

Scallop PDT Input on 2020/2021 RSA Research Recommendations

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Page 12: Updated Scallop RSA Research Priorities with PDT input (clean version)

PDT Input on 2020/2021 RSA Research Recommendations

The Scallop Plan Development Team (PDT) developed the following input over two conference calls and through correspondence.

Labeling:

- Create two groupings: SURVEYS (HIGH) and General Research (instead of H/M/L or H/O). These would be ranked. Staff could add text at outset of this section to clarify.
- In other sections, use KEYWORDS to identify specific research areas like “Bycatch” and then move into text. The rationale for this change is to help make sections more transparent and to add clarity to what that priority is about.

General Comment:

- There are a lot of potential research topics in our current priorities. There are not “8” total priorities, many issues are nested in the text of general topic areas.

1a. Intensive surveys of relevant scallop rotational areas

- Cut duplicative text.

1b. Intensive surveys of areas of interest:

- The PDT recommends that survey “areas of interest” (1b) be defined as places where recruitment is observed in the 2019 surveys. This is in addition to the access areas of interest (1a), and broadscale surveys of the resource (1c). The PDT and RSA support staff from NMFS noted that it is helpful to list specific areas.
 - The PDT identifies areas where recruitment is observed during the specification setting process. This information is generally known by the end of August. The RSA is a competitive grant process, and successful proposals/Pis would need to follow the annual process to know “areas of interest”.

1b. Gulf of Maine

- The PDT recommends continuing intensive surveys in the Gulf of Maine and NGOM management unit in areas that have been fished or are likely to be fished. This data collection is consistent with recommendations from SARC 65.

2. Dredge efficiency:

- There is consensus that this is not a “HIGH” priority for the next cycle.
- There was support for moving to “Other”, and for removing this from the list:
 - To General Research: “Given how long the dredge has been used, we should have a handle on how efficiency changes for everything except density and new designs. Investigating the efficiency of new designs should not be a high priority.” Other members of the PDT felt that there continues to be value at looking into dredge efficiency because the results are used in management and there are still situations (high density) where estimates are not well defined.

- Remove: This has been funded for 2019, wait to see how the research goes before putting back on the list.
- Recent Awards:
 - 2017: A Study to Assess the Effect of Tow Duration and Estimate Dredge Efficiency for the VIMS Sea Scallop Dredge Survey (VIMS) Estimated value: \$1.26 million
 - Report expected 5/29/19
 - 2018: Understanding Dredge Performance for a Lined versus Unlined NMFS Sea Scallop Dredge (VIMS) \$160,098
 - Report expected 6/29/2020
 - 2019: In Situ High-Definition Camera Monitoring to Evaluate Catch Efficiency and Performance of a Survey Dredge (VIMS) 88,941 pounds. Estimated value: \$844,936
 - Two-year project.
- Potential text for dredge efficiency priority:

“Dredge Efficiency: An evaluation and synthesis of dredge efficiency research to support scallop fishery management. Research may focus on analyses of existing data sets.

GENERAL RESEARCH Category:

- Support for maintaining this split. Not H, M, L.

3. Research on impact of offshore wind energy development:

- The PDT noted that one project was already funded in the 2019 RSA cycle. One wind related project funded through the 2019 RSA awards.
- Proposed Text: “Research to assess the impact of offshore wind energy development on the Atlantic sea scallop resource, including, but not limited to, baseline information gathering about abundance, biomass, distribution, growth, and seasonal yield; oceanographic models to assess potential impacts on larval patterns and settlement; questions of fishability, including impact of turbine spacing and orientation on safety and gear interactions, potential time-of-year restrictions for construction activities, and potential changes to management plans to increase the feasibility of fishing opportunities; economic analyses of potential impacts to the scallop fishery and scallop fishing ports; impacts of noise, vibration, and sedimentation during construction and operations.”
 - While some members of the PDT felt that some of the research described above should be conducted as part of an EIS, a PDT member also explained that wind energy developers are funding broad issues that check boxes for BOEM. They felt that the Scallop RSA is an opportunity to fund scallop specific projects.
- The Council received a report on wind energy at its April meeting. The following slides may be relevant to this discussion:

