

Fault Segmentation and Earthquake Behavior: A High Resolution Paleoseismic  
Study in The Southern San Jacinto Fault Zone  
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T. Rockwell, O. Altangerel, D. Ragona  
Geological Sciences  
San Diego State University

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## **Introduction**

The southern San Jacinto fault zone consists of three main splays: the Coyote Creek (CCF), Superstition Mountain (SMF) and Superstition Hills (SHF) faults. The CCF is divided into northern and southern segments, in part defined after its rupture in the 1968 Borrego Mountain earthquake. The southern CCF is itself delineated into three sub-segments, all of which sustained surface rupture in 1968, and each of these sub-segment boundaries are delineated by step-overs and/or fault bends. In contrast, the segment boundary between the southern segment of the CCF and the northern end of the SMF is defined only by a 10° bend or change in strike at the surface. The main reason that these two faults are considered separate is that the 1968 rupture terminated along the southern sub-segment of the CCF. Microseismicity, in contrast, suggests that the southern sub-segment of the CCF is actually the northern end of the SMF, as defined by a 3-km-wide structural step-over at depth. We conducted paleoseismic investigations of the CCF (South Break site, Middle Break site, Northern Shoreline site) and the SMF (Carrizo Wash site and Southern Shoreline site) for this project and combined this new information with earlier work by Gurrola and Rockwell (1996) to show that this inference is generally correct: that the large earthquake history of the southern sub-segment of the CCF and the SMF are similar, and both are quite distinct from that of the central subsegment of the CCF that ruptured in 1968. In this report, the main body of text is taken directly from the MS theses of Altangerel Orgil and Daniel Ragona. There is overlap in some areas, such as outlining the project and scope, as well as in some figures, summary text, etc. Three other theses are still underway and the results from those are only briefly touched on. All will be combined in the final analysis when these results are published.