tektonika

Supporting Information (SI) for

Investigating global correlations between earthquake-generated tsunamis and subduction zone characteristics

Iris van Zelst[a,b,c,*], Silvia Brizzi[d], Elenora van Rijsingen[d,e,f,g], Francesca Funiciello[d], Ylona van Dinther[a,g]

[a] *Seismology and Wave Physics, Institute of Geophysics, Department of Earth Sciences, ETH Zürich, Zürich, Switzerland*
[b] *Institute of Planetary Research, German Aerospace Center (DLR), Berlin, Germany*
[c] *Now at: School of GeoSciences, University of Edinburgh, Edinburgh, UK*
[d] *Laboratory of Experimental Tectonics, Roma Tre University, Rome, Italy*
[e] *Laboratoire de Géologie, École Normale Supérieure, PSL Research University, CNRS-UMR 8538, Paris, France*
[f] *Géosciences Montpellier, CNRS, Montpellier University, Montpellier, France*
[g] *Department of Earth Sciences, Utrecht University, Utrecht, The Netherlands*

Contents supplementary material

In this file:

See Van Zelst (2025) for the SNITCH database, subduction segment coordinates, and scripts used in this study.

*Corresponding author
Email address: iris.vanzelst@ed.ac.uk / iris.v.zelst@gmail.com (Iris van Zelst)

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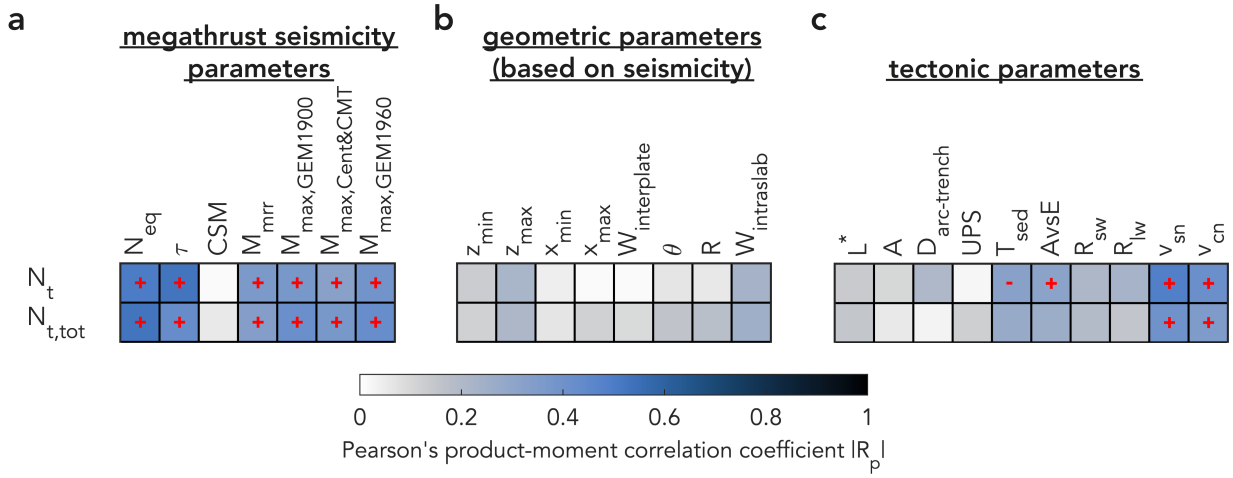

Figure S1: Pearson's rank correlation coefficients of (a) the SNITCH-2007 tsunami event parameters correlated with the megathrust seismicity parameters; (b) the SNITCH-2007 tsunami event parameters correlated with the geometric parameters (based on seismicity); and (c) the SNITCH-2018 tsunami event parameters correlated with tectonic parameters. Significant positive and negative correlations worthy of further investigation as defined in Sec. 3.1 (main text) are indicated by a red plus and minus sign, respectively. See Table 1 in the main text for explanations of the abbreviations.

