

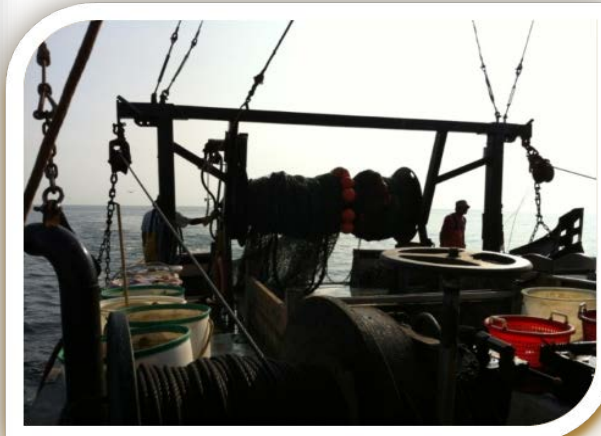
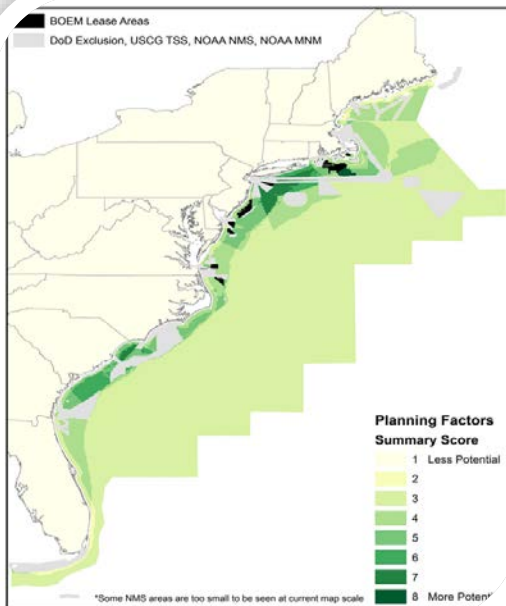


**NOAA**  
**FISHERIES**

Northeast Fisheries Science Center

# Fisheries in a New Era of Offshore Wind Development

Jon Hare and Andy Lipsky  
Northeast Fisheries Science Center



August 21, 2019

# Outline

- Rapid Expansion of Offshore Wind
- Interactions with NOAA Fisheries Scientific Mission
- Key Challenges & Opportunities
- Conclusions



<https://www.nefsc.noaa.gov/rcb/photogallery/scenic-ocean.html>

# Rapid Expansion of Offshore Wind

- Co-existence of wind development, fisheries, and protected species
- This is a “rest of our careers” issue
- We need to work together to be successful



## BOEM "Blown Away" by Record U.S. Offshore Wind Auction

By Nichola Groom | December 15, 2018



A U.S. government auction for three wind leases off the coast of Massachusetts ended on Friday with record-setting bids totaling more than \$400 million from European energy giants including Royal Dutch Shell Plc and Equinor ASA..  
Photo: © benoitgrasser/AdobeStock

***A U.S. government auction for three wind leases off the coast of Massachusetts ended on Friday with record-setting bids totaling more than \$400 million from European energy giants including Royal Dutch Shell Plc and Equinor ASA.***

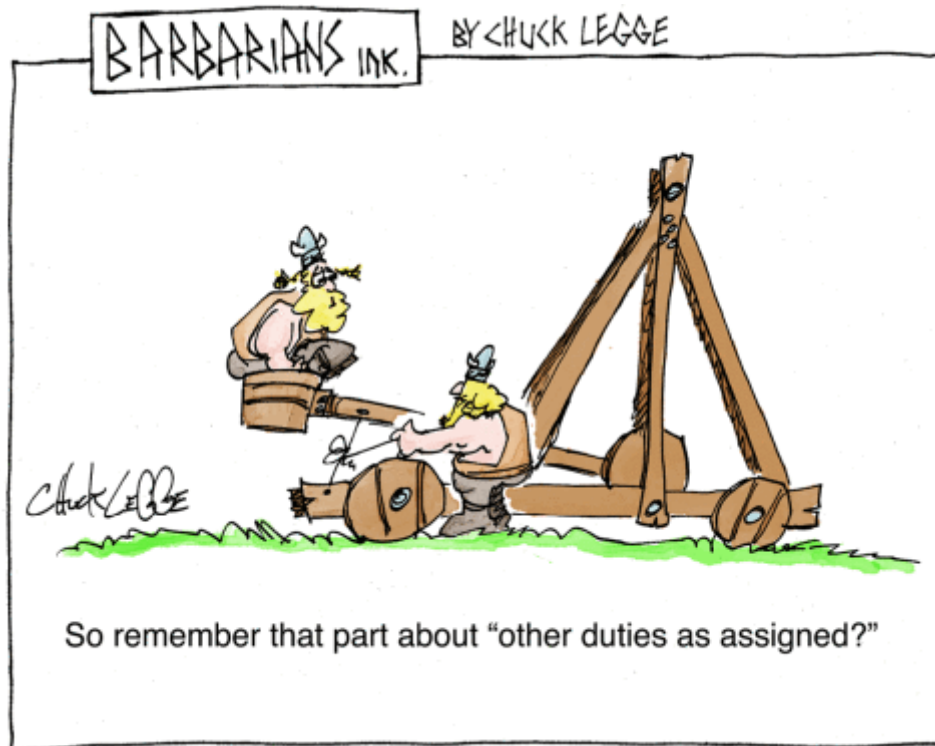
The Bureau of Ocean Energy Management (BOEM) announced the sale's three winners - Equinor Wind US LLC, Mayflower Wind Energy LLC, and Vineyard Wind LLC, at the conclusion of the two-day sale that attracted 11 bidders and lasted 32 rounds.

