

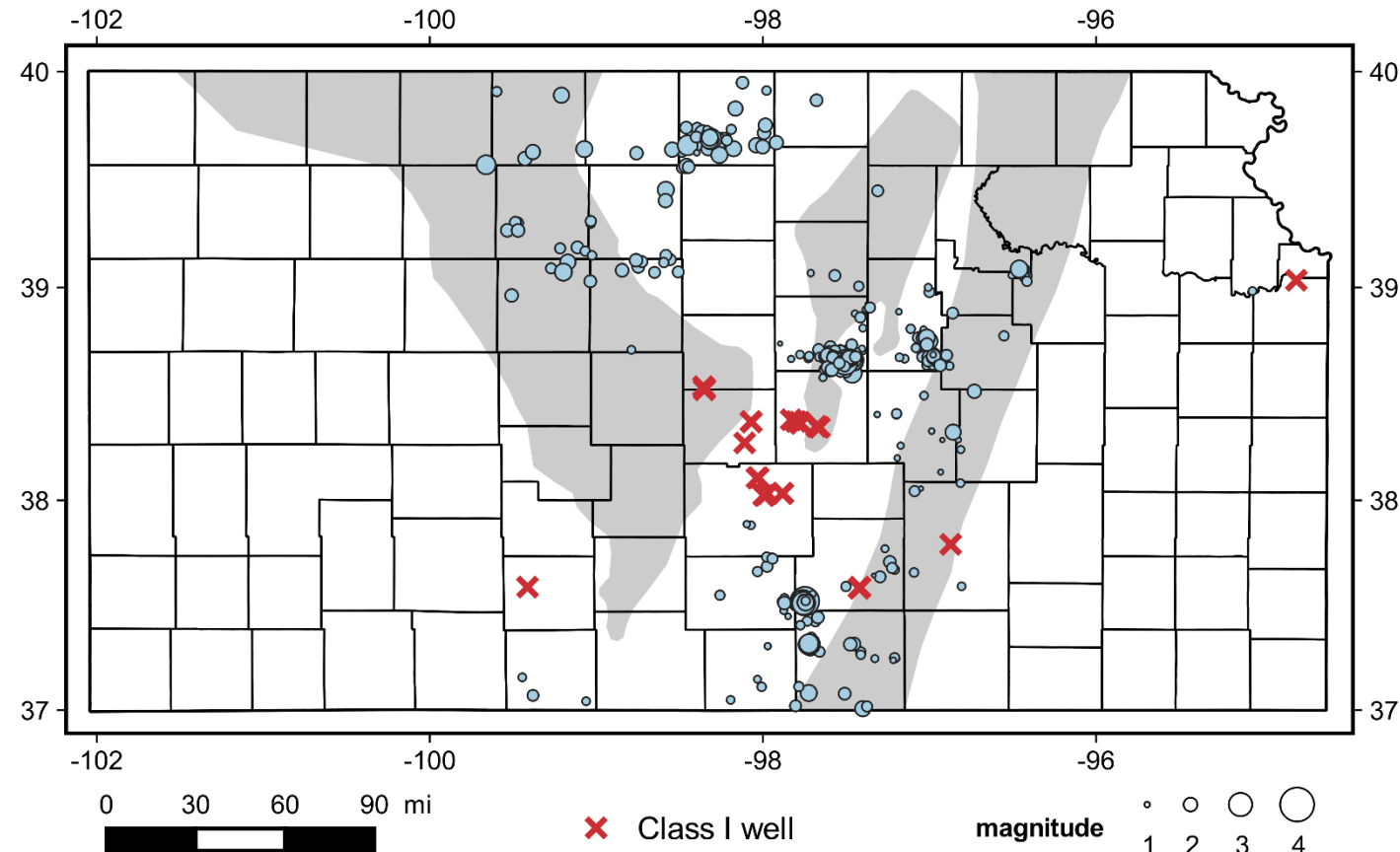
Consortium to Study Trends in Seismicity

