April 2020 Council Meeting Webinar

Tuesday, April 7 – Wednesday, April 8, 2020

Due to public health concerns related to the spread of COVID-19 (coronavirus), the Mid-Atlantic Fishery Management Council's April meeting will be conducted by webinar only. This webinar-based meeting replaces the in-person meeting previously scheduled to be held in Galloway, New Jersey.

Briefing materials and webinar connection information will be posted on the Council's website at http://www.mafmc.org/briefing/april-2020.

Agenda

Tuesday, April 7th

1:00 p.m. — **Council Convenes**

1:00 p.m. - 2:00 p.m. — **2020 Mid-Atlantic State of the Ecosystem Report (Tab 1)**
Dr. Sarah Gaichas - NEFSC

2:00 p.m. – 3:30 p.m. — **Climate Change Scenario Planning (Tab 2)**
- Introduction to scenario planning and plan for potential East Coast/Mid-Atlantic scenario planning exercise

3:30 p.m. – 4:30 p.m. — **Black Sea Bass Commercial State Allocation Amendment (Tab 3)**
- Review scoping plan and document

4:30 p.m. — **Council Adjourns**

Wednesday, April 8th

9:00 a.m. — **Council Convenes**

9:00 a.m. - 9:30 a.m. — **South Atlantic Electronic Reporting (Tab 4)**
- Update on South Atlantic for-hire reporting requirements

9:30 a.m. - 10:30 a.m. — **Blueline Tilefish 2021 Specifications (Tab 5)**
- Review SSC, Advisory Panel, Monitoring Committee, and staff recommendations for 2021 specifications
- Recommend changes to 2021 specifications if necessary

10:30 a.m. - 12:00 p.m. — **Golden Tilefish 2021 - 2022 Specifications (Tab 6)**
- Review SSC, Advisory Panel, Monitoring Committee, and staff recommendations for 2021 - 2022 specifications
- Adopt 2021 - 2022 specifications

12:00 p.m. - 1:30 p.m. **Lunch**

1:30 pm. – 3:30 p.m. **Business Session**

Committee Reports (Tab 7)
- Scientific and Statistical Committee Report

Executive Director's Report (Tab 8)
Chris Moore

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

Liaison Reports (Tab 9)
- New England Council
- South Atlantic Council

Continuing and New Business

MAFMC February 2020 Council Meeting
Duck, NC

Implementation Plan
Move to approve the 2020 Implementation Plan as presented today.
Wilke/Heins
Motion carries by unanimous consent

SSC Membership
Move to approve the following individuals to the Mid-Atlantic Scientific and Statistical Committee for a 3-year term beginning March 1, 2020:

Dr. Alexei Sharov (Stock Assessment)
Dr. Gavin Fay (Fisheries Biologist/Ecologist)
Dr. Geret DePiper (Economist/Social Scientist)
Dr. Jorge Holzer (Economist/Social Scientist)

Elliott/DiLernia
Motion carries by unanimous consent

Review and Approve Public Hearing Document for MSB Goals and Objectives and Illex Permit Amendment
Goals and Objectives
Council consensus to accept Committee change.
(Objective 2.4 will now be: "Investigate opportunities to access international/shared resources of MSB species.")

Simplification of alternatives - Committee recommendation by consensus
Council consensus to accept Committee recommendation.
(Removed 2004-2013 re-qualification period, 1997-2013 plus 2014-2018 double re-qualification period, 48,000-pound trip re-qualifier, and 95% of landings re-qualifier).

Move that the Council choose, as its preferred alternative for re-qualification, Alternative A4, landings between 1997-2013 with Alternative B6, a threshold of 500,000 lbs. in a best year between 1997-2013, creating TIER 1, AND Alternative A2, landings between 1997-2019, with Alternative B2, a threshold of 50,000 lbs. in a best year between 1997-2019, creating TIER 2.
Nolan/DiLernia

Motion to divide the above to an alternative addition and whether to identify as preferred.
Nowalsky/Cimino (19/0/0)
Motion carries

Split Motion 1: Move that the Council add a specific alternative for re-qualification: Alternative A4, landings between 1997-2013 with Alternative B6, a

threshold of 500,000 lbs. in a best year between 1997-2013, creating TIER 1, AND Alternative A2, landings between 1997-2019, with Alternative B2, a threshold of 50,000 lbs. in a best year between 1997-2019, creating TIER 2.
Move to amend the motion to change "a specific alternative" to "an example combination of measures."
Nowalsky/DiLernia (19/0/0)
Motion carries

Move that the Council add an example combination of measures for re-qualification: Alternative A4, landings between 1997-2013 with Alternative B6, a threshold of 500,000 lbs. in a best year between 1997-2013, creating TIER 1, AND Alternative A2, landings between 1997-2019, with Alternative B2, a threshold of 50,000 lbs. in a best year between 1997-2019, creating TIER 2.
(Amended Split Motion)
17/2/0
Motion carries

Split motion 2: I move to postpone the preferred alternative until completion of the presentation.
Nowalsky/deFur
Motion carries without objection

Move that the Tier options in the Public Hearing Document be included for public comment.
Hughes for Committee (14/3/2)
Motion carries

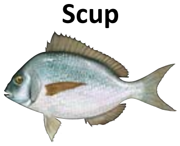
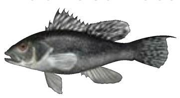
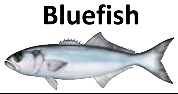
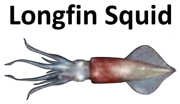
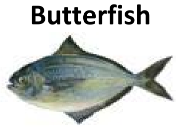
Move that the Council identify D2 (hold baseline) and D3 (VMS) as preferred."
Hughes for Committee (7/7/5)
Motion fails

Postponed split motion 2 on preferred alternative returns:
Move that the Council identify as a preferred combination of measures for re-qualification, Alternative A4, landings between 1997-2013 with Alternative B6, a threshold of 500,000 lbs. in a best year between 1997-2013, creating TIER 1, AND Alternative A2, landings between 1997-2019, with Alternative B2, a threshold of 50,000 lbs. in a best year between 1997-2019, creating TIER 2.
6/11/2
Motion fails

Move to take the document out as amended today for public hearings.
DiLernia/Nolan (19/0/0)
Motion carries

Stock Status of MAFMC-Managed Species

(as of 3/23/20)

SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	**Overfished** ½ B_{MSY}		
Summer Flounder 	$F35\%_{MSP}=0.448$	63 million lbs	No overfishing Not overfished	Most recent benchmark assessment was 2018.
Scup 	$F40\%_{MSP}=0.215$	103.64 million lbs	No overfishing Not overfished	Most recent operational assessment was 2019.
Black Sea Bass 	$F40\%_{MSP}=0.46$	15.53 million lbs	No overfishing Not overfished	Most recent operational assessment was 2019.
Bluefish 	$F_{35\%SPR}=0.183$	219.05 million lbs	No overfishing Overfished	Most recent operational assessment was 2019.
***Illex* Squid (short finned)** 	Unknown	Unknown	Unknown Unknown	Most recent benchmark assessment was 2006; not able to determine current exploitation rates or stock biomass.
Longfin Squid 	Unknown	46.7 million lbs	Unknown Not overfished	Most recent assessment update was 2017; not able to determine current exploitation rates.
Atlantic Mackerel 	$F_{40\%}=0.26$	217.0 million pounds	Overfishing Overfished	Most recent benchmark assessment was 2017
Butterfish 	$F_{Proxy}=2/3M$ $=0.81$	50.3 million lbs	No overfishing Not overfished	Most recent assessment update was 2017.

SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	**Overfished** ½ B_{MSY}		
Surfclam 	$F/F_{threshold} = 1$[a]	$SSB/SSB_{threshold} = 1$[b]	No overfishing Not overfished	Most recent benchmark assessment was 2016.
Ocean Quahog 	$F/F_{threshold} = 1$[c]	$SSB/SSB_{threshold} = 1$[d]	No overfishing Not overfished	Most recent benchmark assessment was 2017.
Golden Tilefish 	$F_{38\%MSP}=0.310$	10.46 million lbs	No overfishing Not overfished	Most recent assessment update was 2017.
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 update was 2018.
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	Recent benchmark failed peer review and invalidated previous 2010 benchmark assessment results. Operational assessment in 2019 used survey data to scale earlier ABC.
Chub Mackerel 	At least 3,026 MT of catch per year[e]	At least 3,026 MT of catch three years in a row[e]	No overfishing Not overfished	No stock assessment.

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 $SSB_0/4$

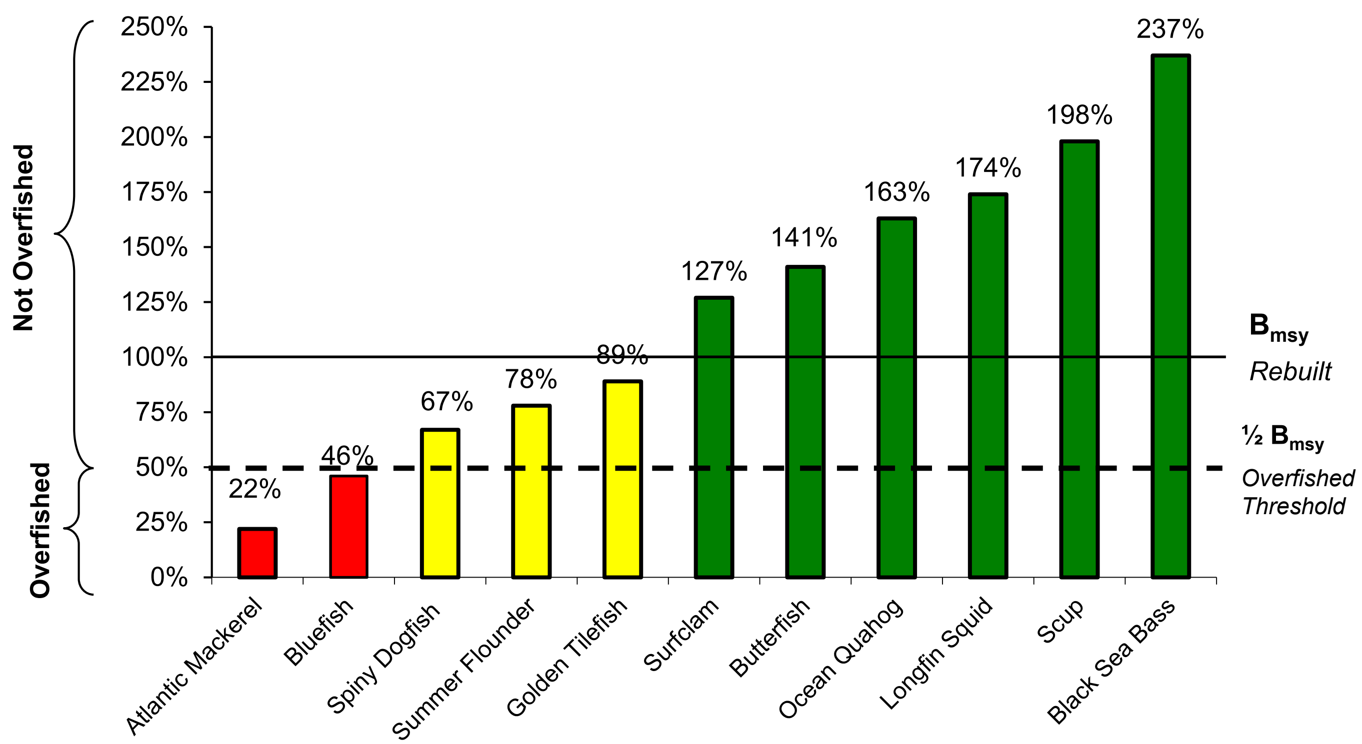
[c] $F_{threshold}$ is 0.019

[d] $SSB_{threshold}$ is calculated as $0.4*SSB_0$

[e] The Council approved these chub mackerel status determination criteria in March 2019; however, they have not yet been approved by NOAA Fisheries.

Stock Size Relative to Biological Reference Points

(as of 3/23/20)



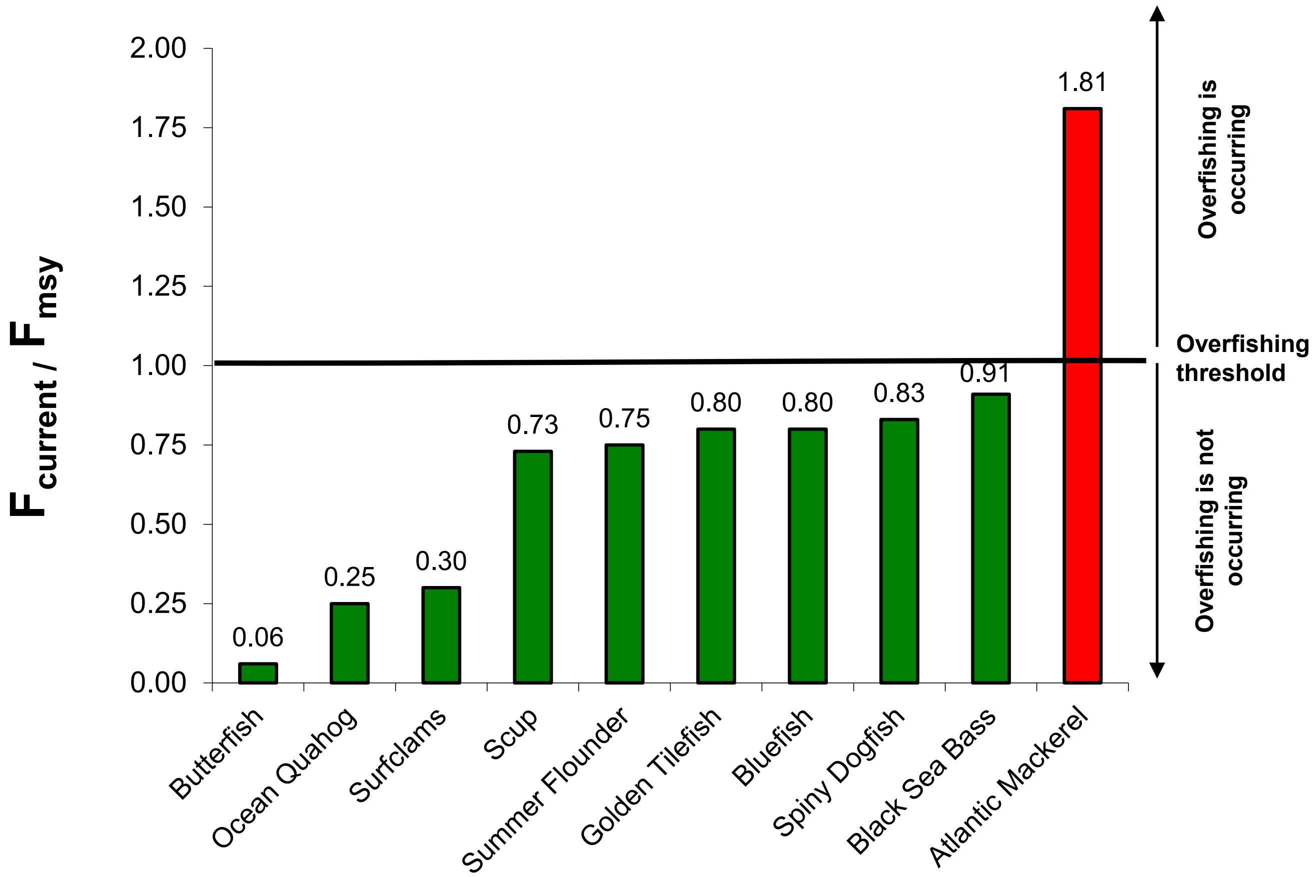
Notes:

- Unknown B_{msy} - *Illex* squid, monkfish (NFMA & SFMA), blueline tilefish (North of Cape Hatteras)
- Of the 14 stocks managed by the Council, 6 are above B_{msy}, 5 are below B_{msy}, and 3 are unknown.
- In March 2019, the Council approved an amendment with management measures for Atlantic chub mackerel. These measures have not yet been approved by NOAA Fisheries. Chub mackerel B_{msy} is unknown.

