

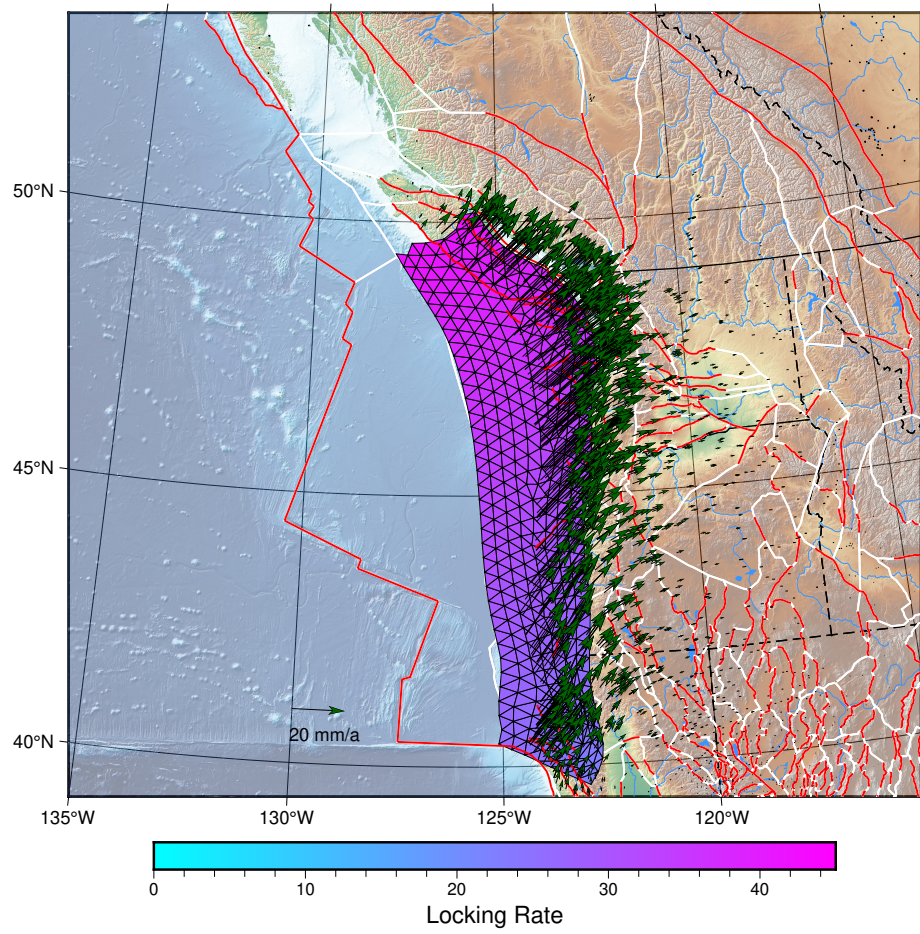


Figure S1: GNSS velocities exclusively from a fully-locked Cascadia subduction zone (using the pole from Demets et al., 2000).

