ScienceAdvances

Supplementary Materials for

Abundant off-fault seismicity and orthogonal structures in the San Jacinto fault zone

Zachary E. Ross, Egill Hauksson, Yehuda Ben-Zion

The PDF file includes:

- fig. S1. Additional details regarding the detected 2016 Borrego Springs aftershocks.
- fig. S2. Cross section along profile A–A′.
- fig. S3. Map of seismic stations used.
- Legends for data set S1 and S2
- Legend for movie S1

Other Supplementary Material for this manuscript includes the following:
(available at advances.sciencemag.org/cgi/content/full/3/3/e1601946/DC1)

- data set S1 (Microsoft Excel format). Seismicity catalog of all detections (unrelocated).
- data set S2 (Microsoft Excel format). Seismicity catalog of hypoDD relocated detections.
- movie S1 (.mov format). Animation of the relocated seismicity in 3D.
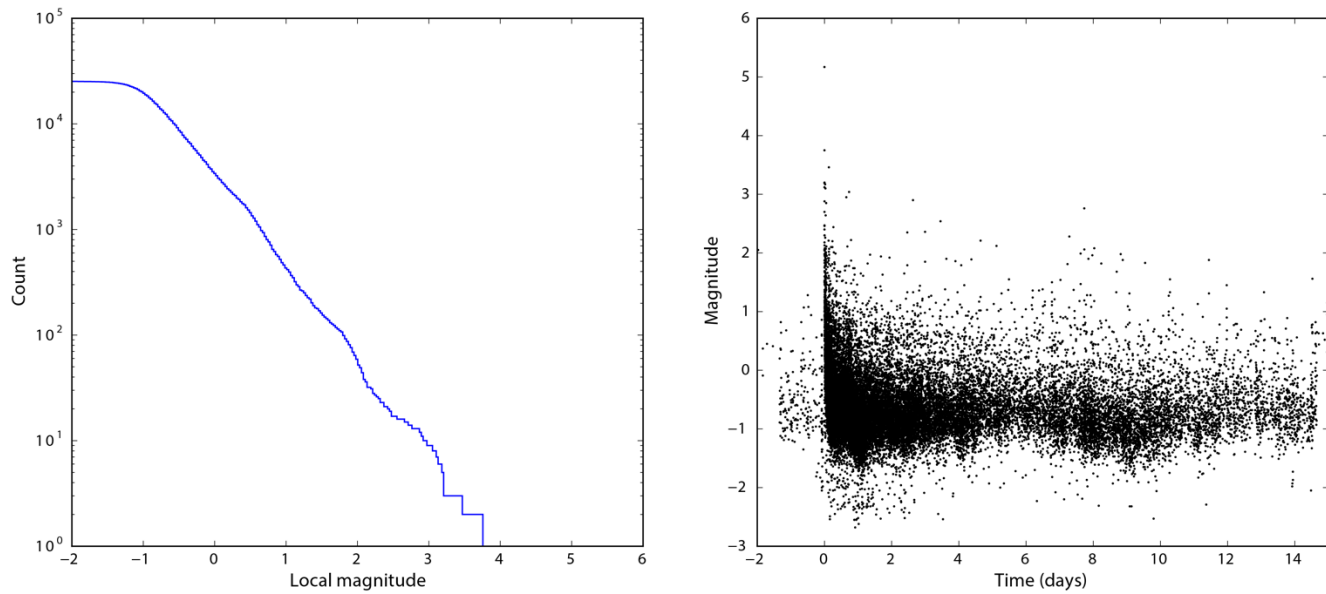
Supplementary Materials

