

# WIND RESOURCE MAPPING FOR UNITED STATES OFFSHORE AREAS

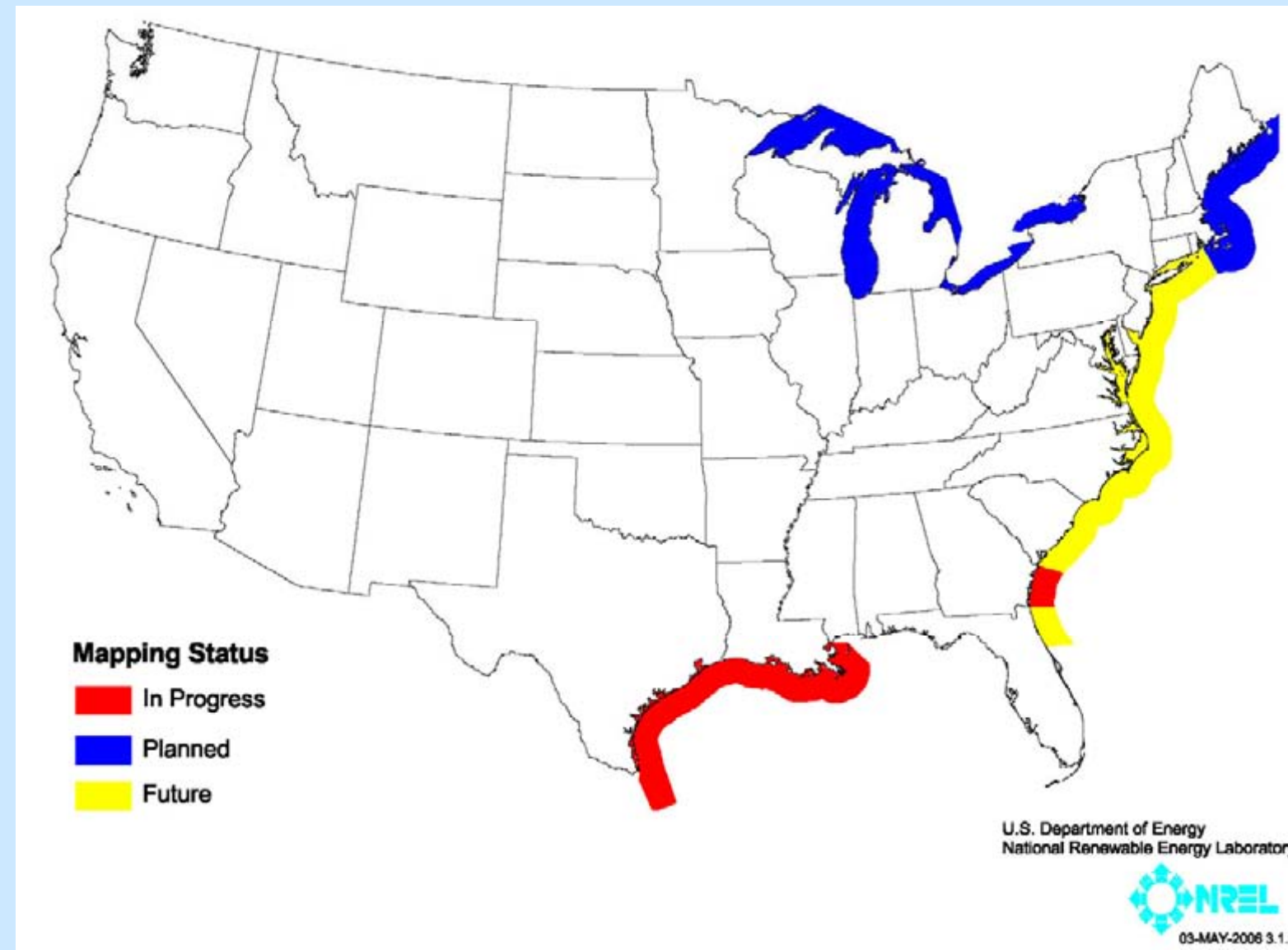
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## Offshore Wind Mapping Project

