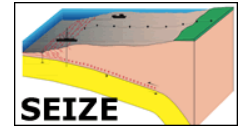


# Spatial Variations in Apparent Stress for Subduction Zone Earthquakes Along the Nicoya Peninsula, Costa Rica



Award: MARGINS-Related

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The incoming plate at the Middle America Trench offshore Costa Rica has significant along-strike bathymetry variability, including smooth sections along northern Costa Rica and seamount covered sections along central Costa Rica. The Nicoya Peninsula is at the junction of these variations and thus an exceptional place to study how variations in the incoming plate structure can influence earthquake rupture properties. We use data from the MARGINS-funded CR-SEIZE seismic experiment seismic data to determine apparent stress for hundreds of earthquakes ranging in magnitude from M 1.5 to 4.5 that occurred on the plate interface. We find higher average apparent stress in the northern and central portions of the Nicoya Peninsula, with lower values in the southern portion of the peninsula (see figure). These results imply stronger coupling and/or higher fault friction in the northern Nicoya Peninsula region than in the southern region. This might be linked to the overall smoother plate being subducted beneath the northern/central portion of the peninsula allowing for stronger coupling at the plate interface (Stankova-Pursley et al., 2008). Efforts currently underway are examining the details of the apparent stress variations and comparisons with other geophysical datasets.

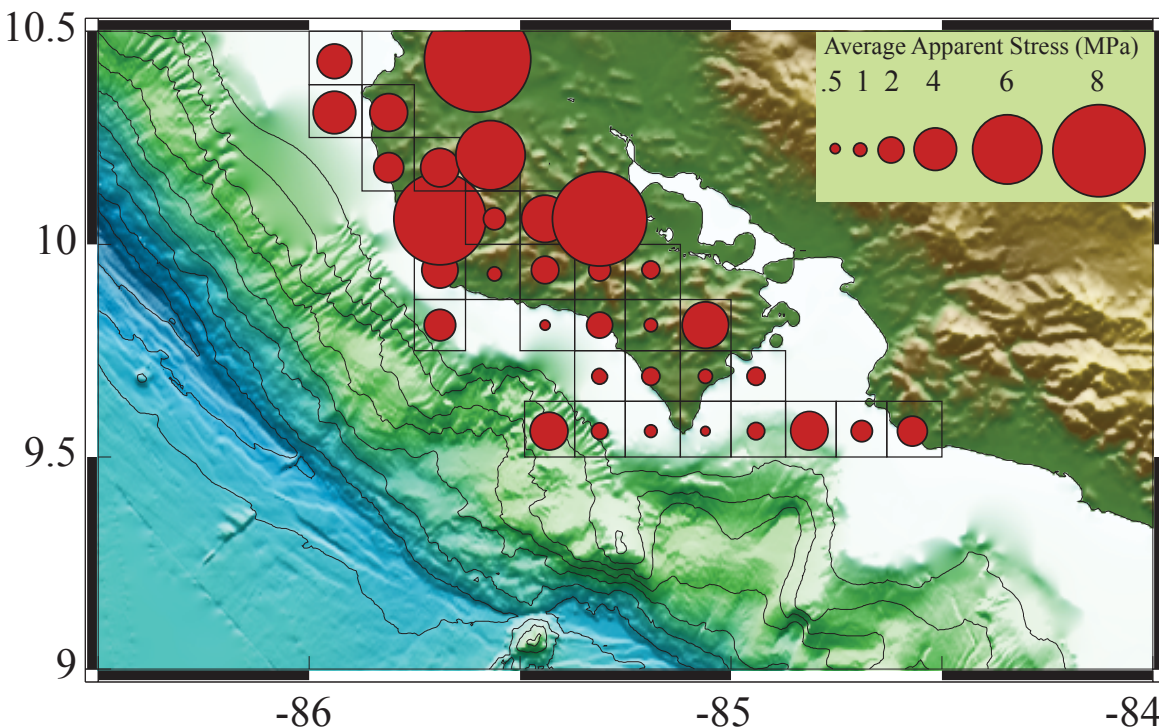


Figure: Apparent stress (MPa) from 272 well-located earthquakes on the plate interface, spatially averaged into bins (boxes) throughout the Nicoya Peninsula. Overall we see larger values, indicative of stronger coupling or higher friction, in the northern and central portions where smooth plate is subducting relative to the southern portion where the Fisher seamount subducts. Coordinates in degrees.