

# Offshore Wind Energy in the Northeast Region Special Session

## III. Research and Monitoring

**NEFMC Meeting**  
**April 18, 2019**



# Overview of federal, state, and developer funded offshore wind research

Heather Deese, Brian Hooker, and Michelle  
Bachman

# DOE's Wind Energy Technology Office (WETO)

- WETO sits within DOE's Office of Energy Efficiency and Renewable Energy (EERE)
- Mission: Advance scientific knowledge and technological innovation to enable clean, low-cost wind energy options nationwide
- Annual budget ~ \$90M (last 4 years). R&D goals:
  - Reduce the cost of wind energy
  - “Support coexistence of offshore wind with the environment, coastal communities, and other users of ocean space”
  - Develop analyses, visions, and strategies for wind energy development
- In addition to its partnerships with industry and academia, the WETO funds R&D at eight national laboratories

# DOE's WETO Research has funded:

- \$200 million in R&D for offshore wind energy development
- \$25 million for understanding, mitigating environmental impacts (onshore & offshore wind)
- “Research to avoid, minimize, and mitigate environmental impacts and competing human uses in a cost-effective manner.”
- Topics include radar interference and technological approaches to mitigating wildlife impacts
- <https://www.energy.gov/eere/wind/offshore-wind-research-and-development>

# DOE's WETO Research – Examples

March 2019 funding announcement – awards will support R&D on technologies to mitigate offshore wind energy impacts on North Atlantic Right Whales, birds, and bats

PNNL's WindSentinel LIDAR buoys



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Office of  
ENERGY EFFICIENCY &  
RENEWABLE ENERGY

EERE News

March 13, 2019

## Energy Department Awards \$6 Million in Wind Energy Research Projects

Today, the Energy Department selected nine projects totaling \$6.2 million that will reduce environmental compliance costs and environmental impacts of land-based and offshore wind energy.

[Full story](#)

# DOE's WETO & NYSERDA – Nat'l Consortium

- National Offshore Wind Energy R&D consortium - DOE selected NYSERDA in 2018 to administer a 4-year, \$41 million private-public partnership to conduct industry-prioritized R&D needs.
- Consortium members:
  - <https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Economic-Opportunities/RD>
- Get email updates:  
<https://www.energy.gov/eere/wind/subscribe-wind-energy-technologies-office-news-updates>

# NYSERDA Funding Opportunity

## Environmental and Fisheries Research for Offshore Wind Energy Development

- Closes May 14, 2019; \$2 million
- Looking to fund one or more projects in the following five categories:
  - A. Ecosystem Dynamics: Examine the relationships between environmental processes, primary productivity, and distributions of species at higher trophic levels
  - B. Commercial Fishing Access: Understanding offshore wind development constraints to commercial fishing access
  - C1. Approaches for Offshore Wind Pre- and Post-construction Monitoring
  - C2. Leveraging Non-traditional Data: Approaches for leveraging non-traditional data for offshore wind environmental decision making
  - C3. Modeling the Effects of Offshore Wind Developments: Modeling the effects of offshore wind developments on the Cold Pool stratification
- [https://portal.nyserda.ny.gov/CORE\\_Solicitation\\_Detail\\_Page?SolicitationId=aorto0000obdvWsAAI](https://portal.nyserda.ny.gov/CORE_Solicitation_Detail_Page?SolicitationId=aorto0000obdvWsAAI)

# BOEM Environmental Studies Program

<https://www.boem.gov/Environmental-Studies-Planning/>

- Understanding Potential Economic Impacts to Commercial Fishing from Offshore Wind Energy Development
- Risk Analysis for Vessel Strikes on Whales from Offshore Wind Development Support Activities
- Hydrodynamic Modeling and Particle Tracking in the U.S. Mid-Atlantic Bight
- Evaluation of potential EMF effects on fish species of commercial or recreational fishing importance
- Understanding of Atlantic Sturgeon Migratory Patterns – Integrating Telemetry and Genetics (w/USGS)
- Atlantic Marine Assessment Program for Protected Species II & III (w/NMFS)
- Movement Patterns of Fish in Southern New England (w/NMFS)
- Fish Auditory Thresholds – Part 1 (w/NMFS)
- Regional Fisheries Monitoring Cooperative Agreement (w/MACEC)

<https://www.masscec.com/offshore-wind>



# Site-specific surveys

<b>Survey</b>	<b>Funding</b>	<b>Status</b>
Vineyard Wind Trawl Survey	Vineyard Wind	New
Vineyard Wind Ventless Trap Survey	Vineyard Wind	New
Vineyard Wind Optical Survey of Benthic Invertebrates and Habitat	Vineyard Wind	New
Vineyard Wind Plankton Survey	Vineyard Wind	New
South Fork Wind Farm Gillnet Survey	Ørsted	New
Block Island Wind Farm Trawl Survey	Ørsted	Ongoing
Block Island Wind Farm Ventless Trap Survey	Ørsted	Ongoing
Cox Ledge Ventless Trap Survey	BOEM/URI/CFRF	Ongoing



# VINEYARD WIND

## MONITORING PROGRAM

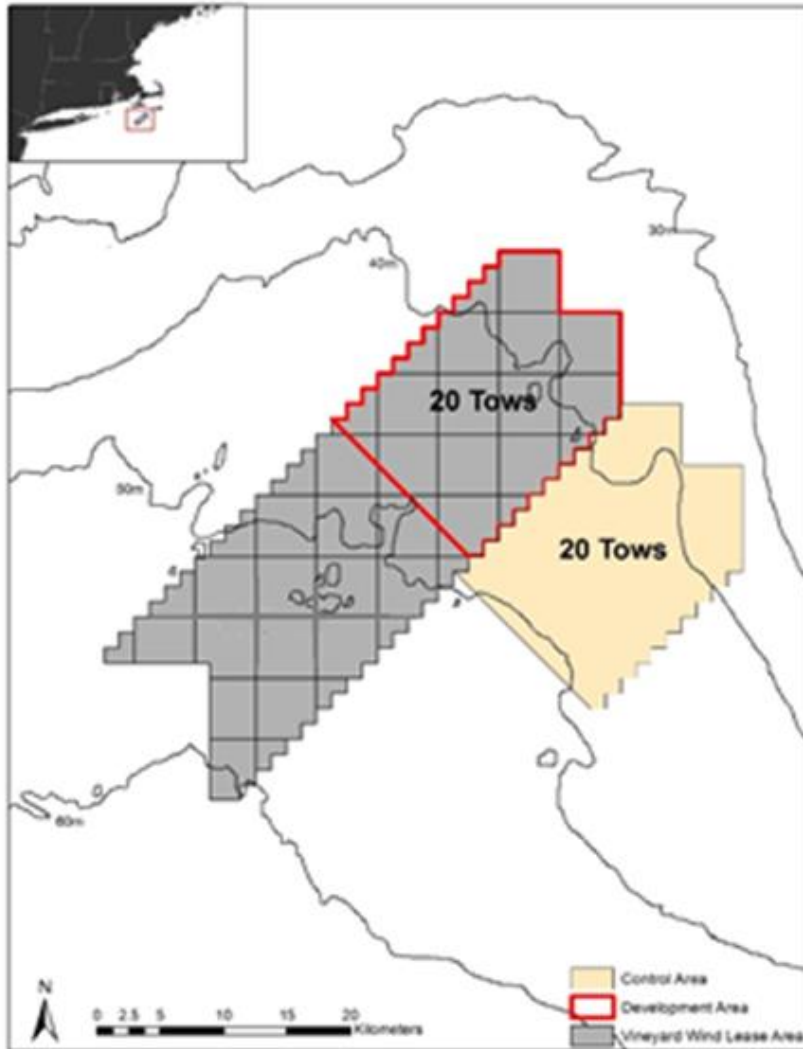
New England Fishery Management Council

April 18, 2019

# FISHERIES MONITORING PLAN DEVELOPMENT

- Entered into MOA with SMAST to develop recommendations
- Pilot video trawl survey FV Justice September 27 – October 4, 2018
- SMAST workshops for fishermen input on pre/during/post construction monitoring plan
  - New Bedford – Nov. 11
  - Rhode Island – Nov. 15
  - Chatham – Nov. 19
  - Martha's Vineyard – Dec. 3
- Over 100 people participated, 63 were active commercial fishermen, approximately 12 recreational fishermen
- SMAST organized follow up meeting with state and federal regulators
- Monitoring plan to support regional studies

