PALMETTO WIND RESEARCH PROJECT

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Build on Progression of Cooperative Working Group

Stepping Offshore to Verify Potential Resource

SRNL
SAVANNAH RIVER NATIONAL LABORATORY
We Put Science To Work

SOUTH CAROLINA Energy Office

santee cooper

CLEMSON UNIVERSITY

COASTAL CAROLINA UNIVERSITY

EcoEnergy

NC STATE UNIVERSITY

PALMETTO RESEARCH PROJECT

WIND

Santee Cooper

Studies Leading to a Request for Proposals from Wind Project Developers

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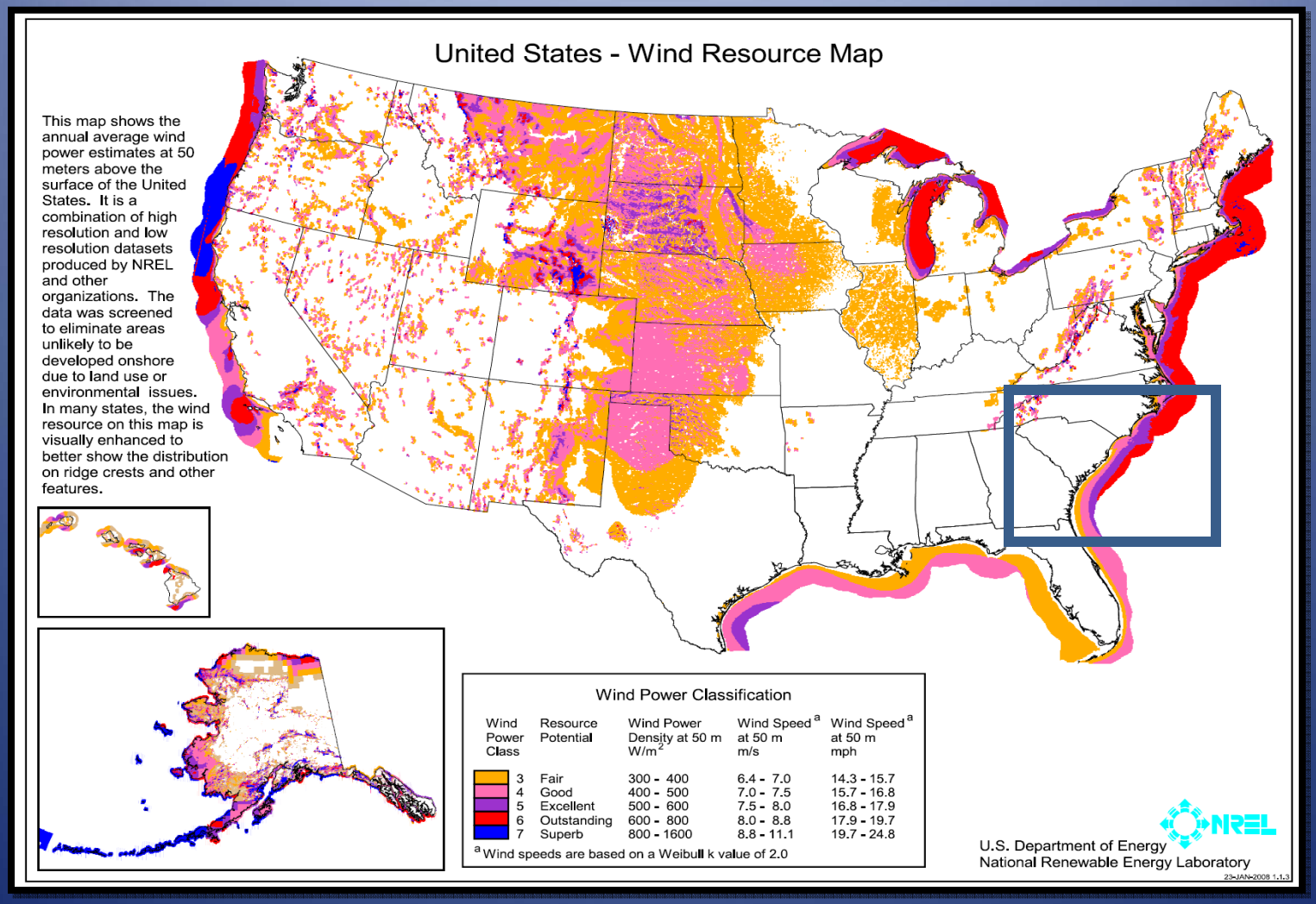
SC Energy Office (US DOE)

