

Coastal Ocean Research to Facilitate Safe and Efficient Development of Offshore Renewable Energy

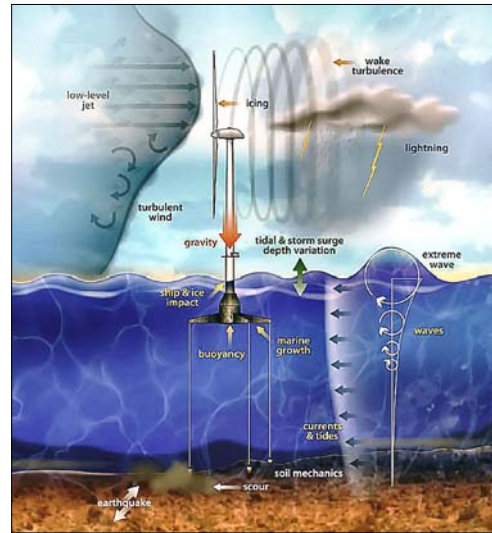
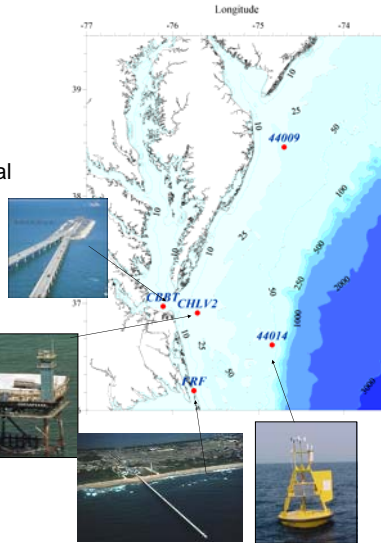
WIND

Strength and variability of the wind for design and power

- Data from
 - Meteorological networks
 - Satellite wind
- Analyze for
 - Variability – vertical and horizontal
 - Average power available
 - Extreme events

From Meteorological network
NOAA, NWS & NDBC

[agreements with NOAA and
ACOE for collaboration]

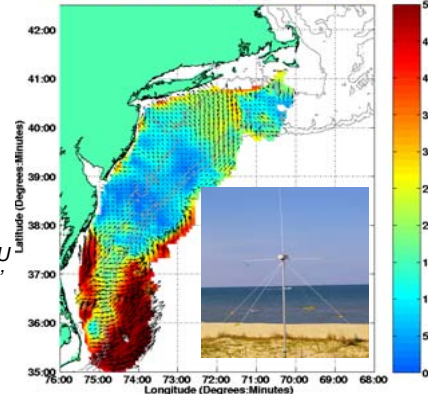


OCEAN CURRENTS

Strength of ocean currents for design and possible power

- Data from
 - high frequency radar systems along the coast
 - offshore moorings and NOAA buoys
- Analyze for
 - Extreme events
 - Average conditions

Mid-Atlantic Raw Velocities (1 Day Avg) 2007/06/04 1600 GMT

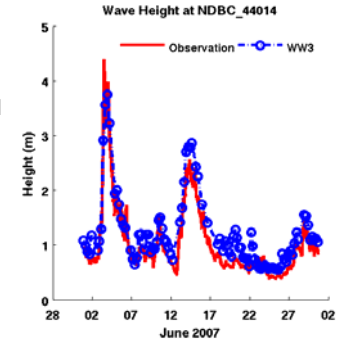


Surface currents measured by ODU and collaborators' radar systems during the wind storm of June 3, 2007

WAVES

Characteristics needed for platform and turbine design and control and maintenance.

- Data from
 - NDBC Data Buoys
 - Wavewatch III and other models
- Analyze for
 - Extreme heights
 - Average conditions
 - Spatial patterns

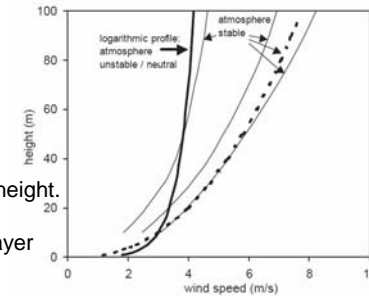


Waves reached heights of 5 m during the wind storm of June 3, 2007

WIND PROFILE

Understanding the variability in the wind above the ocean surface is vital to wind farm design.

- Data from
 - Wind profilers installed by VCERC at CHLT, Duck or Tangier
- Analyze for
 - Vertical variability in relation to hub height.
 - Variations with season and weather
 - Determine atmospheric boundary layer



MODELS

Modeling ocean and atmosphere for analysis and prediction

- Effects of wind farm structures on the flow and stratification field
- Effect of wind farms on the atmosphere
- Use of the wind and waves models for analysis and prediction

The Goal

Nysted Wind Park in the southern part of the Baltic Sea. Nysted has 72 wind turbines rated at 2.3 MW each.