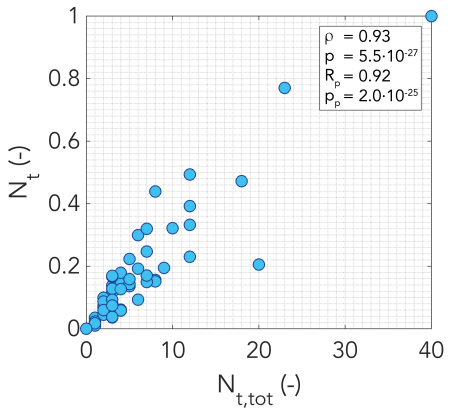

Figure S2: Scatter plot showing the relation between the normalised number of tsunami events caused by earthquakes per km trench N_t and the total number of earthquake-generated tsunami events in a subduction zone segment $N_{t,\mathrm{tot}}$. Each dot represents one subduction zone segment. Correlation coefficients and p-values are indicated for both the Spearman (ρ and p, respectively) and Pearson methods (R_p and p_p, respectively).

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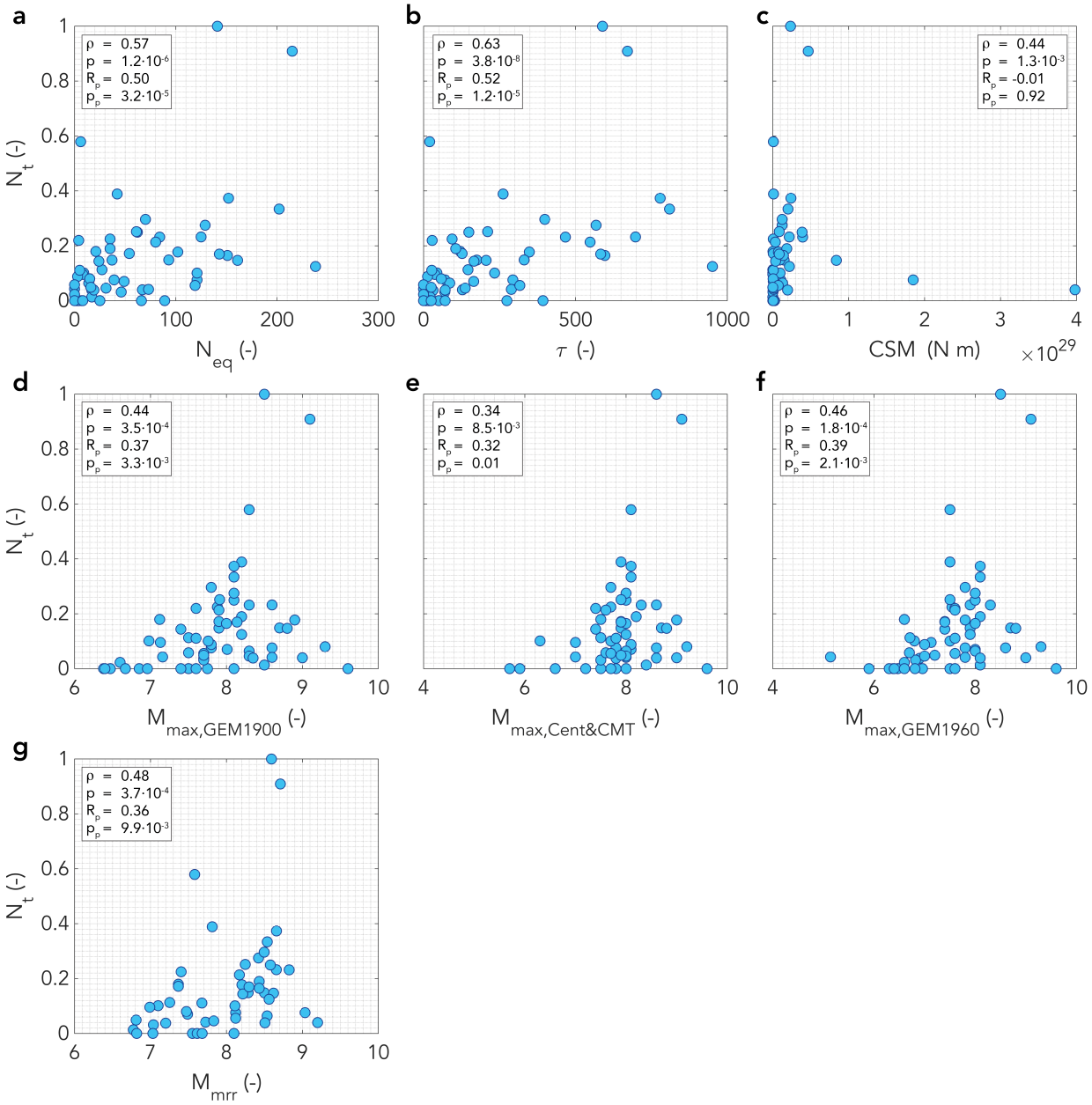

