Rockwell, Tom (San Diego State University, CA)

PALEOSEISMIC SUMMARY OF THE SOUTHERN SAN ANDREAS FAULT SYSTEM: IMPLICATIONS OF LONG-TERM REGIONAL STRAIN RELEASE

The southern San Andreas system is characterized by a complex system of strike-slip, thrust and oblique normal and reverse faults that accommodate the ~50 mm/yr of dextral shear between the Pacific and North American lithospheric plates. Two decades of paleoseismic research by a host of earthquake geologists has produced a rich, albeit incomplete, record of past large earthquakes for southern California and northern Baja California. The primary strike slip faults appear to behave in a relatively predictable fashion, with their behavior largely controlled by total slip, rate and degree of segmentation and fault zone complexity. The San Andreas, with over 300 km of slip, produces large earthquakes with soft segment boundaries whereas the San Jacinto and Elsinore faults, with 25 and 10 km of slip, respectively, appear to have more persistent segment boundaries and express more quasi-periodic behavior. In contrast, the areas both west and east of the San Andreas system appear to behave in a cluster-mode of seismic strain release, with the Eastern California Shear Zone and the Los Angeles basin producing clusters of large earthquakes every few thousand years. These observations are cause for concern in the interpretation of very short-term geodetic data, as well as in the assessment of seismic hazard, and indicate that paleoseismic data must underpin our search for the underlying elements in fault systems dynamics.