Year of data used to determine stock size	
Atlantic Mackerel	2016
Black Sea Bass	2018
Bluefish	2018
Butterfish	2016
Golden Tilefish	2016
Longfin Squid	2016
Ocean Quahog	2016
Spiny Dogfish	2018
Surfclam	2015
Scup	2018
Summer Flounder	2017

Fishing Mortality Ratios for MAFMC-Managed Species

(as of 3/23/20)



Year of data used to determine stock size	
Atlantic Mackerel	2016
Black Sea Bass	2018
Bluefish	2018
Butterfish	2016
Golden Tilefish	2016
Ocean Quahog	2016
Spiny Dogfish	2017
Surfclam	2015
Scup	2018
Summer Flounder	2017

Notes:

- Unknown fishing mortality: *Illex* squid, Longfin squid, monkfish (NFMA and SFMA), and blueline tilefish (North of Cape Hatteras).
- In March 2019, the Council approved an amendment with management measures for Atlantic chub mackerel. These measures have not yet been approved by NOAA Fisheries. The chub mackerel fishing mortality rate is unknown.

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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

MEMORANDUM

Date: March 25, 2020

To: Council

From: Brandon Muffley, Staff

Subject: State of the Ecosystem and EAFM Update – Meeting Materials

On Tuesday, April 7, 2020, Dr. Sarah Gaichas (NEFSC) will present the 2020 Mid-Atlantic State of the Ecosystem report. Dr. Gaichas will also summarize the updates and changes in the 2020 EAFM risk assessment. The Council will review the findings and ecosystem considerations contained in both documents and provide any feedback on the future development and utility of the information provided. Due to changes in the April meeting agenda, an update on other EAFM related projects will not be presented but a briefing memo on those topics is provided.

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

Materials behind the tab:

1. 2020 Mid-Atlantic State of the Ecosystem report
2. State of the Ecosystem response memo
3. 2020 EAFM Risk Assessment update report
4. Staff memo – EAFM activities update
5. Fact sheet - Short-term distribution forecast research

NOAA FISHERIES

2020 State of the Ecosystem
Mid-Atlantic

Total commercial fishery landings were scaled to ecosystem productivity. Primary production required to support Mid-Atlantic commercial landings has been declining since 2000.

Engagement in commercial fishing has declined since 2004 for medium to highly engaged Mid-Atlantic fishing communities. This may be related to the overall downward trend in commercial landings since 1986 and the decline in total revenue since 2004.

2018 retained recreational catch in the Mid-Atlantic was the lowest observed since 1982. There is also a similar, although less steep decline in recreational fishing effort. The party/charter sector is expected to continue to shrink. Recreational species catch diversity has been maintained by increased catch of South Atlantic and state managed species.

Habitat modeling indicates that summer flounder, butterfish, longfin squid, and spiny dogfish are among fish species highly likely to occupy wind energy lease areas. Habitat conditions for many of these species have become more favorable over time within wind lease areas.

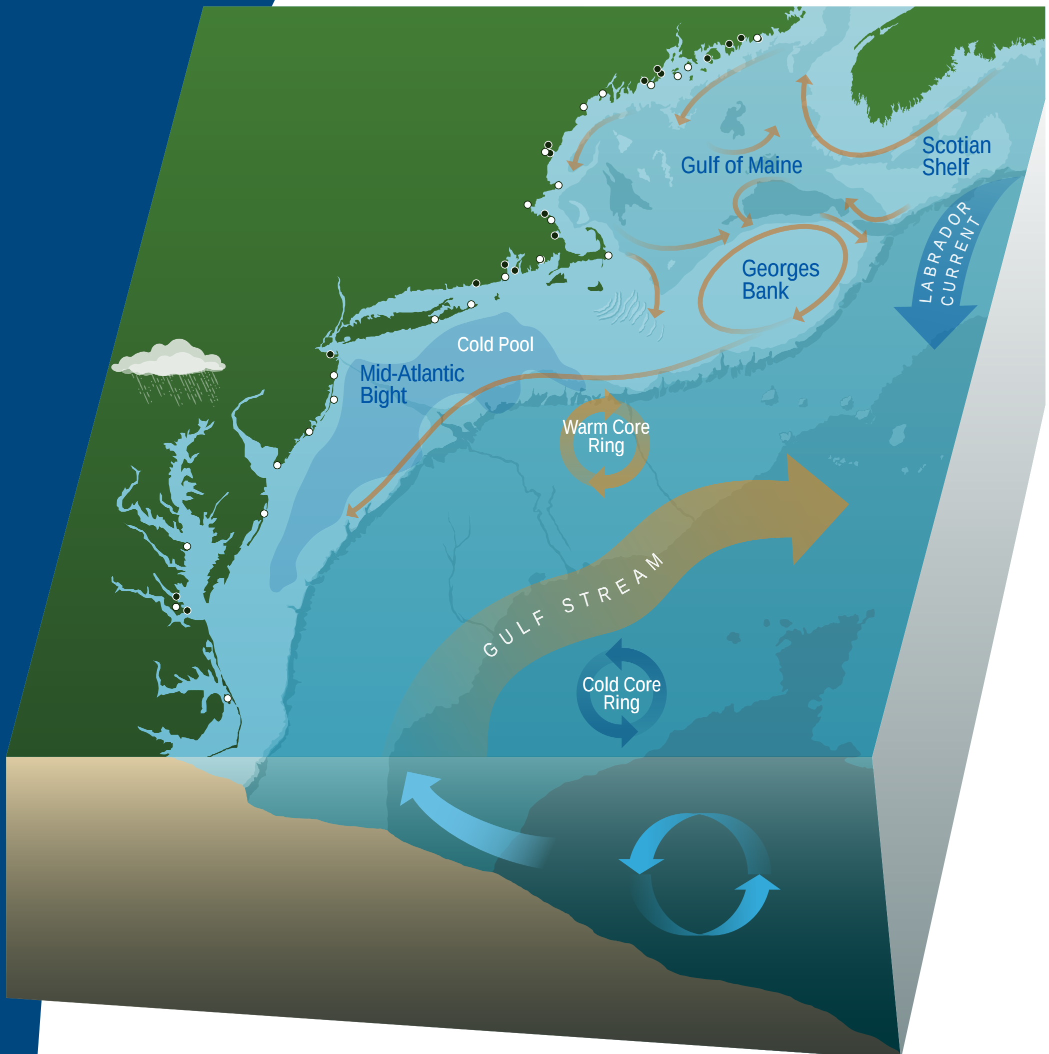
There are no apparent trends in aggregate biomass of predators, forage fish, bottom feeders, and shellfish sampled by trawl surveys, implying a stable food web. However, we continue to see a northward shift in aggregate fish distribution along the Northeast US shelf and a tendency towards distribution in deeper waters.

Forage fish energy content is now being measured regularly, revealing both seasonal and annual variation in energy of these important prey species due to changing ecosystem conditions. Notably, Atlantic herring energy content is half what it was in the 1980-90s.

Nearshore habitats are under stress. Heavy rains in 2018-2019 resulted in unprecedented fresh water and high nutrient flow into the Chesapeake Bay, driving low oxygen, increased oyster mortality, and spread of invasive catfish in this critical Mid-Atlantic nursery habitat. Sea level rise is altering coastal habitats in the Mid-Atlantic, driving declines in nesting seabirds on Virginia islands.

The Northeast US shelf ecosystem continued to experience warm conditions in 2019, with changes in ocean circulation affecting the shelf. The Gulf Stream is increasingly unstable, with more warm core rings resulting in higher likelihood of warm salty water and associated oceanic species such as shortfin squid coming onto the shelf.

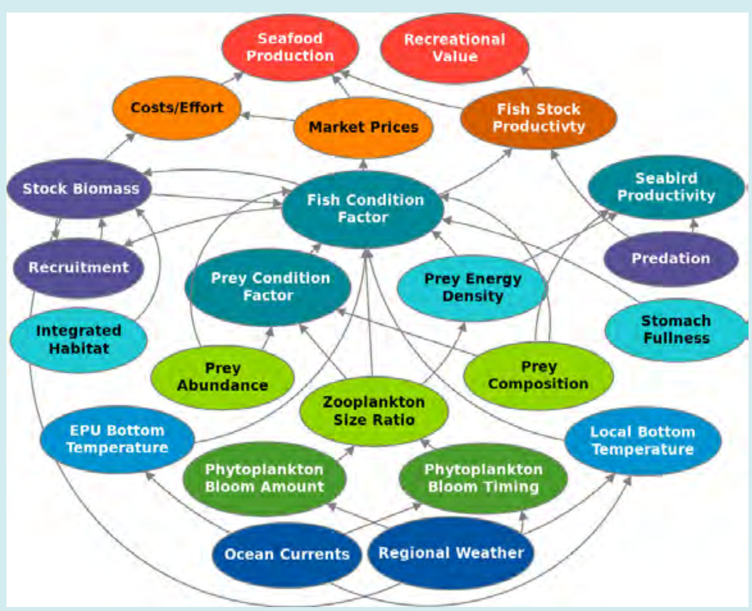
The intensity and duration of marine surface heatwaves are increasing, and bottom temperatures both in the seasonal Mid-Atlantic cold pool and shelfwide are increasing. Warmer temperatures increase nutrient recycling and summer phytoplankton productivity.



The Northeast US Shelf is one of the most productive marine ecosystems in the world. Changes in climate, nearshore, and oceanographic processes as well as human uses affect productivity at all trophic levels and impact fishing communities and regional economies.

Research Spotlight

Fish condition, "fatness", is an important driver of population productivity. Condition is affected by changing habitat (e.g. temperature) and ecosystem productivity, and in turn can affect market prices. We are investigating potential factors influencing fish condition to better inform operational fishery management decisions.



Report Structure

The major messages of the report are synthesized in the 2-page summary, above. The information in this report is organized around general ecosystem-level management objectives (Table 1), and indicators related to these objectives are grouped into four general categories in the four sections below: economic and social, protected species, fish and invertebrates, and habitat quality and ecosystem productivity. Each section begins with a summary of main messages with links to other sections, including any new information added at the request of the Fishery Management Councils, and includes figures with brief descriptions of all current indicators. Detailed technical methods documentation[1] and indicator data[2] are available online. The details of standard figure formatting (Fig. 37a), categorization of fish and invertebrate species into feeding groups (Table 4), and definitions of ecological production units (EPUs, including the Mid-Atlantic Bight, MAB; Fig. 37b) are provided at the end of the document.

Table 1: Established ecosystem-scale objectives in the Mid-Atlantic Bight

Objective Categories	Indicators reported here
Seafood Production	Landings by feeding guild
Profits	Revenue decomposed to price and volume
Recreation	Days fished; recreational catch
Stability	Diversity indices (fishery and species)
Social & Cultural	Commercial engagement trends
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

Economic and Social

The objectives of U.S. federal fishery management include providing benefits to the Nation in terms of seafood production and recreational opportunities, while considering economic efficiency and effects on coastal communities. The indicators in this section consider these objectives for commercial and recreational fishing sectors separately where possible.

Despite mostly meeting fishery management objectives at the single species level (Fig. 14), long term declines in total seafood production and commercial revenue remain apparent. Indicators highlight a declining diversity of recreational opportunities (fishing modes and species). Further, coastal communities with high fishery engagement and reliance are dependent on a smaller number of species than historically, these species are predominantly high valued shellfish vulnerable to increased ocean temperature and acidification. New analysis of wind energy lease areas and modeled habitat occupancy highlights which species are most likely to be found in wind development areas seasonally (Fig. 10).

Commercial sector (MAB)

The amount of potential yield we can expect from a marine ecosystem depends on the amount of production entering at the base of the food web, primarily in the form of phytoplankton; the pathways this energy follows to reach harvested species; the efficiency of transfer of energy at each step in the food web; and the fraction of this production that is removed by the fisheries. Species such as scallops and clams primarily feed directly on larger phytoplankton species and therefore require only one step in the transfer of energy. The loss of energy at each step can exceed 80-90%. For many fish species, as many as 2-4 steps may be necessary. Given the trophic level and the efficiency of

[1] https://NOAA-EDAB.github.io/tech-doc
[2] https://github.com/NOAA-EDAB/ecodata

energy transfer of the species in the ecosystem the amount phytoplankton production required (PPR) to account for the observed catch can be estimated.

Primary production required has declined over the past 20 years (Fig. 1). There is also an apparent cyclical pattern. The overall trend is largely driven by the decrease in landings with an increase in primary production over the same period. The landings in many of the years are dominated by species at lower trophic levels (scallops and clams). The periodicity in the PPR index reflects both the periodicity in primary production (see Fig. 36) and the periodicity in the closed areas for scallop harvest.

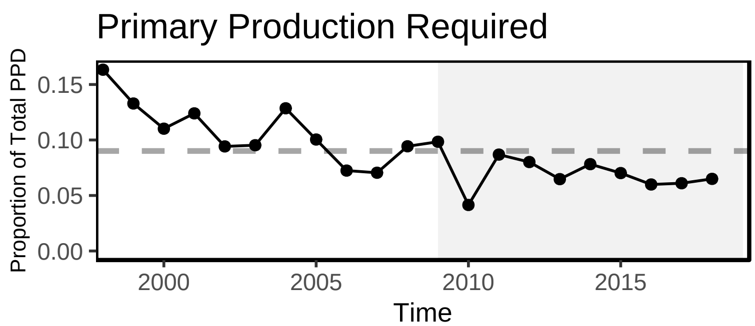


Figure 1: Primary production required to support MAB commercial landings. Included are the top species accounting for 80% of the landings in each year, with 15% transfer efficiency assumed between trophic levels.

Total seafood landings and MAFMC managed species seafood landings have declined over the long term (Fig. 2) with a slight increase 2016-2018. Seafood landings for feeding guilds are also stable or declining overall (Fig. 3), although landings of piscivores and planktivores increased in the MAB. Recent increased landings of *Illex* squid are apparent in the piscivores guild (attributed to the planktivores guild in previous reports). Landings of apex predators are available for 2016-2018 but trends are not detectable in this short time series.

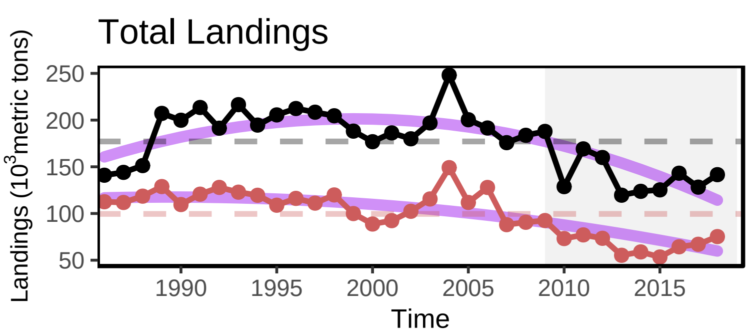


Figure 2: Total commercial seafood landings (black) and Mid-Atlantic managed seafood landings (red).

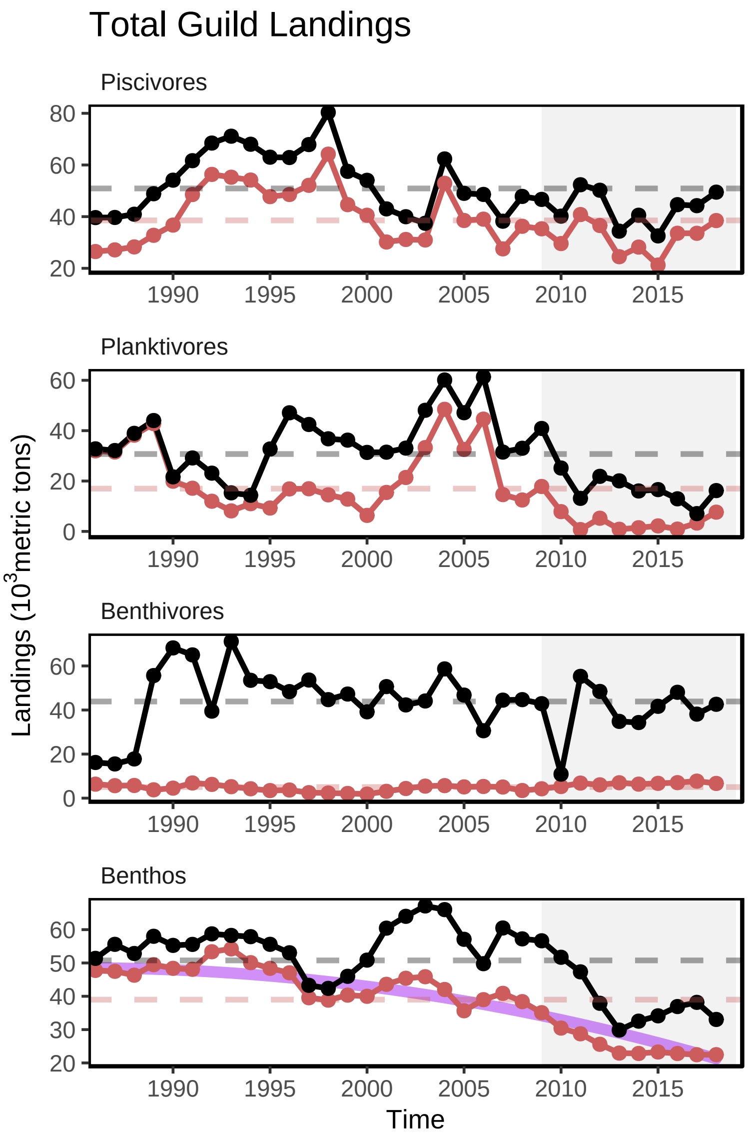


Figure 3: MAFMC managed species landings (red) and total commercial landings (black) by feeding guild.