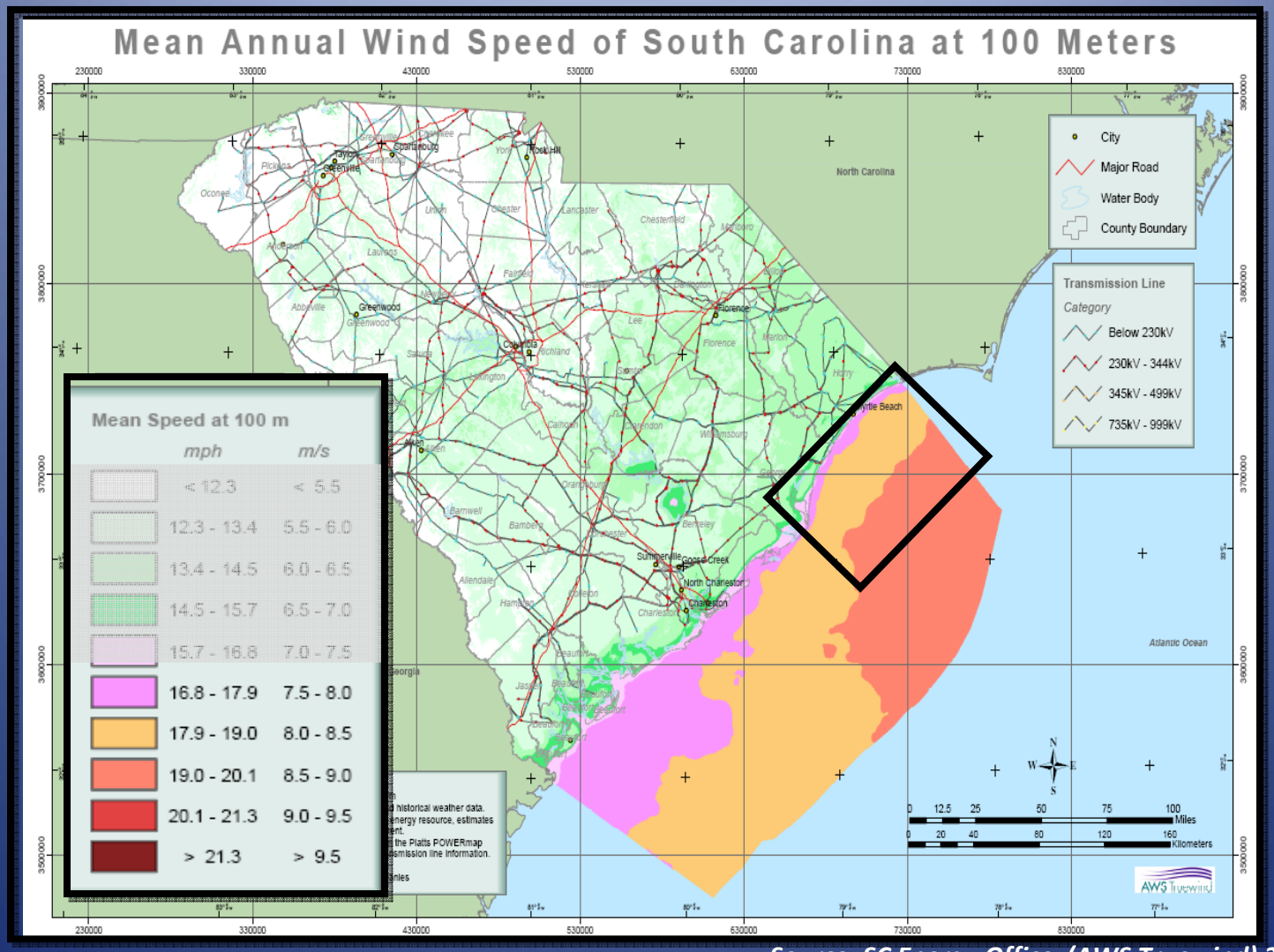
SE II: South Carolina Roadmap to Gigawatt-Scale Coastal Clean Energy Generation: Transmission, Regulation & Demonstration