Figure 1-Current wind energy lease area sites and lease areas; development plans for all areas in color by 2030. Map credit: NEFMC

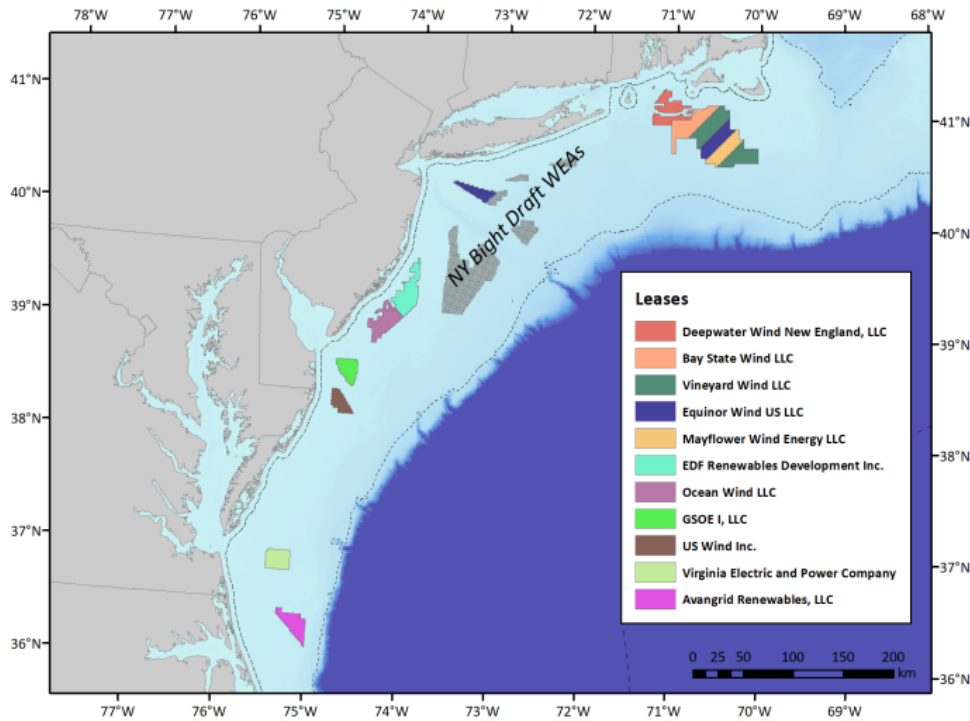
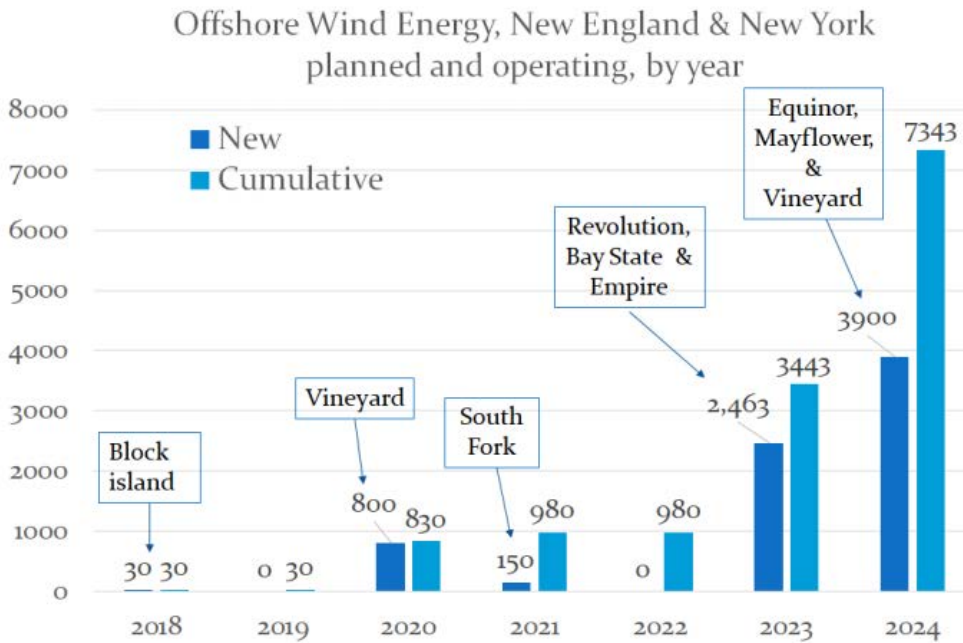


