


CONFLICTING USES OF OCEAN SPACE

Renewable Energy
Systems
&
Ocean Shipping



Overview

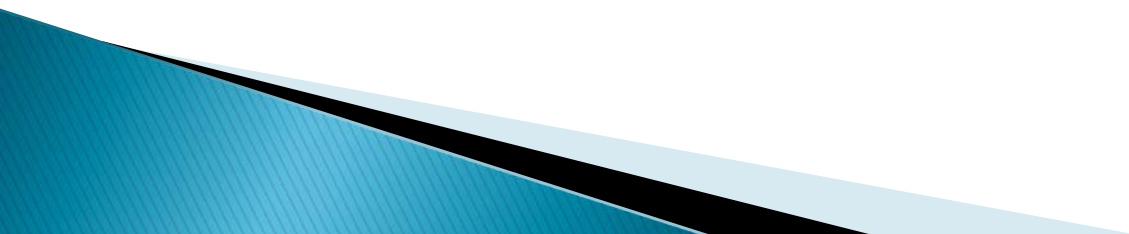
Offshore Wind – Near term

US Offshore Wind Resource and its Potential

What is happening on US East Coast

What is happening in Europe

The problems and opportunities



40 5mw Turbines for new wind farm in German North Sea

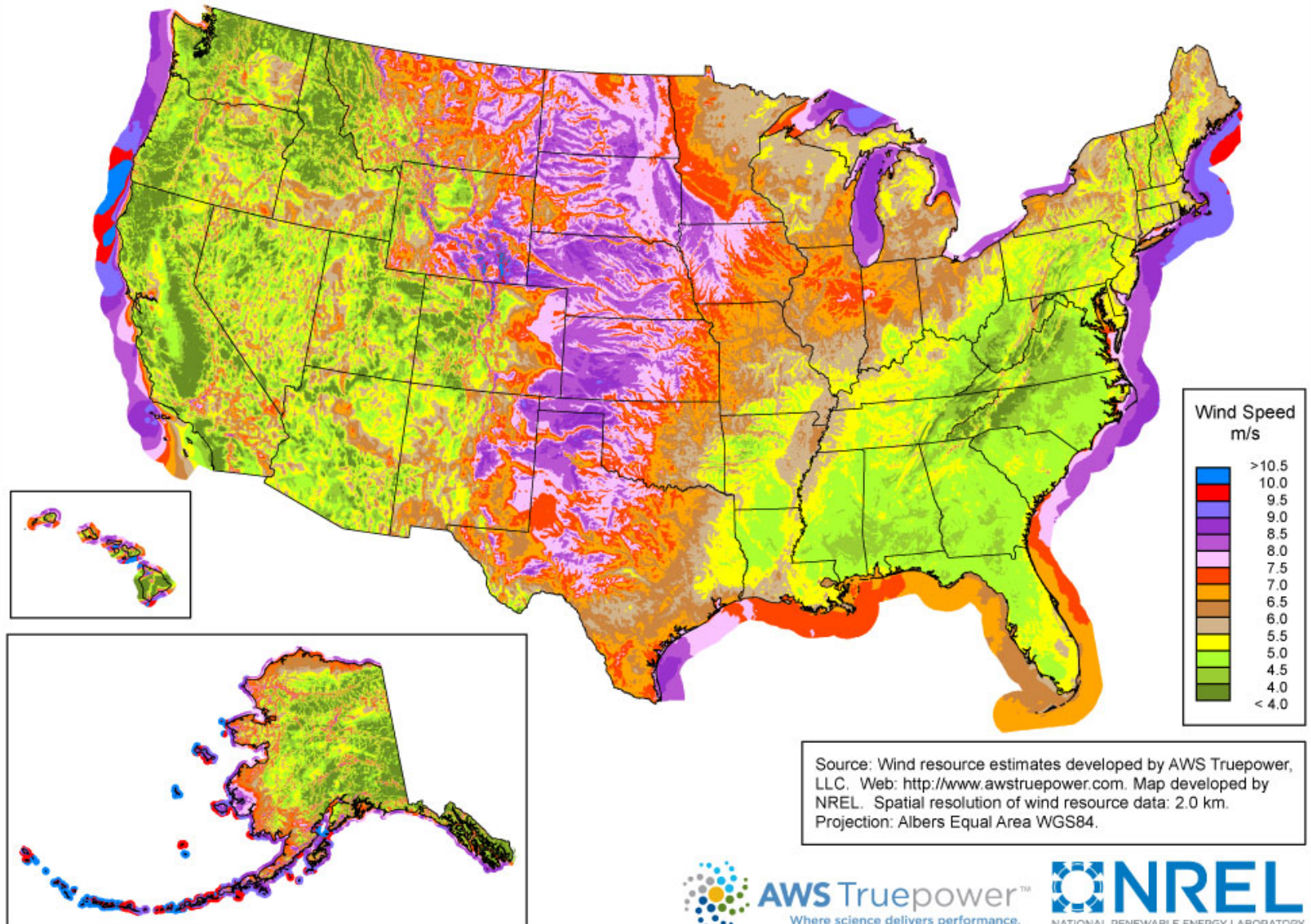


Source: AREVA

OSW Resource

- ▶ Offshore US East Coast = Prime Resources
- ▶ Studies Evaluate Existing Data
 - Stanford / NREL
- Maine to Florida = 1 / 3 of total demand in region using 1 / 3 available space in shallow water and 2 / 3 in deep water out to 200 miles

