

# The Block Island Wind Farm and its Potential Impact on Tourism



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Capstone Presentation 3/17/11

# BIW & Tourism

- History of Block Island & Tourism
- Overview of Deepwater Wind Proposal
  - My interactions with DWW
- Rhode Island Special Area Management Plan (RISAMP)
- What aspects of an offshore wind farm can affect tourism in a coastal community?
- Case study: Samsø, Denmark
- Conclusions

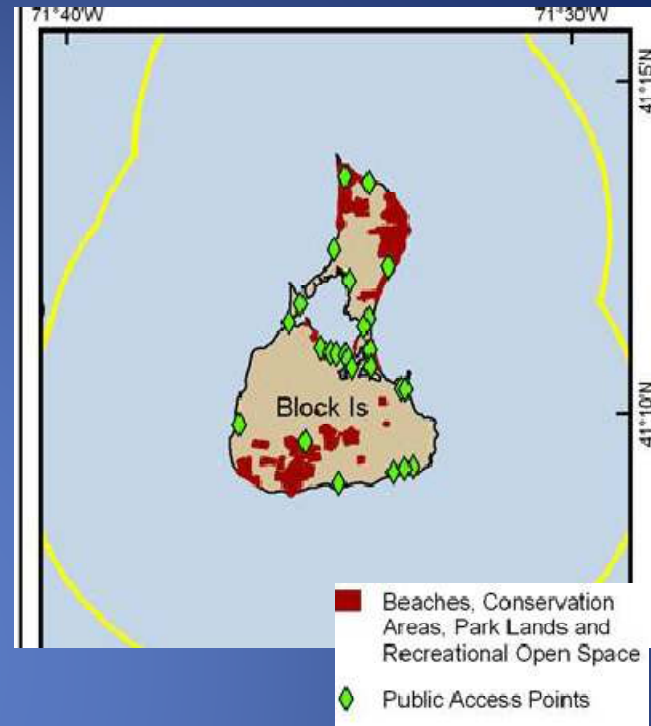
# Block Island Facts

- 6,000 acres
- 13 miles off the coast of Rhode Island
- Formed by glacial movement 10,000 years ago
  - Diverse geography: beaches, kettle ponds, grasslands, sand dunes, bluffs
- Accessible by ferry or airplane
- Population 1,000 year-round
  - Population 10,000 during summer



# Block Island Tourism

- Historic sites
  - Southeast and North Lighthouses
- 17 miles of beaches
- 28 miles of walking trails
- 43% preserved open space
  - bird, whale, and wildlife viewing
- Recreational boating and fishing
  - BI race week
  - 3 main marinas: Payne's, Champlain's, & Boat Basin
- Shopping & dining
  - More than 30 dining establishments & 50 shops



# BIPCO

- BI powered by diesel generators
  - Not connected to mainland grid
  - 2006: 950,000 gallons of No.2 fuel oil
  - 2007: 10.7GWh electricity produced
    - Winter peak 1.5MW, summer peak 4MW
- Electricity 30 to 40 cents per kWh
- Diesel transported via ferry