Figure 2 - Offshore wind energy planned off New York and New England



Source: MW and estimated operation timelines for projects based on U.S. Department of Energy, Offshore Wind Market Update (Sept 2018), Business Network for Offshore Wind, Market Update and Insights (March 2019), and individual developer websites.

From NOAA: <https://s3.amazonaws.com/nefmc.org/III-Research-and-monitoring.pdf>



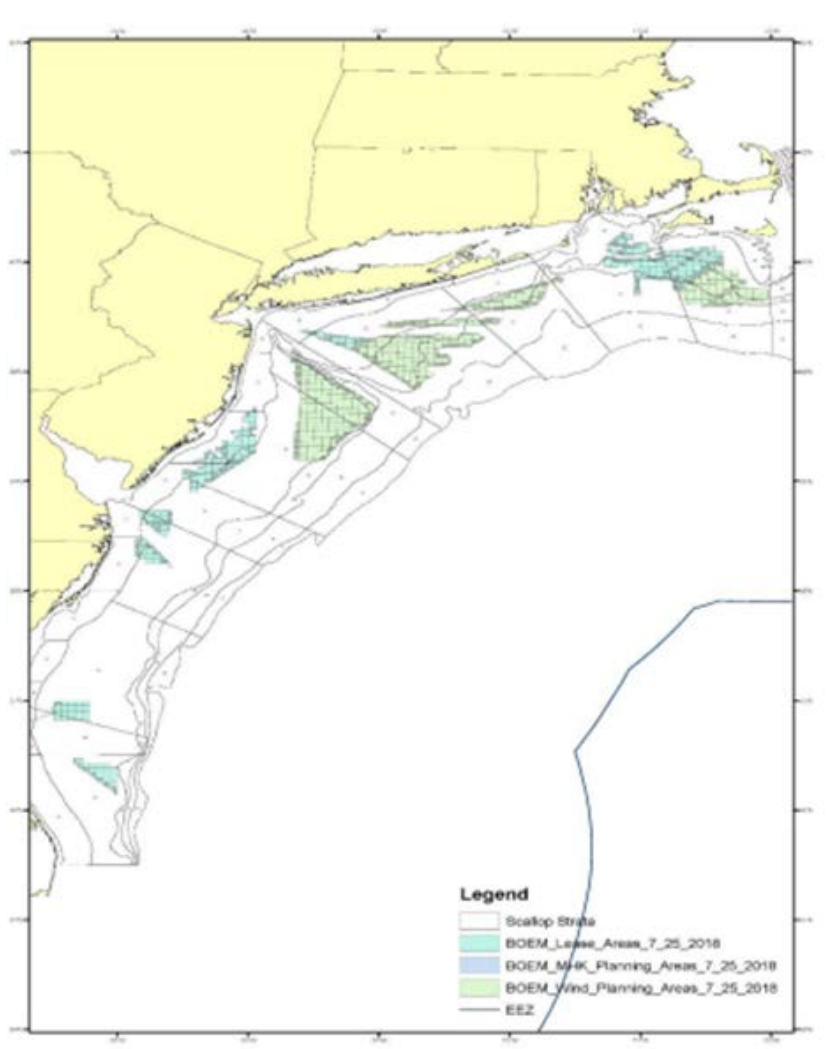
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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <h3>Affected Center surveys</h3> <ul style="list-style-type: none">• Nearly all long-term fishery-independent surveys will be affected.<ul style="list-style-type: none">• Integrated benthic/Atlantic sea scallop• Spring and autumn bottom trawl• Surf clam• Ocean quahog• EcoMon (plankton, physical oceanography)• North Atlantic Right Whale | <h3>Vessel Operation Impacts</h3> <ul style="list-style-type: none">• 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. |
| <p> U.S. Department of Commerce National Oceanic and Atmospheric Administration NOAA Fisheries Page 17</p> | <p> U.S. Department of Commerce National Oceanic and Atmospheric Administration NOAA Fisheries Page 18</p> |

