

**HOLOCENE SLIP RATE OF THE GREEN VALLEY FAULT AT FREEBORN CREEK,
FAIRFIELD, CALIFORNIA**

98HQGR1039

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Components II.3: "Determine the nature and rates of crustal deformation," and II.5: "Identify active faults, define their geometry, and determine the characteristics and dates of past earthquakes".

ABSTRACT

Due to the difficulty of getting permission to access the Freeborn Creek site, an alternate, less desirable site was studied at James Creek near the junction of I80 and State Highway 12. Four traces of the N22W trending Green Valley fault (GVF) had been mapped in this area, with three of them being on land owned by the City of Fairfield. Our best hope of obtaining a Holocene slip rate for the GVF was along Trace No. 2, which was a southerly extension of a fault at the contact between the Markley Sandstone and the Sonoma Volcanics discovered by CALTRANS north of State Highway 12. Geomorphically, the suspect trace was defined by a N22W trending linear swale with a back-facing scarp on its eastern side. The trace projected toward the western side of an apparent faceted pressure ridge south of I80.

Although there were suitable Holocene-age strata, excavations across all three traces failed to uncover signs of Recent activity. Minor Riedel shears (N20E to N40E) offsetting pre-Holocene units in Trenches T-3 and T-6 were found on the eastern side of the site. Analysis of cataclasis along these offsets is in progress. Thin-section data will be compared to that from creeping and non-creeping faults to determine if catastrophic events are possible along the Green Valley fault, which lies along Trace No. 4, offsite less than 200 m to the east.

NON-TECHNICAL ABSTRACT

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NEHRP Elements: II.3 and II.5 **Keywords:** Crustal deformation, Active faults, Paleoseismology

Due to the difficulty of getting permission to access the Freeborn Creek site, an alternate, less desirable site was studied at Jameson Creek near the junction of I80 and State Highway 12. Three of the four traces of the northwest-trending Green Valley fault were investigated on land owned by the City of Fairfield. Although there were suitable strata, excavations across all three traces failed to uncover signs of fault offset during the last 10,000 years. Minor northeast-trending shears offsetting 18,000-year-old sediments were found on the eastern side of the site. This is an indication that the main trace of the fault lies offsite less than 200 m to the east. Future work will concentrate on that trace.