Quarterly Report January 1 to March 31, 2022

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

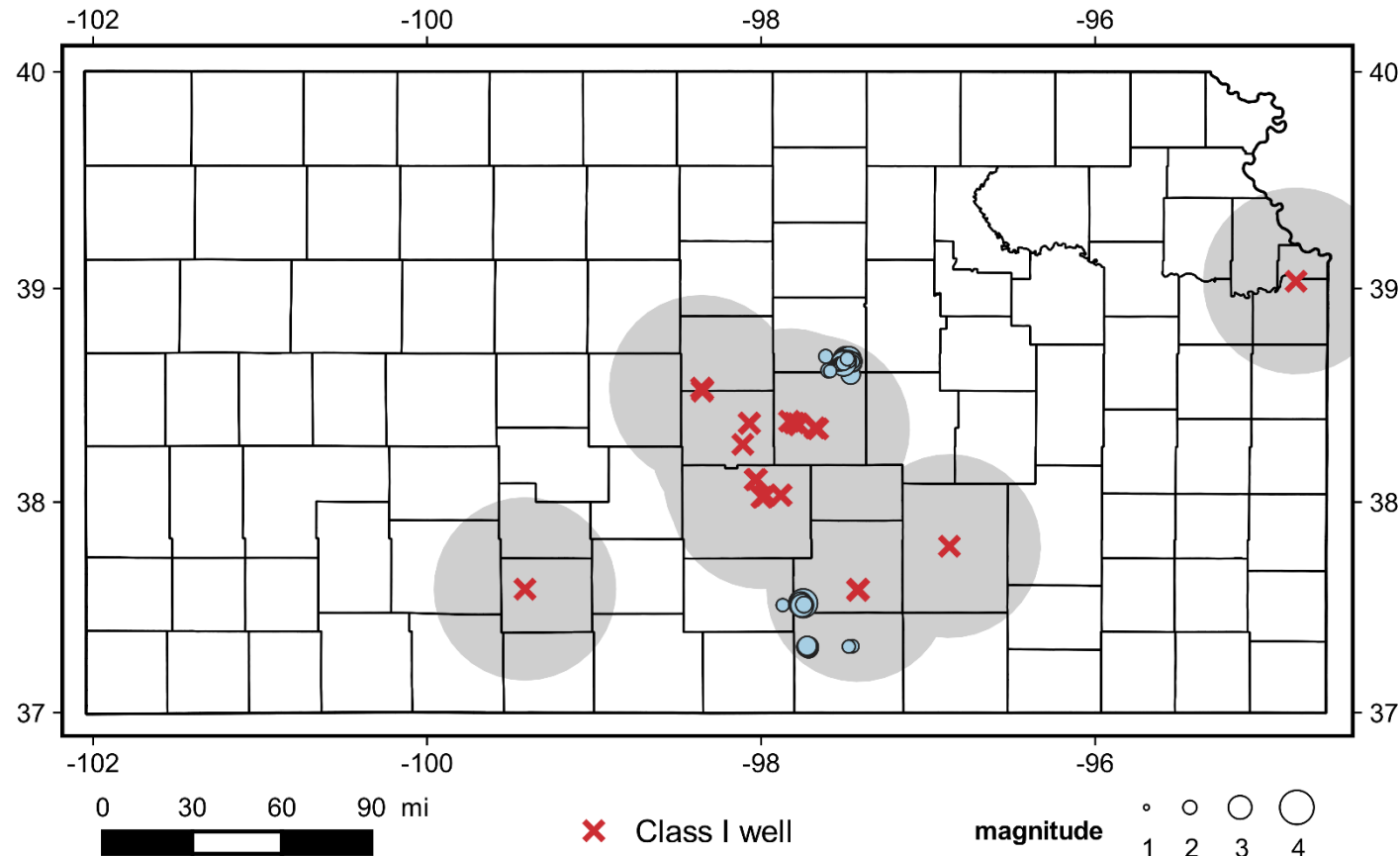


Statewide Earthquakes



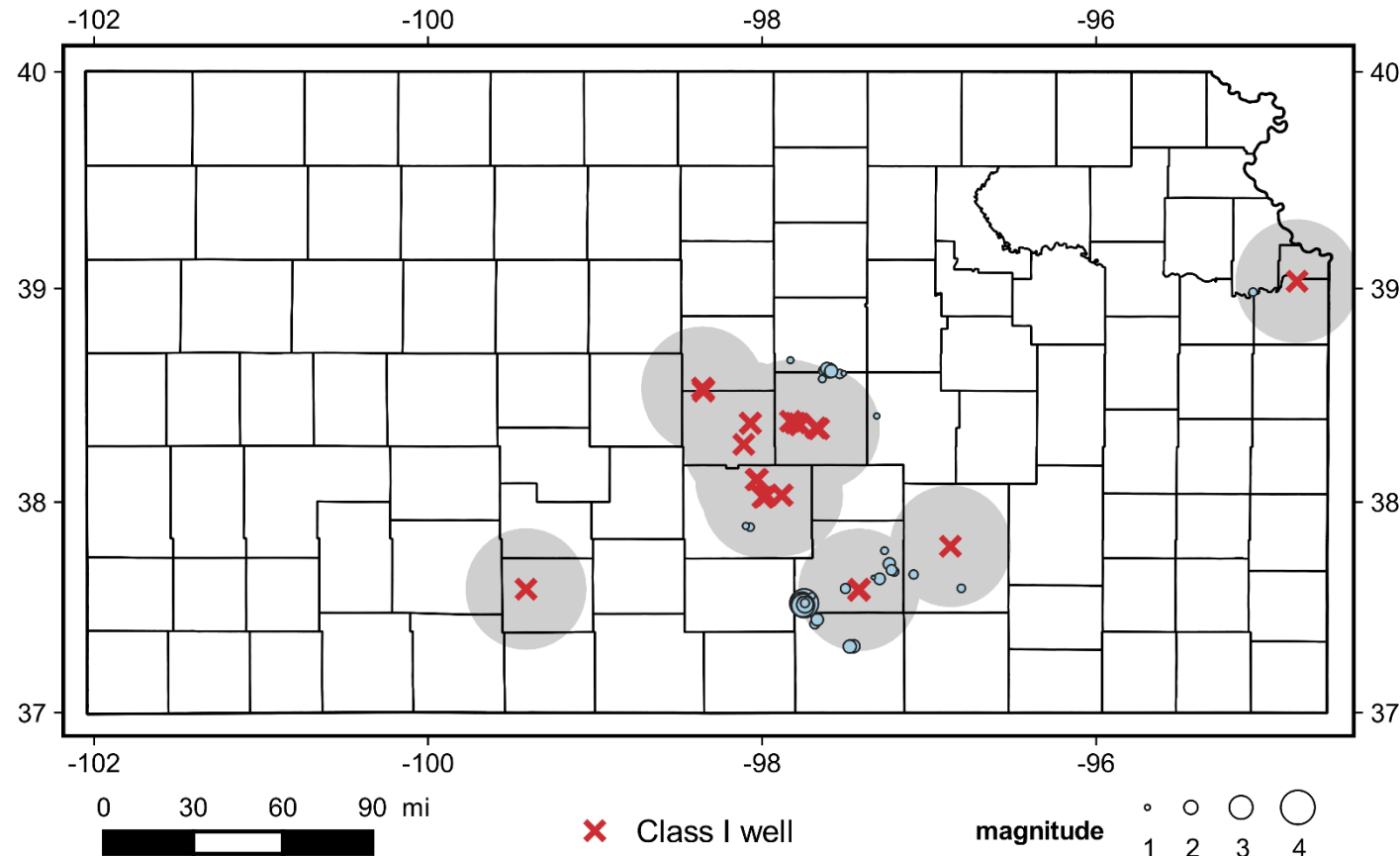
- Statewide earthquakes
 - This quarter: 477
