Overview of Marine Renewable Energy Activities in Massachusetts

3RD BIENNIAL MARTHA'S VINEYARD COASTAL CONFERENCE

Massachusetts Office of Coastal Zone Management

Overview

- Drivers: climate goals and policies
- Summary of marine renewable energy types
- Offshore wind
  - Planning and siting
  - Leasing and energy contracts
  - Next steps

Climate change

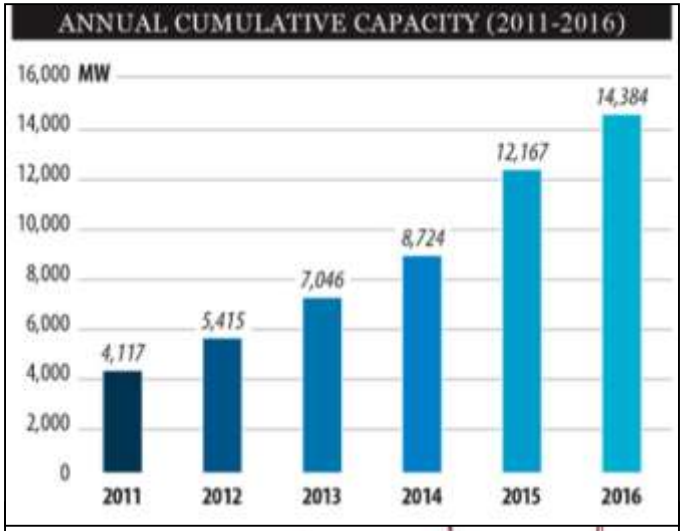
- Global climate change presents a serious threat to Commonwealth's environment, residents, communities, and economy
- Generation and consumption of energy continues to be a significant contributor to GHG emissions
- Great potential for reducing emissions through continued diversification of energy portfolio
- Some marine renewable technologies offer significant potential for sustainable energy
- Need for responsible development and to protect natural resources, ecosystems, and marine uses

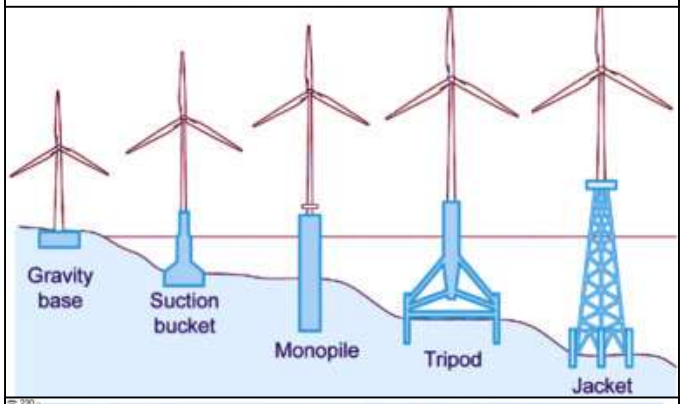
Offshore wind: policy drivers

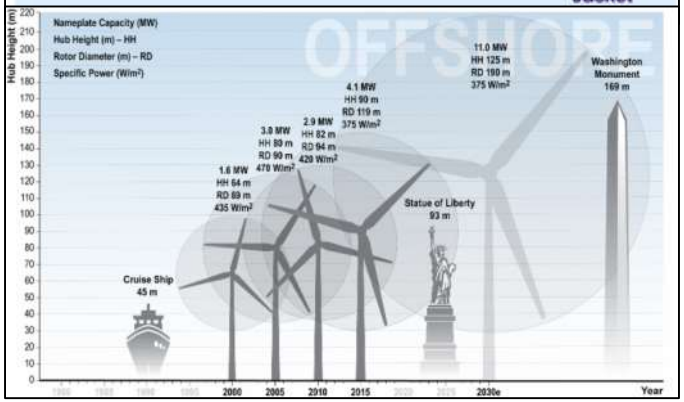
- ***Global Warming Solutions Act*** – economy wide emission reduction goals:
  - 25% below 1990 levels by 2020
  - 80% below by 2050
- ***Renewable Portfolio Standard*** –
  - *2017 - RPS is 12%*
  - *2050 - RPS will be 45%*
- ***Regional Greenhouse Gas Initiative*** – *cap and trade agreement by 10 states*
- ***Energy Diversity Act*** – requires utilities to solicit 1,600 MW of cost- effective offshore wind between 2017-2027
  - Solicitation issued on June 29
  - Proposals due December 20
  - Selection on May 23

