

Atlantic Offshore Wind Energy Development: Geophysical Mapping and Identification of Paleolandscapes and Historic Shipwrecks Offshore South Carolina A Joint South Carolina-BOEM Initiative

M. Richard DeVoe

S.C. Sea Grant Consortium

Patricia Jerman

S.C. Energy Office

Principal Investigators

- **Lead Technical Investigator**
 - *Paul T. Gayes, Ph.D.*, School of Coastal and Marine Systems Science, Coastal Carolina University (CCU)

- **Co-lead Investigators**
 - *Camelia Knapp, Ph.D.*, Earth Sciences and Resources Institute (ESRI-SC), University of South Carolina (USC)

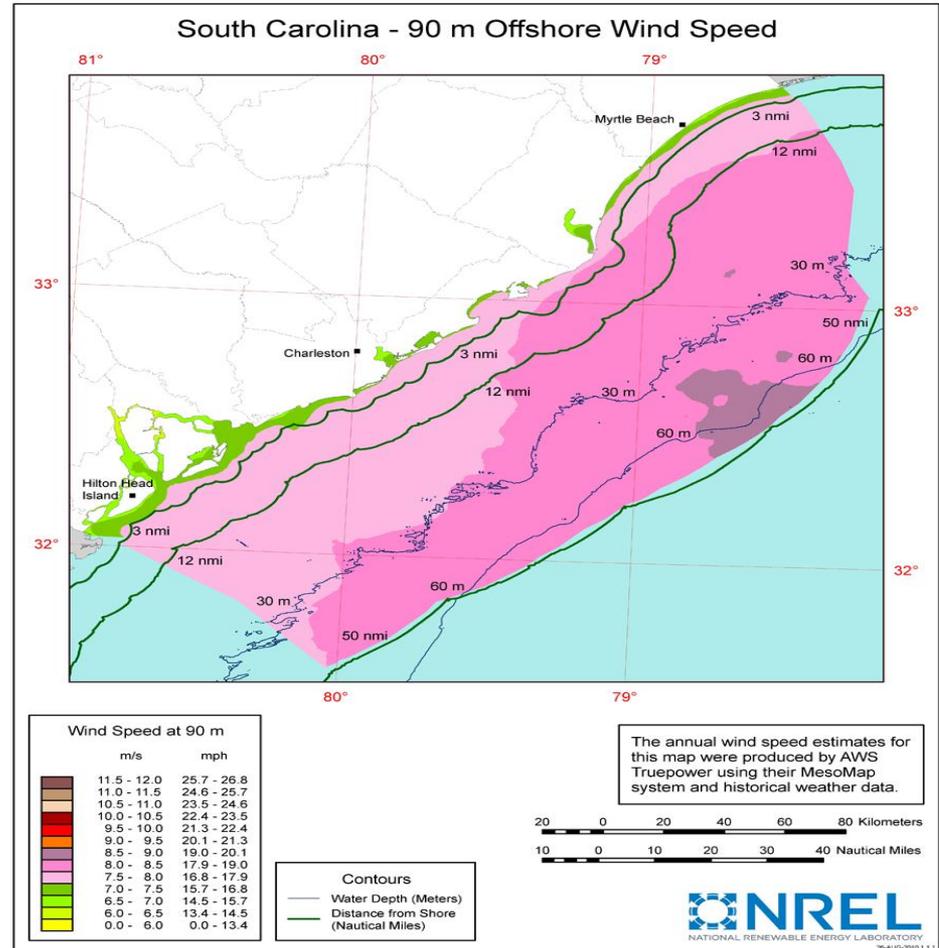
 - *James D. Spirek, M.A.*, South Carolina Institute of Archaeology & Anthropology, University of South Carolina (USC)

