April 2023 Council Meeting

Tuesday, April 4 – Thursday, April 6, 2023

Hyatt Place Durham/Southpoint
(7840 NC-751 Hwy, Durham, NC 27713, 919-688-1800)
<u>or</u> via Webex webinar

This meeting will be an in-person meeting with a virtual option. Council members, other meeting participants, and members of the public will have the option to participate in person at the Hyatt Place Durham/Southpoint or virtually via Webex webinar. Webinar connection instructions and briefing materials will be available at: https://www.mafmc.org/briefing/april-2023.

Tuesday, April 4th

1:00 p.m. – 2:00 p.m.   **Executive Committee Meeting (*Closed Session*) (Tab 1)**
- Review and recommend new SSC membership
- Review Award of Excellence nominations

2:00 p.m.   ***Council Convenes***

2:00 p.m. – 3:30 p.m.   **Short-Term Forecasts of Species Distributions for Fisheries Management Project (Tab 2)**
(Dr. Malin Pinsky, Rutgers University and Dr. Alexa Fredston, University of California Santa Cruz)
- Review results and discuss potential application and next steps

3:30 p.m. – 4:30 p.m.   **East Coast Climate Change Scenario Planning Update (Tab 3)**
- Update from February 2023 East Coast Scenario Planning Summit and next steps

Wednesday, April 5th

9:00 a.m.   ***Mackerel, Squid, and Butterfish Committee, Meeting as a Committee of the Whole***

9:00 a.m. – 9:30 a.m.   ***Illex:* Review 2023 and set 2024-2025 Specifications (Tab 4)**
- Review recommendations from the Advisory Panel, SSC, and staff
- Review 2023 specifications and consider modifications if appropriate
- Approve 2024-2025 specifications

9:30 a.m. – 10:30 a.m.   ***Illex* Permit Action Follow-Up (Tab 5)**
- Review NOAA Fisheries response to request for additional information regarding disapproval of *Illex* Permit Action
- Consider the initiation of a framework to create Vessel Hold Baselines for permits in the *Illex* fishery

10:30 a.m.	*Council Convenes*

10:30 a.m. – 11:30 a.m.	**Habitat Activities Update (Tab 6)**
	(Greater Atlantic Regional Fisheries Office Habitat and Ecosystem Services Division)
	– Presentation on activities of interest (aquaculture, wind, and other projects) in the region
11:30 p.m. – 12:30 p.m.	**Ocean City Video Boat Count Project (Tab 7)**
	– Review results

-------- Lunch 12:30 p.m. – 1:30 p.m. --------

1:30 p.m. – 2:00 p.m.	**Update from ACCSP on Atlantic Recreational Data Implementation Plan (Tab 8)**
	(Geoffrey White, Atlantic Coastal Cooperative Statistics Program)
	– Update on development process and 2023-2027 priorities
2:00 p.m. – 2:30 p.m.	**Marine Recreational Information Program (MRIP) Update (Tab 9)**
	(Katherine Papacostas, NOAA Fisheries, Office of Science and Technology)
	– Update on 2023 MRIP priorities and proposed actions in response to National Academies Study committee recommendations regarding recreational data.
2:30 p.m. – 3:00 p.m.	**Scup Federal Recreational Season (Tab 10)**
	– Review recent ASMFC Board recommendation to NOAA Fisheries to reconsider previously adopted seasonal closure
	– Determine if similar action by the Council is warranted
3:00 p.m. – 4:30 p.m.	**2023 Mid-Atlantic State of the Ecosystem Report (Tab 11)**
	(Dr. Sarah Gaichas, NEFSC)
	– Review and provide feedback
4:30 p.m. – 5:00 p.m.	**NOAA's National Seafood Strategy (Tab 12)**
	(Michael Rubino, NOAA Fisheries)
	– Review of NOAA's proposed strategy

Thursday, April 6th

9:00 a.m. – 1:00 p.m.	**Business Session**
	Committee Reports (Tab 13) – SSC
	Executive Director's Report (Tab 14) (Dr. Chris Moore)

Organization Reports – NOAA Fisheries Greater Atlantic Regional Office, NOAA Fisheries Northeast Fisheries Science Center, NOAA Office of General Counsel, NOAA Office of Law Enforcement, US Coast Guard

Liaison Reports (Tab 15) – New England Council, South Atlantic Council

Other Business and General Public Comment

This meeting will be recorded. Consistent with 16 USC 1852, a copy of the recording is available upon request.

The above agenda items may not be taken in the order in which they appear and are subject to change, as necessary. Other items may be added, but the Council cannot take action on such items even if the item requires emergency action without additional public notice. Non-emergency matters not contained in this agenda may come before the Council and / or its Committees for discussion, but these matters may not be the subject of formal Council or Committee action during this meeting. Council and Committee actions will be restricted to the issues specifically listed in this agenda. Any issues requiring emergency action under section 305(c) of the Magnuson-Stevens Act that arise after publication of the Federal Register Notice for this meeting may be acted upon provided that the public has been notified of the Council's intent to take final action to address the emergency. The meeting may be closed to discuss employment or other internal administrative matters.

Stock Status of MAFMC-Managed Species

(as of 3/23/23)

SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	Overfished ½ B_{MSY}		
Summer Flounder	$F35\%_{MSP}$=0.422	60.87 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Scup	$F40\%_{MSP}$=0.200	99.23 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Black Sea Bass	$F40\%_{MSP}$=0.46	15.92 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Bluefish	$F_{35\%SPR}$=0.181	222.37 million lbs	No overfishing Overfished	Most recent management track assessment was 2021. Dec 2022 research track review – stock status will be updated with 2023 management track assessment.
Illex Squid (short finned)	Unknown	Unknown	Unknown Unknown	2022 research track assessment failed, but peer review agreed likely "lightly fished in 2019," though with cautions.
Longfin Squid	Unknown	46.7 million lbs	Unknown Not overfished	Most recent assessment update was 2020; not able to determine current exploitation rates.
Atlantic Mackerel	$F_{40\%}$=0.22	199.6 million pounds	Overfishing Overfished	Most recent management track assessment was 2021.
Butterfish	F_{Proxy}=2/3M =0.81	43.5 million lbs	No overfishing Not overfished	Most recent management track assessment was 2022.

SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	Overfished $\frac{1}{2} B_{MSY}$		
Chub Mackerel	At least 3,026 MT of catch per year	At least 3,026 MT of catch three years in a row	No overfishing Not overfished	No stock assessment.
Surfclam	$F/F_{threshold} = 1$ [a]	$SSB/SSB_{threshold} = 1$ [b]	No overfishing Not overfished	Most recent management track assessment was 2020.
Ocean Quahog	$F/F_{threshold} = 1$ [c]	$SSB/SSB_{threshold} = 1$ [d]	No overfishing Not overfished	Most recent management track assessment was 2020.
Golden Tilefish	$F_{40\%MSP}=0.261$	12.12 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Blueline Tilefish	Unknown	Unknown	South of Cape Hatteras: No overfishing Not overfished North of Cape Hatteras: Unknown Unknown	Most recent benchmark assessment was 2017.
Spiny Dogfish (Joint mgmt with NEFMC)	$F_{MSY}=0.2439$	175.6 million lbs Female SSB	No overfishing Not overfished	Most recent assessment was 2018. Dec 2022 research track review – stock status will be updated with 2023 management track assessment.
Monkfish (Joint mgmt with NEFMC)	NFMA & SFMA $F_{MAX}=0.2$	NFMA - 1.25 kg/tow SFMA - 0.93 kg/tow (autumn trawl survey)	Unknown Unknown	Management track assessment is being peer reviewed in September 2022.

SOURCES: Office of Sustainable Fisheries - Status Report of U.S. Fisheries; SAW/SARC, SEDAR, and TRAC Assessment Reports.

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[a] $F_{threshold}$ is calculated as 4.136 times the mean F during 1982 – 2015.
[b] $SSB_{threshold}$ is calculated as $SSB_0/4$.
[c] $F_{threshold}$ is 0.019.
[d] $SSB_{threshold}$ is calculated as $0.4*SSB_0$.

Stock Size Relative to Biological Reference Points

(as of 3/23/23)
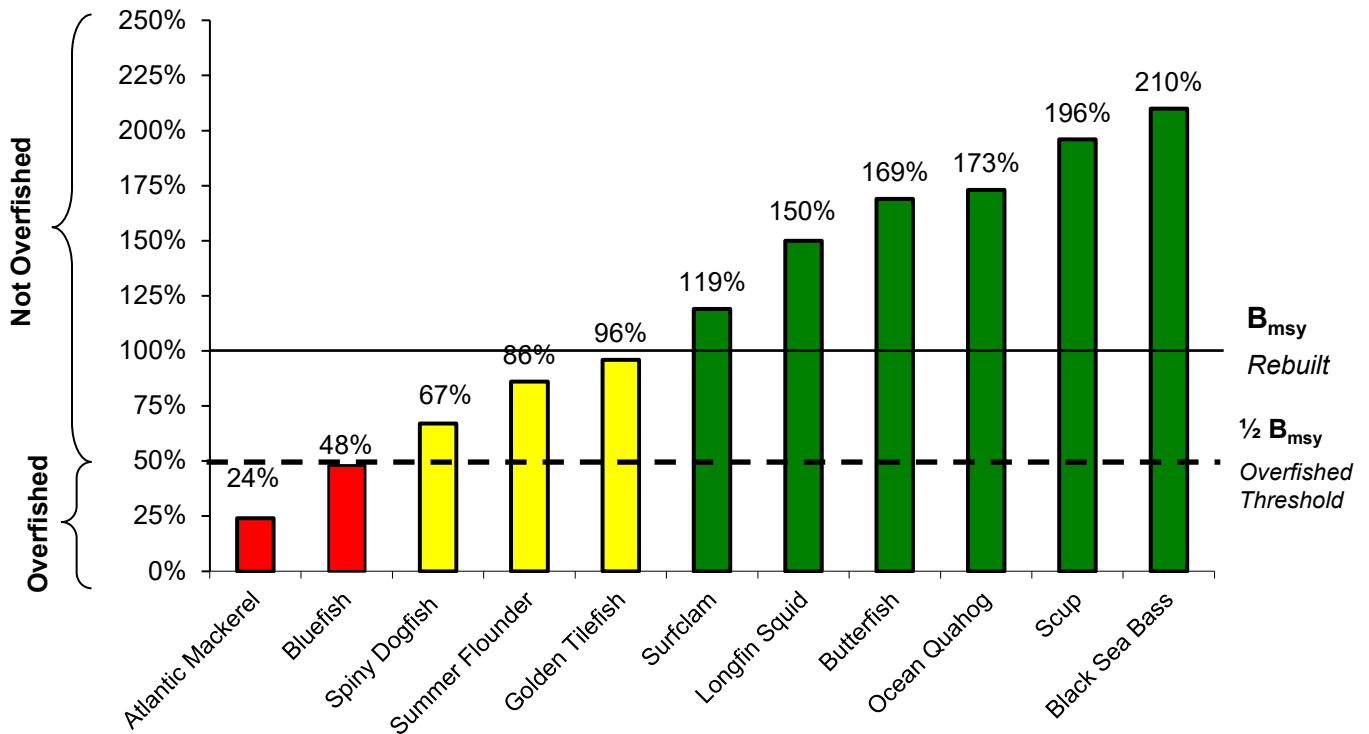
Notes:

- Unknown B_{msy} - *Illex* squid, monkfish (NFMA & SFMA), blueline tilefish (North of Cape Hatteras), and chub mackerel.
- Of the 15 species managed by the Council, 5 are above B_{msy}, 6 are below B_{msy}, and 4 are unknown.

Year of data used to determine stock size	
Atlantic Mackerel	2019
Black Sea Bass	2019
Bluefish	2019
Butterfish	2021
Golden Tilefish	2020
Longfin Squid	2018-2019 (average)
Ocean Quahog	2019
Spiny Dogfish	2018
Surfclam	2019
Scup	2019
Summer Flounder	2019

Fishing Mortality Ratios for MAFMC-Managed Species

(as of 3/23/23)
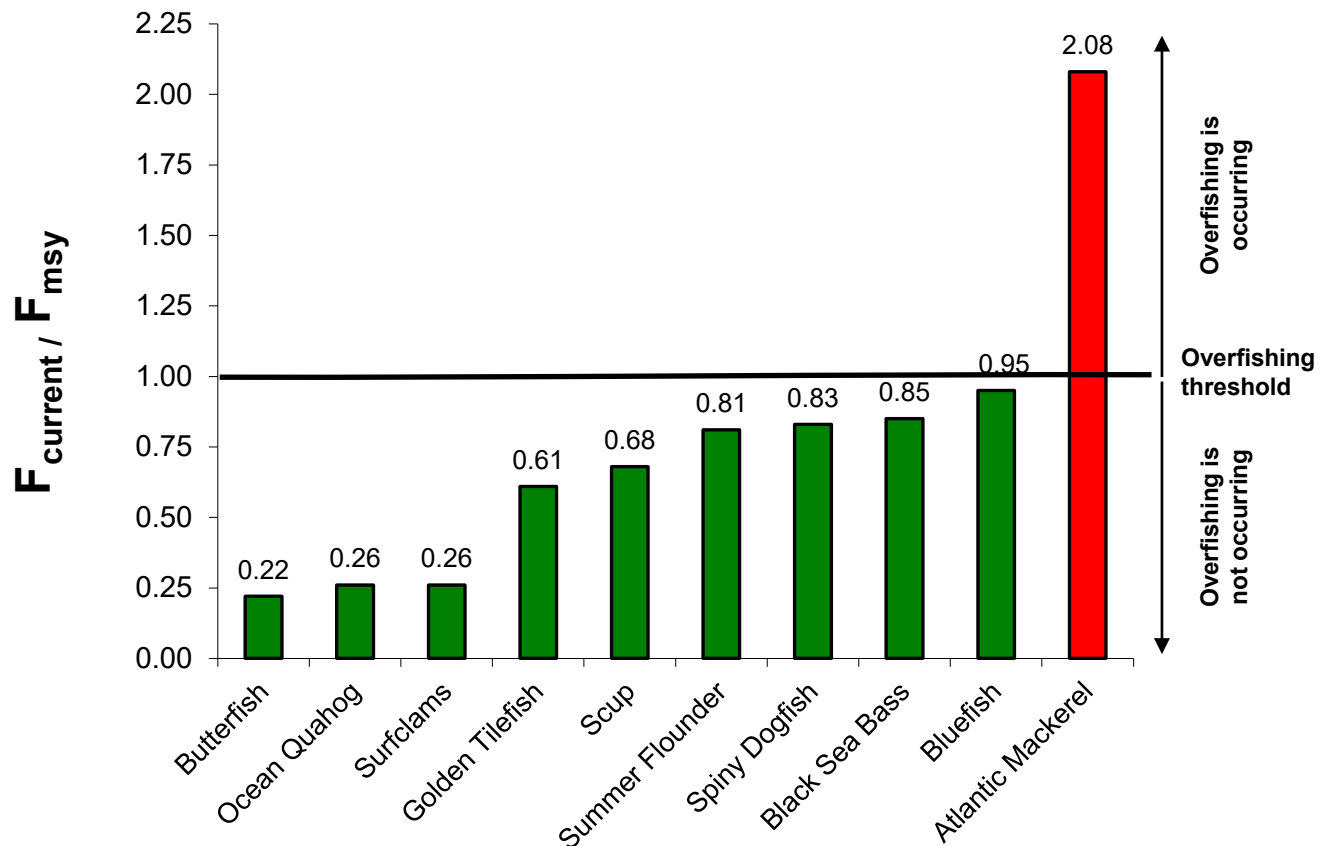
Notes:

- Unknown fishing mortality: *Illex* squid, Longfin squid, monkfish (NFMA and SFMA), blueline tilefish (North of Cape Hatteras), and chub mackerel.
- Of the 15 species managed by the Council, 9 are above F_{msy}, 1 is above, and 5 are unknown.

Year of data used to determine fishing mortality	
Atlantic Mackerel	2019
Black Sea Bass	2019
Bluefish	2019
Butterfish	2021
Golden Tilefish	2020
Ocean Quahog	2019
Spiny Dogfish	2017
Surfclam	2019
Scup	2019
Summer Flounder	2019

Status of Council Actions Under Development

AS OF 3/23/23

FMP	Action	Description	Status	Staff Lead
Summer Flounder, Scup, Black Sea Bass *and* Bluefish	Recreational Harvest Control Rule 2.0 Framework/Addenda	The Recreational Harvest Control Rule Framework (approved June 2022) modified the process for setting recreational management measures for summer flounder, scup, black sea bass, and bluefish (once bluefish is no longer in a rebuilding plan). The new "Percent Change Approach" will sunset no later than the end of 2025. This action will consider a new process to be implemented in time for use in setting 2026 recreational measures. https://www.mafmc.org/actions/hcr-framework-addenda	An FMAT is being formed. The Council and ASMFC's Policy Board are tentatively scheduled to receive an update and discuss next steps at the August 2023 meeting.	Beaty
	Recreational Sector Separation and Catch Accounting Amendment	This amendment considers (1) options for managing for-hire recreational fisheries separately from other recreational fishing modes and (2) options related to recreational catch accounting, such as private angler reporting and enhanced vessel trip report requirements for for-hire vessels. https://www.mafmc.org/actions/recreational-reform-initiative	An FMAT is being formed to begin development of issues for consideration and a draft scoping document. The Council and ASMFC's Policy Board are tentatively scheduled to review a draft scoping document in December 2023.	Dancy/Hart
Surfclam and Ocean Quahog	Surfclam and Ocean Quahog Species Separation Requirements Amendment	As surfclams have shifted toward deeper water in recent years, catches including both surfclams and ocean quahogs have become more common. Current regulations do not allow surfclams and ocean quahogs to be landed on the same trip or in the same tagged cage. The Council is developing and Amendment to modify species separation requirements in these fisheries in the short-term. In addition, staff/NEFSC will explore longer term solutions for monitoring (such as electronic monitoring testing on the clam survey). https://www.mafmc.org/actions/scoq-species-separation	In December 2022 the Council reviewed public comments and agreed to postpone final action to allow time for development of additional alternatives. The FMAT is continuing to work on alternative development in 2023.	Coakley/ Montañez

FMP	Action	Description	Status	Staff Lead
Omnibus	Omnibus Essential Fish Habitat Amendment	This action is an opportunity to utilize the best available fish habitat science to improve EFH designations and support the Council's fish habitat conservation efforts while supporting the EFH consultation process. The consultation process plays an important role in addressing the impacts of non-fishing projects (such as wind energy projects) on fish habitat. This action will concurrently conduct the 5-year EFH review required under the Magnuson Stevens Act while amending fishery management plans for the Council, as needed. https://www.mafmc.org/actions/omnibus-efh-amendment	An FMAT was formed in January 2023. The FMAT will begin the EFH Review and development work for EFH and HAPC designations alternatives. The EOP Committee and Advisory Panel will meet to review technical approaches being considered in early fall 2023.	Coakley
Dogfish and Monkfish	Framework to Reduce the Bycatch of Atlantic Sturgeon	This action was initiated due to the 2021 Biological Opinion (BiOp) that considered the effects of ten FMPs on ESA listed species. The BiOp requires that sturgeon bycatch be reduced in federal large mesh gillnet fisheries, however it does not prescribe specific measures or a target percentage of bycatch reduction.	Initiated in December 2022. NEFMC and MAFMC staff will co-lead the FMAT/PDT. FMAT formation is in progress.	Cisneros

Timeline and Status of Recent MAFMC Actions and Amendments/Frameworks Under Review

As of 3/23/23

The table below summarizes the status of actions after they have been approved by the Council. For information about the status of Council actions under development, please see the document titled "Status of Council Actions Under Development."

Title	Action Number	Council Approval	Initial Submission	Final Submission	NOA Published	Proposed Rule	Approval/ Disapproval Letter	Final Rule	Regs Effective	Notes
Black Sea Bass Commercial State Allocation Amendment	SFSBSB Amd 23	8/4/21	11/19/21	9/14/22						
MSB Rebuilding 2.0 Amendment	MSB Amd 23	6/8/22	8/19/22	10/27/22	10/25/22	11/2/22	1/24/23	2/2/23	2/1/23	
Recreational Harvest Control Rule Framework	SFSBSB FW 17; BF FW 6	6/7/22	8/31/22	11/21/22		12/15/22	N/A	3/9/23	3/9/23	

Timeline and Status of Current and Upcoming Specifications for MAFMC Fisheries

As of 3/23/23

Current Specifications	Year(s)	Council Approval	Initial Submission	Final Submission	Proposed Rule	Final Rule	Regs Effective	Notes
Golden Tilefish	2022-2024	8/11/21	10/7/21	4/22/22	9/14/22	11/10/22	11/9/22	
Blueline Tilefish	2022-2024	4/7/21	10/20/21	5/5/22	8/2/22	11/3/22	12/5/22	
Surfclam and Ocean Quahog	2021-2026	8/12/20	9/2/20	2/24/21	2/17/21	5/13/21	6/14/21	
Longfin Squid	2021-2023	8/10/20	10/14/20	7/2/21	5/26/21	7/22/21	7/22/21	
Butterfish	2023-2024	6/8/22	9/8/22	2/17/23	3/7/23			
Illex Squid	2023	8/10/22	11/10/22	2/15/23	3/7/23			
Atlantic Mackerel (including RH/S cap)	2023	6/8/22	8/19/22	10/27/22	11/2/22	2/2/23	2/1/23	
Chub mackerel	2023-2025	6/8/22	9/8/22	2/17/23	3/7/23			
Bluefish	2023	8/8/22	9/22/22	10/26/22	11/15/22	12/21/22	1/1/23	
Summer Flounder, Scup, Black Sea Bass	2023	8/9/22	9/28/22	10/26/22	12/6/22	1/3/23	1/1/23	
Spiny Dogfish	2023	10/5/22	1/13/23	3/7/23	3/9/23			

Recreational Management Measures

Current Management Measures	Year(s)	Council Approval	Initial Submission	Final Submission	Proposed Rule	Final Rule	Regs Effective	Notes
Summer flounder rec measures	2023	12/13/22	2/21/23	2/21/23				
Black sea bass rec measures	2023	12/13/22	2/21/23	2/21/23				
Scup rec measures	2023	12/13/22	2/21/23	2/21/23				
Bluefish rec measures	2022-2023	12/13/21	1/23/20	3/19/20	5/25/20	6/29/20	6/29/20	Reviewed in 2022. No changes from prevous year's measures.

Mid-Atlantic Fishery Management Council

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 24, 2023

To: Executive Committee

From: Chris Moore, Executive Director

Subject: Executive Committee Closed Session

On Tuesday, April 4, 2023, the Executive Committee will meet in closed session to address two agenda items:

1. <u>Review SSC Membership</u>

On February 27, 2023, the Mid-Atlantic Fishery Management Council released a <u>Request for Nominations</u> to fill one vacancy on its Scientific and Statistical Committee (SSC) due to the recent departure of Dr. Lee Anderson from the SSC. The solicitation indicated that the Council would prioritize candidates with expertise in economics and/or social sciences. At the April Council meeting, the Executive Committee will review the applications received and recommend one candidate to the Council for appointment to the SSC. **A briefing packet will be distributed to Committee members via email**.

2. <u>Review Award of Excellence nominations</u>

The Mid-Atlantic Fishery Management Council's Award of Excellence was established in 2016 to recognize an individual's outstanding contribution to fisheries management, legislation, science, or law enforcement in the mid-Atlantic region. The award has only been presented to one individual – former Council Chairman, Rick Robins. At the February Council Meeting, the Executive Committee agreed to solicit nominations for the MAFMC Award of Excellence. During the April meeting, the Executive Committee will review nominations and consider selecting a recipient for the Award of Excellence. The following document is enclosed behind this memo.

- Award of Excellence Guidelines

Please note that a new <u>Council Awards</u> web page (https://www.mafmc.org/awards) has been created to highlight the Council's awards and past award recipients. The page can be found under the "About" tab on the main navigation menu.

Guidelines for Award of Excellence

The Mid-Atlantic Fishery Management Council Award of Excellence recognizes an individual's outstanding contribution to fisheries management, legislation, science, or law enforcement in the mid-Atlantic region.

Award

The award will be made on a periodic basis subject to the identification and selection of outstanding individuals.

Selection process:

Council members will send written nominations to the Executive Director at any time during the year.

The Executive Director will present nominations to the Executive Committee as they become available.

The Executive Committee will meet to discuss the nominee's achievements and select the recipient by consensus.

The award presentation will occur at an award ceremony in association with a Mid-Atlantic Council meeting.

The recipient will receive an award trophy at the ceremony and a permanent plaque will be placed in the Council office in Dover, DE with a list of all the recipients.

Past Recipients:

August, 2016 - Richard B. Robins, Jr.

Mid-Atlantic Fishery Management Council
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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 22, 2023

To: Council

From: Brandon Muffley, Council staff

Subject: Short-Term Forecasts of Species Distributions for Fisheries
Management Project: Meeting Materials

On Tuesday, April 4, 2023, the Mid-Atlantic Fishery Management Council (Council) will review the preliminary results of a collaborative research project between the Council and Rutgers University to develop a new and innovative modeling approach for short-term forecasts of climate-driven species distributions. The Council will also provide input on future considerations for continued model development and discuss potential opportunities for the Council to utilize and incorporate this information into different Council initiatives and actions.

Materials listed below are provided for Council consideration of this agenda item.

Materials behind the tab:
- Project Overview: Developing Models to Forecast Near-Term Species Distributions
- Meeting Summary: February 23, 2023 Ecosystem and Ocean Planning Committee and Advisory Panel Meeting
- SSC Input: Response to Short-Term Forecast Research Project Terms of Reference from March 7-8, 2023 SSC Meeting

LENFEST
OCEAN
PROGRAM

A scientific summary
March 2023

SUPPORTING SCIENCE
AND COMMUNICATING
RESULTS.

DEVELOPING MODELS TO FORECAST NEAR-TERM SPECIES DISTRIBUTIONS

A project examines dynamic range models as one method to predict economically important stock distributions over 1 − 10 years.

The [2022 Mid-Atlantic State of the Ecosystem Report](#) indicated that the Mid-Atlantic Bight oceanography is changing, the cold pool is becoming warmer, and productivity is declining for many economically important fish species. As such, most research is currently focused on predicting where species will be over the rest of the century- but fisheries managers also need to know where and how fish are moving now.

Understanding short-term species distribution shifts (e.g., over 1-10 years) more closely aligns with management timelines and current stakeholder needs. A project led by Malin Pinsky and Alexa Fredston at Rutgers University and Brandon Muffley with the Mid-Atlantic Fishery Management Council (MAFMC), takes the first steps toward such an approach.

NUTS & BOLTS: HOW THE MODELS WORK

Researchers are taking a retrospective approach to develop these dynamic range models, meaning, they are using data from the past to test if the models can predict things we already know happened. Where they fall short, the researchers are then adjusting the models to better reflect the important biological processes. While not a current focus of this project, this lays the groundwork for developing models that can use projected oceanographic and climate information to make future short-term range forecasts.

IN BRIEF

Guided by priorities in the MAFMC [Ecosystem Approach to Fisheries Management (EAFM) Guidance Document](#), this project aims to use historical data to develop and test a novel modeling method that can help inform near-term management approaches (e.g., 1-10 years) in response to species distribution shifts. Preliminary results show that these dynamic range models have the potential to predict species' ranges in response to changing ocean conditions a result of both climate change and natural variation.
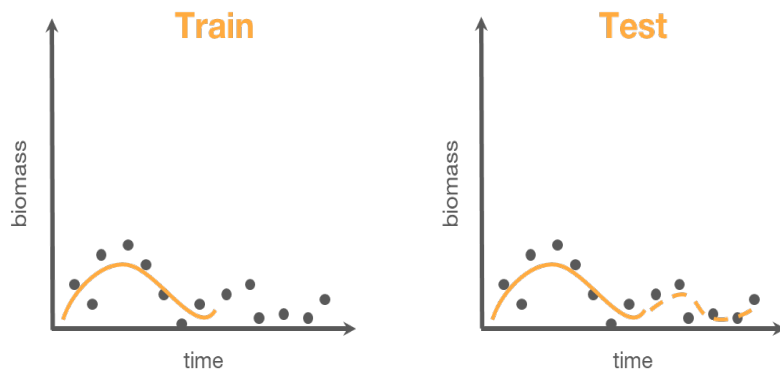

Figure 1

TRAINING VS. TESTING MODELS

A simplified example of how a model trained on data (black dots) from the past (left panel) can predict trends and patterns even in years that were not part of the training data (right panel, dotted line).

The team is using economically important fish species that exhibit a wide range of life history traits and predicted range shifts, including shortfin squid (short lifespan), spiny dogfish (long lifespan), summer flounder (past range shifts in the Mid-Atlantic), and gray triggerfish (potential shifts into the Mid-Atlantic). The model considers simple population dynamic variables such as recruitment, aging, and death, as well as spatially explicit information such as dispersal and non-biological parameters like fishing pressure.

Using data from the Northeast Fisheries Science Center fall bottom trawl survey during the years 1972-2006, researchers train the model. They then test the forecast accuracy by running the model between 2007-2016. Below are some examples of what the model can do for summer flounder.

Figure 2
EXAMPLE OF OUTPUTS FROM THE SUMMER FLOUNDER MODEL

Looking across certain latitudinal patches (shown on left), when applied to summer flounder, the model closely matched observed population distributions (center). For a specific latitudinal patch, the model also closely followed trends in abundance for that area (right).
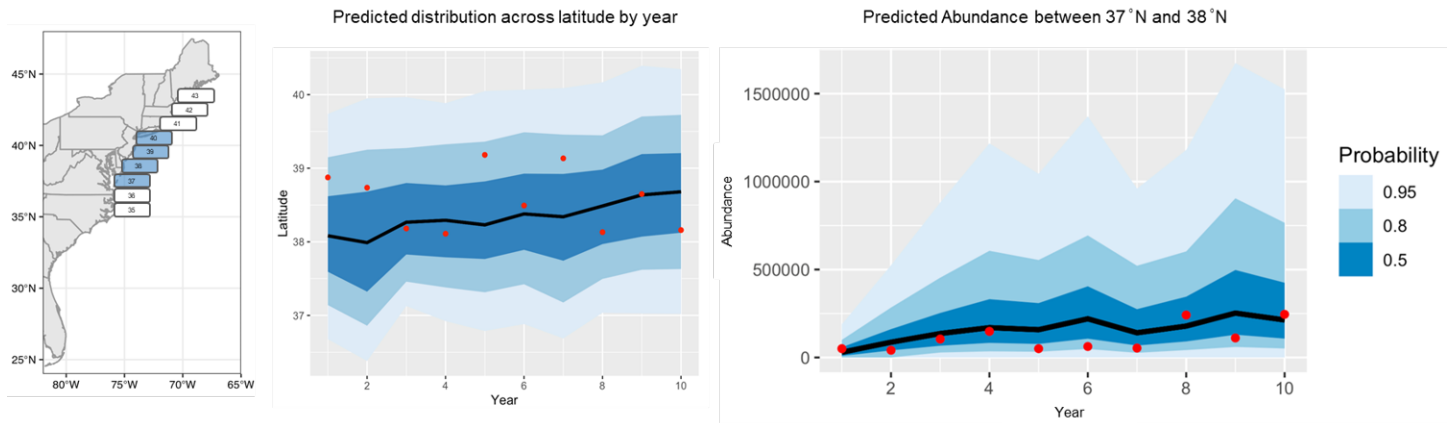
PRELIMINARY FINDINGS

- Non-climate factors (e.g., fishing pressure and larval dispersal) influence species distribution.
- Species distributions are highly variable- they often move north to south, and they are not simply "marching up the coast."
- Dynamic range models have the ability to forecast changes in distribution shifts with some skill, meaning, when trained, they can forecast how populations are distributed from year to year.

UTILITY IN MANAGEMENT

The aim is for scientists to produce reliable predictions of species' distributions for management priorities and needs. Once the models are ready, managers can potentially use them in a variety of approaches and management applications, for example:

- Advance priorities outlined in the EAFM Guidance Document and Risk Assessment
- Evaluate future governance and management considerations developed from the East Coast Climate Scenario Planning
- Inform the Mid-Atlantic State of the Ecosystem Report
- Inform adaptive allocation strategies in the future

Developing confidence in these models requires continued feedback and input from managers, stakeholders, and scientists on what information they need and how the models could or could not be used. Thus, the research team has created and maintained open communication channels with the MAFMC Ecosystem and Ocean Planning (EOP) Committee and Advisory Panel, the Scientific and Statistical Committee, and other species distribution model experts to incorporate their feedback throughout the process. As the project nears its end, information gleaned from the Council will highlight opportunities for future research priorities on this topic.

SUPPORTING SCIENCE AND COMMUNICATING RESULTS.

Ecosystem and Ocean Planning Committee & Advisory Panel Meeting

February 23, 2023
Webinar Meeting Summary

The Mid-Atlantic Fishery Management Council's (Council) Ecosystem and Ocean Planning (EOP) Committee and Advisory Panel (AP) met on Thursday, February 23, 2023 from 1:00 p.m. to 3:00 p.m. The purpose of the meeting was for the EOP Committee and AP to provide feedback on the results and future application of a research project the Council is collaborating on with a research team from Rutgers University. The research team is developing forecast models for four economically important Mid and South Atlantic managed species (Summer Flounder, Spiny Dogfish, *Illex* Squid, and Gray Triggerfish) and is testing the forecasting skill of the models to predict short-term (1-10 years) climate-induced distribution changes. The forecast model has been developed, fully tested, and evaluated for summer flounder and will be fitted and applied to the other three focal species. The EOP Committee and AP provided feedback on the model results, potential model utility, and possible future science and management applications.

EOP Committee Attendees: A. Nowalsky, J. Cimino, M. Duval (Committee Chair), P. Geer, K. Kuhn, S. Lenox, T. Schlichter, S. Winslow (Committee Vice-Chair), D. Stormer, W. Townsend (Council Vice-Chair)

EOP Advisory Panel Attendees: W. Goldsmith, F. Hogan, M. Lapp, E. Bochenek, P. Himchak, P. Lyons Gromen, G. Topping, F. Akers, M. Binsted, B. Brady, J. Firestone, J. Hancher

Other Attendees: M. Pinsky, A. Fredston, C. Collier, E. Knight, S. Close, G. DiDomenico, K. Howington, K. Dancy, J. Curtis, K. Wilke, K. Ripple, M. Waine, B. Muffley, D. Potts, K. Almeida, E. Reid, J. Coakley

Dr. Michelle Duval, EOP Committee chair, started the meeting by welcoming everyone and noting this particular project is part of a larger suite of research projects funded by the Lenfest Ocean Program that seek to improve the scientific knowledge of climate-induced changes to stock distributions and help build climate resilience fisheries.

Project overview and results discussion:

Drs. Pinsky and Fredston provided an overview of the project scope, the development and structure of dynamic range models, and the preliminary retrospective forecast results for summer flounder. They are testing whether spatial population dynamic models that include a temperature effect on recruitment, mortality, or adult movement can predict near-term range shifts. The model has been fully developed and tested for summer flounder; though not all model combinations were able to be run and fully analyzed in time for the meeting. However, the

results from a sub-set of summer flounder model runs indicate that 1) dynamic range models can forecast distribution changes with reasonable skill, 2) the interannual and short-term changes in distribution are highly variable, and 3) non-climate factors (e.g., fishing pressure and dispersal) have a substantial influence on short-term distribution changes.

All model combinations (temperature effects on recruitment / mortality / movement, and other model options) are currently being run on a supercomputer at Rutgers. Once these runs are complete, the research team will formally evaluate and compare the different combinations and also compare results with other species distribution models (SDM) and identify which model combination(s) have the best forecasting skill. The research team will also begin to identify and obtain relevant data sources for the other three species and begin to build out the models for spiny dogfish, *Illex* squid, and gray triggerfish. They emphasized that thus far, the model has not been used to create future forecasts (i.e., 2023 onward) of distribution; the team has only tested the ability of the model to accurately forecast summer flounder distributions from 2007-2016. Further model development, including the development of oceanographic condition forecasts, will also be needed.

Following the presentation, the EOP Committee and AP provided the following questions and input regarding the dynamic range modeling approach and initial results for summer flounder:

- The group asked for confirmation the model has not yet been developed and run for the other three target species and noted recent presentations to the Council regarding science advancements associated with *Illex* and spiny dogfish. It was recommended the research team connect and start a dialogue with those groups conducting relevant research (e.g., the Squid Squad) to learn about each other's activities and potentially help inform the development of these models.
  - The research team confirmed that the models have not yet been fitted to data for the other three target species. The plan is to complete the models later in 2023 but the timing is still uncertain given the need to use new datasets and adapt the model to different life histories. The research team also notes that model development will be a proof-of-concept application to test how they work for these other species.
- There were several comments regarding the appropriateness of this modeling approach for *Illex*. Some of the concerns raised included: using the NEFSC bottom trawl as the primary data source to train the model given its limited coverage of the *Illex* range, there is no stock-recruit relationship, and there is no approved stock assessment model given the complexities of *Illex* stock dynamics.
  - The research team acknowledged the potential challenges associated with *Illex* and noted that part of the project goals are to understand how well dynamic range models perform with different data limitations, stock dynamics and life history characteristics. In addition, the models don't necessarily need to capture or forecast the entire/global range of a stock and can capture some of local or regional dynamics to help understand how/what might be driving distribution changes.
- Many Committee members indicated that any final model needs to include distribution forecasts that can incorporate or respond to future temperature changes in either direction (i.e., warmer or cooler). This component will be critical should these models have any potential management application.

- The research team agreed and noted the current model does not make any assumptions about future temperatures and uses existing temperature data from the NEFSC trawl survey to inform the model. There is a temperature dependence function (a bell curve) within the model to inform temperature effects on recruitment, mortality, and movement. The shape of this function allows the model to account for these temperature effects if temperature is warmer or colder.
- Other members of the group expressed concerns about NEFSC trawl data used to inform the model and identified additional data sources for consideration. For example, potential changes in the timing of when summer flounder might be available to the trawl survey due to earlier/delayed seasonal migration patterns may increase the variability in bottom trawl catch. Data from the for-hire sector and insights from fishermen observations should also be considered.
  - The research team did note that the model does account for uncertainty in the trawl survey data, but seasonal migration issues and other data sources could be areas of further exploration in the future.

<u>Project application and utilization feedback:</u>

Council staff then gave a presentation that identified a range of examples on the potential application and utilization of the research project's results in the Council's science and management processes. Potential areas include: EAFM guidance document and risk assessment, east coast climate change scenario planning, the Mid-Atlantic State of the Ecosystem report, dynamic allocation strategies, and marine spatial planning (e.g., offshore wind and aquaculture). Staff noted, however, that the potential application will likely be different across Council managed fisheries and there is no "one size fits all" approach to what information could be used and for what species.

Following the presentation, the EOP Committee and AP provided the following input regarding the potential future application and use of the model and its outputs by Council:

- Similar to comments raised above, the existing and/or future models need to ensure there is a bi-directional temperature component included in order to accommodate potential increase/decreases in temperature and associated stock distribution changes. Similar comments were made during the recent East Coast climate change scenario planning summit as managers consider information that could support management in 20 years.
  - The EOP Committee agreed with this suggestion given that changes in stock distribution can occur in both directions and may not just be a shift north (and/or east). **The Committee recommended a bi-directional temperature function be considered within the modeling framework.**
  - The Committee also wanted to highlight the need to consider these models and their development for South Atlantic stocks to help understand and prepare for continued and future availability within the Mid-Atlantic.
- Some members of the AP did not support the use of these models in management, particularly for any application associated with *Illex* management due to data limitations, model assumptions, and lack of a specific management need. Others expressed concern about the use of these models in spatial allocation considerations, regardless of species, which

would likely result in the loss of allocation to Mid-Atlantic states. In addition, some AP members felt the models need additional refinement and should consider migration/timing issues associated with the NEFSC trawl survey and include other data sources before management application.

- Some Committee and AP members supported the continued model development and indicated the types of information provided by these models are needed for management. Specific areas of potential application noted by members included the EAFM risk assessment and information on the sensitivity of leading/trailing edges of stock distribution changes (the latter was mentioned as an area of research/interest at the East Coast scenario planning summit).

A similar presentation will be given to the Scientific and Statistical Committee (SSC) during their March 7-8, 2023 meeting. The EOP Committee, AP, and SSC feedback will be provided to the Council for their consideration at the April Council meeting.

Mid-Atlantic Fishery Management Council
Scientific and Statistical Committee Meeting

Short-Term Forecast Research Project

Excerpt from the March 2023 SSC meeting report

Malin Pinsky and Alexa Fredston of Rutgers University presented a detailed overview of their project to develop dynamic models for predicting species distributions in response to climate change. Their models combine spatial analyses of historical bottom trawl data with age-based models to create simulated populations in multiple geographical areas or patches. Simulated populations within these geographical patches can migrate north and south in response to environmental gradients of temperature and randomly by using principles of particle diffusion. Incorporation of fishing mortality within the spatial units helps isolate the potentially confounding effects of spatially heterogeneous fishing mortality on the detection of migration in response to environmental change. Currently the geographical zones are based on one degree of latitude intervals. Input data include abundance, biomass, age, and length data from the fall NEFSC bottom trawl surveys, as well as temperature data from a variety sources. The Bayesian hierarchical state space model was fit initially to the 1972-2006 data.

The predictive skill of the Bayesian hierarchical state space model has been tested by comparing predictions for the 2007-2016 period with observations from the bottom trawl surveys. Various metrics of prediction for Summer Flounder suggest reasonably good correspondence with observed population trends and spatial patterns. As in all models, the variation of predictions increases with the length of the forecast. Model outputs of one to five years are most relevant to Council decisions regarding catch regulations. SSC decisions about appropriate levels of uncertainty in assessments and risk policies could also be informed by such forecasts. The authors noted that true forecasts will also require forecasts of oceanographic conditions on similar time scales.

Modeling efforts for *Illex* squid, Spiny Dogfish, and Gray Triggerfish are currently underway. These species were chosen to illustrate the range of possible applications.

The presentation generated considerable interest from the SSC. Questions of clarification included how the model handles observation error in the surveys, concerns about small area estimation, and effects of missing data. Members noted that distributions of most species have major seasonal shifts across depth gradients and inquired about how such changes are handled within the model. Discussions often simultaneously addressed potential applications of the dynamic range models and the need for future work. Conclusions drawn from those discussions are summarized under the Terms of Reference below.

Terms of Reference

For the short-term forecast research project, the SSC will provide a written report that identifies the following:

1) Comment on potential applicability of short-term forecasts of species distribution for stock assessment, science, and management purposes of Mid-Atlantic species. Consider potential implications for the SSC's OFL CV approach;

- The SSC recognized the significant potential of the models for short-term forecasts for some species. Potential applications include:
  - Model forecasts could be linked to SOE indicators of vulnerability for coastal communities and various social and economic metrics. Investigations of linkages with other SOE indicators are encouraged. EAFM indicators of distributional shifts could be compared with dynamic range model forecasts.
  - Forecasts of distributional shifts could be useful for evaluating recreational fishing performance under various Harvest Control Rules.
  - Evaluation of the feasibility of catch advice relative to the historical distribution of resources.
  - The model could be used as a tool for allocation decisions, particularly if dynamic harvest allocation becomes a possibility.
  - The dynamic range model forecasts may be helpful for interpreting retrospective patterns observed in some species stock assessments.
  - Forecasts may be helpful for interpreting changes in species distributions within and around offshore wind energy areas.
- The SSC expressed concerns that more validation studies are necessary.
  - Applicability will vary greatly among species depending on the spatial domain of the stock and the type of model being used to assess the stock. Currently there are no spatially explicit stock assessments in the Mid-Atlantic region.
  - The dynamic range models could assist with survey redesign, particularly if animals are leaving the defined stock areas.

2) Provide any research recommendations and inclusion of relevant data for future model development that could facilitate their consideration of factors influencing determination of ABCs.

- Accommodate ontogenetic population dynamics, and, in particular, ontogeny as it relates to spatial distribution and habitat utilization.
- Consider alternative patterns of spatial binning. Currently the bins are defined by North/South boundaries, but for many species, distributions along the East/West (or depth) axis may be more important. Thermal preferences of many species vary by age with cooler temperatures preferred by larger individuals. Such preferences often manifest as changes in depth distributions. Future model formulations may benefit by consideration of spatial units defined by both latitude and depth.

- Surveys occur over protracted time blocks and therefore might be considered as a slow-motion depiction of stock distributions rather than a snapshot. In most years, surveys have been conducted with sampling progressing from south to north. The timing and duration of surveys have also varied over time due to logistical and operational factors. Such changes could confound detectability of trends due to climatic change with those attributable to survey timing.
- General patterns of species distribution forecasts should be confirmed by simpler methods.
- Population patches are currently defined by one-degree latitudinal boundaries with no accounting for depth or temperature gradients within patches. Moreover, the width of the sampleable shelf areas, generally <300 m, varies along north-south direction. Accordingly, the number of samples per patch will also vary, resulting in varying levels of precision within the patches.   Adjusting the latitudinal boundaries to achieve more even distribution of samples among patches may be useful.
- Consider potential use of spring bottom trawl surveys along with the fall surveys in the definition of dynamic range models.

M E M O R A N D U M

Date: March 23, 2023

To: Chris Moore, Executive Director

From: Kiley Dancy, Staff

Subject: East Coast Climate Change Scenario Planning Update: Summit Outcomes and Next Steps

On Tuesday, April 4 the Council will discuss the East Coast Climate Change Scenario Planning initiative, covering 1) a recap of the recent Scenario Planning Summit Meeting, and 2) next steps to wrap up the initiative and begin addressing the potential actions identified at the summit.

Summit Meeting Background

The East Coast Scenario Planning Summit Meeting, held February 15-16, 2023, was attended by over 50 East Coast fishery managers. Summit participants consisted of representatives from each of the three U.S. East Coast Fishery Management Councils, the Atlantic States Marine Fisheries Commission, and NOAA Fisheries.

The goal of the summit was to develop a set of potential governance and management actions resulting from a scenario-based exploration of the future. During the meeting, participants discussed ideas already generated throughout the process, added new ideas, evaluated them, and identified some practical next steps.

All summit meeting materials, including the agenda, briefing document, supplemental documents, and list of participants, are available at: https://www.mafmc.org/council-events/2023/scenario-planning-summit. The following sections summarize the summit structure, overarching topics of discussion, preliminary outcomes, and next steps.

Summit Agenda

The summit agenda was organized around the following structure:

- Core team members provided an overview of the overarching themes for discussion and questions for summit participants to focus on (see next section).
- Participants were divided into three breakout groups to discuss each theme in a rotation format. These groups generated new ideas and reviewed ideas from previous groups.

- At the end of Day 1, the Core Team facilitators reviewed the notes from the day's breakout-groups and created a non-prioritized list of potential action areas identified throughout the day. The potential actions were shared with all participants at the start of Day 2.
- Participants were asked to prioritize the potential actions using a dot-voting exercise.
- In a plenary session, participants discussed the top prioritized items and their next steps. The dot-voting exercise revealed the potential actions areas that the group felt should be addressed as a matter of priority. This exercise was not meant to eliminate potential actions for further evaluation, but to focus the plenary discussion on practical next steps for the high priority ideas.

Overarching Discussion Themes

The summit discussions focused on **three overarching themes** highlighted by the Councils and Commission during their meetings in November and December 2022:

Theme 1: Cross Jurisdictional Governance. A major goal of this initiative has been to evaluate the current East Coast fishery governance structure and identify potential changes to increase our ability to respond effectively to changing conditions. "Governance" here addresses the structure of power, authority, and responsibility for fisheries and geographic areas. Guiding questions for the summit included:

- What is the best structure and representation for governance on the U.S. East Coast?
- When and how should management authority change?
- How can we improve the efficiency and the efficacy of joint fishery management plans?
- How can we improve coordination and collaboration among management entities?

Theme 2: Managing Under Increased Uncertainty. Environmental changes are leading to changes in the distribution and abundance of marine resources. In some cases, these changes mean that historical conditions can no longer be used to predict the future, increasing our uncertainty around appropriate catch limits and management responses. Guiding questions for the summit included:

- How can we increase flexibility, adaptability, and robustness in management?
- How can we better accommodate uncertainty in the stock assessment process and address related management challenges?
- How can we improve the ability for fishermen and other stakeholders to adapt to climate change?

Theme 2: Data Sources & Partnerships. In building the scenarios there was much consideration of how well science will be able to assess and predict changes in stock production, distributions, and other changing dynamics. This hinges on the ability to produce and evaluate accurate and timely data. Summit discussions focused on how to better coordinate data collection systems and develop partnerships to leverage existing funding. Guiding questions for the summit included:

- How should we prioritize data/information needed to manage in a changing environment?
- How can we use current funding more efficiently?
- How can we better utilize the fishing industry for data collection?
- What are the best ways to foster outside partnerships for sharing data, especially with other ocean users?

Summit Outcomes

During the April Council meeting, staff will summarize some general themes of the summit discussions, and potential areas of action moving forward. A full report of all summit outcomes and list of possible next steps is still in development. In general, the following themes arose from each of the discussions around the three overarching themes:

Cross Jurisdictional Governance

- While there was support for broader governance structure changes, many would require changes to the Magnuson Stevens Act. Many participants expressed an interest in starting with exploring changes within our existing structure that would be beneficial under changing conditions.
- There was substantial support for moving toward more consistency in the governance structure between management regions, particularly more consistency in the use and structure of Committees between the three Councils. This could allow some representation concerns to be addressed in a more meaningful way, and could be accomplished without legislative changes.
- Many participants supported better mechanisms for information exchange between SSCs, particularly when two Councils are working on the same species.
- There was support for identifying ways to improve coordination between NOAA offices within and particularly across regions.
- Other potential actions included reconsideration and clarification of the roles of Council liaisons, the potential to allow Council member proxies, reconsidering Advisory Panel representation, and developing improved agreements for joint management.

Managing Under Increased Uncertainty

- Many participants were supportive of East Coast management bodies improving and better operationalizing their risk policies.
- In addition, many summit participants would like to see increased focus on robust management strategies instead of trying to capture all sources of uncertainty within our models, which may be impossible.
- Some participants felt additional spatial management considerations may be needed for species changing distributions, for example, considering if different approaches are needed at the leading and trailing edges of species distributions.
- Some participants supported developing best practices for including more "if/then" structures in management, with the aim of increasing predictability and nimbleness when quick responses are needed in response to changing conditions.
- Other potential actions include increased use of community vulnerability analyses, streamlining compliance with the National Environmental Policy Act, identifying and removing institutional baggage, and improving the understanding of the permitting landscape across the East Coast.

Data Sources and Partnerships

- There was broad support for more standardization of data collection to break down geographic barriers along the East Coast (both state and federal).
- Many participants wanted to prioritize recreational data collection improvements to reduce uncertainty, including exploring the possibility of developing a recreational study fleet.
- Modernizing data management systems is likely needed to facilitate better data sharing and to prepare for new data streams.
- Other potential actions included survey mitigation efforts for offshore wind areas, exploring artificial intelligence and other technologies to more rapidly process data for assessments, and developing a better process between management and science to prioritize data needs for climate ready management, including human dimensions data.

Next Steps

The core team is currently finalizing two different documents to be reviewed by the Northeast Region Coordinating Council (NRCC) during their May 9-10, 2023 meeting. These documents will include:

- **A summit report.** This report will focus on the proceedings of the summit meeting, including the main ideas identified during breakout and plenary discussions, the top issues prioritized for more in depth discussion, and the immediate next steps identified by summit participants.
- **A draft action plan for** next steps. This document is being developed by the core team to further develop action items identified at the summit, to identify practical next steps for key potential actions identified at the summit.

The draft action plan will also include some general/process recommendations for NRCC discussion, including the question of which group(s) should be responsible for driving continued work on this process and for developing more detailed plans to address the priority issues.

Due to the inter-jurisdictional nature of this initiative, there are a variety of different types of potential actions that were identified for further consideration. Some actions will be appropriate to pursue on an individual Council, Commission, or agency level, while many others would require either informal coordination, formal and structured coordination, or structural governance changes.

The Mid-Atlantic Council will review the final summit report and NRCC recommendations later in 2023, and consider how to incorporate potential actions from this process into their 2024 implementation plan and future strategic plans/implementation plans. The Council will also remain involved in coordinating or participating in any relevant actions or initiatives that require cooperation between multiple entities.

Additional updates will be posted to the scenario planning website as they are available, at: https://www.mafmc.org/climate-change-scenario-planning.

M E M O R A N D U M

Date: March 24, 2023

To: Council

From: Jason Didden

Subject: *Illex* Specifications

At the April 2023 meeting, the Council will review 2023 *Illex* specifications (making modifications if appropriate) and approve 2024-2025 *Illex* specifications. The following materials are included to support Council action:

1. Staff and Monitoring Committee Recommendations
2. Scientific and Statistical Committee (SSC) Report – See Committee Reports Tab
3. Staff ABC Recommendation Memo to Chris Moore
4. Fishery Performance Report
5. Fishery Information Document

M E M O R A N D U M

Date: March 24, 2023

To: Chris Moore

From: Jason Didden

Subject: *Illex* Specifications – Staff and Monitoring Committee Recommendations

Staff recommends no change to the 2023 *Illex* specifications – the Scientific and Statistical Committee endorsed the status-quo 40,000 metric ton (MT) *Illex* Acceptable Biological Catch (ABC) for 2023 and recommended the same for 2024-2025.

Currently, 4.52% of the ABC, or 1,808 MT, is set aside for discards based on historical observations. The Mackerel, Squid, and Butterfish (MSB) Monitoring Committee[1] observed that discards varied from 315 MT to 1,407 MT from 2012-2021 and that these discard estimates may be impacted by lower observer coverage in 2020-2021 due to COVID-19. Noting the two years before COVID-19 (2018-2019) had discards of 1,407 MT and 1,331 MT, and that those were years when the quota was achieved, the Monitoring Committee concluded that the average, <u>1,369 MT, would avoid the specifications being exceeded. As such, they recommended this discard set-aside for future specifications.</u>

No other changes to *Illex* specifications appeared warranted based on the information available to the Monitoring Committee. However, the public noted that the approaches taken by the Council/Monitoring Committee for *Illex* appeared stringent relative to some other fisheries/sectors managed by the Council.

<u>Non-Target Species – Directed *Illex* Fishery (summarized from draft Environmental Assessment for 2023 *Illex* Specifications)</u>

Staff was directed to include available discard information as part of all 2023 specifications processes. Since the Standardized Bycatch Reporting Methodology focuses on **discards of managed stocks** rather than discards in managed fisheries, staff analyses of discards vary fishery by fishery depending on data availability and historical practices. The Environmental Assessment for 2023 *Illex* specifications used discard ratios and recent landings to develop

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[1] Members of the Monitoring Committee attending a short March 23, 2023 webinar meeting included Jason Didden, Chuck Adams, Lisa Hendrickson, Daniel Hocking, and Maria Fenton. Others attending included Alissa Wilson, Greg DiDomenico, Jeff Kaelin, Katie Almeida, and Mary Sabo.

approximate bycatch amounts for various species encountered in the *Illex* fishery. Due to reduced observer coverage in 2020-2022 (from COVID-19), observer data from 2017-2019 were used.

From 2017-2019 there were on average 61 observed trips annually where *Illex* accounted for at least 50% of retained catch, and those trips form the basis of the following analysis. These trips made 1,298 hauls (averaging 7 hauls per trip) of which 93% were observed.

Using the discard ratio data from these observed hauls and recent *Illex* landings, Table 1 approximates annual discards in the directed *Illex* fishery from 2017-2019, for species estimated with catch of at least 10,000 pounds. The method used for the estimates in the table is a custom staff analysis, and is best considered as a relative indicator of discard species that may be affected by the fishery. On the *Illex* trips identified in this analysis, the 2017-2019 overall discard rate was 2%. The amounts of the various species discarded in the *Illex* fishery appear quite small including for the species noted (*) to be overfished or rebuilding or otherwise depleted (Atlantic mackerel, bluefish, and red hake).

Table 1. Incidental Catch and Discards in the *Illex* Squid Fishery.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	Pounds of given species caught per mt Illex Kept	Pounds of given species discarded per mt Illex Kept	Rough Annual Catch (pounds) based on 3-year (2017-2019) average of Illex landings (24,597 mt)	Rough Annual Discards (pounds) based on 3-year (2017-2019) average of Illex landings (24,597 mt)
SQUID, SHORT-FIN	24,472,176	236,856	52%	1%	2,226	22	54,757,008	529,970
SQUID, ATL LONG-FIN	137,434	1,266	0%	1%	13	0	307,510	2,833
DORY, BUCKLER (JOHN)	59,564	15,045	3%	25%	5	1	133,275	33,663
MACKEREL, CHUB	50,659	18,909	4%	37%	5	2	113,349	42,310
BUTTERFISH	41,301	37,276	8%	90%	4	3	92,411	83,406
HAKE, SPOTTED	35,344	32,203	7%	91%	3	3	79,082	72,054
DOGFISH, SMOOTH	19,930	19,892	4%	100%	2	2	44,595	44,508
BEARDFISH	14,033	5,541	1%	39%	1	1	31,398	12,398
HAKE, SILVER (WHITING	9,919	8,168	2%	82%	1	1	22,194	18,275
FISH, NK	8,332	8,310	2%	100%	1	1	18,642	18,595
SEA ROBIN, NORTHERN	8,078	8,078	2%	100%	1	1	18,075	18,075
MACKEREL, ATLANTIC *	7,902	5,374	1%	68%	1	0	17,682	12,024
SCUP	7,774	5,561	1%	72%	1	1	17,395	12,443
SQUID, NK	6,020	6,020	1%	100%	1	1	13,470	13,470
BLUEFISH *	5,052	1,836	0%	36%	0	0	11,303	4,108
MONKFISH (GOOSEFISH)	4,742	2,211	0%	47%	0	0	10,609	4,947
HAKE, RED (LING) *	4,637	4,280	1%	92%	0	0	10,376	9,576

The observer program creates individual animal records for some fish species of interest, mostly larger pelagics and/or elasmobranchs, as well as tagged fish. Non-expanded counts of these individual fish records from the same trips are provided in Table 2 below.

Table 2. Counts of fish in Individual Animal Records on observed *Illex* trips from 2017-2019

COMNAME	count
DOLPHINFISH (MAHI MAH	4
GROUPER, SNOWY	3
MARLIN, WHITE	1
MOLA, NK	4
MOLA, OCEAN SUNFISH	31
MOLA, SHARPTAIL	1
RAY, TORPEDO	37
SHARK, ATL ANGEL	1
SHARK, BASKING	14
SHARK, BLUE (BLUE DOG	1
SHARK, CARCHARHINID,N	4
SHARK, GREENLAND	2
SHARK, HAMMERHEAD, SC	14
SHARK, HAMMERHEAD,NK	7
SHARK, NIGHT	3
SHARK, NK	3
SHARK, SANDBAR (BROWN	48
SHARK, SPINNER	1
SHARK, THRESHER, BIGE	1
SHARK, TIGER	17
STINGRAY, ROUGHTAIL	19
SWORDFISH	108
TUNA, BLUEFIN	1
TUNA, LITTLE (FALSE A	9
TUNA, YELLOWFIN	3
WRECKFISH	1

M E M O R A N D U M

Date: February 27, 2023

To: Chris Moore, Executive Director

From: Jason Didden, staff

Subject: 2023-2025 *Illex* ABCs

Executive Summary

The Council adopted a preliminary Acceptable Biological Catch (ABC) of 40,000 metric tons (MT) for *Illex* for 2023. The plan was to revisit the ABC after the NMFS Northeast Fisheries Science Center (NEFSC) updated relevant analyses (which has occurred and will be available for the SSC).

Additional information on fishery performance and past management measures can be found in the 2023 *Illex* Fishery Information Document created by staff and the 2023 *Illex* Fishery Performance Report developed by the Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP).

The Council will meet in April 2023 to review the recommendations of the AP, the SSC, and the MSB Monitoring Committee, as well as receive input from the public. The Council will then recommend catch and landings limits and other management measures for 2023-2025.

There could be some rationale from the updated NEFSC analyses to support ABC increases. However, considering the relatively high uncertainties involved, staff recommends maintaining a 40,000 MT ABC for 2023-2025.

Current Measures and Review of Prior SSC Recommendations

The directed fishery operates under a limited access permit system (about 75 permits). The open access/incidental permits are limited to 10,000 pounds per trip. The directed limited access fishery does not start with trip limits, but the fishery is slowed with a 10,000-pound trip limit for all permits once 96% of landings are projected to have occurred. Given a 40,000 MT ABC for 2022, 4.52% was set aside for potential discards, and the remaining catch constitutes a landings quota of 38,156 MT.

In March 2022, the SSC established an ABC of 40,000 MT. This ABC was derived from the Council-supported escapement analysis and was associated with an approximately 5% chance of exceeding the ⅔ F:M generic guidance for data poor species. Model results suggested this provides greater than 50% escapement for *Illex* squid. In July 2022 the SSC noted that the Research Track Assessment did not provide any acceptable reference points which the SSC could use to justify any revision of its previous recommendation.

Recent Catch and Landings

Quotas were reached from 2017-2021. In 2022 only 14% of the quota was landed. The Advisory Panel highlighted high diesel prices and a robust inshore 2022 longfin squid fishery as contributing to lower *Illex* landings in 2022 (see Fishery Performance Report).

Stock Status and Biological Reference Points

There are no accepted reference points. The 2022 Research Track Assessment peer reviewers concurred with the *Illex* working group that the *Illex* stock "was lightly fished in 2019." The reviewers noted that "the term 'lightly fished' needs to be interpreted with caution since it has no specific definition relating to sustainable exploitation."

Staff Recommendation

Updated analyses on likely escapement/overfishing suggest a relatively low risk of catches of up to 40,000 MT causing a problem for the *Illex* stock. Depending on one's risk preference there could be some rationale from the updated analyses to support ABC increases. However, given the relatively high uncertainties involved with this stock, staff recommends maintaining the current ABC through 2025 unless the fishery reaches its quota – whereupon the escapement/overfishing analyses should be revisited to consider potential modifications for the next year.

Illex
Fishery Performance Report
February 2023

The Mid-Atlantic Fishery Management Council's (Council) Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP) met via webinar on February 24, 2023 to review the *Illex* squid Fishery Information Document and develop the following Fishery Performance Reports. The primary purpose of the report is to contextualize recent catch history for the Scientific and Statistical Committee (SSC) by providing information about fishing effort, market trends, environmental changes, and other factors. The trigger questions below were posed to the AP to generate discussion, which began by reviewing the separate *Illex* "fishery information document."
The AP comments summarized below are not necessarily consensus or majority statements.

Advisory Panel members present: Eleanor Bochenek, Katie Almeida, Gerry O' Neill, Meghan Lapp, Sam Martin, Dan Farnham Jr, and Greg DiDomenico.

Others present: Jason Didden, Peter Hughes, Carly Bari, Mike Waine, Tom Miller, Alissa Wilson, and Haley Clinton.

Trigger questions:

1. What factors have influenced recent catch (markets, environment, regulations, etc.)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

Illex Squid

Market/Economic Conditions

Freezer boats always fish *Illex* in the summer - 2022 was no different. Freezer boats fished all summer long. Fishing was not as good as recent years but they still caught *Illex*.

Fuel prices were an extreme deterrent to participation in 2022, especially combined with good longfin squid fishing near the beach. AP member conversations with other fishery participants indicated many folks did the math and chose to fish longfin instead, closer in. After the call staff downloaded 2020-2022 No. 2 Diesel prices from the U.S. Energy Information Administration (www.eia.gov) for reference.
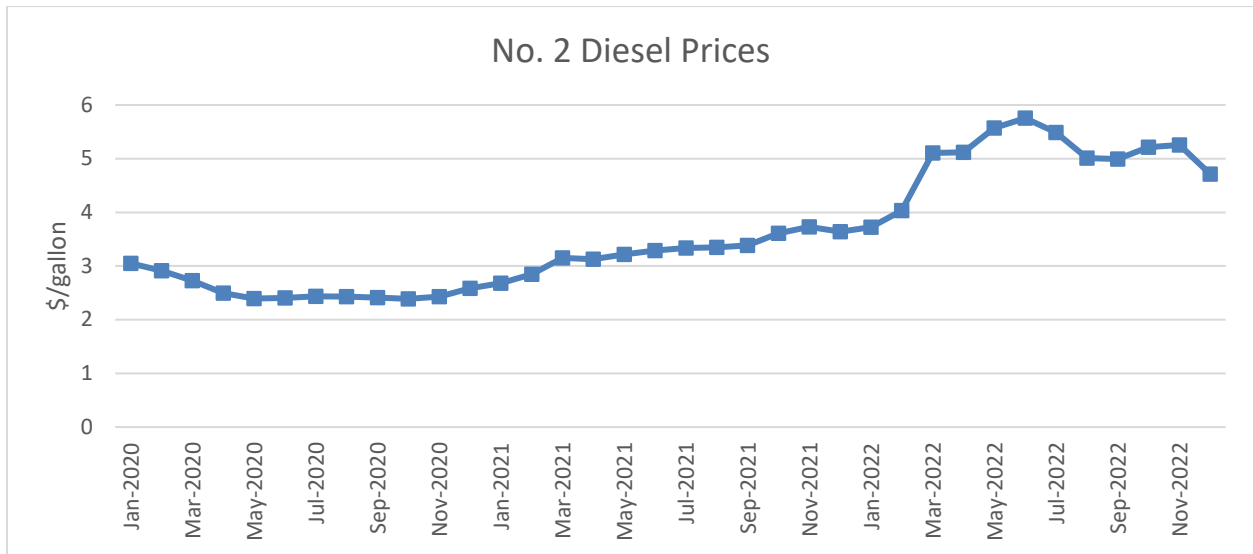
Market conditions/prices specific to *Illex* seemed relatively similar in 2022 as 2021/2020.

U.S. suppliers continue to invest in infrastructure to regularly produce quality product. Steady supply from U.S. producers has helped with marketing – especially focusing on product quality. Think of it in terms of three aspects: efficiency, quality, and speed.

AP notes the potential to also get price increases through season as squid get bigger (higher prices for bigger squid) if fishery stays open.