Figure 3 - Scallop Survey Strata overlaid with current wind energy lease areas (Source: NEFSC)



4. TURTLE RESEARCH:

- Some members of the PDT suggested that turtle research be removed from the priority list, while others felt that it is very important to keep on the list.
 - One additional area of focus that was suggested was shifts in turtle distribution due to climate change.
- Note: Research will be presented on recently funded RSA turtle work at the Share Day.
 - Question: How is this data being used, and who is using it?
- One follow-up from the May 9, 2019 conference call was to review the research recommendations in the current sea turtle biological opinion. The following language comes from the 2018 incidental take statement, and could be used as a rationale for future research:

“RPMs and Terms & Conditions

3. We must continue to review available data to determine whether there are areas or conditions within the action area where sea turtle and Atlantic sturgeon interactions with fishing gear used in the scallop fishery are more likely to occur.

3. To comply with RPM #3 above, we must continue to review all available data on the incidental take of sea turtles in the scallop fishery as well as other suitable information (e.g., data on observed sea turtle interactions with other dredge and trawl fisheries, sea turtle distribution information, satellite tagging and stranding data, or fishery surveys in the area where the scallop fishery operates) to assess whether correlations with environmental conditions (e.g., depth, SST, salinity) or other drivers of incidental take (e.g., gear configuration) can be identified for some or all portions of the action area. If additional analysis is deemed appropriate, within a reasonable amount of time after completing the review, we must take action, if appropriate, to reduce sea turtle interactions and/or their impacts.

5. We must continue to research the extent to which sea turtle interactions with scallop dredge gear occur on the bottom versus within the water column.

5. To comply with RPM#5 above, we must continue to use available and appropriate technologies to better determine where (on the bottom or in the water column) and how sea turtle interactions with scallop dredge gear are occurring. Such information is necessary to assess whether further gear modifications in the scallop dredge fishery will actually provide a benefit to sea turtles by either reducing the number of interactions or the number of interactions causing serious injury and mortality.”

5. BYCATCH RESEARCH:

- Consider tightening up the language in this section.
- Gear modifications: lots of funding over the years – we are using the 1.5:1 hanging ratio as the flatfish AM for YT and WND.
 - What has been tried/tested, what additional dredge modifications beyond what has been implemented and currently being researched will significantly reduce bycatch?

6. SCALLOP MEAT QUALITY RESEARCH:

- Several projects (RSA & SK) have been funded that look at disease and parasites.
- Refine priority to focus on density dependence.

7. MSE:

- Suggestion to remove this for 2020 – could go back on the list in a later cycle.

8. SCALLOP BIOLOGY:

- This priority turned into a catch-all last cycle.
- Can this be organized differently? Should some items be removed?
- Suggest adding discard mortality to be consistent with the Council's 2019 – 2023 research priorities.
- Next "Benchmark" Assessment is 5 years out.

NEW PRIORITY:

- On May 9, the PDT discussed the idea of adding a new priority that could inform the design of future scallop surveys in the Gulf of Maine.
- "Data collection in the Gulf of Maine: This priority includes research aimed at developing approaches for determining optimal survey coverage, frequency, and design in Gulf of Maine. This may include research that evaluates past and current approaches to survey design in the Gulf of Maine (not just the NGOM management unit). This priority may also include projects that evaluate the cost-benefits of research survey design including coverage, frequency, timing, and survey gear, and monitoring the fishery (landings and discards) relative to the net socio-economic benefits. Possible research includes, but is not limited to, evaluation of past and current approaches to survey design in the Gulf of Maine (not just the NGOM management unit) and simulation modelling."

