**Predicting Induced Seismicity in the Eagle Ford Shale Play**

Despite several decade of oil and gas development in the South Texas Eagle Ford Shale Trend, there has been a relatively recent increase and severity of induced earthquakes since 2018 (Fasola et al 2019). For my Data Science Immersive capstone project, I created two models to forecast and better understand the drivers and mechanisms of the seismicity in Karnes County, TX: a SARIMAX model and Recurrent Neural Network model.

For each model, I experimented with various target representations of the seismicity along with exogenous features that represented both oil and gas activity and operator completion (frac) parameters. In testing parameters for each model, the best target to model for was Daily Average Magnitude of seismicity, and the feature that led to the highest correlation with the best model was the Average Volume of Water Injected per Lateral Horizontal Foot. In the image here, I show a possible link between the amount of water injected per foot of completed lateral and the Daily Average Magnitude of earthquakes in Karnes. While these results are preliminary, the relationship is supported by findings published in Fasola et al 2019.