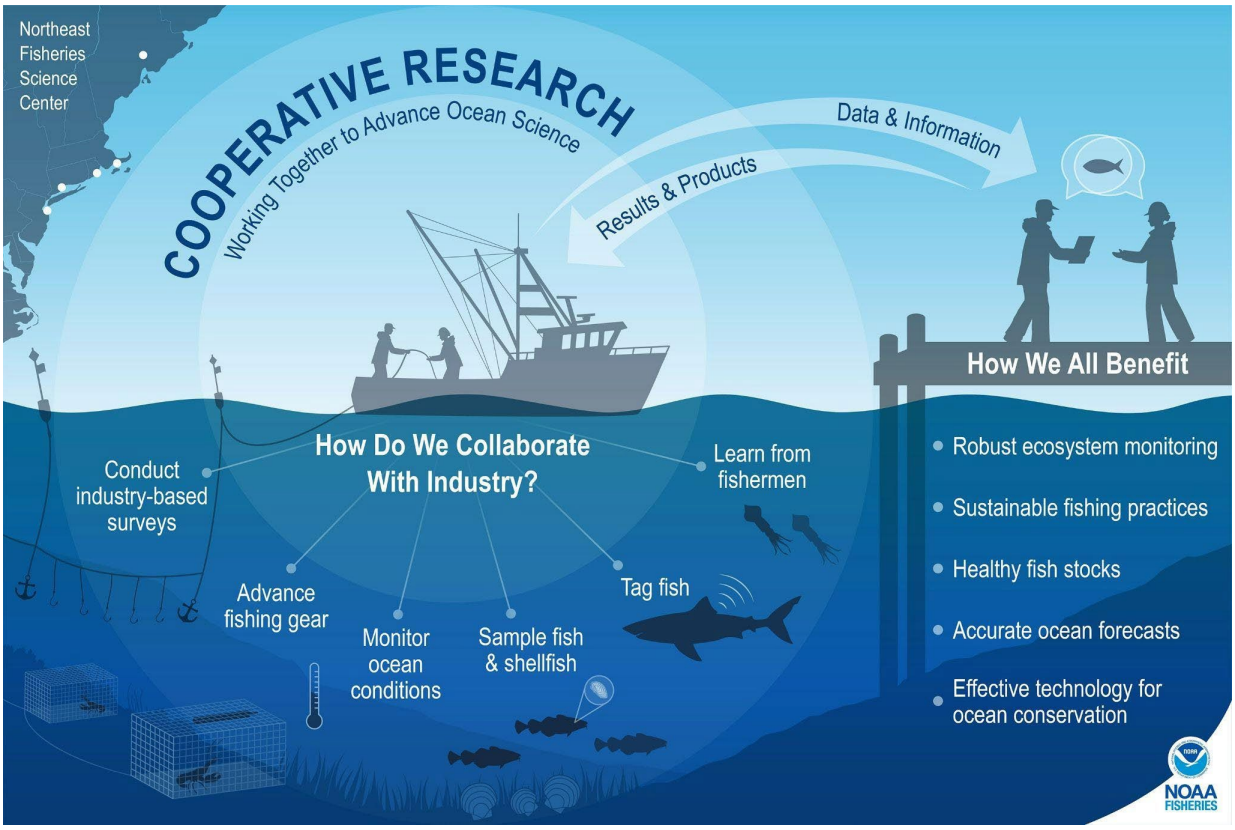
Summary and Proceedings of the 2024 Northeast Cooperative Research Summit



NOAA FISHERIES

National Marine Fisheries Service

Northeast Fisheries Science Center

Contents

EXECUTIVE SUMMARY

The Northeast Fisheries Science Center's (NEFSC) Cooperative Research Branch developed the Northeast Cooperative Research Summit to foster regional coordination of cooperative research and develop new partnerships between the science and fishing communities. The 2024 Northeast Cooperative Research Summit was held in Cape May, New Jersey on February 5, 2024. New Jersey Sea Grant provided local support the Summit.

The goals of the Northeast Cooperative Research Summit were to share ongoing cooperative research efforts, discuss lessons learned, identify research priorities, and develop new relationships between the fishing and science communities. Agenda items included an industry highlight, research presentations, breakout discussions, a research prioritization exercise, and networking opportunities. Breakout discussions focused on 1) Avenues for applying data and results from cooperative research to stock assessments, 2) Working together to understand the impacts of changing climate on ecosystems and fisheries, 3) Assessing the impacts of offshore wind on fishing operations, and 4) Paths forward for cooperative fisheries surveys in the face of offshore wind energy development.

Over 150 members of the fishing community, scientists, managers, and other stakeholders attended the 2024 Northeast Cooperative Research Summit. Of these participants, approximately 28% were members of the fishing community, 51% were researchers, 7% were government scientists or managers, and 14% were other interested parties, including representatives from non-governmental organizations and offshore wind companies.

Through the research prioritization exercise, participants in the Northeast Cooperative Research Summit identified "Research on the impacts of offshore wind on species, habitats, and oceanography", "Research on the environmental drivers of resource species", and "Research on the impacts of offshore wind on fishing operations" as the top research priorities. There was also consistent prioritization of "Research on the impacts of offshore wind on surveys and fishery data collection", "Enhanced catch and effort data collection from commercial and recreational fisheries to support catch per unit effort indices and other scientific uses", "Research on the social and economic factors impacting fishing operations", and "Development of new surveys using different gear types".

Feedback from participants indicated that the 2024 Northeast Cooperative Research Summit was effective at creating new and productive connections between fishermen and scientists, advancing awareness of ongoing cooperative research, and developing a shared sense of hope and vision for fisheries in the Northeast region. Participants were particularly complementary of the active participation from the fishing community, exchange of ideas for new research and connections with industry and science partners, and the opportunity to discuss challenging topics in an atmosphere of mutual respect and learning.

Given the success of the 2024 Northeast Cooperative Research Summit, the NEFSC Cooperative Research Branch will continue to annually host one Northeast Cooperative Research Summit, with the location rotating among states. The 2025 Northeast Cooperative Research Summit will be held in Portland, Maine.

BACKGROUND AND PURPOSE

The Northeast Cooperative Research Summit is a direct result of the input and recommendations gathered during a series of Stakeholder Engagement Sessions in 2019. These Stakeholder Engagement Sessions, hosted by the NEFSC's Cooperative Research Branch (CRB), brought together the fishing and science communities to discuss research ideas and priorities for future projects, and to share past research successes and lessons learned. One priority that emerged from the Stakeholder Engagement Sessions was a need to facilitate

regional coordination of cooperative research and the development of new partnerships. The NEFSC CRB developed the annual Northeast Cooperative Research Summit (hereafter 'the Summit') in response to this demand, and to serve as a step toward a cohesive vision and path for cooperative research in the Northeast region.

The goal of the Summit is to enhance communication, collaboration, and connection between the fishing and science communities. Specifically, the Summit seeks to bring together scientists, managers, and members of the fishing community to communicate and coordinate the variety of cooperative fisheries research being conducted in the Northeast region, identify opportunities for enhanced industry involvement, and outline best practices for applying cooperative research results to science and management. Agenda items for the Northeast Cooperative Research Summit included presentations from researchers and members of the fishing community, breakout group discussions, an industry highlight, and a networking session. Active participation by the fishing industry is prioritized throughout the Summit, including during question and answer sessions following research presentations, as panelists and participants in breakout discussions, and through presentations from fishermen who have contributed significantly to cooperative research throughout their careers.

