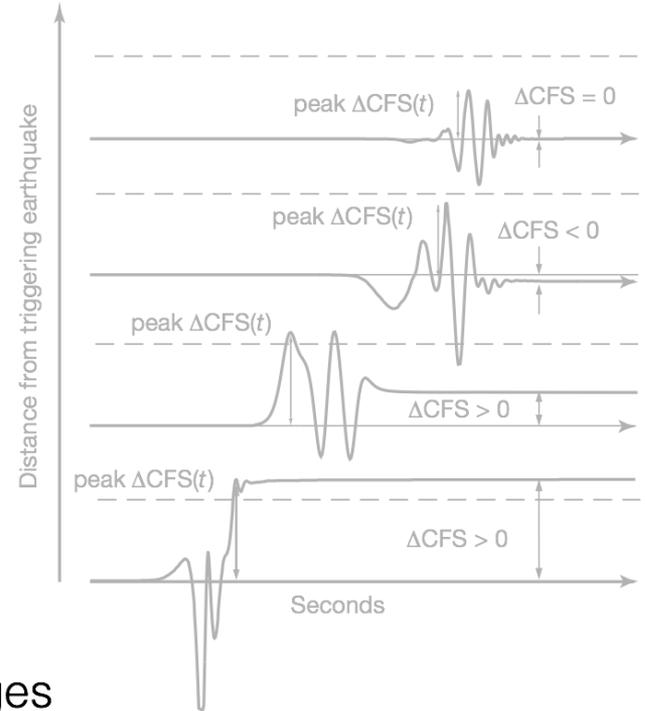
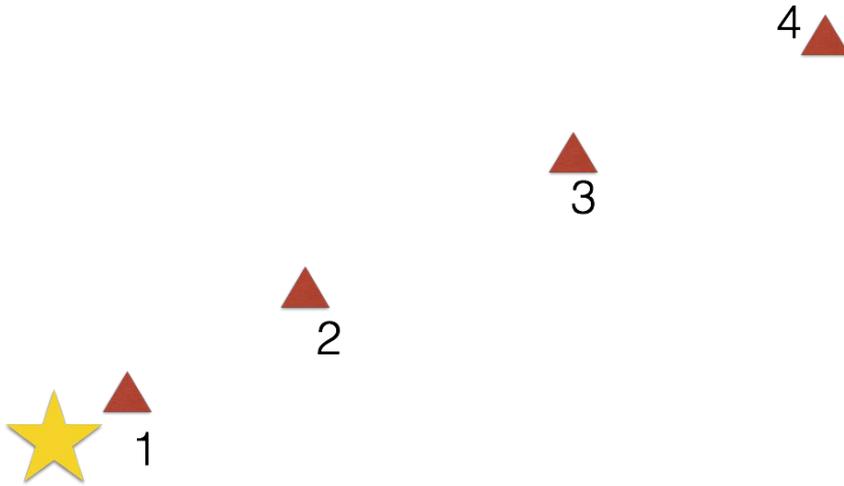


Possible dynamic triggering detection with the OK wavefield experiment

Pawnee Triggers:

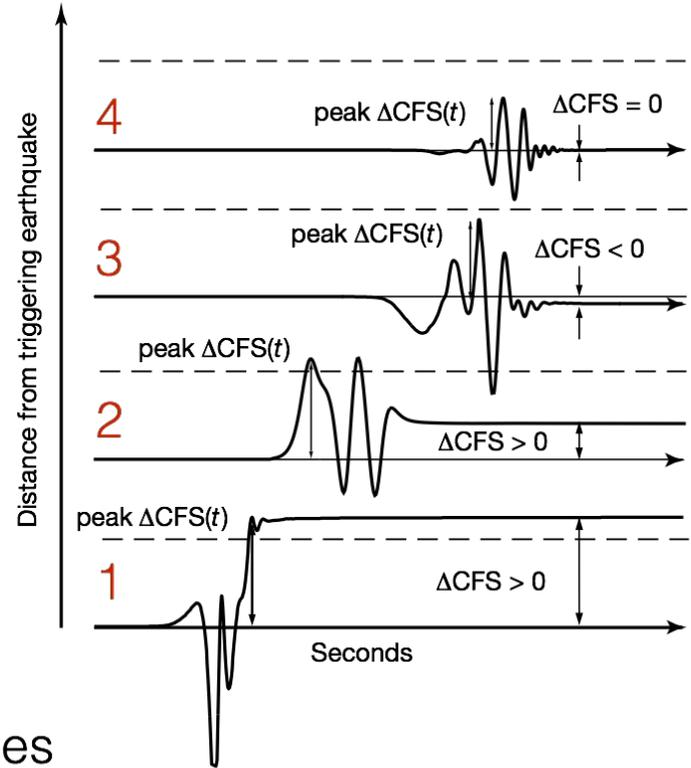
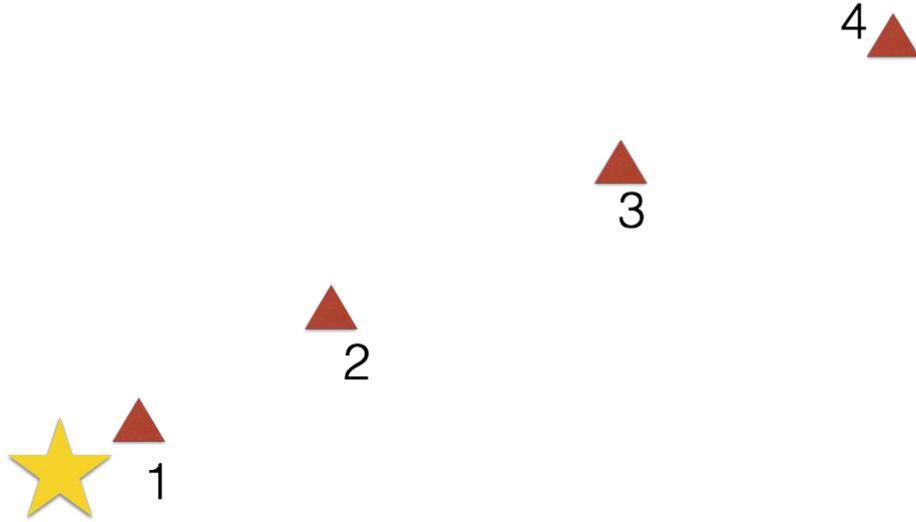
Natalie Accardo, Alex Burky, Wenyuan Fan, Nick Mancinelli

What is earthquake triggering?



$\Delta CFS(t)$: Dynamic Coulomb failure stress changes
 ΔCFS : Static Coulomb failure stress changes

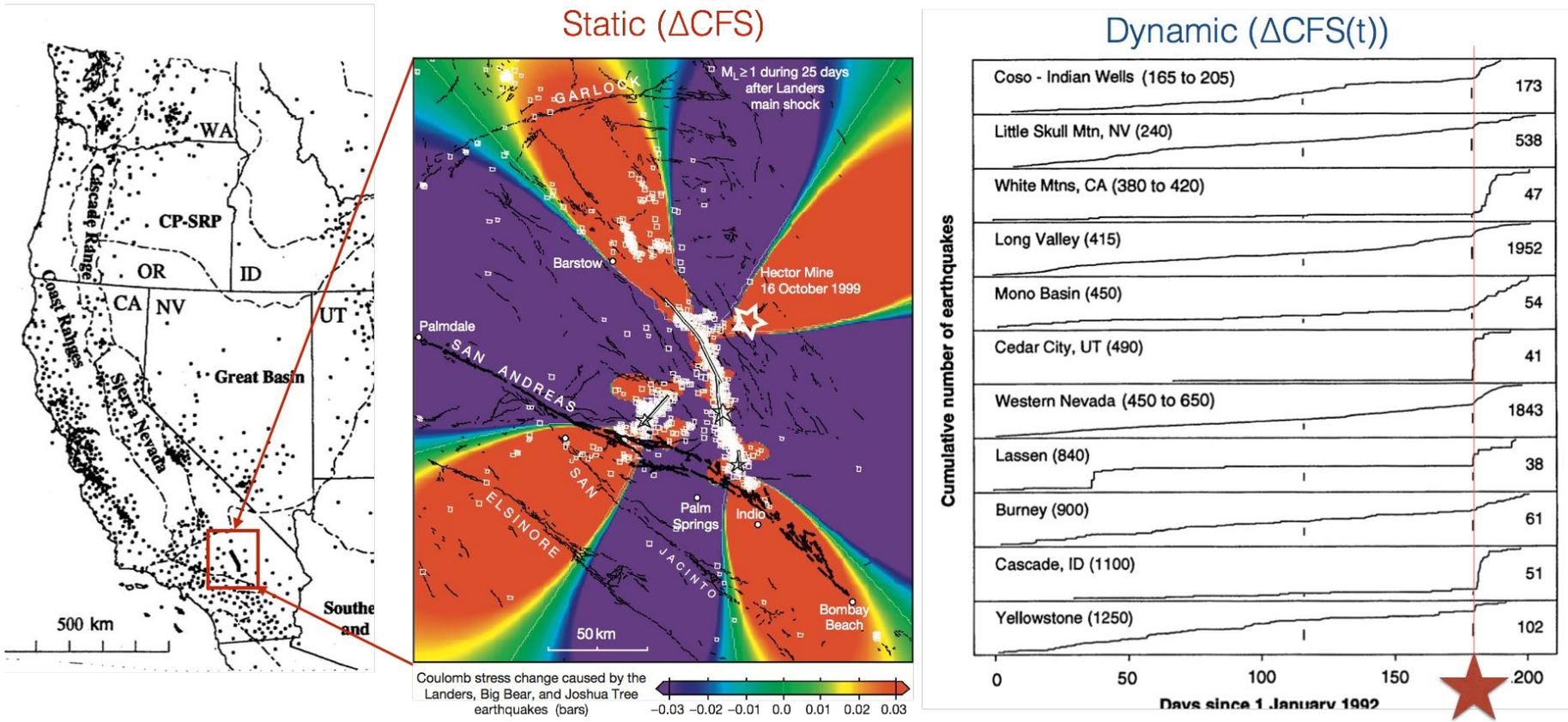
Dynamic and Static Coulomb stress changes