Marine renewable energy

- To meet state and regional goals, marine renewable energy needs to be part of renewable energy portfolio
- Offshore wind – maturing industry provides the greatest potential for significant power
- Marine hydrokinetic (includes tidal and wave energy) – generally in research and development stages

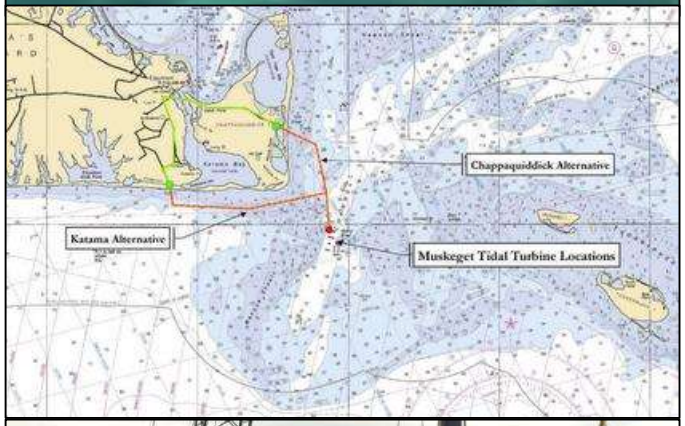






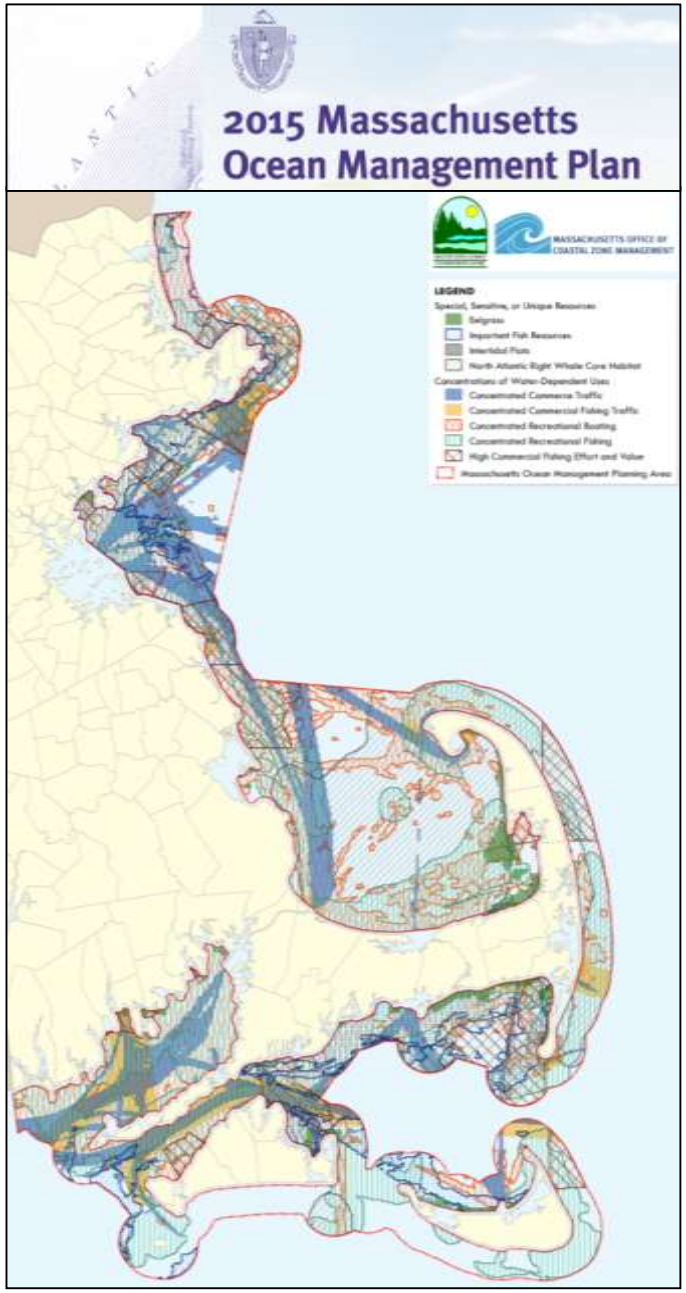
Offshore wind energy

- Winds are stronger and more consistent off coasts
- Close to energy loads
- Wind turbines installed on fixed or floating foundations
- Maturing industry in Europe and China, and expanding
- Primary foundation types: monopile, jacket, gravity, suction
- Technological advances for larger turbines: 9-12 MW



