Project Abstract

An array of excavations at Hog Lake (HL) on the San Jacinto fault (SJF) near Anza, California exposes 3000 years of stratigraphy containing evidence for 9-10 surface ruptures. The site, an ephemeral pond that has recorded successive periods of deposition and desiccation, lies astride the principal active strand of the SJF. Evidence of surface ruptures includes abrupt upward truncation of faults and fissures, angular unconformities and disconformities due to folding, liquefaction, and growth strata on the down-thrown (NE) side of the fault. The most recent event (MRE) is preserved at 0.5 m depth and is overlain by undisturbed, stratified sediment and a well-developed surface soil. Reported observations of no surface rupture at HL resulting from the 1918 earthquake, analysis of the historical earthquake record for the region, and the absence of pollen from introduced plant species overlying the event horizon all suggest that this event is pre-1850 and most likely prehistoric. We acquired an initial suite of 25 C-14 ages on seeds, charcoal and shell to compare results from different media. We found that the dates on seeds collected from individual strata yielded results consistent with stratigraphic relations with no apparent reworking or recycling. We acquired an additional 25 dates on seeds to determine the ages of the past six surface ruptures. These dates show that the Anza segment has ruptured six times in the past 1000 years, with event ages at about AD 1760, 1630, 1360, 1290, 1230, and 1020. Prior to about 1000 AD, which is the age of the oldest section on the downthrown side of the fault, it appears that either there were fewer earthquakes in the preceding 2000 years, as we recognize only four additional events, or that the record is incomplete using only the stratigraphy exposed on the southwest side of the fault. Additional dating is being conducted to further date these earlier events.

These observations indicate that the time between surface ruptures at Anza is relatively short, ranging between 60 and 270 years with an average recurrence interval of about 190 years. As it has been about 240 years since the most recent event, it appears that the Anza segment may be ready to shake, rattle and roll.