Mid-Atlantic Fishery Management Council

Comprehensive Five Year (2020 – 2024) Research Priorities

Discussion Document and Draft Priorities

October 7, 2019

Durham, North Carolina

Introduction

The 2006 reauthorization of the Magnuson-Stevens Act (MSA) required that each federal Council develop a five-year research priorities document. The research priorities developed by the Council should address "fisheries, fisheries interactions, habitat and other areas of research that are necessary for management purposes." NOAA Fisheries and the regional science centers are to consider these research priorities when developing their own research priorities and budgets within the region of the associated Council(s).

The Mid-Atlantic Fishery Management Council (Council), in coordination with the Scientific and Statistical Committee (SSC), completed its first research priorities plan in 2008. That plan was primarily informed by reviewing research recommendations within the various stock assessment documents and the Council's Research Set-Aside Program. The current version of the research plan (2016 – 2020) was approved in 2015 and the Council's Visioning Project and Strategic Plan played a critical role in developing and identifying key themes and elements contained in the document. The current five-year research priorities document runs through 2020; however, the Council agreed to update the research plan early in order to align with and be informed by the development of the Council's next Strategic Plan (2020-2024), the new 5-Year Cooperative Agreement and other Council priorities and guidance documents.

Throughout 2019, Council staff solicited input on the existing research plan and potential priorities from the Advisory Panel, Monitoring Committee and SSC for each species/FMP as part of the fishery specification review process. The staff lead and NEFSC assessment lead then reviewed, or will review, all of the species/FMP specific input received and provide recommendations for Council consideration. The SSC also provided extensive feedback and input regarding existing and potentially new research priority themes.

This discussion and draft priorities document begins with a review of the current research priorities document to evaluate the use and utility of the document to the Council and its regional partners. Updated draft research themes are then included that incorporate SSC input and stakeholder feedback received during the current Strategic Plan development. Revised and re-prioritized species/FMP specific research lists for a few Council-managed species are then provided as examples for Council consideration. Lastly, staff offer potential strategies to improve the plan's effectiveness, including a review process to track research priority progress and the future direction of a comprehensive research and implementation plan.

At the October 2019 meeting, the Council will review and provide feedback on the appropriateness and scope of the draft research priority themes, the organization and prioritization of the species/FMP specific research lists, and approaches to improve the effectiveness of the current document. Council feedback and recommendations will then be incorporated into a revised research priorities document. Final approval of the five-year (2020 – 2024) research priorities is scheduled for the December 2019 meeting.

Review of Current Five-Year Research Plan

As mentioned above, the MSA specifies the Council develop a list of research priorities and those lists be provided to NOAA Fisheries and the NMFS Northeast Fisheries Science Center (NEFSC) to help inform science and budgeting needs and priorities for the region. However, there is little information or understanding as to how these research priority documents have been utilized by the Council and the NEFSC in allocating resources to address the identified science and management priorities. Understanding the utility and applicability of this document may be particularly important to understand given potential differences in overall science goals, objectives, and time/funding scales between the Council and NEFSC. These differences were noted by the SSC at their March 2019 meeting and they questioned how the plan is used by the Council

and the NEFSC to inform priorities for funding and requested information on what research priorities in the current plan were addressed and if any of the research was used within the management process.

A review of Mid-Atlantic Council supported scientific and management projects from 2015-2018, not including any Research Set-Aside projects, was conducted to try and evaluate the use and utility of the current research plan (Table 1). During this time period, the Council supported 21 different projects covering all six fishery management plans (FMPs) and nine different species. These projects covered a wide range of topics including biological information, survey data, stock assessments, social and economic trade-offs and management strategies. Council staff reviewed each project to determine if the project was identified in the current five-year research plan and whether or not it was used to help inform a stock assessment or management. Based on the staff review, the results indicate relatively high overlap of the research priorities plan to inform Council supported projects. Of the 21 total projects, 14 projects (67%) addressed specific research priorities (10) or addressed aspects of the priority themes (4) that are identified in the current research plan. When considering the applicability of the projects, the results are even greater. Over 90% of the projects (19 of the 21) have been, or likely will be in the future, used to support or inform a stock assessment or management action. While the results show high applicability of Council supported projects to inform stock assessments and management, how the current research priorities document was utilized by the Council and staff to inform priority projects and resource allocation is unclear. In 2016-2017, the Council's Collaborative Fisheries Research Program utilized the current five-year research priorities document to identify general specific research priority categories in the RFP and ultimately funded four projects specifically listed under the different species/FMP research needs. How the current five-year plan was used to inform and identify other Council supported projects (10 projects) is not as straightforward. Identifying and prioritizing these projects was largely driven by emerging issues and needs to inform a specific stock assessment or management question, but the research priorities document was not specifically considered.