Revenue for MAFMC managed species has also declined over the long term (Fig. 4), with recent decreases in total revenue driven by decreased prices compared to the 2015 baseline (Fig. 5).

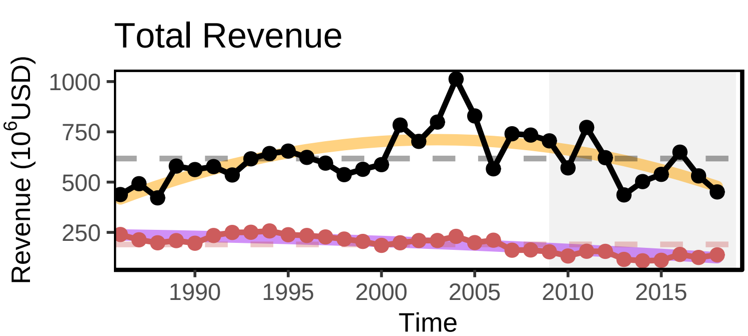


Figure 4: Total revenue for the region (black) and revenue from MAFMC managed species (red).

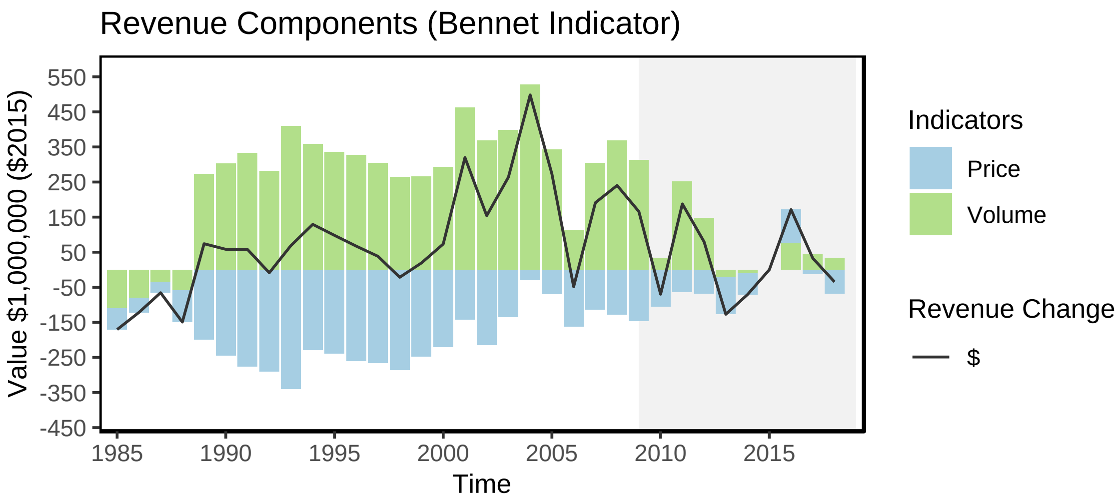


Figure 5: Revenue change from the 2015 base year in 2015 dollars (black), Price (PI), and Volume Indicators (VI) for commercial landings in the Mid-Atlantic.

Commercial fleet diversity indices were updated with 2018 data and remain near the long term average[3].

Commerical fishery engagement measures the number of permits, dealers, and landings in a community[4]. The trend in the number of Mid-Atlantic fishing communities that were highly engaged (red bar) in commercial fishing has shown a decrease since 2004 (Fig. 6). Some of the communities that were highly engaged have moved into the moderate (blue bar) or medium-high (green bar) category, and thus the number of moderately to medium-highly engaged communities have increased. Significant changes in engagement scores have also been observed in medium-highly engaged communities. The average engagement score has decreased since 2004. These changes may be driven by the decline in value landed by primary species such as sea scallops in this group of communities.

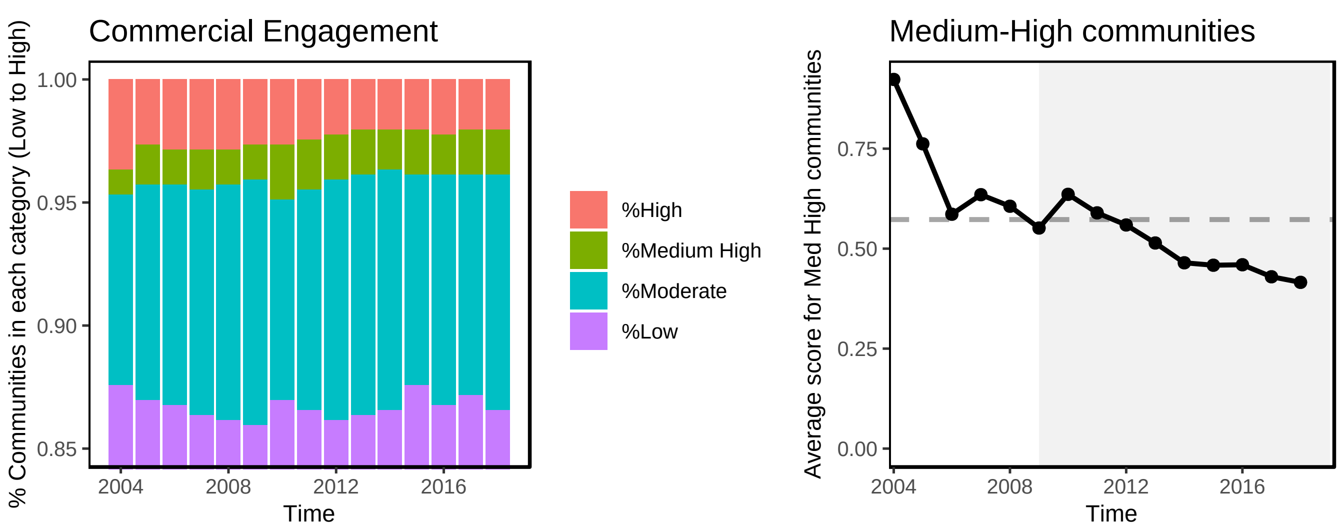


Figure 6: Commercial engagement scores (total pounds landed, value landed, commercial permits, and commercial dealers in a community) for Mid-Atlantic fishing communities, 2004-2018.

[3] https://noaa-edab.github.io/ecodata/human_dimensions#mid-atlantic
[4] https://www.fisheries.noaa.gov/national/socioeconomics/social-indicator-definitions#fishing-engagement-and-reliance-indices

Recreational sector (Mid-Atlantic states)

Indicators for recreational diversity are presented in this report at the request of the MAFMC. In contrast to the commercial seafood production trends, recreational seafood production has been stable since the mid-1990s with the updated MRIP data (Fig. 7). However, 2018 recreational seafood landings were the lowest observed since 1982, with a 47% drop year over year. This drop involved multiple species, including black sea bass, scup, spot, and bluefish, among others and though accompanied by lower recreational effort in 2018, is not fully explained by changes in effort alone. The survey methodology behind these numbers was updated in 2018, and additional years worth of data is needed to understand whether these declines are driven by changes in the precision or other statistical properties of the data.

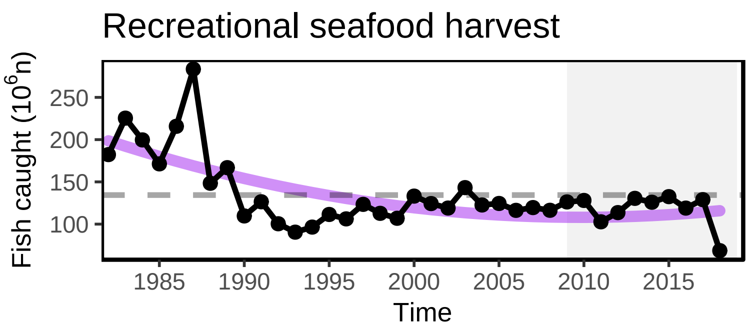


Figure 7: Total recreational seafood harvest in the Mid-Atlantic region.

Updated indicators for recreational opportunities (effort days) show general increases since the 1990s, peaking in the late 2000s and declining since then. This is similar to previously reported trends (Fig. 8).

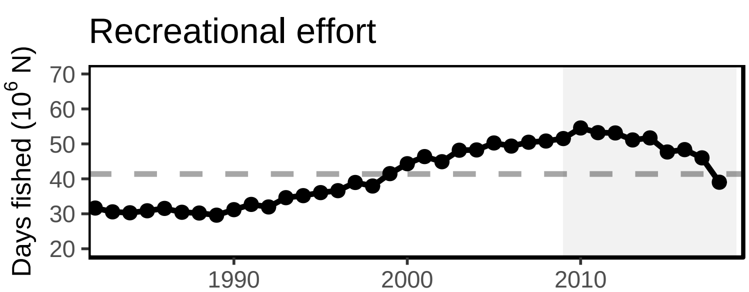


Figure 8: Recreational effort in the Mid-Atlantic.

Indicators for the diversity of recreational effort (i.e. access to recreational opportunities) by mode (party/charter boats, private boats, shore-based), and diversity of catch (NEFMC, MAFMC, SAFMC, and ASMFC managed species) show different trends. The downward effort diversity trend is driven by party/charter contraction (from a high of 24% of angler trips to 7% currently), with a shift towards shorebased angling. Effort in private boats remained stable between 36-37% of angler trips across the entire series. The long-term decrease in species catch diversity in the Mid-Atlantic states reported last year resulted from aggregation of SAFMC and ASMFC managed species into a single group. With SAFMC and ASMFC species considered individually, there is no long term trend in recreational catch diversity. This implies that recent increases in catch of SAFMC and/or ASMFC managed species is helping to maintain diversity in the same range that MAFMC and NEFMC species supported in the 1990s (Fig. 9).

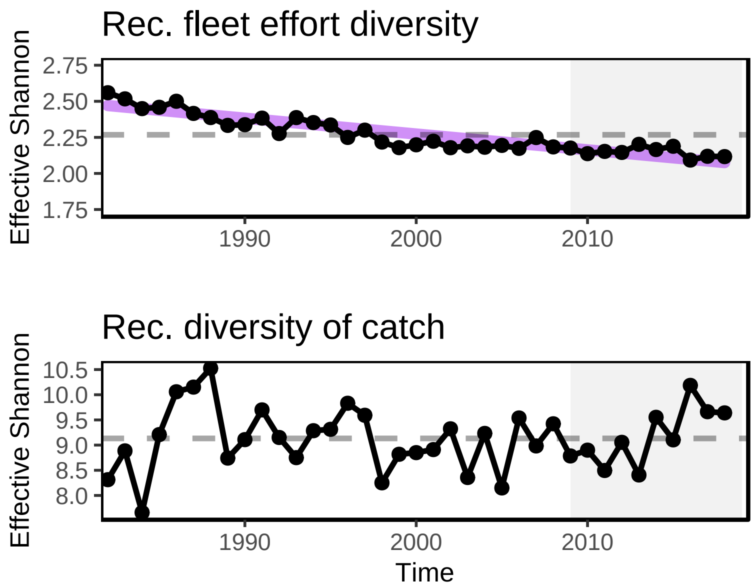


Figure 9: Recreational effort diversity and diversity of recreational catch in the Mid-Atlantic.

Additional social indicators for Mid-Atlantic communities are available online[5].

Fish habitat overlap with offshore wind lease areas (coastwide)

Fish habitat modeling based on NEFSC bottom trawl surveys [1] indicates that summer flounder, butterfish, longfin squid, and spiny dogfish are among fish species highly likely to occupy wind energy lease areas (Fig. 10). Habitat conditions for many of these species have become more favorable over time within wind lease areas (increasing trend in probability of occupancy). Table 2 lists the top 5 species in each season most likely to occupy the wind lease areas in the northern, central, and southern portions of the MAB, along with observed trends in probability of occupancy.

Table 2: Species with highest probability of occupancy species each season and area, with observed trends

	Existing - North		Proposed - North		Existing - Mid		Proposed - Mid		Existing - South	
Season	Species	Trend	Species	Trend	Species	Trend	Species	Trend	Species	Trend
Spring	Little Skate	↗	Atlantic Herring		Little Skate	↗	Spiny Dogfish	↗	Spiny Dogfish	↗
Spring	Atlantic Herring	↘	Little Skate	↗	Atlantic Herring	↘	Atlantic Herring	↘	Longfin Squid	↗
Spring	Windowpane	↗	Longhorn Sculpin	↗	Spiny Dogfish	↗	Little Skate	↗	Summer Flounder	↗
Spring	Winter Skate	↗	Windowpane	↗	Windowpane	↗	Alewife	↘	Clearnose Skate	↗
Spring	Longhorn Sculpin	↗	Alewife	↘	Winter Skate	↗	Silver Hake	↗	Spotted Hake	↗
Fall	Butterfish	↗	Butterfish	↗	Summer Flounder	↗	Longhorn Sculpin	↗	Longfin Squid	↘
Fall	Longfin Squid	↗	Fourspot Flounder		Longfin Squid	↗	Little Skate	↗	Northern Searobin	↗
Fall	Summer Flounder	↗	Longhorn Sculpin	↘	Butterfish	↗	Butterfish	↗	Clearnose Skate	↗
Fall	Winter Flounder	↘	Summer Flounder	↗	Smooth Dogfish	↗	Sea Scallop	↗	Butterfish	↗
Fall	Spiny Dogfish	↘	Spiny Dogfish	↘	Windowpane	↗	Fourspot Flounder	↗	Spiny Dogfish/Spotted Hake	↗

[5]https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/

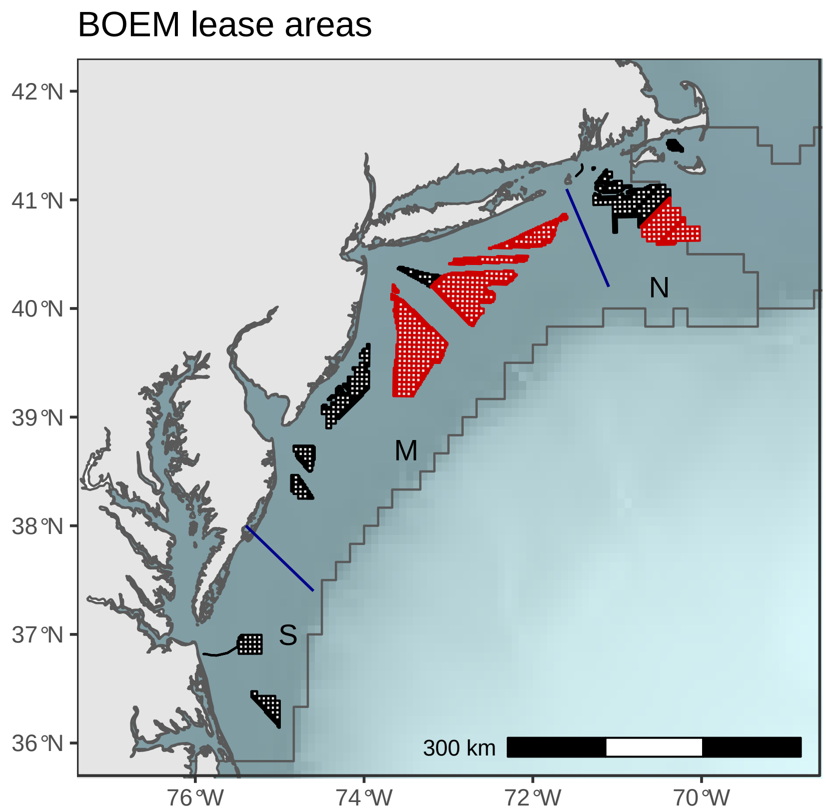


Figure 10: Map of BOEM existing (black) and proposed (red) lease areas in North (N), Mid (M) and South (S) portions of the coast as of February 2019.

