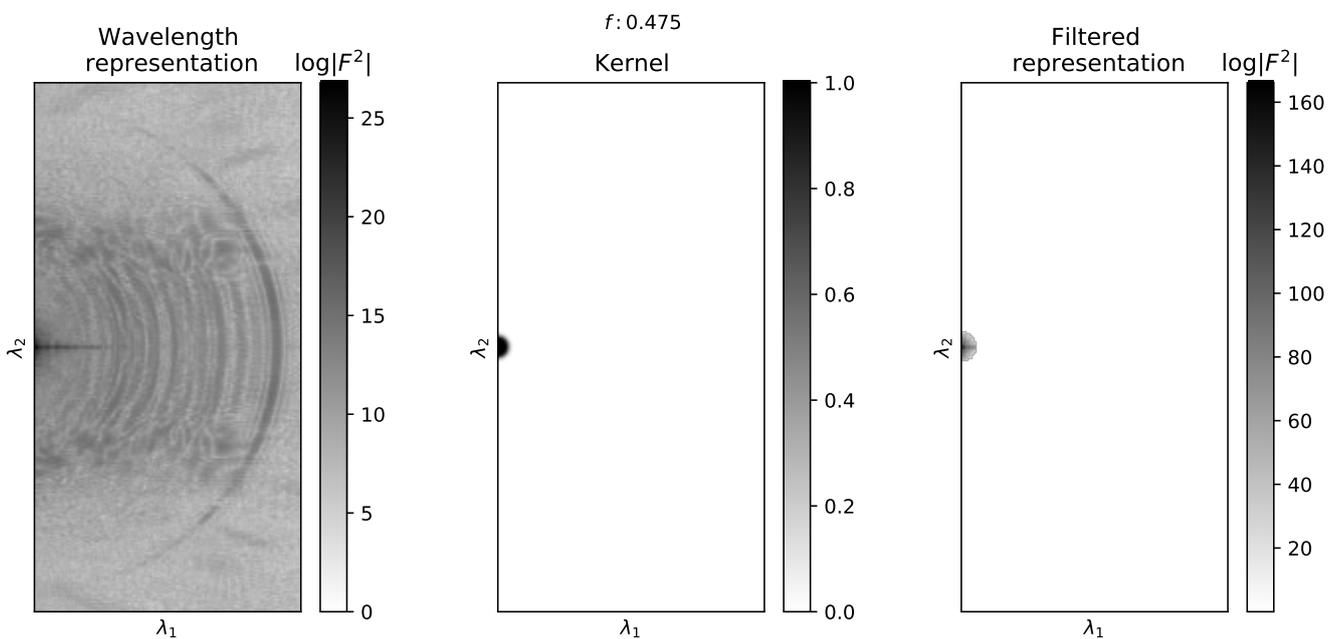
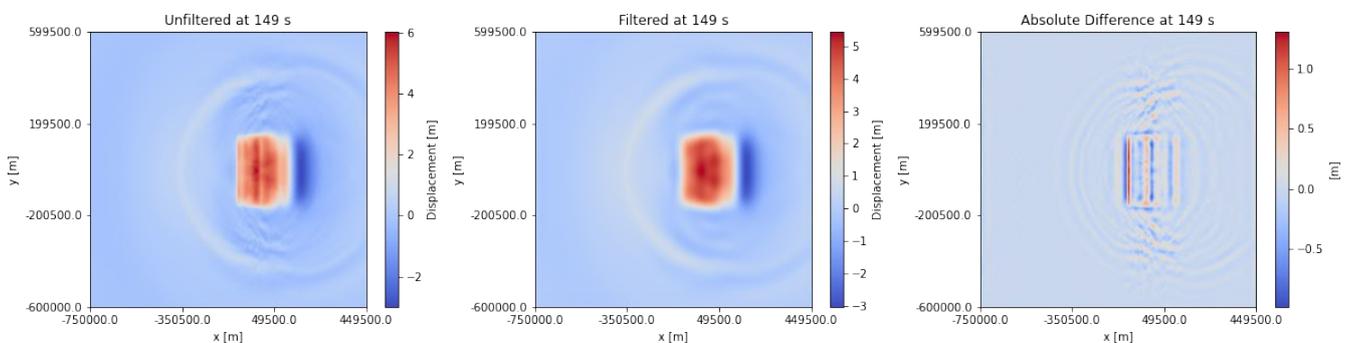


