Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11834, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11834
EGU General Assembly 2008

Seismic history of the Southeastern Sea of Galilee margins, Dead Sea Rift, Israel

Katz,
O.(1,*), $Amit, R.(1), Yagoda, G.(1,2), Hatzor, Y.H.(2), Porat, N.(1), Hecht, H(1)$
(1) Geological Survey of Israel, 30 Malkhe Israel St., Jerusalem 95501, Israel;

(2) Ben Gurion University of the Negev, P. O. Box 653, Be'er Sheva 84105, Isreal;

*Presenting author: Oded Katz, odedk@gsi.gov.il

We studied the seismic-history of the SE margins of the Sea of Galilee, situated along the Dead Sea Rift. The study area hosts the N tip of the seismically-active Jordan valley fault-segment. During the past two millennia a few strong earthquakes are known to have occurred along this segment and current seismicity is recorded.

Morphotectonic mapping using aerial-photos and field observations revealed in the studied area numerous 10 to 100 m long N-S striking lineaments as well as some old landslides. Resolving the interaction between these morphological elements can be a key factor in understanding the level of local seismic hazard and the relative timing of the events.

We excavated trenches across 4 lineaments showing distinct morphological vertical steps. Each trench hosts one or more westwards dipping faults with normal displacement of the soil profiles. Total displacement is up to a meter and in places more than one displacement event can be traced on a single fault plane. The bed rock is highly fractured near the faults. OSL dating of the soil profiles indicates Holocene ages in the westernmost trenches and upper Pleistocene in the easternmost ones.

The largest landslide observed in the field, 500m wide and 1500m long, was selected for detailed analysis. A trench was excavated on the landslide, crossing a lineament clearly detected on both the N and S boundaries of the slide. The 3m deep trench exposed 3 soil profiles developed in the colluvium composing the landslide. The development of the three soil profiles implies cyclic down-slope movement of material and quiescent periods between movement episodes, allowing soil formation. Sedimentary and pedogenic disturbances detected in the trench, may be associated with the slide-crossing lineament. OSL dating of the soil profiles reveals upper Pleistocene ages in the lowermost soil profile and Holocene in the uppermost one. The temporal relationship between the slide and the lineaments are yet unclear, although the overall time frame for sliding events is similar to displacement events.

Results of slope-stability analyses for the slide indicate that the slope is stable under static gravitational loading. Pseudo-static analyses results indicate that a horizontal PGA value of about 0.3g would be required for sliding if residual strength values of the rocks are assumed.

According to the observed displaced soil-profiles in the trenches and the high PGA needed for slope instability we conclude that the study area experienced an intense seismic history with strong earthquakes (Mw 7) and high PGA (0.3g). These findings need to be taken into considerations when seismic hazard evaluations are done.