

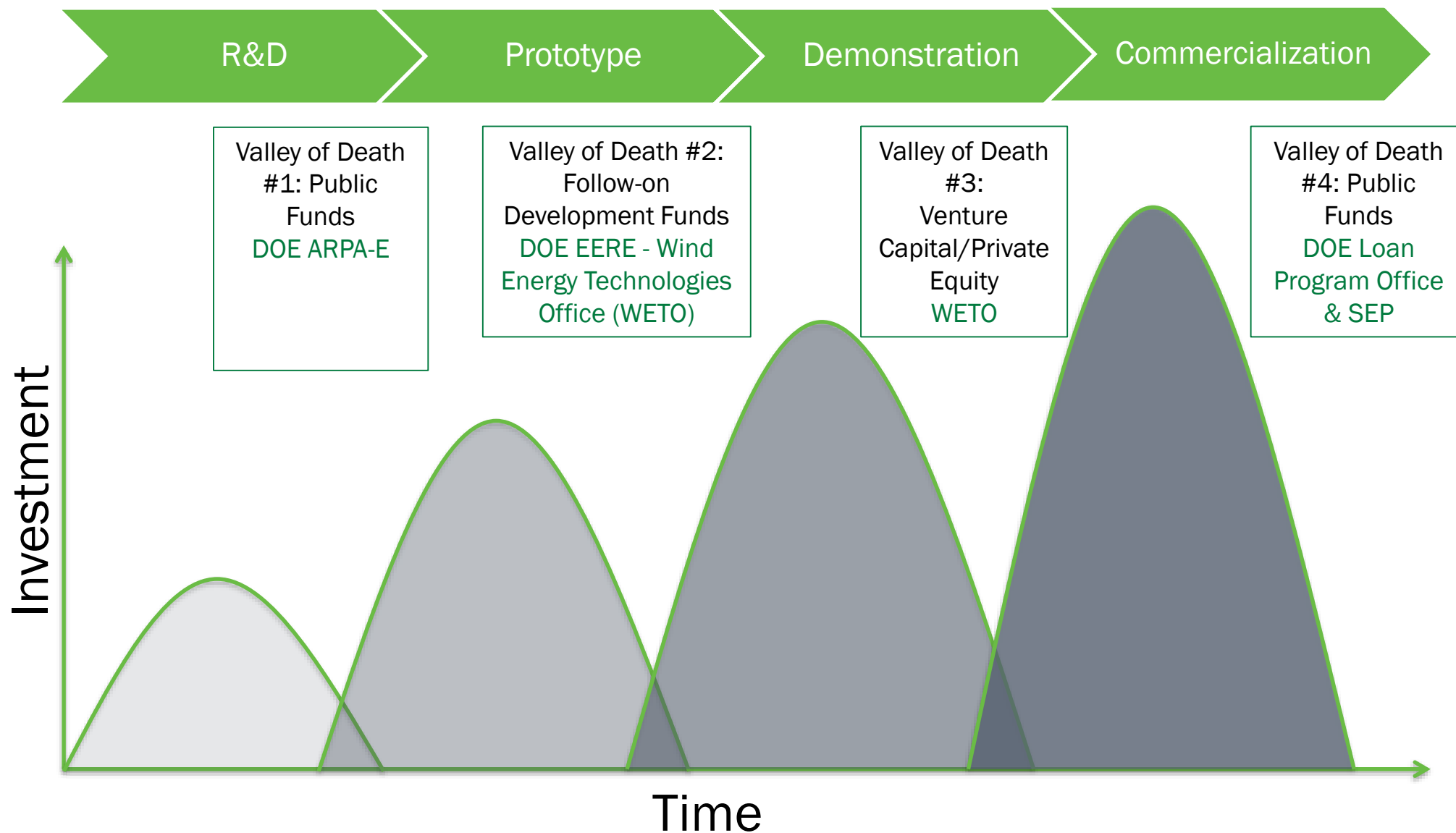
## Offshore Wind at DOE:

