

# Reconstruction of the paleo-landscape of Ognina (Siracusa, South-eastern Sicily) during the occurrence of tsunami and storm events

## PRESENTED BY

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## ABSTRACT

South-eastern Sicily represents one of the Mediterranean areas most impacted by tsunamis and storm events in the past. These extreme marine events left geomorphic and sedimentary imprints, such as large boulders or high-energy deposits, along the coasts. One of these deposits was reported by previous works along the coast of Ognina, a small residential area located 20 km south of Siracusa. The deposits fill the back edge of a ria incised into Miocene limestones, and are composed of three main stratigraphic units attributed to several tsunami and storm events that occurred along the coasts of south-eastern Sicily since the IV century Common Era (CE). In this work, we use numerical models to simulate the impact of these extreme marine events, at the time of their occurrence, along the Ognina coastal sector, with the aim to: i) better define the tsunamigenic sources responsible for the events found in the deposits, ii) verify if some units could be related to a storm event, iii) investigate constrains on the paleo-landscape of the studied area at the time of tsunami and storm occurrence. We reconstructed the morphology of ancient local landscapes using geological and historical information, together with a detailed topographic and geoelectrical survey. We implemented a modelling chain to simulate the tsunami and storm wave propagation upon the ancient landscapes. Our results highlighted that the use of advanced modeling tools, combined with in situ geological evidence and geophysical survey, has the potential to support the attribution of coastal geomorphic imprints to specific tsunami or storm events, the better definition of the paleo-landscapes, and the identification of the most likely tsunamigenic sources. This last aspect plays a fundamental role in providing more reliable characteristics of the tsunami propagation as well as in the assessing of potential tsunami hazard and related coastal impacts.

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