Mary Jane Parks, *SVP Project Development*

US Offshore Wind Development

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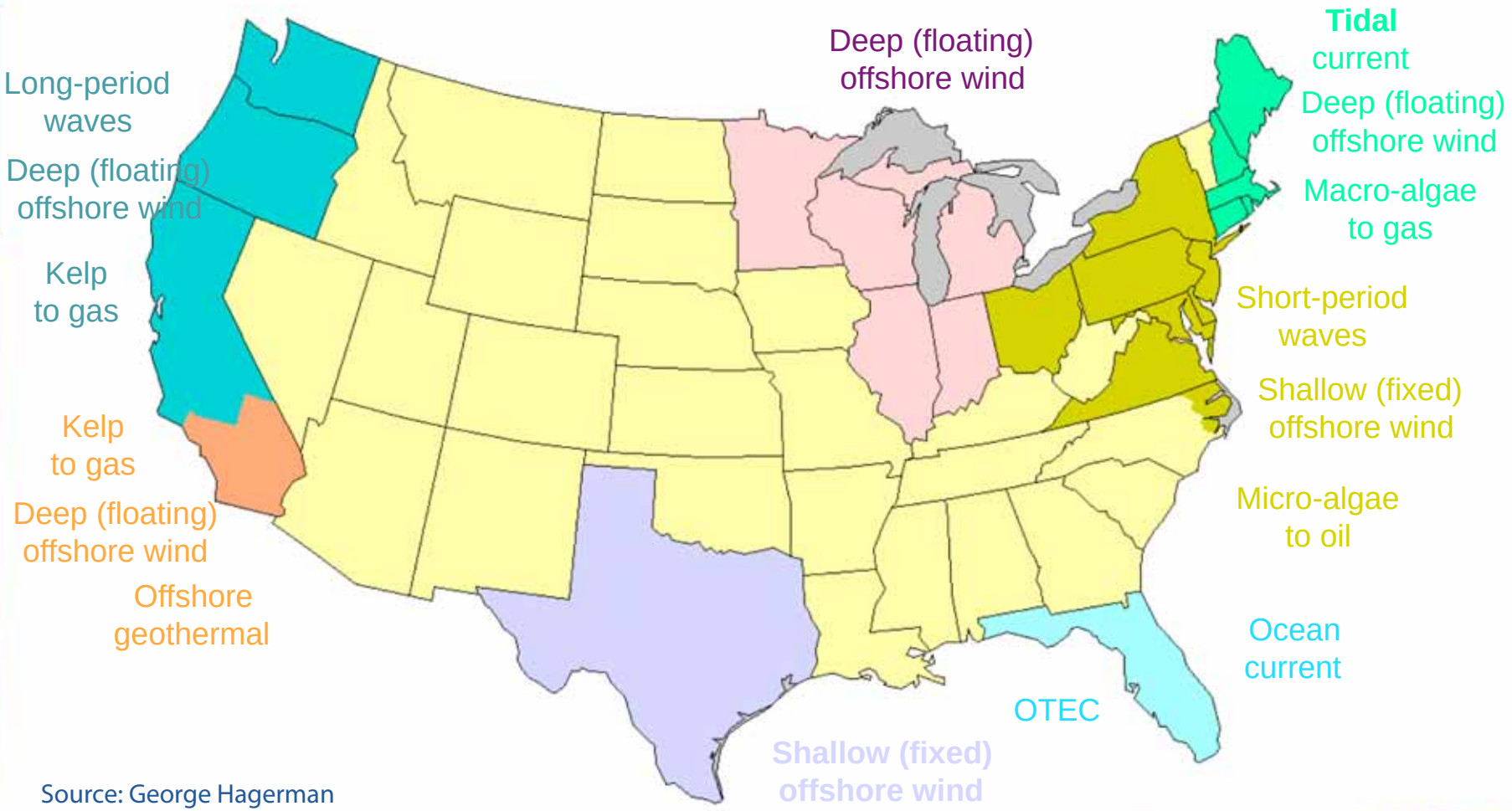
US Offshore Renewables



Source: George Hagerman

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Principle Power Inc.

