

Consortium to Study Trends in Seismicity

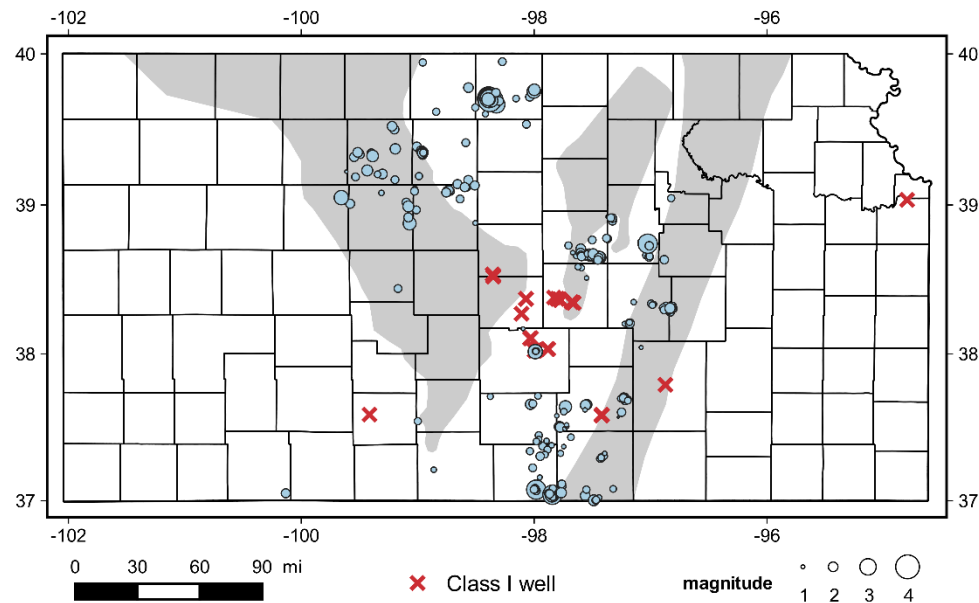
Quarterly Report July 1 to December 31, 2021