Main Wind Resource Potential For U.S. - Offshore

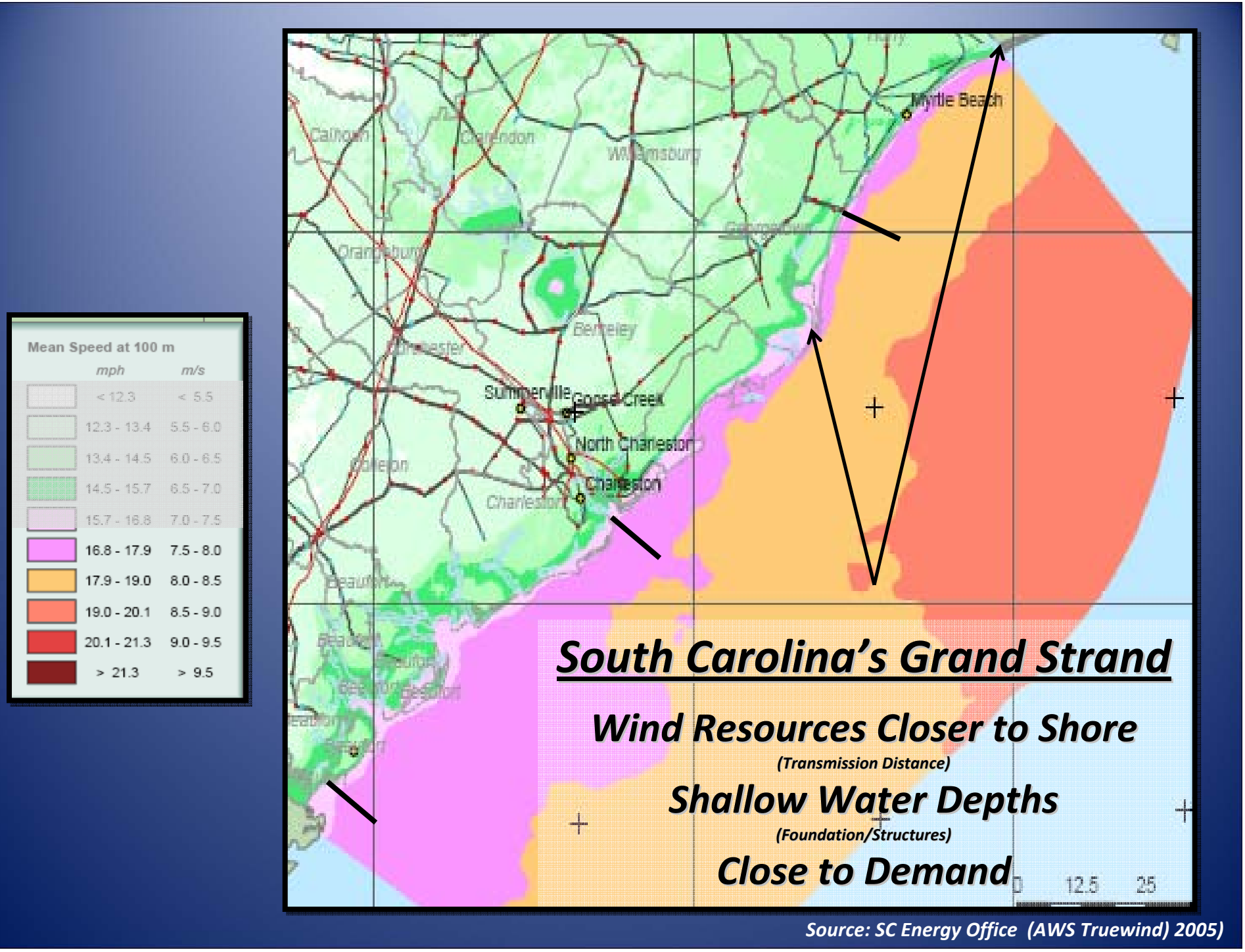


Source: US DOE National Renewable Energy Laboratory

SC Energy Office Commissions Initial Meso-Scale Regional Wind Model Characterization For SC (AWS Truewind)