# FISHERIES MONITORING PLAN - SMAST RECOMMENDATIONS

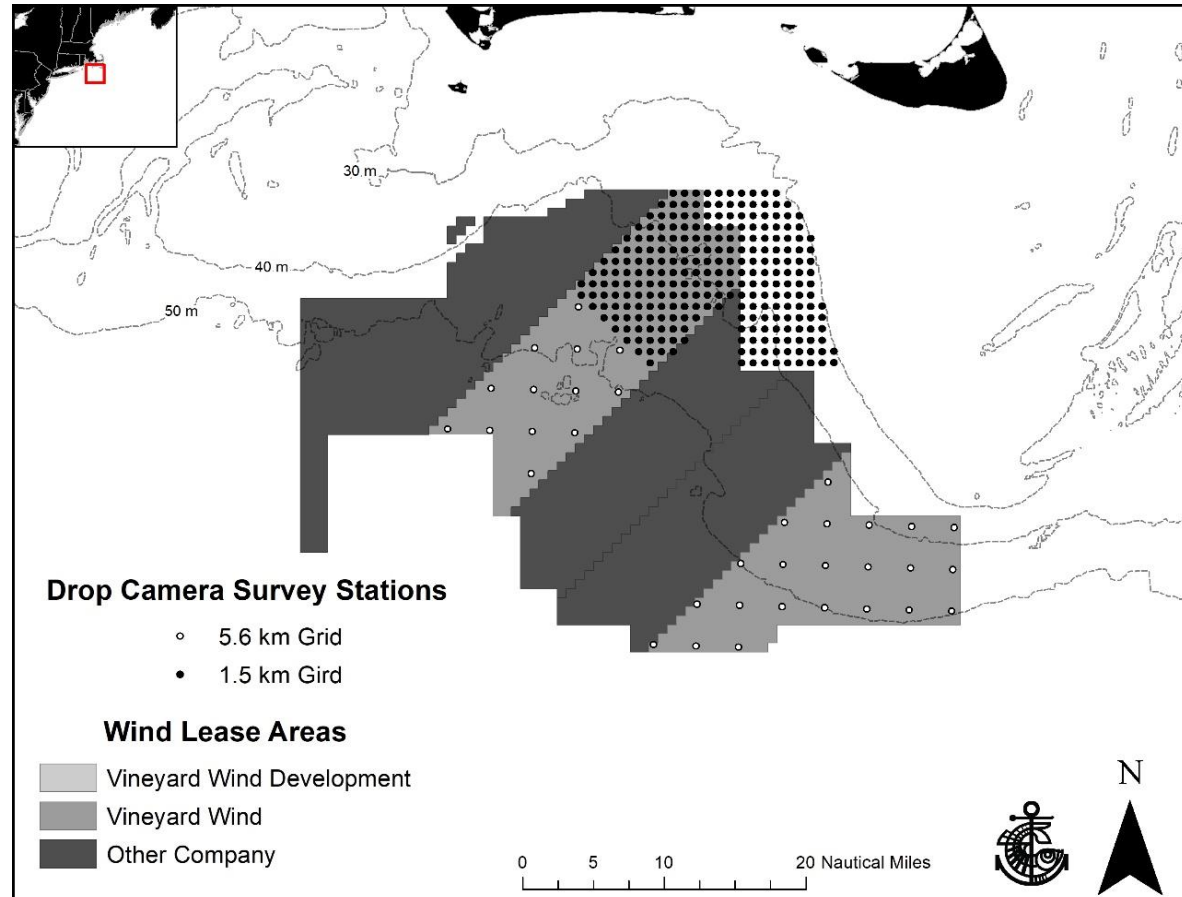


- **NEAMAP Trawl Survey Protocols**
  - Provides a consistent framework with existing surveys in the region and facilitate easier sharing and integration between state and federal agencies.
  - Provides estimates of fish abundance rates, spatial distribution, size structure and length-weight analysis
  - Before/After Control Impact (BACI) analysis.
  - Surveys 4x a year

# FISHERIES MONITORING PLAN – SMAST RECOMMENDATIONS

Drop camera surveys will be used to provide:

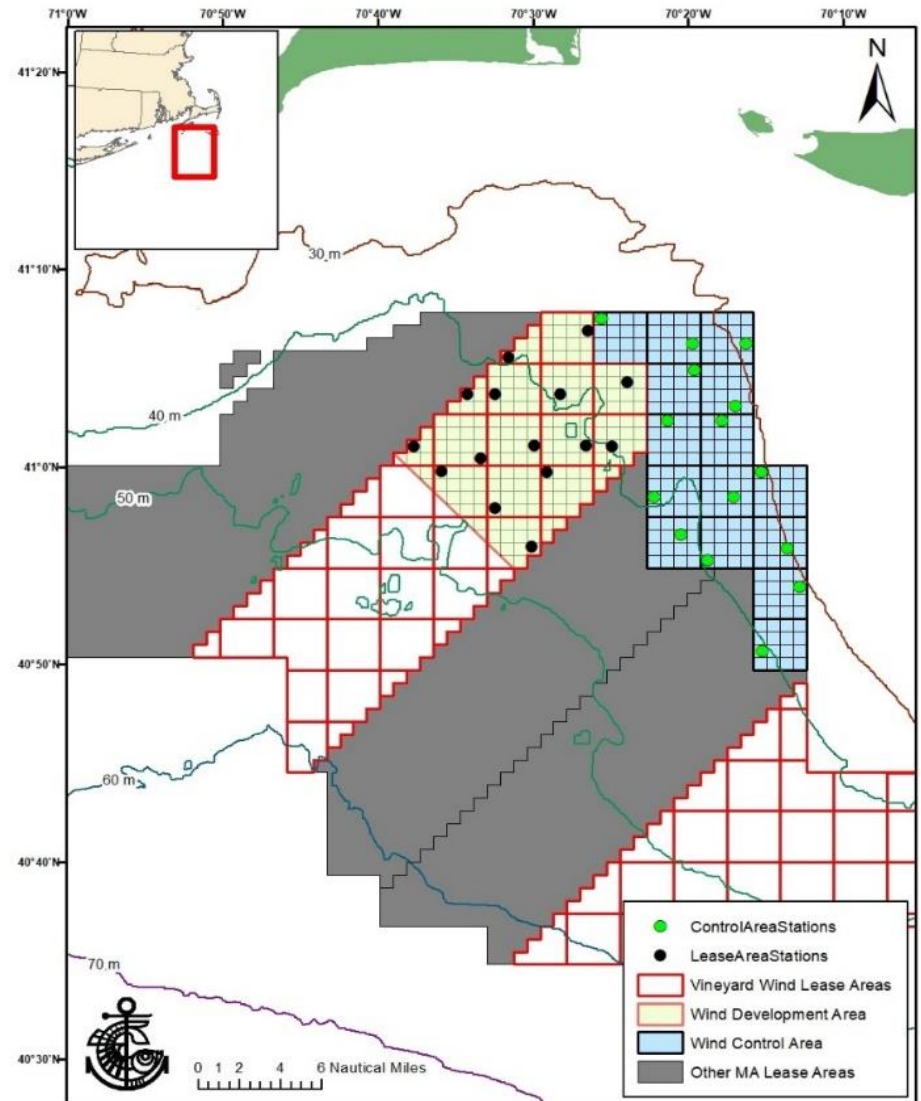
- Distribution and abundance estimates of dominant benthic megafauna
- Classification of substrate type across the survey domain
- Comparison of benthic communities and substrate types between the development area, control area, and broader regions of the U.S. continental shelf.
- Surveys 2x a year



