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On the use of Paleo DEMS for Simulation of historical Tsunami Events

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In this study, we present a methodology to reconstruct a Paleo Digital Elevation Model (PDEM) to alter geomorphological contexts between the present and the desired paleo period. We aim to simulate a historical tsunami propagation in the same geomorphological contexts of the time of the event.
The methodology uses a combination of historical data, GPS-measurements with more recent LIDAR data to build PDEMs.
Antique maps are georeferenced; altitude elevations are attributed through descriptions, and old pictures are used to estimate the original outline of a given site.
Antique maps are georeferenced to obtain the location of landform and building features. Analysis and interpretation of the historical accounts, descriptions and old pictures serve to attribute an approximate elevation to landform and building features.
River mouths and water courses outline can be rebuilt by the boundaries as given in the antique maps. Analysis of present day river mouths with similar characteristics permits the reconstruction of the antique water courses. GPS-RTK measurements along chosen river mouths' in similar geomorphologic environments is used to derive their inclination. We applied this methodology to the 1st November 1755 flooding of Cascais-Portugal. Our results show that using the PDEM we can reproduce the inundation described in most of the historical accounts.
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