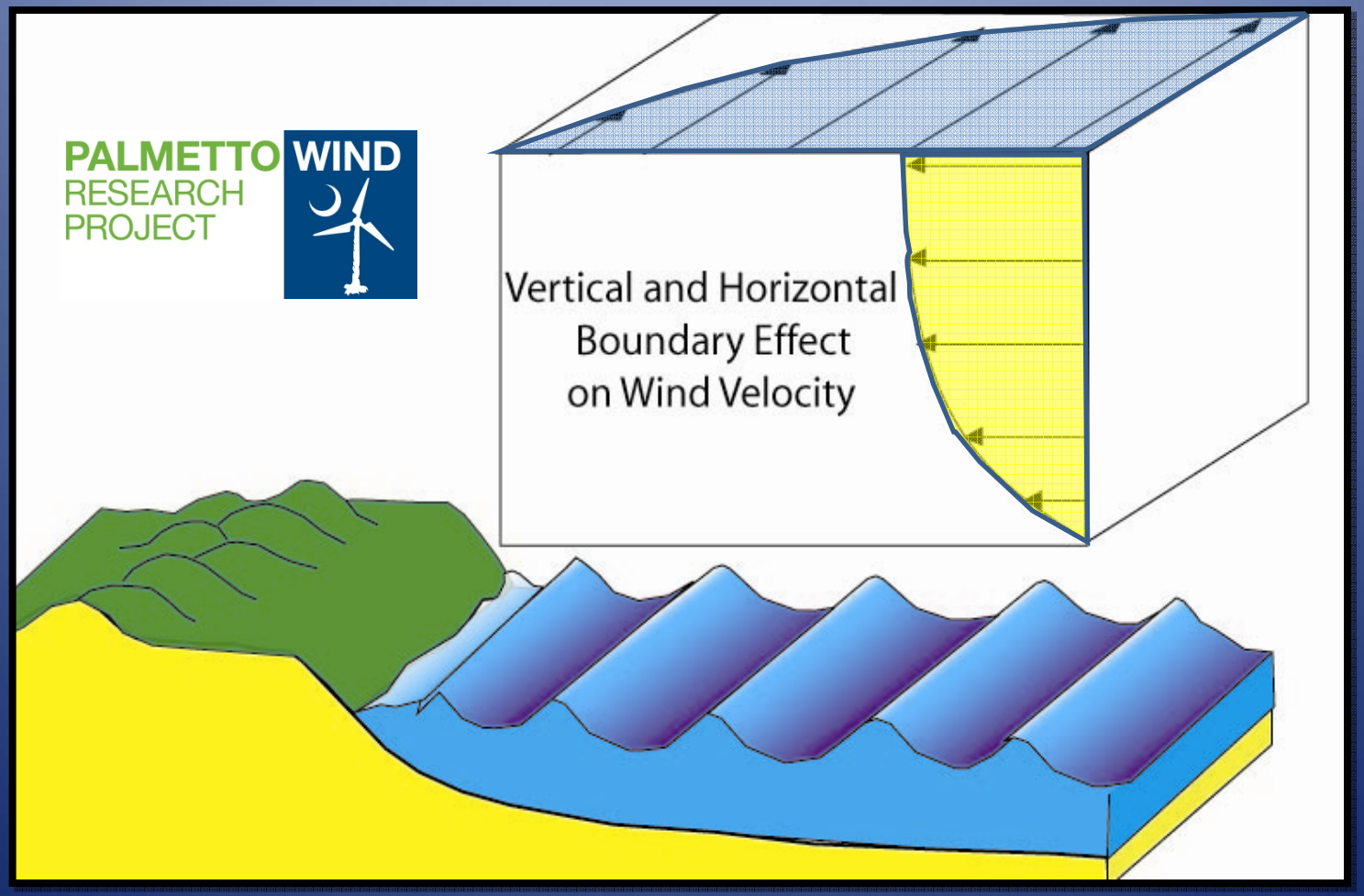
Source: SC Energy Office (AWS Truewind) 2005)



