

## 2005 SCEC ANNUAL REPORT

### SURVEY FOR LOCATIONS AND ORIENTATIONS OF PRECARIOUSLY BALANCED ROCKS ASSOCIATED WITH THE BANNING, SAN ANDREAS, AND SAN JACINTO FAULTS

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Previous studies and rock testing have provided important ground motion constraints for earthquakes on the Mojave section of the San Andreas fault. However, there had not been corresponding studies in the southeastern strand of the fault in Coachella Valley. The precarious rock data in the region can constrain the seismic hazard from large earthquakes on this segment. In particular, ground motion from the large earthquake in about 1680, identified from trenching studies, will be constrained by these rocks. This in turn may provide evidence for the direction of rupture propagation in that earthquake. Recent numerical studies by SCEC have shown that the amount of damage to high-rise buildings in Los Angeles may be critically dependent on the direction of rupture propagation. Since this segment is considered by many to be overdue for the next large earthquake, it is important to document the precarious rocks on both sides of the fault before that event occurs.

We have documented the existence of important zones of precarious rocks in several new places:

1. Near Cottonwood Oasis on the eastern side of the San Andreas fault at the latitude of the north end of the Salton Sea.
2. Near Pinyon Crest halfway between the San Andreas and San Jacinto fault at the latitude of Anza, CA.
3. Halfway between the San Andreas and San Jacinto Fault near Idyllwild, CA.

The total number of rocks located is about two-dozen. We plan to do further documentation and testing of these rocks, which we believe will provide important constraints on the seismic hazard in the area, and in particular on the ground motion from the 1680 earthquake.

#### **Publications**

Brune, J. N., Anooshehpour, A. and Purvance, M. D., 2004. A Band of precariously balanced rocks between the Elsinore and San Jacinto fault zones: constraints on ground motion for large earthquakes, *Geology*, in press (SCEC Contribution Number 818).