

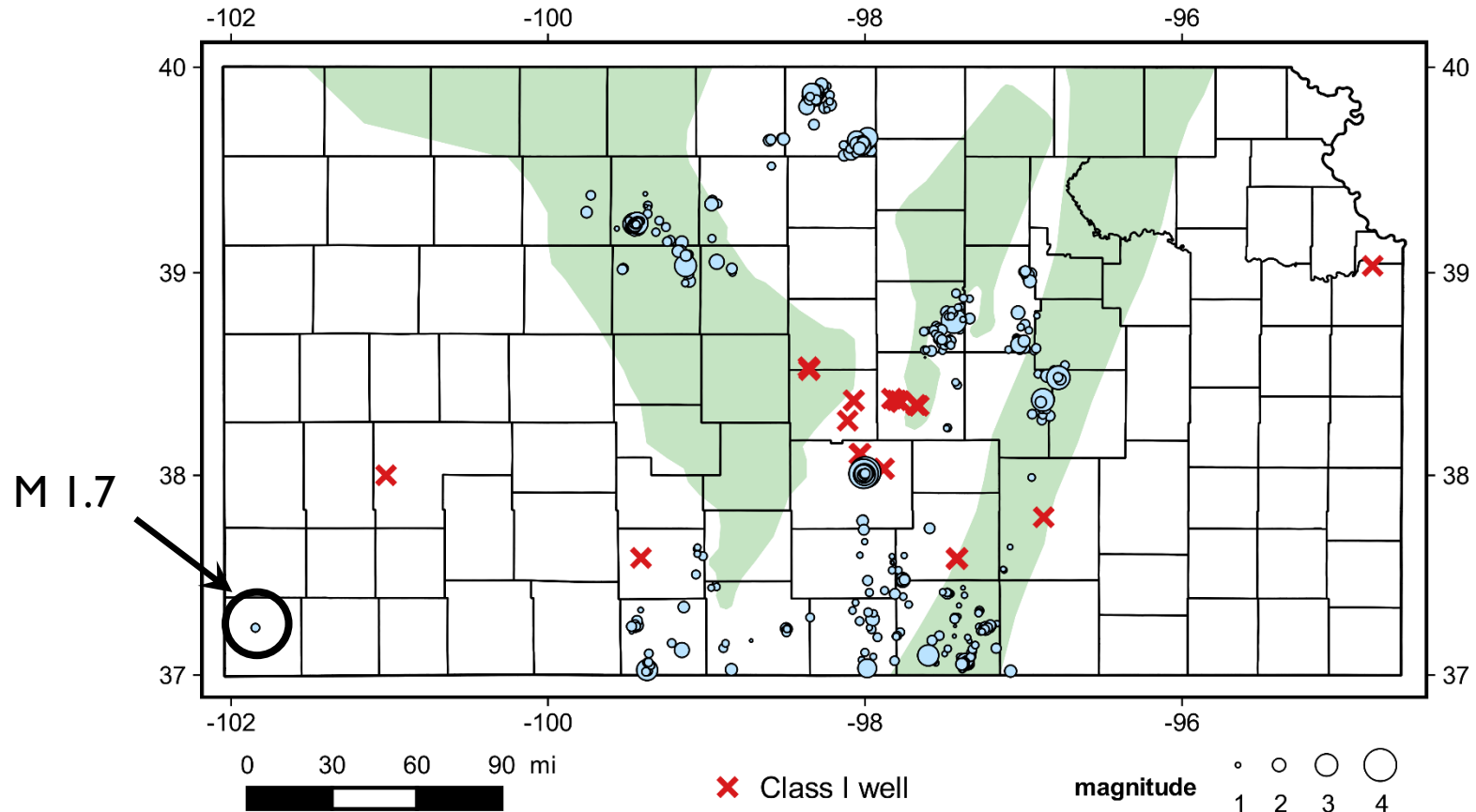
# Consortium to Study Trends in Seismicity

