From regional to local SPTHA: efficient computation of probabilistic inundation maps addressing near-field sources

Manuela Volpe, Stefano Lorito, Jacopo Selva, Roberto Tonini, Fabrizio Romano, and Beatriz Brizuela

Istituto Nazionale di Geofisica e Vulcanologia, Italy

Correspondence: M. Volpe (manuela.volpe@ingv.it)

Supplementary Material
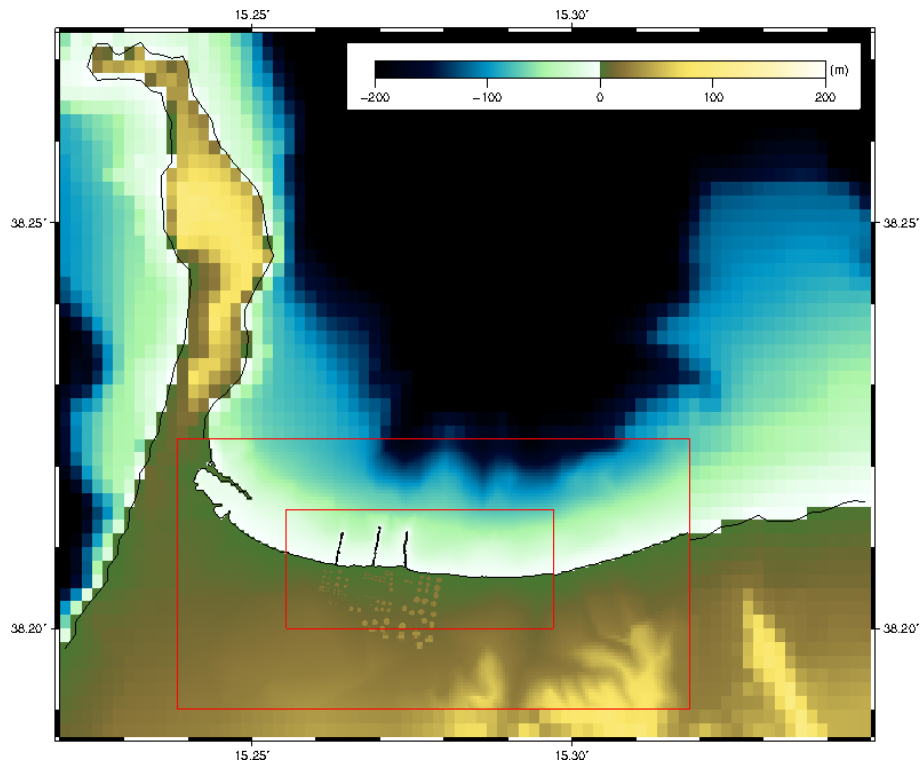
Figure S1. Close-up view of the topo-bathymetric nested grids used for tsunami simulations, with gradually increasing resolution (0.1, 0.025, 0.00625 arc-min). The domain of the outer grid (0.4 arc-min) is the one showed in Fig. 2.
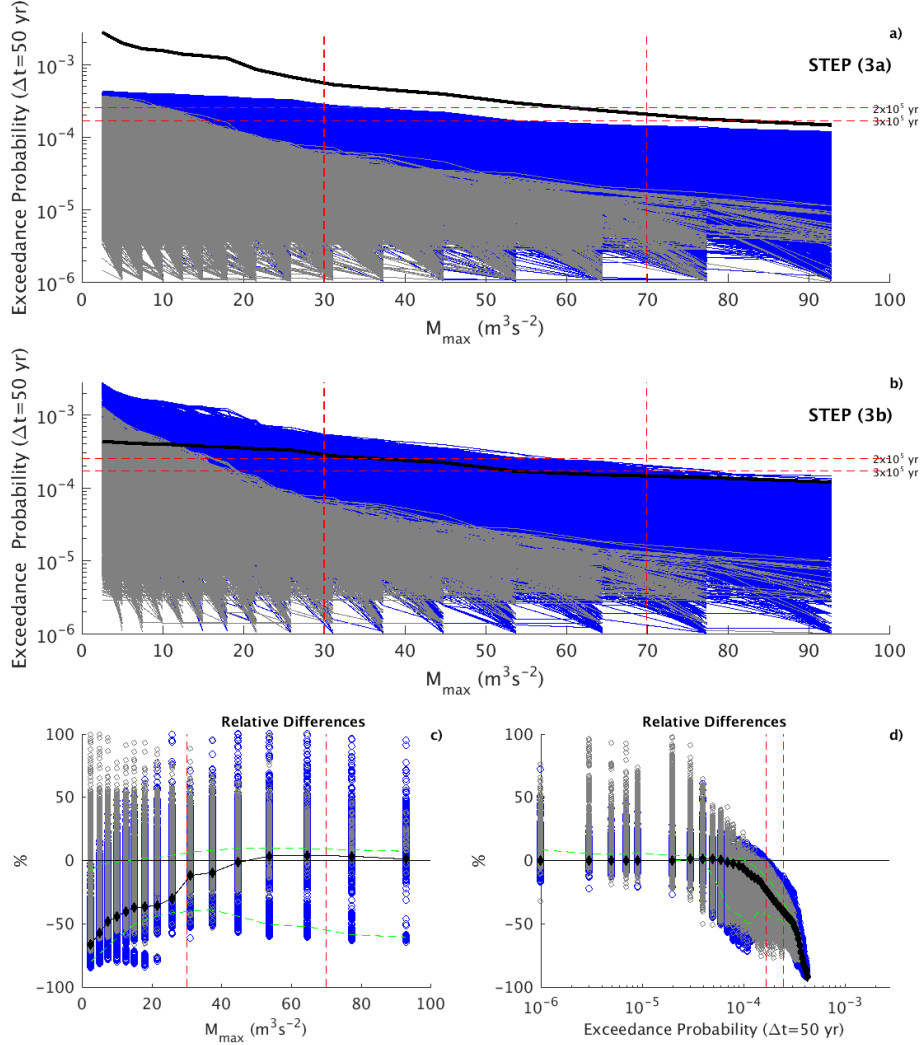
Figure S2. a) Mean hazard curves for M_{max} at all points within the highest resolution grid, as obtained from STEP (3a) of the SPTHA procedure (see text and Fig. 1). Grey and blue colors refer to inland and offshore points, respectively. The bold black