U.S. *Illex* catches do not drive the price of *Illex* – Argentinian *Illex* and Japanese flying squid affect prices. Argentinian *Illex* are in international waters and the Chinese fleet catches high volumes – the world market dominates price. U.S. landings are a small component. Staff previously noted 2019 FAO catch of Argentine shortfin squid was listed as about 250,000 metric tons.

Environmental Conditions

Gulfstream did not shift inward in 2022 like previous years – An AP member noted an article that Spain has caught our *Illex* species.

For *Illex* we need a shift in thinking versus just "what happened last year." We have good years and bad years. 2022 just demonstrates typical variability – wasn't out of the ordinary.

It is critical to continue to involve fishermen in related work to understand environmental linkages (e.g. the Squid Squad – see https://www.mafmc.org/briefing/february-2023).

Management Issues

Management should consider ways to achieve 100% of the quota if in future years the current closure threshold appears to be unnecessarily constraining.

The availability/abundance of *Illex* should be taken into account when considering closures, as abundance appears to be considered when dealing with potential overages in other fisheries such as black sea bass (e.g. Harvest Control Rule procedures for recreational sector). *Illex* and commercial fisheries in general should not be treated differently than other participants.

Other Issues

The allowance for swordfish retention in the *Illex* fishery was discussed. Increasing the current incidental limits (15/trip) have not been a hot topic recently but there is some interest in revisiting that limit.

Research Priorities

See environmental considerations section above.

Additional Public Input

Staff noted that the Council will be addressing potential follow-up to the disapproved *Illex* permit action at the April 2023 meeting.

Illex Fishery Information Document

February 2023

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for *Illex* squid with an emphasis on 2022. Data sources for Fishery Information Documents include unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit http://www.mafmc.org/msb.

Key Facts

- 2022 saw a return to *Illex* landings volatility – only 14% of the 2022 quota was landed.
- Substantial variability is to be expected with any squid species.
- 2017-2021 were consecutive "boom" *Illex* years and represented a unique sequence in the history of the fishery.
- Average price was 15% higher in 2022 than 2021.
- In March 2023 the Scientific and Statistical Committee (SSC) will review the initial 2023 ABC and set 2024-2025 ABCs.

Basic Biology

Illex is a semi-pelagic/semi-demersal schooling cephalopod species that lives less than one year and is distributed between Newfoundland and the Florida Straits. *Illex* is a semelparous, terminal spawner whereby spawning and death occur within several days of mating. The northern stock component (also highly variable) in NAFO Subareas 3 and 4, is assessed and managed separately by the Northwest Atlantic Fisheries Organization (NAFO). The southern/U.S. stock component is located in NAFO Subareas 5 and 6 between the Gulf of Maine and Cape Hatteras, NC and is managed by the Mid-Atlantic Fishery Management Council (the Council or MAFMC) and NMFS. Additional life history information is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Status of the Stock

The 2021 research track assessment (RTA) was unable to develop a method to resolve stock status, so the stock will officially remain "unknown" with respect to being overfished or overfishing. The RTA Review Panel agreed with the RTA Working Group Report that indications from the various assessment approaches were that the stock was lightly fished in

2019. However, the review report stated that the term "lightly fished" should be interpreted with caution because it has no specific definition relating to sustainable exploitation. After evaluating related analyses, the MAFMC's Scientific and Statistical Committee (SSC) recommended continuing the 2022 40,000 metric ton (MT) *Illex* Acceptable Biological Catch (ABC) to start 2023. In March 2023 the SSC will review updated analyses and may revise their 2023 ABC recommendation

In light of the failure of the assessment to produce accepted reference points to guide ABC setting, the SSC had to rely on an ad-hoc approach to setting a 2023 ABC that would meet the Council's risk policy to avoid overfishing and achieve optimum yield. Alternative quotas were examined with respect to their consequences for risk of exceeding escapement targets ranging from 40% to 50%, as has been used for other squid fisheries. In addition, harvest rates of F=2/3 M (natural mortality) have been used for forage species in various assessments around the world. The methodology allowed the SSC to examine the probability of violating the reference point for various levels of catch limits ranging from 24,000 to 60,000 mt. A 40,000 MT ABC was associated with an approximately 5% chance of exceeding a ⅔ F:M generic guidance for data poor species. Model results suggested a 40,000 MT ABC provided greater than 50% escapement for *Illex* squid, and a catch of 60,000 MT increases the chance of less escapement in some years. Previous SSC review (March 2022) of the analyses allowed them to conclude that:

- Escapement has been relatively high over the last 10 years, suggesting a relatively small impact of the fishery on the component of the stock that is exploited.

- Assumptions regarding parameters that were inputs to the analyses were thought to lead to minimum likely estimates.

- Distributions of the joint estimate of F:M suggests that exploitation rate in the fishery is likely low.

- By comparison to empirical escapement reference points used to manage squid fisheries elsewhere globally, the current ABC levels are associated with low risks of exceeding those escapement standards.

- A 40,000 MT ABC will lead to a low risk of overfishing.

(See reports at https://www.mafmc.org/ssc-meetings/2022/march-15-16 and https://www.mafmc.org/ssc-meetings/2022/july-25-26)

Management System and Fishery Performance

Management

The Council established management of *Illex* in 1978 and the management unit includes all federal East Coast waters.

Access is limited with moratorium permits. Trip limits are triggered when the quota is approached. Incidental permits are limited to 10,000 pounds per trip. Additional summary regulatory information is available at https://www.fisheries.noaa.gov/new-england-mid-atlantic/resources-fishing/resources-fishing-greater-atlantic-region. A 2020 action to reduce *Illex* permits given overcapitalization in the fishery was disapproved:

The current quota is 38,192 MT, based on a 40,000 MT Acceptable Biological Catch (ABC) and a 4.52% discard rate (the mean plus one standard deviation of the most recent 10 years of observed discard rates in the previous assessment). Recent SBRM discard rates have been similar, though are not based on calendar years. 2017-2019 discards in the RTA were also a similar portion of total catch. The fishery closes when 96% of the quota is projected to be landed. In 2021 the fishery closed effective August 30, 2021 – there was not a closure in 2022 as only about 14% of the quota was landed.

Recreational catch of *Illex* is believed to be negligible. There are no recreational regulations except for party/charter vessel permits and reporting.

Commercial Fishery

Almost all 2022 landings were with bottom trawl gear. Figure 1, from a previous Science Center data update, describes *Illex* catch 1963-2021 and highlights the early foreign fishery and then domestication of the fishery. Figures 2-3 describe domestic landings, ex-vessel revenues, and prices (inflation adjusted) since 1996. Figure 4 illustrates preliminary weekly 2021 (yellow-orange) and 2022 (blue) landings through the year. Trends in the fall NEFSC trawl index are illustrated in Figure 5 (value was slightly above the median in the terminal year (2022)).

Most *Illex* landings occur in RI, NJ, and MA but further breakdown may violate data confidentiality rules (in spirit if not to the letter). Table 3 provides preliminary information on *Illex* landings by statistical area for 2022. Table 4 describes vessel participation over time.

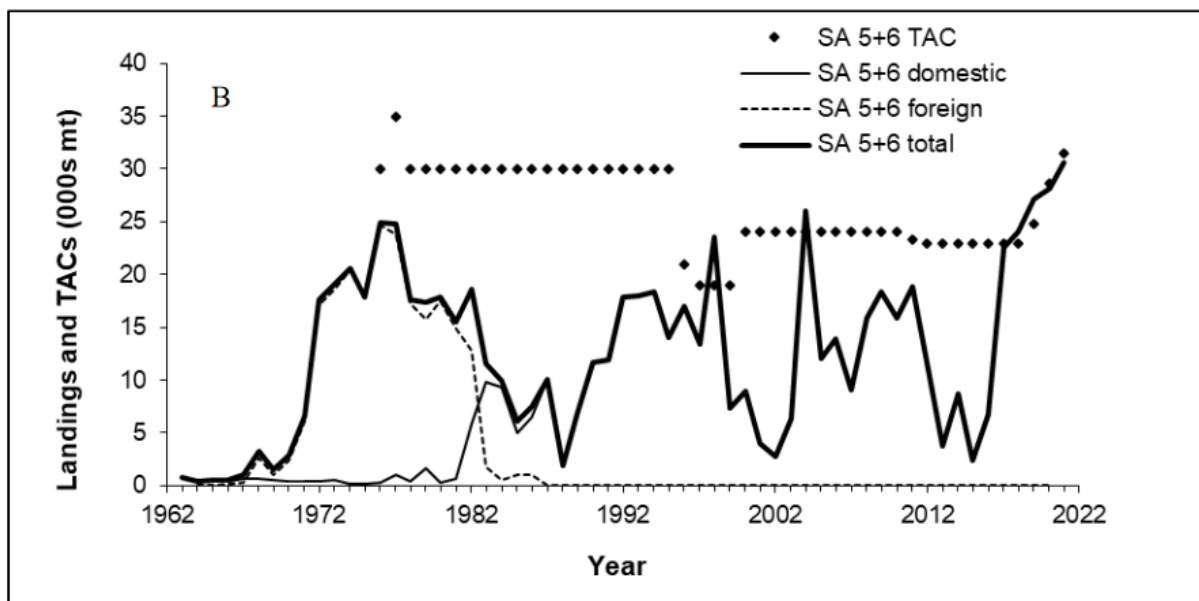The Gross Domestic Product Implicit Price Deflator was used to report revenues/prices as "2022 dollars."

Figure 1. Total annual *Illex* landings (mt) by the U.S. and other countries for 1963-2021. Sources: NEFSC *Illex* Data update, available at https://www.mafmc.org/ssc-meetings/2022/july-25-26.
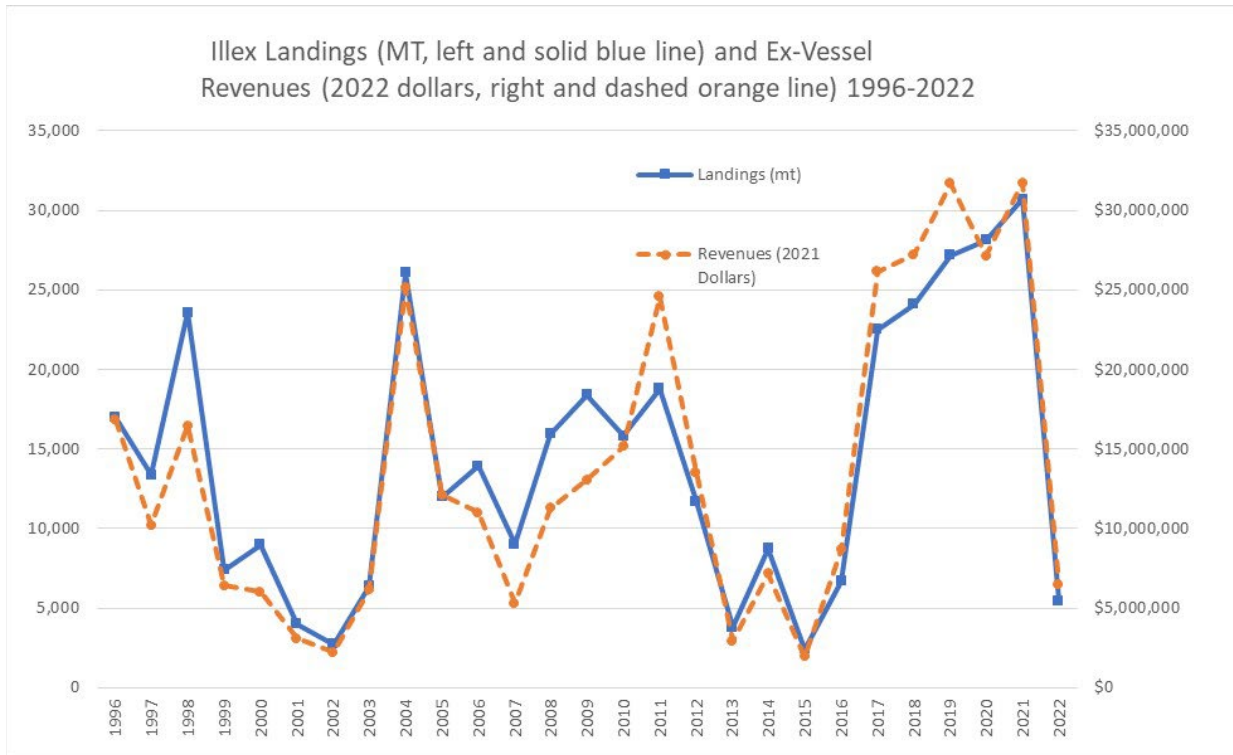
Figure 2. U.S. *Illex* Landings and Ex-Vessel Values 1996-2022. Source: NMFS unpublished dealer data.
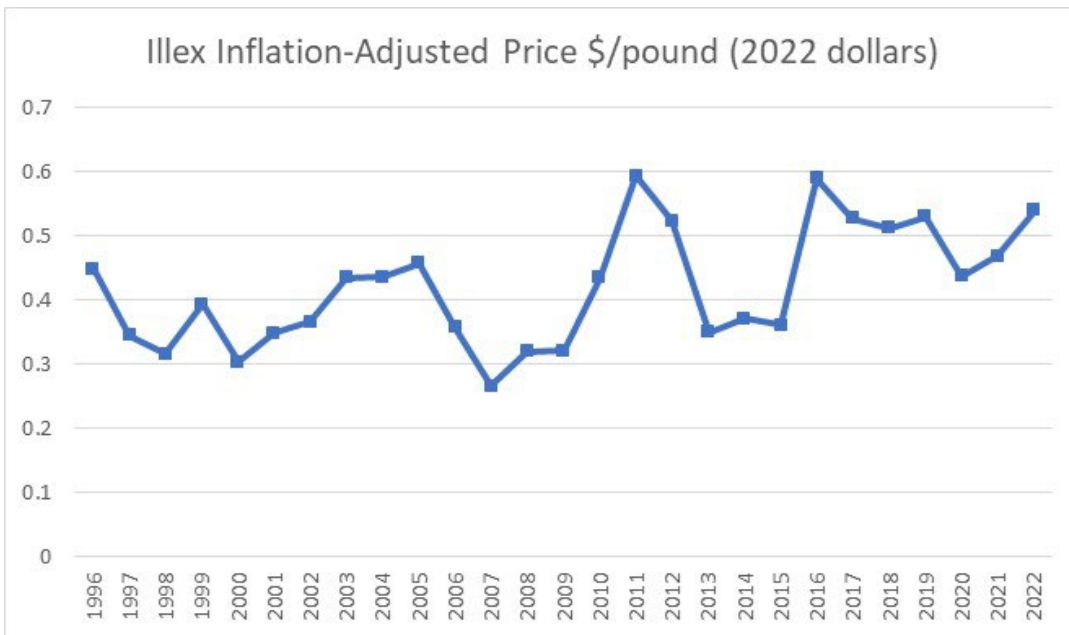

Figure 3. Ex-Vessel *Illex* Prices 1996-2022 Adjusted to 2022 Dollars Source: NMFS unpublished dealer data.
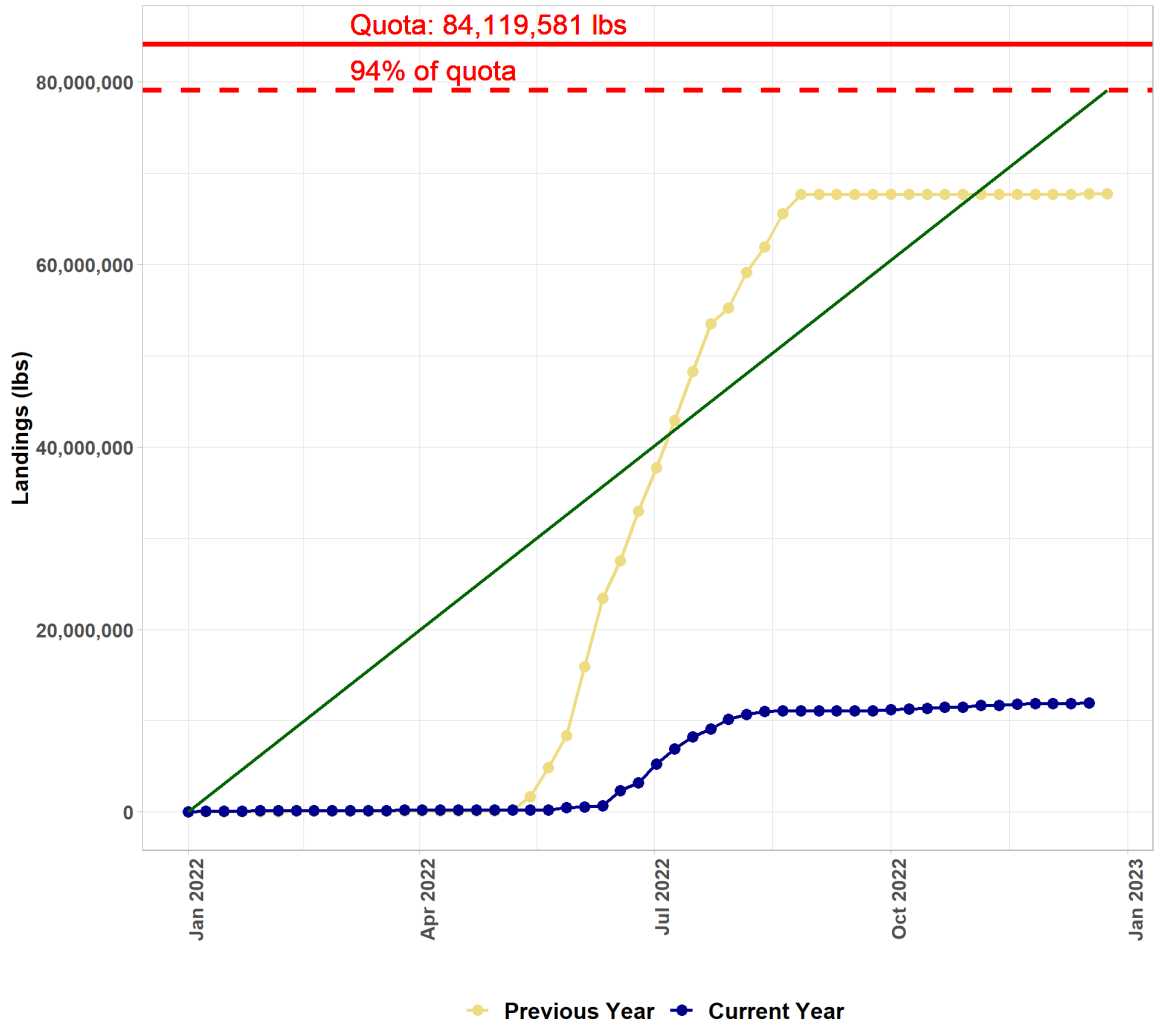
Figure 4. U.S. Preliminary *Illex* landings; 2022 ("current') in blue, 2021 in yellow-orange ("previous"). Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region

Table 1. Commercial *Illex* landings by statistical area in 2022. Source: NMFS unpublished VTR data.

Stat Area	MT
537	94
616	347
622	3,198
623	421
626	859
632	323
Other	168
Total	5,410

Table 2. Vessel participation over time in the *Illex* Fishery based on annual landings (pounds)

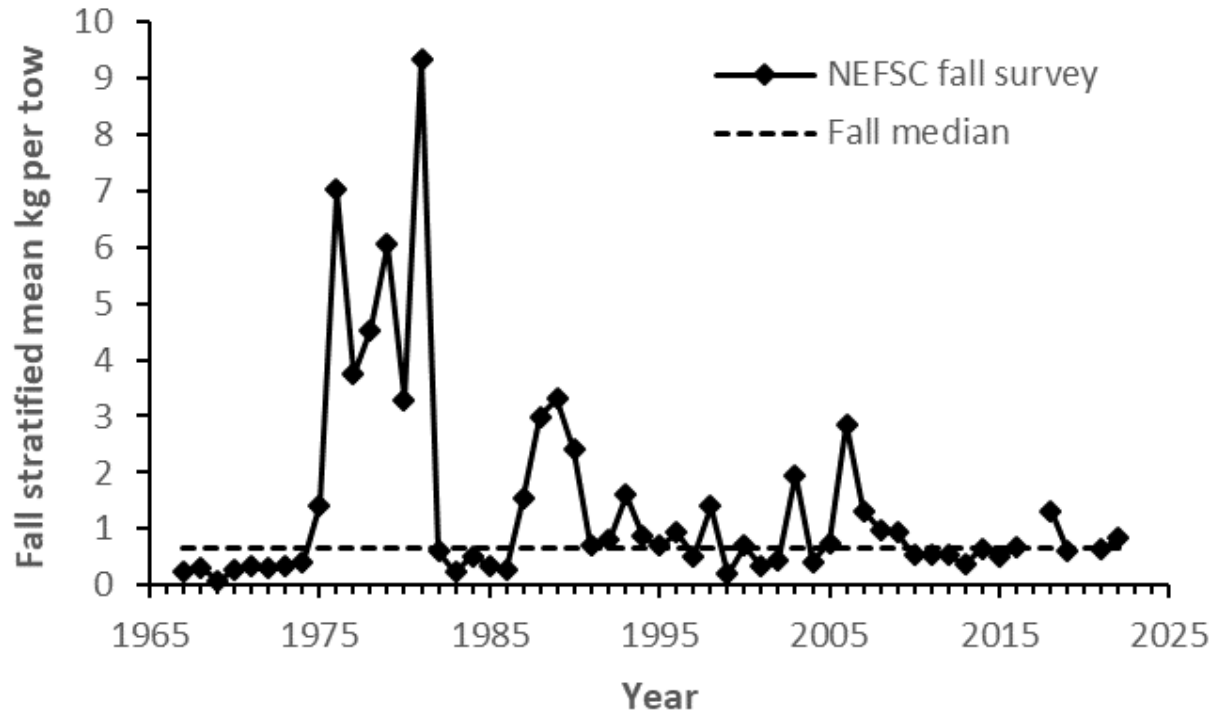| YEAR	Vessels 500,000+	Vessels 100,000 - 500,000	Vessels 50,000 - 100,000	Vessels 10,000 - 50,000	Total
1982	7	7	0	10	24
1983	1	8	7	11	27
1984	4	15	4	6	29
1985	2	6	4	3	15
1986	8	6	4	3	21
1987	7	10	2	1	20
1988	3	3	1	2	9
1989	8	5	1	3	17
1990	12	3	0	1	16
1991	12	1	1	0	14
1992	16	1	0	1	18
1993	19	3	1	3	26
1994	21	7	5	8	41
1995	24	5	2	7	38
1996	24	5	6	4	39
1997	13	9	2	0	24
1998	25	4	1	3	33
1999	6	9	2	10	27
2000	7	7	0	2	16
2001	3	4	1	2	10
2002	2	3	1	1	7
2003	5	6	1	2	14
2004	23	5	2	0	30
2005	10	10	2	2	24
2006	9	8	1	2	20
2007	8	2	1	0	11
2008	12	5	0	0	17
2009	10	3	1	1	15
2010	13	5	0	4	22
2011	17	4	2	0	23
2012	8	3	2	2	15
2013	5	4	3	5	17
2014	5	3	2	2	12
2015	3	0	1	1	5
2016	4	3	3	2	12
2017	14	6	0	0	20
2018	19	7	0	5	31
2019	26	6	0	3	35
2020	25	4	2	1	32
2021	23	8	0	2	33
2022	7	3	3	7	20

Figure 5. Fall NEFSC Trawl Survey Indices (Bigelow data (since 2009) has been converted to Albatross units based on calibration factors – see Miller et al 2010 - https://repository.library.noaa.gov/view/noaa/3726.)

2017 (vessel issue) and 2020 (Covid) are missing.

THIS IS THE END OF THE DOCUMENT

M E M O R A N D U M

Date: March 18, 2023

To: Council

From: Jason Didden, staff

Subject: *Illex* Permits/Capacity: April 2023 Agenda

The Council will consider follow-up actions to the disapproval of the *Illex* Permit Amendment. Please find enclosed the following supporting documents.

1. Staff Recommendation Memo
2. November 2022 Joint Committee/Advisory Panel Summary
3. NMFS Response to Council regarding disapproval clarifications
4. Council request for disapproval clarifications
5. NMFS disapproval letter

M E M O R A N D U M

Date: March 17, 2023

To: Chris Moore

From: Jason Didden, staff

Subject: *Illex* Permits/Capacity: next steps

Based on staff's understanding of the intent of previous Council action, NMFS' disapproval of the *Illex* Permit Amendment, and subsequent communications with NMFS (enclosed), staff recommends that the Council initiate a Framework Adjustment to the Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan. The Framework would consider implementing a volumetric vessel hold baseline requirement and upgrade restriction for all *Illex* limited access permits. A similar volumetric requirement is in place for the directed mackerel fishery (see below), and most regional limited access programs have baselines to control increases in fishing power/capacity (generally horsepower and length).

Overcapacity is a common characteristic of most fisheries except those managed with tradable quota systems (variously known as ITQ[1]s (e.g. surfclam/ocean quahog), IFQ[2]s (e.g. golden tilefish), and/or catch shares). Staff notes that public perspectives on capacity in the *Illex* fishery have been consistently diverse starting from the early 2019 scoping of the *Illex* Permit Amendment through to the November 2022 Joint MSB Committee/Advisory Panel (AP) Meeting (summary enclosed). Comments have ranged from taking no action at all, to measures that would reduce the existing overcapacity by eliminating some existing limited access permits (overcapacity was indicated by NMFS' Northeast Fisheries Science Center staff analyses as part of the *Illex* Permit Amendment).

If the Council decides to initiate this Framework, staff would schedule a Committee/AP meeting to develop alternatives, and bring those alternatives to the Council for Framework Meeting #1 (likely June or August 2023). Any refinements would be addressed, and brought to the Committee/AP for recommendations before a final decision at Framework Meeting #2 (likely October or December 2023).

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[1] ITQ = Individual Transferable Quota
[2] IFQ = Individual Fishing Quota

Mackerel Fish Hold Regulations Overview

Summary: Primary limited access directed mackerel permits must get a fish hold certification and have a 10% upgrade restriction. If a permit was in CPH (not active but has a "Confirmation of Permit History) then the first/next vessel must get a hold certification.

Rationale: The rationale/goal for baselines as described in the 1998 Consistency Amendment developed by NMFS was "capping fishing power." This aligns with issues mentioned in several national standards guidelines, especially #5 Efficiency: "Efficiency. In theory, an efficient fishery would harvest the OY with the minimum use of economic inputs such as labor, capital, interest, and fuel. Efficiency in terms of aggregate costs then becomes a conservation objective, where "conservation" constitutes wise use of all resources involved in the fishery, not just fish stocks." So capping additional vessel fishing power ("capital") to catch Optimum Yield (OY) becomes a conservation objective because the "wise use of all resources" is being addressed.

50 CFR 648.4(a)(5)(iii)

(H) - Vessel baseline specification.

(1)   In addition to the baseline specifications specified in paragraph (a)(1)(i)(H) of this section, the volumetric fish hold capacity of a vessel at the time it was initially issued a Tier 1 or Tier 2 limited access Atlantic mackerel permit will be considered a baseline specification. The fish hold capacity measurement must be certified by one of the following qualified individuals or entities: An individual credentialed as a Certified Marine Surveyor with a fishing specialty by the National Association of Marine Surveyors (NAMS); an individual credentialed as an Accredited Marine Surveyor with a fishing specialty by the Society of Accredited Marine Surveyors (SAMS); employees or agents of a classification society approved by the Coast Guard pursuant to 46 U.S.C. 3316(c); the Maine State Sealer of Weights and Measures; a professionally-licensed and/or registered Marine Engineer; or a Naval Architect with a professional engineer license. The fish hold capacity measurement submitted to NMFS as required in this paragraph (a)(5)(iii)(H)(1) must include a signed certification by the individual or entity that completed the measurement, specifying how they meet the definition of a qualified individual or entity.

(2)   [this mostly addressed other baselines when mackerel limited access was initiated, but then for the hold measurement noted: "The hold capacity baseline for such" [confirmation of permit history – CPH]] "vessels will be the hold capacity of the first replacement vessel after the permits are removed from CPH. Hold capacity for the replacement vessel must be measured pursuant to paragraph (a)(5)(iii)(H)(1) of this section.

(I)   Upgraded vessel. See paragraph (a)(1)(i)(F) of this section. In addition, for Tier 1 and Tier 2 limited access Atlantic mackerel permits, the replacement vessel's volumetric fish hold capacity may not exceed by more than 10 percent the volumetric fish hold capacity of the vessel's baseline specifications. The modified fish hold, or the fish hold of the replacement vessel, must be resurveyed by a surveyor (accredited as in paragraph (a)(5)(iii)(H) of this section) unless the replacement vessel already had an appropriate certification.

Mackerel, Squid, and Butterfish Committee and Advisory Panel Joint Meeting Summary

November 16, 2022 Webinar

The Mid-Atlantic Fishery Management Council's (Council) Mackerel, Squid, and Butterfish (MSB) Committee and Advisory Panel (AP) met jointly on November 16, 2022 at 9am. The purpose of this meeting was to discuss potential follow-up regarding the disapproved *Illex* Permit Amendment.

MSB Committee Attendees: Peter Hughes (Chair), Sara Winslow (Vice-Chair), Melanie Griffin, Dan Farnham, Emily Gilbert, Adam Nowalsky, Michelle Duval, Eric Reid, and Joe Cimino,

MSB AP Attendees: Dan Farnham Jr, Drew Minkiewicz, Emerson Hasbrouck, Fred Akers, Gerry O' Neill, Greg DiDomenico, Jeff Kaelin, Katie Almeida, Meghan Lapp, Pam Lyons Gromen, Robert Ruhle, Sam Martin,

Other Attendees: Jason Didden (MAFMC Staff), John Almeida, Alan Bianchi, Alissa Wilson, Carly Bari, Drew Minkiewicz, Maria Fenton, Michael Luisi, Mike Roderick, Ryan Clark, Sarah Bland, Wes Townsend

Jason Didden of Council staff provided an overview of NMFS' disapproval rationale as well as staff input that an individual transferrable quota (ITQ) system may be the most direct way to address excess capacity and the race to fish. The efficiency gains that are a component of ITQs could also address a number of the issues identified by NMFS in their disapproval rationale.

AP perspectives varied and recommendations included: re-submit after further clarifying how the Amendment addresses the issues identified by NMFS; request further detail on NMFS' disapproval rationales; take no further action; ask NMFS what actions are possible to freeze the capacity footprint of the fishery; consider other actions (e.g. a new control date, a separate fish hold alternative, or a fishery start date). There was no support for moving forward with an ITQ.

The Committee discussed the pros and cons of moving forward, and also whether the issues intended to be addressed by the action (excess capacity and rapid use of quota) still apply given recent quota increases and the fishery landing only a small portion of the quota in 2022. NMFS reiterated that any management measures need to link to corresponding purposes and needs, and must also align with the fishery management plan's goals and objectives, as well as relevant National Standards per the Magnuson–Stevens Fishery Conservation and Management Act.

(Committee motions are on next page)

The Committee passed the following motions:

I move that the Committee recommend that the Council request a more detailed explanation of the amendment rejection in terms of all 10 national standards and what NMFS recommends for future amendment development. Reid/Cimino, 7-0-1

I move that the Committee recommend that the Council explore options/requirements for a framework or amendment to implement a fish hold measurement and baseline limitation for the *Illex* fishery. Farnham/Duval 7-0-1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

March 8, 2023

Dr. Christopher Moore
Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street
Suite 201
Dover, DE 19901

Dear Chris:

On September 6, 2022, we disapproved the majority of the measures proposed in Amendment 22 to the Mackerel, Squid, and Butterfish Fishery Management Plan. In the decision letter to the Council, dated September 6, 2022, I provided details on the basis for that determination. The September letter fully described how the action did not meet the purpose and need of the Amendment and was inconsistent with National Standards 4, 5, 6, and 7; there is no further detail I can offer beyond what was specified in that letter. I did not address the other National Standards because our review did not identify any inconsistencies with them.

The Council has requested more information on how the *Illex* permit measures in Amendment 22 differ from the longfin squid measures that were approved in Amendment 20. As you recall, Amendment 20 revised the longfin squid permits, reduced excessive longfin squid catch during Trimester II, and minimized impacts to spawning aggregations and associated egg mops. The three main differences between the measures in Amendment 22 and Amendment 20 are: (1) Amendment 20 included conservation elements important to the target stock; (2) the possession reductions made in the new longfin squid tiered permits (particularly Tier 2 and Tier 3) were moderate relative to the catch that vessels receiving Tier 2 and 3 permits had previously landed, and these changes were less impactful overall to fishery participants than the proposed provision in Amendment 22; and (3) the permit qualification criteria specified in Amendment 20 were substantially lower than proposed in Amendment 22.

I'd like to focus on two specific areas where the amendments stand in stark contrast. First, the qualification criteria in Amendment 20 allowed any vessel with at least 10,000 lb of longfin squid landings from 1997-2013 to qualify for the highest Tier 1 permit. In contrast, Amendment 22 proposed minimum *Illex* qualification criteria of 500,000 lb for Tier 1, 100,000 lb for Tier 2, and 50,000 lb for Tier 3. As such, a vessel with similar *Illex* landings to longfin landings could have qualified for a Tier 1 longfin squid permit but would have been relegated to an "incidental" permit for *Illex*. Amendment 22 did not establish a rational basis for such a significant difference. Second, the stock conditions and resulting quotas were markedly different at the time that we made our decisions on these two amendments. In 2018, when we made the decision to approve Amendment 20, the longfin squid quota had remained relatively constant at approximately 49 million lb from 2013 (the last year to qualify for a Tier 1 permit) to 2018 (notably, in the years since we approved Amendment 20, the quota has remained constant at roughly 50 million lb). In contrast, while the *Illex* quota remained similarly flat at 50 million lb

from 2013 to 2018, between 2018 and 2022 when we made our decision regarding Amendment 22, the quota had increased each year, reaching a peak of 84 million lb, a 67-percent increase. Amendment 22 did not establish a rational basis to conclude that the proposed capacity reductions were still warranted and necessary in the face of increasing quotas.

One final point of difference between the two amendments is the span of time between the qualification time period used and the time at which the Council, and later NOAA's National Marine Fisheries Service, made our decisions on these amendments. Both amendments based permit requalification on the same timespan of 1997-2013, but while we approved Amendment 20 in 2018, it was another four years before we considered Amendment 22, nearly doubling the time between the end of the proposed qualification time period and the decision. Also, although not directly relevant to our approval/disapproval decisions, the public's reactions to and perspectives on the two amendments also differed substantially. Not only was the fishing industry much more split on the *Illex* permit issue, during the comment period for Amendment 22 we received a substantial number of letters, the majority of which opposed the amendment. In contrast, we received no public comments opposing the longfin squid permit revision measures when we were considering Amendment 20.

Should the Council wish to pursue development of an action to require measurement and/or restrictions on vessel hold capacity for the *Illex* fishery as was done for the mackerel fishery, we will continue to participate and engage with the Council as needed. Please reach out to Emily Gilbert, Acting Assistant Regional Administrator for Sustainable Fisheries, if you have further questions.

Sincerely,

Michael Pentony
Regional Administrator

cc: Michael Luisi, Council Chair, Mid-Atlantic Fishery Management Council
    Peter Hughes, Mackerel, Squid, and Butterfish Committee Chair

January 18, 2023

Mr. Michael Pentony
Regional Administrator
National Marine Fisheries Service
Greater Atlantic Region
55 Great Republic Drive
Gloucester, MA 01930

Dear Mr. Pentony:

At the December 2022 Council meeting, the Council discussed NMFS' disapproval of most of the provisions in Amendment 22 to the Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) and passed the following motion:

> That the Council request a more detailed explanation of the Amendment 22 decision relative to all 10 National Standards and MSB Amendment 20's approval (longfin squid permits) and what NMFS recommends for future Amendment development on fish hold provisions and consideration of historic participants with limited flexibility to pursue other fisheries.

The Council continues to believe that Amendment 22 effectively addressed the FMP's goals/objectives and complied with the National Standards. We also note that the disapproved *Illex* squid permit measures are substantially similar to the longfin squid permit measures contained in Amendment 20, which was approved by NMFS and implemented several years ago. Per the Council motion above, please provide additional detail regarding the National Standards as they relate to your disapproval, including an explanation of how the disapproved *Illex* permit measures in Amendment 22 differ from the longfin squid measures in Amendment 20.

Also, given that the capacity estimates in Amendment 22 indicate that a "race to fish" is likely to occur in the future when *Illex* availability/abundance is high, please provide recommendations on suitable measures to address the needs of those historic participants in the *Illex* fishery who have limited flexibility to pursue other fisheries. These could include fish hold upgrade limitations and/or other measures that you consider approvable.

Please contact me with any questions.

Sincerely,

Christopher M. Moore, Ph.D.
Executive Director, Mid-Atlantic Fishery Management Council

CC: M. Luisi, J. Didden, P. Hughes

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

September 6, 2022

Mr. Michael Luisi
Council Chair
Mid-Atlantic Fishery Management Council
800 North State Street
Suite 201
Dover, DE 19901

Dear Mike:

By this letter, I am disapproving the majority of the provisions in Amendment 22 to the Mackerel, Squid, and Butterfish Fishery Management Plan (FMP). As you know, Amendment 22 intended to revise the number and types of *Illex* squid permits to reduce the negative effects from a race to fish in recent years. This amendment also intended to align the fishery goals and objectives with current Mid-Atlantic Fishery Management Council vision and priorities. I am disapproving the *Illex* permit measures in the amendment, but will be approving the adjusted FMP goals and objectives in a future *Federal Register* notice. Additionally, we intend to make the Council's recommended clarification that *Illex* squid moratorium permits must report daily catch via the vessel monitoring system on *Illex* squid trips in a future action pursuant to our rulemaking authority under section 305(d) of the Magnuson-Stevens Fishery Conservation and Management Act.

The Council adopted Amendment 22 for Secretarial review and implementation at its July 2020 meeting. In undertaking this review, section 304(a)(1) of the Magnuson-Stevens Act requires the Secretary of Commerce to make a determination as to whether Amendment 22 is consistent with the Magnuson-Stevens Act and other applicable laws and publish a notice of availability for the amendment in the *Federal Register*. Section 304(a)(2) of the Magnuson-Stevens Act requires the Secretary to take into account the information, views, and comments received on the amendment from interested parties when making a decision to approve, disapprove, or partially approve a Council amendment.

We published a Notice of Availability for Amendment 22 on June 7, 2022 (87 FR 34629), and accepted public comments on the amendment through August 8, 2022. We received 54 comments from commercial fishermen and fishing organizations. Of these comments, 22 were in support of the amendment, 31 comments were in opposition to the action, and 1 comment was not applicable. The *Illex* squid fishing industry participants continue to be split in their support of this action because only some of the industry participants would have benefitted from this action, while other industry participants would have borne the costs.

Our review of Amendment 22 determined the amendment and supporting analyses do not demonstrate how the Council's proposed action (1) meets the purpose and need of the Amendment and the goals and objectives of the FMP; (2) is consistent with National Standard 4 of the Magnuson-Stevens Act, which requires fishery conservation and management measures

allocate fishing privileges fairly and equitably; (3) is consistent with National Standard 5 of the Magnuson-Stevens Act, which requires fishery conservation and management measures consider efficiency in the utilization of fishery resources; (4) is consistent with National Standard 6 of the Magnuson-Stevens Act, which requires fishery conservation and management measures take into account variations and contingencies in a fishery; or (5) is consistent with National Standard 7 of the Magnuson-Stevens Act, which requires fishery conservation and management measures minimizes costs to the extent practicable.

Allocations

National Standard 4 of the Magnuson-Stevens Act requires Councils to assess the effects of allocating or assigning fishing privileges among various United States fishermen to ensure such allocation is: (A) Fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

As stated above, allocations should be reasonably calculated to promote conservation; however, there is no known conservation issue with the *Illex* squid stock (for which the Council's Scientific and Statistical Committee (SSC) has provided evidence concluding that the stock is lightly exploited and the current fishery footprint is small relative to the fishery potential). Because the stock is lightly exploited, the SSC has recommended increases in the *Illex* squid acceptable biological catch (ABC) in each of the past three years and the quota has increased by 67 percent since Amendment 22 was initiated. When development of this action began in 2018, the *Illex* squid ABC was 24,000 mt, and the 2022 *Illex* squid ABC was recently increased to 40,000 mt (87 FR 48447).

The Council has previously expressed concerns with quota overages; however, we have existing controls in place to address these concerns. The *Illex* squid quota was exceeded in 2018 and 2019, but since then we have been tracking landings closely and using more sophisticated projection models that enable us to close the fishery at Council-prescribed closure thresholds at the appropriate time. These were the only 2 years that the quota was exceeded in the past 11 years, and we have avoided quota overages in 2020 and 2021, despite significant increases in landings to take advantage of increasing quotas.

Efficiency

National Standard 5 requires Councils to consider efficiency in the utilization of fishery resources, as long as no such measure has economic allocation as its sole purpose.

According to the National Standard Guidelines at 50 CFR 600.330(c), a system used for limiting access may be considered to combat overfishing, overcrowding, or overcapitalization in the fishery to achieve OY, or may be appropriate for an underutilized fishery to reduce the chance that these conditions will adversely affect the fishery in the future, or to provide adequate economic return to pioneers in a new fishery. None of these conditions apply to the *Illex* squid fishery as the fishery has not encountered issues in achieving OY in recent years, we have sufficient controls in place, as well as 25 years of experience under the existing limited access program that has functioned well. In fact, it has only been in the last six years (after the proposed cutoff of 2013) that the fishery has consistently approached and achieved full yield.

Additionally, the Guidelines at § 600.330(e), state that National Standard 5 prohibits those measures that distribute fishery resources among fishermen on the basis of economic factors alone, and that have economic allocation as their only purpose. While the Council contends that the measures included in Amendment 22 are proposed as a way to combat a race to fish, as discussed above, this action does not reduce fishing capacity in a manner that removes potential for a race to fish, and throughout the development of this action public testimony from proponents of the action focused almost entirely on economic allocation, an infringement of National Standard 5.

Variations and Contingencies
National Standard 6 requires Councils to take into account and allow for variation among, and contingencies in, fisheries, fishery resources, and catches.

The *Illex* squid fishery currently operates with 75 limited access vessels that have an unlimited possession limit (all of which qualified under the original limited access program based on fishing history prior to 1997). The proposed action would reduce that to 39 vessels with unlimited possession limits, reducing fishing opportunity for the remaining 36 vessels by imposing fishing limits that could lead to substantial inefficiencies in their fishing operations. Absent any conservation need or other rationale supported by the evidence, to further reduce opportunities for permitted vessels to participate in the *Illex* squid fishery would be contrary to the intent of National Standard 6. Given the unknown and uncertain impacts of climate change on fish stocks in the region, the potential impacts of wind energy development on the squid fishery to conduct operations, and shifting and evolving markets, any reduction in flexibility in the *Illex* squid fishery could have detrimental effects. By consolidating the majority of harvest opportunities into fewer vessels and fishing companies, we would potentially be increasing the risk that the fishery could fail to effectively adapt to changing conditions and continue to achieve OY.

Minimizing Costs
National Standard 7 requires Councils to minimize costs and avoid unnecessary duplication in the development of management measures where practicable.

The economic analysis for Amendment 22 asserts that the proposed action would have resulted in negligible impacts for those vessels that would be reduced to a Tier 3 permit because those vessels do not regularly derive a substantial portion of their revenues from *Illex* squid, with the exception of one vessel in 2019. The vessels that would be reduced to Tier 2 permits would have experienced greater negative economic impacts because they would have been constrained by trip limits and face greater operational and competitive inefficiencies. The vessels that would have retained their unlimited (Tier 1) permits would have been expected to benefit from positive economic impacts because they would have access to a greater amount of the quota with unconstrained fishing opportunity. Therefore, the Council's analysis reached a conclusion that the overall economic impacts for this action would be slightly positive because the increased fishing and revenue opportunities provided to the Tier 1 vessels would cancel out the decreased fishing and revenue opportunities placed on the Tier 2 (and to some extent Tier 3) vessels. However, in terms of costs and benefits, 36 of the 75 permit holders would have face reduced

opportunities and therefore would have borne the costs of the action, but the benefit to the overall community was lacking because the proposed action would have still allowed for a race to fish to persist.

The National Standard 7 Guidelines at § 600.340(c)(1) also direct that "management measures should be designed to give fishermen the greatest possible freedom of action in conducting business … that are consistent with ensuring wise use of the resources and reducing conflict in the fishery." Reducing fishing opportunities for almost half of the *Illex* squid fleet when not necessary for conservation, not solving the perceived race to fish, and reducing flexibility through restrictive possession limits was determined to be directly contrary to the intent of National Standard 7.

Conclusion
If a Council FMP or amendment is disapproved based on inconsistencies with the Magnuson-Stevens Act or other applicable laws, section 304(a)(3) of the Magnuson-Stevens Act requires the Secretary to recommend actions the Council could take to conform the amendment to the relevant legal requirements. Section 304(a)(4) provides Councils the opportunity to revise and resubmit amendments for Secretarial review after addressing the relevant legal requirements. As discussed above, to conform Amendment 22 to the requirements of applicable law, the Council must either substantially revise the amendment to clearly articulate how the actions proposed by the Council are consistent with the National Standards and the goals and objectives of the FMP, or reconsider the proposed action and revise the amendment to adopt different measures that address a management need without violating the National Standards. However, given the fundamental flaws and inconsistencies we identified, we suggest the latter approach would be more likely to be successful.

We recognize this action represents a difficult decision for the Council. Since development, there have been proponents and opponents of this action and they have presented compelling arguments for and against the final measures. Council staff, in particular, did an admirable job in presenting the facts and supporting the Council through its deliberations on this challenging action. It is unfortunate that we find ourselves with this outcome, but my staff and I remain able and willing to work with the Council should it wish to reconsider this action.

Sincerely,

Michael Pentony
Regional Administrator

cc: Dr. Christopher Moore, Executive Director, Mid-Atlantic Fishery Management Council

Mid-Atlantic Fishery Management Council

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 23, 2023

To: Council

From: Jessica Coakley, Staff

Subject: Habitat Activities Update

The Council will receive a presentation from the NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO) Habitat and Ecosystem Services Division (HESD) on activities of interest in the region.

Back in December 2015, when the Council initially adopted its habitat policies on fishing and non-fishing activities (https://www.mafmc.org/habitat), the Council also asked GARFO HESD to provide the Council with updates on projects of concern that are occurring throughout the region. Since there are numerous projects in the region each year, the Council identified its projects of concern to include: 1) All offshore projects (e.g., energy projects, cables, sand mining, etc.), and 2) Only large scale nearshore/estuarine projects (i.e., includes any large transportation and port development projects). In addition, the Council requested periodic written and/or verbal updates on projects of concern including other habitat activities of interest occurring at least biannually, if possible.

During this April presentation, GARFO HESD staff will highlight activities including aquaculture, offshore wind activities, and coastal storm risk management activities underway in the Greater Atlantic Region. They will also provide a brief update on some of NOAA's activities associated with the Bipartisan Infrastructure Law and the results of their scenario planning exercise on the Susquehanna River where state and federal agencies are seeking ways to balance the passage of anadromous fish over four dams with the prevention of the expansion of aquatic invasive species such as the northern snakehead.

M E M O R A N D U M

Date: March 24, 2023

To: Council

From: Jason Didden

Subject: Ocean City Video Boat Count Project Results

The Council will review the results of the project that counted boats going through the Ocean City, Maryland ocean inlet, which is an observation point for all of Maryland's ocean recreational fishing effort. The goal of the project was to evaluate the practicability of using such an approach for estimating Maryland's ocean fishing effort and to make preliminary comparisons with estimates calculated by the Marine Recreational Information Program (MRIP). A memo summarizing the project for the Council's Scientific and Statistical Committee is included in this tab, and another memo with additional results from the project will be posted as supplementary material on the Council's website by March 31, 2023.

Mid-Atlantic Fishery Management Council

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M E M O R A N D U M

Date: March 7, 2023

To: Chris Moore

From: Jason Didden, staff

Subject: Ocean City, MD Video Project Summary for Scientific and Statistical Committee (SSC)

This memo supports an informational discussion at the March 2023 SSC meeting regarding a pilot project to use a video camera to count boats going through the ocean inlet in Ocean City, Maryland ("OC Inlet" hereafter). Full results will be presented at the Council's April 2023 meeting. The OC Inlet creates an observation point for all of Maryland's ocean recreational fishing effort. Using the back bays to the south or north to reach other ocean inlets is possible but not practicable. Likewise, running down the Chesapeake to the ocean is not practicable.
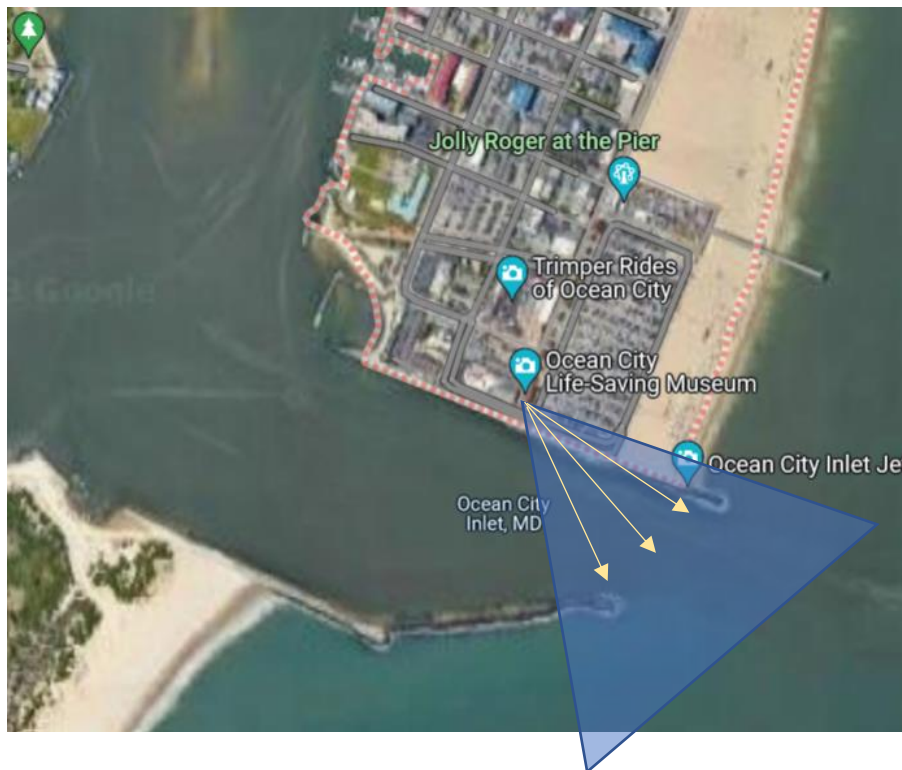

Figure 1. Project Location – OC Inlet, Google Maps

The Ocean City Life-Saving Station Museum allowed use of their tower (and power) for mounting the camera and housing equipment. COVID-19 delayed installation of the camera system until July 5, 2020 (so July 6, 2020 was the first full day). It was quickly evident that there

was sufficient light from the inlet parking lot and/or lights on vessels to reasonably discern night passage. Periods of fog do not appear to have been excessive, and have been tracked and the counts in the morning or evening expanded based on the missing time.[1] Recording continued into 2021 with the intent of obtaining a full calendar year of recording. Unfortunately the camera suffered damage from water intrusion and ceased operation on March 3, 2021. While replaced under warranty, troubleshooting, supply issues, and refurbishment of the lifesaving tower delayed deployment of a new camera until August 4, 2021. Recording continued until April 26, 2022, when the recorder was retrieved. Staff had planned to download videos remotely, but connection issues corrupted all but very short video downloads despite a hardline connection to the recording system. Staff periodically exchanged 6-8 terabyte hard drives as they filled. Due to a proprietary recording format, the recorder was retrieved in April 2022 so that the videos could be reviewed, but even that was more challenging than anticipated (see lessons learned below). Staff and a contractor have been reviewing the videos to create fishing boat and angler trip range estimates.

The OC Inlet is incredibly busy in the summer months. To simplify counting for this project, only vessels that might reasonably be engaged in recreational fishing were counted. Counting is segregated by am and pm. Once it became clear that almost no activity occurred between 9:30 and 2:30, these times generally stopped being counted to save time (except for some occasional re-checking), and the activity before and after was also noted (for example there might have been zero boats from 8:30-9:30 and zero boats from 2:30-3). Vessels not counted included government vessels, commercial fishing vessels, thrill rides, parasailing boats, jet skis, and kayaks. Jet skis are very prevalent and go back and forth across the inlet threshold, but minimal fishing on jet skis was observed. Minimal kayaking was observed to leave the inlet. The inlet is too busy to simultaneously count in both directions – only outbound vessels were recorded.

One camera was utilized with its view arc approximated in Figure 1. Most vessels turn left/north departing the inlet due to shoals to the southeast, but some will turn south behind a jetty or cross the shoals. Based on a meeting in Ocean City, MD with several local captains, 5 categories of vessels that went through the inlet and went out of view or out of the view arc were counted: (1) small/median powerboats (except as described above) that turn left or proceed east; (2) large powerboats ("cabin cruisers" and/or "deadrises"); (3) sailboats; (4) "maybes" - generally very small powerboats that appear unlikely to engage in fishing; and (5) power boats, generally smaller, that turn south and disappear out of view. Sailboats venturing through the OC Inlet appear to be negligible, mostly from a tour operator that would not be fishing.

This approach was used due to both simplifying the counting, and to allow different estimates of anglers per boat to be applied later, per discussion below. The qualitative vessel-type judgement of the reviewer introduces immediate uncertainty into any counts. The most acute issue is probably the parasailing operations, which frequently use the inlet with several vessel styles and are similar to many boats that may be fishing, especially when viewed in fast-forward. An effort

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[1] There was minimal activity between 9:30pm and 2:30am. To the degree that fog resulted in missed counting time outside of these hours, the proportion of the missed 9.5 hours of meaningful am or pm counting time is used to expand the large powerboat boat effort. Only half of that expansion is applied to the other categories as it seems reasonable that the large powerboats will run similarly in fog but the other categories seem likely to be dissuaded by fog. Activity could often be seen in fog but not discerned by vessel type. For example, if half of the time was missed from 2:30 am until noon, then the count would be doubled for large powerboats (e.g. 10/0.5 = 20) and increased by 1/3 for the other categories (e.g. 3/0.75 = 4, a 1/3 increase). Special circumstances are also considered, for example an entire busy tournament morning through 6am was obscured by fog, so the next day's count through 6am was used.

was made to exclude them from counts, but there are certainly some that were counted, and some boats that may have appeared very similar to the parasailing boats that may have not been counted. Vessels fishing in the inlet were not counted unless they subsequently depart seaward of the inlet. To the extent practicable, vessels are tracked visually and not counted if they make a U-turn and reenter the inlet/back bays, which happens with some frequency especially if the seas are rough. The reviewer cannot pick up all such returns visually especially during busy times. It is virtually certain that some boats transited the inlet twice in one outing and were counted twice – viewing in any degree of fast forward does not allow tracking of individual vessels. It is also certain that some boats, perhaps a substantial portion that get counted, never fished but were only out for a cruise. Ranges of boats fishing are used to account for this behavior, and this provides a transition into the methods used to estimate potential ranges of trips. Each category is addressed separately, and at this point the approaches are best described as "analysts prerogative," though have been informed by discussions with fishermen.

1. Small Powerboats that turn left or proceed generally eastward. Staff preliminarily estimates that 50%-90% of these trips may have fished in the ocean. Trips departing before 9am generally appear headed off-shore and probably have a very high percentage of "ocean fishing." Trips later in the day are less certain in terms of ocean fishing activity versus cruising or fishing mostly in the back bays.

2. Large Powerboats: these are boats designed and dedicated for fishing. Staff preliminarily estimates that 95%-99% of these trips may have fished in the ocean.

3. Sailboat activity was negligible, and most was on a tour that would definitely not be fishing. Staff preliminarily estimates that 0%-5% of these trips may have fished in the ocean.

4. The "Maybes" did not appear likely to be fishing but were not completely dismissed. They could be very small powerboats or large cruisers without a fishing deck. Staff preliminarily estimates that 10%-20% of these trips may have fished in the ocean – they are not a substantial portion of the counts, though more than sailboats.

5. Boats headed out of sight to the south. These are generally smaller boats, but many appear to be "fishy." Staff preliminarily estimates that 50%-80% of these trips may have fished in the ocean, but they may have spent more time in the back bays.

An example of boats counts from July 2020 for the small and large powerboats that exit view north and/or east is provided below (Figure 2). Activity is generally higher on the weekends, but weather can result in low effort on any given day – for example Tropical Storm Fay was in the area on July 10, 2020.
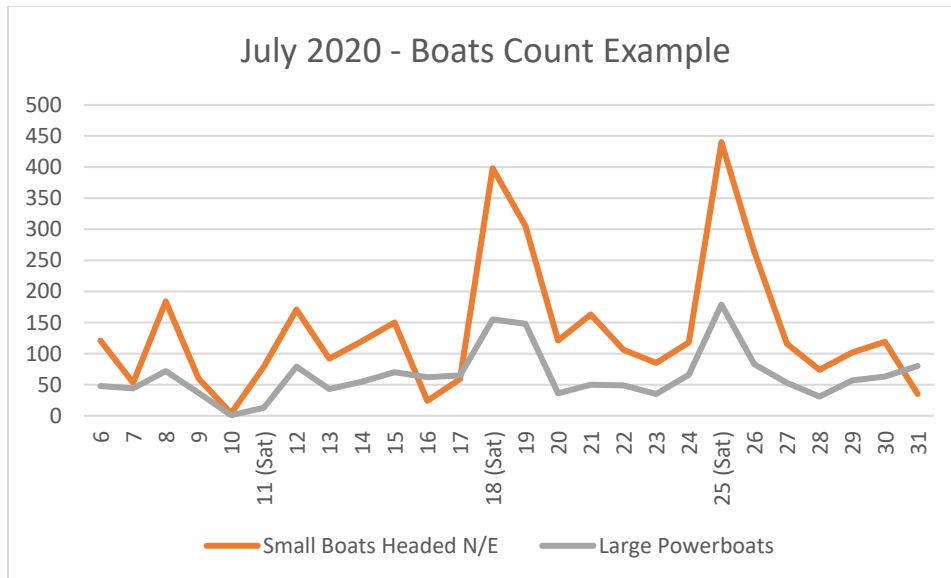

Figure 2, July 2020 Boat Counts Example

Besides assuming a proportion of vessels fishing, to get an approximation of potential trips, a range of anglers per boat must also be assumed. MRIP access point survey data indicated that in 2020, the average ocean private boat trip in Maryland had 3.7 anglers with a range (1.96 standard errors) of 3.0 to 4.5 (pers com John Foster, MRIP staff). For-hire trips, which staff thinks is likely representative of the "large powerboat" group, averaged 4.9 with a range (1.96 standard errors) of 4.1 to 5.8 (pers com John Foster, MRIP staff). Wave by wave estimates are available and could be matched to the monthly estimates but given the ballparking nature of this exercise the annual values seemed likely sufficient. With the boat counts, a range of fishing participation, and a range of anglers per boat, one can construct a range of possible trips, though this range still doesn't fully account for all uncertainties. An example of a constructed angler trip range for July 2020 (all boat types) is provided below (Figure 3).

It was unfortunate that the camera system was not set up leading into the July 4th 2020 weekend starting wave 4, but staff noted that wave heights were consistently low that week (hourly wave height at the weather buoy 19 miles off the MD/DE border for July 1-5 2020 averaged 2.4 feet with no observations over 3.0 feet), and the weather was seasonal except for thunderstorms July 1 (Saulsbury Airport). Winds at the ferry dock in Lewes were also seasonal, generally below 10 knots. Considering the weather and the holiday week, it seems reasonable to expect high participation for July 1-5, except for July 1 given thunderstorms were in the area. If the lowest Wednesday counts are used for July 1, and the highest other matching July day of week counts are used for July 2 (Thursday), July 3 (Friday), July 4 (Saturday), and July 5 (Sunday), it seems possible to fill in the missing days with data that should approximate what occurred so that a full month can be estimated.
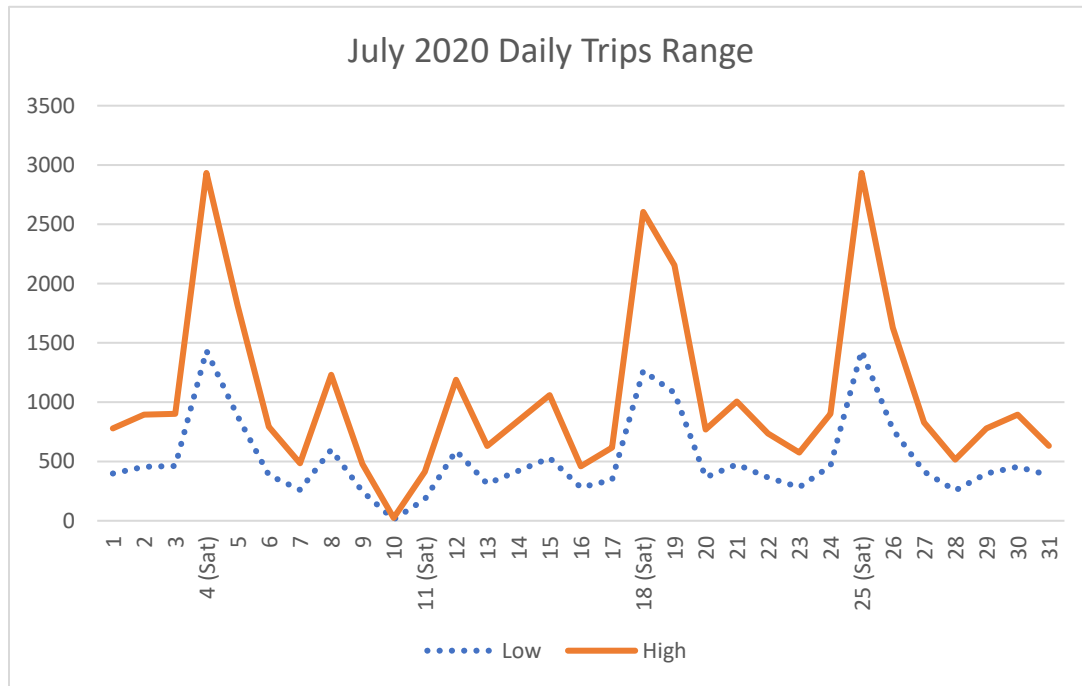
Figure 3. Daily extrapolated ocean angler trips.

For the April Council meeting, staff and a contractor are completing the counts and extrapolations for the time period that data was collected in a similar fashion as above. Staff will also compare the estimates with MRIP Maryland ocean effort by private boats, deducting out the MRIP charter effort estimates (since the counts from the project include charter boats).

Initial Lessons Learned

1. Logistics and equipment issues were major challenges. Any use of a similar system for conducting actual estimates would have to have additional redundancies to avoid loss of data collection. Substantial on-site presence and additional information technology skills would be needed to monitor and correct problems.
2. Video retrieval, storage, and viewing were major challenges and extended the time needed to complete the project. It is likely that different systems could automatically retrieve data and store to the cloud with a file type that is more accessible.
3. This location provided a good view of the inlet. However, the inlet was busier than anticipated, limiting the speed at which video could be reviewed and extending the time required to complete the project. Also, the uncertainty about vessel behavior out of view complicates interpretation of the counts. The geography of the area is conducive to funneling effort and viewing the inlet, but the shoal offshore creates a complicated pattern of vessel behavior after leaving the inlet. A very wide angle could help see where vessels go, but the busyness of the inlet limits the amount of time one can track any given vessel and would make it difficult to discern vessel types. Multiple cameras would greatly add to the complexity of using cameras to count vessels. It may be possible that machine learning/ artificial intelligence could be used to automate counting, but the behavior of jetskis, boats that often fish near the inlet threshold, and non-fishing parasailing operations would seem likely to complicate automatic counting. The issue of

vessel behavior once beyond the inlet threshold would also be a continuing challenge without an immediate solution.

4. Given the challenging behavior of vessels once clearing the inlet, the counts provide some perspective on vessel activity, but staff does not immediately see a path to how a relatively simple video system could be used to accurately and precisely estimate ocean recreational fishing effort in Maryland.

Atlantic Coastal Cooperative Statistics Program

Atlantic Recreational Implementation Plan

2023 – 2027

Table of Contents

The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a state-federal cooperative program to collect, manage, and disseminate statistical data and information on the marine and estuarine commercial and recreational fisheries of the Atlantic Coast. The ACCSP has provided coordination and data collection standards for recreational data collection efforts from Maine to Florida since 2004. The Marine Recreational Information Program (MRIP) of NOAA Fisheries was developed in 2008 out of the need to modify survey methods for collecting saltwater recreational fishery data for estimating fishery catch and effort for use by stock assessment scientists and marine fishery managers.

In 2013, the MRIP Executive Steering Committee adopted a hybrid approach to implementation (PDF, 45 pages). Under this approach:

- NOAA Fisheries maintains a central role in developing data collection and estimation methods, administering recreational fishing surveys, implementing survey and data standards, and producing recreational fisheries statistics.

- Regional and state partners identify data collection priorities, coordinate survey operations and on-site data collection, and participate in quality assurance and quality control procedures.

- The Marine Recreational Information Program's eight Regional Implementation Teams are responsible for publishing Regional Implementation Plans that identify regional information needs and recommendations for programmatic improvements.

As the MRIP evolved, the Atlantic region, through the ACCSP Partners have played a more active role MRIP planning, survey implementation, and pilot research projects to test new data collection techniques. The MRIP Access Point Angler Intercept Survey (APAIS) transitioned to Atlantic state conduct of field data collection with central administration, coordination, and data processing for Maine through Georgia provided by ACCSP staff in 2016 and the MRIP For-hire Telephone Survey (FHTS) and Large Pelagics Telephone (LPTS) Add-on followed in 2020. These MRIP surveys on the Atlantic Coast of Florida are also conducted by the state; however, they are coordinated along with the Gulf of Mexico coast by the Gulf States Marine Fisheries Commission (GSMFC). The ACCSP's Coordinating Council and Recreational Technical Committees of state, Commission, Council, and federal partners has developed this implementation plan in response to regional needs on the Atlantic Coast. This plan will guide MRIP in allocating resources to further improve to best address data needs of fishery assessors and managers in the Atlantic Coast region. The plan is also used by ACCSP in the annual ACCSP funding process to guide regional developments of recreational data collections that may not be addressed within the MRIP.