## Quarterly Report July 1 to September 30, 2019

Rex Buchanan, Shelby Peterie, Rick Miller, *Kansas Geological Survey*

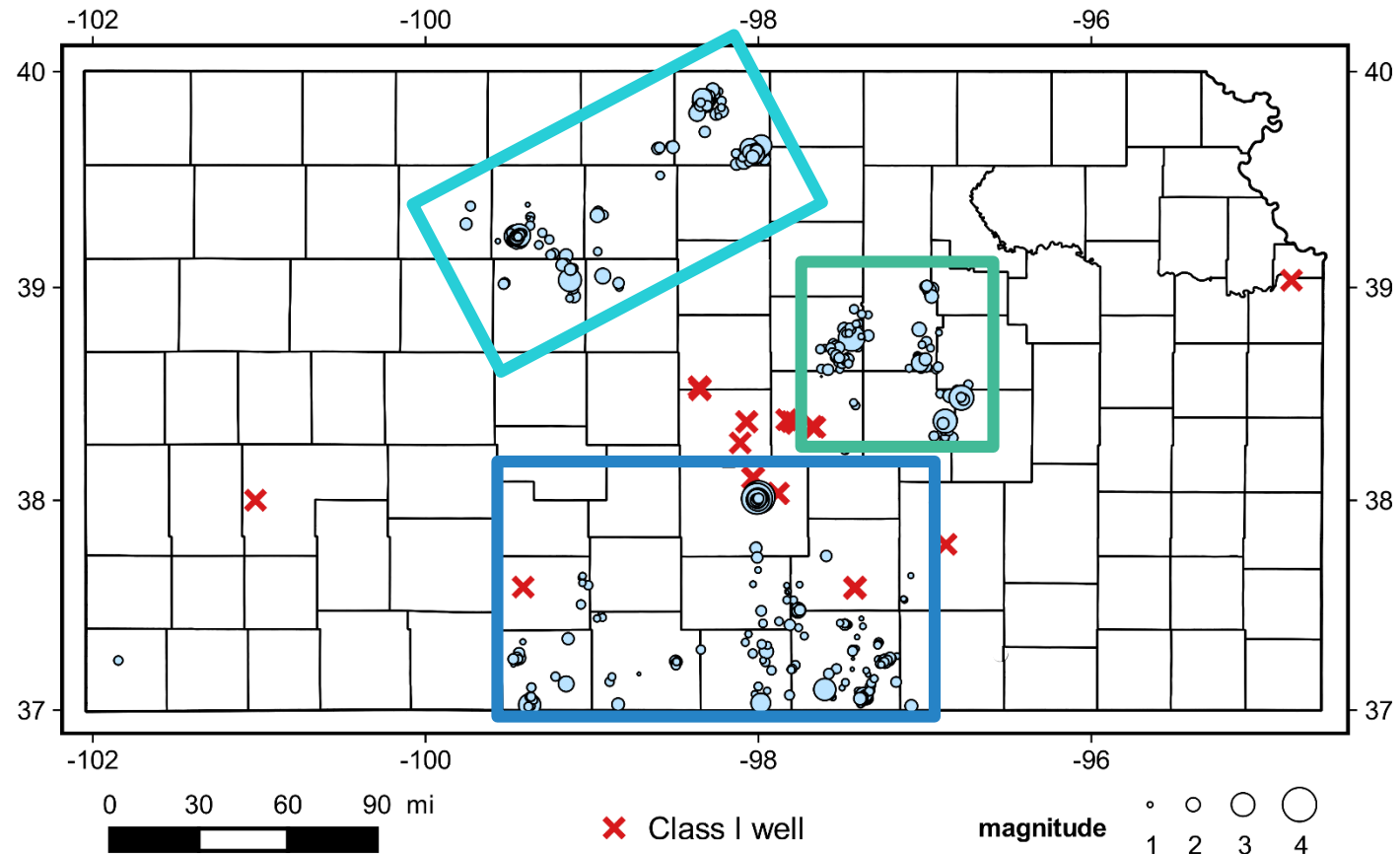


# Statewide Earthquakes

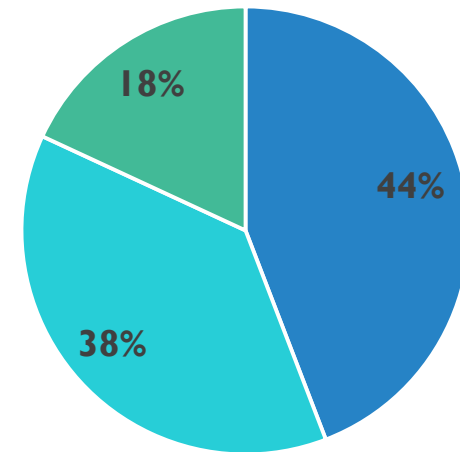


Total: 514

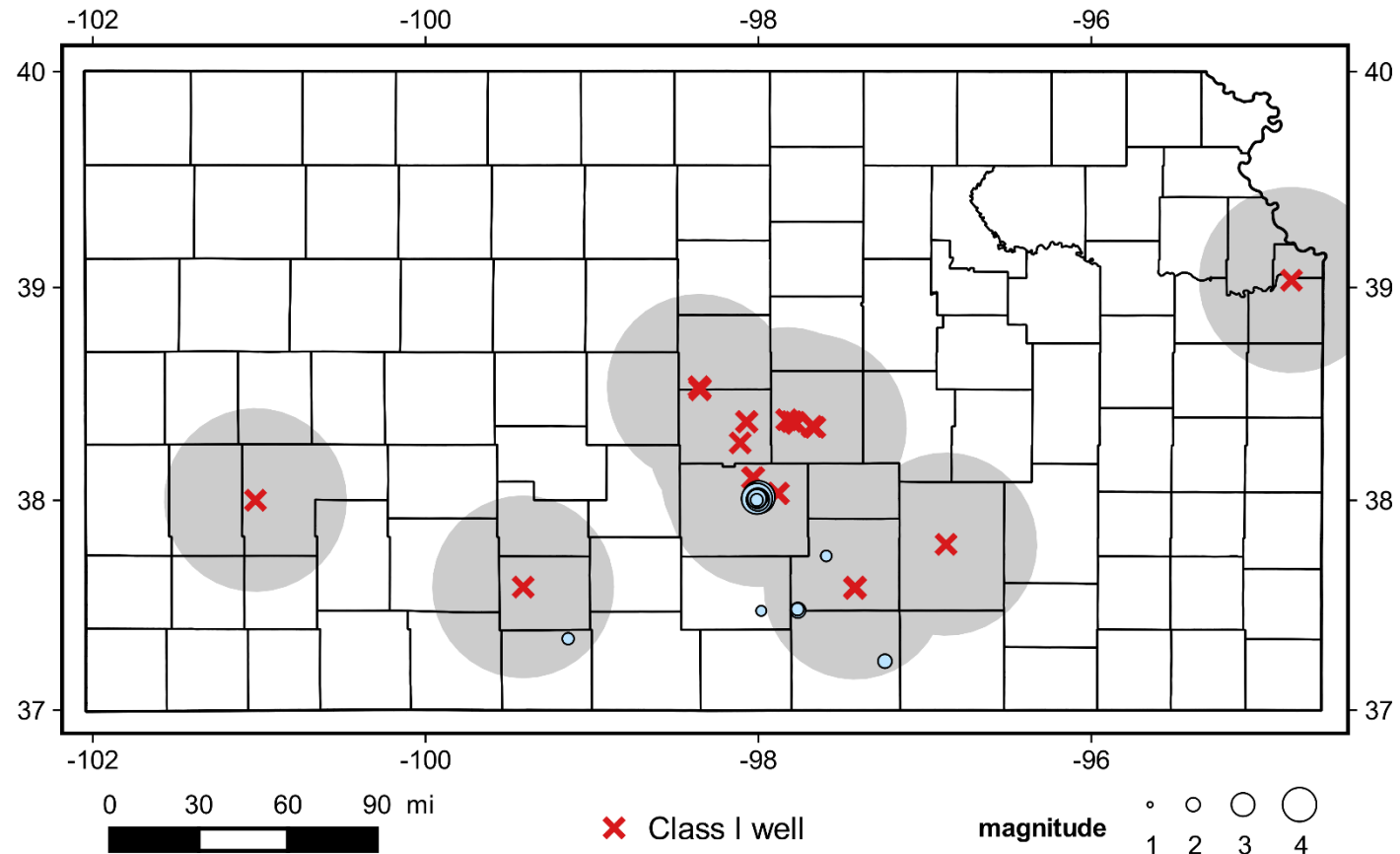
# Statewide Earthquakes



Total: 514



