SF	Collaborative Research: Imaging the Mantle in the Central American Subduction Factory (Volcanic Origins ILluminated in Costa Rica And Nicaragua ((VOLCAN)))	
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Despite ample evidence that volcanic arcs arise from melting in the underlying mantle wedge, it remains unclear where and why such melting takes place. To complement geochemical proxies for melting processes, which exhibit nearly their complete global range in Central America, we use broadband seismology to image the mantle wedge, downgoing plate, and arc crust in the Central American Subduction Factory. The experiment is designed to differentiate fluid, temperature, and compositional variations at depth, in order to elucidate the processes that cause and control melting beneath arcs.

The main phase of data collection is scheduled to begin in July, 2004, and continue for 18 months. A total of 45 PASSCAL broadband seismographs will be deployed across the arc in Nicaragua and Costa Rica. These data will be analyzed for a wide variety of seismic parameters from regional and teleseismic sources, including *P* and *S* velocity, attenuation, discontinuity structure, anisotropy, and hypocenters.

Initial Results:

During July, 2003 we visited most prospective station sites and organized experimental logistics. Both Costa Rica and Nicaragua have good transportation infrastructures and deployment should be straightforward. We installed one pilot station just south of Tenorio volcano, Costa Rica, and have begun data transfer. In-country collaborators have begun to build vaults for the remaining stations.

In a feasibility test, records from one permanent broad-band station (JTS) show remarkable secondary phases from events 50-150 km deep beneath Nicaragua. The phases require a low-velocity layer, several km thick, at top of the subducting slab that is 14% slower than surrounding mantle. The layer may be a hydrated zone, as inferred at other arcs, but with much higher H_2O content [Abers *et al.*, 2003].

Figures and Captions

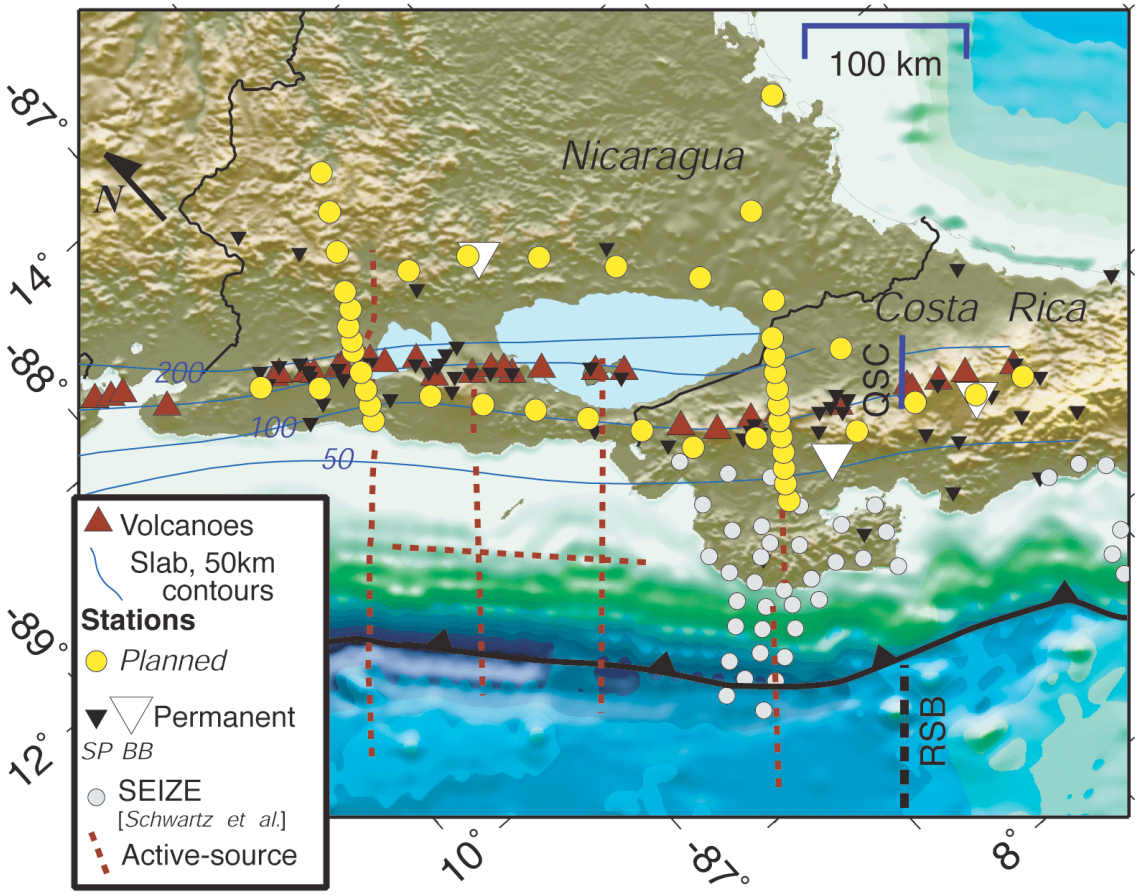

Figure 1: Planned PASSCAL station deployment (yellow) and others (see key). RSB: rough-smooth boundary on downgoing Cocos Plate; QSC: slab break at depth (Protti *et al*., 1995).

Publications and Presentations

Abers, G.A., T. Plank and B.R. Hacker, The wet Nicaragua slab, *Geophys. Res. Lett.*, *30*(2), 1098, 2003