- Founded in 2007
- Mission
  - Renewable Energy IPP and Project Developer
  - Commercialize disruptive renewable technologies
- Offshore Renewables – WindFloat
  - Patented, floating foundation for >50M depth
  - Exclusive, world-wide license from MI&T
- Concentrated Solar – Cool Earth Solar
  - MOI for exclusive development rights in specific markets
- Strong and Experienced Management Team

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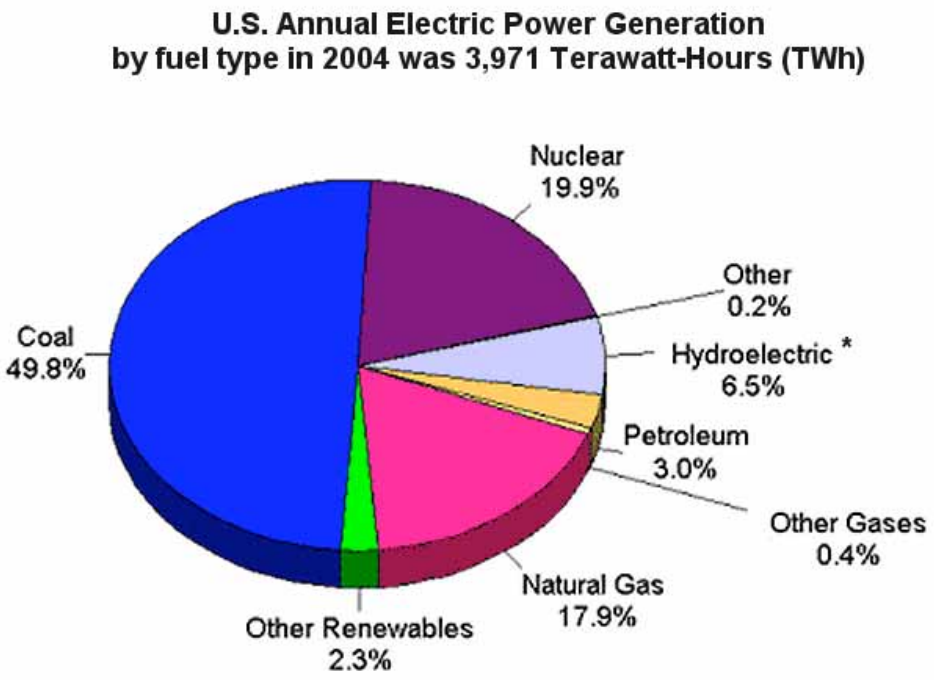
Offshore Renewables Potential



* Note: Hydroelectric includes generation from pumped-storage facilities after subtracting energy used for pumping

Generation in TWh/yr

- Wave ~ 250-260
- Tidal ~ 150
- Offshore wind
  - Shallow >300
  - Deep >900
- Potential is >40% of present energy generation

