Southeast Offshore Storage Resource Assessment (SOSRA)

An SSEB Carbon Management Program

Presented to:

Southern States Energy Board Associate Members

Presented by:

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Carbon Management Program

2003 Chairman's Initiative

- Carbon capture and storage (CCS) research and development
  - Knowledge sharing through partnerships
  - Workforce development

Reduce atmospheric carbon dioxide (CO_2) from large, stationary sources and safely and permanently store CO_2 in suitable geologic formations

Carbon Management Program

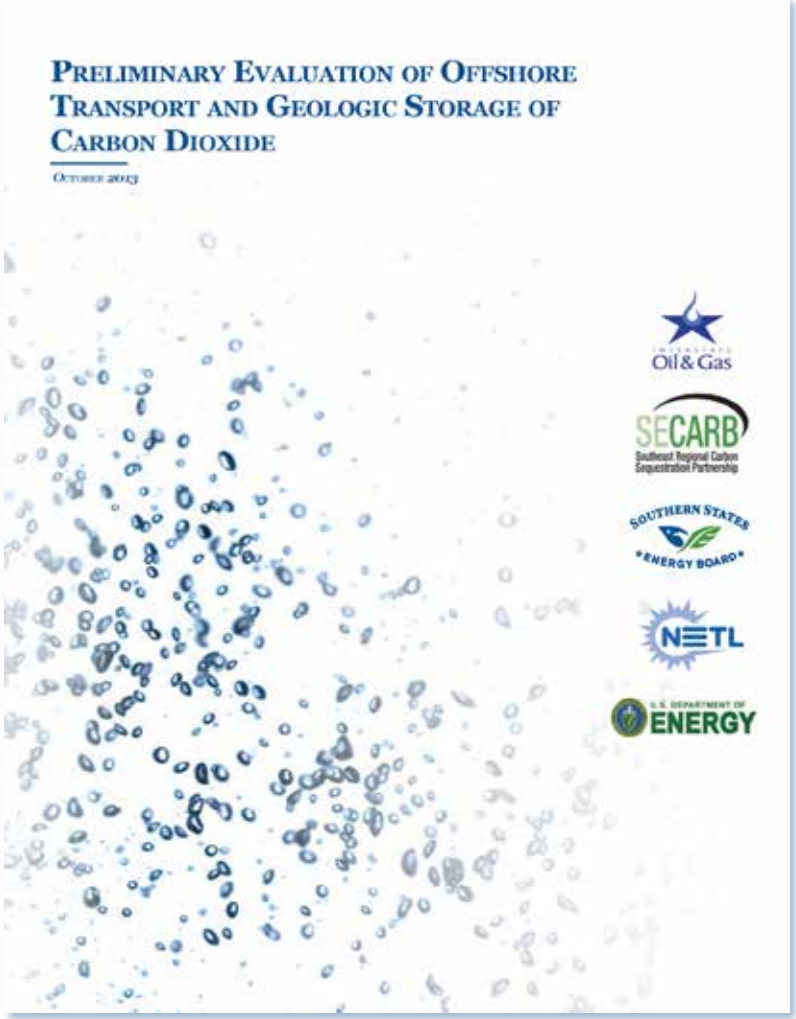
- SSEB manages the following projects:
  - Southeast Regional Carbon Sequestration Partnership (SECARB)
  - Southeast Regional CO_2 Sequestration Technology Training Program (SECARB-Ed)
  - **Southeast Offshore Storage Resource Assessment (SOSRA)**

- SSEB supports the following projects:
  - Central Appalachian Basin Unconventional (Coal/Organic Shale) Reservoir Small-Scale CO_2 Injection Test
    - Lead: Virginia Polytechnic and State University's Virginia Center for Coal and Energy Research
    - SSEB Support: Project management and outreach/education
  - Offshore CO_2 Storage Resource Assessment of the Northern Gulf of Mexico (Texas-Louisiana)*
    - Lead: Bureau of Economic Geology at The University of Texas at Austin
    - SSEB Support: Outreach and education