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

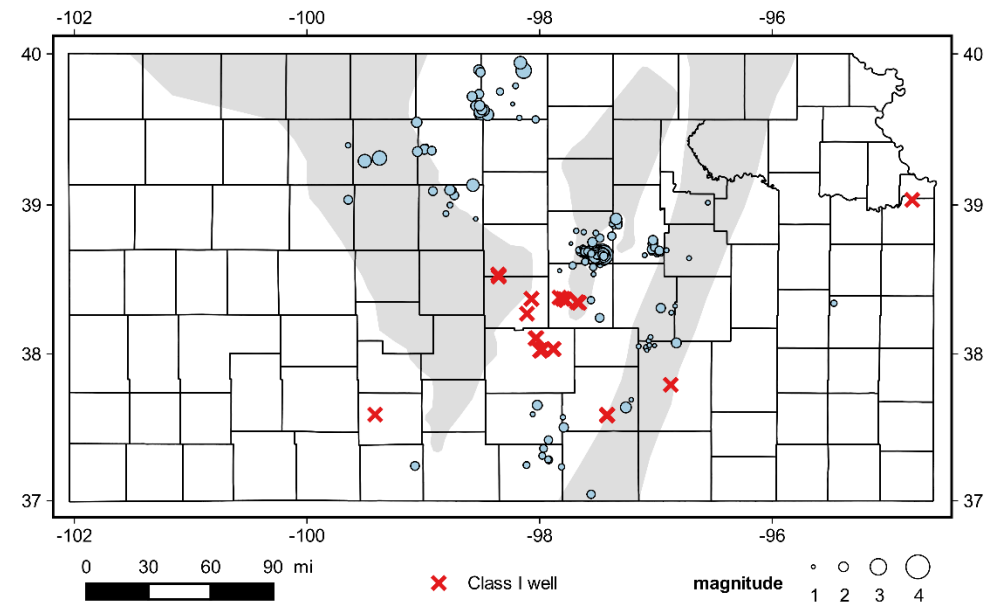


Statewide Earthquakes

2021 Q3 = 309



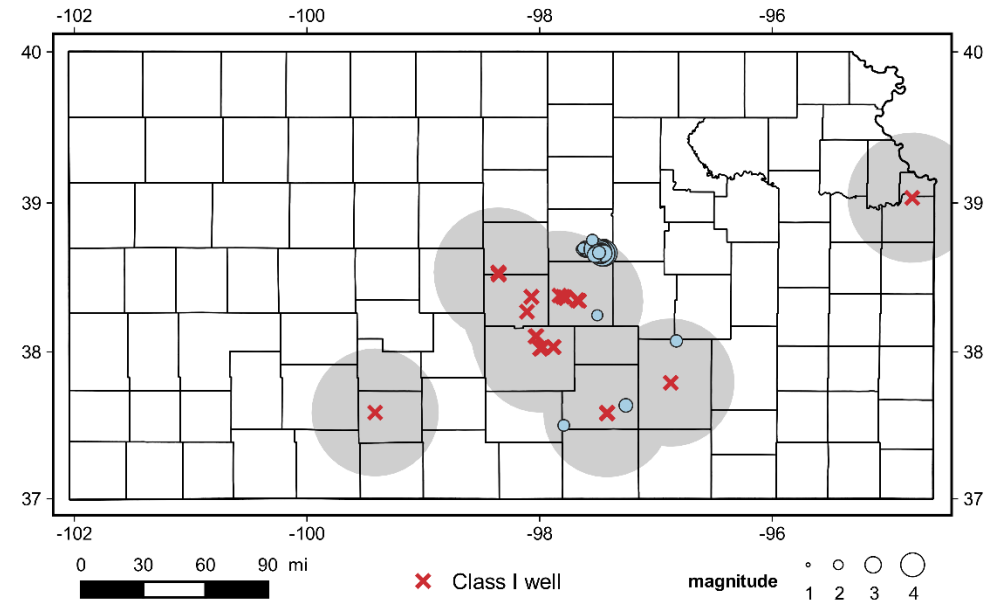
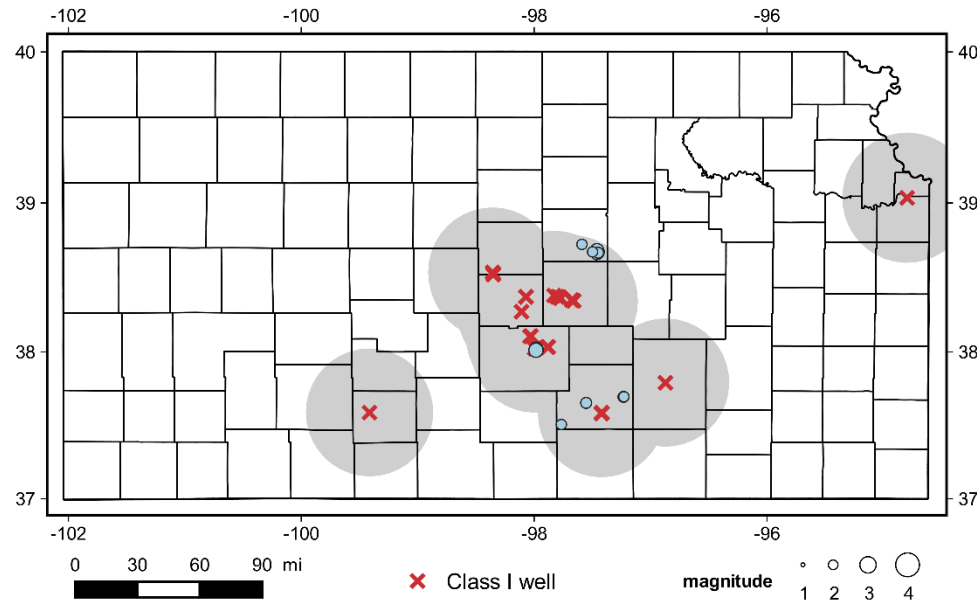
2021 Q4 = 463



CSTS Alerts

2021 Q3 = 15

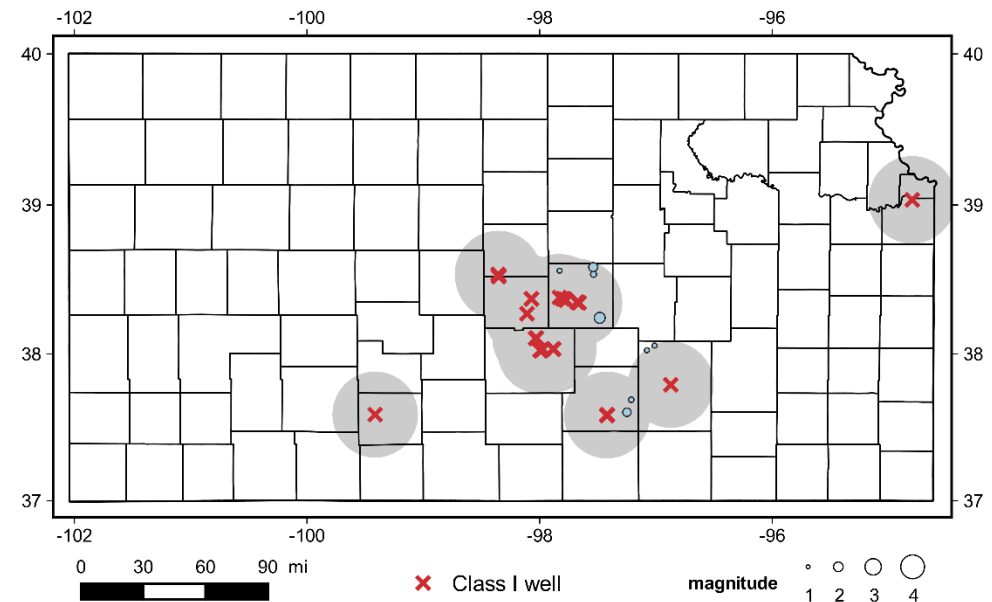
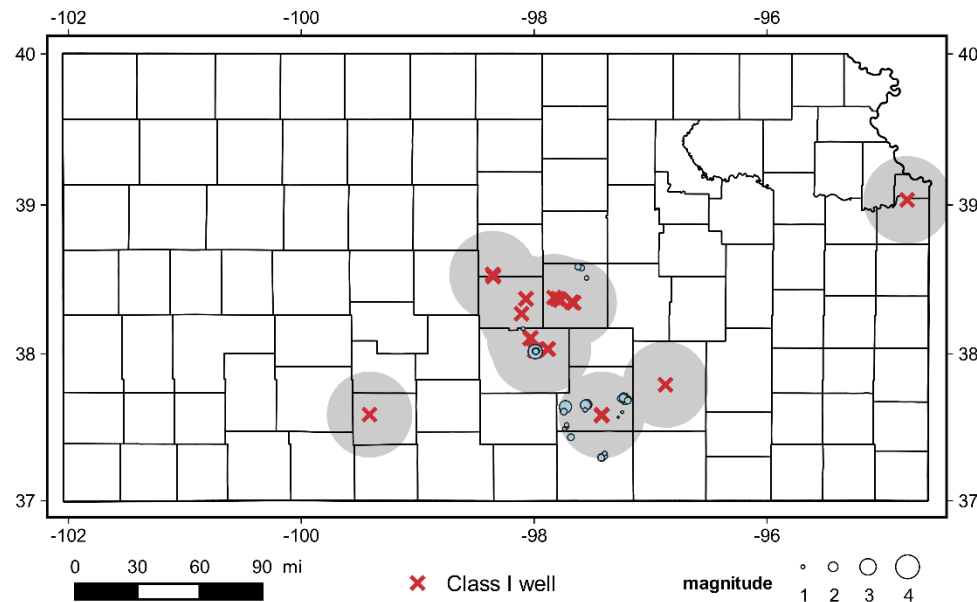
2021 Q4 = 138