Figure 1. Attendees of the 2024 Northeast Cooperative Research Summit participating in an opening exercise intended to identify and make connections among the fishing and science communities.

SUMMIT PROCEEDINGS

The Summit followed the format, described below.

- Research Presentations and Discussions
- Breakout Discussions
- Research Prioritization Exercise
- Industry Highlight
- Networking Opportunities

A primary goal of the Summit was to elevate the role of fishermen in the scientific process and to open lines of communication between the science and fishing communities. To support this goal, comments, perspectives, and questions from fishing industry members were prioritized following each research presentation and throughout breakout discussions. Furthermore, all breakout session panels included members of the fishing industry. The Summit had opening

and closing remarks from leadership in the Northeast Fisheries Science Center's Cooperative Research Branch (Dr. Anna Mercer) and the fishing industry (Captain Kevin Wark, F/V Dana Christine II, Barnegat Light, NJ).

Oral presentation abstracts from the Northeast Cooperative Research Summit are available in Appendix I.

Figure 2. Captain Kevin Wark, F/V Dana Christine II providing remarks during the "Industry Highlight" at the 2024 Northeast Cooperative Research Summit.

PRESENTATIONS

Presentations at the 2024 Northeast Cooperative Research Summit covered a wide variety of topics, ranging from industry contributions to ocean models to collaborative development of stock assessment methods to economic impacts of offshore wind energy development (Table 1).

Table 1. Presentations included in the 2024 Northeast Cooperative Research Summit.

Presentation Title	**Presentor, Affiliation**
Enhancing sustainable development of the winter bait fishery for Atlantic menhaden through implementation of a cooperative survey	Genny Nesslage, University of Maryland Center for Environmental Science Chesapeake Biological Laboratory
In search of striped bass: How New York fishermen got us on the fish for a study in legacy contamination	Amanda Dauman, Cornell Cooperative Extension of Suffolk County
The impact of bacterial contamination on the live tautog fishery: An emerging need for cooperative research	Tor Vincent, Tor Fisheries

Presentation Title	Presentor, Affiliation
Development and testing of assessment approaches for longfin and shortfin squid	Mike Wilberg, University of Maryland Center for Environmental Science Chesapeake Biological Laboratory
Marine carbon dioxide removal: Engaging the fishing community in understanding and shaping an emerging climate change mitigation solution	Sarah Schumann, Fishery Friendly Climate Action; Annie Hawkins, Responsible Offshore Development Alliance
Cold pool stratification influences on	Samantha Alaimo, Rutgers University

commercial species dynamics in the Mid-Atlantic Bight	
Using fishing vessel data in the Rutgers "Doppio" ocean forecast system	John Wilkin, Rutgers University
Using fine-scale fishery data to estimate economic impact of wind farms on the summer flounder fishery	Meghna Marjadi, Northeast Fisheries Science Center and University of Massachusetts Dartmouth School for Marine Science and Technology
Evaluating if a modification to commercial sea scallop dredges can reduce bycatch and increase catch efficiency	Jennifer Gius, Rutgers University
ScallApp: A tool to engage the fishing industry in tracking scallop health and reproduction	David Bethoney, Commercial Fisheries Research Foundation

Each presentation was 8 minutes in duration, followed by 7 minutes for questions and discussion. Common themes touched upon during the discussions following presentations included: enthusiasm for tools and research that enable fishermen to contribute quantitative information to fisheries science and stock assessments; research partnerships to address urgent and solvable issues affecting fishermen, such as novel options for live fish tags; how temporal management approaches, such as trimesters, impact the availability of data collected by the fishing community for scientific applications; the impact of the cold pool on resource species; advancing the application of oceanographic model outputs, which include bottom temperature data from fishing vessels, in stock assessments; data sources and methods for estimating the economic impacts of offshore wind, including suggestions to include fishing vessel transit paths in economic impact analyses; modified scallop dredge gear performance across habitat types and weather conditions; questions about the fuel usage associated with modified scallop dredges; and consolidating and standardizing the hardware and software that fishermen use to collect data for science while at sea to maximize efficiency.

BREAKOUT DISCUSSIONS

Avenues for applying data and results from cooperative research to stock assessments

Stock assessments rely on a multitude of data sources, from surveys and ecosystem indicators to fishery and biological data, to track and predict changes in the abundance of resource species over time. Cooperative research, which includes but is not limited to data from industry-based surveys, high resolution fishery data, and bycatch mortality estimates, provides a unique opportunity to leverage the expertise of the industry to maximize the impact of these data in stock assessments. This breakout session focused on avenues forward in applying these data, what challenges need to be overcome and what successes we can build on in a positive and collaborative arena.

Panelists:

- Genny Nesslage - University of Maryland Center for Environmental Science
- Greg DiDomenico - Lund's Fisheries
- Jameson Gregg - Virginia Institute of Marine Science
- Kiersten Curti - Northeast Fisheries Science Center, Population Dynamics Branch
- Stefan Axelsson - F/V Dyrsten, Cape May, NJ

Discussion Summary:
Panelists began the session identifying species in which the inclusion of cooperative research has led to a better understanding of the state of the stock. Atlantic mackerel, butterfish, and shortfin squid were highlighted as successful examples of getting the right experts in the room together at the appropriate time in the stock assessment process to help inform data gathering, model development, and interpretation of results. Cooperative research specifically contributed to these stock assessments through expanded biological data, identification of ecosystem drivers, characterization of fishing operations and treatment of fishery dependent data, and understanding of stock availability to the fishery and surveys. In addition, the collaborative approach taken in the Atlantic mackerel, butterfish, and shortfin squid stock assessments also allowed members of the fishing industry to better understand the data that support the assessment models and contribute to estimates of stock productivity. Other species highlighted as examples were American lobster, Atlantic menhaden, and sea scallops in which data from the fishing industry are utilized to calculate growth rates, characterize fishery catch, and estimate abundance, all of which are critical components of stock assessments. The production of research products by stock assessment deadlines was identified as being a key to success in integrating industry knowledge and data in stock assessments.

The discussion then transitioned to identifying species that would most benefit from new information and contributions from cooperative research. Panelists highlighted data-limited species and species that fisheries surveys do not sample well, such as spiny dogfish, skates, monkfish, mackerel, and Atlantic cod, as priorities for cooperative research. Monkfish was specifically identified as a priority species as there are many uncertainties about the population dynamics of the stock and a research track stock assessment is on the horizon (2027). Participants also suggested that emerging fisheries are valuable targets for cooperative research, as new research can have a high impact.

The discussion then shifted to the types of cooperative research that can be used to improve stock assessments. Ways for incorporating cooperative research into stock assessments identified during this discussion included: exploring and quantifying ecosystem drivers, quantifying fishery selectivity, quantifying discard mortality, identifying sources of uncertainty for catch estimates, and quantifying socio-economic drivers of fishery catch, among others. One

panelist specifically identified a need to enable fishermen to collect data regarding gear performance and active acoustics. Audience participants identified a need for more design and experimentation on alternative fishing gears and conservation gear engineering, although this research is not directly applicable in stock assessments. Attendees also suggested that future cooperative research seek to quantify and apply socio-economic data to stock assessments.