** Complementary Project to SOSRA*

SECARB Phase III Regional Assessments

- ***Preliminary Evaluation of Offshore Transport and Geologic Storage of Carbon Dioxide*** (SSEB/IOGCC, SECARB Phase III, Published October 2013)
- Other Regional Storage Assessments (SECARB Phase III)
  - Geologic Storage Resource
    - Data for Atlas (every two years)
    - Lower Tuscaloosa & Woodbine Formations – Gulf Coast states
    - South Carolina – Florida Area
    - Tertiary Gulf Coast Coals
    - Barnett Shale - Texas
    - Paleozoic Shale Gas Reservoirs - Alabama
    - Basal Sandstone - Tennessee
  - Characterization - Lower and Upper Cretaceous

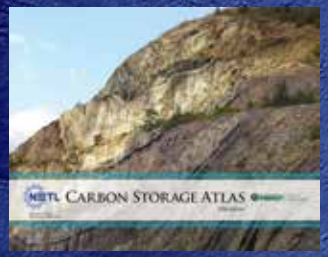


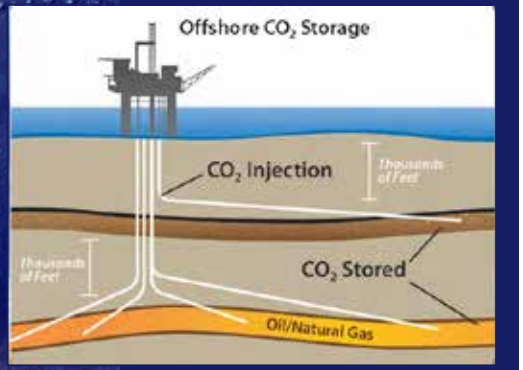
Advantages of Offshore CO_2 Storage

- Avoids issues with heavily populated, onshore areas.
- Typically one owner for leasing and pipeline siting.
- Reduces difficulty of obtaining surface and mineral owner rights if on federal lands.
- Reduces risks to underground sources of drinking water.
- Formation fluid in offshore sediments is typically similar to sea water in terms of chemistry and salinity (30,000 to 40,000 ppm total dissolved solids).
- Utilizes existing infrastructure from natural gas and oil facilities and right-of-ways.
- Provides CO_2 storage in areas of many large, stationary CO_2 sources along coastlines and areas that may have potentially limited options for onshore CO_2 storage.