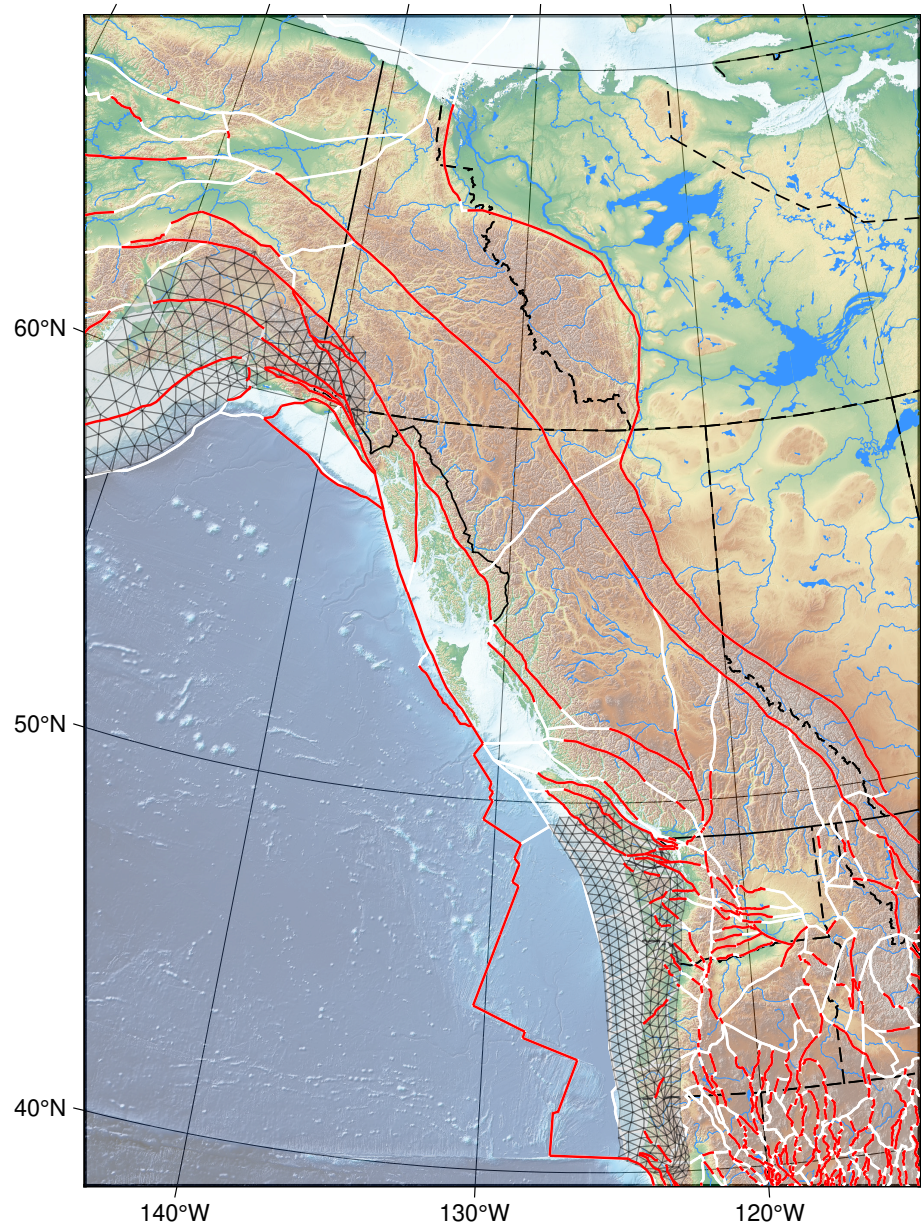


Figure S2: Block and fault geometry for western Canada and the Cascadia margin. Faults are shown in red, and off-fault block boundaries are shown in white. The triangular meshes for subduction interfaces are shown as small black triangles.

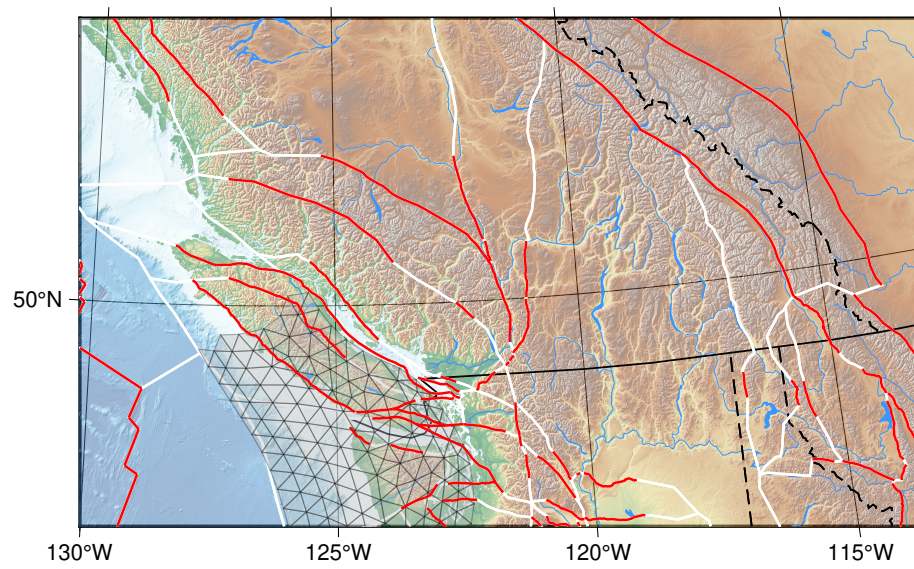


Figure S3: Same as Figure S2, but with a focus on southern British Columbia and Washington.