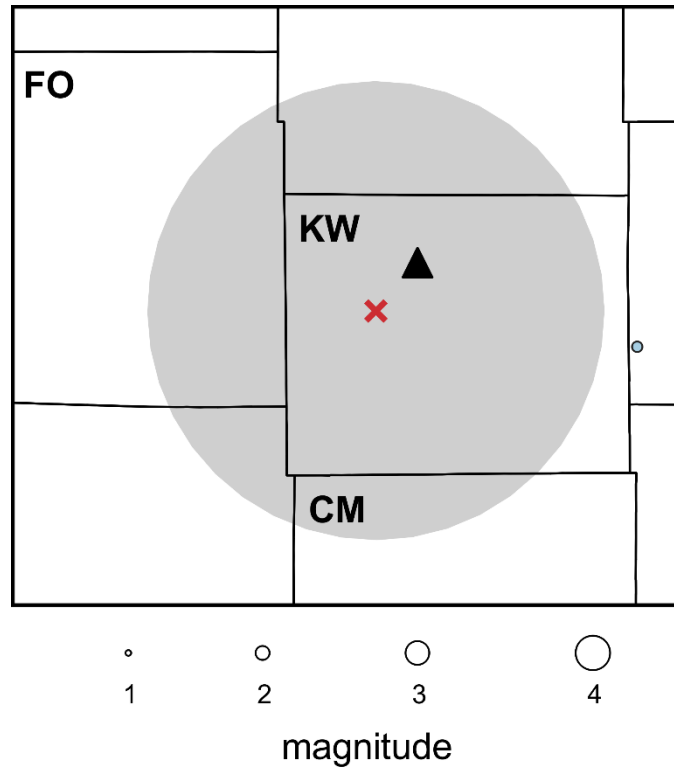
Earthquakes Within 20 miles

2021 Q3 = 53

2021 Q4 = 12

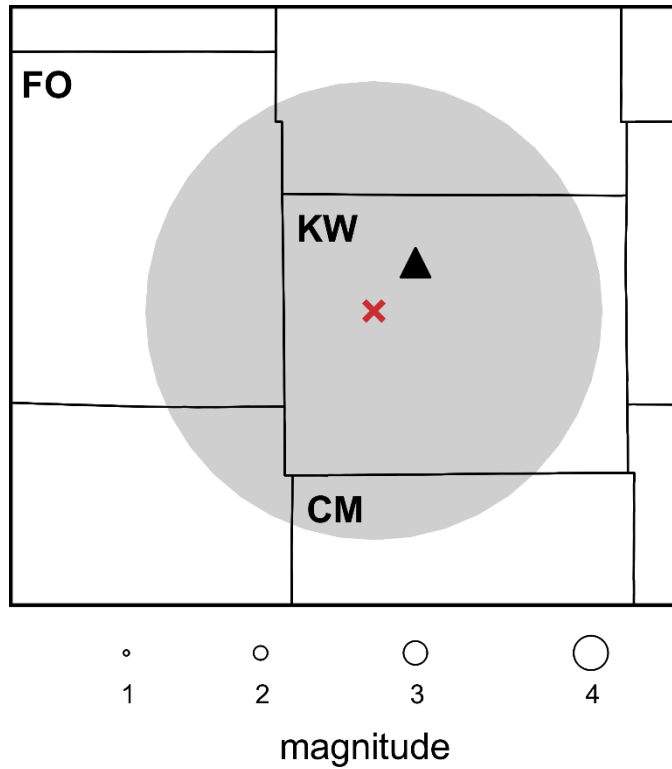


Kiowa County: 2021 Q3



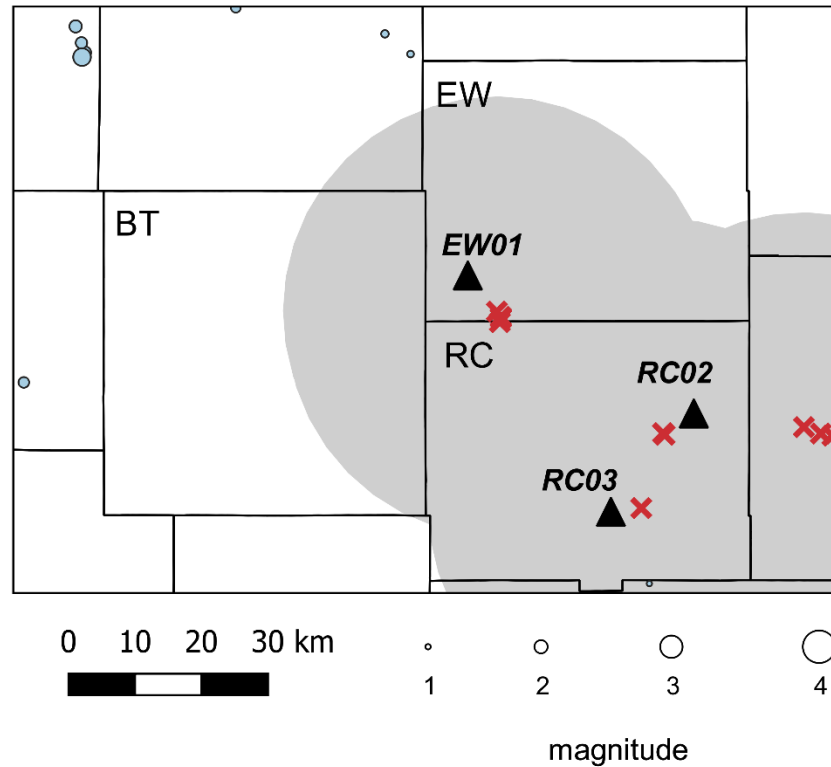
- Located earthquakes
 - none
- 3 Subnetwork events
 - M -0.4 to -0.2
 - 2.3 to 4.7 mi
- Consistent with past observations

