts. Geophysical data (Seismic reflection data) of the region displays normal faults and horst and graben geometries in the basement and reverse faults and popup structures overprint these in the cover sequence. The Lower Jurassic Datta Formation is dominantly comprised of fluvial/continental-deltaic strata deposited in an overall graben fill setting following the Late Triassic marine regression on the southwestern margin of the Neothetys (Salt Range, Pakistan). The area therefore provides sedimentological evidences for an abrupt sea-level fall comparable with the European basins, Iran and Afghanistan. The normal faults in the region provide evidences for the Pangaea breakup revealing a tectonic control on the sea-level fall at the Triassic-Jurassic boundary similar to those observed on in the Karoo rift system that triggered regional sea-level fall and separation of the Indian plate from the African and Arabian plates.