# Investing in R&D to enable offshore wind energy development in all U.S. coastal regions

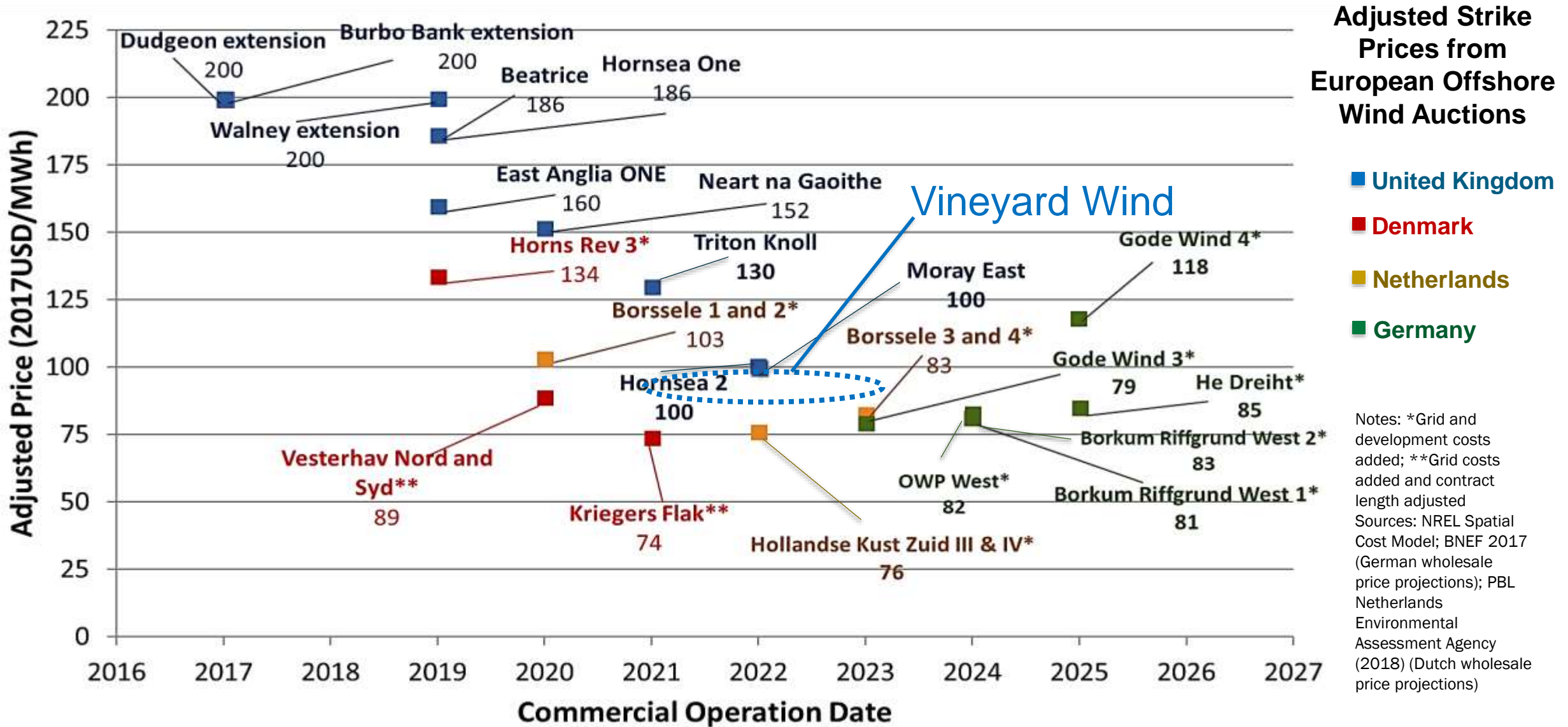
Alana Duerr, Ph.D., Offshore Wind Lead  
Wind Energy Technologies Office  
2019 NASEO Energy Policy Outlook Conference  
February 5-8, Washington, D.C.



# Offshore Wind at DOE – A Technology Progression from ARPA-E to Loan Guarantee



# Industrialization and optimism about technology driving falling EU (and now U.S.) procurement prices – continued R&D crucial



# WETO Broad Mission and Portfolio




**Mission: Advance scientific knowledge and technological innovation to enable clean, low-cost wind energy options nationwide**



**Land based, offshore, and distributed wind**

- **Key Opportunities**
  - Reduce Cost through Technology R&D
  - Reduce Market Barriers to Deployment
  - Reduce Grid Integration Impacts
- **How? Directed lab research, competitive awards, collaboration with Federal partners, communication with stakeholders**