# Supplementary Material

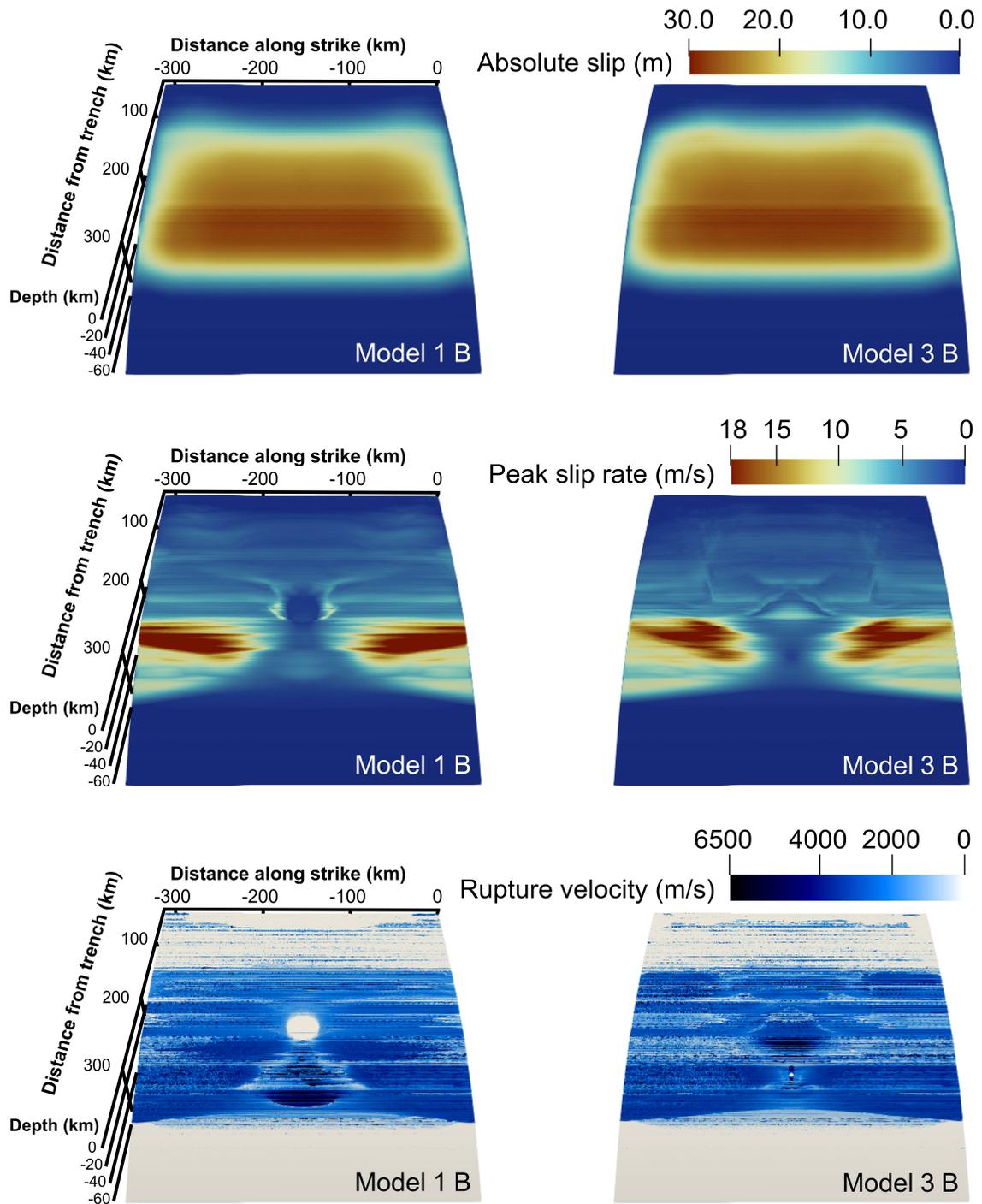
## 1 SUPPLEMENTARY TABLES AND FIGURES



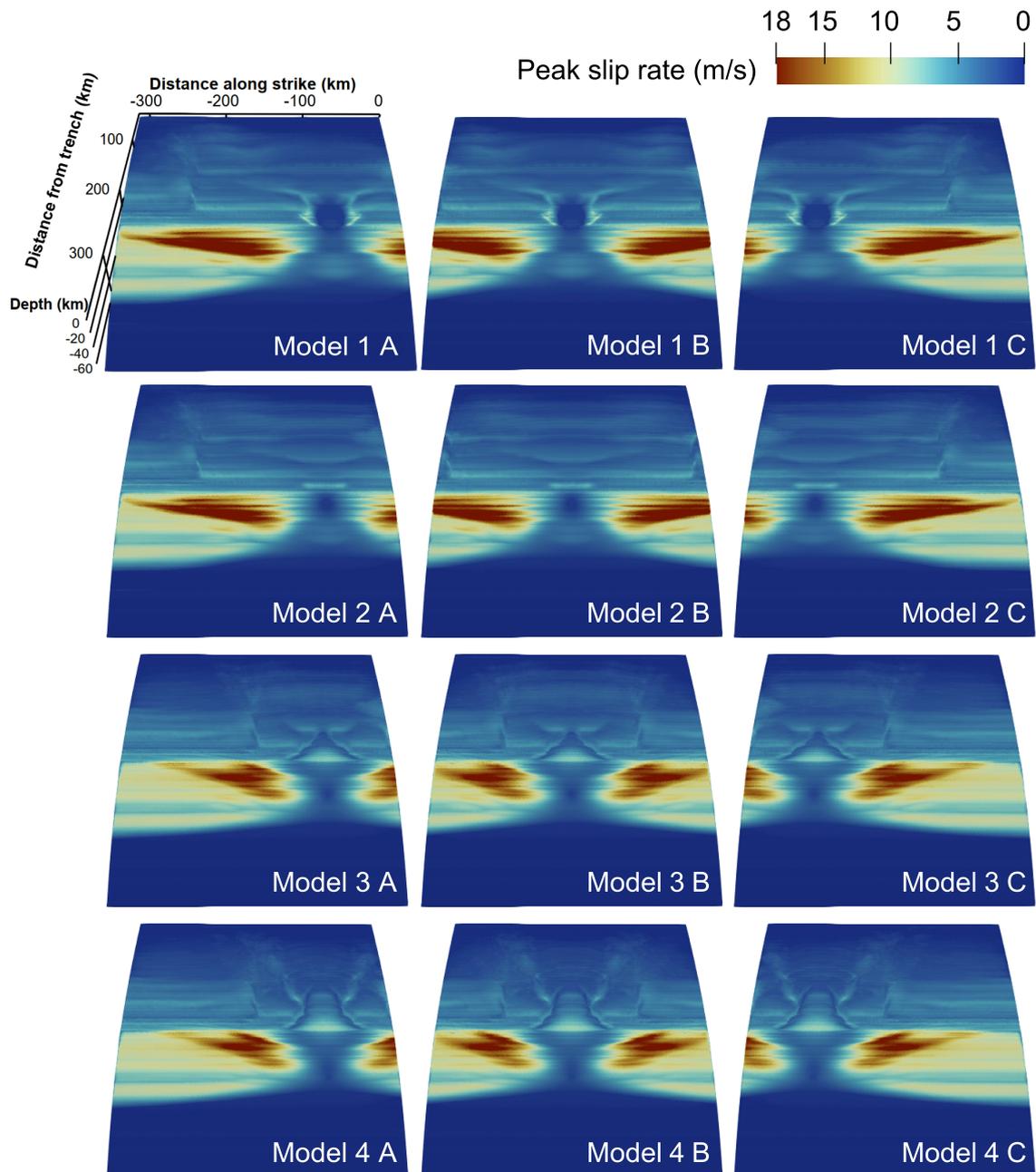
**Figure S1.** Fourier-filtering process to remove seismic waves: Exemplary wavenumber representation (left) of the displacement field of model 5: Seismic waves are represented by radial symmetric lines. The coefficients are removed by the developed smooth filter kernel (middle), which results in a filtered wavenumber representation (right).



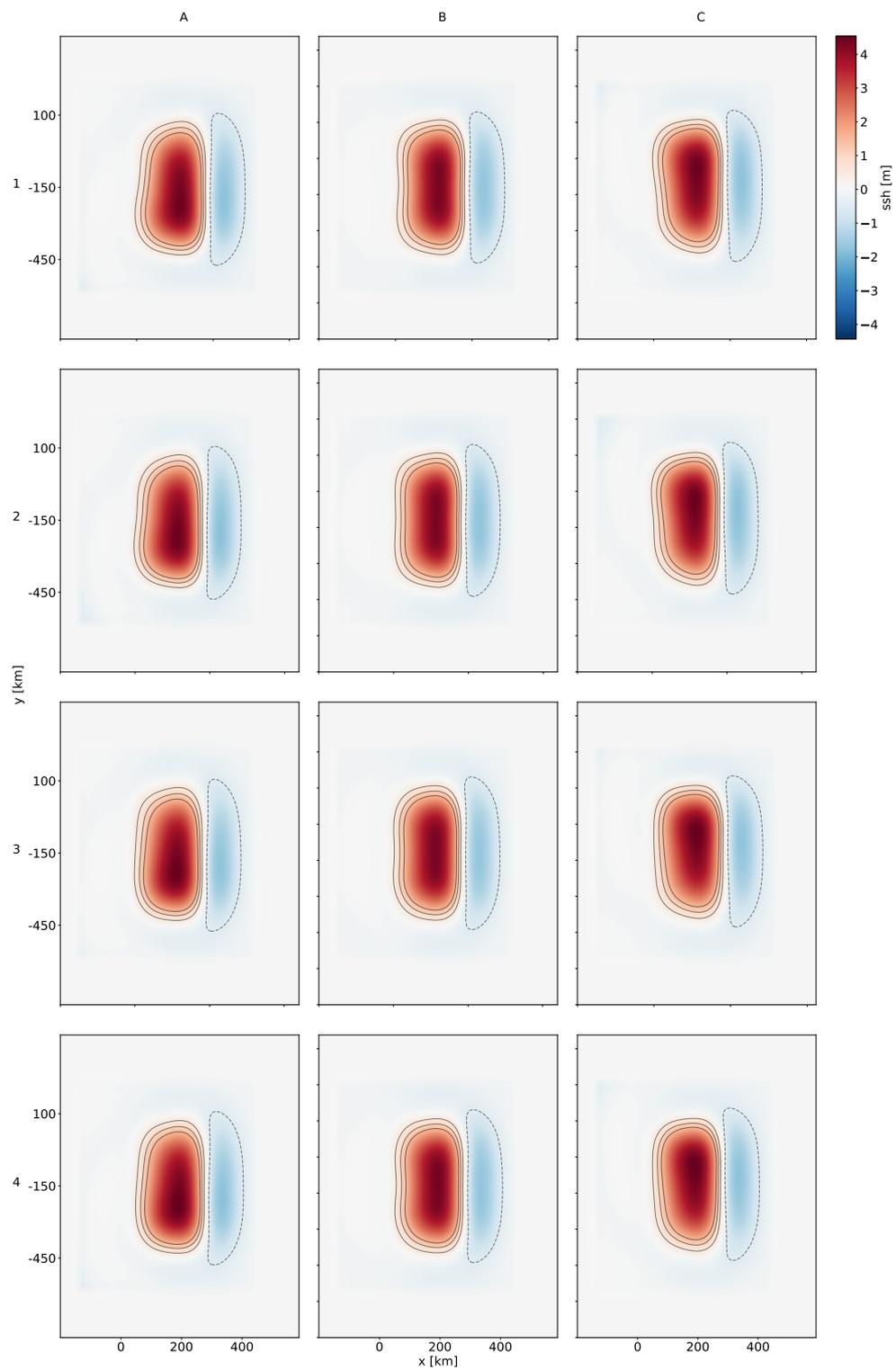
**Figure S2.** The earthquake model seafloor displacement of model 5 at  $t=149$  s (left). The filtered displacement (middle) and the difference between both (right).



