



**4-D Ruptures Histories of Major Plate
Boundary Faults:
*A view into Long-Term fault behavior and fault
interaction***

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**4-D ruptures histories of major plate boundary faults:
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Long paleoseismic records from three major plate boundaries, the complex southern San Andreas fault system of southern California, the Dead Sea Transform in the Levant, and the North Anatolian fault in Turkey, provide insights into long-term rupture behavior of plate boundary fault systems as a function of fault zone complexity. Large earthquakes on the San Jacinto, San Andreas and Imperial faults of southern California exhibit evidence for mode-switching between earthquake clusters and more periodic behavior. Similarly, the Dead Sea Transform, where the fault transitions from a simple to a complex system in northern Israel, exhibits clusters of moderate earthquakes interspersed with large earthquakes with large displacements, followed by periods of quiescence. In contrast, the simple (single-stranded) central portion (1944 rupture segment) of the North Anatolian fault exhibits both characteristic and periodic behavior whereas the western, multi-stranded section of the NAF exhibits more variability in terms of earthquake timing. These differences in rupture behavior are attributed to fault and stress interaction in complex fault systems versus relatively simple loading and strain release in the simple example.



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Dr. Thomas Rockwell is a nationally and internationally renowned paleoseismologist and geomorphologist. Having served as Geology Group Leader for the Southern California Earthquake Center for many years, he is an expert on the tectonics and earthquake hazards of southern California and Baja California, has conducted extensive trenching programs to date earthquakes on faults in the western U.S., South and Central America, the Middle East and Asia, and routinely uses soil stratigraphy and geomorphology combined with various radiometric dating techniques to assess rates of fault activity, determine recency of faulting, and date past earthquakes. His research focuses on understanding earthquake occurrence in time and space. Current and past projects include the characterization of fault systems behavior by understanding patterns of past recurrence of large earthquakes on faults in southern California, northern Mexico, Panama, Honduras, Argentina, Chile, Portugal, Spain, Turkey, India, Mongolia, and Israel. This work includes resolving information on slip per event, as it relates to understanding the controls on segmentation and rupture termination. He has also worked extensively on the affects of tectonism on the landscape, and using geomorphology to constrain rates and timing of tectonic events. Included in this latter aspect is detailed mapping and dating of marine terraces along the west coast of North America and assessment of paleosea level during the late Quaternary. He has also served as a consultant or project manager for numerous dam seismic safety studies, LNG siting studies, pipeline fault crossings, and other fault hazard studies, and has served on review panels for many nuclear power plant seismic reviews, including several in the United States, Turkey, Korea, Chile and Armenia. In his academic role, Dr. Rockwell has supervised over 50 MS and PhD student thesis projects, published over 150 peer-reviewed journal publications and conference papers, and authored several hundred summaries (abstracts) of papers presented at professional meetings.