Evaluation of paleoearthquake timing, northern San Andreas fault, Fort Ross, California (Year 2)

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Program Element II: Research on Earthquake Occurrence and Effects

Key Words: Paleoseismology, Trench investigation, Recurrence interval

INVESTIGATIONS UNDERTAKEN

This research is designed to better constrain the late Holocene paleoseismic history of the San Andreas fault near Fort Ross, California. The timing and recurrence of earthquakes along the San Andreas fault and fault segmentation are among the most critical issues for reducing uncertainties in probabilistic analyses of seismic hazard in northern California. This paleoseismic study will help assess the timing and recurrence of earthquakes along the northern San Andreas fault.

We have identified two sites near Fort Ross where late Holocene alluvial-fan sediments are deposited across the main trace of the San Andreas fault: the "Orchard" and "Fort Ross Creek" sites. During December 2000, we conducted initial (Year One) trenching at the Orchard site under a previous NEHRP award. This effort shows that the site preserves evidence of the 1906 rupture as well as possible evidence of as many as three earlier earthquakes, in the form of upward fault terminations in alluvium, fissure fills, and possible scarp-derived colluvium. We are waiting for additional age-dating assistance to complete the analysis of these trench exposures. In the present effort, we will conduct additional paleoseismic trenching across an uphill-facing fault scarp at the Fort Ross Creek site, as a second opportunity to obtain information on earthquake timing. At this site, we anticipate obtaining evidence of paleoearthquakes on the basis of upward fault terminations in alluvial stratigraphy and scarp-derived colluvium shed from the fault scarp. Based on the presence of abundant charcoal exposed in previous trenches, we propose to obtain age estimates of faulted and unfaulted deposits at both sites via radiocarbon analyses of charcoal fragments.

NON-TECHNICAL SUMMARY

This research will provide information on the timing of past large earthquakes along the San Andreas fault in northern California. This part of the fault ruptured during the 1906 San Francisco earthquake, but knowledge of the dates of earlier earthquakes is poor. The timing and recurrence of earthquakes along the San Andreas fault is one of the most critical issues for determining seismic hazard in northern California. This paleoseismic study will help provide information that will be used to evaluate the probabilities of strong ground motions and other earthquake-related hazards in northern California.

REPORTS PUBLISHED

None.

DATA AVAILABILITY

Additional detailed information on the investigation is available from the Principal Investigators listed above. This information includes detailed site maps and logs of trenches.

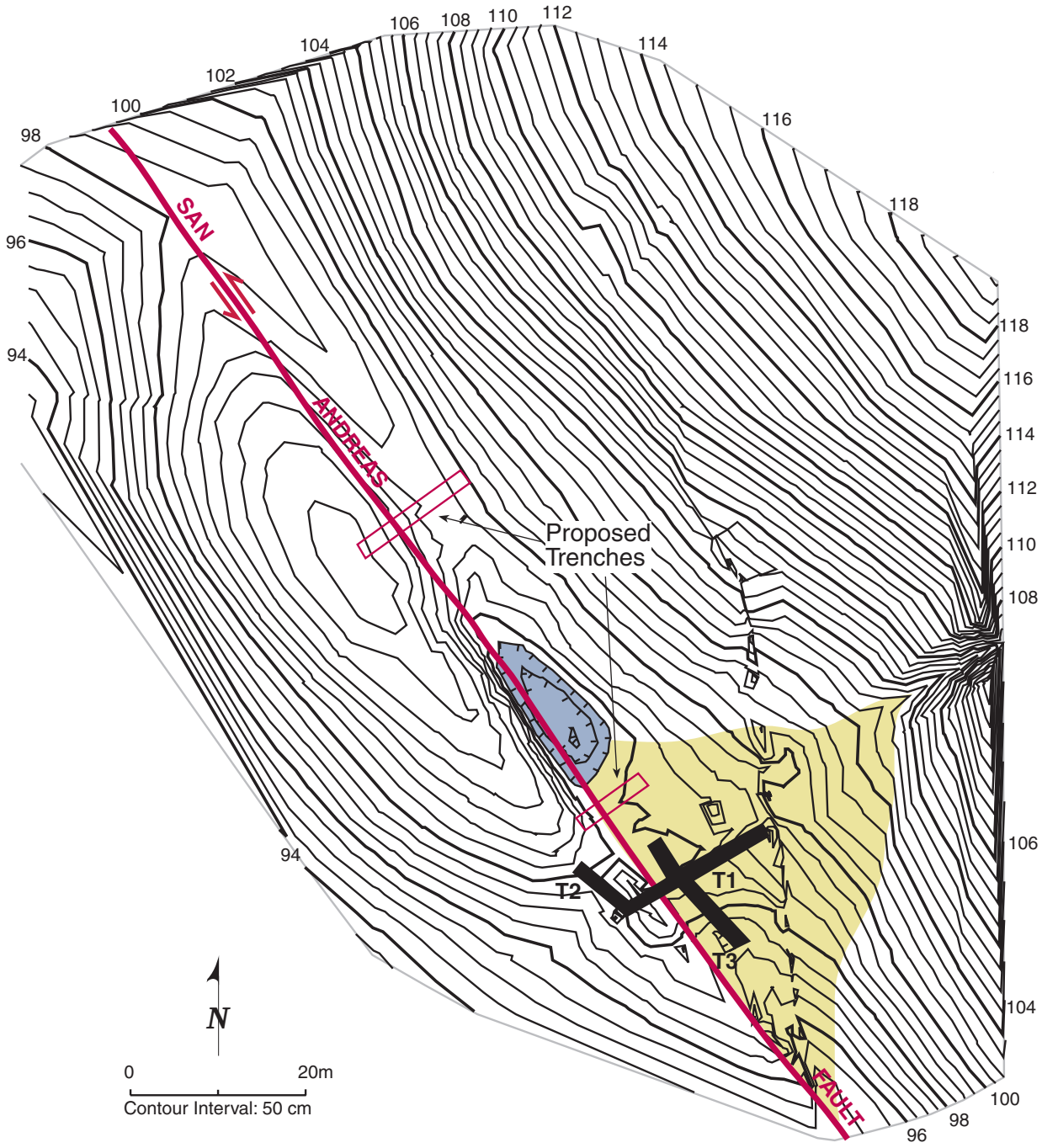

Figure 4. Detailed geologic map of the orchard site showing San Andreas fault, FY00 trenches T1, T2, and T3 (filled boxes), and proposed FY02 trench locations (open boxes).