- **BOEM Investigators (TBD)**

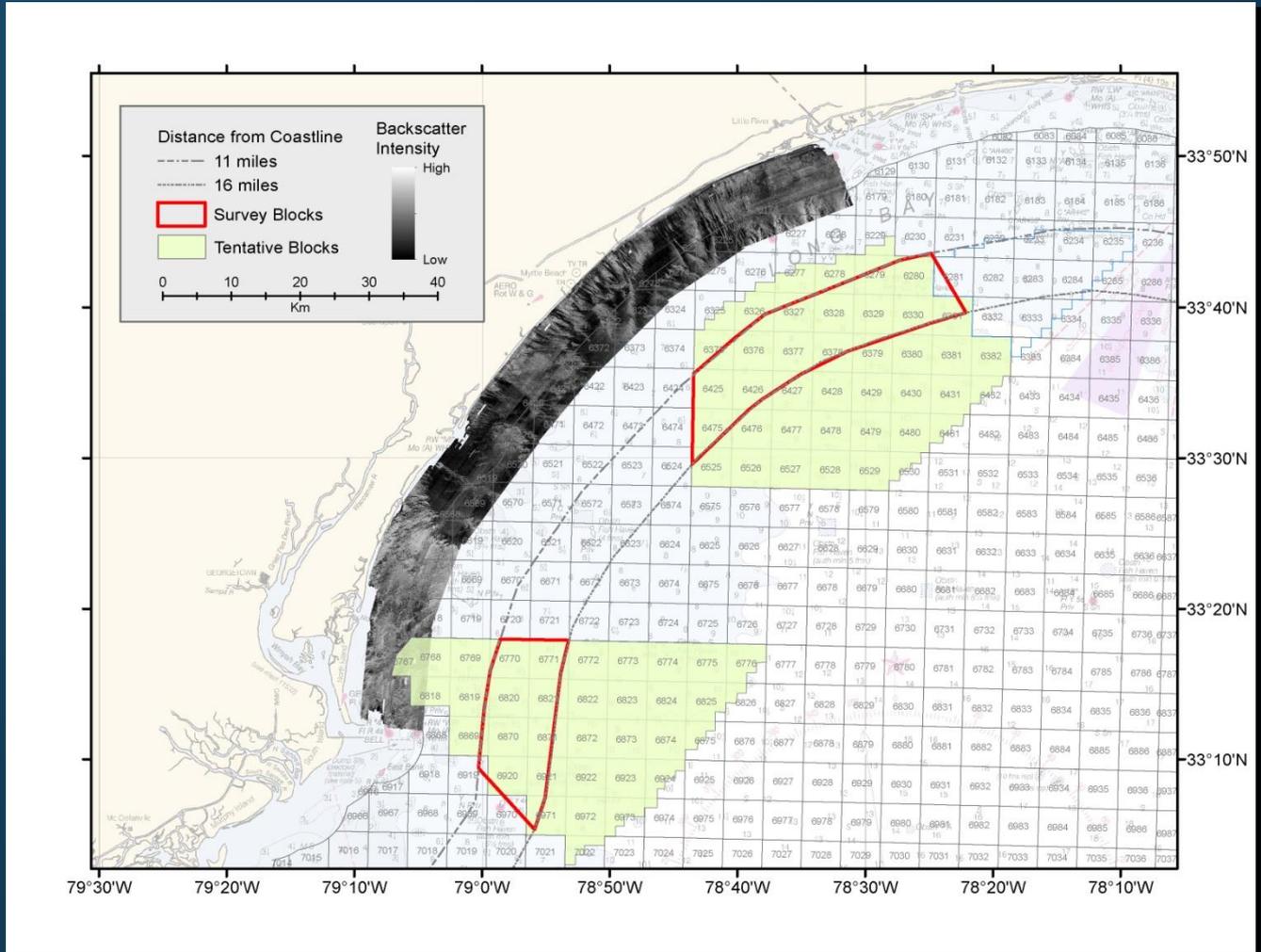
Associate Investigators

- *Till Hanebuth, Ph.D.*, School of Coastal and Marine Systems Science, CCU
- *Rich Viso, Ph.D.*, School of Coastal and Marine Systems Science, CCU
- *James Knapp, Ph.D.*, Department of Earth & Ocean Sciences, USC
- *Scott White, Ph.D.*, Department of Earth & Ocean Sciences, USC
- *M. Scott Harris, Ph.D.*, Department of Geological Sciences, College of Charleston
- *Ashley Deming, M.A.*, South Carolina Institute of Archaeology & Anthropology, USC
- *Nathan Fulmer, B.A.*, South Carolina Institute of Archaeology & Anthropology, USC

The wind resource found off the coasts of southern North Carolina and northern South Carolina show high potential



Proposed study areas (N=2) for the geophysical mapping and archaeological data collection. Also shown is the extent of the inshore USGS-SCSGC Coastal Erosion Study Geophysical Data coverage.