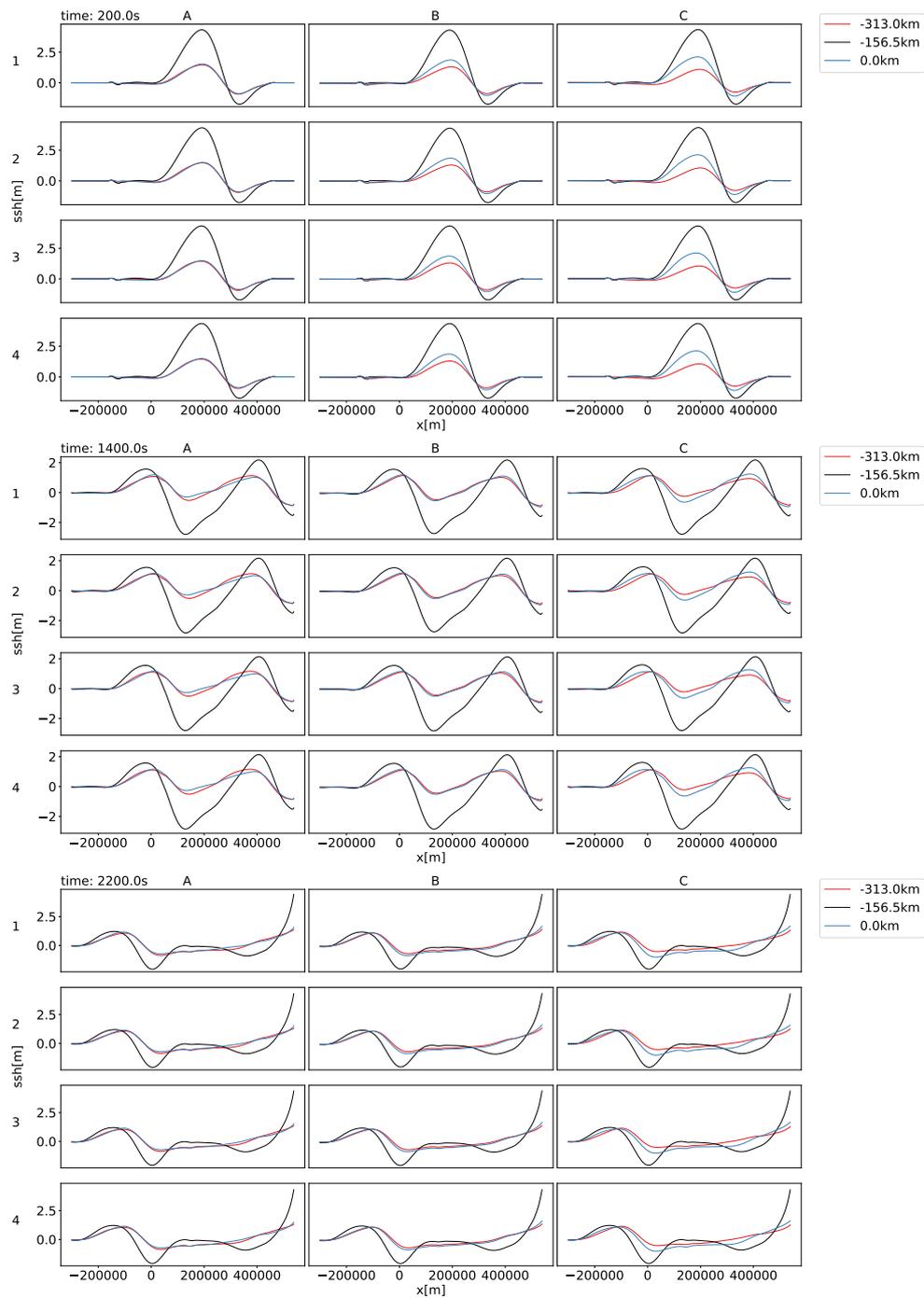
**Figure S3.** Final slip, peak slip rate, and rupture velocity for higher resolution (h=500m, p=5) dynamic rupture models 1B and model 3B (reference model) after 200 s at the end of the DR simulation.



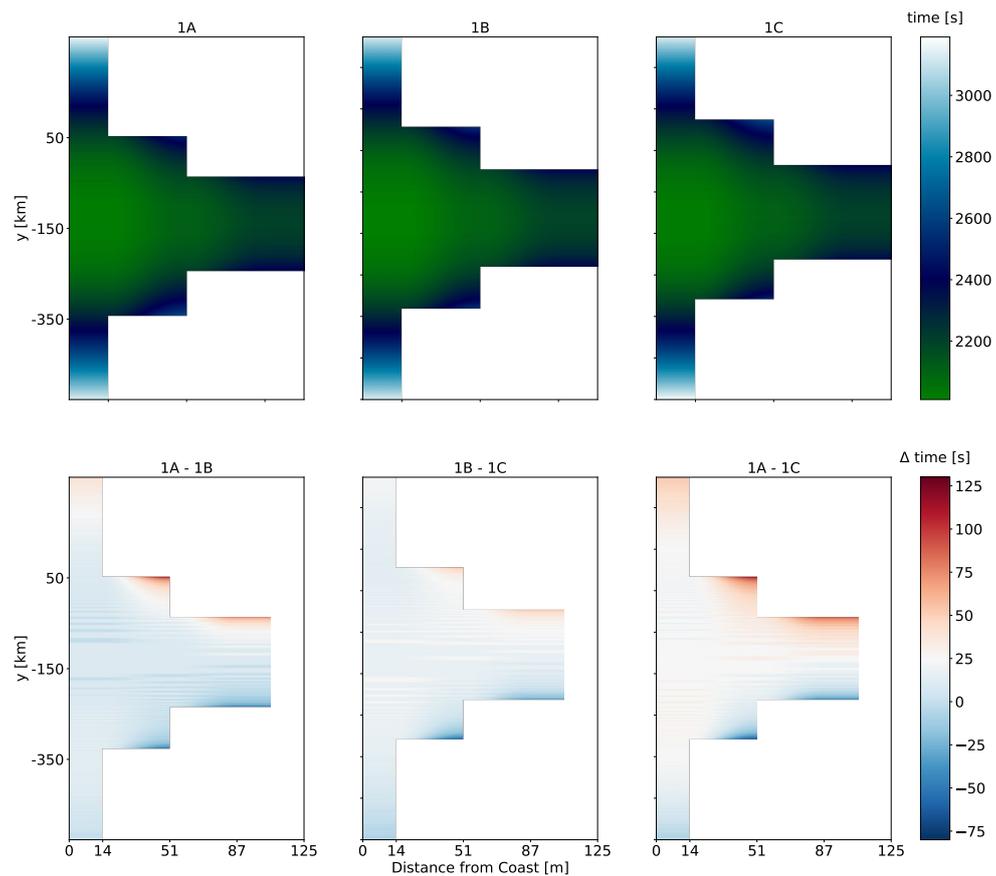
**Figure S4.** Peak slip rate (PSR) in m/s on the fault plane at the end of all dynamic rupture models. The highest PSR is located at the same depth for all earthquakes and the overall pattern of the PSR is similar. Lateral extending bands are visible due to lateral extending material properties on the fault. The shallower the hypocenter location, the higher the PSR. Even though the material properties and stresses along strike are the same, we see along arc differences of the PSR distribution at same depths.