Hydrokinetic energy

- Several areas in state waters with very high tidal current velocities
- Wave resources exist but not as high compared to other geographies
- 3 FERC preliminary permits – all expired or not renewed
- Only a few full-scale devices have been installed
- Progress but industry still at early stages, more R&D

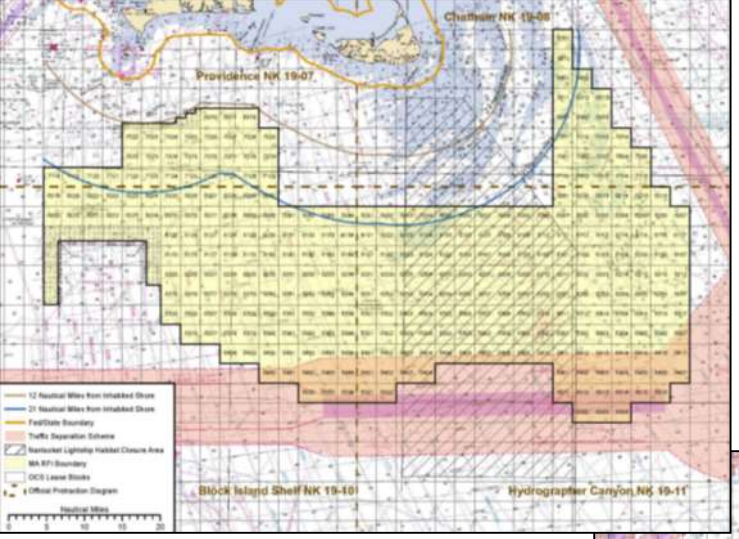


Planning, siting and management

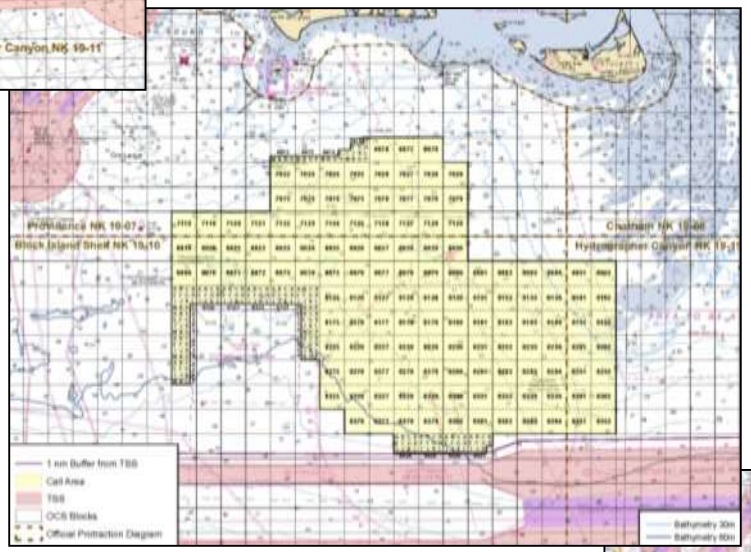
- Given potential for impacts to natural resources and conflicts with existing water-dependent uses, planning and siting is critical
- State waters: MA Ocean Plan; CCC and MVPC regional plans
- Federal waters (OCS) – BOEM
- Tidal energy – FERC
- Northeast Ocean Plan