# Deepwater Wind's Proposal

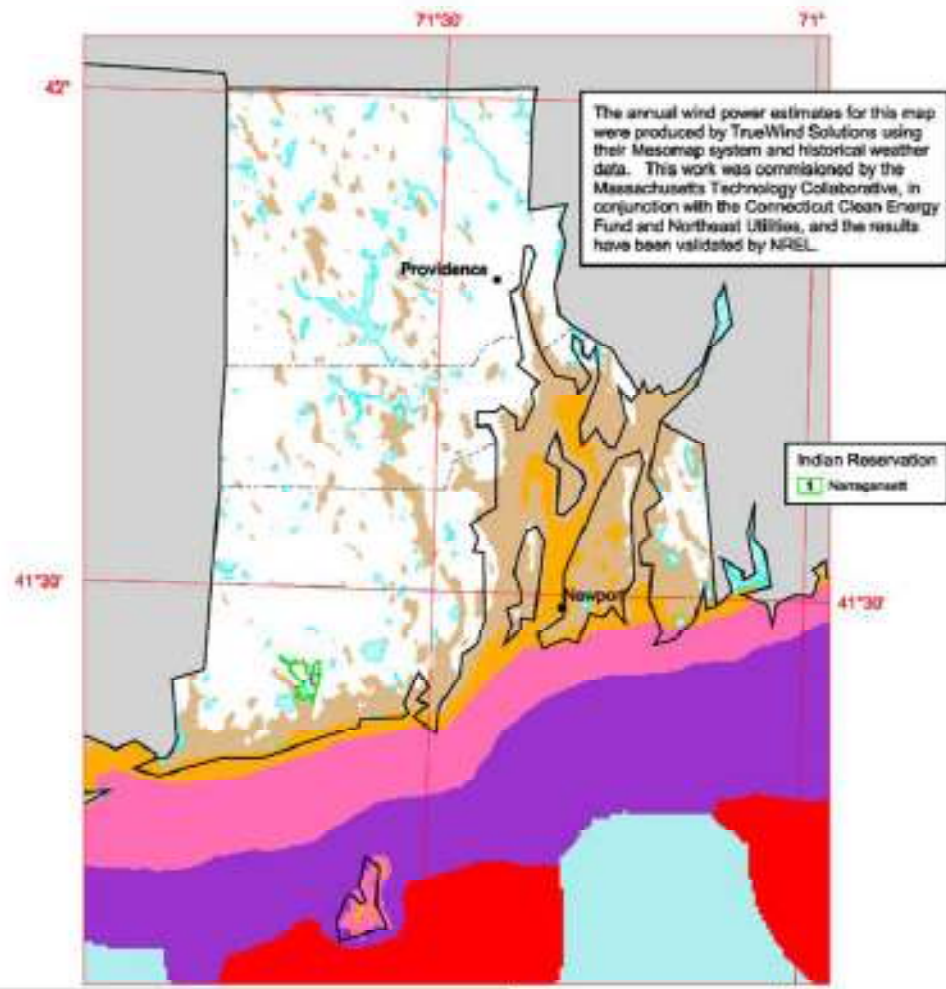
- BI offshore wind Class 4-6
- 2008 winning proposal for cheaper, more reliable source of energy for BI
  - Small demonstration project 3 miles SE
  - Larger, utility-scale project in federal waters
- Block Island Wind Farm, 5 to 8 turbines totaling 30MW
  - 100,000MWh/yr. (14,300 RI households)
  - 22 mile, 34.5kV transmission cable to connect to mainland
  - National Grid agreed to pay 24.4 cent per kWh for electricity produced



# RISAMP

- Coastal Resources Management Council and University of Rhode Island
  - Map existing uses and critical use zones (for transportation, animals, and military)
  - Draft zoning map and regulatory standards for protecting ocean resources
  - Protect RI's coastline and waters for both natural environment and human enjoyment

## Rhode Island - 50 m Wind Power



Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m $W/m^2$	Wind Speed* at 50 m $m/s$	Wind Speed* at 50 m $mph$
1	Poor	0 - 200	3.0 - 5.6	0.0 - 12.5
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	> 800	> 8.8	> 19.7

\*Wind speeds are based on a Weibull's value of 2.0



U.S. Department of Energy  
National Renewable Energy Laboratory



06/FE9-2007 v. 1.3

# View From SE & N Lights

- Southeast Light built 1874, North Light 1867
- Section 106 of the National Historic Preservation Act
  - Wind turbines possibly qualify as “adverse effect”
    - Removal from National Register of Historic Places
    - Disqualified from federal tax breaks and grants



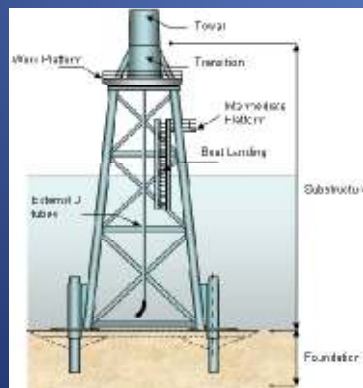
# Navigational Lights & Sound

- United States Coast Guard
  - 2 flashing amber lights visible up to 2.3 miles (Cape Wind)
  - Possible daytime navigational lights providing paths through turbine array
    - Not visible on land
- Federal Aviation Administration
  - Red flashing lights on the top of each nacelle
  - Visible on land
  - Only operating when aircraft approach
- Less than USEPA's Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare (Cape Wind)

# Recreational Boating & Fishing

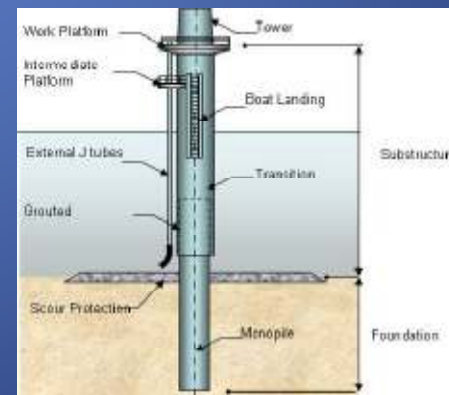
## Positives

- No plans to implement “safety zone” to restrict access
- Opportunity for boat tours of facility
- Artificial reef effect
  - Jacketed foundation