A comprehensive evaluation of the utility and use of the research plan by the NEFSC is difficult to conduct and is not included here. However, the NEFSC 2016-2021 Strategic Plan[1], the FY2020 Annual Guidance Memo[2], and the 2020-2023 Greater Atlantic Region Strategic Plan[3] include a number of research and science priorities that align with the broad research themes and needs identified in the Council's current five-year priorities document. Common priorities between the Council, NEFSC, and NEFSC/GARFO plans include: improving fishery data collection through increased use of electronic technologies, incorporation of ecosystem level information into stock assessments, improving stock assessment information, modelling approaches and capacity, and increased utilization and incorporation of social and economic information into the management process.

Consideration should be given for a more comprehensive review and evaluation of the various (Mid-Atlantic, New England, NEFSC) research plans and priorities to align similarities, highlight differences, and ensure continued communication and coordination to maximize limited resources.

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[1] The 2016-2021 Northeast Fisheries Science Center Strategic Plan can be found at: https://nefsc.noaa.gov/rcb/stratplan/
[2] The FY2020 Annual Guidance memo can be found at: https://nefsc.noaa.gov/rcb/stratplan/agm-fy20-final.pdf
[3] A presentation outlining the strategic goals of the 2020-2023 Northeast Regional Plan can be found at: https://s3.amazonaws.com/nefmc.org/14a.-190531_Strat-Plan-Presentation.pdf

Table 1. Summary of Mid-Atlantic Fishery Management Council supported projects from 2015-2018 used to support science and management needs.

Project Title (Year Started)	Primary Species/FMP	From 5-year research plan (Y/N)	Used in Assessment and/or Management (Y/N)
Acceptable Biological Catch (ABC) Control Rule and Risk Policy Management Strategy Evaluation (2017-2018)	Omnibus	Y	Y - Management
Surf clam species diagnostics and population connectivity estimates to inform management (2018)	SCOQ	N	Possibly Yes in future
Summer Flounder Recreational Management Strategy Evaluation (2018)	Summer Flounder	Not specific research item but related to issues addressed in introduction	Likely Yes in future
Summer Flounder Commercial/Recreational Allocation Model (2016)	Summer Flounder	Y	Y - Management
Summer Flounder Commercial/Recreational Allocation Model Update (2018)	Summer Flounder	Y	Likely Yes in future
Summer Flounder Recreational Measures Model (2015)	Summer Flounder	N	N
Estimating and mitigating the discard mortality rate of black sea bass in offshore recreational rod-and-reel fisheries (2016)	Black Sea Bass	Not specific research item but related to issues addressed in introduction	Not yet
Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid-Atlantic Species (2016)	SF/S/BSB	Not specific research item but related to issues addressed in introduction	Y - Management
Collaborative development of a winter habitat model for Atlantic Mackerel, version 2.0, for the identification of "cryptic" habitats and estimation of population availability to assessment surveys and the fishery (2016)	Atlantic Mackerel	Y	Y - Management
Changes in availability of Mid-Atlantic fish stocks to fisheries-independent surveys (2016)	SF/BSB/Spiny Dogfish	N	Not yet
Fisheries-independent pilot survey for golden (*Lopholatilus chamaelonticeps)* and blueline (*Caulolatilus microps*) tilefish throughout the range from Georges Bank to Cape Hatteras (2017)	Golden Tilefish and Blueline Tilefish	Y	Y - Management
Developing and Testing Stock Assessment Models for Black Sea Bass Using Stock Synthesis (2016)	Black Sea Bass	Y	Not directly, support for primary assessment model
Black Sea Bass Habitat Research Needs in the Mid-Atlantic (2017)	Black Sea Bass/Habitat	N	N?