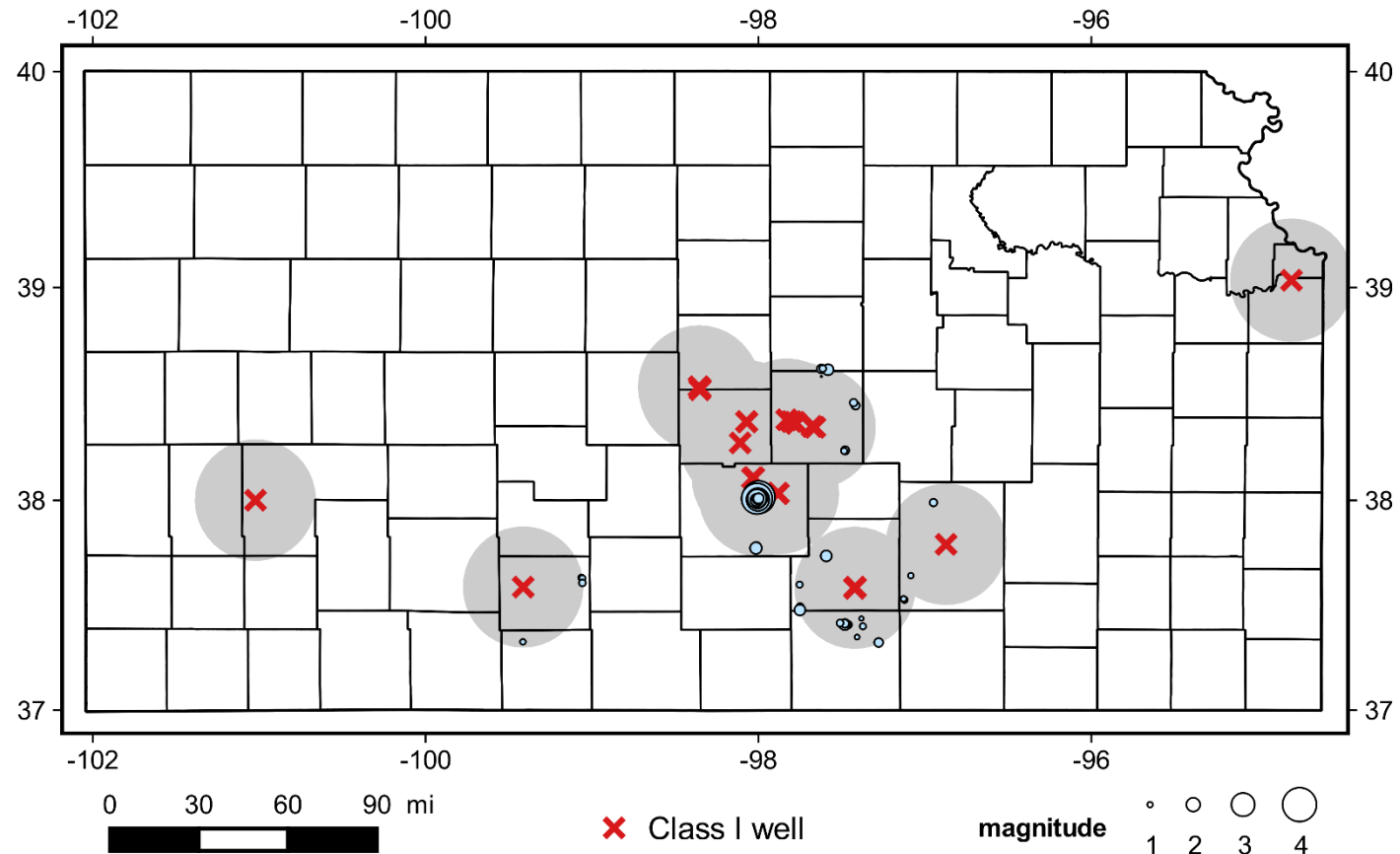
# CSTS Alerts



Total: 29

*8 in the  
previous quarter*

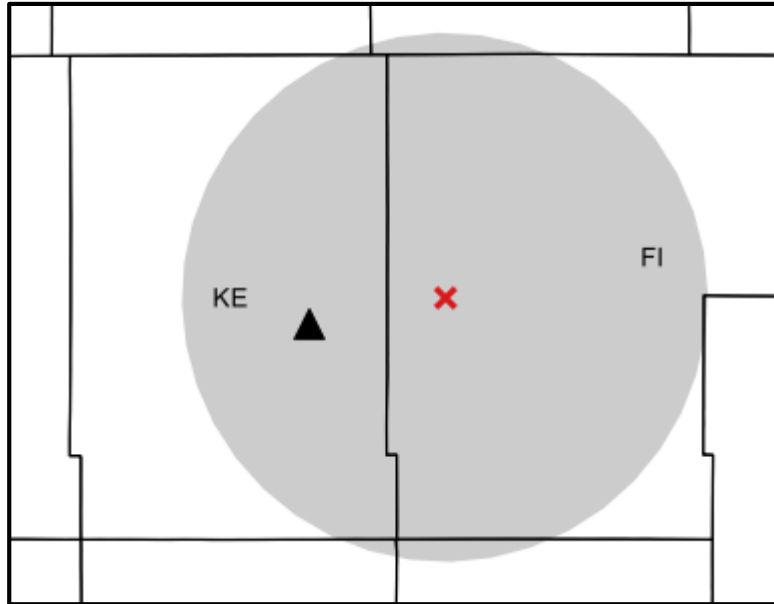
# Earthquakes Within 20 miles



Total: 93

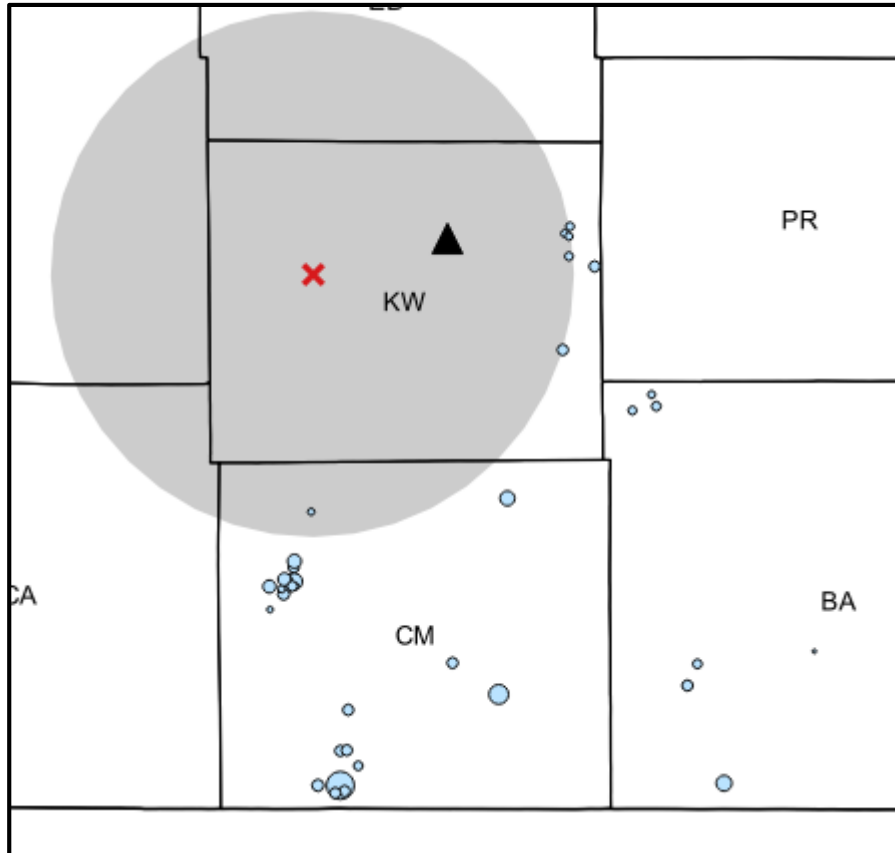
*74 in the  
previous quarter*

# Finney County



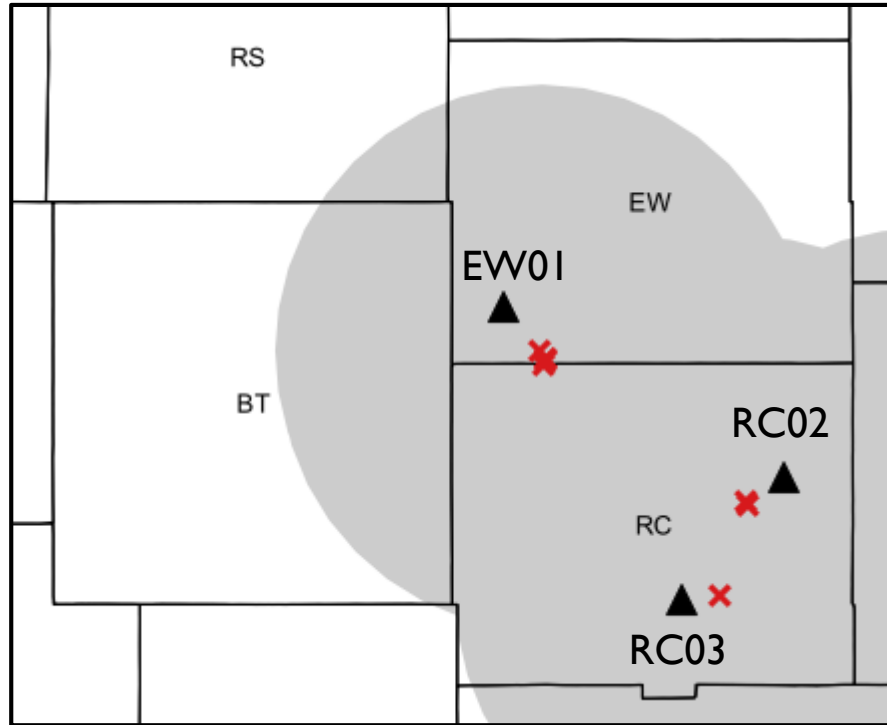