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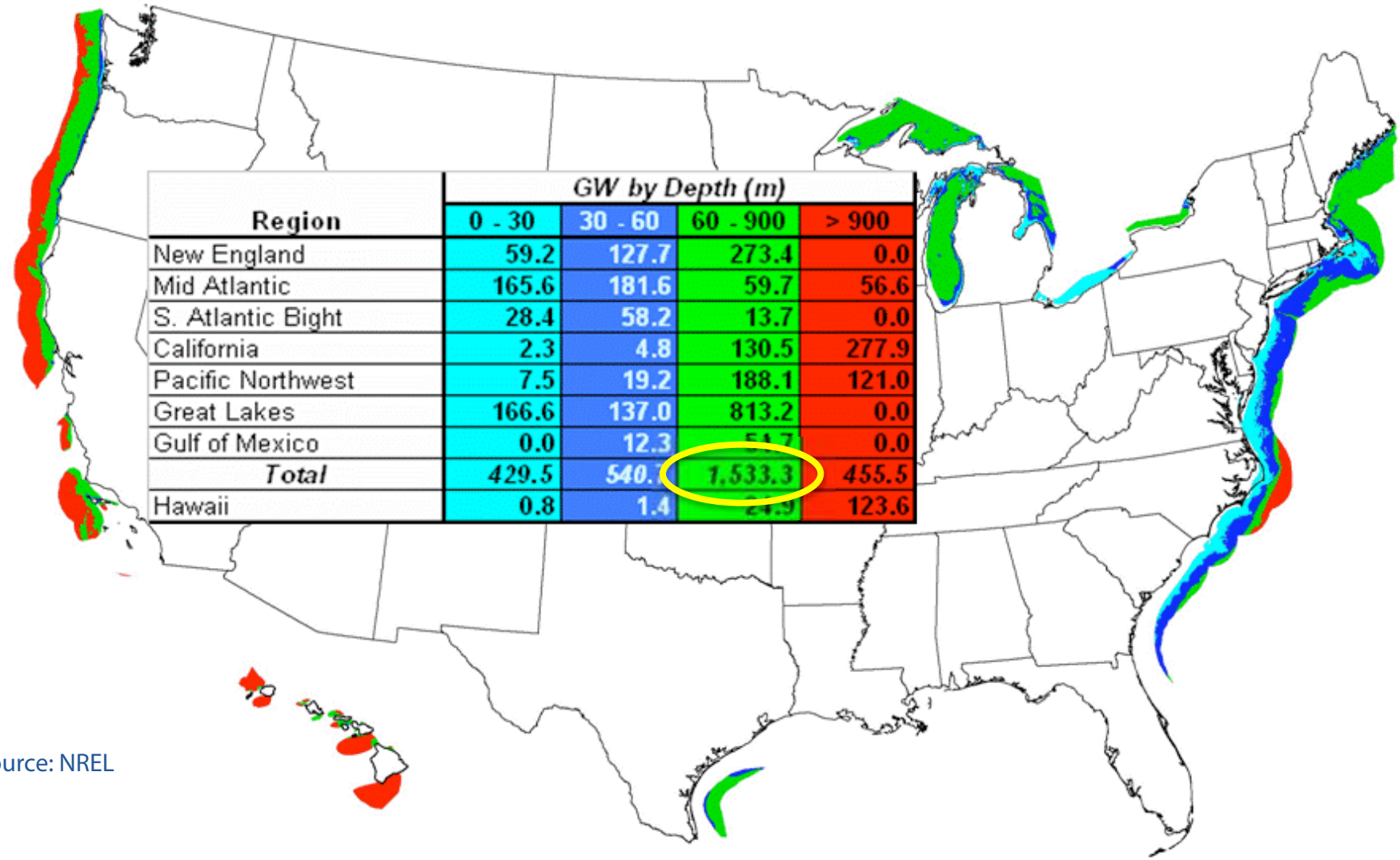
US Offshore Wind Energy



Region	GW by Depth (m)			
	0 - 30	30 - 60	60 - 900	> 900
New England	59.2	127.7	273.4	0.0
Mid Atlantic	165.6	181.6	59.7	56.6
S. Atlantic Bight	28.4	58.2	13.7	0.0
California	2.3	4.8	130.5	277.9
Pacific Northwest	7.5	19.2	188.1	121.0
Great Lakes	166.6	137.0	813.2	0.0
Gulf of Mexico	0.0	12.3	[illegible]	0.0
Total	*429.5*	*540.[illegible]*	*1,533.3*	*455.5*
Hawaii	0.8	1.4	[illegible]	123.6

Source: NREL

Deep Ocean Offshore Wind Concepts

WindSea (semi-submersible)

Hywind (spar)

Blue H (tension leg)

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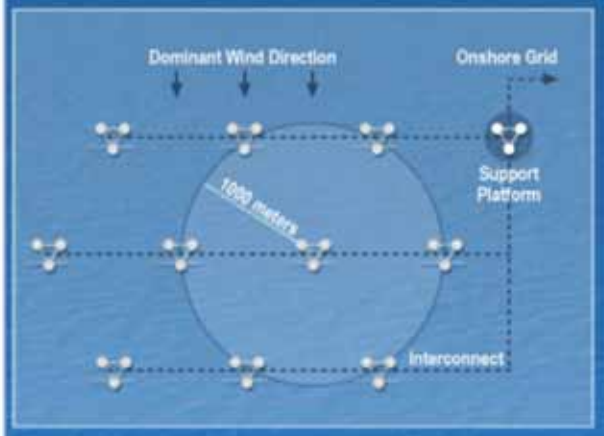
Wind Farm and Interconnect Layout



