



## **Late Holocene slip rate for the Mojave San Andreas fault from two sites near Palmdale, California, USA**

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The 1200 km long San Andreas Fault is a right-lateral strike-slip fault that accommodates about 75% of the plate motion between the North American and the Pacific Plates. The ~100-km long Mojave section of the San Andreas fault (MSAF) defines a major double restraining bend in big-bend section of the San Andreas fault in southern California. The Holocene geologic slip rate on the MSAF is not well known, despite its importance for understanding earthquake hazard, apparent discrepancies between geologic and geodetic slip rates, and potential long-term fault interactions in southern California. Here we use detailed surficial geologic mapping, excavations, and radiocarbon dating of charcoal to document and date landforms offset by the MSAF at two slip-rate sites. We use a bracketing approach to define the age of the offset landform, using deposits that pre- and post-date the formation of the landform. This approach gives a maximum and minimum age for the offset landform. We then combine the maximum possible maximum and the minimum possible minimum age, based on 2-sigma confidence interval for the  $^{14}\text{C}$  ages, with the maximum and minimum displacement values to get maximum and minimum paleoslip rates. At site X-12, a beheaded channel that formed between ~1700 and ~550 calBP is offset ~50 to ~60 m. At the Ranch Center site, a channel that formed between ~4300 and ~1200 calBP is deflected ~70 to ~110 m behind a shutter ridge. The two sites are within 30 km of each other, and thus are reasonably assumed to have shared a common average slip history over the last few thousand years, particularly considering the large number of surface rupturing events indicated by paleoseismic studies over the last ~1500 yr along the MSAF. The overlap between the allowable slip rates from each site yields a late Holocene MSAF geologic slip rate between ~28 and ~60 mm/yr.