Evaluating the Importance of Chub Mackerel in HMS Diets (2018)	Chub Mackerel	N	Not yet
A Genetic-based Investigation of Blueline Tilefish: Development of molecular markers and an assessment of stock structure and connectivity (2015)	Blueline Tilefish	Y	Y - Both
Blueline tilefish biological sample collection (2016)	Blueline Tilefish	Y	Y - Assessment
Atlantic mackerel stable isotope analyses (2017)	Atlantic Mackerel	Y	Y - Assessment
Blueline Tilefish DLM Toolkit - ABC Recommendations (2017-2018)	Blueline Tilefish	N	Y
Delphi Process - Blueline Recreational Catch (2016)	Blueline Tilefish	N	Y
Mackerel Quota DLM/MSE (2017)	Atlantic Mackerel	Y	Y
Implementing Electronic Logbook Reporting for Mid-Atlantic For-Hire Fisheries (2016 - 2017)	Omnibus / Recreational Fisheries	Not specific research item but one of major themes	Y - Management

Draft Research Priority Themes

Key research themes were included in the current priorities document and were to address broad concepts that were responsive to input received during the Visioning Project and development of the original Strategic Plan regarding the data and science used in the management process. For example, the current five-year research priorities document includes a number of key science and research themes to address the Strategic Plan Science Goal to improve the timeliness and accuracy of the information used by the Council.

The Council is currently developing an updated Strategic Plan that will guide Council priorities and activities for the next five years (2020-2024). The Council recently agreed to update the Science goal that seeks to *ensure that the Council's management decisions are based on timely and accurate scientific information*. The Science goal was modified to address public comments that "focused on data accuracy and credibility, followed by inclusion of on-the-water observations and use of collaborative research in the scientific and decision-making processes." This simplified Science goal focuses on the core of the Council's mandated science-based decision-making process. In addition, the updated Strategic Plan will include an Ecosystem goal that specifies the Council *support the ecologically sustainable utilization of living marine resources in a manner that maintains ecosystem productivity, structure, and function*. This goal seeks to address a wide range of Council issues related to climate change, forage, habitat, species interactions, and other factors that impact the health of the marine ecosystem.

Similar to approach taken with the current research priorities, the updated document seeks to align research priorities with the updated Strategic Plan to ensure consistency, appropriately prioritize Council resources, and improve coordination of science and management efforts throughout the region.

Provided below are the broad research priority themes, along with a short narrative, staff propose to include in the updated research priorities document. These priority themes reflect feedback received from the SSC and include some topics contained in the current document as well as new themes. These are provided to

solicit Council feedback on the appropriateness of the existing themes and recommendations for new/additional themes that will align with the new strategic plan.

Stock assessment improvement (existing)

Improvements to the data and analysis supporting the stock assessment process was identified as the Council's top priority in the current research priorities document. At their March 2019 meeting, the SSC commented the next research priorities document should continue to focus on stock assessment improvements. Significant stock assessment improvements have been made for a number of Council managed species including black sea bass, ocean quahog, Atlantic surfclam, and summer flounder. A major focus of the current plan was for all Council-managed species to have a quantitative assessment. While not all species have a quantitative framework, Atlantic mackerel now has an approved benchmark assessment with fishing and biomass proxy reference points, and *Illex* squid is scheduled for a research track assessment in the fall of 2021. However, since implementation of the current research document, the Council has added two more species (blueline tilefish and chub mackerel) to its list of managed species responsibilities, neither of which has acceptable quantitative stock assessments. The Northeast Region Coordinating Council (NRCC) recently approved a new stock assessment process that makes assessments more flexible, increases research opportunities and establishes a long-term assessment schedule. This process will provide more timely stock assessment information and should provide for significant advancements in the regions stock assessment capabilities and capacity.

While advancements have been made and new information obtained (see Table 1 for examples), continued focus and advancement of data collection programs that improve size/age composition of the catch, discard estimates and associated mortality rates, and fishery independent abundance information remains a priority. Feedback obtained during the development of the new strategic plan also highlight the need for continued science-based industry collaboration and increased utilization of fishing fleet information and on-water observations. In addition, building off the efforts in the recent summer flounder benchmark that included the development of the Ecosystem Context for Stock Assessment report, continued development and inclusion of ecosystem factors and environmental covariates in stock assessments should remain a priority.