# Regional Wind Team

## Team composition:

- Northeast Fisheries Science Center
- Greater Atlantic Regional Fisheries Office
- NOAA-Headquarters
- Fisheries Management Councils & Commission

***“Other duties as assigned”***



# Regional Wind Team

## Wind Team Leads



Andy Lipsky  
NEFSC



Sue Tuxbury  
GARFO



Doug Christel  
GARFO

Wind Team includes numerous NEFSC, GARFO, HQ, NEFMC, MAFMC, and ASMFC staff

# Rapid Expansion of Offshore Wind

## BOEM is Lead Federal Agency
















- 15 leases in the Atlantic
- Upcoming lease sale in NY
- Planning Activities in NC & SC, and recently MA, NH & ME
- Planned Leasing Activities on West Coast and Hawaii

Not just a Northeast Issue



# Rapid Expansion of Offshore Wind

- Planned projects extend to 2027 (20+ year operations)
- Does not include all current leases nor new leases
- Does not include areas where moored technology would be used
- *“Rest of our careers”*

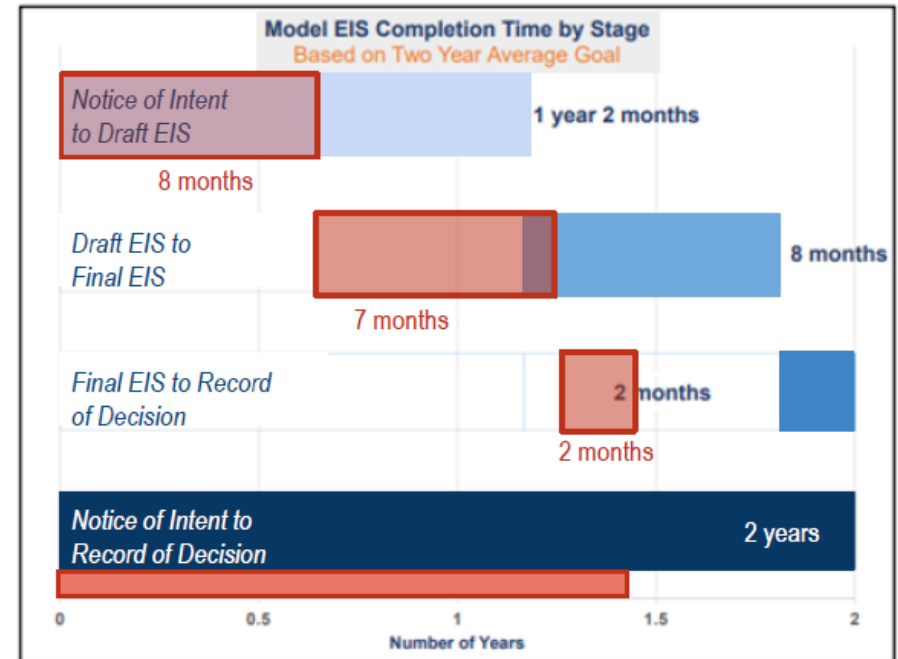
Year*	Project	Company
2020	Coastal Virginia Offshore Wind	  
2021	Vineyard Wind (MA)	
2022	South Fork (NY, RI, MA)	
2022	Ocean Wind (NJ)	
2022	Bay State Wind (MA)	
2022	U.S. Wind (MD)	
2023	Revolution Wind (RI, MA)	
2023	Skipjack Windfarm (DE)	 
2025	Dominion Energy (VA)	
2026	EDF Renewables (NJ)	
2027	Empire Wind (NY)	
2027	Kitty Hawk (NC)	

