Supplementary Materials:

Geometrical effects of a subducted seamount on stopping megathrust ruptures

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Figure captions:

Figure S1: Final slip distribution on the planar subduction fault with a seamount of $w^* = 0.077$, $h_s = 0$, and $d^* = 0.69$. Light grey bar represents the rupture nucleation zone. Dark grey area denotes the seamount location and size. The seamount stops a coseismic rupture for $\sigma^* = 12\%$ (red) but cannot impede it for $\sigma^* = 10\%$ (blue).

Figure S2: A diagram of normalized $\sigma^*_{\min}$, d^*, and w^* for planar models. $\sigma^*_{\min}$ refers to the normalized minimum additional effective normal stress that is required for a seamount to stop ruptures. The normalized seamount width is w^*, and the normalized seamount-trench distance is d^*.

Figure S3: An example of finite-element mesh of a subducted seamount sitting on a megathrust subduction fault model. (a) A zoom-in plot of the seamount. h_s is the seamount height and w_b is the basal width. (b) The entire megathrust subduction fault interface and the footwall (slab).

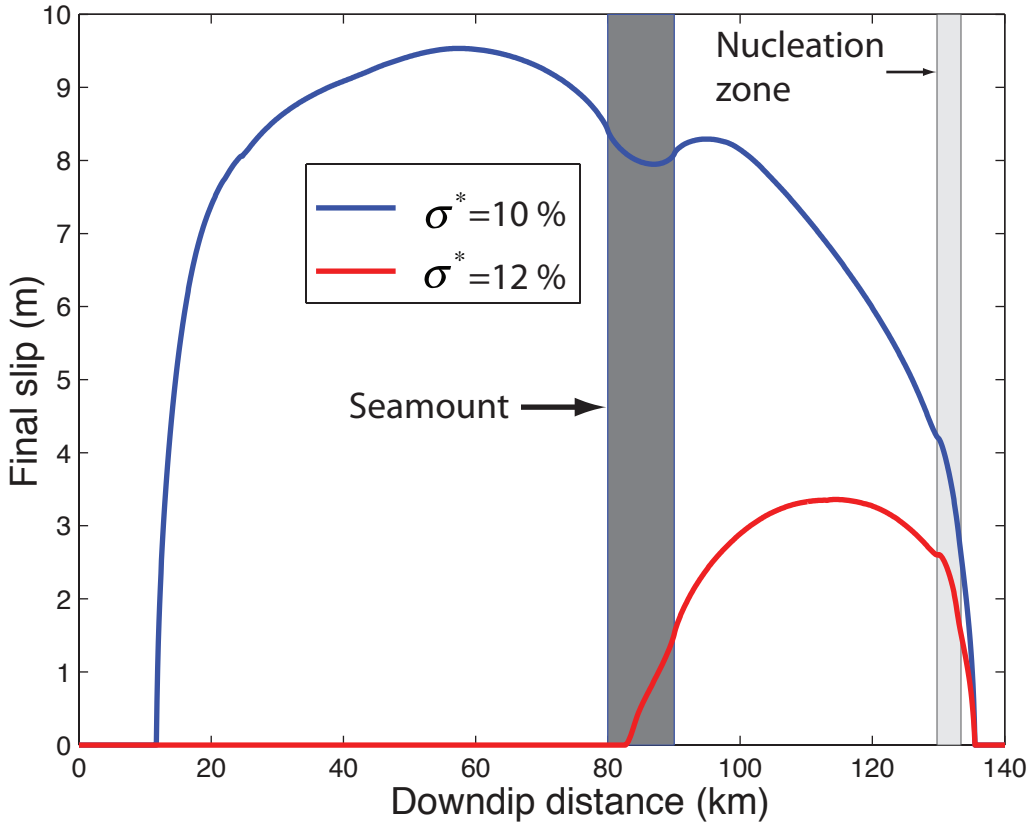
Nucleation
zone
σ*=10 %
σ*=12 %
Seamount
Final slip (m)
Downdip distance (km)
0
1
2
3
4
5
6
7
8
9
10
0
20
40
60
80
100
120
140

Figure S1.

