

Geomechanical Properties of Mesozoic Rift Basins: Applications for Geosequestration

Award Number: DE-FE0023334

Project Summary:

This project aimed to develop geomechanical characterization methodologies by combining laboratory rock core testing with downhole tools that determine the strength of rock formations. Data from these tests was planned to be used to model the behavior of caprocks encountered in the Newark Basin in New York. Specifically, the project objective was to study the potential effects that fluid injection would have on the in-situ stresses and faults in the basin and help to determine the ability of the target formation to accommodate the increase in pore pressure. The approach was expected to be applicable for evaluating geomechanical properties for similar basins, both onshore and offshore.

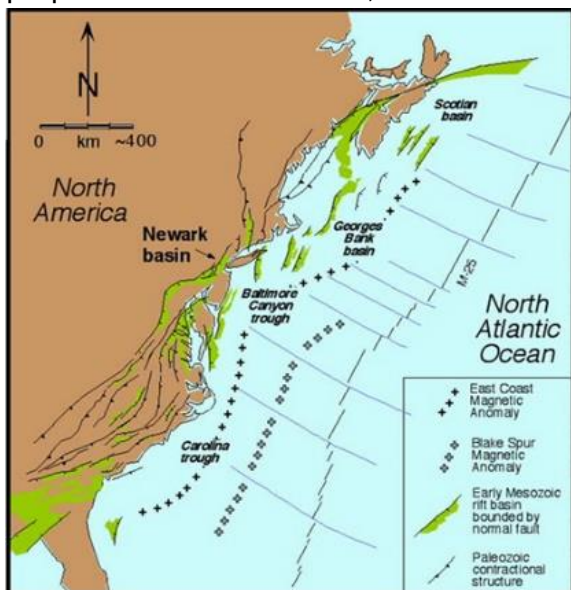


Figure 1: Location of the project basin (Newark) and other east coast rift basins where project results may be applicable.

Prime Performer:
Geostock Sandia, LLC

Principal Investigator:
Daniel Collins

Project Duration:
10/1/2014 – 4/30/2017

Performer Location:
Houston, Texas

Field Sites:
Newark Basin

Program:
Carbon Storage

Project Outcomes:

This project developed a geomechanical characterization methodology that combined laboratory characterization and rock core testing with novel wireline operations to measure in-situ stress conditions. Data from these tests were used to model the behavior of caprocks encountered in the Newark Basin in New York and to determine localized stress perturbations at reservoir scale. Borehole image logs provided geological information of bedding, faults, and micro-faults in the formations. The magnitude of in-situ stresses was measured in the test well using a wireline-deployed downhole testing system. Modeling tested the amount of pore pressure that could bring critically oriented fractures to failure. Understanding the seismic and leakage risks associated with injecting carbon dioxide at potential geological carbon storage sites will increase the storage security of injected fluids.

Presentations, Papers, and Publications

Final Report: [Geomechanical Characterization and Modeling of the Newark Basin](#) (April 2018) Daniel Collins, Natalia Zakharova, Dave Goldberg