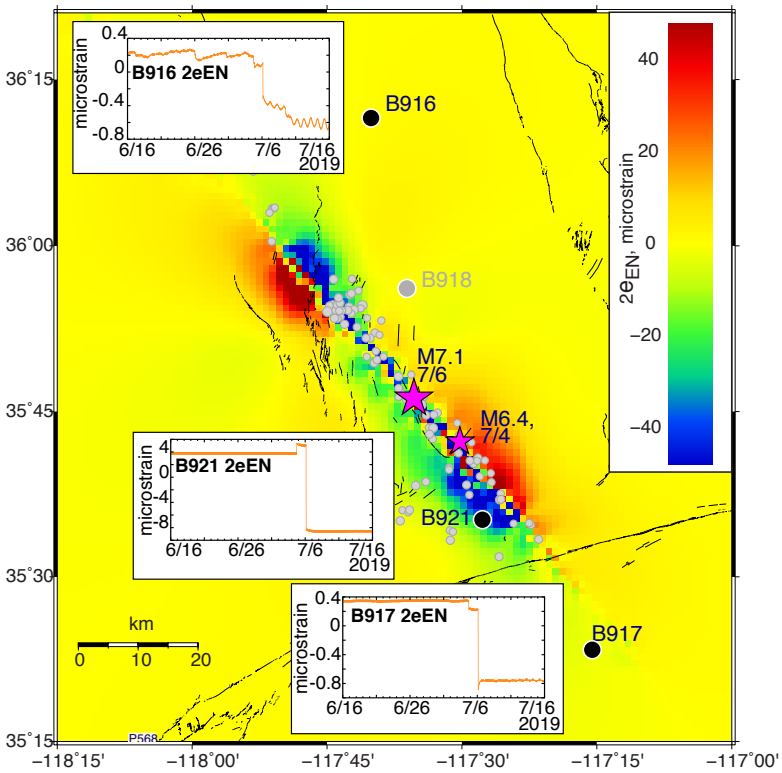
Postseismic deformation as recorded by PBO borehole strainmeters following principal events of the 2019 Ridgecrest, California earthquake sequence

In July 2019, three PBO borehole strainmeters recorded the two largest events in the Ridgecrest earthquake sequence at distances of about 50 km or less. Station B921, 14 km south of the epicenter of the M6.4 foreshock on July 4, recorded coseismic strain steps in excess of a microstrain, followed by decelerating transient strains of opposite sense. However, this transient strain was in the same direction as the coseismic strain offsets at the same strainmeter caused by the M7.1 mainshock 34 hours later. A speculative interpretation is that the M6.4 event triggered slip on the future M7.1 rupture plane in the same sense as the larger event's imminent rupture. For the M7.1 mainshock, coseismic strain offsets, as large as several microstrain on some components, were recorded at all three functioning strainmeters, with peak dynamic strains about an order of magnitude larger. The mainshock was itself followed by postseismic transient strain recorded by the two strainmeters southeast of the rupture (B917 and B921); this transient deformation was a small fraction of the coseismic strains and decelerated rapidly within an hour or two of the mainshock. As of 60 days after the M7.1, changes in long-term strain rates have continued at B921 and B917, largely consistent with the directions of the coseismic strains from that event. The poster will compare the postseismic strains with post-earthquake deformation observed using GNSS, InSAR, and other techniques.



The figure shows the 2eEN strain component calculated based on the finite fault model posted by G. Hayes (https://earthquake.usgs.gov/earthquakes/eventpage/ci38457511/finite-fault); 30-minute strain time series corrected for tides, atmospheric pressure, and pre-event slopes; and earthquakes M4 and greater from 4 July 2019 to 6 Sept 2016.