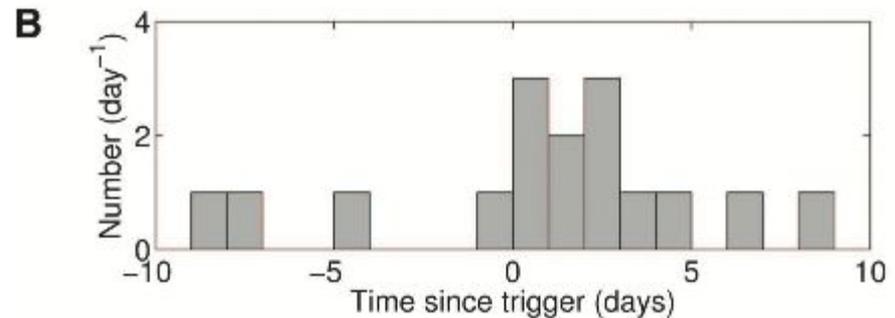
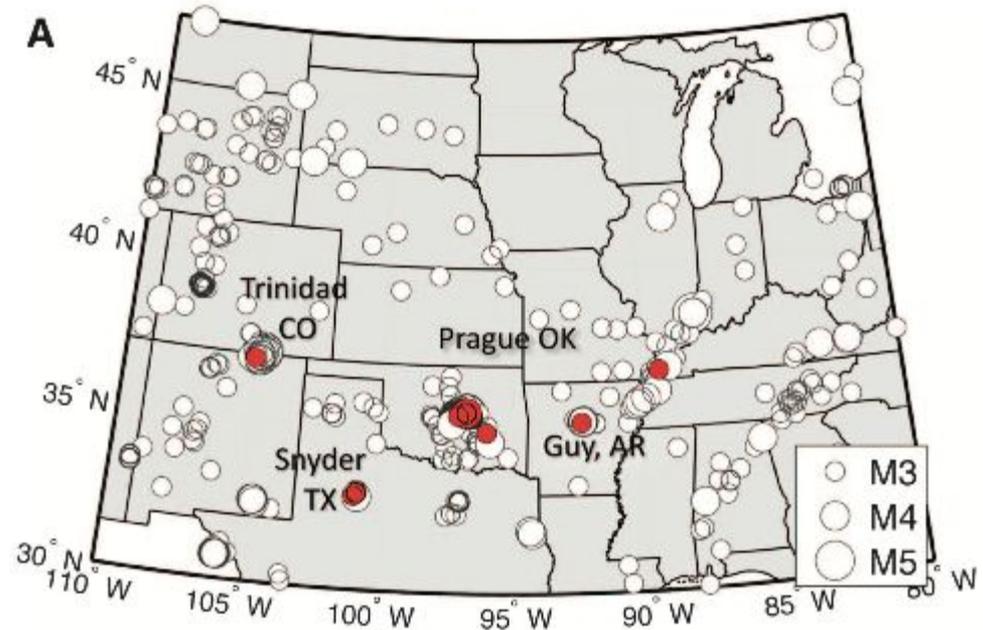
$\Delta CFS(t)$: Dynamic Coulomb failure stress changes

ΔCFS : Static Coulomb failure stress changes

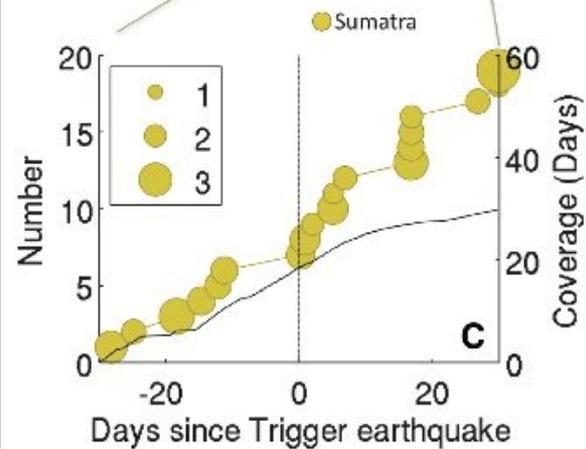
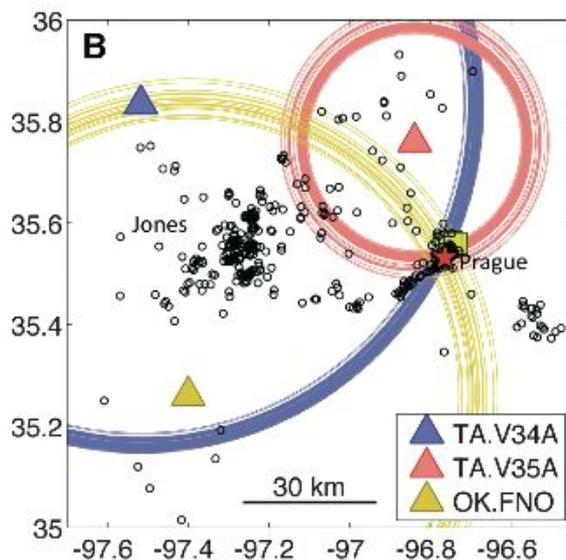
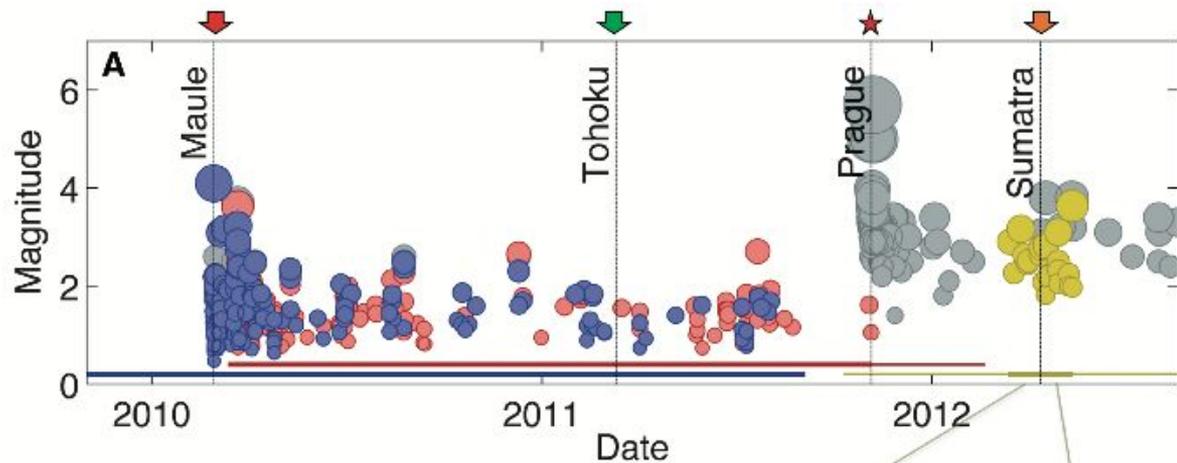
Dynamic ($\Delta\text{CFS}(t)$) and Static (ΔCFS) Coulomb stress changes