Research to support measures which reduce/eliminate discards (existing)

Obtaining accurate discard information and the management challenges to reduce regulatory discards remain, particularly within the recreational sector. Stakeholder feedback during the development of both strategic plans and during many Advisor Panel meetings focus on the need significantly reduce discards and develop new management strategies to convert regulatory discards into harvest to provide both economic and biological benefits. As noted in the current priorities document, reducing regulatory discards through improved gear performance, and the development of management procedures and approaches to allow for greater retention of catch or the avoidance of unmarketable, sub-legal or otherwise prohibited species should continue to be explored.

The Council has supported a variety of discard related projects (see Table 1), primarily in the summer flounder, scup and black sea bass fisheries. Findings from those projects have yet to directly change management approaches and additional research, data collection and management strategies are needed. In addition, there is a need for continued focus on collaborative research opportunities with both commercial and recreational vessels to evaluate gear selectivity, discard mortality estimates, and innovative management strategies to avoid and minimize discards.

Collect and incorporate social and economic data into fishery management decision process and stabilize yields (existing)

The continued collection, analysis, and increased utilization of social and economic information in the Council's decision process remains a high priority for the Council and stakeholders. While the Council has been successful in meeting the biological mandates of the MSA, the resulting social and economic consequences have been viewed as unnecessarily severe by both commercial and recreational stakeholders.

Over the last several years, the Council initiated or implemented a number of socioeconomic related policy and management actions. One policy within the Council's EAFM guidance document is to evaluate ecosystem-level trade-offs, including social and economic considerations. The Council has made significant EAFM advancements including the completion of an EAFM risk assessment which identified 12 different social and economic risk elements that may threaten achieving the social and economic objectives the Council may have for its fisheries. Building off the results of the risk assessment, the Council is currently piloting the development a summer flounder conceptual model that will consider the biological, socioeconomic, and management high priority risk elements affecting summer flounder and its fisheries. Once complete, the Council will consider conducting a comprehensive management strategy evaluation (MSE) to answer management questions and objectives identified from the conceptual model which may focus on social and economic targets, thresholds, and trade-offs. Development of MSE approaches for its managed species was identified as a high priority by the Council in the current priorities document and the need for continued investment in collection and development of EAFM information, analytical tools and management strategies remains.

Beyond EAFM related activities, the Council is currently considering potential changes to its risk policy to more fully account for economic objectives. Utilizing the results of two different MSE projects, the Council is evaluating nine different risk policy alternatives that consider both biological and economic impacts and trade-offs associated with the alternatives. For the future, the Council has expressed interest in explicitly including both biological and economic factors in the risk policy and the potential development of a forage-based specific risk policy. Additional data collection programs and quantitative modeling approaches need to be conducted to more comprehensively evaluate the biological and socioeconomic implications of these risk policy modifications.

In addition, in 2018 the Council approved changes to the acceptable biological catch (ABC) control rule to allow for constant, multi-year ABCs using the average ABCs (or average risk of overfishing) to provide for management and fishery stability (a goal identified in the current research plan). However, the social and economic implications and trade-offs of this approach have not been conducted. Lastly, a recent joint Council-SSC meeting primarily focused on increased capacity and utilization of the SSC to provide needed social and economic science information to the Council, highlighting the continued importance and prioritization of this theme.

Evaluation of Existing Allocations to Fishery Sectors (existing)

A number of Council managed species allocate the acceptable biological catch (ABC) by fishery sector and, in some cases, by state. The fairness, equity and overall management structure of many of the current allocation scenarios have been questioned by stakeholders and fishery managers. In addition, stakeholders have noted the general inflexibility of the fixed quota allocation system currently in place and recommended that the Council consider alternative methods to allocate annual quotas. Changing species distributions, stock productivity and the recently updated MRIP recreational catch timeseries have only added to the desire to reconsider current allocation scenarios. The EAFM risk assessment results indicated "allocation" was a high

risk element for 12 of the Council's fisheries and/or sectors, the most of any risk element considered. Recent Council actions (e.g., Summer Flounder Commercial Issues Amendment) have tried to address allocation issues, but not all stakeholders have been supportive of the efforts to date and many more allocation decisions remain. Therefore, there remains a strong need to identify methods and analyses (i.e., management strategy evaluation, scenario planning) that determine optional allocation options that incorporate biological, social and economic considerations.