Discussions then moved to the question of how the science community can better involve the fishing industry in the stock assessment process. Panelists highlighted the importance of providing opportunities for industry participation early in the stock assessment process and of working to build hypotheses and research projects together. Early collaboration helps ensure that the knowledge and data derived from cooperative research will be utilized in stock assessments. Setting clear and reasonable expectations at the start of cooperative research projects that are intended to inform stock assessment is key, including acknowledging the often-lengthy timeline for taking research from initiation to application, and the challenges associated with producing research with a level of certainty that is acceptable for use in stock assessments and management. One panelist encouraged industry members to reach out to researchers with ideas and observations, as researchers are eager to develop research projects and proposals that address current needs. Researchers can help shape fishermen's observations into research questions and identify avenues for applying knowledge and research products to stock assessments. One attendee suggested to industry participants that if a stock assessment has a trend that does not match what they are seeing on the water, then they should approach a scientist. Only by having open dialogues about assessment inputs and outcomes will the science and fishing communities be able to address inconsistencies and build trust.

The breakout discussion concluded by digging into the timing of and uncertainty in stock assessments. A general frustration among industry members is the delay between when research is completed and stock assessments are updated. This challenge is persistent throughout stock assessments not just in the Northeast, but nationwide and internationally. New tools, such as electronic data collection systems, automated data validation, and streamlined data access platforms, could start to address this issue, but progress will likely be slow. The question of stock assessment uncertainty was of great interest to the group and a lengthy discussion ensued. Stock assessment models were characterized as a simplification of what is happening in the world, and that estimating uncertainty, and how it affects catch limits, is extremely hard. Adding new data sources or advancing modeling frameworks, while important for advancing the science, can introduce new sources of uncertainty. Managers are required by law to consider scientific uncertainty when setting catch limits, which creates a challenging scenario for applying the best available science. The discussion wrapped up by touching on the use of market value in stock assessments and the need for a better understanding of what affects effort and landings. While trends in survey catch, size, and ages are observed over time and are critical to stock assessments, industry knowledge and cooperative research are uniquely able to provide context to highly complex fishery dependent data (fishery removals), ensuring that these data are interpreted accurately.

Overall, this breakout discussion highlighted the areas of opportunity and challenges for applying cooperative research data and results to stock assessments.

"There has been slow but steady progress in applying cooperative research to stock assessments." -Kiersten Curti, Northeast Fisheries Science Center

"There are a lot of things we do know, but that seems to get washed out in the things we don't know." - Greg DiDomenico, Lunds Fisheries

"Most of science is working to answer one question, but identifying two more questions in the process." - Mike Wilberg, University of Maryland Center for Environmental Science Chesapeake Biological Laboratory

Figure 3. Participants engaging in the “Avenues for applying data and results from cooperative research to stock assessments” breakout session at the 2024 Northeast Cooperative Research Summit.

Working together to understand the impacts of changing climate on ecosystems and fisheries

This breakout session focused on the opportunities for science and industry to collaborate in the face of climate change. The impacts of a rapidly changing climate have already been observed by commercial fishermen and scientists. As the ecosystem changes, it is necessary for research and management to streamline processes allowing fisheries to adapt. It is crucial to continue to create spaces where scientists and the fishing industry can communicate in order to better incorporate fishermen’s observations in future research. Involving fishermen in the collection of environmental data via collaborative research initiatives provides us better information about how the changing climate is impacting our fisheries and through improved communications can also provide fishermen with additional tools to optimize their efforts.

Panelists:

- Bill Bright - F/V Retriever, F/V Defiance, Cape May, NJ
- Glen Gawarkiewicz - Woods Hole Oceanographic Institution
- Grace Saba - Rutgers University
- John Manderson - OpenOcean Research
- Rob Jarmol - F/V Christy, Cape May, NJ

Discussion Summary:

Panelists and participants highlighted how cooperative research can be used to adapt to the effects of changing ecosystems and fisheries. One of the challenges identified by both panelists and participants was the reality that science and management are rarely able to keep pace with the rate of change observed in the environment. Participants identified several roadblocks for getting environmental information into management, including the timelines associated with acquiring and securing funding, conducting research, and writing papers, which often takes years. Furthermore, there are many different stocks that need to be assessed, thus conclusions can come long after an issue was initially identified by the fishing industry (up to 5-7 years). Scientific research and the governance structure operate at a slower pace than ecosystem processes, limiting our ability to adapt appropriately to the changing ecosystem. Finding methods to streamline these processes is crucial to give fishermen the ability to adapt to

ecosystem changes. Collaborative research provides the framework for science and industry to come together and work to respond to changing ecosystems and fisheries more efficiently.

In talking about potential solutions, participants identified a few successful case studies, where science and industry worked together to affect positive change. One example was the Squid Squad, an interdisciplinary group of research scientists, industry members and managers, who work together to better understand the oceanographic drivers of regionally important squid stocks. Having a regular platform for conversations about what fishermen are seeing on the water and how the oceanography of the region may impact the fishery has allowed for the development of collaborative shortfin and longfin squid research projects. Expansion of this collaborative model to other fisheries was identified to make opportunities for engagement and conversation more accessible. The discussion highlighted the importance of building upon the positive growth demonstrated by the Environmental Monitors on Lobster Traps and Large Trawlers (eMOLT) program and the Graphical Offshore Fishing Information System Homepage (GOFISH) to continue to streamline data collection and increase data accessibility for fishermen. Participants also cited the scallop fishery as a successful example of a fishery in which science has kept up with changes in the fishery year to year. The scallop fishery's ability to adapt was attributed to it being of high value. The need for this to be repeated in smaller or lower value fisheries was reiterated by numerous participants.

Participants suggested ways in which cooperative research could work to increase our understanding of the scope and impacts of our changing climate. The main theme of these suggestions was working to strengthen communications between scientists and industry. Incorporation of industry knowledge into the development of future research projects is crucial to ensure that science keeps up with the environmental changes fishermen are observing. Maintaining open and frequent communication between scientists and industry is necessary to help narrow the gap in timing between industry observations and science. Scientists need to work to improve science communication including data interpretation and potential impacts on target species. There was general agreement from the group that there is hope for the future of collaborative research. Multiple participants and panelists mentioned the success of current initiatives, such as the inclusive NOAA Fisheries internship (IN FISH), in working together to teach the next generation of scientists about the value of collaborating with industry and learning from each other. Despite the optimism expressed for the future of cooperative research, fishermen expressed feeling less hopeful for the future generation of fishermen unless changes are made.

"We [scientists] don't have the money to spend the time on the water that is necessary. Industry does have the information about how animals are moving and responding to event scale changes." - John Manderson, Open Ocean Research

"I am hopeful. There are smart young people who are really interested in our life and what we do." - Kevin Wark, F/V Dana Christine II

"Cooperative research is the only hope we have and the only way forward." -Bill Bright, F/V Retriever, F/V Retriever and F/VDefiance

Figure 4: Panelists in the “Working together to understand the impacts of changing climate on ecosystems and fisheries” breakout session at the 2024 Northeast Cooperative Research Summit.