Protected Species

Protected species include marine mammals (under the Marine Mammal Protection Act), endangered and threatened species (under the Endangered Species Act), and migratory birds (under the Migratory Bird Treaty Act). In the Northeast US, endangered/threatened species include Atlantic salmon, Atlantic and shortnose sturgeon, all sea turtle species, and 5 baleen whales. Fishery management objectives for protected species generally focus on reducing threats and on habitat conservation/restoration; here we report on the status of these actions as well as indicating the potential for future interactions driven by observed and predicted ecosystem changes in the Northeast US region. Also, a marine mammal climate vulnerability assessment is currently underway and for Atlantic and Gulf of Mexico populations and will be reported on in future versions of this report.

While harbor porpoise bycatch continues to be quite low as reported previously, this year saw the continuation of four Unusual Mortality Events (UMEs) for three large whale species and four seal species, with several mortalities attributed to human interactions. Strong evidence exists to suggest that the level of interaction between right whales and the combination of offshore lobster fishery in the US and snow crab fishery in Canada is contributing substantially to the decline of the species.

Whales (coastwide)

North Atlantic right whales are among the most endangered large whale populations in the world. Changes in right whale trends can have implications for fisheries management where fisheries interact with these whales. Additional management restrictions could have a large impact on fishing times, gears, etc. Although the population increased steadily from 1990 to 2011, it has decreased recently (Fig. 11). Reduced survival rates of adult females and diverging abundance trends between sexes have also been observed. It is estimated that there are only about 100 reproductive adult females remaining in the population. In 2018 there were no new calves observed, and a drop in annual calf production roughly mirrors the abundance decline (Fig. 12), however seven new calves were born in 2019. Right whale distribution has changed since 2010. New research suggests that recent climate driven changes in ocean circulation has resulted in right whale distribution changes driven by increased warm water influx through the Northeast Channel, which has reduced the primary right whale prey (*Calanus finmarchicus*) in the central and eastern portions of the Gulf of Maine.

Three large whale Unusual Mortality Events (UMEs) are ongoing for North Atlantic right whales, humpback whales (117 dead to date since January 2016[6]), and minke whales (80 dead to date since January 2017[7]). In all three cases human interaction appears to have contributed to increased mortalities, although investigations are not complete. Since 2017, 30 right whale mortalities have been documented, 9 in the US and 21 in Canada[8]. During 2019, 9 dead right whales have been documented in Canada and one in the US. Three of these mortalities were determined to have been due to vessel strike while the remainder are undetermined at this time.

[6] https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2020-humpback-whale-unusual-mortality-event-along-atlantic-coast

[7] https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2020-minke-whale-unusual-mortality-event-along-atlantic-coast

[8] https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2020-north-atlantic-right-whale-unusual-mortality-event

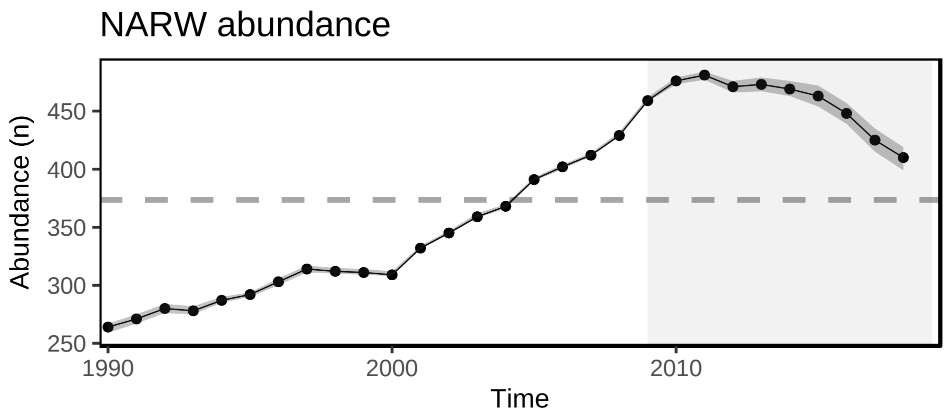


Figure 11: 1990-2018 right whale abundance estimates with 95% credible intervals. These values represent the estimated number of animals alive sometime during the year referenced and NOT at the end of the year referenced. Three known deaths were recorded in 2018, but these deaths were not reflected in the 2018 estimate because those animals were alive sometime during the year. An additional 10 known deaths occurred in 2019.

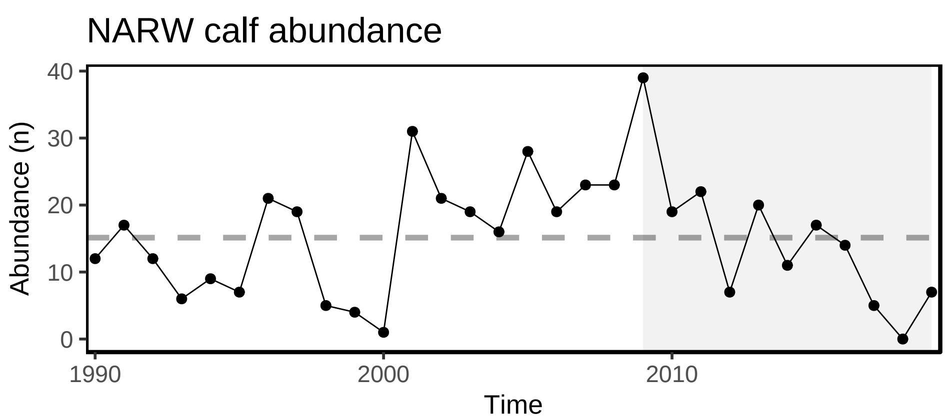


Figure 12: Number of North Atlantic right whale calf births, 1990 - 2019.

Seals (coastwide)

The best current abundance estimate of harbor seals (*Phoca vitulina*) is 75,834 (CV = 0.15), based on a survey conducted during the pupping season in 2012. A population survey was conducted in 2018 to provide updated abundance estimates and these data are in the process of being analyzed, as part of a larger trend analysis. Tagging studies of both gray and harbor seals demonstrate long-range movements throughout the Gulf of Maine and mid-Atlantic.

The number of grey seals (*Halichoerus grypus*) in U.S. waters has risen dramatically in the last 2 decades, with few observed in the early 1990s to roughly 24,000 observed in southeastern Massachusetts in 2015. Roughly 30,000 - 40,000 gray seals were estimated in southeastern Massachusetts in 2015, using correction factors applied to seal counts visible in Google Earth imagery. As of 2016, the size of the grey seal population in Canada, which is part of the same stock as the grey seals in the U.S., was estimated to be roughly 425,000, and increasing by 4% a year. In U.S. waters, the number of pupping sites has increased from 1 in 1988 to 9 in 2019. Mean rates of increase in the number of pups born at various times since 1988 at 4 of the more data-rich pupping sites (Muskeget, Monomoy, Seal, and Green Islands) ranged from -0.2% (95%CI: -2.3 - 1.9%) to 26.3% (95%CI: 21.6 - 31.4%). These high rates of increase provide further support that seals from Canada are continually supplementing the breeding population in U.S. waters. Fisheries interactions have also increased over the past 2 decades, with fewer than 10 total estimated grey seal interactions in 1993, to more than 1000 annually in four out of the last 5 years; this is the highest bycatch of any US marine mammal species.

A UME for both gray and harbor seals was declared in 2018, triggering an investigation into the cause of this event. Tests so far suggest phocine distemper virus as a potential cause, although the investigation is not yet complete. Several cases of phocine distemper in harp (*Pagophilus groenlandicus*) and hooded seals (*Cystophora cristata*) have been identified recently, and these two species have been added to the UME[9].

Current information suggests that gray seals eat primarily sand lance, hakes and flatfish, and squids, while harbor seals consume a variety of groundfish (hakes, cod, haddock, flatfish), redfish, herring and squids, however much of this information comes from juvenile animals and more research is needed on animals at other life stages. Additional analysis of gray and harbor seal diet is currently underway at the NEFSC using a variety of techniques (analysis of stomach contents, fatty acids, and DNA). This information can eventually be coupled with estimates of population abundance and consumption rates to estimate total biomass removals of fish due to pinniped predation.

Nesting waterbird abundance (Virginia)

Many nesting waterbird species on Virginia barrier islands have declined over the last 20-25 years[10]. Between 1993 and 2018, Common Terns declined by 80.6% in coastal Virginia. Considerable declines have been documented in all 3 geographic regions that supported colonies in 1993. These declines have been attributed to habitat loss linked to sea level rise. All functional groups have declined since 1993 (Fig. 13).

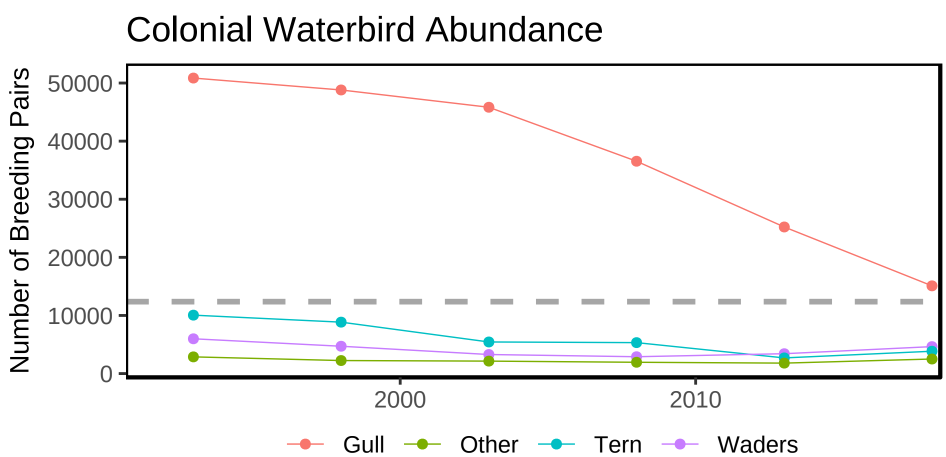


Figure 13: Functional group population estimates derived from Table 4 of Watts, B. D., B. J. Paxton, R. Boettcher, and A. L. Wilke. 2019. Status and distribution of colonial waterbirds in coastal Virginia: 2018 breeding season. Center for Conservation Biology Technical Report Series, CCBTR-19-06. College of William and Mary and Virginia Commonwealth University, Williamsburg, VA. 28 pp.

[9]https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2019-pinniped-unusual-mortality-event-along

[10]https://ccbbirds.org/wp-content/uploads/CCBTR-19-06_Colonial-waterbirds-in-coastal-Virginia-2018.pdf

Fish and Invertebrates

Fishery management aims to keep individual harvested species within population ranges where productivity is maximized over the long-term. However, these managed species represent a subset of the full ecosystem, interacting with a wider range of predators and prey and relying on diverse habitats. Indicators in this section summarize single species status as well as tracking trends for broad categories of fish within the ecosystem, including changes in biomass, distribution, condition, and productivity. Changes in overall predator and prey levels as well as distribution have implications for managed fish productivity, fishing operations, and regional fishery management.

Stock status and aggregate distribution (coastwide)

Single species management objectives of maintaining biomass above minimum thresholds and fishing mortality below limits are being met for all but one MAFMC managed species, though the status of four stocks is unknown (Fig. 14). Bluefish biomass is below the threshold, but fishing mortality was below the limit, while mackerel biomass was below the threshold and fishing mortality was above the limit.

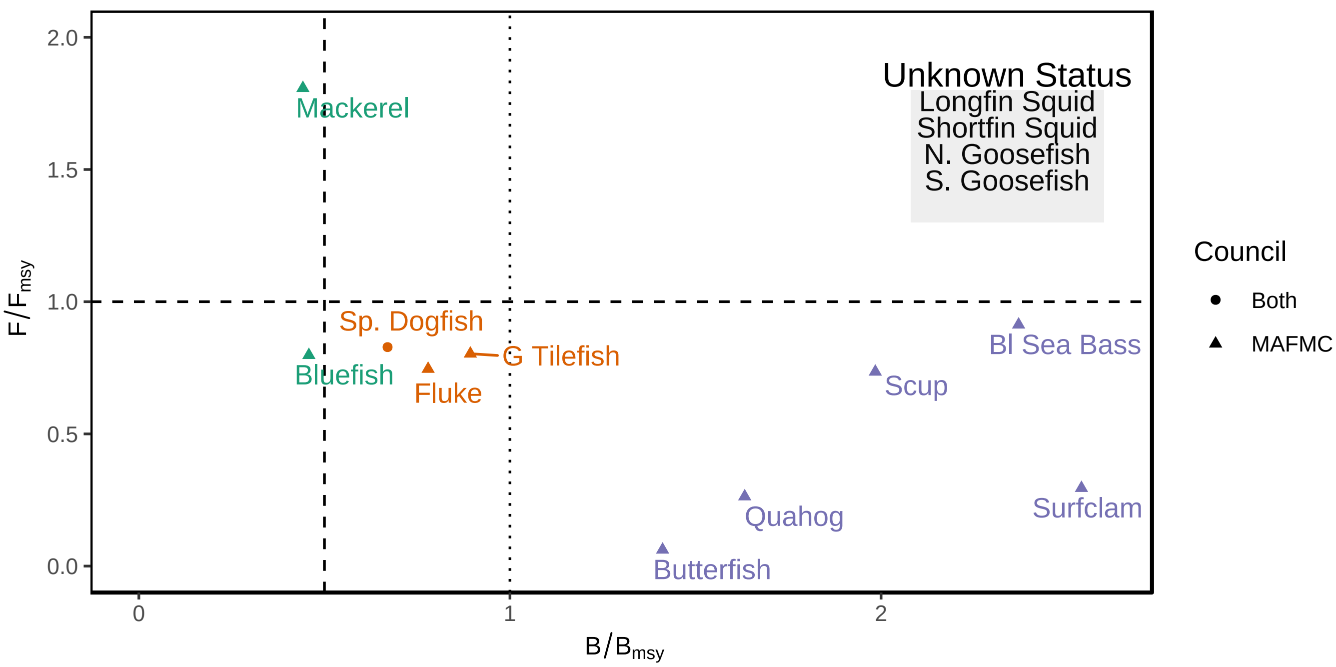


Figure 14: Summary of single species status for MAFMC and jointly managed stocks (Goosefish and Spiny dogfish).

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. 15). We hope to expand analysis beyond fish. Marine mammal distribution maps are available online[11]; updated maps and trends are currently being developed.

[11] https://www.nefsc.noaa.gov/AMAPPSviewer/

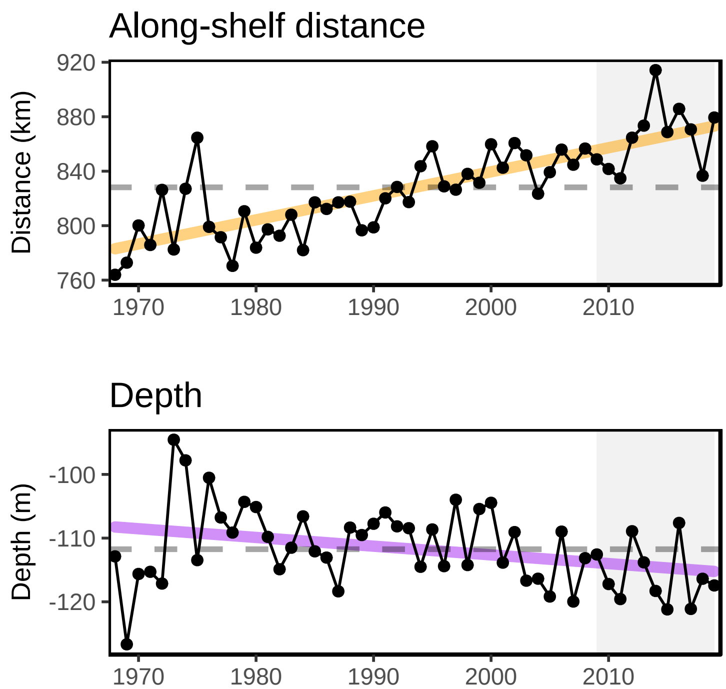


Figure 15: Aggregate species distribution metrics for fish in the Northeast Large Marine Ecosystem. Along-shelf distance measures the center of biomass along an axis oriented from the southwest to the northwest generally following the slope of coastline.

Southeast US fish occurrence (coastwide)

Preliminary analysis of NEFSC trawl survey data shows limited occurrence of South Atlantic Fishery Management Council (SAFMC) managed species groups during the fall, but almost never in spring. Lack of these species on spring surveys suggests that they are not overwintering in our region. There is no detectable trend in fall frequency of occurrence of SAFMC managed species as a group over time, nor are there detectable trends for the most common southeast US shelf species in the trawl surveys: blue runner, Spanish mackerel, chub mackerel, cobia.