- Objective is to develop high-resolution validated wind resource maps for priority regions up to 50 nautical miles offshore
  - East coast areas from Maine to northern Florida
  - Western Gulf of Mexico (Texas and Louisiana)
  - Great Lakes
- Project is jointly funded by DOE/NREL, states, and other organizations
  - Wind resource modeling performed by AWS Truewind using MesoMap (numerical model) system
  - Validation of model data conducted by NREL and collaborators using available measurement data and other information
- Offshore wind potential estimates will be made by state and other criteria

## Offshore Wind Mapping Regions



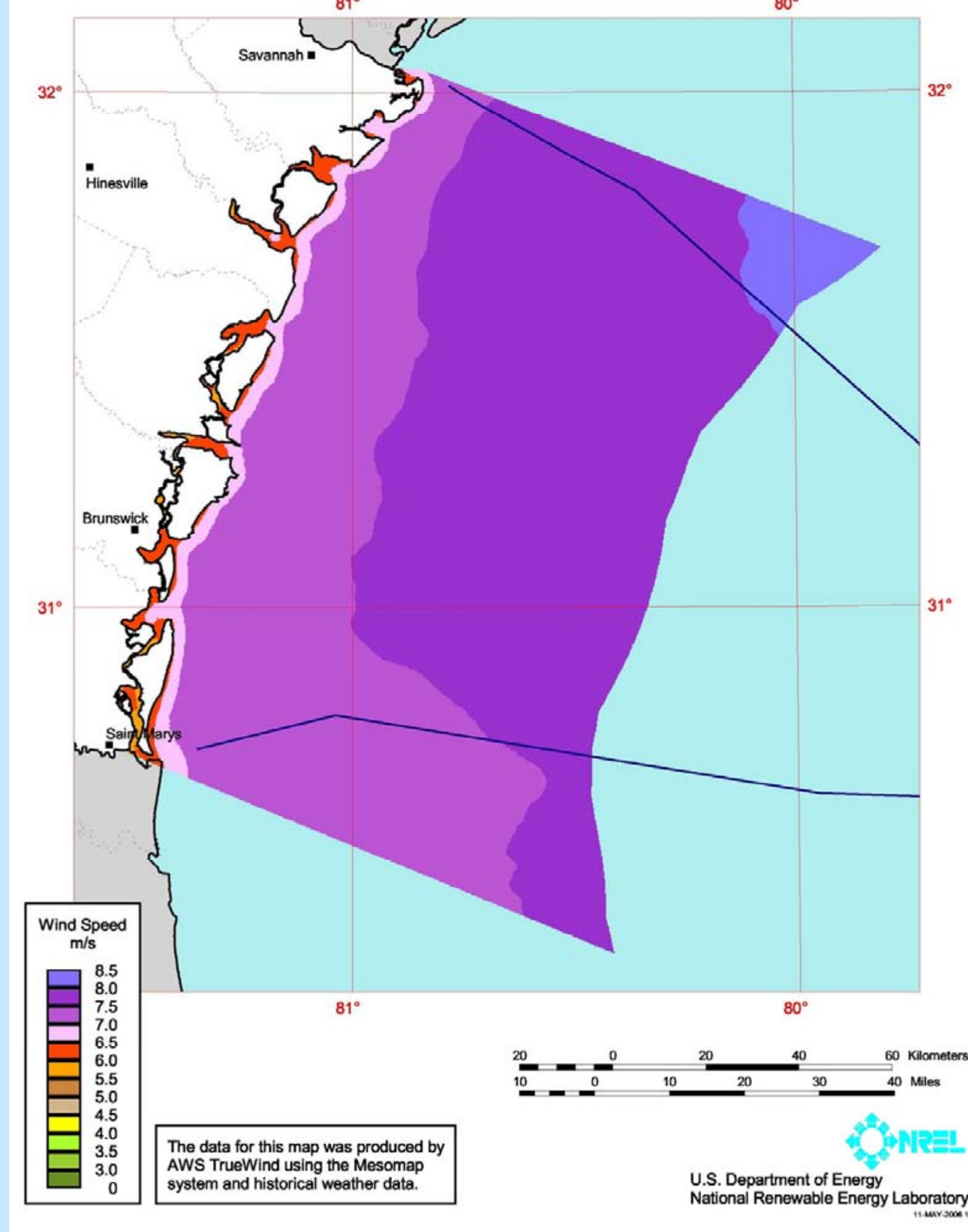
## Methodology for Estimating Offshore Wind Potential