Baseline Assessment of Current Regional Data Collection Programs and Data Needs

MRIP General Survey

The MRIP is a data collection program that uses several regionally designed sampling surveys to collect representative data and produce statistically robust estimates of recreational fishing effort and catches. Complementary surveys covering recreational fishing for finfish in marine and estuarine waters by shore, for-hire and private boat anglers comprise the general survey design of the Atlantic Coast MRIP. The Fishing Effort Survey (FES) and For-Hire Telephone Survey (FHTS) provide data to produce angler effort estimates (trips per angler) and the Access Point Angler Intercept Survey (APAIS) provides individual angler catch data to produce

average catch rates by anglers. The two survey products are used to produce total catch and effort estimates by shore, for-hire and private boat anglers. This general survey design is conducted through a combination of the ACCSP, GSMFC, state partners, and federal contractors in Maine through Florida.

The main products of the MRIP general survey are bi-monthly, state level estimates of effort and catch for all saltwater finfish species encountered in the APAIS. Precise annual estimates of landings and discards are adequate for stock assessments of managed species for commonly encountered fishes. However, annual estimates at state and regional levels may lack adequate precision for species that are rarely intercepted in the general survey. For example, deep water fishing trips which target fewer common fish such as Tilefish, offshore of southeastern states, are rarely intercepted by the APAIS and so consistently precise catch estimates may not be available over a long time series. These bi-monthly and annual catch estimates may not be timely nor precise enough for monitoring and management of recreational fisheries with Annual Catch Limits (ACLs); however, bi-monthly estimates may be used to predict whether an ACL will be met before the end of a fishing year. Although the MRIP surveys are not intended or designed to provide in-season quota monitoring, more precise estimates on a shorter time scale (both sampling and production of estimates from data) would provide higher certainty in managing fisheries with established ACLs.

For-Hire Recreational Fishing Components of Atlantic MRIP

In addition to shore and private/rental boats, anglers that fish from for-hire charter vessels are interviewed at the dock when they are intercepted in the APAIS. The Atlantic APAIS also includes a separate mode for headboats (i.e., party boats), and interviews during these assignments are conducted at sea, so that detailed data from discarded fish may also be collected. The APAIS interviewer rides the headboat, observes anglers while they are fishing, and identifies, counts, and measures discarded fish. This protocol was adopted on the Atlantic Coast in 2005 following a year of preliminary testing and a pilot study in South Carolina.

Effort for both sectors of the for-hire recreational fishery (i.e., charter and headboats) is estimated through a weekly telephone survey of for-hire vessel operators, called the For-Hire Telephone Survey (FHTS). This telephone survey replaced the Coastal Household Telephone Survey (CHTS) for these sectors in 2004 and provides precise estimates of angler-effort by the same bi-monthly sampling periods, by state. In the Southeastern States (NC to FL), the headboat sector of the FHTS is replaced by a special survey program of NOAA Fisheries, the Southeast Regional Headboat Survey (SRHS). The SRHS utilizes a census logbook reporting method to produce bimonthly estimates of catch and effort for this portion of the for-hire fishing fleet.

MRIP General Survey Components – Future Focus Areas

Access Point Angler Intercept Survey (APAIS)

2022 APAIS sampling levels are adequate to produce precise annual regional catch estimates of many state-managed species based on recommended levels of precision identified as standards by the ACCSP. For specific fisheries, some state partners elect to conduct additional dockside APAIS assignments not funded through the MRIP to reduce variances of the catch estimates (as measured by Percent Standard Error (PSE)), including Massachusetts, Rhode Island, Delaware, North Carolina, and South Carolina. Atlantic states from Maine through Georgia conduct at-sea headboat assignments to collect angler interview and discard data. Beginning in 2021, additional Modern Fish Act (MFA) funding through NOAA Fisheries was made available for Atlantic states site assignments from Maine to Georgia. This increased the total number of APAIS assignments sampled by 30% with the target of improving estimate precision for all species. In the first year, this increase led to a 19% increase in the number of overall interviews. Atlantic states funding was distributed with a focus

on areas and fishing modes with longer seasons and greater species diversity, particularly those with routinely higher PSEs.

MRIP state conduct for Florida recreational fisheries is directed through the GSMFC. A large portion of the funds allocated to Florida were used to increase the number of assignments along the Atlantic and Gulf coasts in areas and fishing modes where PSEs have been historically high. The ACCSP annual reports to MRIP include tracking of indicator species PSE levels. However, additional analyses to quantify effectiveness of these additional assignments for reducing PSEs is needed to evaluate if sampling changes have met the data needs to support fisheries management.

The accuracy and precision of estimates for the released portion of recreational catch is an issue which still requires future attention. Currently in the modes sampled by the APAIS dockside survey, catch per unit effort (CPUE) information for discarded catch is based on angler recall of the number of each species released by each angler intercepted, and the accuracy of that recall at the dock is unknown. Furthermore, dockside intercept surveys are inadequate for collecting information about the size and condition of fish released at sea, which are critical data needs for stock assessments. APAIS protocols for at-sea sampling are adequate for headboats but, due to small fleets and higher costs, the number and variety of vessels eligible for at-sea observations of discards is small. APAIS protocols do not allow for at-sea sampling observations from charter and private boats. Without adequate data from those sectors on areas and depths fished, it is unknown whether the length frequency of discards observed from headboats is representative of the entire recreational boat fishery.

Fishing Effort Survey (FES)
Fishing effort for shore and private boat mode angling from Maine to Florida was historically collected through the CHTS. However, it was determined that the CHTS was biased and inefficient due to low response rates and an increasing number of households without landline telephones. As more people abandoned landlines for cellphones, a growing number of potential respondents became unreachable. For this reason, MRIP transitioned to a new methodology in 2018 to provide a more representative sample and explicitly account for bias. The FES is a mail survey that utilizes state recreational saltwater fishing license databases to target licensed anglers and the U.S. Postal Service address database to distribute surveys to unlicensed anglers. The FES uses a two-month recall design to collect data. Fishing effort estimates increased following the transition to FES, depending on the state and mode, and MRIP should continue to evaluate improvements to FES methodology in the future.

For-Hire Telephone Survey (FHTS)
The FHTS focuses specifically on estimating the numbers of angler trips in the charter boat and headboat fishing modes. Since implemented in 2000, the FHTS has resulted in improved effort estimates for charter and headboat modes of fishing, which has improved overall precision of catch estimates for the charter fleet. However, non-response rates in the FHTS remain a concern. To increase coverage, GARFO vessel trip reports (VTRs) are used to calculate MRIP effort estimates for the part of the fleet that reports via mandatory VTRs.

Atlantic states from Maine to Florida maintain the MRIP online Vessel Directory. Staff in Maine to Georgia complete calls via the ACCSP-hosted Assignment Tracking Application (ATA) which houses a Computer Assisted Telephone Interviewing system (CATI) and Florida conducts the FHTS in coordination with the GSMFC.

Some for-hire fisheries are exploring management as a distinct sector with their own allocation. However, current FHTS survey methodology does not meet the data monitoring needs for sector management options in for-hire fisheries. For this reason, the ACCSP has identified increased timeliness of catch and effort estimates as a high priority along with maintaining dockside sampling levels. Electronic logbooks have the capability to produce accurate and timelier catch and effort statistics when paired with dockside validation. The Mid-Atlantic Fishery Management Council (MAFMC) implemented mandatory electronic logbook reporting options for federally permitted charter and headboat vessels in 2018 and the South Atlantic Fishery Management Council (SAFMC) and New England Fishery Management Council (NEFMC) followed in 2021. These regulatory changes increase the burden on for-hire fishery participants when conducted in addition to the current FHTS methods. Modifications to the FHTS may be necessary to reduce reporting burden for those vessels included in MRIP certified data collection programs.

Special Surveys and Data Collection Programs

Highly Migratory Species

Highly Migratory Species (HMS) are federally managed billfish, tuna, and sharks that range along the entire Atlantic and Gulf of Mexico regions. NOAA Fisheries directly manages these species since they range across regional boundaries in US waters. A summary of the HMS-targeted data collection programs along the Atlantic Coast is provided below.

MRIP Large Pelagic Survey (Large Pelagic Intercept, Telephone, and Biological Surveys)

The Large Pelagic Survey (LPS) began in 1992 as a specialized survey program of rare event HMS species in support of domestic management and international treaties. The LPS includes several surveys: a targeted angler intercept survey, the Large Pelagic Intercept Survey, which is similar to the APAIS but only intercepts recreational and for-hire fishing trips which targeted HMS species; the Large Pelagic Telephone Survey, which is a list-frame sampling survey to produce angler effort estimates in the HMS/LPS fisheries; and the Large Pelagic Biological Survey, used to obtain biological samples for life-history parameter estimation, such as age, size, and sex distribution, as well as reproduction parameters. The collective surveys collect information to identify fishing effort and catch (harvest and discard) from vessels holding HMS permits, and is conducted from Maine to Virginia during the months of June through October.

HMS Catch Card Census – Maryland and North Carolina

Highly Migratory Species Catch Card Census programs began in 1998 to improve reporting compliance required of for-hire licenses or HMS permits, and to identify catch (harvest and discard). Two states have chosen to implement these census programs and are essentially the same in each state. The programs include private anglers as well as for-hire charter and headboat operators from Maryland and North Carolina holding a Charter/Headboat HMS permit. All recreationally landed Bluefin tuna, billfish, and swordfish must be reported via a catch card, regardless of waters fished (state or federal). Reporting of Bluefin tuna dead discards is also required, while the Maryland Catch Card program also collects data on shark landings.

HMS Catch Reporting Program

The HMS Catch Reporting program is used to identify harvest and dead discards of Bluefin tuna, as well as harvest of billfish and swordfish. This program operates from Maine through Texas and the Caribbean territories, covering private anglers as well as for-hire headboats and charter vessels holding Atlantic HMS permits for fishing in federal waters. Any vessel landing one of the species listed above is required to report

their catch within 24-hours after the end of the trip via an online reporting system on the HMS permits website, the HMS Catch Reporting Smartphone App, SAFIS eTrips, or telephone.

Atlantic HMS Tournament Registration and Reporting System (ATR)

All tournaments offering rewards or prizes for the catch or landing of Atlantic HMS are required to register with NMFS within 30 days of the start of the event, and must report all catch and the number of participating vessels for each day of the event within seven days of the completion of the event. Registration and reporting may be done via the online ATR portal, or via paper forms provided for download on the NMFS website. Data collected via the ATR system is used for ICCAT reporting purposes, and is one of the primary data sources for tracking the 250 billfish limit (included blue and white marlin and roundscale spearfish) imposed on the U.S. Atlantic recreational billfish fishery by ICCAT.

Reef Fish Species

Florida State Reef Fish Survey (SRFS)

The Florida SRFS began in July of 2020 and is a specialized recreational fishing survey, certified by MRIP, which provides more precise estimates of private boat effort and catch for reef fishes on the Gulf and Atlantic coasts of Florida. The survey uses angler intercept data collected through the APAIS, combined with additional assignments (drawn with the APAIS sample), which target reef fish trips to estimate CPUE at the angler trip level. A complementary mail survey of state saltwater fishing license holders with the State Reef Fish Angler designation directly estimates targeted fishing effort for reef fishes. That State Reef Fish Angler designation is required to legally harvest certain types of reef fishes[1] from a private boat. Under-coverage attributed to fishing effort by unlicensed anglers without the special reef fish designation is accounted for in the APAIS and supplemental intercept surveys.

South Atlantic Red Snapper Season Survey

Since 2017, during the South Atlantic Red Snapper season, the state of Florida conducts special surveys during short recreational season openings for Red Snapper in the South Atlantic that are designed to estimate in-season landings with high precision. Precise estimates are necessary to track the small annual catch limit (ACL), which allows for a very limited harvest season <10 days in duration (as few as 2-3 days in recent years). Private boat fishing effort and CPUE are monitored by surveying recreational boating activity in coastal inlets and conducting separate dockside interviews with boat parties as they return from trips. For-hire vessel operators with federal permits receive a data sheet in the mail that allows them to keep track of trips and catch, which is followed up by telephone calls after the season ends to collect data. In-season landings estimates help track the South Atlantic Red Snapper ACL and improve precision for stock assessments. Biological data collected from harvested fish, including length, weight, age, sex, and genomics also contribute to regional stock assessments.

For-hire Logbook Programs

The following items provide additional information on ongoing for-hire data collection programs along the Atlantic Coast associated with logbook reporting requirements. These data collection programs utilize logbooks for reporting details of individual recreational fishing trips in the for-hire fishery on the Atlantic Coast. Federally required (mandatory) reporting is linked to specific fishery management plans (FMPs) and permits to participate in the specific fisheries (e.g., groundfish through the Greater Atlantic Regional Fisheries

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[1] Mutton Snapper, Yellowtail Snapper, Hogfish, Red Snapper, Vermillion Snapper, Gag, Red Grouper, Black Grouper, Greater Amberjack, Lesser Amberjack, Banded Rudderfish, Almaco Jack, and Gray Triggerfish

Office (GARFO)). Individual state logbook reporting programs may be comprehensive in scope or limited to fishery-specific data collections.

GARFO Vessel Trip Reporting For-hire Logbooks

Commercial and for-hire operators participating in New England and Mid-Atlantic fishery FMPs are required to report results of all fishing trips via VTR, a mandatory trip-reporting logbook data collection program administered by NOAA GARFO. Trip reports are required to be submitted within 48 hours. VTR data are incorporated into the MRIP bi-monthly effort estimates.

Southeast Region Headboat Survey (SRHS)

The SRHS was implemented in the South Atlantic in 1972 and extends from North Carolina through Florida. The survey focuses on producing landings and effort estimates from the federally permitted headboat fishery targeting offshore reef fishes. This data collection program includes mandatory electronic trip reporting by headboats on a weekly basis along with a dockside intercept program to validate reporting and obtain biological samples for age, growth, and reproductive parameters used in stock assessments. Federal regulations require only federally permitted boats to report to the SRHS so headboats without federal permits are not included. Headboats which do not have a federal permit are also not included in the FHTS which can represent a significant gap in coverage in regions where reef fishes are targeted in state waters.

The APAIS headboat at-sea sampling component is conducted in much of the same region that is covered by the SRHS (NC, SC and GA), although MRIP does not produce landings estimates for use by stock assessment or management for headboats in the South Atlantic. The state of Florida also conducts at-sea observer surveys of headboats on the Atlantic coast. The primary objective of at-sea headboat surveys in the South Atlantic is to provide size and species composition data for discards for use in regional stock assessments. These data collection programs overlap in time and space, however, the headboat catch estimates generated by MRIP apply to Maine - Virginia and the SRHS estimates for headboat catch are used from North Carolina - Florida.

Southeast For-hire Integrated Electronic Reporting (SEFHIER)

NOAA Fisheries implemented reporting requirements for more than 3,000 federally permitted for-hire vessels through the Southeast For-Hire Integrated Electronic Reporting (SEFHIER) program in January 2021. The purpose of this program is to enhance the timeliness and accuracy around the information about for-hire trips including catch, effort, and discards. All federal South Atlantic/Atlantic-only Charter/Headboat permitted vessels have been required to submit electronic trip reports since Jan. 5, 2021. These data are not currently referenced in MRIP methodology and estimates.

Maryland Charter Fisheries Logbook

The Maryland DNR charter logbook began in 1995 as a mandatory weekly reporting program for charter boats fishing for Striped Bass in Chesapeake Bay only. This program was modified to include reporting by vessels and/or captains holding several recreational fishery permits in MD: The Chesapeake Bay & Coastal Sport Charter Boat License, the Maryland Commercial Fishing Guide License, and/or the Maryland Unlimited Tidal Fish License. These permits and reporting requirements cover all species in the Chesapeake Bay and coastal Maryland waters. This program collects variables to determine fishing effort, and harvest, including weights from landed fish and catch disposition (e.g., released, landed, kept, regulatory release, etc.). Vessel operators are required to submit trip level reports on a weekly basis.

Maryland DNR provides the trip data to MRIP for those vessels selected in the FHTS to be used for effort estimation in lieu of telephone survey responses by Maryland vessel operators (who are not called by the FHTS). Maryland ocean-side for-hire vessel operators holding a federal for-hire vessel permit are required to submit VTRs to NOAA as well as the state reporting requirements. Hence, there is the potential for duplicative reporting by Maryland for-hire vessels fishing in coastal Atlantic waters.

Other state data collection programs

The following state logbook programs cover for-hire vessels in varying scope of vessels and fisheries in paper or electronic reporting forms. They are referenced here as areas for future coordination and possible integration if later certified by MRIP. Currently (2022), none of these programs are used in MRIP estimation:

- Rhode Island DFW via SAFIS eTrips and eLogbook
- Connecticut Party and Charter Vessel Black Sea Bass Program
- New York State Vessel Trip Reports via SAFIS eTrips
- New Jersey Striped Bass Bonus Program
- Virginia Cobia Permit Reporting Program & February Black Sea Bass Reporting Program
- South Carolina For-hire Logbook

Other logbook programs
- MAFMC Recreational Tilefish Permitting and Electronic Reporting (private angler)

For-hire Observer Programs

Note the Atlantic APAIS general survey includes at-sea observer data collection on headboats from Maine to Georgia (see APAIS section on page 2). Additional program(s) highlighted below.

Florida

Historically, for-hire observer coverage on the Atlantic coast of Florida was limited to large-party headboats. A cooperative research program for charter vessels was pilot tested in 2013-2015 with funding through MARFIN (Sauls and Ayala, 2020) and in 2021 observer coverage on the Atlantic coast of Florida was expanded to include the offshore charter fishery. Charter boat operators are voluntarily recruited into the survey and vessels are randomly selected each week to carry an observer during a single trip. Fishery observers collect information on the depth fished, gear used, types and sizes of fish retained and released, release methods, and the condition of released fish at each unique fishing location during a sampled trip. Some regulatory discards are marked with conventional tags prior to release. Data are used to monitor catch and release methods in the charter fishery, estimate discard mortality, and characterize the size distribution of discards for Southeast Data, Assessment, and Reviews (SEDARs).

The ACCSP solicited input from state and federal partners to develop the prioritized list of regionally important data needs.

1. **Improved precision (PSE) and presentation of MRIP estimates**
2. **Comprehensive for-hire data collection and monitoring**
3. **Improved recreational fishery discard and release data**
4. **Improved timeliness of MRIP recreational catch and harvest estimates**
5. **Expanded Biological sampling for recreational fisheries**
6. **Improved in-season monitoring**

Priorities are described below to provide justification for the regional importance along with the approach for implementation and where possible, the estimated annual costs. Some priorities have associated MRIP-certified methodologies and action. However, some are included for utility in fisheries stock assessment and management. ACCSP will continue to update this plan as regional priorities change or methods to collect and utilize data evolve. The use of citizen science as a data collection tool is supported to supplement census or survey methods, as appropriate.

Costs of implementation may come in a form of tradeoffs other than dollars. With the move to cumulate estimates via the MRIP Recreational Fishing Survey and Data Standards in 2023, cumulative estimates throughout the year (e.g., January – July) will generally have lower PSEs than that of a single month's estimates. That is, if focusing on cumulative estimates throughout the year, each additional month might result in lower PSE as the year progresses and so the trade-off between smaller sample size (and thus likely higher PSEs) for a single month may not be as relevant. However, if monthly estimates are desired, the trade-off between PSE and timeliness would need to be considered (see "Improved timeliness of MRIP recreational catch and harvest estimates" section). ACCSP and MRIP partners are encouraged to develop proposals to address these data needs.

Improved precision (PSE) of MRIP catch estimates

For many managed species on the Atlantic Coast, MRIP estimates are reasonably precise at the annual and regional scale for interjurisdictional stock assessments. Inshore species that are frequently encountered in the APAIS survey also have reasonably precise state-level estimates for use in single jurisdiction assessments. However, regional estimates through 2021 for some species are not precise enough to meet fisheries assessment and management needs.

Managed species with chronically high PSEs have been prioritized for improvements. Historically, efforts to reduce PSE have primarily focused on increasing the APAIS sample size; however, ACCSP recommends that future resources continue to focus on targeted sampling design changes, alternative estimation approaches, and methods to optimize sampling effort (with strategic allocation of samples at existing or increased levels) to reduce PSEs to acceptable levels.

Progress has been made to address precision of MRIP estimates through the Modern Fish Act (MFA) increases to Atlantic APAIS and the adoption of MRIP Survey and Data Standards. Beginning in Wave 5, 2020 and fully implemented in 2021, the annual Atlantic APAIS sampling assignments have been increased by 30% supported by MFA funds. Similar funding in the Gulf region was allocated to increase APAIS sampling on the

Atlantic coast of Florida. Assignment increases were cooperatively developed between MRIP, ACCSP, GSMFC, and the states. Allocation of assignments was based on length of sampling season, species diversity, and mode of fishing.

It is unlikely that optimized sample allocation alone will address data needs for rare event species pulse fisheries or those with very small ACL's (e.g., tilefish, Red Snapper, Cobia, tuna, and billfish). Specialized data collection should also be developed to address these particularly problematic species. For example, alternative catch and effort surveys are necessary to track the ACL for Red Snapper over the harvest season which occurs over a period of days. Also, LPS and HMS catch card programs are an alternative method implemented to address low precision estimates for billfish and tuna. Methods should be developed to collect data from private anglers on species not sufficiently encountered by APAIS to develop precise-enough estimates through other means. As the need for reliable estimates increases for managed species under quotas, alternative survey methods could be developed for MRIP certification with a regional framework that is scalable.

Biological stock boundaries often do not coincide with state boundaries used to pre-stratify the MRIP APAIS and FES (e.g., the northern and southern Black Sea Bass stock split at Cape Hatteras, the Gulf of Maine and Georges Bank stocks of Atlantic Cod, the Long Island Sound management unit of Tautog, the Gulf and Atlantic stocks of many species separated at the Florida Keys). As a result, precise estimates of recreational removals for both input to stock assessments and annual quota monitoring would be beneficial to have at a finer scale and often with different boundaries than in MRIP's pre-stratified design.

There are several approaches to resolving this issue: (1) increase sample size to allow for more precise post-stratified estimates; (2) distribute base number of assignments to pre-stratified sub-state regions (as some states already do); and (3) further stratify the survey around important biological boundaries, which may require changes to the survey sampling schedule.

Post-stratification (using MRIP domain estimation) is the simplest approach, and methods to improve precision would also help improve the usability of finer spatial scale estimates. However, some boundaries cannot be resolved with post-stratification. For example, Monroe County (the Florida Keys) straddles two federal fishery management council jurisdictions and is a stock boundary for many assessments in the Gulf of Mexico and Atlantic. Currently in MRIP, all effort and catch for this county is assigned to west Florida estimates regardless of waters fished (note: Monroe County, Florida estimates are post-stratified for Black Grouper, Gag, Greater Amberjack, Mutton Snapper, Yellowtail Snapper, Blueline Tilefish, Nassau Grouper, Goliath Grouper, Snowy Grouper, and Red Grouper). Although county-level estimates of landings and discards may be post-stratified to reassign to the Atlantic, there is often a need to develop estimates of removals from this county by area fished (Gulf and Atlantic), and this is not possible with the current MRIP design. A combination of methods may be required to fully resolve this issue for all recreationally important species.

A related issue is the development and presentation of post-stratified estimates. Currently, MRIP offers SAS template programs to allow users to define custom domains to post-stratify estimates along appropriate biological or management boundaries. Developing web tools to allow users to obtain custom estimates, or estimates for a standardized set of regions with standardized, pre-defined boundaries, with the appropriate calibration factors applied, would improve usability and transparency of these estimates for use in stock assessments and the management process. These could be provided to all users through the current MRIP interface, or to a subset of more advanced users through the ACCSP Data Warehouse interface.

Expected costs: The ACCSP recommends the continuation of the MFA at $900k per annum to continue supporting APAIS sampling and data presentation.

Comprehensive for-hire data collection and monitoring

For-hire catch and effort estimates combine distinct data collection methodologies for effort (FHTS) and catch (APAIS) with a validation component. This provides adequate coverage for commonly encountered species on an annual basis. However, FHTS and APAIS overlap with other mandatory reporting requirements varying by jurisdiction, such as federal VTRs, SRHS, and state or regional logbook programs. Some data streams are not fully integrated into MRIP estimates (preliminary and/or final). The current system has been criticized for increased reporting burden on captains, lack of integration of data collection to produce catch statistics, and under coverage of pulse fisheries and deep-water species.

Recent changes in fishery management practices have further strengthened the argument for the use of logbooks in the for-hire sector. The NEFMC, MAFMC, and SAFMC have implemented mandatory electronic for-hire reporting requirements to improve reporting. Federally permitted charter vessels are required to submit fishing activity via electronic logbooks within 48 hours of a fishing trip (NEFMC/MAFMC) or within 7 days of a fishing trip (i.e., weekly; SAFMC). These actions have allowed for logbook data collection to monitor both catch and effort data within the federally permitted for-hire sector.

ACCSP supports development of MRIP certified logbook programs with validation as one method to monitor catch and effort in the for-hire fishery. Logbook compliance with reporting requirements depends on effective outreach and enforcement mechanisms; however, logbook programs may not always be practicable due to legislative or regulatory hurdles or may not be preferred by fisheries managers, necessitating reliance on statistically-valid surveys instead. The critical need along the Atlantic Coast is to minimize overlapping for-hire fishery reporting programs. A Comprehensive For-hire Data Collection Program with full, but not duplicative, coverage of both federally and non-federally permitted boats needs to be implemented. Non-federally permitted boats include vessels that fish exclusively in state waters or for fishes not currently regulated via permits that have reporting requirements.

To meet future data collection and fishery monitoring needs, data collection must be timely, precise, cost effective, and minimize the reporting burden on captains and anglers. The ACCSP recommends this Comprehensive For-hire Data Collection Program continue development and certification efforts to ensure minimal reporting burden and to leverage data sharing among federal and state programs. Coverage shall include headboats and charter boats fishing in both state and federal waters, and methods may include logbooks where feasible, and alternative approaches to data collections for fishery monitoring where logbooks are not feasible or practicable. The implemented program should follow MRIP certified designs for logbooks with validation or sampling surveys.

In an effort to draft an Atlantic Comprehensive For-hire Data Collection Program, the RTC updated the ACCSP Data Standards with a set of minimum data standards for for-hire reporting and, with consultation from NOAA Fisheries, submitted a document to the MRIP certification process detailing the use of census logbook data with validation. Participating in the MRIP certification methodology is the first step in working towards the ability for for-hire recreational estimates to be calculated either through survey or census logbook. The RTC and NOAA Fisheries will continue to update the data standards and to progress within the MRIP certification process.

Recognizing various federal logbooks have been implemented, the Atlantic region needs completion and certification of a method to validate logbooks and further utilize logbook effort and catch in MRIP estimates. The new program shall meet the needs of statistical estimation, stock assessment, and fisheries management.

Expected costs: MRIP is not expected to cover costs of external logbook data collection programs. Maintaining funding for general survey FHTS and APAIS data collection will support the field component of the for-hire comprehensive program. However, there may be costs to MRIP staffing related to design review, data collection and estimation workloads that cannot be estimated at this time.

Improved recreational fishery discard and release data

In response to stock declines, fishery managers have taken regulatory steps to reduce harvest in the recreational sector, including increased size limits, reduced bag limits, and reduced recreational fishing seasons to ensure harvest levels do not exceed management targets. This has translated into a growing portion of recreational catch that is released at sea and unavailable for direct observation in dockside surveys. Numbers of discarded fish and accurate species identification of discarded fishes are more difficult to obtain with precision than harvested catch, due largely to the fact that current methods rely on angler recall.

Proper identification of discarded species is a requirement for any type of estimation of released fish. Studies have shown anglers have varying ability to identify their catch, including a study on the Pacific Coast that demonstrated anglers could reliably recognize Pacific Halibut and Sand Bass (unique body morphs without similar conspecifics) but had difficulty with rockfishes which encompass many species which are very similar in appearance. The Atlantic Coast region has similar species identification issues with flounders, kingfishes, sharks, and some reef fishes. Lack of angler expertise in proper identification of species requires they be reported at family or genus level groups. These grouped discarded species must be delineated into their constituent species prior to stock assessment to provide accurate and complete counts of all discards of a particular species. There is no standard method and little supplementary information to aid in these delineations. Given the regulatory status and differential stock health within these species groupings, accurate identification is paramount for holistic management. Supplemental surveys to ascertain the makeup of species within these groups should not be the only method for improving discard identification. Distribution of taxonomic keys or other fish identification guides or tools for these species, and an increase in angler education and outreach about proper fish identification, should be a priority part of any improved program for discarded fish identification, enumeration, and biological data collection. Citizen science may be used to capture discarded and released species and length frequency information.

The Atlantic APAIS has included a protocol specific to for-hire headboat at-sea discard monitoring and angler interviewing since 2005 wherein state interviewers directly observe recreational anglers as they fish on headboats and collect information on the species composition, size, and release condition of discards. Based on the success of projects funded to date, the use of at-sea observers in the headboat fishery has proven to be a viable method for collecting accurate data on discards that fills important data gaps in stock assessments. However, headboat sampling could be improved with an expanded frame of active, eligible vessels participating (currently voluntary participation within the APAIS), and an increased number of headboat fishing trips sampled. The ACCSP supports and recommends improvements to the current headboat at-sea sampling program to include more robust sample sizes to support better precision of discard rates and composition, and improved outreach efforts to increase participation by eligible headboats throughout the Atlantic Coast.

Discard data from headboat mode is not necessarily representative of other modes. Florida successfully pilot tested the use of fishery observers on charter boats on the Atlantic coast and recently secured state funding to support this monitoring long-term; however, expanding this to other Atlantic states may be limited by available funds. More information is also needed for private/rental and shore mode discards. While addition of observers on charter vessels might be too costly at this time and is not feasible for private boats, one modest improvement would be inclusion of depth fished in the intercept. The APAIS collects coarse trip-level data on the primary area fished (inland, state territorial seas up to 3 miles from shore, or federal waters greater than 3 miles from shore) but does not provide data on the depth fished. These data are critical for determining depth-dependent discard mortality for released portions of recreational catch.

Expected costs: Cannot be estimated at this time.

Improved timeliness of recreational catch and harvest estimates

There are two aspects of timing to consider regarding recreational catch and harvest estimates: the unit of estimation (i.e., month, two-month wave, cumulative, annual) and how quickly estimates are generated after an estimation period has ended. State and Commission managed species would benefit from monthly estimates to set seasons, especially in northern areas where fish may only be active during one month of a two-month wave, or for ephemeral fisheries where a species may pass through and be available for only one month (e.g., Cobia). This could be especially important to for-hire fishery captains as it could assist business planning. Also, even though MRIP was not designed to track ACLs, having more refined temporal estimates could help reduce gaps or buffers set between ACLs and Annual Catch Targets (ACTs), allowing anglers to harvest more fish by reducing uncertainty in landings. Both the 2016 and 2021 National Academy of Science (NAS) Review recommended additional evaluation of the cognitive properties of the two-month recall period, and a shorter estimation period would likely reduce any recall bias. APAIS data collection is already amenable to monthly recreational estimates and the FES was found to not have significant differences between one- and two-month recall periods (Andrews et al., 2018).

In terms of how quickly estimates are generated, currently annual estimates of catch and harvest are often not available until April of the following year and wave estimates are not available until 45 days after the completion of a wave. Improving the timeliness of recreational catch and harvest estimates could help fishery managers better predict when seasons need to be closed before landings are exceeded. Managers would also have more time to develop management options before decisions for an upcoming season must be made if a reduction in the lag time is achieved. Electronic data collection of both the APAIS and FHTS in 2019 and 2021, respectively, has allowed for quicker access to raw data for use in the estimation process and also improved the quality of data.

The trade-off between the additional cost of moving to monthly waves and/or faster turn-around time for generating estimates should be evaluated against budgeting for improved precision at the current two-month/annual levels and other recreational data priorities. Moving to one-month waves without additional sampling could result in monthly estimates of sufficiently low precision that having monthly estimates does not actually improve management. Andrews et al. (2018) discerned that, while there was no significant difference in effort estimates between a feasible one-month alternative to the FES and the current FES, multiple reference periods in a single survey may reduce bias for one-month estimates. In determining trade-offs of effort survey design, Andrews at al. (2018) recommend consideration be given to estimate precision, sampling requirements needed to support different levels of resolution, and also the impact of increased

sampling on survey costs. Given the change in data presentation to cumulative estimates in CY2023, the potential to change FES to monthly recall should be revisited.

Expected costs: Cannot be estimated at this time.

Expanded Biological sampling for recreational fisheries

Fishery-dependent monitoring programs on the Atlantic Coast which collect vital statistics on catch and effort from the recreational fishery do not provide some of the critical data inputs needed for age-based stock assessments. The MRIP is the only dedicated coast-wide fishery dependent program that monitors private and for-hire charter boat-based segments of the recreational fishery. The MRIP strives to provide a statistically valid sample of the size composition and biomass of harvested finfish that is representative of the spatial and temporal distribution of the recreational fishery. However, for many important managed species, the MRIP survey intercepts low numbers of landed fish, particularly for species with strict harvest limits, such as Red Snapper, or that are targeted by a small subset of participants in the overall recreational fishery, such as tilefishes and deep-water grouper species. Furthermore, time constraints and strict interview procedures of the APAIS do not allow field interviewers to collect age structures or record sex from fish sampled.

Methods to supplement data collected through the APAIS are needed to collect length, weight, age structures and sex ratios from managed species that are representative of current recreational landings. Doing so does not necessarily require a uniform coast-wide approach, since biological sampling may be more efficient and cost effective when it is targeted at the scale appropriate for a given fishery. Biological sampling may be incorporated into supplemental surveys that are also needed to improve timeliness and precision of catch estimates for specialized fisheries. An example is the Red Snapper Season Survey that Florida has implemented to monitor in-season landings on the Atlantic coast, which also provides a unique opportunity to collect biological samples from large numbers of fish over a short sampling period. Supplemental survey(s) could be focused on intercepting trips with catch and maximizing biological samples, whereas the APAIS would continue to be the primary data source for catch-per-unit-effort. The supplemental survey(s) should also allow for the collection of trip-level data on area fished, depths fished, fishing methods, and characteristics of discards (numbers by species, proportions under legal size limits, immediate mortalities, and notable impairments).

Expected costs: Cannot be estimated at this time.

Improved in-season monitoring

Stock assessments may partition fishery removals into seasons or redefine calendar years into fishing years. Fishery managers also require precise estimates of landings and discards over time periods that better match the scale of the recreational fishery. For example, for federally managed species with an ACL that cannot be exceeded, recreational fisheries have demonstrated the capacity to exceed limits well before the end of a full year. Thus, annual seasons have been reduced and precise estimates are now needed over much shorter periods (in some cases weeks or days) to ensure that ACLs are not exceeded and overfishing is not occurring. Increasing precision of estimates within waves may be necessary for species where the unit of analysis has a temporal scale less than a year.

The MRIP is intended to be a general survey and is therefore not designed for the purposes of in-season management of recreational fisheries with ACLs. Improving timeliness of estimates is one feasible

method to improve ability to monitor in-season estimates but the cost of increasing sample sizes to produce precise enough estimates is high. Development of data collection as supplemental to MRIP also has the potential to address in-season monitoring, especially related to fisheries with short seasons. Additionally, it's possible that a different approach to management, rather than data collection method and/or supplemental surveys, would be more useful for species with small seasons and/or rare occurrences.

The 2021 NAS review of MRIP yielded several suggestions to assist with improving in-season monitoring including: using raw data streams of MRIP data, mode-based projecting and/or forecasting, further implementation of new technologies to better collect data, and using supplemental and ancillary data. Additionally, new recreational surveys and survey methods could be implemented but partners should anticipate the need for possible inter-calibration and continued survey development, ensuring that these needs are also clearly communicated to anglers, managers, and stakeholders. It will also be beneficial to continue pilot testing new approaches including the use of harvest tags or web-based reporting used to track the harvest of individual fish or private recreational fisheries license endorsements. These could be used to identify a subset of licensed anglers to better target managed species.

Expected costs: Cannot be estimated at this time.

Note on utility of citizen science to address data needs:
Citizen science was originally identified as a separate data priority but was later removed noting that citizen science as a tool to support data needs rather than its own individual priority. Angler-reported recreational fishing activity and catch, supplemental to the MRIP, continues to be an evolving aspect of engaging citizens in fisheries management and in helping to bolster the breadth of data collection for state, federal, council, and Commission partners. The ultimate use of citizen science data may be supplemental to MRIP in the assessment and management process, and may not include integration into the MRIP. Citizen Science data collection methods can assist with capturing changing spatial and temporal presence/absence of species and important species-length information. While productive for agency-public relationships, the vast majority of data collection tools (i.e., mobile applications) have not yet followed a standardized approach to data collection. A number of partners in the South Atlantic (e.g., 'Release' by the SAFMC and 'Catch U Later' by NC DMF) have collaborated with ACCSP to create these mobile-based applications on the Atlantic Coast and there are continued plans to further standardize data standards/elements. This could include the use of a 'switchboard' base application which can have a standard set of questions/responses to choose from to provide flexibility based on partners needs and could be submitted in the same format and data stream(s).

A more standardized approach to data collection via opt-in angler applications would provide more useful data for use in stock assessments by assuring data are collected in the same manner, regardless of where the data are being collected which in turn could allow for data users to potentially include opt-in angler reported information into the recreational fishery management process for management. In 2020, the RTC and ASMFC Assessment Science Committee preliminarily discussed data element needs and data utility of opt-in angler reported information, including the potential for biases and the difficulty in assuring data reliability for statistical use of data. Another major factor to be considered is the communication and outreach required to begin and maintain engagement from a broad segment of the angling public.

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Recreational Fishing Data Priorities for 2023

February 03, 2023

NOAA Fisheries spotlights fiscal year 2023 priorities, fiscal year 2022 achievements to support the recreational fishing data collection program.

Photo credit: Clark Lo.

NOAA Fisheries has published its Marine Recreational Information Program [Implementation Plan](#), which identifies its recreational fishing data collection program priorities for fiscal year 2023. Priorities include examining current survey designs to see where improvements can be made; implementing plans to transition to new and improved survey methods; and supporting regional data collection priorities.

"Our partners and stakeholders play a key role in achieving programmatic milestones and identifying regionally specific data collection needs," said Richard Cody, chief of the Office of Science and Technology's Fisheries Statistics Division. "This plan reflects their contributions and collaboration."

Program Priorities for Fiscal Year 2023

Effective Implementation of New, Improved Survey Methods

We will continue to develop and implement [transition plans](#) in coordination with state and regional survey sponsors. They outline crucial steps for moving from one survey method to a new or improved survey method. The goal of these plans is to preserve the continuity of historical fisheries catch and effort information and to minimize disruption to fisheries management during the transition.

Redesign of the Large Pelagics Survey

We plan to complete the final phase of sampling for the new Large Pelagics Survey design. Large pelagics include tuna, sharks, billfish, and other offshore species. We will test various methods to optimize the productivity of the survey, or the number of interviews conducted per sampling assignment. Once certified, the survey design may be an option for expanding coverage and improving the precision of catch estimates for other fisheries not frequently encountered through our other surveys.

Support for Regional Priorities

We will continue to work with regional teams to update and implement their regional implementation plans. These teams are located in the:

- Atlantic (Atlantic Coast and Atlantic Highly Migratory Species)
- Pacific
- Gulf of Mexico
- Caribbean
- Pacific Islands
- Alaska

The plans specify regional data collection priorities along with funding and technical needs that help drive decision-making. They are living documents formally updated every 5 years.

Commitment to Continuous Improvement

As part of our ongoing commitment to continuous improvement and providing quality data, we will further investigate potential sources of errors in our survey designs and methodologies. We will make plans to address these once identified. While it's impossible to eliminate all potential sources of error from a survey design, certain statistical methods can be employed to help reduce error.

Key Program Highlights for Fiscal Year 2022

Developed Transition Plan for Gulf State Recreational Fishing Surveys

The Gulf of Mexico Transition Team developed a plan that outlines the process for incorporating catch estimates from Gulf of Mexico state surveys into NOAA Fisheries science and management. These state surveys include:

- LA Creel
- Mississippi Tails n' Scales
- Alabama Snapper Check
- Florida State Reef Fish Survey
- Texas Coastal Creel Survey

Administered $3 Million to Partners to Support Regional Priorities

We provided additional funds to the Atlantic Coastal Cooperative Statistics Program, GulfFIN, and Pacific RecFIN to support increased sampling along the Atlantic, Gulf of Mexico, and Pacific coasts. This funding helps support regional data collection priorities to meet unique fisheries management needs.

Provided Tailored Technical Resources

NOAA Fisheries hosted six webinars to provide stock assessors, fisheries analysts, and other recreational data users with best practices for accessing, analyzing, and using recreational fishing data.

We also developed informational products that help explain how the agency estimates recreational catch per angler trip, number of angler trips, and total catch. They cover such topics as statistical weighting and precision.

Completed Report to Congress on In-Season Management

We completed a plan that addresses recommendations from the National Academies of Sciences, Engineering, and Medicine's 2021 study, Data and Management Strategies for Recreational Fisheries with Annual Catch Limits ☑.

Tracking Progress

Since 2008, NOAA Fisheries' Marine Recreational Information Program has tracked annual updates of the program's work to provide recreational fishing statistics. This information helps assess the current health of fisheries and guides informed fisheries management decisions.

Thank you to our partners and stakeholders who are critical to our collaborative operations. They include:

- Recreational anglers
- For-hire captains
- State agencies
- Fisheries information networks
- Interstate marine fisheries commissions
- Regional fishery management councils

Last updated by Office of Science and Technology on February 09, 2023

NOAA Fisheries, Atlantic Coast Partners Release Plan to Improve Atlantic Recreational Fisheries Data

March 21, 2023

The Atlantic Coastal Cooperative Statistics Program and NOAA Fisheries have released a Regional Implementation Plan that highlights priorities over the next 5 years for improving recreational fisheries data collection on the Atlantic Coast.

The Atlantic Coastal Cooperative Statistics Program and NOAA Fisheries have jointly released the Marine Recreational Information Program Regional Implementation Plan for the Atlantic Coast. It highlights data needs and funding priorities over the next 5 years for improving recreational fisheries data collection on the Atlantic Coast.

"Our regional and state partners are essential to developing, executing and improving our national network of recreational fishing surveys that inform catch estimates," said Evan Howell, NOAA Fisheries, director of the Office of Science and Technology. "We rely on partners like ACCSP to efficiently facilitate regional partnerships and joint data collection activities, as well as identify regional priorities through tools like our regional implementation plans. I want to thank all of our partners for their hard work to develop this plan together, and we look forward to our continued partnership as the plan is implemented."

ACCSP ☒ is the state-federal partnership that collects, manages, and disseminates Atlantic commercial and recreational fisheries data and serves as the MRIP Regional Implementation Team for the Atlantic Coast. It also coordinates state conduct of the MRIP Access Point Angler Intercept Survey and For-Hire Survey from Maine to Georgia. Program partners include coastal resource agencies from 15 states and the District of Columbia, 2 interstate marine fisheries commissions, 3 regional fishery management councils, the U.S. Fish and Wildlife Service, and NOAA Fisheries. To provide better data for stock assessment and management, the ACCSP Coordinating Council and Recreational Technical Committee (RecTech) identified top priorities for improving recreational data collection on the Atlantic Coast through 2027.

Atlantic Coast Prioritized Activities

- Improved precision and presentation of MRIP estimates
- Comprehensive for-hire data collection and monitoring
- Improved recreational fishery discard and release data
- Improved timeliness of MRIP recreational catch and harvest estimates
- Expanded biological sampling of recreational fisheries
- Improved in-season monitoring

"Through the ACCSP, state, regional and federal partners are able to cooperatively identify and prioritize recreational fishery data needs for the entire Atlantic Coast and coordinate efforts to address these needs and improve recreational data collection," said Angela Giuliano, ACCSP RecTech chair. RecTech is composed of ACCSP partner personnel who specialize in survey design, statistical estimation of fishing effort, catch, and participation, and the operation of recreational sampling programs.

The Atlantic Regional Implementation Plan will help guide NOAA Fisheries' allocation of resources to best address the data needs of regional fishery stock assessors and managers.

"Working together, we have allocated targeted increases in sample size by month and mode to improve precision of MRIP estimates," said Dawn Franco, RecTech vice-chair. "We are also working on methodology to improve for-hire data collection. Over the next 5 years, we can achieve even more by building on our momentum and nurturing the relationships that have been forged."

National Perspective

NOAA Fisheries maintains a central role in developing data collection and estimation methods, administering recreational fishing surveys, implementing survey and data standards, and producing recreational fisheries statistics. Regional and state partners identify regional data collection priorities, coordinate survey operations and on-site data collection, and participate in quality assurance and quality control procedures.

Through Regional Implementation Plans, each region plays a critical role in identifying which survey methods are most suitable for its science, stock assessment, and management needs. NOAA Fisheries uses these plans to develop a national inventory of partner needs and associated costs, and to annually specify priority-setting criteria for supporting those needs. These plans inform MRIP decision-making for ongoing research priorities and budget allocation. The Regional Implementation Plans are adjusted at least every 5 years or as necessary based on changing science, management needs, and budget availability.

This collaborative approach is critical to addressing region-specific needs for improving recreational fishing data and supporting fishing opportunities for generations to come.

Last updated by Office of Science and Technology on March 21, 2023

REPORT TO CONGRESS

NATIONAL MARINE FISHERIES SERVICE: RESPONSE TO NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE 2021 RECOMMENDATIONS

Developed pursuant to: The Modernizing Recreational Fisheries Management Act of 2018 (Public Law 115-405)

I.   EXECUTIVE SUMMARY

The Modernizing Recreational Fisheries Management Act of 2018, Public Law 115-405, mandated that the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) commission a National Academies of Sciences, Engineering, and Medicine (NASEM) study that evaluates:

> *"(A) how the design of the Marine Recreational Information Program [MRIP], for the purposes of stock assessment and the determination of stock management reference points, can be improved to better meet the needs of in-season management of annual catch limits under section 303(a)(15); and (B) what actions the Secretary, Councils, and States could take to improve the accuracy and timeliness of data collection and analysis to improve the Marine Recreational Information Program and facilitate in-season management."*

It also required NMFS to submit a report to Congress responding to the NASEM recommendations. The first requirement was completed in 2021, and this report responds to the second requirement.

In its consensus study report, the NASEM Committee made 12 recommendations with an accompanying set of conclusions regarding data collection, data use, and alternative management strategies that NMFS and its partners, including Regional Fishery Management Councils, Interstate Marine Fisheries Commissions, and state agencies, could consider. This report describes NMFS' and its partners' detailed assessment of NASEM's recommendations, including evaluations of each recommendation and associated set of conclusions, and NMFS' proposed course of action for each. In summary:

- Many of the NASEM recommendations suggest continuing ongoing agency practices and NMFS intends to do so, and to recommend equivalent actions by partners in all such cases.
- There are several recommendations that call for exploration and development of forecasting methods for in-season catch and management. In those regions in which the regional managers are practicing or considering practicing catch forecasting, NMFS will recommend that the regional managers consider following the report's recommendations.
- The NASEM report recommends conducting research and pilot studies of a number of statistical methods to improve the precision and accuracy of catch and forecasting estimates. NMFS will explore these recommended methods where applicable and recommend their consideration by partners, including members of the MRIP Regional Implementation Teams described in Section II. Undertaking such research and development will be subject to availability of funds and will generally be prioritized based on MRIP Regional Implementation Plan priorities and the requirements of NMFS Transition Plans.
- The NASEM report includes recommendations to pursue alternative management approaches to better align management actions and accountability with data availability. In most cases, these methods are available for use at present, and NMFS will continue to recommend the Regional Fishery Management Councils consider them.

NMFS' proposed courses of action described in Section III are preliminary. The timeframe allotted by the Modernizing Recreational Fisheries Management Act to produce this report allowed for productive, initial conversations with all involved parties toward which each recommendation is directed. More discussion, planning, and coordination will be needed among NMFS, Councils, Commissions, and states to be able to develop more detailed plans to address those of the recommendations and conclusions that are identified for further action by NMFS. Any consideration by NMFS to implement these recommendations would occur in the context of NOAA, Department of Commerce, and Administration priorities and resource tradeoffs.

II. NMFS REVIEW OF DATA AND MANAGEMENT STRATEGIES FOR FISHERIES WITH ANNUAL CATCH LIMITS

NASEM published its consensus study report, *Data and Management Strategies for Recreational Fisheries with Annual Catch Limits[1]*, in December 2021. The study committee recognized that MRIP has improved the recreational catch data used in stock assessments, and the program produces "critically important" data that are unlikely to be replaced "as a source of spatially and temporally consistent catch information for monitoring and stock assessment of [Regional Fishery Management] Council-managed stocks." The committee also acknowledged that MRIP was not designed to produce the near real-time monitoring data needed to support in-season management tools, and that it would take a substantial increase in funding to expand the program for in-season management. The report presents approaches for optimizing available recreational fishing data for in-season management and alternatives for managing recreational fisheries with annual catch limits (ACLs). The report further notes:

- In-season management is not required for most fisheries nationwide due to broad regional diversity in management needs. The report identifies those fisheries for which in-season management is currently practiced or desired by Regional Fishery Management Councils, Marine Fisheries Commissions, and States.
- Electronic reporting data collection systems relying on voluntary self-reported data are "*unlikely to advance MRIP over the coming years[2]*," especially app-based voluntary reporting, due to low participation in such programs and the high potential for bias in the resulting catch estimates. Mandatory self-reporting, however, coupled with probability-based validation surveys could be considered on a case-by-case basis for specific recreational fisheries where precise monitoring and management are considered crucial, and where sufficient compliance can be achieved. The report highlights other potential uses of self-reported data, such as for projection modeling rather than for direct catch

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[1] National Academies of Sciences, Engineering, and Medicine (2021) Data and Management Strategies for Recreational Fisheries with Annual Catch Limits. The National Academies Press, Washington, DC. www.nationalacademies.org/our-work/data-and-management-strategies-for-recreational-fisheries-with-annual-catch-limits

[2] https://nap.nationalacademies.org/resource/26185/RecFish%20Report%20Highlight_2021.pdf

estimation. It also acknowledges that tablet-based field data collection[3] associated with probability sampling has led to improved data quality and decreased processing time.
- The MRIP Regional Implementation Teams[4] (RITs), whose membership includes NMFS, Fishery Management Councils, Commissions and state agencies, and other regional partners play an important role in identifying and addressing unique regional processes and needs. Many of the report's recommendations are directed at this broader coalition of partners.

The NASEM Committee made 12 recommendations with an accompanying set of conclusions regarding data collection, data use, and alternative management strategies the agency and its partners could consider. These recommendations and conclusions were complex and variable in terms of subject matter and to whom they were directed. Only one recommendation was directed exclusively at NMFS, while the other 11 were jointly directed at NMFS (spanning NMFS Headquarter Offices and the Regional Offices and Science Centers around the country), and numerous external partner entities, including Regional Fishery Management Councils, Interstate Marine Fisheries Commissions, and state agencies. As such, NMFS coordinated a dual-track evaluation effort to obtain input that would allow this report to reflect national and regional (as well as federal and partner) needs, interests, and capabilities related to recreational fisheries in-season management. On one track, an internal team with nationwide representation and a wide range of expertise from across NMFS evaluated each recommendation and set of associated conclusions. In parallel, the agency engaged the MRIP Regional Implementation Council, or the leadership of each MRIP RIT, who facilitated partner evaluation of the recommendations and conclusions. This report reflects the following entities' input:

- **From the NMFS Internal Team:**
  - Office of Science and Technology (OST)
    - Fisheries Statistics Division
  - Office of Sustainable Fisheries (OSF)
    - Domestic Fisheries Division
    - Atlantic Highly Migratory Species Management Division (OSF's Atlantic HMS Division)
  - National Saltwater Recreational Fisheries Program (RecFish)
  - Greater Atlantic Regional Fisheries Office (GARFO)
  - Northeast Fisheries Science Center (NEFSC)
  - Southeast Regional Office (SERO)
  - Southeast Fisheries Science Center (SEFSC)
  - West Coast Regional Office (WCRO)
  - Northwest Fisheries Science Center (NWFSC)
  - Southwest Fisheries Science Center (SWFSC)
  - Pacific Islands Regional Office (PIRO)
  - Pacific Islands Fisheries Science Center (PIFSC)
  - NMFS Directorate – Senior Scientist for Stock Assessments

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[3] www.fisheries.noaa.gov/recreational-fishing-data/recreational-electronic-reporting-glance#how-is-electronic-reporting-used-to-collect-recreational-fishing-data
[4] www.fisheries.noaa.gov/recreational-fishing-data/marine-recreational-information-program-teams#regional-implementation-teams

- **From the MRIP RITs:**
  - Atlantic RIT
    - Atlantic States Marine Fisheries Commission (ASMFC)
    - New England Fishery Management Council (NEFMC)
    - Mid-Atlantic Fishery Management Council (MAFMC)
    - South Atlantic Fishery Management Council (SAFMC)
    - New Jersey Department of Environmental Protection (NJ DEP)
    - Maryland Department of Natural Resources (MD DNR)
    - North Carolina Department of Environmental Quality (NC DEQ)
    - South Carolina Department of Natural Resources (SC DNR)
    - Florida Fish and Wildlife Conservation Commission (FL FWC)
  - Gulf of Mexico RIT
    - Gulf States Marine Fisheries Commission (GSMFC)
    - Gulf of Mexico Fishery Management Council (GMFMC)
    - Florida Fish and Wildlife Conservation Commission (FL FWC)
    - Mississippi Department of Marine Resources (MDMR)
    - Louisiana Department of Wildlife and Fisheries (LDWF)
  - Pacific (West Coast) RIT
    - Pacific States Marine Fisheries Commission (PSMFC)
  - Caribbean RIT
    - NMFS Southeast Regional Office – Caribbean Experts
    - United States Virgin Islands Department of Planning and Natural Resources (USVI DPNR)
  - Pacific Islands RIT
    - Hawaii Division of Aquatic Resources (HI DAR)
    - West Pacific Fishery Management Council (WPFMC)
  - Alaska RIT
    - The Alaska RIT did not provide evaluations of the recommendations and conclusions. The team stated the findings of the report are of limited applicability to managing recreational fisheries in Alaska. It noted that its region does not have federally managed recreational fisheries with annual catch limits and/or requiring in-season management action by NMFS. The team further noted that in-season management action may be necessary for Chinook salmon recreational fisheries due to language in the Pacific Salmon Treaty, but those actions are taken by the state on fisheries occurring solely, or nearly so, in state waters.
  - Atlantic HMS RIT
    - SEFSC HMS Scientist
    - OST Large Pelagics Survey (LPS) Experts

In synthesizing the input provided by all the entities above, we found:

- All recommendations in the NASEM report have been considered, fully or in part, by NMFS and/or partner entities in the regions with the most in-season management needs (e.g., in the Southeastern United States). Many are actively being explored regionally,

where applicable, with opportunities to cooperatively build on existing efforts. A few have been investigated regionally and not further pursued due to resource limitations.

- The NASEM report's recommendations and conclusions are particularly relevant to the members of the RITs. The RITs were created to address the variability in data collection based on fisheries and management needs. These recommendations highlight the critical role these bodies play in developing data collection improvements based on the unique management needs and priorities of each region.
- NMFS and RITs generally supported pursuit of many of NASEM's recommendations, noting that different regional management needs necessitate potentially different approaches in response. They highlighted the Atlantic and Gulf regions as having the most in-season management needs for recreational fisheries, and the West Coast, Pacific Islands, Caribbean, and Alaska as having numerous differing needs.
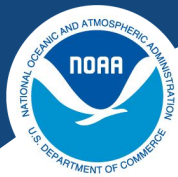
NOAA FISHERIES

Office of Science and Technology

NOAA Fisheries' recreational data collection program, MRIP, is a state-regional-federal partnership that develops, improves, and implements a national network of recreational fishing surveys to estimate total recreational catch.

MRIP Survey and Data Standards guide the design, improvement, and quality of data produced by our surveys.

7 Key Areas:

- Survey concepts and justification

- Survey design

- Data quality

- Transition planning

- Review procedures

- Process improvement

- Access and information management

SCAN ME

Marine Recreational Information Program Survey and Data Standards

WHAT DO THE STANDARDS DO?

The shared use of a single set of survey requirements and guidelines across seven key areas helps promote data collection and distribution consistency across the national network of recreational fishing surveys. By implementing these standards, we help reduce ambiguity and potential misinterpretation of data to best inform sustainable fisheries management.

WHY WERE THE STANDARDS DEVELOPED?

The standards were developed to meet recommendations from the National Academies of Sciences, Engineering, and Medicine to establish performance standards. The standards also align with requirements and best practices of other federal agencies that produce statistics for decision-making. As part of the government's guidelines for statistical programs, the Office of Management and Budget requires federal agencies to establish their own criteria for determining when an estimate is too unreliable or imprecise to publicly release (precision standard). The precision standard also creates flexibility for data users to pursue alternative analysis options that use more precise estimates.

Implementation Timeline

2020

Phased Implementation begins in late 2020

Phased implementation helps provide adequate adaptation time for fisheries stock assessors and managers

2021 2022

Implementation Continues

- Delivered presentations to regional FINs
- Published MRIP Data User Handbook
- Added preview query to Query Tool to acclimate data users
- Held Data User Seminar Series

2023+

Final Phase (Access and Information Management)

- Shift from producing estimates in 2-month waves to cumulative estimates. Increased sample sizes = more reliable estimates
- Implementation of precision standard (no longer providing highly imprecise estimates with percent standard error above 50)

HOW WAS THE PRECISION STANDARD DEVELOPED?

Our precision standard (not providing highly imprecise estimates with PSEs above 50, which are typically not statistically different from zero) was developed through collaborative feedback from partners who explored effects of imprecise estimates on stock assessment results. Partners determined estimates above 40 PSE should be used with caution. The U.S. Census Bureau does not provide estimates with a PSE above 30. The Atlantic Coastal Cooperative Statistics Program continues to set a goal of achieving PSEs below 30.

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 24, 2023

To: Council

From: Hannah Hart, Staff

Subject: Scup Federal Recreational Season

On Wednesday, April 5, the Council will receive an update on a recommendation made by the Atlantic States Marine Fisheries Commission (ASMFC) Summer Flounder, Scup, and Black Sea Bass Board (Board) during their March 2, 2023 meeting. During this meeting the Board reviewed proposed state recreational measures for scup and black sea bass. As part of that discussion, the Board moved to request that NOAA Fisheries reconsider the January 1 – April 30 scup federal waters closure adopted during the Joint Council/Board December 2022 meeting. The Council should consider whether they wish to comment on this issue prior to the publication of a final rule this spring.

In addition to this cover memo, materials listed below are provided for the Council's consideration of this agenda item.

1) March 2023 Atlantic States Marine Fisheries Commission Summer Flounder, Scup, Black Sea Bass Board meeting summary and motions.

2) Atlantic States Marine Fisheries Commission Summer Flounder, Scup, and Black Sea Bass Technical Committee memorandum on proposed 2023 regional recreational management measure for scup and black sea bass.

Background

In December 2022, the Council and Board met jointly to consider scup recreational measures for 2023. This was the first time setting recreational management measures using the new Percent Change Approach in conjunction with results from the Recreational Demand Model (RDM). Using the RDM, the Percent Change Approach required a 10% reduction in recreational harvest of scup in 2023. The Council and Board agreed to reduce the federal recreational possession limit from 50 to 40 fish and shorten the federal-waters season from a year-round open season to a May 1 – December 31 open season. These measures did not achieve the full 10% reduction in harvest required; therefore, the Council and Board also agreed that the states would further modify state measures through the Commission process to achieve the full 10% coastwide harvest reduction. Note that given the timing of the rulemaking process, the modifications to the federal season would not be fully effective in 2023 and would primarily impact 2024.

At the December meeting, although the Council and Board approved the modified federal scup season, there was some discussion about how the May 1 – December 31 open season may disproportionally impact some states. Specifically, members from some southern states like New Jersey voiced concern about federal waters being closed at the start of the year given the importance of waves 1 and 2 (January – April) to the for-hire sector. Northern states however, expressed the need for the modified season since those states would take the bulk of the required reduction in state waters and there was a desire to maintain some consistency between state and federal waters regulations. There was also concern about the accuracy of wave 1[1] and 2 Marine Recreational Information Program (MRIP) data and how in past years a single trip has greatly inflated harvest estimates for those waves.

March 2023 ASMFC Board meeting discussion

At the March 2023 Board meeting, the Board reviewed a range of options for state scup regulations that are intended to achieve the bulk of the required 10% reduction in harvest. Details about the proposed regional regulations can be found below in the "ASMFC Technical Committee Memorandum." Collectively, the proposed regulations in state waters would achieve a 9.6% reduction in harvest. It is difficult to accurately predict the impacts of state measures in combination with federal measures. However, due to the minimal amount of harvest that occurs in federal waters, federal measures are expected to have a low impact on the overall reduction.

Following the presentation there was continued discussion related to the modified federal scup season. Some Board members as well as for-hire captains from New Jersey spoke against the previously approved May 1 – December 31 open season. It was noted that due to the timing of federal rule making the modified federal season would not go into effect until 2024, therefore having no impact on 2023 harvest. The Board ultimately agreed that because the proposed state adjustments meet virtually the full 10% reduction in coastwide harvest, and because the Council and Board also recommended a decrease in the federal possession limit, that it would be appropriate to recommend to NOAA Fisheries to reconsider the scup federal waters closure (January 1 – April 30). The Board also expressed interest in the Council discussing this issue at the April Council meeting.

Council objective

The Council should consider whether they wish to comment on this issue prior to publication of the final rule this spring. The Greater Atlantic Regional Office (GARFO) will consider all public comments and any recommendations made by the Council and Board during the public comment period on the proposed rule before publication of the final rule.

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[1] Within the scup management unit wave 1 (January – February) Marine Recreational Information Program (MRIP) data is only available for North Carolina due to survey coverage.

Atlantic States Marine Fisheries Commission

ASMFC Summer Flounder, Scup and Black Sea Bass Board

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

ASMFC Summer Flounder, Scup and Black Sea Board
March 2, 2023

For more information, please
contact Toni Kerns, ISFMP,
Tina Berger, Communications or
the identified individual at
703.842.0740

Meeting Summaries, Press Releases and Motions

TABLE OF CONTENTS:

SUMMER FLOUNDER, SCUP AND BLACK SEA BASS MANAGEMENT BOARD (March 2, 2023)
Meeting Summary
The Summer Flounder, Scup and Black Sea Bass Board (Board) met via webinar to consider black sea bass and scup recreational regulations for the 2023 fishery.

Background
In December 2022, the Board and the Mid-Atlantic Fishery Management Council (Council) met jointly to set recreational measures for 2023. The Percent Change Approach, as implemented under Addendum XXXIV to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP), was used in conjunction with the Recreational Demand Model (RDM) to determine that both scup and black sea bass require a 10% reduction in recreational harvest in 2023.

For black sea bass, the Board and Council decided to proceed with the regional conservation equivalency process as outlined in Addendum XXXII, which requires each region (MA-NY, NJ, DE-NC) to implement black sea bass regulations that will achieve a cumulative 10% harvest reduction by weight. For scup, the Board and Council recommended reducing the federal possession limit to 40 fish and shortening the season to May 1 – December 31. Given these measures would not achieve the full 10% reduction, the Board and Council agreed that states would further modify their measures through the Commission process to achieve the full 10% coastwide harvest reduction.

In January and February 2023, the Summer Flounder, Scup, and Black Sea Bass Technical Committee used the RDM to recommend options for 2023 recreational measures for black sea bass and scup which achieve a 10% reduction for both species.

2023 Black Sea Bass and Scup Recreational Measures
At its webinar meeting on March 2, the Board reviewed and approved the presented range of state/regional options for 2023 scup and black sea bass measures as developed by the RDM, which can be found here. Following this meeting, the states will need to select and inform the Commission of their final 2023 state waters measures for both scup and black sea bass, which will be included in a letter to NOAA Fisheries. 2023 summer flounder recreational measures will be the same as the 2022 measures.

In response to submitted public comment and concerns raised by a few Board members, the Board discussed the merits of whether the scup recreational fishery should remain open in federal waters from January 1-April 30, 2024. Given the selected state measures will achieve the required reduction, the Board will recommend to NOAA Fisheries that it reconsider the scup federal waters closure as described above.

For more information on black sea bass, please contact Tracey Bauer, Fishery Management Plan Coordinator, at tbauer@asmfc.org, and for more information on scup and summer flounder, contact Chelsea Tuohy, Fishery Management Plan Coordinator, at ctuohy@asmfc.org.

Motions
Move to approve the range of state/regional options for 2023 black sea bass recreational measures developed using the Recreational Demand Model as presented today.

Motion made by Ms. Meserve and seconded by Dr. McNamee. Motion approved with one abstention from NOAA Fisheries.

Main Motion
Move to approve the use of the Recreational Demand Model to establish 2023 scup recreational measures to achieve a 10% reduction of the RDM's estimated 2023 harvest under 2022 measures, and recommend NOAA Fisheries reconsider the federal waters closure based on the reduction achieved by the state regulations.
Motion made by Mr. Cimino and seconded by Mr. Borden. Main motion divided.

Motion to divide the question.
Motion made by Mr. Nowalsky and seconded by Mr. Batsavage. Motion passes by consent with two abstentions.

Divided Main Motion #1
Move to approve the use of the Recreational Demand Model to establish 2023 scup recreational measures to achieve a 10% reduction of the RDM's estimated 2023 harvest under 2022 measures.
Motion substituted.

Motion to Substitute
Move to approve the range of state/regional options for 2023 scup recreational measures developed using the Recreational Demand Model as presented today.
Motion made by Ms. Meserve and seconded by Dr. McNamee. Motion passes (8 in favor, 1 opposed, 2 abstentions).

Divided Main Motion #1 as Substituted
Move to approve the range of state/regional options for 2023 scup recreational measures developed using the Recreational Demand Model as presented today.
Motion passes. Roll Call: In Favor - MA, RI, CT, NY, DE, MD, VA, NC; Opposed - NJ; Abstentions - NH, NOAA.