Blue runner (*Caranx crysos*) was the southeast US shelf species with the highest frequency of occurrence over time. While there were no detectable trends, recent warm years have led to some observations of blue runner further north within the timing of the fall survey (Fig. 16). Four of the five the most northerly catches have happened since 2010, with the furthest north in 2012 in GOM and 3 on GB in 2018. Other indicators corroborate these observations. For example, butterfish have been observed in Gulf of Maine common tern fledgling diets between 2009-2011 and again in 2018 (New England Report Fig. 13b). As temperature and ocean circulation indicators trend toward extremes (next section), fishery management will likely face continued changes in species distribution.

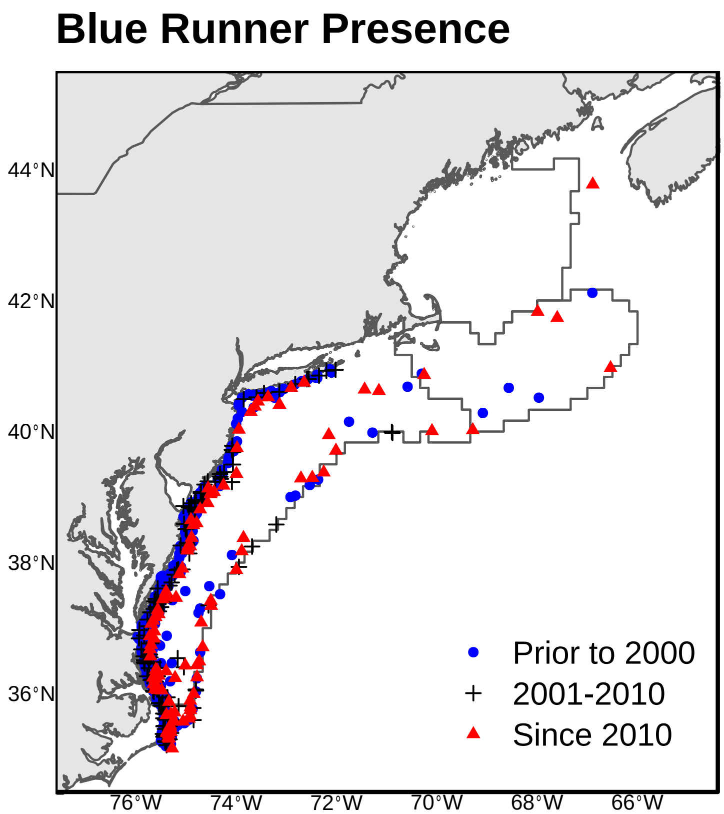


Figure 16: Blue runner presence on Northeast Shelf

Survey biomass (MAB)

Examining trends in biomass by aggregate groups rather than individual species reveals the overall stability of the trophic structure within the system. In past reports we noted several trends in aggregate biomass which might suggest an instability in this structure. This year we include information on survey biomass uncertainty as well as the mean trend. When considering variable catch between survey stations within strata for each year (Fig. 17), several previously identified trends are no longer significant, and others are unlikely to be ecologically significant. For example, our statistical analysis based on annual means suggests that benthivores had a positive trend in spring surveys. However, including sampling variability suggests that this trend is driven by uncertain estimates late in the time series.

Stability in biomass for these aggregate groups would suggest no major disturbances to overall trophic structure in the MAB. Both shelfwide and inshore surveys show stability over time for benthivores and planktivores. Similarly, piscivores and benthos are stable over time in the fall and spring, respectively. Including biomass uncertainty also demonstrates the similarity of trend and often magnitude of estimates between the NEFSC and NEAMAP surveys. These patterns will be explored in more detail using spatio-temporal analyses that include both surveys at once.

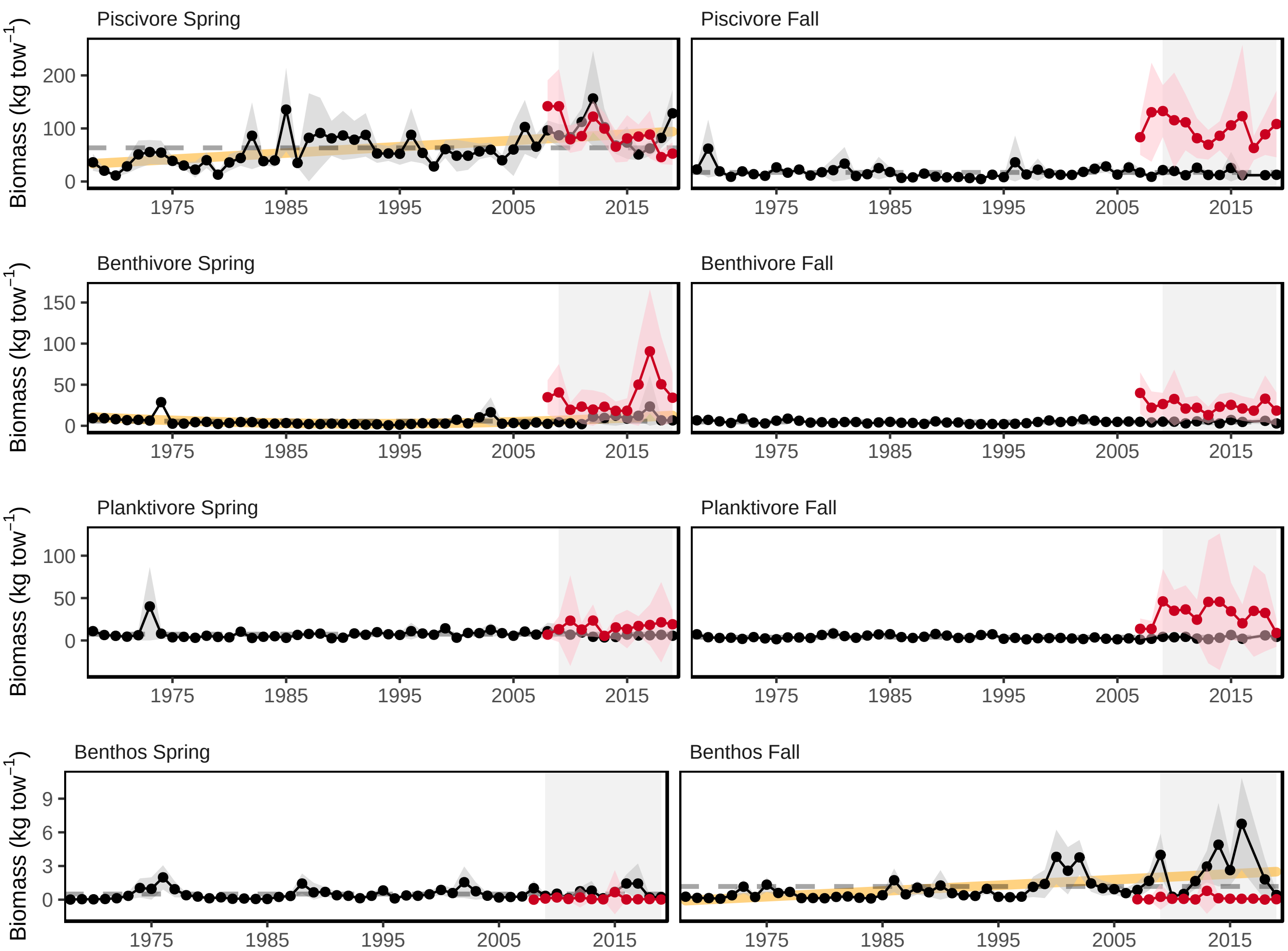


Figure 17: Spring (left) and fall (right) surveyed biomass in the Mid-Atlantic Bight. Data from the NEFSC Bottom Trawl Survey are shown in black, with NEAMAP shown in red. The shaded area around each annual mean represents 2 standard deviations from the mean.

Fish condition (MAB)

Fish condition, a measure of 'fatness' as an indicator of health and a factor that influences fecundity, is measured as the weight at a given length in relation to the average. For this report, females of all species adequately sampled in the Mid-Atlantic Bight portion of the fall NEFSC bottom trawl survey were analyzed (rather than both sexes of MAFMC managed species across the full Northeast US Shelf as in past years). Overall, condition factor has been mixed for the past decade, in contrast to overall high condition up to 2000 and overall lower condition for 2001-2010 (Fig. 18). The timing of these shifts is similar to shifts in the small-large zooplankton indicator (Fig. 36). Condition factor for some MAFMC managed species (bluefish, butterfish) were high in the MAB in 2018-2019. Black sea bass and goosefish have had generally poor condition in the MAB since 2015. Summer flounder condition has varied considerably 2016-2019 in the MAB.

Statistical analyses indicate that these trends in condition may be related to temperature changes and copepod size structure, but are not likely related to density dependence for most species. Fish condition is an important driver of population productivity as well as market prices, so we will investigate these potential links to changing habitat (temperature) and ecosystem productivity to evaluate whether they can inform decisions on annual catch limits. Work will continue over the coming year to explore relationships between fish condition and other indicators in this report (Research Spotlight, p. 2).

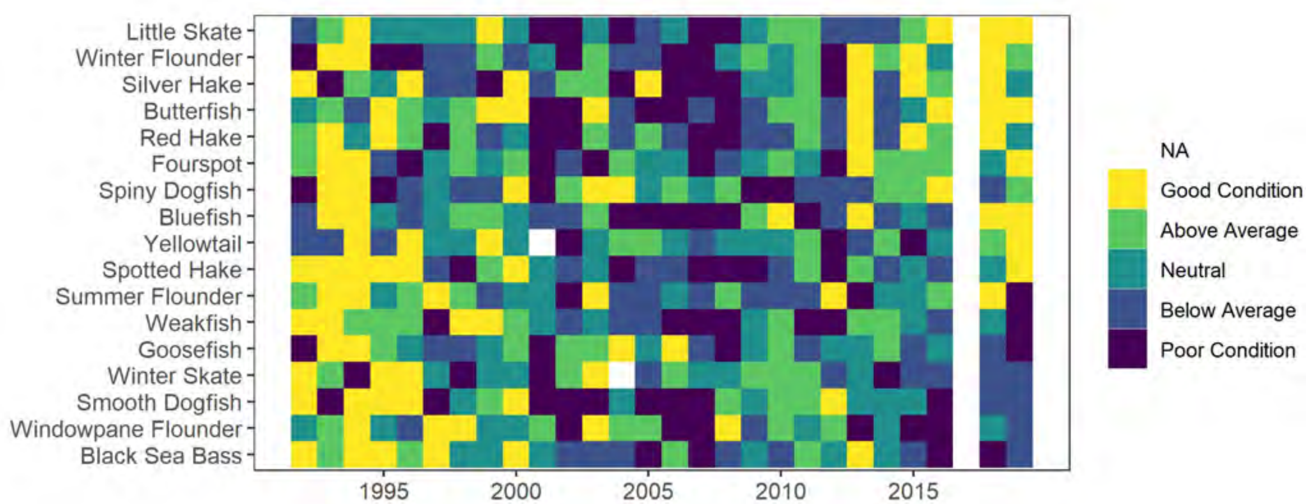


Figure 18: Condition factor for fish species in the MAB. MAB data are missing for 2017 due to survey delays.

Fish productivity (MAB)

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. 19). The indicator shows that fish productivity has been relatively low in this region since 2010, although productivity across all species is trending back up towards average. Species with above average 2018 productivity in the Mid-Atlantic include witch flounder, silver hake and red hake. As for MAFMC managed species in other regions, in 2017 Summer flounder had above average production in the Gulf of Maine while butterfish had above average production on Georges Bank based on this indicator[12]. However, for 2018, it was mainly New England managed species with above average productivity in the New England systems.

[12] https://noaa-edab.github.io/ecodata/InteractiveSOE

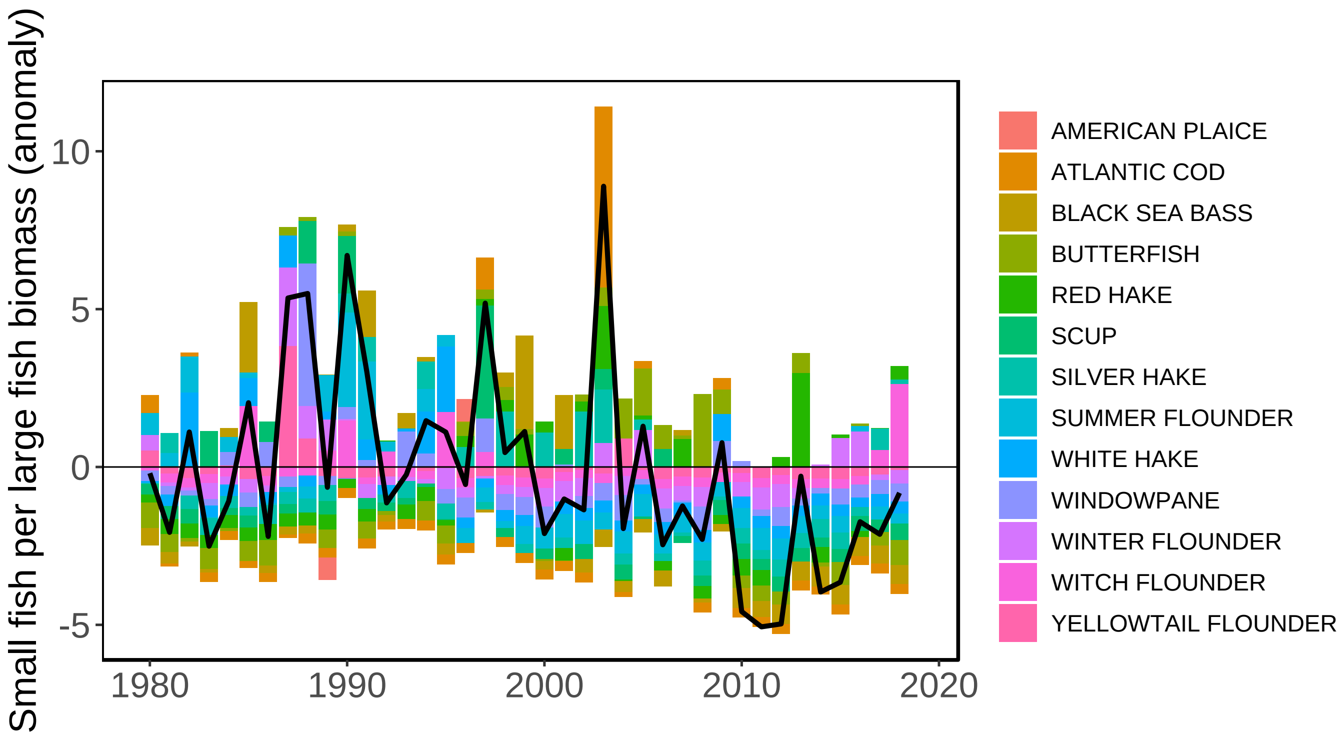


Figure 19: Small fish per large fish biomass anomaly in the Mid-Atlantic Bight. The summed anomaly across species is shown by the black line.

Forage fish energy content (coastwide)

Nutritional value of forage fishes as prey (energy content) is related to both environmental conditions and fish growth and reproductive cycles. Energy content is now being measured systematically on NEFSC trawl surveys, revealing both seasonal and interannual variation as well as differences from older measurements (Table 3). Notably, the energy density of Atlantic herring was almost half the value (5.69 +/- 0.07 kJ/g wet weight) reported in earlier studies (10.6-9.4 kJ/ g wet weight). Silver hake, sandlance, longfin squid (*Loligo* below) and shortfin squid (*Illex* below) were also lower than previous estimates [2,3]. Energy density of Alewife, butterfish and Atlantic mackerel were higher than earlier estimates. Sampling and laboratory analysis is ongoing, with the goal of continuing routine monitoring of energy density of these species.

Table 3: Forage fish mean energy density (ED) mean and standard deviation (SD) by season and year, compared with 1980s (Steimle and Terranove 1985) and 1990s (Lawson et al. 1998) values. N = number sampled.