Assessing the impacts of offshore wind on fishing operations

As offshore wind farms proliferate across the Northeast, their operating footprints can overlap with longstanding fishing grounds. This critical juncture demands research to understand the operational and economic impacts of offshore wind on commercial fishing. In this breakout session, we discussed the urgent need for scientists, fishermen, and industry to unite as partners to navigate this uncharted territory. Through data collection, analysis, and open dialogue, we can work together to assess how offshore wind development will impact fishing operations, and share that information with policy makers, developers, and the communities that will be affected.

Panelists:

- Annie Hawkins - Responsible Offshore Development Alliance
- Ben Galuardi - Greater Atlantic Regional Fisheries Office
- Chris Rainone - F/V Annice Marie, Barnegat Light, NJ
- Daphne Munroe - Rutgers University
- Tom Dameron - Surfside Foods, Overboard Solutions

Discussion Summary:
A wide ranging discussion was sparked by a number of prompts from the moderator. Prompts included: “How can the cooperative research approach be applied to understand the long-term impacts of offshore wind energy development on commercial fishing operations?”, “How should industry be involved in research on the impacts of wind on fishing operations?”, “What types of opportunities/resources do we need to better quantify the economic and operational impacts of offshore wind energy development on commercial fishing?”, “How can we create accessible platforms for sharing scientific findings and the lived experiences of fishermen with policymakers and wind energy developers ”, and “When thinking about impacts to fishing communities, what other types of fishing industry members should we consider? How can industry help facilitate this type of research that includes more than impacts to just fishing vessels?”. Discussions following these prompts often returned to general concerns about vessel operations in wind

farms and the strong sense that fishermen need to play a larger role in shaping the research conducted to help assess the impacts of these developments.

A recurring theme of discussion was the idea that fishermen should be in the room when defining what research questions should be asked about the impacts of offshore wind on fishing operations. It was also noted that fishermen should also be engaged well before building models of fishing footprints, while building these models, and during interpretation of model results. Another key point arising from this session was the need to think about how to quantify the impacts to fishing communities beyond operations and lost harvest. This is a complex and difficult topic, but expanding how impacts propagate from fishermen to processors, ports, and communities was identified as a key need for future research.

Several participants noted that currently there is no clear process for communicating fisheries research needs to offshore wind developers. Fishermen feel their expertise is not being recognized and that they are being sidelined by both regulators and developers when it comes to decision making. For the fishing community, unclear roles, conflicting regulations, and a perceived lack of accountability among federal agencies is leading to further frustration. Additionally, it was also noted that there is a general lack of funding for cooperative research, and that most of the funding is coming from offshore wind/private sector and the framing of research questions and projects may be influenced by permitting and developer interests. There was also a sense that longer time series or more complex studies may be needed to differentiate between the impacts of offshore wind developments and a changing climate.

Despite these concerns, participants emphasized that cooperative research presented an avenue to better understand the long term effects that wind farms could have on commercial fishing operations. Fine-scale fishing and oceanographic data were identified as key factors that could be collected to better assess broader economic and fishery impacts. Cooperative research projects could also explore alternative fishing methods or technologies that might mitigate some of the current risks and challenges posed by operating near wind farms. Finally, by taking on leadership positions in the research itself, fishermen can start to develop a collaborative decision making strategy and establish the communication channels to regulatory agencies and wind developers that they feel are currently lacking.

"Without cooperative research we're in trouble. If the Government does research and it doesn't line up with what happens in the ocean, then there is a gap." - Chris Rainone, F/V Annice Marie

"Fishermen should be involved in a leadership role. When other people try to figure it out they get it wrong." - Annie Hawkins, Responsible Offshore Development Alliance

"We always concentrate on the landed value, but that is such a small piece of the overall impact." - Tom Dameron, Surfside Foods, Overboard Solutions

"There is no real forum for fishermen to become leaders in research. There is no real council to decide what is good/not good site specific for each of these wind farms." - Anonymous participant

Figure 5. Participants engaging in the “Assessing the impacts of offshore wind on fishing operations” breakout session at the 2024 Northeast Cooperative Research Summit.

Paths forward for cooperative fisheries surveys in the face of offshore wind energy development

The development of offshore wind in the Northeast region will have impacts on our ability to conduct region-wide fisheries resource surveys. Areas developed for offshore wind farms will be difficult or impossible to access using traditional mobile-gear surveys, potentially altering existing surveys and time series. There is a critical need for alternative survey techniques that can provide data on the distribution, abundance, biomass, length composition, and biology for resource species and their habitats. There is also a need to adapt long term fisheries surveys in a manner that maintains data inputs to stock assessments and advice for fisheries management. In addition, a patchwork of surveys is being developed to monitor site-level impacts of offshore wind farms on the marine ecosystem. Standardization of these surveys is critical to combining data sets to assess cumulative impacts. New technologies, survey methods, and analytical approaches provide both a challenge to integrate into existing assessments and management advice, but also present an opportunity to fill existing data gaps and potentially improve recommendations to resource managers. This breakout session focused on the challenges, opportunities, and priorities for cooperative fisheries surveys in the face of offshore wind energy development.

Panelists:

- Kevin Wark, F/V Dana Christine II, Barnegat Light, NJ
- Catherine Foley, Northeast Fisheries Science Center, Ecosystem Survey Branch
- Dave Rudders, Virginia Institute of Marine Science
- Fred Mattera, Commercial Fisheries Center of Rhode Island; Commercial Fisheries Research Foundation
- Jason Morson, Rutgers University/Northeast Fisheries Science Center

Discussion Summary:
This breakout session highlighted the approaches and challenges for executing surveys in and around offshore wind farms. Discussion focused on the benefits of providing more data, with sufficient sample sizes, and using more gear types to collect data across more fisheries. Several participants commented that by leveraging the knowledge of the fishing industry, smaller vessels and a wider variety of gear types could be used to sample. The need to find

alternative gear types for these areas and to understand the selectivity of these gears was emphasized.

Some of the challenges for developing and maintaining survey operations in the face of offshore wind included communication between stakeholders, recruitment of fishermen, and the need for standardization of surveys throughout the Northeast region. Panelists and participants discussed how many organizations are starting to tackle offshore wind and develop surveys, however there is little communication between these organizations. The panel communicated the importance of consistency and the advantages of using the same methods among different organizations performing similar surveys. One panelist explained how for assessment scientists to be able to use the data from these surveys, standardization of survey design and data collection is very important and should be discussed between organizations developing surveys. Another challenge brought to the discussion was the speed of offshore wind development. Many pre-construction surveys have been limited in duration (less than 2 years) and participants expressed concern about the certainty of the baseline established in those limited years. Participants also discussed if and how surveys will need to be adjusted as offshore wind turbines are decommissioned and then rebuilt with newer technology that is unknown.

