Achieving Co-existence between Fisheries and Offshore Wind Development in the U.S.

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Northeast Fisheries Science Center
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We cover over 420,000 sq. km. of ocean from Canada to North Carolina.
State Driven Expansion of Offshore Wind

Renewable portfolio standard
Renewable portfolio goal (voluntary)

NOAA FISHERIES
Rapid Expansion of Offshore Wind

Projected Offshore Wind Development by 2030

- 1,700 Turbines
- 8,500 Km of Cable

Potential Effects on Fisheries

Fisheries
Coastal communities
Habitat
Marine mammals
Data gathering using ships and aircraft

- 15 leases in the Northwest Atlantic
- Planning Activities in Mid-Atlantic & Gulf of Maine
- Planned Leasing Activities on U.S. Pacific Coast and Hawaii Islands
Understanding Interactions w/ U.S. Fisheries Mission

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

http://www.thecolledge.org/jennys-blog/the-scientific-method-the-question
Commercial and recreational fisheries generated:

- Total sales: $212 billion
  - NY $5.5 billion
- Total jobs: 1.7 million
  - MA: 97,000
  - NJ: 52,000

Both economic value and stock status overall improving in New England and Mid-Atlantic-Areas to become largest Wind Energy Developments in the Globe.
Challenges: Fisheries & Wind Overlaps

U.S. Scallop Fishery is one of the Top Fisheries in the U.S

$500M in Landings Annually
Challenges: Fisheries & Wind Overlaps

Squid VMS 2015-2016 (<4 knots)
Challenges: Fisheries & Wind Overlaps

The importance of an area is highly specific to the most impacted fisheries, ports, and gear types.
Challenges: Fisheries & Wind Overlaps

NY Bight Call Areas with 2011-2016 Groundfish, Herring, Mackerel, Scallop, Squid, Surfclam/Ocean Quahog VMS Overlaid
Interactions of Wind on U.S. Fisheries Scientific Enterprise

177 Fishing Communities
12 States

Stratum 1: 44%
Stratum 73: 32%
Inshore stratum 20: 60%
Stratum 5: 32%

Atlantic Mackerel: 2016-02-03 13:00:00 GMT

Managed Fisheries
5 sea turtles
4 pinnipeds
34 cetaceans
3 ESA Listed teleosts
3 molluscs
9 elasmobranchs
2 cephalopods
5 crustaceans
39 teleosts

Complex Habitats
(from freshwater to open ocean)

Marine Mammal Protected Act & Endangered Species Act
Identified Research Needs: Effects on Fisheries

Pre-construction (now)
Construction (soon)
Operation (20-30 yrs)
Decommissioning (20+ yrs)

Acoustic surveys
Seafloor Disturbance
Water Column Disturbance
Vessel Traffic
Construction Noise
Lighting
Displacement of Fishing
Habitat Conversion
Lighting & Vessel Safety
## Impacts on Scientific Surveys

<table>
<thead>
<tr>
<th>Survey</th>
<th>Year Started</th>
<th>Survey Design</th>
<th>Major Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn Bottom Trawl Survey</td>
<td>1968</td>
<td>Random Stratified Design - North Carolina to Nova Scotia (bottom trawl)</td>
<td>abundance; length, age, sex, weight, diet, maturity samples, distribution, components of Ecosystem Monitoring survey</td>
</tr>
<tr>
<td>Spring Bottom Trawl Survey</td>
<td>1963</td>
<td>Random Stratified Design - North Carolina to Nova Scotia (bottom trawl)</td>
<td>abundance; length, age, sex, weight, diet, maturity samples, distribution, components of Ecosystem Monitoring survey</td>
</tr>
<tr>
<td>Scallop Survey</td>
<td>1979</td>
<td>Random Stratified Design (dredge); line transect (HabCam)</td>
<td>biomass, abundance, distribution, size and sex of sea scallops and other benthic fauna</td>
</tr>
<tr>
<td>Atlantic Surfclam and Ocean Quahog Surveys</td>
<td>1980</td>
<td>Random Stratified Design (hydraulic dredge)</td>
<td>biomass, abundance, distribution, size and sex of Atlantic surfclam and ocean quahog</td>
</tr>
<tr>
<td>Ecosystem Monitoring Survey</td>
<td>1977</td>
<td>Random Stratified Design (linked to Trawl Survey Design); fixed stations embedded in design (plankton and oceanographic sampling)</td>
<td>Phyto/nkton, zooplankton, ichthyoplankton, carbonate chemistry, nutrients, marine mammals, sea birds</td>
</tr>
<tr>
<td>North Atlantic Right Whale Aerial Surveys</td>
<td>1998</td>
<td>Aerial line transects</td>
<td>Right Whale population estimates; dynamic area management</td>
</tr>
<tr>
<td>Marine mammal and sea turtle ship-based and aerial surveys</td>
<td>1991</td>
<td>Line transects for ship and aerial surveys. Plus opportunistic biological and physical oceanographic sampling from shipboard surveys</td>
<td>Abundance and spatial distribution of marine mammals, sea turtles, and sea birds</td>
</tr>
</tbody>
</table>

277 Years of Combined Survey Effort
Support Fisheries that contribute $14 Billion Annually to U.S. GDP
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 in Summary

• Pace & scale of pending development
• Addressing impacts to Scientific surveys & assessments
  ➢ Time and resources to design supplemental surveys to integrate into assessments and existing time series
  ➢ Peer-review process for design, calibration, and implementation
• Effectively engaging commercial and recreational fishing industry in the process
• Collaborative Research and monitoring to address cumulative impacts
Opportunities: Partnering with Fishing Industries- RODA

Responsible Offshore Development Alliance

- 14 States on Atlantic & emerging Pacific Coast
- 30 Federal and State-permitted fisheries
- Atlantic fishing associations, dealers, processors, and over 130 vessels

2019 Memorandum of Understanding with NOAA/NMFS & BOEM

- Identifies areas of mutual interest between agencies and RODA
- Promotes engagement of commercial fishing industry in offshore wind development process
- Commits to incorporate fishing expertise in planning and development
- Support development of regional research and monitoring efforts
collaboration

noun
Two or more people working together towards shared goals
Collaboration Opportunities

Regional Framework

- Dev 1
- Dev 2
- Dev 3

Topic 1
Topic 2
Topic 3

Responsible Offshore Science Alliance

https://earthobservatory.nasa.gov/images/89063/offshore-wind-farms-make-wakes
Innovation
Opportunities: Trans-Atlantic Collaboration

Working Group on Marine Renewable Energy

Affiliation: WAPUG
Chair: Marijke Vermaas

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.

Meta-Analysis of Finfish Abundance at Offshore Wind Farms

Elizabeth T. Mathratta & William R. Dardick

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Thanet Fishermens Association and Wind Farms

Merlin Jackson and John Nichols
A wave of challenges and opportunities