Offshore wind: OCS process

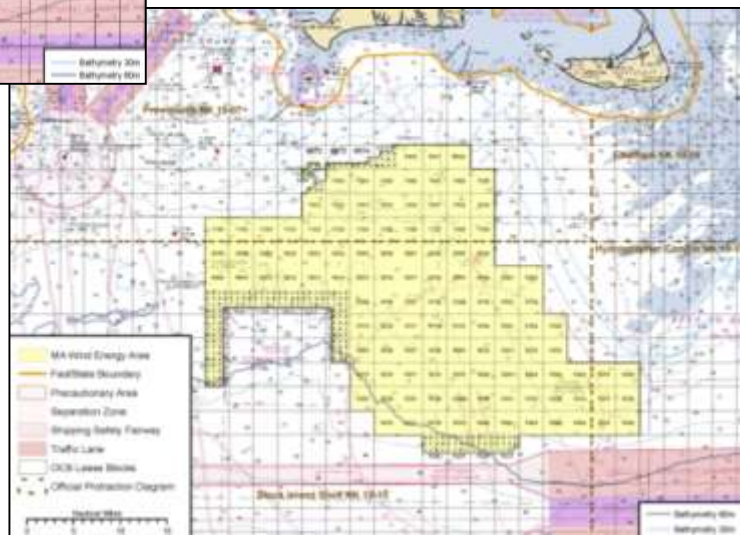
- Bureau of Ocean Energy Management (BOEM) responsible for renewable energy development on Outer Continental Shelf (OCS)
  - 2009: Formation of Intergovernmental Task Force to advise BOEM in the planning, siting, and analysis of offshore wind
  - 2010-2011: Request for Interest; Call for Interest and Nominations
  - 2011-2012: Identification of Wind Energy Areas
  - 2013 and 2015: Competitive auctions / lease sales