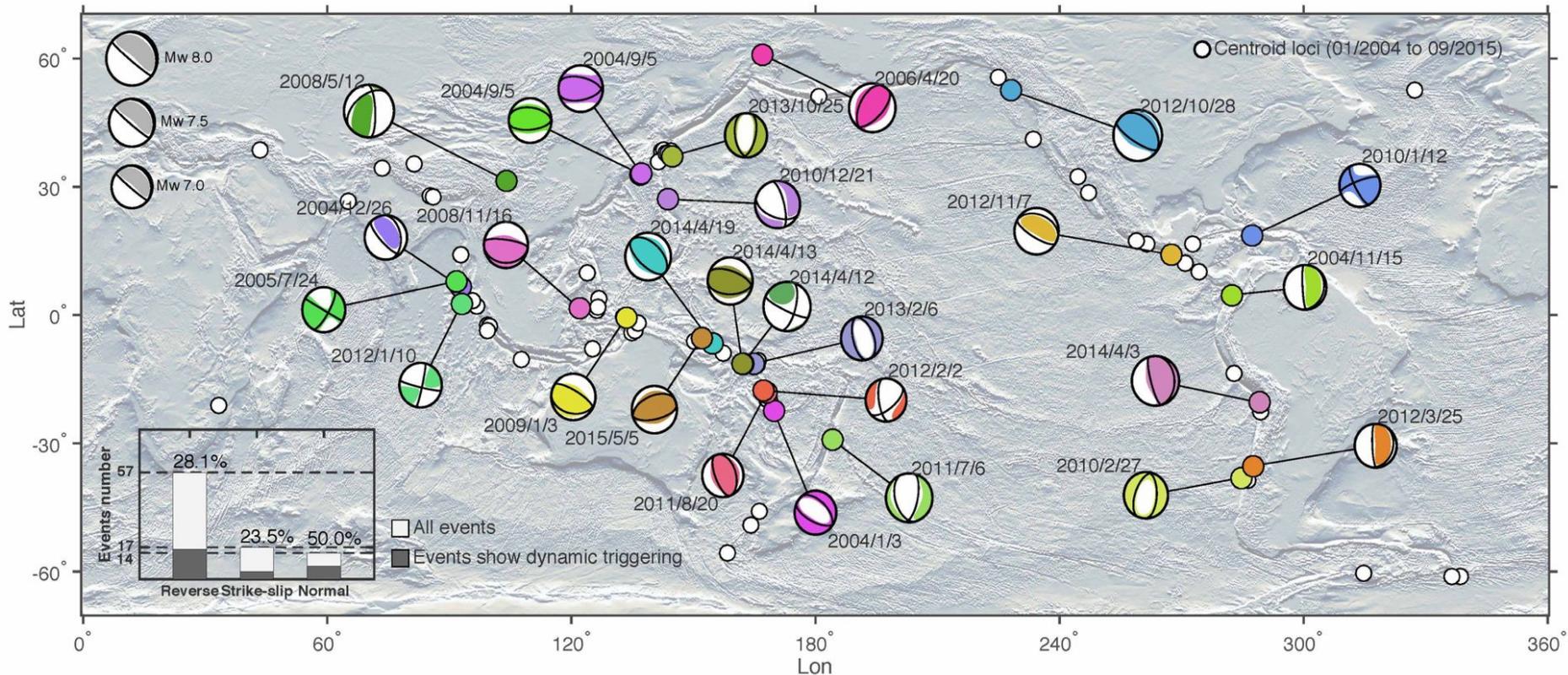
Enhanced Remote Earthquake Triggering at Fluid-Injection Sites in the Midwestern United States



Prague, OK



Local near-instantaneous dynamic triggering of large earthquakes



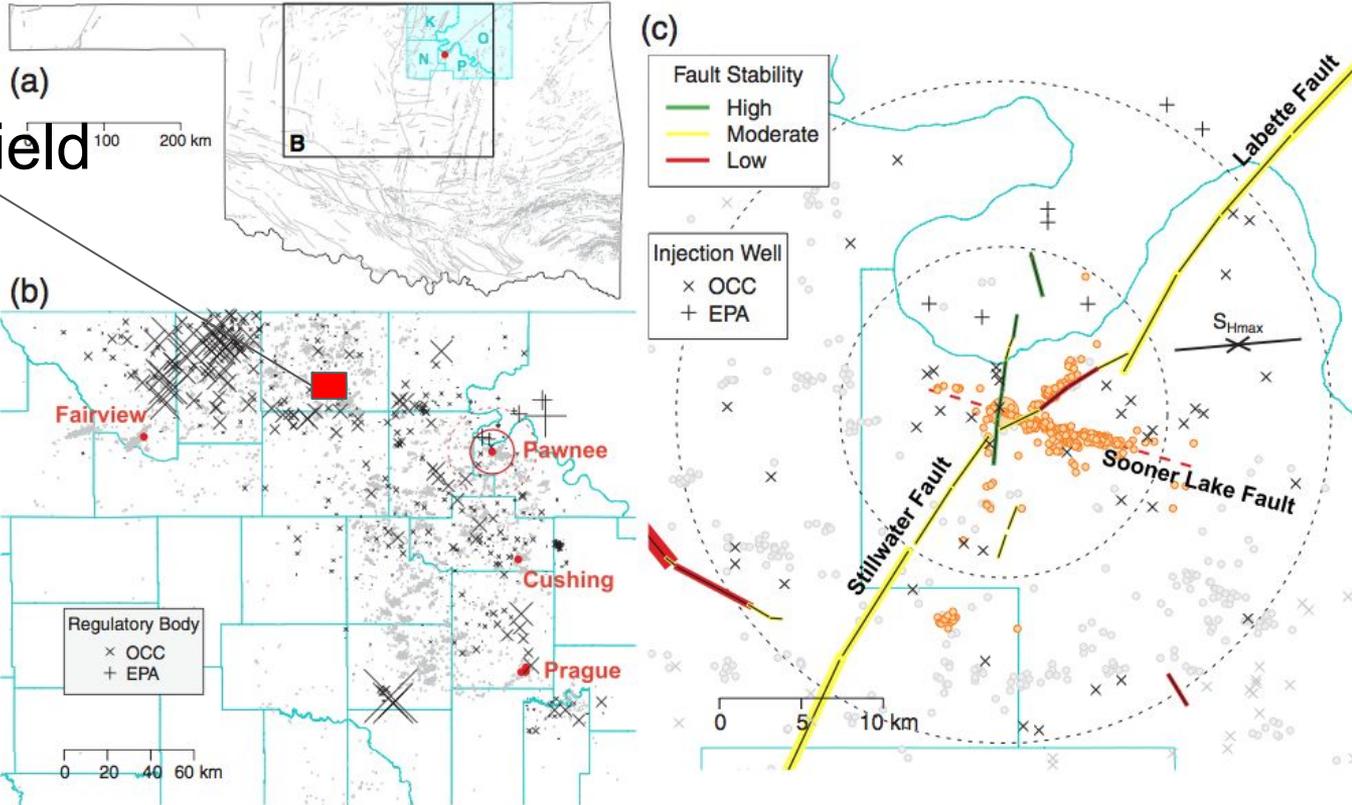
Question:

Can regional M5 earthquake (> 50km) also dynamically trigger earthquakes near injection fields?

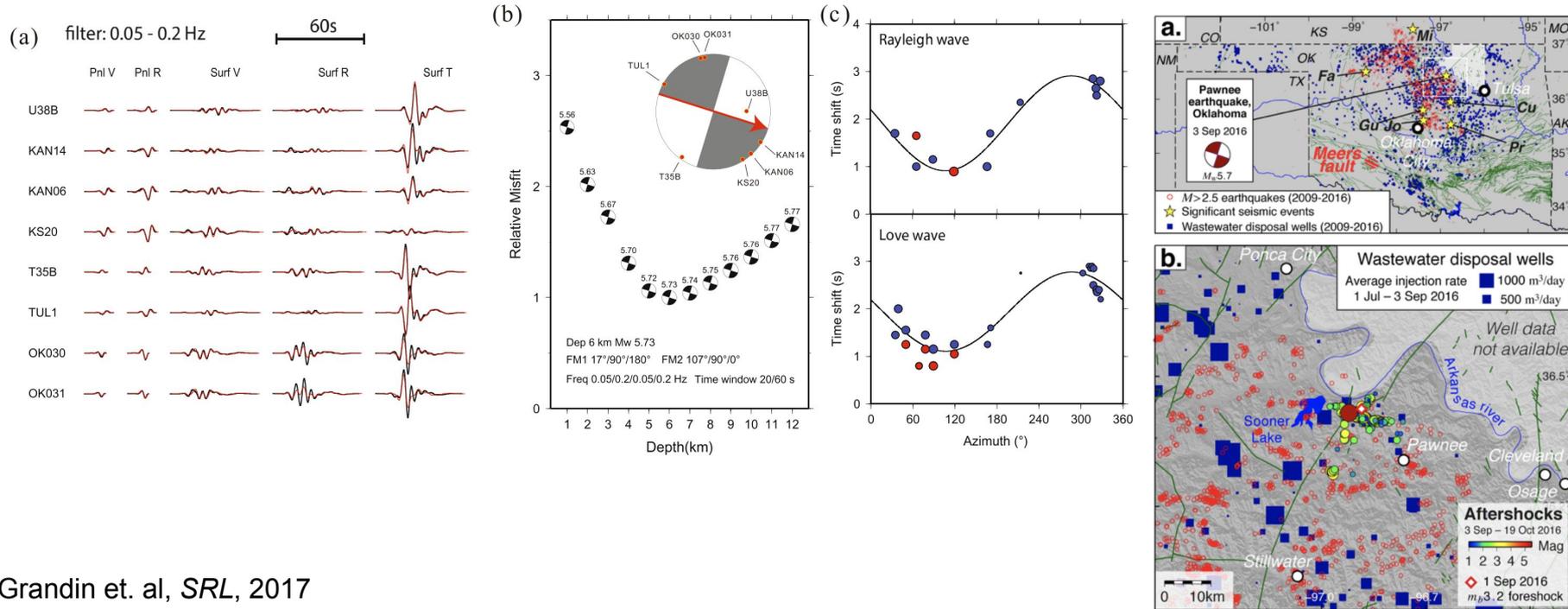
We use the wavefield Golay array to detect possible dynamically triggered earthquakes beneath the array due to the passing waves from the Pawnee Mw 5.8 earthquake.