 - Last quarter: 676
- Fewer in Saline County
- Largest: M 3.7 near Cheney
 - Three M 3+
 - a dozen M 2

CSTS Alerts



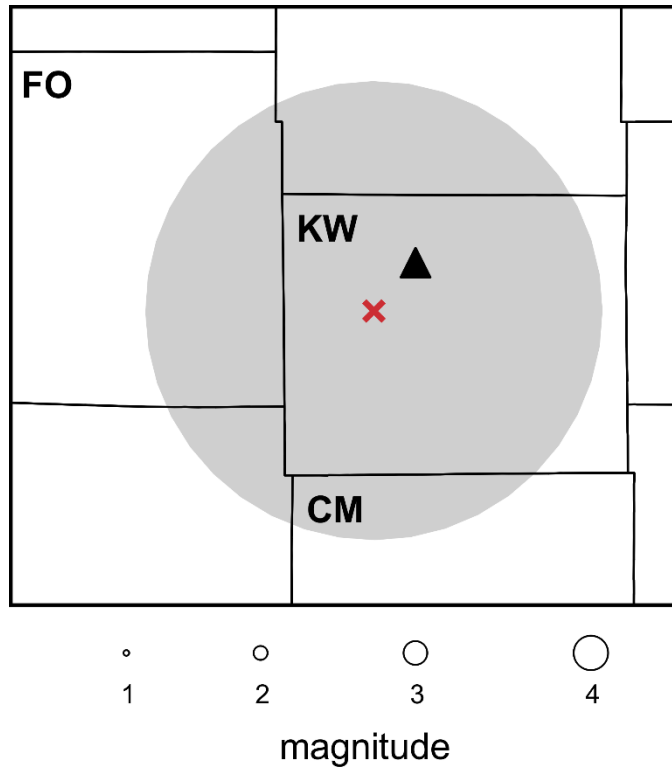
- Criteria
 - $M \geq 2$
 - 30 mi of tier I wells
- Alerts
 - This quarter: 67
 - Last quarter: 141