Atlas V Offshore CO_2 Storage Potential

Offshore CO_2 Storage Potential



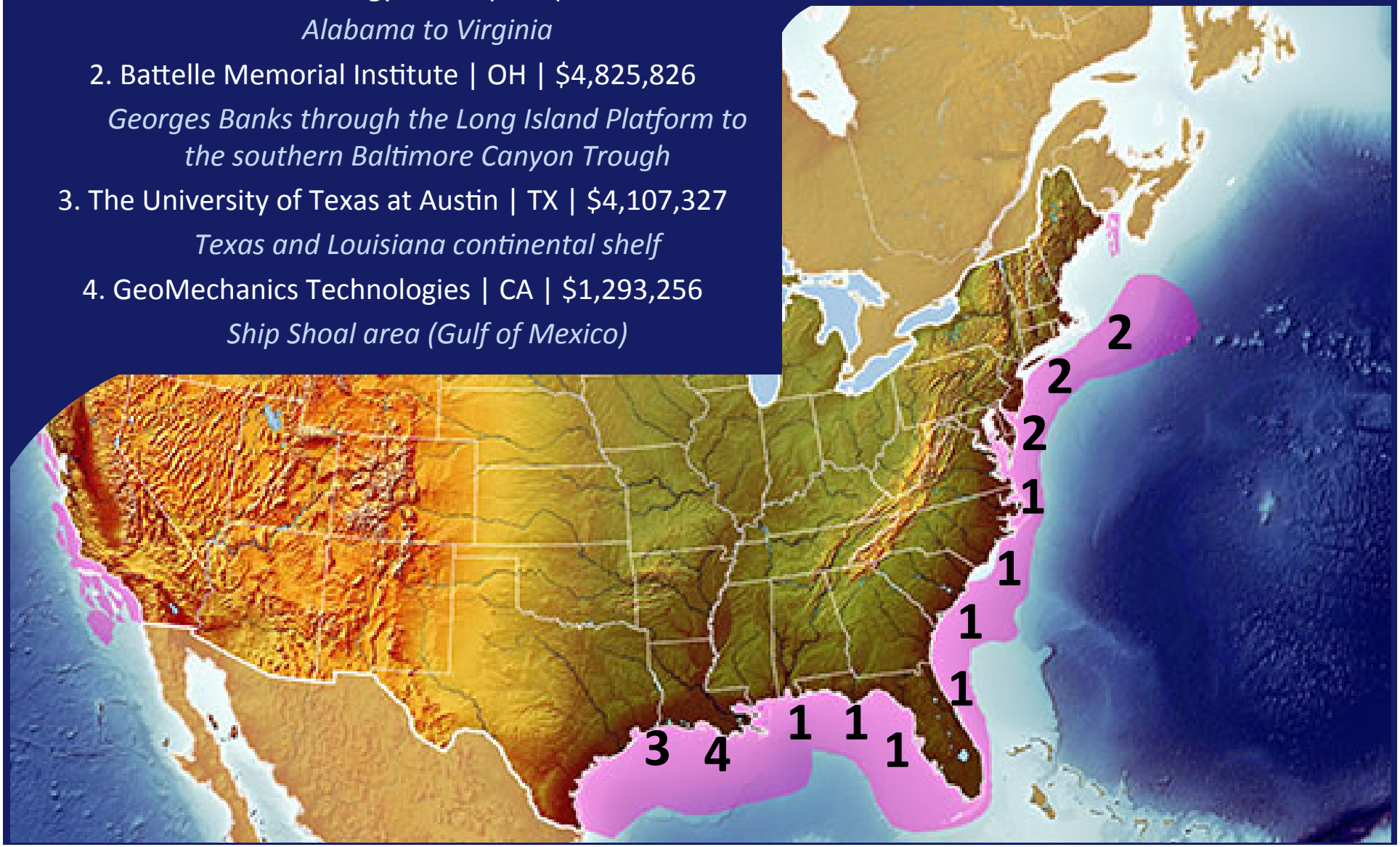


U.S. DEPARTMENT OF ENERGY | Office of Fossil Energy NETL

Four Offshore Projects in NETL Carbon Storage Program

1. Southern States Energy Board | GA | $4,951,808
   Alabama to Virginia
2. Battelle Memorial Institute | OH | $4,825,826
   Georges Banks through the Long Island Platform to the southern Baltimore Canyon Trough
3. The University of Texas at Austin | TX | $4,107,327
   Texas and Louisiana continental shelf
4. GeoMechanics Technologies | CA | $1,293,256
   Ship Shoal area (Gulf of Mexico)

> *"The program is working to develop and advance the effectiveness of onshore and offshore carbon storage technologies, reduce the challenges associated with implementation, and prepare them for widespread commercial deployment in the 2025–2035 time frame."*
>
> - NETL News Release