The Mw 5.8 Pawnee earthquake

Wavefield



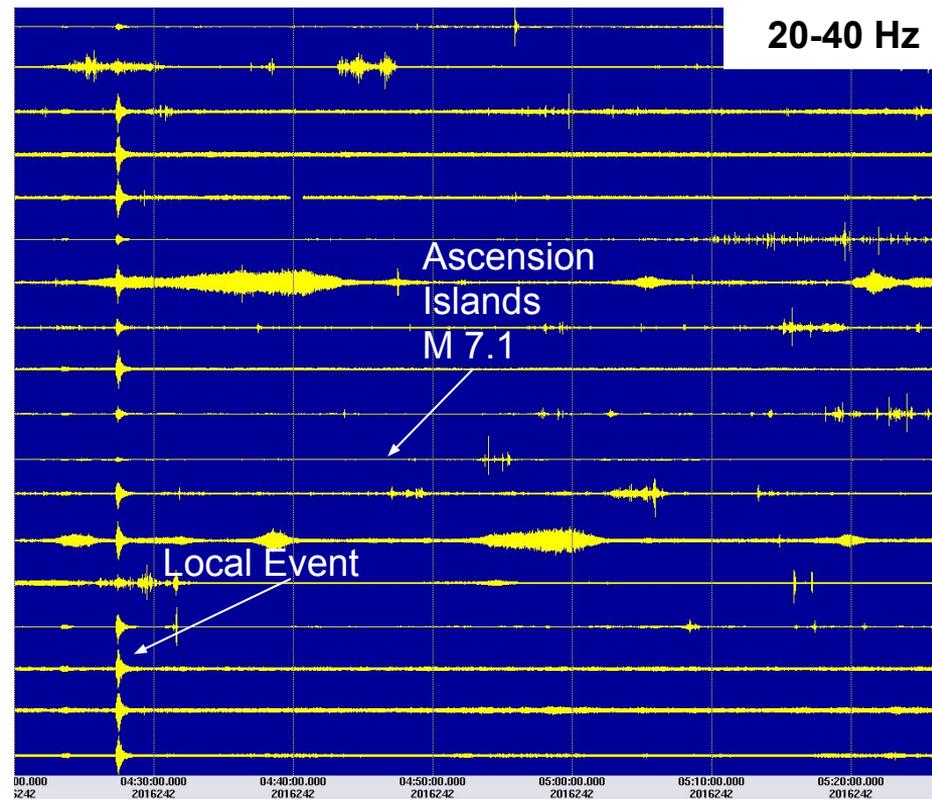
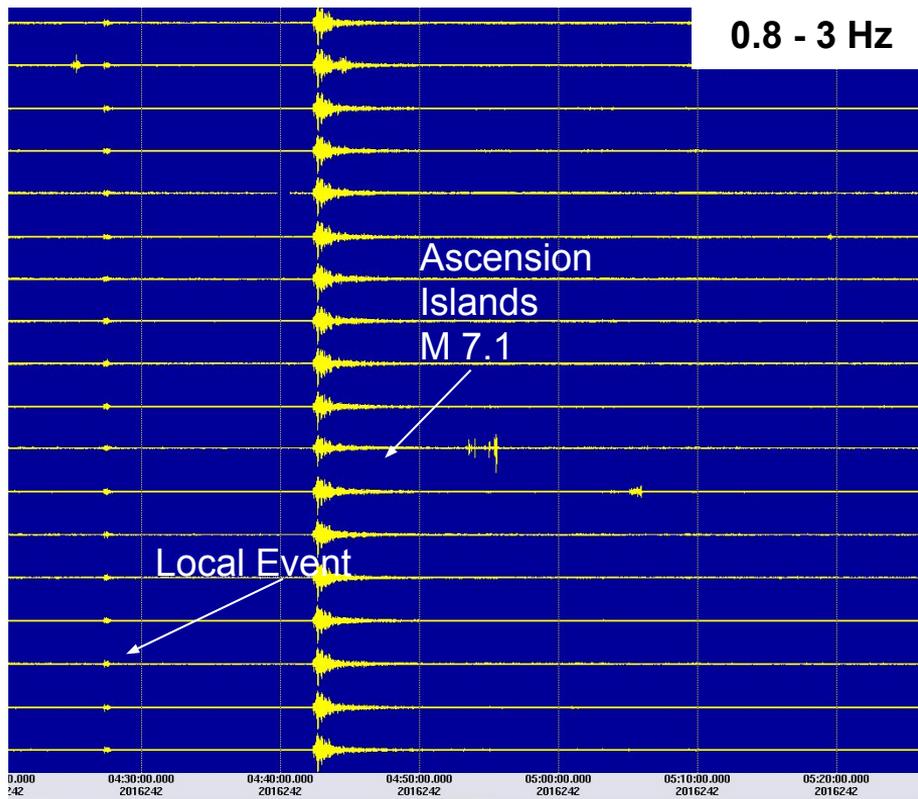
The Mw 5.8 Pawnee earthquake