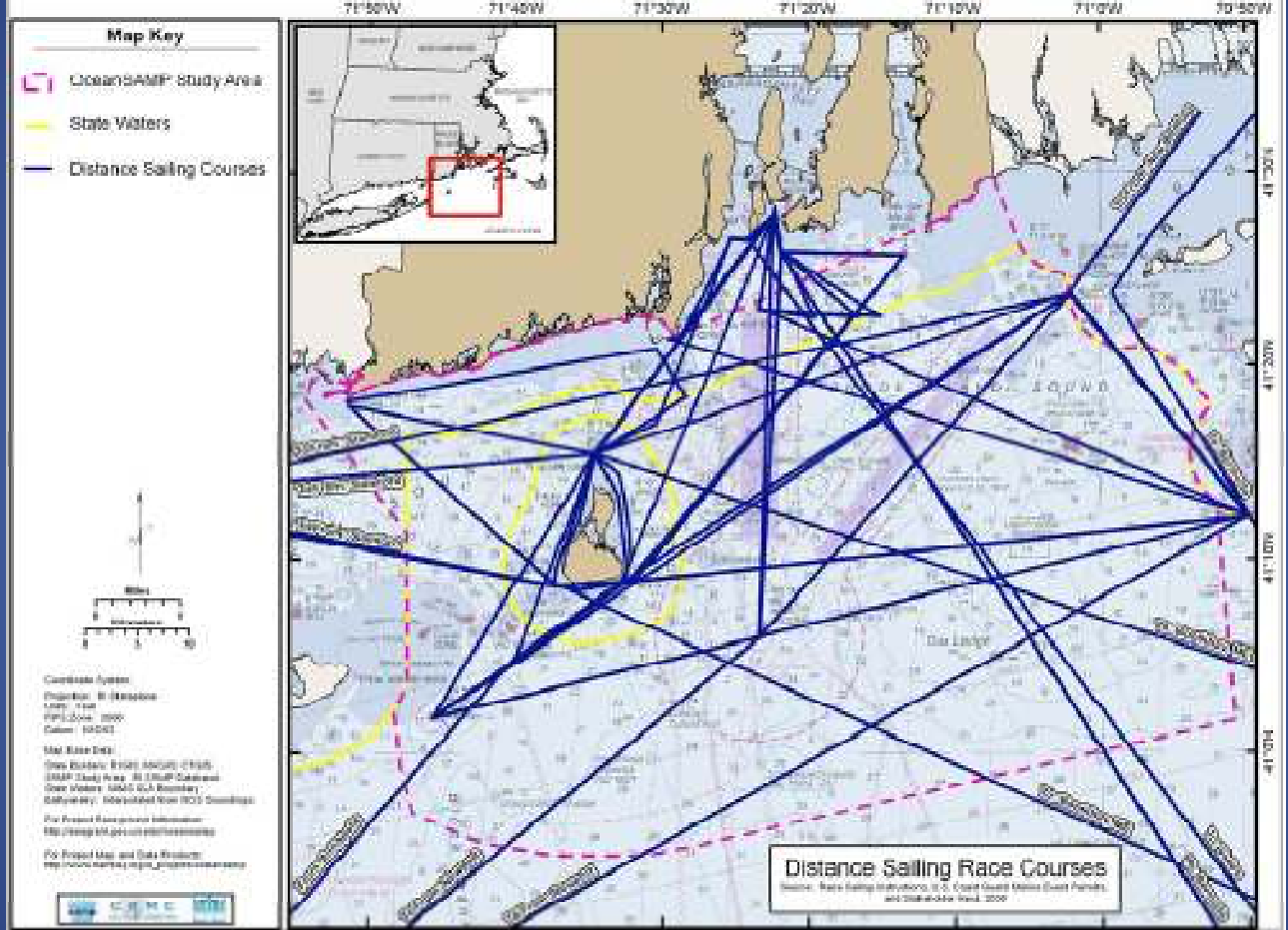


## Negatives

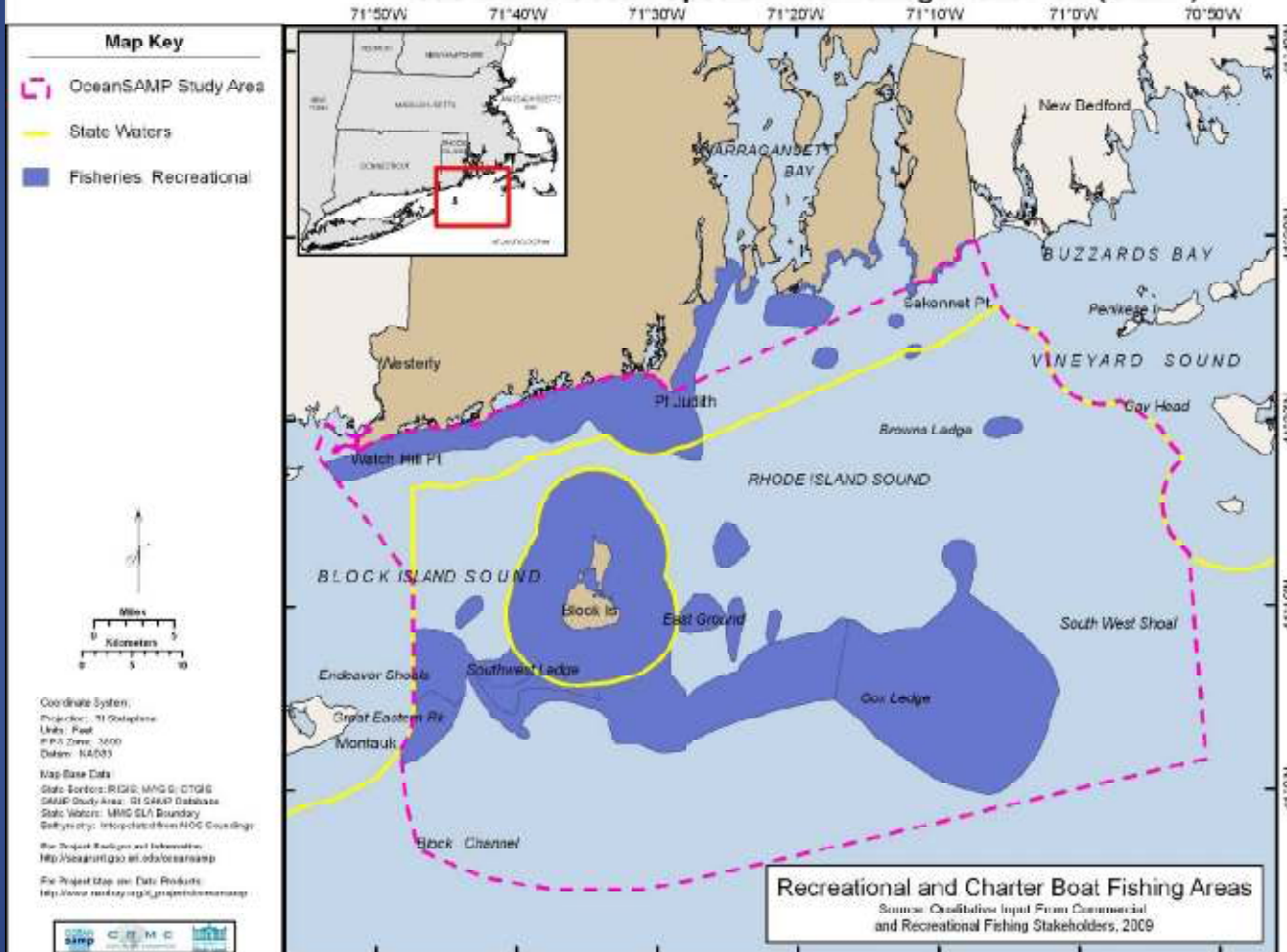
- Avoidance of arrays fearing navigational hazards or increased insurance premiums
- Invasive species
- Possible rerouting of race courses