Southeast Offshore Storage Resource Assessment

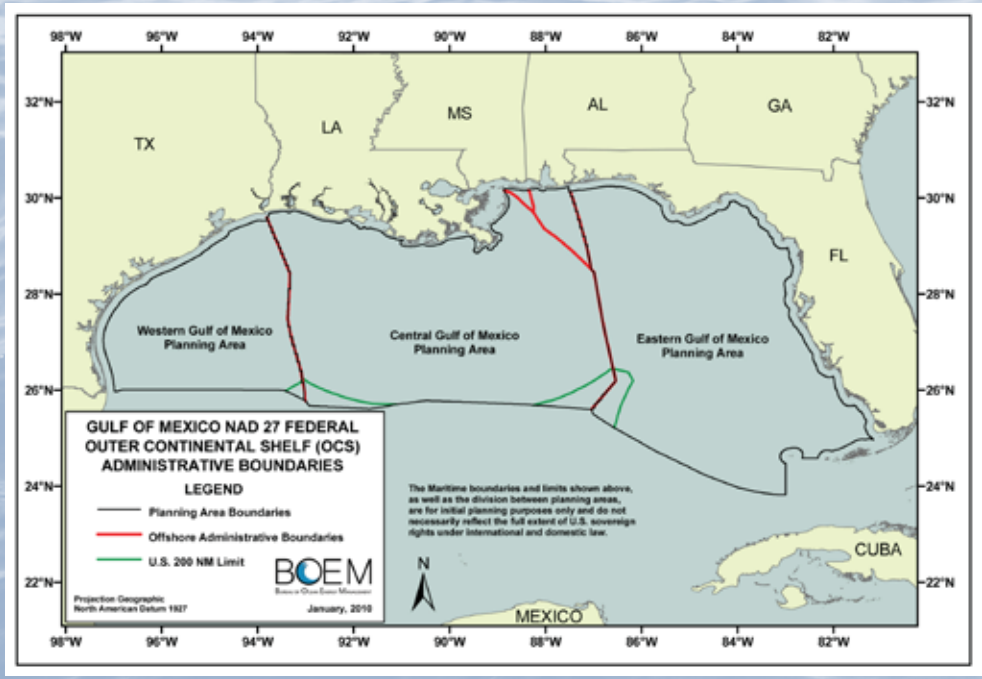
SOSRA | 2015-2018

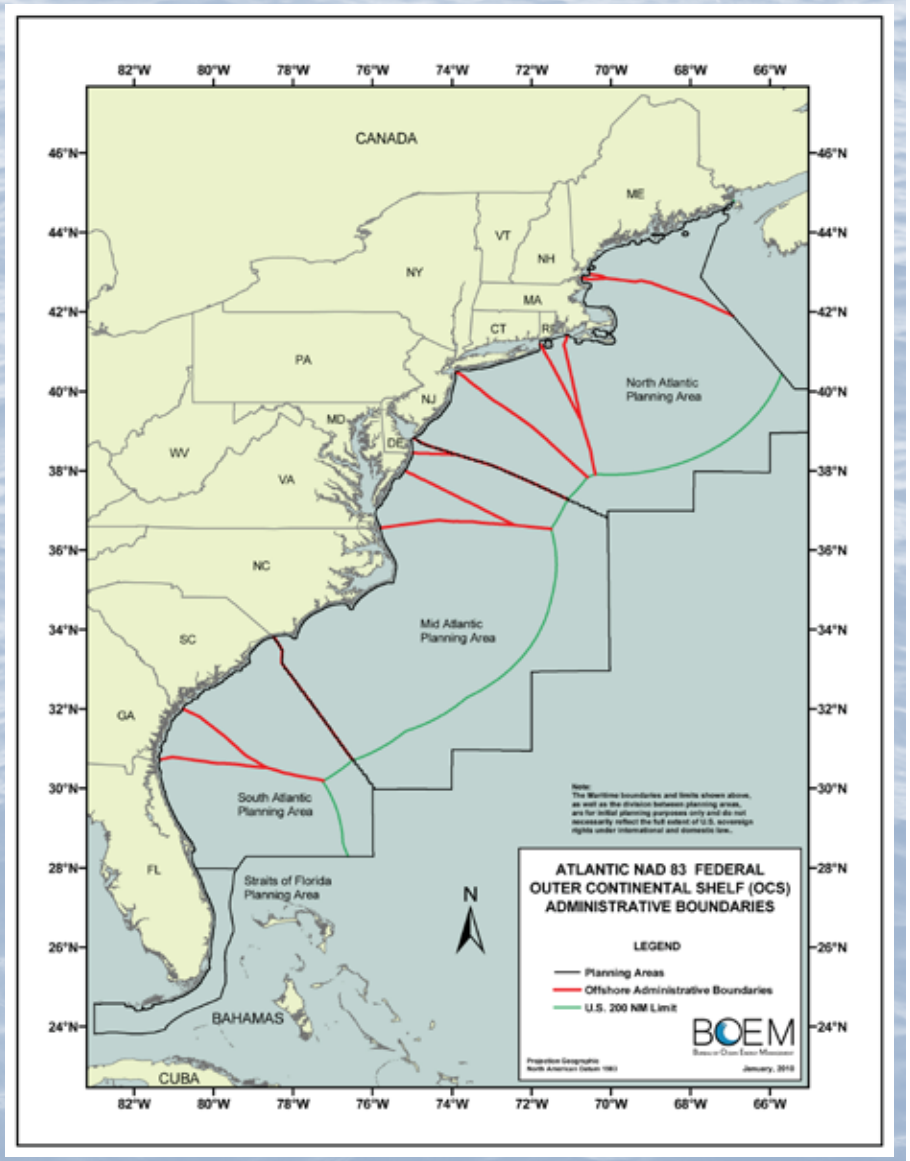
This material is based upon work supported by the U.S. Department of Energy National Energy Technology Laboratory.
Cost share provided by research partners and SSEB Carbon Management Partners.

