## Brawley Earthquake Swarm August-September, 2012

*This report was provided by Martha Merriam of Caltrans.*

The desert region of southern California about 5 miles north of Brawley was rocked by a series of mostly small earthquakes beginning Saturday, August 26. The two largest earthquakes in the swarm were a **M**5.3 at 19:31 August 26 (12:31 PDT) and a **M**5.5 about a half hour later at 20:57 August 26 (13:57 PDT), at depths of 13.1 km and 9 km respectively. The events are considered a swarm, characterized by a localized surge in earthquake frequency with no single shock conspicuously larger than the other shocks. 750 events greater than **M**1 have occurred since the onset, however the swarm is diminishing with an average of one daily occurring after two weeks. USGS seismographs and analysis computers were overwhelmed by the number of events.

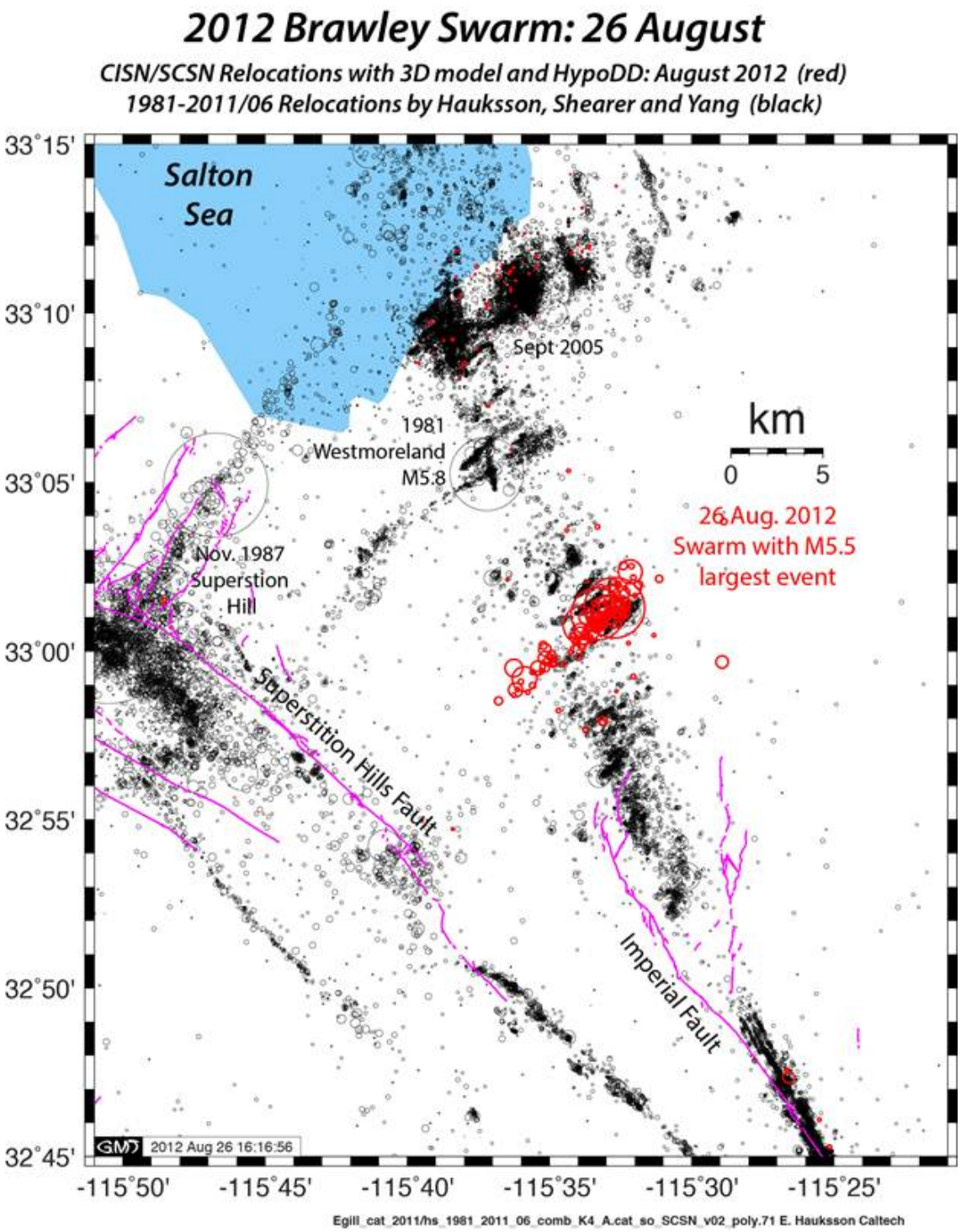
Swarms such as this one commonly occur in this area south of the Salton Sea and 100 miles east of San Diego known as the Brawley Seismic Zone. The last major swarm was in September 2005, when a thousand events occurred, the largest of which was **M**5.1. In 1981, a swarm hit a region five miles to the northwest of the latest sequence, with the largest measuring **M**5.8 (the largest earthquake the Brawley Seismic Zone has historically produced). Similar swarms have occurred in the 1930s, '60s, and 70s. A swarm in this area has never been followed by a large earthquake on another fault.

The Brawley Seismic Zone is a northeast-striking transition zone between the Imperial and San Andreas faults. The area is considered a zone of extension and focal mechanisms developed for the two largest events reflect this characterization. What sets off the swarms is not known.

The largest events were felt from Orange County and San Diego east into Arizona. No deaths or serious injuries were reported, but the shaking was sharp enough to postpone what was to be the first day of the school year in Brawley. Leaders of the town of Brawley, a city of 25,000 located 170 miles southeast of Los Angeles, declared a state of emergency after the earthquakes rattled 19 mobile homes off their blocks. At one point, about 10,000 residents in the city were without power, and the quakes also caused water line disruptions. Further north in the Coachella Valley, residents posted on Facebook and Twitter that they saw the water in their pool splash and watched their hanging lamps swing.

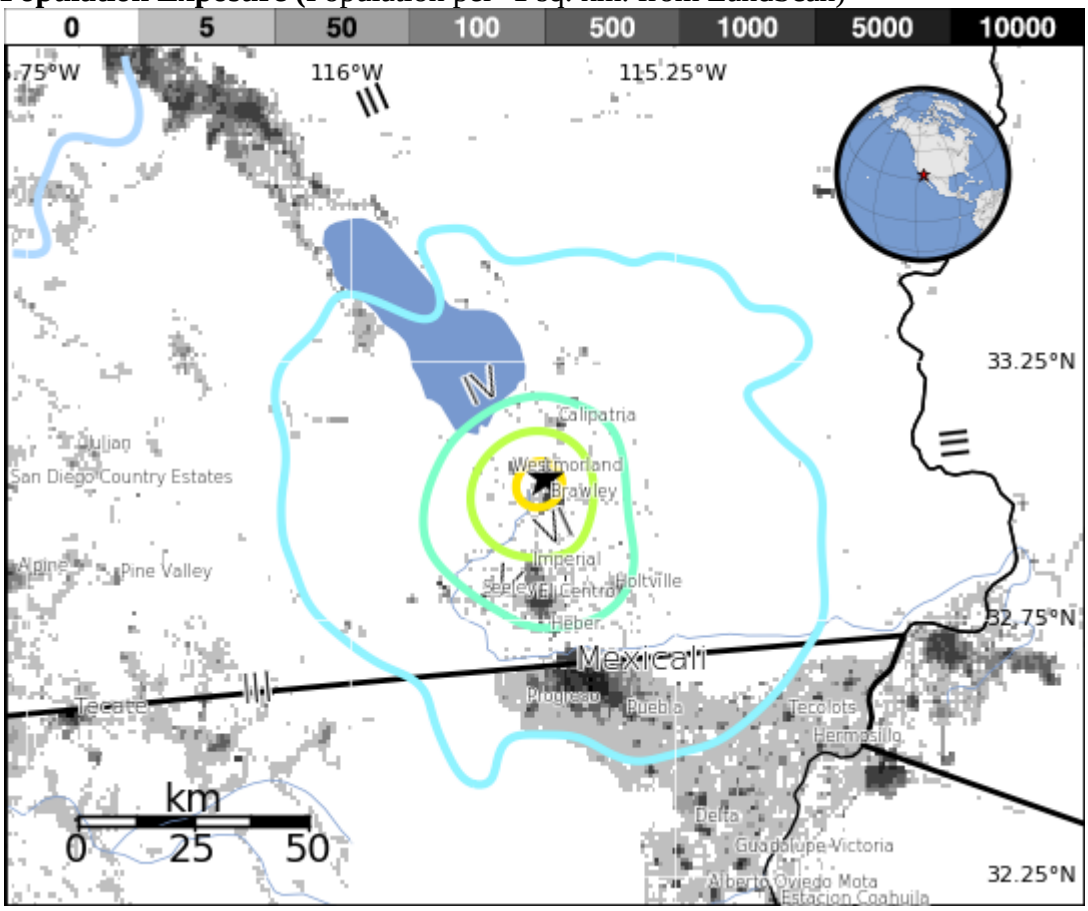
A field visit on 8/27/12 by a Caltech geologist found no evidence of surface rupture or liquefaction. It would be surprising to find such earthquake phenomena associated with events of this magnitude, as surface rupture usually accompanies larger events with shallow depth.

Mobile home in Brawley displaced off it blocks.  Air conditioner in background, gas meter, etc. were damaged.




Location of the August-September, 2012 Brawley Earthquake Swarm in relation to historic swarms that occurred in the Brawley Seismic Zone and nearby faults. The Coachella section of the San Andreas Fault follows the eastern shore of the Salton Sea north of the 2012 swarm.

**Population Exposure (**Population per ~1 sq. km. from LandScan)




Intensity map for **M**5.5 earthquake. Highest reported intensity was VII, described as felt by all, with negligible damage to well-designed and constructed buildings and slight to moderate damage to well-built ordinary buildings.

http://www.scsn.org/2012Brawley.html

http://earthquake.usgs.gov/earthquakes/map/

http://response.scec.org/