**Slip history of the Dead Sea fault system since 100 ka**

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The long-term behavior of active faults may be recorded in the landscape as cumulative earthquakes progressively offset landforms such as streams, fans, and ridges. To achieve the best understanding of the slip history for a given fault, high accuracy offset and age constraints for a significant number of these landforms should be obtained. In the present work we construct a slip history for the Dead Sea fault (DSF) system from Turkey to Jordan. Our analysis focuses on utilizing the paleoclimate history of the Eastern Mediterranean for the last 140 kyr with an emphasis on Intense Precipitation Episodes (IPEs) likely to have triggered systematic stream gully erosion and alluvial fan aggradation. IPEs are documented by the occurrence of sapropel layers, high lake stands and significant changes in vegetation and dated by multiproxy approaches of which we favor speleothems from caves located along the DSF. Overall, we define 11 IPEs during the last 140 kyr. In parallel, we compile 181 cumulative offset values along nine segments of the DSF system between Turkey and Jordan, only 55 of which were previously associated with an age determination. We employ an offset clustering analysis that we link to the defined IPEs chronology to propose new ages for 57 undated offsets, revise 18 published values and discard 6 more. Our consolidated dataset is composed of 106 offset values with related ages spanning the entire DSF system.

Monte Carlo analysis of this high-resolution dataset indicates consistent along-strike slip rates along the DSF system with values ranging from 5.0 to 5.8 mm/yr (2-sigma), outside of the geometrically complex Lebanese Bend. A slight, but statistically significant positive gradient may be observed from south to north. Over observation windows of 2-121 kyr individual datasets indicate that temporal slip-rate variability is unlikely along the Yammouneh fault, possible along the Roum, Jordan Valley and Wadi Araba faults and likely along the Hacipasa and Missyaf faults. Where visible, the largest slip rate gradient occurs at 7.5-8.5 ka BP and appears to be a system-wide characteristic.