Objectives

- Characterize offshore CO_2 storage opportunities and conduct a volumetric analysis
- Model offshore CO_2 storage to identify well and reservoir configurations that are capable of meeting the goal of 30 megatonnes or greater storage in key focus areas
- Develop of Best Practices Manuals (BPMs) to advance the state of knowledge while reducing the cost of storage operations

Bureau of Ocean Energy Management Planning Areas





U.S. Department of Energy (DOE)
National Energy Technology Laboratory (NETL)
Project Officer:
Mary A. Sullivan

Overall Project Management

Southern States Energy Board (SSEB)
Lead PI: Kenneth Nemeth
Co-PI/Contact PI/Project Coordinator: Kimberly Sams Gray
Key Team Member: Patricia Berry

Financial Management
Key Team Members:
Kathy Sammons
Leigh Parson

Technical Program Advisor
Gerald R. Hill, Ph.D., Inc. (Hill)
Lead PI:/Advisor:
Gerald R. Hill, Ph.D.

Planning Area Managers

Mid-Atlantic Planning Area
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Virginia Center for Coal and Energy Resources (VCCER)
Lead PI:
Nino Ripepi, Ph.D.
Advisor:
Michael Karmis, Ph.D.
Co-PI:
Ellen Gilliland

South Atlantic Planning Area
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Lead PI:
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Venkat Lakshmi, Ph.D.
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Eastern Gulf of Mexico Planning Area
Oklahoma State University (OSU)
Lead PI:
Jack Pashin, Ph.D.

Planning Area Partners

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Lead PI:
William Lassetter

South Carolina Geological Survey (SCGS)
Lead PI:
Scott Howard

Geological Survey of Alabama (GSA)
Lead PI:
Denise Hills
Key Team Members:
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Marcella McIntyre-Redden

Advanced Resources International, Inc. (ARI)
Lead PI:
David Riestenberg

Schedule

PHASE I/BUDGET PERIOD 1 | 10/01/2015 to 3/31/2017

GO/NO-GO DECISION POINT: *The data collected and analyzed in Phase I is sufficient to perform a quality prospective storage resource assessment and the project should proceed to Phase II.*

PHASE II/BUDGET PERIOD 2 | 4/01/2017 to 9/30/2018

3/2015 Proposal Submitted

10/2015 PROJECT BEGINS

3/2016 Geologic Overview Completed (Task 2.0)

3/2017 Data Analysis Completed (Task 4.0)

3/2018 Geologic Characterization and Volumetric Calculations Completed (Task 5.0)

