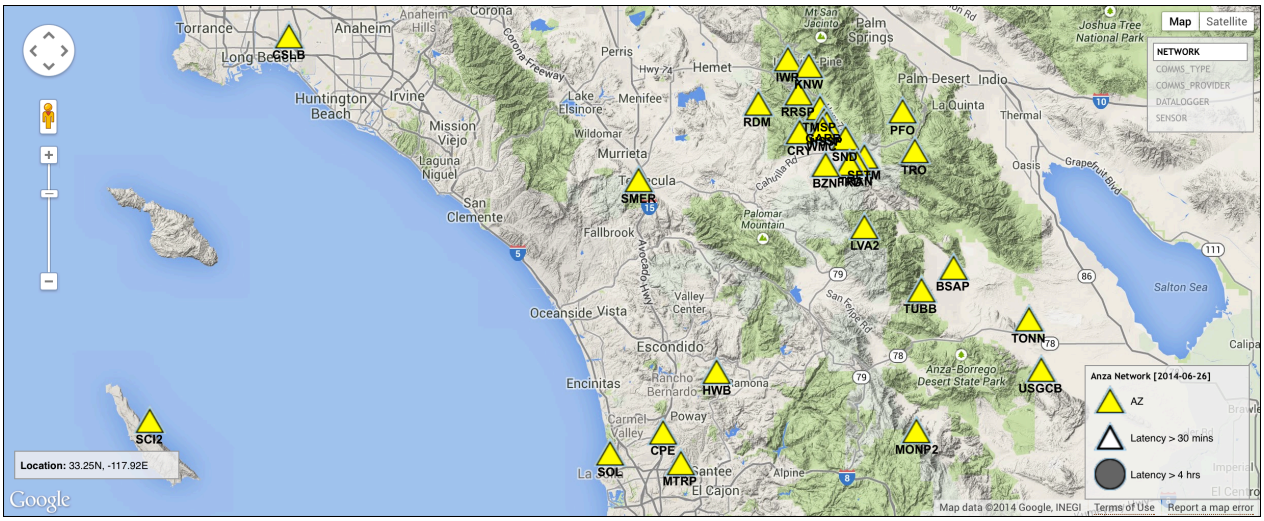
Item V

SCRIPPS INSTITUTION OF OCEANOGRAPHY
UC San Diego

ANZA Seismic Network – A Foundation for San Diego Earthquake Early Warning System

The ANZA seismic network utilizes state-of-the-art broadband and strong motion sensors with real-time telemetry to monitor local and regional seismicity in southern California. The ANZA network provides digital recordings of high-resolution seismic data for earthquakes in the region. The network provides real-time data to the Advanced National Seismic System (ANSS), the California Integrated Seismic Network (CISN), and the greater San Diego community. The ANZA seismic network was funded by the USGS since its initiation in 1982 until 2014. In 2014 the USGS made the decision to defund the ANZA network. In an amazing display of support from the private sector, Seismic Warning Systems Inc., generously provided five years of operational support for the ANZA seismic network starting in 2015. The ANZA seismic network continues to freely provide real time data to CISN and ANSS, as an external network to both organizations.