Recreational Data Collection (new)

During the March 2019 meeting, SSC members noted that recreational data collection may be a priority theme the Council may want to consider in the updated research priorities document. The incorporation of the new MRIP recreational catch timeseries into stock assessments and the implications within the management system are just beginning to be considered and addressed by the Council. The SSC noted the inclusion of the new MRIP catch timeseries and the differential catch trends among Council managed species introduces an important new source of scientific uncertainty. The recent passing of the Modernizing Recreational Fisheries Management Act of 2018 adds to the uncertainty of recreational fisheries management but may also provide for opportunities to collect new/additional information and dedicate resources to improving management approaches for recreational fisheries. For example, Sections 201 and 202 of the Act require increased incorporation of various recreational data sources and an evaluation of alternative data collection methods (e.g., smart phone apps).

Collect ecosystem data and development of ecosystem tools and management strategies to support EAFM initiatives (new)

The Council's new 2020-2024 Strategic Plan, the 2016-2021 NEFSC Strategic Plan and the 2020-2023 Greater Atlantic Region Strategic Plan all include a focus on ecosystem science as a major goal, theme or strategy. There is broad support for the continued collection of ecosystem-level climate, habitat, fleet dynamics, and species interaction information to help improve our understanding on the current and anticipated impacts of climate change on the region's fisheries and the broader marine ecosystem. Advances in scientific information and understanding will lead to the continued improvement, development, and utilization of ecosystem tools, products, and processes such as the Integrated Ecosystem Assessment, State of the Ecosystem reports, and the Climate-Ready Fisheries Management, respectively. The future success of the Council's EAFM process relies on the continued support of these activities and requires the investment in ecosystem science and data collection.

Climate change impacts on stock productivity and distribution shifts (new)

Climate-related changes in the Mid-Atlantic have already been widely observed and documented by fishermen, managers, and scientists. These changes in the environment have led to shifts in stock distributions, possible changes in stock productivity and have the potential to impact the Council's ability to effectively manage these resources. While this theme is embedded in a number of other included priorities (e.g., stock assessment, socioeconomic considerations, allocation and EAFM initiatives), the SSC felt this should be a stand-alone theme given the importance of this issue and its linkages to other research and management priorities. Incremental scientific advances under this theme can inform efforts and activities under other priority themes. NOAA Fisheries recently released a technical memo[4] outlining a six-step science-management process to incorporate, account for and respond to changing climate conditions and the

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[4] Karp, M.A. et. al. 2018. Accounting for Shifting Distributions and Changing Productivity in the Fishery Management Process: From Detection to Management Action. U.S. Dept. of Comm, NOAA. NOAA Technical Memorandum NMFS-F/SPO-188, 37 p. http://spo.nmfs.noaa.gov/tech-memos

impacts to fisheries. Enhanced data collection programs to detect change and the development of short/mid-range distribution forecast models to understand the drivers and magnitude of change and the associated biological and management risks are critical research needs. Developing management strategies and governance structure options through MSE simulation, scenario planning and/or structured decision making are necessary to create adaptive approaches to respond to continually changing conditions and risks.

Draft Species/FMP Specific Priorities List

The current (2016 – 2020) species/FMP specific research priorities were primarily derived from the research needs identified by the stock assessment workgroup from the most recent benchmark stock assessment for a specific species. A broader and more comprehensive process to solicit input on research priorities was undertaken for this document. Input on current and new priorities was provided by the Advisory Panel, Monitoring Committee, and the SSC as part of the specification review/setting process for each Council managed species. Staff then worked with the Council species lead and the NEFSC assessment leads to review all input received, as well as the research priorities identified in the benchmark stock assessment reports and SSC meeting reports, to develop a revised list of species/FMP specific research priorities. Going forward, staff propose an annual or biennial review of the species/FMP specific research priorities be conducted. A more frequent review will help ensure the priorities are reflective of the current state of science (i.e., remove priorities that may have been addressed) and accurately reflects the Council's science and management research priorities (i.e., add new priorities that may develop). This annual/biennial review would not apply to the broader research priority themes which would remain the same for the entire five-year plan.