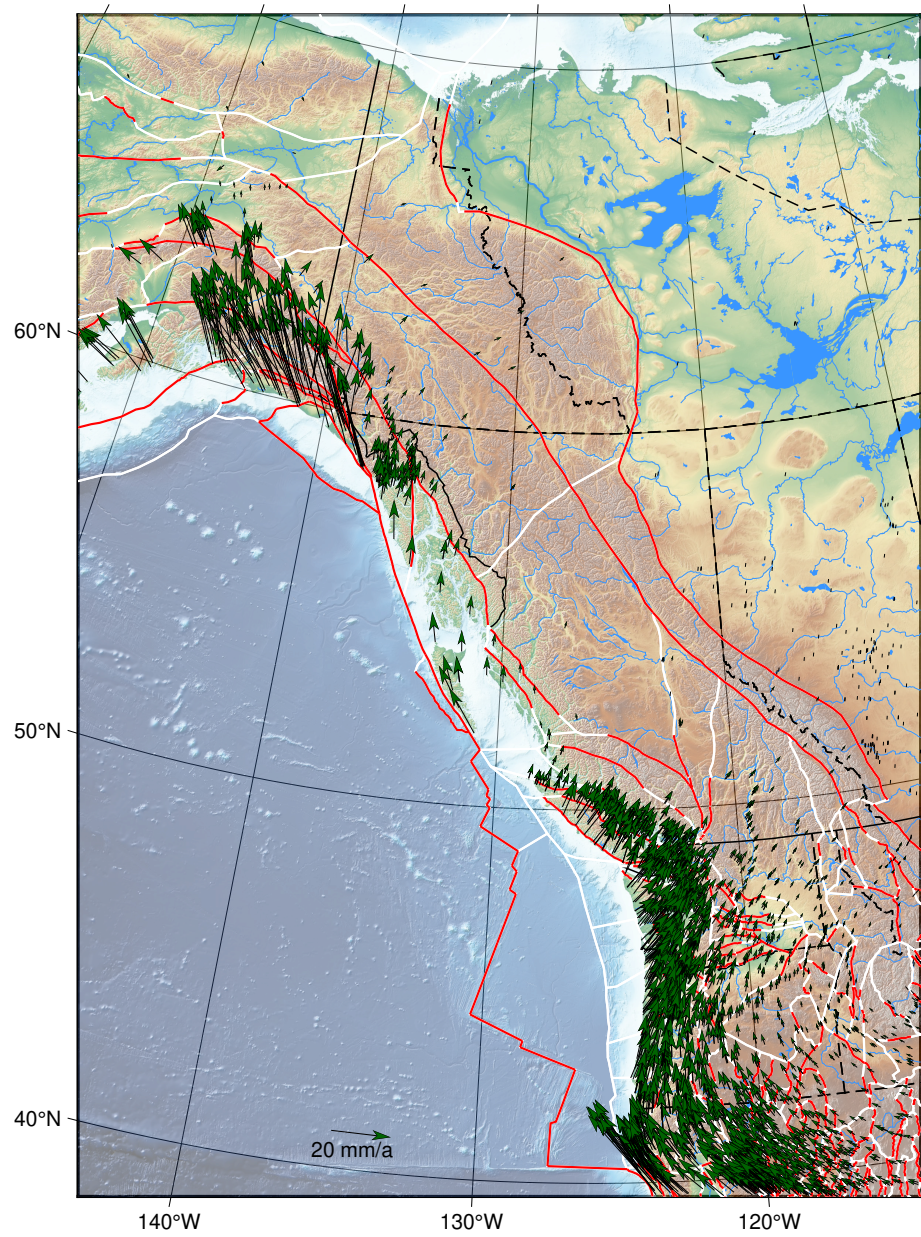


Figure S4: Predicted GNSS velocities for the study area

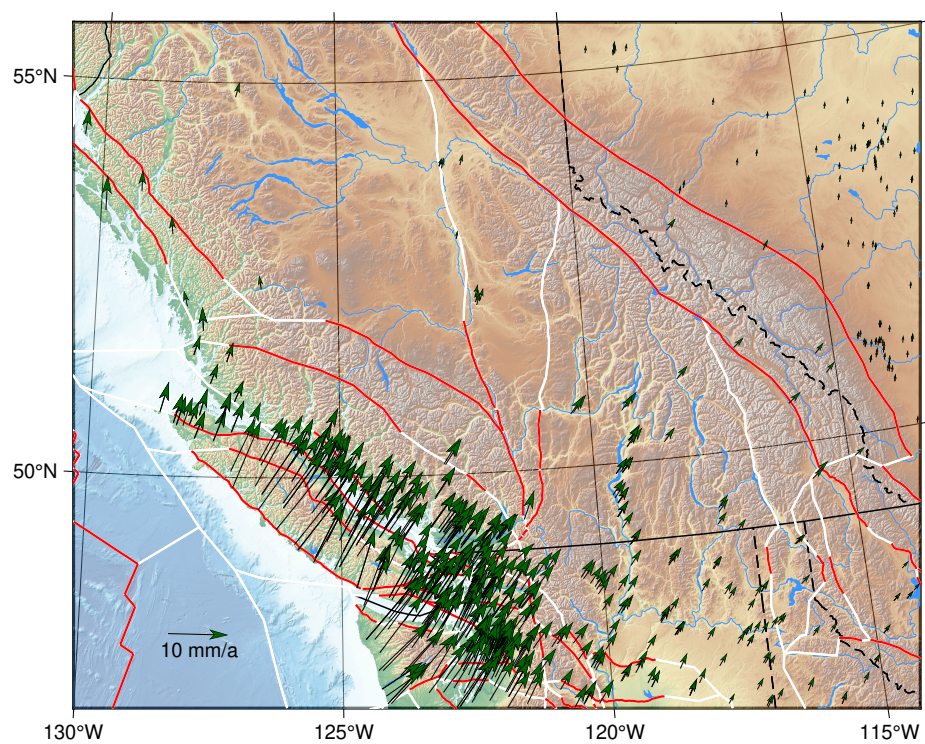


Figure S5: Predicted GNSS velocities for southern BC and vicinity