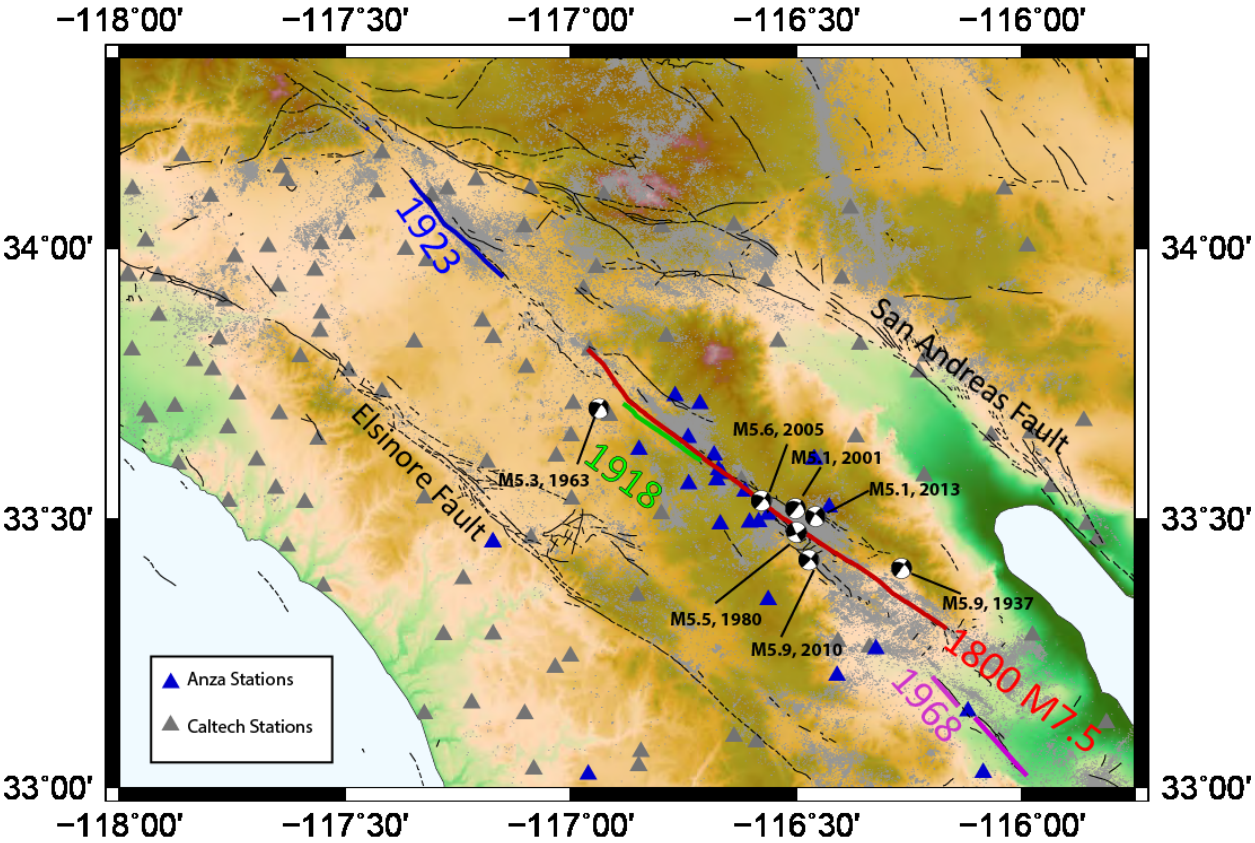
The ANZA seismic network currently consists of twenty-nine operational stations. Most of the stations are located along the San Jacinto fault starting with IWR and RDM towards the top of the map, and TONN and USGCB on the right side of the map. The San Jacinto fault is one of the two most dangerous faults in southern California, the other being the San Andreas Fault. All of the ANZA San Jacinto fault stations are well positioned for earthquake early warning. The remaining ANZA stations provide coverage of the Elsinore fault (SMER, MONP2), San Diego region (SOL, CPE, MTRP), the underserved off-shore region (SCI2), and a public outreach project at Cal State Long Beach (CSLB).



Proximity to Fault is Critical to Early Warning

The ANZA Seismic Network provides extensive real time coverage of the San Jacinto Fault Zone, augmenting the regional coverage provided by the Southern California Seismic Network. Due to their proximity to the active faults, ANZA network stations are well positioned for Earthquake Early Warning with 20 stations positioned very close to the fault between Hemet and Ocotillo Wells, covering the highest risk segment of the fault for more than 120 km. The ANZA stations can provide about 25 seconds of early warning to downtown San Diego from a large event on the San Jacinto Fault Zone. Early warning from large events on the San Andreas Fault should be at least 40 seconds. The ANZA network and Seismic Warning Systems are starting to work together to integrate their systems to improve early warning times, leveraging the best aspects of both systems.

Appendix - Background on San Jacinto Fault Zone



The 230km-long San Jacinto Fault Zone is the most seismically active fault zone in southern California and accommodates a large portion of the plate motion in the region. It is arguably the largest seismic hazard to the Inland Empire, Riverside County, and San Diego County. Extensive paleoseismic work indicates that the SJFZ has repeatedly produced large (MW > 7.0) earthquakes in the past 4000 years, and has the potential to rupture along nearly the entire length of the fault zone in a single event. The last through-going event probably occurred on November 22, 1800 with the average recurrence time for such events estimated at 257±79 years. The last major event in the central San Jacinto Fault Zone was the M6.8 1918 San Jacinto Earthquake with a 20 km surface rupture from Blackburn Canyon over to Hog Lake. Figure 2 shows the source regions for the M 7.5 1800 (red), M 6.9 1918 (green), M 6.3 1923 (blue), M 6.8 1968 (magenta) earthquakes. Since 1 January 1980, five earthquakes with magnitudes ML > 5 occurred on the SJFZ, with all five hypocenters within a 15 km aperture in the geometrically complex Trifurcation area southeast of Anza (Figure 2). The most recent event is the ML = 5.1 11 March 2013 event immediately followed by a concentrated sequence of aftershocks. Taken together, the geologic, geodetic, and seismologic data indicate that a significant fraction of the SJFZ is in the late interseismic phase of the earthquake cycle. As such, the SFJZ represents a significant current seismic hazard to the region, especially in case of a large event rupturing the "Anza gap" and the surrounding sections of the fault.