# FISHERIES MONITORING PLAN – SMAST RECOMMENDATIONS

Ventless Lobster trap, black sea bass, plankton survey objectives:

- Estimate the size and distribution of lobster and black sea bass populations in the development and control areas
- Classify population dynamics including, length, sex, reproductivity success, age, diet, and disease
- Estimate relative abundance and distribution of planktonic species
- Obtain movement patterns of lobsters through tagging study
- Survey May - October



# CONTACT DETAILS

The full SMAST report is available at:  
[www.vineyardwind.com/fisheries](http://www.vineyardwind.com/fisheries)

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**NOAA**  
**FISHERIES**

**Northeast  
Fisheries  
Science Center**

# Offshore Wind Development: Implications for Northeast Fisheries Science Center Surveys

April 18, 2019

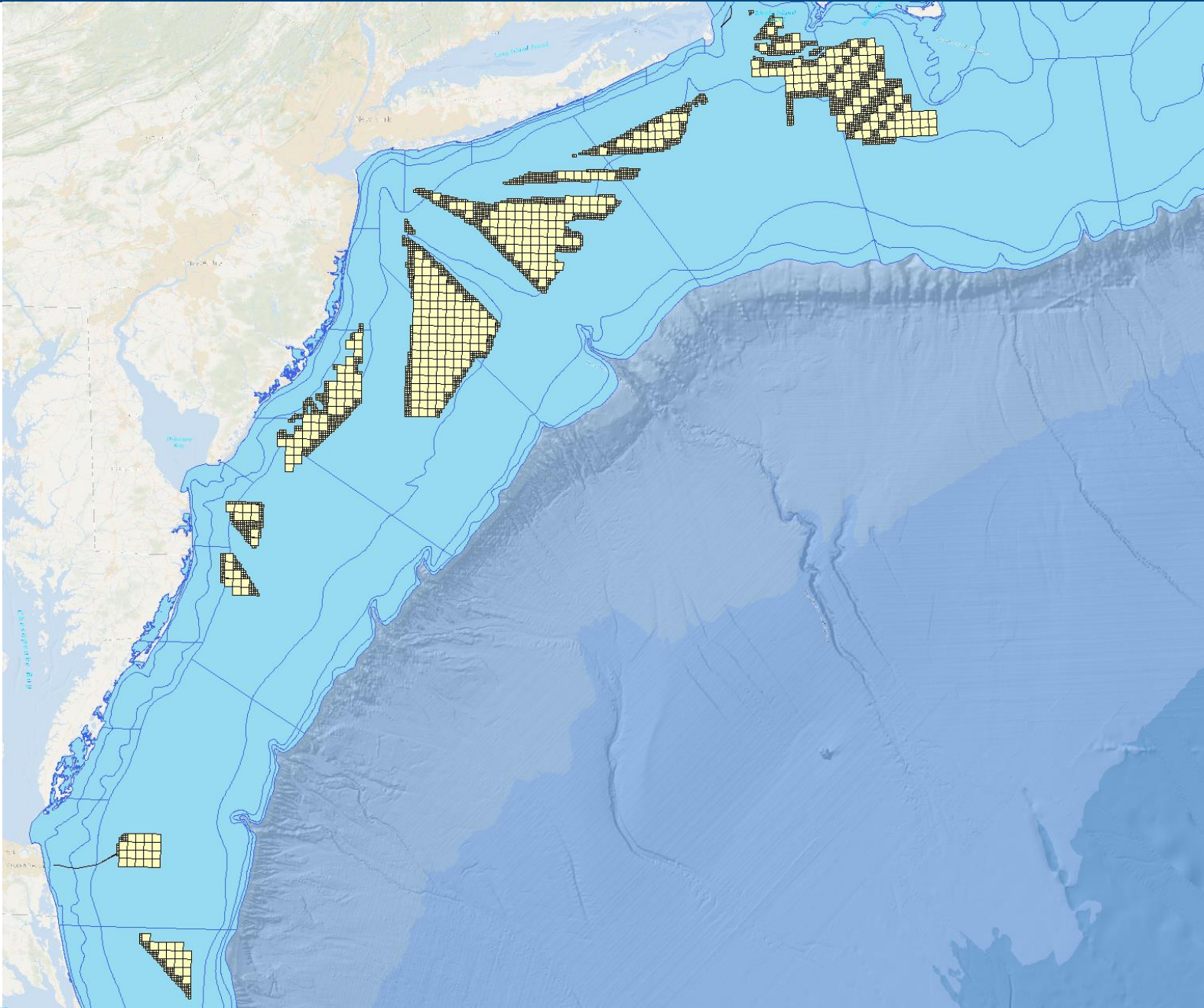


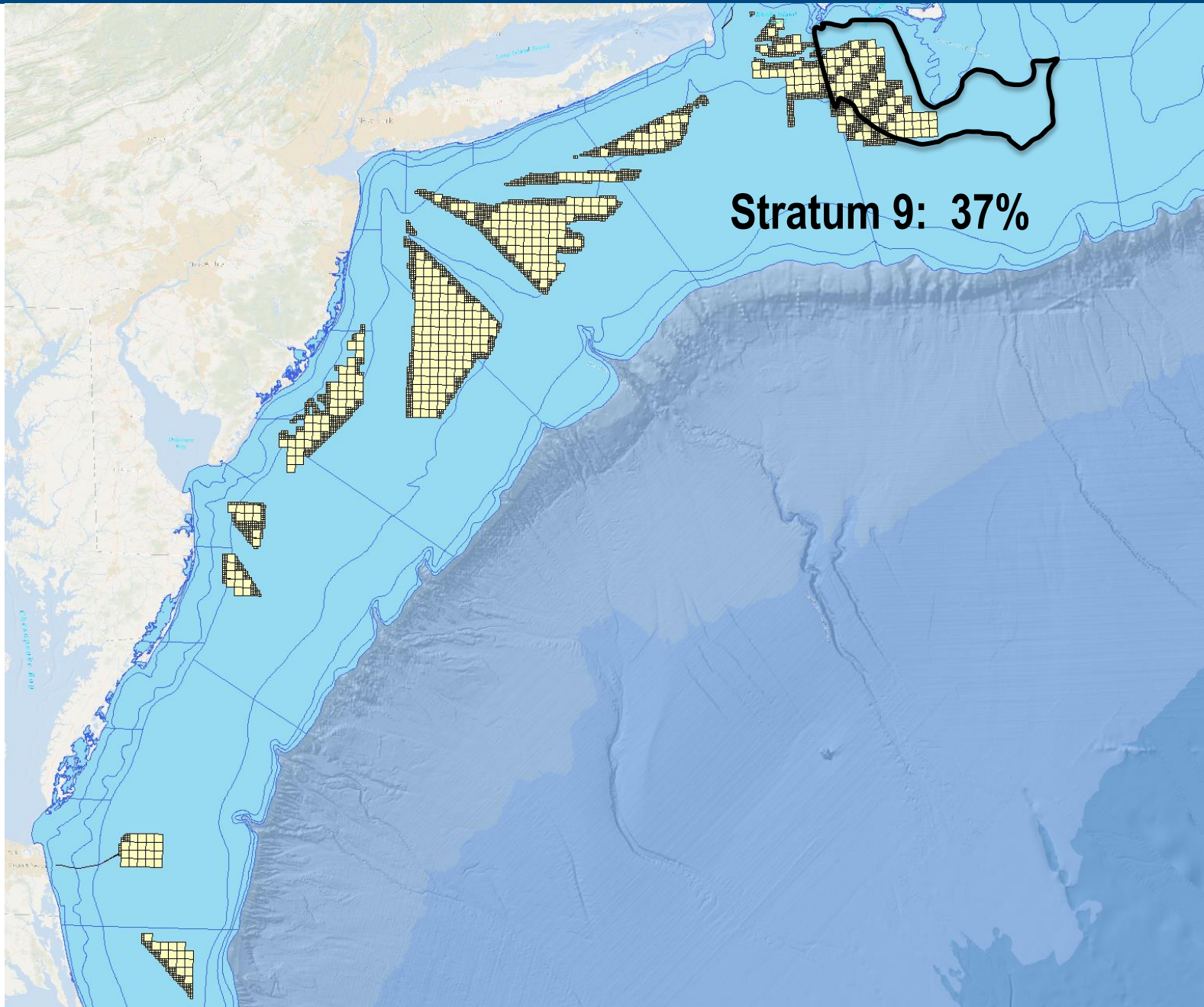
# Affected Center surveys

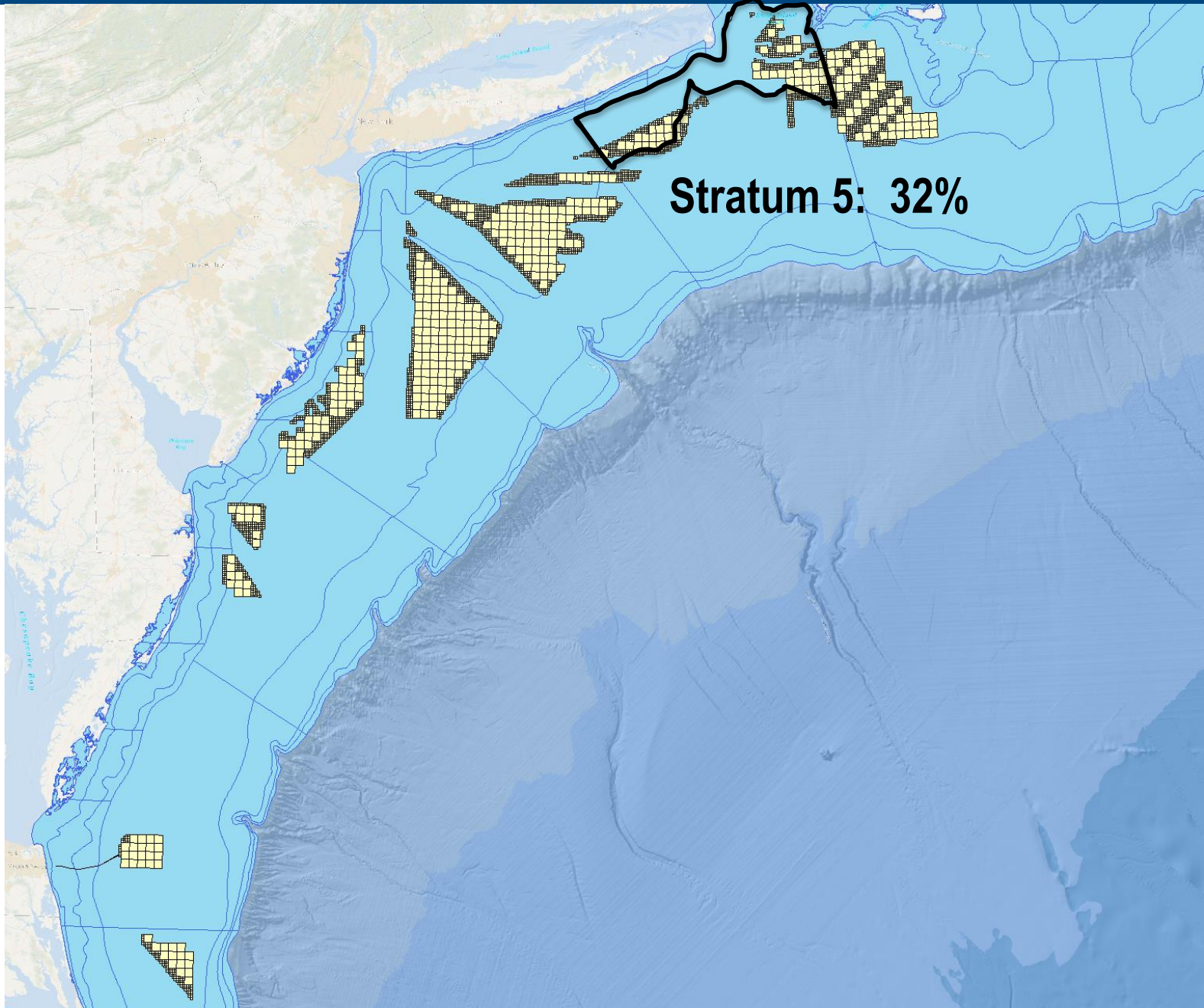
- Nearly all long-term fishery-independent surveys will be affected.
  - Integrated benthic/Atlantic sea scallop
  - Spring and autumn bottom trawl
  - Surf clam
  - Ocean quahog
  - EcoMon (plankton, physical oceanography)
  - North Atlantic Right Whale

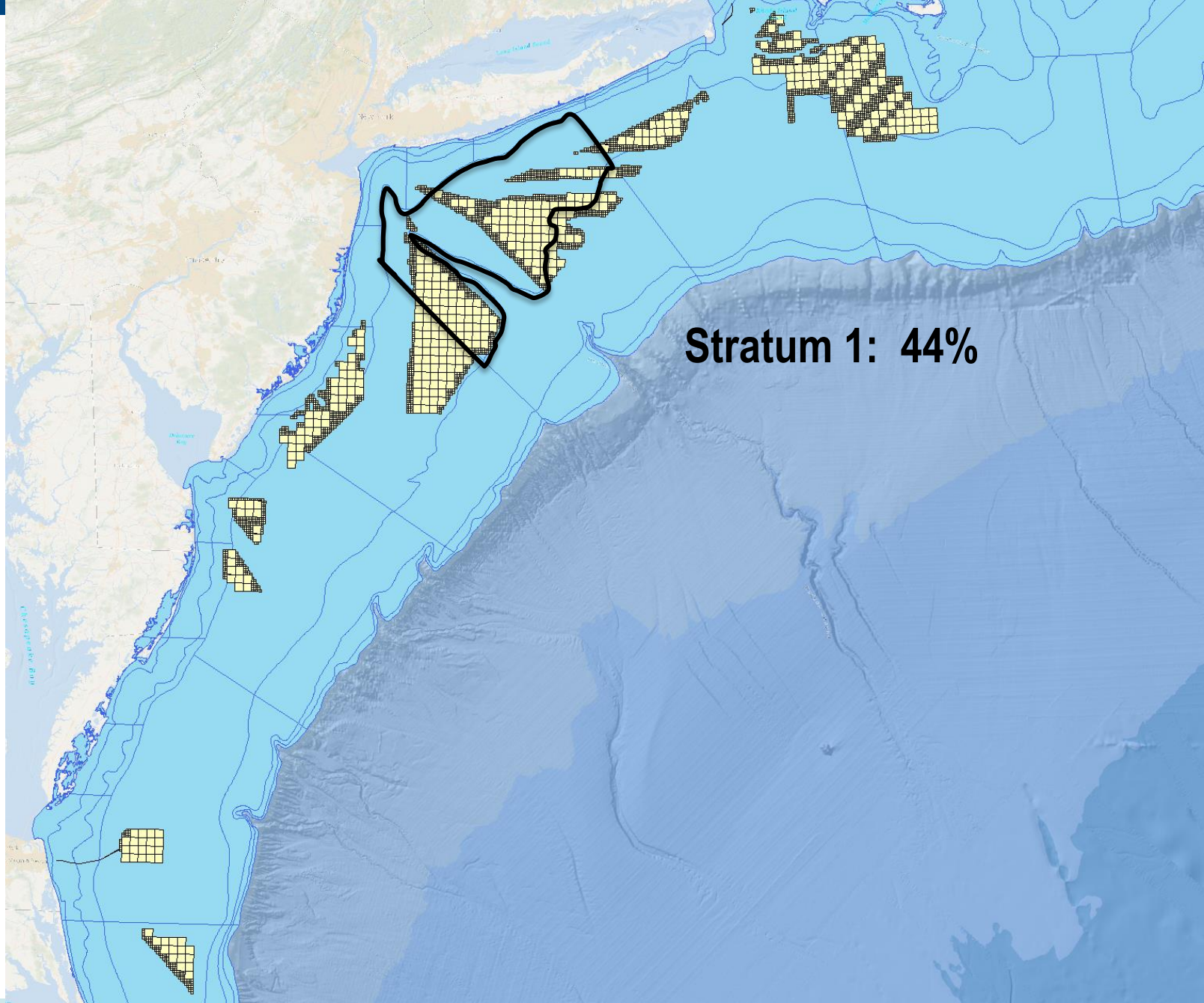
# Affected Center surveys

- The actual effects on each survey and associated potential mitigation have yet to be characterized.
- This presentation focuses on bottom trawl survey examples.
- There are several generic issues that apply to many surveys, however.