	2017				2018				Total		1980s	1990s
	Spring		Fall		Spring		Fall					
Species	ED (SD)	N	ED (SD)	N	ED (SD)	N	ED (SD)	N	ED (SD)	N	ED	ED (SD)
Alewife	6.84 (1.62)	128	8.12 (1.46)	50	6.45 (1.21)	47	7.41 (1.6)	42	7.1 (1.62)	267	6.4	
Atl. Herring	5.34 (0.94)	122	5.77 (1.31)	52	6.69 (0.85)	51	5.41 (1.34)	50	5.69 (1.19)	275	10.6	9.4 (1.4)
Atl. Mackerel		NA	7.24 (1.13)	50	5.33 (0.86)	51	6.89 (1.07)	50	6.48 (1.32)	151	6.0	
Butterfish	7.13 (1.59)	65	7.31 (1.45)	89	4.91 (1.12)	53	8.1 (2.7)	50	6.92 (2.04)	257	6.2	
Illex	5.54 (0.4)	77	5.43 (0.51)	52	5.5 (0.52)	50	4.76 (0.79)	50	5.33 (0.63)	229	7.1	5.9 (0.56)
Loligo	5.22 (0.36)	83	5.24 (0.26)	60	4.84 (0.63)	52	4.6 (0.72)	50	5.02 (0.56)	245	5.6	
Sand lance	6.66 (0.54)	18		NA	5.78 (0.34)	60	7.99 (0.74)	8	6.17 (0.81)	86	6.8	4.4 (0.82)
Silver hake	4.25 (0.39)	189	4.42 (0.45)	50	4.19 (0.39)	50	4.55 (0.63)	50	4.31 (0.46)	339	4.6	

Habitat Quality and Ecosystem Productivity

Productivity of harvested fish and protected species, and therefore sustainability of fisheries, depends on adequate habitat, which encompasses physical and chemical conditions and biological productivity at the base of the food web. Many harvested and protected species on the Northeast US shelf occupy several distinct habitats throughout their life cycle, including estuaries, nearshore coastal, and offshore environments. The indicators in this section provide information on the changing conditions encountered by managed species in different seasons and across habitats, which may explain observed changes in species distribution and productivity. New for this year, habitat models were used to determine which species are most likely to occupy offshore wind energy development lease areas. Ultimately, a better understanding of these ecological drivers may permit proactive management in a changing system.

While management limiting nutrient inputs has significantly improved water quality in Chesapeake Bay [4], extremely high precipitation in late 2018-early 2019 led to reduced water quality. Temperature in coastal and offshore habitats continues to trend towards unprecedented levels, accompanied by alterations in ocean circulation patterns. Observed changes at the base of the food web, including timing of production and plankton community composition, affect productivity of protected and managed species in ways we do not yet fully understand.

Estuarine habitat quality (Chesapeake Bay)

Many important MAFMC managed species use estuarine habitats as nurseries or are considered estuarine and nearshore coastal-dependent (summer flounder, scup, black sea bass, and bluefish), and interact with other important estuarine-dependent species (e.g., striped bass and menhaden).

The Chesapeake Bay experienced below average salinity, caused by the highest precipitation levels ever recorded for the watershed throughout 2018 and 2019. Shifts in physical conditions changed the salinity dynamics throughout the Chesapeake Bay environment, impacting habitat conditions and biological responses for multiple species of interest, including eastern oysters, blue crab, striped bass, shad and herring, invasive blue catfish, and underwater seagrasses. Low salinity levels recorded by NOAA Chesapeake Bay Office's Chesapeake Bay Interpretive Buoy System (CBIBS) at Stingray Point showed below-average levels starting in summer 2018 and continuing through spring of 2019 (Fig. 20).

High flows during the winter and spring of Water Year (WY) 2019 came during a critical time of year when the nutrients delivered to the Bay fuel algal blooms, which can cause low dissolved oxygen in the summer. Low dissolved oxygen levels less than 2.0 mg/l (or hypoxia) are harmful to oysters, crabs and fish. The high flows, and associated nutrient loads, during WY 2019 contributed to summer dissolved-oxygen levels in the Bay that were the 3rd lowest recorded in Maryland waters, according to the Maryland Department of Natural Resources[13].

In Maryland, the Spatfall Intensity Index, a measure of oyster recruitment success and potential increase in the population, was 15.0 spat/bu, well below the 34-year median value of 39.8. Blue catfish, an invasive species in the Chesapeake, spread over the last two summers due to the lower salinity levels.

[13] https://www.usgs.gov/center-news/september-hypoxia-report

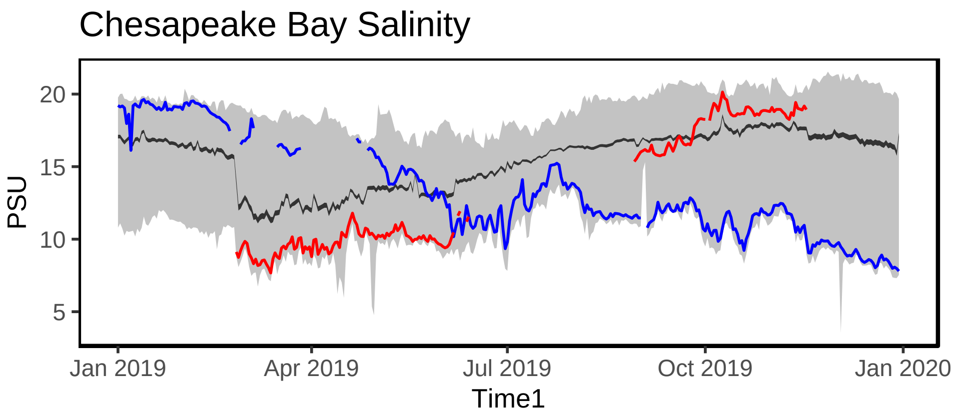


Figure 20: Salinity in Chesapeake Bay throughout 2018 (blue) and 2019 (red) as well as the daily average 2008-2019 (black) and the full observed range 2008-2019 (gray shading).

Estuarine water quality is measured in many other locations coastwide. Work is in progress to evaluate dissolved oxygen, chlorophyll, and nitrogen in NOAA-monitored estuaries throughout the Northeast US to get a better picture of important fishery nursery habitat in the region.

Oceanographic conditions (coastwide)

Globally, 2019 was the 2nd warmest year on record and the last five years have been the warmest in the last 140 years[14].

Since the 1860's, the Northeast US shelf sea surface temperature (SST) has exhibited an overall warming trend, with the past decade measuring well above the long term average (and the trendline; Fig. 21). Changes in the Gulf Stream, increases in the number of warm core ring formations and anomalous onshore intrusions of warm salty water are affecting the coastal ocean dynamics with important implications for commercial fisheries [5].

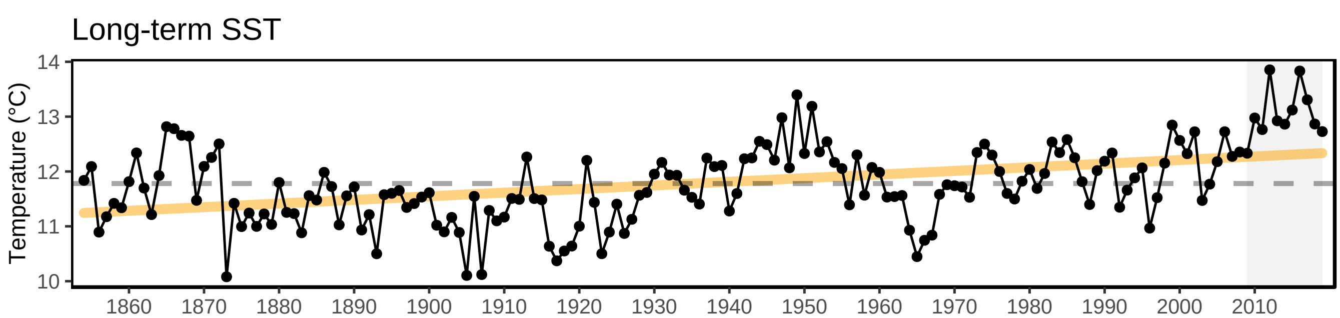


Figure 21: Average annual sea surface temperature (SST) over the Northeast US Shelf

Gulf Stream and Warm Core Rings (coastwide)

The Gulf Stream is shifting further northward and becoming more unstable. Over the last decade, the Gulf Stream Index (GSI) has an increasing trend indicating a northward shift in the Gulf Stream. In 2018, the GSI was at its most northerly position recorded since the year 1995 (Fig. 22). A more northerly Gulf Stream position is associated with warmer ocean temperature on the Northeast US shelf [6], a higher proportion of Warm Slope Water in the Northeast Channel, and increased sea surface height along the U.S. east coast [7].

[14] https://www.nasa.gov/press-release/nasa-noaa-analyses-reveal-2019-second-warmest-year-on-record

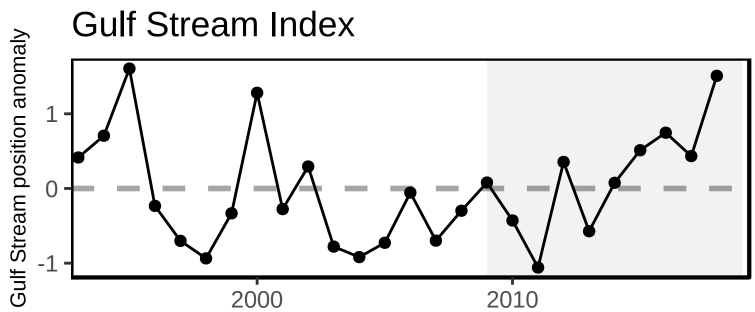


Figure 22: Index representing changes in the location of the Gulf Stream north wall. Positive values represent a more northerly Gulf Stream position.

Concurrently, large amplitude Gulf Stream meanders are forming more frequently further west [8]. There has also been a regime shift since 2000 after which there has been a significant increase in the number of warm core rings formed each year (Fig 23; [9]. The greater number of warm core rings increases the probability of intrusions of warm/salty Gulf Stream water onto the continental shelf. Any resulting accumulation of warmer water will add to the long term warming already occurring on the shelf. This in turn may lead to a response in species distributions [9].

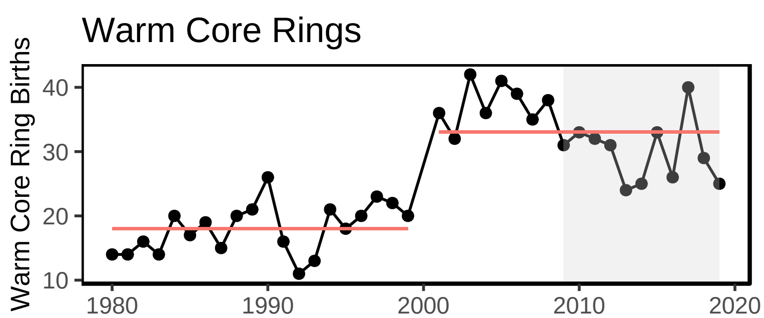


Figure 23: Interannual Variability of the WCR formation between 1980 and 2019. The regime shift (denoted by the split in the red solid line) is significant at the turn of the century. Figure reproduced with permission from Gangopadhyay, et al. (2019). 2018 and 2019 data points based on personal communication with A. Gangopadhyay (2020).

Gulf Stream Index and Labrador Slope Water (Northeast Channel)

The changing position of the Gulf Stream north wall described above directly influences oceanic conditions in the Gulf of Maine (GOM). Since the mid-2000's, warmer, saltier slope water associated with the Gulf Stream has dominated the input into the GOM at the Northeast Channel, with 2017 and 2019 consisting of 99% warm slope water (Fig. 24), the highest estimated in the time series. The changing proportions of source water affect the temperature, salinity, and nutrient inputs to the Gulf of Maine ecosystem.

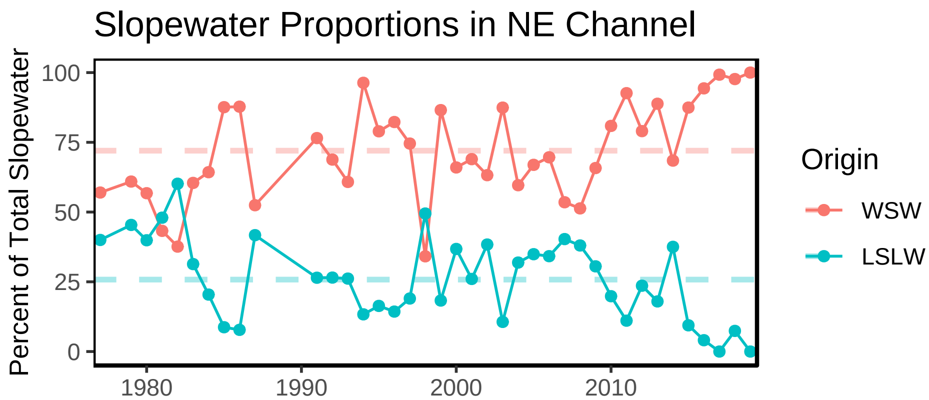


Figure 24: Proportion of Warm Slope Water (WSW) and Labrador slope water (LSLW) entering the GOM through the Northeast Channel.

Ocean temperature, surface and bottom (MAB)

The regional ocean is warming. Annual surface and bottom temperature in the MAB has trended warmer since the early 1980s; while seasonal temperatures have trended warmer in spring, summer, and fall. The 2019 winter MAB temperatures were below average, while the temperatures in spring and summer were among the top six during the satellite data record (1982-2019) and fall was above average (Fig. 25). 2019 MAB bottom temperature was just above the time series average (Fig. 26).

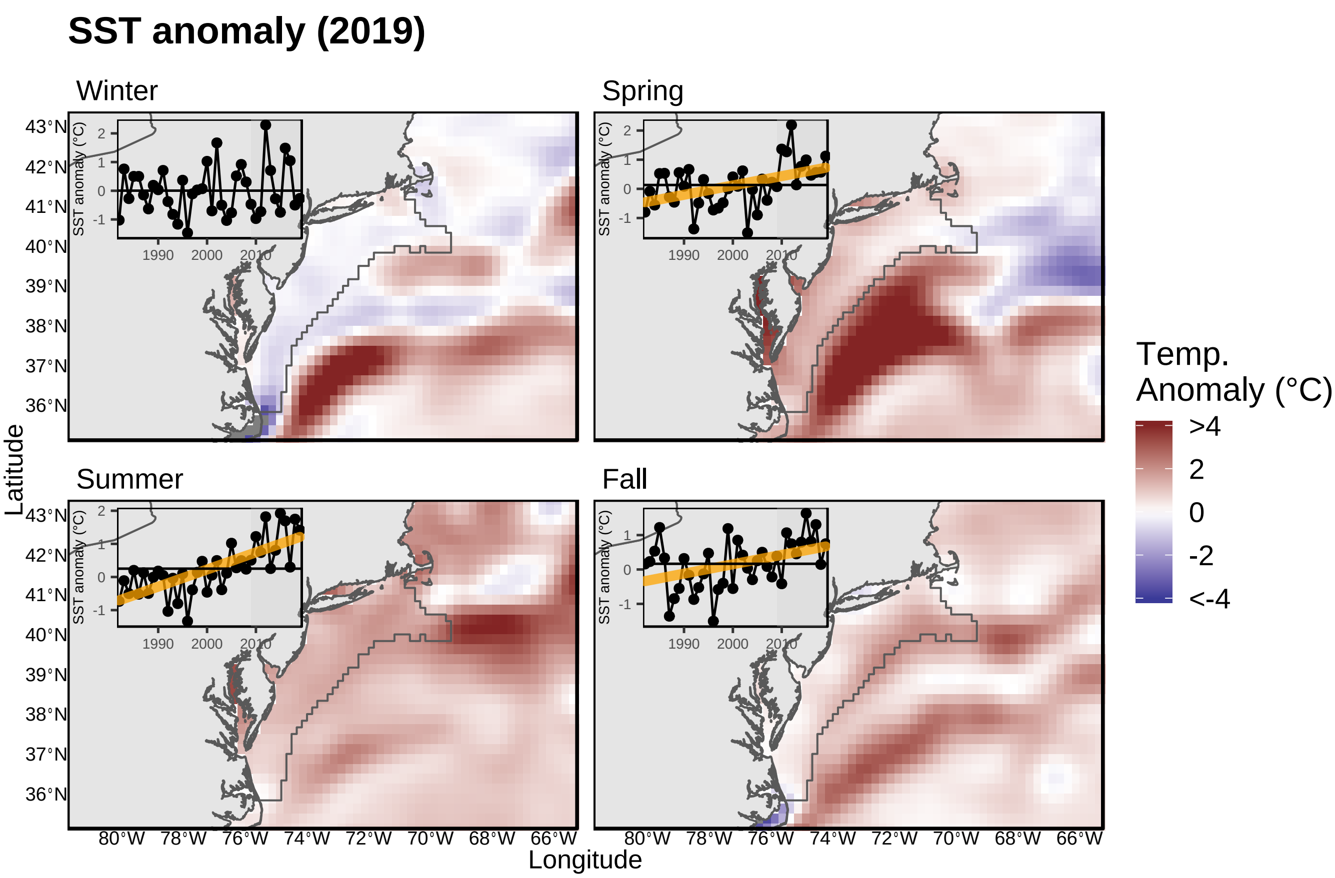


Figure 25: MAB seasonal sea surface time series overlaid onto 2018 seasonal spatial anomalies.