United States - Land-Based and Offshore Annual Average Wind Speed at 80 m



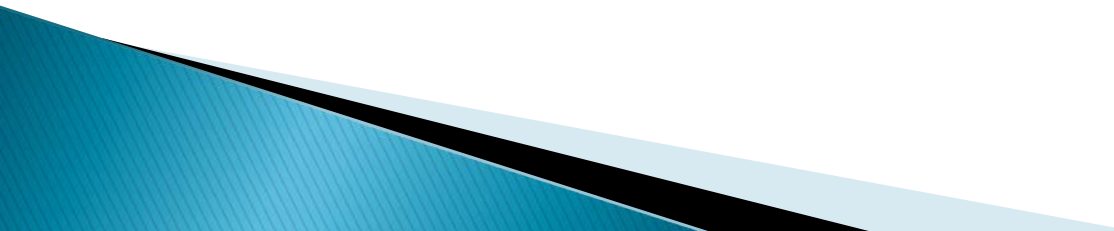
AWS TruepowerTM
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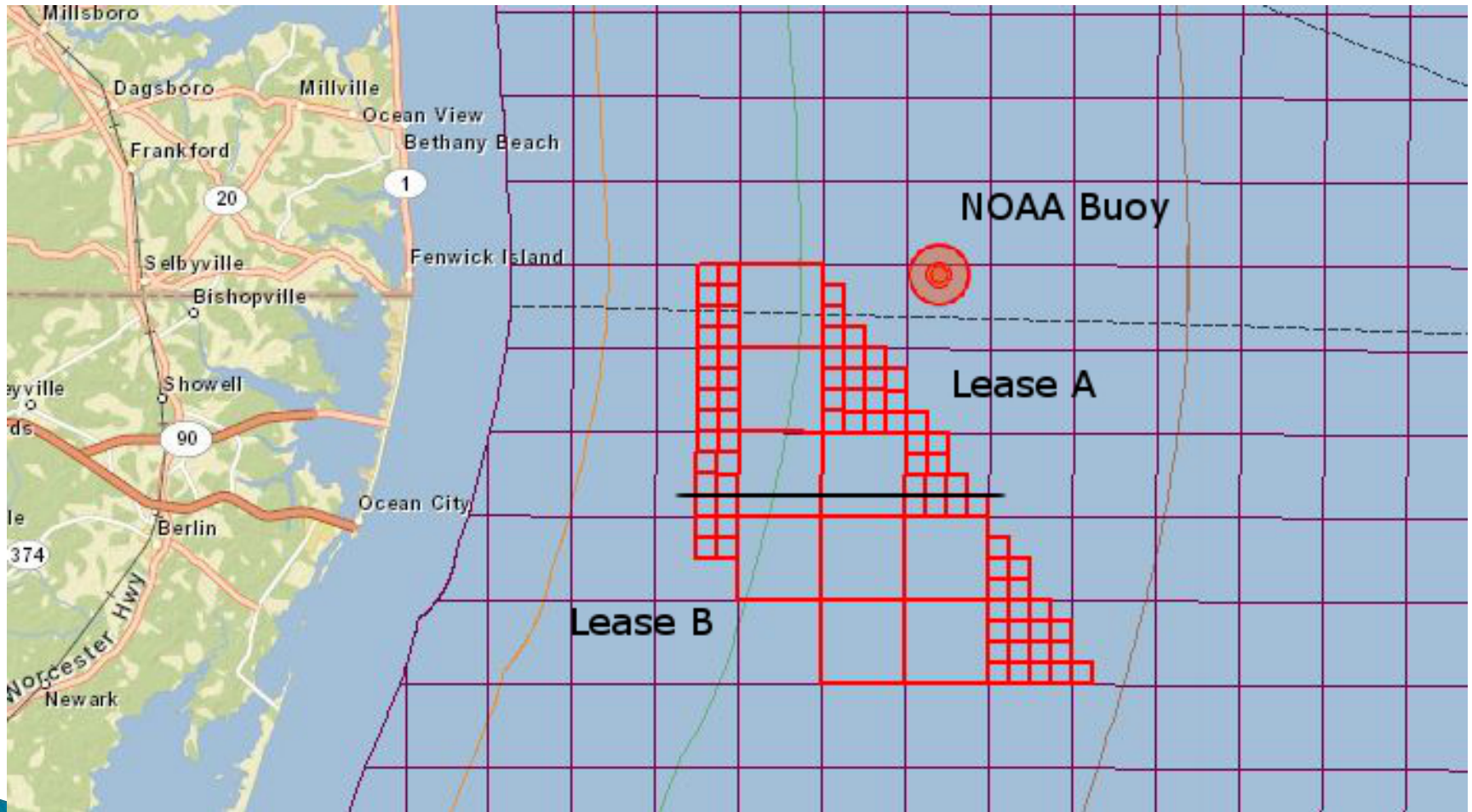
NREL
NATIONAL RENEWABLE ENERGY LABORATORY

