The properties of the heavily weathered and damaged material in the top few hundred meters of the crust are understood only in general terms, despite their great importance to observed seismic motion, crustal hydrology, and numerous other applications. The low normal stress at shallow depth renders the subsurface material highly susceptible to failure and strongly attenuative, masking details of deeper structures and processes. Analysis of coherence between different data sets in a wide frequency band (0.0003-100 Hz) at Piñon Flats reveals close relationships between seismic and other (e.g. oceanic, atmospheric and anthropogenic activities) activities in the shallow crust. Study of borehole seismic and pore pressure data from the Garner Valley Downhole Array indicates a significant 14% velocity decrease in the top 6 m followed by a rapid recovery in ~240 second associated with a PGA of 39 Gal caused by the 2010 El Mayor-Cucapah earthquake. The recorded low PGA indicates that shallow soft materials might have been loosened by the fluctuation of fluids and thus producing > 10% decrease of seismic velocity.