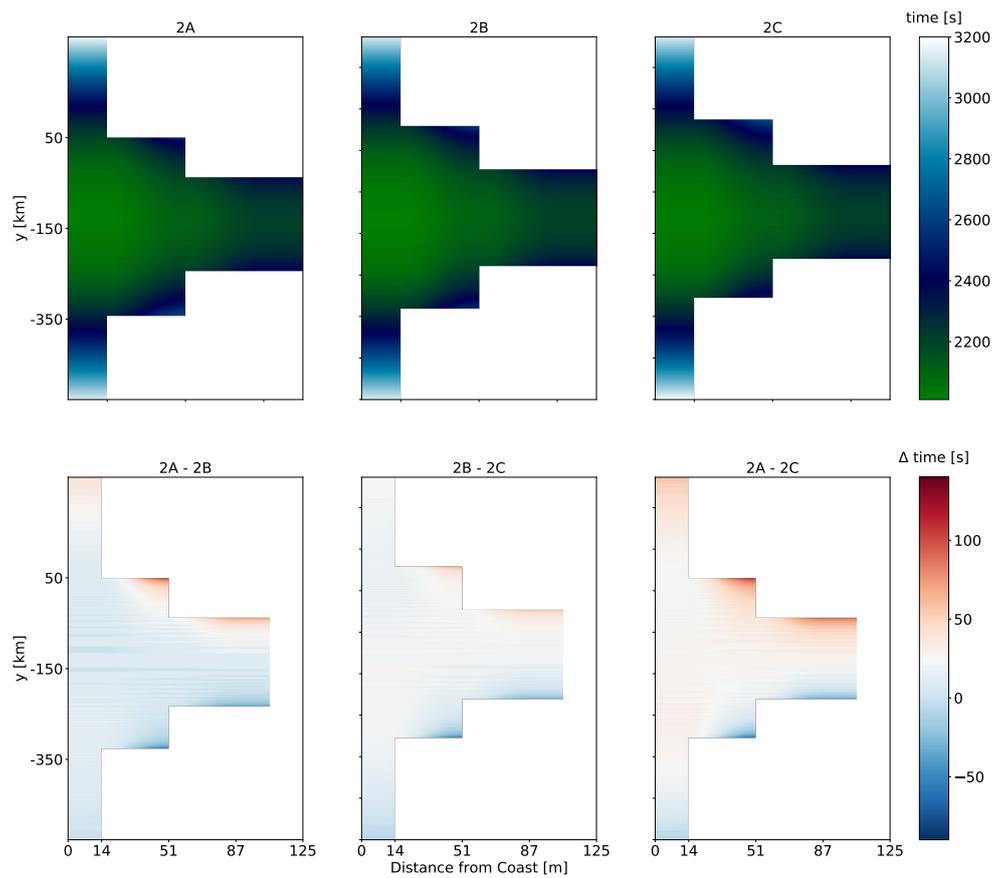
**Figure S5.** Seafloor height at  $t=200$  s with contours at  $-0.5$ ,  $0.5$ ,  $1.0$  and  $1.5$  m, at the end of the earthquake simulation.



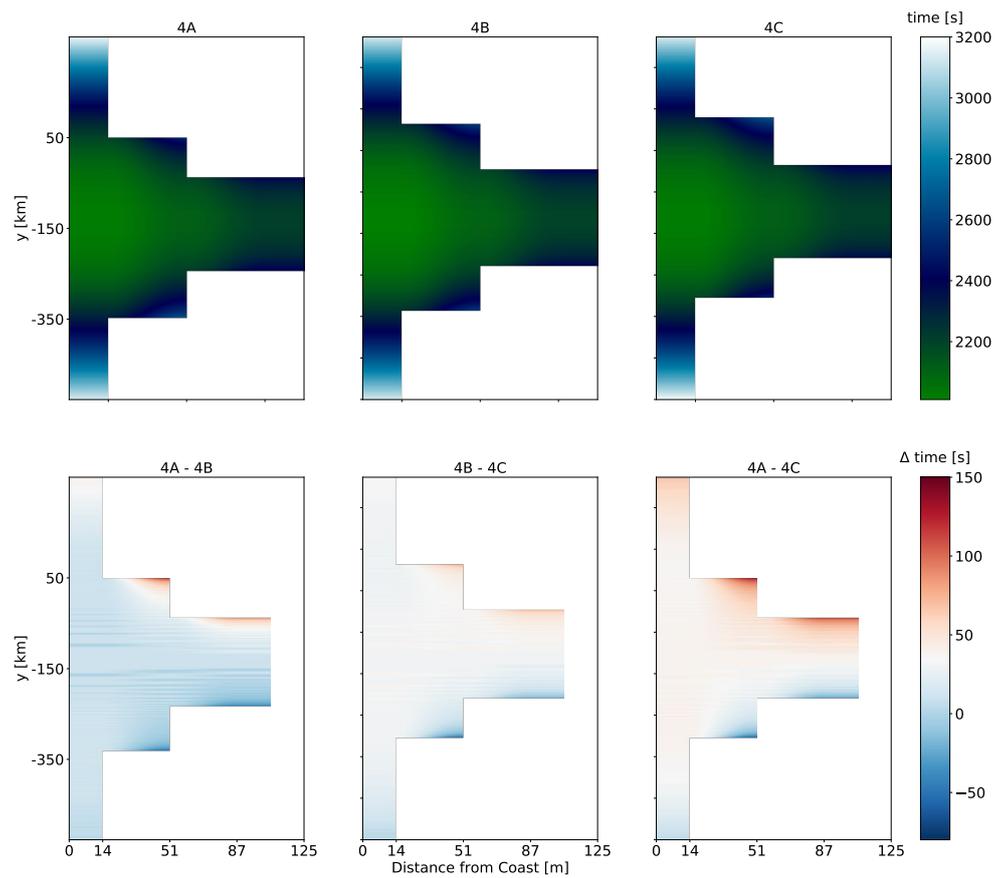
**Figure S6.** Trajectories of the sea surface height for dynamically sourced tsunamis at  $y = -313.0$ ,  $-156.0$  and  $0$  km. Directly after the earthquake at  $t = 200$  s, during the wave propagation at  $t = 1400$  s and at the time of inundation at  $t = 2200$  s.