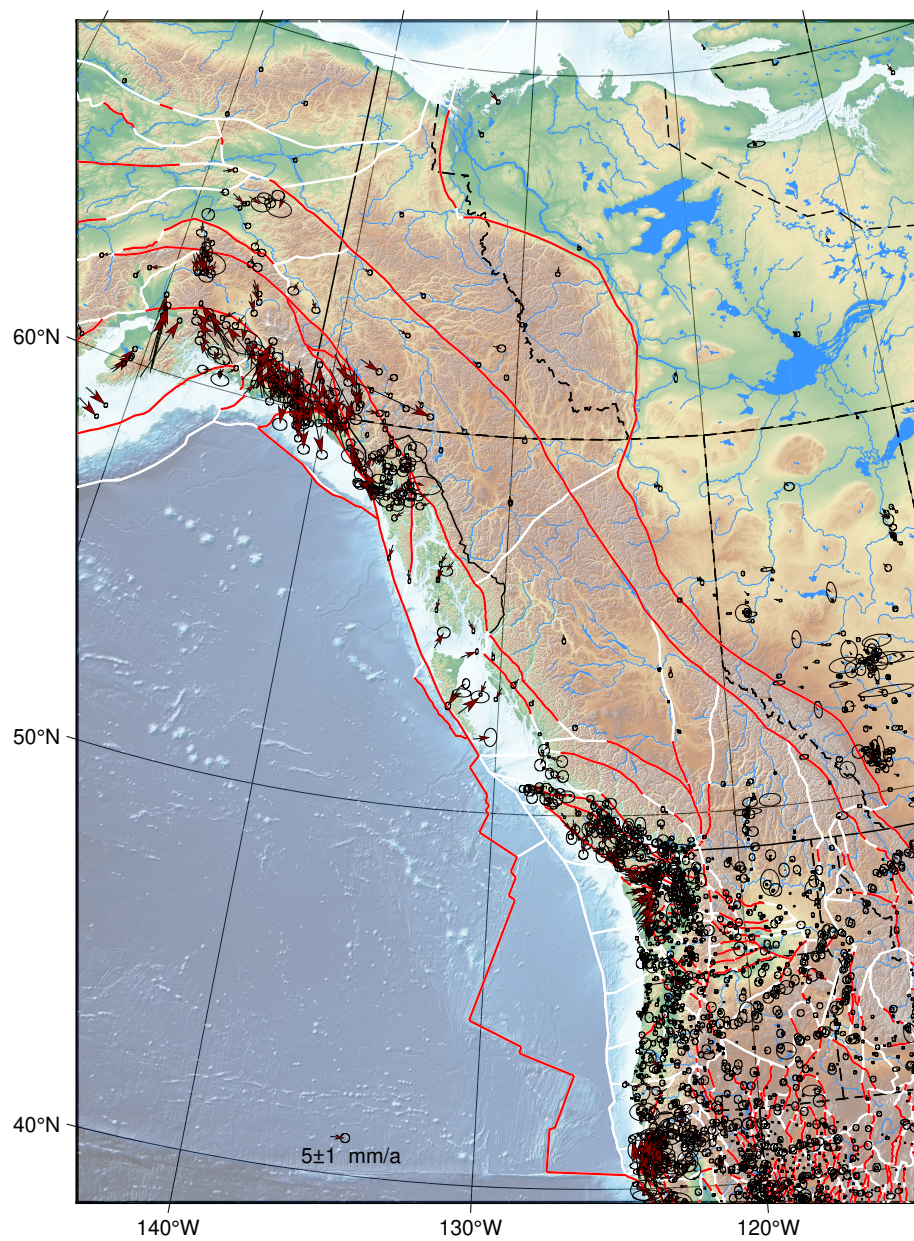


Figure S6: GNSS velocity residuals for the study area

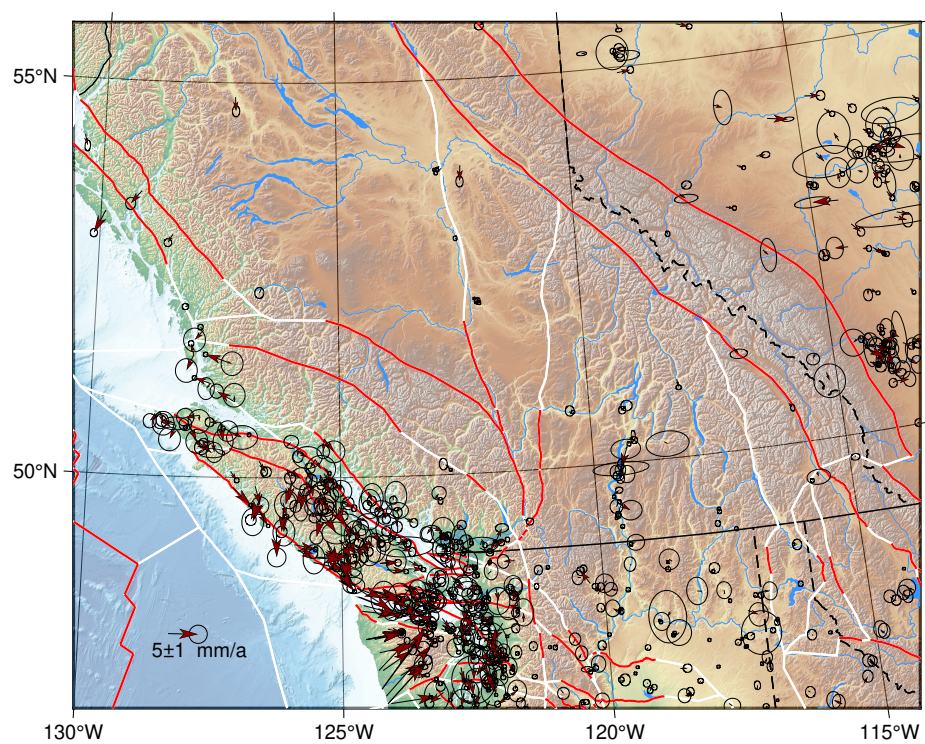


Figure S7: GNSS velocity residuals for southern BC and vicinity