- No located earthquakes
- No subnetwork events

# Kiowa County



- 4 located earthquakes
  - M 1.3 to 1.4
  - previously identified clusters
- No subnetwork events

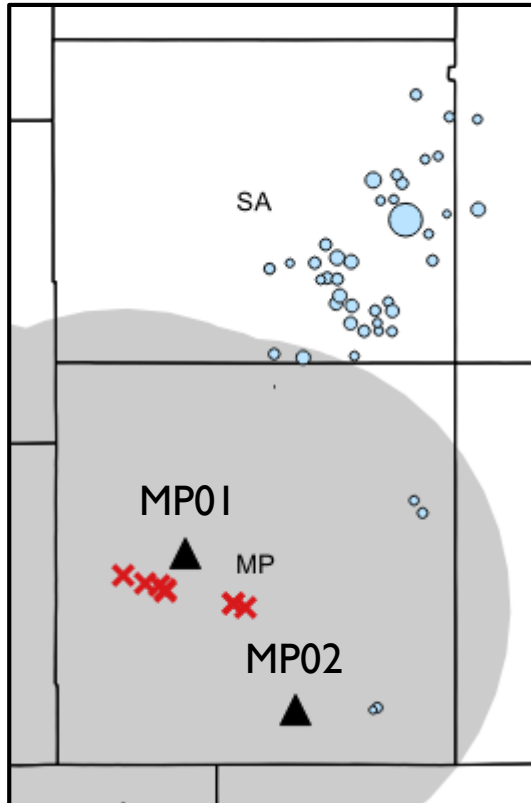
# Rice and Ellsworth Counties



- No located earthquakes
- Subnetwork events
  - RC03: 175 (blasts)
  - None elsewhere