20+ operation period  
2047 and beyond

# Rapid Expansion of Offshore Wind

## NMFS Provides Advice to BOEM

- Concurrence under NEPA and EIS Review
- MMPA Incidental Take Authorization
- ESA Section 7 Consultation
- EFH Consultation
- National Wildlife Coordination Act



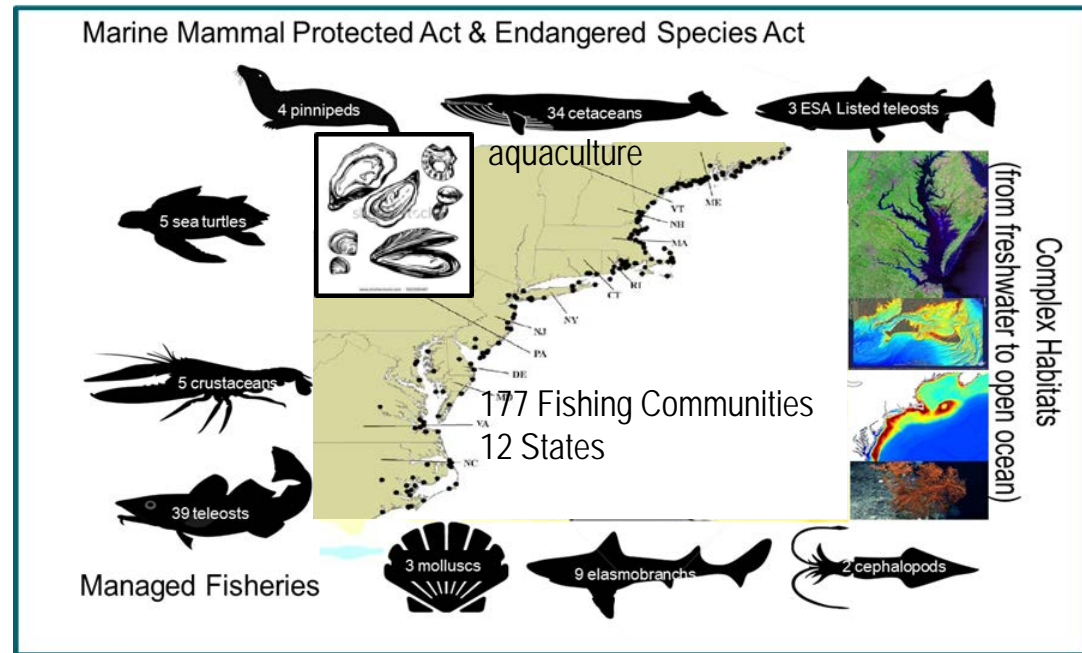
EO 13807 - "One Federal Decision" policy  
2 year timeline  
Department of Interior Order  
1.5 year timeline



# Rapid Expansion of Offshore Wind

## Wind development interacts with all NOAA Fisheries Interests

- Fisheries
- Fishing Communities
- Marine Mammals
- Endangered Species
- Essential Fish Habitat
- Aquaculture
- Marine Ecosystems



# Interactions w/ NOAA Fisheries Mission

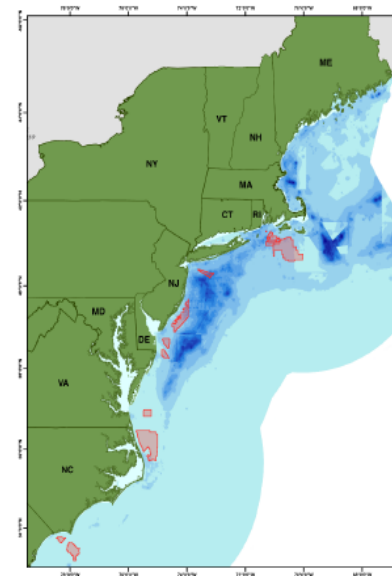
## Baseline Studies (BOEM & NMFS)

- Fishing revenue studies
- Habitat Characterization
- Marine Mammal Surveys (AMAPPs)
- Seabird Surveys
- Sound studies
- 50+ years of survey effort

OCS Study  
BOEM 2017-012

**Socio-Economic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic**

Volume I—Report Narrative



U.S. Department of the Interior  
Bureau of Ocean Energy Management  
Office of Renewable Energy Programs

BOEM  
Bureau of Ocean Energy Management

# Interactions w/ NOAA Fisheries Mission

## Construction (soon) & Decommissioning (20+ yrs later)

- Seafloor Disturbance
- Sediment Suspension and Deposition
- Dredging & Cabling
- Noise & Vessel Traffic
- Lighting
- Displacement of Fishing Effort