Column Stabilization and Closed Loop Active Ballast System

Integrated Column/Tower

Boat Landing and Safety Equipment

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Safety First – Themes

- Technology
  - Water depth independent semi-submersible
  - Strong mooring configuration
  - Overturning moment absorbed by hydrostatics
  - Foundation stability
  - Minimize pitch and yaw
- Installation
  - Port assembly – lower cost and practical
  - Turbine/mast installation – known location and equipment
  - Benefit of offshore installation
  - Longer deployment window
  - Mooring installation vessels

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Offshore Wind in California

- **Utility interest**
- **Project Description**
  - Phase One – 10 MW (2 turbines)
  - Scale to 150MW (30 turbines total)
- **Grid Connection**
  - Interconnection at Shore Substation
- **Community Involvement**
  - Recreational Interests
  - Local Fishermen
  - Community Environmental
- **Green Pricing / Green Credits**

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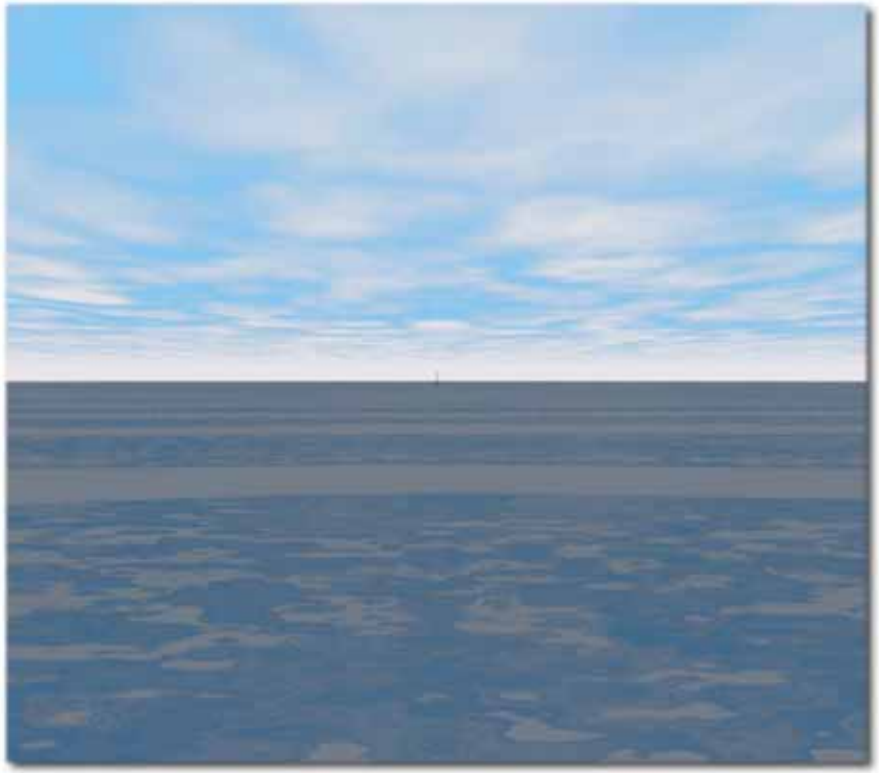
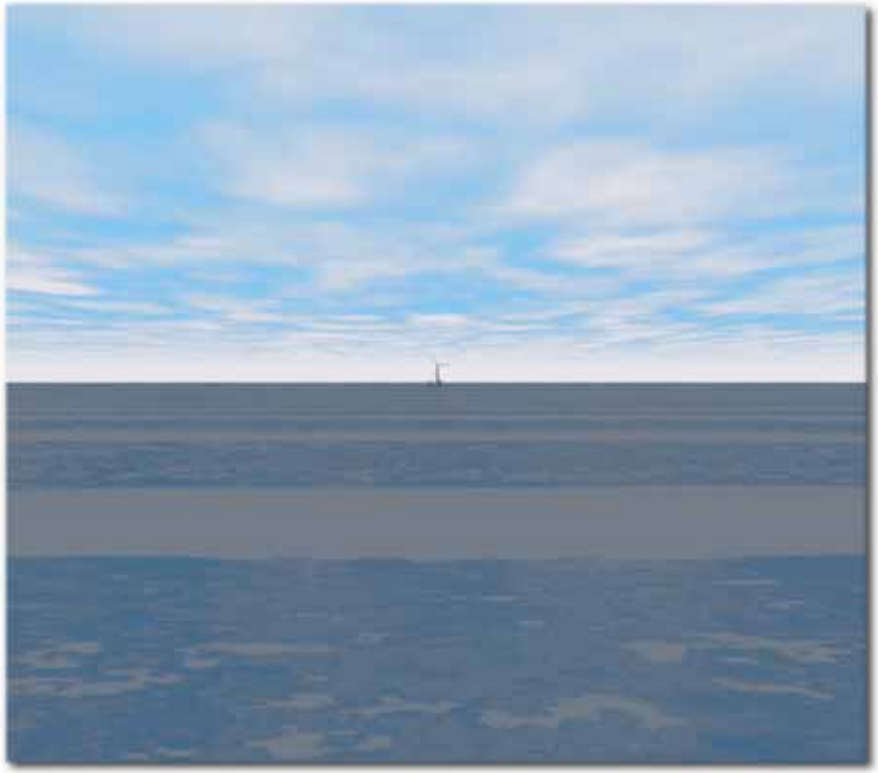
Power Plant Visibility