Figure S3: Scatter plots showing the relation between the normalised number of tsunami events caused by earthquakes per km trench N_t and the megathrust seismicity parameters: (a) number of earthquakes N_{eq}; (b) seismicity rate: number of events per century and per 10^3 km trench τ; (c) cumulative seismic moment CSM; (d) maximum M_w from 1900–2007 according to the ISC-GEM catalogue $M_{\mathrm{max,GEM1900}}$; (e) maximum M_w from 1900–2007 according to the Centennial & CMT catalogues $M_{\mathrm{max,Cent\&CMT}}$; (f) maximum M_w from 1960–2007 according to the ISC-GEM catalogue $M_{\mathrm{max,GEM1960}}$; (g) equivalent representative magnitude in the sense of Ruff and Kanamori (1980) M_{mrr}. Each dot represents one subduction zone segment. Correlation coefficients and p-values are indicated for both the Spearman and Pearson methods.

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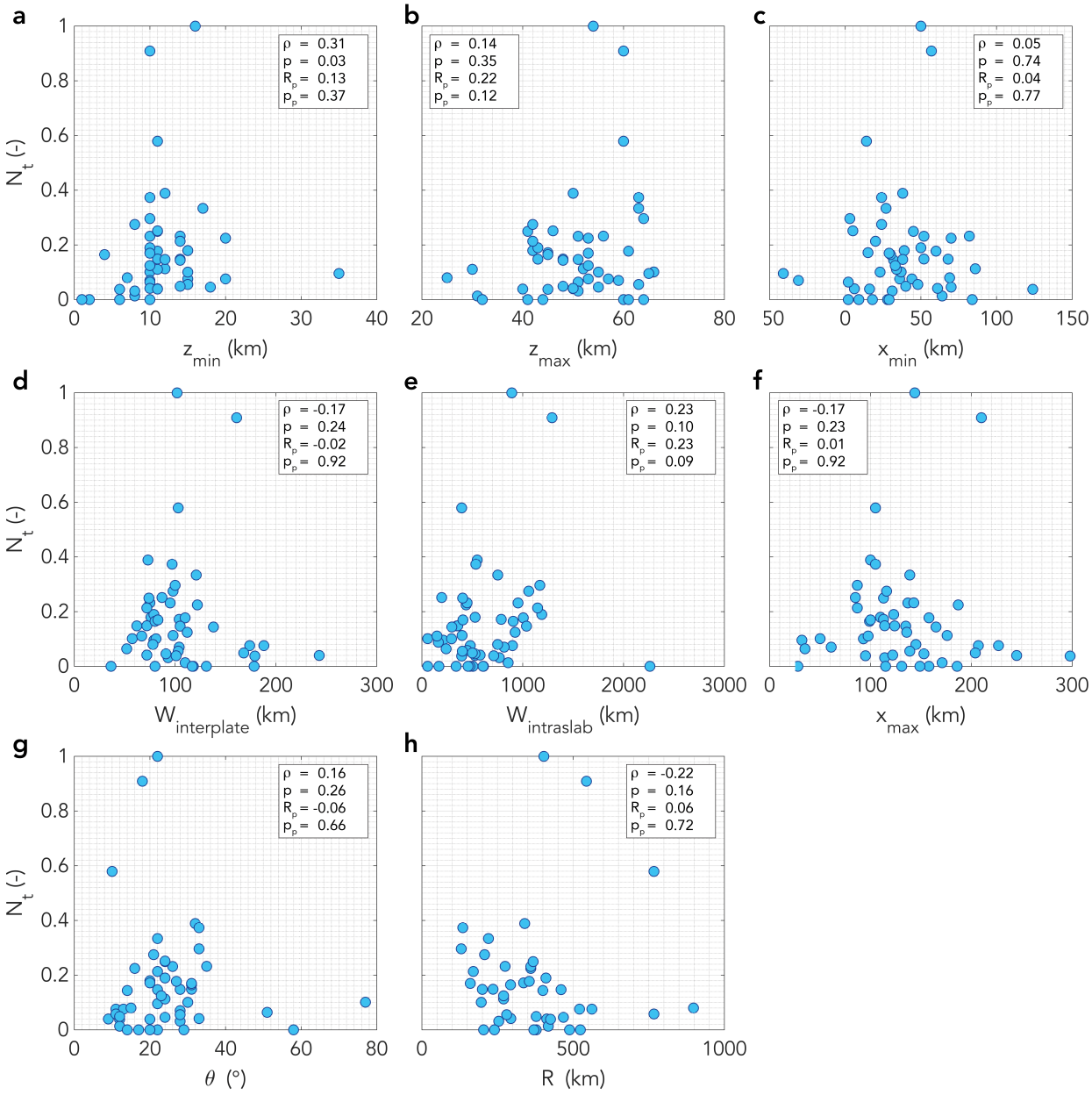