When discussing approaches for surveys within wind energy areas, panelists and participants agreed that a single gear type will not be able to survey the full species complex within offshore wind. Several panelists suggested that newer technologies, non-traditional, and non-extractive approaches could be valuable. Multiple gear types are fished in these areas, therefore surveys should also implement a variety of gear types in order to effectively survey this area. In addition to multiple gear types, downscaling certain gear types may be an effective approach to dealing with the spatial limitations offshore wind creates for traditional mobile gear survey methods. Recommendations for non-traditional methods were also reviewed as alternatives such as environmental DNA (eDNA), baited remote underwater video systems (BRUVS), acoustic surveys, tagging studies, and hook and line survey methods. Tagging studies were brought up several times, and multiple participants indicated their participation in some in the past and currently. These studies were also pointed to as a means of understanding issues such as fish availability around wind energy areas, which may be informative to survey indices and assessments.

The group also discussed whether calibration studies would be needed, the challenges of executing these, their applicability to different gear types, and the need for spatial overlap. Also discussed were the potential timelines of incorporating new survey data into models and stock assessments, and how these could be species and/or fishery specific. Finally, participants discussed different survey objectives (e.g. local population or habitat change versus stock-wide abundance metrics) and designs as factors contributing to differences in survey methodology.

“We need to have a variety of gear types. We should be using different gear types in the same areas to compare; gillnets, ventless traps, trawl. Different gear types are much more effective and that's what we want to represent what species are there on those grounds.” - Fred Mattera, Commercial Fisheries Center of Rhode Island; Commercial Fisheries Research Foundation

“It is clear this (surveys) will take a multifaceted approach. One size is not going to fit all even if you look at this from a single species perspective. This isn't a single species issue but this is an ecological issue.” - Dave Rudders, Rutgers University

“Maintaining standardization as much as possible is really important when thinking of how we are going to integrate this data into existing time series. For assessment scientists to be able to use the data coming in, going to them early in the (survey) design process is really important to ensure we are designing surveys that can work with the existing models and frameworks that we are using.” - Catherine Foley, Northeast Fisheries Science Center

Figure 6. Participants engaging in the “Paths forward for cooperative fisheries surveys in the face of offshore wind energy development” breakout session at the 2024 Northeast Cooperative Research Summit.

RESEARCH PRIORITIES

Description:

A research prioritization exercise was conducted during the 2024 Cooperative Research Summit to identify the top research priorities for cooperative research in the Northeast region. During this exercise, each participant was asked to place six stickers next to research topics that they identified as top research priorities. Participants used different color stickers to indicate whether they were industry members, scientists, or other stakeholders. The 15 research topics that participants selected their top priorities from were as follows:

Fishery Dynamics

- Enhanced catch and effort data collection from commercial and recreational fisheries to support catch per unit effort indices and other scientific uses
- Research on the social and economic factors impacting fishing operations
- Research on discard mortalities of resource species

Conservation Gear Engineering

- Research on bycatch reduction/avoidance in mobile gear fisheries
- Research on bycatch reduction in fixed gear fisheries

Fishery Independent Surveys

- Geographic expansion of existing industry-based surveys
- Development of new surveys for specific species
- Development of new surveys using different gear types

Biological Research

- Research on age, growth, and reproductive dynamics of resource species
- Research on stock structure and migration dynamics of resource species

Offshore Wind and Fisheries Research

- Research on the impacts of offshore wind on fishing operations
- Research on the impacts of offshore wind on species, habitats, and oceanography
- Research on the impacts of offshore wind on surveys and fishery data collection

Ecosystem Research

- Research on the environmental drivers of resource species
- Research on species interactions (predation, competition, etc.)

Participants were also able to suggest additional research priorities that they felt were not covered in the list above. These additional research priorities included:

- How research and/or data sets can be useful to fishermen (e.g. eMOLT providing temperature data to fishermen)
- How management affects economics
- Electronic monitoring to improve data turn around time
- Research to support delisting sturgeon from endangered species list
- Research on mitigation for offshore wind energy development and fisheries
- Research on how windmills will affect the fish and ecosystems they are being built on.
- There is a lot of talk about the detriments of offshore wind farms. I think more research could be done about what is possible, such as dropping camera pods in the Block Island and South Fork Wind Farms to chronicle the growth of underwater communities on and around the new structures.
- We need to better understand the impact of climate change on the region and fisheries.
- Water quality models. Clean Water Act contributions to fisheries science
- Offshore wind solutions/fisheries mitigation approaches. We often talk about trying to identify the potential problems and impacts of offshore wind, but we really need to start talking about what actions we can take now and in the near future to minimize/mitigate/avoid those impacts.
- Fishermen collecting bottom temperature data for research (more eMOLT).
- Research on forage/prey movement and habitat use to develop a baseline when thinking about larger-scale regional change.
- Research on bycatch of horseshoe crabs.
- Climate change impacts.

Figure 7. Attendees participating in the research prioritization exercise at the 2024 Northeast Cooperative Research Summit.

Results:

Overall, participants at the 2024 Summit clearly identified the impacts of offshore wind energy development and ecosystem research as the top priorities (Figure 8). Specifically, “Research on

the impacts of offshore wind on species, habitats, and oceanography", "Research on the environmental drivers of resource species", and "Research on the impacts of offshore wind on fishing operations" were the top three research priorities. Other research topics that were identified as high priority included "Research on the impacts of offshore wind on surveys and fishery data collection", "Enhanced catch and effort data collection from commercial and recreational fisheries to support catch per unit effort indices and other scientific uses", "Research on the social and economic factors impacting fishing operations", and "Development of new surveys using different gear types". These results highlight the need for more research in these areas.

There were some differences in research priorities between scientists, researchers, and other community members. Scientists placed higher priority on research topics with an ecosystem-focus, such as "research on the impacts of offshore wind on species, habitats, and oceanography", and "research on the environmental drivers of resource species", and uniquely prioritized "research on stock structure and migration dynamics of resource species". Members of the fishing community, on the other hand, placed higher priority on research related to survey impacts and approaches, including "research on the impacts of offshore wind on surveys and fishery data collection" and "development of new surveys using different gear types". There was consistent prioritization among groups of "Research on the impacts of offshore wind on species, habitats, and oceanography", indicating that this is a high priority area for future cooperative research.

In 2023, a similar exercise was conducted in Virginia, Rhode Island, and Maine, yielding comparable results. The significant interest in offshore wind research aligns closely with findings from the 2023 Cooperative Research Summits in Virginia and Rhode Island. However, each region also identified a distinct secondary topic: Virginia prioritized growth and reproductive dynamics, while Rhode Island focused on enhancing catch and effort data collection. In Maine, the top two topics were research related to stock structure of resource species and the social and economic factors affecting harvest. Comparing these trends across events, highlight the influence of geographic location on research priorities.