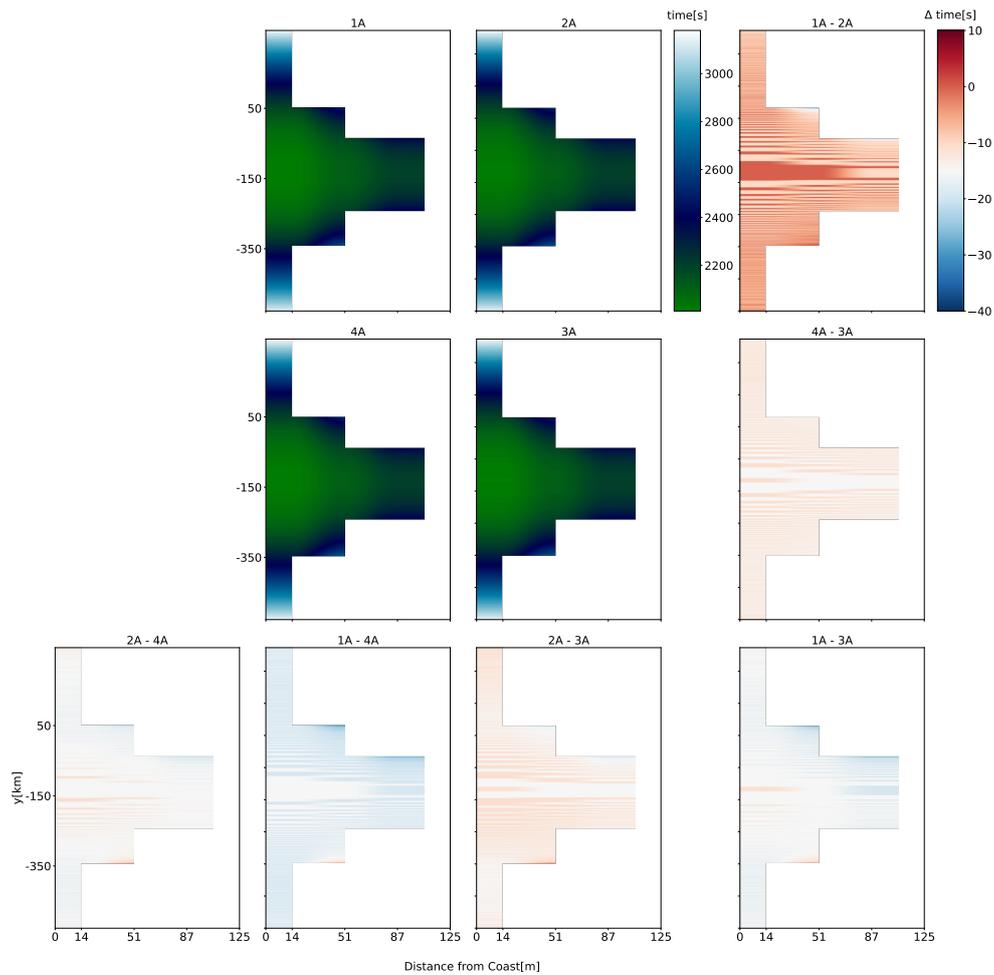
**Figure S7.** Inundation comparison for model 1.A-1.C. The hypocenter locations for the dynamic rupture simulations vary along strike.



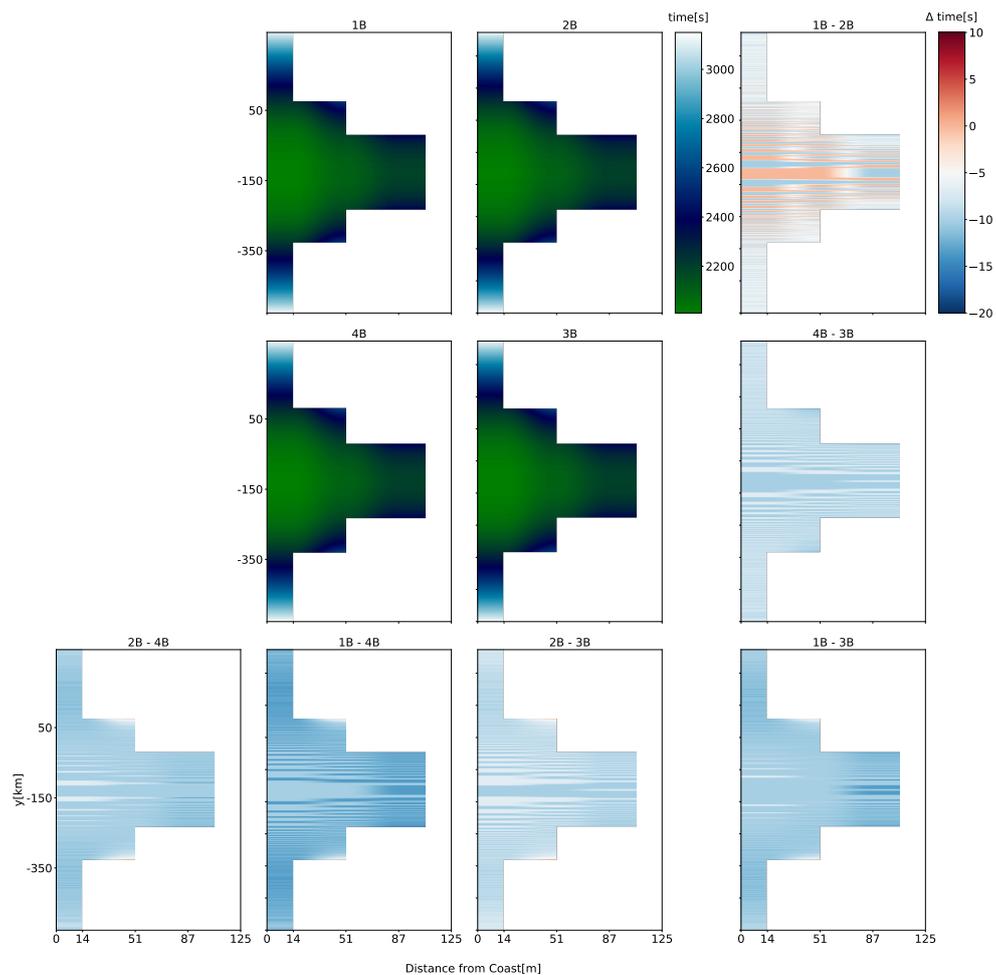
**Figure S8.** Inundation comparison for model 2.A-2.C. The hypocenter locations for the dynamic rupture simulations vary along strike.