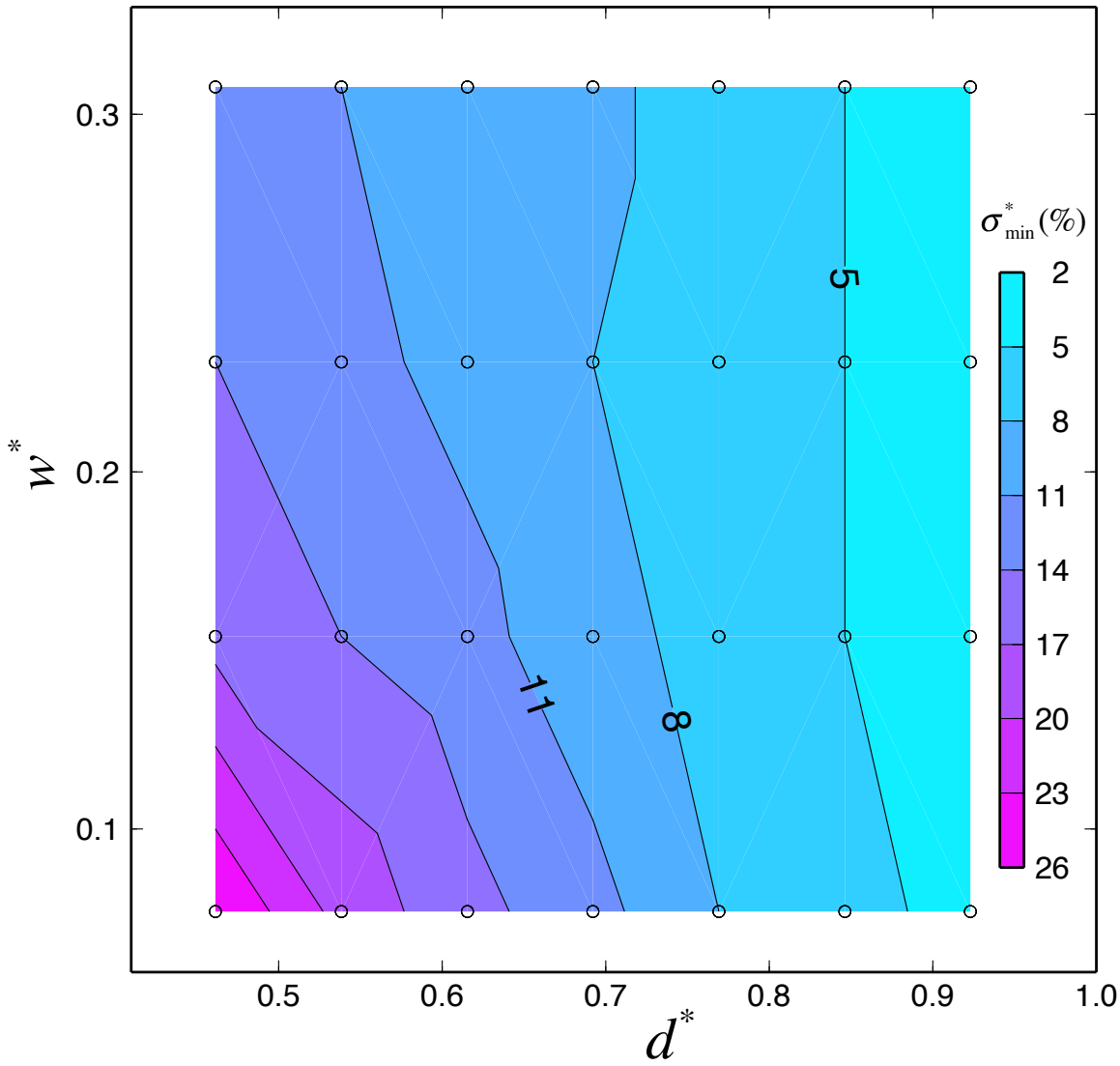

Figure S2.

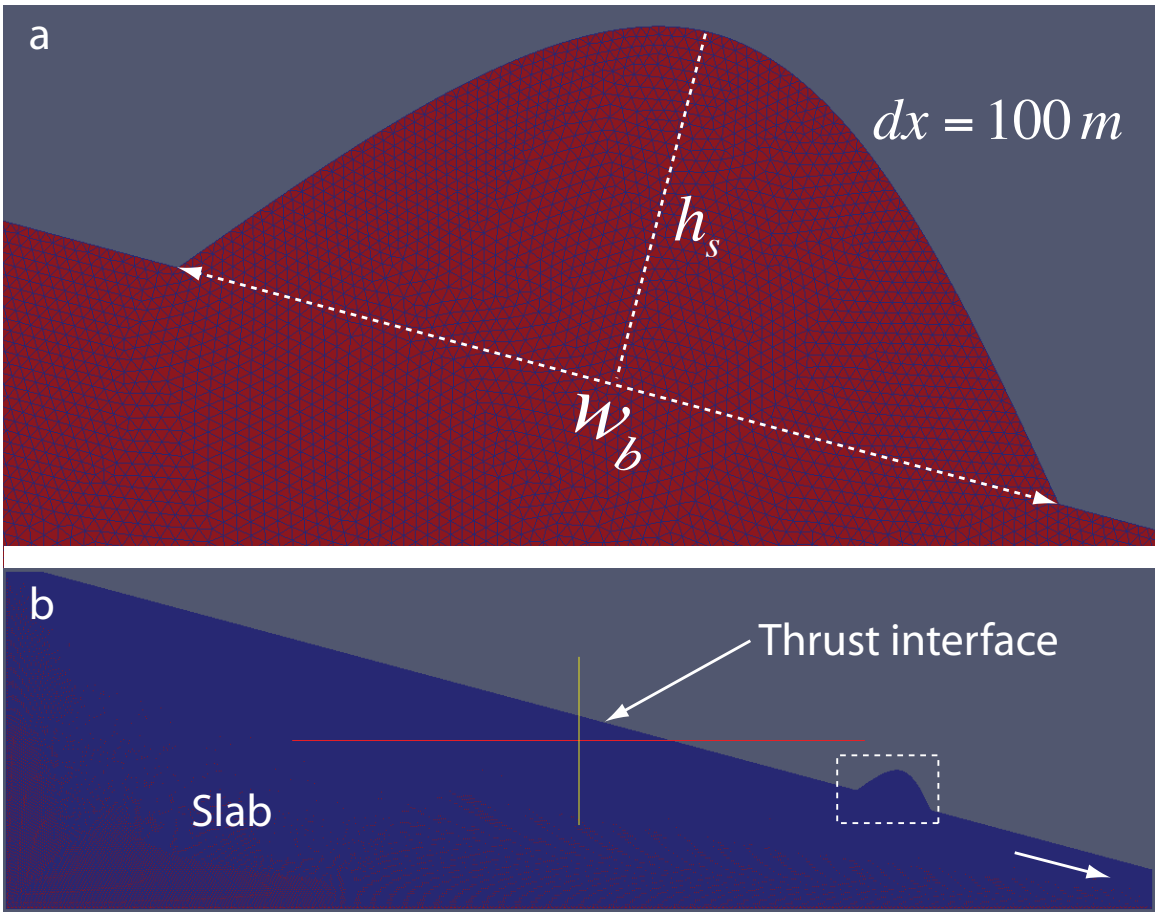

Figure S3.