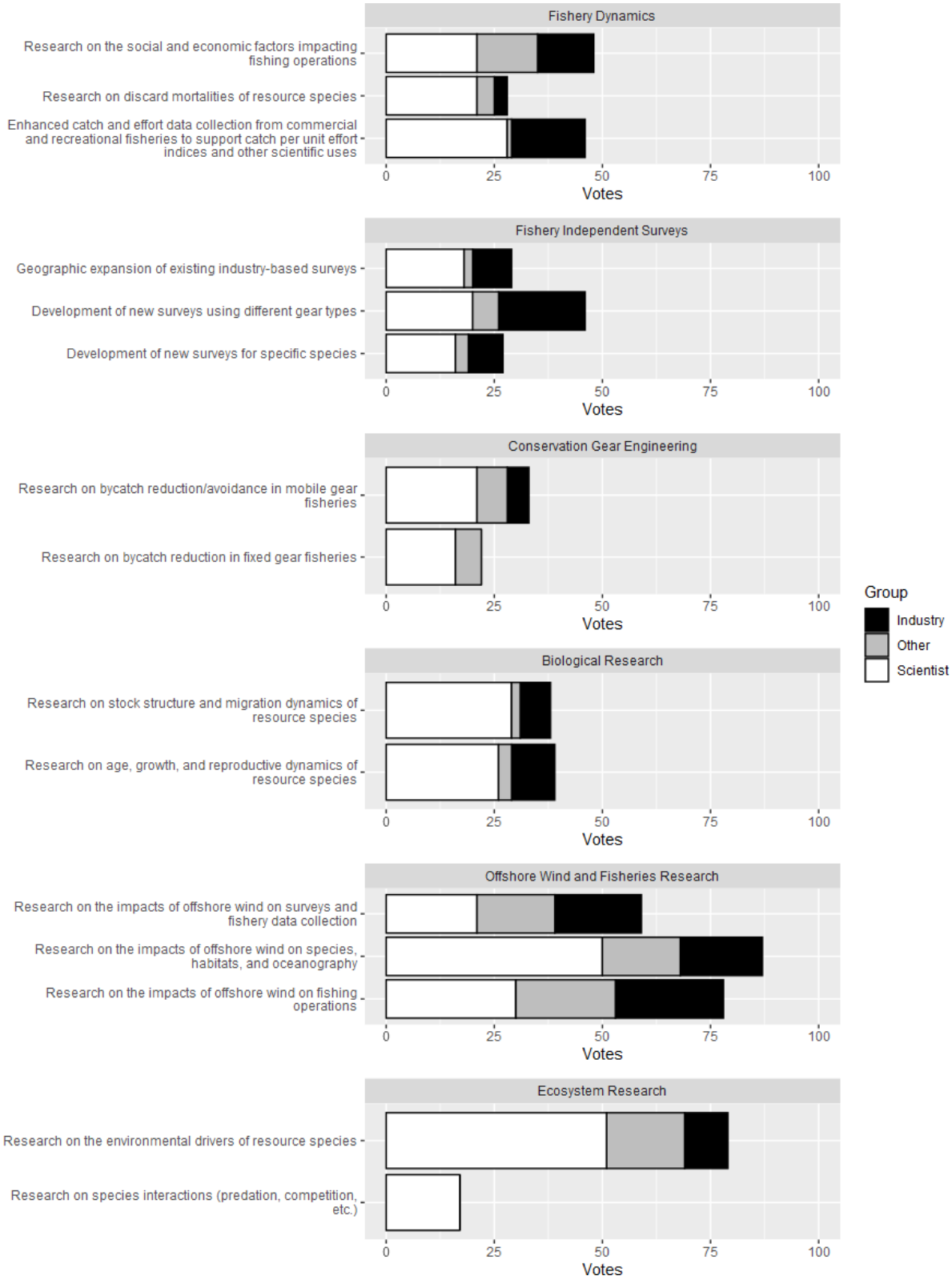


Figure 8. Results from the research prioritization exercise at the 2024 Northeast Cooperative Research Summit. Attendees were given stickers to vote on research topics that they believe are priority. The black portion of each bar indicates votes from members of the fishing community, the white portion of each bar indicates votes from scientists, and the gray portion of each bar indicates votes from other participants.

PARTICIPATION AND FEEDBACK

Collectively, over 150 members of the fishing and scientific communities attended the Northeast Cooperative Research Summit in Cape May, NJ. Of these participants, approximately 28% were industry members, 51% were researchers, 7% were government scientists or managers, and 14% were other interested parties, including representatives from non-profit organizations and offshore wind companies.

Feedback provided by participants indicated that the 2024 Northeast Cooperative Research Summit was largely successful in achieving the goal of enhancing communication and coordination of cooperative research in the Northeast region. When asked to rate the overall success of the Summit, 73% of participants ranked the Summit as completely successful, 23% of participants ranked the Summit as very successful, 4% of participants ranked the Summit as mostly successful, and no one ranked the Summit as partially successful or not successful.

When participants were asked how their knowledge/experience of cooperative research in the Northeast changed due to their participation in the Summit, 58% indicated a substantial increase, 26% indicated a moderate increase, 9% indicated a slight increase, and 7% indicated no increase.

When asked to rate the relevance of the presented information at the Summit, 82% of participants indicated that the materials presented were highly relevant, 18% of participants indicated that the materials presented were mostly relevant, and no one indicated that the materials presented were not relevant.

Participants also expressed appreciation for the high turnout and active participation from the fishing community and the opportunities provided to make connections and develop new research ideas and collaborations. As one participant put it, the Summit “was the best gathering of fishermen and scientists in over 20 years”.

Areas for improvement include more breakout sessions, more booths representing groups engaging in cooperative research, more structured networking time, and better facilitation of breakout session discussions to stay focused on the themes and cooperative research contributions.

A selection of testimonials from participants are provided below.

“I was impressed at the industry/fishing community turnout. It is easy to get a bunch of scientists in a room, but seeing significant turnout to the other groups is really impressive.“

“I enjoyed the quality of the talks given as well as the acknowledgement of the fishing industry's value.”

“It was wonderful seeing so many groups be positive and hopeful for the future of fisheries.”

“The progress made over the last couple years has been very impressive. Looking forward to many more years of bridging the gap between industry and scientific research.”

“The NCRS is a huge benefit for everyone and is something that is very important to keep having.”

“This was my first summit, and it was an incredible one. Anna in particular was an engaging and well-spoken host. As a fellow female in fisheries science, I felt inspired coming out of the summit.”

“It's an honor to be included and the opportunity to make connections with researchers and fishermen from other states face to face is invaluable. I have already had two proposal collaborations as a result of this year's summit and I'm hoping for more.”

“It was an enjoyable and informative meeting, and I was able to make important connections to facilitate cooperative research.”

“It was valuable connecting with fishermen and understanding their concerns/priorities.”

“It was valuable hearing about new research and collaborations that I didn't know about.”

NEXT STEPS

Given the success of the 2024 Northeast Cooperative Research Summit, the NEFSC Cooperative Research Branch will continue to host one Northeast Cooperative Research Summit annually, with the location rotating among states in the Northeast. The 2025 Northeast Cooperative Research Summit will be held in Portland, Maine. Focusing on a single summit that rotates location each year will support continued coordination and communication across the Northeast region, while also providing opportunities for regionally-specific discussions and partnership development.

ACKNOWLEDGEMENTS

The 2024 Northeast Cooperative Research Summit would not have been possible without the support of New Jersey Sea Grant, including managing logistics and recruiting participants. The Summit greatly benefited from active participation from members of the fishing community, who took time off the water and away from their jobs to attend. We are especially grateful to the fishing community members who contributed to breakout session panels and to the industry highlight, Captain Kevin Wark.