Kiowa County: 2021 Q4



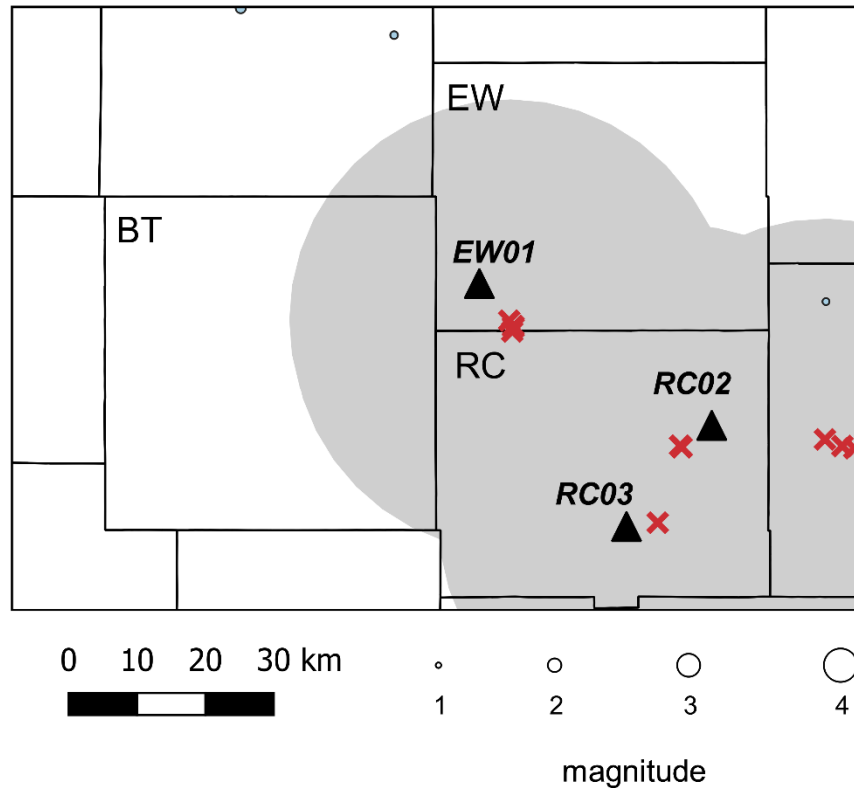
- Located earthquakes
 - none
- Subnetwork events
 - none

Rice and Ellsworth Counties: 2021 Q3



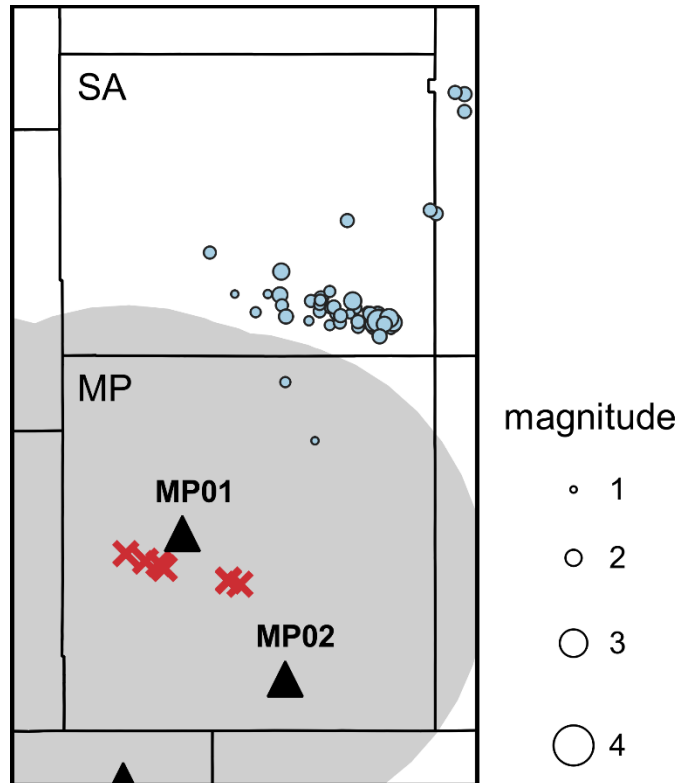
- Located earthquakes
 - none w/in 20 mi
- Subnetwork events
 - EW01: 8
 - RC02: 12, largest M 0.1
 - RC03: 5
- Slight uptick at RC02