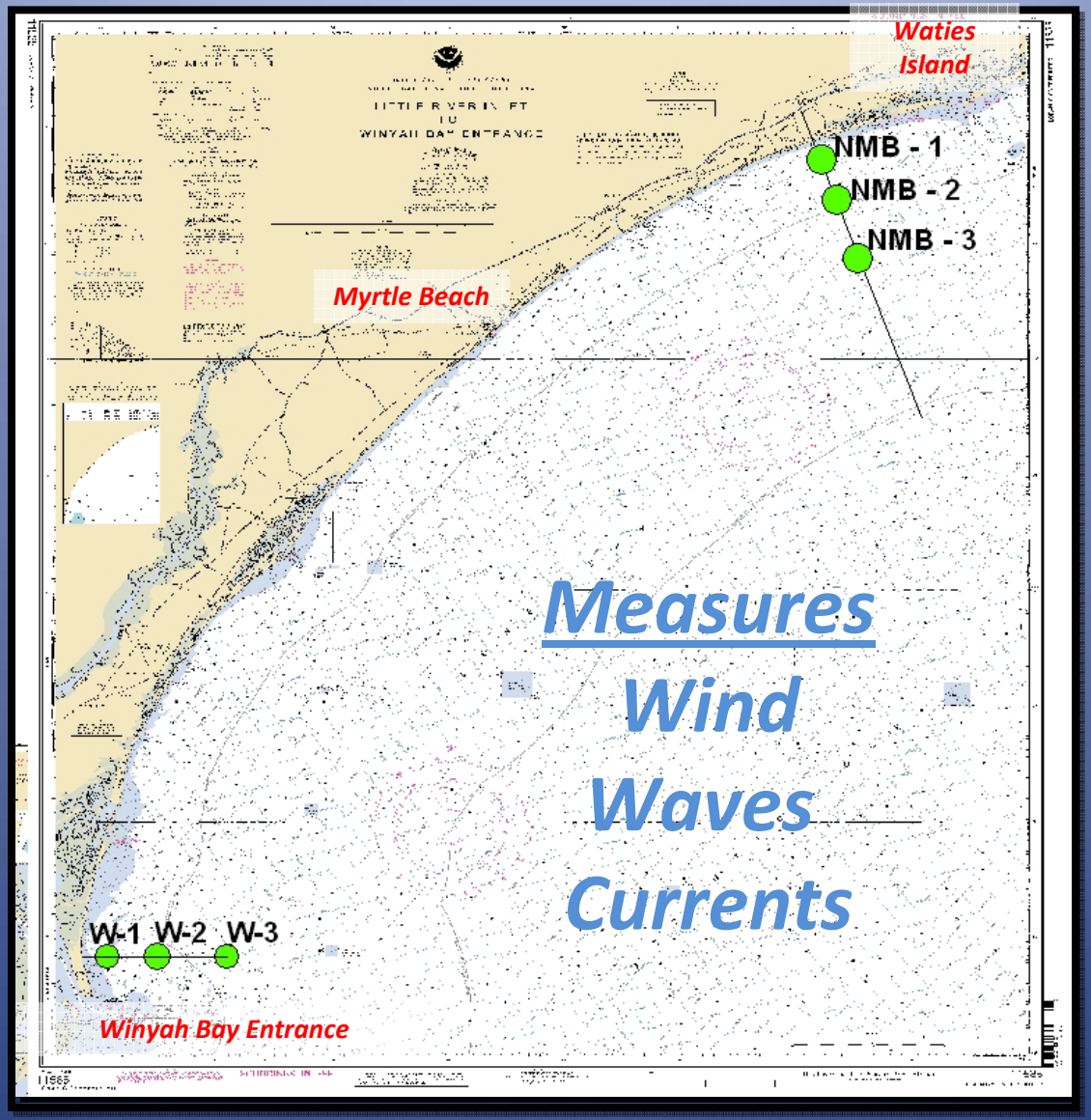
Source: SC Energy Office (AWS Truewind) 2005)