Scallop TOR #3 From SARC 65:

Summarize existing data, and characterize trends if possible, and define what data should be collected from the Gulf of Maine area to describe the condition and status of that resource. If possible provide a basis for developing catch advice for this area.

[From Summary Report of the 65th Northeast Regional Stock Assessment Review Committee \(SARC 65\)](#). July 20, 2018. SARC 65 members: Patrick Sullivan (Chair), Cathy Dichmont, Coby Needle, Geoff Tingley.

The panel report was prepared by Dr. Patrick Sullivan.

“3. Summarize existing data, and characterize trends if possible, and define what data should be collected from the Gulf of Maine area to describe the condition and status of that resource. If possible provide a basis for developing catch advice for this area.

- This TOR was fully met.
- Consider what data are needed to run the SAMS model in the immediate future and then prioritize the collection of the information needed through surveys and fishery monitoring. Plan to expand information collection to support other applications, including the CASA model at a later date.
- Evaluate the cost-benefits of developing research surveys and monitoring the fishery (landings and discards) relative to the net socio-economic benefits.
- Historically a number of different survey approaches have been applied. From this point, a single survey methodology should be selected and applied to create a single, informative and consistent abundance time series. Consideration of fishery-dependent data should explicitly include options for using the available VMS data to provide a usable measure of effort. Consider using an optical survey, while obtaining the required biological information from the fishery.
- An outline approach for informing management for this area was presented. For the immediate future, consider a data-limited method for informing management (such as that proposed), with further development of fishery-dependent (e.g. CPUE) and fishery independent (survey) derived abundance indices to inform adjustment of the ABC (up and down) in proportion to change in the most informative index.
- With limited research options available, collation and use of appropriate and informative fishery-dependent information to support assessment should be fully explored. This should include approaches to quantify metrics for catches, discards and landings (i.e. to give representative CPUE and LPUE) and also patterns of spatial density distribution.
- Due to the range and scale of uncertainties, multi-year projections are unlikely to be sufficiently accurate at this point and therefore not useful at the moment. One-year projections may still be useful.”

HIGH SURVEYS (HIGH Priority) (In order of importance)

1. Survey Related Research (a, b, and c have equal priority).

Survey results must be available by early August of the year in which the survey is conducted (e.g., survey results that would inform 202~~10~~ fishing effort decisions must be available by mid-early August 2020~~19~~). Successful projects may be asked to provide data in a standardized format.

1a. ~~An~~ intensive industry-based survey of each of the relevant scallop rotational areas (~~Closed Area I~~, Closed Area II, Nantucket Lightship, Elephant Trunk and Hudson Canyon) that will provide estimates of total and exploitable biomass to be used for setting fishery catch limits under the rotational area management program. ~~To support these area management decisions, survey data and biomass estimates must be available by early August of the year in which the survey is conducted (e.g. survey results that would inform 2020 fishing area decisions must be available by August 2019). Areas proposed to be open in the following fishing year generally have a higher priority than other areas.~~

1b. an intensive industry-based survey of areas of importance (i.e., open areas with high scallop recruitment or areas of importance to the fishery). For 2019, the priority areas are ~~likely to be the HAPC in Closed Area II and surrounds, the area south of Closed Area II (formerly part of Closed Area II Extension), Delmarva, areas off Long Island where scallop recruitment was observed during 2019 surveys,~~ and areas of the Gulf of Maine that have recently been or are likely to be fished.

1c. a resource wide industry-based survey of scallops within Georges Bank and/or Mid-Atlantic resource areas. The survey or surveys do not need to be carried out by a single grant recipient. The primary objective of these surveys would be to provide an additional broad scale biomass index in addition to the federal survey to improve the overall precision of the scallop biomass estimate produced by the Scallop Plan Development Team.