Rice and Ellsworth Counties: 2021 Q4



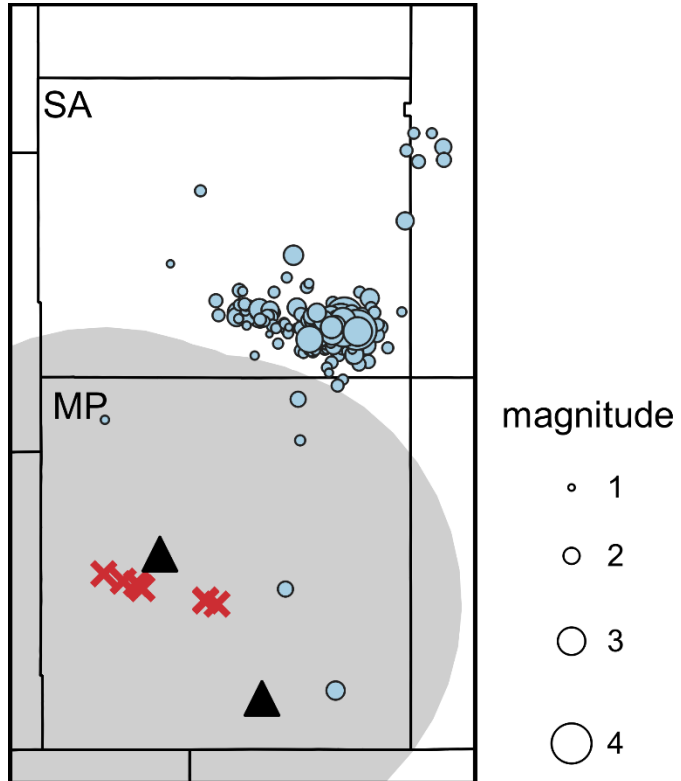
- Located earthquakes
 - None w/in 20 mi
- Subnetwork events
 - EW01: 1
 - RC02: 6
 - RC03: 3
- Mostly consistent with past observations

McPherson County: 2021 Q3



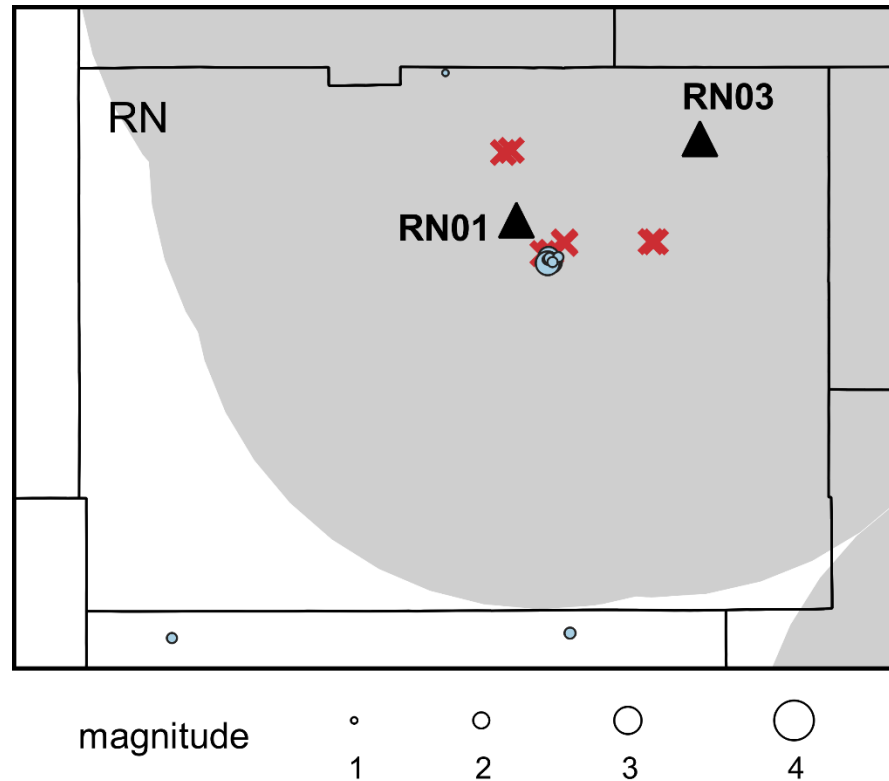
- Located earthquakes
 - 2, M 1.1 to 1.4
 - >15 miles from wells
 - consistent with MGA
- Subnetwork events
 - MP01: 1.1
 - MP02: 1.2
 - subzero
- Consistent with past observations

