



The 1979 Nice airport tsunami (French Riviera): comparison between field investigations and a refined numerical modelling of the landslide and consecutive tsunami

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On 16 October 1979, a tsunami of a local origin hits the French Riviera around Nice, France, killing 8 people and generating important economic losses. Its impact was felt from Hy eres to Menton, France. The main effect of this tsunami was flooding in the neighbourhoods of La Salis and La Garoupe, Antibes, France. A synthesis of unpublished reports written in the context of an administrative investigation was conducted. Various archives were also consulted (newspapers, fire and rescue unit reports, insurance reports, etc.), and a field survey was organized in 2009 to record testimonies from the inhabitants who witnessed the flood in La Salis, Antibes, the area where the effects of the tsunami were the greatest. Comparing precise testimonies and the 1979 topographic information available allowed the authors to precisely map the flood and to deduce the runup values which reached 3.5 m locally, with a maximal distance of flooding of 150m inland. In the light of this new information, a new simulation of the tsunami is conducted. A study of slide viscosity and water incorporation is performed using a detailed numerical model based on a single initial volume (10 million m³, in accordance with available data). The propagation of the tsunami is simulated with a multi-grid parallel finite-difference code. Tide gage records in Nice and Villefranche are presented and compared to numerical results. Maximum elevation maps from the simulation are compared to the witness-based flood maps, showing good agreement, and highlighting a focusing of the waves on Antibes. Calculated resonance periods in the Nice, Villefranche, Port Vauban and La Salis harbours match with most of the main components calculated in both observed and computed waveforms. Comparing modelling to field investigation results – which had never been done for the 1979 Nice airport tsunami – emphasizes the interests of such collaboration between geographers and geophysicists for a better understanding of tsunamis' triggering processes and propagation.