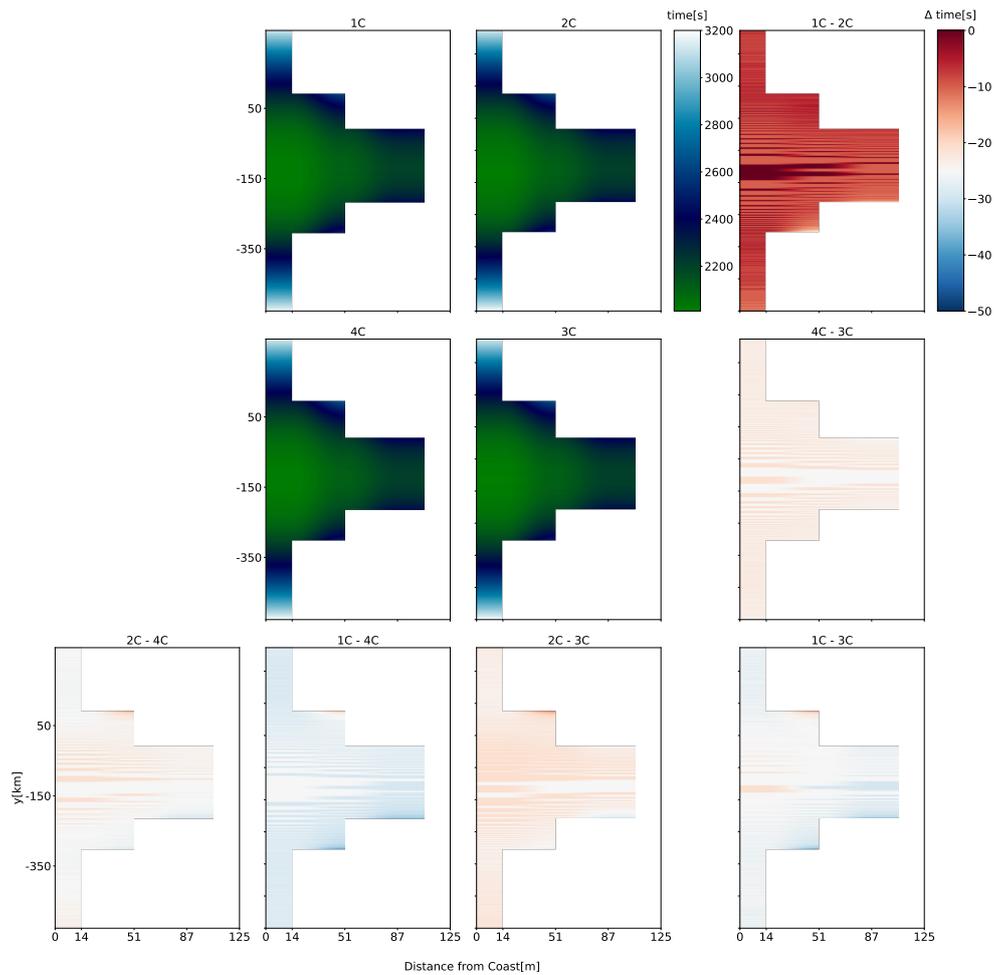
**Figure S9.** Inundation comparison for model 4.A-4.C. The hypocenter locations for the dynamic rupture simulations vary along strike.



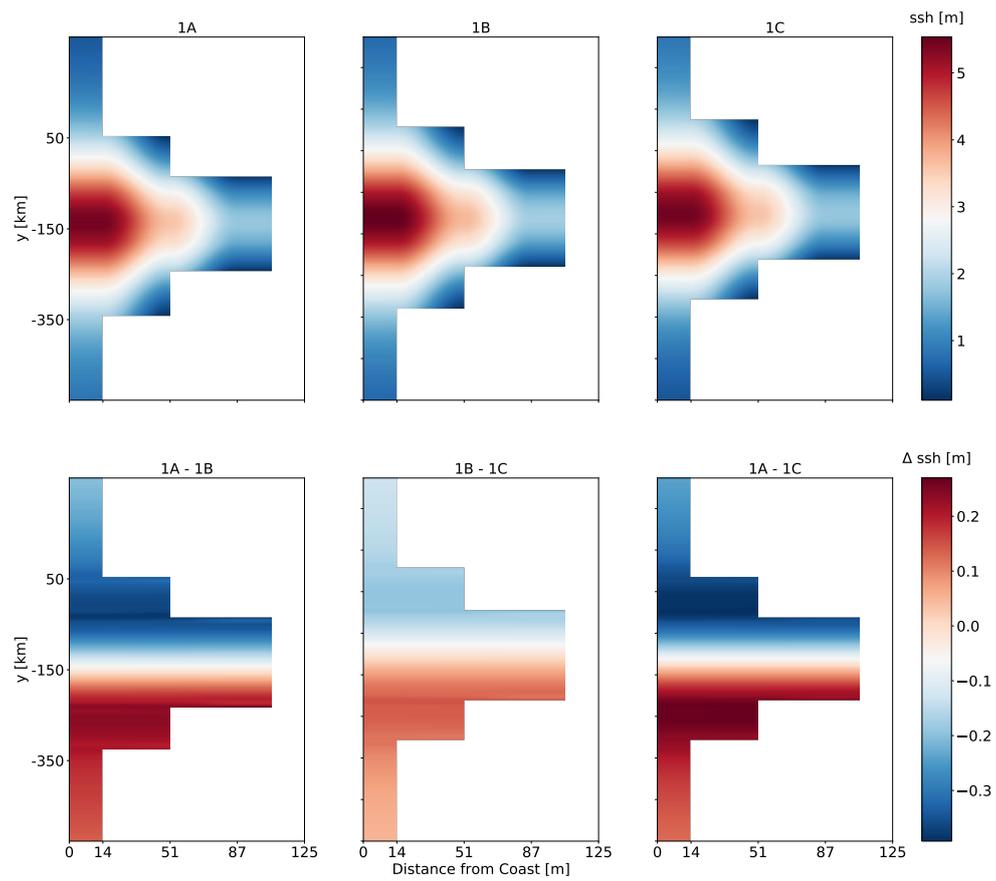
**Figure S10.** Inundation comparison for model 1.A-4.A. The hypocenter locations for the dynamic rupture simulations vary with depth.



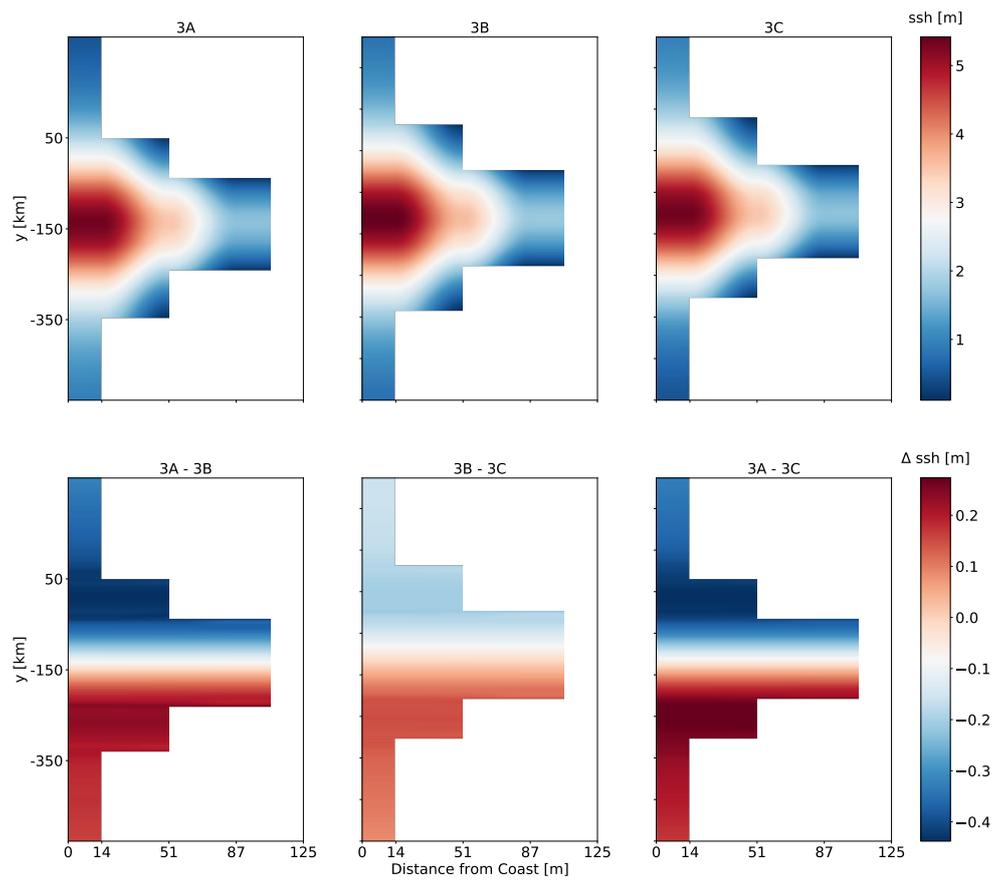
**Figure S11.** Inundation comparison for model 1.B-4.B. The hypocenter locations for the dynamic rupture simulations vary with depth.