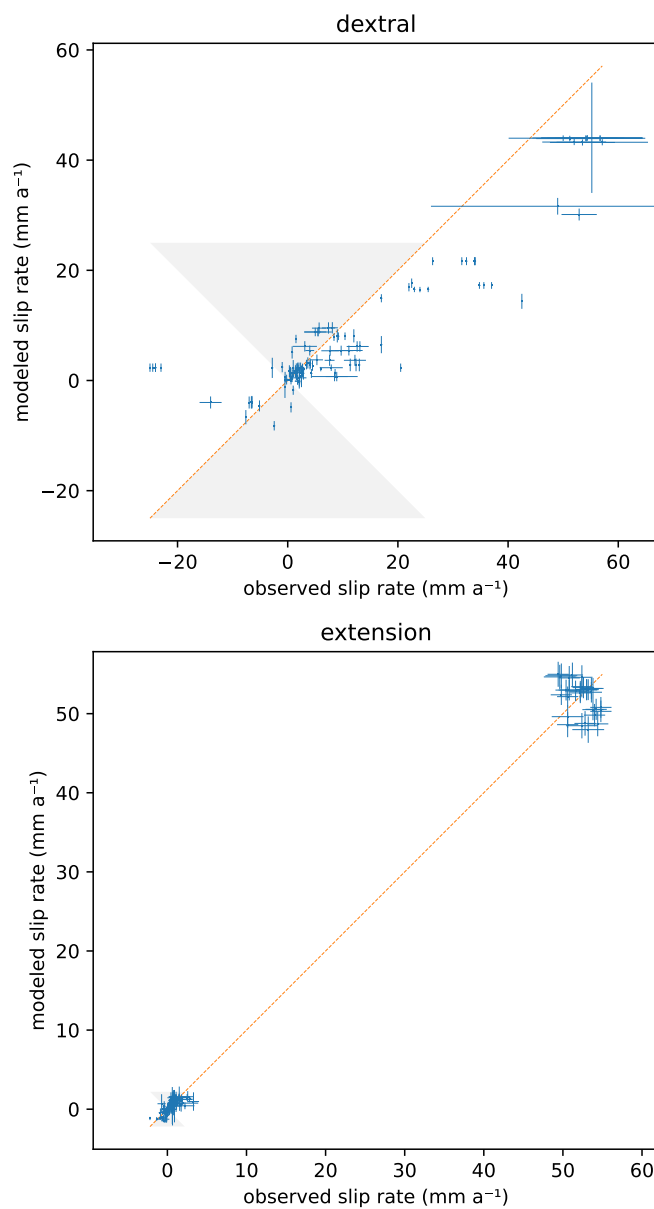


Figure S8: Observed vs. predicted geologic slip rates. Negative dextral rates are sinistral; negative extension rates are contraction.