- Build GIS database elements
  - 50 m wind power class
  - Water depth
  - Distance from shore
  - Offshore administrative units
    - Datasets created by Mineral Management Service
- Wind resource grid cells
  - 200 m x 200 m size
  - Classified by GIS elements
- Final Products
  - Tables of wind resource by state
  - Documentation and publication of materials

## Major Data Sets for Offshore Wind Assessment and Validation of Model Results

- Meteorological station data from National Climatic Data Center, National Data Buoy Center, and other sources
  - Coast Guard stations, lighthouses, coastal marine automated network, offshore platforms and towers, buoys
  - Airports and military bases (island or coastal only)
- Other wind data
  - Ocean satellite-derived wind speed estimates (QuikSCAT and SSM/I data sets)
  - Sodar, Lidar, and Radar measurements (limited availability)
  - Weather-balloon stations (island or coastal only)
  - Reanalysis upper air data (model-derived)

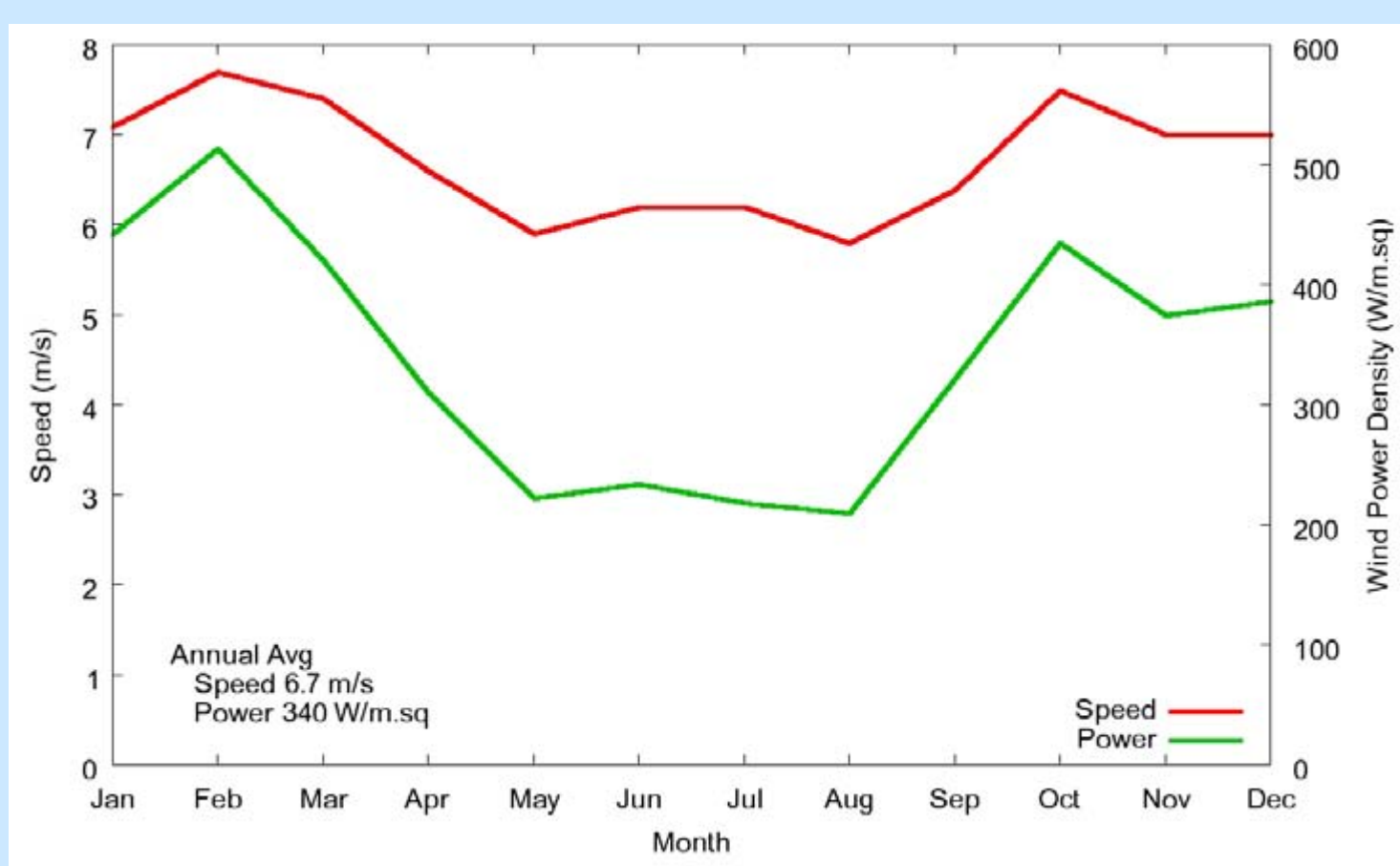
## Georgia Preliminary 90 m Offshore Wind Speed