# 2016 National Offshore Wind Strategy: DOE Actions

Strategic Themes	Action Areas
 <p>Reducing Technology Costs &amp; Risks</p>	<ol style="list-style-type: none"><li>1. Offshore Wind Power Resource &amp; Site Characterization</li><li>2. Offshore Wind Plant Technology Advancement</li><li>3. Installation, Operation &amp; Maintenance, &amp; Supply Chain Solutions</li></ol>
 <p>Supporting Effective Stewardship</p>	<ol style="list-style-type: none"><li>4. Ensuring Efficiency, Consistency and Clarity in the Regulatory Process</li><li>5. Managing Key Offshore Wind Environmental and Human Use Concerns</li></ol>
 <p>Improving Understanding of the Costs and Benefits of Offshore Wind</p>	<ol style="list-style-type: none"><li>6. Offshore Wind Electricity Delivery and Grid Integration</li><li>7. Quantifying/Communicating the Costs and Benefits of Offshore Wind</li></ol>

# Current Research Activities: Technology R&D

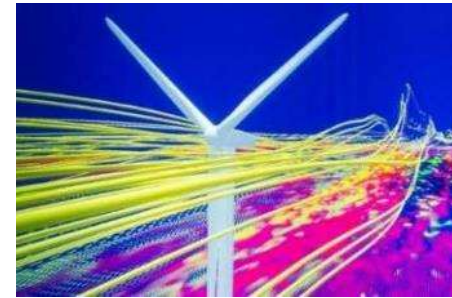
## Offshore Wind Advanced Technology Demonstration Projects

Demonstration and deployment of innovative commercial scale technologies with the potential to lower the cost of energy (LEEDCo, University of Maine)



## Offshore Wind Plant Optimization (Atmosphere to Electrons, A2e)

Improve the performance and reliability of next-generation optimized plants by investigating systems-level efficiency losses influenced by atmospheric conditions and turbine-turbine wake interaction in large turbine arrays



## Resource Characterization and Siting Research

Lidar buoy deployment and data analysis; upgrades to lidar and acceptance testing (FY19); deployment in CA with BOEM (FY19); hurricane modeling; wind forecasting improvement projects.



## Floating Technology R&D and Design Tools

Integrated systems engineering toolsets, high-fidelity simulation capabilities, controls research.



## Offshore Wind Specific Standards Development

# Current Research Activities: Technology R&D

## Offshore Wind R&D Consortium

What?	Why?	How?
<ul style="list-style-type: none"><li>• Competitive solicitation</li><li>• \$20.5M in Federal funds with required industry matching</li><li>• NYSERDA selected in June 2018</li></ul>	<ul style="list-style-type: none"><li>• Collaboration</li><li>• Multiple funding rounds</li><li>• Accelerated Learning</li><li>• Commercial Adoption</li></ul>	<ul style="list-style-type: none"><li>• R&amp;D Roadmap and Solicitations</li><li>• <b><i>First RFP to be released in February – subscribe to WETO Newsletter to stay up to speed!</i></b></li></ul>

## Offshore National Facilities Request for Information

- Opened August 8, closed September 14
- Existing facilities, facilities upgrades, new facilities, R&D
- Catalogue and publish the results



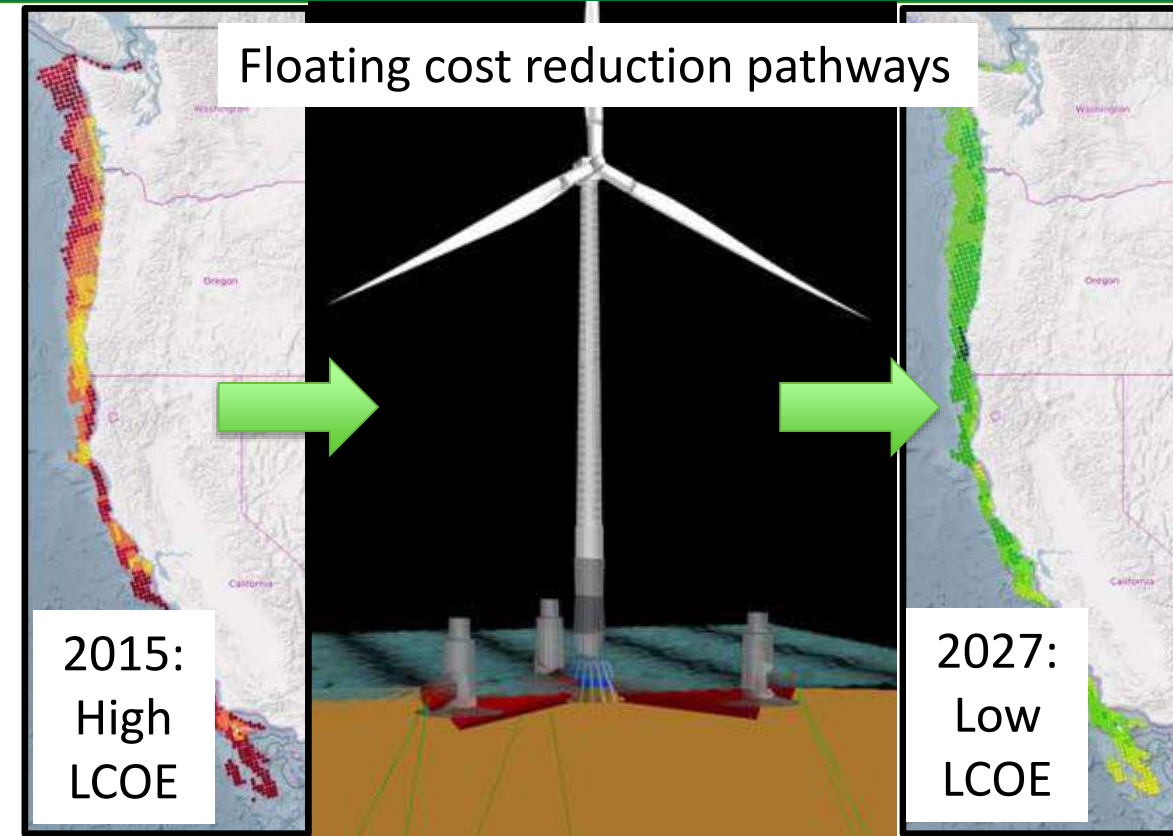
Photo Credits (Left to Right): University of Maine; MassCEC; Clemson Glimpse; Force Technology; Debbie Aldridge, University of California, Davis