APPENDIX I - 2024 COOPERATIVE RESEARCH SUMMIT ORAL PRESENTATION ABSTRACTS

Abstract #1
Title: Enhancing sustainable development of the winter bait fishery for Atlantic menhaden through implementation of a cooperative survey
Author: Genny Nesslage
Affiliation: University of Maryland Center for Environmental Science Chesapeake Biological Laboratory
Contact: nesslage@umces.edu
Abstract:
A cooperative acoustic survey of the overwintering resident stock of Atlantic menhaden (Brevoortia tyrannus) was conducted offshore of the New Jersey coast in February 2022. The goals of the survey were to address industry's need for collection of novel scientific data to support enhanced sustainable fishing opportunities, expand the use of cooperative science, and promote scientifically informed fisheries management of Atlantic menhaden. Our primary objectives are to: 1) estimate overwintering biomass and structure of Atlantic menhaden in the winter bait fishery's primary fishing area, 2) evaluate performance of industry acoustics in estimating Atlantic menhaden biomass, and 3) evaluate ageing uncertainty. We systematically surveyed the primary winter bait fishing region 15-50 mi offshore from the southern border of Hudson Canyon to the Delaware border using a commercial midwater trawling vessel equipped with a recordable Simrad ES80 split-beam, hull-mounted 38kHz ES38B transducer and FSV25S (20 kHz) omnidirectional sonar. Acoustic data were analyzed to produce estimates of school number and biomass and to evaluate the utility of industry acoustics in cooperative research. Menhaden were collected from each trawl set to determine age, size, sex, and maturity of fish caught. Additional opportunistic samples were collected by the scientific survey team at sea for five days after the survey and at port throughout the remainder of the Atlantic menhaden winter trawl fishing season. An ageing exchange among the Virginia Institute of Marine Science, NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory, and New Jersey Department of Environmental Protection was conducted to quantify ageing uncertainty. This study was a collaboration between fishing industry members and federal, state, private, and academic scientists funded by the Saltonstall-Kennedy Program award NOAA Grant NA20NMF4270163.

Abstract #2
Title: In search of striped bass: How New York fishermen got us on the fish for a study in legacy contamination
Author: Amanda Dauman
Affiliation: Cornell Cooperative Extension of Suffolk County
Contact: aml357@cornell.edu
Abstract:
From June 2022 to December 2023, Cornell Cooperative Extension of Suffolk County (CCE) worked closely with commercial and recreational fishermen to catch striped bass from Raritan Bay to Montauk Point in the NY Bight, and from the East River to Orient Point in the Long Island Sound. Fish were caught to provide samples to the NYS Dept. of Environmental Conservation (NYSDEC) for their reassessment of striped bass tissue for legacy contaminants, such as PCBs, and contaminants of emerging concern, like PFAS. Areas closed in the '90s for contamination concerns would finally be investigated again to reassess the striped bass and, hopefully, reopen the areas to commercial fishing. The proof in showing the water quality had also steadily improved was icing on the cake for the fishermen we worked with. The support of fishermen from all over New York's marine districts was what made this project possible. Let us

show you the stats of the fish caught, the guys we worked with, where we went, and how we coordinated this massive undertaking.

Abstract #3
Title: The impact of bacterial contamination on the live tautog fishery: An emerging need for cooperative research
Author: Tor Vincent
Affiliations: Tor Fishing
Contact: coastaldebrisgrappling@gmail.com
Abstract:
In the live tautog market, a 3 lb fish or smaller is sought after. They are usually steamed and served whole as part of a meal for several people. The tags required for tautog sold into the live market, however, have produced lesions and infections in these small fish. The tags were specified by the vendor as fin tags to be used on seal, alligator and sea turtle fins. The mechanical damage from the large incision was expanded by the movement of the oversized tag. The open wound was infected by opportunistic bacteria and became a large soft tissue infection on fish in holding tanks. The overwhelming majority of commercial holding tanks are closed systems. These systems are designed to allow the entire tank to be colonized by marine bacteria that are part of the normal flora of the fish. The purpose is to allow these bacteria to manage the ammonia loading. For decades the live market industry has demonstrated that tautog are very durable and resilient in these closed system tanks. The new occurrence of these infections has negatively impacted the market because the damaged fish are unsaleable. Soft tissue infection causing bacteria, such as Vibrio spp. and Shewanella spp., are likely candidates participating in these infections. The warming waters may be causing a greater population of these bacteria through the northeast. A study to understand the bacteria concentrations in the habitat and diet of the fish carried to the tanks could help us understand whether that is a contributing factor. The tags broke the integrity of the fish's immune defenses wide open, but it is unknown whether that alone caused the problem. A collaborative approach between scientists and fishermen participating in the live tautog fishery is needed to address this urgent issue.

Abstract #4
Title: Development and testing of assessment approaches for longfin and shortfin squid
Author: Mike Wilberg
Affiliation: University of Maryland Center for Environmental Science
Contact: wilberg@umces.edu
Abstract:
Longfin inshore squid and northern shortfin squid (Doryteuthis pealeii and Illex illecebrosus; hereafter longfin and shortfin squid) represent the 8th and 11th most valuable commercial fisheries on the US east coast with a combined dockside value of ~$57 million/year during 2016-2020. However, neither species currently has model-based estimates of biomass, fishing mortality rates, or stock status. This cooperative research project will bring together scientists and industry partners to develop an integrated length-based, state-space stock assessment model for squids. Length-based approaches are particularly suitable for difficult-to-age species like longfin and shortfin squid, and squid processors have collected many years of data needed to inform such models. The model will operate on a short sub-annual time step appropriate for longfin and shortfin squid that live approximately 6 months, and it will use available data from industry, surveys, and other research activities. We will develop operating models to conduct thorough simulation testing of the assessment model to evaluate its performance. The assessment model will be applied to longfin and shortfin squid to estimate biomass, fishing mortality rates, and stock status. The methods and partnerships developed during this research will improve the scientific basis for managing these valuable fisheries resources.

Abstract #5

Title: Marine carbon dioxide removal: Engaging the fishing community in understanding and shaping an emerging climate change mitigation solution
Authors: Annie Hawkins1, Sarah Schumann2
Affiliations: Responsible Offshore Development Alliance1, Fishery Friendly Climate Action2
Contact: fisheryfriendlyclimateaction@gmail.com
Abstract:
Marine carbon dioxide removal (mCDR) is an emerging climate change mitigation strategy that ramps up the ocean's natural chemical and biological processes to sequester and store excess carbon dioxide from the atmosphere in order to reduce its contribution to global climate change. Specific mCDR techniques that are being considered include ocean fertilization, macroalgae cultivation and sinking, ocean alkalinity enhancement, artificial upwelling and downwelling, and electrochemical removal of carbon dioxide from seawater. Because mCDR operates by enhancing certain oceanic processes, it can interact with fishery ecosystems, resources, and activities in complex ways that are not yet well understood. Therefore, it is imperative to begin convening with commercial fisheries stakeholders as soon as possible and to develop an accurate understanding of the technical, ecological, and governance aspects of diverse mCDR approaches. It is equally important to produce guidance for the regulatory and scientific community on fishery-sensitive mCDR governance, effective stakeholder outreach and communication, and co-production of knowledge in a mCDR context, in order to harmonize any future mCDR development with the goals of supporting fishery ecosystems and fishing activities. This presentation will describe a new project led by the Responsible Offshore Development Alliance and Fishery Friendly Climate Action to engage fishermen in the Northeast, Alaska, and West Coast in building up expertise on mCDR approaches within fishing communities and in developing early guidance from these experts. After an overview of the status and landscape of mCDR research and development, presenters will lead participants in a discussion about how collaborative research may be able to help resolve unknowns related to: mCDR baseline assessment; monitoring, reporting, and verification (MRV); and ecological impacts assessment.