Request for Interest area



Call for Interest and Nominations area



Wind Energy Area

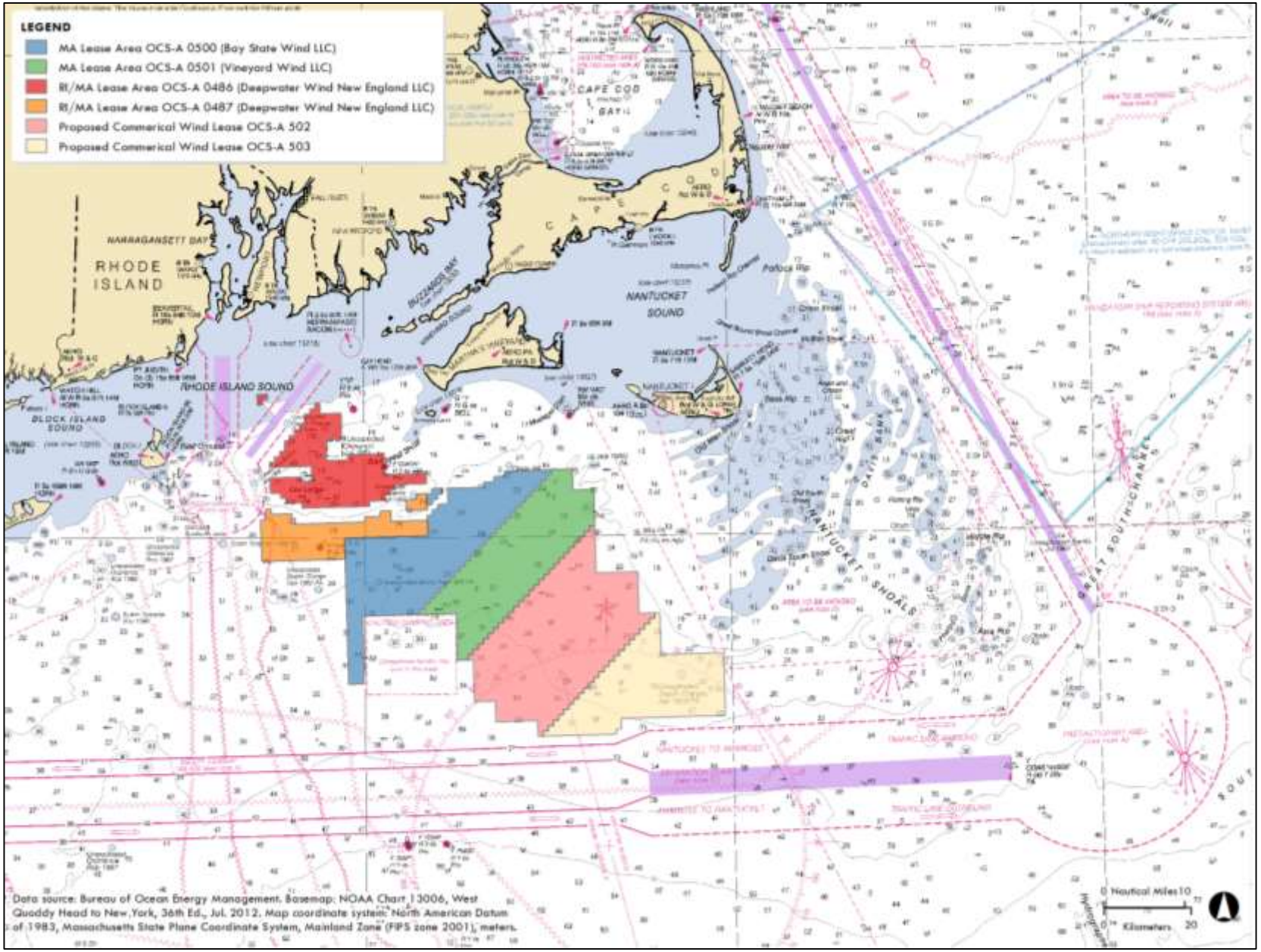
Offshore wind: stakeholder groups

- To augment federal process, MA convened two groups to engage stakeholders on fisheries and marine habitat issues:
  - **Fisheries Working Group on Offshore Wind Energy**: commercial fishermen and reps from different ports and sectors, recreational fishermen, scientists, and state and federal agencies
  - **Habitat Working Group on Offshore Wind Energy**: scientists and technical experts from environmental organizations, academia, and state and federal agencies

Environmental studies

- State and federal investment in marine wildlife surveys and characterization work
- Gap survey in 2010 to identify available data and needs
- Marine mammals and turtles – 4 years aerial survey + 3 years passive acoustic
- Marine avifauna – 3 years aerial survey
- Benthic characterization – 2 years