# Interactions w/ NOAA Fisheries Mission

## Operations (for 20+ yrs)

- Seafloor & Water Column Disturbance
- Habitat Conversion
- Noise & Vessel Traffic
- Electromagnetic Fields
- Lighting & Vessel Safety



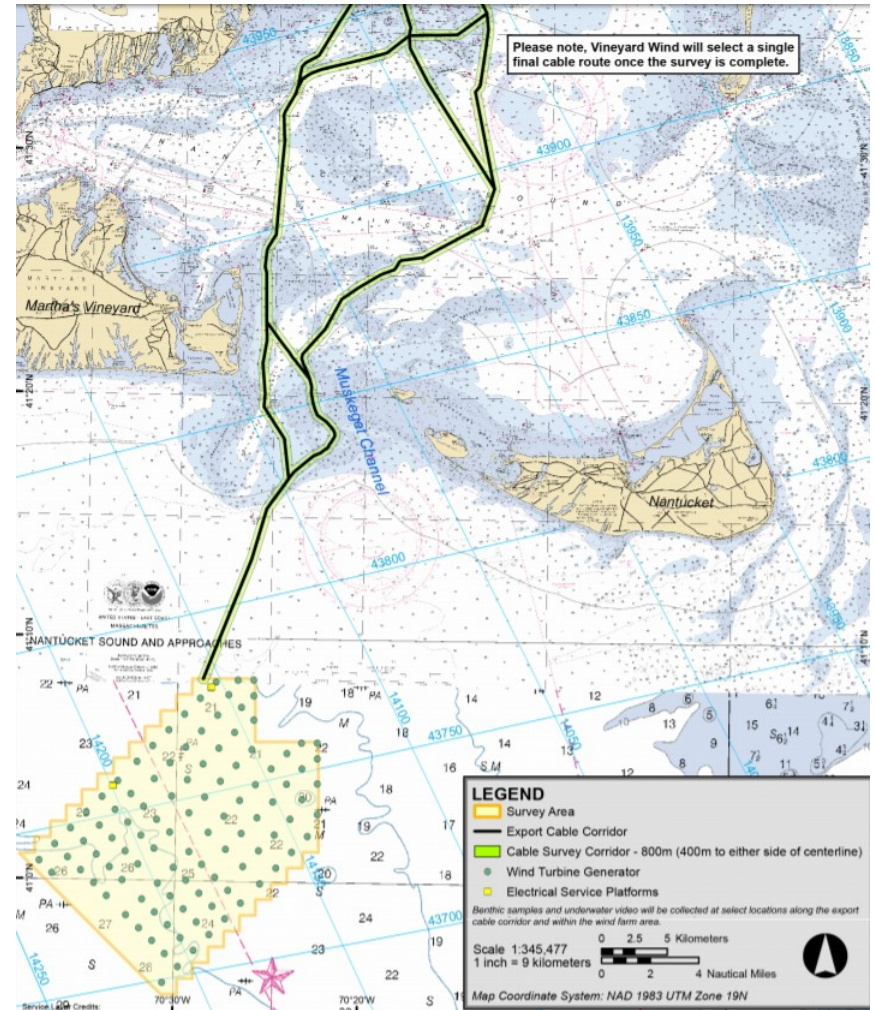
<https://earthobservatory.nasa.gov/images/89063/offshore-wind-farms-make-wakes>

# Interactions w/ NOAA Fisheries Mission

## Construction, Operation, Deconstruction

- Cabling both inside & outside of lease areas
- Understanding of electromagnetic fields

<https://cdn.offshorewind.biz/wp-content/uploads/sites/2/2018/05/29104823/vineyard-wind-starts-environmental-surveys.jpg>



# Interactions w/ NOAA Fisheries Mission

## Fisheries Interactions

- Exclusion of some fishing activity
- Creating new habitat (species & ecosystem-level affects)
- Biological effects of noise, electromagnetic fields, etc



Recreational and Commercial Fishermen View the Block Island Wind Farm Through a Different Lens



<https://seagrant.gso.uri.edu/recreational-and-commercial-fishermen-view-the-block-island-wind-farm-through-a-different-lens/>

<https://turnto10.com/news/local/construction-finishes-on-block-island-wind-farm>

# Interactions w/ NOAA Fisheries Mission

## Marine Mammal Interactions

- Exclusion / attraction
- Behavior - feeding, socializing, nursing
- Stress (noise)
- Ecosystem changes (oceanography, prey, habitat)