line represents the envelope of the curves from STEP (3b). Red dashed lines represent the values used to obtain probability (Fig. S3) and hazard (Fig. S4) inundation maps. b) Same as a) but using STEP (3b). The bold black line is the envelope of the curves from STEP (3a). c) Relative differences in terms of exceedance probability (in $50yr$) as a function of M_{max}, computed as $[(3a) - (3b)]/(3b)$. The black line is the median of the point distribution; the green dashed lines correspond to the 16th and 84th percentile. d) Same as c) but in terms of M_{max} as a function of the exceedance probability (in $50yr$).
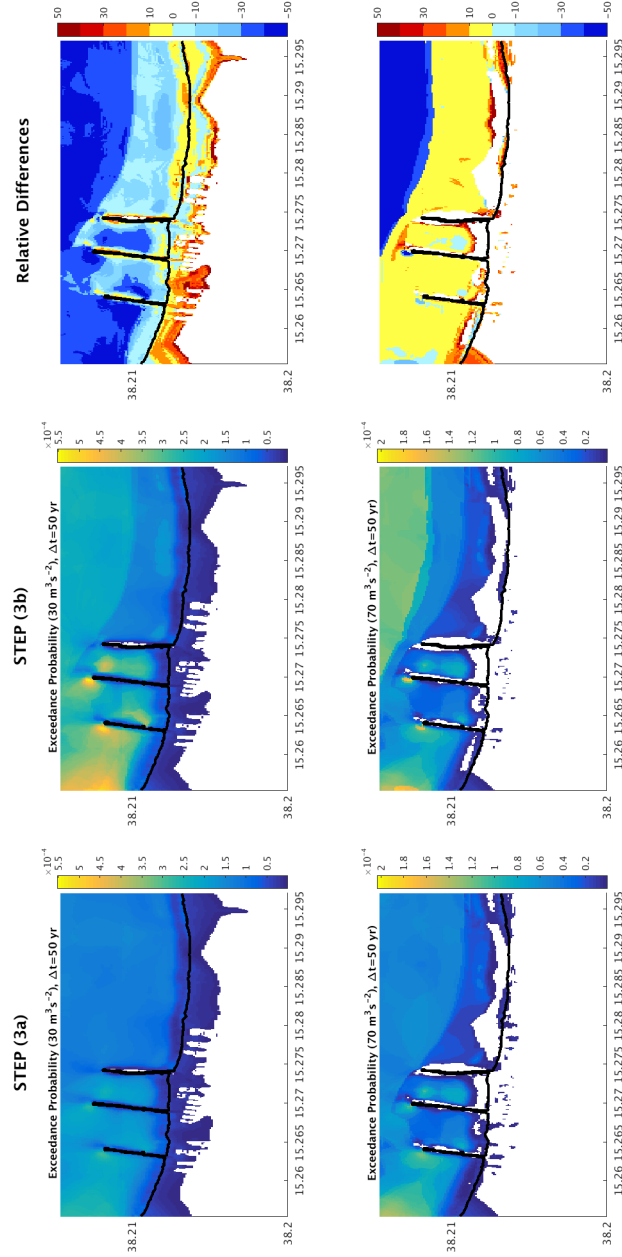
Figure S3. Probability maps (inner grid) for M_{max} derived from the hazard curves in Fig. S2 at two different thresholds ($30m^3s^{-2}$, $70m^3s^{-2}$) for STEP (3a) and (3b) and relative differences computed as $\left[(3a)-(3b)\right]/(3b)$.