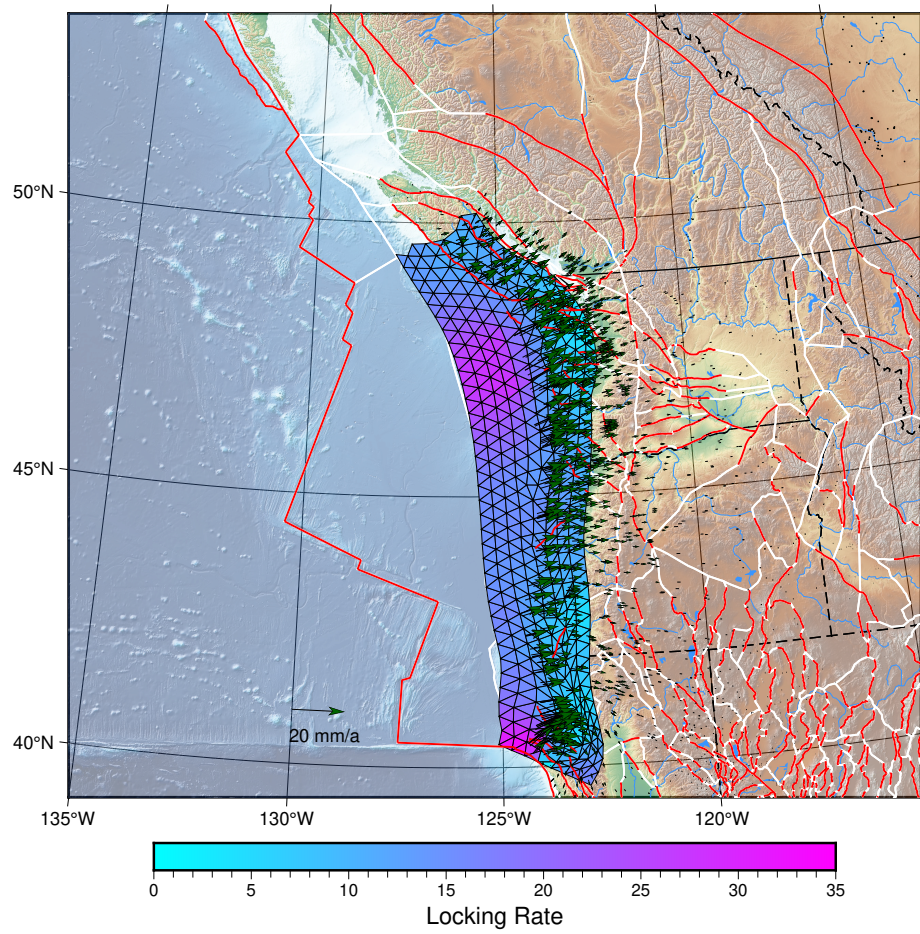


Figure S9: GNSS velocities exclusively from the locking of the Cascadia subduction zone as determined by this inversion

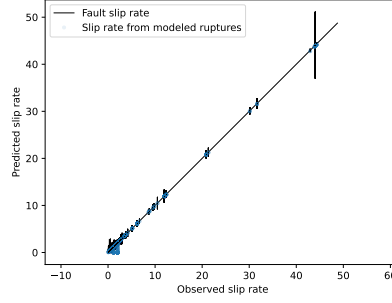


Figure S10: Observed and modeled slip rates for each subfault for the rupture rate inversion. Small black dots are the ‘observed’ slip rates resulting from the geodetic inversion, with $1\text{-}\sigma$ uncertainty from propagation of data uncertainties in the block model; the central values are plotted with the same x and y values. Blue dots are the modeled slip rates based on the rupture rate inversion; the x values are the observed slip rates, and the y values are the modeled slip rates. The thin black line indicates a 1:1 fit.

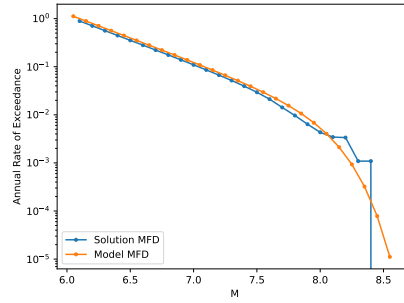


Figure S11: Target and modeled magnitude–frequency distribution for on–fault ruptures