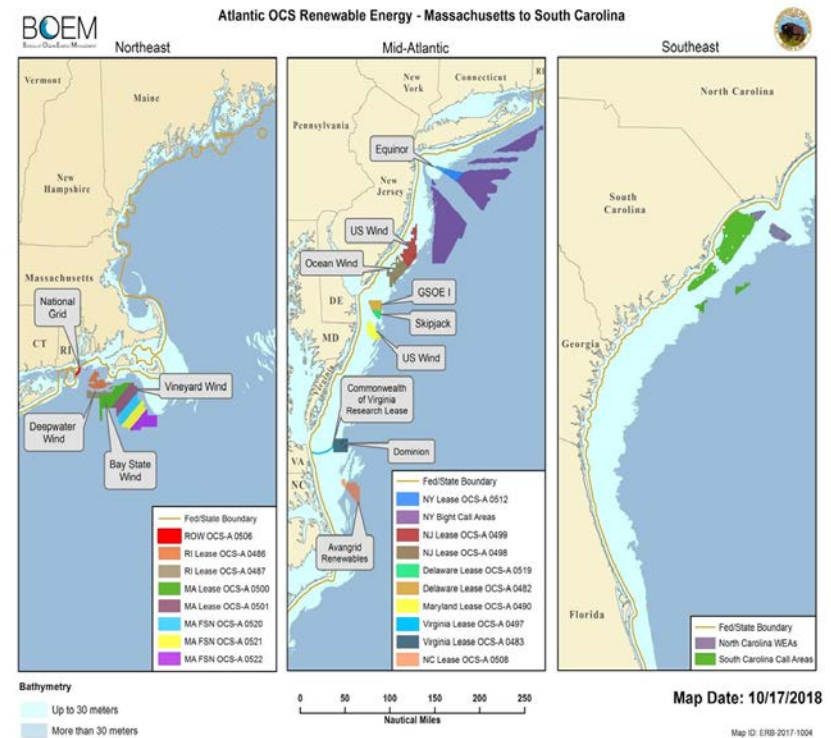


Kraus, S.D., R.D. Kenney, and L. Thomas. 2019. A Framework for Studying the Effects of Offshore Wind Development on Marine Mammals and Turtles. Report prepared for the Massachusetts Clean Energy Center, Boston, MA 02110, and the Bureau of Ocean Energy Management. May, 2019.

# Interactions w/ NOAA Fisheries Mission

## Cumulative Impacts

- Multiple projects constructed over next 7+ years
- Operations over next 27+ years
- What are cumulative ecosystem effects?
- How do we evaluate?





# Interactions w/ NOAA Fisheries Mission

- What are affects of construction, operation, and decommissioning on fisheries, protected species, aquaculture, habitats, and ecosystems (including human communities)?
- Can these effects be mitigated?
- How will components of the complex socio-ecological system adapt?



<http://www.thecolledge.org/jennys-blog/the-scientific-method-the-question>

# Interactions w/ NOAA Fisheries Mission

## Operations (20 years)

- Displacement of Fishing Effort
- Displacement of Survey Effort
  - shipbased & aerial (50+ year time series)

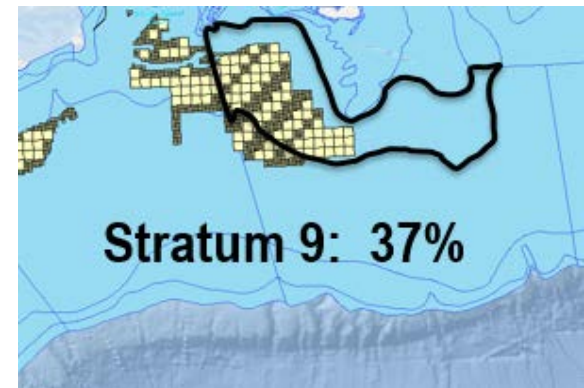


# Interactions w/ NOAA Fisheries Mission

## Displacement of Survey Effort

- Random-stratified design
- Ship and aircraft line transects
- Habitat effects of wind-farms

Bigelow-Albatross Calibration  
magnified x1, x5, x10, x50 ??



“~60% of Southern New England Survey Blocks for NARW Aerial Surveys will be impacted”

**NOAA scientist: Offshore wind projects will likely affect viability of fishery surveys**

By Chris Chase  
April 19, 2019

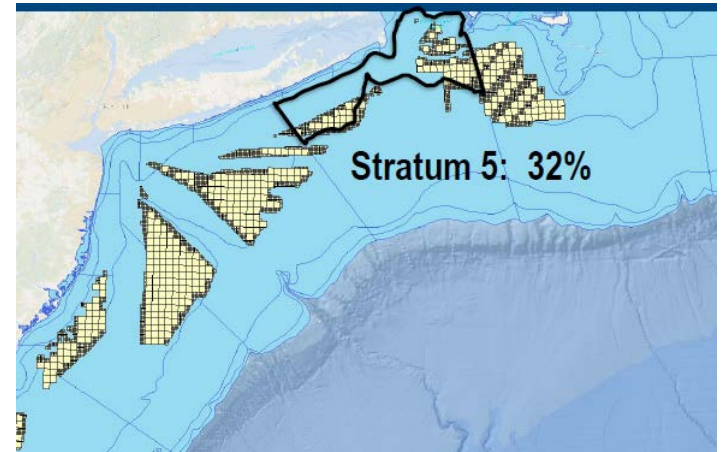
SHARE    

<https://www.seafoodsource.com/news/supply-trade/noaa-scientist-offshore-wind-projects-will-likely-affect-viability-of-fishery-surveys>