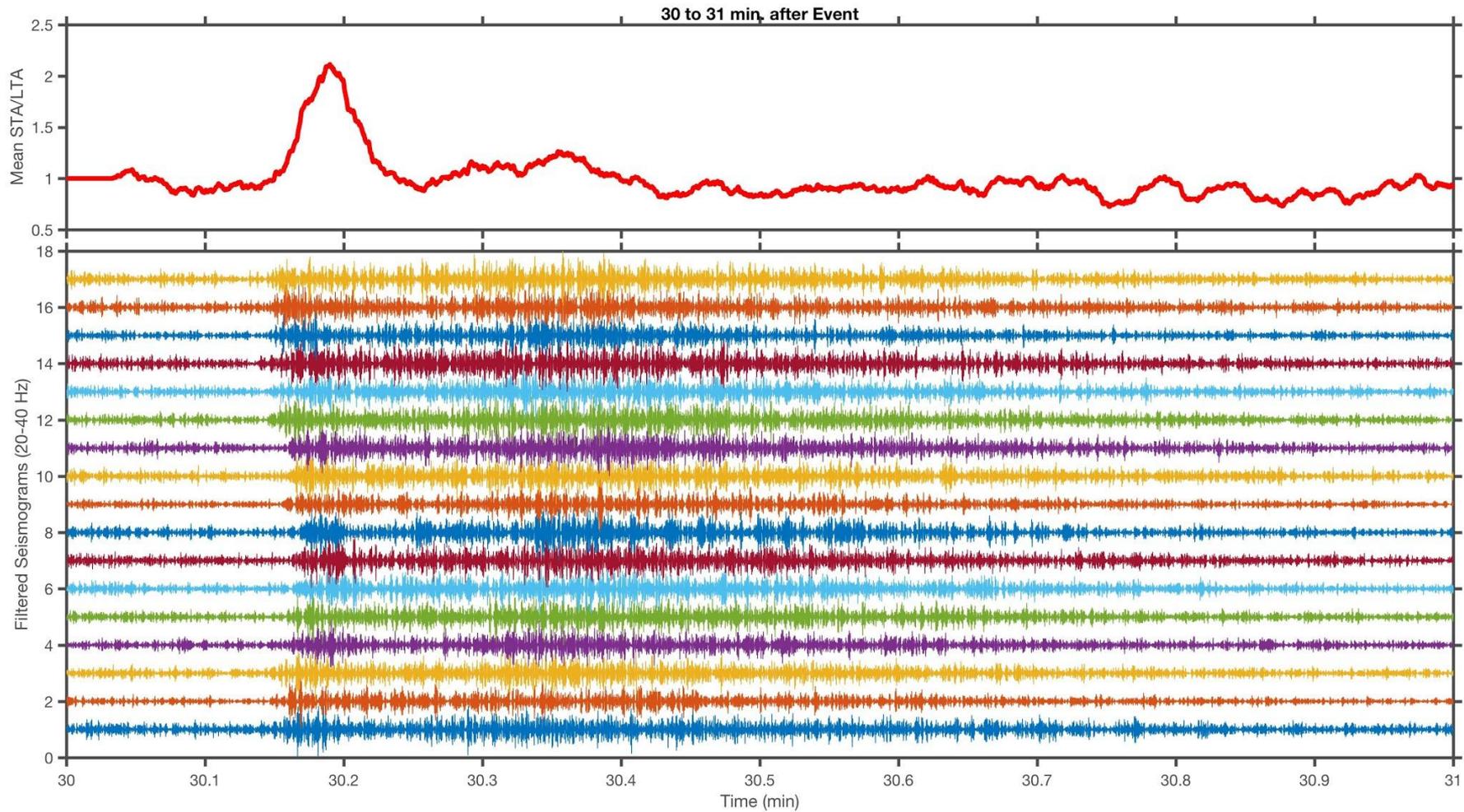


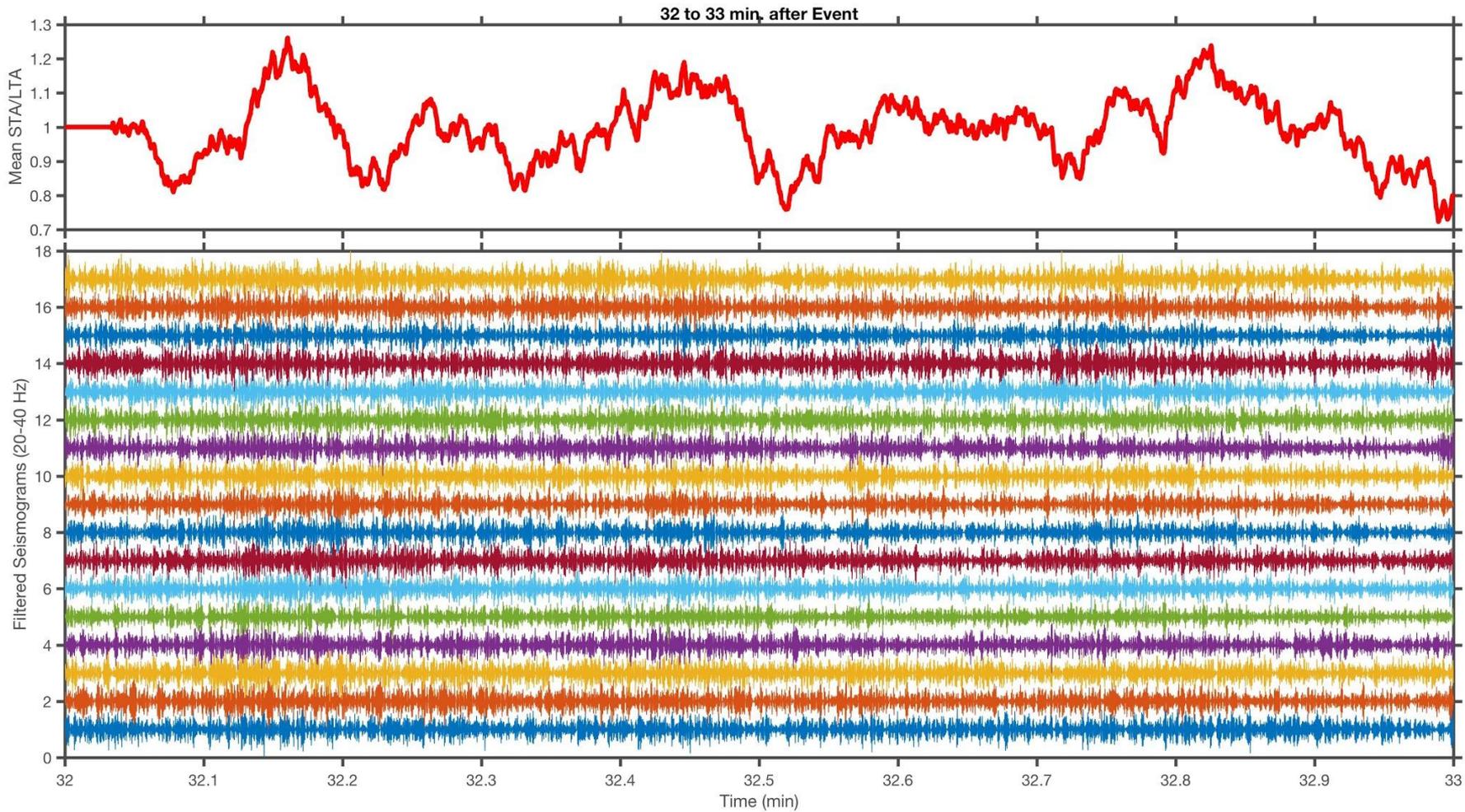
Grandin et. al, *SRL*, 2017

Chen et. al, *Nature*, 2017

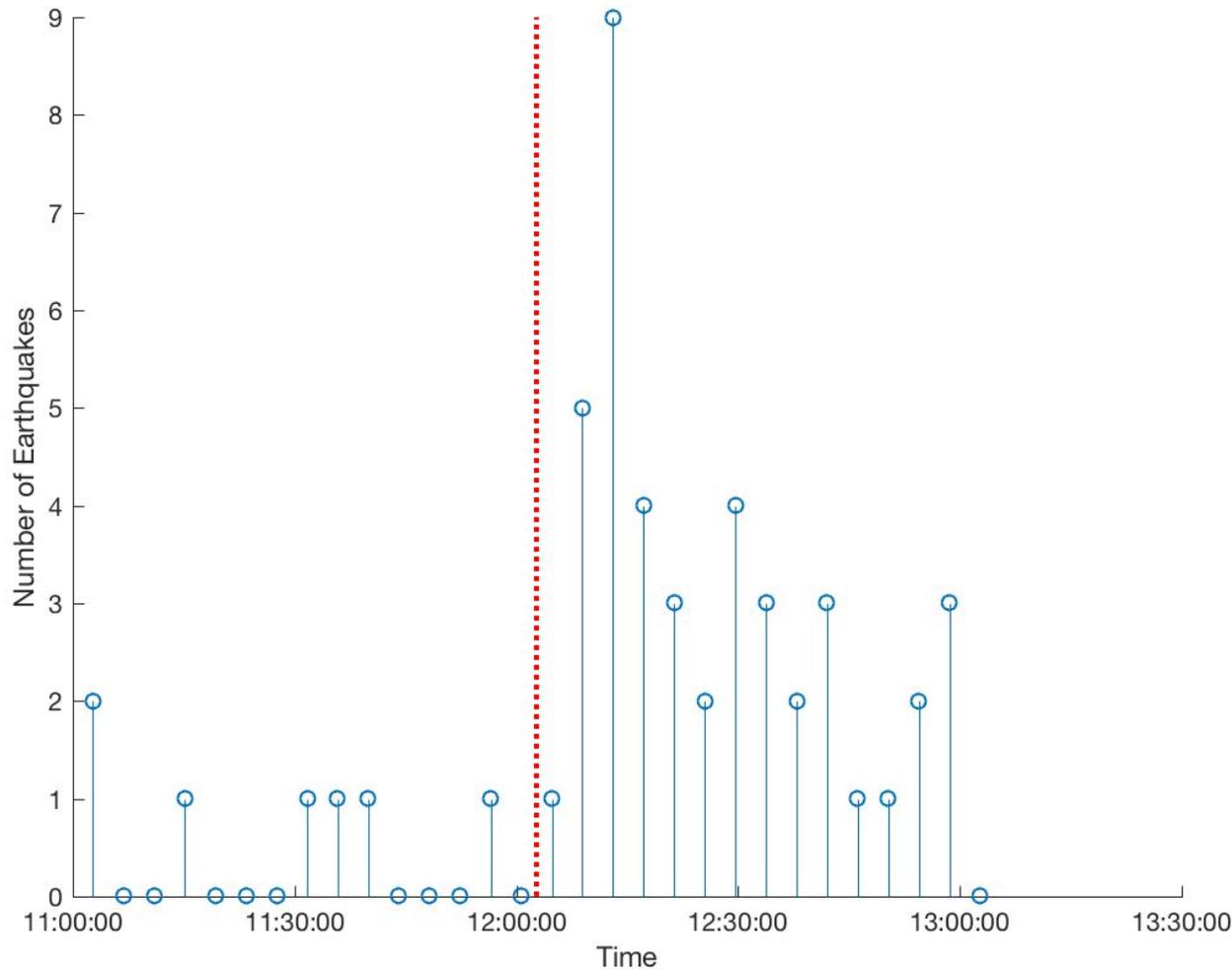