McPherson County: 2021 Q4



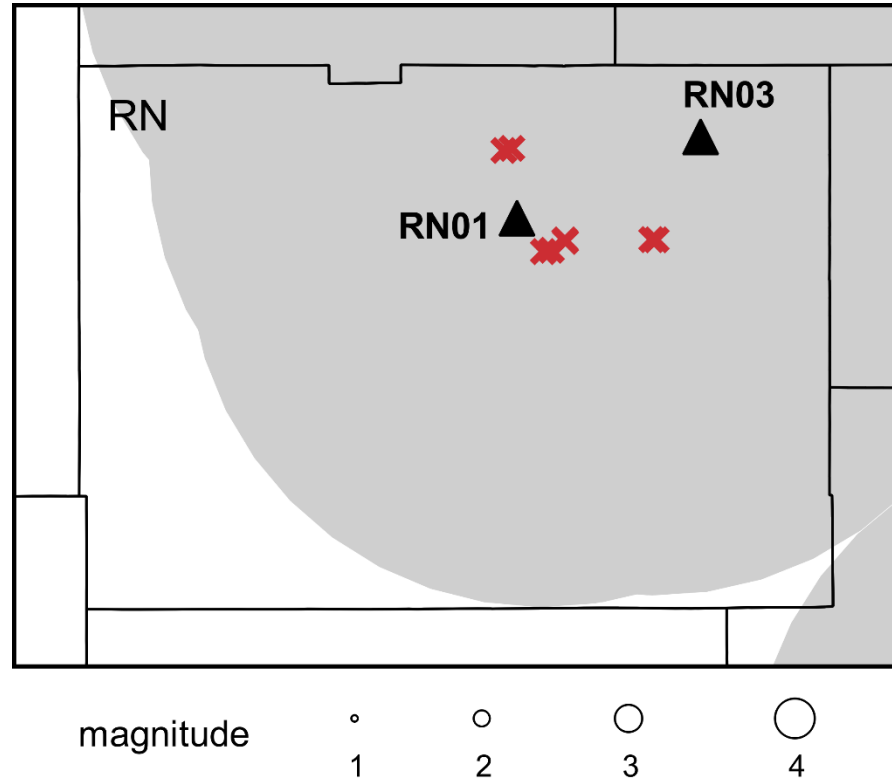
- Located earthquakes
 - 4, M 1.2 to 2.2
 - >15 miles from wells
 - consistent with MGA
- Subnetwork events
 - MP01: 10 (Largest M 0.3)
 - MP02: 7 (Largest M 0.0)
- Consistent with past observations

Reno County: 2021 Q3



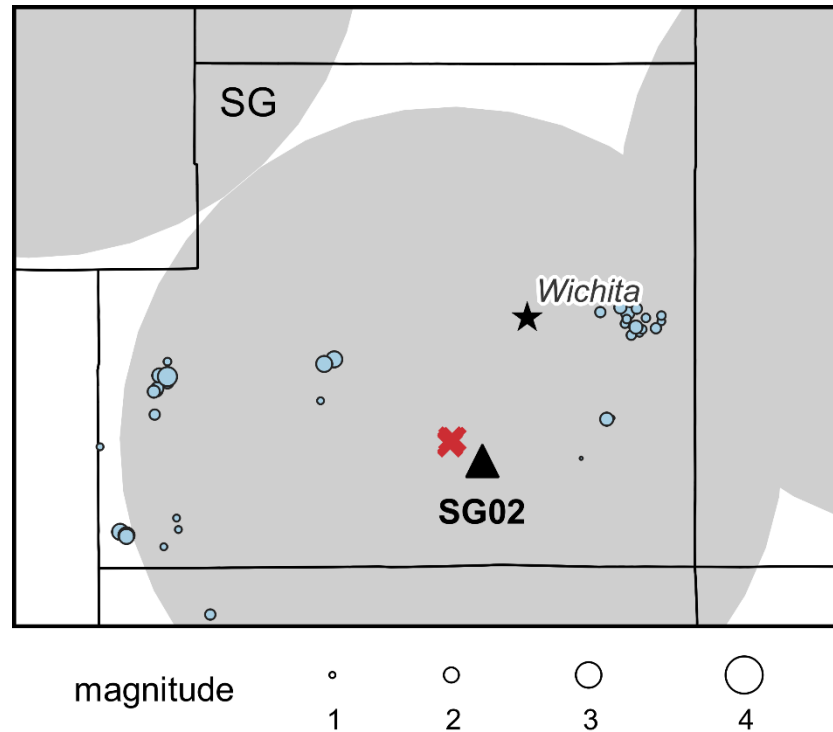
- Located earthquakes
 - 9 earthquakes
 - largest = M 2.7
- Subnetwork events
 - RN01: 26
 - consistent with the Hutchinson cluster
 - More than previous quarter
 - RN03
 - 5 M < 0