fig. S1. Additional details regarding the detected 2016 Borrego Springs aftershocks. The left panel contains the cumulative frequency-magnitude distribution for all 25,393 detected events. The catalog is complete to roughly M_L –0.8, with approximately 16 times as many events detected as by the regional network. The right panel shows the distribution of magnitudes as a function of time relative to the mainshock. A small foreshock sequence occurred roughly three hours before the mainshock with 25 events.
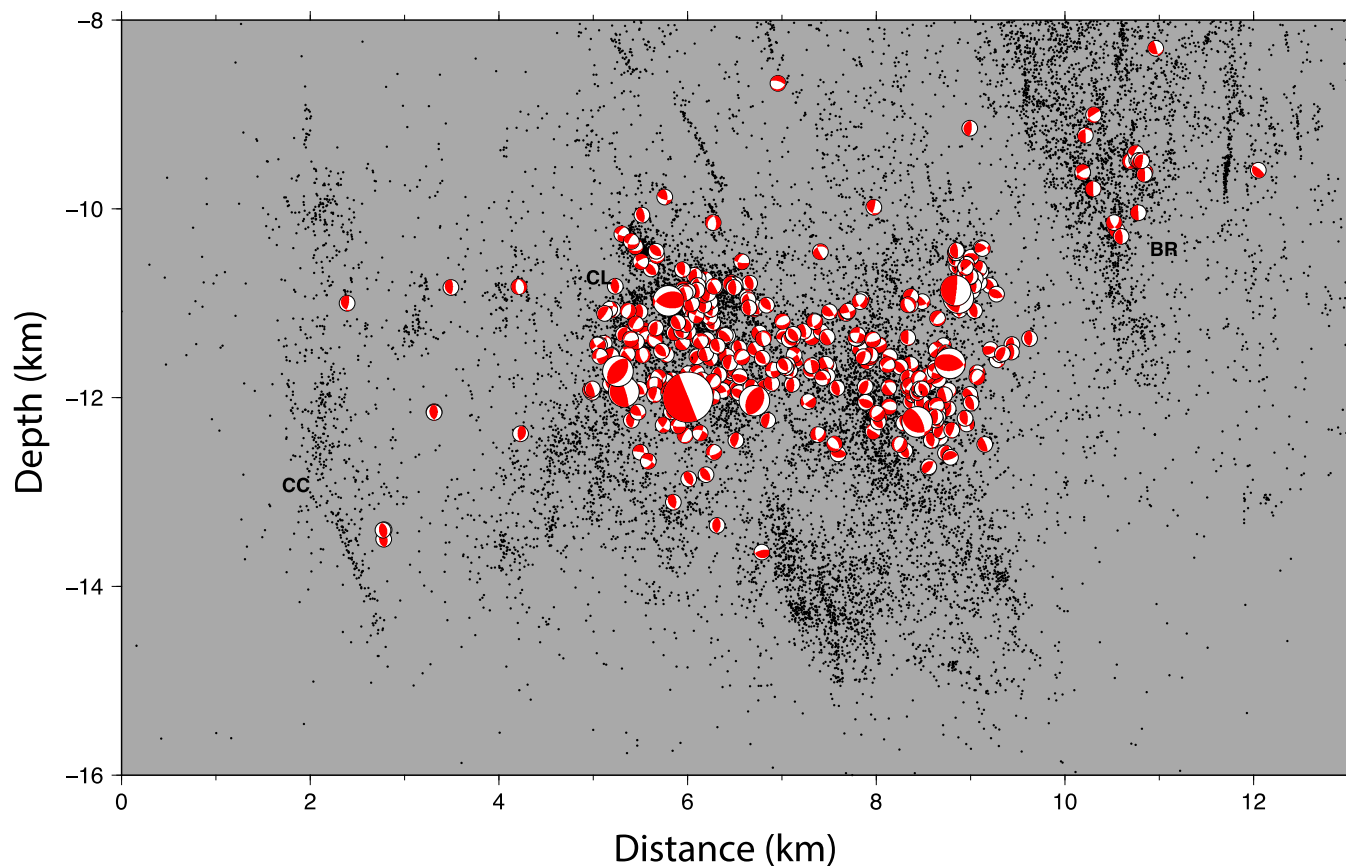
fig. S2. Cross section along profile A−A′. Aftershock focal mechanisms are displayed for events with M > 1.0. The largest focal mechanism corresponds to the 2016 Borrego Springs mainshock. All focal mechanisms shown are rear hemisphere projections. Black dots are the same seismicity from Fig. 2.
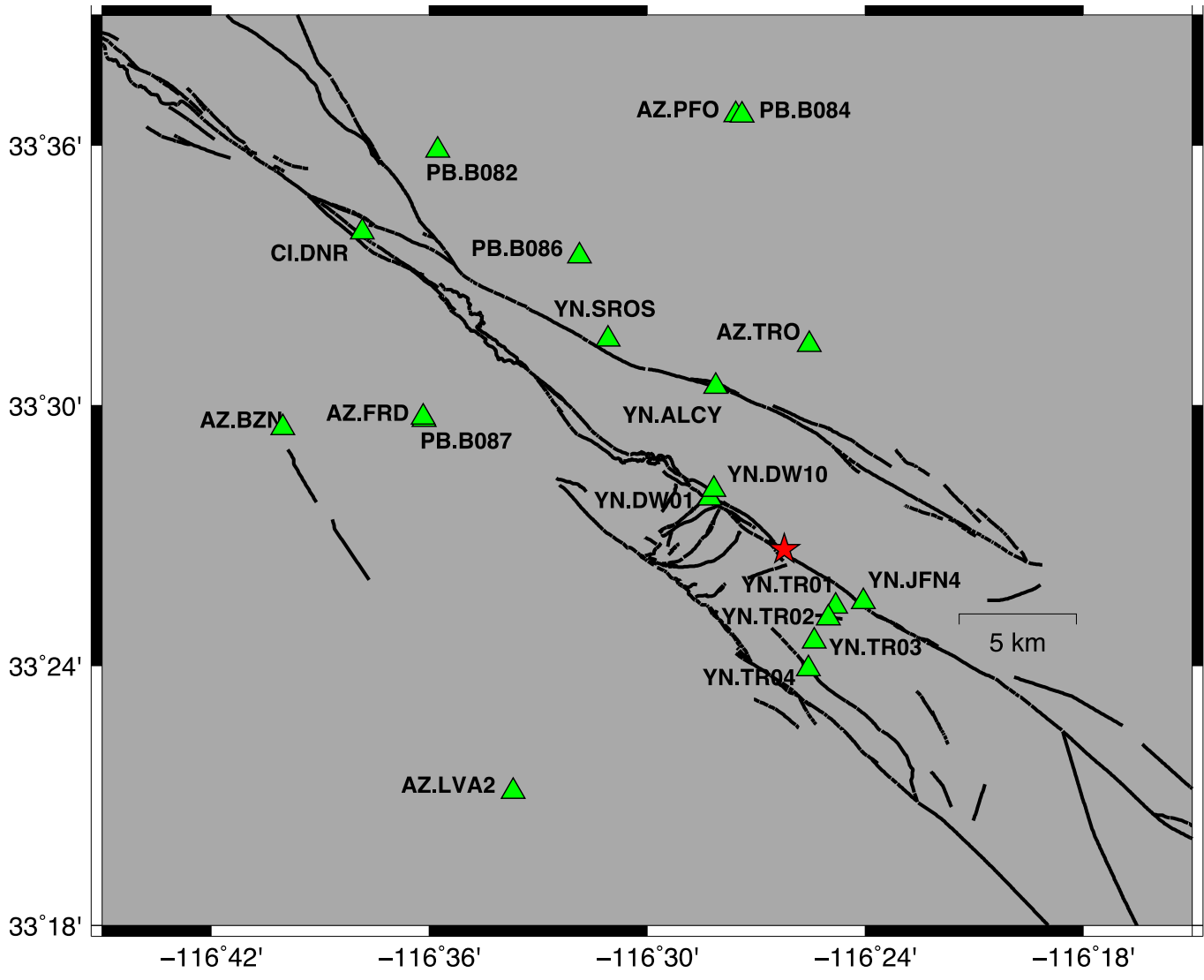
fig. S3. Map of seismic stations used. Green triangles denote the 19 broadband and short-period seismometers used for cross-correlation of waveforms. The red star indicates the mainshock epicenter.

Additional files:

data set S1. Seismicity catalog of all detections (unrelocated). Excel spreadsheet containing the coordinates, magnitudes, and origin times of the 25,392 original events detected, including template self-detections. This dataset is visually summarized in fig. S1.

data set S2. Seismicity catalog of hypoDD relocated detections. Excel spreadsheet containing the 9,891 events that were successfully relocated using the hypoDD algorithm. It includes the coordinates, magnitudes, and origin times of each event. Columns follow the hypoDD program output format: Event ID, Latitude, Longitude (decimal degrees), Depth (km), East-west, north-south, depth location (m) relative to cluster centroid, East-west, north-south, depth error (m), Origin data year, month, day hour, minute, second, Magnitude, Number of cross-correlated P- and S-wave data, Number of catalog P- and S-wave data, Rms residual for cross-correlated, catalog data, Cluster index.

movie S1. Animation of the relocated seismicity in 3D. The relocated seismicity is shown in 3D from a horizontal perspective. At the start of the movie, the viewpoint is exactly the same as in Fig. 2, and then rotates around the vertical axis in a clockwise sense. The red dot indicates the mainshock hypocenter.