Project Abstract

We initiated a 3-D paleoseismic investigation approximately 4 km northwest of Prado Dam to quantify the slip rate of the southern portion of the Chino fault. The trench site is located at the mouth of a small deflected canyon at the front of the Chino Hills where the Chino fault juxtaposes degraded old alluvial fan surfaces to the northeast from bedrock of the hills to the southwest. Near the trench site the fault was mapped by an alignment of benches, tonal lineaments, saddles and right-laterally offset drainages. Our excavations revealed a 40- m- wide zone of apparently inactive northwest-striking high angle faults that coincides with the geomorphic expression of the Chino fault. These faults cut bedrock of the Miocene age Puente Formation but do not deform overlying colluvium, channel and debris flow deposits. Based on the degree of soil development in deposits overlying the fault zone, we infer that the bedrock faults have not ruptured since at least the late Pleistocene. The geometry of a bedrock channel margin exposed in one of the trenches further suggests that the fault has not experienced recent right lateral movement. Radiocarbon dates from deposits overlying the fault zone are pending. Trenches upslope and to the west of the mapped main trace of the Chino fault revealed a 10- m- wide low-angle reverse fault zone that dips 10 to 30 degrees to the southwest and juxtaposes bedrock over older alluvial fan deposits. This is similar to the expression of the fault in geotechnical trenches to the north and south of our site. By contrast, the only known active strands of the fault are nearly vertical. To date we have found no indications of Holocene activity on the Chino fault at our trench site. Work to determine the timing of past earthquakes on the low angle faults at our site is ongoing, but the site is probably not going to assist us in determining a lateral slip rate.