Divided Main Motion #2
Move to recommend NOAA Fisheries reconsider the federal waters closure based on the reduction achieved by the state regulations.
Motion passes (6 in favor, 3 opposed, 2 abstentions).

MEMORANDUM

TO: Summer Flounder, Scup, and Black Sea Bass Management Board

FROM: Summer Flounder, Scup, and Black Sea Bass Technical Committee

DATE: February 15, 2023

SUBJECT: Proposed 2023 Regional Recreational Management Measures for Scup and Black Sea Bass

Background

In December, the Summer Flounder, Scup, and Black Sea Bass Management Board (Board) and the Mid-Atlantic Fishery Management Council (Council) met jointly to set recreational measures for 2023. The Percent Change Approach, as implemented under Addendum XXXIV to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP), was used in conjunction with the Recreational Demand Model (RDM) to determine that both scup and black sea bass require a 10% reduction in recreational harvest in 2023.

For black sea bass, the Board and Council opted to proceed with the regional conservation equivalency processes as outlined in Addendum XXXII, as opposed to implementing uniform coastwide measures. Addendum XXXII requires each region (MA-NY, NJ, DE-NC) to implement black sea bass regulations that will collectively achieve but not exceed the recreational harvest limit. Additionally, each region is expected to achieve a cumulative 10% harvest reduction by weight.

For scup, the Board and Council agreed at the December joint meeting to reduce the federal possession limit to 40 fish and shorten the season to May 1 – December 31. Because this did not achieve the full 10% reduction, the Board and Council also agreed that states would further modify state measures through the Commission process to achieve the full 10% coastwide harvest reduction.

Regional Proposals

The Summer Flounder, Scup, and Black Sea Bass Technical Committee used the RDM to recommend options for 2023 recreational measures for black sea bass and scup which achieve a 10% reduction for both species. There are specific black sea bass and scup measures associated with each option, as the model relies on inputs of measures from both species to calculate estimates of 2023 harvest. Options are organized by region (MA-NY, NJ, DE-NC) for both species. Please note that when final options are selected, some states may make minor adjustments to the season dates to achieve as close to a 10% reduction as possible.

The states from Delaware to North Carolina have proposed to reduce the scup bag limit to 40 fish to match the 2023 federal possession limit, but no additional reductions were taken. The Technical Committee focused on achieving the 10% reduction in scup recreational harvest from the states of New Jersey through Massachusetts because 1) a majority of scup harvest (99%) occurs from these states and any reduction in the states south of Delaware would likely have a negligible effect on coastwide scup harvest; and 2) the RDM's median estimate of harvest in Maryland was always zero due to high PSEs in the MRIP estimates of catch-per-trip, and therefore harvest reductions were unable to be calculated.

M23-19

Table 1 details the proposed options for black sea bass and scup recreational measures for Massachusetts to New York. The regional percent reduction was not calculated by the RDM for every single possible combination of options from each state, but from one set of measures selected by each state. Table 2 provides the percent reductions of scup and black sea bass for the entire northern region (MA-NY) based on the example set of measures selected by each state.

Table 3 details the proposed options and associated percent reduction for each species for New Jersey.

Table 4 details the proposed options and associated percent reduction for each species for the southern region, Delaware through North Carolina (north of Cape Hatteras). Each state may select one of the two options as long as the 10% black sea bass reduction is met by the region.

Table 1. Proposed recreational management measures for the northern region, from Massachusetts to New York.

State	Options	Black Sea Bass Measures Mode	Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Black Sea Bass Harvest	Scup Measures Mode	Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Scup Harvest
MA	Option 1	All	16.5"	4	5/20 - 9/7	-10.4	Private	10.5"	30	5/1 - 12/31	-7.6
							Shore	9.5"			
							For-hire	10.5"	40	5/1 - 6/30	
									30	7/1 - 12/31	
	Option 2	All	16"	3	5/20 - 9/2	-10.3	Private	10.5"	30	5/1 - 12/31	-7.6
							Shore	9.5"			
							For-hire	10.5"	40	5/1 - 6/30	
									30	7/1 - 12/31	
	Option 3	All	16"	4	5/20 - 6/30	-10.3	Private	10.5"	30	5/1 - 12/31	-7.8
							Shore	9.5"			
				2	7/1 - 9/11		For-hire	10.5"	40	5/1 - 6/30	
									30	7/1 - 12/31	
	Option 4	Private/Shore	16"	3	5/20 – 8/31	-10.3	Private	10.5"	30	5/1 - 12/31	-7.6
							Shore	9.5"			
		For-hire		4			For-hire	10.5"	40	5/1 - 6/30	
									30	7/1 - 12/31	
	Option 5	Private/Shore	16"	2	5/20 - 10/24	-10.0	Private	10.5"	30	5/1 - 12/31	-7.5
							Shore	9.5"			
		For-hire		4	5/20 - 9/4		For-hire	10.5"	40	5/1 - 6/30	
									30	7/1 - 12/31	
	Option 6	Private/Shore	16"	3	5/20 - 6/30	-10.1	Private	10.5"	30	5/1 - 12/31	-7.5
				1	7/1 - 8/31		Shore	9.5"			
				3	9/1 - 10/23		For-hire	10.5"	40	5/1 - 6/30	
		For-hire		4	5/20 - 9/4				30	7/1 - 12/31	
RI	Option 1		16.5"	2	5/22 - 8/26	-10.3	Shore	9.5"	30	5/1 - 12/31	-3.1

2

State	Options	Mode	Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Black Sea Bass Harvest	Mode	Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Scup Harvest
			Black Sea Bass Measures					**Scup Measures**			
		Private/shore		3	8/27 - 12/31		Private	10.5"			
		For-hire	16"	2	6/18 - 8/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
				6	9/1 - 12/31				40	9/1 - 10/31	
	Option 2	Private/shore	16.5"	2	5/22 - 8/26	-10.1	Shore	9.5"	30	5/1 - 12/31	-3.7
				3	8/27 - 11/30		Private	10.5"			
		For-hire		2	6/17 - 8/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
				6	9/1 - 11/30				40	9/1 - 10/31	
	Option 3	Private/shore	16.5"	2	5/22 - 8/31	-11.7	Shore	9.5"	30	5/1 - 12/31	-3.0
				3	9/1 - 12/31		Private	10.5"			
		For-hire		2	6/18 - 8/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
				6	9/1 - 12/31				40	9/1 - 10/31	
	Option 4	Private/shore	16.5"	2	5/22 - 8/31	-11.0	Private/shore	10.5"	30	1/1 - 12/31	-14.0
				3	9/1 - 12/31						
		For-hire		2	6/18 - 8/31		For-hire		30	1/1 - 8/31, 11/1 - 12/31	
				6	9/1 - 12/31				50	9/1 - 10/31	
CT	Option 1	Private/shore	16.5"	5	5/19 - 12/1	-11.9	Shore	9.5"	30	5/1 - 12/31	-1.6
				5	5/19 - 8/31		Private	10.5"			
		For-hire		7	9/1 - 12/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
									40	9/1 - 10/31	
	Option 2	Private/shore	16"	2	5/19 - 12/1	-14.5	Shore	9.5"	30	5/1 - 12/31	-5.1
				5	5/19 - 8/31		Private	10.5"			
		For-hire		7	9/1 - 12/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
									40	9/1 - 10/31	
	Option 3	Private/shore	16"	5	5/19 - 6/23	-10.1	Shore	9.5"	30	5/1 - 12/31	-5.0
					7/8 - 12/1		Private	10.5"			
		For-hire		5	5/19 - 8/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
				7	9/1 - 12/31				40	9/1 - 10/31	
	Option 4	Private/shore	16"	5	5/19 - 9/30	-10.1	Shore	9.5"	30	5/1 - 12/31	-5.3
				2	10/1 - 10/23		Private	10.5"			
		For-hire		5	5/19 - 8/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
				7	9/1 - 12/31				40	9/1 - 10/31	
NY	Option 1	All	16.5"	3	6/23 - 8/31	-11.7	Shore	9.5"	30	5/1 - 12/31	-15.0
							Private	10.5"			

State	Options	Mode	Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Black Sea Bass Harvest	Mode	Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Scup Harvest
				6	9/1/ - 12/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
									40	9/1 - 10/31	
	Option 2	All	16"	3	7/1 - 8/31	-10.8	Shore	9.5"	30	5/1 - 12/31	-14.9
							Private	10.5"			
				6	9/1 - 12/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
									40	9/1 - 10/31	
	Option 3	All	16"	2	6/28 - 8/31	-10.8	Shore	9.5"	30	5/1 - 12/31	-14.9
							Private	10.5"			
				6	9/1 - 12/31		For-hire	10.5"	30	5/1 - 8/31, 11/1 - 12/31	
									40	9/1 - 10/31	

Table 2. The percent reduction of black sea bass and scup harvest for the northern region (MA-NY) achieved by the combination of measures that the states selected for this memo, by state and for the region as a whole.

State	Option from Table 1	Percent Reduction in Black Sea Bass Harvest	Percent Reduction in Scup Harvest
MA	Option 1	-10.4	-7.6
RI	Option 2	-10.1	-3.7
CT	Option 3	-10.1	-5.0
NY	Option 1	-11.7	-15.0
Total Northern Region Reduction		-10.6	-9.7

Table 3. Proposed recreational management measures for New Jersey, and associated percent reduction.

State	Options	Mode	Black Sea Bass Measures Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Black Sea Bass Harvest	Mode	Scup Measures Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Scup Harvest
NJ	Option 1	All	12.5"	10	5/17 - 6/19	-10.6	All	10"	30	8/1 - 12/31	-10.3
				1	7/1 - 8/31						
				10	10/1 - 10/31						
				15	11/1 - 12/31						
	Option 2	All	12.5"	10	5/17 - 6/19	-10.6	All	10"	30	1/1 - 10/15	-12.6
				1	7/1 - 8/31						
				10	10/1 - 10/31						
				15	11/1 - 12/31						
	Option 3	All	12.5"	10	5/17 - 6/19	-10.3	All	10"	30	8/1 - 12/31	-12.6
				2	7/1 - 8/7						
				10	10/1 - 10/31						
				15	11/1 - 12/31						
	Option 4	All	12.5"	10	5/17 - 6/19	-10.9	All	10"	30	8/1 - 12/31	-10.1
				2	7/20 - 8/31						
				10	10/1 - 10/31						
				15	11/1 - 12/31						

Table 4. Proposed recreational management measures for the southern region, from Delaware to North Carolina (north of Cape Hatteras), and associated percent reduction.

State	Options	Mode	Black Sea Bass Measures Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Black Sea Bass Harvest	Mode	Scup Measures Minimum Size Limit	Bag Limit	Dates of Open Season	Percent Reduction in Scup Harvest
DE-NC	Option 1	All	13"	15	5/15 - 7/15, 7/27 - 12/31	-10.8	All	9"	40 (30 in VA)	1/1 - 12/31	1.0
	Option 2	All	13"	15	5/15 - 9/30, 10/10 - 12/31	-11.5	All	9"	40 (30 in VA)	1/1 - 12/31	0.5

Mid-Atlantic Fishery Management Council

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M EM O R A ND U M

Date: March 22, 2023

To: Council

From: Brandon Muffley, Council staff

Subject: Mid-Atlantic State of the Ecosystem Report – Meeting
               Materials

On Wednesday, April 5, 2023, Dr. Sarah Gaichas (NEFSC) will present the 2023 Mid-Atlantic State of the Ecosystem (SOE) report. The Council will review the findings and ecosystem considerations contained in the report and provide any feedback on the future report development and the utility of the information for management. Dr. Gaichas will also provide an update on the SSC's Ecosystem Work Group activities and their approaches to potentially integrate SOE and other climate information into the science and management process.

Materials listed below are provided for Council consideration of this agenda item.

Materials behind the tab:
- 2023 Mid-Atlantic State of the Ecosystem report
- Cover letter and State of the Ecosystem response memo
- March 2023 SSC Ecosystem Work Group update report

2023 State of the Ecosystem

Mid-Atlantic
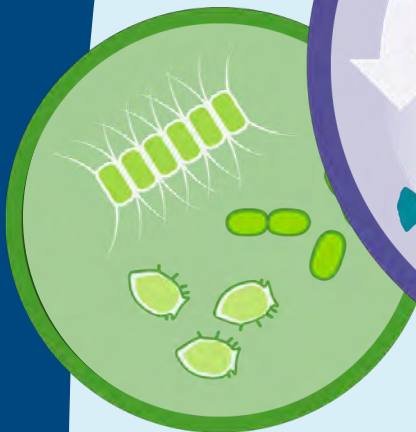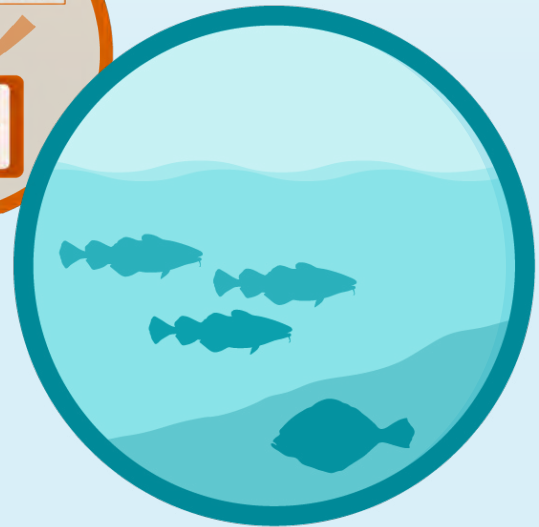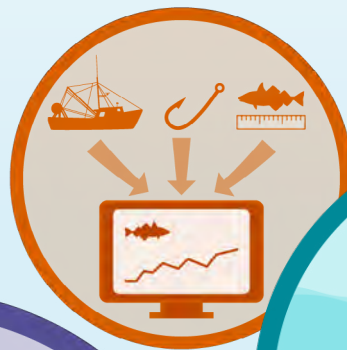
Performance Relative to Fishery Management Objectives

Trends and status of indicators related to broad ecosystem-level fishery management objectives, with implications for the Mid-Atlantic Fishery Management Council (MAFMC)

OBJECTIVE (Indicator)	TREND	CURRENT STATUS	IMPLICATIONS
Seafood production (total and MAFMC managed landings)	Decline	Below long term average	Commercial landings are at the lowest point observed, driven by recent declines in species not managed by the Mid-Atlantic Council. Recreational harvest is declining due to multiple drivers. COVID-19 likely exacerbated existing trends, but impacts are not uniform across fisheries. Biomass trends within the ecosystem continue to be stable. Climate indicators continue to exceed historical bounds, which affects stock distributions and will generate other ecosystem changes.
Commercial profits	Decline	Below long term average	Regional commercial revenue is the lowest that has been observed, driven in part by managed clam species. Falling prices are almost universal and due to market dynamics including COVID-19 impacts. Monitor climate risks to surfclams and ocean quahogs.
Recreational opportunities (effort and fleet diversity)	**EFFORT** No trend / **FLEET DIVERSITY** Decline	**EFFORT** Near long term average / **FLEET DIVERSITY** Below long term average	Recreational effort shows no long term trend and is near average, but fleet diversity is decreasing because of a shift away from party/charter to shore-based fishing. This shift results in a decreased range of recreational fishing opportunities. Shore-based anglers will have access to different species/sizes of fish than vessel-based anglers.
Stability (fishery and ecosystem diversity maintained over time)	**FISHERY** No trend / **ECOSYSTEM** Mixed trends	**FISHERY** Near long term average / **ECOSYSTEM** Near long term average	Commercial: Fleet diversity metrics suggest stable capacity to respond to the current range of fishing opportunities. Recreational: Species catch diversity has been maintained by a different set of species over time and continues to be above the long-term mean. Ecosystem: Adult fish diversity indices are stable, but several climate and oceanography metrics are changing and should be monitored as warning signs for potential regime shift or ecosystem restructuring.
Social and cultural (community fishery engagement, reliance, and environmental justice vulnerability)	**Status only indicator**	**Environmental justice status for top commercial and recreational communities**	These indicators are used to identify top fishing communities and those with environmental justice concerns based on 2020 data. Highlighted communities may be vulnerable to changes in fishing patterns due to regulations and/or climate change. When any of these communities also experience environmental justice issues, they may have lower ability to successfully respond/adapt to change. The top Mid Atlantic recreational communities changed between 2019 and 2020.
Protected species (coastwide bycatch, population numbers, mortalities)	**BYCATCH** Mixed trends / **POPULATION NARW** Decline	**BYCATCH** Meeting objectives / **POPULATION NARW** Below long term average	Mixed bycatch trends through 2021 are related to fishery management, shifts in population distribution combined with fishery shifts, and population increase for seals. Recent bycatch data is uncertain. Population drivers for North Atlantic Right Whales (NARW) include combined fishery interactions/vessel strikes, distribution shifts, and copepod availability. Unusual mortality events continue for 3 large whale species.

Risks to Meeting Fishery Management Objectives

Climate and Ecosystem Productivity Risks

Climate change, most notably ocean warming and changes in the Gulf Stream, continue to affect the Mid-Atlantic ecosystem:

- 2022 was among the warmest years on record in the North Atlantic, with both long term surface and bottom warming observed in the Mid-Atlantic.

- The Gulf Stream is becoming less stable and moving further north, which can affect the physics, chemistry, and biology of the Northeast Shelf.

- The cold pool is becoming warmer, smaller, and shorter in duration, which affects habitat for multiple federally managed species.

- Ocean acidification in western Long Island Sound, nearshore to mid-shelf waters of the Mid-Atlantic Bight off the coast of New Jersey, and in waters > 1000 meters may impact organisms.

- Above average early winter and late fall phytoplankton blooms were observed in the Mid-Atlantic, but larger phytoplankton concentrations were below average in early fall.

- The value of Chesapeake Bay habitat for fishes is changing. Several finfish species, including summer flounder, show relative decline in Chesapeake Bay habitat usage. There is evidence that suitable habitat for juvenile summer flounder has declined between 47% and 64% since 1996.

- Shifts in species distribution are being observed across many managed fish and marine mammal species, complicating regional management by changing fishing patterns and risks.

- Fish condition was mixed in 2022, and fish productivity is declining for many managed species.

Other Ocean Uses: Offshore Wind Risks

More than 31 offshore wind development projects are proposed for construction on the Northeast shelf, covering more than 2.4 million acres by 2030. Additional large areas are being considered. In existing and proposed leases of the Northeast:

- 1–34% of port revenue from fisheries currently comes from areas proposed for offshore wind development. Some of these port communities score medium-high to high in environmental justice concerns and gentrification vulnerability.

- Up to 17% of annual commercial landings and revenue for Mid-Atlantic managed species occur in lease areas and may shift to other areas.

- Development at different scales will affect species differently, negatively affecting species that prefer soft bottom habitat while potentially benefiting species that prefer hard structured habitat.

- Planned wind areas overlap with important right whale foraging habitats, and altered local oceanography could affect right whale prey availability. Development also brings increased vessel strike risk and the potential impacts of pile driving noise.

- Scientific surveys are key to understanding the impacts of climate change and other drivers on managed species, and inform management advice. Planning for impacts to scientific surveys is in progress.

- Current plans for rapid buildout in a patchwork of areas would spread the impacts differentially throughout the region.

Characterizing Ecosystem Change

Multiple System Drivers

The Northeast shelf ecosystem is changing, which is affecting the services that the ecosystem provides. To illustrate how multiple factors are driving change in this complex ecosystem, we are using three overarching concepts: multiple system drivers, regime shifts, and ecosystem reorganization. Societal, biological, physical, and chemical factors are the **multiple system drivers** that influence marine ecosystems through a variety of different pathways.
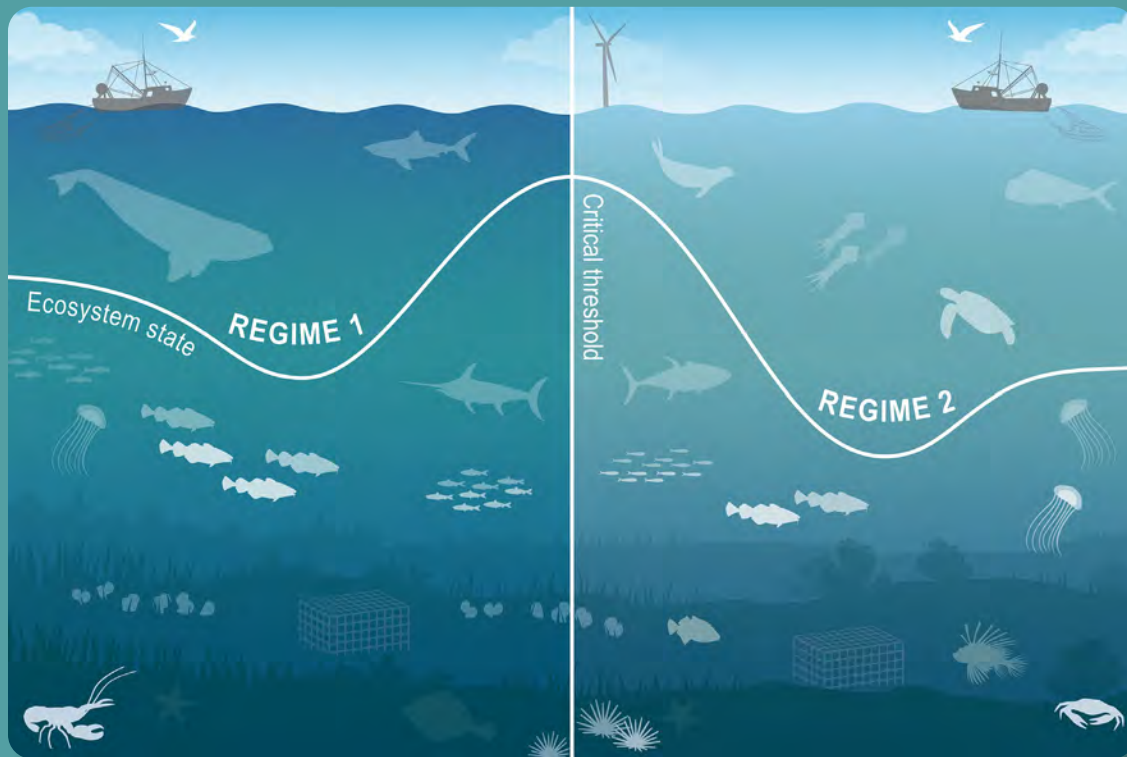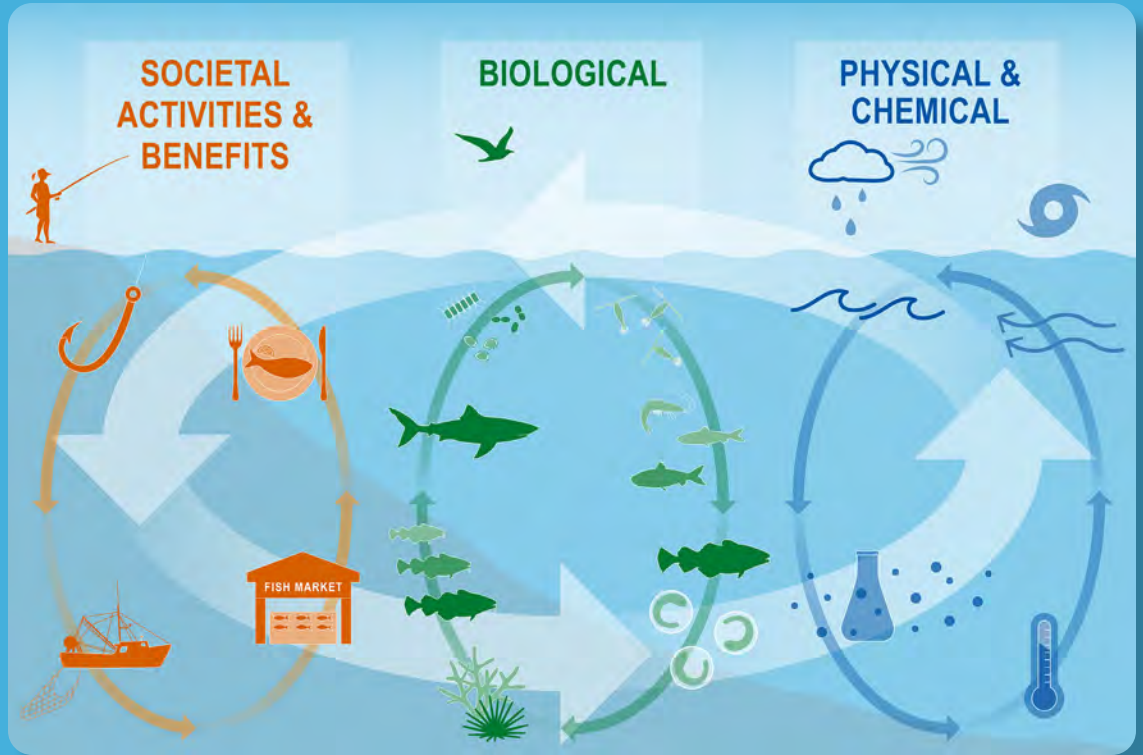
Regime Shift

These drivers affect fishery management objectives such as seafood production and recreational opportunities, as well as other ecosystem services we derive from the ocean. Changes in the multiple drivers can lead to **regime shifts**—large, abrupt and persistent changes in the structure and function of an ecosystem. Regime shifts and changes in how multiple system drivers interact can result in **ecosystem reorganization** as species and humans respond and adapt to the new environment.

Introduction

About This Report

This report is for the Mid-Atlantic Fishery Management Council (MAFMC). The purpose of this report is to synthesize ecosystem information to allow the MAFMC to better meet fishery management objectives, and to update the MAFMC's Ecosystem Approach to Fishery Management (EAFM) risk assessment. The major messages of the report are synthesized on pages 1 and 2, and synthesis themes are illustrated on page 3. The information in this report is organized into two sections; performance measured against ecosystem-level management objectives (Table 1), and potential risks to meeting fishery management objectives (climate change and other ocean uses).

Report structure

The two main sections contain subsections for each management objective or potential risk. Within each subsection, we first review indicator trends, and the status of the most recent data year relative to a threshold (if available) or relative to the long-term average. Second, we synthesize results of other indicators and information to outline potential implications for management (i.e., connecting indicator(s) status to management and why an indicator(s) is important). For example, if there are multiple drivers related to an indicator trend, which drivers may be more or less supported by current information, and which, if any, can be affected by management action(s)? Similarly, which risk indicators warrant continued monitoring to evaluate whether regime shifts or ecosystem reorganization are likely? We emphasize that these implications are intended to represent testable hypotheses at present, rather than "answers," because the science behind these indicators and syntheses continues to develop.

A glossary of terms[1], detailed technical methods documentation[2], and indicator data[3] are available online. The details of standard figure formatting (Fig. 57a), categorization of fish and invertebrate species into feeding guilds (Table 3), and definitions of ecological production units (EPUs, including the Mid-Atlantic Bight, MAB; Fig. 57b) are provided at the end of the document.

Table 1: Ecosystem-scale fishery management objectives in the Mid-Atlantic Bight

Objective categories	Indicators reported
Provisioning and Cultural Services	
Seafood Production	Landings; commercial total and by feeding guild; recreational harvest
Profits	Revenue decomposed to price and volume
Recreation	Angler trips; recreational fleet diversity
Stability	Diversity indices (fishery and ecosystem)
Social & Cultural	Community engagement/reliance and environmental justice status
Protected Species	Bycatch; population (adult and juvenile) numbers, mortalities
Supporting and Regulating Services	
Biomass	Biomass or abundance by feeding guild from surveys
Productivity	Condition and recruitment of managed species, primary productivity
Trophic structure	Relative biomass of feeding guilds, zooplankton
Habitat	Estuarine and offshore habitat conditions

Performance Relative to Fishery Management Objectives

In this section, we examine indicators related to broad, ecosystem-level fishery management objectives. We also provide hypotheses on the implications of these trends—*why* we are seeing them, what's driving them, and potential or observed regime shifts or changes in ecosystem structure. Identifying multiple drivers, regime shifts, and potential changes to ecosystem structure, as well as identifying the most vulnerable resources, can help managers determine whether we can do anything differently to meet objectives and how to prioritize for upcoming issues/risks.

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[1] https://noaa-edab.github.io/tech-doc/glossary.html
[2] https://NOAA-EDAB.github.io/tech-doc
[3] https://github.com/NOAA-EDAB/ecodata

Seafood Production

Indicators: Landings; commercial and recreational

This year, we present updated indicators for total commercial landings (all species, all uses, fleets from all nations), US seafood landings (species for human consumption landed by US fleets), and Council-managed US seafood landings (Mid-Atlantic Fishery Management Council (MAFMC) and jointly managed species landed by US fleets for human consumption). Total commercial landings (black) within the Mid-Atlantic have declined over the long term, and total US seafood landings are near their all time low. Because there is no long term trend in MAFMC managed US seafood landings, the decline in US seafood landings in the Mid-Atlantic region is likely driven by recent declines in species not managed by the Mid-Atlantic Council (Fig. 1).
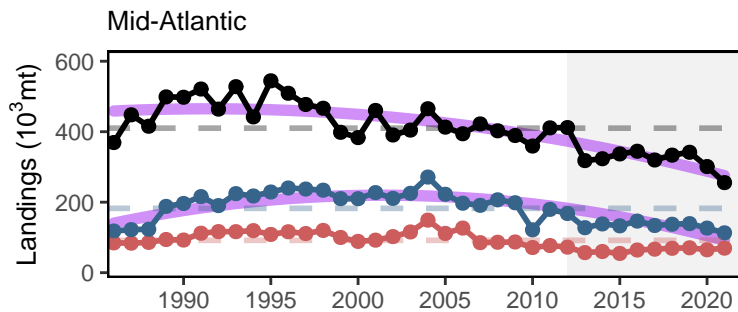
Figure 1: Total commercial landings (black), total U.S. seafood landings (blue), and Mid-Atlantic managed U.S. seafood landings (red)

Landings by guild include all species and all uses, and are reported as total for the guild and the MAFMC managed species within the guild. As reported in previous years, landings of benthos presented a significant downward trend, primarily driven by surf clam and ocean quahog. However, total landings of planktivores is now also presenting a significant downward trend, primarily due to decreases in species not managed by the Mid-Atlantic Council (Atlantic herring and Atlantic menhaden; Fig. 2).
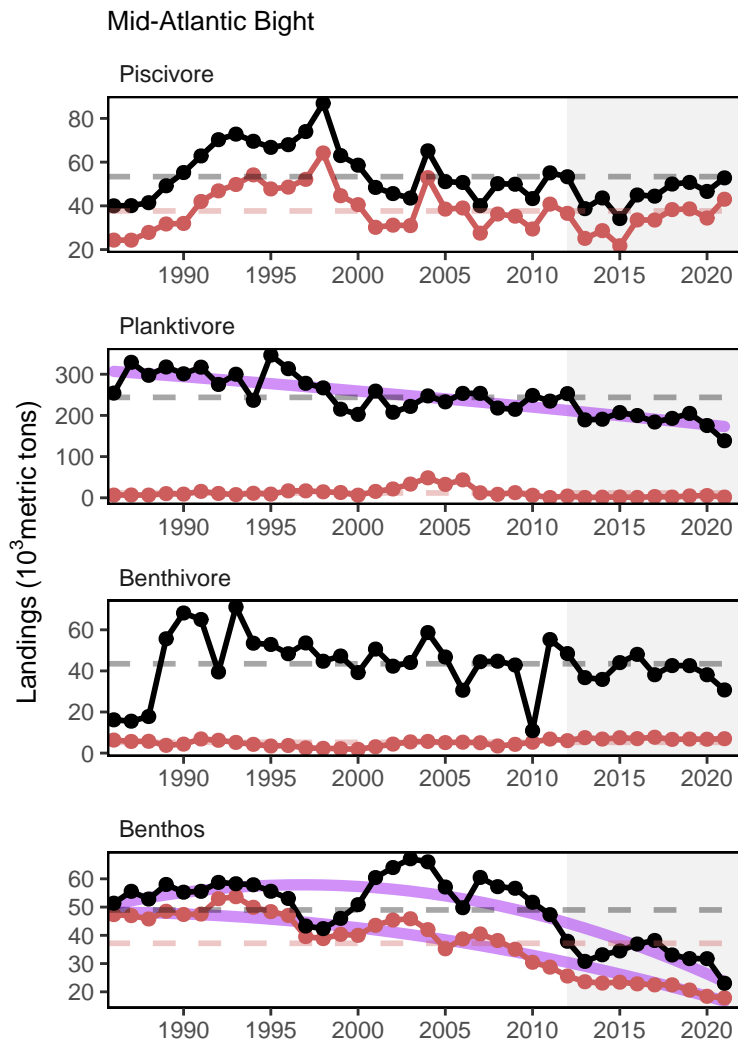
Figure 2: Total commercial landings (black) and MAFMC managed U.S seafood landings (red) by feeding guild.

Total recreational harvest (retained fish presumed to be eaten) is down in the MAB (Fig. 3). Although harvest has increased from a historic low in 2018, it is still below the long term average.
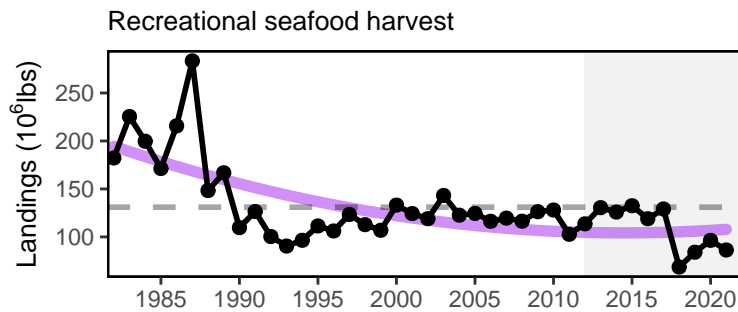
Figure 3: Total recreational seafood harvest (millions of pounds) in the Mid-Atlantic region.

Recreational shark landings show an increase in pelagic sharks over the past decade, with a sharp decrease in 2018 - 2019 persisting through 2022 (Fig 4). This is likely influenced by regulatory changes implemented in 2018 intended to rebuild shortfin mako stocks. In 2021 the International Commission for the Conservation of Atlantic Tunas (ICCAT) finalized recommendations for a two-year retention ban for shortfin mako (ICCAT Rec.21-09), which will also affect total overall landings of pelagic sharks in coming years.
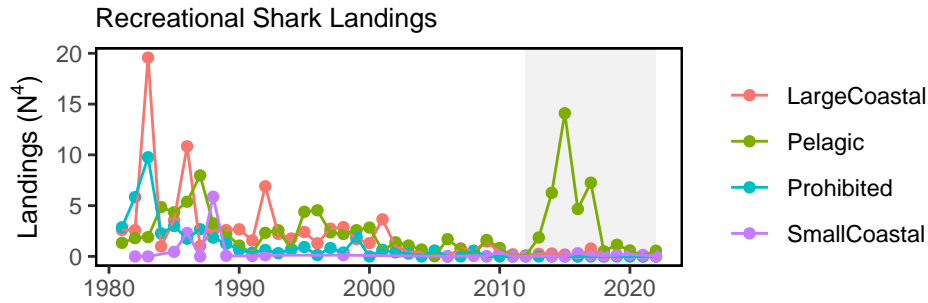
Figure 4: Recreational shark landings from Marine Recreational Information Program.

Aquaculture production is not yet included in total seafood landings, but we are working toward including it in future reports. Available aquaculture production of oysters for a subset of Mid-Atlantic states indicates a decline in recent years.[4]

Implications

Declining commercial (total and seafood) and recreational landings can be driven by many interacting factors, including combinations of ecosystem and stock production, management actions, market conditions (including COVID-19 disruptions), and environmental change. While we cannot evaluate all possible drivers at present, here we evaluate the extent to which stock status and system biomass trends may play a role.

Stock Status and Catch Limits   Single species management objectives (1. maintaining biomass above minimum thresholds and 2. maintaining fishing mortality below overfishing limits) are being met for all but one MAFMC managed species, though the status of six stocks is unknown (Fig. 5). In addition, the status of Spiny dogfish and bluefish are based on 2022 research track assessments and are thus waiting for a management track update to finalize stock status.

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[4]https://noaa-edab.github.io/ecodata/human_dimensions_MAB#Commercial; "Oyster Aquaculture" tab
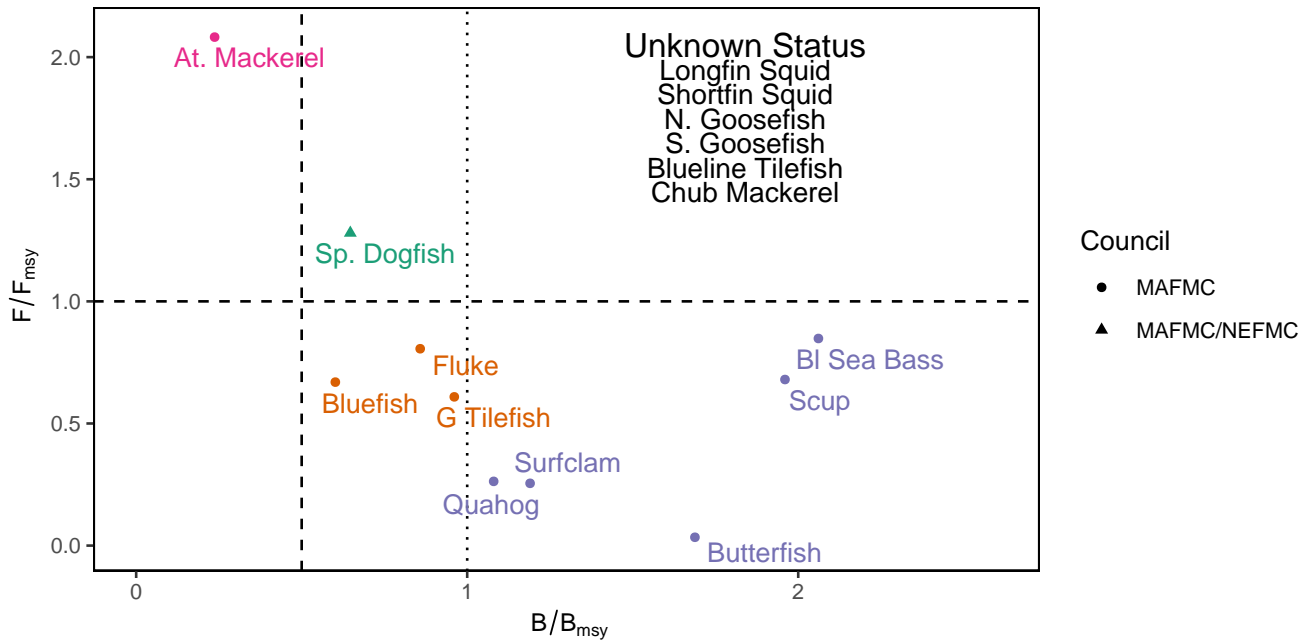
Figure 5: Summary of single species status for MAFMC and jointly federally managed stocks (Spiny dogfish and both Goosefish). The dotted verticxal line is the target bioomass reference point of Bmsy. The dashed lines are the management trehsolds of one half Bmsy (vertical) or Fmsy (horizontal). Stocks in red are below the biomass threshold (overfished) and have fishing mortality above the limit (subject to overfishing), stocks in green are above the biomass threshold but have fishing mortality above the limit. Remaining stocks have fishing mortality within limits: stocks in orange are above the biomass threshold but below the biomass target, and stocks in purple are above the biomass target.

Stock status affects catch limits established by the Council, which in turn may affect landings trends. Summed across all MAFMC managed species, total Acceptable Biological Catch or Annual Catch Limits (ABC or ACL) have been relatively stable 2012-2020 (Fig. 6). Although these figures have not been updated with 2021 data, we do not expect a single year's update to change the narrative. The recent total ABC or ACL is lower relative to 2012-2013, with much of that decrease due to declining Atlantic mackerel ABC. This is true even with the addition of blueline tilefish management in 2017 contributing an additional ABC and ACL to the total 2017-2020, due to that fishery's small relative size.
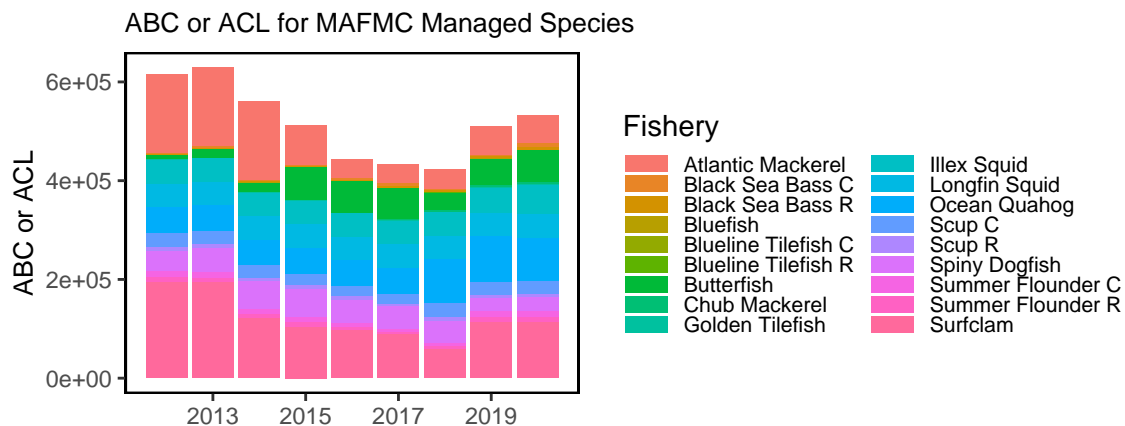
Figure 6: Sum of catch limits across all MAFMC managed commercial (C) and recreational (R) fisheries.

Nevertheless, the percentage caught for each stock's ABC/ACL suggests that these catch limits are not generally constraining as most species are well below the 1/1 ratio (Fig. 7). Therefore, stock status and associated management constraints are unlikely to be driving decreased landings for the majority of species.
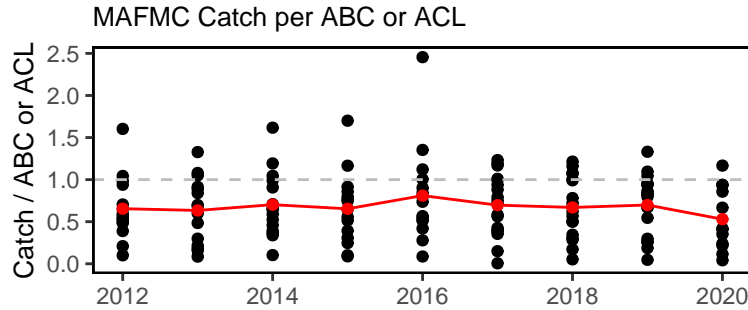

Figure 7: Catch divided by ABC/ACL for MAFMC managed fisheies. High points = Recreational Black Sea Bass. Red line indicates the median ratio across all fisheries.

System Biomass   Although aggregate biomass trends derived from scientific resource surveys are mostly stable in the MAB, spring piscivores, spring benthivores, and fall benthos show long-term increases (Fig. 8). While managed species make up varying proportions of aggregate biomass, trends in landings are not mirroring shifts in the overall trophic structure of survey-sampled fish and invertebrates. Therefore, major shifts in feeding guilds or ecosystem trophic structure are unlikely to be driving the decline in landings.
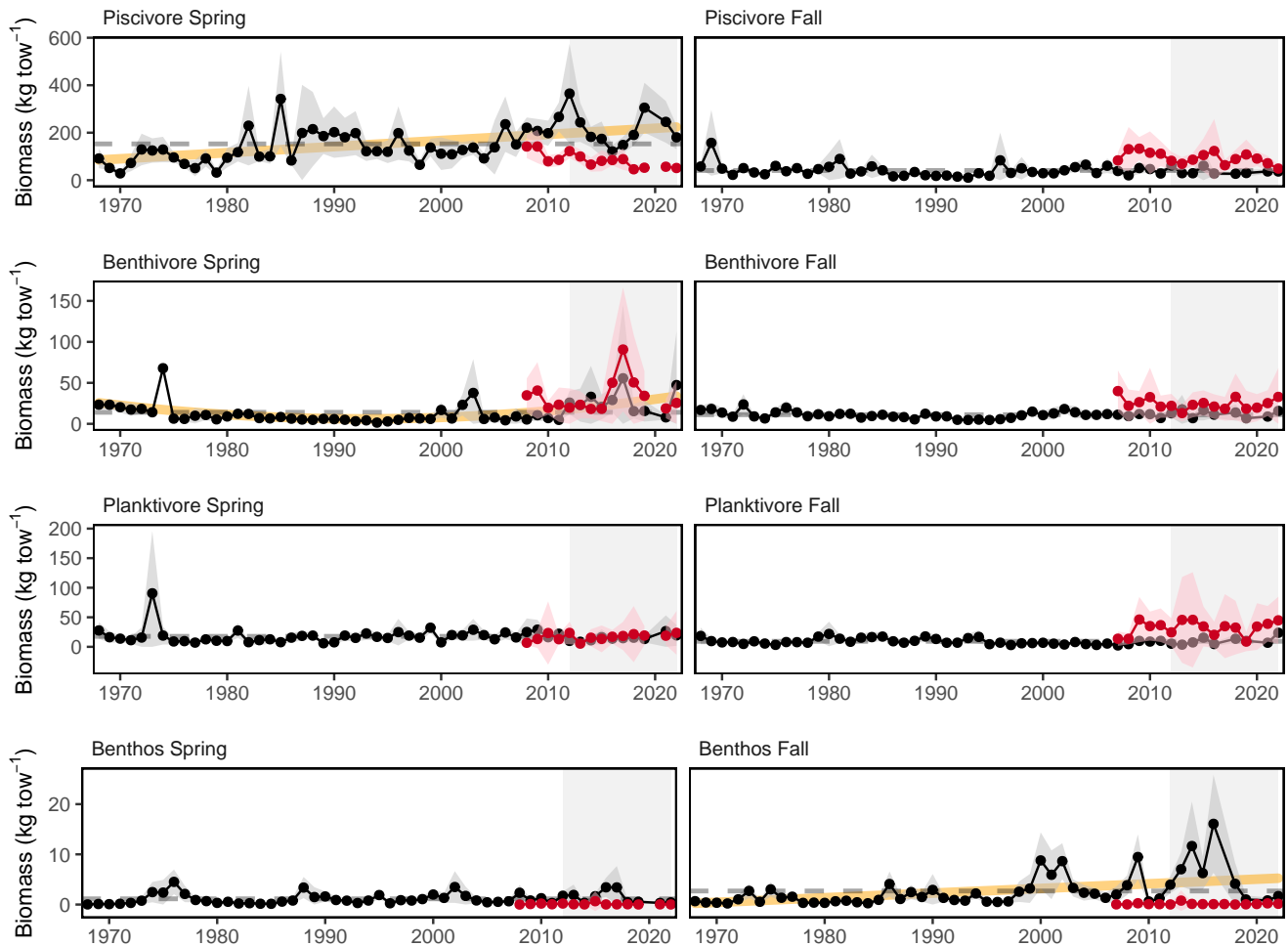
Figure 8: Spring (left) and fall (right) surveyed biomass in the Mid-Atlantic Bight. Data from the NEFSC Bottom Trawl Survey are shown in black, with the nearshore NEAMAP survey shown in red. The shaded area around each annual mean represents 2 standard deviations from the mean.

Effect on Seafood Production Stock status is above the minimum threshold for all but one stock, and aggregate biomass trends appear stable, so the decline in commercial seafood landings is most likely driven by market dynamics affecting the landings of surfclams and ocean quahogs, as landings have been below quotas for these species. The long term decline in total planktivore landings is largely driven by Atlantic menhaden fishery dynamics, including a consolidation of processors leading to reduced fishing capacity between the 1990s and mid-2000s.

Climate change also seems to be shifting the distribution of surfclams and ocean quahogs, resulting in areas with overlapping distributions and increased mixed landings. Given the regulations governing mixed landings, this could become problematic in the future and is currently being evaluated by the Council.

The decline in recreational seafood harvest stems from other drivers. Some of the decline, such as that for recreational shark landings, is driven by management intended to reduce fishing mortality on mako sharks. However, NOAA Fisheries' Marine Recreational Information Program survey methodology was updated in 2018, so it is unclear whether the record-low landings for species other than sharks in 2018 are driven by changes in fishing behavior or the change in the survey methodology. Nevertheless, the recreational harvest seems to be stabilizing at a lower level than historical estimates.

Other environmental changes require monitoring as they may become important drivers of landings in the future:

- Climate is trending into uncharted territory. Globally, 2022 was among the warmest years on record[5] (see Climate Risks section).

- Stocks are shifting distribution, moving towards the northeast and into deeper waters throughout the Northeast US Large Marine Ecosystem (Fig. 9).
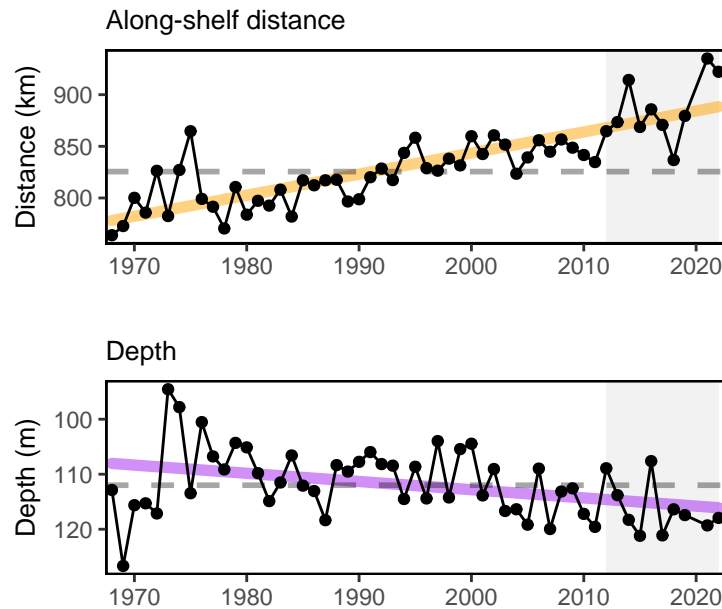

Figure 9: Aggregate species distribution metrics for species in the Northeast Large Marine Ecosystem.

- Some ecosystem composition and production changes have been observed (see Stability section).
- Some fishing communities are affected by environmental justice vulnerabilities (see Environmental Justice and Social Vulnerability section).

Commercial Profits

Indicators: revenue (a proxy for profits)

Total commercial revenues (black) within the Mid-Atlantic and Mid-Atlantic managed species revenue both present long-term declining trends. Total revenue is at, and revenue from Mid-Atlantic managed species is near, an all-time low (Fig. 10).

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[5]https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature
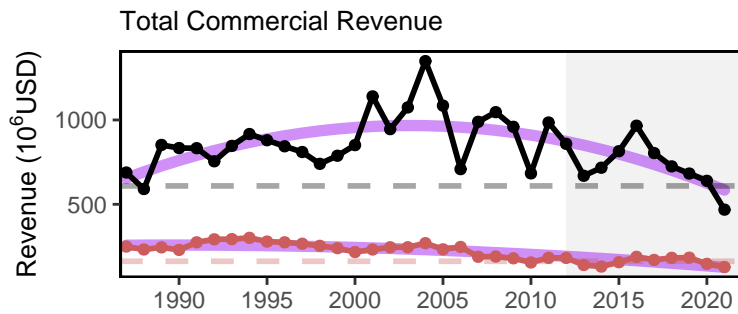
Figure 10: Revenue for the for the Mid-Atlantic region: total (black) and from MAFMC managed species (red).

Revenue earned by harvesting resources is a function of both the quantity landed of each species and the prices paid for landings. Beyond monitoring yearly changes in revenue, it is even more valuable to determine what drives these changes: harvest levels, the mix of species landed, price changes, or a combination of these. The Bennet Indicator decomposes revenue change into two parts, one driven by changing quantities (volumes), and a second driven by changing prices.

Total revenue trends, decomposed to price and volume indicators (Fig. 11), mirror price and volume indicator trends for the benthos (clams; orange in Fig. 12) group, especially over the past decade. However, of note is that only piscivore volume is up across species guilds for either prices or volume when compared to the 2015 benchmark year.
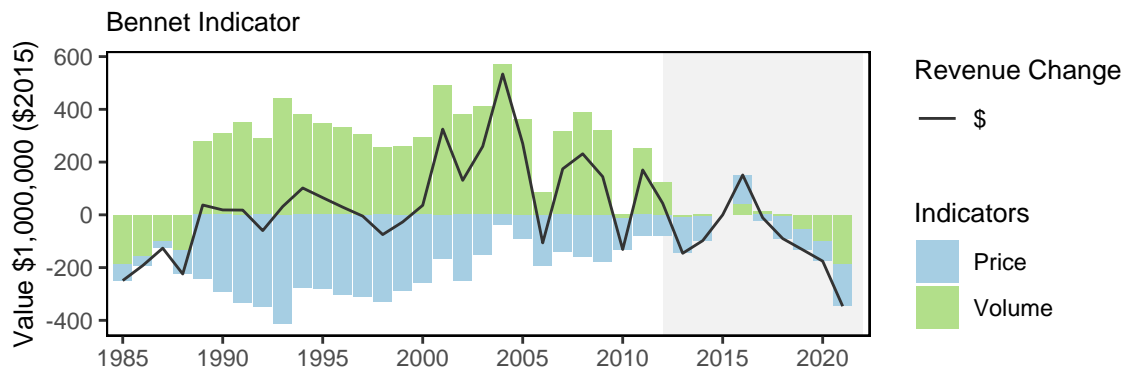

Figure 11: Revenue change from the 2015 values in dollars (black), Price (PI), and Volume Indicators (VI) for commercial landings in the Mid-Atlantic Bight.
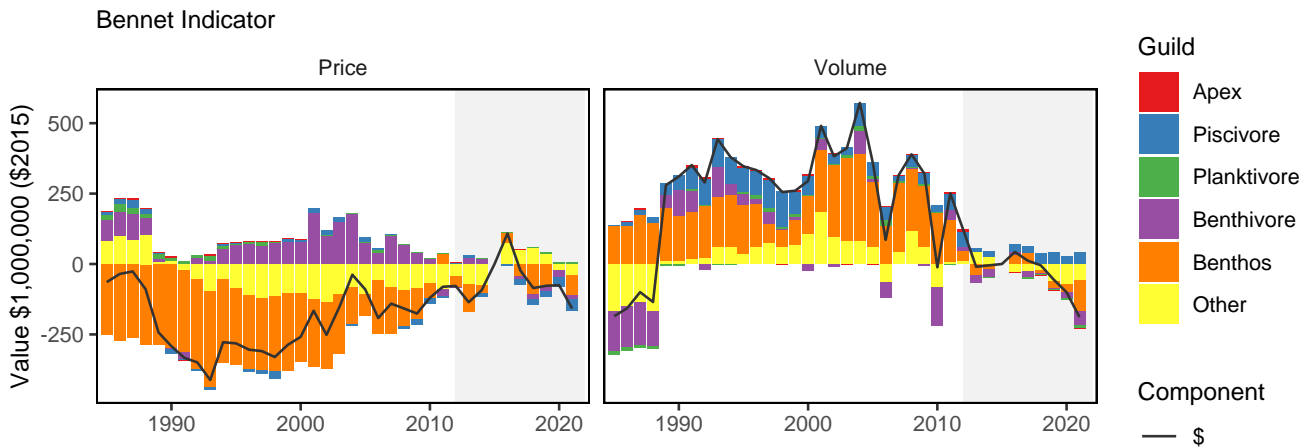
Bennet Indicator

Figure 12: Total component value in dollars (black) for commercial landings in the Mid-Atlantic Bight.

Implications

In a similar manner to seafood landings, the results here are driven in large part by market dynamics affecting the landings of surfclams and ocean quahogs, as landings have been below quotas for these species. Changes in other indicators, particularly those driving landings and those related to climate change, require monitoring as they may become important drivers of revenue in the future; for example:

- Surfclams and ocean quahogs are sensitive to warming ocean temperatures and ocean acidification.

- Acidification levels in surfclam summer habitat are approaching, but not yet at, levels affecting surfclam growth (see Climate Risks section).

Recreational Opportunities

Indicators: Angler trips, fleet diversity

Recreational effort (angler trips) in 2021 is around the long-term average (Fig. 13). However, recreational fleet diversity (i.e., effort by shoreside, private boat, and for-hire anglers) has declined over the long term (Fig. 14).
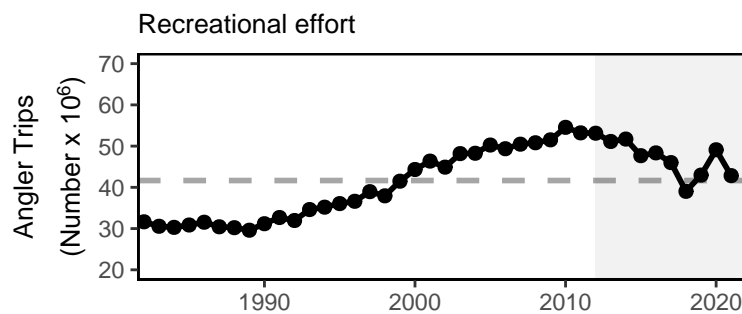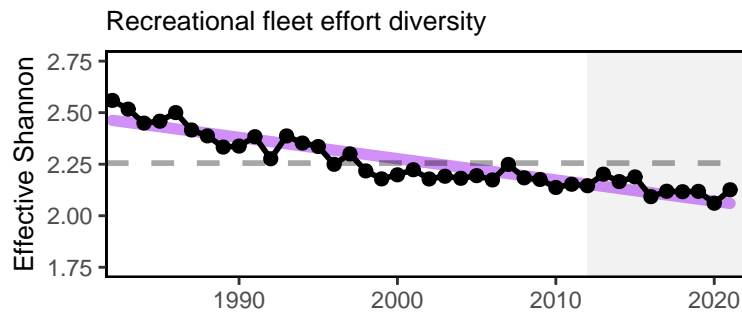

Figure 13: Recreational effort in the Mid-Atlantic.

Recreational fleet effort diversity

Figure 14: Recreational fleet effort diversity in the Mid-Atlantic.

Implications

While the overall number of recreational opportunities in the MAB is above the long-term average, the continuing decline in recreational fleet effort diversity suggests a potentially reduced range of recreational fishing options, despite the slight increase in this indicator's value between 2020 and 2021.

The downward effort diversity trend is driven by party/charter contraction (2% currently), and a shift toward shorebased angling, which currently makes up 61% of angler trips.. Effort in private boats remains stable at around 37% of trips.

Changes in recreational fleet diversity can be considered when managers seek options to maintain recreational opportunities. Shore anglers will have access to different species than vessel-based anglers, and when the same species is accessible both from shore and from a vessel, shore anglers typically have access to smaller individuals. Many states have developed shore-based regulations where the minimum size is lower than in other areas and sectors to maintain opportunities in the shore angling sector.

Stability

Indicators: fishery fleet and catch diversity, ecological component diversity

While there are many potential metrics of stability, we use diversity indices as a first check to evaluate overall stability in fisheries and ecosystems. In general, diversity that remains constant over time suggests a similar capacity to respond to change over time. A significant change in diversity over time does not necessarily indicate a problem or an improvement, but does indicate a need for further investigation. We examine commercial fleet and species catch diversity, and recreational species catch diversity (with fleet effort diversity discussed above), and diversity in zooplankton, and larval and adult fishes.

Fishery Diversity   Diversity estimates have been developed for fleets landing managed species, and species landed by commercial vessels with Mid-Atlantic permits. A fleet is defined here as the combination of gear type (Scallop Dredge, Other Dredge, Gillnet, Hand Gear, Longline, Bottom Trawl, Midwater Trawl, Pot, Purse Seine, or Clam Dredge) and vessel length category (less than 30 ft, 30 to 50 ft, 50 to 75 ft, 75 ft and above). Commercial fishery fleet count and fleet diversity have been stable over time in the MAB, with current values near the long-term average (Fig. 15). This indicates similar commercial fleet composition and species targeting opportunities over time.
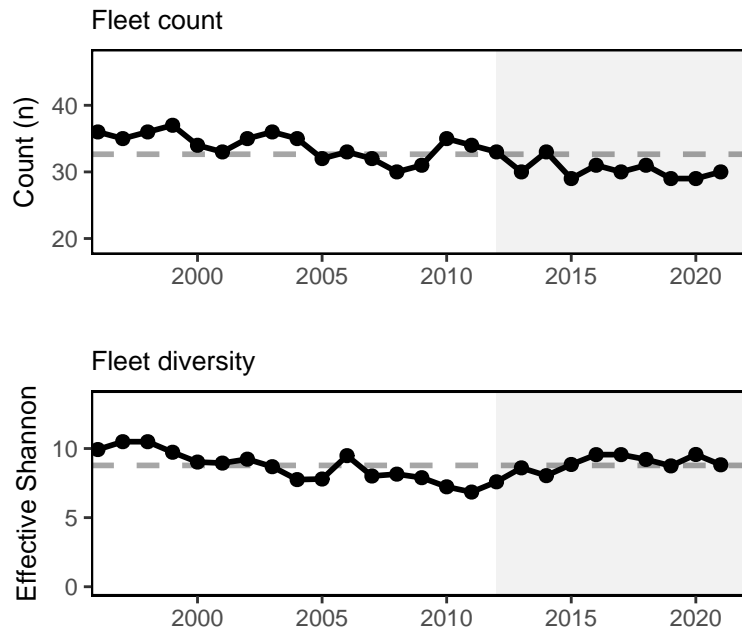
Figure 15: Commercial fleet count and diversity in the Mid-Atlantic.

Commercial fisheries are relying on fewer species relative to the mid-90s, and current species revenue diversity is near the historical low point (Fig. 16). Although with precedent, the drop between 2020 and 2021 is relatively large.
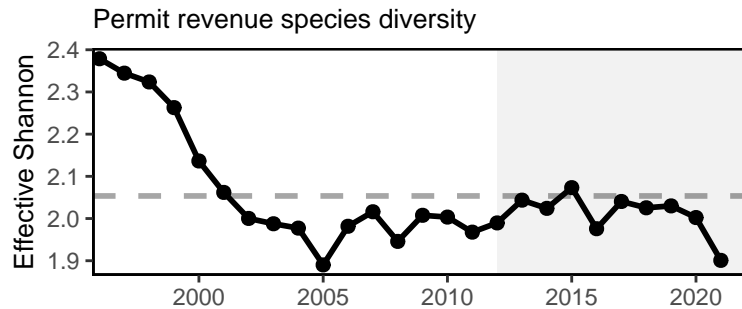

Figure 16: Species revenue diversity in the Mid-Atlantic.

As noted above, recreational fleet effort diversity is declining (Fig. 14), so this metric suggests an unstable range of recreational fishing opportunities. However, recreational species catch diversity has no long term trend so is considered stable, and has been at or above the long term average in 7 of the last 10 years (Fig. 17).
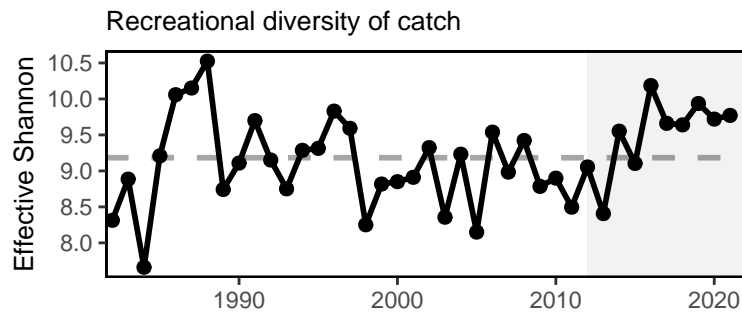
Recreational diversity of catch

Figure 17: Diversity of recreational catch in the Mid-Atlantic.

Ecological Diversity Ecological diversity indices show mixed trends. Zooplankton diversity is increasing in the MAB (Fig. 18). Larval fish diversity shows no trend, and high interannual variability with 2021 values at the mean. Adult fish diversity is measured as the expected number of species in a standard number of individuals sampled from the NEFSC bottom trawl survey. There is no vessel correction for this metric, so indices collected aboard the research vessel Albatross IV (up to 2008) and research vessel Bigelow (2009-2021) are calculated separately. Despite this, adult fish diversity indices appear stable over time, with current values within one standard deviation from most historic estimates (Fig. 19).
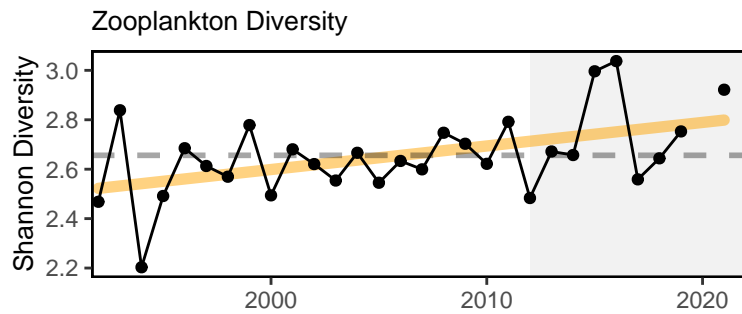
Zooplankton Diversity

Figure 18: Zooplankton diversity in the Mid-Atlantic Bight, based on Shannon diversity index.

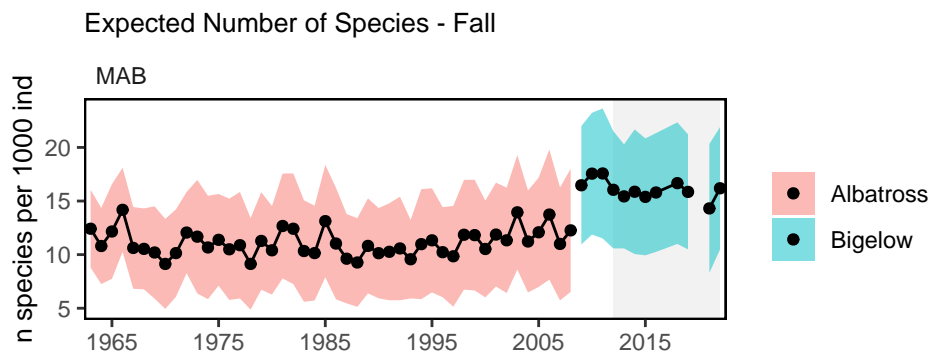Expected Number of Species - Fall

Figure 19: Adult fish diversity in the Mid-Atlantic Bight, based on expected number of species. Results from survey vessels Albatross and Bigelow are reported separately due to catchability differences.