Earthquakes Within 20 miles



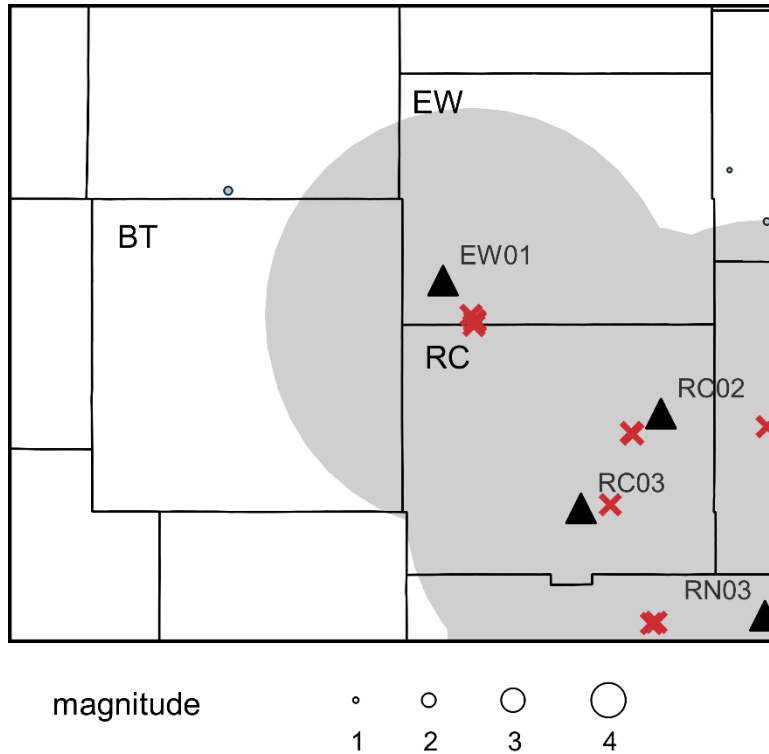
- Earthquakes w/in 20 mi
 - This quarter: 69
 - Last quarter: 12
- Primarily from Cheney cluster

Kiowa County



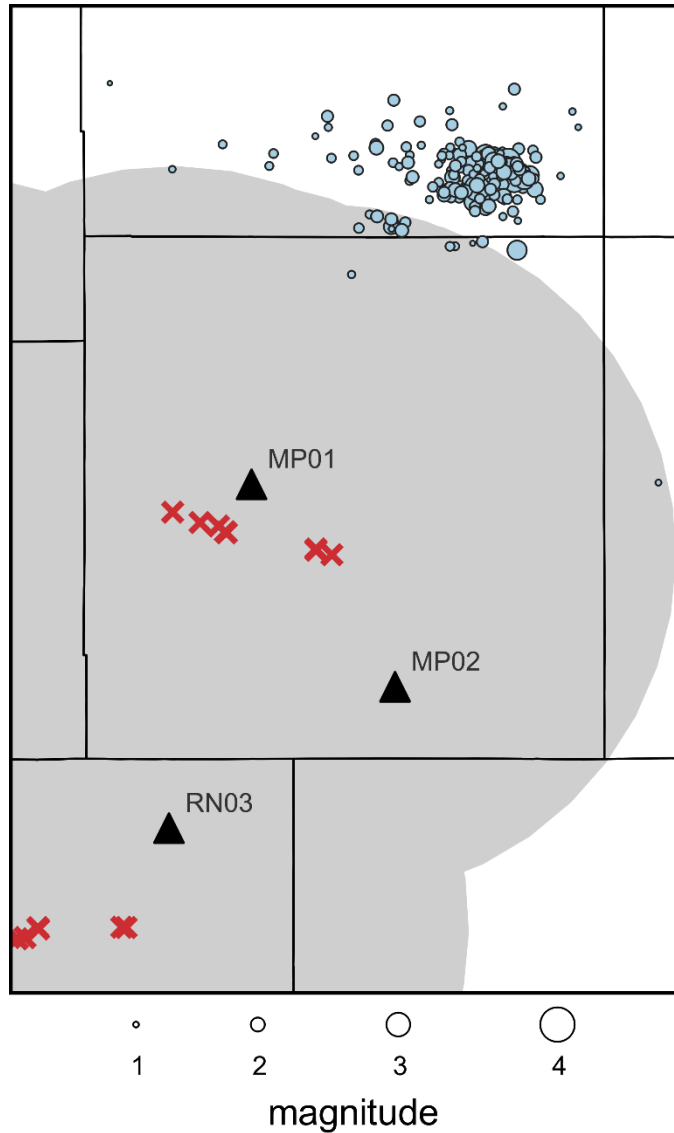
- Located earthquakes
 - None
- Subnetwork events
 - $3 M < 0$
 - 1.2 to 3.4 mi
- Consistent with past observations