Reno County: 2021 Q4



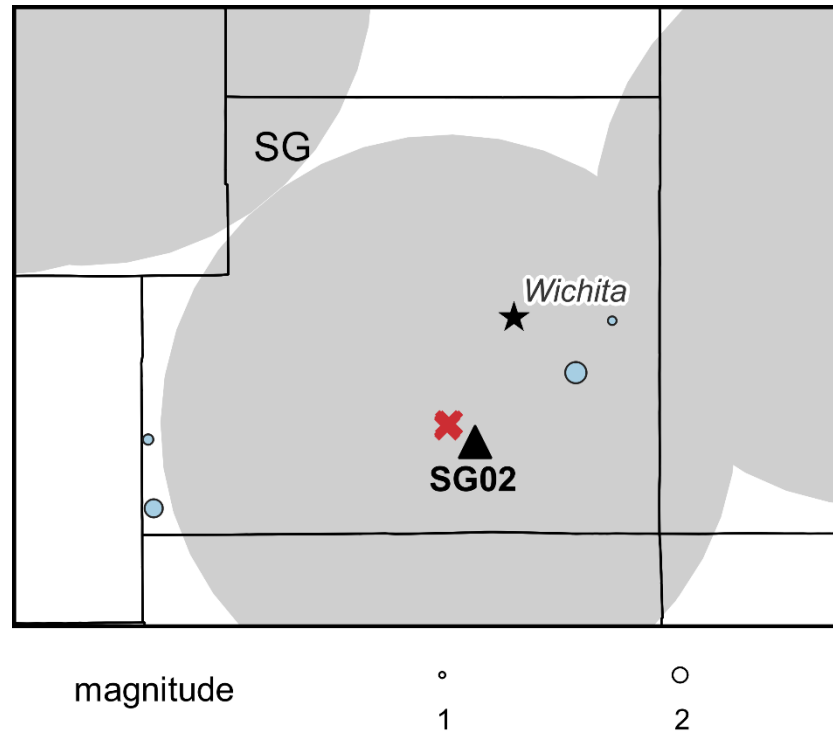
- Located earthquakes
 - None
- Subnetwork events
 - RN01: 3
 - Much less than historic average
 - RN03
 - $2 M < 0$

Sedgwick County: 2021 Q3



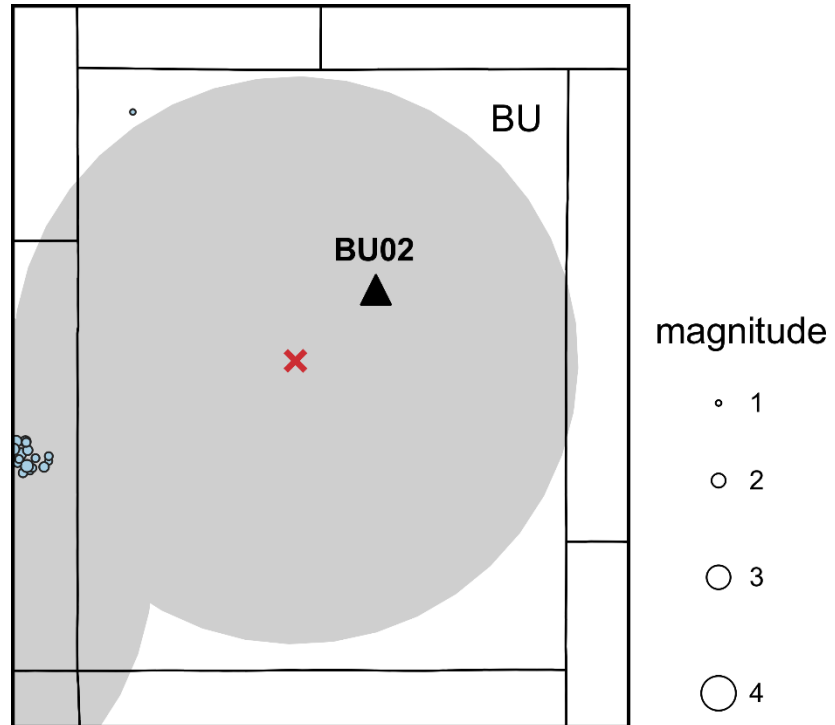
- Located earthquakes
 - 42 events
 - $M < 1$ to $M 2.4$
 - 3 $M2+$
 - 11 previous quarter
- 3 Subnetwork events
 - largest $M 0.4$
 - 2 mi to 12 mi (Wichita)

Sedgwick County: 2021 Q4



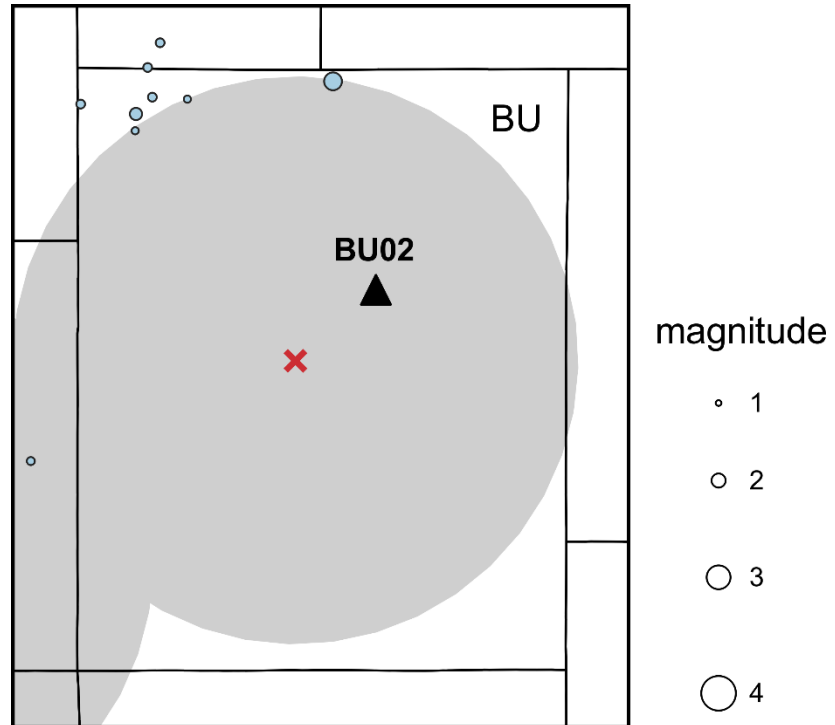
- Located earthquakes
 - Two, M 1.3-2.6
- One Subnetwork event
 - M -0.2
 - 4.2 mi