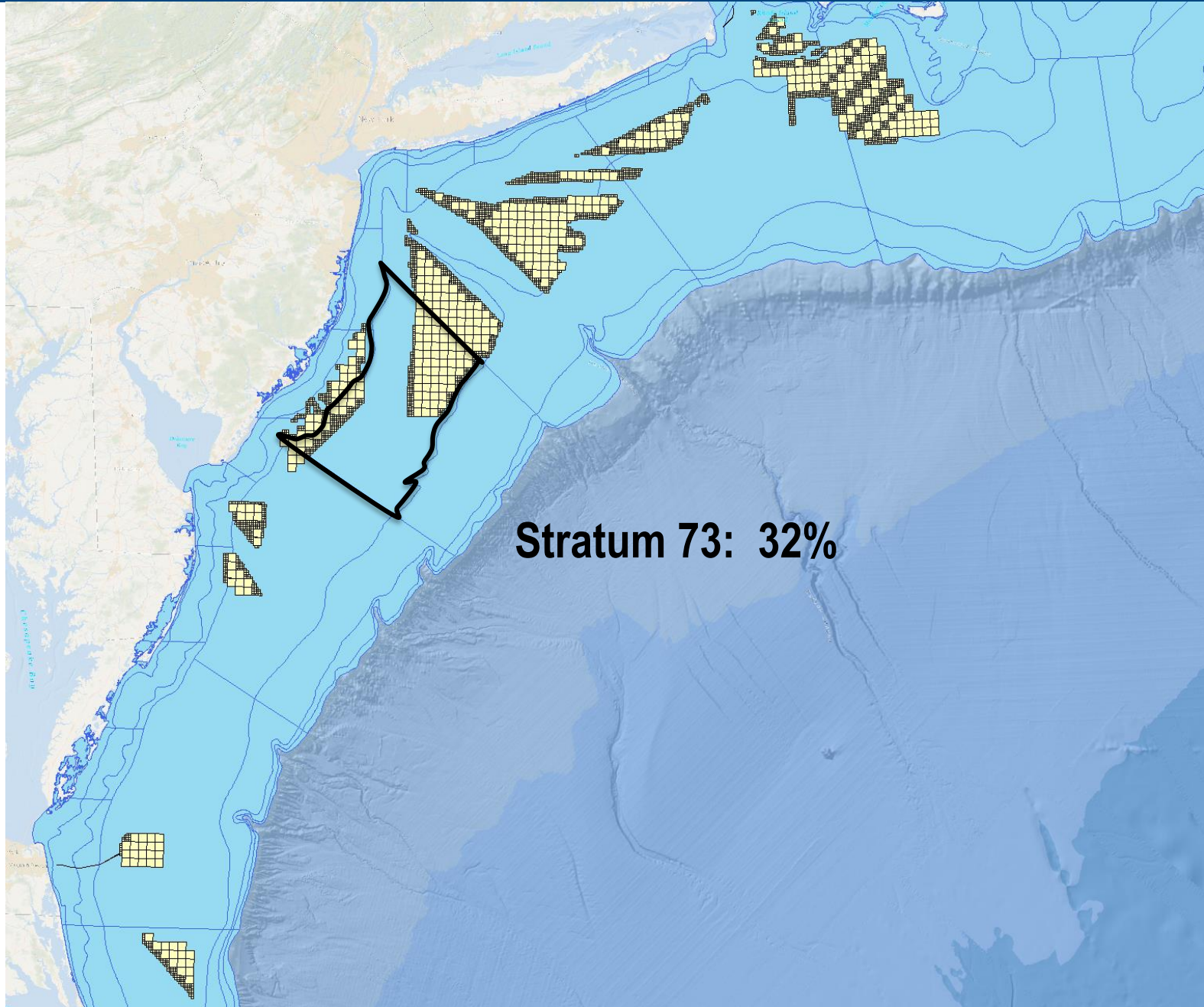




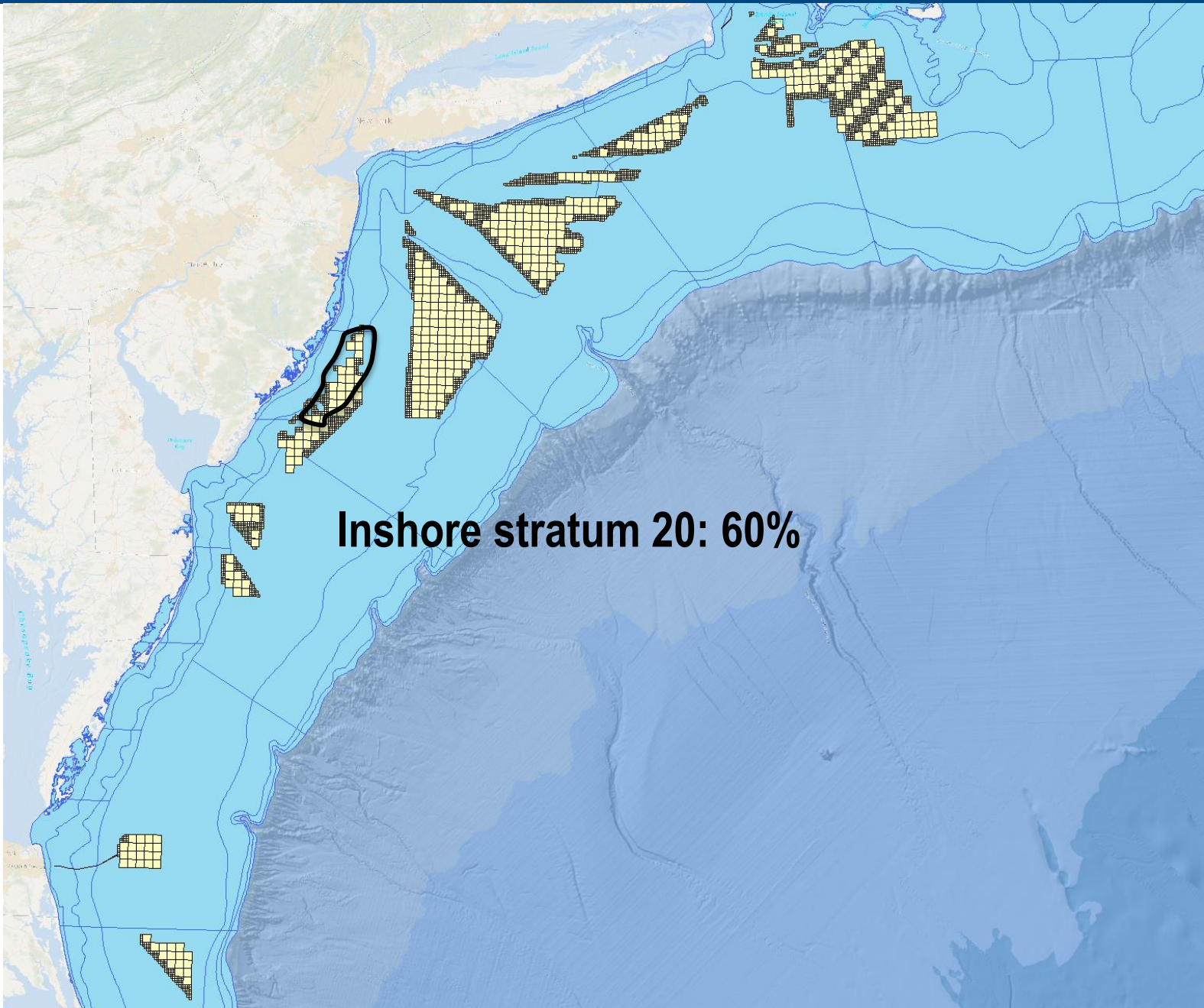




**Stratum 1: 44%**

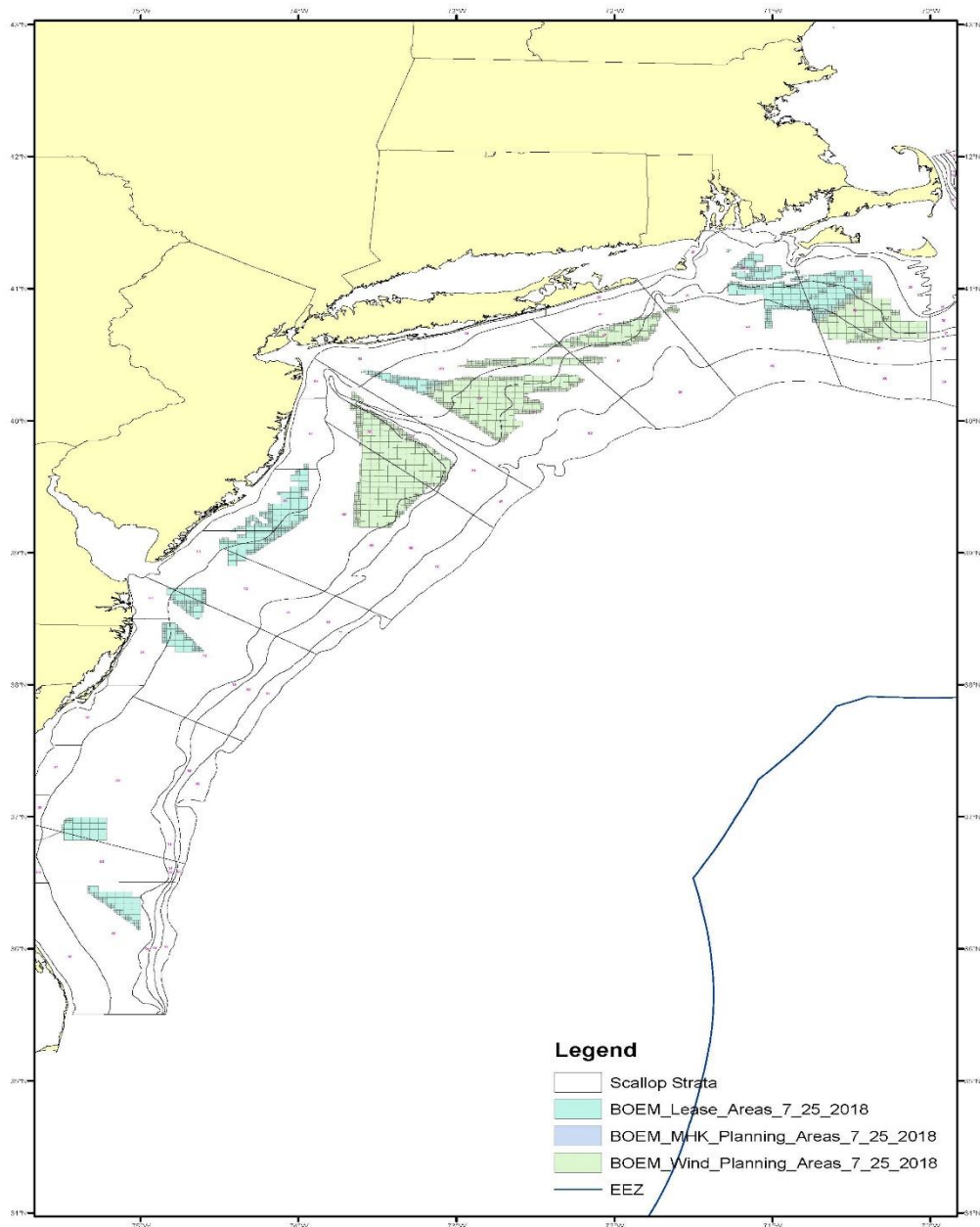


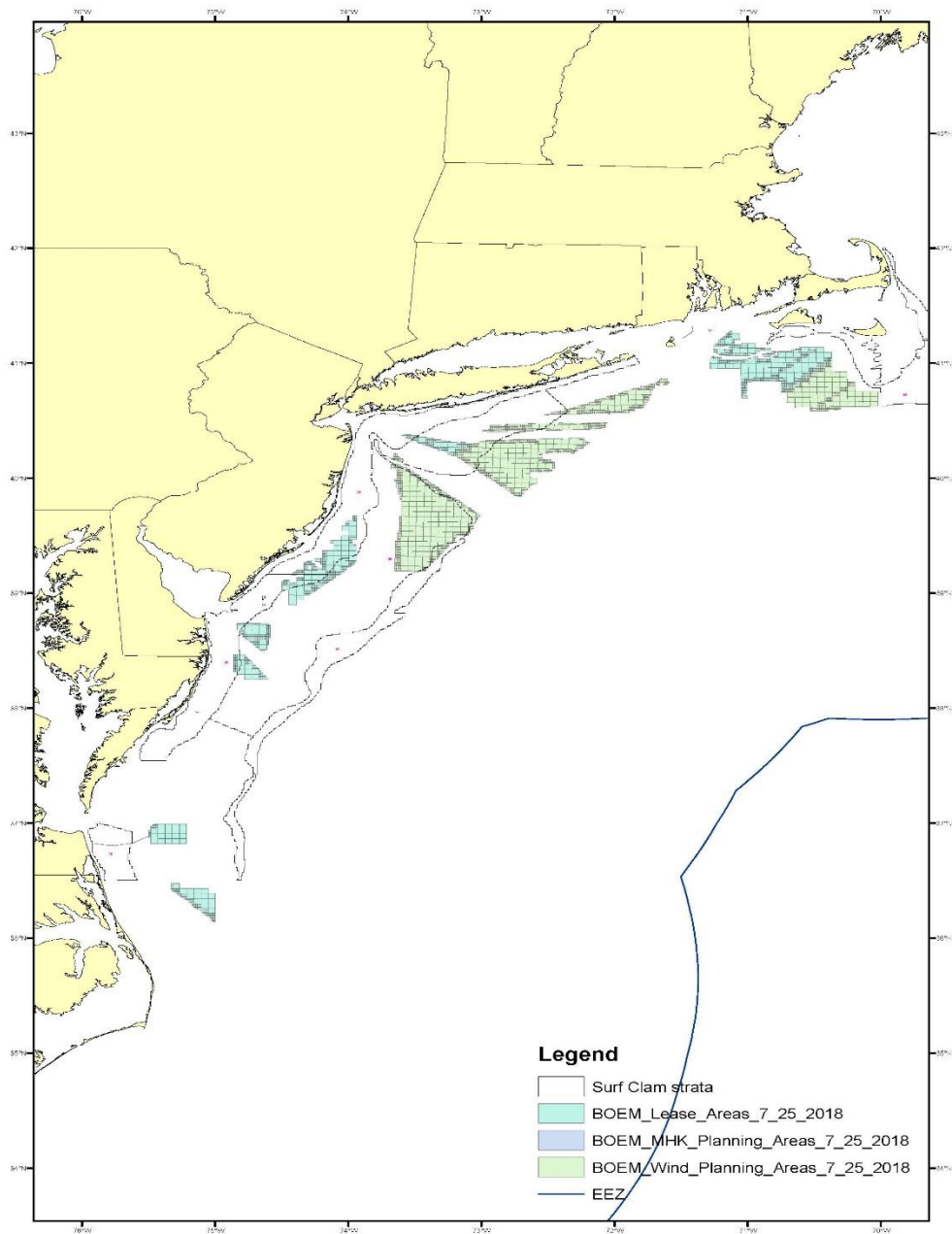
**Stratum 73: 32%**

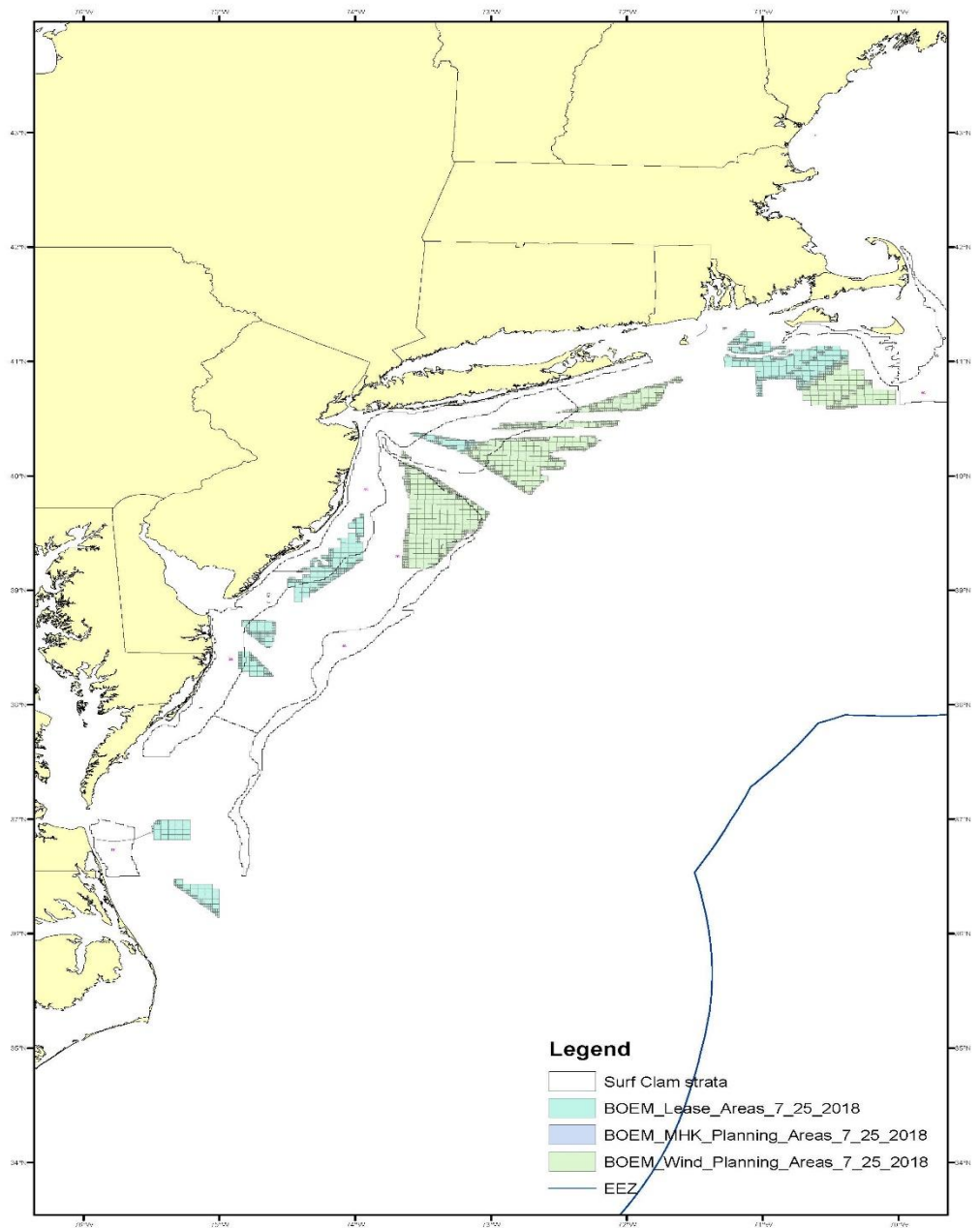


**Inshore stratum 20: 60%**









## Using July, 2018 lease and planning areas

- Anywhere from 0 – 60% of a bottom trawl survey stratum area could potentially be included in a lease or planning area.
- Short-term: areas may shift or be reduced.
- Long-term: areas may be increased.
- Challenge: how large will these areas ultimately be? Will they be completely occupied? At what rate?

# Types of implications for trawl surveys and other NEFSC long term monitoring programs in general

1. Vessel operations/access
2. Statistical survey design and estimation

## Goals:

- Maintain historical time series
- Maintain quality of information flow for stock and ecosystem assessments

# Vessel Operation Impacts

- Restrictions on vessel operations may turn wind energy areas into untrawlable habitat.
- Bigelow currently restricts operations to  $> 1$  n mi from Block Island wind installation.
- Although OMAO leadership endorses this, there are no other standard protocols for operation within or near windfarm arrays.
- Commanding officer is ultimately responsible for safe navigation of vessel: operations depend on conditions, and are the call of each vessel's C.O.

# Vessel Operation Impacts

- Bigelow is four stories high (85' air draft). Vessel may not clear the turbine blades.