Rice and Ellsworth Counties



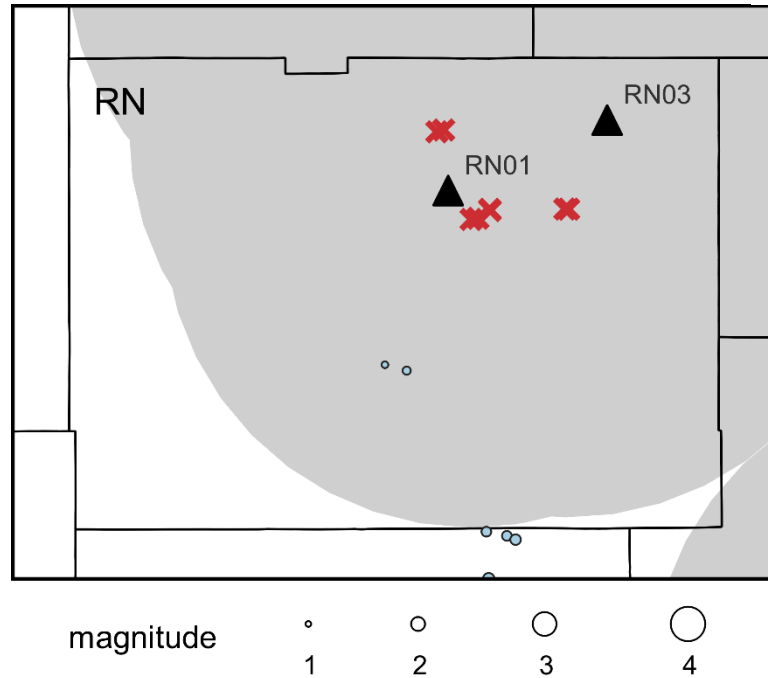
- Located earthquakes
 - none w/in 20 mi
 - continued seismicity in RS
- Subnetwork events
 - EW01: 1
 - RC02: 3
 - RC03: 4, largest M 0
- Reduced seismicity in RS

McPherson County



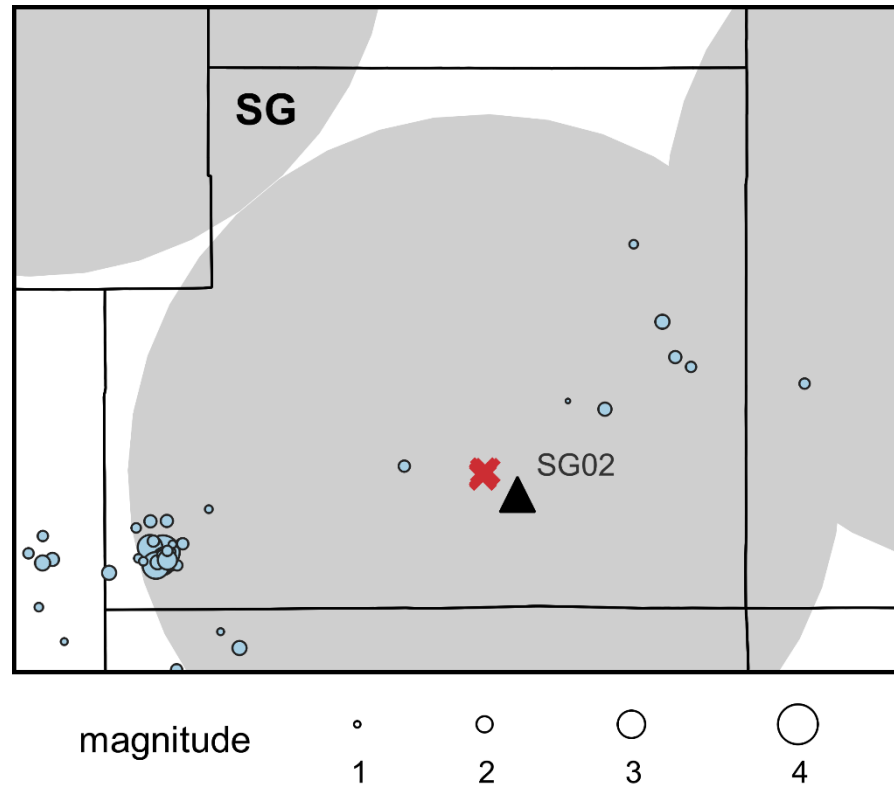
- Located earthquakes
 - 16, M 1.0 to 1.2
 - >15 miles from wells
 - consistent with MGA
- Subnetwork events
 - MP01: 10, largest M 0.1
 - MP02: 7, all M < 0
 - Subzero
- Similar to previous quarters, slightly elevated

