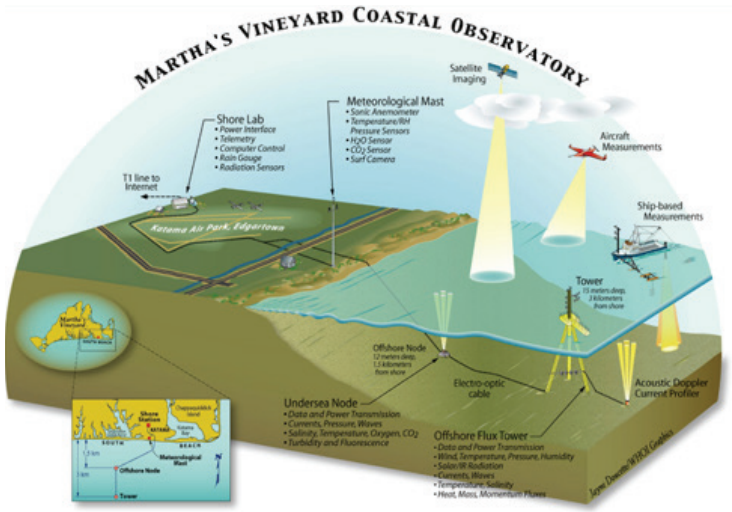
POWER-US

PARTNERSHIP FOR OFFSHORE WIND ENERGY RESEARCH

Proposed Ocean Test Bed for Offshore Wind Energy

An Ocean Test Bed is **both an offshore area** used to evaluate and advance atmospheric, oceanic, biologic and geologic monitoring technologies for offshore wind **as well as a convening body** that facilitates technology adaptation for improving site characterization.

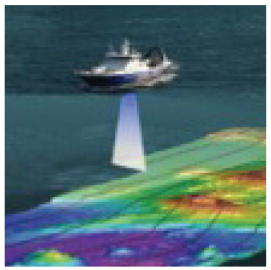
The U.S. offshore wind industry lacks sufficient at-sea facilities for critical wind energy research. Focusing initial efforts at the well-sited Martha's Vineyard Coastal Observatory, and its offshore tower, would **facilitate rapid, near-term atmospheric, oceanic, and geologic studies that would benefit the industry.** Improvements would enable larger research projects to utilize the tower, conduct initial data collection efforts, and leverage more than $300 million in existing federal research assets in the region.



Grand Challenges in Site Characterization:

- Maximize domain awareness and minimize impacts on critical marine mammal species.
- Advance infrastructure development while preserving the marine ecosystem's goods and services.
- Develop novel, high-resolution geocharacterization techniques.
- Build an accurate estimate/forecast of the atmospheric boundary layer.
- Identify and address systemic barriers, including data sharing and platform and sensor access.

A bottom profiling REMUS AUV can match the data collection efforts of much larger, more expensive vessels.

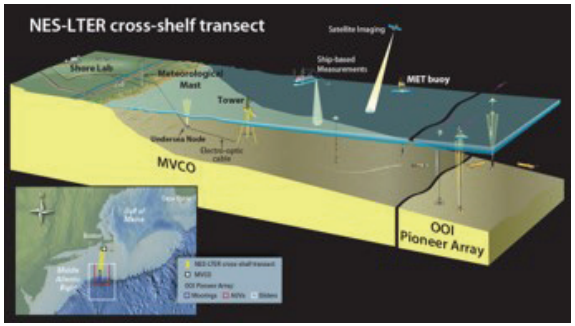


Four Actions are Required in 2020:

1. Establish consensus and ***convene stakeholders*** to form and support the OTB.
2. Support initial ***benchmark studies*** in atmospheric, oceanographic, biologic and geologic resource characterization using the ***R/V Neil Armstrong*** within the ***LTER Transect***, and an expanded ***MVCO platform***.
3. Initiate a ***legal framework*** for research/public/private partnerships.
4. Work with MA leaseholders to locate a new, ***federally funded***, Air-Sea Interaction Tower.

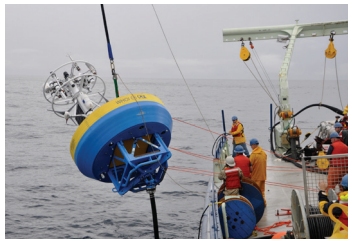
Woods Hole Oceanographic Institution | Tufts University | UMass Dartmouth

The POWER-US Ocean Test Bed is situated at the intersection of our nation's top ocean research assets and its first commercial scale offshore wind project.