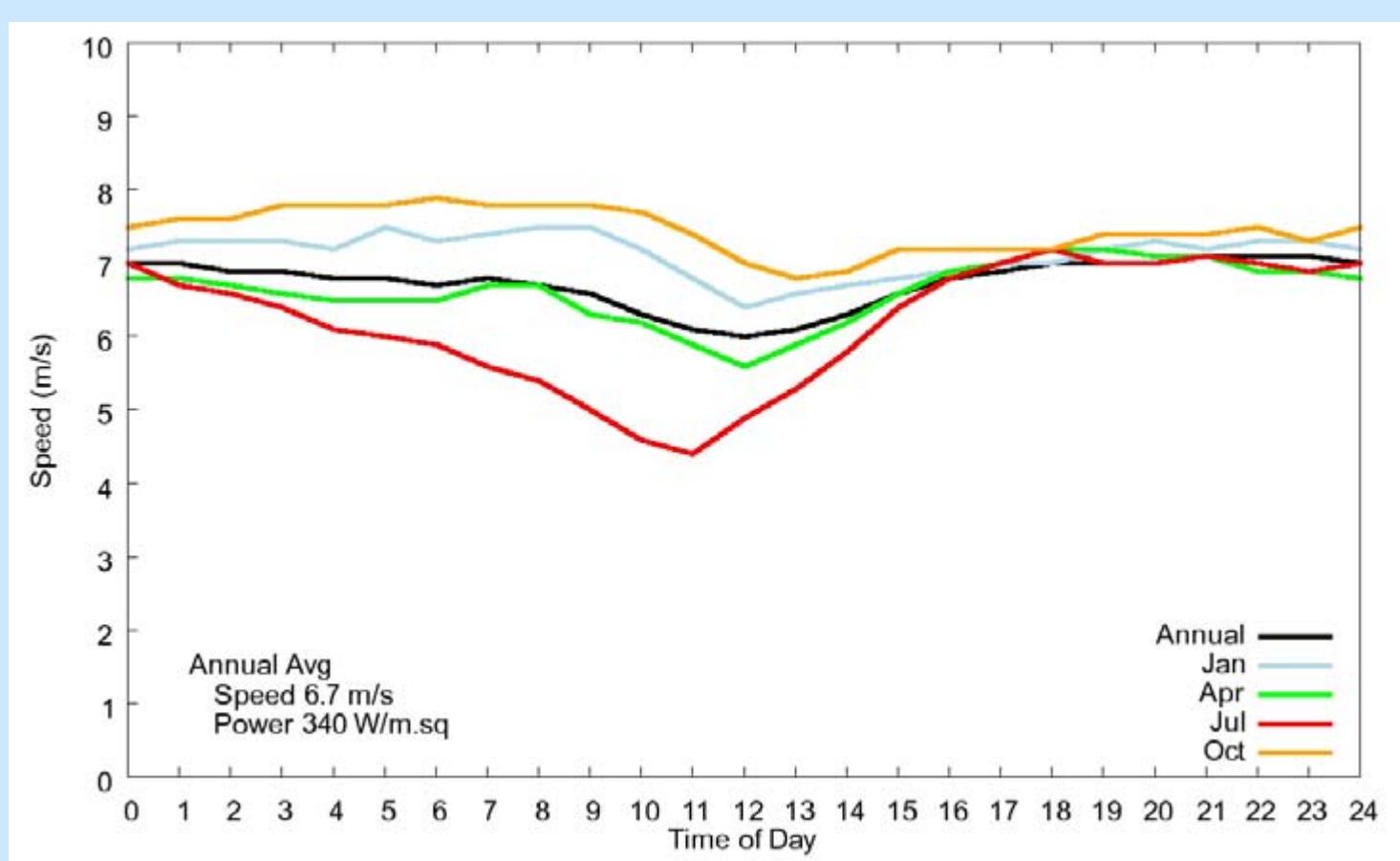
## Georgia Offshore Wind Mapping

- Georgia is the first offshore region to be mapped
- Jointly funded by Georgia Environmental Facilities Authority and DOE/NREL
- Preliminary wind resource estimates based on model output data (unvalidated) from AWS Truewind
- NREL, in collaboration with Georgia Institute of Technology and Skidaway Institute of