- NOAA aerial surveys will have to operate at higher altitudes. (Dolphins will not be detectable.)

# Vessel Operation Impacts

- We should not necessarily expect the Bigelow to operate in a wind energy area.
- The Sharp and current chartered clam vessel are also not likely to operate in a wind energy area.
- Proposed medium-sized NOAA vessel or smaller platform may be appropriate, but has implications for productivity and standardization.



# Vessel Operation Impacts

- Cabling will likely further reduce trawlable bottom (un- or under-buried) both inside and outside these areas.
- Any attraction of fixed gear or recreational effort to the area could also reduce trawlable habitat.
- Navigational restrictions from Coast Guard still under development for construction phase.

# Statistical survey design

- We currently select station locations randomly within a stratum.
- Random site selection will no longer be possible: sites near turbines (or potentially within entire wind energy areas) will be systematically eliminated.
- The area occupied by turbines (or entire wind energy areas) will increase over time.

# Statistical survey design

- If new survey type is required, calibration will be required to maintain a standardized time series, or there will be a gap until new series are established.
- If new survey type is required, peer review of survey design and associated transition and calibration processes will be required.

# Data gaps

## Identification of

- Modified gear and vessel configurations to meet operational constraints
- Alternative technologies
- Complementary survey design
- Calibration between standard and new survey to maintain 56 year old standardized time series
- Similar issues with other regional surveys (scallop, surf clam, ocean quahog, cetacean, plankton)

# Data gaps: How to fill them?

- Data gaps are still being identified.
- How to fill those gaps is still undefined.
- There are no resources within the Center to systematically identify those gaps and how to fill them.

# Current status of discussion on this issue

- Intermittent brainstorming at this point (internal)
- Northeast Trawl Advisory Panel (NTAP) could expand focus and provide valuable input on e.g., trawl gear and vessel modifications.

# Wind project research and monitoring: different or unified goals?

- Each individual project may develop research and monitoring programs designed to meet individual project permit processes.
- These currently are not necessarily designed to fill systematic long-term coastwide monitoring gaps.
- A unified coastwide approach would be valuable to leverage these projects' planned research and monitoring programs.
- Mitigation may be necessary to address gaps in long-term coastwide monitoring.

# How can the Council help?

- Council support to help build Center capacity will improve the quality of fishery-independent data as wind farm areas increase.
- Collaboration with the Center, RODA, and ROSA will help address these issues.