Reno County



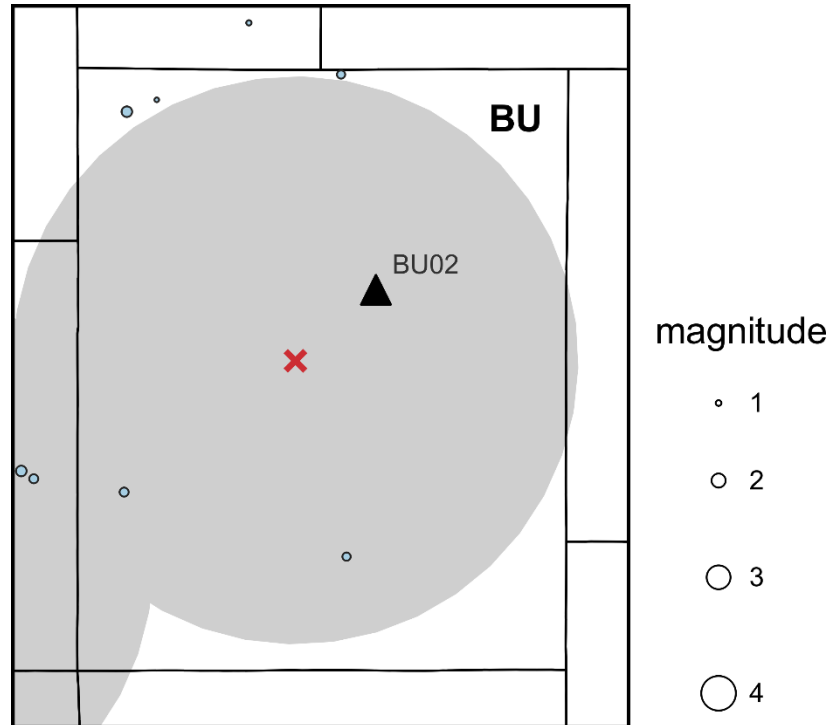
- Located earthquakes
 - 2 earthquakes
 - largest = M 1.4
- Subnetwork events
 - RN01: 7
 - RN03: 12
- Seismicity continues to be low
 - M2+ since last quarter