09-JAN-2012 3.1.1

Status of US East Coast OSW

- ▶ No Wind Farms yet installed
 - ▶ Cape Wind Nantucket sound leased but ?
 - ▶ Federal Lease Sales held in RI/MA and VA
 - ▶ (30 sq mi and 20 sq mi)
 - ▶ Lease Sale planned in 2014 in MD
 - ▶ (15 sq mi)
 - ▶ Concerns about barge traffic in MD WEA
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Maryland OSW Lease Area



Studies of Vessel Traffic Densities

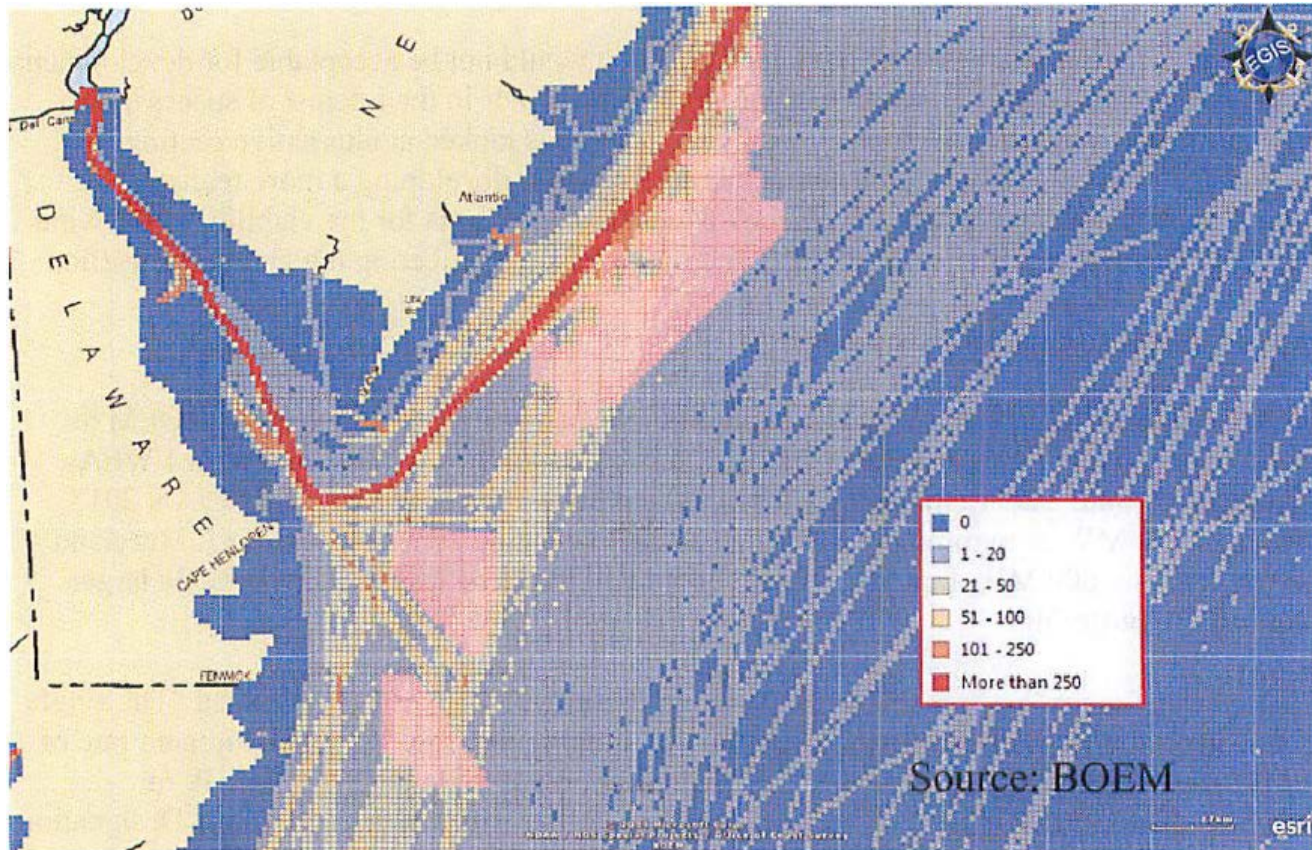
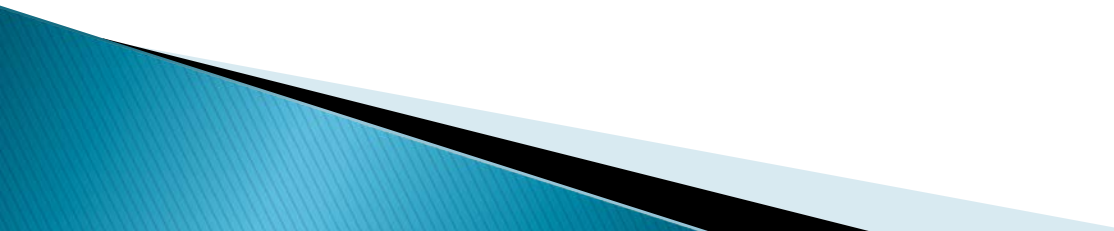



Figure 1: 2010 Density Plot of Tug and Barge Routes through NJ, DE and MD WEAs

What's Happening in Europe

- ▶ OSW Activity 2012 – connected 293 turbines in 9 farms = 1,166 MW; invested ~ E 4bn; installed 369 turbines.
 - ▶ Cumulative total connected 1,662 turbines in 55 farms, 10 countries, 4,995 MW
 - ▶ 14 Projects / 3,300 MW under construction
 - ▶ Av turbine size installed in 2012 = 4 MW and av. Wind farm size = 271 MW, av WD = 22M
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The Problem and the Opportunity

- ▶ New Uses for regions with long traditions
 - ▶ Should studies consider altering traffic patterns
 - ▶ How to measure public benefits from alternative uses
 - ▶ Coping with more crowded spaces and higher traffic densities
 - ▶ Navigation Safety as the goal
 - ▶ The value of orderly, managed traffic
 - ▶ Wind farms as Nav. Aids?
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Largest Wind Farm in Denmark (400MW – 111 x 3.5MW)



Source: Dong