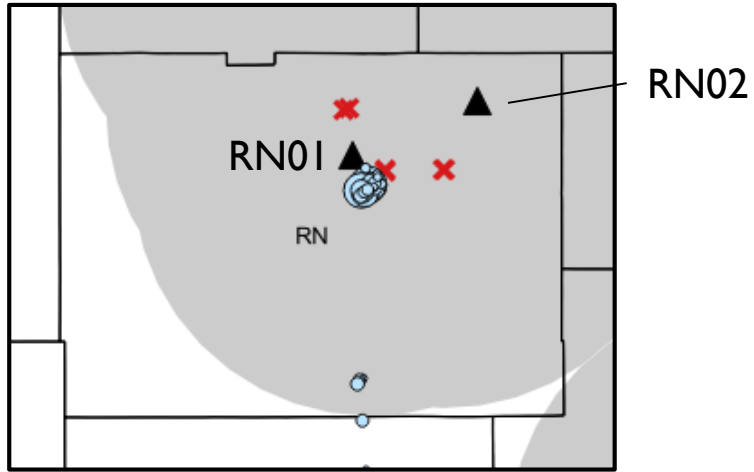


# McPherson County

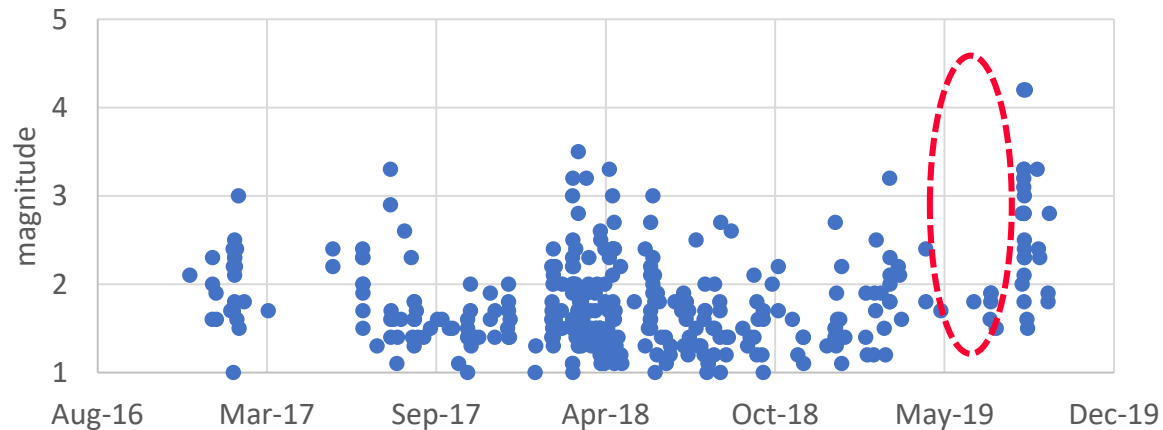


- 8 located earthquakes
  - M 0.4 to 1.7
  - > 10 miles from wells
  - persisting near MGA
- 6 subnetwork events
  - MP02: 5
  - MP01: 1
  - M < 0

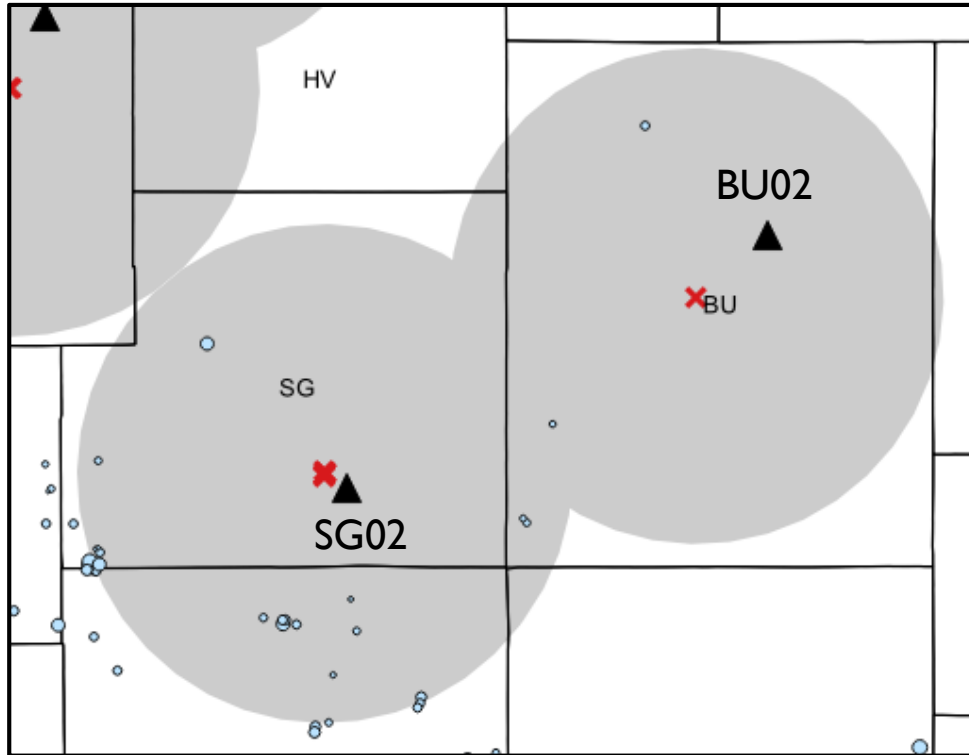
# Reno County



- 59 located earthquakes
  - M 1.2 to M 4.6
  - two M > 4 in August
- 455 subnetwork events at RN01
  - consistent with the Hutchinson cluster
  - about half August 16-18
- Seismicity gradually declining prior to the August events