10 miles offshore



5 miles offshore

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Equipment

Source: Libherr Cranes

Source: Talisman Energy / Beatrice

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Overall Timeline

- Stakeholder Involvement
- Environmental Studies
- Regulatory Application, Review, Approvals
- Phased Construction
- Commercial Operation Date
- Operation, Maintenance, Monitoring

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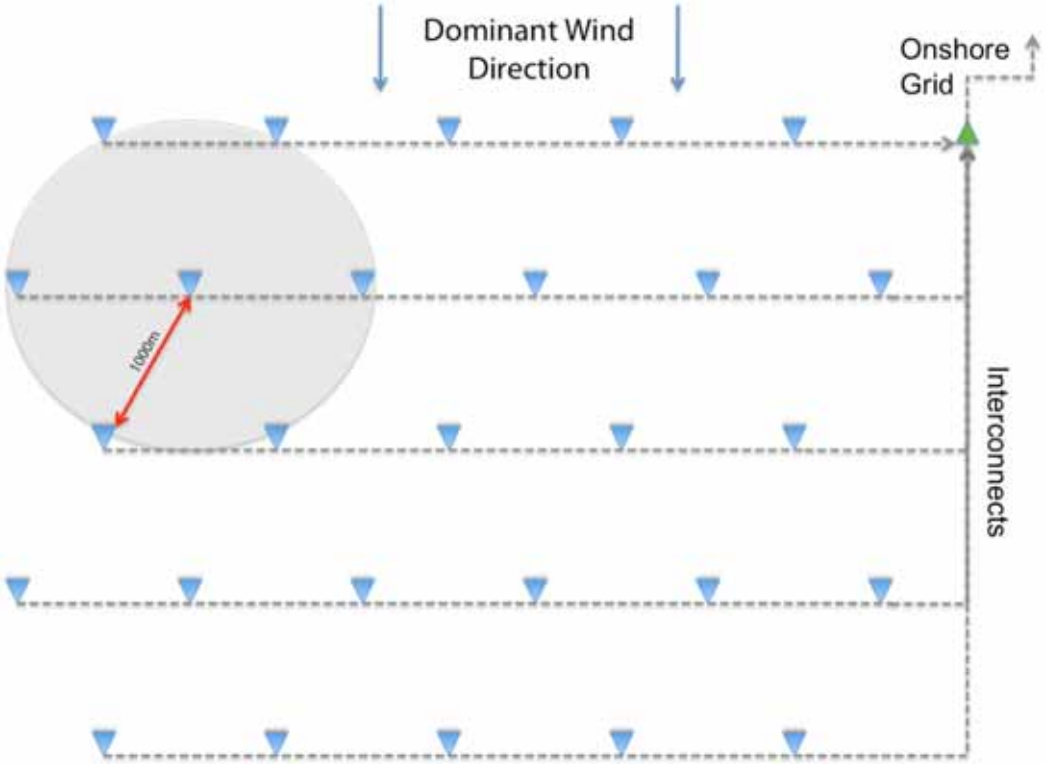
Project Layout