Oceanography, is analyzing the available measurement data for validation of the preliminary map estimates
- Preliminary wind resource estimates will be revised based on validation results to produce final wind maps
- Offshore wind potential estimates will be produced for specified criteria

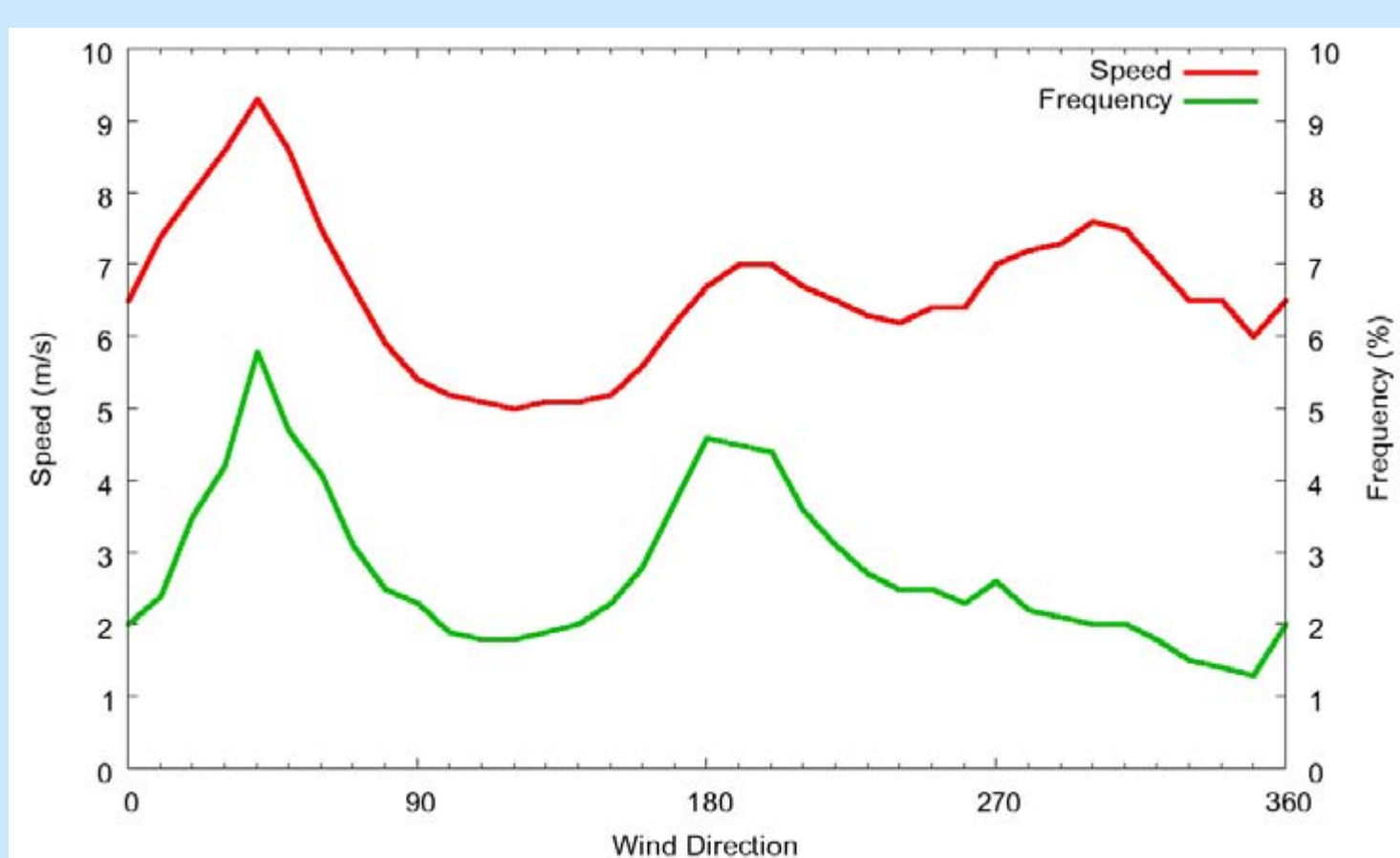
Savannah Light Station  
Speed and Power by Month