Filtering Teleseismic and Local Events



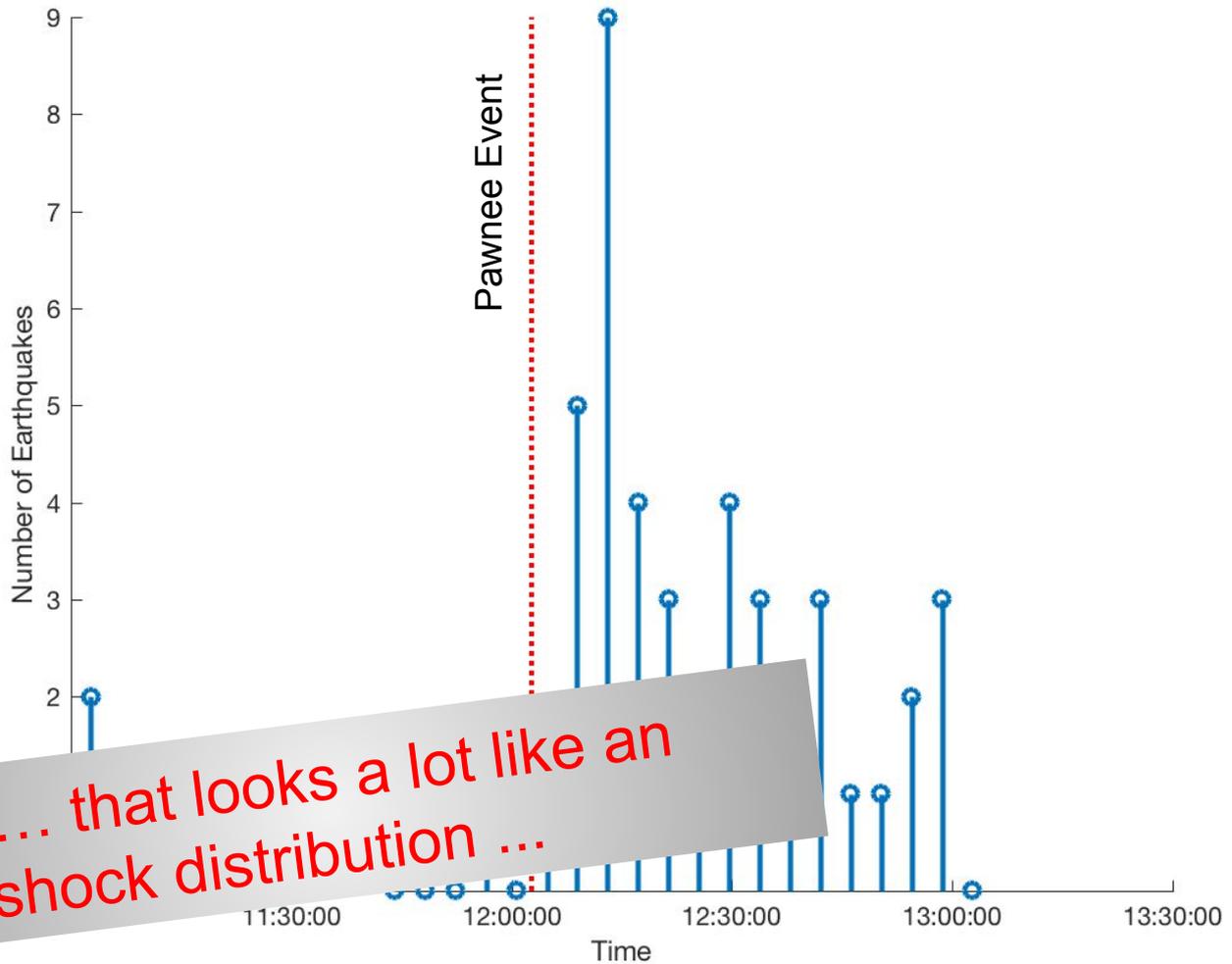




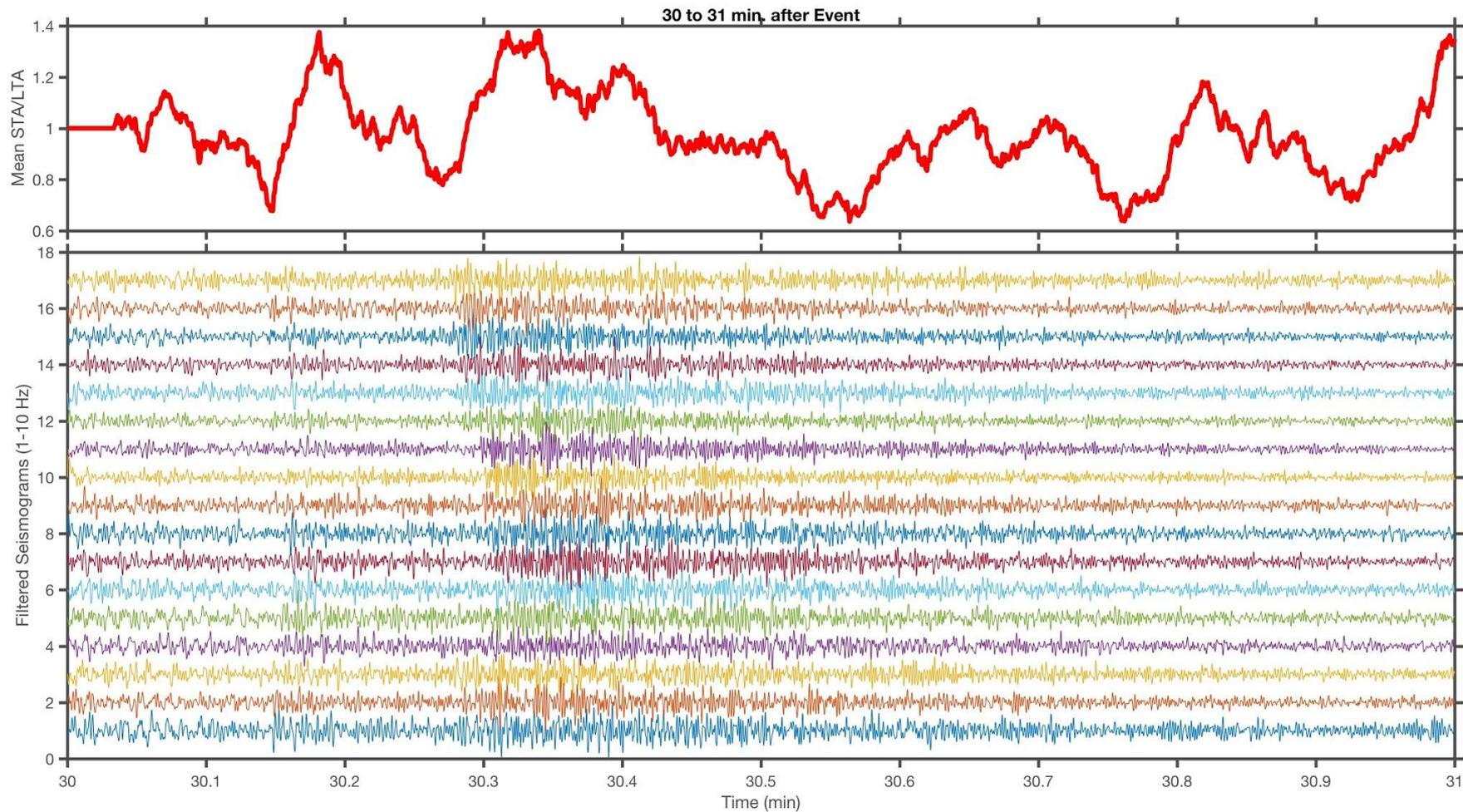
Event Distribution following the Pawnee Event