Phase I. Cross Shore Instrument Array
Atmospheric/Oceanographic Buoys

Phase II. Vertical Instrument Array
Offshore Instrument Platform



Cross-Shore Verification



Measures

Wind

Waves

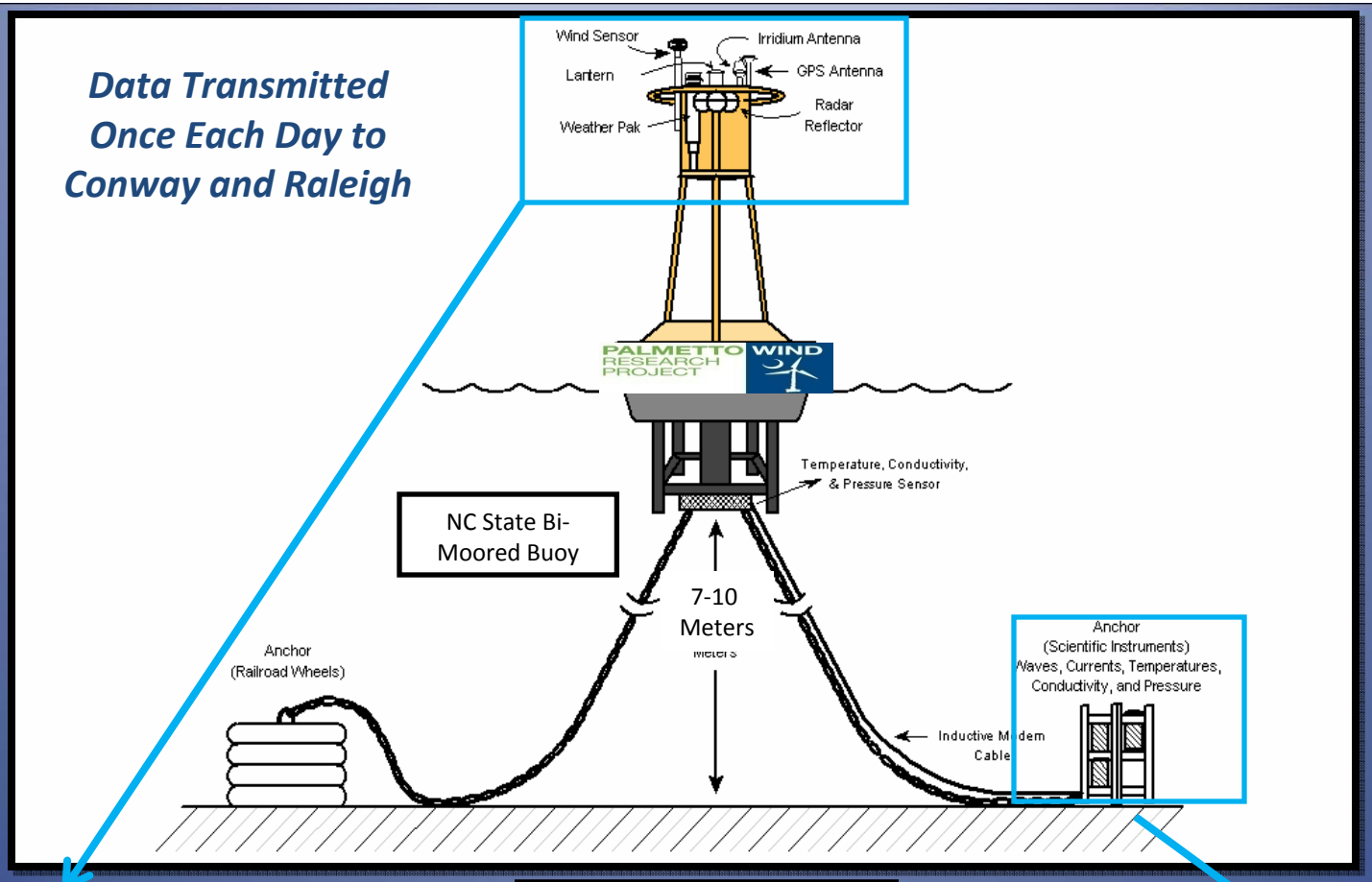
Currents

Two Shore-Normal Instrumentation Transects

Instruments @ Beach , 1.5, 3 and 6 Miles

