

Supplemental Data Set (Station Data and Earthquake Catalogs):

Rupture process of the Mw 7.0 December 5, 2024 Offshore Cape Mendocino earthquake

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Data Sets S0-S3 with station data and (rapid enhanced relocated) earthquake catalogs in text format (Yoon et al., 2025), to accompany the paper (Pollitz et al., 2025) describing how these catalogs were created; References in supplement.

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ELECTRONIC SUPPLEMENT – Data Sets (Yoon et al., 2025)

Data Set S0 (Data00_supplement.txt): 67 stations (Figure S14-S16, inverted triangles), all located within the region defined by (39.5° to 41.5° latitude, -126° to -123° longitude), with continuous seismic data (all sampled at 100 Hz) used as input to the automatic workflow in Figure S13, listed in alphabetical order of network then station name. Number of stations from each contributing network: 25 from BK, 10 from GM (temporary network deployed after the Mw 7.0), 22 from NC, 2 from NP, 8 from PB. These stations include: 39 three-component broadband (HH*) seismometers (24 from BK, 7 from GM, 8 from NC), 9 three-component (HN*) accelerometers (1 from BK, 3 from GM, 3 from NC, 2 from NP), 8 three-component short-period (EH*) sensors all from the PB network, and 11 single-component vertical short-period (EHZ) sensors all from the NC network.

- Column 1: Network name
- Column 2: Station name
- Column 3: Latitude (deg)
- Column 4: Longitude (deg)
- Column 5: Depth (km), negative depth values indicate elevation above ground.
- Column 6: Sampling rate (Hz)

- Column 7: Number of components; indicates number of additional columns
- Column 8: Component channel name
- Column 9: Component channel name (only specified if more than 1 component)
- Column 10: Component channel name (only specified if more than 1 component)

Data Set S1 (Data01_supplement.txt): 4,241 enhanced (but not relocated) aftershock catalog events (Figure S14; output from Figure S13d in workflow) between 2024-12-05 00:00:00 to 2024-12-18 00:00:00 UTC.

- Column 1: Origin time as YYYY-MM-DDTHH:MM:SS.SSSSSS (UTC)
- Column 2: Origin time as seconds since 2024-12-05 00:00:00 UTC
- Column 3: Latitude (deg)
- Column 4: Longitude (deg)
- Column 5: Depth (km)
- Column 6: Local Magnitude (calculated; see Figure S13d)
- Column 7: Unique event ID (different from ComCat event ID in Data Set S3)
- Column 8: Event circular rupture radius (km), calculated assuming constant $\Delta\sigma = 3$ MPa stress drop and seismic moment determined from event magnitude: $3 \text{ MPa} = \Delta\sigma = \frac{7}{16} \frac{M_0}{R^3}$, $M_w = \frac{2}{3} \log_{10} M_0 - 6.07$

Data Set S2 (Data02_supplement.txt): 2,447 enhanced relocated catalog events (Figure S15; output from Figure S13e in workflow) between 2024-12-05 00:00:00 to 2024-12-18 00:00:00 UTC.

- Column 1: Origin time as YYYY-MM-DDTHH:MM:SS.SSSSSS (UTC)
- Column 2: Origin time as seconds since 2024-12-05 00:00:00 UTC
- Column 3: Latitude (deg)
- Column 4: Longitude (deg)
- Column 5: Depth (km)
- Column 6: Local Magnitude (calculated; see Figure S13d)
- Column 7: Unique event ID (same as event ID for enhanced catalog in Data Set S1)
- Column 8: Event circular rupture radius (km), calculated assuming constant $\Delta\sigma = 3$ MPa stress drop and seismic moment determined from event magnitude: $3 \text{ MPa} = \Delta\sigma = \frac{7}{16} \frac{M_0}{R^3}$, $M_w = \frac{2}{3} \log_{10} M_0 - 6.07$

Data Set S3 (Data03_supplement.txt): 445 ComCat catalog events (Figure S16; USGS Earthquake Hazards Program, 2017) provided by Northern California Seismic System (USGS Menlo Park, 1966; NCEDC, 2014), downloaded on 2024-12-18, within latitude 39.5° to 41.5°, longitude -126° to -123°.

- Column 1: Origin time as YYYY-MM-DDTHH:MM:SS.SSS (UTC)
- Column 2: Origin time as seconds since 2024-12-05 00:00:00 UTC
- Column 3: Latitude (deg)
- Column 4: Longitude (deg)
- Column 5: Depth (km)
- Column 6: Magnitude from ComCat
- Column 7: ComCat event ID
- Column 8: Event circular rupture radius (km), calculated assuming constant $\Delta\sigma = 3$ MPa stress drop and seismic moment determined from event magnitude: $3 \text{ MPa} = \Delta\sigma = \frac{7}{16} \frac{M_0}{R^3}$, $M_w = \frac{2}{3} \log_{10} M_0 - 6.07$

References in the Supplement

NCEDC (2014). Northern California Earthquake Data Center. UC Berkeley Seismological Laboratory. Dataset. <https://doi.org/10.7932/NCEDC>

Pollitz, F. F., K. A. Guns, and C. E. Yoon (2025). Rupture process of the Mw 7.0 December 5, 2024 Offshore Cape Mendocino earthquake. *Geophysical Research Letters*.

USGS Menlo Park. (1966). *USGS Northern California Seismic Network* [Data set]. International Federation of Digital Seismograph Networks. <https://doi.org/10.7914/SN/NC>

U.S. Geological Survey, Earthquake Hazards Program (2017). Advanced National Seismic System (ANSS) Comprehensive Catalog of Earthquake Events and Products: Various, <https://doi.org/10.5066/F7MS3QZH>

Yoon, C. E., Pollitz, F. F., and Guns, K. A. (2025). Station Data and Earthquake Catalogs - Rupture process of the Mw 7.0 December 5, 2024 Offshore Cape Mendocino earthquake [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.14947769>