

SEIZE/ SF	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 US, Costa Rican, and German institutions (follow-up proposals have been 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>).

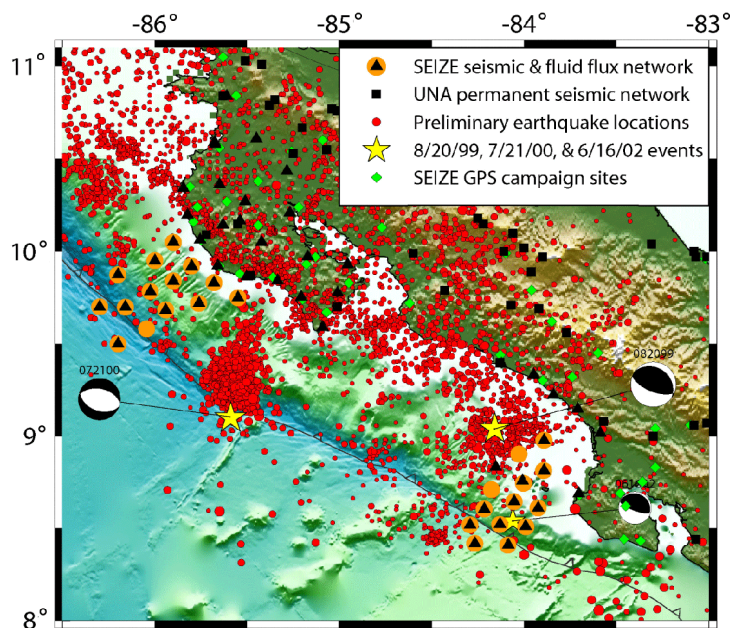


Figure 1. CRSEIZE (Costa Rica Seismogenic Zone Experiment, 1999-2001) was a large international effort to collect GPS, fluid flow and seismic observations in order to better understand mechanical behavior of the seismogenic zone. Results to date indicate considerable heterogeneity, with a shallowing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