# Rhode Island Ocean Special Area Management Plan (SAMP)

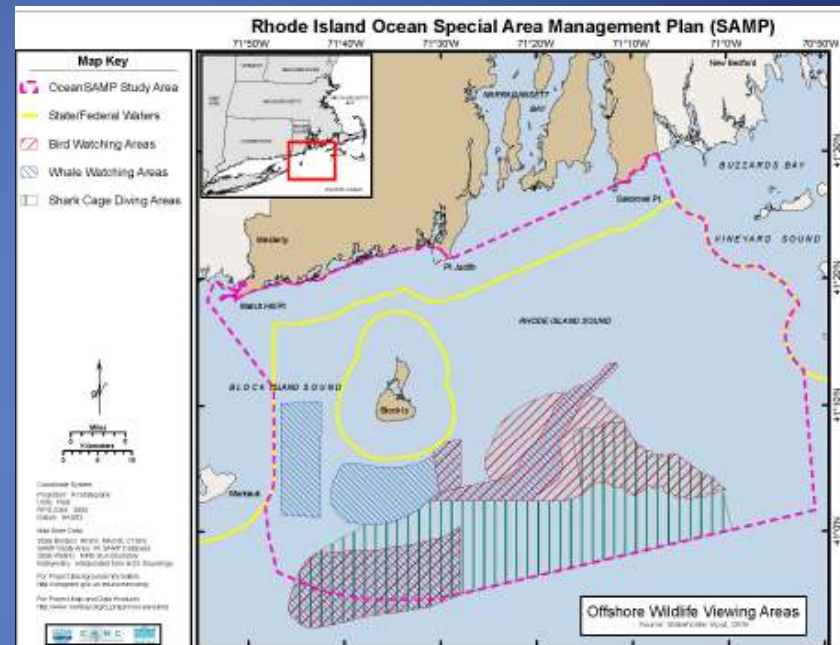


# Rhode Island Ocean Special Area Management Plan (SAMP)



# Offshore Wildlife Viewing & Diving

- Whales may be displaced by underwater vibrations
- Birds may avoid turbine blades
- No major offshore dive sites (sunken ships) are located in proposed wind farm site
  - Opportunity for diving in array



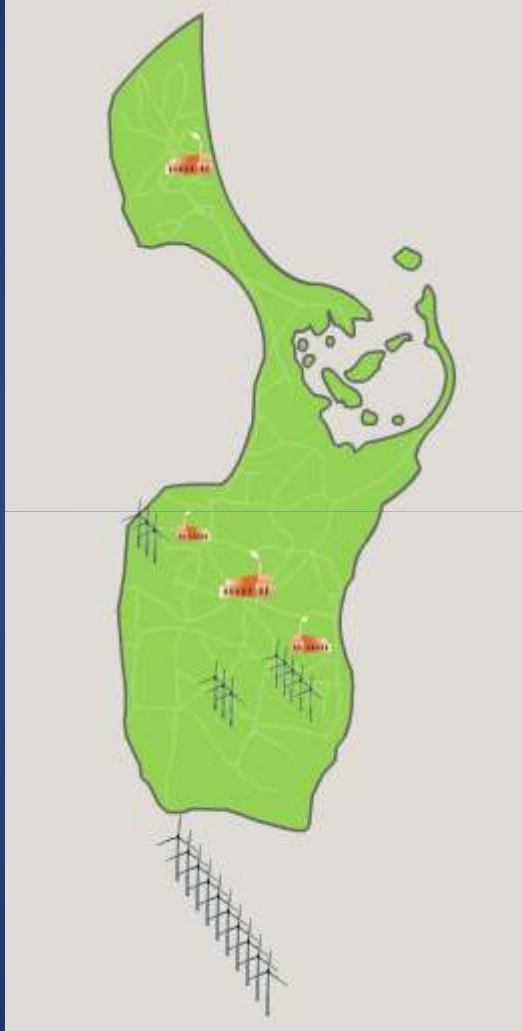
# Property Values & Aesthetics

- 2003 “The Effect of Wind Development on Local Property Values” found no adverse affect on property values
  - 25,000 real estate transactions within 5 miles of 10 of largest onshore wind farms in the US
- 2007 University of Delaware “The Effect of Wind Power Installations on Coastal Tourism” survey
  - 50% visit same beach if turbines about 1 mile from shore, 93.7% if about 14 miles from shore
  - 66% out-of-state tourists and 84% Delaware residents would visit new beach
  - 44% tourists would pay for boat tour of facility
- 2009 Roger Williams University study
  - 83.9% of Block Island voters and 71% of homeowners would be in favor of 5 to 8 turbines, 3 miles from shore with a connecting cable to the island

# Samsø, Denmark

- 100% self-sufficient and renewable in 10 years
  - Onshore wind provides electricity
  - Offshore wind offsets carbon emissions
    - Ten 1MW turbines
  - District heating mostly from burning hay
- Similarities to Block Island
  - Largely rural island
  - Accessibly only by ferry and plane
  - Small population (Samsø about 4,000 people)
  - Main industries tourism and agriculture





# Will BIW Affect Tourism?

- May affect NRHP status of Southeast Light, but likely not North Light
- Most navigational lights will not be visible from shore
- Turbines will be inaudible onshore
- Recreational fishing and boating should be able to continue unaffected
  - Chances for increased biomass from artificial reef effect
  - Opportunity for boat tours of facility
- While some wildlife may be displaced by turbines, most popular offshore viewing sites are in federal waters
- Offshore dive sites will be unaffected
- No conclusive evidence that property values decrease with the construction of an offshore wind farm
- Will largely depend on personal opinion