Implications

Fleet diversity indices are used by the MAFMC to evaluate stability objectives as well as risks to fishery resilience and maintaining equity in access to fishery resources [1].

Stability in commercial fleet diversity metrics suggests stable capacity to respond to the current range of fishing opportunities. However, commercial species diversity is relatively low, indicating substantial changes in fishing activities even as the fleet composition sees relative stability.

Declining recreational fleet effort diversity, as noted above, indicates that the party/charter boat sector continues to contract, with shoreside angling becoming more important, as a percentage of recreational angler trips.

Stability in recreational species catch diversity has been maintained by a different set of species over time. A recent increase in Atlantic States Marine Fisheries Commission (ASMFC) and South Atlantic Fishery Management Council (SAFMC) managed species in recreational catch is helping to maintain diversity in the same range that MAFMC and New England Fishery Management Council (NEFMC) species supported in the 1990s.

Ecological diversity indices can provide insight into ecosystem structure. Changes in ecological diversity over time may indicate altered ecosystem structure with implications for fishery productivity and management [2]. Stable adult fish diversity indicates the same overall number and evenness over time, but doesn't rule out species substitutions (e.g., warm-water replacing cold-water). In addition, the change in survey vessels complicates interpretation of long-term fish diversity trends.

In the MAB, existing diversity indicators suggest overall stability in the fisheries and ecosystem components examined. However, declining recreational fleet diversity suggests a potential loss in the range of recreational fishing opportunities. Increasing zooplankton diversity (due to increases in abundance of several taxa and stable or declining dominance of an important copepod species) suggests a shift in the zooplankton community that warrants continued monitoring to determine if managed species are affected. In addition, the species diversity in landings warrants continued attention given its relatively low value and large year over year decline.

Environmental Justice and Social Vulnerability

Indicators: Environmental Justice and Social Vulnerability in commercial and recreational fishing communities

Social vulnerability measures social factors that shape a community's ability to adapt to change. A subset of these factors can be used to assess potential environmental justice issues. Environmental Justice is defined in Executive Order 12898 as federal actions intended to address disproportionately high and adverse human health and environmental effects of federal actions on minority and low-income populations. Three of the existing NOAA Fisheries Community Social Vulnerability Indicators (CSVIs), the Poverty Index, Population Composition Index, and Personal Disruption Index, can be used for mandated Environmental Justice analysis[6].

Commercial fishery engagement measures the number of permits and dealers, and pounds and value landed in a community, while reliance expresses these numbers based on the level of fishing activity relative to the total population of a community. Recreational fishery engagement measures shore, private vessel, and for-hire fishing effort while reliance expresses these numbers based on fishing effort relative to the population of a community.

In 2022, we reported the top ten most engaged, and top ten most reliant commercial and recreational fishing communities and their associated environmental justice vulnerability based on 2019 data. Here we apply the same selection standard for top ten fishing communities for both sectors using 2020 data, and again examine the environmental justice vulnerability in this updated set of communities. Changes in fishing activity between years changed community engagement and reliance rankings, and changes in vulnerability indicators changed environmental justice vulnerability scores.

Communities plotted in the upper right section of Fig.20 scored high for both commercial engagement and reliance using both 2019 and 2020 data, including Cape May and Barnegat Light, NJ, and Reedville, VA. Communities that ranked medium-high or above for one or more of the environmental justice indicators in 2020 are highlighted in bright orange, including Newport News, VA; Atlantic City, NJ; and Beaufort, Columbia and Hobucken, NC. Hampton

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[6]https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators-coastal-communities

Bays/Shinnecock, NY ranked medium-high based on 2019 data but decreased to medium for its environmental justice vulnerability based on 2020 data reported here.

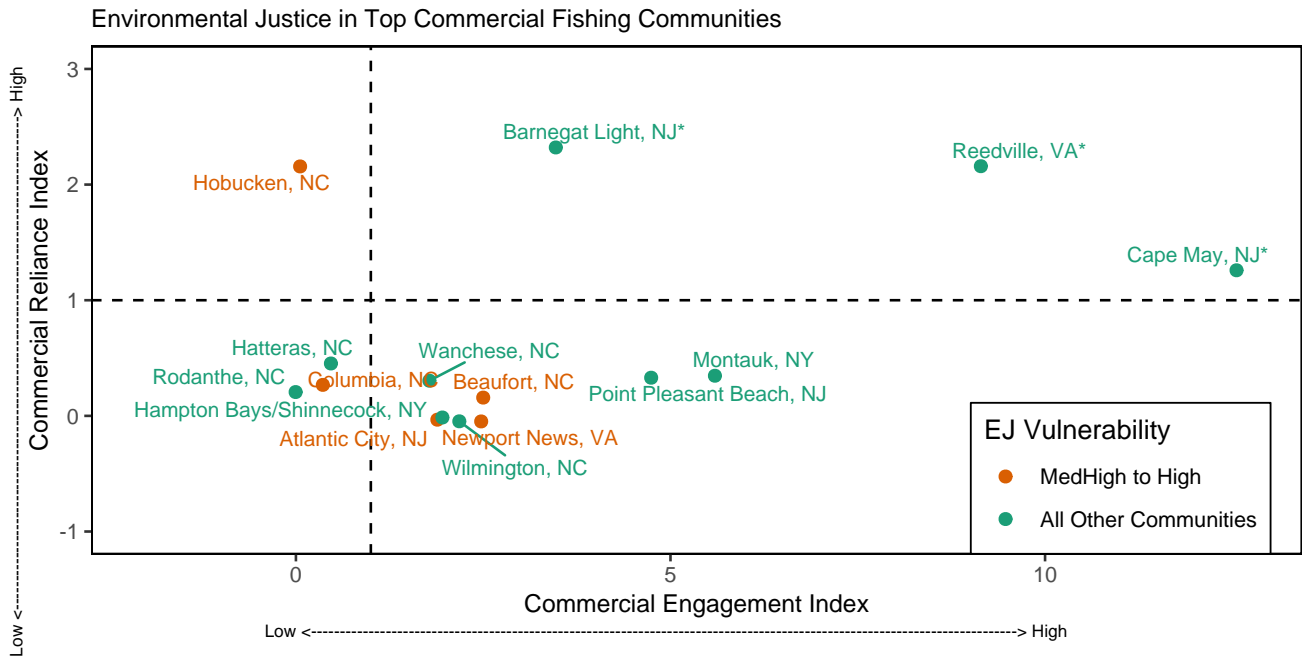Environmental Justice in Top Commercial Fishing Communities

Figure 20: Commercial engagement, reliance, and environmental justice vulnerability for the top commercially engaged and reliant fishing communities in the Mid-Atlantic. Communities ranked medium-high or above for one or more of the environmental justice indicators are highlighted in bright orange. *Community scored high (1.00 and above) for both commercial engagement and reliance indicators.

Fig. 21 shows the detailed scores of the three environmental justice indicators for the same communities plotted in Fig.20. Communities are plotted clockwise in a descending order of commercial engagement scores from high to low, with the most highly engaged community, Cape May, NJ, listed on the top. Among the communities ranked medium-high or above for environmental justice vulnerability, Atlantic City, NJ scored high for all of the three environmental justice indicators. Columbia, NC scored high for the personal disruption index and the poverty index. Hobucken, NC scored high for the personal disruption index. Newport News, VA scored medium-high for the population composition index[7]. Beaufort, NC scored medium-high for the poverty index.

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[7]Due to missing data, the Poverty Index is missing for Hobucken and Rodanthe, NC
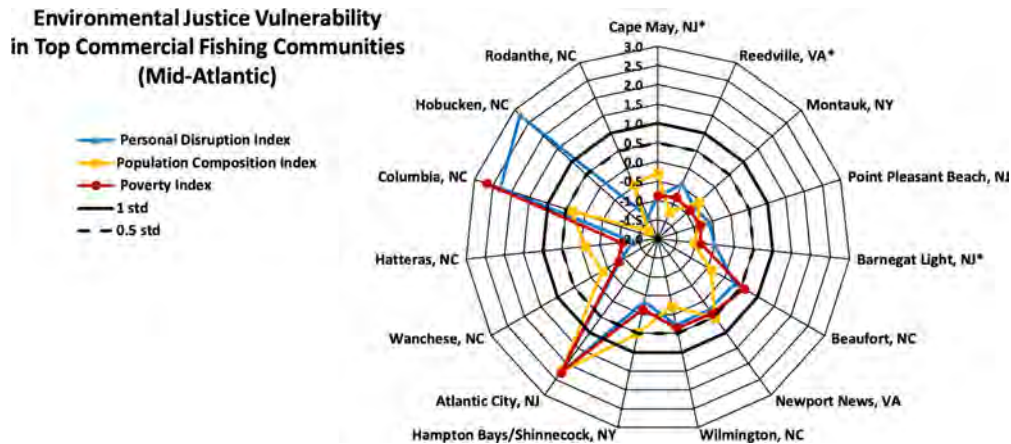
Figure 21: Environmental justice indicators (Poverty Index, population composition index, and personal disruption index) for top commercial fishing communities in Mid-Atlantic. *Community scored high (1.00 and above) for both commercial engagement and reliance indicators.

Considerably more communities scored high for both recreational engagement and reliance based on 2020 data relative to 2019. Joining Barnegat Light, NJ in the upper right section are Babylon, NY, Nags Head, NC, Hatters, NC, Stevensville, MD, Atlantic Highlands, NJ, Morehead City, NC, Montauk, NY, Point Pleasant Beach, NJ, Ocean City, MD, Point Lookout, NY, Manteo, NC, and Vandemere, NC. Fig.22. Communities that ranked medium-high or above for one or more of the environmental justice indicators are highlighted in bright orange, including Ocean City and Bivale, MD; Hatteras, Manteo, Vandemere, and Hobuken, NC.
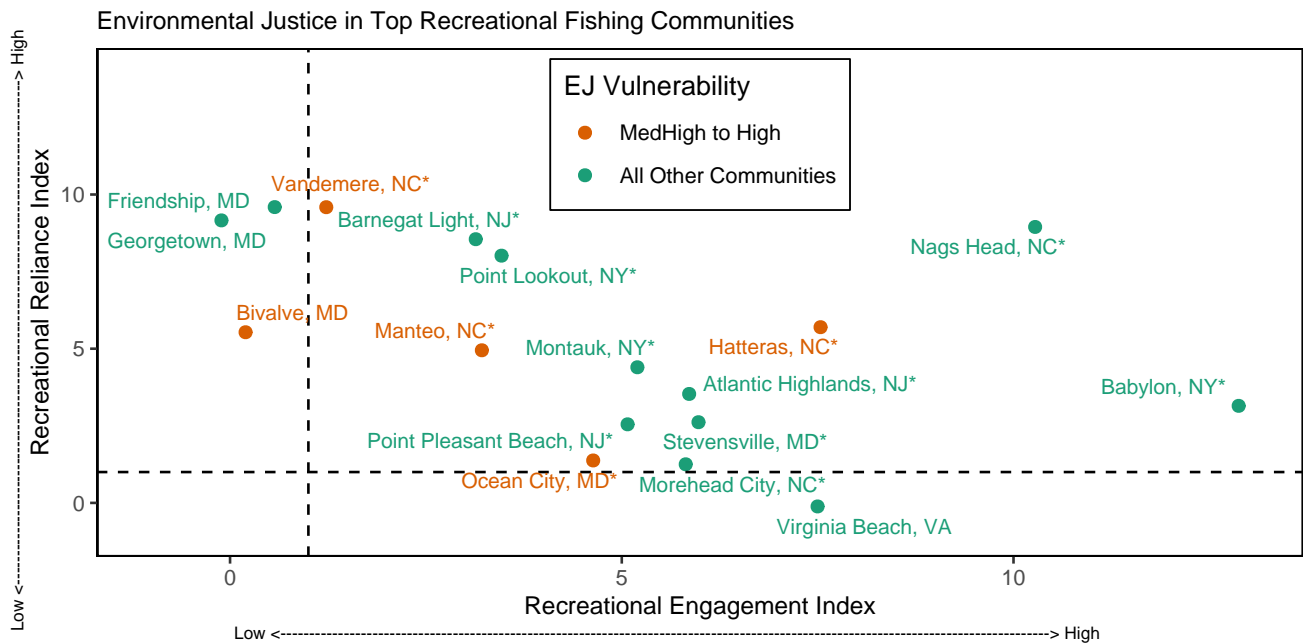

Figure 22: Recreational engagement and reliance, and environmental justice vulnerability, for the top recreationally engaged and reliant fishing communities in the Mid-Atlantic. Communities ranked medium-high or above for one or more of the environmental justice indicators are highlighted in bright orange. *Community scored high (1.00 and above) for both recreational engagement and reliance indicators.

Fig. 23 orders communities clockwise in a descending order of recreational engagement scores from high to low, with the most highly engaged community, Babylon, NY, listed on the top. Among the communities with environmental

19

justice concerns, Hatteras and Vandemere, NC scored medium-high for personal disruption and poverty index. Ocean City, MD and Hobucken, NC scored medium-high for personal disruption index. Manteo, NC scored high for poverty index. Bivale, MD scored medium-high for population composition index[8].
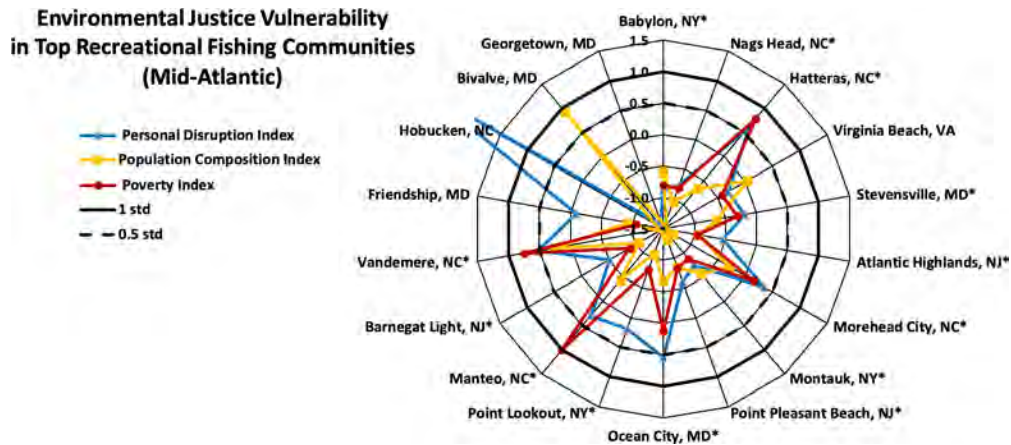

Figure 23: Environmental justice indicators (Poverty Index, population composition index, and personal disruption index) for top recreational fishing communities in Mid-Atlantic. *Community scored high (1.00 and above) for both recreational engagement and reliance indicators.

Both commercial and recreational fishing are important activities in Montauk, NY, Barnegat Light and Point Pleasant Beach, NJ, Hatteras and Hobuken, NC, meaning these communities may be impacted simultaneously by commercial and recreational regulatory changes. Among these communities, Hobucken scored high for the personal disruption index[9]. Hatteras scored medium-high for the personal disruption index and Poverty Index. Montauk, NY, Barnegat Light, Cape May and Point Pleasant Beach, NJ scored lower than medium-high for all of the three environmental justice indicators, indicating that environmental justice may not be a major concern in these communities at the moment based on the indicators analyzed.

Implications

There was an increase in recreational fishing activities in many of the top recreational communities from 2019 to 2020. This increase may be due to multiple factors including the recreational boating boom across the country[10] and increasing interest in for-hire/charter recreational fishing trips as an preferred outdoor recreation activities and ways to social distance in response to the COVID-19 pandemic [3].

These plots provide a snapshot of the presence of environmental justice issues in the most highly engaged and most highly reliant commercial and recreational fishing communities in the Mid-Atlantic. These communities may be vulnerable to changes in fishing patterns due to regulations and/or climate change. When any of these communities are also experiencing social vulnerability including environmental justice issues, they may have lower ability to successfully respond to change.

Protected Species

Protected species include marine mammals protected under the Marine Mammal Protection Act, endangered and threatened species protected under the Endangered Species Act, and migratory birds protected under the Migratory Bird Treaty Act. In the Northeast U.S., endangered/threatened species include Atlantic salmon, Atlantic and shortnose sturgeon, all sea turtle species, and five baleen whales. Fishery management objectives for protected species generally focus on reducing threats and on habitat conservation/restoration. Here we report on the status

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[8]Due to missing data, the Poverty Index is missing for Hobucken, NC, Bivalve and Georgetown, MD

[9]Due to missing data, the Poverty Index is missing for Hobucken, NC

[10]National Marine Manufacturers Association. 2021. U.S. Boat Sales Reached 13-Year High in 2020, Recreational Boating Boom to Continue through 2021. Available at: https://www.nmma.org/press/article/23527

of these actions as well as indicating the potential for future interactions driven by observed and predicted ecosystem changes in the Northeast U.S. Protected species objectives include managing bycatch to remain below potential biological removal (PBR) thresholds, recovering endangered populations, and monitoring unusual mortality events (UMEs).

Indicators: bycatch, population (adult and juvenile) numbers, mortalities

Average indices for both harbor porpoise (Fig. 24) and gray seal bycatch (Fig. 25) are below current PBR thresholds, meeting management objectives. However, the 2019 bycatch estimate for gray seals was highest in the time series.
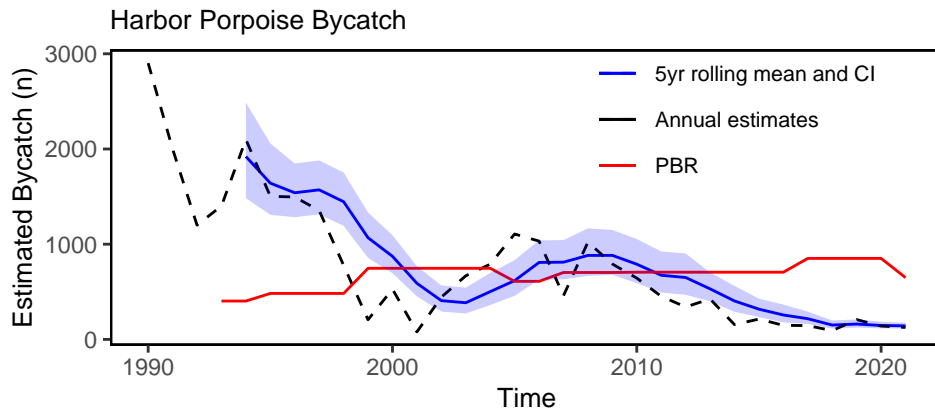

Figure 24: Harbor porpoise average bycatch estimate for Mid-Atlantic and New England gillnet fisheries (blue) and the potential biological removal (red).

The annual estimate for gray seal bycatch has declined since 2019, in part driven by declining gillnet landings. In addition, estimates since 2019 have greater uncertainty stemming from low observer coverage since 2019. The rolling mean confidence interval remains just below the removal threshold.
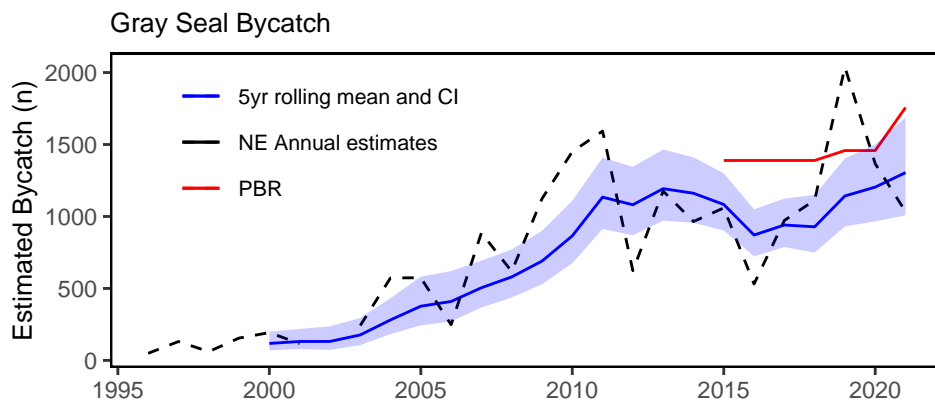
Figure 25: Gray Seal average bycatch estimate for gillnet fisheries (blue) and and the potential biological removal (red).

The North Atlantic right whale population was on a recovery trajectory until 2010, but has since declined (Fig. 26). Reduced survival rates of adult females and diverging abundance trends between sexes have also been observed. It is estimated that there are fewer than 70 adult females remaining in the population.
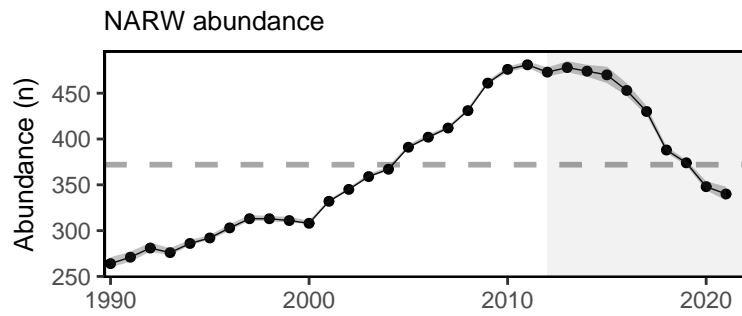
Figure 26: Estimated North Atlanic right whale abundance on the Northeast Shelf.

North Atlantic right whale calf counts have generally declined after 2009 to the point of having zero new calves observed in 2018 (Fig. 27). However, since 2019, we have seen more calf births each year, with 20 births in 2022.
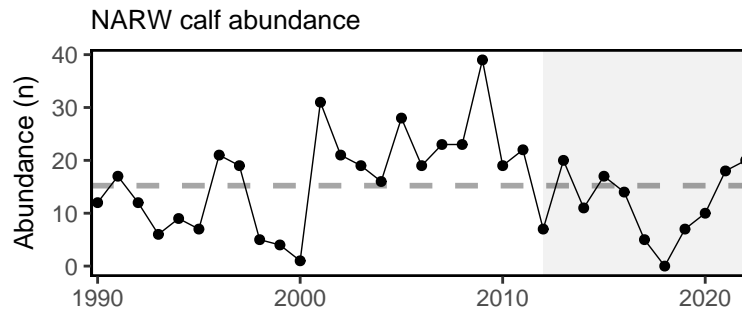

Figure 27: Number of North Atlantic right whale calf births, 1990 - 2021.

This year, the Unusual Mortality Event (UME) for North Atlantic right whales continued. Since 2017, the total UME right whale mortalities includes 35 dead stranded whales, 14 in the US and 21 in Canada. When alive but seriously injured whales (22) and sublethal injuries or ill whales (37) are taken into account, 94 individual whales are included in the UME. Recent research suggests that many mortalities go unobserved and the true number of mortalities are about three times the count of the observed mortalities [4]. The primary cause of death is "human interaction" from entanglements or vessel strikes[11].

A UME continued from previous years for humpback whales (2016-present); suspected causes include human interactions. A UME for both gray and harbor seals on the Maine coast was declared in June 2022 due to a high number of mortalities thought to be caused by highly pathogenic avian influenza virus. A UME for minke whales that began in 2017 remains open, but is pending closure as of January 2023[12].

Implications

Bycatch management measures have been implemented to maintain bycatch below PBR thresholds. The downward trend in harbor porpoise bycatch could also be due to a decrease in harbor porpoise abundance in US waters, reducing their overlap with fisheries, and a decrease in gillnet effort. The increasing trend in gray seal bycatch may be related to an increase in the gray seal population (U.S. pup counts).

The number of gray seals in U.S. waters has risen dramatically in the last three decades. Based on a survey conducted in 2016, the size of the gray seal population in the U.S. during the breeding season was approximately

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[11]https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-north-atlantic-right-whale-unusual-mortality-event
[12]https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events

27,000 animals, while in Canada the population was estimated to be roughly 425,000. The population in Canada is increasing at roughly 4% per year, and contributing to rates of increase in the U.S., where the number of pupping sites has increased from one in 1988 to nine in 2019. Mean rates of increase in the number of pups born at various times since 1988 at four of the more data-rich pupping sites (Muskeget, Monomoy, Seal, and Green Islands) ranged from no change on Green Island to high rates of increase on the other three islands, with a maximum increase of 26.3% (95%CI: 21.6 - 31.4%; [5]). These high rates of increase provide further support for the hypothesis that seals from Canada are continually supplementing the breeding population in U.S. waters.

Strong evidence exists to suggest that interactions between right whales and both the fixed gear fisheries in the U.S. and Canada and vessel strikes in the U.S. are contributing substantially to the decline of the species [6]. Further, right whale distribution has changed since 2010. New research suggests that recent climate driven changes in ocean circulation have resulted in right whale distribution changes driven by increased warm water influx through the Northeast Channel, which has reduced the primary right whale prey (the copepod *Calanus finmarchicus*) in the central and eastern portions of the Gulf of Maine [6–8]. Additional potential stressors include offshore wind development, which overlaps with important habitat areas used year-round by right whales, including mother and calf migration corridors and foraging habitat [9,10]. This area is also the only known right whale winter foraging habitat. Additional information can be found in the offshore wind risks section.

The UMEs are under investigation and are likely the result of multiple drivers. For the large whale UMEs, human interaction appears to have contributed to increased mortalities, although investigations are not complete. An investigation into the cause of the seal UME so far suggests avian flu virus as a potential cause.

A climate vulnerability assessment is currently underway for Atlantic and Gulf of Mexico marine mammal populations and will be reported on in future versions of this report.

Risks to meeting fishery management objectives

Climate and Ecosystem Productivity

Large scale climate related changes in the ecosystem can lead to changes in important habitats and ecological interactions, potentially resulting in regime shifts and ecosystem reorganization.

Climate Change Indicators: ocean temperature, heatwaves, currents, acidification

Ocean and estuarine temperature and salinity The ocean continues to warm, altering habitat conditions experienced by a wide range of species. 2022 was among the warmest years on record in the North Atlantic [11] and ocean temperatures continue to warm at both the surface (Fig. 28) and bottom (Fig. 29) throughout the Mid-Atlantic. Bottom temperature shows a long term warming trend in all seasons, while sea surface temperature shows significant long term warming in spring, summer, and fall. Seasonal sea surface temperatures in 2022 were above average for most of the year, however late spring storms caused deep mixing, which delayed stratification and surface warming in late spring and early summer.

SST anomaly (2022)
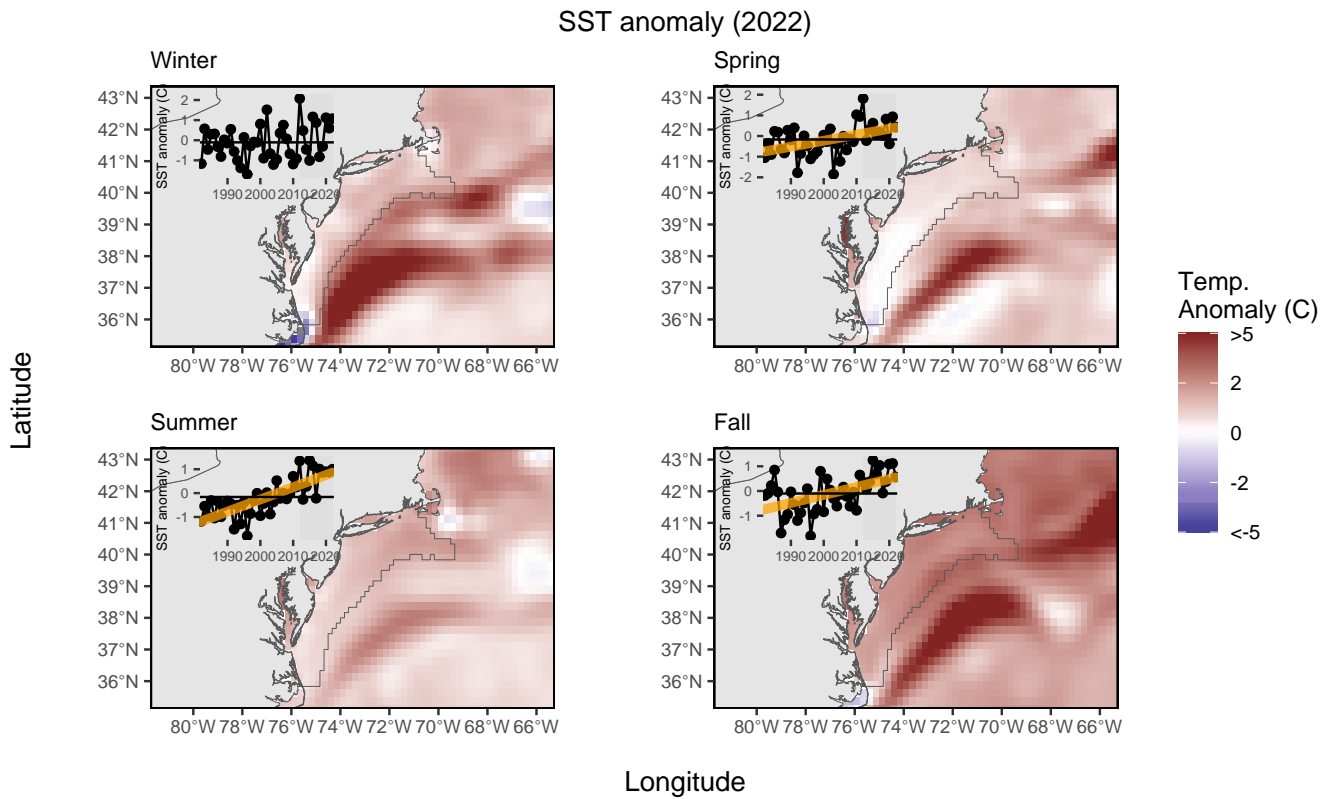
Figure 28: MAB (grey outline) seasonal sea surface temperature (SST) time series overlaid onto 2021 seasonal spatial anomalies. Seasons are defined as: Jan-Mar for winter, Apr-Jun for spring, Jul-Sep for summer, and Oct-Dec for fall.
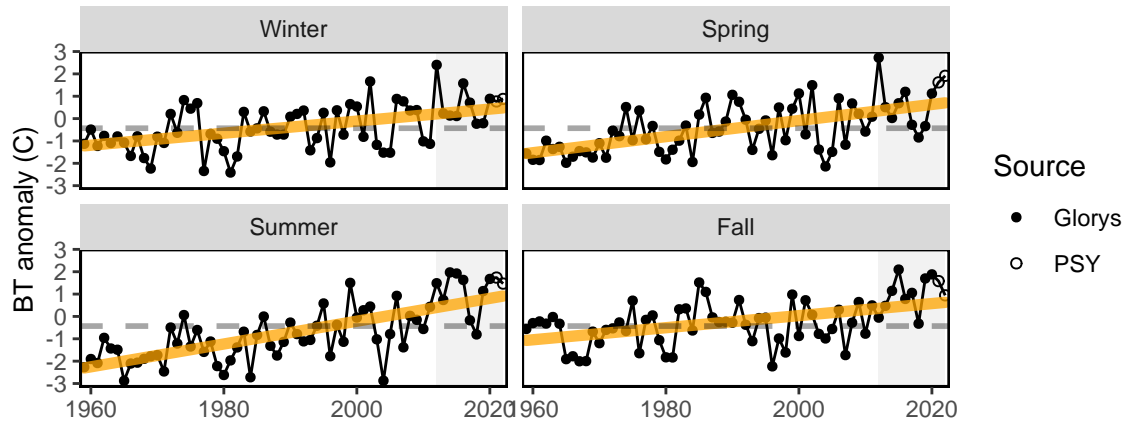
Figure 29: MAB seasonal bottom temperature (BT) anomaly time series. Seasons are defined as: Jan-Mar for winter, Apr-Jun for spring, Jul-Sep for summer, and Oct-Dec for fall. The final 2 years of each time series (open circles) are modeled estimates subject to change.

In addition to increasing temperatures overall, ocean summer conditions now last longer within each year. In the MAB, the transition date from warm stratified summer conditions to well mixed cool fall conditions is getting later (Fig. 30).

Number of Days between Spring and Fall Transition Dates

Figure 30: Ocean summer length in the MAB: the annual total number of days between the spring thermal transition date and the fall thermal transition date. The transition dates are defined as the day of the year when surface temperatures changeover from cool to warm conditions in the spring and back to cool conditions in the fall.

The Chesapeake Bay experienced a warmer-than-average winter 2022, and average conditions in the spring and summer. Fall 2022 was cooler relative to the baseline period 2008-2021 as measured by satellites[13] and by buoys[14] (Fig. 31, lef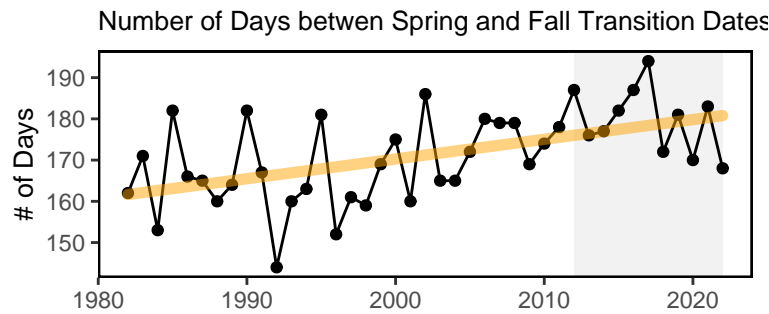t panel), which also indicated above-average salinity in the Chesapeake Bay throughout the summer and fall (Fig. 31, right panel).
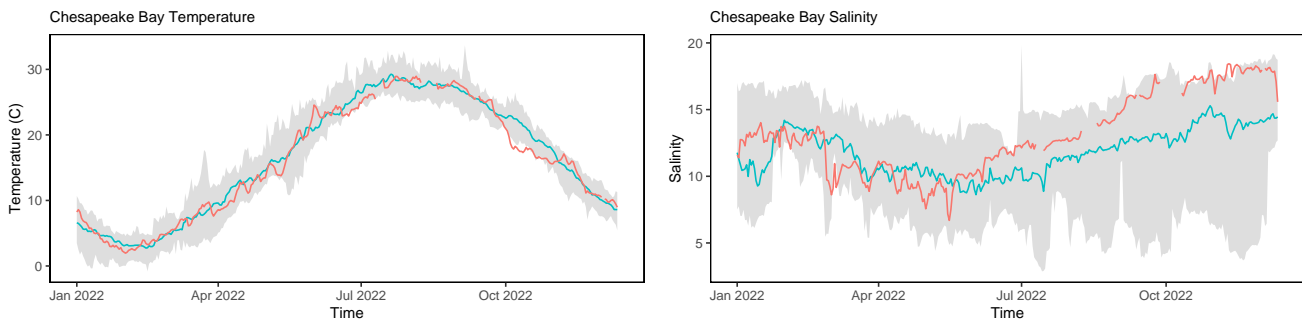

Figure 31: NOAA Chesapeake Bay Interpretive Buoy System Gooses Reef buoy sea water temperature (left) and salinity (right); Red = 2022, Blue = Long term average 2010-2020.

Extreme temperature events   The increase in surface and bottom water temperature observed in the Northeast US may represent long term incremental stress on marine organisms, especially those relying on cooler water habitats for some or all life stages. In addition to changes in long-term average conditions, short-term extreme temperature events can produce acute stress on marine organisms, especially when the baseline temperature is increasing. To identify these extreme events separately from the baseline warming, we have changed our methods describing marine heatwaves (MHWs, [12]; [13]; [14]) to remove the global warming signal. Therefore, these indicators look different than in previous reports, but MHWs identified now are truly extreme departures from an already warming ecosystem. A combination of long-term ocean warming and MHWs should be used to assess total heat stress on marine organisms.

In 2022, the Mid-Atlantic Bight experienced two distinct surface marine heatwaves starting on August 29th and November 7th, lasting 9 and 11 days respectively (Fig. 32). Both ranked low among all recorded MWHs (75th and 73rd respectively). The top 4 strongest surface MHWs in the MAB occurred during the last ten years, with the two events in 2012 ranked as 1st and 3rd. No bottom MHWs were observed in 2022. The strongest bottom MHWs occurred in the fall of 1985 followed by the second strongest in the winter/spring of 2012.
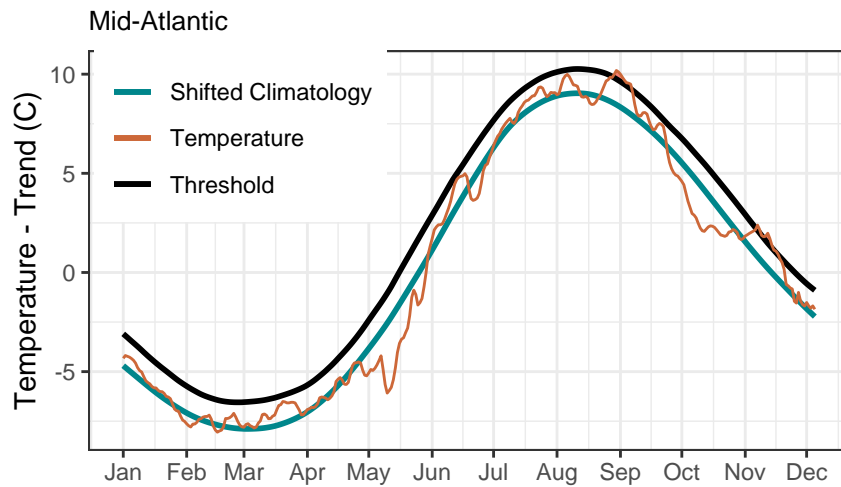
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[13]https://coastwatch.noaa.gov/cw/index.html
[14]https://buoybay.noaa.gov/

Figure 32: Marine heatwave events (red shading above black line) in the Mid-Atlantic occuring in 2022.

Ocean currents and features   Variability of the Gulf Stream is one of the major drivers of changes in the oceanographic conditions of the Slope Sea and subsequently the Northeast U.S. continental shelf [15]. Changes in the Gulf Stream and Slope Sea can affect large-scale climate phenomena as well as local ecosystems and coastal communities. During the last decade, the Gulf Stream has become less stable and shifted northward [16,17] (Fig. 33). A more northern Gulf Stream position is associated with warmer ocean temperature on the northeast shelf [18], a higher proportion of Warm Slope Water in the Northeast Channel, and increased sea surface height along the U.S. east coast [19].
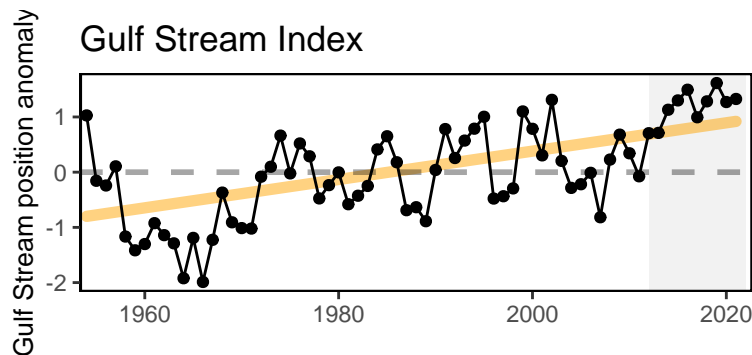
Figure 33: Index representing changes in the location of the Gulf Stream north wall. Positive values represent a more northerly Gulf Stream position.

Since 2008, the Gulf Stream has moved closer to the Grand Banks, reducing the supply of cold, fresh, and oxygen-rich Labrador Current waters to the Northwest Atlantic Shelf [20]. Nearly every year since 2010, warm slope water made up more than 75% of the annual slope water proportions entering the Gulf of Maine. In 2017 and 2019, almost no cooler Labrador Slope water entered the Gulf of Maine through the Northeast Channel (Fig. 34). The changing proportions of source water affect the temperature, salinity, and nutrient inputs to the Gulf of Maine ecosystem. In 2021, warm slope water continued to dominate (86.1%) inputs to the Gulf of Maine.
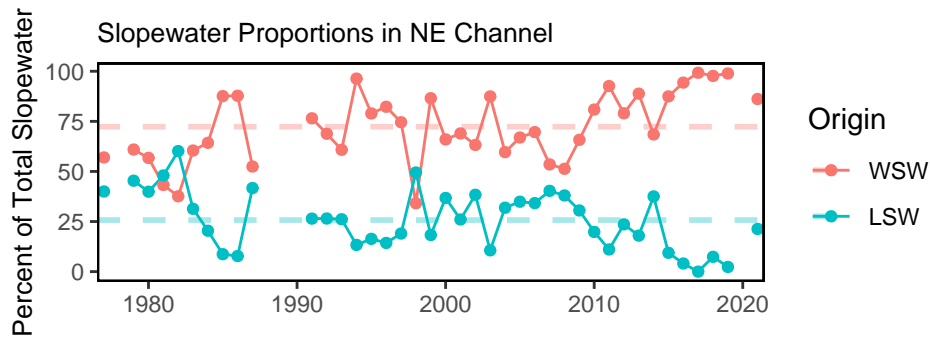
Figure 34: Proportion of Warm Slope Water (WSW) and Labrador Slope Water (LSLW) entering the Gulf of Maine through the Northeast Channel.

The increased instability of the Gulf Stream position and warming of the Slope Sea may also be connected to the regime shift increase in the number of warm core rings formed annually in the Northwest Atlantic [15,21] (Fig. 35). When warm core rings and eddies interact with the continental slope they can transport warm, salty water to the continental shelf [22], which can alter the habitat and disrupt seasonal movements of fish [23]. Transport of offshore water onto the shelf is happening more frequently [23,24], and can contribute to marine heatwaves in the Mid-Atlantic Bight [22,25] as well as the movement of shelf-break species inshore [23,26,27].

2022 had the same number of warm core rings (21) as 2021, but most of the 2022 rings formed east of 60 W and fewer were observed near the shelf break region.
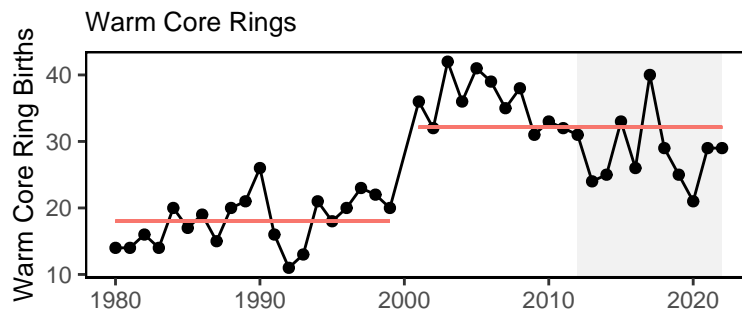
Figure 35: Warm core ring formation on the Northeast U.S. Shelf: Annual number of rings.

Changes in ocean temperature and circulation alter habitat features such as the seasonal cold pool, a 20–60 m thick band of cold, relatively uniform near-bottom water that persists from spring to fall over the mid and outer shelf of the MAB and southern flank of Georges Bank [28,29]. The cold pool plays an essential role in the structuring of the MAB ecosystem. It is a reservoir of nutrients that feeds phytoplankton productivity, is essential fish spawning and nursery habitat, and affects fish distribution and behavior [28,30]. The average temperature of the cold pool is getting warmer over time [31,32], the area is getting smaller [33], and the duration is getting shorter (Fig. 36).
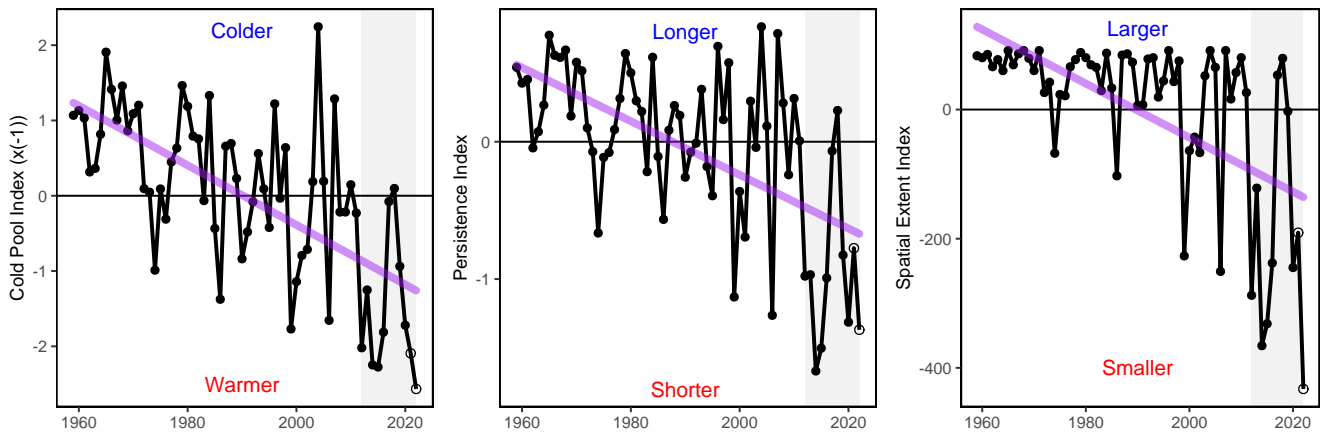
Figure 36: Seasonal cold pool indices: mean temperature within the cold pool, cold pool persistence, and spatial extent.

Ocean Acidification   Ocean acidification (OA) has caused measured declines in global ocean pH, and is projected to continue declining if high carbon dioxide emissions continue [34]. OA also changes the availability of minerals required by organisms to form calcified structures such as shells. Calcifying conditions in seawater can be determined by measuring aragonite saturation state (Ω_{Arag}), the tendency of a common type of calcium carbonate, aragonite, to form or dissolve. When Ω_{Arag} is less than 1, shells and other calcium carbonate structures begin to dissolve. Typical surface ocean Ω_{Arag} is 2-4, but extremes can be <1 or >5 [35]. As the ocean absorbs carbon dioxide, both pH and Ω_{Arag} decrease and can cause organisms to respond with reduced survival, calcification rates, growth, and reproduction, as well as impaired development, and/or changes in energy allocation [37]. However, sensitivity levels vary, and some organisms exhibit negative responses to calcification and other processes when Ω_{Arag} is as low as 3.

Summer-time (2007-present) Ω_{Arag} on the U.S. Northeast Shelf varies in space and time, ranging from 0.64 to 2.49 (Fig. 37, left panel). Spatially, the lowest bottom Ω_{Arag} has occurred in the Gulf of Maine, western Long Island Sound, nearshore to mid-shelf waters of the Mid-Atlantic Bight off the coast of New Jersey, and in waters > 1000 meters. Ω_{Arag} was at or below the sensitivity levels for both Atlantic sea scallop [38] and longfin squid [39,40] in Long Island Sound and the nearshore and mid-shelf regions of the New Jersey shelf (Fig. 37, right panels). The sensitivity levels of bottom Ω_{Arag} occurred during August 2016, July 2018, and August 2019 for both species, and additionally in August 2021 for the Atlantic sea scallop.
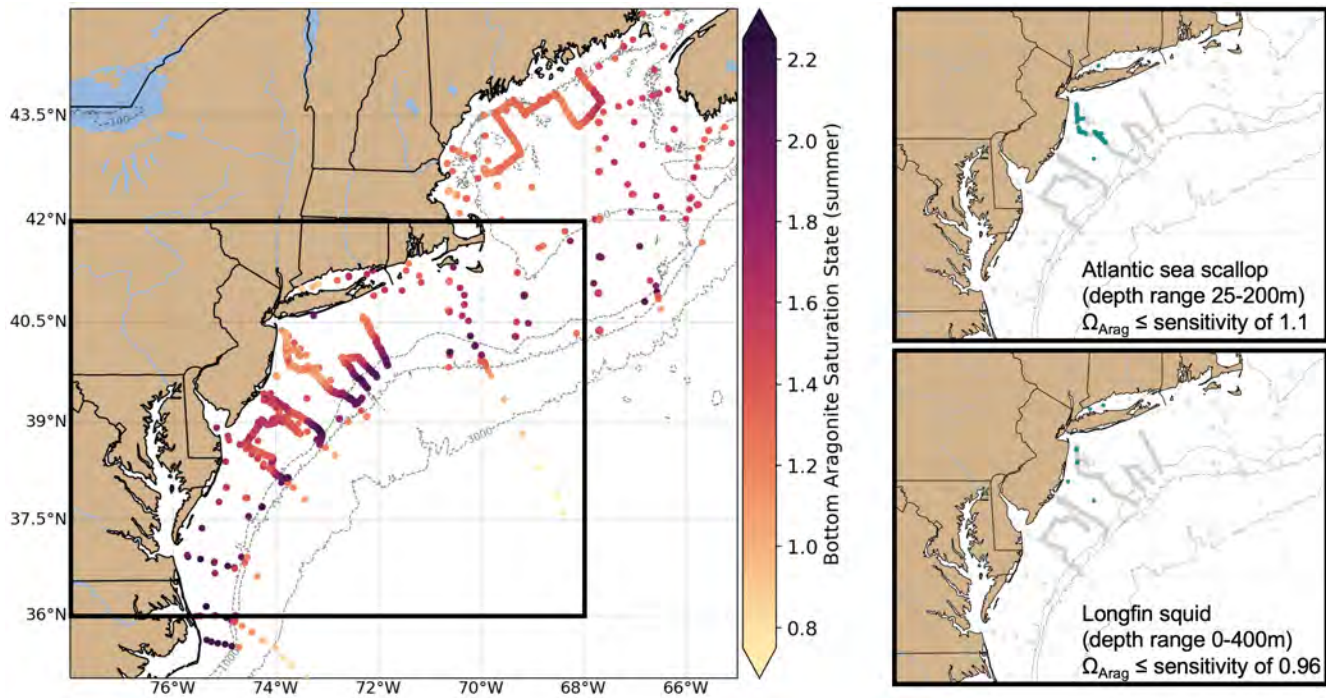
Figure 37: Left panel: Bottom aragonite saturation state (Ω_{Arag}; summer only: June-August) on the U.S. Northeast Shelf based on quality-controlled vessel- and glider-based datasets from 2007-present. Right panel: Locations where summer bottom Ω_{Arag} were at or below the laboratory-derived sensitivity level for Atlantic sea scallop (top panel) and longfin squid (bottom). Gray circles indicate locations where carbonate chemistry samples were collected, but bottom Ω_{Arag} values were higher than sensitivity values determined for that species.

Ecosystem Productivity Indicators: phytoplankton, zooplankton, forage fish, fish condition

Phytoplankton   Phytoplankton support the food web as the primary food source for zooplankton and filter feeders such as shellfish. Numerous environmental and oceanographic factors interact to drive the abundance, composition, spatial distribution, and productivity of phytoplankton. In 2022, MAB phytoplankton biomass (surface chlorophyll) was above average in winter, but below average in August and September. Below average phytoplankton biomass could be due to reduced nutrient flow to the surface and/or increased grazing pressure. Chlorophyll concentrations were above average in early fall and a fall bloom was detected in November/December. Primary productivity (the rate of photosynthesis) was average through spring, above average in the summer and average in the fall (Fig. 38).
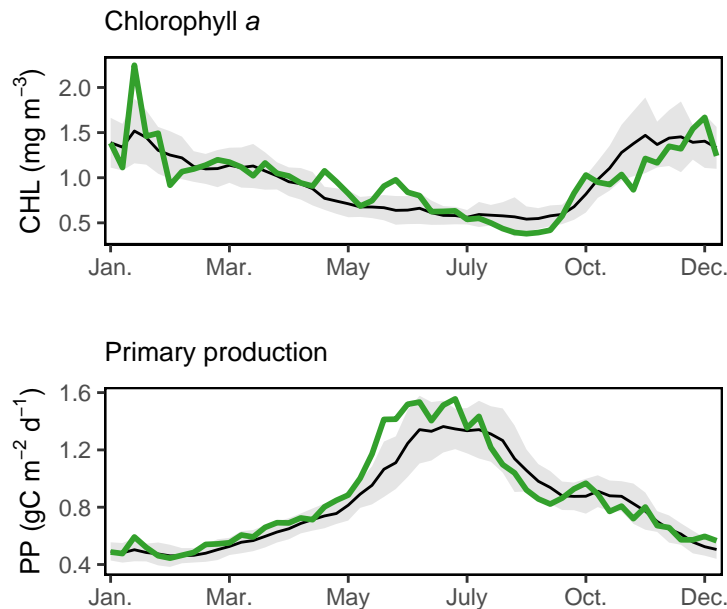
Figure 38: Weekly chlorophyll concentrations and primary productivity in the Mid-Atlantic are shown by the colored line for 2022. The long-term mean is shown in black and shading indicates +/- 1 standard deviation.

The seasonal cycle of phytoplankton size distribution shows that the winter/spring and fall bloom periods are dominated by larger-celled microplankton, while smaller-celled nanoplankton dominate during the warmer summer months. The proportion of the smallest phytoplankton, picoplankton (0.2-2 microns), is relatively constant throughout the year. In 2022, microplankton proportions were average for most of the year, and above average peaks correspond to the bloom periods observed in chlorophyll concentration (Fig. 39).
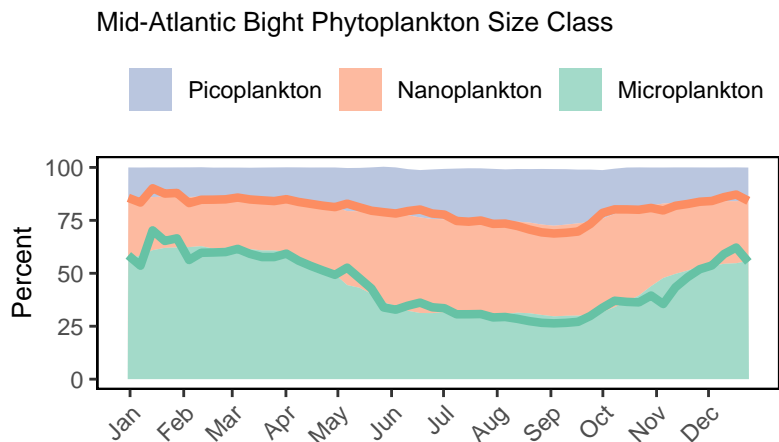
Figure 39: The annual climatology (1998-2022) percent composition of the phytoplankton size classes in the Mid-Atlantic based on satellite observations in the shaded portions. The 2022 proportions for the microplankton (>20 microns, green) and nanoplankton (2-20 microns, orange) are shown in the bold lines.

Zooplankton The zooplankton community is changing in the MAB. Two dominant groups show long term trends: 'sea butterflies' (pteropods) show a long term increase in the MAB, and the copepod *Pseudocalanus* spp. has a long term decreasing trend (Fig. 40). Pteropods are important prey items for planktivores such as herring and mackerel,

as well as some sea birds. Despite being susceptible to shell degradation by ocean acidification, their abundance has remained above long term mean since 2004. Pseudocalanus spp. are important prey for many larval fish species, and can influence phytoplankton standing stock through grazing. Pseudocalanus spp. abundance has been below the long term mean since 2000 and continues to decrease with increasing temperature.
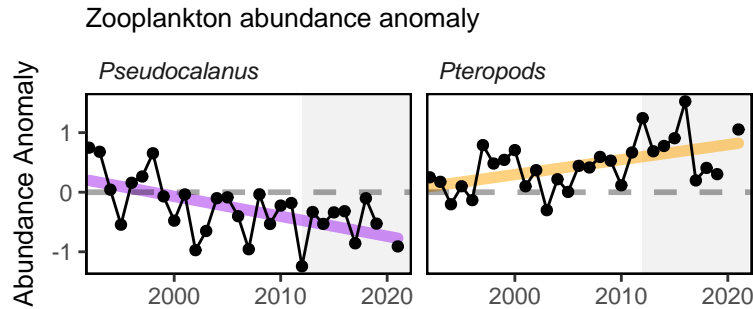
Figure 40: Abundance Annomalies of pseudocalanus and pteropods in Mid-Atlantic Bight.

Forage Fish Energy Content Nutritional value (energy content) of juvenile and adult forage fish as prey is related to environmental conditions, fish growth, and reproductive cycles. Forage energy density measurements from NEFSC trawl surveys 2017-2022 are building toward a time series to evaluate trends (Fig. 41). Data from the fall 2021 and spring 2022 survey measurements were consistent with previous reports: the energy density of Atlantic herring increased to over 7 kJ/g wet weight, but was still well below that observed in the 1980s and 1990s (10.6-9.4 kJ/ g wet weight). Silver hake, longfin squid (*Loligo* in figure) and shortfin squid (*Illex* in figure) remain lower than previous estimates [41,42]. Energy density of alewife, butterfish, sand lance, and Atlantic mackerel varies seasonally, with seasonal estimates both higher and lower than estimates from previous decades.
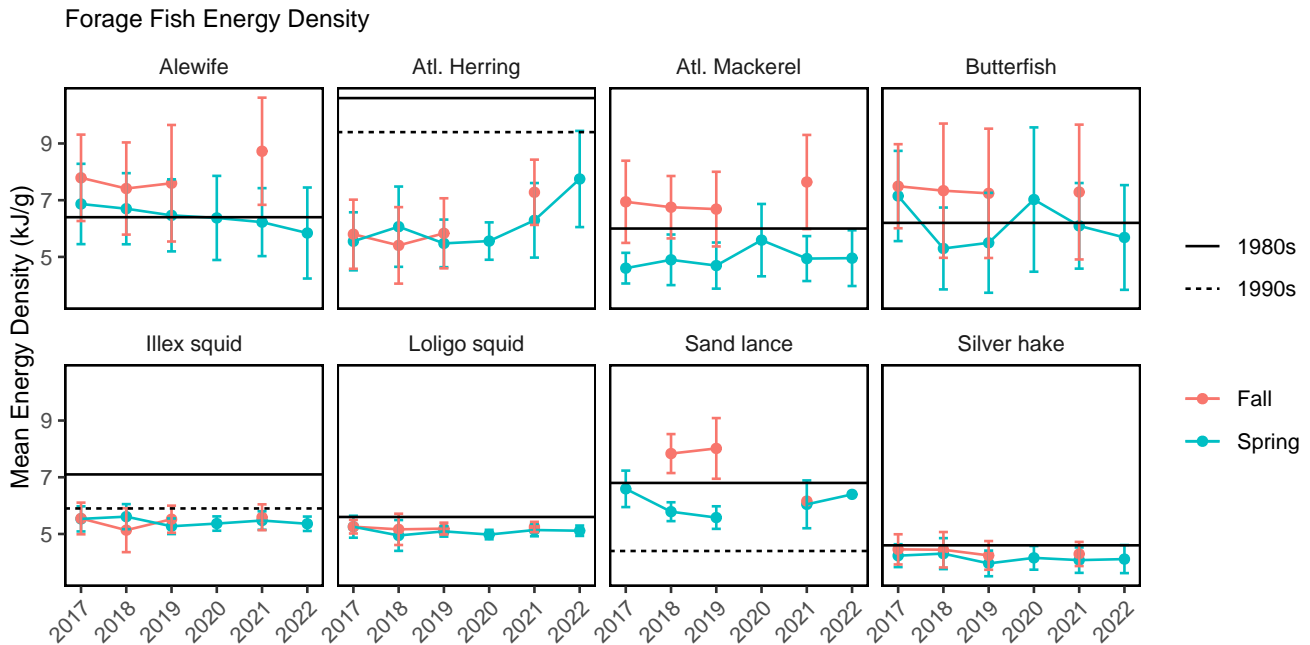
Figure 41: Forage fish energy density mean and standard deviation by season and year, compared with 1980s (solid line; Steimle and Terranove 1985) and 1990s (dashed line; Lawson et al. 1998) values.

Forage Fish Biomass Index The amount of forage fish available in the ecosystem combined with the energy content of the forage species determines the amount of energy potentially available to predators in the ecosystem. Changes in the forage base could pose a risk to managed and protected species production. A new spatially-explicit forage index estimated the combined biomass of 20 forage species using stomach contents information from 22 predatory fish species collected on bottom trawl surveys. While the resulting indices show no long term trends in the Mid-Atlantic, they do show overall higher forage fish in fall relative to spring (Fig. 42), with highest forage biomass during fall in the mid-1980s. Changes in the distribution of forage biomass also affects predator distribution. Spatial subsets of this index were included in the bluefish research track stock assessment to investigate forage-driven changes in bluefish availability to recreational fisheries and surveys.
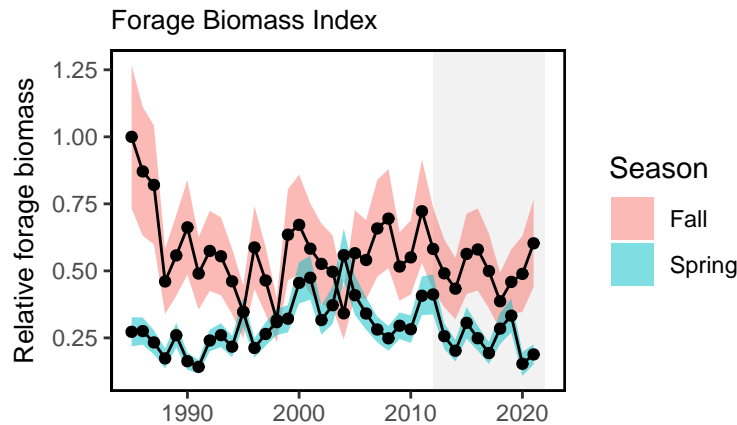
Figure 42: Forage fish index based on spring and fall survey predator diets.

Fish Condition The health and well being of individual fish can be related to body shape condition indices (i.e., weight at a given length) such as relative condition index, which is the ratio of observed weight to predicted weight based on length [43]. Heavier and fatter fish at a given length have higher relative condition which is expected to improve growth, reproductive output, and survival. A pattern of generally good condition was observed across many MAB species prior to 2000, followed by a period of generally poor condition from 2001-2010, with a mix of good and poor condition from 2011-2019. Condition was again mixed in 2022, but a number of species improved in condition from the relatively low condition year in 2021 (Fig. 43). Preliminary results of synthetic analyses show that changes in temperature, zooplankton, fishing pressure, and population size influence the condition of different fish species.
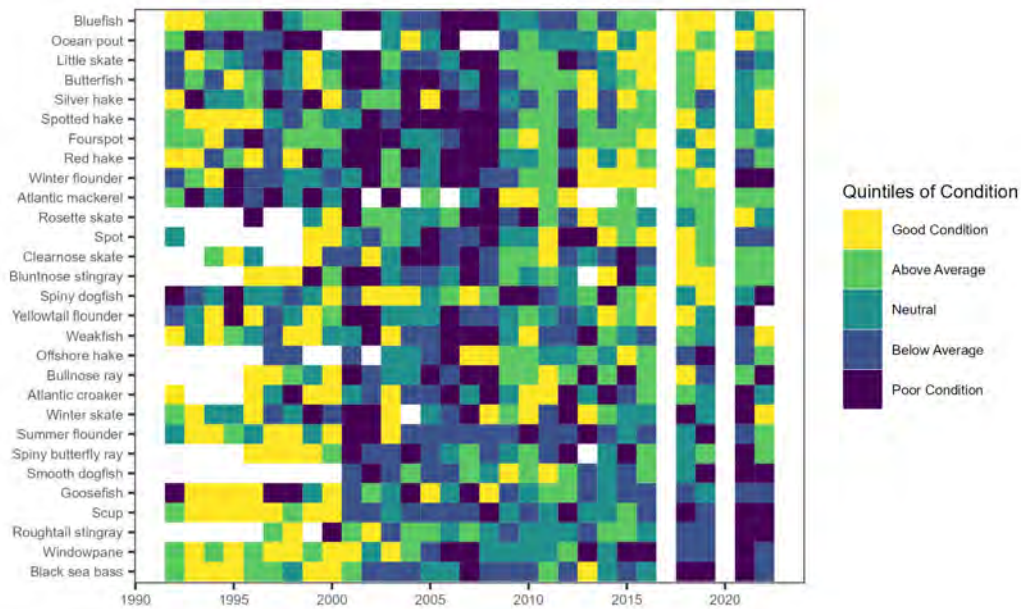
Figure 43: Condition factor for fish species in the MAB based on fall NEFSC bottom trawl survey data. MAB data are missing for 2017 due to survey delays, and no survey was conducted in 2020.

Fish Productivity   We describe patterns of aggregate fish productivity in the Mid-Atlantic with the small fish per large fish anomaly indicator, derived from NEFSC bottom trawl survey data (Fig. 44). The indicator shows that productivity has been declining in this region since 2010. A similar analysis based on stock assessment model outputs (recruitment per spawning stock biomass anomaly) for stocks primarily inhabiting the Mid-Atlantic region also shows a decline in productivity.
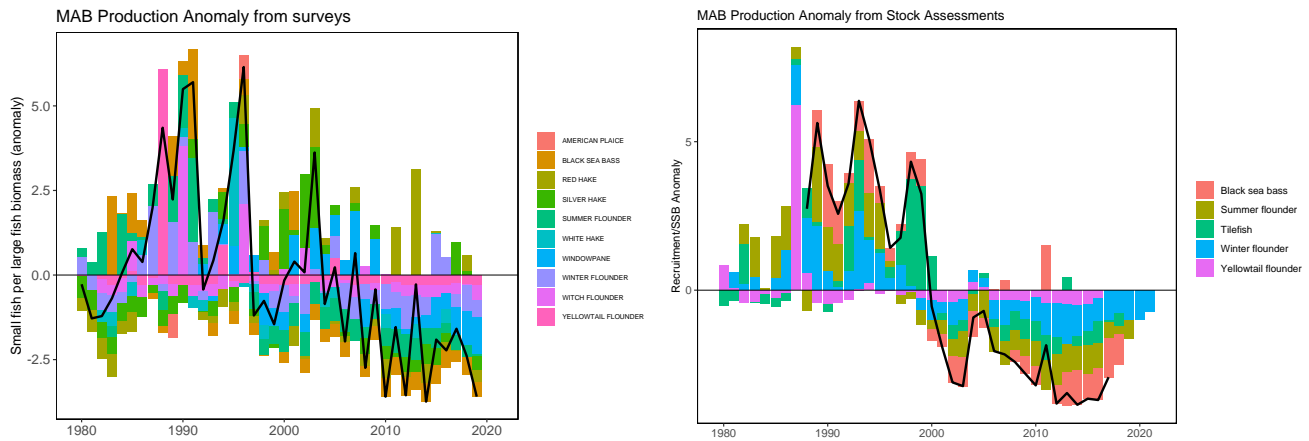
Figure 44: Fish productivity measures. Left: Small fish per large fish survey biomass anomaly in the Mid-Atlantic Bight. Right: assessment recruitment per spawning stock biomass anomaly for stocks mainly in the Mid-Atlantic. The summed anomaly across species is shown by the black line.