# Interactions w/ NOAA Fisheries Mission

## Survey Issues

- Outside wind energy area
- Inside wind energy area
- Calibration / Detectability
- Statistical survey design
- Assessments
- Initiated Center WG - first order evaluation
- Will work with partners and stakeholders to address



# Key Challenges & Opportunities

- Committing staff without dedicated funding (some temp funding)
- Wind team
- Regulatory review
- Unable to be responsive to science requests
- Doing best we can and will continue

Bloomberg

Climate Changed

## Connecticut Is Set to Join in \$70 Billion Offshore Wind Expansion

By [Chris Martin](#)

June 5, 2019, 7:57 AM EDT

- ▶ Move mirrors actions in New York, New Jersey, Massachusetts
- ▶ Senate bill now with governor would meet third of state's need

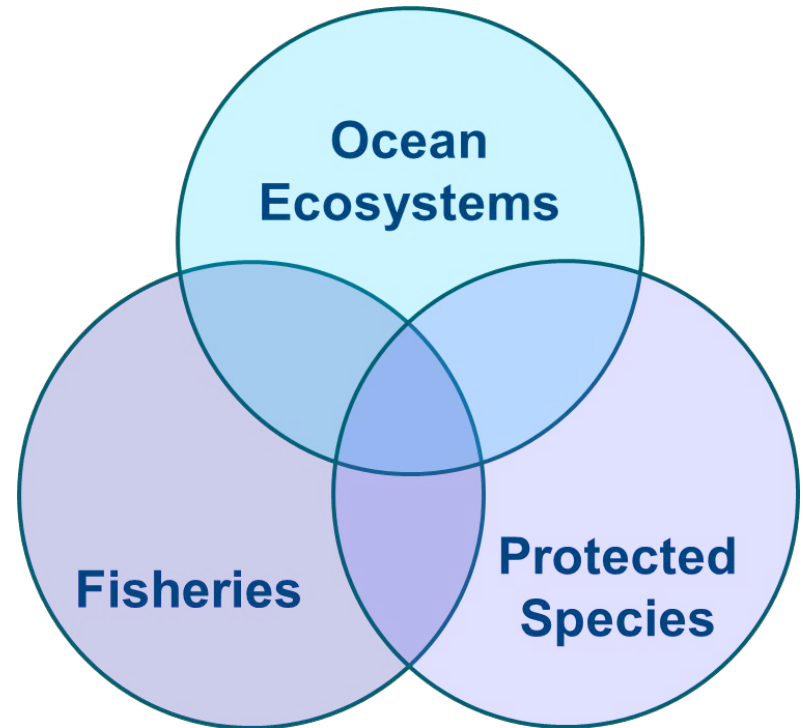
LIVE ON BLOOMBERG  
Watch Live TV >  
Listen to Live Radio >  
Bloomberg  
Television



<https://www.bloomberg.com/news/articles/2019-06-05/connecticut-set-to-join-in-70-billion-offshore-wind-expansion>

# Key Challenges & Opportunities

- Pace & scale of development
- Effectively engaging NOAA Fisheries stakeholders in the process
- Addressing science questions (e.g., fisheries, protected species, ocean ecosystems)



# Key Challenges & Opportunities

- How will floating wind technology change map of wind development?
- What knowledge is transferrable for pile to floating developments? Scientific, regulatory, design, ...



## Maine Aqua Ventus floating wind farm gets green light

Published on June 24, 2019 by [Dave Kovaleski](#)

# Key Challenges & Opportunities

## Joint MOU NOAA, BOEM, and RODA (Responsible Offshore Development Association)

*“NOAA/NMFS, BOEM, and RODA (Parties) have a mutual interest in the responsible planning, siting, and development of offshore wind power ... in a way that considered impacts to the fishing industry, fisheries resources protected resources, and the marine habitats upon which fishery resources depend”*



Deepwater Wind's Block Island array. Deepwater Wind photo.