Lease areas


LEGEND
MA Lease Area OCS-A 0500 (Bay State Wind LLC)
MA Lease Area OCS-A 0501 (Vineyard Wind LLC)
RI/MA Lease Area OCS-A 0486 (Deepwater Wind New England LLC)
RI/MA Lease Area OCS-A 0487 (Deepwater Wind New England LLC)
Proposed Commerical Wind Lease OCS-A 502
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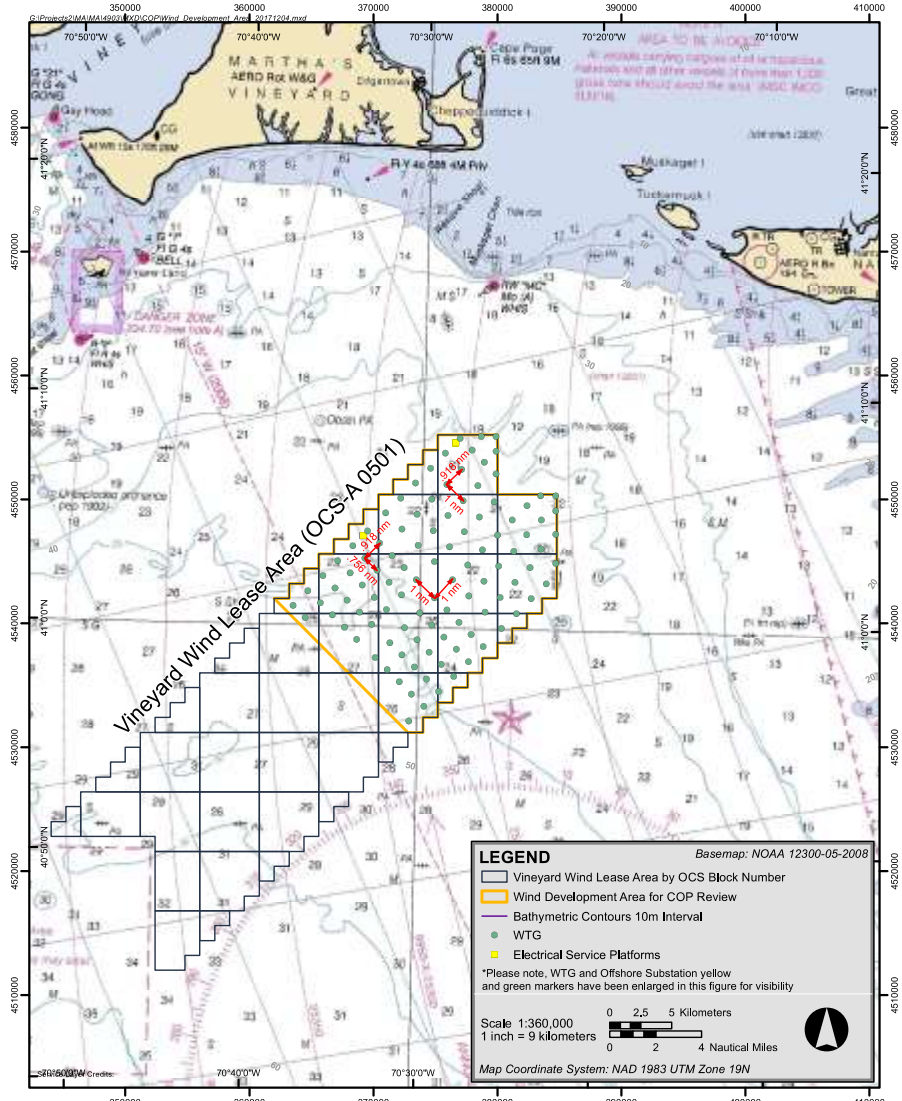
RHODE ISLAND
NARRAGANSETT BAY
RHODE ISLAND SOUND
BLOCK ISLAND SOUND
BUZZARDS BAY
CAPE COD BAY
NANTUCKET SOUND
NANTUCKET SHOALS
GREAT SOUTH CHANNEL
Data source: Bureau of Ocean Energy Management. Basemap: NOAA Chart 13006, West Quoddy Head to New York, 36th Ed., Jul. 2012. Map coordinate system: North American Datum of 1983, Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.
0 Nautical Miles 10
Kilometers 20