GENERAL RESEARCH (Not Ranked)

~~2. Investigation of variability in dredging efficiency across habitats, times, areas, scallop densities, and gear designs to improve dredge survey estimates. Research may focus on analyses of existing data sets.~~

2. Dredge Efficiency: An evaluation and synthesis of dredge efficiency research to support scallop fishery management. Research may focus on analyses of existing data sets.

~~GENERAL RESEARCH (Not Ranked)~~

3. Research to assess the impact of offshore wind energy development on the Atlantic sea scallop resource, including, but not limited to, baseline information gathering about abundance, biomass, distribution, growth, and seasonal yield; oceanographic models to assess potential for impact on larval patterns and settlement; questions of fishability, including impact of turbine spacing and orientation on safety and gear interactions, potential time-of-year restrictions for construction activities, and potential changes to management plan to increase feasibility of fishing; economic analyses of potential impacts to fishery and individual ports; impacts of noise, vibrations, and sedimentation during construction and operations.~~Research to assess the impact of offshore wind energy development on the Atlantic sea scallop resource, including larval settlement and dispersal. Research may also focus on the impacts of low frequency noise and vibrations on the animals.~~
4. Research to support the investigation of turtle behavior and its potential impact on the scallop fishery in the Mid-Atlantic and Georges Bank (via satellite tagging or other means). This could include research to understand their seasonal movements, vertical habitat utilization, and the status and range of the population in response to climate change.
5. Bycatch research: Identification and evaluation of methods to reduce the impacts of the scallop fishery with respect to bycatch of small scallops and non-target species. This would include projects that determine seasonal bycatch rates of non-target species, characterize spatial and temporal distribution patterns, collect and analyze catch and bycatch data on a near-real time basis, as well as the associated discard mortality rates of key bycatch species. Research efforts focusing on non-target bycatch should provide results that would help the scallop industry avoid pending or potential implementation of accountability measures. Projects should consider the enforceability and feasibility of regulations in the commercial fishery.
6. Scallop meat quality research: Research aimed at describing the occurrence of disease and parasites, as well as understanding the mechanisms and processes (including the life cycle, distribution and transmission, and relationship to sea turtles) that affect scallop product quality; research aimed at evaluating the impact of density dependence and the potential impacts of area rotation on scallop product quality, marketability, meat weights, and seasonal monitoring would be particularly useful.
7. Research that evaluates the effectiveness of current management procedures for achieving management objectives and simulates alternative procedures based on a range of performance criteria (i.e. Management Strategy Evaluation), including evaluating biological, social and economic impacts and associated long-term consequences of rotational management and the overall scallop management plan.
8. Research on scallop biology, including studies aimed at understanding recruitment processes (reproduction, timing of spawning, larval and early post-settlement stages, age and growth, and yield), examination of environmental stressors on reproduction and growth, and research related to scallop spat and seeding projects. This priority also includes research on natural mortality, such as

scallop predation (e.g., starfish, crab, snails, and dogfish), discard mortality, and juvenile mortality events. This priority includes research on scallop biology in the Gulf of Maine region.

9. Data collection in the Gulf of Maine: This priority includes research aimed at developing approaches for determining optimal survey coverage, frequency, and design in Gulf of Maine. This may include research that evaluates past and current approaches to survey design in the Gulf of Maine (not just the NGOM management unit). This priority may also include projects that evaluate the cost-benefits of research survey design including coverage, frequency, timing, and survey gear, and monitoring the fishery (landings and discards) relative to the net socio-economic benefits. Possible research includes, but is not limited to, evaluation of past and current approaches to survey design in the Gulf of Maine (not just the NGOM management unit) and simulation modelling.

SURVEYS (HIGH Priority)

1. Survey Related Research (a, b, and c have equal priority).

Survey results must be available by early August of the year in which the survey is conducted (e.g., survey results that would inform 2021 fishing effort decisions must be available by mid-August 2020). Successful projects may be asked to provide data in a standardized format.

