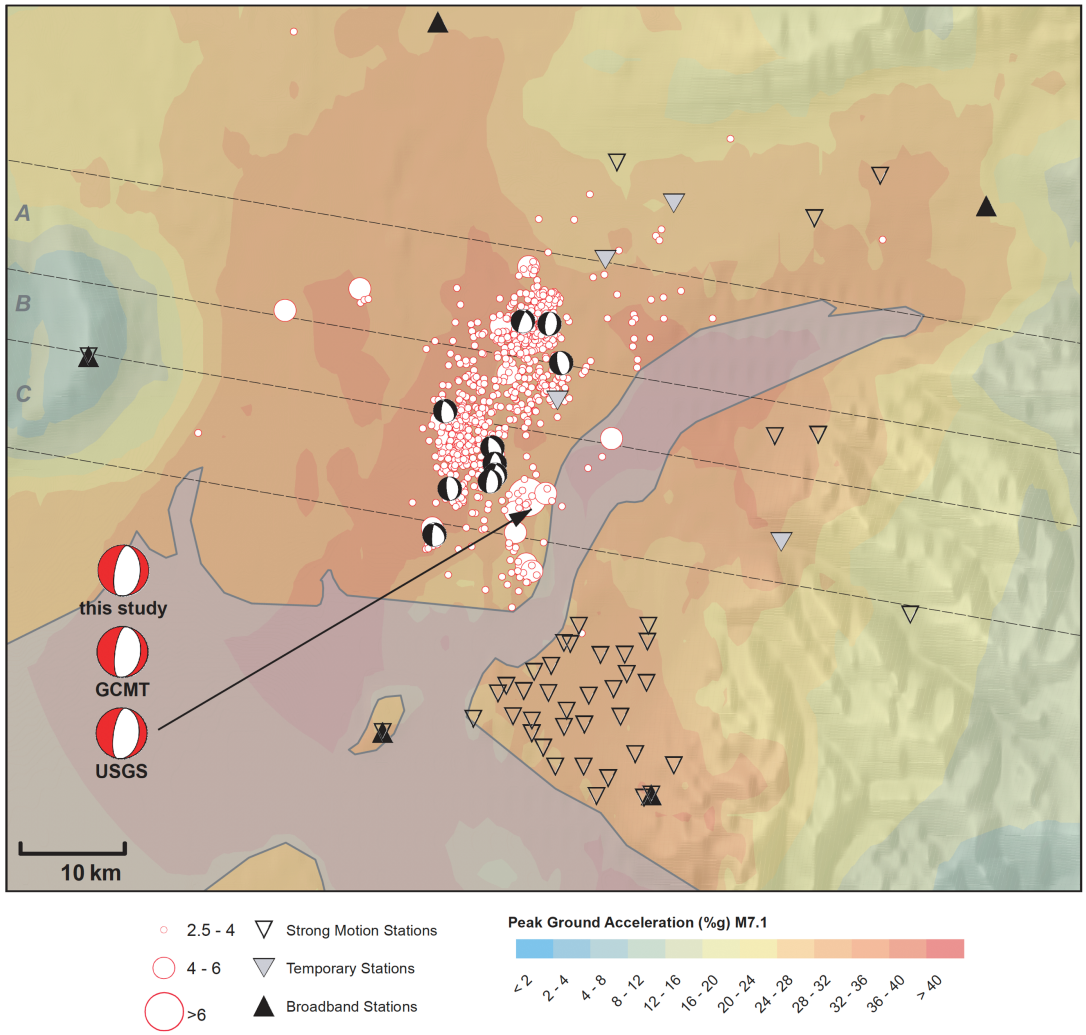
The M_w7.1 Anchorage earthquake of 30 November 2018 exhibited phenomena of broad scientific interest and societal importance. We document observations that point to future directions of research and hazard mitigation. The rupture mechanism, aftershocks, and deformation of the mainshock are consistent with extension inside the Pacific plate near the down-dip limit of flat subduction. Peak ground motions exceeding 25% were observed across more than 8,000 km², though the most violent near-fault shaking was avoided because of the hypocenter was nearly 50 km below the surface. Aftershock activity has been vigorous with roughly 300 felt events in the first six months, including two dozen aftershocks exceeding M4.5. Broad subsidence of up to 5 centimeters across the region is consistent with the rupture mechanism. The passage of seismic waves, and possibly the co-seismic subsidence, mobilized ground waters resulting in temporary increases in stream flow. Though there were many failures of natural slopes and soils, the shaking was insufficient to reactivate many of the failures observed during the 1964 M9.2 earthquake. This is explained by the much shorter duration of shaking as well as the lower amplitude long-period motions in 2018. The majority of observed soil failures were in anthropogenically-placed fill soils. The structural damage can be attributed to both the failure of these emplaced soils as well as to the ground motion itself. There is some correlation between the observed ground motions and building damage. However, the paucity of instrumental ground motion recordings outside of downtown Anchorage makes these comparisons challenging. The earthquake demonstrated the challenge of issuing tsunami warnings in complex coastal geographies and highlights the need for a targeted tsunami hazard evaluation of the region. The event also demonstrates the challenge of estimating the probabilistic hazard posed by intraslab earthquakes.



Mainshock epicenter with peak ground acceleration contours. Aftershock locations are shown in red. Strong motion and broadband seismic stations locations are keyed to the legend.