In addition, staff propose a different organizational and prioritization approach for the species/FMP specific priorities list. Draft research priorities are separated into two different categories, short-term/smaller scale and long-term/larger scale projects. Within each category, the different research projects are then listed in priority order. This type of approach was suggested by the SSC and is meant to reflect the different end users of this document – the Council, the NEFSC and other science partners – and to devise a document that is both tactical and strategic in addressing the most important research and science needs for effective management by the Council. The short-term/smaller scale priorities provide a tactical approach to answer specific scientific and management questions, particularly when limited resources (i.e., funding, expertise and staff) are available. These priorities are where the Council would likely focus its attention and are the types of projects the Council has typically supported in the past when opportunities are available. Addressing these short-term/small scale projects can lead to incremental advances in support of long-term/large scale priorities. These priorities are more strategic and seek to address larger concepts and issues that likely require significant resources over an extended period of time. This approach allows the Council, NEFSC and other partners to leverage resources, for example matching funds and technical expertise, to identify funding opportunities to address these larger projects. If implemented, the SSC indicated they could potentially provide this type of information (i.e., short/smaller versus long/larger) when developing research priorities during the ABC setting process.

Below are updated species/FMP specific research priority lists for a few species that are organized by short-term/smaller scale and long-term/larger scale projects. These are provided as examples in order to get feedback from the Council on this organizational and prioritization approach. Based on Council feedback, staff with then work with the species lead and NEFSC stock assessment lead to finalize the research priority list for each species/FMP.

Draft list of research needs for selected Mid-Atlantic Council managed species

GENERAL

SHORT-TERM/SMALLER SCALE

1. Investigate stock structure utilizing otolith microchemistry and other genetic analyses for different Mid-Atlantic stocks (e.g., blueline tilefish, black sea bass, Atlantic mackerel, and surfclam)

2. Explore the utilization of local ecological knowledge to help characterize and understand fisheries habitat change over time to help identify areas of greatest need of protection.

3. Create a framework to improve social science information regarding crew employment, renumeration and job satisfaction for all Mid-Atlantic fisheries.

4. Evaluate the potential impacts of offshore wind development on habitats and productivity of Council-managed stocks.

5. Evaluate the relationship between changes in landings limits and the rates and magnitude of discarding in the commercial and recreational fisheries.

LONG-TERM/LARGER SCALE

6. Collect accurate size and age composition of commercial and recreational catch (including the discarded component of the catch) to develop or improve catch at age matrices for all managed stocks.

7. Incorporate ecosystem level data (predator/prey interactions, trophic dynamics, etc.) into single and multi-species assessment and management models.

8. Investigate potential sector and region allocation changes and adaptive management strategies to respond to changing environmental conditions.

9. Develop tools to collect representative economic information on fixed and variable trip costs to understand fleet profitability for all Mid-Atlantic fisheries.

10. Evaluate potential socio-economic impacts of offshore wind development on Council-managed fisheries, including changes in fishing behavior, changes in the distribution of fishing effort, changes in revenues, and differential impacts on commercial and recreational fisheries.

11. Implement novel supplemental surveys to derive fishery independent indices of abundance (black sea bass, golden and blueline tilefish, Atlantic mackerel).

SCUP

SHORT-TERM/SMALLER SCALE

12. Evaluate the spatial and temporal overlap of Scup and squid to better understand and characterize Scup discard patterns.

13. Characterize the pattern of selectivity for older ages of Scup in both surveys and fisheries.

14. Explore the relationship between Scup market trends, regulatory changes, and commercial landings and discards.

LONG-TERM/LARGER SCALE

15. Evaluate the role and relative importance of implemented management strategies (i.e., gear restricted areas, increased minimum mesh size, and minimizing scup and squid fishery interactions) versus the long-term climate variability to the increases in stock abundance and high recruitment events since 2000.

16. Characterize the current Scup market and explore the development of new markets.

17. Explore the applicability of the pattern of fishery selectivity in the model to the most recent catch data to determine whether a new selectivity block in the model is warranted.

ATLANTIC MACKEREL

SHORT-TERM/SMALLER SCALE

18. Investigate stock structure and spawning components through additional otolith microchemistry and/or genetic projects.

LONG-TERM/LARGER SCALE

19. Develop methods to implement an acoustic survey for Atlantic mackerel (NEFSC trawl survey or industry-based platform).
20. Explore potential changes in environmental conditions (habitat changes, larval diets, cannibalism, etc.) that impact larval survival and recruitment.
21. Initiate a reproductive study in the U.S. to obtain fecundity estimates and spawning seasonality. Update Canadian fecundity estimates (which are currently based on a 1986 publication) and compare estimates between countries.
22. Obtain biological samples from all components of the fishery and covering both spawning contingents.
23. Investigate possible growth and maturity differences between spawning contingents.
24. Continue to pursue modeling approaches that explicitly account for the spatial structure of the stock (i.e. two spawning contingents).

