

Southeast Offshore Storage Resource Assessment (SOSRA)

DOE-NETL

VCCER Advisory Board Meeting
21 May 2018

Mid-Atlantic Research Team

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



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



**Virginia Center for
Coal and Energy
Research**

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



- **University of Oklahoma**
Expertise in regional seismic interpretation and basin analysis

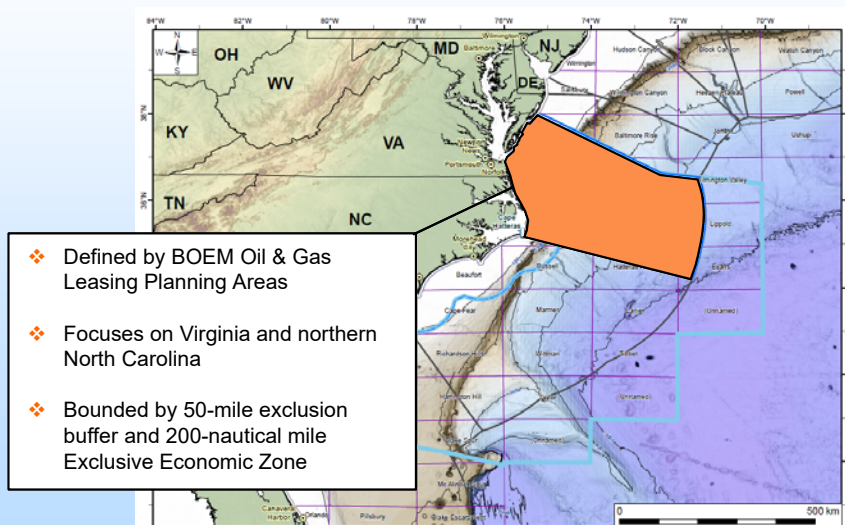


Motivation and Objectives

- Environmental policy and/or economic incentives could drive demand for geologic storage of captured anthropogenic CO₂
- Offshore CO₂ storage presents several advantages:
 - Vast storage potential
 - Single regulatory authority
 - Simplified mineral/pore-space ownership
- Objectives:
 - Estimate volume of CO₂ that can be permanently stored in the outer continental shelf of the Mid-Atlantic
 - Use existing, publicly available data

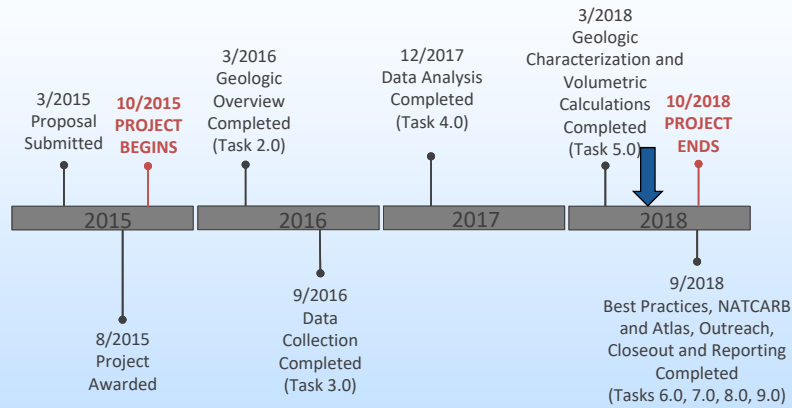
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SOSRA Mid-Atlantic Study Area



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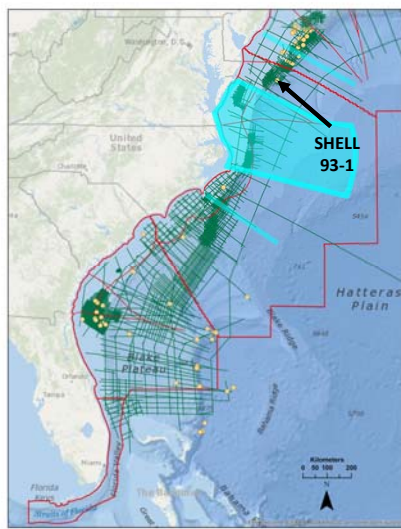
SOSRA Project Timeline



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

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Data Overview



- **Wells**
 - Atlantic Slope Project (1967): 13
 - Atlantic Margin Coring (1976): 3
 - Ocean Drilling Program (1987): 2
 - Shell Oil and Gas Exploration (1984): 1
 - Coastal onshore wells
- **2D multi-channel seismic**
 - Acquired during 1970's – 1980's
 - Released to public after 25-year proprietary term
 - 20 surveys, 4,500 lines
 - Varying density and quality

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Challenges

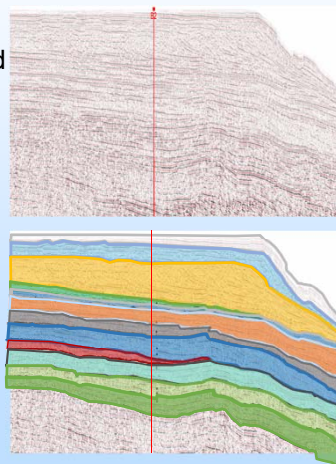
- **Limited well coverage**
 - Majority of wells are shallow-penetrating, academic projects
 - Drilled for purposes other than petroleum exploration
 - Nearest deep exploration well is several hundred miles from area of interest
 - Confidence in well-seismic correlations decreases with increasing distance
- **Legacy seismic data**
 - Acquisition and processing methodology is largely undocumented
 - Comparison of data from different surveys is difficult
 - Unprocessed “raw” data is not available (and may no longer exist)
 - Data is “as-is”, cannot verify or test different processing parameters

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Accomplishments

- **Data Coverage and Quality Assessment**
 - Reduced data sets to 20 surveys and 200 lines based on favorable characteristics
- **Regional Geologic Framework**
 - Geology delineated into 12 units
 - Based on sequence stratigraphy (200 lines) and facies analysis
 - Potential reservoirs identified
- **Velocity Model**
 - Required to convert seismic interpretations from time to depth

Survey E-01-75: Dip Line A 125



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Ongoing Work

- **Seismic Facies-Lithology Association**

- Correlate seismic signal characteristics (facies) with known lithology at wells
- Used to assign physical properties throughout study area
 - Permeability, porosity, net-to-gross
- Include lateral variation between and beyond wells

- **Storage Resource Assessment**

- Regional scope
- Estimated volume based on technical limits, without regard for economics

- **Storage Capacity Assessment**

- Limited to most promising targets
- Estimated volume based on practical considerations and simulation outcomes

Combined seismic interpretation and facies association

