Summary of Geologic and Paleoseismic Studies for the San Jacinto and Elsinore fault zones, and Faults of the Eastern California Shear Zone For Inclusion in RELM

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In support of RELM activities for 2004, I began three primary tasks that will substantially add to the evolving system-level, time-dependent earthquake-ruptureforecast model for southern California. Specifically, I have been summarizing and compiling published and unpublished geologic and paleoseismic information for the San Jacinto fault, Elsinore fault, and faults of the Eastern California Shear Zone.

For the Elsinore fault, I have completed a paper on the Holocene slip rate from work done in the 1990's. I have also calculated pdf's of event ages for late Holocene earthquakes recorded at Glen Ivy Marsh where sufficient radiocarbon control exists. The final task will be to construct a late Holocene rupture history for the entire fault, based on the limited existing data.

For the San Jacinto fault, I have (with Gordon Seitz and Tim Dawson) extended the earthquake record for the Anza "seismicity" gap back to about 3200 years BP (funded separately by SCEC and USGS). We will soon have a suite of new radiocarbon dates that will tightly constrain the ages of these events, but preliminary results display surprising long-term variability in production rate, as well as an interesting anti-correlation with events on the San Andreas fault (see the annual SCEC report on the Hog Lake results). I have also compiled relevant published and thesis work from the southern San Jacinto fault zone, including the Superstition Hills, Superstition Mountain and Coyote Creek faults. I am working on a paper that summarizes the late Holocene paleoseismology of the southern San Jacinto fault zone. Along with the Hog Lake results, this will be a major step forward in understanding strain release on this major fault.

For the Eastern California Shear Zone, much of the paleoseismic data collected through about 1998 is summarized in Rockwell et al. (2000). However, following the 1999 Hector Mine earthquake, considerable new paleoseismic work was conducted on faults to the east of the 1992 rupture, and there has also been continued data collection in the western and northern ECSZ. For the RELM effort, I will compile and characterize all existing paleoseismic data, geologic data relating to total fault slip, and information on slip per event for faults in the ECSZ. This work has not yet been accomplished but will begin this winter.