PALMETTO WIND RESEARCH PROJECT

Data Transmitted Once Each Day to Conway and Raleigh



Instrumentation Provided By NC State University

Graphics Courtesy of L. Piestrafesa

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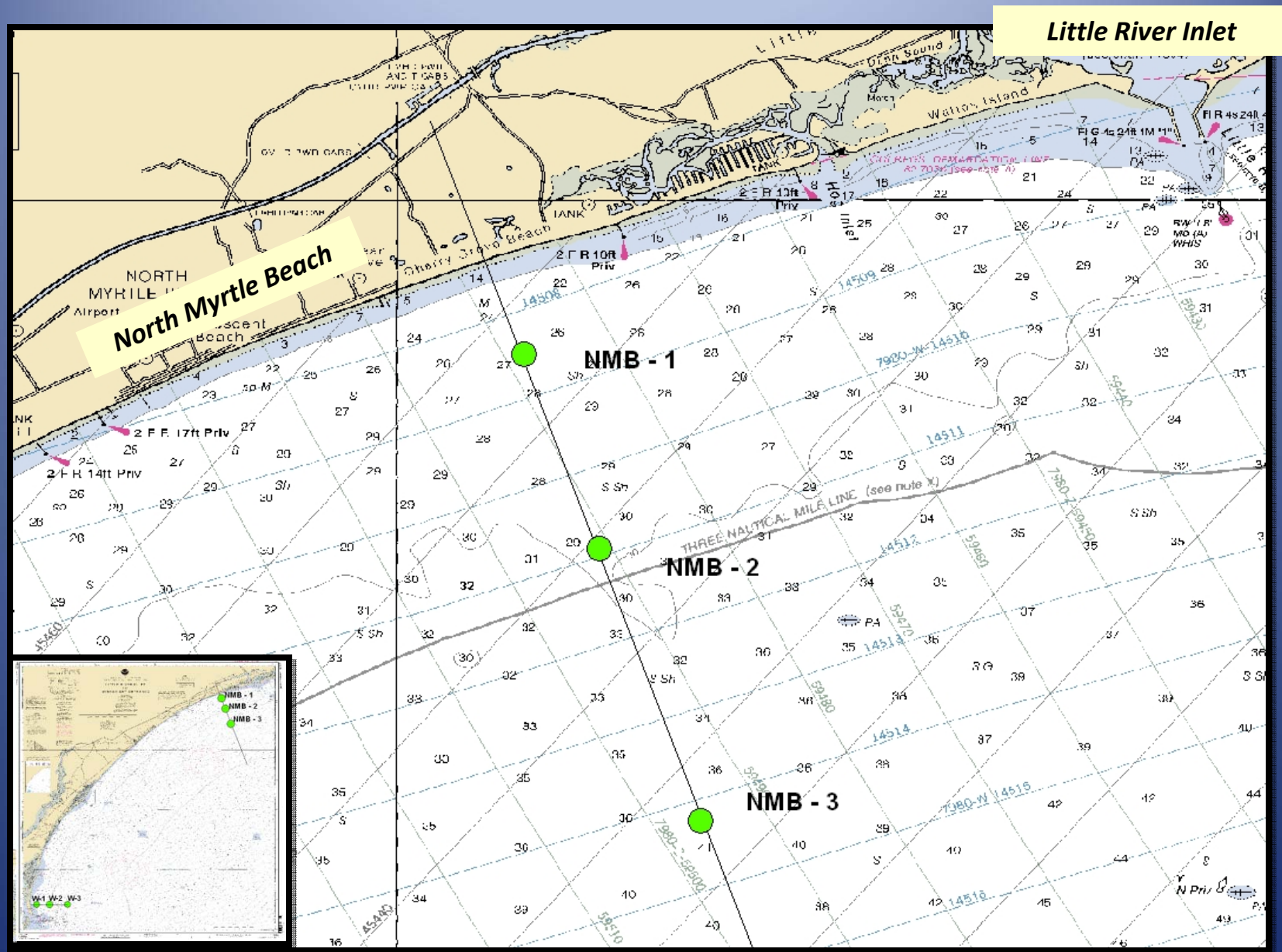
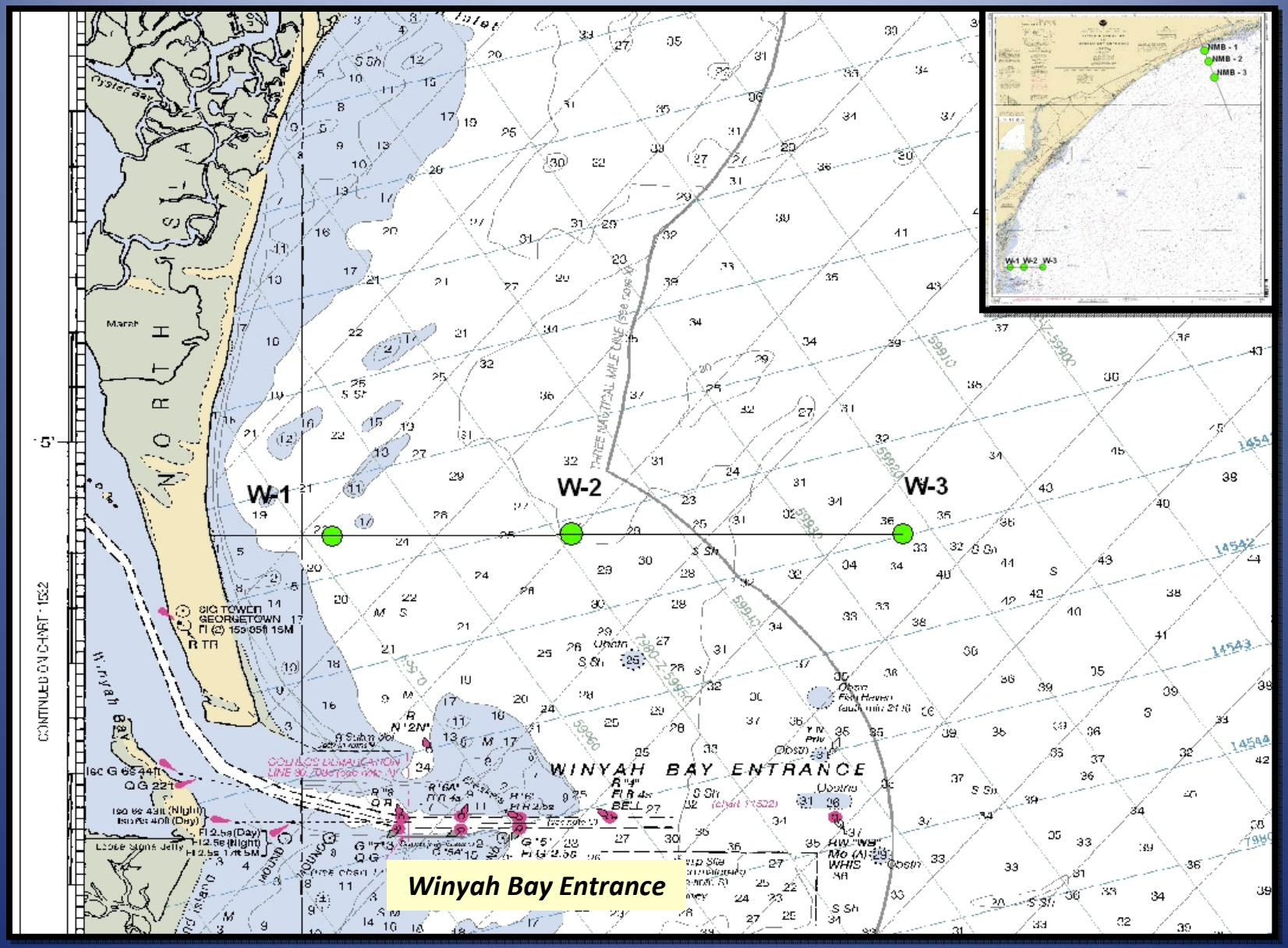


