We made important progress on two MARGINS initiatives: determining the volcanic flux rate on a relatively short time scale (less than 4 my) and serendipitously discovering a locality with abundant mantle xenoliths, the first such locality associated with the Central American volcanic chain. The first progress area was the main theme of our proposal. We collected more than 60 new samples from Costa Rican volcanoes. Our sampling focused on the older, lower slopes of the larger volcanic complexes. Although our lab work was held up by renovation and machining delays, we completed 25 $^{40}\text{Ar}/^{39}\text{Ar}$ dates, which conclusively show that the major centers are 4 to 10 times older than we had previously assumed (Patino et al., 2000). This greater age means there is less recycling of subducted highly mobile elements than we had proposed. We are drafting a paper based on these new data. We will collect additional Costa Rican samples in May, recollecting in areas where our initial samples were too glassy for reliable dating and adding new areas based on our revised understanding of the ages of the large complexes. We have just sent off 17 Nicaraguan samples for irradiation. We will carry out additional sampling in Nicaragua in the late summer, once again focusing on the older parts of the volcanoes.

The second area of progress was unexpected. Costa Rican colleague, Guillermo Alvarado, told us of a new xenolith locality. We immediately obtained a small supplement, visited the site and found abundant ultramafic nodules in all outcrops, including some that were 10 cm long. Dunites, lherzolites and pyroxenites are present. Many of the dunites are cumulate textured. More than half of the thin sections examined so far have veinlets. A representative veined dunite is shown in Figure 1. Two graduate students, Fara Lindsay and Alissa Henza, have begun thesis projects on the nodule collection.


**Figures and Captions**

**Figure 1:** Thin section of cumulate textured dunite with vein crossing diagonally.

**Publications and Presentations**