SPINY DOGFISH

SHORT-TERM/SMALLER SCALE

25. Integrate recent information on the efficiency of the NEFSC survey gear as it relates to: distribution of spiny dogfish beyond the current NEFSC trawl survey geographic footprint (including inter annual differences); gear efficiency; depth utilization within the footprint; distribution within the survey footprint under different environmental conditions.
26. Explore model-based methods to derive survey indices for Spiny Dogfish
27. Investigate alternative stock assessment modeling frameworks that evaluate: the effects of stock structure; distribution; updated biological information such as sex ratio and spiny dogfish productivity; state-space models; and sex-specific models.
28. Evaluate the utility of the study fleet information as it relates to issues identified under priority #25 above.

LONG-TERM/LARGER SCALE

29. Research opportunities to increase domestic and/or international market demand.
30. Expand information on the efficiency of the NEFSC survey gear as it relates to: distribution of spiny dogfish beyond the current NEFSC trawl survey geographic footprint (including inter annual differences); gear efficiency; depth utilization within the footprint; distribution within the survey footprint under different environmental conditions.
31. Continue aging studies for spiny dogfish age structures (e.g., fins, spines) obtained from all sampling programs (include additional age validation and age structure exchanges), and conduct an aging workshop for spiny dogfish, encouraging participation by NEFSC, Canada DFO, other interested state agencies, academia, and other international investigators with an interest in dogfish aging (US and Canada Pacific Coast, ICES).
32. Evaluate ecosystem effects on spiny dogfish acting through changes in dogfish vital rates.

BLUELINE TILEFISH

SHORT-TERM/SMALLER SCALE

33. Identify data sources and sampling methods to improve the accuracy of the commercial and recreational catch timeseries with improved spatial resolution.
34. Incorporate mandatory logbook reporting for all recreational anglers and collect fishery-dependent information such as effort, total catch and length information on harvested and discarded fish.
35. Collect additional biological samples to enhance understanding of the dynamics and biological characteristics of the stock (e.g., age and size of maturity, maximum age, fecundity, spawning periods).

LONG-TERM/LARGER SCALE

36. Collect additional age information from the commercial and recreational sectors and research the reliability of aging methods and determination of growth parameters.
37. Investigate new stock assessment approaches, including non-equilibrium methods, should be explored.
38. Conduct habitat studies of deep-water sites in the mid-Atlantic (Norfolk Canyon, Baltimore Canyon, and Hudson Canyon).

Next Steps and Future Direction

The MSA requires each Council to develop a list of research priorities to help inform the research and budget priorities for the regional science center. However, there is little information or understanding as to how these research priority documents have been utilized by the Council and the NEFSC in allocating resources and address the identified science and management priorities. A review of the current 2016-2020 research priorities document was conducted in order to evaluate its utility and applicability. Based on this review and input from the SSC, staff propose modifications to the organization and prioritization of the document in an effort to develop a more tactical and strategic document to more effectively advance scientific and management information that is aligned with the resources and priorities of the Council and NEFSC. Council feedback on the research priority themes and the species/FMP research priorities list will then be incorporated into a revised 2020 – 2024 research priorities document for Council consideration and approval at the December 2019 meeting.

In an effort to move beyond the current process of creating a long list of priorities that get reviewed every five years which may or may not be used to inform science and budget priorities, staff also propose a new approach and process to evaluate the utility and implementation of the research priorities document. An annual or biennial review of the current priorities list by the AP, Monitoring Committee and SSC will help ensure the document is reflective of the current state of scientific knowledge and Council priorities. In addition, staff propose developing a review process to track the progress toward addressing research priorities and to identify what research has been completed and why other topics may not have been addressed.

Lastly, staff propose more comprehensive review and evaluation of the various (Mid-Atlantic, New England, NEFSC) research plans and priorities. Since the NEFSC serves both the Mid-Atlantic Council and the New England Fishery Management Council, which has its own research priorities list, it must consider both research priority documents to inform research and budget priorities for the entire region. A more comprehensive and holistic review can help identify research similarities, highlight differences, and ensure continued communication and coordination to maximize and leverage limited staff and fiscal resources. This evaluation could lead to the development of comprehensive research priorities plan for the Council to provide a process and approach to effectively and efficiently carry out and address the identified research needs.