Northern Grand Strand Transect

PALMETTO RESEARCH PROJECT WIND



Southern Grand Strand Transect

PALMETTO RESEARCH PROJECT WIND

Data Transmitted Once Each Day

QA/QC Checked

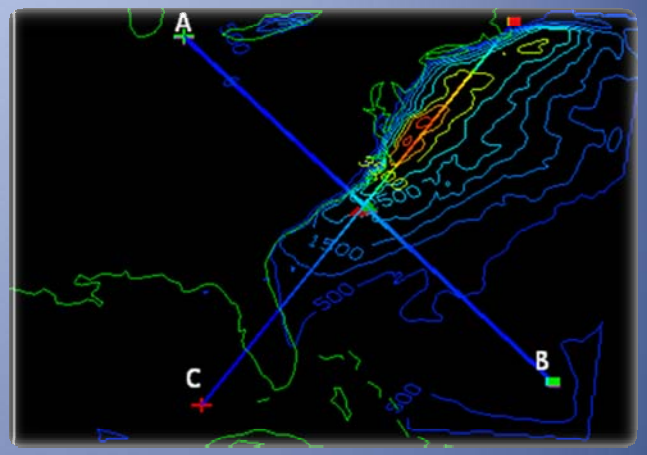
Show What Conditions Have Been

Analyze Wind, Wave, Current Energy Potential at Sites

Assimilated into NCSU/NCAR Atmosphere/Ocean Interactively Coupled Model

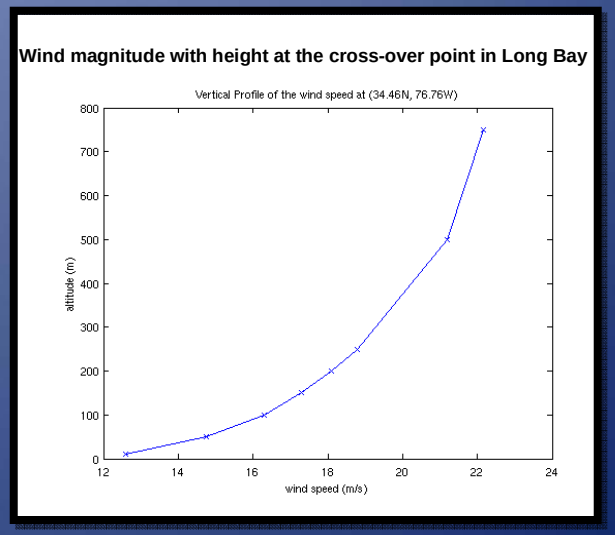
Refine Spatial and Temporal Character of Resource-Select Site for Vertical Verification

Predictive/Forecast Bi-products



Model Output for Wind Conditions at 50, 100 and 150m . Non-Storm Day 2/22/07
(From Bao, Pietrafesa and Peng in Prep)

Projected Vertical Wind Profile at Selected location
(From Bao, Pietrafesa and Peng in Prep)



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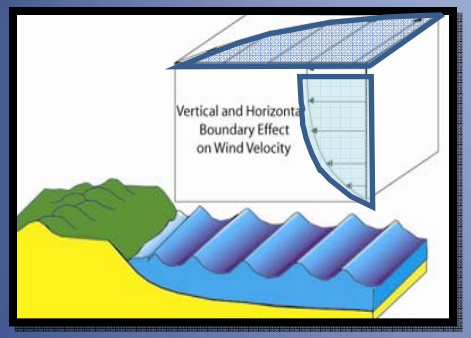

Key Dataset

Physical Measurements at Hub Elevation Requires Offshore Tower

BUOY ARRAYS

Verify Near Surface Coastal Boundary

Refine Spatial Distribution of Class 5+ resources

With compiled exclusionary zones select site for verification of resource at operational height

SANTEE COOPER OFFSHORE PLATFORM

Construct Offshore Platform - Direct Measurements Verifying Magnitude and Character at Hub Elevation

Navy R-2 Tower –Georgia
http://www.ndbc.noaa.gov/station_page.php?station=spag1

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TIMETABLE

Deploy Buoy-Based Cross Shore Instrument Array Daily Data Transmission-Assimilated into Interactively Coupled Model	April/May 2009
Compile Resource Verification / Boundary Characterization	
Tentatively Project Spatial Distribution , Use previously Compiled Exclusionary Information - Site and Construct Offshore Tower	Oct./Nov. 2009
Complete One-Year Monitoring at Operational Elevation	Oct./Nov. 2010

With Partnering Agencies and Organizations Continue to work parallel on other issues such as Environmental , Regulatory, Engineering, Financial etc.