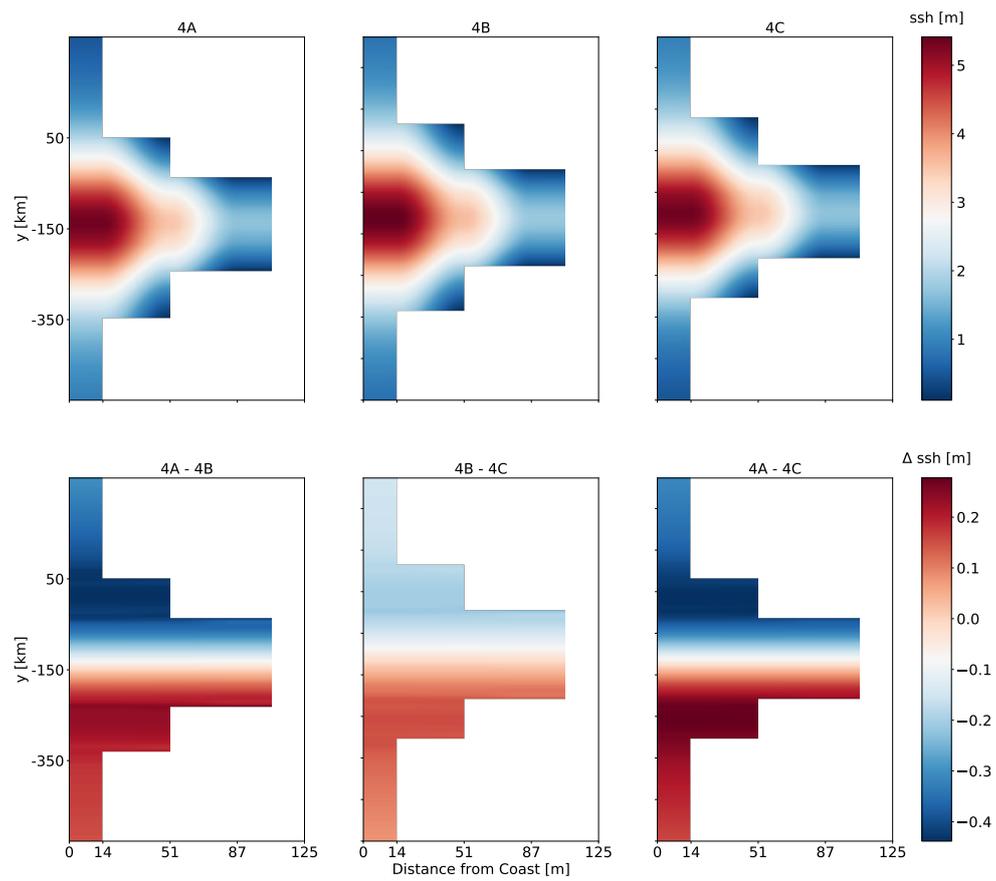
**Figure S12.** Inundation comparison for model 1.C-4.C. The hypocenter locations for the dynamic rupture simulations vary with depth.



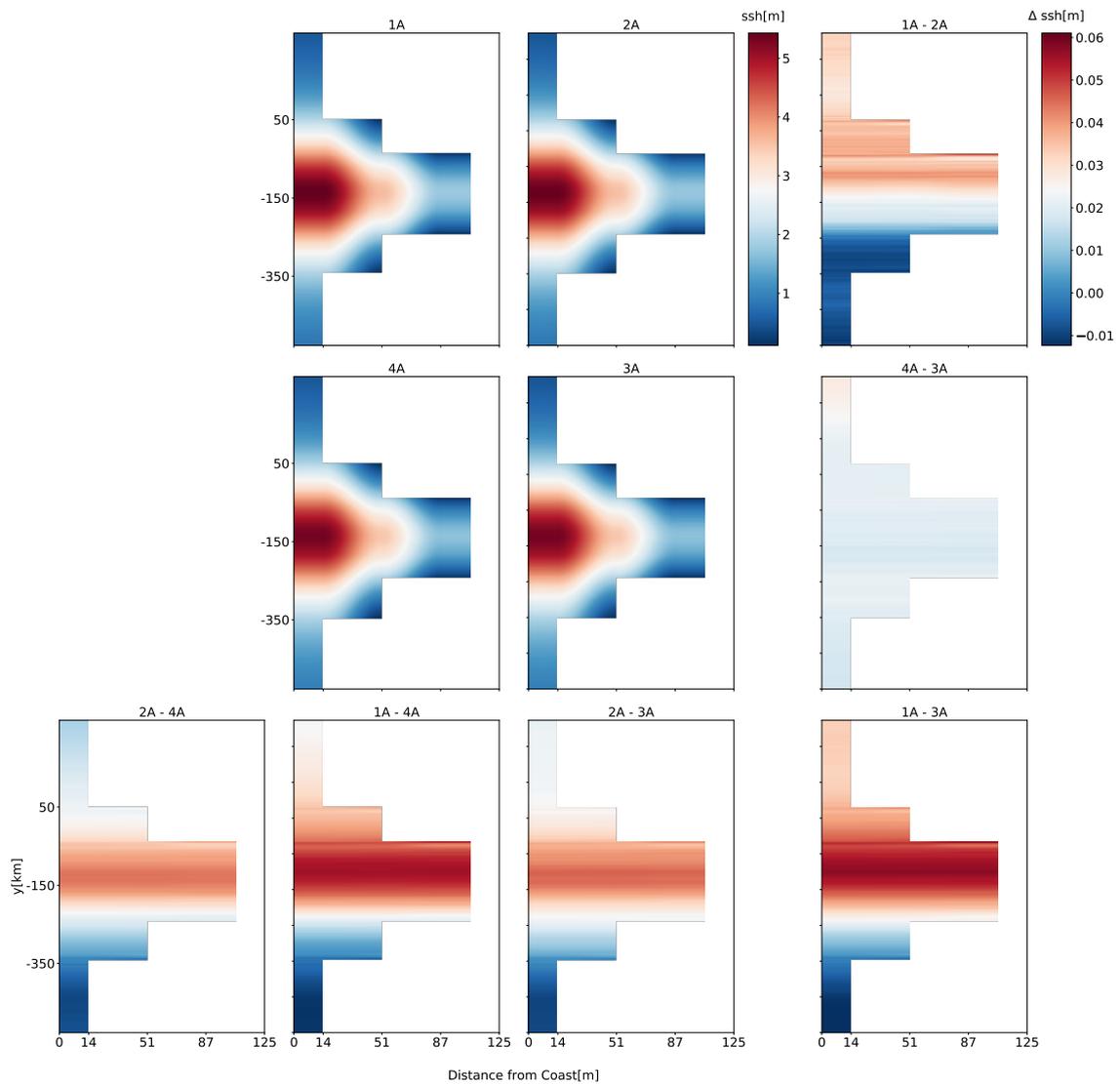
**Figure S13.** Comparison of the seafloor height at the moment when the tsunami arrives the coast for model 1A-C. The hypocenter locations for the dynamic rupture simulations vary along strike.