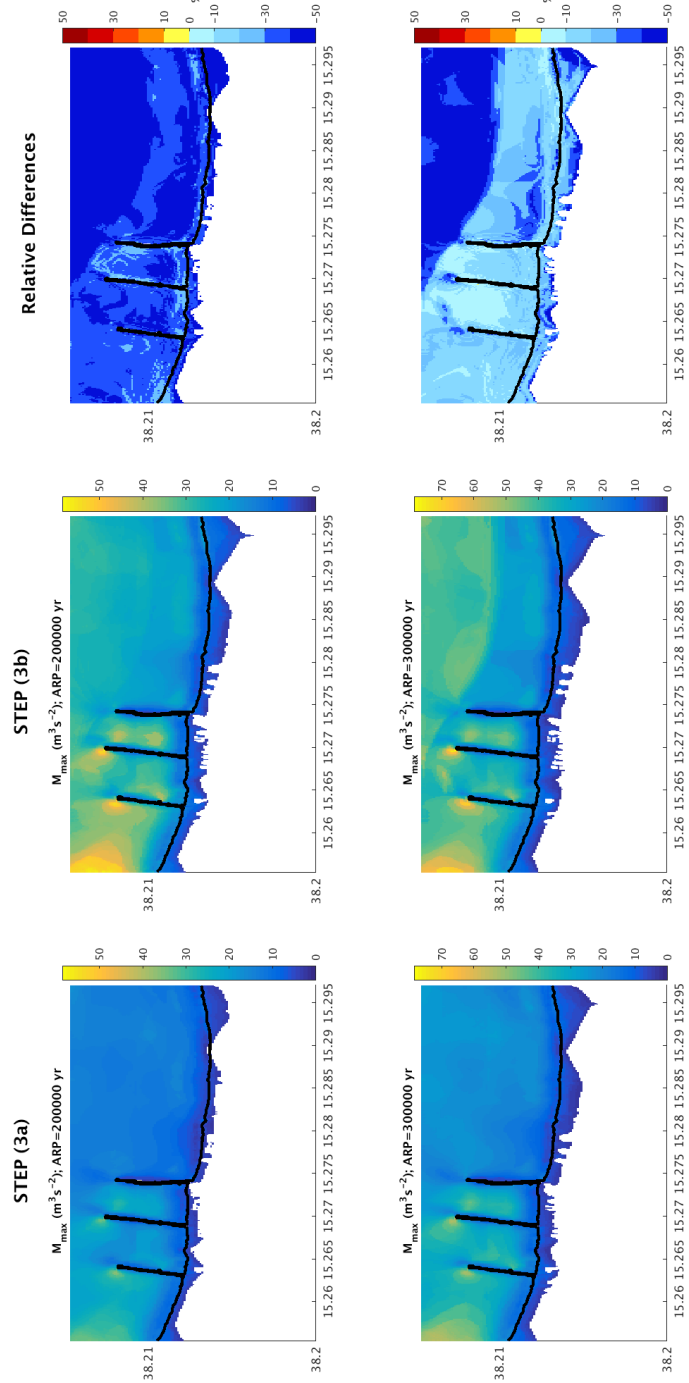
Figure S4. Hazard maps (inner grid) for M_{max} derived from the hazard curves in Fig. S2 at two different ARPs ($2 \times 10^5 yr$, $3 \times 10^5 yr$) for STEP (3a) and (3b) and relative differences computed as $[(3a) - (3b)]/(3b)$.