

Project Abstract

A study was done to examine possible losses to San Diego County should a full-fault earthquake-rupture occur along the Rose Canyon fault, which runs directly through portions of San Diego and is evidenced by Mt. Soledad and the San Diego Bay. The total length of the fault is ~70 km (including the Silver Strand fault). Following the 2002 National Seismic Hazard Mapping Program, we consider a full fault rupture to be between magnitude 6.7 and 7.5, with the most likely magnitude being 7.0. Using this range of magnitudes, sampled at every 0.1 units, and six different attenuation relationships, 54 different shaking scenarios were computed using OpenSHA (www.OpenSHA.org (<http://www.OpenSHA.org>)). Loss estimates were made by importing each scenario into the FEMA program HAZUS-MH MR1. The total economic loss is estimated to be between \$7.4 and \$35 billion. The analysis also provides the following estimates: 109 - 2,514 fatalities, 8,067 - 76,908 displaced households, 2,157 - 20,395 in need of short term public shelter, and 2 - 13 million tons of debris generated. As in a previous study done on the effect of a Puente Hills earthquake in Los Angeles, this study shows the effect of attenuation relationship choice to have a greater effect on predicted ground motion than the choice of magnitude, thus leading to larger uncertainty in the loss estimates. A full fault rupture along the Rose Canyon fault zone would be a rare event, but due to the proximity of the fault to the City of San Diego, the possibility is worth consideration for possible mitigation efforts.