Ecosystem Structure Indicators: distribution shifts, diversity, predators

As noted in the Landings Implications section above, stocks are shifting distribution throughout the region. In aggregate, fish stocks are moving northeast along the shelf and into deeper waters.

Zooplankton diversity is increasing in the MAB, while adult fish diversity indices appear stable over time, with

33

current values within one standard deviation from most historic estimates (see Diversity Indicators section, above).

Indicators for shark populations, combined with information on gray seals (see Protected Species Implications section, above), suggests predator populations range from stable (sharks, Fig. 45) to increasing (seals) in the MAB. Stable predator populations suggest stable predation pressure on managed species, but increasing predator populations may reflect increasing predation pressure.
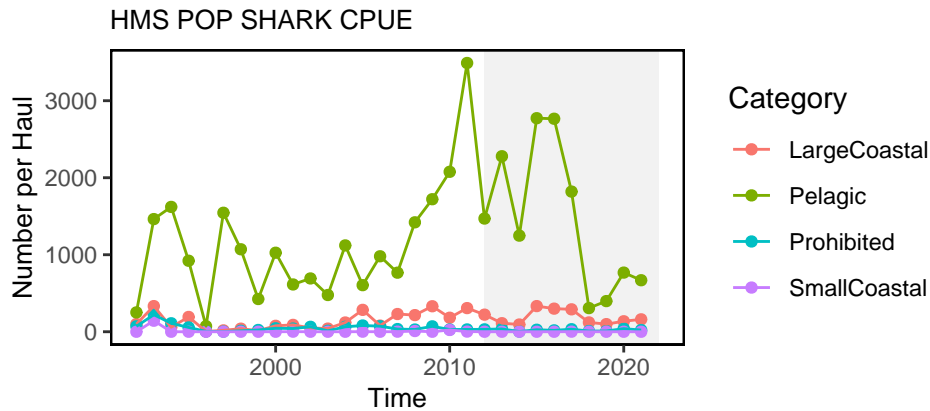
Figure 45: Estimated number of sharks per unit effort from Highly Migratory Species Pelagic Observer Program data.

Stock status is mixed for Atlantic Highly Migratory Species (HMS) stocks (including sharks, swordfish, billfish, and tunas) occurring in the Mid-Atlantic region. While there are several HMS species considered to be overfished or that have unknown stock status, the population status for some managed Atlantic sharks and tunas is at or above the biomass target (Fig. 46), suggesting the potential for robust predator populations among these managed species.

Figure 46: Summary of single species status for HMS stocks; key to species names at https://noaa-edab.github.io/tech-doc/atlantic-highly-migratory-species-stock-status.html.

As noted in the Protected Species section, gray seal populations are increasing. Harbor and gray seals occupying New England waters are generalist predators that consume more than 30 different prey species. An evaluation of

hard parts found in seal stomachs showed that harbor and gray seals predominantly exploit abundant demersal fish species (i.e., red, white, and silver hake). Other relatively abundant prey species found in hard-part remains include sand lance, yellowtail flounder, four-spotted flounder, Gulf Stream flounder, haddock, herring, redfish, and squids.

A stable isotope study utilizing gray seal scat samples obtained from Massachusetts habitats showed individual gray seals can specialize on particular prey [44]. It also found that gray seals vary their diet seasonally, focusing on demersal inshore species prior to the spring molt, and offshore species such as sandlance after molting. DNA studies on gray seal diet in Gulf of Maine and Massachusetts waters found spiny dogfish and Jonah crab present in gray seal scat samples [45,46], with sandlance and menhaden dominant off Monomoy, MA [47]. Skate and crab remains were also found in gray seal stomach remains. In contrast to direct feeding, it is uncertain if the presence of skates and crabs is due to secondary consumption or scavenging.

Habitat Risk Indicators: habitat assessments, submerged aquatic vegetation, estuarine habitat quality, fishing gear impacts

Habitat Assessments   The Northeast Regional Marine Fish Habitat Assessment (NRHA) is a collaborative effort to describe and characterize estuarine, coastal, and offshore fish habitat distribution, abundance, and quality in the Northeast. This includes mapping inshore and offshore habitat types used by focal fish species, summarizing impacts of habitat climate vulnerability on these species, modeling predicted future species distributions, and developing a publicly accessible decision support tool to visualize these results. This is a three-year project led by the New England and Mid-Atlantic Fishery Management Councils in collaboration with many partners including NOAA Fisheries[15].

New habitat model-based richness estimates   Species richness was derived from habitat models for 55 common species sampled by the spring and fall NEFSC bottom trawl surveys during the year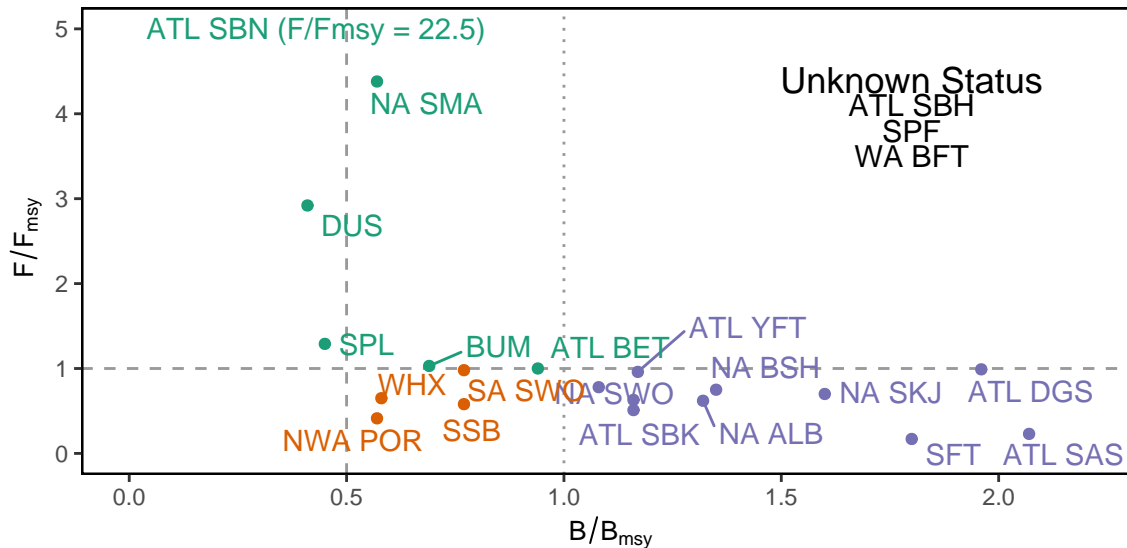s 2000-2019 as part of the NRHA. The joint species distribution model controls for differences in capture efficiency across survey vessels, revealing patterns of declining richness in the Mid-Atlantic Bight and increasing richness in more northerly regions (i.e., the Gulf of Maine; Fig. 47). These patterns reflect the decreasing probability of occurrence of cooler-water species in the south (Atlantic cod, American plaice, pollock, thorny skate) and the growing prevalence of warm-water species in the north (weakfish, spotted hake, and black sea bass), likely as a result of rising water temperatures.
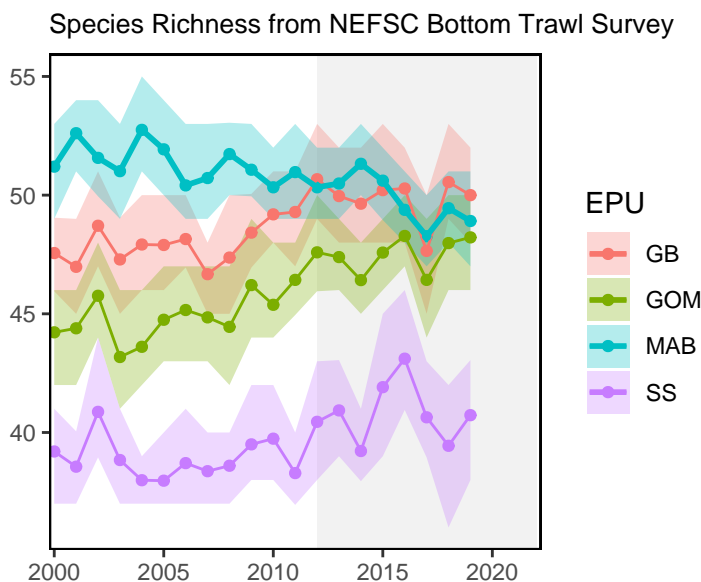

Figure 47: Habitat model-based species richness for 55 common species sampled by NEFSC bottom trawl surveys.

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[15]https://www.mafmc.org/nrha

Submerged Aquatic Vegetation   Submerged aquatic vegetation (SAV) is designated as a Habitat Area of Particular Concern (HAPC) for summer flounder and is important habitat for many fish species, particularly during vulnerable juvenile stages. Increased SAV coverage (including wild celery, water stargrass, and hydrilla) in the tidal fresh areas of the Chesapeake Bay (Fig. 48) has been attributed to restoration efforts. This ecosystem engineering has improved water quality, promoting further expansions of SAV meadows. However, in the higher salinity region near the mouth of the Chesapeake Bay (Fig. 48), increased water temperatures continue to inhibit eelgrass expansion. In 2021, the return to normal water temperature in the summer corresponded to a slight improvement in both eelgrass and widgeon grass coverage.

Submerged Aquatic Vegetation (SAV) Abundance
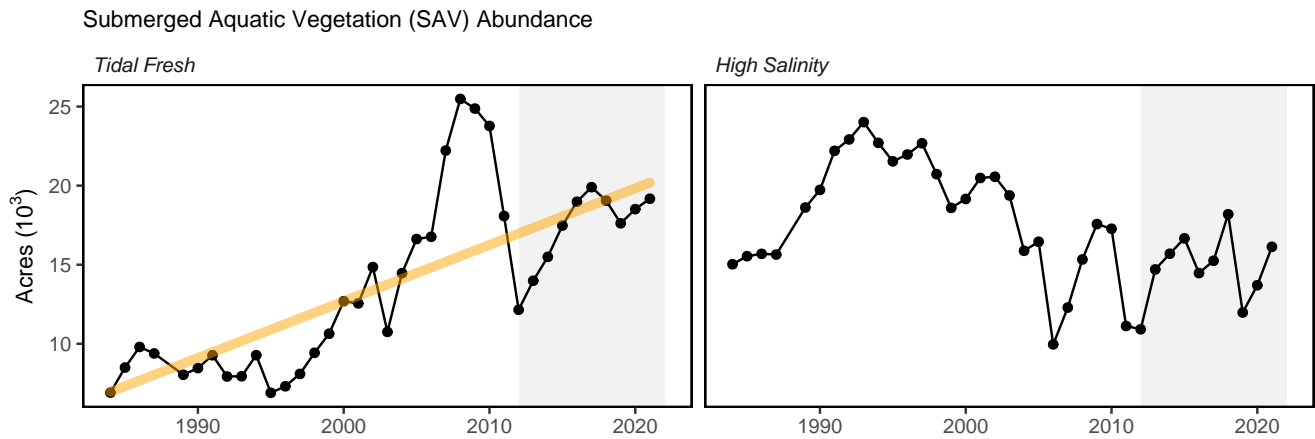
Figure 48: Submerged Aquatic Vegetation (SAV) coverage in tidal fresh and high salinity regions of the Chesapeake Bay.

Fishing Gear Impacts   Estimates of the impacts of fishing gear on habitat are available through the habitat section of the Northeast Ocean Data Portal[16]. The data portal hosts selected outputs from the Northeast Fishing Effects Model which combines seafloor data (sediment type, energy regime) with fishing effort data to generate percent habitat disturbance estimates in space and time. More detailed information can be found in the Synthetic Indicator Catalog.[17]

Implications

Links between climate change and managed species   Estuarine, nearshore, and offshore habitats support many life stages of state and federally managed species, and are highly vulnerable to climate change. Below we highlight how recently observed habitat changes affect several key managed species in Chesapeake Bay and in both nearshore and offshore waters of the MAB. Overall, multiple drivers interact differently for each species, producing a range of population impacts.

Estuarine habitat and managed species   Relative habitat use of Chesapeake Bay by several finfish species, including Atlantic croaker, spot, summer flounder, weakfish, clearnose skate, and horseshoe crab is declining [48]. There is evidence suitable habitat for juvenile summer flounder growth has declined by 50% or more [49]. Climate change is expected to continue impacting habitat function and use for multiple species. Restoration of oyster reefs (see below) and marshes could help address these challenges.

Average water temperatures in 2022 (Fig. 31, left) and below-average hypoxic volume throughout the summer suggest favorable conditions for striped bass and blue crabs. Strong winds from the remnants of Hurricane Ian reduced hypoxia by mixing the water column in early October. However, the juvenile striped bass index was low, similar to the past four years, and the total population of blue crabs was at its lowest point in the history of the winter dredge survey. Lower winter temperatures may have contributed to higher overwintering mortality of adult female and juvenile blue crabs. The updated ASMFC striped bass stock assessment shows population numbers

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[16]https://www.northeastoceandata.org/data-explorer/
[17]https://noaa-edab.github.io/catalog/northeast-fishing-effects-model.html

remain below the management threshold. Habitat conditions in the Chesapeake Bay could be one factor limiting striped bass population recovery and may have contributed to poor blue crab recruitment over the past few years, leading to lower overall abundances.

Forage and structure-forming species were likely favored by 2022 conditions in Chesapeake Bay. Average water temperatures in 2022 and above-average salinity conditions mean a suitable habitat year for bay anchovy, a key forage species. Bay anchovy abundances are directly correlated with the area of suitable habitat. Above-average salinities beginning in June 2022 (Fig.31, right) were associated with strong oyster recruitment [50]. However, oyster populations are severely depleted from historical levels. Large-scale restoration in 10 tributaries across the Chesapeake Bay is helping recover oyster reef habitat and populations in select areas.

Offshore habitat and managed species   Ocean acidification also has different implications, depending on the species and life stage. Summer aragonite saturation was at or below the sensitivity levels for both Atlantic sea scallop and longfin squid in Long Island Sound and the nearshore and mid-shelf regions of the New Jersey shelf (Fig. 37, right panels) several times over the past decade. Recent lab studies have found that surf clams exhibited metabolic depression in a pH range of 7.46-7.28 [51]. Aggregated data from 2007-2021 show that summer bottom ocean pH (7.69-8.07) has not yet reached the metabolic depression threshold observed for surfclams in lab studies so far. The projected effects of changing temperature and ocean chemistry over the coming century may alter surfclam growth and reproduction [52].

While offshore habitat conditions have degraded for some species, they have improved for others. Between 2017 and 2021, extraordinarily high availability of northern shortfin squid (*Illex*) were observed in the Mid-Atlantic, resulting in high fishery catch per unit effort (CPUE) and early fishery closures. High instances of squid catch near the shelf break are significantly related to low bottom temperatures (< 10 degrees C), high salinity (>35.6 psu), increased chlorophyll frontal activity, as well as the presence and orientation of warm core rings. Warm core rings are an important contributor to squid availability, likely influencing habitat conditions across different life stages and as a transport mechanism of higher salinity water to the shelf. In addition, fishing effort is often concentrated on the eastern edge of warm core rings, which are associated with upwelling and enhanced productivity. There were fewer warm core rings near the continental shelf in 2022, which combined with economic fishery drivers may have contributed to total catch of *Illex* squid being 20% less than the total catch reported in 2021.

Marine heatwave impacts   The adjustment to the marine heatwave methodology shows that extreme temperature events happen intermittently in many years, but have not been increasing over time in the Mid-Atlantic. While temperature variability in isolation has not changed, considering the overall increase in ocean temperature at both the surface and the bottom in the region, extreme events can represent additional stress to organisms. While marine heatwaves lasting over days may disturb the marine environment, long lasting events such as the warming in 2012 (Fig. 49) can have significant impacts to the ecosystem [25]. The 2012 heatwave affected the lobster fishery most notably, but other species also shifted their geographic distributions and seasonal cycles [53]. During the 2017 event, warm water fish typically found in the Gulf Stream were caught in shallow waters near Block Island, RI [23].

Mid-Atlantic Marine Heatwave Intesity
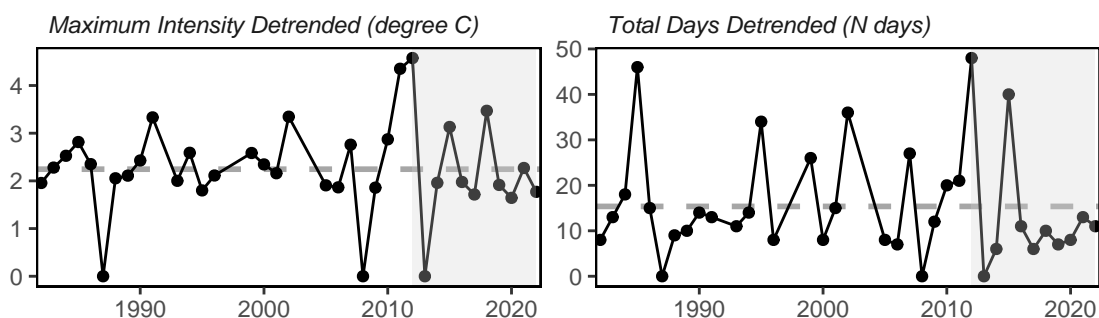
Figure 49: Marine heatwave maximum intesity (left) and total days each year (right) in the Mid-Atlantic Bight.

Cold pool impacts Changes in the cold pool habitat can affect species distribution, recruitment, and migration timing for multiple federally managed species. Southern New England-Mid Atlantic yellowtail flounder recruitment and settlement are related to the strength of the cold pool [31]. The settlement of pre-recruits during the cold pool event represents a bottleneck in yellowtail life history, during which a local and temporary increase in bottom temperature negatively impacts the survival of the settlers. Including the effect of cold pool variations on yellowtail recruitment reduced retrospective patterns and improved the skill of short-term forecasts in a stock assessment model [31,32]. The cold pool also provides habitat for the ocean quahog [33,54]. Growth rates of ocean quahogs in the MAB (southern portion of their range) have increased over the last 200 years whereas little to no change has been documented in the northern portion of their range in southern New England, likely a response to a warming and shrinking cold pool [55].

Distribution shift impacts Trends for a suite of 48 commercially or ecologically important fish species along the entire Northeast Shelf continue to show movement towards the northeast and generally into deeper water (Fig. 9). Habitat model-based species richness suggests shifts of both cooler and warmer water species to the northeast (Fig. 47). Similar patterns have been found for marine mammals, with multiple species shifting northeast between 2010 and 2017 in most seasons (Fig. 50, [56]).

Figure 50: Direction and magnitude of core habitat shifts, represented by the length of the line of the seasonal weighted centroid for species with more than 70 km difference between 2010 and 2017 (tip of arrow).

38

Shifting species distributions alter both species interactions and fishery interactions. In particular, shifting species distributions can alter expected management outcomes from spatial allocations and bycatch measures based on historical fish and protected species distributions.

Ecosystem productivity change impacts   Climate and associated changes in the physical environment affect ecosystem productivity, with warming waters affecting the rate of photosynthesis at the base of the food web. Warm temperatures can increase the rate of primary production, however they also increase stratification, which limits the flux of deep water nutrients to the surface. Thus most of the increased summer production in the MAB is from smaller phytoplankton and may not translate into increased fish biomass.

While pteropods are increasing over time, smaller zooplankton are periodically shifting abundance between the larger, more nutritious copepod *Calanus finmarchicus* and smaller bodied copepods, and common *Pseudocalanus* copepods show a long term decrease in the MAB. The nutritional content of forage fish changes seasonally in response to ecosystem conditions, with apparent declines in energy density for Atlantic herring and *Illex* squid relative to the 1980s, but similar energy density for other forage species. Overall forage fish biomass has fluctuated in the MAB over time. Some of these factors are now being linked to the relative condition of managed fish.

The apparent decline in productivity across multiple managed species in the MAB, along with mixed fish conditions in 2022, also suggest changing ecosystem productivity at multiple levels. During the 1990s high relative abundance of smaller bodied copepods and a lower relative abundance of *Calanus finmarchicus* was associated with regime shifts to higher fish recruitment [57]. The unprecedented climate signals along with the trends toward lower productivity across multiple managed species indicate a need to continually evaluate whether management reference points remain appropriate, and to evaluate if ecosystem regime shifts have occurred or reorganization is in progress.

Other Ocean Uses: Offshore Wind

Indicators: development timeline, revenue in lease areas, coastal community vulnerability

As of January 2023, 31 offshore wind development projects are proposed for construction over the next decade in the Northeast (timelines and project data are based on Tables E-2, E-4, and E-4-2 of South Fork Wind Farm Final Environmental Impact Statement). Offshore wind areas are anticipated to cover 2.4 million acres by 2030 in the Greater Atlantic region (Fig. 51). Beyond 2030 values include acreage for future areas in the Central Atlantic and Gulf of Maine Area planning area for floating research array.
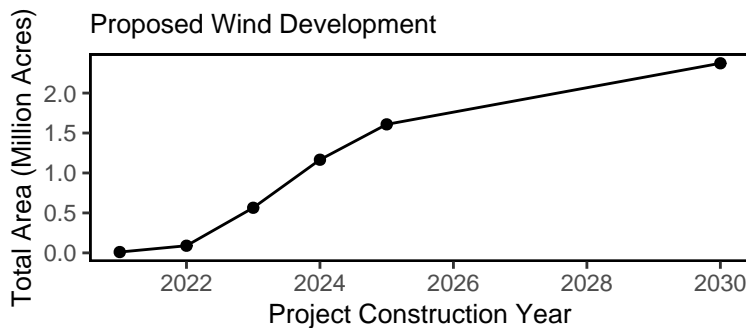
Figure 51: Proposed wind development on the northeast shelf.
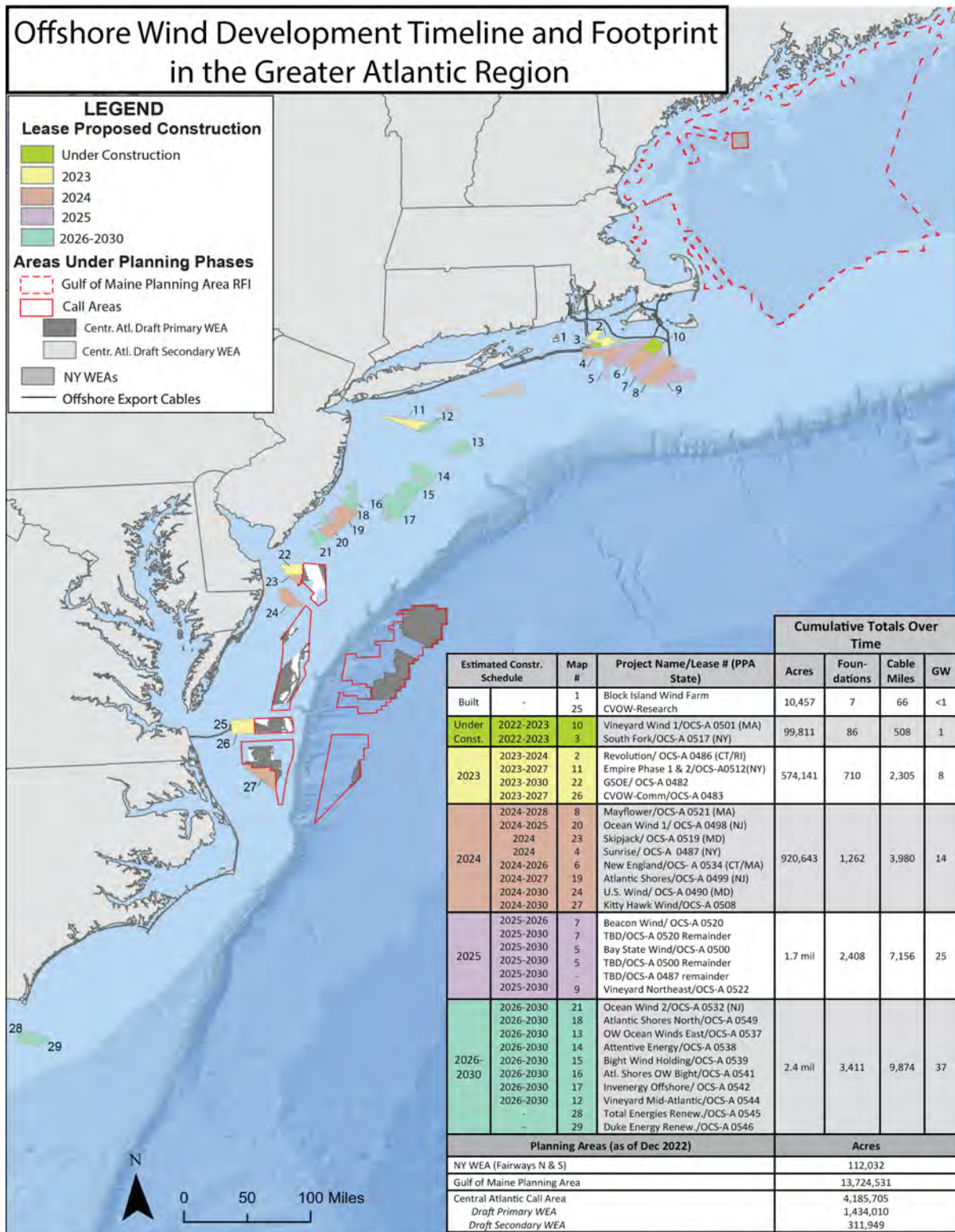
Figure 52: All Northeast Project areas by year construction ends (each project has 2 year construction period).

Just over 3,400 foundations and more than 9,000 miles of inter-array and offshore export cables are proposed to

date. The colored chart in Fig. 52 also presents the offshore wind development timeline in the Greater Atlantic region with the estimated year that foundations would be constructed (matches the color of the wind areas). These timelines and data estimates are expected to shift but represent the most recent information available as of January 2023. Based on current timelines, the areas affected would be spread out such that it is unlikely that any one particular area would experience full development at one time. Future wind development areas are also presented. Additional call areas, which may eventually become lease areas, totalling over 488,000 acres in the Central Atlantic[18] may be identified for BOEM's anticipated 2023 lease sale. It's anticipated that the Central Atlantic leases will fulfill outstanding offshore wind energy production goals for VA and NC.

Based on federal vessel logbook data, commercial fishery revenue from trips in the current offshore wind lease areas and the draft Central Atlantic Bight Primary and Secondary Call Areas have varied annually from 2008-2021, with less than $1 million in revenue overlapping with these areas for most fisheries. However, some fisheries see periodic spikes in revenue overlap with wind energy lease areas, including up to $4.7 million affected in the surfclam fishery and nearly $4.3 million affected in the longfin squid fishery in 2008 and 2016, respectively.(Fig. 53).
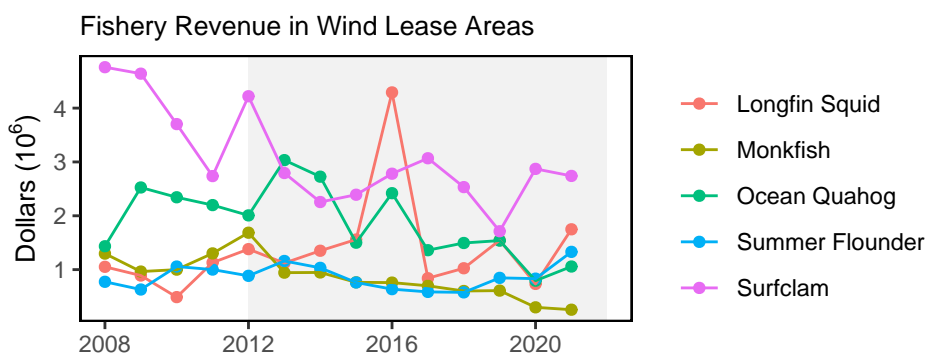
Figure 53: Fishery revenue in wind energy lease areas in the Mid-Atlantic.

Of MAFMC-managed fisheries, the chub mackerel fishery could be the fishery most affected by offshore wind development, with a maximum of 17% of annual regional fishery revenue occurring within potential wind lease areas and the Central Atlantic draft call areas during this period, followed by the surfclam (16%), black sea bass (15%), ocean quahog (13%), and blueline tilefish fisheries (10%). The spiny dogfish fishery was the least affected, at 3% maximum annual revenue affected, while 5% of annual revenues were affected for several others (bluefish, butterfish, and summer flounder). A maximum of 10% of the annual longfin squid revenues were affected by these areas, with similar effects for the scup (9%), Atlantic mackerel (8%), monkfish (7%) and golden tilefish (6%) fisheries (see Table 2). While up to 14% of annual *Illex* squid revenue overlapped with offshore wind areas, this is likely overestimated due to the precision of logbook data when compared to vessel monitoring system data (see Table 2).

Table 2: Top Species Landings and Revenue from Wind Energy Areas. * Landings and revenue for these species are likely underestimated due to limited coverage of these fisheries in historic reporting requirements for vessels issued federal permits by the NMFS Greater Atlantic Regional Fisheries Office. However, such limitations also suggest an inaccurately higher proportion of such landings and revenues in existing lease areas. ** Clearnose skates were reported separately from skates, which is presumed to include all skates managed under the Northeast skate complex. *** Based on comparison with other data sources, the high values for Illex squid are likely overestimates affected by the methods used to model logbook data to estimate spatial overlap of fishign operations with wind energy areas.

NEFMC, MAFMC, and ASMFC Managed Species	Maximum Percent Total Annual Regional Species Landings	Maximum Percent Total Annual Regional Species Revenue
Black drum*	36	34
American eel*	15	29
Clearnose skate**	19	20

NEFMC, MAFMC, and ASMFC Managed Species	Maximum Percent Total Annual Regional Species Landings	Maximum Percent Total Annual Regional Species Revenue
Atlantic menhaden*	25	19
Atlantic chub mackerel*	16	17
Atlantic surfclam	17	16
Black sea bass	15	15
Yellowtail flounder	15	15
Illex squid***	14	14
Offshore hake	14	14
Ocean quahog	13	13
Atlantic sea scallops	13	12
Blueline tilefish*	8	10
Skates**	10	10
Longfin squid	9	9
Scup	8	9
Atlantic mackerel	8	8
Monkfish	9	7
Red hake	11	7

Proposed wind development areas interact with the region's federal scientific surveys. Scientific surveys are impacted by offshore wind in four ways: 1. Exclusion of NOAA Fisheries' sampling platforms from the wind development area due to operational and safety limitations; 2.Impacts on the random-stratified statistical design that is the basis for scientific assessments, advice, and analyses; 3.Alteration of benthic and pelagic habitats, and airspace in and around the wind energy development, requiring new designs and methods to sample new habitats; and, 4.Reduced sampling productivity through navigation impacts of wind energy infrastructure on aerial and vessel survey operations. Increase vessel transit between stations may decrease data collections that are already limited by annual days-at-sea day allocations. The total survey area overlap ranges from 1-14% for all Greater Atlantic federal surveys. Individual survey strata have significant interaction with wind, including the sea scallop survey (up to 96% of individual strata) and the bottom trawl survey (BTS, up to 60% strata overlap). Additionally, up to 50% of the southern New England North Atlantic right whale survey's area overlaps with proposed project areas. A region-wide survey mitigation program is underway [58].

Equity and environmental justice (EJ) are priority concerns with offshore wind development and fisheries impacts in the Northeast. Fig. 54 links historic port revenue (2008-2021) from within all wind lease areas as a proportion of the port's total revenue based on vessel trip reports as described in the revenue and landings of species in the wind indicator above. The range (minimum and maximum) of total percent revenue from within wind energy areas is presented in the graph and Mid-Atlantic ports are sorted from greatest to least revenue from within wind areas.

For example, Atlantic City, NJ had a minimum of 11% and maximum of 30% overlap of fisheries revenue in potential wind development areas to the total port fisheries revenue between 2008-2021. Those communities that score Med-High or higher in at least one of the vulnerability indicators that address environmental justice concerns (i.e., Poverty, Population Composition, Personal Disruption; see indicator definitions) are noted with a triangle. Gentrification pressure is also highlighted here, with those communities that score Med-High or higher in one or more gentrification pressure indicators (i.e., Housing Disruption, Retiree Migration, Urban Sprawl) represented with a circle (Fig. 54). BOEM reports that cumulative offshore wind development (if all proposed projects are developed) could have moderate impacts on low-income members of environmental justice communities who work in the commercial fishing and for-hire fishing industry due to disruptions to fish populations, restrictions on navigation and increased vessel traffic, as well as existing vulnerabilities of low-income workers to economic impacts [59].

Port Revenue from Wind Energy Area
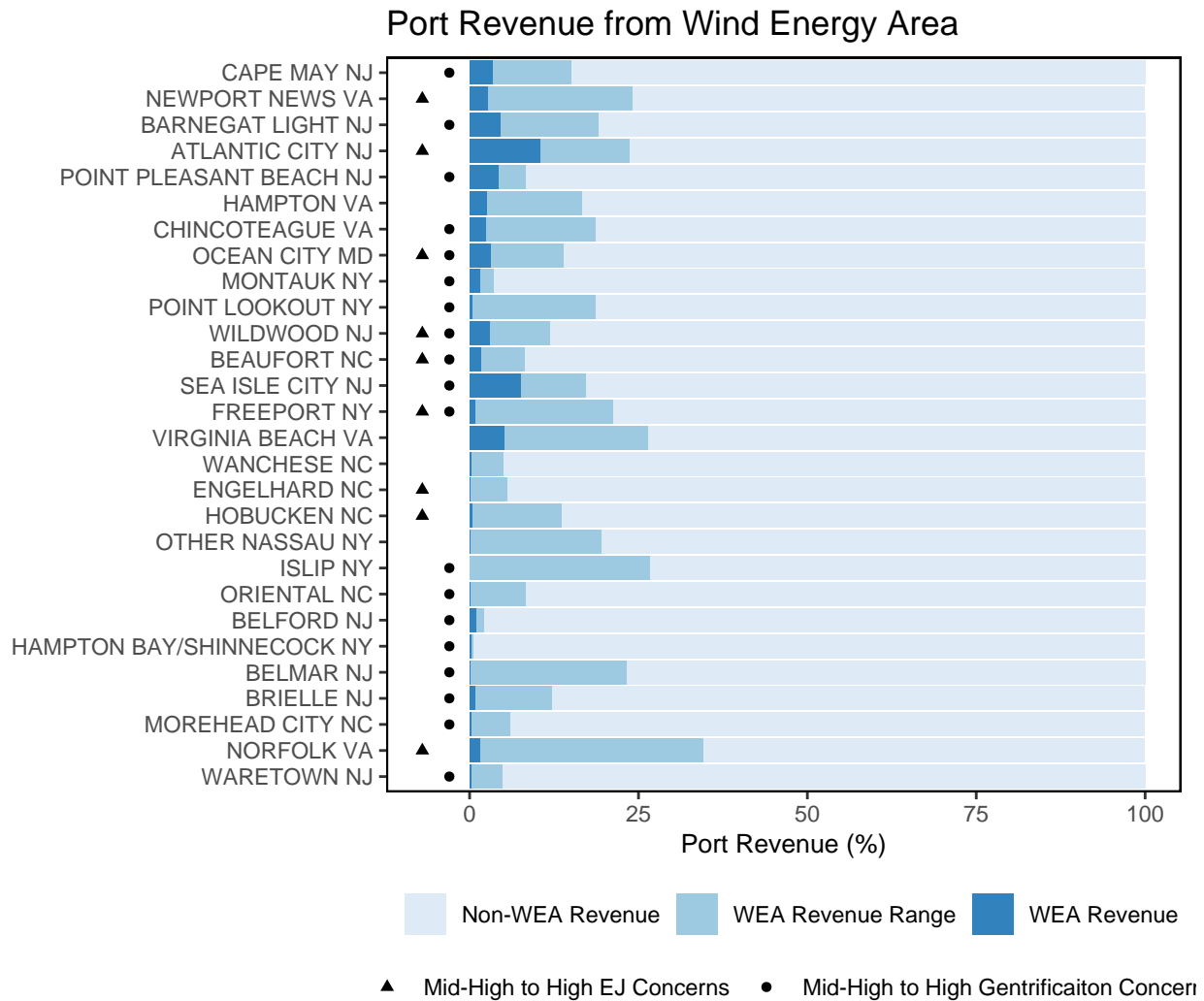
Figure 54: Percent of Mid-Atlantic port revenue from Wind Energy Areas (WEA) in descending order from most to least port revenue from WEA. EJ = Environmental Justice.

Some ports in New England land Mid-Atlantic managed species from wind areas as well. For the maximum percent value reported in each New England port, the majority (at least 50% based on both value and pounds) of those landings were Mid-Atlantic managed species within wind areas for Barnstable, MA, Boston, MA, Hyannis, MA, North Kingstown/Davisville, RI, and Point Judith, RI. Woods Hole, MA would be added to this list based on pounds only, but did not exceed 50% of value from Mid-Atlantic managed species within wind areas.

Port Revenue from WEA, majority MAFMC species
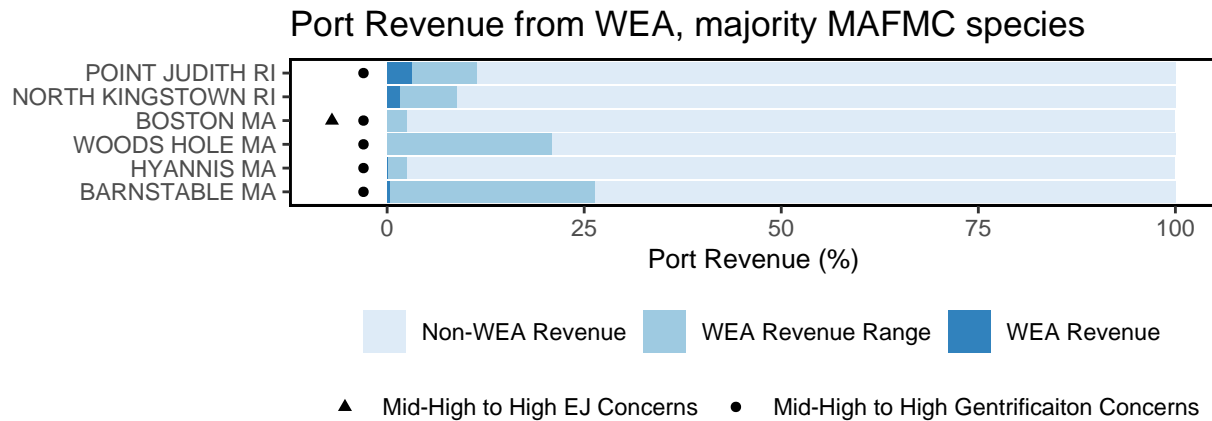
Figure 55: Percent of New England port revenue with majority MAFMC landings from Wind Energy Areas (WEA) in descending order from most to least port revenue from WEA. EJ = Environmental Justice.

Top fishing communities high in environmental justice concerns (i.e., Atlantic City, NJ, Newport News, VA, Hobucken and Beaufort, NC) should be considered in decision making to reduce the social and economic impacts and aid in the resilience and adaptive capacity of underserved communities. It also highlights communities where we need to provide further resources to reach underserved and underrepresented groups and create opportunities for and directly involve these groups in the decision-making process.

Implications

Current plans for rapid buildout of offshore wind in a patchwork of areas spreads the impacts differentially throughout the region (Fig. 52).

Up to 17% of maximum annual fisheries revenue for major Mid-Atlantic commercial species in lease areas and draft call areas could be forgone or reduced and associated effort displaced if all sites are developed. Displaced fishing effort can alter historic fishing area, timing, and method patterns, which can in turn change habitat, species (managed and protected), and fleet interactions. Several factors, including fishery regulations, fishery availability, and user conflicts affect where, when, and how fishing effort may be displaced, along with impacts to and responses of affected fish species.

Planned development overlaps right whale mother and calf migration corridors and a significant foraging habitat that is used throughout the year [9] (Fig 56). Turbine presence and extraction of energy from the system could alter local oceanography [60] and may affect right whale prey availability. For example, persistent foraging hotspots of right whales and seabirds overlap on Nantucket Shoals, where unique hydrography aggregates enhanced prey densities [61,62]. Wind leases (OCS-A 0521 and OCS-A 0522) currently intersect these hotspots on the southwestern corner of Nantucket Shoals and a prominent tidal front associated with invertebrate prey swarms important to seabirds and possibly right whales. Proposed wind development areas also bring increased vessel strike risk to whales from construction and operation vessels, in addition to potential impacts such as displacement, increased levels of communication masking, and elevated stress hormones from pile driving and operational noise.
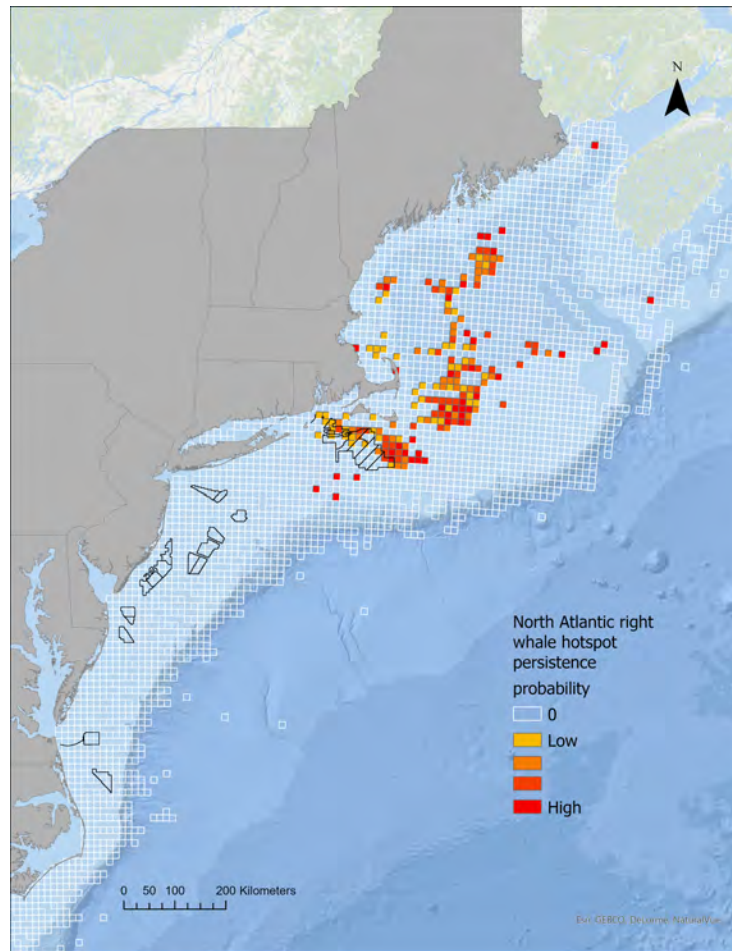
Figure 56: Northern Right Whale persistent hotspots and Wind Energy Areas.

Scientific data collection surveys for ocean and ecosystem conditions, fish, and protected species will be altered, potentially increasing uncertainty for stock assessments and associated management decision making.

The increase of offshore wind development can have both positive (e.g., employment opportunities) and negative (e.g., space-use conflicts) effects. Continued increase in coastal development and gentrification pressure has resulted in loss of fishing infrastructure space within ports. Understanding these existing pressures can allow for avoiding and mitigating negative impacts to our shore support industry and communities dependent on fishing. Some of the communities with the highest fisheries revenue overlap with offshore wind development areas that are also vulnerable to gentrification pressure are Point Pleasant and Atlantic City, NJ, Ocean City, MD, and Beaufort, NC.

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Document Orientation

The figure format is illustrated in Fig 57a. Trend lines are shown when slope is significantly different from 0 at the $p < 0.05$ level. An orange line signifies an overall positive trend, and purple signifies a negative trend. To minimize bias introduced by small sample size, no trend is fit for < 30 year time series. Dashed lines represent mean values of time series unless the indicator is an anomaly, in which case the dashed line is equal to 0. Shaded regions indicate the past ten years. If there are no new data for 2022, the shaded region will still cover this time period. The spatial scale of indicators is either coastwide, Mid-Atlantic states (New York, New Jersey, Delaware, Maryland, Virginia, North Carolina), or at the Mid-Atlantic Bight (MAB) Ecosystem Production Unit (EPU, Fig. 57b) level.
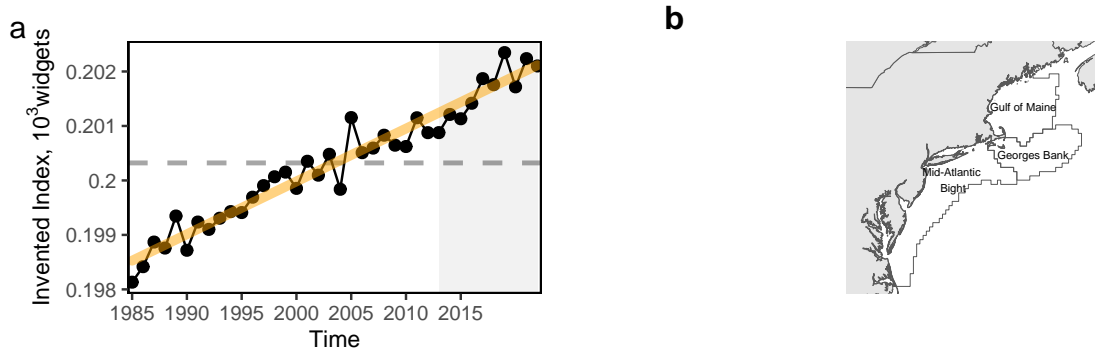
Figure 57: Document orientation. a. Key to figures. b.The Northeast Large Marine Ecosystem.

Fish and invertebrates are aggregated into similar feeding categories (Table 3) to evaluate ecosystem level trends in predators and prey.

Table 3: Feeding guilds and management bodies.

Guild	MAFMC	Joint	NEFMC	State or Other
Apex Predator				bluefin tuna, shark uncl, swordfish, yellowfin tuna
Piscivore	bluefish, longfin squid, northern shortfin squid, summer flounder	goosefish, spiny dogfish	acadian redfish, atlantic cod, atlantic halibut, clearnose skate, little skate, offshore hake, pollock, red hake, silver hake, smooth skate, thorny skate, white hake, winter skate	fourspot flounder, john dory, sea raven, striped bass, weakfish, windowpane
Planktivore	atlantic mackerel, butterfish		atlantic herring	alewife, american shad, blackbelly rosefish, blueback herring, cusk, longhorn sculpin, lumpfish, menhaden, northern sand lance, northern searobin, sculpin uncl
Benthivore	black sea bass, scup, tilefish		american plaice, barndoor skate, crab,red deepsea, haddock, ocean pout, rosette skate, winter flounder, witch flounder, yellowtail flounder	american lobster, atlantic wolffish, blue crab, cancer crab uncl, chain dogfish, cunner, jonah crab, lady crab, smooth dogfish, spider crab uncl, squid cuttlefish and octopod uncl, striped searobin, tautog
Benthos	atlantic surfclam, ocean quahog		sea scallop	blue mussel, channeled whelk, sea cucumber, sea urchin and sand dollar uncl, sea urchins, snails(conchs)

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1026

22 March, 2023

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901

To the Council,

In this memo we list comments and requests received on the 2019-2022 State of the Ecosystem (SOE) reports, and how we responded to those requests. We include comments from both Councils because adjustments to the report were made in response to both. We welcome feedback on whether this memo is useful and how to improve it for future SOE reporting.

The memo is now reorganized into categories of requests in descending order of overall Council priority. The new Rank column summarizes priority and was derived from combined discussion with the Mid-Atlantic SSC ecosystem working group and a survey of selected MAFMC members coordinated by Council staff in July 2022.

The attached document includes a table where we summarize all comments and requests with sources. The Status and Progress columns briefly summarize how we responded, with a more detailed response in each memo section. In each detailed response, we refer to SOE sections where changes are found or describe information that was not sufficiently developed to include in the 2023 SOE in an effort to solicit feedback on how best to develop indicators for future reports.

We welcome comments on the entire SOE report as well as information included in this memo, and look forward to feedback from the SSC and Council.

Sincerely,

Sarah Gaichas, PhD
Research Fishery Biologist
Ecosystem Dynamics and
Assessment Branch
Northeast Fisheries Science Center

encl: State of the Ecosystem 2023: Request Tracking Memo

cc: Jon Hare

State of the Ecosystem 2023: Request Tracking Memo

Introduction

In the table below we summarize all comments and requests with sources. The memo is now reorganized into categories of requests in descending order of overall Council priority. The new Rank column summarizes priority and was derived from combined discussion with the Mid-Atlantic SSC ecosystem working group and a survey of selected MAFMC members coordinated by Council staff in July 2022. The Progress column briefly summarizes how we responded, with a more detailed response to each request in a section for each request category. In the Status column, "In SOE" indicates a change included in the report(s).

Table 1: State of the Ecosystem requests by category and Council priority.

Request	Year	Rank	Source	Status	Progress
System level thresholds/ref pts					
Compare EOF (Link) thresholds to empirical thresholds (Large, Tam)	2021	Highest	MAFMC SSC	In progress	Analysis planning with Mid SSC
Trend Analysis / Inflection / Break points	2019 - 2022	Highest	Both Councils and SSCs	In progress	Prototype analysis 2022-2023
Optimum yield for ecosystem	2021	Highest	NEFMC	In progress	Analysis planning with Mid SSC
How does phyto size comp affect EOF indicator, if at all?	2021	High	MAFMC	In progress	Analysis planning with Mid SSC
Sum of TAC/ Landings relative to TAC	2021	Moderate	MAFMC SSC	In SOE-MAFMC, In progress-NEFMC	Seafood Production section
Nutrient input, Benthic Flux and POC (particulate organic carbon) to inform benthic productivity by something other than surface indicators	2021	Low	MAFMC SSC	Not started	Lacking resources this year
Reduce indicator dimensionality with multivariate statistics	2020	Lowest	NEFMC	In progress	Analysis planning with Mid SSC
Management					
Incorporate social sciences survey from council	2020	High	NEFMC	Not started	Lacking resources this year
Management complexity	2019	High	MAFMC	In progress	Student work needs further analysis, no further work this year
Recreational bycatch mortality as an indicator of regulatory waste	2021	High	MAFMC SSC	Not started	Lacking resources this year
Include New England ports with significant reliance on mid species be included in the Mid SOE	2022	Unranked	MAFMC	In SOE	Other Ocean Uses: Offshore Wind section
Re-evaluate EPUs	2020	Lowest	NEFMC	Not started	Lacking resources this year
Short term forecasts					
Using phytoplankton trends to forecast fish stocks	2022	High	MAFMC	Not started	Lacking resources this year
Short term forecasting (water temp, productivity)	2022	High	NEFMC	Not started	Lacking resources this year
Regime shifts					
Time series analysis (Zooplankton/Forage fish) to tie into regime shifts	2021	High	MAFMC SSC	In progress	Individual projects started
Regime shifts in Social-Economic indicators	2021	High	NEFMC SSC	In progress	Analysis planning with Mid SSC
Multiple system drivers					
Linking Condition	2020	High	MAFMC	In progress	Not ready for 2023
Avg weight of diet components by feeding group	2019	High	Internal	In progress	Part of fish condition project
Cumulative weather index	2020	Moderate	MAFMC	In progress	Data gathered for prototype

Request	Year	Rank	Source	Status	Progress
Fall turnover date index	2021	Moderate	MAFMC SSC	In SOE	Climate and Ecosystem Productivity section
Modeling cold pool/warm core ring and wind development interactions	2022	Moderate	MAFMC	Not started	Lacking resources this year
Impact of climate on data streams (changes in catchability of survey)	2022	Moderate	NEFMC SSC	Not started	Lacking resources this year
Young of Year index from multiple surveys	2019	Moderate	MAFMC	Not started	Lacking resources this year
Links between species availability inshore/offshore (estuarine conditions) and trends in recreational fishing effort?	2021	Unranked	MAFMC	In progress	Bluefish prey index inshore/offshore partially addresses
Tell Social stories like we try to tell biological stories	2022	Unranked	GARFO	Not started	Lacking resources this year
What determines a "risk"? Include aquaculture as a risk?	2022	Unranked	NEFMC SSC	Not started	Lacking resources this year
Mean stomach weight across feeding guilds	2019	Low	MAFMC	In progress	Intern evaluated trends in guild diets
Environmental Justice - Further Explanation and maybe have Soc Sci folks on call to explain	2022	Low	MAFMC SSC	In SOE	Social and cultural section
Changing per capita seafood consumption as driver of revenue?	2021	Low	MAFMC	Not started	Lacking resources this year
Relate OA to nutrient input; are there "dead zones" (hypoxia)?	2021	Low	MAFMC	Not started	Lacking resources this year
Estuarine Water Quality	2020	Low	NEFMC	In SOE-MAFMC, In progress-NEFMC	Intern project 2021 needs expansion
Decomposition of diversity drivers highlighting social components	2021	Lowest	MAFMC SSC	Not started	Lacking resources this year
Indicators of chemical pollution in offshore waters	2021	Lowest	MAFMC	Not started	Lacking resources this year
Estuarine condition relative to power plants and temp	2019	Lowest	MAFMC	Not started	Lacking resources this year
Functional group level status/thresholds/ref pts					
Forage availability index (Herring/Sandlance)	2021	Moderate	NEFMC	In SOE	Climate and Ecosystem Productivity section
VAST and uncertainty	2020	Moderate	Both Councils	In progress	Not ready for 2023
Seal index	2020	Low	MAFMC	In progress	Not ready for 2023
Apex predator index (pinnipeds)	2021	Low	NEFMC	In progress	Protected species branch developing time series
Biomass of spp not included in BTS	2020	Lowest	MAFMC	Not started	Lacking resources this year
Stock level indicators					
Shellfish growth/distribution linked to climate (system productivity)	2019	Moderate	MAFMC	In progress	Project with A. Hollander
Indicator of scallop pred pops poorly sampled by bottom trawls	2021	Moderate	NEFMC	Not started	Lacking resources this year
Sturgeon Bycatch	2021	Lowest	MAFMC SSC	Not started	Lacking resources this year
SOE admin					
SOE usage tracking	2022	Unranked	MAFMC SSC	In progress	Request in to communications experts
Include estimates of inclusion years in request memo	2022	Unranked	NEFMC SSC	In progress	Reorganized memo to clarify project timing

Responses to comments

System level thresholds/reference points

Further refining ecosystem level overfishing (EOF) indicators and investigating optimum yield (OY) at the ecosystem level was identified as highest priority by both the MAFMC SSC working group and by surveyed MAFMC members. Methods for evaluating ecosystem indicator trends, inflection points, and breakpoints (regimes, see below) were also ranked highest priority by both SSC and Council as these methods apply to ecosystem level thresholds and reference points, as well as to indicators at the functional group or stock level, or to indicators of climate or habitat risk. Several other SSC and Council requests are related to or support these analyses and can likely be addressed by planned analyses.

The EOF indicators were first presented in 2021 and were discussed in depth with the MAFMC SSC working group in April 2022 and February 2023. Considerable progress has been made on updating data inputs for the EOF indicators and planning for system level threshold analyses with the MAFMC SSC. After reviewing previous presentations of the EOF indicators, Andy Beet (NEFSC) reviewed solutions to several data input problems identified in July 2022 (menhaden landings were added and differences between different data sources were resolved). An outstanding data input task is completing discard estimates for all species in the Northeast US, which is in progress.

An in depth review of methods and associated thresholds for the three EOF indicators has been completed. A plan for adapting these methods to data specific to our region (primary production and landings) was discussed with the MAFMC SSC. Finally, a simulation study is being planned to use the Northeast US Atlantis ecosystem model [1] to investigate robustness of thresholds and determine how informative they can be. This portion of the research will likely address the MAFMC request to evaluate how phytoplankton size composition might affect the EOF indicator. It will also address SSC questions raised about tradeoffs between fishing for different species groups to address EOF, and how climate driven changes in transfer efficiency might be incorporated into or impact EOF indicators. In addition, the NEUS Atlantis model may be able to address the lower priority requests on nutrient input and benthic flux contributions to system productivity once model sensitivity analysis determines whether these model components behave reasonably. We expect to present results of EOF analyses to the SSC in late 2023. If reviews are positive, EOF indicators may appear in the 2024 SOE, and if further work is needed they should appear in the 2025 SOE.

Automated methods for estimating both short term and long term trends, evaluating time series inflection points, and identifying breakpoints (regimes) are being tested.

- The `ecodata` R package already incorporates long term trend estimation based on Hardison et al. [2]. This research found that trends were most robustly distinguished from autocorrelation in indicator time series of 30 years or longer. However, there is still considerable interest in robust methods for assessing short term trends, especially for the most recent portions of time series and for shorter indicator time series. In 2022, work was initiated on short term trend analysis robust to autocorrelation by Andy Beet and Kim Bastille (NEFSC). The short term trend fitting method needs more simulation testing to address performance with missing data. If this simulation can be completed, it is likely to be available for SOE and risk assessment analyses in 2023 for possible inclusion in the 2024 SOE.

- Kim Bastille (NEFSC) has also been working on methods to identify inflection points in indicator time series based on Large et al. [3] and [4]. A standardized method has been implemented as a prototype and applied to several existing SOE indicators in 2022, but several questions on default approaches to be used across multiple indicators require more in depth analysis and review. If this work can be completed, it is likely to be available for SOE and risk assessment analyses in 2023 for possible inclusion in the 2024 SOE.

- A method for identifying breakpoints has been implemented by Kim Bastille and Laurel Smith (NEFSC) and a prototype analysis developed using SOE indicators in 2022. If this method can be further developed, it may be reviewed in 2023 along with other regime shift analyses (see below).

Work is in progress by John Walden and Geret DePiper (NEFSC) to combine multiple indicators into single integrated indices (Index Numbers) using Data Envelopment Analysis. This work has been reviewed by the MAFMC SSC ecosystem working group in July 2022 and again in February 2023. Index Numbers evaluate sets of environmental indicators and management output indicators to determine system performance. The approach combines

important management outputs linked to objectives (e.g. commercial revenue, recreational days fished, right whale abundance) and likely ecosystem drivers of change in these outputs (e.g., chlorophyll a, zooplankton, aggregate fish biomass) into an analysis evaluating aggregating inputs and outputs into single indicators used to determine whether system performance has improved over time relative to a reference year. An initial case study using the SOE indicators identified above was presented in July 2022, and a follow up analysis evaluating individual Index Numbers for SOE management objectives (Seafood Production, Recreational Opportunities, etc.) was presented in February 2023. Integrated Index Numbers based on some of these case studies may be further reviewed by the MAFMC SSC ecosystem working group and developed for the 2024 SOE.

Management

Council members tended to give higher priority rankings to requests in this category relative to the SSC working group, but overall both ranked management related requests high priority.

In 2022, MAFMC requested that New England ports with significant reliance on Mid-Atlantic managed species be included in the Mid-Atlantic SOE analysis of potential risks to fishery management from offshore wind development. Angela Silva (NEFSC) evaluated landings for all New England ports by both value and pounds, and included New England ports with over 50% of maximum value or pounds MAFMC managed species landed from wind areas between 2008-2021. Six ports were identified as "significantly reliant" using this criteria, and we included this information in the 2023 MAFMC SOE (p.43-44).

We lacked resources to address three high-ranked requests this year, including incorporating a social sciences survey from the NEFMC, continuing development of a management complexity indicator started by an intern in 2020, and developing an indicator of regulatory waste based on recreational bycatch mortality.

We are unfamiliar with the social sciences survey highlighted by NEFMC. Additional information on this survey is needed in order to follow up on this request.

It may be possible to address the requests on management complexity and recreational bycatch mortality as part of the Mid-Atlantic EAFM risk assessment update in 2023 if appropriate expertise can be brought into this process.

The request to re-evaluate Ecosystem Production Units (EPUs) was ranked lowest priority. We do not forsee having the resources to address this request, which is a large project, in the near future.

Short term forecasts

The SSC working group ranked these new requests higher priority relative to Council members, but overall both ranked short term forecasting requests high priority.

While using phytoplankton trends to forecast fish stocks may be feasibly simulation tested within the Atlantis modeling framework described above for EOF indicators, this is a long term project that would require dedicated effort to achieve, likely by a postdoctoral researcher.

Some experimental short term forecasts of regional water temperature are currently available, and could be investigated or presented to the SSCs during the 2024 cycle if this remains a high priority. Short term forecasts of species distributions for fisheries management are in progress with Rutgers University and MAFMC, which may also address this request. Skill assessment of these forecasts, as well as determining the context in which they would be used (stock assessment projections? habitat projections? other uses?) would be needed to bring them into the management process (this is better developed for the ongoing Rutgers/MAFMC project). Incorporating short term forecasts into the SOE outside the ongoing Rutgers/MAFMC project would require a similar level of effort to the phytoplankton/fish forecasting project above.

Additional resources are needed to address these requests in the coming year.

Regime shifts

Adding information on regime shifts was considered a high priority by both the Council and SSC. Time series analysis of zooplankton and forage fish to evaluate potential linked regime shifts is currently in progress, and multiple projects may contribute to this. We are working to coordinate existing projects (see below) into a synthesis product for the

SOE. Because the projects are on different timelines, it is difficult to give a target date for SOE synthesis. However, we expect to have some project results published prior to the 2024 SOE. With these publications complete, some synthesis may be presented in the following SOE cycle.

Table 2: Selected Regime Shift Projects. Methods: rpart = recrusive partitioning R package, DFA = dynamic factor analysis, EOF = empirical orthoganal function, SEWS = spatial early warning signals, DEA = data envelopment analysis, GAMs = general additive models. Ecosystem Component: Env = environmental drivers, Fish = fish, Zoo = zooplankton, Landings = fishery landings.

Analysis	Methods	Ecosystem Component	Temporal Scale	Spatial Scale	Availability
SOE Indicator Comparison	rpart	Env to Fish	Annual	EPU	Available Now
Condition (1)	rpart	Env to Fish	Annual, fall only	EPU or shelf	Multi species available now
Condition (2)	DFA	Fish	Annual?	EPU	In progress
Zooplankton	multiple	Zoo	Seasonal	EPU	In review
Zooplankton VAST	EOF	Zoo	Seasonal	EPU	In progress
SST	SEWS	Env	Annual?	NW Atlantic	In progress
DEA	DEA	Zoo to Landings	Annual	EPU	In progress
Stock Recruit	changepoint and GAMs	Fish	Annual	Stock	Not started, could use stock smart

Regime shifts in socio-economic indicators may be addressed in the ongoing work described above by John Walden and Geret DePiper (NEFSC) integrating multiple indicators into Index Numbers. Once the structure of the Index Numbers is determined, these time series can be evaluated for change points using any of the methods described in the table above.

Multiple system drivers

This category contains a wide array of requests with many projects currently in progress. There were two requests ranked high priority, eight ranked moderate priority (or unranked because they are newer requests), and eight ranked low or lowest priority. Given the number of SOE requests, those ranked lowest priority that have not already been started are unlikely to be addressed.

The high priority request in this category is incorporating the ongoing fish condition project and associated analyses into the SOE. Regime shift analyses of fish condition may be available for the 2024 SOE, while linking fish condition to ecosystem drivers using GAMs will require more time with current resources.

One moderate priority request was included in the 2023 SOE: a fall turnover index has been included in both the MAFMC and NEFMC reports in the Climate and Ecosystem Productivity sections.

One low priority request was included in the 2023 SOE: we updated text with further explanation of the Environmental Justice indicators.

An unranked request to evaluate links between species availability inshore and offshore and trends in recreational fishing effort was partially addressed using a spatial index of forage fish to evaluate bluefish availability to the recreational fishery during the research track assessment in December 2022. This forage fish index has been included in the 2023 SOE.

Several other moderate/unranked and low priority requests are currently in progress or started as intern projects, including a cumulative weather index, mean stomach weights across feeding guilds, and estuarine water quality for the NEFMC SOE. If sufficient resources are found to finish these projects, they could be included in the 2024 SOE.

Functional group level status/thresholds/ref pts

Requests in this category were considered moderate to low priority by the SSC and Council. However, many were already in progress prior to ranking, and one has been included in the 2023 SOE.

The NEFMC requested a forage availability index (including both managed species such as herring and unmanaged species such as sandlance). A spatial index of forage availability was developed for the bluefish research track assessment as described above. This index was partitioned into EPUs and presented in both the 2023 MAFMC and NEFMC SOEs in the Climate and Ecosystem Productivity sections.

Gray seal pup count indices are already included in the NEFMC SOE, and indices of populations for other seals and apex predators are in development by the protected species branch. These additional indices were not ready for the 2023 report.

Investigating time series of biomass for species not well represented in bottom trawl surveys was partially addressed by the forage index included in the 2023 report. However, only a subset of forage species are not well represented in bottom trawl surveys, and other species that are not forage are also not well represented in bottom trawl surveys. This request was ranked lowest priority by the Council and SSC, and given the difficulty of synthesizing data on poorly sampled species, is unlikely to be addressed in the near future.

Stock level indicators

Requests in this category were ranked moderate to lowest priority by the SSC and Council. Indicators of this nature would be well suited to Ecosystem and Socioeconomic Profiles (ESP) developed during research track assessments for individual stocks. Some aspects of these indicators may benefit SOE reporting as well.

One request, linking shellfish growth and distribution to climate change and system productivity, is in progress. Alexis Hollander (VIMS) completed her thesis on surfclam growth in relation to bottom temperature in 2022, and information from this work can likely be included in the 2024 SOE, pending publication of student thesis results.

The request for indicators of scallop predators that are poorly sampled by bottom trawls is similar to the request in the category above addressing all species not well sampled by bottom trawls. It is possible that this request could be clarified and addressed during a scallop research track assessment.

The request for a sturgeon bycatch indicator was ranked lowest priority by the SSC and Council, so is unlikely to be addressed in the near future.

SOE admin

These relatively new requests were not ranked; however, both are in progress.

Investigation of uses of the SOE as requested by the MAFMC SSC is in progress with the assistance of NOAA communications experts using a combination of website analytics and citation information. We hope to have an update on uses of the SOE for the 2024 report/request memo.

