Imaging the deep root of the Mexican Volcanic Zone:
A collaborative project to map the subducting Rivera/Cocos plates and the
source region of the overlying volcanic centers

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General issues in arc magmatism

Issues specific to western MVZ

- How is the subduction of the Rivera microplate related to extension and evolution of the Jalisco block?
- Why do we find ocean–island basalt type lavas in a subduction zone?
- How are the locations of modern volcanic centers related to the subduction of the Rivera and Cocos plates?

Corner flow may causes advective heating. Slab volatiles depress the solidus. Ripe environment for melting.

Magma mixing, storage and assimilation in the lower crust?

How is mantle melt production linked to intrusion and eruption in the crust?

A recently-funded seismic experiment is designed to help shed light on these issues, both general and specific.

- Mapping the Rivera Subduction zone (MARS)
- 50 broadband instruments in Jalisco/Colima
- 18-month deployment including inset linear array (shown in purple)
- Teleseismic dataset suitable for imaging the subducted slab geometry and characterizing the mantle wedge
- Local microseismicity will also delineate slab geometry and indicate stress states in the slab and overlying crust.
- Convergence of multiple arrays near volcano de Colima may provide details of lower crust and near-Moho processes
- Currently slated for deployment in late 2005 or early 2006

(Top) Triangles mark tentative locations of seismic sites. The purple instruments form a higher resolution linear array ideal for looking at possible slab tears in detail.

(Bottom) Green instruments are part of the network operated by the Colima Volcano Observatory. Faint gray stations are not part of the current deployment but show what would be necessary to provide the best images of the lower crust and near-Moho region.