1a. An intensive industry-based survey of each of the relevant scallop rotational areas (Closed Area II, Nantucket Lightship, Elephant Trunk and Hudson Canyon) that will provide estimates of total and exploitable biomass to be used for setting fishery catch limits under the rotational area management program.

1b. an intensive industry-based survey of areas of importance (i.e., open areas with high scallop recruitment or areas of importance to the fishery). For 2019, the priority areas are where scallop recruitment was observed during 2019 surveys, and areas of the Gulf of Maine that have recently been or are likely to be fished.

1c. a resource wide industry-based survey of scallops within Georges Bank and/or Mid-Atlantic resource areas. The survey or surveys do not need to be carried out by a single grant recipient. The primary objective of these surveys would be to provide an additional broad scale biomass index in addition to the federal survey to improve the overall precision of the scallop biomass estimate produced by the Scallop Plan Development Team.

GENERAL RESEARCH (Not Ranked)

2. Dredge Efficiency: An evaluation and synthesis of dredge efficiency research to support scallop fishery management. Research may focus on analyses of existing data sets.

3. Research to assess the impact of offshore wind energy development on the Atlantic sea scallop resource, including, but not limited to, baseline information gathering about abundance, biomass, distribution, growth, and seasonal yield; oceanographic models to assess potential for impact on larval patterns and settlement; questions of fishability, including impact of turbine spacing and orientation on safety and gear interactions, potential time-of-year restrictions for construction activities, and potential changes to management plan to increase feasibility of fishing; economic analyses of potential impacts to fishery and individual ports; impacts of noise, vibrations, and sedimentation during construction and operations.

4. Research to support the investigation of turtle behavior and its potential impact on the scallop fishery in the Mid-Atlantic and Georges Bank (via satellite tagging or other means). This could include research to understand their seasonal movements, vertical habitat utilization, and the status and range of the population in response to climate change.

5. Bycatch research: Identification and evaluation of methods to reduce the impacts of the scallop fishery with respect to bycatch of small scallops and non-target species. This would include projects that determine seasonal bycatch rates of non-target species, characterize spatial and temporal distribution patterns, collect and analyze catch and bycatch data on a near-real time basis, as well as the associated discard mortality rates of key bycatch species. Research efforts focusing on non-target bycatch should provide results that would help the scallop industry avoid pending or potential implementation of accountability measures. Projects should consider the enforceability and feasibility of regulations in the commercial fishery.

6. Scallop meat quality research: Research aimed at describing the occurrence of disease and parasites, as well as understanding the mechanisms and processes (including the life cycle, distribution and transmission, and relationship to sea turtles) that affect scallop product quality; research aimed at evaluating the impact of density dependence and the potential impacts of area rotation on scallop product quality, marketability, meat weights, and seasonal monitoring would be particularly useful.

7. Research that evaluates the effectiveness of current management procedures for achieving management objectives and simulates alternative procedures based on a range of performance criteria (i.e. Management Strategy Evaluation), including evaluating biological, social and economic impacts and associated long-term consequences of rotational management and the overall scallop management plan.

8. Research on scallop biology, including studies aimed at understanding recruitment processes (reproduction, timing of spawning, larval and early post-settlement stages, age and growth, and yield), examination of environmental stressors on reproduction and growth, and research related to scallop spat and seeding projects. This priority also includes research on natural mortality, such as scallop predation (e.g., starfish, crab, snails, and dogfish), discard mortality, and juvenile mortality events. This priority includes research on scallop biology in the Gulf of Maine region.

9. Data collection in the Gulf of Maine: This priority includes research aimed at developing approaches for determining optimal survey coverage, frequency, and design in Gulf of Maine. This may include research that evaluates past and current approaches to survey design in the Gulf of Maine (not just the NGOM management unit). This priority may also include projects that evaluate the cost-benefits of research survey design including coverage, frequency, timing, and survey gear, and monitoring the fishery (landings and discards) relative to the net socio-economic benefits. Possible research includes, but is not limited to, evaluation of past and current approaches to survey design in the Gulf of Maine (not just the NGOM management unit) and simulation modelling.