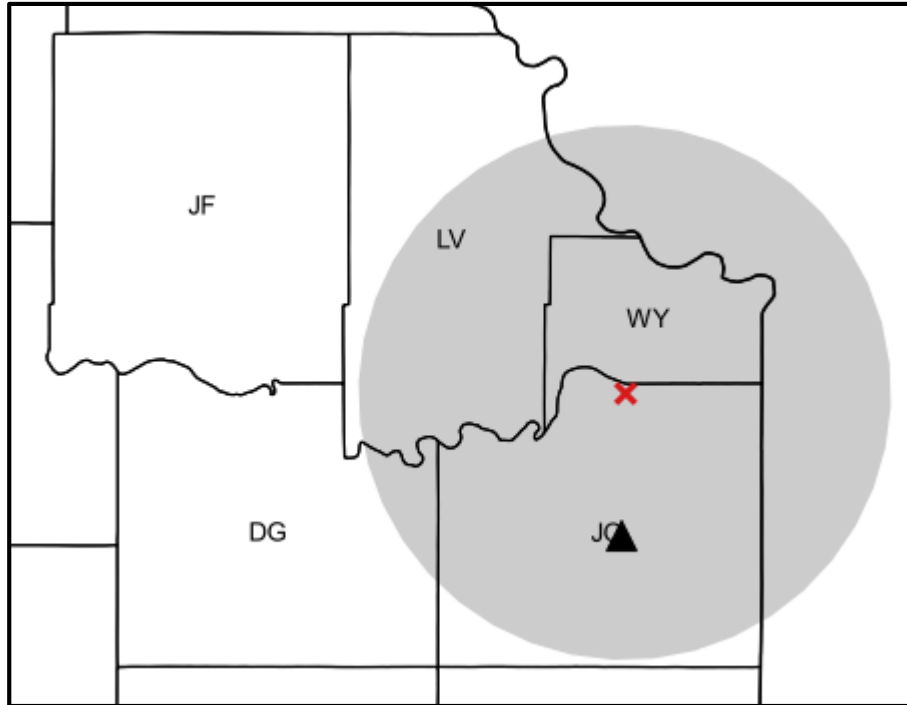


# Sedgwick and Butler Counties



- 22 located earthquakes
  - M 0.9 to M 2.0
  - along known trends
- Subnetwork events
  - BU01: one M 0.6
  - SG02: ten
    - most on August 5<sup>th</sup> (M < 0)