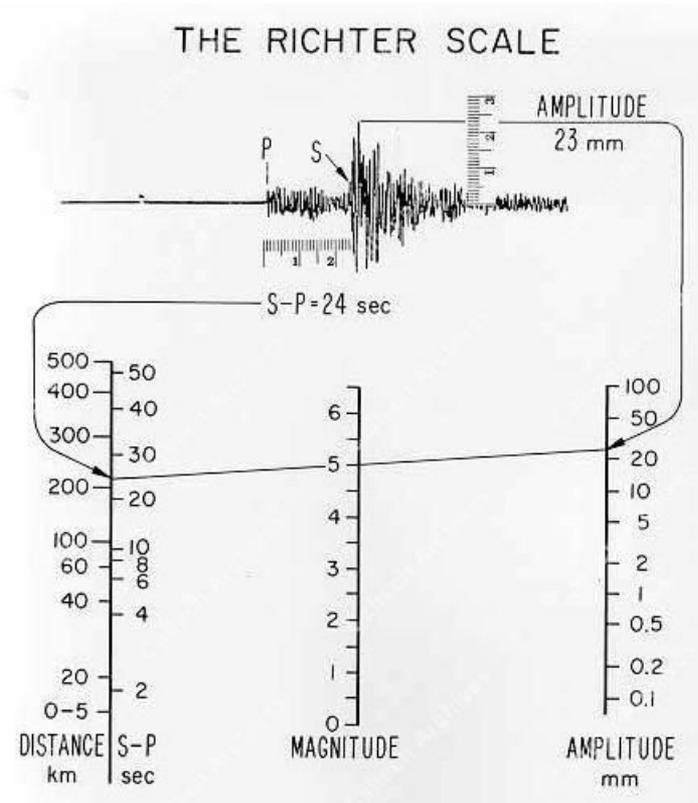
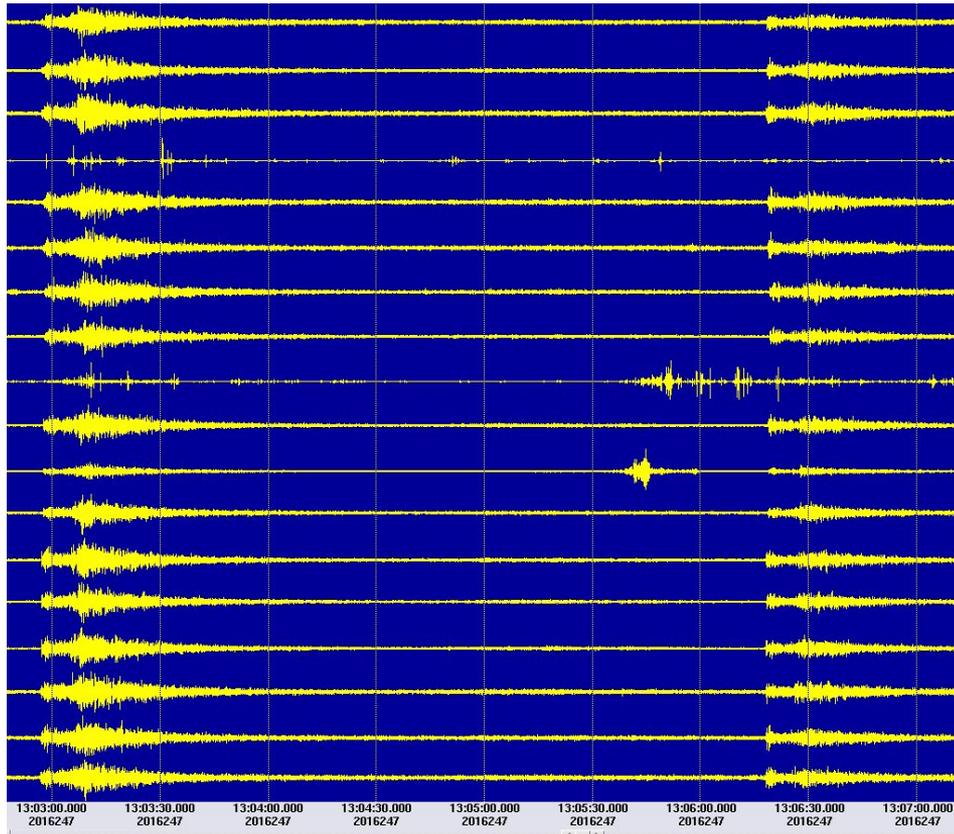
Event Distribution following the Pawnee Event

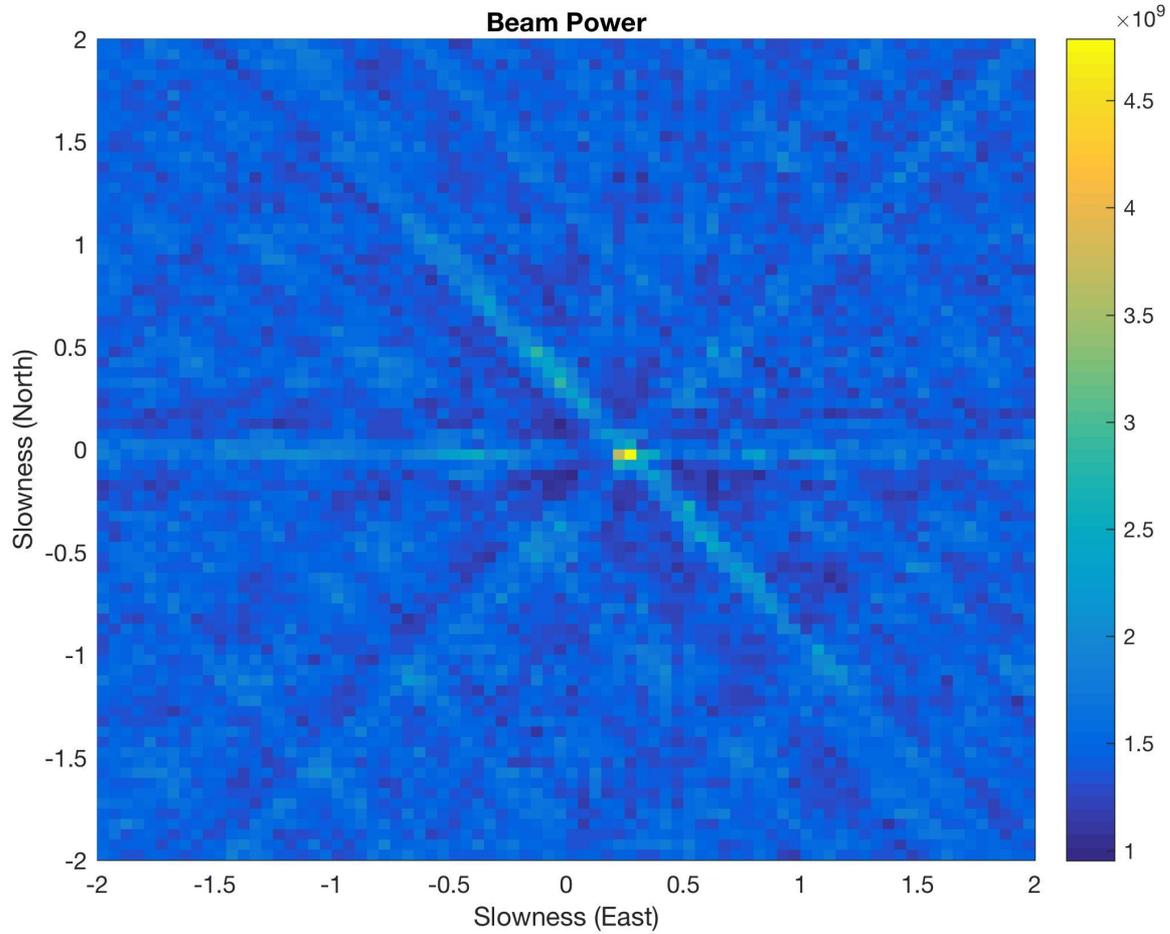


Huh ... that looks a lot like an aftershock distribution ...

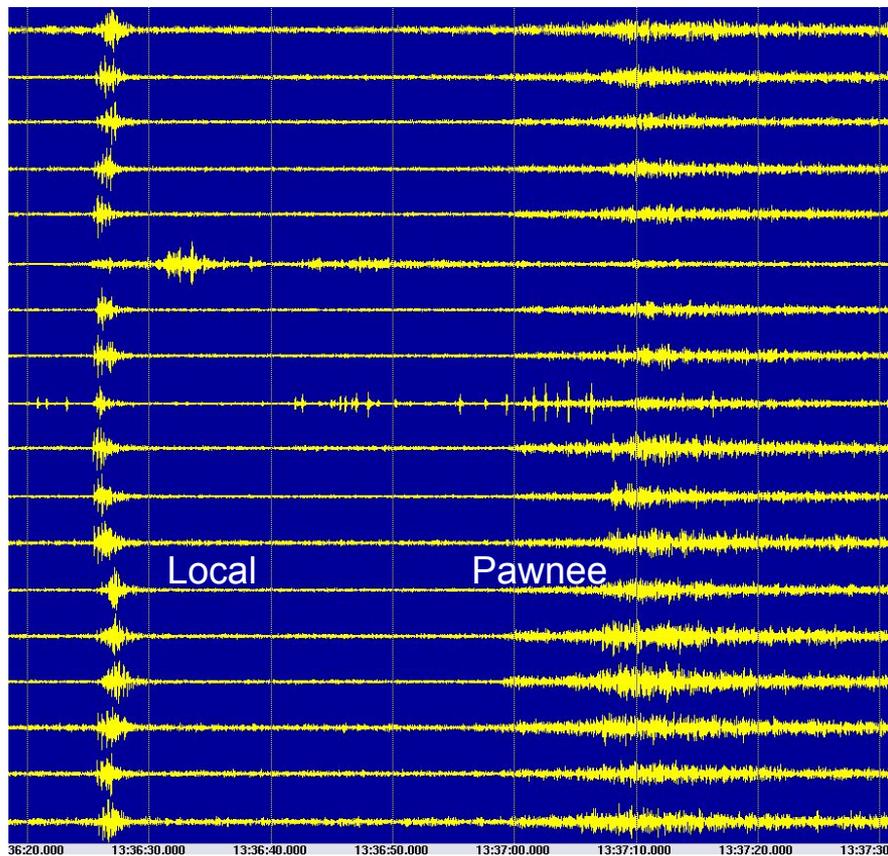


How far away are these events anyway?