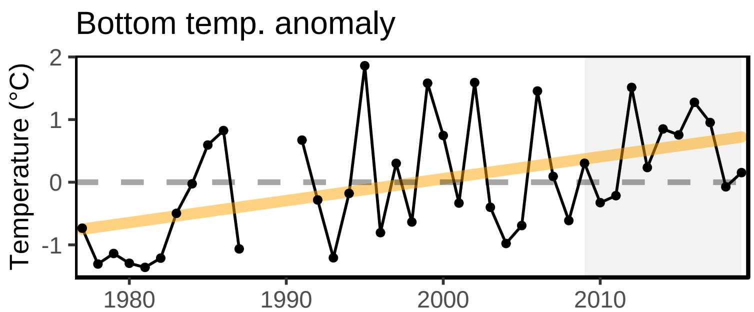


Figure 26: Annual bottom temperature in the Mid-Atlantic Bight.

Cold pool index (MAB)

Changes in ocean temperature and circulation alter habitat features such as the cold pool, a 20–60 m thick band of cold, relatively uniform near-bottom water that persists from spring to fall over the mid-shelf and outer shelf of the Middle Atlantic Bight (MAB) and Southern Flank of Georges Bank [10]. 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 [10]. The average temperature of the cold pool has been getting warmer over time (Fig. 27, calculated based on [11]) and the area of the cold pool is shrinking. These changes can affect distribution and migration timing for species that depend on the cold pool habitat.

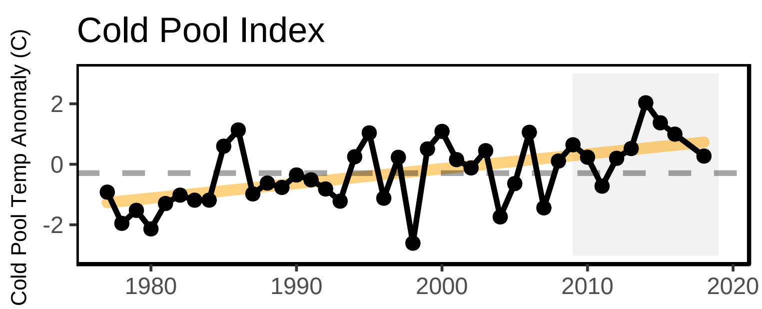


Figure 27: Temperature anomaly in cold pool region, defined as the area with a mean September-October bottom temperature <12°C from 1963 to 2013.

Marine heat waves (MAB)

Marine heatwaves measure not just temperature, but how long the ecosystem is subjected to the high temperature. They are driven by both atmospheric and oceanographic factors and can have dramatic impacts on marine ecosystems. Marine heatwaves are measured in terms of intensity (water temperature) and duration (the cumulative number of degree days) using satellite measurements of daily sea surface temperature. Plotted below are maximum intensity and cumulative intensity, which is intensity times duration. Here we define a marine heatwave as a warming event that lasts for five or more days with sea surface temperatures above the 90th percentile of the historical daily climatology (1982-2010) [12].

The strongest heatwaves on record in the Middle Atlantic Bight occurred in the winter of 2012 in terms of maximum intensity (+5.13 °C above average) and in the winter/summer of 2012 in terms of cumulative intensity (515 °C-days; Fig. 28). In 2019, the Middle Atlantic Bight experienced six distinct marine heatwaves in the spring, summer, and fall with one of the strongest events beginning on July 3 and lasting 21 days (Figs. 29, 30). Relative to prior years, this marine heatwave ranked 17th on record in terms of maximum intensity (+2.88 °C above average on Jul 22). Another strong marine heatwave began on Aug 1 and lasted 24 days, which was 20th on record in terms of cumulative intensity (46 °C-days).

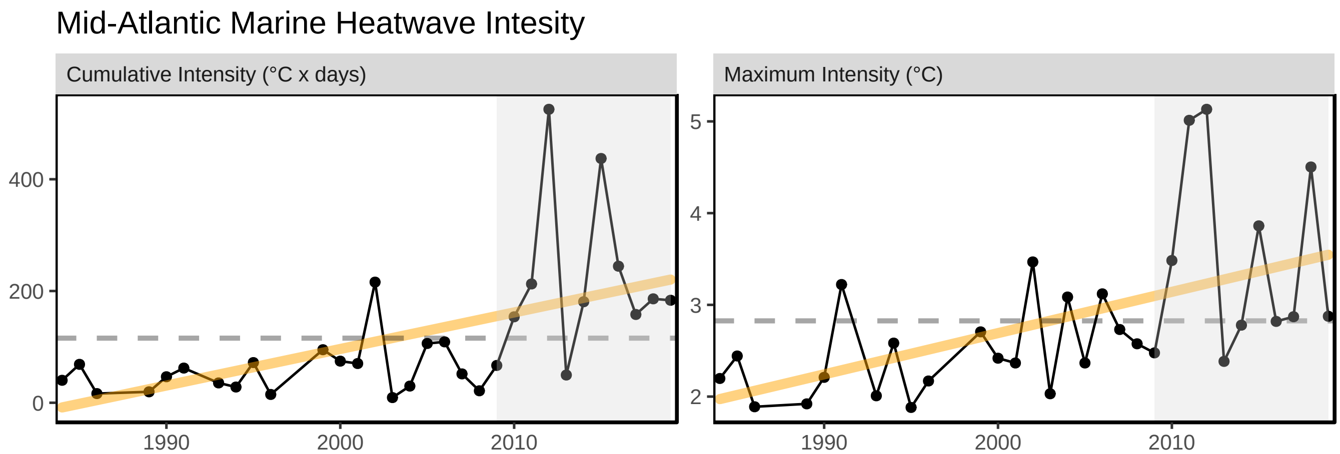


Figure 28: Marine heatwave cumulative intensity (left) and maximum intensity (right) in the Mid-Atlantic Bight.

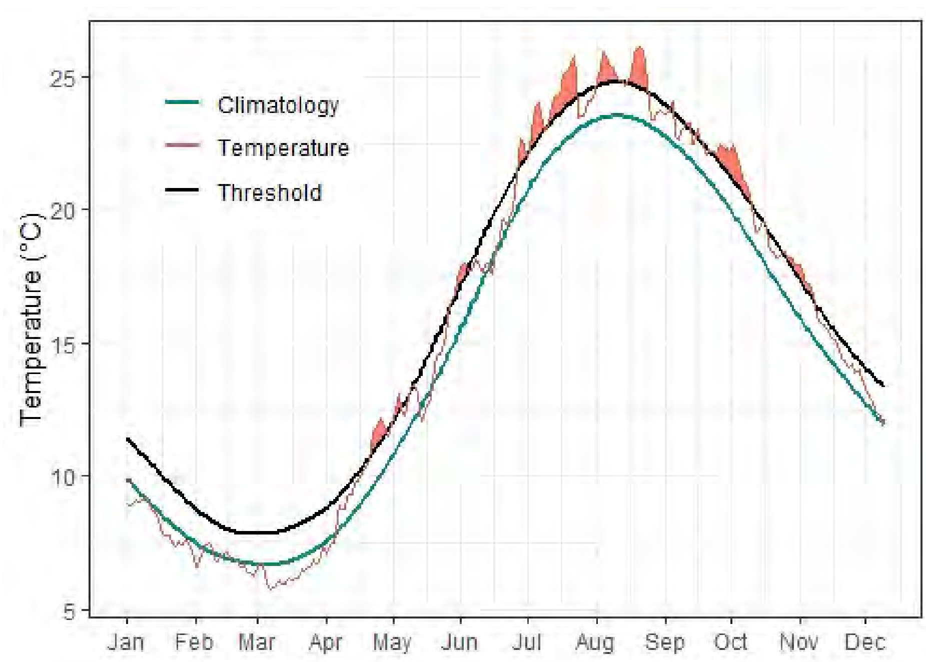


Figure 29: Marine heatwave events (red shading above black threshold line) in the Mid-Atlantic occurring in 2019.

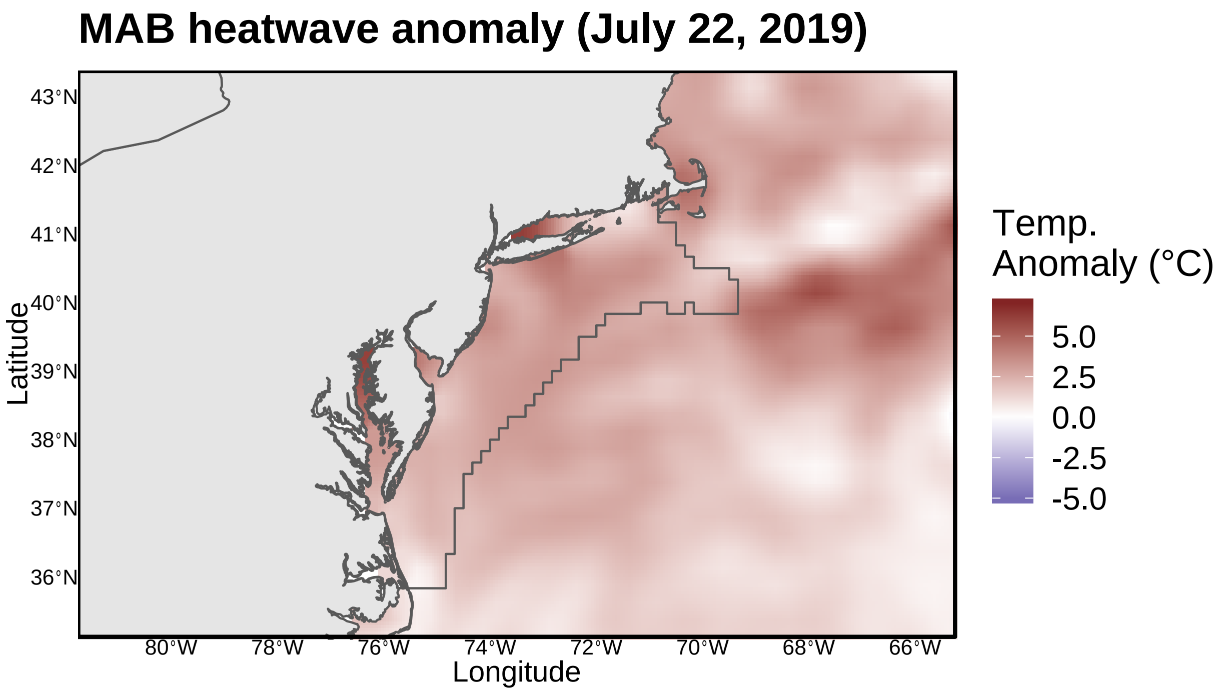


Figure 30: Maximum intensity heatwave anomaly in the Mid-Atlantic Bight occurring on July 22, 2019.

Primary production (MAB)

Phytoplankton primary production is a function of biomass, light, and temperature, and sets the overall level of potential fish and fishery productivity in an ecosystem. All primary production and chlorophyll estimates presented here are satellite-derived. There is a trend of increasing primary production in the Mid-Atlantic, primarily driven by increased summer production, which is due to warmer temperatures and increased bacterial remineralization and nutrient recycling (Fig. 31). This increased productivity is most likely from smaller-celled species that contribute less to fish production compared to larger phytoplankton. The fall of 2019 had an early above average phytoplankton bloom (Fig. 32), most likely comprised of larger diatom species, with above average blooms in the central portion of the shelf (Fig. 33).

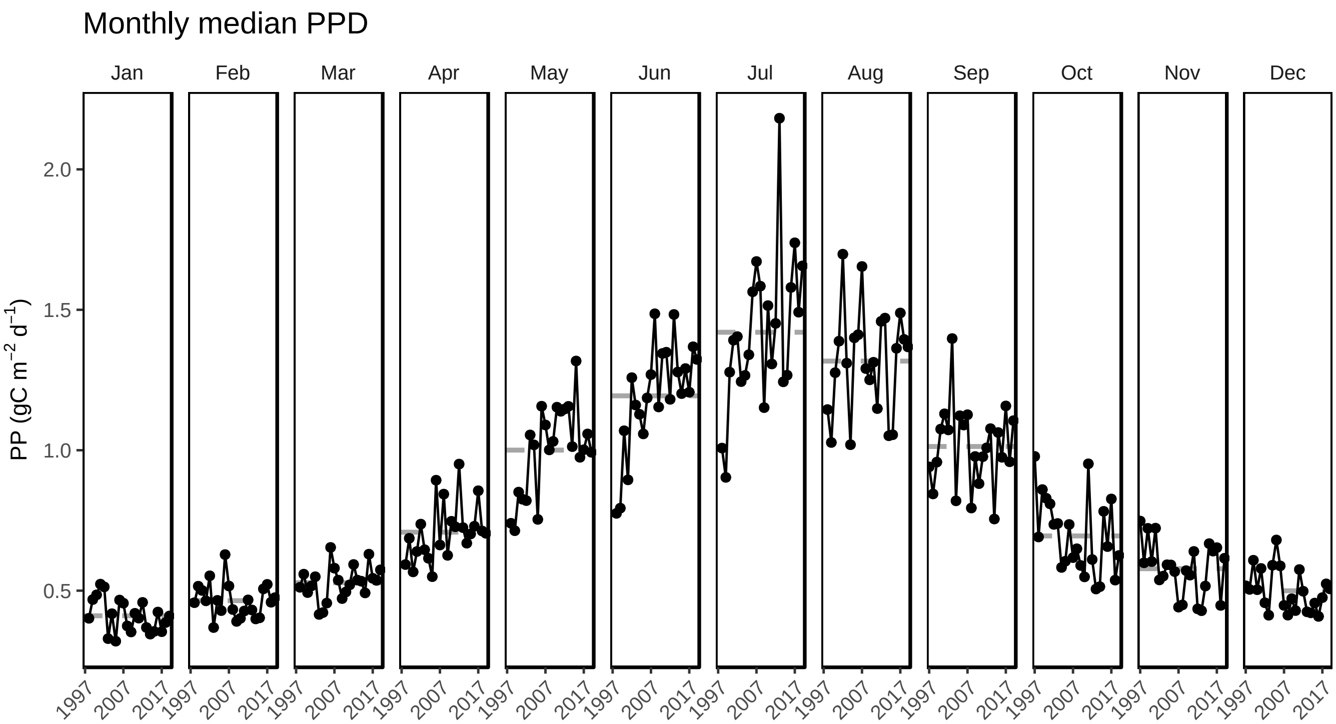


Figure 31: Monthly primary production trends show the annual cycle (i.e. the peak during the summer months) and the changes over time for each month.

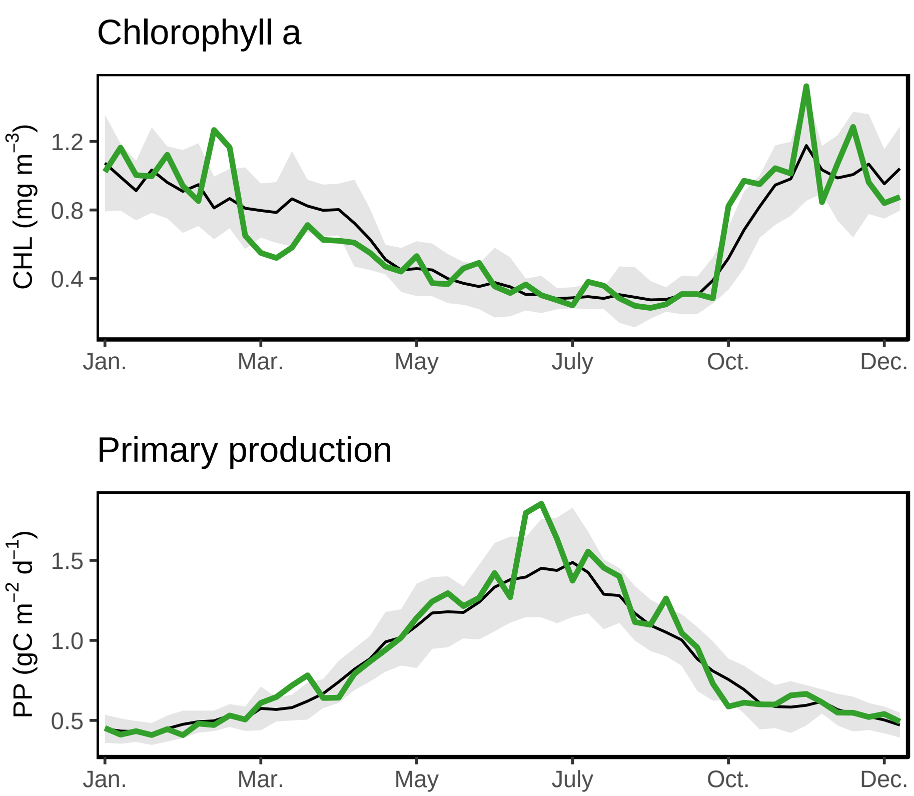


Figure 32: Weekly chlorophyll concentrations in the Mid-Atlantic are shown by the colored line for 2019. The long-term mean is shown in black, and shading indicates +/- 1 sample SD.

