**Sample_Stratigraphic unit_Sample material_C14 age, years B.P._Calibrated age.**_PC-7E-51_K_Charcoal_308±68 B.P._A.D.1445-1680 or 1758-1804, or 1938-1954__PC-7E-53_K _Charcoal_387±67B.P._A.D.1415-1655__PC-7E-55_Channel on top of layer G_Charcoal_377±40B.P._A.D. 1441-1643__ Event A__PC-7E-29_G_Charcoal_373±46B.P._A.D.1439-1648__PC-7E-26_G_Charcoal_484±68B.P._A.D.1315-1348, or 1391-1517, 1587-1623.__ Event B__PC-7E-54_Charcoal_678±67B.P._A.D.1235-1410_Table 1: Radiocarbon ages of charcoal samples.

Timing of faulting events:

Faulting A happened when layer G was at the surface. We got a calibrated age of A.D. 1439-1648 received from precise date on three targets, from sample PC-7E-29 in layer G. Therefore the age is precise enough to be considered. In addition, a precise date on 3 targets was also obtained from sample PC-7E-55 which dated to be A.D.1441-1643. This sample was collected from a channel that caps faulting event A. The dates are nearly identical, and thus the faulting event is bracketed between A.D.1439-1643. We use the midpoint of this range as our preferred age for event A in table 2.

Event B happened when layer E was at the surface. Layer E dated to be A.D. 1235-1410. Therefore, event B occurred during or shortly after this time period. Since event B occurred before layer G was deposited, it probably occurred prior to A.D. 1439-1648 (the age of the youngest sample from layer G). We used the sedimentation rate shown in figure 8 to estimate our preferred age of A.D. 1380 for event B (see table 2).

When radiocarbon dates on detrital charcoal are the only age control, it is not possible to place a limit on the youngest possible age for an earthquake horizon with 100 % certainty. Because radiocarbon ages on detrital charcoal samples represent maximum ages for the sedimentary layers from which the samples were collected, we dated multiple samples from most layers. We consider the youngest date from each layer to be the most reliable.

**Recurrence intervals:**

Table 2 shows the recurrence interval calculated using the preferred age for each faulting event. The average recurrence interval is about 160 years, assuming that no events have gone unrecorded. We have opened up another trench a few hundred meters further to the southeast, astride the San Andreas Fault to confirm these results and to look for younger events. The trench will also be deepened to extend the paleoearthquake history back in time.

Event _Preferred age_From bracketing carbon sample_Recurrence interval__B_A.D. 1380_A.D. 1235-1410_ 163 YEARS__A_A.D. 1543_A.D. 1439-1648___Table 2: Ages of faulting events and recurrence interval.

**Discussion and previous work:**

Previous paleoseismic and geomorphic work on the San Bernardino and Mojave segments has helped to constrain the ages of prehistoric earthquakes and evaluate the continuity and length of the fault rupture. Exceptional site stratigraphy allowed detailed paleoseismic studies at Pallett Creek, Wrightwood, and Pitman Canyon. Another paleoseismic location is available at Cajon Creek at Cajon Pass, and City Creek. A high sedimentation rate, where the San Andreas Fault cuts a thick section of interbedded debris flow gravel, fluvial sands, and peat characterize all sites. This setting is favorable for paleoseismic investigation because prehistoric and historic earthquakes are well preserved. At Pallett Creek, 55 km northeast of Los Angeles, Sieh (1978, 1984) and Sieh et al (1989), described sandblows and other liquefaction features, buried scarps and truncated fault strands in dated peat and alluvium that record a history of 12 earthquakes during the past 1700 years.
Table 3 summarizes the youngest 6 earthquake events at Pallett Creek, their dates, and the interval between them. The 1857 Fort Tejon and the 1812 San Juan Capistrano earthquakes were recorded in the sediments and they are referred to as events Z and X respectively. The third youngest event, V, is dated to be A.D. 1480.

**Events_Dates_Recurrence intervals__**Z_1857___X_1812_44 years__V_1480_332 years__T_1346_134 years__R_1100_246 years__N_1048_52 years__Table 3: summary of events, recurrence intervals, and dates at Pallett Creek, Sieh et al, 1989.

At Wrightwood, Fumal et al. (1993) used upward termination of fault ruptures, scarps, fissure, and folding to identify event horizons where the San Andreas Fault zone crosses Swarthout Creek, 3 km northwest of Wrightwood and 22 km southeast of Pallett Creek. In addition, the authors used the conventional carbon dates to analyze 21 samples of carbon from peat layers and 1 sample of wood from debris flow deposit. The youngest event, the 1857 Fort Tejon earthquake, was recorded in the offset layers. The second event, the 1812 San Juan Capistrano earthquake, was also recorded by the folding of the sediments below the youngest earthquake horizon. Table 4 summarizes the youngest 5 events and their recurrence intervals.

**Events_Dates_Recurrence intervals__**
1_1857___2_1812_44 years__3_1700__4_1610_90 years__5_1470_140 years__Table 4: summary of events, dates, and recurrence intervals at Wrightwood.
At Pitman canyon, along the southwest flank of the San Bernardino Mountains and 26-km southeast of Wrightwood, Seitz et al. (1994) demonstrated that the 1857 earthquake event did not extend that far southeast into Pitman canyon. However, they revealed that 7 events occurred in the past 1150 years. Table 5 lists the events and their recurrence intervals.

**Events_Dates_Recurrence intervals_**_1_1812___2_1690_122 years__3_1590_100 years__4_140 years__5____6_1190___7_1060_130years_ _Table 5: summary of events, dates, and recurrence intervals at Pitman canyon.

Table 6 illustrates different interpretations of the same data obtained by all authors discussed above. Seitz et al., 1994 and Fumal et al., 1993 interpreted the Pallett Creek data differently. That proves that more work needs to be done to investigate some of the ambiguity left behind. Some of the primary concerns are to see how far the 1812 earthquake has ruptured, to get more precise carbon dates, and to reduce the error bars.