Sedgwick County



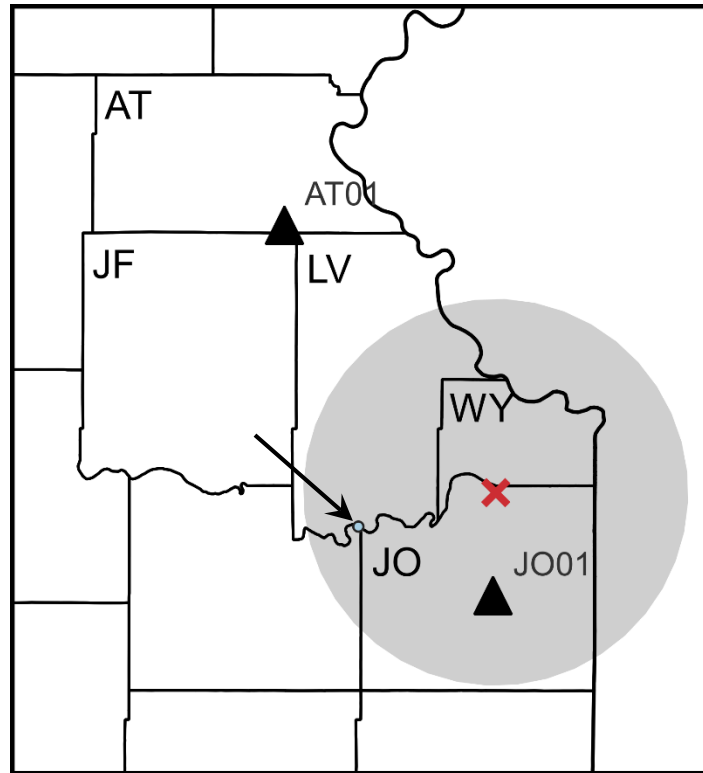
- Located earthquakes
 - 49 events
 - 12 M 2-2.9
 - 4 M 3+ (largest = M 3.7)
 - only 2 previous quarter
- Subnetwork events
 - 19 events $M \leq 0$
 - less than 2 mi from SG02
 - most from January 2-3

Butler County



- Located earthquakes
 - 2, M 1.4 and 1.5
- Subnetwork events
 - 29 events, < 2 mi
 - majority Jan 2 and Feb 23

Johnson and Atchison Counties



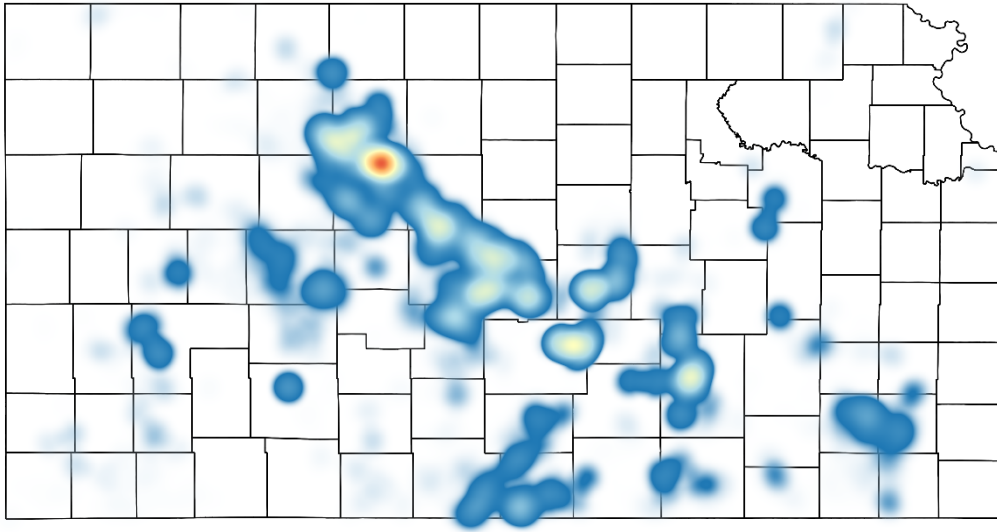
magnitude

- 1
- 2
- 3
- 4

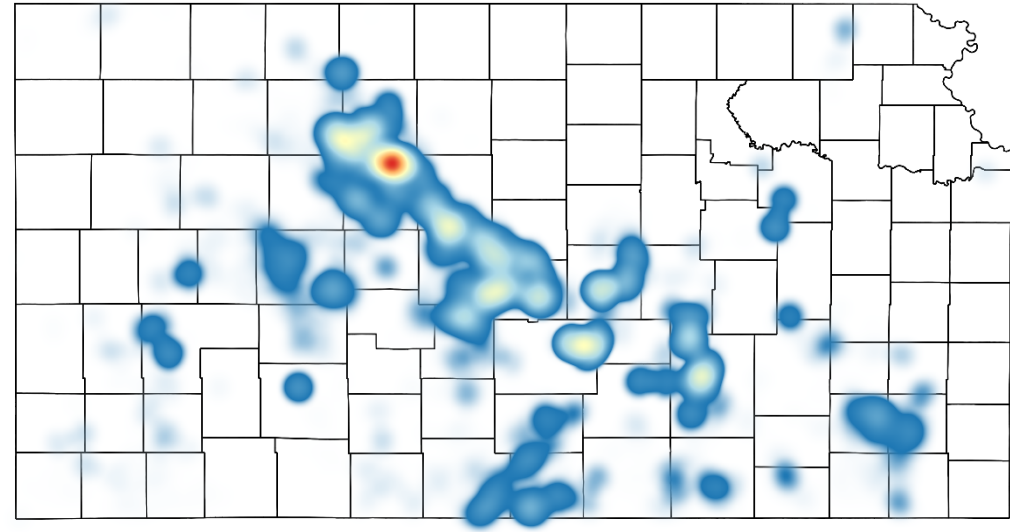
- Located earthquakes
 - one
 - M 1.4 in DG
- Subnetwork events
 - 5 in JO $M \leq 0.1$
 - 2 in AT $M < 0$

