

Variations in Microseismic Monitoring Response, Eagle Ford, South Texas

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Abstract

Observations from Microseismic surveys in the Eagle Ford show dramatically different results in two wells that were expected to have a similar response. Two wells were monitored using downhole equipment in dedicated listening wells. The updip well in Frio County is 16 miles north of the downdip well in La Salle County. Over this distance there is no marked change in mineralogy and the two wells had the same

- stratigraphic zone
- well orientation
- drilling and casing design
- geophysical monitoring equipment, and
- similar frac design.

However, the Eagle Ford fractured with vastly different intensity and frequency in the two microseismic locations, with the up dip well having fewer and lower magnitude events.

We assume that the microseismic accurately recorded fracturing in the Eagle Ford Shale. The differences between the two wells must be due to different rock mechanics in the two portions of the shale basin.

- Possible contributing factors could include:
- Pore pressure may account for the number and magnitude of microseismic events
- Partially depleted Austin Chalk updip
- Updip Eagle Ford is more Naturally Fractured than downdip
- Depth in the basin
- Higher pressure

Our observation is that microseismic events vary predictively with location within a basin. This has implications for the design of and expectations for future updip microseismic monitoring as the industry continues to explore the oil window of shale basins.