Power of science: Alliance will call for fisheries-focused wind power research



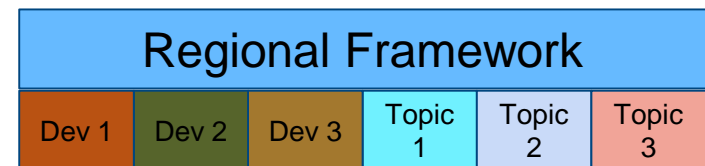
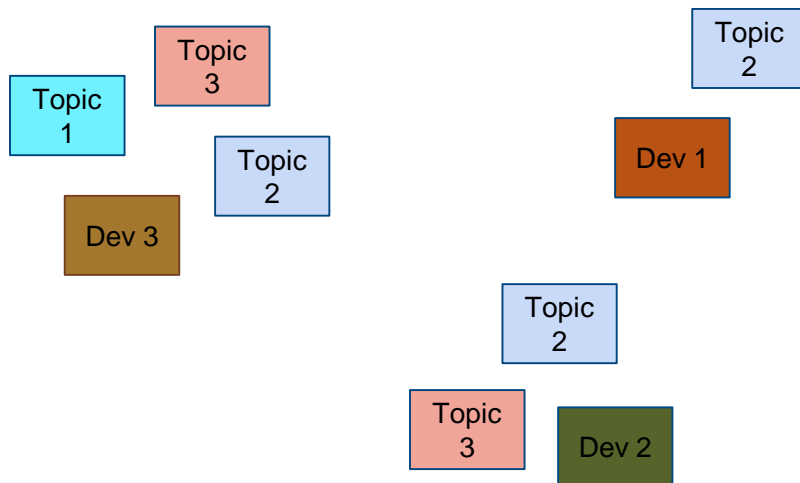
# Key Challenges & Opportunities

## Responsible Offshore Science Alliance

How do we work together?

fishing industry, wind developers, states, feds, universities, energy companies, others

### Current State



# Key Challenges & Opportunities

- Block Island Experience



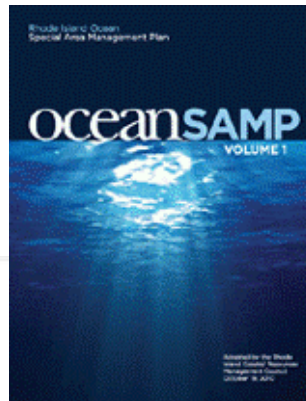
Estuarine, Coastal and Shelf Science

Volume 147, 20 June 2014, Pages 1-10



Fine-scale spatial patterns in the demersal fish and invertebrate community in a northwest Atlantic ecosystem

Anna J. Malek <sup>a, R, B</sup>, Jeremy S. Collie <sup>a</sup>, James Gartland <sup>b</sup>



 Rhode Island **Sea Grant**

Researchers Look at How the Block Island Wind Farm Impacts Recreation and Tourism

May 8, 2019  Rhode Island Sea Grant  Coastal Communities, News, Research

*Social scientists report their research results at Coastal State Discussion*

WORKBOAT

NEWS ▾

BLOGS ▾

RESOURCES ▾

HOME / NEWS / OFFSHORE / FEDERAL REGULATORS, FISHERMEN AGREE TO CONSULT ON OFFSHORE WIND

## Federal regulators, fishermen agree to consult on offshore wind

By Kirk Moore on MARCH 26, 2019

SHARE    



The Rhode Island-based fishing vessel Virginia Marise near the Block Island Wind Farm. Deepwater Wind photo.

<https://www.workboat.com/news/offshore/federal-regulators-fishermen-agree-to-consult-on-offshore-wind/>



NOAA FISHERIES

# Key Challenges & Opportunities

- European Experience (20+ years)

## Working Group on Marine Renewable Energy

Affiliation: HAPISG

Chair: Marijke Warnas

The Working Group on Marine Renewable Energy (WGMRE) coordinates the flow of science between certain working groups and its application in relation to offshore energy installations.

WGMRE's remit includes correlating the science from groups on specialist topics such as seabirds, benthic ecology, and fish ecology and its application in planning, consenting and regulatory processes in relation to tidal (in-stream and barrage), wave and offshore wind energy.

Print it Send to f t in Share it



© Kovalenko Inna, Fotolia

### LINKS

- > [View all members of this group](#)
- > [WGMRE Terms of Reference](#)



Reviews in Fisheries Science & Aquaculture



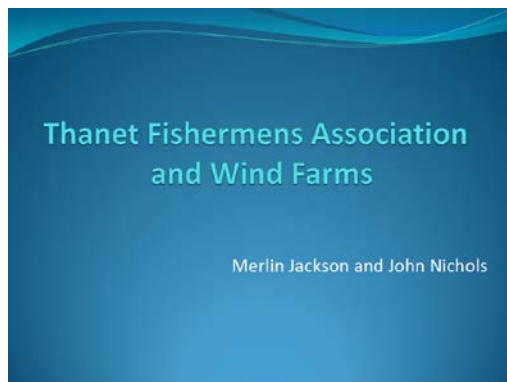
ISSN: 2330-8249 (Print) 2330-8257 (Online) Journal homepage: <https://www.tandfonline.com/loi/brfs21>