- Mooring footprint: 8 x water depth
- Predominant Wind directions: North and South
- Area permitted: < 5 square miles



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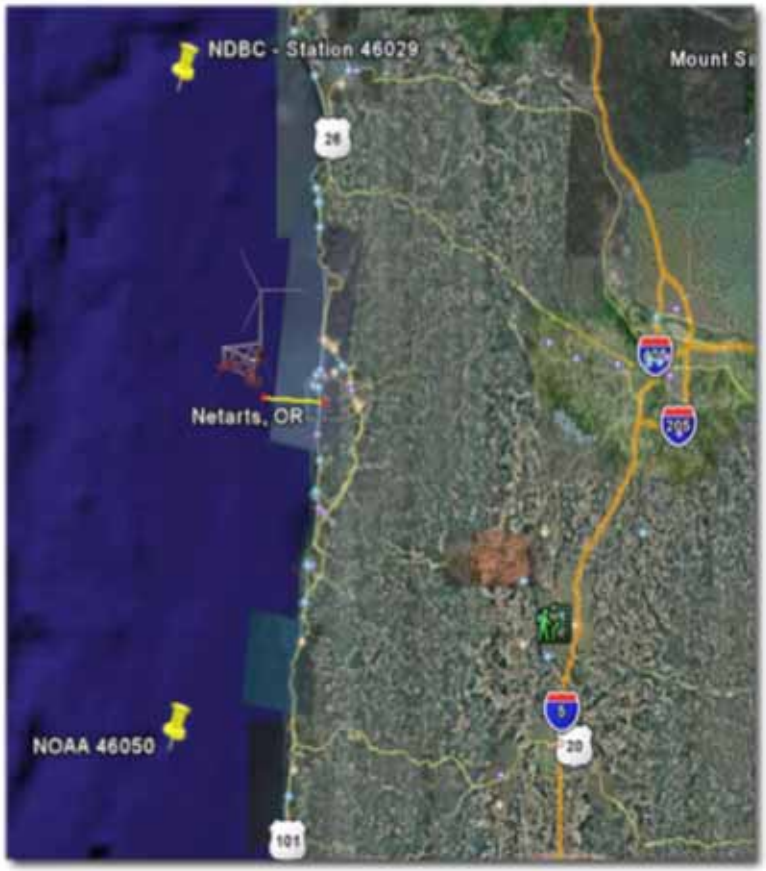
Site Selection

- Wind resource > 7 m/s
- Grid capacity & expansion
- Distance to fabrication site
- Dedicated assembly site
  - Successive fabrication,
  - Assembly and installation
  - Vessels on long term contract
  - Shore infrastructure near major highway



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Permits

Participant/Agency	Permit/Document
Minerals Management Services (MMS)	OCS Lease NEPA document lead agency
National Oceanic and Atmospheric Association (NOAA)	NEPA review
National Marine Fisheries Service	Threatened and Endangered Species Review
U.S. Army Corps of Engineers (USACE)	Section 10 or 404
U.S. Coast Guard	Aids to Navigation Permit
U.S. Fish and Wildlife Service	Threatened and Endangered Species Review
Federal Aviation Administration (FAA)	Over flight permit
State Office of Archaeology	Historical and Archaeological Review
State Fish and Wildlife Department	Environmental Quality/EPA Checklist
State Lands/Department of Natural Resources	Land Lease
Additional site dependent permits	As required

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