10/2015 PROJECT ENDS

2015 | 2016 | 2017 | 2018

8/2015 Project Awarded

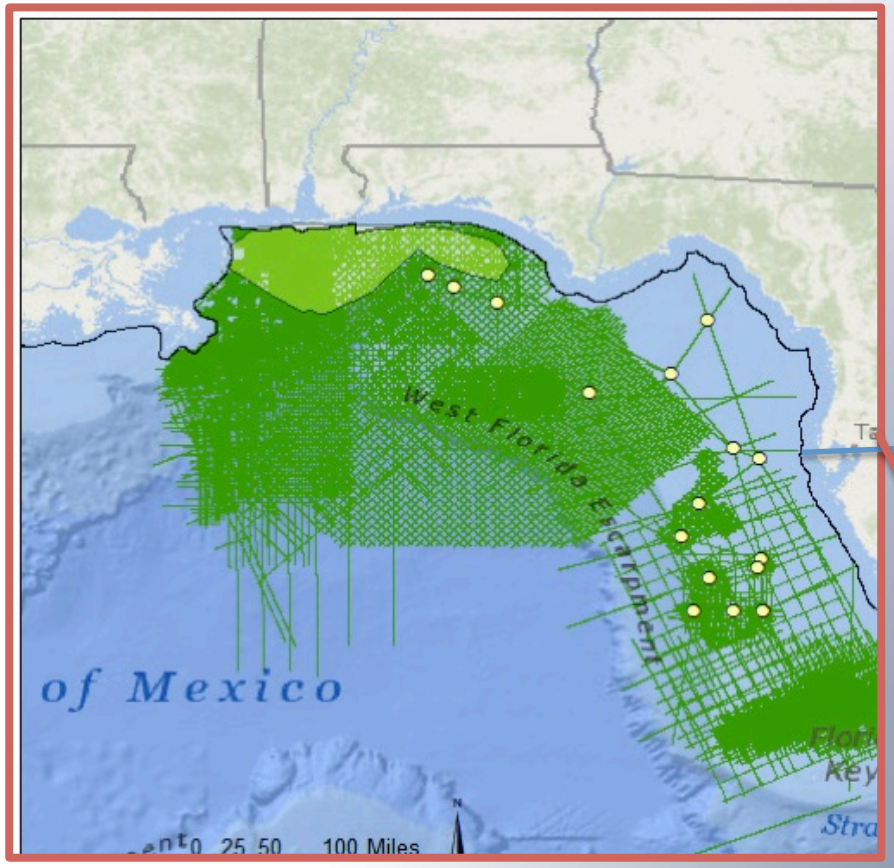
9/2016 Data Collection Completed (Task 3.0)