# Current Research Activities: Analysis and Modeling

Net value of offshore wind in Northeast



Floating cost reduction pathways



## Understanding technology trends, costs, and benefits

- NREL: [2017 Offshore Wind Market Update](#)
- LBNL: [“Estimating the Value of Offshore Wind Along the US Eastern Coast”](#)
- NREL (PENDING): “The Potential Impact of Offshore Wind on a Future Power System in the U.S. Northeast”

## Identifying and evaluating technology improvement opportunities

- NREL: Floating offshore wind systems optimization studies
- NREL: Evaluating future cost reduction pathways



# Current Research Activities: Market Acceleration and Deployment

## WINDEXchange

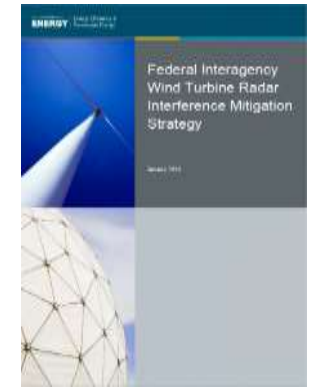
Program designed to provide information on wind energy development to stakeholders. Includes wind resource potential data, economic impact evaluation models, information on state resources and more.



## Wind Turbine Radar Interference Mitigation Working Group

DOE, DOD, DOI, NOAA, and FAA collaborating on R&D to:

- 1) Improve capacity to evaluate the impacts of wind energy on sensitive radars
- 2) Develop mitigation measures to increase resilience of existing radars to wind turbines
- 3) Encourage the development of next-generation radars resistant to wind turbine interference



## Environmental Research

- WREN international collaborative, as well as the Bats and Wind Energy Cooperative and the National Wind Coordinating Collaborative
- Tethys database
- Monitoring technology development



# Current Research Activities: Market Acceleration and Deployment

## Advanced Wind R&D to Reduce Costs and Environmental Impacts FOA

**\$6M** to support the development and validation of advanced technology to reduce environmental impacts

- Topic Area 3: Development and Validation of Offshore Wind Monitoring and Mitigation Technologies
  - \$2m in funding
  - Proposals currently under review
  - Selections anticipated in early 2019





# U.S. DEPARTMENT OF **ENERGY**

Thank you.

<https://www.energy.gov/eere/wind/>

**WETO News Subscription:** <https://www.energy.gov/eere/wind/subscribe-wind-energy-technologies-office-news-updates>

**Offshore Wind Market Update:** <https://www.energy.gov/eere/wind/downloads/2017-offshore-wind-market-update>

**National OSW Strategy:** <https://energy.gov/sites/prod/files/2016/09/f33/National-Offshore-Wind-Strategy-report-09082016.pdf>

**Environmental Knowledge Base for Marine and Wind Energy (Tethys):** [tethys.pnnl.gov](http://tethys.pnnl.gov)