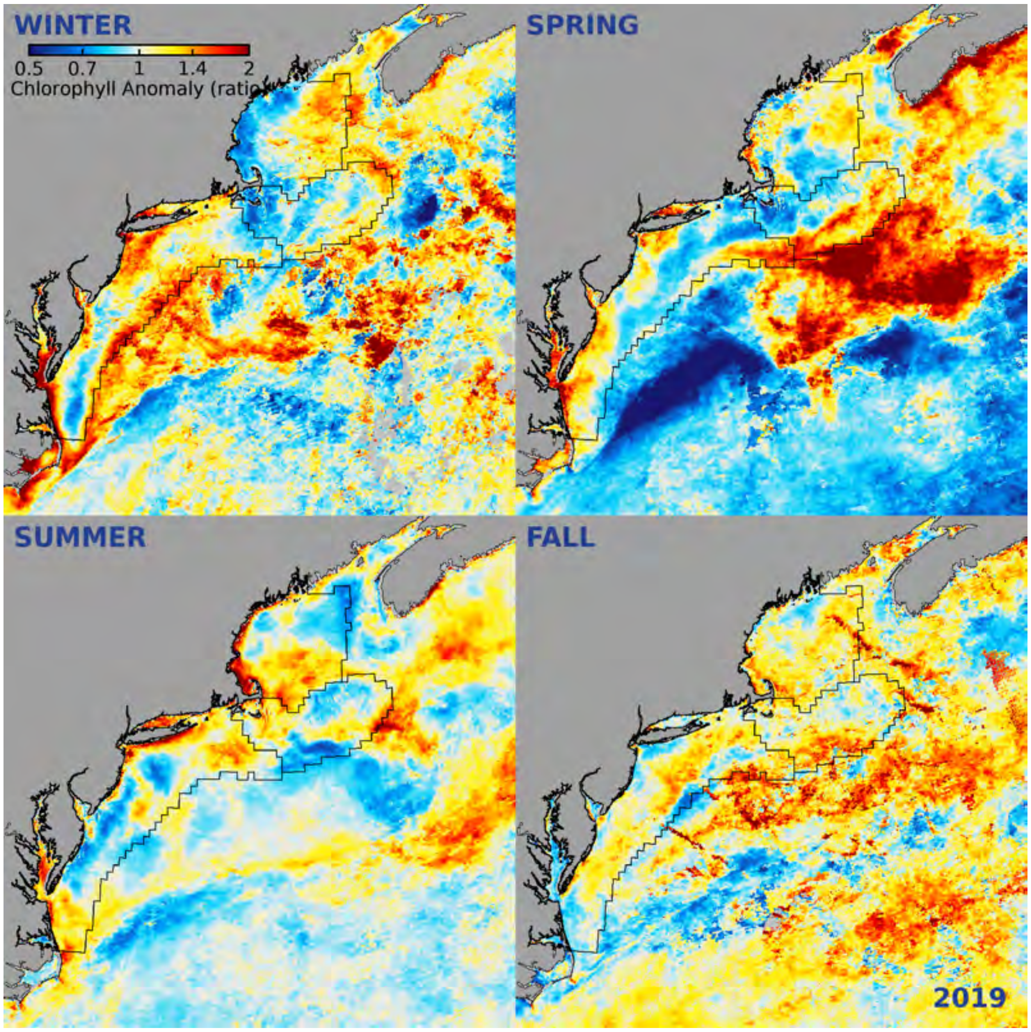


Figure 33: Seasonal chlorophyll a anomalies in 2019.

Zooplankton (MAB)

The most abundant zooplankton species in the MAB are the small-bodied species *Centropages typicus*, *Psuedocalanus* spp., and *Temora longicornis* [13]. The large-bodied species *Calanus finmarchicus* is also abundant in the MAB and is an important prey for larval fish and the North Atlantic right whale. The mean abundance of small-bodied copepods was slightly above average in 2018 (Fig. 34). This increase in abundance from the previous year was driven by all members of the small-bodied taxa above in addition to *Centropages hamatus*. While the long term trend in *Psuedocalanus* abundcance remains significantly negative in the MAB, 2018 abundance values were slightly above the long term mean and were the highest abundance values in the MAB since 1998 for this species. *Calanus finmarchicus* abundance was also higher in 2018 than in the previous 10 years, following a period of lower abundance between 2014-2017 (Fig. 34).

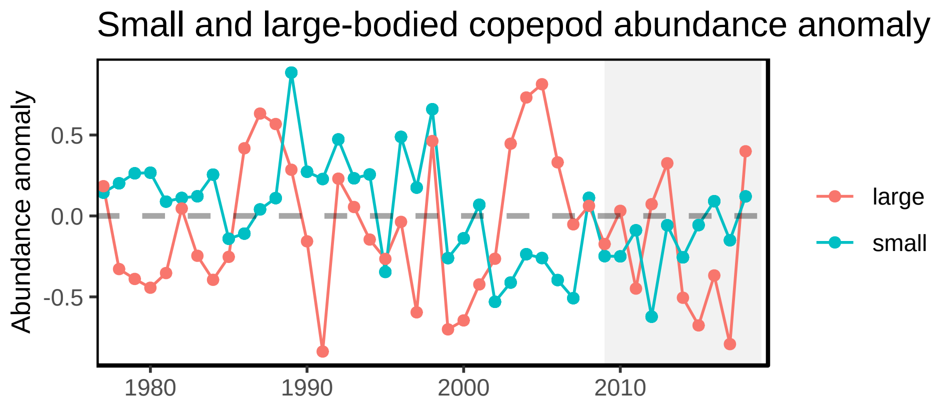


Figure 34: Abundance anomaly time series for copepod size groups found in the MAB.

Cnidarians (jellyfish) exhibit an increasing trend in abundance over the long term record, and higher than normal abundance during the 1990's when the abundance of small-bodied copepods was highest (Fig. 35). Euphausiids (krill), important prey items for many fish species, also exhibit a long term increasing trend in abundance in the MAB (Fig. 35).

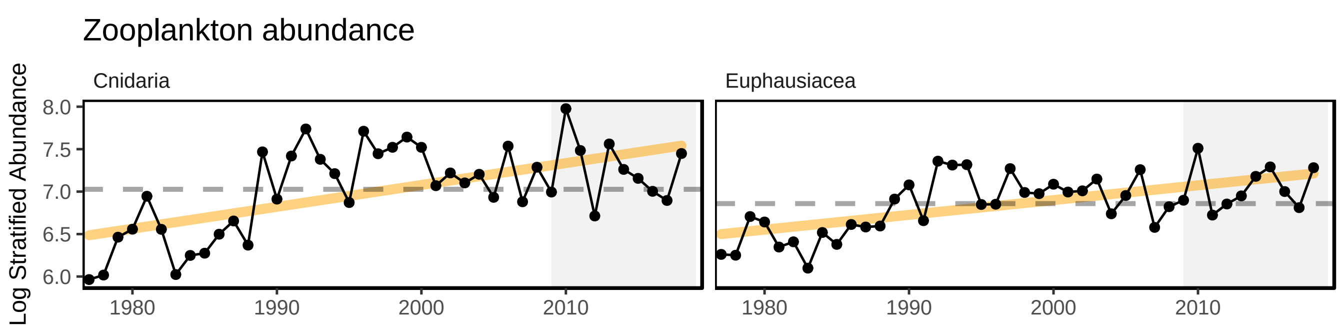


Figure 35: Stratified abundance of cnidarians and euphausiids in Mid-Atlantic Bight.

Fluctuations in primary production over time (Fig. 36) may relate to observed patterns in copeopod size structure (Fig. 34). This period also corresponds with regime shifts in fish recruitment [14].

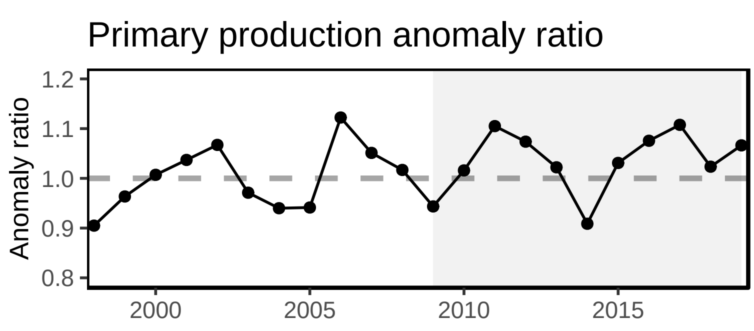


Figure 36: MAB annual primary production anomaly.

Changes in primary productivity, phytoplankton and zooplankton composition and abundance affect the food web and may be related to observed changes in fish condition, recruitment patterns, and forage fish energy content. However, more research and analyses are needed to directly link these connections. Any attempt to predict how the ecosystem will respond to changes in climate and fishing patterns ultimately will depend on understanding these connections. Our objective is to shed light on these fundamental issues and to document changes affecting human communities and the fishery ecosystem on which we depend.

Contributors

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Document Orientation

The figure format is illustrated in Fig 37a. 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 2018, 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. 37b) level.

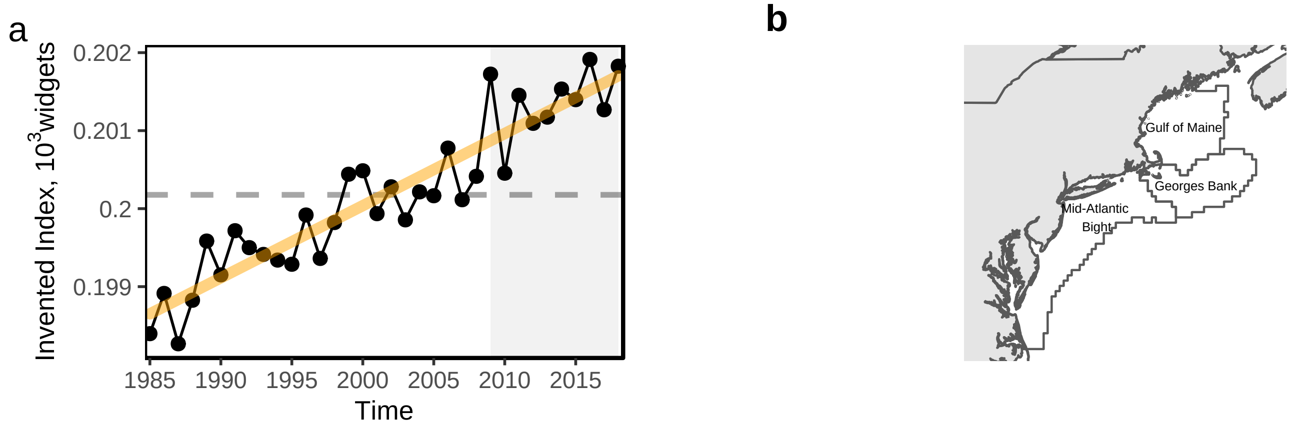

Figure 37: Document orientation. a. Key to figures. b.The Northeast Large Marine Ecosystem.

Fish and invertebrates are aggregated into similar feeding categories (Table 4) to evaluate ecosystem level trends in predators and prey.

Table 4: Feeding guilds and management bodies.

Guild	**MAFMC**	**Joint**	**NEFMC**	**State or Other**
Apex Predator	NA	NA	NA	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	NA	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	NA	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	NA	sea scallop	blue mussel, channeled whelk, sea cucumber, sea urchin and sand dollar uncl, sea urchins, snails(conchs)

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State of the Ecosystem 2020: Response Memo

11 March 2020

Introduction

In the table below we summarize all comments and requests with sources. The Progress column briefly summarizes how we responded, with a more detailed response in the numbered Memo Section. In the Progress column, "SOE" indicates a change included in the report(s).

Request	**Source**	**Progress**	**Memo Section**
Formal response to requests	Both Councils	This response memo.	Introduction
Consider report card like Alaska's	Both Councils	SOE summary bullets (page 1).	1
Include summary visualization	Both Councils	SOE infographics (page 1-2).	2
Include uncertainty estimates for all indicators	Both Councils	SOE survey biomass uncertainty included; feedback requested for other indicators.	3
Include Downeast ME (Scotian Shelf EPU)	NEFMC	SOE survey biomass now includes most of downeast ME; human dimensions include downeast ME.	4
Link zooplankton abundance and or community composition to fish condition	NEFMC	SOE page 2 research spotlight.	5
Ocean acidification information	Both Councils	Work in progress to develop baseline and monitoring.	6
Gulf Stream Index/Labrador current interaction	Both Councils	SOE Labrador current and Gulf Stream indices now included in both reports.	7
Include source for PP estimates (satellite vs in situ)	NEFMC	SOE clarified that all PP estimates are from satellite.	8
Shellfish growth/distribution linked to climate (system productivity)	MAFMC	Project with R. Mann student to start late 2020.	9
Estuarine condition relative to power plants and temp	MAFMC	Inadequate resourses to address this year.	10
Frequency and occurrence of warm core rings	MAFMC	SOE added new indicator.	11
Cold pool index	MAFMC	SOE added new indicator.	12
Nutrient inputs and water quality near shore	MAFMC	SOE Chesapeake update; summary of data from National Estuarine Research Reserve network started, example info included here.	13
Link environmental and social, economic indicators	NEFMC	SOE added new PP required, habitat and wind overlap, page 2 conceptual model.	14
Quantitative overlap of wind area and habitat and fishing areas	MAFMC	SOE added new indicator for habitat and wind overlap, wind overlap with fisheries for next round.	15
Include links to Social Science websites	NEFMC	SOE link included in both reports.	16
Management complexity	MAFMC	Project started by summer student in 2018, needs further analysis.	17
South Atlantic Council managed species represented in recreational indices	MAFMC	SOE revised indicator and noted change in report.	18
Add social elements from overview conceptual model to NE conceptual model	NEFMC	Older general conceptual model replaced by specific links between indicators in report.	19

(continued)

Request	Source	Progress	Memo Section
Avg. weight of diet components by feeding group, mean stomach weight across feeding guilds	Both Councils	Stomach fullness analysis started–species level; feedback requested.	20
North Atlantic Right Whale calf production indicator	NEFMC	SOE added new indicator.	21
Distinguish managed species in report	NEFMC	SOE Council managed species separated in landings figures.	22
Marine Mammal consumption	MAFMC	SOE added discussion of seal diets.	23
Small pelagic abundance	MAFMC	SOE have survey planktivore time series but would like to improve; see also SOE forage energy density.	24
Young of Year index from multiple surveys	MAFMC	SOE fish production from NEFSC trawl; feedback reqested on how to expand.	25
Biomass of sharks	MAFMC	HMS provided landings for 3 years and working on full time series, still looking for source of biomass data.	26
Diversity metric for NEFSC trawl survey	NEFMC	Need to reconcile different survey vessel catchabilites or split by vessel.	27
Ecosystem risk score	MAFMC	SOE PP required, marine heat waves are steps towards this; feedback requested for other desired analyses.	28
Inflection points for indicators	Both Councils	SOE warm core rings; general analysis of combined indicators initiated but not yet finished.	29

Responses to comments

1 Report Card

Both Councils asked for a summary "report card" similar to that used in Alaska [1]. The first page of each of this year's SOE reports summarizes the key messages with icons showing the message theme (e.g., commercial fisheries, fishing communities, forage species, system productivity, etc). At present, we synthesized key findings on both existing and new indicators. We welcome suggestions for indicators that should always be tracked in this section, and for further refinements to make this summary more useful.

2 Summary Visualization

Both Councils asked for a summary visualization. The first page of each SOE report uses icons developed to help visualize different report components. The second page of each SOE report has both a map visualizing the key oceanographic features mentioned in the report along with fishing communities, and a conceptual model visualizing potential linkages between report indicators. The conceptual model is discussed further under point 5 below.

3 Uncertainty Estimates

Both Councils asked for uncertainty estimates to be included with indicators. As a first step, we included survey design-based uncertainty estimates[1] for all surveys where we had haul specific information (all but the inshore ME-NH survey). