Strong-motion data highlights for the 5.1Mw La Habra Earthquake of March 28, 2014

Strong-motion records from the magnitude 5.1 Mw earthquake which occurred about 2 km east of La Habra in Southern California, at 9:09 pm on March 28, 2014, are available from the Center for Engineering Strong Motion Data (CESMD). Strong-motion data from about 300 structural and ground response stations of the California Integrated Seismic Network (CISN) from the networks of CGS, USGS, SCSN and DWR are available at this time for view and download.

According to the Southern California Seismic Network, this earthquake could be associated with the Puente Hills thrust (PHT). The PHT is a blind thrust fault that extends from this region to the north and west towards the City of Los Angeles. This fault has also been associated with the M5.9 1987 Oct. 1 Whittier Narrows earthquake. The La Habra earthquake was preceded by two foreshocks, the larger of M3.6 at 8:03 pm and several aftershocks.

The largest peak ground acceleration (PGA) of 0.71g was recorded at epicentral distance of about 2 km, in the city of Brea. The peak ground velocity (PGV) was about 27 cm/s/s at this station. The station Rowland Heights - Colima and Nogales, about 7 km north of the epicenter, had the largest PGV of 31 cm/s/s. As of April 09, records from 20 stations had the peak ground acceleration larger than 10%g. 10 records were obtained within about 10 km from the epicenter. The closest station to the epicenter was at the distance of about 2 km in Fullerton which recorded PGA about 0.36g. Figure 1 shows a CESMD map of the stations that recorded this earthquake.

Figure 2 shows the observed peak ground acceleration versus epicentral distance for the La Habra earthquake. In this figure, the observed PGAs at the CISN strong-motion stations are compared with the ground motion prediction from Boore and Atkinson 2008 GMPE (BA08), for Vs30 of 360 m/s and reverse fault.

Figure 3 shows the peak ground velocity of the stations that recorded this earthquake versus epicentral distance. The PGVs are compared with the ground motion prediction of BA08, for Vs30 of 360 m/s and reverse fault.

Figure 4 shows the contour map of the instrumental intensity from the CISN ShakeMap for the La Habra earthquake.

Processing of more ground and structural records is in progress now and the new and reprocessed records will be available soon at the CESMD web site.

CESMD staff at USGS and CGS, April 9, 2014

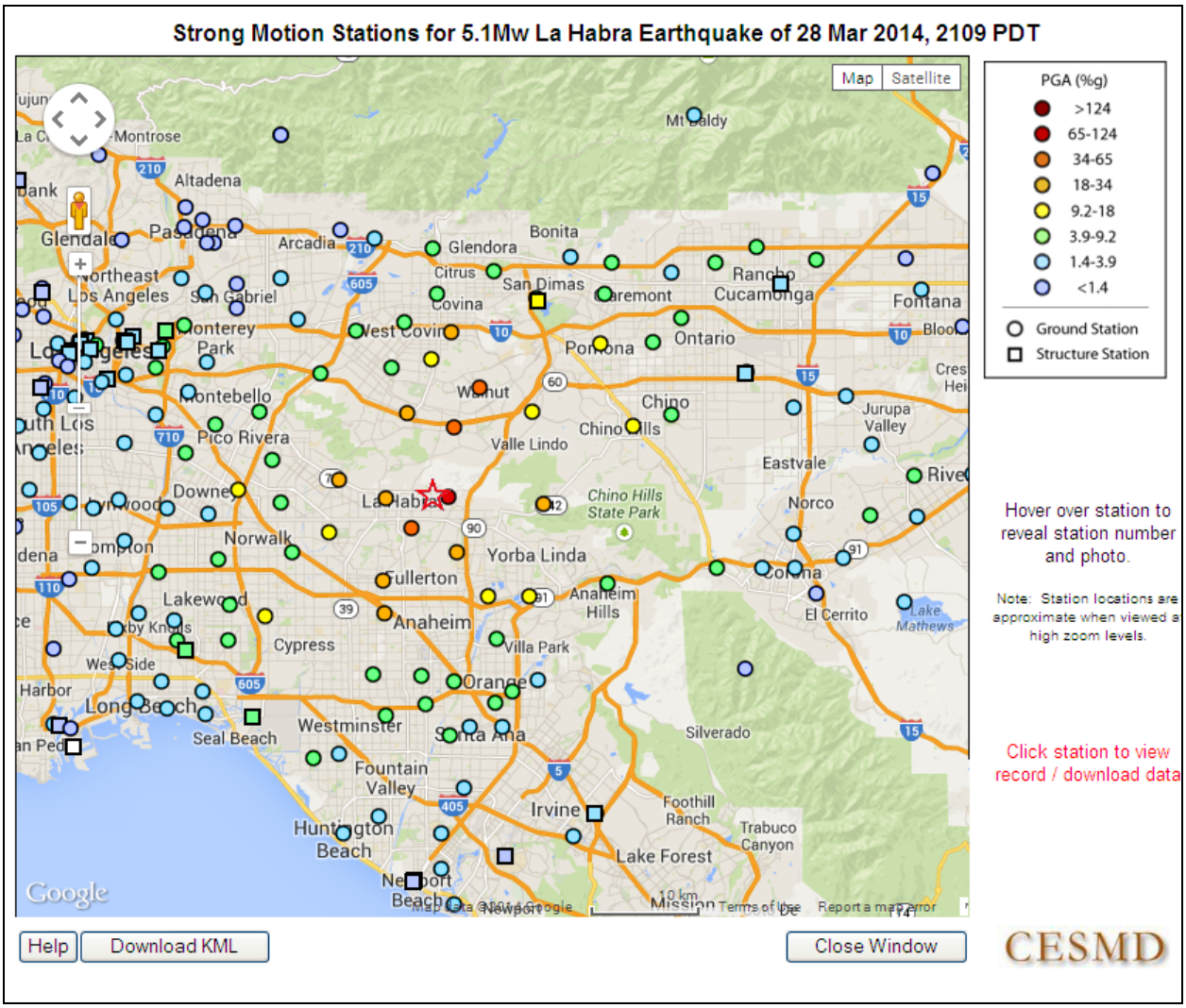

Figure 1. Strong-motion stations of CISN (CGS, USGS, SCSN and CDWR) that recorded the M5.1 La Habra earthquake of March 28, 2014. (www.strongmotioncenter.org).

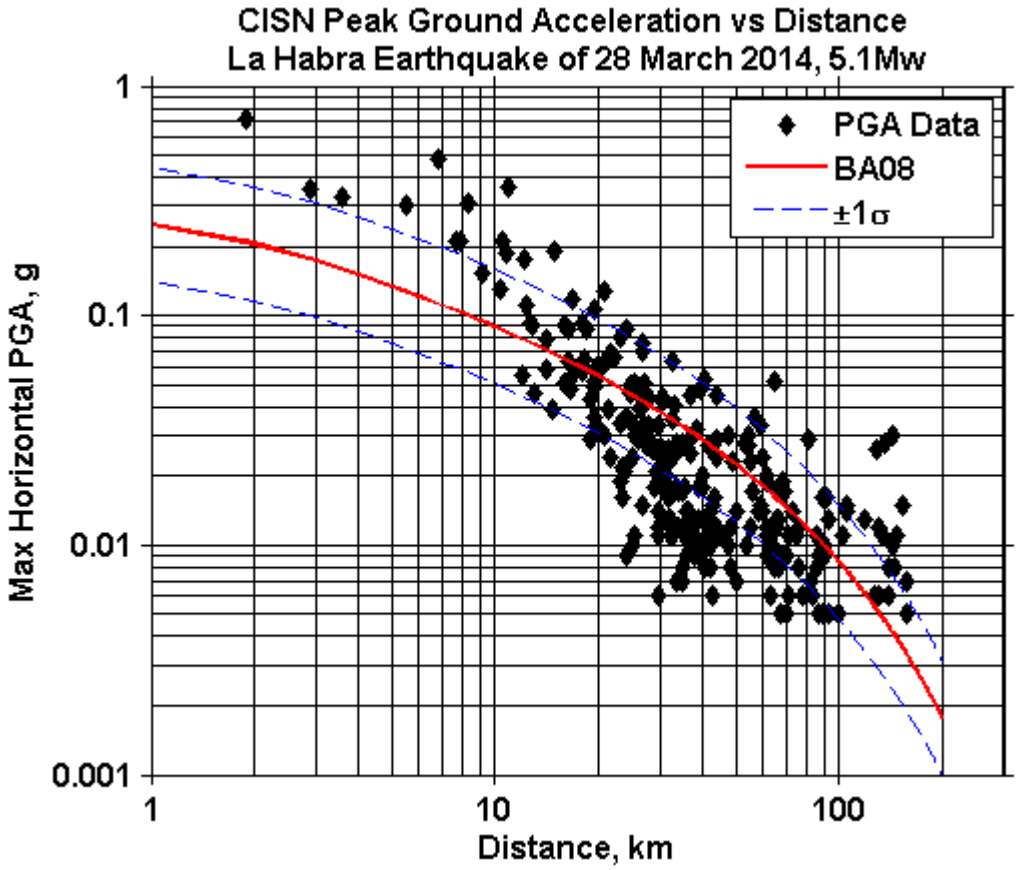

Figure 2. Peak ground acceleration versus epicentral distance and the ground motion prediction from Boore and Atkinson 2008 (BA08). For M<6, Rjb (Joyner and Boore distance) is approximately equal to epicentral distance (Boore and Atkinson, 2008).

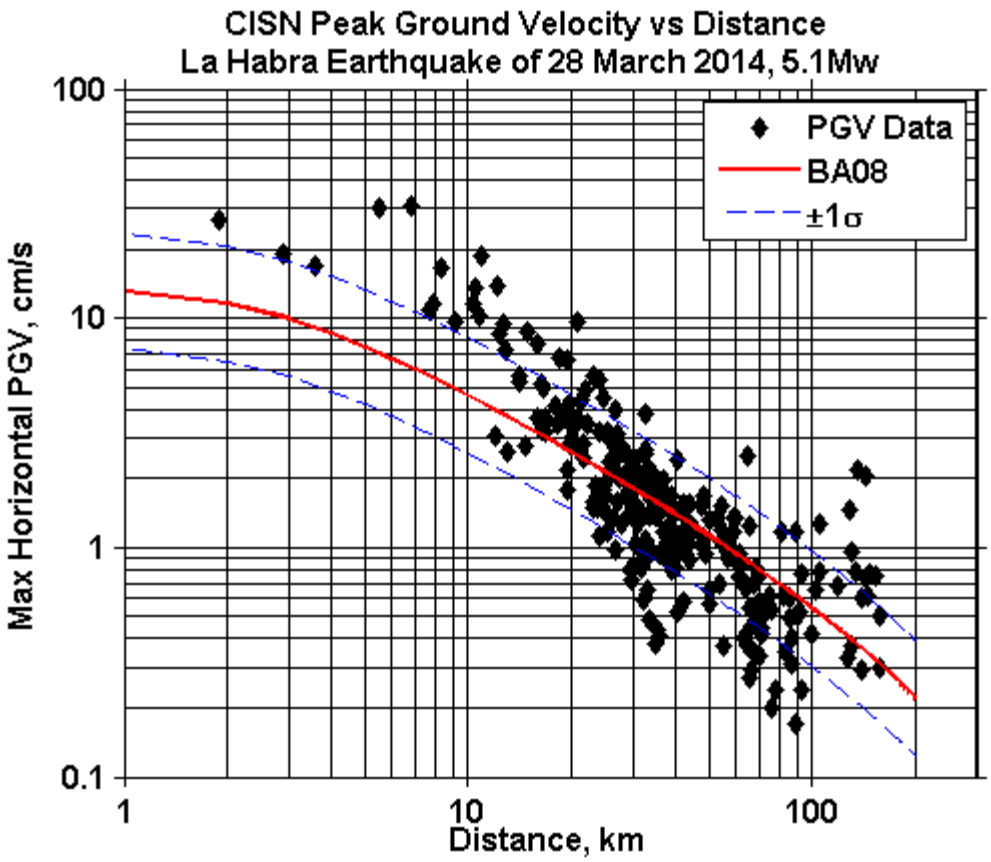

Figure 3. Peak ground velocity versus epicentral distance and the ground motion prediction from Boore and Atkinson 2008 (BA08).

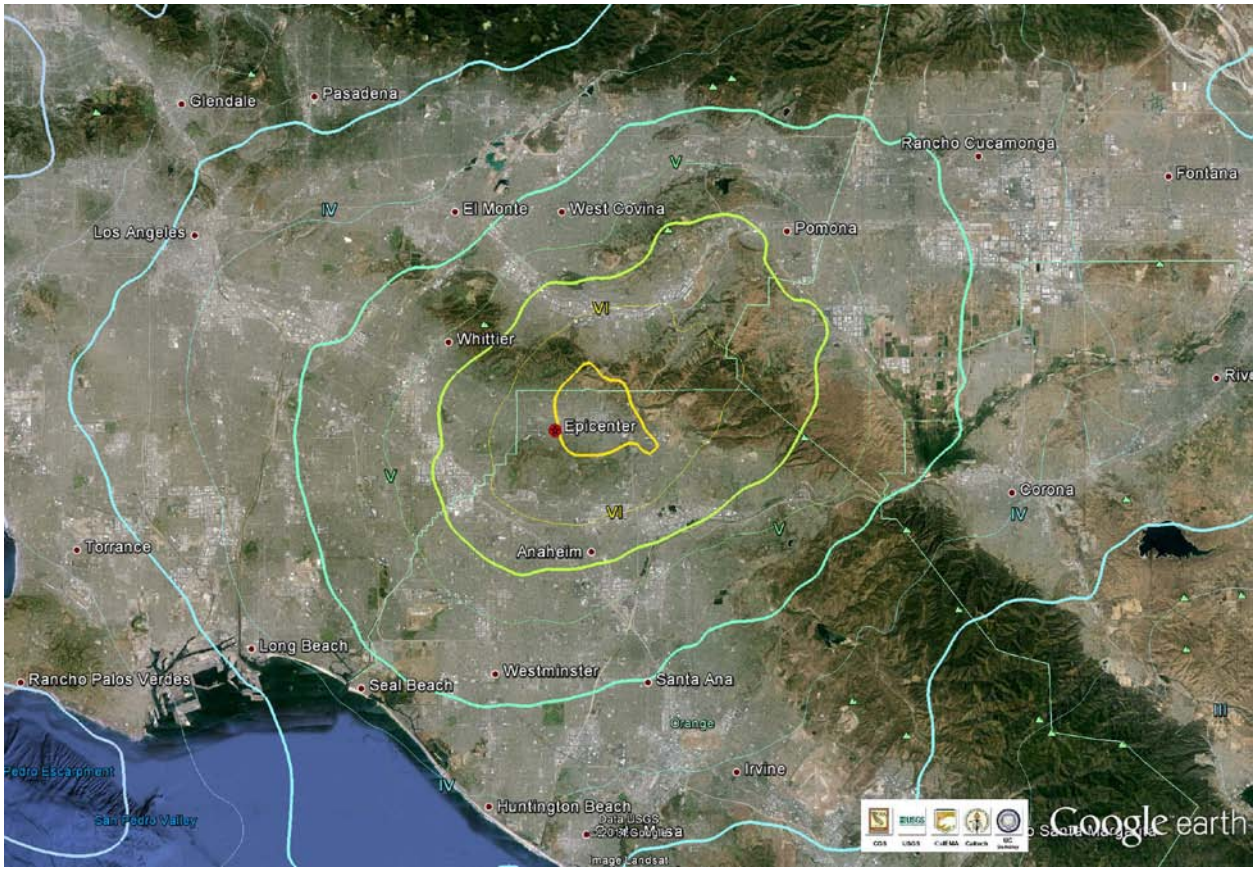

Figure 4. Contour map for the instrumental intensity from the CISN ShakeMap for the M5.1 La Habra earthquake.

Reference:

Boore, D. M., and G. M. Atkinson (2008). Ground-Motion Prediction Equations for the Average Horizontal Component of PGA, PGV, and 5%-Damped PSA at Spectral Periods between 0.01 s and 10.0 s, Earthquake Spectra, Volume 24, No.1, 99-138.