Abstract #6
Title: Cold pool stratification influences on commercial species dynamics in the Mid-Atlantic Bight
Author: Samantha Alaimo
Affiliation: Rutgers University
Contact: alaimo@marine.rutgers.edu
Abstract:
The Mid Atlantic Bight (MAB) is a dynamic ocean region with strong seasonal cycles. Thermal variability in the MAB is dominated by a distinctly cold, nutrient-dense, "pocket" of bottom water that forms annually known as the Cold Pool. The timing of the annual Cold Pool spring formation, summer intensification, and fall breakdown can all vary from year to year. This interannual evolution of the MAB Cold Pool supports ecological services for a variety of commercial and recreationally targeted species, including the summer flounder (Paralichthys dentatus), striped bass (Morone saxatilis), and spiny dogfish (Squalus acanthias).

Abstract #7
Title: Using fishing vessel data in the Rutgers "Doppio" ocean forecast system
Author: John Wilkin
Affiliations: Rutgers University
Contact: jwilkin@rutgers.edu
Abstract:
Rutgers University operates an ocean modeling and prediction system (widely referred to as "Doppio") for the waters of the Mid-Atlantic Bight and Gulf of Maine. Each day the system generates a new 3-day forecast of sea level, ocean currents, salinity and temperature of the full 3-dimensional water column. To enhance forecast skill, the Doppio system assimilates all available data from satellites, surface current measuring radars, drifters, profiling floats, and

ships – including temperature data from sensors on fishing gear acquired by vessels participating in the NOAA eMOLT program. The presentation will describe the basics of how data and models are merged, an assessment of the model bottom temperature forecast skill, and an introduction to the East Coast Community Ocean Forecast System (ECCOFS) under development at Rutgers for future National Ocean Service operations.

Abstract #8
Title: Using fine-scale fishery data to estimate economic impact of wind farms on the summer flounder fishery
Author: Meghna Marjadi
Affiliations: Northeast Fisheries Science Center; University of Massachusetts Dartmouth
Contact: meghna.marjadi@noaa.gov
Abstract:
Offshore wind projects are being developed across the Northeast continental shelf as an approach to mitigate the effects of climate change; however, these projects will overlap with historical fishing grounds and displace fishing. Accurate spatial data to represent fishing activity is required to inform decisions about wind farm locations and estimate economic exposure. In the northeast, the National Oceanic and Atmospheric Administration uses logbooks to estimate fishing locations for active vessels. Logbook 'footprints' use one central location for each trip to produce coarse estimates of fishing areas and uncertain estimates of exposed revenue. At-sea observer data is used to expand logbook positions to broader 'footprints'. Fine-scale data, available from Northeast Fisheries Science Center Study Fleet vessels, provide more precise estimates of active-fishing footprints and can be used to estimate exposure and determine biases of logbook footprints. Previous comparisons of logbook and active-fishing footprints for longfin squid (Doryteuthis pealeii) suggested that restricting the assumed spread of logbook locations could reduce biases. Application of these methods for other fisheries will facilitate understanding of how coarse logbook data can be used to accurately estimate economic exposure across fishing gears and types when fine-scale data are unavailable. We used Study Fleet data from the summer flounder fishery (Paralichthys dentatus; 2014-2022), to compare coarse logbook footprints and fine-scale active-fishing footprints. Preliminary results suggest that spreading coarse logbook footprints to the 90th percentile of observer distributions underestimates economic exposure, while restricting logbook footprints to the 25th and 50th percentiles yields more accurate estimates of economic exposure.

Abstract #9
Title: Evaluating if a modification to commercial sea scallop dredges can reduce bycatch and increase catch efficiency
Author:Jennifer Gius
Affiliation: Haskin Shellfish Research Lab, Rutgers University
Contact: jgius@hsrl.rutgers.edu
Abstract:
Atlantic sea scallops (Placopecten magellanicus) represent a valuable commercial fishery in the northeast US. Although current scallop dredge configurations allow some bycatch to escape, non-target species are still retained. In this study, a modification was made to the current legal dredge to allow changing the angle of the cutting bar relative to the seafloor. This modification was intended to create greater turbulence behind the cutting bar and lead to small sea scallops and some bycatch being ejected from the twine top before entering the chain bag. To evaluate how adjustments made to the angle of the modified cutting bar impacted bycatch and catch efficiency, paired tows (n=149) were conducted with the modified dredge and a standard commercial dredge in the US Mid-Atlantic and on Georges Bank between 2019 and 2022. Four angles were tested: 15-, 30-, 45-, and 60-degrees. With the cutting bar set at either 45- or 60-degrees, there was a statistically significant reduction (up to 87%) of almost every commonly caught bycatch species, including economically important species like summer flounder and monkfish. There was also a significant reduction (up to 61%) in the amount of debris (shell, sponge, sand dollars) in the modified dredge compared to the standard dredge. In addition,

there was a small (~10%) but statistically significant reduction in scallop catch. However, some fraction of these unretained scallops were small (<100mm) and would have been discarded anyway. These results suggest the modified scallop dredge could significantly reduce bycatch and catch sorting time. Additional field efforts completed in 2023 along with ongoing computational modeling of the flow around the dredge will provide a greater understanding of the performance of this dredge modification for reducing bycatch.

Abstract #10
Title: ScallApp: A tool to engage the fishing industry in tracking scallop health and reproduction
Author: David Bethoney
Affiliation: Commercial Fisheries Research Foundation
Contact: dbethoney@cfrfoundation.org
Abstract:
A changing climate is impacting the ecology of the Atlantic sea scallop through the emergence of diseases and changes in reproductive dynamics. These conditions are monitored during annual dredge surveys, but these surveys almost exclusively occur in the late spring to summer. Thus, they offer an annual snapshot which prohibits the ability to track these conditions through the year. The need for year-round and area specific information on scallop reproduction and meat quality can be filled by the fishing industry. In this project, a fishery dependent approach to collect data that tracks these conditions through space and time was piloted. A data collection tool was developed, in the form of an app, that can be downloaded and operated by members of the scallop fishing community. The app, ScallApp, was designed as a self-instructed, quick to use tool. During the completed pilot phase scallopers were able to consistently collect timestamped and geolocated disease and gonad stage data along with images of individual scallops. To manage the images and sampling session data collected at sea, a database was constructed. The database allowed the researchers to process the images and assign a ‘verified’ status to app users that submitted correctly identified biological parameters in sequential sampling sessions. These verified data submissions were then fed to a data portal that creates interactive distribution maps for use by the broader fishing industry, as well as fisheries scientists, managers, and educators. The components of this project provide a comprehensive infrastructure that can be utilized by a broader fleet of participating fishermen to collect images throughout the year, across the range of the resource, and contribute to a near real-time understanding of environmental impacts to sea scallop biology.