Figure S4: Scatter plots showing the relation between the normalised number of tsunami events caused by earthquakes per km trench N_t and the geometric parameters defining the seismogenic zone: (a) depth of the updip limit of the seismogenic zone $z_{\min}$; (b) depth of the downdip limit of the seismogenic zone $z_{\max}$; (c) distance from the trench of the updip limit of the seismogenic zone $x_{\min}$; (d) downdip width of the seismogenic zone $W_{\text{interplate}}$; (e) downdip length of the slab $W_{\text{intraslab}}$; (f) distance from the trench of the downdip limit of the seismogenic zone $x_{\max}$; (g) dip of the megathrust θ; (h) curvature radius of the slab at the trench R. Each dot represents one subduction zone segment. Correlation coefficients and p-values are indicated for both the Spearman and Pearson methods.

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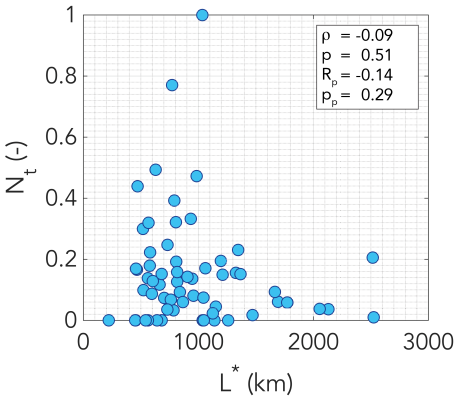

Figure S5: Scatter plot showing the relation between the normalised number of tsunami events caused by earthquakes per km trench N_t and the trench-parallel extent of the subduction zone segment L^*. Each dot represents one subduction zone segment. Correlation coefficients and p-values are indicated for both the Spearman and Pearson methods.

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References used in the supplementary material

Ruff, L., Kanamori, H., 1980. Seismicity and the subduction process. Physics of the Earth and Planetary Interiors 23, 240–252.

Van Zelst, I., 2025. Data & scripts for 'Investigating global correlations between earthquake-generated tsunamis and subduction zone characteristics'. doi:10.5281/zenodo.7118751.

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