The NSF-supported LTER will monitor the changing ecology of the Northeast Shelf, connecting the MVCO to the OOI's Pioneer Array

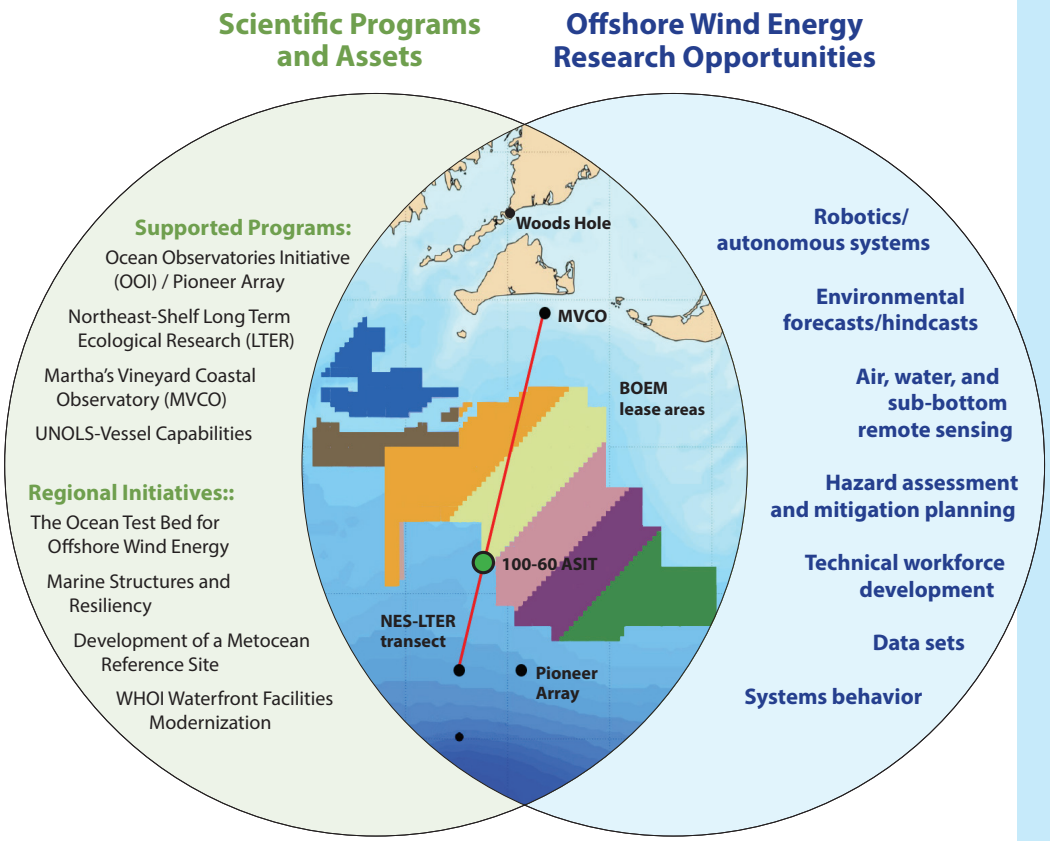
The R/V Armstrong, a new UNOLS vessel maintained by WHOI.



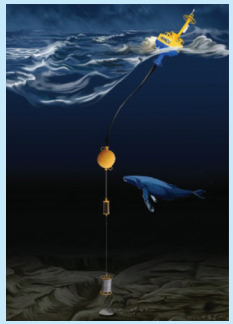
Buoys in the Pioneer Array are critical to the NSF Ocean Observatories Initiative.

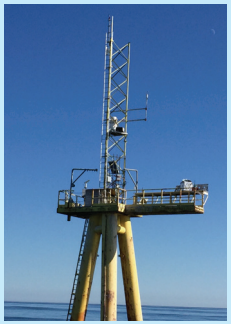
The United States has the **most advanced ocean research assets in the world**. Focusing these assets on offshore wind will enable us to develop our own technical resources and become a major player in the global offshore wind energy market.

The coordinated use of these existing scientific programs and assets would be relevant not only to the U.S. Offshore Wind industry and its effective regulation, but also to basic and applied ocean and atmospheric sciences.



OTB Long-term Goals

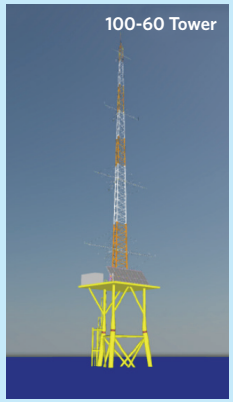


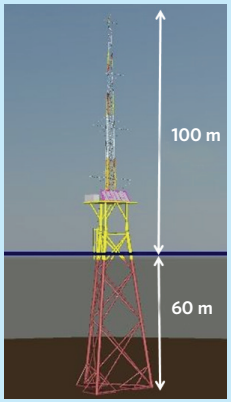


A Gold Standard for Data Collection

An Ocean Test Bed will ensure that advanced U.S. scientific and engineering knowledge can be applied towards increasing confidence in finance, insurance and regulatory requirements.

The U.S. ocean tech sector is **ready to transform resource characterization** for offshore wind and can lead the U.S. to gaining a strong foothold in this global industry.





New Infrastructure

Design and build a **new Mid-shelf Air-Sea Interaction Tower (M-ASIT)** just south of the Massachusetts Offshore Wind Lease Areas in 65 m of water, reaching 100 m above the water to support long term atmospheric and oceanic monitoring, sensor development, AUV docking stations, acoustic propagation research, and other basic science needs.