



SEISMOGENIC SUBMARINE SLUMP TSUNAMIS ALONG THE LEVANTINE COAST

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A careful screening of historical accounts of earthquakes and tsunamis in the Levant reveals considerable amount of sea-waves associated with earthquakes that have been originated along the continental Dead Sea Transform System. Paleoseismic evidence of surface rupture on-land of earthquakes that were reported to generate abnormal sea waves exemplifies that process.

The close association of the damaged area on land and the coast hit by the tsunami, and the narrow limits of the affected coast, point towards seismogenic landslide tsunamis. The numerous scars that appear along the Levantine continental slopes support this assumption.

Integrating the past reports of earthquakes and tsunamis as well as the geology, bathymetry and seismotectonics of the Eastern Mediterranean, allow for the following preliminary considerations:

1. Construction of the tsunamigenic framework of the Levantine region, including a preliminary estimate of the spectrum and return periods of the potential events.
2. Determining the threshold parameters of tsunamigenic earthquakes in the Levant as magnitude ~6 and distance of 100 km away from the sea.
3. Adjusting the tsunami decision matrix of the Levant.
4. Understanding that for seismogenic slump tsunamis, where the slump is nearby the earthquake, the shaking and sometimes the retreat of the water are the warning. Thus, education is the best strategy for awareness and lifesaving in such events.
5. Simulating the potential tsunami scenarios in the region and determining the maximum expected wave heights and downdrafts at the shoreline, and most importantly, delineating the zones of potential inundation.

Nevertheless, some very important issues are still left to be investigated:

1. What are the exact geometry and mechanical characteristics of the local slumps? These are necessary for realistic tsunami scenarios.
2. What ground acceleration is needed to trigger a submarine slump? This would refine the relationship of 'magnitude – distance from the sea', improve the decision matrix, and may also advice on the possibility of spontaneous release of tsunamigenic landslides.
3. Since not all of the past strong earthquakes generated tsunamis, there might be some other factors that control the slumping process, yet to be resolved.

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