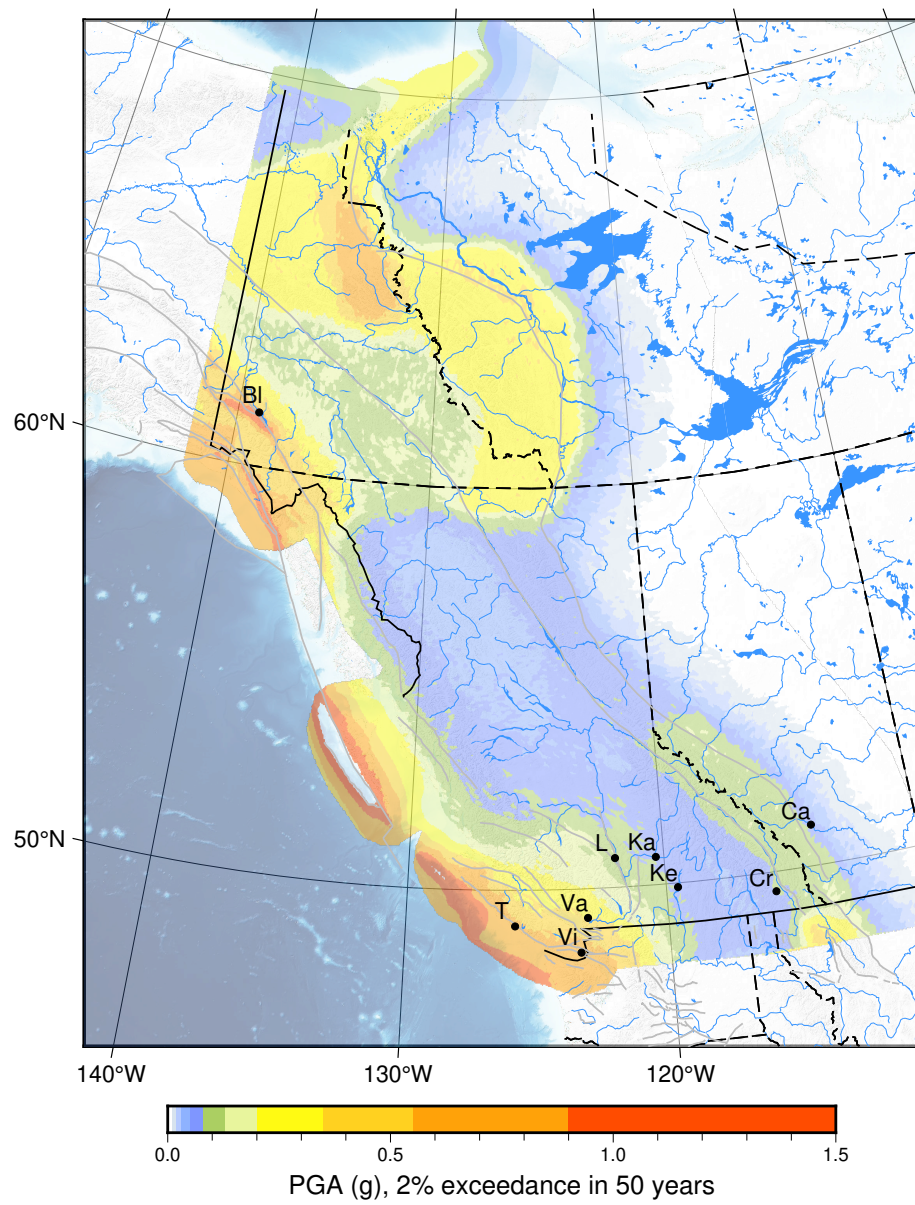


Figure S12: Peak Ground Acceleration (g) for an exceedance rate of 2% in 50 years, from the stock Canada model (SHM6).

