

Morphotectonic evolution of the Dead Sea transform in the Jordan Valley, Jordan.

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Abstract

Remote sensing and field studies of the Jordan Valley area from the Dead Sea in the south to the Lake Tiberias in the north shows different morphotectonic features indicating the active nature of the Jordan Valley Fault, which is a segment of the Dead Sea Transform. These features include different scale pressure ridges and sag depressions, stream offsets, linear valley courses along the transform, and fault scarps. In man made and natural trenches, the transform shows negative and positive flower structures associated with transtensions and transpressions respectively. In addition to active sinistral strike slip movement along the transform, the boundary faults show active vertical movement as indicated from fault scarps in the recent sediments. From the offset of Post Pleistocene streams, the calculated slip rate is 4.9 mm/yr in the past Late Pleistocene. The different deformational styles of the Quaternary sediments and the angular unconformity between the different units indicate six phases of tectonic movements ranging from the Pre-Pleistocene uplifting phase to the Holocene historical and instrumental earthquakes.