Overall Goals and Objectives

1. *Initiate a systematic geophysical survey of two areas offshore of South Carolina that have high probability of being initially developed for wind power generation.*
2. *Conduct detailed surveys to*
 - a. *Assess geoarchaeological potential of pre-historic habitation at select sites and*
 - b. *Provide baseline information concerning the potential to identify prehistoric and relict landforms, historic shipwrecks and objects, and hazardous MEC/UXO lying in the SC-OCS.*
3. *Conduct a detailed geophysical survey connecting the proposed survey area and a similarly extensive geophysical survey completed through a partnership with the USGS from 0-5 miles offshore.*

Work Elements

1. Geophysical Mapping and Data Acquisition
2. Compilation of Archaeological and Historical Records of Potential Cultural Resources in the Study Areas
3. Data Processing
4. Initial Data Products and Interpretation
5. Collection of Detailed Site-Specific Data from Fine-Scale Geophysical and Direct Seabed Observations for Cultural Resources Assessments and In-Situ Habitat Data
6. Potential Cable Route Corridor Detailed Site Survey
7. Integration of Map, Report, and Publication Materials

Mapping

Two Tasks:

- Regional Scale Habitat Mapping
- Regional Scale Cultural Resource Survey

Points:

- A comprehensive, integrated geophysical survey of priority wind energy development areas will serve as the baseline for the objectives of the project.
- The habitat and cultural resources objectives of the project target different spatial scales, which are reflected in the standards for those types of surveys by BOEM.

Archaeological Surveys & Historical Records

The archaeological research objective of this proposal is to lay the foundation for the identification of:

1. Submerged prehistoric sites or relict landforms suitable to the preservation of these sites
2. Historic sites, structures, or objects

Data Processing

- Processing, integration, visualization, and archiving of all geophysical data collected -
 - A non-trivial and complex exercise
- The outputs will be in standard file formats for the various types of data collected -
 - Will be used to create a robust database for the South Carolina Outer Continental Shelf (SC-OCS)
- PIs will work cooperatively to generate initial data products and interpretations to target -
 - Site specific validation of potential hard bottom habitat and
 - Areas warranting detailed cultural resource surveys/assessment

Initial Data Products and Interpretation

- **Geologic Framework and Habitat Maps**
 - Side scan and Multibeam Data Sets
 - CHIRP Sub-bottom Data
 - Preliminary Geologic and Habitat Maps from Seafloor Classification
 - Magnetometer Data

- **Initial Integrated Interpreted Products**
 - Essential Fish Habitat/Hard Grounds
 - Integration in 3D Subsurface Models
 - Paleolandscape Archaeological Analysis

Focused Higher Resolution Efforts

- Detailed Habitat/Cultural Resource Survey and Validation
 - Site Specific, High-resolution Cultural Resources Surveys
 - Habitat Classification Validation
- High Resolution Geophysical Survey of Potential Cable Corridors

Characterization Products

1. Geospatial (GIS) data files including maps of the seafloor indicating where wind-energy development can avoid known conflicts (geological, biological, and archeological delineations, elevation and slope maps, seabed targets, etc.).
2. Interpreted two-dimensional cross-sections of the shallow subsurface delineating seismic facies, geologic units, paleochannels, "bright-spots", potential faults and fractures, potential sediment transport.
3. Integrated stratigraphic images of the shallow sub-bottom data with existing lower frequency, industry, 2-D seismic lines.
4. 3-D geologic models to include the high resolution seafloor bathymetry, the subsurface images, and the ground truth cores for evaluation with respect to location and volumetric estimates of geologic targets.

R/V Coastal Explorer

"Coastal Science Serving South Carolina"



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rick.devoe@scseagrant.org

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tjerman@energy.sc.gov