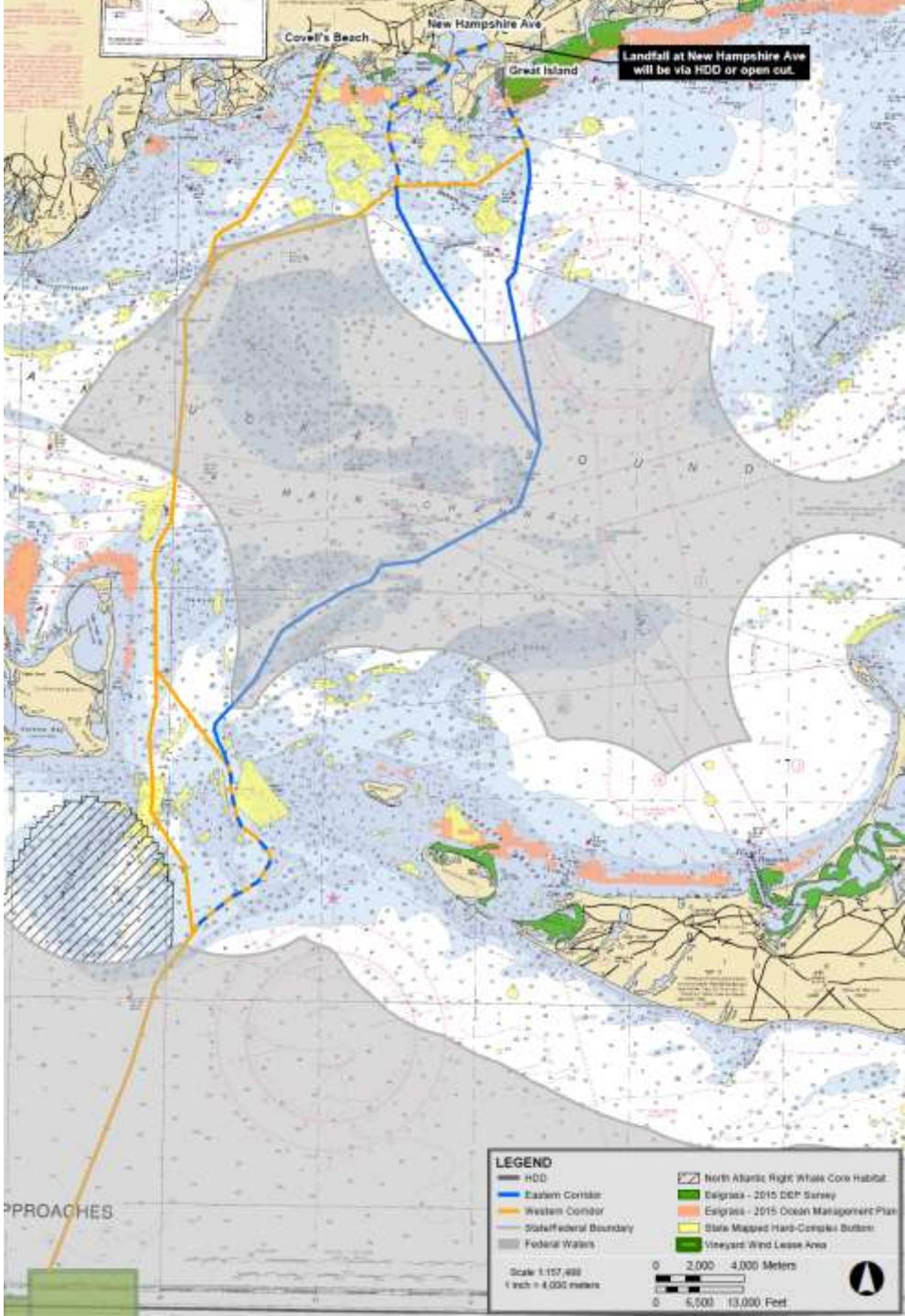
Wind energy procurement

- Baker-Polito Administration announcement: Vineyard Wind selected by electric distribution companies for contract negotiations for 800MW
- Copenhagen Infrastructure Partners and Avangrid Renewables
- Vineyard Power Cooperative – local non-profit energy cooperative
- Construction and Operations Plan (COP) submitted to BOEM December 2017
- NEPA scoping for Draft & Final EIS

VINEYARD WIND

Vineyard Wind





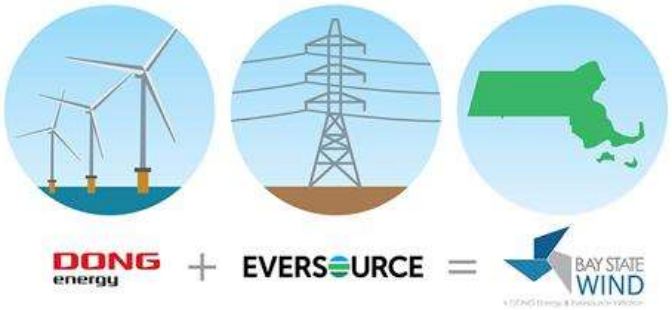
Wind energy procurement

- Rhode Island announcement: Deepwater Wind selected for 400MW project through MA procurement process
- RI Office of Energy Resources and Division of Public Utilities & Carriers independently evaluated proposals
- Deepwater Wind enter negotiations with National Grid
- BOEM approved Site Assessment Plan in October 2017
- PPA for 90 MW South Fork Wind Farm approved by Long Island Power Authority
- COPs in development

DEEPWATERWIND

Orsted Energy – Bay State Wind

- SAP approved by BOEM in June 2017
- Survey work recently completed:
  - Benthic geophysical and geotechnical surveys
  - Avifauna
  - Cable reconnaissance
  - FLIDAR and met buoys operational
- Construction and Operations Plan in development
- Transmission connection proposed to Brayton Point



Proposed sale notice for unleased areas

- Lease Areas OCS-A 502 and 503 went unsold during the 2015 Lease Sale
- On December 16, 2016 and January 4, 2017, Statoil Wind and PNE Wind individually submitted unsolicited lease requests for both lease areas
- At Task Force meeting in May, recommendation to move forward with leasing
- Draft Proposed Sale Notice recently reviewed by Task Force
- Proposed sale notice to be issued in January 2018
- Auction planned for Summer 2018