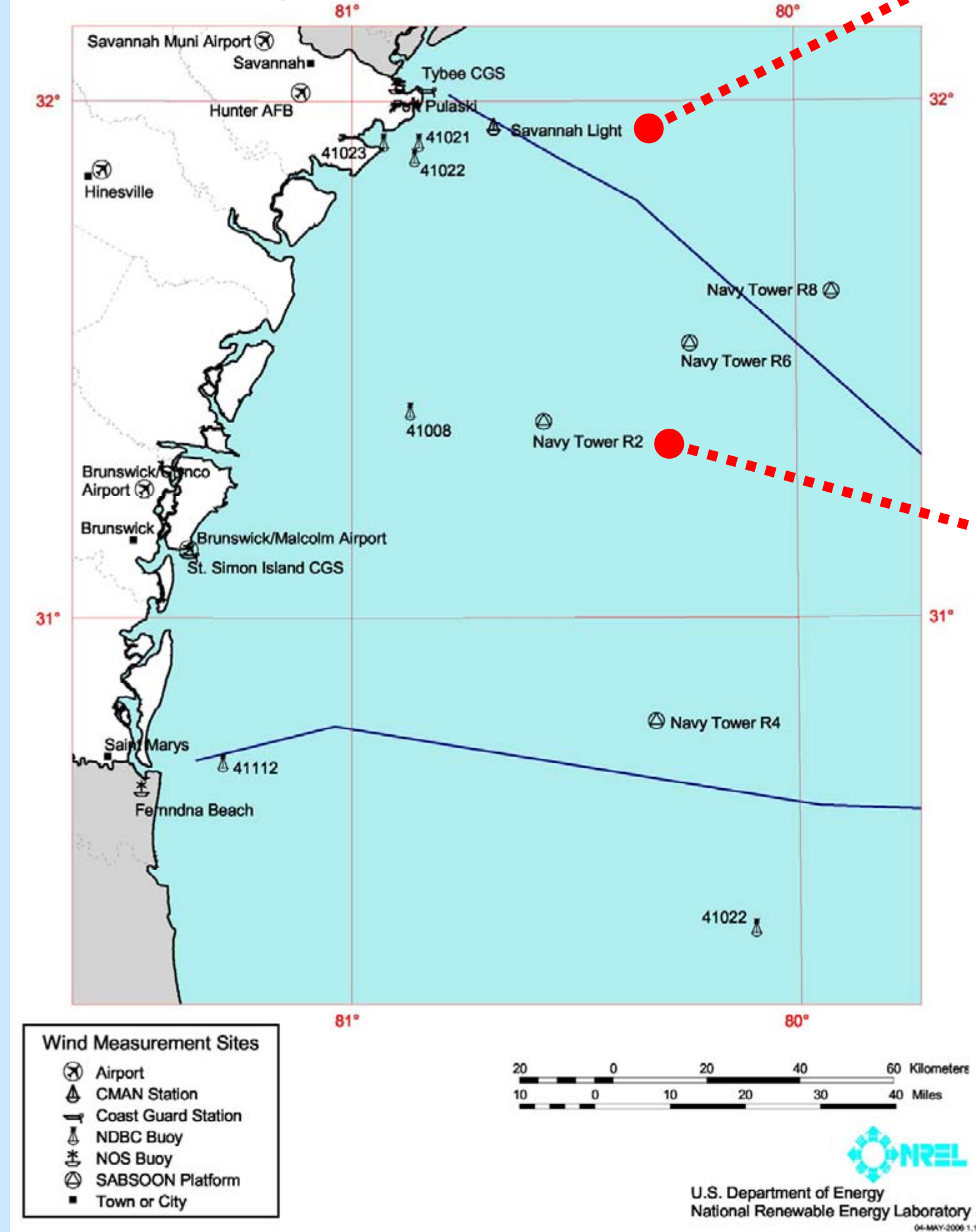
Savannah Light Station  
Speed by Hour



Savannah Light Station  
Frequency and Speed by Direction

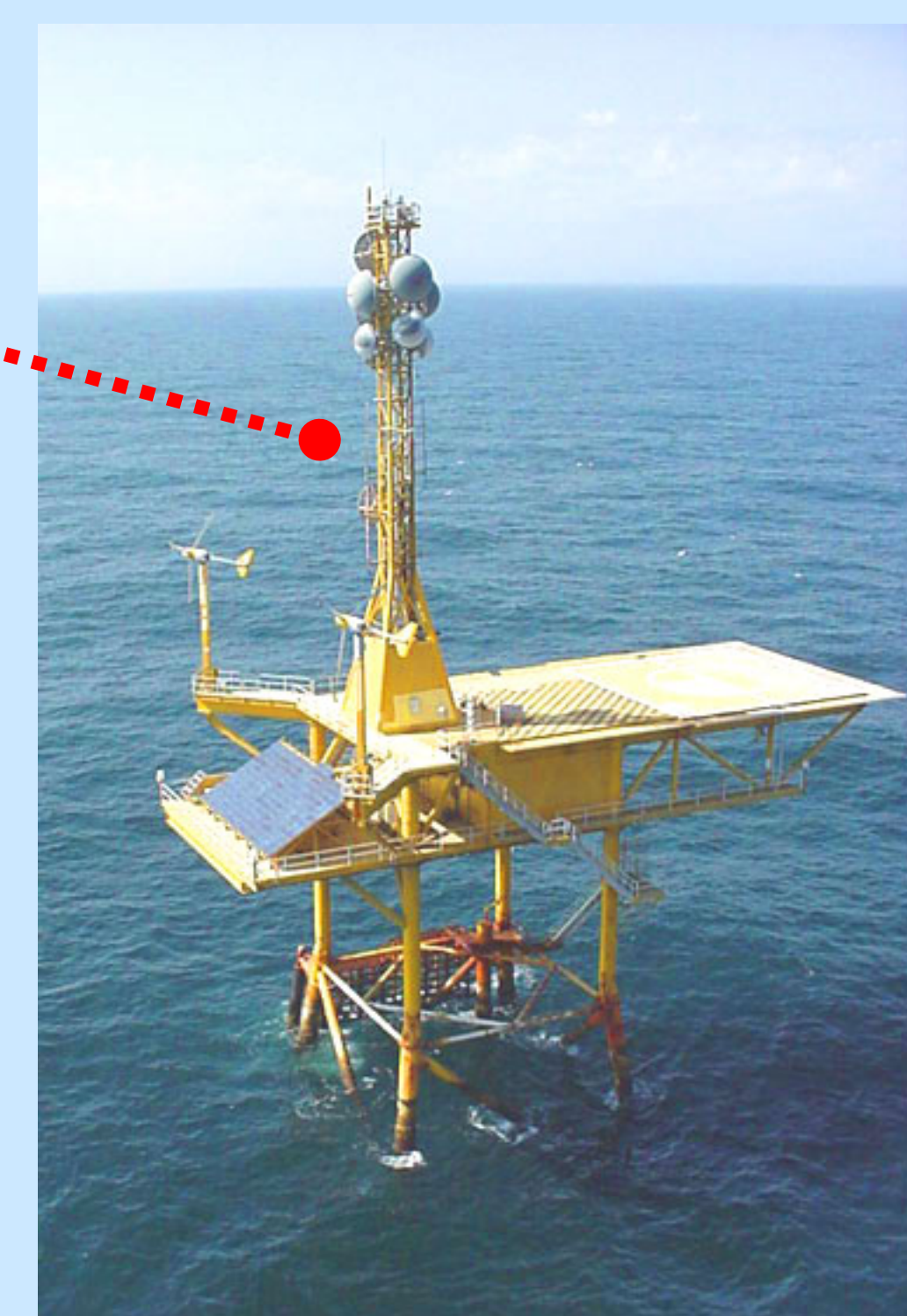


## Georgia Wind Measurement Sites



Savannah Light Station

- Anemometer height — 33 m above sea level
- Preliminary analysis of wind data indicate Class 4 wind resource at this site



U.S. Navy Tower R2

- Anemometer height — 50 m above sea level