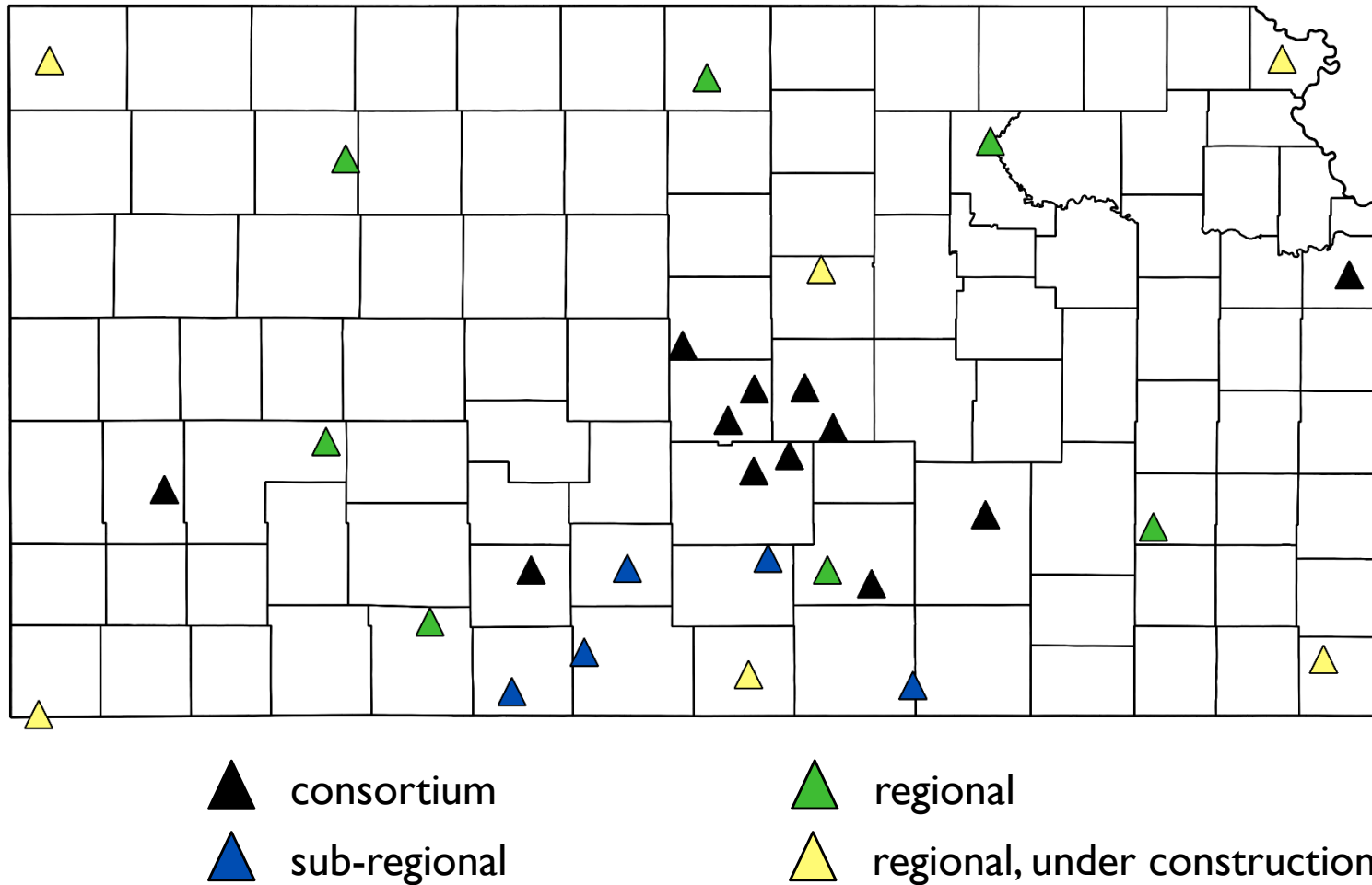
# Johnson County



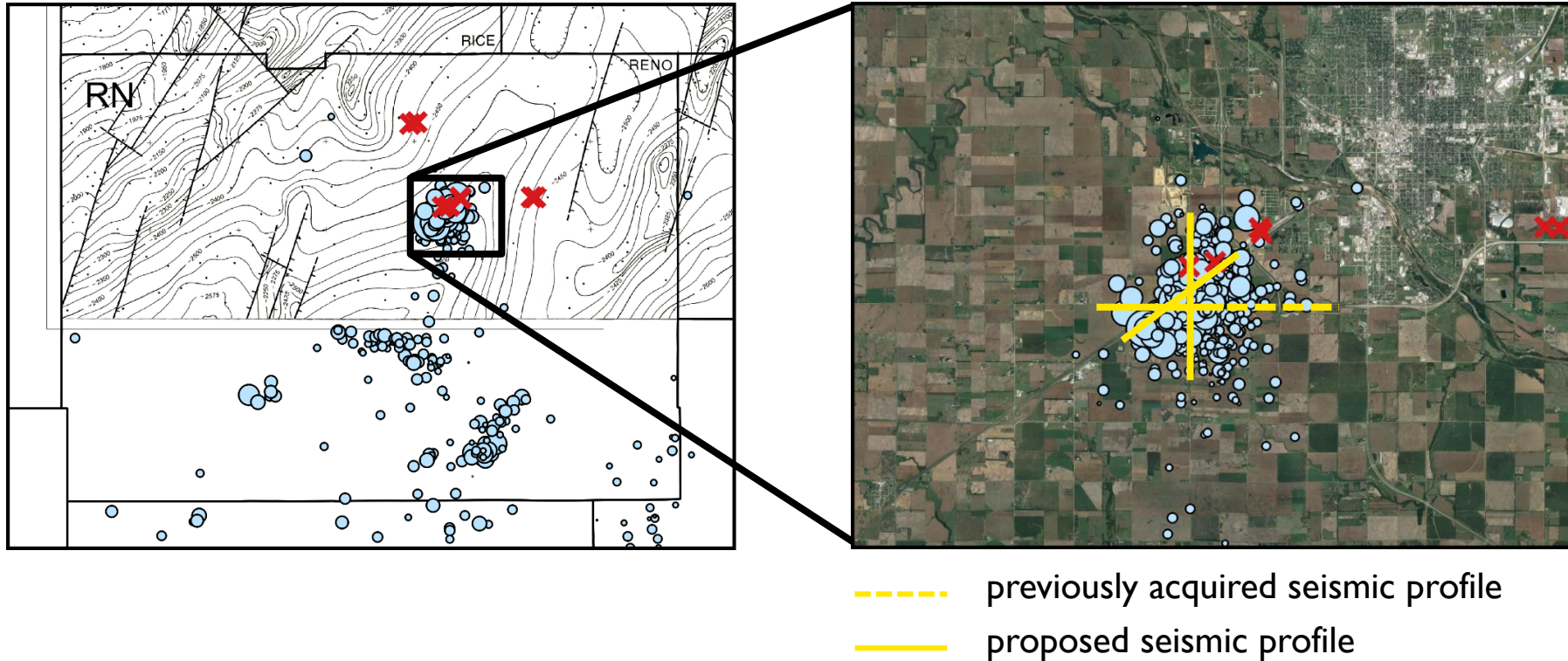
- No located earthquakes
- No subnetwork events

# Discussion and Plans

# Enhanced Network

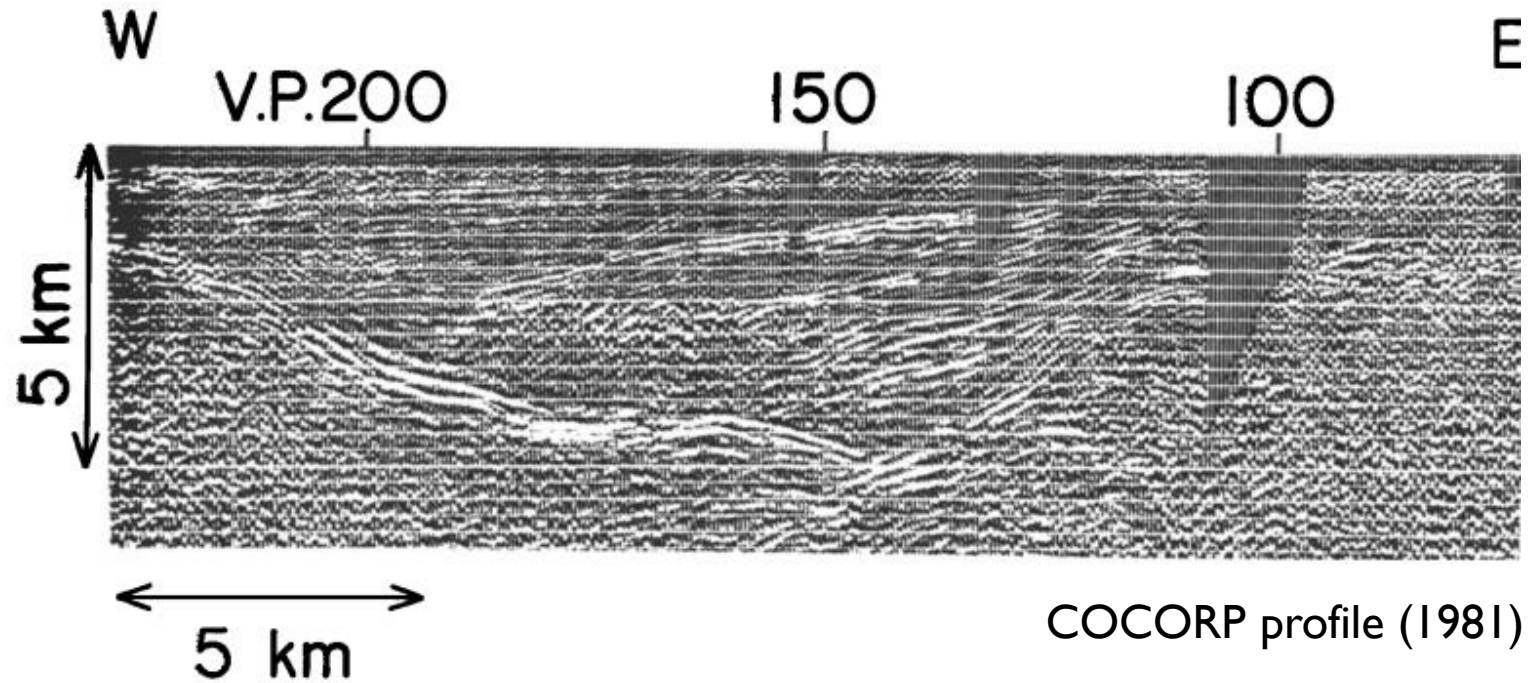


# Hutchinson Cluster



*USGS proposal for a seismic reflection profile of the Hutchinson cluster*

# Velocity Function



*Graduate student research project to improve velocity function around sub-arrays*