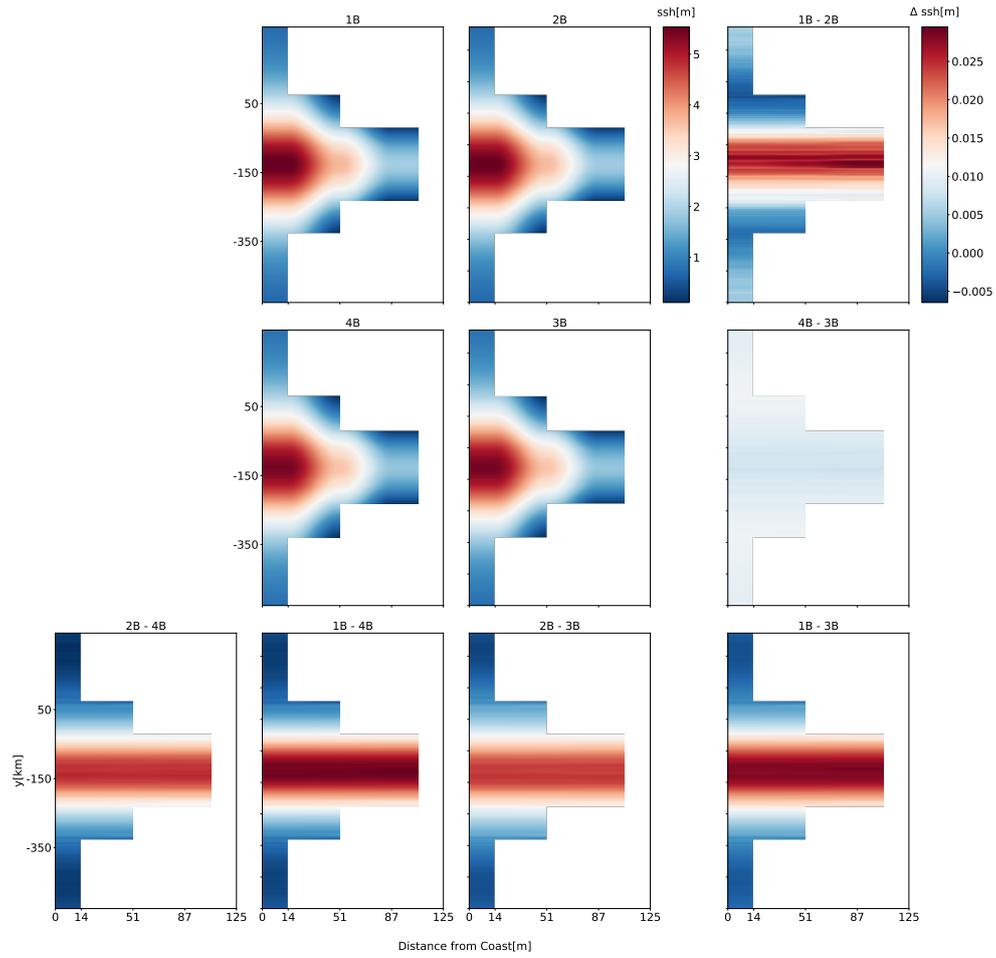
**Figure S14.** Comparison of the seasurface height at the moment when the tsunami arrives the coast for model 3A-C. The hypocenter locations for the dynamic rupture simulations vary along strike.



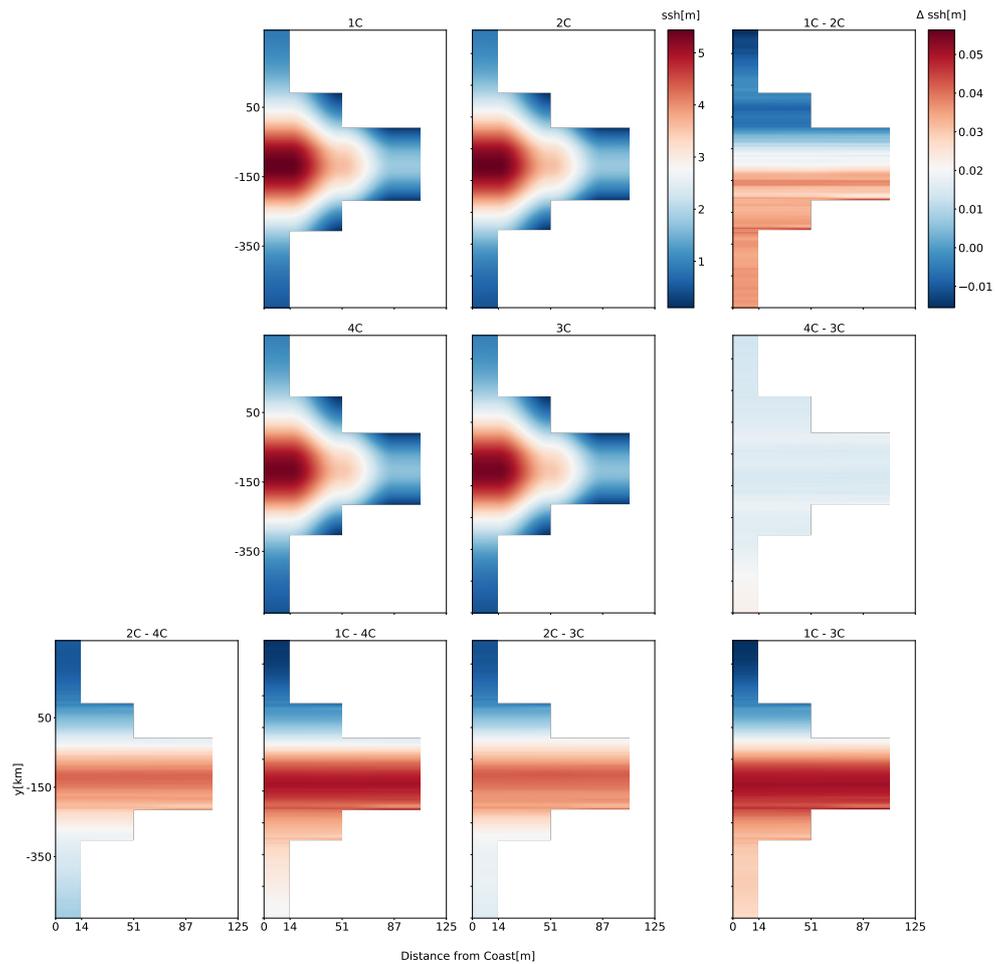
**Figure S15.** Comparison of the seafloor height at the moment when the tsunami arrives the coast for model 4A-C. The hypocenter locations for the dynamic rupture simulations vary along strike.



**Figure S16.** Comparison of sea surface height for wave fronts arriving at the coast for the models 1.A-4.A. The difference between the models is shown as  $\Delta \text{ssh}$ .



**Figure S17.** Comparison of the seafloor topography and sea surface height at the moment when the tsunami arrives the coast for model 1.B-4.B. The hypocenter locations for the dynamic rupture simulations vary with depth .



**Figure S18.** Comparison of the seafloor topography and sea surface height at the moment when the tsunami arrives the coast for model 1.C-4.C. The hypocenter locations for the dynamic rupture simulations vary with depth.