The restructuring of this memo according to prioritization is intended to partially address the requests for timelines on in progress SOE requests by the NEFMC SSC. While not all project timelines are currently available, we have reported estimates in this document where possible. In addition, the effort to prioritize requests in 2022 ensures that limited resources are applied to the highest priority issues.

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Review of SSC Ecosystem Working Group Objectives and Intended Outcomes

The MAFMC SSC Ecosystem Working Group (WG) was established in May 2021 to assist the Council in developing short term and long term objectives to advance the operational use of ecosystem information in management decisions. As reported in September 2021, March 2022, and September 2022 the WG has identified three general objectives:

1. Expanding and clarifying the ecosystem portion of the SSC OFL CV determination process (short term objective)
2. Developing prototype processes to provide multispecies and system level scientific advice appropriate for Council decision making, in particular where there are multispecies and multifleet tradeoffs linking directly to economic and social outcomes (long term objective)
3. Collaborating with SSC species leads, stock assessment leads, and relevant working groups in developing the stock-specific Ecosystem and Socio-economic Profiles (ESP) process to specify stock-specific Ecosystem ToRs that are impactful and can be integrated into assessments (moderate-term objective)

Objectives 1 and 3 aim to integrate appropriate ecosystem information at the stock level of management decision making, while objective 2 applies to current Council EAFM processes and potential future multispecies and system level objectives.

Intended outcomes of WG work for the Council include:

- An OFL CV process that makes better use of ecosystem information in determining the ABC
- Evaluation of multiple ecosystem indicators and potential development of thresholds for use in a revised EAFM risk assessment and/or other Council processes
- Increased range of opportunities for relevant ecosystem information to be considered in management decision processes

Progress

At the joint Council/SSC meeting in October 2022, the SSC Ecosystem Working Group provided an update on current work, and sought Council feedback on priorities for development and use of integrated ecosystem-level indicators within existing or new Council processes (see October 2022 report to the Council, p.3-8 and Presentation, slides 6-11).

Since October 2022:

- WG member Sarah Gaichas submitted a summary of the SCS7 Keynote "Using Ecosystem Information in the Stock Assessment and Advice Process" that highlights MAFMC SSC and SSC Ecosystem WG projects (see draft attached at the end of this document).
- The Bluefish Research Track assessment's ESP document addressing ToR 1 ecosystem effects on the stock received high praise from CIE reviewers.
- The State of the Ecosystem (SOE) request prioritization completed by the WG in 2022 has been incorporated into work going forward for 2023 and future SOEs, and is reflected in the 2023 SOE request tracking memo.
- The WG met 27 February 2023 to review updates on four projects related to the objectives above. Notes from the review are detailed below.

Objective 1: OFL CV and ecosystem effects

These projects will enhance the SSC's current OFL CV process or address stock reference points, and therefore fit within existing Council decision processes.

ABC decisions with environmentally driven recruitment WG member Mike Wilberg's lab (U. Maryland) is collaborating with John Wiedenmann's lab (Rutgers) to simulate an environmental effect on stock recruitment and test how it impacts assessment uncertainty. Implications of choosing both the appropriate OFL CV based on an environmental effect linked to recruitment and an inappropriate OFL CV will be evaluated using an updated MSE framework. The group is conducting a mini-review on environmental drivers in the region to get an idea of trends, periodicity, autocorrelation to inform the analysis. A simulated species based on Summer flounder is the initial case study.

Jeewantha Bandara (Rutgers) presented current work in progress. A literature review of summer flounder environmental influences along with analysis of relationships between multiple SOE environmental indicators and summer flounder recruitment has been completed. A significant relationship between temperature anomalies and summer flounder recruitment has been found. In addition, hypothetical relationships between environmental drivers and summer flounder recruitment (gaussian and sigmoidal) have been developed for testing within the MSE framework. The goal is to have a range of feasible relationships for testing, not necessarily limited to those found in this region for summer flounder. The group is compiling a list of harvest control rules representing those used across the US (including the MAFMC risk policy) as well as environmentally-driven control rules to be tested within the framework. The goal is to have simulations, including the MSE framework and harvest control rule options, ready to start by May. Key performance metrics will include SSB, catch, and variability in catch under different environmental conditions.

The Ecosystem WG agreed with reducing the scope of work to focus on a summer flounder-like species, rather than extending to an additional life history type, and looks forward to reviewing initial results this summer.

Alternative stock performance metrics considering current conditions WG member Paul Rago and SSC member Brian Rothschild presented a method to recast stock assessment outputs taking explicit account of current (perhaps environmentally driven) realized recruitments, rather than all observed historical recruitments. The method uses available stock assessment information (catch, SSB, recruitment) and potentially can consider stock, economics, and ecosystem information. Examples were developed for bluefish, summer flounder, and sea bass, each showing relative SSB and relative yield plots (with expected SSB and expected yield given current conditions as a basis). Preliminary analysis suggested that we could have done better had we fished at optimal rate for bluefish. Summer flounder could have had better SSB with less catch. Black sea bass rebuilt above target, suggesting management overshot? The analyses revealed some stocks that did not necessarily produce higher recruitment at higher SSB such as summer flounder, where the odds ratio suggested that recruitment is higher when stock size is lower. In contrast, bluefish did produce higher recruitment under higher SSB, and sea bass performed similarly.

The SSC WG discussed potential to use this type of comparison to expectations given recent productivity within ABC mode or rebuilding analyses. The approach asks how effectively we are managing given the hand we are dealt currently, which can be measured using current recruitment, as well as current weight at age, maturation, and selectivity. There are likely connections with the simulation analysis described above, as well as the Index Numbers approach described below, which can also evaluate performance relative to current ecosystem conditions. The WG and full SSC could consider how this approach might

be incorporated into current decisions, and how to more formally use current ecosystem and economic information in determining expected SSB and yield.

Objective 2: Multispecies and system level ecosystem advice

These projects can be used to inform the existing Council EAFM process, or new Council decision processes at the multispecies or ecosystem level.

Ecosystem overfishing indicators   Andy Beet (NEFSC) presented an update from the April 2022 meeting on data inputs, data analysis, methodology, and planned empirical and simulation analyses to further develop regionally specific ecosystem overfishing (EOF) indicators at the February 2023 meeting. These indicators were presented in the 2021 SOE, but were not updated due to data constraints in 2022. Because the data inputs are still incomplete and discussion of analyses with the SSC are planned to evaluate appropriate thresholds, the EOF indicators are not included in the 2023 SOE.

The 2021 EOF indicators were based on commercial landings of federally managed species. However, EOF indicators are designed to be based on total catch. In 2022, catch data for Atlantic menhaden was added; because this is the highest volume fishery on the US East Coast it is important to include menhaden catch in the EOF indicators. Work continues to include commercial discards and recreational catch of all species. Comparisons among commercial landings data sources were also completed to ensure that inputs to the indicators are correct. Discrepancies between the Sea Around Us data source and NEFSC data sources were resolved by including live weight instead of meat weight for shellfish landings. The Ecosystem WG agreed that these changes to input data were appropriate, and suggested double checking that all state landed species (not federally permitted) were included in the input data.

Detailed methods were reviewed for each of the three EOF indicators: Ryther (total catch per unit area), Fogarty (total catch per total primary production), and Friedland (total catch per mean chlorophyll). Because the originally published thresholds for each indicator were based on global average ocean productivity and trophic level of the catch, the initial step is to recalculate the thresholds using regional estimates of productivity and catch trophic level. As a next step, simulation analysis was proposed using the Northeast US Atlantis ecosystem model to test the robustness of the resulting regional thresholds to different levels of fishing.

The SSC Ecosystem WG agreed with this general approach and had several suggestions for simulation scenarios. First, evaluating tradeoffs between functional groups is desirable as there are many combinations of group fishing levels that may lead to, or relieve, ecosystem overfishing. Evaluating both biomass/biodiversity objectives and economic and social objectives will be important (not all species are equally valued). Finally, the relationship between transfer efficienciy and ocean warming should be investigated. If transfer efficiency is assumed constant but climate change means it is not, how is that accounted for in the EOF indicators and simulations?

Index Numbers for ecosystem performance   John Walden (NEFSC) presented an update to the Index Numbers analyses following initial presentation and WG suggestions at the July 2022 meeting. The approach combines any number of related indices into a single index, with weighting determined by an output distance function created using Data Envelopment Analysis (DEA). The output set contains all outputs that can be produced from a given set of inputs, and is used to compare a realized output from the maximum potential output given an input. Index Numbers can be used to evaluate performance relative to the best potential performance in a given year, and determine whether system performance

has improved over time relative to a reference year. It also allows many indicators to be collapsed into a single indicator.

Based on previous discussion, new analysis integrated multiple indicators addressing a particular management objective into Index Numbers. Initial SOE management objectives included seafood production, recreational opportunities, and environmental quality, using data from 1982-2019. For these initial tests, 1982 is the reference year, although the choice of the reference year could be made using managers' judgement of a particularly ideal year or poor year as a baseline. The index was demonstrated to scale appropriately, and several visualizations were shown, including line plots presented previously and heatmaps comparing each index to its baseline to look across indices.

Results of these example Index Numbers showed that current seafood landings are lower than initial year in both the Mid-Atlantic and New England, with the Mid doing slightly better than New England at present. Indices for both seafood landings and recreational opportunities dropped after 2010, although the recreational opportunities index did not drop that much relative to 1982, and the Mid and New England looked similar across recreational index numbers. The combined environmental quality index is currently above the 1982 baseline in the Mid-Atlantic, and near the baseline in New England. Using these Index Numbers, the state of environment is 40% better in the Mid-Atlatnic relative to the 1982 reference year.

The SSC Ecosystem WG discussed the potential to apply this analysis with the risk assessment review, for instance to help establish targets or thresholds that the EOP Committee has expressed interest in seeing. WG members Geret DePiper and Sarah Gaichas plan to meet with other SOE leads to explore how to bring Index Numbers forward in the upcoming SOE cycle. This could involve taking some of the indicators with a common theme (Seafood production for example) to condense into input and output indices through this analysis.

Objective 3:

Development of Ecosystem-Socioeconomic Profiles in Research Track assessment working groups facilitates the inclusion of ecosystem information within the current stock assessment process, and therefore fits within existing Council decision processes.

Ecosystem and Socioeconomic Profiles (ESPs) are used within the North Pacific stock assessment process as a structured way to include stock-relevant ecosystem information within stock assessments. An overview of the North Pacific ESP development process is available here. An example conceptual model of ecosystem interactions with Eastern Bering Sea Pacific cod demonstrates pathways for ecosystem indicators to enter the assessment process.
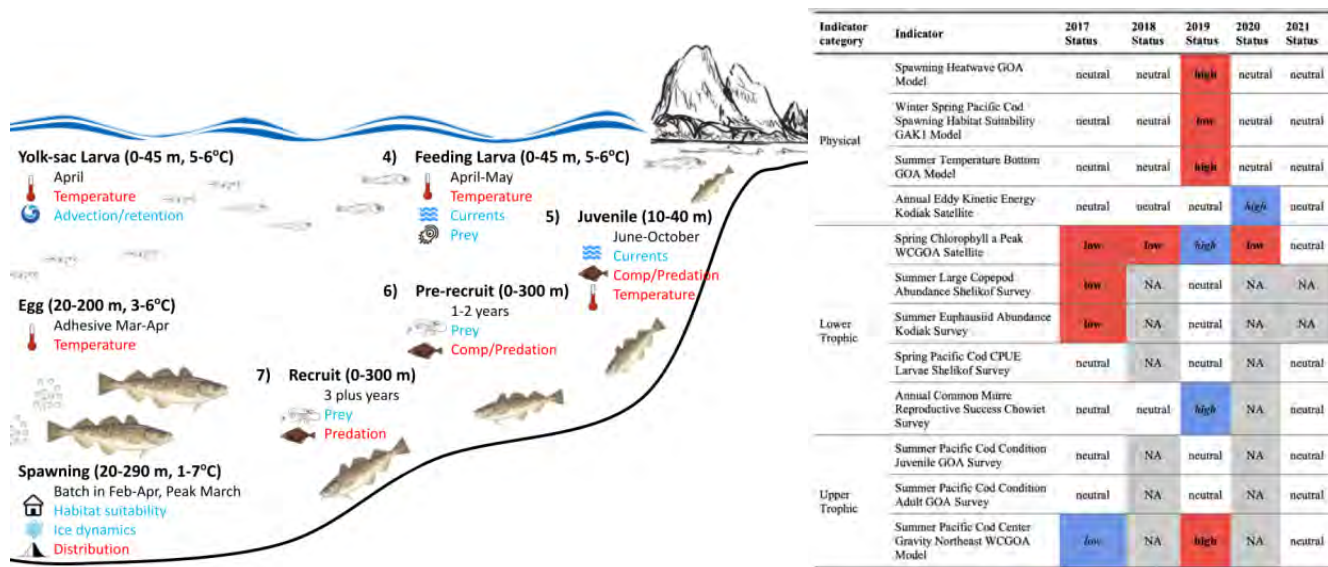
Figure 1. Left, AFSC caption "In 2021, our scientists developed a working conceptual Ecosystem and Socioeconomic Profile model of Eastern Bering Sea Pacific cod stock showing various indicators impacting the Pacific cod populations.", Right, Gulf of Alaska Pacific Cod risk table from the ESP. Credit: NOAA Fisheries.

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ESPs are currently in development in the Northeast US for multiple Mid-Atlantic and New England stocks. Work under Objective 3 continues with the participation of Gavin Fay in the black sea bass WG. The Bluefish Research Track ESP was presented December 7 2022, and was well received by CIE reviewers. Reviewers commented that it was the most complete treatment of a stock assessment "ecosystem ToR" they had seen, and formed a good basis for integrating further ecosystem information into the stock assessment in the future. The full ESP document is available as a working paper from the stock assessment data portal.
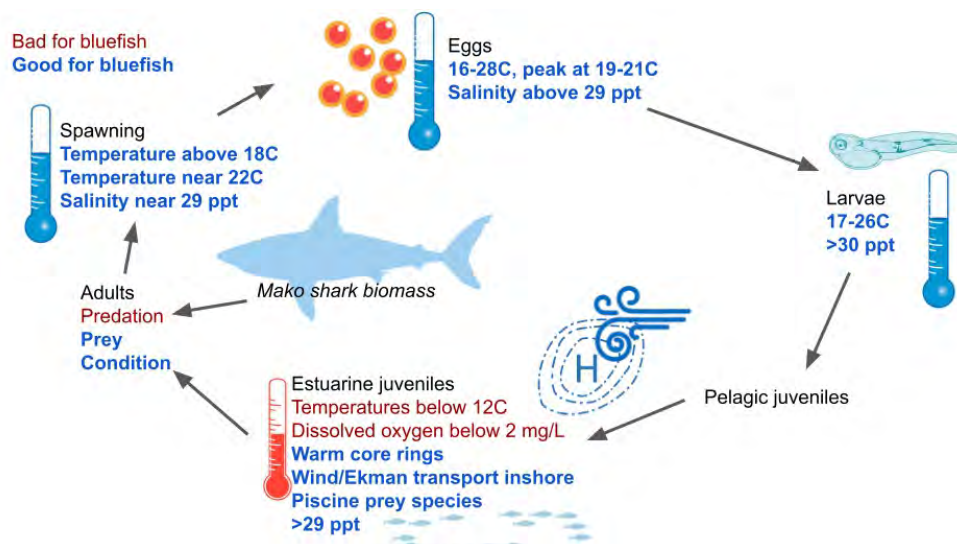
Figure 2: Bluefish conceptual model from the 2022 Research Track ESP Credit: Abigail Tyrell, Bluefish RT WG

In addition to the conceptual model, a summary table was developed for bluefish ecosystem indicators. This type of summary could contribute to OFL CV decisions with further information on how these indicator levels affect uncertainty in assessment.

Ecosystem indicators summary

Indicator category	Indicator	2017 Status	2018 Status	2019 Status	2020 Status	2021 Status
Distribution	Fall center of gravity of small (<=30.3cm) bluefish (northings, km)	neutral	**high**	neutral	NA	NA
	Fall center of gravity of medium (30.3-50.0cm) bluefish (northings, km)	neutral	neutral	**high**	NA	NA
	Fall center of gravity of large (>=50.0cm) bluefish (northings, km)	neutral	**high**	**high**	NA	NA
	Fall center of gravity of small (<=30.3cm) bluefish (eastings km)	neutral	neutral	neutral	NA	NA
	Fall center of gravity of medium (30.3-50.0cm) bluefish (eastings km)	neutral	neutral	**high**	NA	NA
	Fall center of gravity of large (>=50.0cm) bluefish (eastings km)	neutral	neutral	**high**	NA	NA
Climate	First day of the year when the mean temperature of the region is warmer than 18C	neutral	neutral	**neutral**	neutral	*low*
	Last day of the year when the mean temperature of the region is warmer than 18C	**high**	neutral	neutral	**high**	**high**
	Number of days when at least 75% of the region is warmer than 18C	**high**	neutral	neutral	neutral	**high**
	Proportion of the central Atlantic colder than 18C in July	neutral	neutral	neutral	*low*	*low*
	Proportion of the central Atlantic between 18-25.6C in July	neutral	neutral	*low*	*low*	**high**
	Proportion of the central Atlantic warmer than 25.6C in July	neutral	neutral	**high**	**high**	neutral
	Mean crossshore wind in the central Atlantic in April and May	neutral	**high**	neutral	*low*	*low*
	Mean alongshore wind in the central Atlantic in April and May	*low*	**high**	*low*	neutral	neutral
Natural mortality	Spring condition of small (<=30.3cm) bluefish	neutral	neutral	neutral	*low*	neutral
	Spring condition of medium (30.3-50.0cm) bluefish	neutral	neutral	neutral	high	neutral
	Spring condition of large (>=50.0cm) bluefish	*low*	neutral	**high**	**high**	**high**
	Fall condition of small (<=30.3cm) bluefish	neutral	neutral	neutral	**high**	**high**
	Fall condition of medium (30.3-50.0cm) bluefish	neutral	neutral	neutral	**high**	**high**
	Fall condition of large (>=50.0cm) bluefish	neutral	**high**	neutral	**high**	neutral

Figure 3: Bluefish indicator summary table from the 2022 Research Track ESP Credit: Abigail Tyrell, Bluefish RT WG

The SSC Ecosystem WG looks forward to the feedback of the full SSC on any of these topics, and always welcomes new members.

NOAA's National Seafood Strategy

Purpose

The *National Seafood Strategy,* outlines our direction for supporting a thriving domestic U.S. seafood economy and enhancing the resilience of the seafood sector in the face of climate change and other stressors. Our vision is to ensure that:

- U.S. seafood continues to be produced sustainably
- The U.S. seafood sector contributes to the nation's climate-ready food production and to meeting critical domestic nutritional needs
- U.S. seafood production increases to support jobs, the economy, and the competitiveness of the U.S. seafood sector
- Supply chains and infrastructure are modernized with more value-added activity in the United States
- Opportunities are expanded for a diverse and growing seafood workforce

Strategy Drivers

NOAA Fisheries' *National Seafood Strategy* supports the growing importance of seafood in meeting global needs and recognizes the unprecedented challenges faced by the U.S. seafood sector.

Seafood is Good for People

Seafood is one of the best sources of nutrients essential for human health and well-being. It is also critical to providing food to a growing global population.

Seafood is Good for the Economy

The U.S. harvests about 10 billion pounds of seafood annually with a dockside value of $6.3 billion. Domestic seafood is also an economic engine that supports 1.2 million jobs and generates $165 billion in sales across the broader economy.

Seafood is Good for the Planet

Harvested responsibly, as it is in the United States, seafood is also an environmentally friendly way to produce a nutritious food given its relatively low carbon footprint and efficient use of

The U.S. seafood industry is facing unprecedented challenges.

Climate change is rapidly altering species location, size, and composition. It is also intensifying storms and impacts on infrastructure.

The **coronavirus pandemic** disrupted markets and trade, decreasing the economic viability of the seafood industry and limiting access to some seafood.

New technologies and other ocean uses, such as offshore wind energy, will affect use of ocean space and potentially result in conflicts.

Significant **labor shortages** plus aging harvesting, processing, and distribution **infrastructure** affect production, safety, and cost-effectiveness in the industry.

resources, and is increasingly a critical part of food systems designed to reduce and mitigate the effects of climate change.

Strategy Framework

The *National Seafood Strategy* focuses on NOAA Fisheries' work to sustainably manage marine fisheries and produce seafood responsibly, based on sound science. It is one of a suite of strategies that describes how we will support the nation's fisheries and execute our mission in the face of climate change, market disruptions, and new ocean uses.

The *National Seafood Strategy* also allows NOAA Fisheries to address important national issues such as the resilience of coastal fishing communities; the financial viability of the seafood industry; the effects and opportunities of international trade; and the importance of seafood to nutrition, food security, food sovereignty, subsistence fishing, and traditional Tribal fishing rights.

To implement the *Seafood Strategy,* NOAA Fisheries will partner with state and other federal agencies, the National Sea Grant College Program, Tribes, non-government organizations, fishermen, seafood farmers, and other stakeholders to address the challenges facing the seafood sector, especially when resources are limited.

GOAL 1: Sustain or increase sustainable U.S. wild capture production

Changes in ocean conditions and the resulting shifts in distribution and abundance of marine resources, as well as the intensity of damaging storms are affecting access to and production of seafood as well as subsistence and Tribal fishing. These factors, in addition to new ocean uses and advances in sampling technologies and data modernization call for an evolution in science and management frameworks for a climate-ready seafood sector, including:

- **Fisheries Science.** Provide the science and economic and social analyses necessary for fisheries management under changing ecosystem dynamics.
- **Fisheries Management.** Maximize fishing opportunities and sustainable seafood production while ensuring the sustainability of fisheries through effective and efficient management. Support the commercial fishing industry and fishing communities in their efforts to adapt to climate change and thrive in a changing ocean economy.
- **Habitat Conservation in Support of Fisheries.** Protect and restore habitat important to our nation's fisheries and support resilient coastal communities.

GOAL 2: Increase sustainable U.S. aquaculture production

Seafood is a healthy and climate-friendly nutrition choice and demand is increasing. Aquaculture is one of few ways to significantly increase domestic seafood production—it's how the majority of growth in demand has been met in the last 20 years. Supporting gradual, diverse, and regionally-appropriate growth of the domestic industry will depend on an efficient, strategic, and science-based regulatory approach that considers and mitigates impacts on protected resources, essential fish habitat, and marine ecosystems.

- **Marine Aquaculture Management and Regulatory Efficiency**. Accelerate progress on implementing an efficient, predictable, timely, and science-based regulatory framework for marine aquaculture.
- **Aquaculture Science**. Provide science-based advice and tools to minimize potential effects of an aquaculture operation on the environment and conduct coordinated, applied scientific research in support of sustainable industry development.

GOAL 3: Foster access to domestic and global markets for the U.S. seafood industry

A thriving, well-regulated domestic seafood industry—capable of competing at home and abroad—will translate into greater global seafood supply and food security from sustainable U.S. fisheries. It will also decrease our reliance on foreign fisheries that are at greater risk of overfishing, IUU fishing, and forced labor.

- **Communication and Promotion.** Increase public awareness of the availability, sustainability, and nutritional value of all U.S. seafood.
- **U.S. Market Development**. Work with federal partners and others to identify and develop U.S. seafood markets and put more U.S. seafood back on U.S. plates
- **Fair Trade.** Promote fair seafood trade by combating IUU fishing and related harmful fishing practices around the world and by expanding access to foreign markets for U.S. seafood.

GOAL 4: Strengthen the entire U.S. seafood sector

The COVID-19 market disruptions highlighted systemic challenges to the U.S. seafood industry and the importance of supporting the entire seafood/fisheries value chain, including after seafood hits the docks. Addressing these challenges will help the seafood industry to rebuild more quickly and enable the industry to be more resilient and flexible in the face of potential future crises and market shocks.

- **Seafood as a Vital Part of the Blue Economy**. Support the U.S. commercial fishing, marine aquaculture, and seafood communities to adapt and thrive in a changing ocean economy and given new competing uses.
- **Seafood Infrastructure.** Work across federal agencies to modernize U.S. seafood infrastructure (e.g., vessels, hatcheries, port and dock facilities, processing, storage, working waterfronts) to strengthen and enhance opportunities for coastal seafood communities and regional food economies.
- **Workforce Development.** Foster a growing and diverse seafood workforce and attract young fishermen and seafood farmers to the sector.

Strategy Implementation

Informed by public comment and advice from our partners, NOAA Fisheries will prepare an implementation plan for the National Seafood Strategy with specific actions, timelines, partnerships, and milestones.

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 23, 2023

To: Michael P. Luisi, Chairman, MAFMC

From: Paul J. Rago, Ph.D., Chair, MAFMC Scientific and Statistical Committee (SSC)

Subject: Report of the March 2023 SSC Meeting

Executive Summary

Mid-Atlantic State of the Ecosystem (SOE) Report
The SOE Report for 2023 included a number of key findings:

- Climate risks appear to be increasing with notable increases in bottom temperature, the frequency of heat waves from August through fall, and changes in seasonality metrics.
- The Mid-Atlantic Cold Pool is both warming and becoming smaller.
- Ocean acidification is expanding and more warm core rings from the Gulf Stream are intruding on slope water.
- Distributional shifts are occurring for many species; this complicates both stock assessments and management decisions.
- Many species show declining trends in condition factor and several reveal long term declines in energy content.
- Commercial fishing revenue is declining but overall biomass estimates are generally stable.
- Wind energy areas may impact commercial fishing revenue, have differential impacts (some positive) by species, and require changes to future biological surveys.

The SSC greatly appreciated the thoroughness of the report, the transparency of data and process, and the responsiveness to annual requests for modifications.

Potential Use of Short-Term Forecasts of Species Distributions for Management
The SSC provided comments on a Dynamic Range Model developed by investigators at Rutgers University. For summer flounder, the model creates forecasts of population densities by area over a geographic range from 34 to 44 degrees latitude. Each "patch" includes an age-based

population model which includes the influence of temperature on key biological processes.   The SSC encouraged continued development of the approach and potential utility for management decisions, but recommended additional validation studies including comparisons with simpler methods. Further consideration of survey sampling issues and age-dependent responses to temperatures should be considered in future research.

***Illex* Squid ABC Specifications for 2023-2025**
An interdisciplinary team of scientists and fishermen (aka, the Squid Squad) reported on their joint activities to better understand the biological oceanography and the fishery for *Illex* squid. Weekly meetings since 2019 have allowed for collaboration on a number of projects including various peer-reviewed publications, joint industry/research cruises, and collection of synoptic fine-scale information from biological sampling of catches. The SSC appreciated their collaboration as a model for other meaningful partnerships.

The methodology to estimate the risk of overfishing at various quotas was updated to include sampling uncertainty in the survey-based estimates of abundance in the NEFSC fall bottom trawl survey. This additional uncertainty is considered in conjunction with uncertainty in natural mortality, availability of *Illex* to the fishing areas, and catchability of research trawl gear. Addition of this uncertainty did not significantly alter the risk evaluation process previously used.

The updated assessment approach, software and user manual were delivered to the NEFSC for use in 2023 and future assessments. **Results from the application of the methodology to updated data from 2022 led the SSC to retain their recommendation of a 40,000 mt ABC for 2023. Moreover, the SSC recommended the same ABC for 2024 and 2025.**   The SSC noted the high level of uncertainty in our overall understanding of *Illex* population dynamics, and recommended continued collection of high resolution samples from the fishery and further investigations into their reproductive biology.

Review of Pilot Video Monitoring Study for Quantification of Recreational Fishing Effort
The SSC appreciated the logistical challenges of video monitoring of fishing effort for nearly three years and the exemplary work of Jason Didden to lead this project. More detailed analyses are underway; the SSC encouraged development of a structured subsampling program and potential software tools to facilitate interpretation and processing. When analyses are completed this project should serve a valuable basis for evaluating future studies and potential integration with other MRIP effort monitoring tools.

Results of Recreational Summer Flounder Management Strategy Evaluation (MSE) Project
This multi-year MSE project is based on a set of linked simulation models that incorporate an operating model of stock dynamics, an assessment model to estimate stock condition, a decision model to make catch recommendations, and a recreational fishing catch and effort model to simulate harvests. The recreational effort model incorporates expected behavioral responses of

harvesters under varying trip and size regulations. Components of this project will also be used to evaluate the efficacy of alternative regulations in the Summer Flounder, Black Sea Bass, and Scup fisheries for 2023 and beyond. The SSC strongly endorsed the continuation of this research effort and encouraged continued engagement with the many partners who have contributed ideas along the way.

Progress Report from the SSC Ecosystem Work Group

The Ecosystem Work Group reported on a number of ongoing and new initiatives to improve the utility of the State of the Ecosystem report for management. These include a better understanding of the role of temperature induced changes in recruitment on ABC recommendations, new measures of ecosystem overfishing, new methods for indexing system level responses, and approaches for evaluating the efficacy of management measures.

Progress Report from the SSC Economic Work Group

The Economic Work Group will focus on a number of high priority Council projects and continue work as requested on the Research Set Aside program. Anticipated activities include work on the Harvest Control Rule, Essential Fish Habitat, and a comprehensive review of the EAFM risk assessment.

Background

The SSC met via webinar from 7th – 8th March 2023, addressing the following topics:

- State of the Ecosystem Report for Mid-Atlantic Region
- Summary of Ecosystem Work Group activities
- Short-Term Forecasts of Species Distributions
- *Illex* 2023-2025 ABC specifications
- Presentation of pilot study report on a recreation effort monitoring based on video monitoring
- Findings of Management Strategy Evaluation for Summer Flounder
- Report of the Economic Work Group plans for 2023 and beyond
- Other business

See Attachment 1 for the meeting's agenda. An Executive Summary provides a quick summary of the primary conclusions of the SSC.

Most SSC members were able to participate for both days of the meeting (Attachment 2). Other participants included Council members, Council staff, NEFSC and GARFO staff, and representatives of industry, stakeholder groups, and the general public. Council staff provided outstanding technical support throughout the process. The SSC benefited from preparations prior to the meeting; presentations and supporting documents were relevant and high quality. A special thanks to Brandon Muffley who guided the SSC's work before, during, and after the meeting.

Within the SSC, Thomas Miller's guidance on *Illex* discussions and similar expertise from Rob Latour's contributions on Short Term Forecast were both substantial and greatly appreciated. I thank Sarah Gaichas, Brandon Muffley, and staff from the ecosystem team at NEFSC for their excellent meeting notes, and members of the SSC and Council staff for their comments on an earlier draft of this report.

All documents referenced in this report can be accessed via the SSC's meeting website https://www.mafmc.org/ssc-meetings/2023/march7-8. This report uses many acronyms: a comprehensive guide is listed in Attachment 3.

Mid-Atlantic State of the Ecosystem Report

Sarah Gaichas presented the 2023 State of the Ecosystem (SOE) for the Mid-Atlantic. Her presentation included an overview of the major trends, highlights of significant changes, and a summary of responses by the team of nearly 70 scientists who contributed to the report. The report begins with a report card on current ecosystem properties, a summary of risks, and a focal point synthesis. The report was well received by the SSC who complimented Sarah and her team for the comprehensive nature of the report, the transparency of methods, accessibility of the underlying data, and their ongoing responsiveness to requests for improvements.

Highlights from the SOE report include:

- Climate risks appear to be increasing with notable increases in bottom temperature, the frequency of heat waves from August through fall, and changes in seasonality metrics.
- The Mid-Atlantic Cold Pool is both warming and becoming smaller.
- Ocean acidification is expanding and more warm core rings from the Gulf Stream are intruding on slope water.
- Distributional shifts are occurring for many species; this complicates both stock assessments and management decisions.
- Many species show declining trends in condition factor and several reveal long term declines in energy content.
- Commercial fishing revenue is declining but overall biomass estimates are generally stable.
- Wind energy areas may impact commercial fishing revenue, have differential impacts (some positive) by species, and require changes to future biological surveys.

Specific questions from the SSC related to the determination of "regime shifts" and whether such determinations could be defined in the Northeast Region. Evidence suggests significant changes in fish recruitment, zooplankton species composition and abundance, and condition factor of fish. Another question expressed concern about the focus on commercially important species rather than other species. It was noted that commercial and recreational landings are a primary source of information, all species observed in the bottom trawl surveys are considered for derivation of ecosystem metrics.

Questions about socio-economic issues focused on the potential inclusion of state-level data to address measures of "satisfaction" in recreational fishing. Members noted that SOE graphs labeled as measures of profit are actually measures of revenue. This was followed by a request to incorporate cost estimates for both commercial and recreational fishing. These data, along with demography of the fishermen and the fleet (size and age of vessels), would help explain the differences in revenue trends among communities and species. Sarah and Geret responded that cost surveys are expensive to conduct and therefore infrequent, and Geret noted that a new survey is in the planning stages for implementation in 2023. Additional questions inquired about fuller integration of environmental justice metrics into the broader management concerns.

Several SSC members noted the potential value of including information on smaller fish commonly caught in nearshore or estuarine studies by various states. Such indices are commonly used in stock assessments as indices of abundance for age 0 and 1 fish, but routine collection of these data is challenging because of the many different survey designs and data formats.

The focus on Mid-Atlantic ecosystem condition is valuable, but inclusion of key findings from the Gulf of Maine, Georges Bank, and possibly the Scotian Shelf would provide additional context for the observed trends.

Comments from the public included kudos for the presentation and report as well as questions about inclusion of menhaden abundance estimates from models in the Southeast Atlantic region.

Another commenter requested inclusion of information from the north---Rhode Island, specifically.   Council staff reported that the Council will be receiving a briefing on the 2023 Northeast Commercial Fishing Vessel Cost Survey.

Request Tracking Memo

The NEFSC accumulates recommendations annually from the MAFMC and NEFMC. These requests are prioritized and addressed as available resources allow. The SSC applauded the transparency of this process. Many requests require initiation of long-term research programs. In view of planned wind energy developments, inclusion of more marine mammal, sea bird, and top predator data was recommended as an important priority.

Short-Term Forecasts of Species Distributions

Malin Pinsky and Alexa Fredston of Rutgers University presented a detailed overview of their project to develop dynamic models for predicting species distributions in response to climate change. Their models combine spatial analyses of historical bottom trawl data with age-based models to create simulated populations in multiple geographical areas or patches. Simulated populations within these geographical patches can migrate north and south in response to environmental gradients of temperature and randomly by using principles of particle diffusion. Incorporation of fishing mortality within the spatial units helps isolate the potentially confounding effects of spatially heterogeneous fishing mortality on the detection of migration in response to environmental change.   Currently the geographical zones are based on one degree of latitude intervals. Input data include abundance, biomass, age, and length data from the fall NEFSC bottom trawl surveys, as well as temperature data from a variety sources. The Bayesian hierarchical state space model was fit initially to the 1972-2006 data.

The predictive skill of the Bayesian hierarchical state space model has been tested by comparing predictions for the 2007-2016 period with observations from the bottom trawl surveys. Various metrics of prediction for Summer Flounder suggest reasonably good correspondence with observed population trends and spatial patterns. As in all models, the variation of predictions increases with the length of the forecast. Model outputs of one to five years are most relevant to Council decisions regarding catch regulations. SSC decisions about appropriate levels of uncertainty in assessments and risk policies could also be informed by such forecasts. The authors noted that true forecasts will also require forecasts of oceanographic conditions on similar time scales.

Modeling efforts for *Illex* squid, Spiny Dogfish, and Gray Triggerfish are currently underway. These species were chosen to illustrate the range of possible applications.

The presentation generated considerable interest from the SSC. Questions of clarification included how the model handles observation error in the surveys, concerns about small area estimation, and effects of missing data. Members noted that distributions of most species have major seasonal shifts across depth gradients and inquired about how such changes are handled

within the model. Discussions often simultaneously addressed potential applications of the dynamic range models and the need for future work. Conclusions drawn from those discussions are summarized under the Terms of Reference below.

Terms of Reference

For the short-term forecast research project, the SSC will provide a written report that identifies the following:

1) *Comment on potential applicability of short-term forecasts of species distribution for stock assessment, science, and management purposes of Mid-Atlantic species. Consider potential implications for the SSC's OFL CV approach;*

- The SSC recognized the significant potential of the models for short-term forecasts for some species. Potential applications include:
    o Model forecasts could be linked to SOE indicators of vulnerability for coastal communities and various social and economic metrics. Investigations of linkages with other SOE indicators are encouraged. EAFM indicators of distributional shifts could be compared with dynamic range model forecasts.
    o Forecasts of distributional shifts could be useful for evaluating recreational fishing performance under various Harvest Control Rules.
    o Evaluation of the feasibility of catch advice relative to the historical distribution of resources.
    o The model could be used as a tool for allocation decisions, particularly if dynamic harvest allocation becomes a possibility.
    o The dynamic range model forecasts may be helpful for interpreting retrospective patterns observed in some species stock assessments.
    o Forecasts may be helpful for interpreting changes in species distributions within and around offshore wind energy areas.
- The SSC expressed concerns that more validation studies are necessary.
    o Applicability will vary greatly among species depending on the spatial domain of the stock and the type of model being used to assess the stock. Currently there are no spatially explicit stock assessments in the Mid-Atlantic region.
    o The dynamic range models could assist with survey redesign, particularly if animals are leaving the defined stock areas.

2) *Provide any research recommendations and inclusion of relevant data for future model development that could facilitate their consideration of factors influencing determination of ABCs.*

- Accommodate ontogenetic population dynamics and, in particular, ontogeny as it relates to spatial distribution and habitat utilization
- Consider alternative patterns of spatial binning. Currently the bins are defined by North/South boundaries, but for many species, distributions along the East/West (or depth) axis may be more important. Thermal preferences of many species vary by age with cooler temperatures preferred by larger individuals. Such preferences often manifest as changes in depth distributions. Future model formulations may benefit by consideration of spatial units defined by both latitude and depth.

- Surveys occur over protracted time blocks and therefore might be considered as a slow-motion depiction of stock distributions rather than a snapshot. In most years, surveys have been conducted with sampling progressing from south to north. The timing and duration of surveys have also varied over time due to logistical and operational factors. Such changes could confound detectability of trends due to climatic change with those attributable to survey timing.
- General patterns of species distribution forecasts should be confirmed by simpler methods.
- Population patches are currently defined by one-degree latitudinal boundaries with no accounting for depth or temperature gradients within patches. Moreover, the width of the sampleable shelf areas, generally <300 m, varies along north-south direction. Accordingly, the number of samples per patch will also vary, resulting in varying levels of precision within the patches. Adjusting the latitudinal boundaries to achieve more even distribution of samples among patches may be useful.
- Consider potential use of spring bottom trawl surveys along with the fall surveys in the definition of dynamic range models.

Illex Squid

I opened this session by noting my role as a contractor to the Council for the purpose of providing technical support to the Council on *Illex* ABC analyses. Details of my analyses are provided below. To avoid any appearance of conflict of interest, Dr. Michael Wilberg (SSC vice chair) chaired this portion of the meeting and Dr. Thomas Miller led discussions on the Terms of Reference.

Squid Squad Presentation: Kim Hyde, Sarah Salois, and Anna Mercer

Since 2019 an interdisciplinary group of scientists and fishermen have been meeting weekly to address biology and fishery for squid and the underlying effects of oceanography. The only organizing principle for this group is a common desire to understand this enigmatic species better. Meetings began after an Industry-sponsored summit in 2019 and continued through the Research Track Assessment in 2021. Since then, the group has continued to meet weekly to follow up on research recommendations and refine understandings of oceanography and fisheries. Their collective activities have led to several planned and published peer-reviewed papers, a PhD dissertation, and development of technologies to rapidly acquire synoptic and representative information on the size composition of the landings along the east coast. Such information will be the foundation of any type of real-time management methods.

The net result of this project has been improved collaboration among all parties. An area of particular focus has been warm-core rings. Satellite imagery can be used in near real-time to follow the genesis and fate of rings as they encounter the continental shelf. They are thought to deliver squid to the fishing areas and stimulate primary production. Hypotheses about warm core rings by oceanographers can be confirmed by observations of fishermen. Oceanographers are able to quantify the attributes of the rings which has, in turn, led to improved interpretation of causal factors underlying changes in commercial CPUE.

The Squid Squad has also led to the development of improved proposals to fund both oceanographic and fisheries projects. Ongoing efforts include a joint project between the F/V Dyrsten and the R/V Endeavor to examine salinity intrusions and *Illex* squid catch rates. The strong collaborative spirit of the discussions strengthens the credibility and relevance of the proposed work.

SSC commenters noted that ideally we would quantify offshore abundance of *Illex*. Our current understanding is based primarily upon on-shelf sampling and fishing activity. Indirect evidence of migrations is obtained via estimation methods that infer the amount of biomass necessary to support observed fisheries. Stable isotopic ratios of oxygen may provide confirmatory evidence of offshore populations. Fine-scale spatial and temporal data from study fleets may prove to be particularly helpful. One SSC member asked whether there has been any increase in fleet catch rates in response to improved oceanographic data. To date, it has not been possible to tell.

Overall, the SSC greatly appreciated the presentation by the Squad, noting that it exemplifies true collaborative work to advance both science and management.

Rago Presentation

The risk of overfishing in *Illex* squid is estimated by using an escapement model approach developed by Rago in 2022. The model relies on estimates of relative abundance from the fall bottom trawl survey I_t and total catches C_t in the calendar year. The escapement model parameters are natural mortality M, availability v of *Illex* squid to the fishing areas, and catchability q of squid in trawls. Each of these parameters is subject to considerable uncertainty and cannot be estimated within the model. Instead, the uncertainty in each of these parameters is informed by the scientific literature and various studies conducted as part of the 2021 Research Track Assessment. These parameters are assumed to be uniformly distributed. By integrating over the ranges of each parameter it is possible to estimate the sampling distribution of output variables of interest. In particular, the sampling distributions of fishing mortality F, initial stock biomass $B.0$ and escapement Esc can be derived. The sampling distributions can then be compared to various theoretical biological reference points to estimate the risk of overfishing.

In 2022, the SSC recommended that additional uncertainty associated with survey-based biomass estimates could readily be incorporated into the escapement model methodology. In response to this recommendation, the model was updated to add another layer of uncertainty based on the relative precision of the fall survey biomass estimate. Per standard sampling theory, the estimated mean was assumed to be normally distributed with a standard deviation equal to the standard error of the estimate from a stratified random survey.

The escapement model was updated to include this uncertainty in the biomass estimate. Simulations were conducted to compare the result from 2022, which did not consider uncertainty in survey biomass with a revised model that did include such uncertainty. The side-by-side comparison included only data from 1997-2021 to ensure strict comparability with the results presented to the SSC in 2022. While the modification increased the biological realism of the

escapement model, the changes had only minimal effects on the risks of overfishing under alternative quotas. As expected, the differences that did occur were generally restricted to changes in the tails of the distributions.

Inclusion of uncertainty in the surveys did result in an increase in the risk of exceeding the F/M threshold of 0.666 when a 40,000 mt quota was considered. Assuming that the population was at 50% of B_{msy}, the catch level consistent with this assumption declines from 40,000 mt to 37,000 mt. However, it should be noted that the probability of falling below a 50% escapement threshold remains low (<10%). Overall, the inclusion of additional uncertainty in the abundance indices had little effect on the overall risk evaluation and is unlikely to have affected the selection of catch levels had the information been considered in 2022. In other words, it's unlikely that the SSC's previous recommendation of an ABC of 40,000 mt in 2022 and 2023 would have changed.

In 2022, the SSC also recommended that a user manual for the estimation and risk model be prepared to facilitate transfer to the NEFSC. A copy of the manual and R code was given to the NEFSC in February and used by Lisa Hendrickson to update the assessment report with new data through 2022.

Hendrickson Presentation

Lisa Hendrickson, NEFSC, presented the results of a working paper that included 2022 catch and fall bottom trawl survey data. The improved methodology for estimating the uncertainty of relative abundance estimates was also incorporated. Although catches in 2022 were very low, the estimated fishing mortality was also very low. The ranges of estimated escapement were well above any theoretical biological reference points, and F/M ratios were well below any such reference points described in the scientific literature for finfish species. When 2022 results were combined with the modeling results from previous years, there were no major changes to the risk profiles. The Council's risk policy was applied by assuming two levels of stock abundance where B/B_{msy}= 0.5 and 1.0, respectively. Under the lower value the acceptable risk of overfishing is 20%. Under a 50% escapement threshold the highest level of catch admissible under this risk policy is 47,000 mt. Alternatively, an F/M threshold of 0.67 would allow 38,000 mt. Finally, if the biological reference point was defined as the joint probability of falling below a 50% escapement threshold and exceeding a F/M threshold of 0.66, catches up to 60,000 mt would be admissible.

Staff Memo

Jason Didden, Council staff, provided an overview of the 2022 fishery, trends in prices, and comments from fishery Advisory Panel. Catches in 2022 were well below quota but prices were high. Prices however are primarily determined on the world market. High fuel prices and availability of the more valuable longfin squid are thought to have reduced fishing effort for *Illex* squid. Staff recommended continuation of the current ABC of 40,000 mt for 2023

In view of two prior reviews of the methodology by the SSC in 2022 and coherence of the current results with earlier results, few questions and comments were received from the SSC or public. A question was asked about the common warning in fishery science to avoid the use of equilibrium approaches. While the approach used for *Illex* is simple, it does incorporate implicit estimates of the processes required to support the observed fishery. Model results suggest that immigration of individuals into the fishing area during the season must be substantial. Natural mortality ranges include the full range of estimates drawn from the literature, but do include the additional mortality associated with maturation and spawning. Finally, the integration of uncertainty in q, v, M, and survey abundances offsets, in part, the uncertainty that would arise in a more realistic model of stock dynamics.

Another question concerned fluctuations of survey abundance with oscillating patterns of survey abundance and high catch levels—is there any evidence of autocorrelations? Historical analyses revealed weak autocorrelations that could induce modest oscillations. Abundances between years tend to fluctuate up to 5-fold since there is little to no overlap of individuals alive at the end of one fishing year and the start of the next fishing year.

Illex ABC recommendations for 2023

Following these presentations and general discussion, the SSC addressed the Terms of Reference (*italics*) for *Illex* Squid. Responses by the SSC (standard font) to the Terms of Reference provided by the MAFMC are as follows:

Terms of Reference

For *Illex* squid, the SSC will provide a written report that identifies the following for the 2023-2025 fishing years:

1) A. *Review the preliminary 2023 Illex acceptable biological catch (ABC) of 40,000 MT recommended by the SSC in July 2022 and determine if an ABC adjustment is warranted. If so, please specify an adjusted 2023 Illex ABC and provide any rationale and justification for the adjustment;*

   The SSC received a detailed analysis addressing sources of additional uncertainty that were not included in prior analyses presented to the SSC. These analyses did not change the SSC's view that an ABC of 40,000 MT is appropriate for this stock given the current state of knowledge.

   B. *Provide an Illex ABC for the 2024-2025 fishing years. If appropriate, provide any new or different rationale that was not addressed in Term of Reference 1A;*

   Given the information available, the SSC does not see any reason to deviate from the 2023 ABC for *Illex* of 40,000 MT for 2024 and 2025

An assessment of *Illex* stock is scheduled for 2025, although its format is not yet clear. Prior to the availability of a new assessment, the SSC will review the following information to determine the appropriateness of the current ABC:
a) Updated data on catches and discards
b) if available, within-season weights and catches that are being collected collaboratively by industry and researchers

2) *The most significant sources of scientific uncertainty associated with determination of the ABC;*
The SSC notes the following sources of uncertainty in reaching its recommended ABC
- The high level of uncertainty in the biomass of the resource
- Productivity of the stock and therefore which reference points are suitable
- The fraction of the Illex stock that occurs outside of the fishing area, and the contribution of that fraction to the reproductive potential of the stock overall
- The catchability of the stock
- The rate of natural mortality experienced by the stock
- The composition and distinctness of cohorts
- The variability in cross shelf transport, and the role of variability in eddy formation at the Gulf Stream front, particularly under a changing climate

3) *Research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation;*

The SSC recommends the following actions:
- Continue to maintain the high temporal resolution of samples from the fishery that track within season changes in the composition and length structure of the squid while on the shelf.
- Continue the coordination of linked collection of biological data from the fishery and oceanographic observations on the shelf.
- Continue the collaboration with industrial stakeholders that has produced valuable insights in our understanding of the biology and dynamics of the stock.
- Investigations into the reproductive biology of squid.
- Develop estimates of stock productivity that would lead to recommendations for suitable reference points.
- Research to examine the distribution, abundance of squid that occur off the shelf and the connectivity of squid during this period to the squid that occur on the shelf and are susceptible to fishing.

4) *The materials considered by the SSC in reaching its recommendations;*

- Evaluation of Alternative Catch Limits for *Illex* in 2023 (Hendrickson, Rago)
- Effects of Survey Uncertainty on Risk of Violating Escapement and Fishing Mortality (P. Rago)
- User Manual for *Illex* Risk Analysis, v1.0 (Rago)
- Presentation: Update on Squid Squad Research Activities
- Staff Memo: 2023-2025 ABC Recommendations and Considerations

-

5) *A conclusion that the recommendations provided by the SSC are based on scientific information the SSC believes meets the applicable National Standard guidelines for best scientific information available.*

The SSC believes these recommendations meet National Standard guidelines for best available scientific information available.

Review of Pilot Video Monitoring Study for Quantification of Recreational Fishing Effort

Jason Didden presented initial findings of a three-year pilot study to monitor recreational fishing effort. The study ran from 2020 to 2022 at Ocean City, MD. The advantage of this port is that nearly all the angler trips pass a fixed point. Unfortunately, many other vessels pass this same point. The objectives were to monitor angler trips remotely via video and explore the possibility of estimating angler effort for a segment of the recreational survey. Technological and logistical difficulties have made the data analyses challenging. These challenges included:

- The volume of boat traffic makes it difficult to identify individual vessels and to positively identify fishing trips.
    - Only outgoing vessels could be monitored accurately
    - Vessel trips could not be linked to subsequent angler intercepts
- Mechanical breakdowns of video equipment led to loss of sampling days
- Downloading of video files had to be done manually rather than via WiFi.
- Post processing of video files was cumbersome and subject to error, especially at night and on foggy days.
- As expected, fishing activity varied by season, day of the week, time of day and weather conditions.
- The personnel hours required to operate such a program exceed current capacity of the MAFMC.

The SSC appreciated the challenges of the overall project and reported their similar experiences with automated video systems. Research on these techniques is evolving rapidly; AI type processing may be possible when such software becomes more available. Current software may assist in identification of potential fishing activity to reduce post processing time. Similarly, a structured subsampling program would reduce post processing time but the variations of season, day of week and time of day will require many strata. Discussions with MRIP and other ground-truthing studies in the Southeast and Gulf are encouraged. The SSC applauded Jason's dedicated work on this project and encouraged more comprehensive evaluation of results as time permits. It should provide a sound basis for future work.

Results of Recreational Summer Flounder Management Strategy Evaluation Project

Gavin Fay, Lou Carr-Harris, and Brandon Muffley presented an overview of results from a multi-year study to improve the recreational fishing experience by using a Management Strategy Evaluation (MSE) approach. The project has engaged over 800 stakeholders over a three-year period of development. Objectives included improved quality of angling experience, angler equity, stock sustainability, and socioeconomic sustainability. Seventeen performance metrics were used to monitor performance of alternative strategies. A total of eight different management procedures were considered. A series of interconnected simulation models were developed to address stock dynamics, simulate the stock assessment process, estimate recreational harvest demand under various policy choices, and simulate the fishery removals. The updated models and data sets are evaluated on an annual time step with no within-year lags between the generation of population model results, assessment evaluation, management decisions, and implementation of regulations. Simulated assessments are conducted every two years.

The MSE approach allows for a full evaluation of system level responses to both scientific uncertainty and alternative management strategies. Angler behavior in response to regulations is informed by various ancillary studies and the scientific literature. Trip and size limits are important in evaluating angler demand and resulting satisfaction. Survivability of discarded fish also plays an important role in evaluating the efficacy of management policies. One of the ancillary benefits of this research effort has been the development of a recreational demand model that can be applied to other species (Scup, Black Sea Bass) in development of regulations for 2023-2024.

The SSC appreciated the thoroughness of the MSE approaches and the comprehensive consideration of multiple objectives and tradeoffs. SSC members cautioned that the investment of a large number of stakeholders cannot be squandered. Follow through in derivation of management measures and actual regulations is important to avoid disenfranchisement of this constituency. Education of individuals and organizations that did not participate in the development of the MSE is essential.

Technical questions from the SSC and public included:

- Was the likelihood of compliance with regulations considered? (Answer: To some extent but not exhaustive.)
- How is fishing effort determined? (Answer: Performance of the demand model was evaluated independently and validated.)
- Is the Summer Flounder fishery considered in isolation to fishing activity on related species that might constitute alternative species or have different demand curves? (Answer: Summer Flounder trips are linked to Black Sea Bass trips, but there is no population model for Black Sea Bass. Hence population status is constant.)

- Can the individuals who participated in the initial development of the project be re-engaged to learn about the results? (Answer: This is a good idea and will be considered.)

Progress of SSC Working Groups

Ecosystem Working Group

The three primary objectives of this WG are to: 1) expand and clarify the ecosystem portion of the SSC's OFL CV determination process; 2) develop prototype processes to provide multispecies and system-level scientific advice, especially when there are multispecies and multi-fleet tradeoffs; and 3) collaborate with SSC and stock assessment leads, and appropriate working groups, to develop stock-specific Ecosystem and Socio-economic profiles. Sarah Gaichas reported on four separate projects that are now underway.

- The first is a project coordinated by Mike Wilberg, John Wiedenmann, and their graduate students to use an MSE model to evaluate alternative harvest policies when recruitment is driven by environmental trends. Summer Flounder and Atlantic Mackerel are the focal species.
- Methods for defining ecosystem overfishing definitions are also being evaluated at NEFSC. Alternative definitions all rely on some form of thermodynamic considerations of energy transfer through the ecosystem. The basis for defining net primary production varies among methods as do the methods for considering trophic level within ecosystems. The underlying concept is to create a "safe operating space" for management. The SSC looks forward to recommendations regarding appropriate measures that can be evaluated historically and monitored going forward.
- John Walden, NEFSC, has applied an approach known as Data Envelopment Analysis (DEA) to develop stock-specific Ecosystem and Socio-economic Profiles (ESP). The methodology integrates separate indicators into a single performance metric. Work includes collaboration with SSC species leads, stock assessment leads, and relevant working groups to facilitate incorporation of such indices into assessments.
- Paul Rago and Brian Rothschild are collaborating to develop various system level performance indicators using the results of stock assessments. Retrospective analyses focus on how well management measures are controlling spawning stock biomass and achieving MSY. Historical estimates of recruitment are used to generate predicted landings and SSB levels under optimal fishing mortality. These projections help isolate the effects of controllable parameters (i.e., fishing mortality) from uncontrollable parameters such as recruitment and changes in average weights at age.

Time constraints did not permit feedback from the SSC on these topics, but the SSC will be updated again at its May 2023 meeting.

Economic Working Group

In 2021-2022 the Economic Work Group collaborated with the Council's Research Steering Committee (RSC) and the Council to consider factors necessary for a restart of the Research Set Aside (RSA) program.   This "proof-of-concept" project is now complete and under consideration by the MAFMC for implementation.   In 2023 the Work Group's efforts will be governed by the expertise and interests of the group, requests from the Council, and Council priorities. Research topics identified by the Council with important economic facets include:

- Priority #2: Develop recreational measures for Summer Flounder, Scup and Black Sea Bass. This will be a follow up to the SSC's review of Harvest Control Rules (HCR) in 2022.
- Priority #5: Updating of the HCR methodology after the regulations sunset in 2025.
- Priority #40: Work with the RSC to address key concerns with the new RSA program, particularly the economic costs of enforcement.
- Priority #45: Essential Fish Habitat.
- Priority #50: EAFM risk assessment comprehensive review.

Items on Economics Group "watchlist" are:

- Priority #37: regarding separation requirements in the Surfclam and Ocean Quahog fisheries
- Priority #70: Use of ACL carryover in fisheries
- Priority #66: Allocation strategies related to quota transfers to ensure equity.
- The overall capacity of the SSC to address economic issues is ultimately limited. Concerns were expressed that substantive involvement in a few issues is preferable to overcommitment.
- Fishery Performance metrics (Rago and Rothschild) as described under the Ecosystem Work Group above.

Other Business

- Olaf Jensen summarized a study recently published by his graduate student, (Bi, et al. 2022) on the topic of consistency of advice from stock assessments. An important question is "how large should the uncertainty buffer for catch advice be to account for variations in perceived stock status between assessment updates?" The study synthesized data from RAM legacy database and other stock assessments around the world. The mean CV was about 100% whereas values of 60% were uncommon. The 60% CV level is used for a number of MAFMC species.   Results do not generally indicate an inter-assessment bias or trend in variation; instead, the inaccuracies tend to vary randomly. Assessments that are updated annually tend to have lower CVs, but this may be an artifact of a concomitant absence of review of model assumptions and applicability. Research Track assessments are more likely to result in major changes because all model assumptions are open to revision.   Depending on the relative mix of commercial and

recreational harvests, application conversion factors to historical recreational catch data induces major changes in stock assessments.

- o Consideration of climate change as a factor underlying assessment uncertainty will be the next step in this research project.
- o Questions from the public on this topic asked whether the scientists would be examining management and implementation uncertainty in a similarly rigorous fashion.

- The irreplaceable Lee Anderson previously served as the socio-economic lead for Golden Tilefish and Ocean Quahog. It is anticipated that a new SSC member will assume Lee's responsibilities. See Council webpage for details on other species and topic responsibilities - Draft 2023 Species/Topic Lead.
- For purposes of economic stability and regulatory stability, the Council often prefers multi-year specifications for ABCs. These approaches can be problematic with respect to the Council's risk policy, especially if the population is trending downward from a high level. Progress on this topic will be reviewed prior to the next meeting of the SSC. Outstanding issues include clarification of Council regarding objectives for multi-year specifications, including the application of risk policy to multi-year ABCs.
- The SSC's OFL CV working group will convene before the next SSC meeting to review current status of the OFL CV guidelines and check for consistency of applications.
- The May 9-10, 2023 meeting of the SSC will be an in-person meeting, with a remote option, in Baltimore, MD.

Attachment 1

Mid-Atlantic Fishery Management Council

Scientific and Statistical Committee Meeting

March 7 – 8, 2023 via Webinar

Webinar Information
(Note: same information for both days)
Link: **March 7-8, 2023 SSC Meeting**
Call-in Number: 1-415-655-0001
Access Code: 2334 904 7321; Password: XbJWmFSp773

AGENDA

Tuesday, March 7, 2023

9:00   Welcome/Overview of meeting agenda (P. Rago)

9:05   Ecosystem Science Updates (S. Gaichas)
- 2023 NEFSC Mid-Atlantic State of the Ecosystem Report
- SSC Ecosystem Work Group – update and feedback on work group progress

11:00   Break

11:15   Short-Term Forecasts of Species Distributions for Fisheries Management (A. Fredston and M. Pinsky, Rutgers Univ.)
- Review modeling framework and results
- Provide feedback to Council on potential use and application of models and information in science and management

12:30   Lunch

1:30   *Illex* 2023-2025 ABC specifications
- Update from the Northeast Squid Squad on recent science advancements and findings (K. Hyde, A. Mercer, and S. Salois, NEFSC)
- Review of updated "Indirect Method" analysis for quota considerations (L. Hendrickson, NEFSC and P. Rago)

3:00   Break

3:15   Continue Illex 2023-2025 ABC specifications
- Review staff memo and 2023-2025 *Illex* ABC recommendations (J. Didden)
- SSC 2023-2025 *Illex* ABC recommendations (T. Miller)

5:00   Adjourn

Wednesday, March 8, 2023

8:30   Ocean City, MD Recreational Video Project (J. Didden)
- Overview of project design, results, and potential applications

9:00   Results and Findings from the EAFM Recreational Summer Flounder Management Strategy Evaluation (B. Muffley, G. Fay, and A. Carr-Harris)

10:15   Break

10:30   Report from SSC Economic Work Group (G. DePiper)
- Work group projects and engagement opportunities for 2023

11:00   Other Business
- Species/topic lead assignments
- Stock assessment updates: 2023-2024 schedule and peer review needs
- Plans for other SSC Work Groups: Constant/Average ABC and OFL CV

12:30   Adjourn

Note: agenda topic times are approximate and subject to change

Attachment 2

MAFMC Scientific and Statistical Committee
March 7-8, 2023
Meeting Attendance via Webinar

<u>Name</u>   <u>Affiliation</u>

SSC Members in Attendance:

Paul Rago (SSC Chairman)   NOAA Fisheries (retired)
Tom Miller   University of Maryland – CBL
Ed Houde   University of Maryland – CBL (emeritus)
Dave Secor   University of Maryland – CBL
John Boreman   NOAA Fisheries (retired)
Jorge Holzer (March 8th only)   University of Maryland
Yan Jiao   Virginia Tech University
Rob Latour   Virginia Institute of Marine Science
Brian Rothschild   Univ. of Massachusetts-Dartmouth (emeritus)
Olaf Jensen   U. of Wisconsin-Madison
Sarah Gaichas   NOAA Fisheries NEFSC
Wendy Gabriel   NOAA Fisheries (retired)
Mike Wilberg (Vice-Chairman)   University of Maryland – CBL
Cynthia Jones   Old Dominion University
Gavin Fay   U. Massachusetts-Dartmouth
Alexei Sharov   Maryland Dept. of Natural Resources
Geret DePiper   NOAA Fisheries NEFSC
Mark Holliday   NOAA Fisheries (retired)

Others in attendance (only includes presenters and members of public who spoke):

Kim Hyde (March 7th only)   NEFSC
Jason Didden   MAFMC staff
Brandon Muffley   MAFMC staff
Malin Pinsky (March 7th only)   Rutgers University
Julia Beaty   MAFMC staff
Jeff Kaelin   Lund's Fisheries
Alexa Fredston   University of California Santa Cruz
Anna Mercer (March 7th only)   NEFSC
Lisa Hendrickson (March 7th only)   NEFSC
Sarah Salois (March 7th only)   NEFSC
Katie Almeida   Town Dock
Greg DiDomenico   Lund's Fisheries
Andrew Carr-Harris (March 8th only)   NEFSC
Mike Waine (March 16th only)   American Sportfishing Association

Attachment 3. Glossary

ABC—Acceptable Biological Catch
AIC—Akaike's Information Criterion
B_{msy}—Biomass at maximum sustainable yield
CV—Coefficient of Variation
DEA—Data Envelopment Analysis (DEA)
DFO—Department of Fisheries and Oceans, Canada
ESP—Ecosystem and Socio-economic Profiles
EAFM—Ecosystem Approach to Fisheries Management
F—Instantaneous rate of fishing mortality
FSV—Fishery Survey Vessel
GARFO—Greater Atlantic Region Fisheries Office
HCR—Harvest Control Rule
M—Instantaneous rate of natural mortality
MRIP—Marine Recreational Information Program
MTA—Management Track Assessment
MSC—Marine Stewardship Council
MSE—Management Strategy Evaluation
OFL—Overfishing Limit
P*—Probability of overfishing
q—catchability coefficient parameter
RHL—Recreational Harvest Limit
RSA—Research Set Aside
RSC—Research Steering Committee
RTA—Research Track Assessment
R/V—Research Vessel
SOE—State of the Ecosystem
SSB_{msy}—Spawning stock biomass at maximum sustainable yield
SSC—Scientific and Statistical Committee
v—availability parameter

Mid-Atlantic Fishery Management Council

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 24, 2023

To: Council

From: Chris Moore, Executive Director

Subject: Executive Director's Report

The following materials are enclosed for review during the Executive Director's Report at the April 2023 Council Meeting:

1.   2023 Planned Council Meeting Topics

2.   2023 Council Meeting Schedule

3.   2024 Council Meeting Schedule (Draft)

4.   Action Plan: Omnibus Essential Fish Habitat Amendment

5.   Action Plan: Recreational Sector Separation and Catch Accounting Amendment (SF/Scup/BSB and Bluefish)

6.   Action Plan: Recreational Harvest Control Rule 2.0 Framework/Addenda (SF/Scup/BSB and Bluefish)

7.   Staff Memo: Draft timeline for development of a policy/process for reviewing EFP applications for Unmanaged Forage Amendment ecosystem component species

8.   Staff Memo: Update on Sea Turtles

9.   Staff Memo: Golden Tilefish Survey Update and Expansion of South Atlantic Deepwater Longline Survey

10. Staff Memo: Offshore Wind Updates

11. New Climate Change and Mid-Atlantic Fisheries Web Page

12. Email to Advisors: March MREP Management Workshop

2023 Planned Council Meeting Topics

Updated: 3/23/23

April 4-6, 2023 Council Meeting – Durham, NC
- 2023 *Illex* Specifications: review
- 2024-2025 *Illex* Specifications: approve
- Illex Permit Action Follow-Up
- Habitat Activities (including aquaculture and wind): update
- Offshore Wind: update
- East Coast Climate Change Scenario Planning: update
- 2023 Mid-Atlantic State of the Ecosystem Report: review
- Short-Term Forecasts of Species Distributions Project: review results and discuss next steps
- NTAP Restrictor Rope Research: review results
- Ocean City Video Project: review results
- ACCSP Update
- MRIP Update
- Scup Federal Recreational Season: discuss Board recommendation and consider Council action

June 6-8, 2023 Council Meeting – Virginia Beach, VA
- 2024 Atlantic Surfclam and Ocean Quahog Specifications: review
- 2024 Blueline Tilefish Specifications: review
- 2024 Golden Tilefish Specifications: review
- Monkfish and Dogfish Joint Framework to Reduce the Bycatch of Atlantic Sturgeon: review and approve range of alternatives
- 2024 Atlantic Chub Mackerel Specifications: review
- 2024 Butterfish Specifications: review
- Offshore Wind: update
- Unmanaged Commercial Landings Report: review

August 8-10, 2023 Council Meeting – Annapolis, MD
- 2024-2025 Summer Flounder and, Scup, and Black Sea Bass Specifications: approve (joint with ASMFC SFSBSB Board)
- 2024 Black Sea Bass Specifications: approve (joint with ASMFC SFSBSB Board)
- Summer Flounder, Scup, and Black Sea Bass Commercial Measures: review (joint with ASMFC SFSBSB Board)
- Scup Commercial Discards and Gear Restricted Areas (GRA): review analysis and discuss next steps
- Recreational Harvest Control Rule 2.0 Framework/Addenda: discuss next steps (joint with ASMFC Policy Board)
- 2024-2025 Bluefish Specifications and Recreational Management Measures: approve (joint with ASMFC Bluefish Board)
- 2024-2025 Atlantic Mackerel Specifications: approve
- 2024-2025 Atlantic Mackerel River Herring and Shad Cap: approve
- Research Set-Aside Program Redevelopment: update

October 3-5, 2023 Council Meeting – New York City, NY
-   2024-2026 Spiny Dogfish Specifications: approve
-   SCOQ Species Separation Requirements Amendment: review and approve any additional alternatives
-   2024-2026 Longfin Squid Specifications: approve
-   Executive Committee: review progress on 2023 Implementation Plan and discuss draft 2024 deliverables
-   Policy/Process for Reviewing Exempted Fishing Permit Applications for Unmanaged Forage Amendment Ecosystem Component Species: approve~~Council Process for Reviewing EFP Applications: approve~~
-   Private Recreational Tilefish Permitting and Reporting: review performance
-   EAFM Risk Assessment Review: approve
-   Biennial Review of 2020-2024 Research Priorities Document: review and approve
-   Habitat Activities (including aquaculture): update
-   Offshore Wind: update
-   NTAP Restrictor Rope Research: review results

December 11-14, 2023 Council Meeting – Philadelphia, PA
-   2024-2025 Recreational Management Measures for Summer Flounder and~~,~~ Scup~~, and Black Sea Bass~~: approve (joint with ASMFC SFSBSB Board)
-   2024 Recreational Management Measures for Black Sea Bass: approve (joint with ASMFC SFSBSB Board)
-   Summer Flounder, Scup, Black Sea Bass Commercial Minimum Mesh Size Regulations and Exemptions: review and discuss next steps (joint with ASMFC SFSBSB Board)
-   Summer Flounder, Scup, Black Sea Bass, and Bluefish Sector Separation and Recreational Catch Accounting Amendment: review and approve draft scoping document (joint with ASMFC Policy Board)
-   Recreational Harvest Control Rule 2.0 Framework/Addenda: review and discuss next steps (joint with ASMFC Policy Board)
-   Monkfish and Dogfish Joint Framework to Reduce the Bycatch of Atlantic Sturgeon: final action
-   2024 Implementation Plan: approve
-   Golden Tilefish IFQ Program Review: review final report

Mid-Atlantic Fishery Management Council

2023 Council Meeting Topics At-a-Glance

	April	June	August	October	December
Mackerel, Squid, Butterfish *and* **River Herring and Shad (RH/S)**	• 2023 *Illex* Specifications Review • 2024-2025 *Illex* Specs • Illex Hold Issue	• 2024 Chub Mackerel Specs Review • 2024 Butterfish Specs Review	• 2024-2025 Atlantic Mackerel Specs • 2024-2025 RH/S Cap	• 2024-2026 Longfin Squid Specs	
Recreational Reform			• Rec Harvest Control Rule 2.0 FW: Discuss		• Rec Sector Separation and Catch Accounting Amd: Approve Scoping Doc • Rec Harvest Control Rule 2.0 FW: Discuss
Summer Flounder, Scup, Black Sea Bass (SF/S/BSB)	• Scup Recreational Season: Discuss		• 2024-2025 Summer Flounder and Scup Specs and Commercial Measures • 2024 Black Sea Bass Specs and Commercial Measurse • Scup GRA Review		• 2024-2025 Summer Flounder and Scup Rec Mgmt Measures • 2024-2025 Black Sea Bass Rec Mgmt Measures • SF/S/BSB Commercial Min Mesh Size Review
Bluefish			• 2024-2025 Bluefish Specs and Rec Measures		
Golden and Blueline Tilefish		• 2024 Blueline Tilefish Specs Review • 2024 Golden Tilefish Specs Review		• Private Tilefish Permitting/ Reporting Update	• Golden Tilefish IFQ Program: Review Final Report
Atlantic Surfclam and Ocean Quahog (SC/OQ)		• 2024 SC/OQ Specs Review		SC/OQ Species Separation Amd: Review/Approve Additional Alternatives	
Spiny Dogfish		*See protected resources*		• 2024-2026 Dogfish Specs	
Monkfish		*See protected resources*			
Science Issues	• Short-Term Forecasts of Species Distributions • Ocean City Video Project		• RSA Redevelopment Update	• 2020-2024 Research Priorities Document Review • NTAP Restrictor Rope Results	
EAFM	• 2023 State of the Ecosystem Report			• EAFM Risk Assessment Review: Approve • Council Process for Reviewing EFP Applications: Approve	

	April	June	August	October	December
Habitat/ Wind/ Aquaculture	• Habitat Update	• Wind Update		• Habitat Update • Wind Update	
Protected Resources		• Dogfish/ Monkfish FW to Reduce Sturgeon Bycatch: Review Alternatives			• Dogfish/ Monkfish FW to Reduce Sturgeon Bycatch: Review Alternatives: Final Action
Other	• Scenario Planning Update	• Unmanaged Commercial Landings Report		• Executive Committee: Draft 2024 Deliverables	• 2024 Implementation Plan: Approve

Acronyms/Abbreviations

ALWTRP	Atlantic Large Whale Take Reduction Plan	NEFSC	Northeast Fisheries Science Center
Amd	Amendment	NTAP	Northeast Trawl Advisory Panel
EAFM	Ecosystem Approach to Fisheries Management	Rec	Recreational
EFH	Essential Fish Habitat	RH/S	River Herring and Shad
FMP	Fishery Management Plan	RSA	Research Set-Aside
GRA	Gear Restricted Area	SC/OQ	Atlantic Surfclam and Ocean Quahog
HMS	Highly Migratory Species	SF/S/BSB	Summer Flounder, Scup, Black Sea Bass
Mgmt	Management	Specs	Specifications
MREP	Marine Resource Education Program	SSC	Scientific and Statistical Committee
MSB	Mackerel, Squid, Butterfish		

2023 Council Meeting Schedule

(As of September 20, 2022)

February 7 – 9, 2023	Hotel Washington 515 15th Street NW Washington, DC 20004
April 4 – 6, 2023	Hyatt Place Durham Southpoint 7840 NC-751 Hwy Durham, NC 27713
June 6 – 8, 2023	Hilton Virginia Beach Oceanfront 3001 Atlantic Avenue Virginia Beach, VA 23451
August 8 – 11, 2023	Westin Annapolis 100 Westgate Circle Annapolis, MD 21401
October 3 – 5, 2023	Yotel NYC 570 Tenth Avenue New York, NY 10036
December 11 – 14, 2023	The Notary Hotel 21 North Juniper Street Philadelphia, PA 19107

2024 Council Meeting Schedule

(As of March 24, 2023)

February 6 – 8, 2024	The Westin Arlington Gateway 801 North Glebe Road Arlington, VA 22203
April 9 – 11, 2024	Sheraton Atlantic City Convention Center Hotel 2 Convention Boulevard Atlantic City, NJ 08401
June 4 – 6, 2024	Hyatt Place Long Island/East End Atlantis Banquets & Events 431 East Main Street Riverhead, NY 11901
August 12 – 15, 2024	The Westin Philadelphia 99 South 17th Street at Liberty Place Philadelphia, PA 19103
October 8 – 10, 2024	Hyatt Place Dewey Beach 1301 Coastal Highway Dewey Beach, DE 19971
December 9 – 12, 2024	The Westin Annapolis 100 Westgate Circle Annapolis, MD 21401

Action Plan to Develop an Amendment to address
Essential Fish Habitat requirements for all Council FMPs (i.e., omnibus)
(Updated as of March 20, 2023)

Council: Mid-Atlantic

Type of Action: An omnibus "EFH Amendment" with a concurrent EFH Review.