Butler County: 2021 Q3



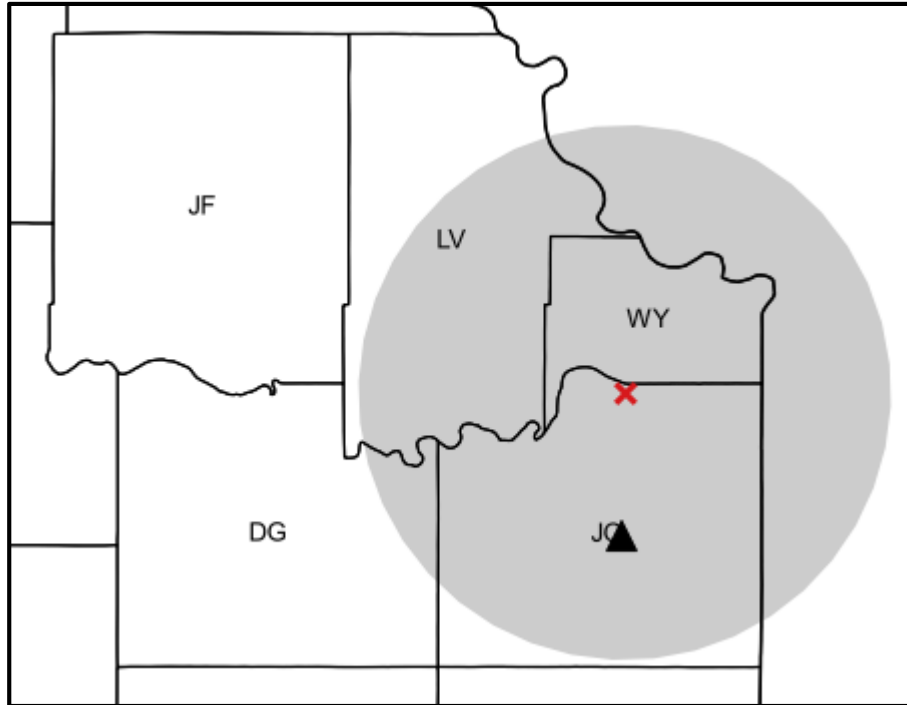
- Located earthquakes
 - none in BU
- Subnetwork events
 - BU02: 4
 - 4-11 mi
 - Largest M 0.7 (4 mi)
 - consistent with previous

Butler County: 2021 Q4



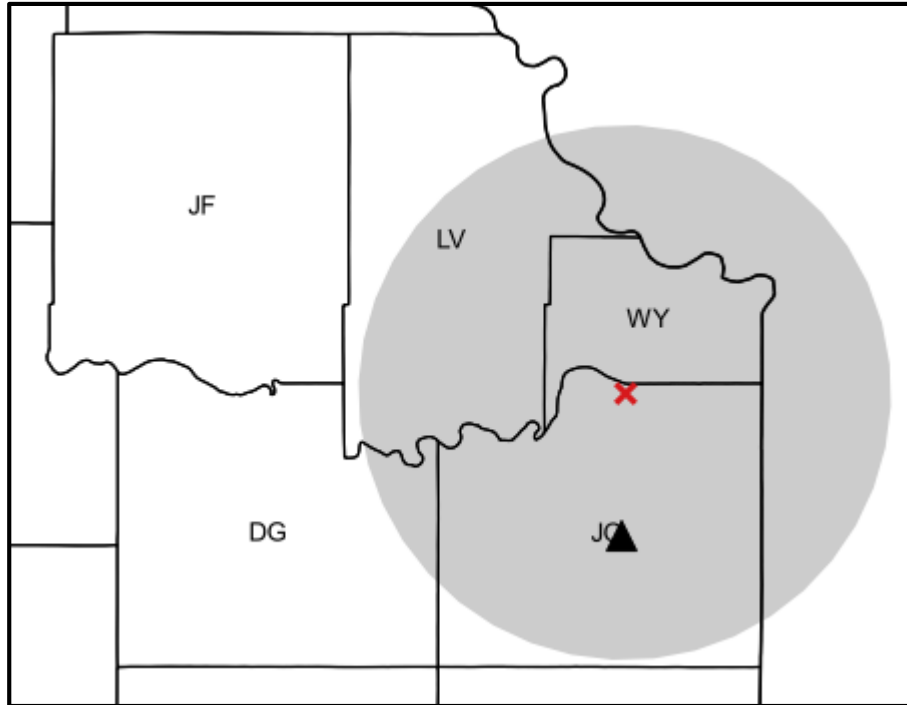
- Located earthquakes
 - three in northwest BU
 - M 2.4
 - consistent with low-energy
- Subnetwork events
 - BU02: 1
 - 9 mi
 - consistent with previous

Johnson County: 2021 Q3



- Located earthquakes
 - none
- Subnetwork events
 - none

Johnson County: 2021 Q4



- Located earthquakes
 - none
- Subnetwork events
 - $M < 0$
 - 1 mi

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