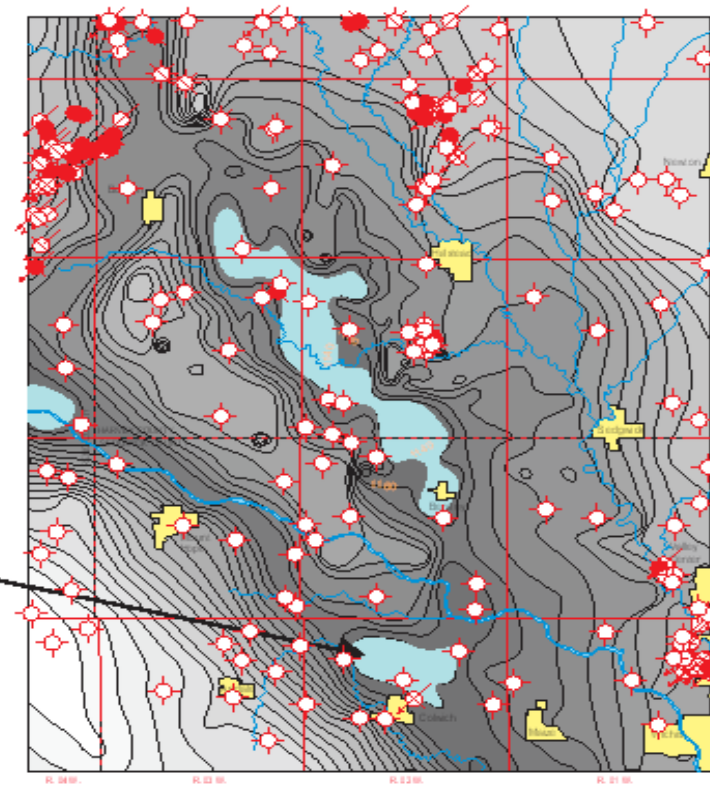


# Abandoned Arbuckle Wells

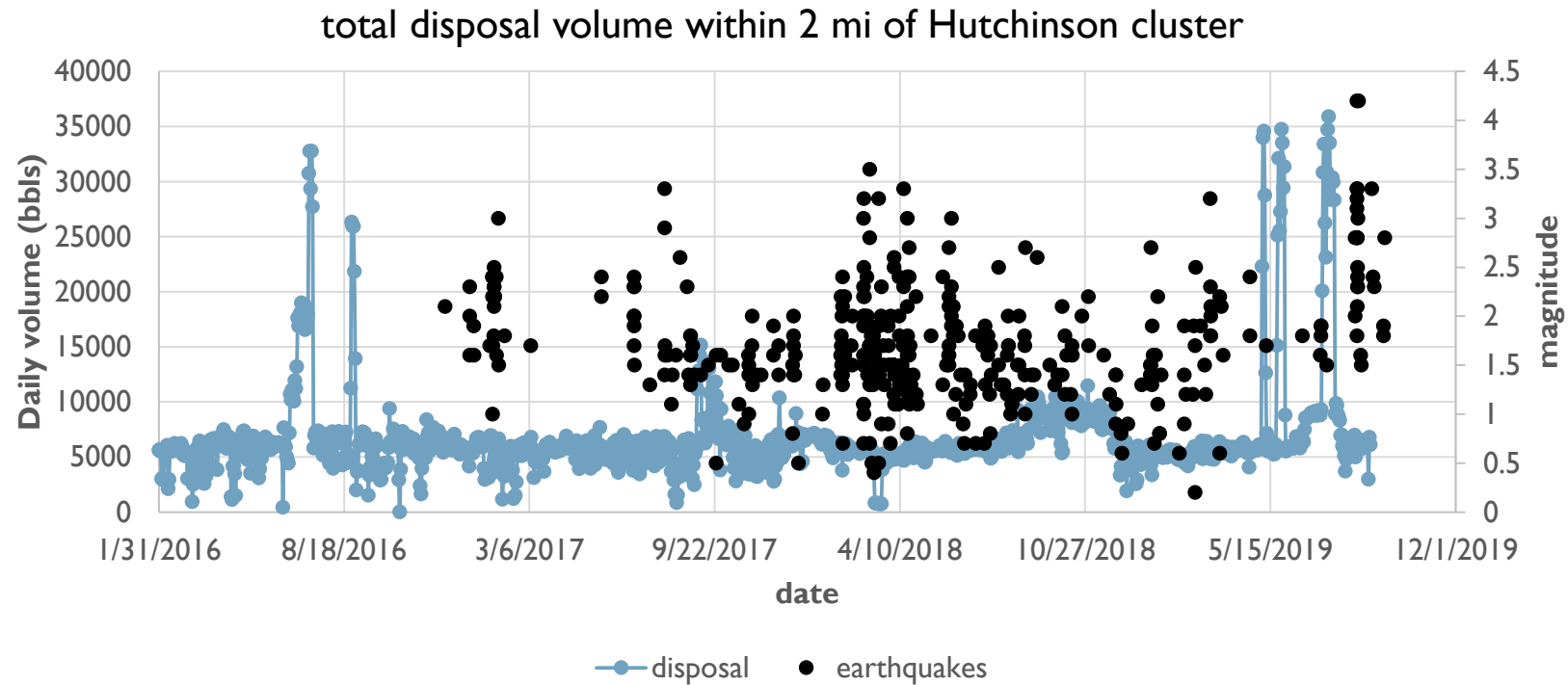
*KCC increase in activity  
looking for and plugging  
abandoned wells*

areas where Arbuckle  
fluid levels are at or  
above shallow aquifer

Arbuckle disposal wells NW of Wichita



# Injection Patterns and Seismicity



*injection patterns in Reno County and temporal (and spatial) earthquake patterns*

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