Applicable Fisheries: All Council fisheries with EFH designation requirements. Monkfish is excluded, as MAFMC is not the lead Council.

Objective of Action: This action will address the 10 components of the Essential Fish Habitat Review for the Council and the Council will consider revising EFH components or associated management measures as part of this an omnibus action to amend all FMPs simultaneously.

Expertise Sought:

Fishery Management Action Team (FMAT)		
Agency	**Expertise**	**Person**
MAFMC	FMAT Chair	Jessica Coakley
MAFMC	Habitat	Tori Kentner
NMFS GARFO	Habitat/GARFO Lead on Action	Jessie Murray
NMFS GARFO	Sustainable Fisheries	Doug Potts
NMFS GARFO	Protected Resources	Danielle Palmer
NMFS GARFO	NEPA	Sharon Benjamin
Monmouth U/NEFSC/NEFMC	Habitat Modeling	Chris Haak
NEFSC	Habitat, Economics	TBD
NEFMC	Habitat	Michelle Bachman

Type of NEPA Analysis Expected: Document expected to be an EA.

Acronym	NEPA Analysis	Requirements
EA	**Environmental Assessment**	**NEPA applies, no scoping required, public hearings required under MSA***
EIS	Environmental Impact Statement	NEPA applies, scoping required, public hearings required

* If significant impacts are identified the action will be elevated to an EIS.

Types of Measures to be Considered: The Council will consider measures that address the 10 components of the EFH review for the FMPs.

1. Description and Identification of EFH
Evaluate new scientific literature and information from other relevant sources to see whether species-specific EFH description and identification, as written in the FMP as text and provided as maps, is appropriate and reflects best available information and methods. Suggest changes to EFH text or map designations as appropriate.

2. Fishing activities that may adversely affect EFH
Review whether there have been changes in or newly available information on fishing activities that may adversely affect EFH. Evaluate the impact of fishing activities on EFH.

3. Non-Magnuson-Stevens Act fishing activities that may adversely affect EFH
Review whether there have been changes in current Non-Magnuson-Stevens Act fishing (e.g., state water fisheries). Evaluate the impact of non-MSA fishing activities on EFH.

4. Non-fishing related activities that may adversely affect EFH
Review whether there have been changes to or newly available information on non-fishing activities affecting habitat. Evaluate the impact of non-fishing activities on EFH.

5. Cumulative impacts analysis
Review cumulative impacts discussions across all FMPs, and update if appropriate.

6. Conservation/Fishing Impact Recommendations
Review fishing and non-fishing activities and determine whether actions to minimize impacts on EFH or other conservation actions are appropriate.

7. Prey species
Review prey species information and determine if updates are appropriate.

8. Identification of HAPC
Review current HAPC designations and approach, and consider new approaches and/or new candidate HAPC designation and approaches.

9. Research Needs
Review existing habitat research needs and determine whether updates are appropriate.

10. Develop approaches to better integrate goals and objectives into habitat actions.
Consider how habitat goals and objectives can be used to make the Council's use of its habitat authorities more effective.

Applicable Laws/Issues:

Magnuson-Stevens Act	Yes
Administrative Procedures Act	Yes
Regulatory Flexibility Act	Yes
Paperwork Reduction Act	Unlikely, depends upon the actions taken
Coastal Zone Management Act	Possibly; depends upon effects of the action on the resources of coastal states in the management unit
Endangered Species Act	Possibly; level of consultation, if necessary, depends upon the actions taken
Marine Mammal Protection Act	Possibly; level of consultation, if necessary, depends upon the actions taken
E.O. 12866 (Regulatory Planning and Review)	Yes
E.O. 12630 (Takings)	Unlikely; legal review will confirm
E.O. 13132 (Federalism)	Unlikely; legal review will confirm
Essential Fish Habitat	Yes
Information Quality Act	Yes

Other Issues: At this time, no additional issues have been identified.

Timing Issues: At this time, no timing issues have been identified.

Amendment Timeline (Development/Review/Implementation; as of March 20, 2023):

2023-2025 Development Track	
October 2022	Council initiated action and omnibus Amendment
January 2023	FMAT Formed
February 2023	First FMAT meeting to review draft action plan and identify next steps
March – August 2023	Develop approaches for EFH and HAPC designation alternatives (1 & 8); begin to address other aspects of the EFH Review (2-7); may include meetings of FMAT and additional habitat experts)
Early Fall 2023	Ecosystem and Ocean Planning (EOP) Committee reviews approaches/alternatives to develop EFH and HAPC designations (1 & 8)
Fall 2023 – July 2024	Continue development work. May include meetings of FMAT, EOP Committee and EOP Advisory Panel
August 2024	Council approves public hearing draft
September/October 2024	Public Hearings and Comment Period
November 2024	EOP Committee meets to consider public comment/develop recommendations to Council
December 2024	Council considers taking final action – submits to NMFS for review, rulemaking, and implementation
January – April 2025	Rulemaking document finalized
December 2025	Final Rule by NMFS

**Recreational Sector Separation and Catch Accounting Amendment to the
Summer Flounder, Scup, and Black Sea Bass and Bluefish Fishery Management Plans**

Draft Action Plan
2/22/2023

Amendment Goal: The purpose of this amendment is to review and consider options for managing for-hire recreational fisheries separately from other recreational modes (referred to as sector separation) as well as options related to recreational catch accounting, such as private angler reporting and enhanced vessel trip reporting (VTR) requirements for the summer flounder, scup, black sea bass, and bluefish fisheries. This action aims to address expressed interest in sector separation to make better use of for-hire VTR data, which some anglers perceive as being more accurate than the Marine Recreational Information Program (MRIP) data. In addition, this action considers options to improve recreational catch accounting with the intent to reduce uncertainty in the recreational data. This amendment is being developed by the Mid-Atlantic Fishery Management Council (Council) and Atlantic States Marine Fisheries Commission (Commission).

Types of Measures Expected to be Considered: The Council and the Commission's Interstate Fishery Management Program Policy Board (Policy Board) will review and consider options for managing for-hire recreational fisheries separately from other recreational modes (referred to as sector separation) as well as options related to recreational catch accounting for summer flounder, scup, black sea bass, and bluefish. In previous conversations on these issues, the types of measures for potential consideration included:

Sector separation
- No action/status quo
- Managing the recreational for-hire and private/rental fisheries with separate allocations of catch or harvest, including possible options for:
  - Separate Annual Catch Limits (ACLs) for each recreational sector
  - Separate Recreational Sub-ACLs for each recreational sector
  - Separate Recreational Harvest Limits (RHLs)
- Managing the recreational for-hire and private/rental fisheries with separate management measures (bag limits, size limit, seasons, or other measures). Although this is already done for some species/state/mode combinations, this amendment may consider a more uniform approach to separate measures. If the Council and Policy Board choose to prioritize separate measures over other types of sector separation, an amendment may not be necessary depending on the options considered.

Recreational catch accounting
- No action/status quo
- Mandatory private angler reporting
- Tagging programs (i.e., anglers or groups of anglers are issued tags for specific number of fish each year)
- Mandatory tournament reporting

- Enhanced VTR requirements
- Voluntary angler reporting programs to supplement or enhance recreational survey programs

Expected Amendment Timeline:

This amendment was initiated in October 2020 along with several other [Recreational Reform Initiative Topics](). However, in February 2021, work on this amendment was put on hold to prioritize development of the Recreational Harvest Control Rule Framework/Addenda. In December 2022 the Council and Policy Board agreed to continue to develop the Recreational Sector Separation and Catch Accounting Amendment.

The expected amendment timeline (as of January 2023; assuming an environmental assessment; subject to change) is as follows:

Spring/Summer 2023	Form Fishery Management Action Team (FMAT)/ Plan Development Team (PDT)
Summer-Fall 2023	FMAT/PDT develops issues for consideration and draft scoping document. Possible Advisory Panel (AP) and Monitoring Committee discussion.
December 2023	Council and Policy Board approve a scoping and public information document for public comment
January-February 2024	Scoping hearings and comment period
Spring 2024	APs review scoping comments and provide input to Council and Policy Board on scope of amendment and possible approaches
Spring 2024	FMAT/PDT reviews scoping comments and AP input and provides recommendations to Council and Policy Board on scope of amendment and possible approaches
Spring 2024	Council and Policy Board review scoping comments and FMAT and AP recommendations; define scope of action
Summer 2024	FMAT/PDT begins to develop draft alternatives
August 2024	Council and Policy Board review preliminary alternatives
Fall 2024	Continued FMAT/PDT development and analysis of alternatives; AP input on draft alternatives
December 2024	Council and Policy Board approve final range of alternatives for inclusion in a public hearing document/Commission draft amendment document
Winter 2025	FMAT/PDT develops public hearing document/Commission draft amendment document
Spring 2025	Council and Policy Board approve public hearing document; Policy Board approves draft amendment document for public comment
Spring/Summer 2025	Public hearings and comment period
Spring/Summer 2025	AP meeting to provide input on preferred alternatives; FMAT/PDT meeting to provide recommendations to Council/Board
August 2025	Final action
Fall 2025	Staff develop and submit draft environmental assessment (EA)
Winter 2026	NMFS and other agencies review EA; final edits completed; Rulemaking and comment periods (4-7 months after EA finalized)
TBD	Target effective date (may or may not need to line up with start of fishing year depending on measures approved)

Summer Flounder, Scup, Black Sea Bass, and Bluefish
Recreational Harvest Control Rule 2.0 Framework/Addenda
Draft Action Plan
2/22/2023

https://www.mafmc.org/actions/hcr-framework-addenda

Framework/Addenda Goal: This management action is being developed by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission). This is a follow-on action to the Recreational Harvest Control Rule Framework/Addenda, which implemented the Percent Change Approach for setting recreational management measures. In adopting the Percent Change Approach, the Council and the Commission's Interstate Fishery Management Program Policy Board (Policy Board) agreed that it should sunset by the end of 2025 with the goal of considering if an improved measures setting process should be used starting with the 2026 measures. The Council and Policy Board agreed that the other alternatives in the Recreational Harvest Control Rule Framework/Addenda should be further developed, including consideration of fishing mortality-based approaches, example management measures, and concerns raised by the Council's Scientific and Statistical Committee (SSC) during their spring 2022 review of the alternatives.

Alternatives to be Considered: In June 2022, the Council and Policy Board passed the following motion when taking final action on the Recreational Harvest Control Rule Framework/Addenda: "Move to further develop Alt. B (Pct Change Approach), Alt. D (Biological Reference Point Approach) and Alt. E (Biomass Based Matrix Approach) for implementation no later than the beginning of the 2026 fishing year. Further development should consider, at minimum, F-based approaches for Alt. B and development of measures using modeling or other approaches for Alts. D and E. Further evaluate the issue of "borrowing" as raised by the SSC for alt B, D, and E."[1] These alternatives are briefly described below and are described in detail in the reference guide and final framework document for the previous action. The Council and Policy Board may also identify other alternatives to address the objectives of the action.

- **Percent Change Approach** – This approach was implemented starting with the 2023 recreational management measures for summer flounder, scup, and black sea bass. It will also be used for bluefish once that stock is no longer under a rebuilding plan. Under the Percent Change Approach, a determination is made to either liberalize, restrict, or leave measures unchanged based on two factors: 1) Comparison of a confidence interval around an estimate of expected harvest under status quo measures to the average recreational harvest limit (RHL) for the upcoming two years and 2) Biomass compared to the target level, as defined by the most recent stock assessment. These two factors are used to define a target harvest level for setting management measures. The target is defined as a percentage difference from expected harvest under status quo measures.
- **Biological Reference Point Approach and Biological Based Matrix Approach** - These alternatives use a combination of indicators to place the stock in one of multiple potential management measure "bins." The indicators vary by alternative and include expected harvest

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[1] The report from the SSC review is available at https://www.mafmc.org/ssc-meetings/2022/may10-11.

under status quo measures, biomass compared to the target level, fishing mortality, recruitment, and/or trends in biomass. Bins associated with poor indicators would have more restrictive management measures and bins with positive indicators would have more liberal measures. Measures would be assigned to all bins the first time the approach is used through the specifications process.

- **Target metric for setting measures** – The previous framework/addenda considered if recreational measures in state and federal waters should collectively aim to achieve a target level of harvest (e.g., based on the RHL), recreational dead catch (e.g., based on the recreational annual catch limit), or fishing mortality.
- **Other alternatives** – This new management action may consider other alternatives, as appropriate. For example, this could include potential revisions to the accountability measures, considerations related to conservation equivalency, and other topics.

Draft Timeline – *Subject to change*

Spring 2023	• Fishery Management Action Team (FMAT)/Plan Development Team (PDT) formed
Spring and Summer 2023	• FMAT/PDT meetings to review previously considered alternatives, lessons learned from first application of Percent Change Approach and use of Recreational Demand Model for setting 2023 measures, and initial discussions of path forward, including potential role of the Scientific and Statistical Committee (SSC). • Monitoring Committee (MC)/Technical Committee (TC) meeting to discuss process used to set 2023 measures and potential future improvements.
August 2023	• Council and Policy Board meeting to review progress and discuss next steps, including potential role for the SSC.
Fall 2023	• FMAT/PDT meetings to continue development of alternatives. • AP meeting to review progress and provide input (potentially combined with AP meeting for 2024 recreational measures).
December 2023	• Council and Policy Board meeting to review progress and discuss next steps
Early 2024 - Summer 2024	• FMAT/PDT meetings to continue development of alternatives and develop draft document for public hearings.
August 2024	• Council and Policy Board meeting to approve final range of alternatives and approve draft document for public hearings through Commission process
Fall 2024	• Public hearings
Late 2024/Early 2025	• FMAT/PDT and AP meetings to provide input to Council and Policy Board prior to final action.
April 2025	• Council and Policy Board meeting for final action.
Spring-December 2025	• Development, review, and revisions of framework/addenda documents. • Federal rulemaking. • MC/TC use new process to set 2026 recreational measures.
Late 2025 or early 2026	• Effective date of implemented changes.

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: March 24, 2023

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: Draft timeline for development of a policy/process for reviewing EFP applications for Unmanaged Forage Amendment ecosystem component species

The Council included the following as a deliverable on their 2023 Implementation Plan: *Develop a policy and/or process for reviewing EFP applications for new or expanding fisheries as it relates to the unmanaged forage amendment.* This deliverable refers to Council considerations regarding issuance of Exempted Fishing Permits (EFPs) to allow vessels to retain greater than the 1,700 pound combined possession limit for species listed as ecosystem components (ECs) under the Unmanaged Forage Omnibus Amendment. In implementing this possession limit, the Council aimed to prohibit the development of new and expansion of existing directed commercial fisheries on unmanaged forage species in Mid-Atlantic federal waters until the Council has had an adequate opportunity to assess the scientific information relating to any new or expanded directed fisheries and consider potential impacts to existing fisheries, fishing communities, and the marine ecosystem. The Council requires an EFP as a first step towards consideration of allowing landings beyond the 1,700 pound possession limit. The Council considered the first such potential EFP in 2021 and 2022 when they reviewed an EFP application for Atlantic thread herring. The Council agreed to develop a process to help guide their review of future EFP applications.

The draft timeline below outlines proposed next steps for developing this policy/process. An Ecosystems and Ocean Planning (EOP) Committee meeting has been scheduled for April 27, 2023 to provide initial guidance for this process. EOP Advisory Panel (AP) meetings are also planned, as shown below.

Council staff will work closely with NOAA Fisheries staff to ensure that the relevant regulations and procedures regarding issuance of EFPs are considered throughout this process. Formation of a Fishery Management Action Team is not needed given that development of Council policies does not require a fishery management plan amendment or framework adjustment.

Draft Timeline – *Subject to change*

April 27, 2023	• **EOP Committee meeting** via webinar:
	    ○ Review relevant outcomes from the Unmanaged Forage Omnibus Amendment.
	    ○ Review the Pacific Fishery Management Council's operating procedure for consideration of EFPs for ecosystem component species.
	    ○ Review lessons learned from recent thread herring EFP application.
	    ○ Provide guidance to staff on development of a draft policy/process.

May 2023	• **EOP AP meeting** via webinar to provide input on development of a draft policy/process.
June 2023	• **Council meeting** (June 6-8, Virginia Beach, VA) to review Committee discussions, review AP input, and provide guidance to staff.
July – August 2023	• Staff develops draft policy/process based on Council guidance.
September 2023	• **EOP AP meeting** via webinar to review draft policy/process and provide input to Committee and Council. This may be combined with EOP AP meetings on other topics (e.g., risk assessment, essential fish habitat review). • **EOP Committee meeting** via webinar or in person to review draft policy/process, review AP input, and provide recommendations to the Council. This may be combined with EOP Committee meetings on other topics (e.g., risk assessment, essential fish habitat review).
October 2023	• **Council meeting** (October 3-5, New York City, NY) to review draft policy/process, consider AP input and Committee recommendations, and consider adopting a policy/process.

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M E M O R A N D U M

Date: March 21, 2023

To: Chris Moore, Executive Director

From: Karson Cisneros, Staff

Subject: Update on Sea Turtles

Background

At the April 2022 Meeting, the Council received an update from NOAA Fisheries staff on their public outreach efforts related to sea turtle bycatch, gear research, and potential mitigation measures in trawl fisheries in the Greater Atlantic Region. Background information, descriptions of gear designs, research results, type of information needed, and recordings from informational webinars can be found on their website. Stakeholders had many questions and concerns and the feedback throughout the outreach is summarized here.

Next Steps

NOAA Fisheries staff have indicated that their current plan is to complete the outstanding research on squid turtle excluder devices (TEDs) and data loggers, and then evaluate potential management responses as needed. There is no timeline for when a proposed rule may be out, as it depends on the ongoing research. NOAA staff intends to reach out to the Councils during that proposed rule process.

The Cornell Cooperative Extension received funding through NOAA's Bycatch Reduction Engineering Program (BREP) to conduct additional testing with TEDs in the longfin squid fishery with field work planned for 2023. As part of this project's outreach, they organized a workshop with longfin squid fishermen at Superior Trawl in Narragansett on March 3, 2023. The purpose of this workshop was to discuss TED measures under consideration for the longfin fishery, collect industry comment, show fishermen the cable TED gear, and get design feedback for an additional industry recommended design to be tested. A meeting summary from this event is not yet available, however the meeting was well attended with 34 attendees in person and 3 virtual. The comments in the below email from Mark Philips reference this March 3rd workshop.

Questioning turtle excluders

 I went to a meeting about turtle excluders in Pt. Judith at the beginning of March. While I am not denying turtle interaction I do question the frequency of interaction.

I started fishing on deck in 1964 when I was 8 years old. So I am in my 59th year of fishing and in those years I have caught 2 turtles. When I was at my peak I put 280 days in the ocean, now it's more like 150-170 days and doing the math from Carrie Upite. That meant I should have caught 162 turtles in my career. That's a long way from 2.

I have been involved in a lot of different fisheries, one of them was tuna pair trawling. We were under a 2 turtle bycatch cap for the 6 pairs. We carried technically 50% observer coverage which meant each pair had 1 observer but in reality it was closer to 100% because the observer was required to observe the other boat's haul. In 4 years the 12 boats never caught the 2 turtle cap. We were shut down for political reasons not scientific reasons. I can't help but think this is the same.

It seems that if the turtle people are that concerned about turtle interactions maybe they should look at the 476 yearly recreational boat strikes in their Biological Opinion.

Mark S Phillips
F/V Illusion

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M E M O R A N D U M

Date: March 24, 2023

To: Dr. Chris Moore, Executive Director

From: Hannah Hart and José Montañez, Council staff

Subject: Golden Tilefish Survey Update and Expansion of South Atlantic Deepwater Longline Survey

Golden Tilefish Survey

The 2023 golden tilefish fishery independent bottom longline survey will take place in Mid-June to early July. This 14-day survey was designed using the results from the pilot golden and blueline tilefish survey conducted in the summer of 2017 and builds on the golden tilefish survey conducted in the summer of 2020. The goal of the 2023 fishery independent bottom longline survey is to extend the timeseries to derive an index of abundance for the golden tilefish stock and collect other biological information to support the golden tilefish stock assessment. The survey will be conducted by Dr. Jill Olin, assistant professor at Michigan Technical University. PI Olin will be responsible for project design with NOAA-NEFSC personnel, and all work proposed. For continuity purposes, the same commercial vessel and crew that assisted in prior surveys will be used to conduct the 2023 survey.

Expansion of South Atlantic Deepwater Longline Survey

Background

The South Atlantic Deepwater Longline (SADL) survey is a cooperative survey with industry that targets several deepwater snapper/grouper species, including blueline tilefish, in waters from the North Carolina/Virginia border to the Florida Keys. The objective of the survey is to generate indices of abundance and collect biological information to support stock assessments and management of several federally managed stocks. The survey was initially conducted in 2020 and since then has occurred annually.

Although blueline tilefish along the Atlantic coast makes up a single population, the stock is split into two management areas, a Mid-Atlantic management area north of the North Carolina/ Virginia border and a South Atlantic management area from North Carolina to Florida, so that each Council can set their own specifications. There is currently no stock status information relevant to the Mid-Atlantic management area due to insufficient data. The expansion of the SADL north into Mid-Atlantic waters will allow scientists and managers to collect information on blueline tilefish throughout its range as well as monitor potential distribution shifts of other deepwater species.

Proposed Expanded SADL Survey

The proposed expanded survey would utilize the same methodology used in the south Atlantic, but the areas fished would include waters off Virginia, Maryland, Delaware, and New Jersey (Figure 1).
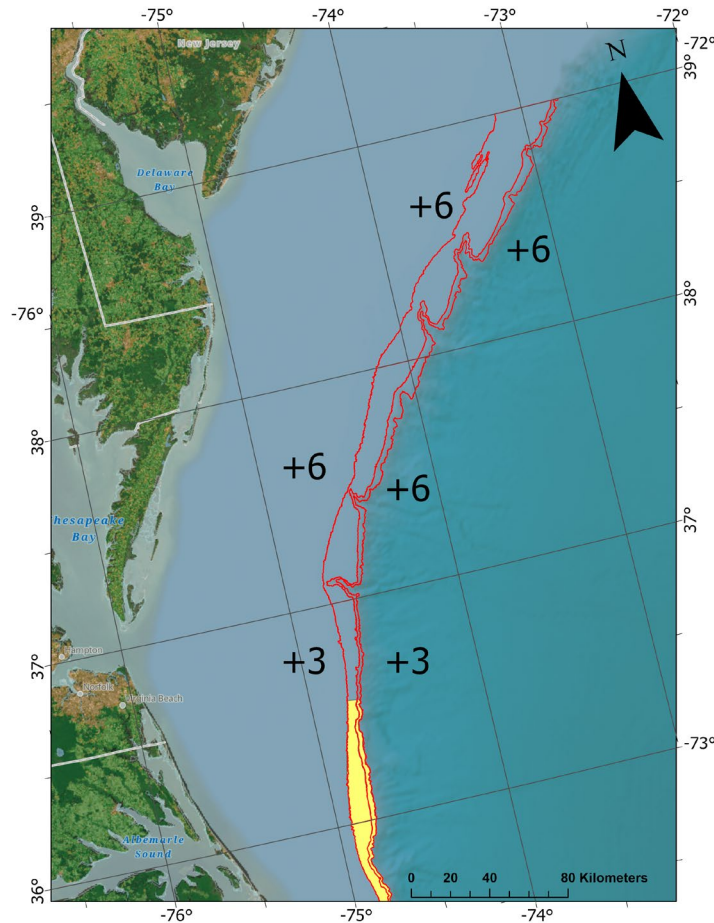

Figure 1. 2023 proposed northern extent of the SADL survey shown by the red outlined area. Proposed northern extent extends to 39 degrees north to approximately Delaware Bay/Wilmington Canyon. The distance from shore (+/- 10 km) will be approximately 90 km to 160 km depending on depth and latitude. Yellow shaded area shows the current northern survey boundary at the NC/VA boarder.

Based on catches from the Mid-Atlantic 2017 Pilot Tilefish Survey and a 2015 South Atlantic Cooperative Research Project, the proposed area would encompass the range of the Atlantic blueline tilefish stock and meet up with the southernmost latitude fished in the Mid-Atlantic Golden Tilefish Survey. More information related to the background, methods, and 2020-2021 SADL results can be found here.

The Council has committed to funding the expansion of the SADL north in 2023 and is coordinating with staff from the Southeast Fishery Science Center, South Carolina Department of Natural Resources, and Northeast Fishery Science Center on survey logistics and permitting requirements.

M E M O R A N D U M

Date: March 21, 2023

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: Updates on Offshore Wind Energy Development

This memo summarizes select recent updates in offshore wind energy development. This list is not intended to be exhaustive and focuses on updates of greatest relevance to the Mid-Atlantic Fishery Management Council.

- **Submitted comment letters:** Since the February 2023 Council meeting, the Council submitted the following comment letters:

    o MAFMC and NEFMC Letter to BOEM: Draft Environmental Impact Statement for New England Wind Project off Massachusetts (2/21/23)
    o MAFMC and NEFMC Letter to BOEM: Draft Environmental Impact Statement for Sunrise Wind Project offshore New York, Massachusetts, and Rhode Island (2/14/23)
    o MAFMC and NEFMC Letter to BOEM: Draft Environmental Impact Statement for Coastal Virginia Offshore Wind Project (2/14/23)

- **Comment letters in progress:** Council staff are working on a comment letter to the Bureau of Ocean Energy Management (BOEM) on the draft environmental impact statement for SouthCoast Wind (formerly Mayflower Wind; comments due 4/3/2023)

- **Ongoing construction:** Construction is underway for the South Fork and Vineyard Wind 1 projects.

    o **South Fork Wind:** Export cables are being installed off Long Island. Vessels anchoring or using bottom contact fishing gear are requested to avoid certain areas during installation. See the Northeast Mariners Briefings for more information, including maps of active work zones and boulder relocations.

    o **Vineyard Wind 1:** Scour protection materials are being installed for 17 turbine foundations. There are no surface markings for these locations. Vineyard Wind is recommending that vessels using bottom tending gear avoid these areas until they are marked on NOAA charts later this year after the turbine foundations are installed. More information, including maps of the locations, are available here.

- **Ongoing survey activities (geotechnical, geophysical, fisheries, etc.):** Several offshore wind projects are undertaking geophysical, geotechnical, fisheries, and other types of survey work throughout the region. These surveys use a variety of gear types, including

some equipment that is installed in a location for extended periods of time (e.g., buoys, acoustic receivers). The best way to stay informed of these survey activities is to sign up for email updates from individual wind developers (see the project specific links available here). Some developers are also using the Waterfront App to share information such as survey vessel locations.

- **Offshore wind and whales:** NOAA Fisheries has updated their FAQ page to provide more information on offshore wind energy development and whales. An additional page provides answers frequently asked questions about marine mammal necropsies.

- **New Jersey solicitation:** The New Jersey Board of Public Utilities opened its third offshore wind energy solicitation, seeking to award between 1.2 GW and 4 GW of offshore wind capacity. More information is available here.

- **National Academies Standing Committee on Offshore Wind Energy and Fisheries:** This new committee held their first meeting in closed session on March 15, 2023. The next two meetings will be held on April 13 and April 26-27 and will be open to the public. More information will be posted here once it is available.

- **Transmission planning:** The Department of Energy (DOE) and BOEM are carrying out a number of efforts to improve energy transmission planning and development, including offshore wind energy transmission. For example, a two-year Atlantic Offshore Wind Transmission Study is underway and the agencies held a series of stakeholder workshops.

- **Floating offshore wind:** DOE is leading an initiative to reduce the cost of floating offshore wind energy by more than 70% by 2035. As part of this effort, the agency held the Floating Offshore Wind Shot Summit in February 2023. More information is available here.

- **BOEM Director:** In January 2023, the Department of Interior announced Liz Klein as the new director of BOEM.

- **NOAA Fisheries Senior Advisory on Offshore Wind:** Katie Westfall joined NOAA Fisheries as a Senior Advisor on offshore wind. In this role she will focus on improving the efficiency of offshore wind permitting at NOAA and enhancing external coordination and engagement with other agencies, senior officials, and external groups.

- **Fisheries liaisons outreach:**
  - o **New England Council meeting:** Fisheries liaisons from multiple wind projects are hosting an outreach event during the New England Fishery Management Council meeting. The event will take place at the Hilton Mystic in Mystic, CT from 9:00 am to 5:00 pm on April 18, 2023.
  - o **Other events:** Fisheries liaisons for most offshore wind projects periodically hose port hours, dock visits, and other outreach events. The best way to stay informed of these outreach events is to sign up for email updates from individual wind developers (see the project specific links available here).

- **Mid-Atlantic Ocean Forum:** The fifth annual Mid-Atlantic Ocean Forum will be held in New York City on May 17 and 18, 2023. The agenda has not been finalized but will

likely include sessions on offshore wind. More information will be posted here as it becomes available.

- **Stay informed:**
  - A wind agenda item, including a presentation from BOEM staff, is planned for the Council's June 2023 meeting in Virginia Beach. More information will be posted to the meeting page once it is available.

  - To stay up to date on individual wind projects, including development of fishery communications plans, details on offshore survey operations, outreach events, and other updates, see the project-specific links available at https://www.mafmc.org/offshore-wind-notices.

  - The Mid-Atlantic Ocean Data Portal maintains a list of current and recent government agency actions and public comment opportunities relevant for the Mid-Atlantic Region. This list can be viewed here.

  - The New York State Energy Research and Development Authority (NYSERDA) maintains an archive of free, publicly available webinars for stakeholders interested in issues relating to offshore wind and the environment. The archive is available at https://www.nyetwg.com/webinar-library.

Climate Change and Mid-Atlantic Fisheries

Climate change is having profound impacts on our oceans, fisheries, and coastal communities. Over the past century, the Northeast region has experienced some of the greatest warming and highest rates of sea-level rise of any area around the world. As the marine environment becomes warmer and more acidic, some species are experiencing changes in distribution and productivity. Understanding and adapting to climate change is critical to the Mid-Atlantic Fishery Management Council's mission of managing sustainable and productive fisheries.

How is the Mid-Atlantic Council responding to climate change?

Building resilient, "climate ready" fisheries is a long-term endeavor. The Council is coordinating closely with its science and management partners to explore governance issues, address climate science needs, and develop new tools and adaptive management approaches. This page highlights a selection of the Council's actions to build climate resilience in Mid-Atlantic fisheries and ecosystems, as well as to increase the Council's capacity to respond to climate change. These actions are organized around eight themes:

1. Strengthening partnerships to prepare for governance challenges

2. Addressing changing distributions

3. Monitoring emerging fisheries

4. Implementing an ecosystem approach to fisheries management

5. Incorporating climate information in management decisions

6. Ensuring healthy fish habitat

7. Advancing climate science

8. Planning for the future

STRENGTHENING PARTNERSHIPS TO PREPARE FOR GOVERNANCE CHALLENGES

East Coast fisheries management relies on coordination among multiple fishery management organizations. Climate-driven changes in species distributions are expected to introduce new jurisdictional issues. To prepare for these challenges, the Mid-Atlantic Council is working with its science and management partners to explore potential solutions and next steps for adapting and responding to climate change.

Climate Change Scenario Planning: The Council is currently collaborating with other East Coast fishery management organizations on a climate change scenario planning initiative. The goals of this project are to assess how climate change might affect stock distribution and availability of East Coast marine fisheries over the next 20 years and to identify implications and potential actions for fishery management and governance. Learn more at East Coast Climate Change Scenario Planning Initiative.

Council Committee Structure: The Council has taken steps to increase representation of New England states in the Mid-Atlantic Council process by adding seats for New England Fishery Management Council members on the Summer Flounder, Scup, and Black Sea Bass Committee and the Mackerel, Squid, Butterfish Committee. The Council may explore other changes based on recommendations from the scenario planning process.

Back to Top ↑

ADDRESSING CHANGING DISTRIBUTIONS

The Mid-Atlantic region has experienced rising ocean temperatures over the past several decades, along with changes in the geographic distribution of many fish stocks. The Council has initiated a number of fishery management actions to address new management and governance challenges that have resulted from changing stock distributions.

Photo Credit: Michael Eversmier

Blueline Tilefish: In 2015, the Council initiated management of blueline tilefish in the Mid-Atlantic in response to evidence that commercial and recreational landings of blueline tilefish in the Mid-Atlantic were increasing rapidly. The Mid-Atlantic portion of the stock was added to the Council's Tilefish Fishery Management Plan in 2017. The South Atlantic Council continues to manage the fishery south of the NC/VA line. Learn more at Blueline Tilefish Amendment.

Black Sea Bass Allocations: In 2021, the Council and the Atlantic States Marine Fisheries Commission modified the state allocations of the black sea bass commercial quota in response to changes in stock distribution that have occurred since the state allocations were first established. The allocations are now based on a combination of historical allocations and biomass distribution. The revised allocations are dynamic and will be updated each time the stock assessment or other appropriate data source suggests that the regional distribution of the stock has changed. Learn more at Black Sea Bass Commercial State Allocation Amendment.

Surfclam/Ocean Quahog Species Separation Requirements: The Council is currently considering changes to the species separation requirements for the Atlantic surfclam and ocean quahog fisheries. Although current regulations do not allow for the two species to be landed on the same trip, industry has reported that it is becoming increasingly difficult to avoid mixed catches as Atlantic surfclam have shifted to deeper waters. Learn more at Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment.

Allocation Review Policy: The Council has adopted a policy which requires allocations to be reviewed at least every 10 years. This will help ensure that the Council regularly considers new information, including changes in distribution, that may inform the need for allocation revisions. Learn more at MAFMC Allocation Review Policy.

MONITORING EMERGING FISHERIES

Climate change can also give rise to emerging fisheries for previously-unmanaged stocks. The Council has taken steps to avoid the potential overexploitation in these emerging fisheries.


Unmanaged Forage Protections: In 2016, the Council approved a commercial possession limit for more than 50 forage species which were previously unmanaged in Mid-Atlantic federal waters. The goal was to prohibit the development of new and expansion of existing commercial fisheries on unmanaged forage species in mid-Atlantic waters until the Council has had an opportunity to assess the scientific information and consider potential impacts. Learn more at Unmanaged Forage Omnibus Amendment.

Annual Report on Landings of Unmanaged Species: The Council receives an annual report on commercial landings of "unmanaged" species (i.e., species not managed by the Mid-Atlantic, New England, or South Atlantic Councils, NOAA Fisheries, the Atlantic States Marine Fisheries Commission, or states). These reports allow the Council to monitor landings for evidence of emerging unmanaged fisheries and determine if further evaluation is needed. Learn more at 2022 Unmanaged Commercial Landings Report.

Policy to Evaluate New or Expanding Fisheries: In 2023, the Council plans to develop a policy regarding the use of Exempted Fishing Permits as first step in considering the potential for new or expanded fisheries for species covered by the Unmanaged Forage Amendment.

IMPLEMENTING AN ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

Photo Credit: NOAA Fisheries
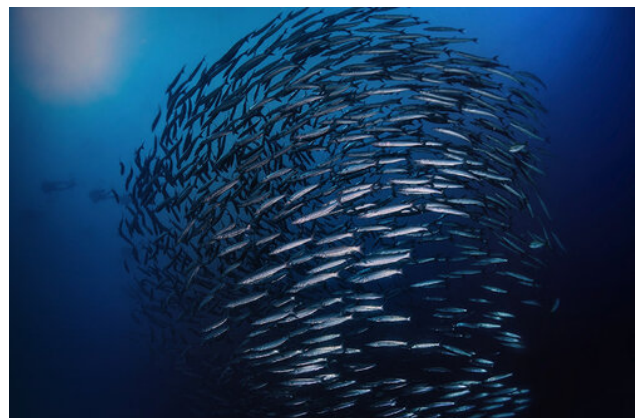
Ecosystem Approach to Fisheries Management: In 2016 the Council approved an EAFM Guidance Document which outlined a path forward to more fully incorporate ecosystem considerations into marine fisheries management. The EAFM Guidance Document is designed to help the Council incorporate key ecosystem considerations, such as climate change and climate variability, into decision making. Learn more at Ecosystem Approach to Fisheries Management.

Back to Top ↑

INCORPORATING CLIMATE INFORMATION IN MANAGEMENT DECISIONS

As part of EAFM implementation, the Council has collaborated with science and management partners to develop new ways of considering ecosystem information in the management process.

State of the Ecosystem Reports: The Council reviews an annual "State of the Ecosystem" report from NOAA Fisheries that synthesizes information about recent ecosystem conditions. These reports contain detailed summaries of climate change trends (ocean temperature, heatwaves, currents, acidification) and the apparent impacts of those trends on ecosystem health. Learn more at 2022 State of the Ecosystem Report - Mid-Atlantic Bight.

Risk Assessment: The Council also uses a comprehensive risk assessment, updated annually, to help decide where to focus limited resources to address priority ecosystem considerations. The risk assessment takes into account 25 different ecosystem risk factors, including climate vulnerability and distribution shifts, and highlights priority species/issues for more detailed evaluation. Learn more at 2022 EAFM Risk Assessment Update.

Climate Vulnerability Assessments: The Council and its Scientific and Statistical Committee (SSC) review vulnerability assessments developed by the Northeast Fisheries Science Center. These assessments identify species, habitats, and communities that are most vulnerable to a changing climate. The Council and SSC use this information to understand ecosystem risk, identify research priorities, and prepare and plan for a changing environment. Learn more at Climate Vulnerability Assessments.

SSC Ecosystem Working Group: A working group of the Council's SSC is developing strategies to advance the operational use of ecosystem information in science and management decisions.

ENSURING HEALTHY FISH HABITAT

Climate change is impacting the function, suitability, and distribution of fish habitats. Understanding how climate change will impact these habitats is necessary to inform decisions about habitat conservation and restoration, fisheries management, and coastal and offshore planning. The Council is engaged in several initiatives aimed at assessing and protecting fish habitat.

Photo Credit: Michael Eversmier

Essential Fish Habitat Amendment: The Council is developing an omnibus amendment that will review and update essential fish habitat (EFH) designations for all Council-managed stocks. This action is an opportunity to utilize the best available fish habitat science to improve EFH designations and support the Council's fish habitat conservation efforts. Learn more at Omnibus Essential Fish Habitat Amendment.

Northeast Regional Habitat Assessment (NRHA): The Council also recently collaborated with its science and management partners on a comprehensive assessment of fish habitat distribution, abundance, and quality in the Northeast. This project resulted in a powerful Data Explorer Tool which allows users to explore information on fish distribution, habitat, and more. Learn more at Northeast Regional Habitat Assessment.

Habitat Crosswalk: One particularly useful component of the NRHA Data Explorer is the Habitat Crosswalk, which identifies the dependence or occurrence of species on specific habitat types while conveying information about species and habitat vulnerability to climate change. Learn more at NRHA Habitat Crosswalk.

ADVANCING CLIMATE SCIENCE

Additional research is needed to understand the impacts of climate change on Mid-Atlantic fisheries. The Council is involved in several research efforts to address these climate data gaps.

Short-Term Forecasts of Species Distributions for Fisheries Management: The Council and Rutgers University are developing forecast models to predict short-term climate-induced distribution changes for four economically important Mid and South Atlantic managed species (summer flounder, spiny dogfish, *Illex* squid, and gray triggerfish). Learn more here.

Expansion of the South Atlantic Deepwater Longline (SADL) Survey: The Council is collaborating with the NOAA Fisheries' Southeast and Northeast Fisheries Science Centers and the South Atlantic Fishery Management Council to expand the SADL survey north to include areas off Virginia, Maryland, Delaware, and New Jersey. The SADL survey currently uses industry fishing vessels to collect information on a variety of deepwater species, such as golden and blueline tilefish, from the Florida Keys to the NC/VA border. The expansion of the survey will allow scientists and managers to monitor potential distribution shifts of deepwater species and collect information on blueline tilefish throughout its range.

Climate/Ecosystem Terms of Reference for Stock Assessments: in 2020, the Northeast Region Coordinating Council implemented a new stock assessment process designed to improve the quality, timing, and planning of Northeast stock assessments. As part of this process, new Terms of Reference were developed that task scientists with identifying relevant ecosystem and climate influences on a particular stock and how those factors may impact the available data, modeling approaches, reference points, stock status, and projections.

Electronic Reporting: NOAA Fisheries recently implemented the Council's recommendation to require commercial and for-hire fishermen and some private anglers to submit trip reports electronically. The transition from paper to electronic reporting increases the timeliness and accuracy of fishery-dependent data, allowing fishery managers to identify and respond to management issues, including climate-related concerns, more quickly. Learn more at Electronic Reporting.

Back to Top ↑

PLANNING FOR THE FUTURE

Managing fisheries for climate resilience and adaptability requires strategic thinking and long-term planning. The Council uses several planning documents that inform the Council's climate initiatives.

Photo Credit: John McMurray

Strategic Plan: The Council's Strategic Plan serves as the primary framework for setting long-term goals, planning management activities, and tracking progress. The current strategic plan, for the years 2020-2024, contains several climate-related objectives and strategies, plus additional objectives and strategies that indirectly support the Council's response to climate change. Learn more at MAFMC Strategic Plan.

Annual Implementation Plans: Each year, the Council develops a detailed Implementation Plan which describes the management activities the Council expects to undertake in the upcoming year within the context of the Council's five-year strategic plan. This process gives Council members and stakeholders an opportunity to raise new issues and ensures that the Council is continuing to make progress toward long-term goals. Learn more on the Strategic Plan page linked above.

Five-Year Research Priorities: The Magnuson-Stevens Act (MSA) requires that each regional Council develop a five-year research priorities document. The Council's current 5-year research priorities document identifies a number of climate-related research needs. Learn more at 2020-2024 Research Priorities.

Back to Top ↑

ADDITIONAL RESOURCES
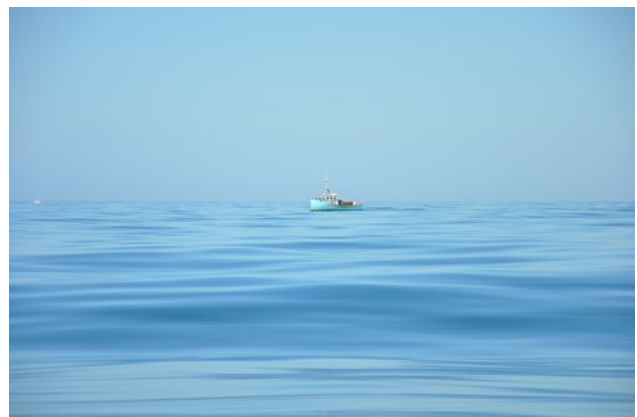
Mid-Atlantic Council

- East Coast Climate Change Scenario Planning
- MAFMC Climate Science and Fisheries Workshop (2015)
- East Coast Climate Change and Fisheries Governance Workshop (2014)

NOAA/NOAA Fisheries

- Climate Change in the Northeast U.S. Shelf Ecosystem
- The Northeast Shelf: A Changing Ecosystem
- Northeast Regional Climate Action Plan
- NOAA Fisheries Distribution and Analysis Mapping Portal (DISMAP)
- Current Conditions of the Northeast U.S. Shelf Ecosystem
- Climate Vulnerability Assessments
- Integrated Ecosystem Assessment
- NOAA Climate Program Office

Other

- Atlantic States Marine Fisheries Commission Climate Change Page
- Ocean Adapt - Changes in Marine Species Distributions (Rutgers University)

From: Didden, Jason <jdidden@mafmc.org>
Sent: Wednesday, March 8, 2023 4:55 PM
To: Didden, Jason <jdidden@mafmc.org>
Cc: Elizabeth Moore <emoore@Gmri.org>
Subject: RE: March MREP Management Workshop - a few spots left!

Greetings AP'ers!

A few seats opened for this month's March 21-23 (Tues-Thur) **Fisheries Management Workshop** by the Marine Resource Education Program (**MREP**). It's in Hanover, MD near BWI airport.

Travel and hotel costs are covered *for participating attendees.*

MREP is designed by fishermen for fishermen to help them engage in the management process (active fishery participants are prioritized).

If you're interested in attending, please fill out the **short** application at this link: https://mrep.gmri.org/apply.

Council staff participate, and we have not encountered fishermen who regretted attending. Many of you have already attended, but for folks who haven't, please consider applying! Or if you know someone who might be interested, please forward this to them.

If you have questions, you can reach out to me or Liz Moore (cc'd, emoore@gmri.org or 207-228-1680). Liz is the MREP program manager for our area.

Thanks!
Jason

Jason Didden
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MID-ATLANTIC | FISHERY MANAGEMENT COUNCIL

Sending comments? Written comments must be received at the New England Fishery Management Council (NEFMC) office no later than 8:00 a.m., Thursday, April 13, 2023 to be considered at this meeting. Please address comments to Council Chair Eric Reid or Executive Director Tom Nies at: NEFMC, 50 Water Street, Mill 2, Newburyport, MA 01950. Email submissions should be sent to comments@nefmc.org. ** Written comments must address items listed on the agenda for this meeting or issues that will be brought up under the open period for public comment.

IMPORTANT: The Council will hold its April 2023 meeting at the Hilton Hotel in Mystic, CT. A webinar option will be available for individuals who cannot or prefer not to attend in person. The Council continues to follow all public safety measures related to COVID-19 and intends to do so for this meeting. Please participate remotely if you are experiencing COVID symptoms or do not feel well. Updates will be posted on the Council's April 2023 meeting webpage.

PUBLIC COMMENTS: The Council's "Guidelines for Providing Public Comments" can be found here. Anyone interested in speaking during the open period for public comment on Wednesday, April 19, 2023 at 1:45 p.m. should fill out the sign-up sheet on the table at the entrance to the Council meeting room. To speak remotely, email Janice Plante at jplante@nefmc.org to get on the list.

Tuesday, April 18, 2023

9:00 a.m.   **Closed Session** (Council Chair Eric Reid)
Closed session to discuss executive director search

9:30   **Introductions and Announcements** (Council Chair Eric Reid)

9:35   **Reports on Recent Activities**
Council Chair, Council Executive Director, Greater Atlantic Regional Fisheries Office (GARFO) Regional Administrator, National Oceanic and Atmospheric Administration (NOAA) General Counsel, Northeast Fisheries Science Center (NEFSC), Mid-Atlantic Fishery Management Council (MAFMC), Atlantic States Marine Fisheries Commission (ASMFC), U.S. Coast Guard, NOAA Enforcement

10:45   **Monkfish Report** (Libby Etrie)
Update on work to review and improve the Monkfish Research Set-Aside Program

11:00   **Protected Resources – Atlantic Sturgeon** (Staff)
Update on joint New England/Mid-Atlantic Council action to reduce sturgeon bycatch in monkfish and dogfish gillnet fisheries; initiate Monkfish Framework Adjustment 15

11:30   **On-Demand/Ropeless Fishing Gear Conflict Working Group** (Staff)
Update on formation of new working group to address preventing gear conflicts with on-demand/ropeless fishing gear

12:00 p.m.   **NOAA Fisheries National Seafood Strategy** (Michael Rubino, NOAA Fisheries)
Presentation and Council comments on the draft NOAA Fisheries National Seafood Strategy

12:30   **Lunch Break**

1:45   **Socioeconomic Survey of Hired Captains and Crew in New England and the Mid-Atlantic** (Matt Cutler, NEFSC)
Presentation on Northeast Fisheries Science Center survey to assess current social/economic conditions of commercial fishing crews; the survey is a follow-up to NEFSC's 2018-2019 study to determine demographic, well-being, and work condition changes over time

2:15   **Enforcement Committee Report** (Pat Keliher)
Enforcement Committee feedback on: (1) on-demand/ropeless fishing gear and Gear Conflict Working Group; (2) Atlantic Salmon Aquaculture Framework; (3) reducing gillnet/protected resources interactions; (4) NOAA Office of Law Enforcement priorities; and (5) Council enforcement-related work priorities for 2023

2:45   **Scallop Committee Report** (Melanie Griffin)
Update on scallop work priorities for 2023, including changes to the Scallop Research Set-Aside Program; **NOTE:** potential scallop fishery access to the Northern Edge will be discussed next under the Habitat Committee report

3:05   **Habitat Committee Report** (Council Chair Eric Reid)
Northern Edge: (1) consider both Habitat Committee and Scallop Committee input, (2) discuss and potentially approve preliminary goals and objectives for possible management action, and (3) consider initiating action to revise the habitat management area (HMA) on the Northern Edge of Georges Bank to authorize scallop fishery access to the area; Aquaculture: final action on framework adjustment to facilitate offshore Atlantic salmon aquaculture; Offshore Energy and Habitat-Related Work: update

Wednesday, April 19, 2023
9:00 a.m.   **Groundfish Committee Report** (Rick Bellavance; SSC Vice Chair Dr. Cate O'Keefe)
Metrics for Amendment 23 Monitoring System Review: (1) progress report on developing performance metrics and indicators for review process to evaluate new groundfish monitoring system under Amendment 23, and (2) Scientific and Statistical Committee feedback on metrics and indicators; Acceptable Biological Catch (ABC) Control Rules: progress report on facilitated process to develop new ABC control rules for groundfish; Atlantic Cod Management Transition Plan: update; Addressing Canadian Halibut Catch Swings in U.S. Management: update; Gulf of Maine Haddock: Council discussion

12:00 p.m.   **Skate Committee Report** (Scott Olszewski)
Update on work under 2023 skate priorities

12:30   **Lunch Break**

1:45   **Open Period for Public Comment**
Opportunity for the public to provide brief comments on issues relevant to Council business but not listed on this agenda (please limit remarks to 3-5 minutes)

2:00   **Ecosystem-Based Fishery Management (EBFM) Committee** (John Pappalardo)
Prototype Management Strategy Evaluation (MSE): progress report on prototype MSE planning meetings for EBFM and the Georges Bank example Fishery Ecosystem Plan (eFEP); EBFM Public Information Workshops: committee advice on conducting deep-dive workshops

2:30   **State of the Ecosystem** (Dr. Sean Lucey, NEFSC)
Presentation on the Northeast Fisheries Science Center's State of the Ecosystem 2023 New England report

3:30   **Scientific and Statistical Committee** (SSC Vice Chair Dr. Cate O'Keefe)
SSC feedback on EBFM pMSE strategy and the State of the Ecosystem 2023 report for New England

4:15   **Congressional Update** (Dave Whaley)
Update on legislative activities; Council discussion

Thursday, April 20, 2023
9:00 a.m.   **Atlantic Herring Committee Report** (Cheri Patterson)
River Herring/Shad: (1) update on coordinated work with ASMFC and MAFMC, and (2) PDT analysis of recent low river herring/shad estimates in the Atlantic herring fishery; Inshore Midwater Trawl Closure: update on action to revisit Amendment 8 closure

12:00 p.m.   **Marine Resource Education Program (MREP)** (Liz Moore, Gulf of Maine Research Institute)
Presentation on the Marine Resource Education Program; overview of science and management components

12:30 p.m.   **Lunch Break**

1:30   **Understanding Uncertainty: Stock Projections** (Staff)
Informational overview and Council discussion on uncertainty in stock projections with two examples from recent frameworks

2:45   **Risk Policy Working Group** (Staff)
Discussion of and decision on terms of reference for revising the Council's Risk Policy; Council guidance to Risk Policy Working Group

3:45   **Other Business**

Times listed next to the agenda items are estimates and are subject to change.
This meeting is being held in person and by webinar. Council member financial disclosure forms are available for examination on the Council website.

Although other non-emergency issues not contained on this agenda may come before this Council for discussion, those issues may not be the subject of formal action during this meeting. Council action will be restricted to those issues specifically listed in this notice and any issues arising after publication of this notice that require emergency action under section 305 (c) of the Magnuson-Stevens Act, provided the public has been notified of the Council's intent to take final action to address the emergency.

Documents pertaining to Council actions are available for review prior to a final vote by the Council.
Please check the Council's website, www.nefmc.org, or call (978) 465-0492 for copies.
This meeting will be recorded. Consistent with 16 USC 1852, a copy of the recording is available upon request.

South Atlantic Fishery Management Council
Update and Liaison Report

March 2023

The South Atlantic Fishery Management Council (Council) met in Jekyll Island, Georgia, March 6-10, 2023. Below is a summary of salient discussions.

Commercial Electronic Logbook Amendment
This amendment is being developed jointly with the Gulf Council to require commercial logbooks be submitted via electronic reporting forms instead of the currently used paper-based forms for the South Atlantic Snapper Grouper, Atlantic Dolphin Wahoo, Atlantic and Gulf of Mexico Coastal Migratory Pelagics, and Gulf Reef Fish Fishery management plans. The Council reviewed progress on the amendment and approved it for public hearings. Additionally, the timeline was revised to have final approval in September 2023.

Snapper Grouper Amendments and Projects
Discard Mortality Reduction & Red Snapper Catch Levels (Regulatory Amendment 35)
Regulatory Amendment 35 was initiated to revise red snapper catch levels to be based on the most recent acceptable biological catch (ABC) recommendations from the SSC and to reduce dead discards of snapper grouper species in response to concerns over impacts of dead discards on allowable catches of snapper grouper species, most notably red snapper.

Staff presented the draft amendment, including a summary of public comment and draft rationale for each action. NMFS SERO discussed potential recreational opportunities for exempted fishing permits for red snapper. NMFS is developing a request for EFP proposals that will be focused on reducing discards of red snapper and testing potential management strategies. A separate path for experimental commercial fishing opportunities is being developed through internal funding.

The Council approved the amendment for formal review.

If approved, the amendment will reduce red snapper catch levels based on the SSC's recommendation and prohibit the use of more than one hook per line for the snapper grouper recreational sector in the South Atlantic EEZ.

Gag and Black Grouper (SG Amendment 53)
Amendment 53 proposes establishing a rebuilding plan and adjusting catch levels for gag in response to the most recent stock assessment (SEDAR 71) and proposes management measure modifications for gag and black grouper. The Council reviewed public hearing comments, approved modifications to the purpose and need, and reviewed rationale for each action. The Council approved the amendment for formal review.

Management Strategy Evaluation for the Snapper Grouper Fishery
The Council is conducting a Management Strategy Evaluation (MSE) to explore long-term management strategies for the South Atlantic snapper grouper fishery. The Snapper Grouper Committee received a presentation on MSEs from Blue Matter Science. Blue Matter Science described preliminary information being included in the MSE, and discussions at the most recent Snapper Grouper AP and SSC meetings. The Committee provided guidance on conceptual management options and key uncertainties.

Private Recreational Permitting (Amendment 46)
Amendment 46 considers the establishment of a private recreational permit and education component for the South Atlantic snapper grouper fishery. The Council reviewed scoping comments and provided guidance on actions and alternatives to develop for discussion in June 2023.

Scamp and Yellowmouth Grouper (Amendment 55)
SEFSC staff presented the results of the SEDAR 68 stock assessment for scamp and yellowmouth grouper. Staff provided an overview of management changes that are needed to incorporate the results from SEDAR 68 into management. The Council directed staff to initiate work on the amendment.

Wreckfish (Amendment 48)
A review of the Wreckfish ITQ Program was completed in 2019 and included recommendations for improvement, particularly with respect to confidentiality issues and related constraints; moving away from a paper coupon-based program to an electronic program; cost recovery; wreckfish permit requirement; allocation issues; offloading sites and times; and economic data collection. Staff reviewed the amendment and NMFS staff provided a presentation on cost recovery in ITQ fisheries. The Council solicited public comment on this amendment during the public comment session and will consider the amendment for formal approval in September 2023.

Coastal Migratory Pelagics Amendments and Projects
Atlantic Spanish Mackerel
At their December 2022 meeting, the Council expressed their frustration with the Atlantic Spanish mackerel assessment (SEDAR 78) and the importance of having accurate catch level recommendations to move forward with needed management discussions. To that end, the Council passed a motion directing the SSC to provide catch level recommendations for Atlantic Spanish mackerel at their April 2023 meeting, either from the updated assessment or using a data-limited approach. SSC Chair Dr. Jeff Buckel updated the Council on the January 2023 SSC

meeting including the terms of reference developed by the Spanish mackerel workgroup and discussion of alternative methods of setting ABCs.

The Council received a letter from the Southeast Fisheries Science Center (SEFSC), stating that the revisions to SEDAR 78 requested by the SSC in January are exploratory in nature and would require extensive rework. The SEFSC recommended the SSC develop its ABC advice based on the assessment and supporting analyses completed to date.

The Council discussed the potential for adding an Atlantic Spanish mackerel research track assessment on the SEDAR schedule. The Committee would like the research track assessment to occur during the same time block as the greater amberjack research track assessment but acknowledges that this may present workload challenges and should be discussed at the next SEDAR Steering Committee meeting.

Port Meetings
In December 2022 the Council directed staff to begin working on a plan to conduct port meetings for king and Spanish mackerel to aid in revising the goals and objectives of the CMP FMP and to gain a comprehensive understanding of the fisheries to improve management efforts. Council staff presented a planning document and received the following guidance:
- Port meetings should focus on the king and Spanish mackerel fisheries (Gulf and Atlantic)
- Port meetings will be open to all members of the public (commercial, for-hire, recreational, and others) interested in discussing the king and Spanish mackerel fisheries.
- As possible, port meetings should be conducted in key communities throughout the Gulf of Mexico and along the Atlantic up to the southern end of Massachusetts. As such, working with the Gulf of Mexico, Mid-Atlantic, and New England Fishery Management Councils, the Atlantic States Marine Fisheries Commission, and state agencies will be integral to the success of port meetings.
  - This is especially important given the joint nature of the CMP FMP and the need to concur with the Gulf Council on modifications to the FMP goals and objectives.
- After port meetings have been conducted, staff will develop a final report that includes notes from all port meetings conducted and a thematic analysis identifying patterns and themes among the different port meetings.

Habitat Projects
Habitat Blueprint
In 2020 the Council set out to re-state and evaluate its goals and objectives pertaining to EFH in the South Atlantic region and relative to meeting mandates under the Magnuson-Stevens Act. This effort resulted in this *Habitat Blueprint*, which the Council intends to use as a guide to better focus activity that supports these mandates in a coordinated and effective manner with regional and state partner agencies. Work on the project was interrupted by other priorities but the Council is re-initiating it with the intent of completing the Blueprint in September 2023. Council staff provided background on the development of the Blueprint, an overview of Habitat Blueprint Workgroup progress and anticipated work for 2023.

Essential Fish Habitat Policies and 5-year Review

The Council is undertaking revisions to existing EFH policies and a review of current EFH designations to satisfy 5-year review requirements. Work will be conducted throughout 2023 and will be initially coordinated through the Habitat and Ecosystem-Based Management Advisory Panel.