# In summary, impacts will include (but are not limited to)

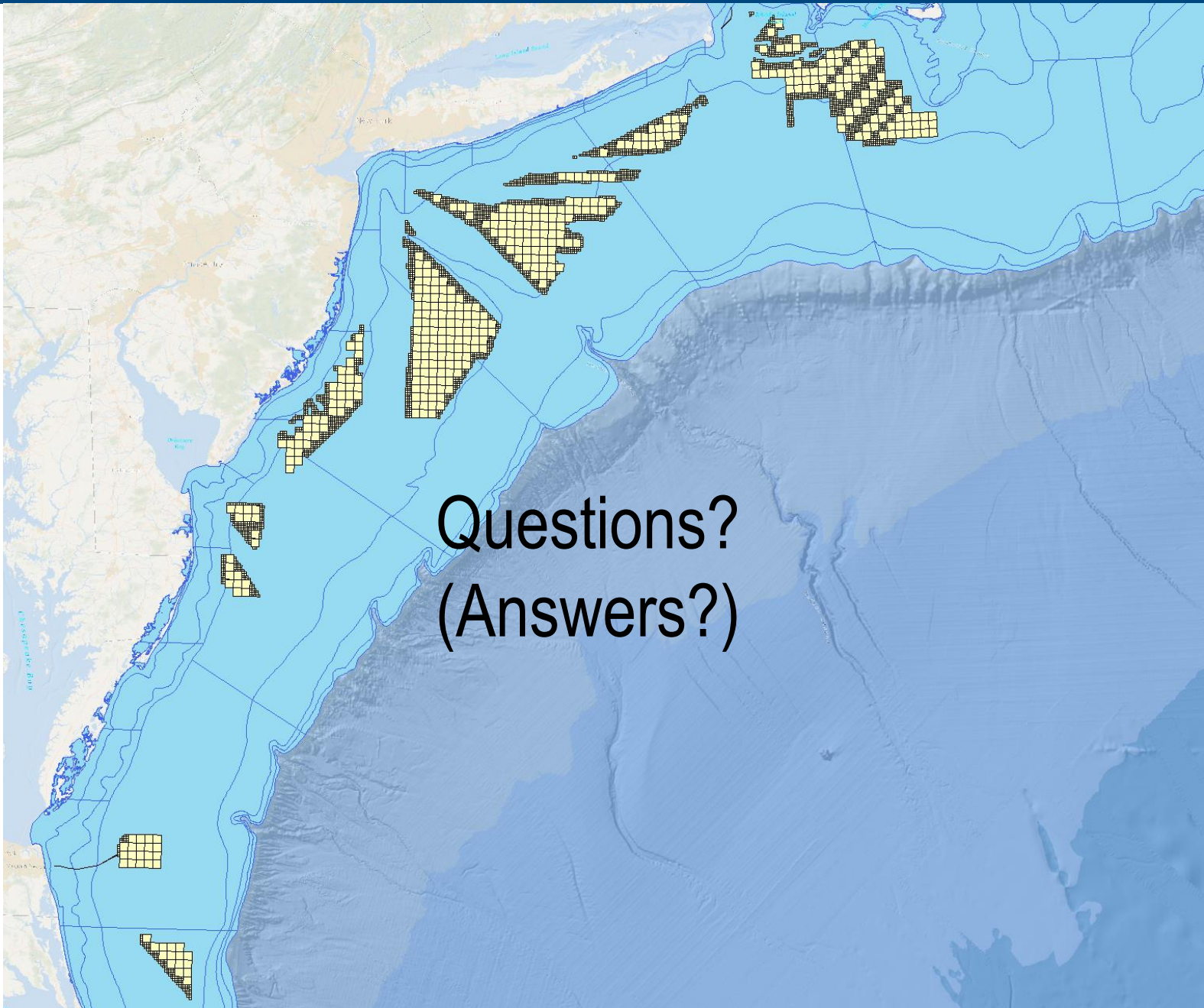
- Reductions in precision of fishery-independent survey indices in stock assessments.
- Reductions in accuracy due to potential changes in availability.
- Reductions in precision when calibrations are required (new vessels, gear types, protocols, statistical designs).
- Reductions in sampling efficiency as vessel transit times increase and/or sampling vessel size decreases.

("Wind Farm Effects that will Impact NEFSC Survey Operations and Concomitant Stock Assessments Impacts Draft Breakout Group Summary". November, 2018)

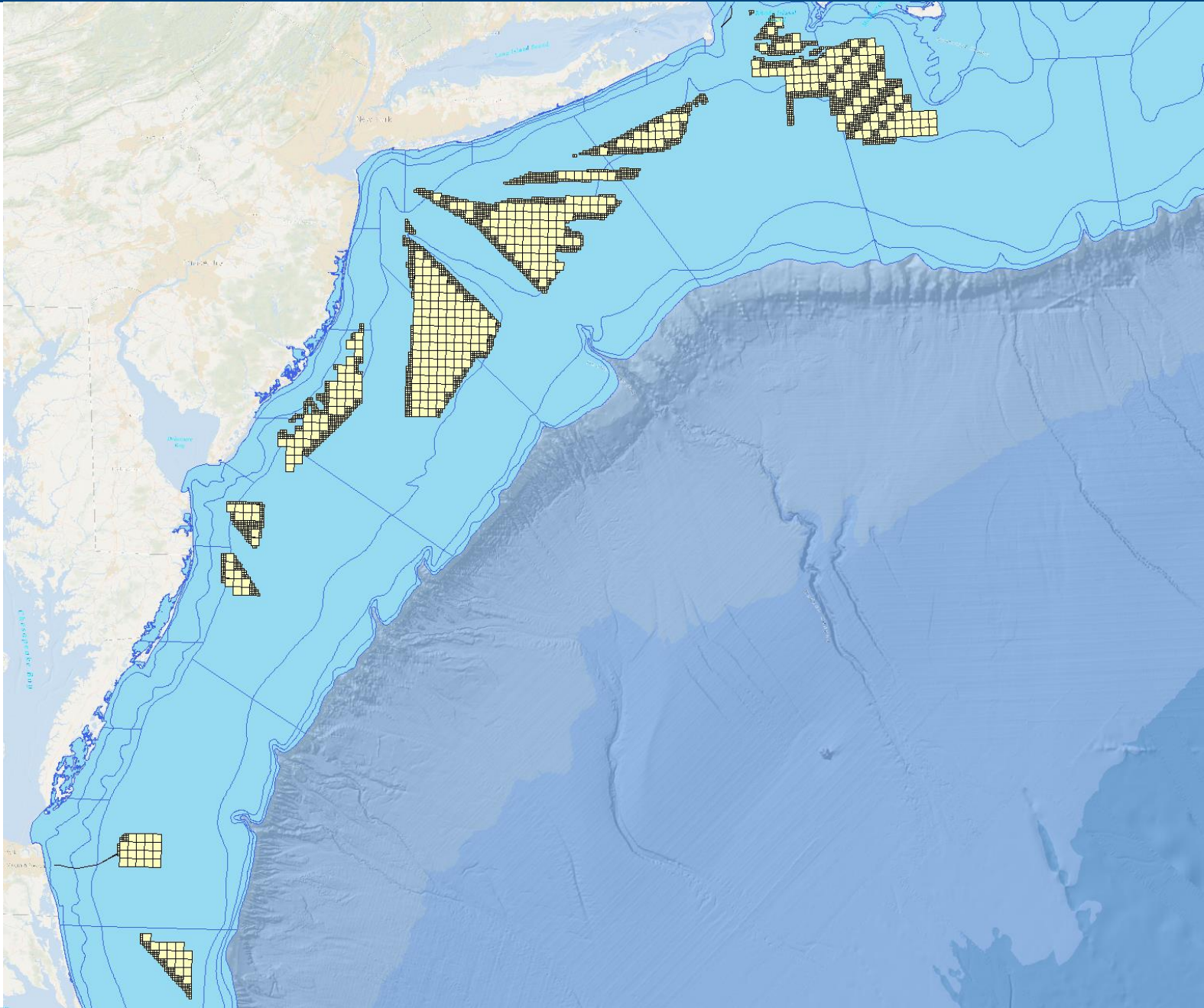
## In summary,

- Time and resources need to be available to design new supplemental surveys that can be integrated into stock assessments and existing time series.
- That process includes peer review of the design and calibration, and implementation.

(“Wind Farm Effects that will Impact NEFSC Survey Operations and Concomitant Stock Assessments Impacts Draft Breakout Group Summary”. November, 2018)



Questions?  
(Answers?)



Annie Hawkins  
Responsible Offshore Science Alliance

# Discussion Question

- What should the Council's role in regional science and research efforts be?