



Submarine landslides hazard offshore Israel

Oded Katz

Geological Survey of Israel, Jerusalem, Israel (odedk@gsi.gov.il)

Submarine landslides pose significant natural hazards. They can damage seafloor infrastructure, such as that used to recover oil and gas or seafloor telecommunication cables, and even generate tsunamis. We recently mapped 447 submarine landslides across the east Mediterranean continental slope, offshore Israel (hereafter the studied area). The mapped landslides are found at water depths of 130 m to 1,000 m and their volume ranges $10^{-5} - 10^0$ km³. Landslide scars are typically related to a critical slope angle of $>4^\circ$. Landslides at the northern part of the studied area are spatially associated with fault scarps and are smaller than the ones on the southern part. In this work we evaluate the potential hazard to population and to on- and off- shore facilities posed by submarine landslides across the studied area.

We integrate three independent probabilities: (1) the probability for a landslide event of **a given volume**, based on the size distribution of the mapped landslides; (2) the probability for a landslide event in **a given time**, based on the reoccurrence time of triggering earthquakes with $M > 7$, and on a 50,000 years general time frame derived from submarine landslides identified across the Mediterranean Sea; (3) the probability for a landslide event in **a given area**, based on the distribution of slopes exceeding the critical angle. Overall, the fraction of potentially destructive landslides (size > 0.1 km³) is small, 0.05. Thus, considering typical planning time scales of less than 100 years, the calculated hazard is only moderate.

The small fraction of landslides with tsunamogenic potential (size > 1 km³), suggests that the hazard for landslide-induced tsunamis along the open slope part of the studied area is small. Landslides in the southern part of the studied area are larger and thus present a somewhat bigger potential source of tsunami waves.