Disposal Volumes

2020

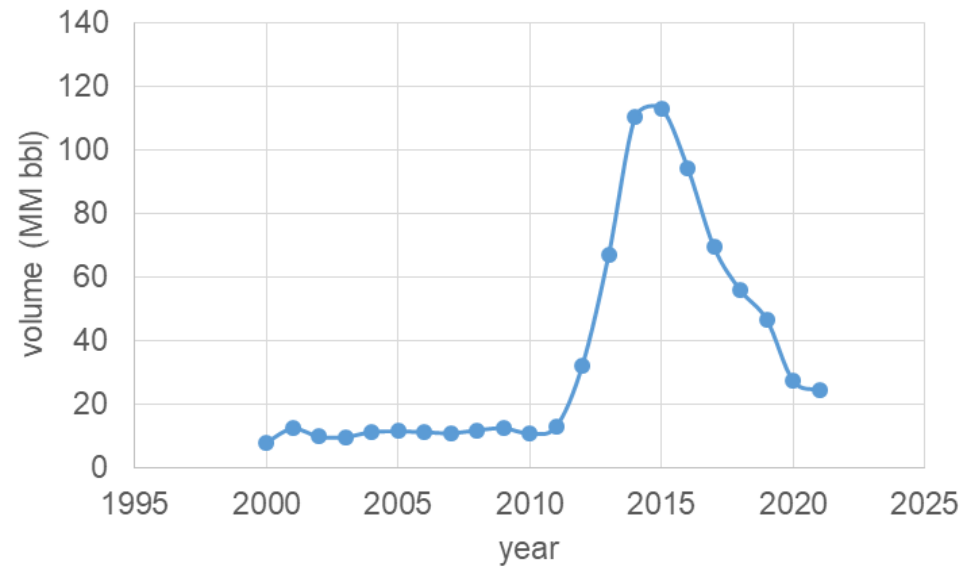


2021

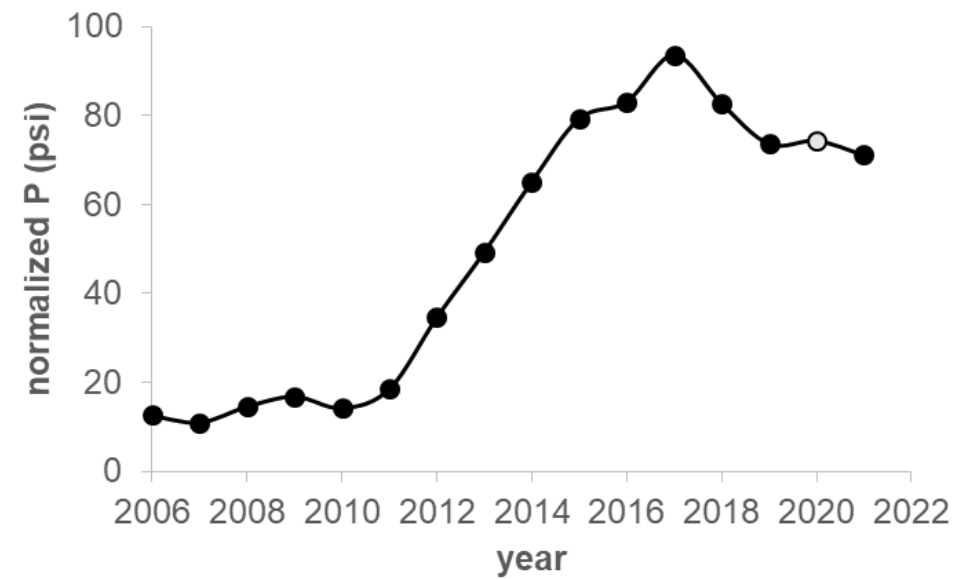


Harper County

Disposal Volume



Arbuckle Formation Pressure



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