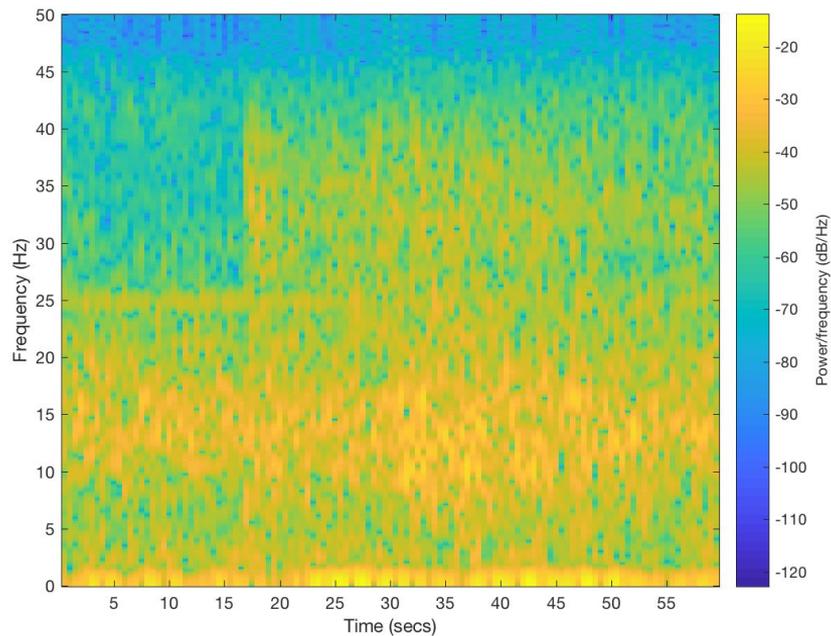


Comparing Regional and Local Events

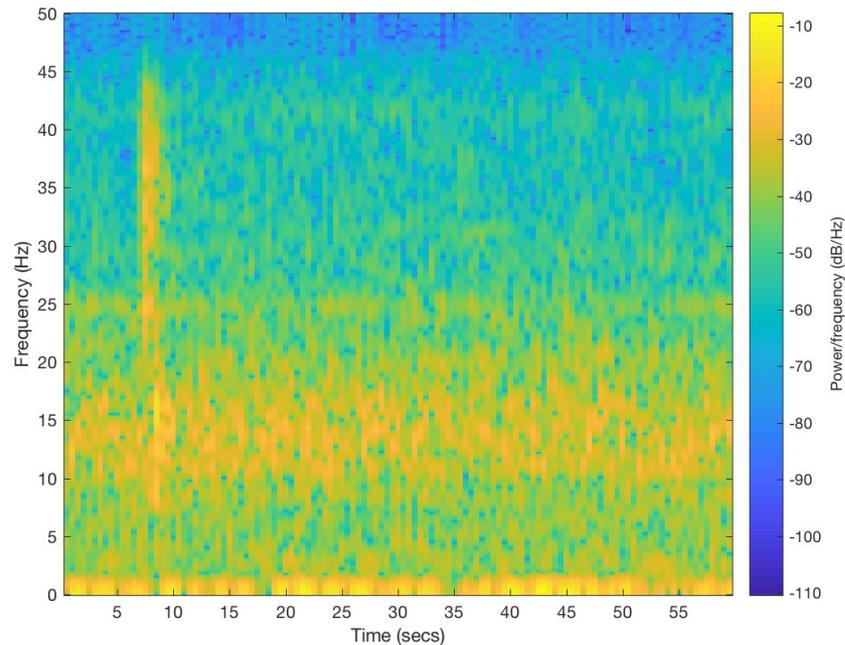


Comparing Spectrograms

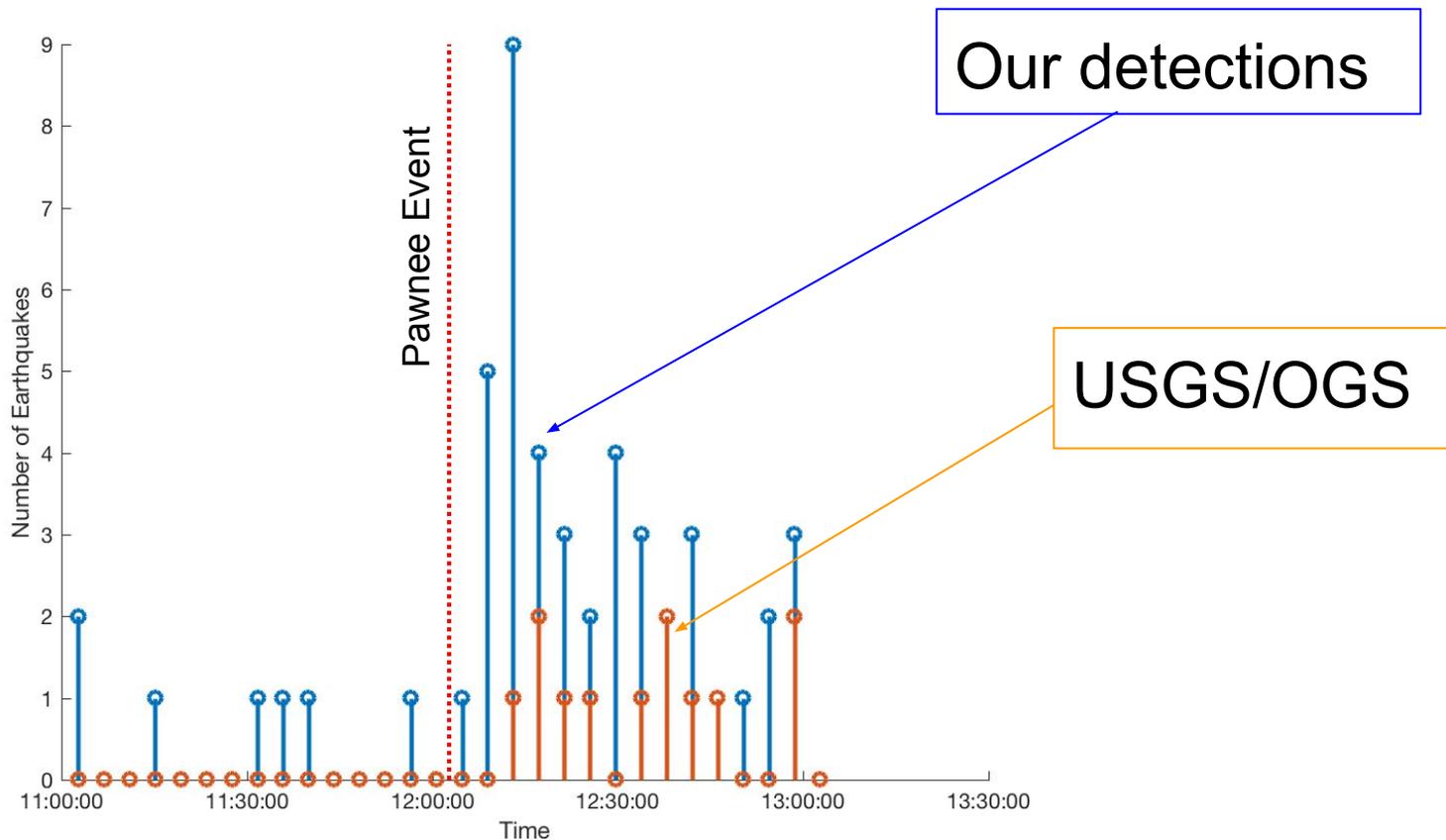
Pawnee Aftershock



Local Event



Regional events detection with small aperture array



Conclusions/Future Directions

- 1, We detected more Pawnee earthquake aftershocks (comparing to OGS catalog).
- 2, Systematic detect earthquakes with possible dynamically triggered earthquakes a few hours after large earthquake surface waves passing by (Ask questions please, we have done some work, but running out of time).
- 3, Test statistical significance of the detected earthquakes.
- 4, Locate the detected events (more stations), and investigate the correlations between event occurrence with local fault structures.

Event Distribution following the Pawnee Event

