Southeast Offshore Storage Resource Assessment (SOSRA)

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Advisory Committee: state geological surveys, universities, state oil and gas boards, oil and gas companies, and utilities (no contract, no decision making authority)
**SOSRA Study Area**

**RED** boundary represents the planning areas.

**PINK** areas are currently under consideration for leasing in the 2017-2022 Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program (DPP).

*All of the new area in the January 2015 DPP falls within the SOSRA study area.*

http://www.boem.gov/2017-2022-DPP/
Mid-Atlantic

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Virginia Polytechnic Institute and State University
Mid-Atlantic: Team

- **Virginia Tech**
  Public land-grant university founded in 1872.

- **VCCER**
  Interdisciplinary study, research, information, and resource facility for the Commonwealth of Virginia.

- **VA DMME**
  Virginia agency which houses the state’s geological survey and mining, oil, and gas regulatory bodies.

- **ADVISOR**
  Robert Milici, Scientist Emeritus, USGS; former state Geologist of Virginia
Mid-Atlantic: Study Area

- Defined by BOEM Oil & Gas Leasing Planning Areas
- Focuses on Virginia and northern North Carolina
- Bounded by 50-mile exclusion buffer and 200-nautical mile Exclusive Economic Zone
Current Tasks

- Task 2.0 Geologic Overview
- Task 3.0 Data Collection

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Upcoming Tasks

- Task 3.0 Data Collection
- Task 4.0 Data Analysis
Mid-Atlantic: Project Activity Update

Upcoming Tasks

• Task 4.0 Data Analysis

Tasks 2.0-4.0 support key deliverables:
• Initial Geologic Characterization Report
• Comprehensive Project Database
• SOSRA Data Quality and Coverage Evaluation → basis for Go/No-Go Decision Point
Task 2.0: Geologic Overview and Characterization

Previous characterization by:

- K.C. Bayer + R.C. Milici (former Commissioner of Mineral Resources and State Geologist for Virginia)
- Fugro Consultants, Inc.
- Gulf Coast Carbon Center

Subcontractors for Task 2.0:

- DMME + R.C. Milici
- Fugro Consultants, Inc.
Task 2.0: Geologic Overview and Characterization

Map of oil and gas potential

- Based on parameters such as: source bed, reservoir rocks, seals and thermal maturation

- 5 of the exploration wells found significant amount of gas:
  - In 3 of the 5 wells, oil condensate was associated with the gas
  - Not enough for commercial production

- Significant uncertainty in structural interpretation

SOSRA-Mid-Atlantic Tasks will:

- refine previous characterization efforts with additional data
- Assess CO₂ storage potential

Oil and Gas Potential

- Fair
- Poor
- Salt deposit (?)
- Reef deposit (?)

Modified from Bayer and Milici, 1987
Brine Storage Capacity

- Potomac Aquifer: largest, deepest, and stratigraphically lowest aquifer in VA
- Confining zone is regionally extensive: not practical to consider the entire aquifer as an injection reservoir
- Dense clay interbeds: suitable primary seal for a smaller-scale, localized injection zone

Formation thickness (m):
- 1000-750
- 750-500
- 500-200
- 200-100
- 100-50
- 50-10
- <10

Adequate Depth

[Source: http://www.beg.utexas.edu/gccc/forum/codexdownloadpdf.php?ID=54]
Task 3.0: Data Collection

Data Overview

- **Wells**
  - Atlantic Slope Project (1967): 13
  - Atlantic Margin Coring (1976): 3
  - Ocean Drilling Program (1987): 2
  - Shell Oil and Gas Exploration (1984):
    - Shell 93-1 has the only velocity measurement

- **2D multi-channel seismic**

- **Proprietary data sets**

- **Ties from outside study area**
Task 3.0: Data Collection

Seismic interval velocity log from Shell 93-1 Well

Schlumberger Well Seismic Tool (WST)

- Water Depth 5,000 ft
  True Vertical Depth 17,740 ft
- Combined with gamma ray and sonic logs to infer geologic lithology
- Can correlate logs and lithology with seismic horizons to extrapolate geological interpretations across study area
- Target Identified
  Early Cretaceous
  Late Jurassic
  Potential hydrocarbon intervals thin
Task 3.0: Data Collection

Seismic Data

Previous research of 2D Multichannel seismic data
- 19 different seismic surveys
- Summary sheets available for all (seismic trackline maps, list of field parameters)

Density of seismic coverage depends on the area’s geological structure
- Complex (near modern shelf break): Dense grid of seismic grid required
- Less complex (distal continental slope): less data is needed
Task 3.0: Data Collection

Line 18074 (Shell):
Cross section of shelf structure

Seismic depth section
Planned Activities for early next Quarter:

• Meetings with Mid-Atlantic subcontractors, DMME and Fugro to select seismic lines for interpretation based on Quality and Coverage Assessment

• Strategic planning meeting of Mid-Atlantic and South-Atlantic teams to address overlap and processing