Offshore Storage Resource Assessment

Award Number: DE-FE0026392

Project Summary:

The goal of this project was to perform a high-level quantitative assessment of the volume of carbon dioxide (CO_2) that can be stored in depleted oil and natural gas fields in the offshore federal waters of the Gulf of Mexico (GoM) on a field-by-field basis. The project was divided into two phases, Phase I addressed identifying and ranking depleted oil and natural gas fields in the offshore GoM, and phase II addressed the enhanced quantification of the CO_2 storage volume using a 4-component, compositional reservoir simulator (COZ) which account for CO_2-hydrocarbon phase behavior, CO_2 solubility in water, reservoir properties, and initial/current reservoir conditions (pressure, temperature, fluids in place).

Prime Performer:
NITEC, LLC

Principal Investigator:
Chet Ozgen

Project Duration:
10/1/2015 – 9/30/2017

Performer Location:
Denver, Colorado

Program:
Carbon Storage

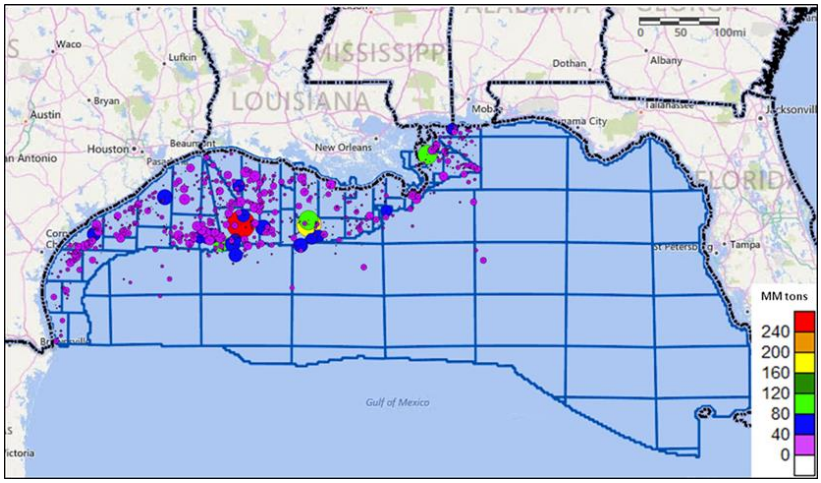

Figure 1: Map showing the location and storage potential of depleted fields.

Project Outcomes:

This study found that significantly more CO_2 can be stored in depleted gas reservoirs than depleted oil reservoirs, given similar reservoir conditions. As part of this project, new correlations were developed which will improve the ability to estimate the CO_2 storage capacity of oil and gas reservoirs which have realized some level of production to date. For the existing depleted reservoirs, the new correlation allows direct estimation of the CO_2 storage capacity. For the reservoirs that are still on production, an estimate can be made based on current cumulative production, however additional CO_2 storage will be possible due to further production of reservoir fluids. Based on the correlations developed in this project and the data provided in the U.S. Department of the Interior, Bureau of Ocean Energy Management reserves database, total CO_2 storage capacity in 675 depleted fields can range from 4,075 to 4,748 million tons (figure 1), depending on surface injection pressure (equipment) limitations.

Presentations, Papers, and Publications

Final Report: Offshore Storage Resource Assessment (December 2017) Bill Savage, Chet Ozgen