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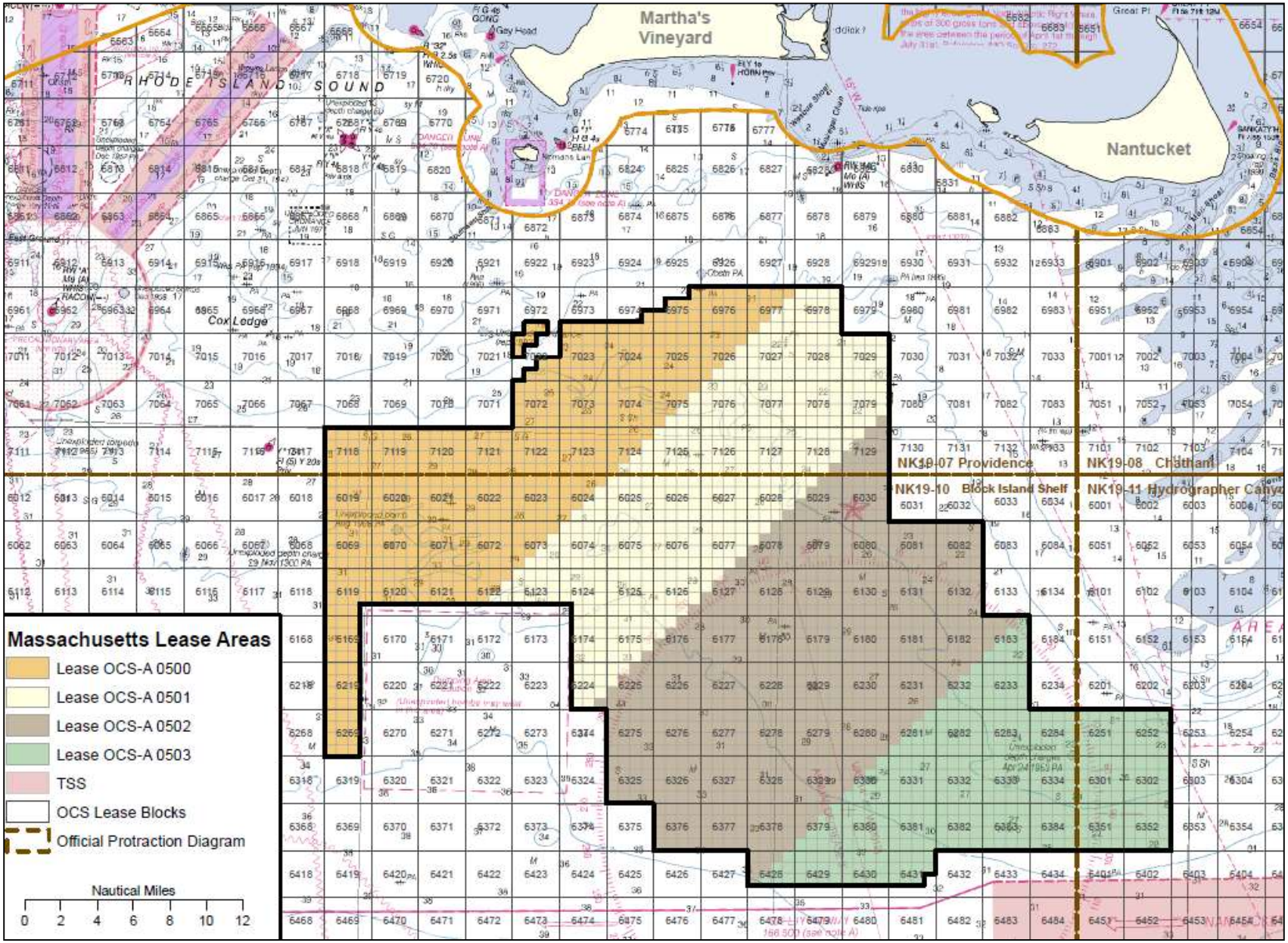

Thank you

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