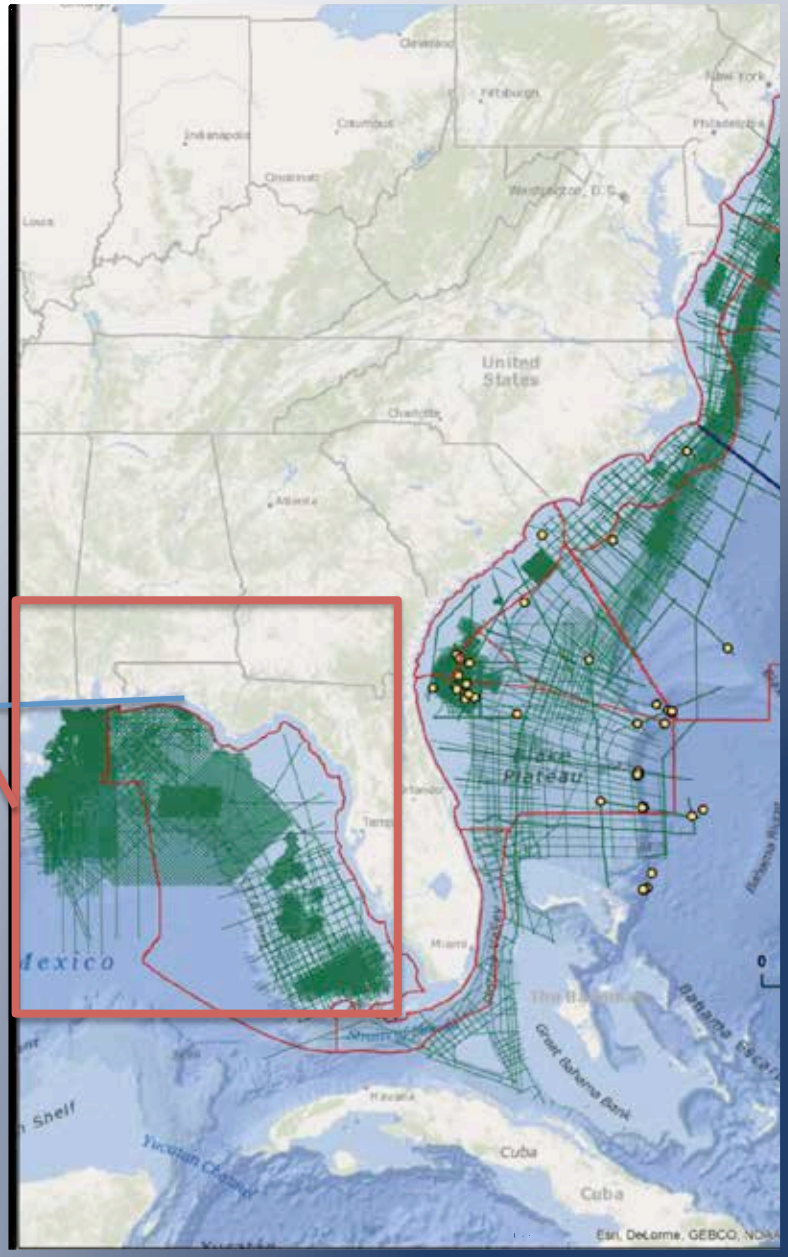
GO/NO-GO DECISION POINT

9/2018 Best Practices (Task 6.0) Natcarb and Atlas (Task 7.0) Outreach (Task 8.0) Closeout and Reporting (Task 9.0) Completed

Note: Task 1.0, Project Management and Planning, extends throughout the entire program period.

Data Coverage





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Presentations at Conferences and Informal Briefings

Knowledge Sharing

Technology Transfer

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Southeast Offshore Storage Resource Assessment (SOSRA)

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The Southern States Energy Board (SSEB) is leading a coalition of southern universities and technical experts to assess prospective geologic storage resources for carbon dioxide (CO_2) in the State and Federal waters of three planning areas:

- The Mid-Atlantic
- The South Atlantic
- The eastern Gulf of Mexico

The goal of the Southeast Offshore Storage Resource Assessment (SOSRA) project is to develop a high-level approximation of the amount of CO_2 that might be stored utilizing key geologic and environmental factors that influence the storage potential. The research includes significant advances in knowledge and technology that can facilitate assessment and quantification of offshore CO_2 storage resources in the SOSRA region and provide a pathway toward commercialization.

SSEB will serve as the overall lead for the project. To perform the work, SSEB is partnering with Virginia Polytechnic Institute and University's Virginia Center for Coal and Energy Research, the University of South Carolina, and Oklahoma State University for local management of the three planning areas. Virginia Department of Mines, Minerals, and Energy, South Carolina Geological Survey, Geological Survey of Alabama, Advanced Resources International, Inc., and Gerald R Hill, PHD, Inc. also will provide technical expertise to the project.

A proposal to support the SOSRA project was submitted to the U.S. Department of Energy's National Energy Technology Laboratory in March. SSEB received notification of selection for award negotiations in June. The SOSRA project will be underway for three years, beginning on October 1, 2015.

The University of Texas at Austin is leading a sister project funded under the same DOE program entitled the Offshore CO_2 Storage Resource Assessment of the Northern Gulf of Mexico (Upper Texas-Western Louisiana Costal Areas). The University of Texas at Austin, in partnership with Southern States Energy Board, will study the inner continental shelf portions of the Texas and Louisiana Gulf of Mexico coastal areas in order to assess the CO_2 storage capacity of depleted oil and natural gas reservoirs. This work also will assess the ability of regional saline geological formations to safely and permanently store nationally-significant amounts of CO_2. The results of this work will improve the current understanding of CO_2 storage potential for a large area of the Gulf of Mexico adjacent to significant industrial emissions sources. SSEB will provide regional education and outreach support for the project.

Regional map of the SOSRA study area, which covers a large part of the continental shelf of the southeastern U.S. and has yet to be assessed for CO2 storage potential.

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sseb.org/programs/sosra

Questions?