## Meta-Analysis of Finfish Abundance at Offshore Wind Farms

Elizabeth T. Methratta & William R. Dardick

To cite this article: Elizabeth T. Methratta & William R. Dardick (2019) Meta-Analysis of Finfish Abundance at Offshore Wind Farms, *Reviews in Fisheries Science & Aquaculture*, 27:2, 242-260

To link to this article: <https://doi.org/10.1080/23308249.2019.1584601>



# Key Challenges & Opportunities

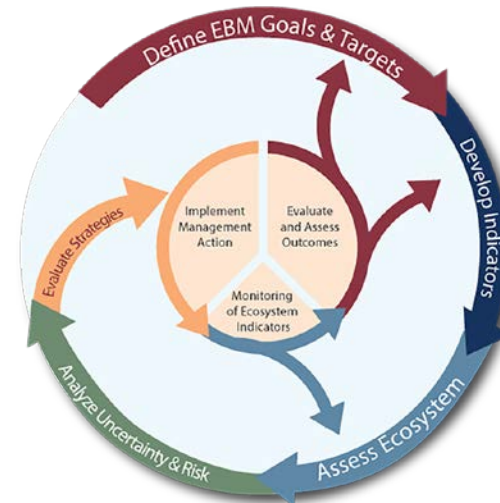
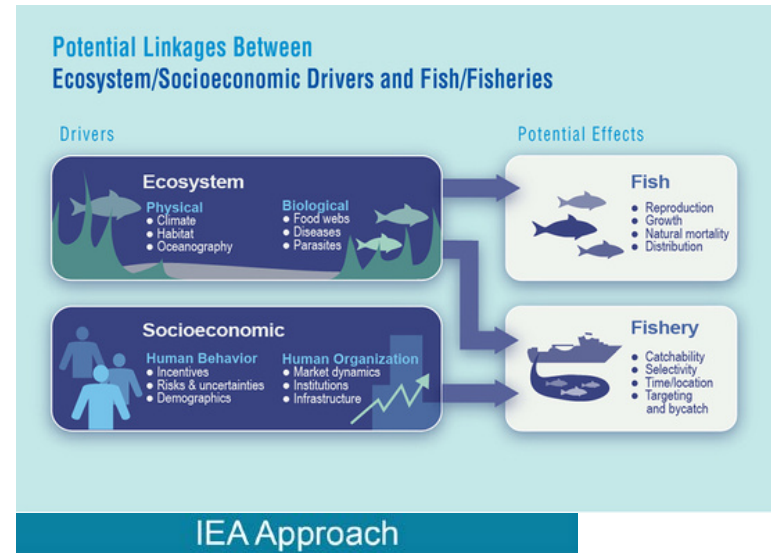
- New fishing methods and opportunities (hook-and-line; recreational)
- New management approaches
- Research and science opportunities (BACI/BAG designs, ocean observing)



<http://www.anglersforoffshorewind.org/blog>

# Key Challenges & Opportunities

- Ecosystem Based Management / Ecosystem Based Fisheries Management
- Integrated Ecosystem Assessments



# Conclusions

- *“Rest of our careers”*
- Co-existence
- Fisheries and fishing communities
- Protected species
- Aquaculture
- Habitats & ecosystems
- Renewable energy



<https://www.sciencemag.org/careers/2017/09/research-your-career-options-well-graduation>

How to include in our science / how to conduct our science<sup>30</sup>?

# Conclusions

- Opportunity to collaborate
- Opportunity to develop regional science frameworks
- Opportunity to implement coexistence through Ecosystem Based Management



<https://www.nefsc.noaa.gov/ecosys/>

# More information

## Offshore Wind in the Northeast Region

*This webpage is collaboratively managed by the Mid-Atlantic and New England Fishery Management Councils*



<http://www.mafmc.org/northeast-offshore-wind>

A screenshot of the New England Fishery Management Council website. The top navigation bar includes the council logo, "News", "Glossary", "Get Involved", "Contact Us", and a search box. Below this is a secondary menu with "Management Plans", "About Us", "Council Meetings", "Committees", "Calendar", "Library", and "Subscribe". The "Library" item is highlighted, and below it, the text "Meeting Materials" is visible. The main content area displays the title "April 2019 Offshore Wind in the Northeast Region: Special Session" in white text against a blue background with a water ripple pattern.

<https://www.nefmc.org/library/april-2019-offshore-wind-in-the-northeast-region-special-session>