

**SEIZE/
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Collaborative Research: Imaging the Seismogenic Zone with Geodesy and Seismology: Two Land Ocean Transects Across Costa Rica and the Middle America Trench

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- An original steady-state conceptual model with well-defined up- and down-dip limits, and a locked zone in between that periodically ruptures in a megathrust earthquake, has been refined to a dynamic model. In the dynamic model seismic/aseismic transitions exhibit spatial variations in depth, patches within the seismic regions may freely slip aseismically, and spatial attributes of the up- and down-dip limits and the seismic/aseismic patches may vary as a function of time.
- Established sustained partnership and collaboration between U.S., Costa Rican, and German institutions (proposals for follow-up work submitted to various agencies).
- Established archive of seismic event parameters (http://es.ucsc.edu/~hdeshon/crseize_homepage.html) and GPS data (raw and site velocities) (<http://www.geodesy.miami.edu>). Waveforms are disseminated through the IRIS Data Management Center (<http://www.iris.edu>).

Figures and Captions

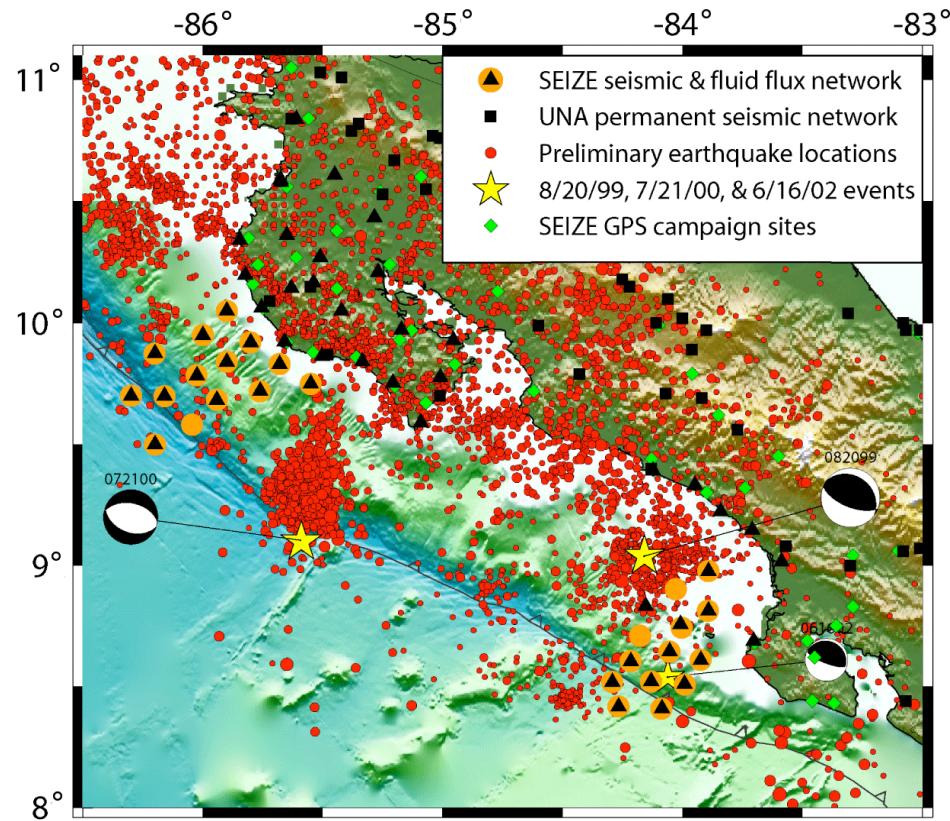


Figure 1: CRSEIZE (Costa Rica Seismogenic Zone Experiment) was a large international effort conducted in 1999-2001 to collect GPS, fluid flow, and seismic observations in Costa Rica in order to better understand the mechanical behavior of the seismogenic zone. Results to date indicate considerable heterogeneity, with a shallowing of the up dip limit of seismicity around the Nicoya Peninsula from 20 to 10 km where the origin of subducting oceanic crust changes from East Pacific Rise (EPR) to Cocos-Nazca Spreading Center (CNS) and temperatures on the incoming plate appear to increase. Geodetic modeling reveals that plate coupling varies greatly, with less than about 50% of plate motion locked in northern Costa Rica and close to 100% locked in southern Costa Rica. In northern Costa Rica, locked zones are aseismic, while more freely slipping regions have abundant microseismicity.

Publications and Presentations

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