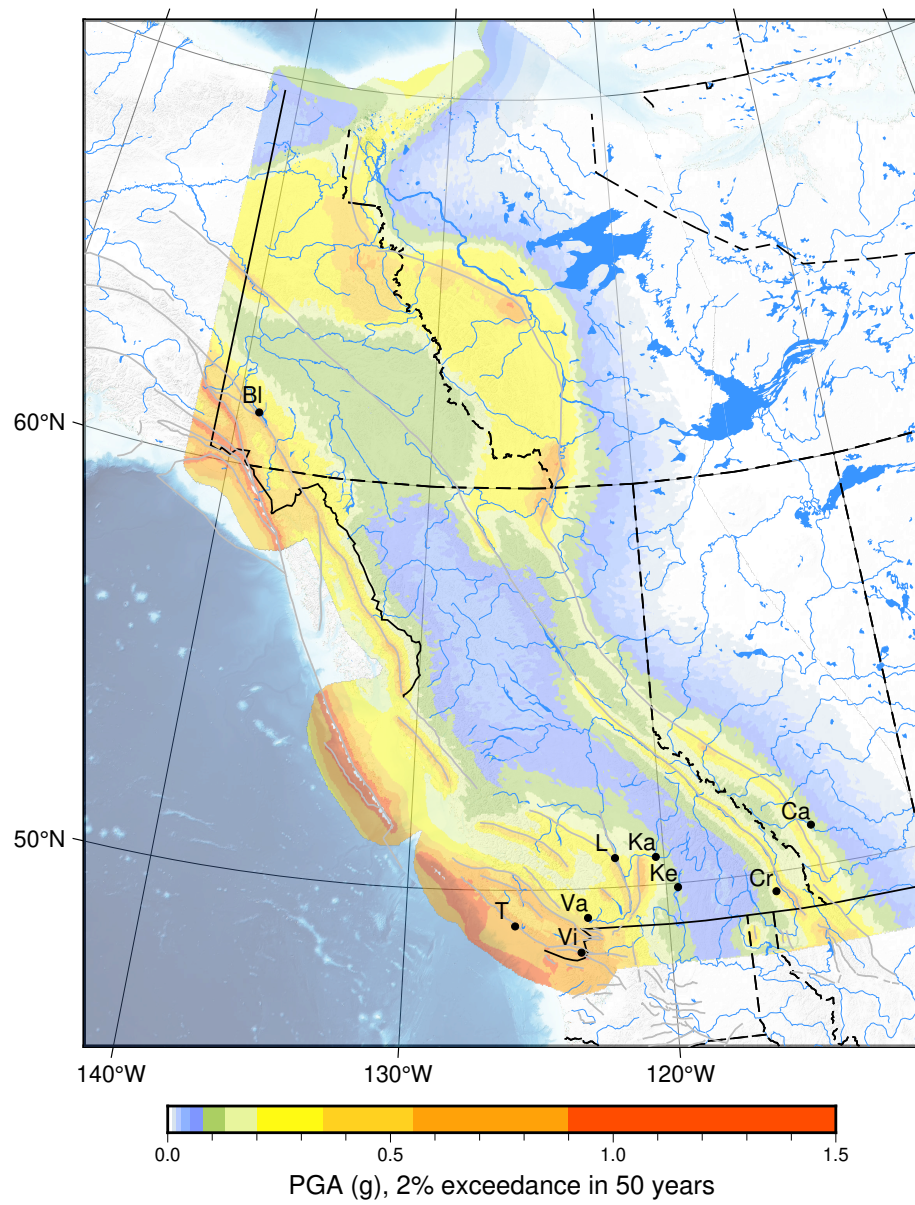


Figure S13: Peak Ground Acceleration (g) for an exceedance rate of 2% in 50 years, from the stock Canada model (SHM6).

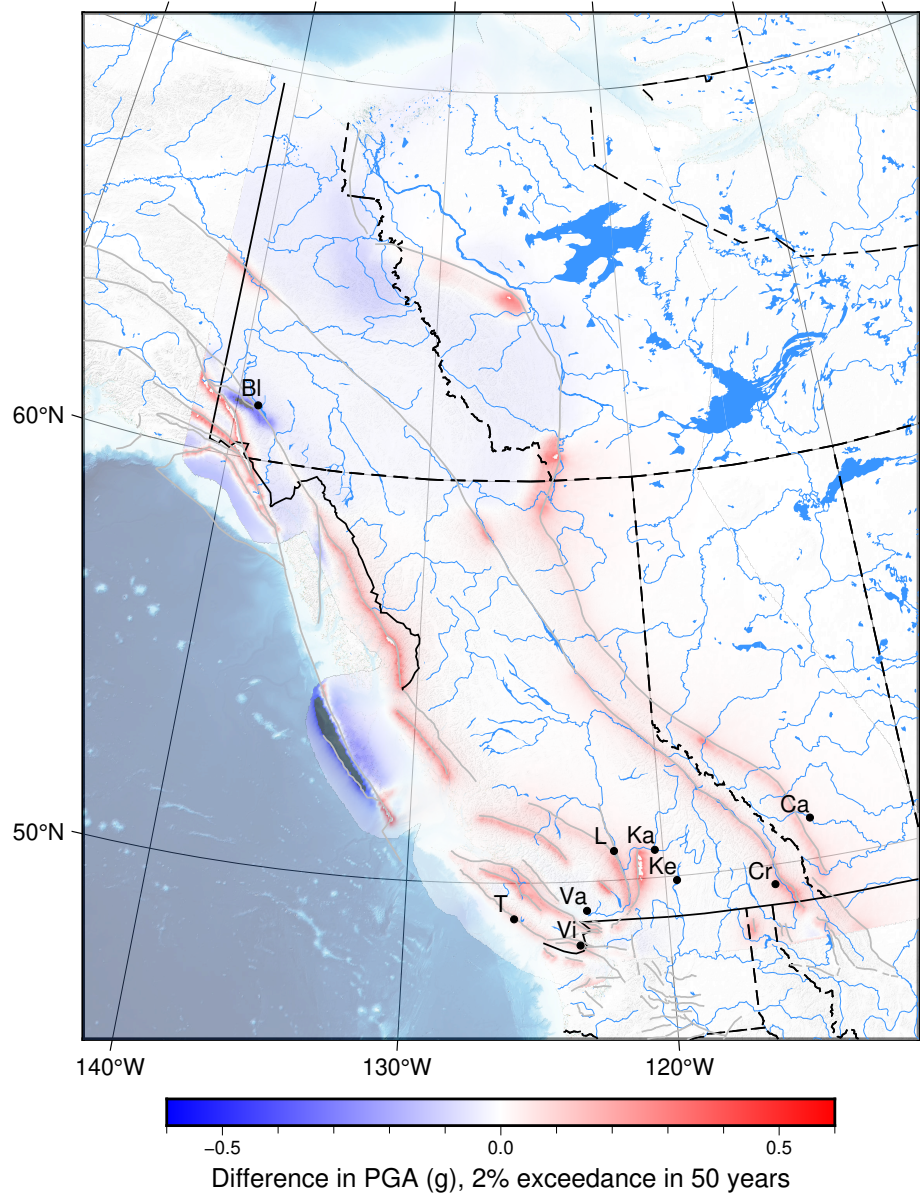


Figure S14: Difference in PGA (g) from the stock model (Figure ??) minus the block model (Figure ??) for an exceedance rate of 2% in 50 years. Positive values (red) indicate an increase in hazard from the block model compared to the stock model, while positive values (blue) indicate a decrease in hazard from the block model compared to the stock model.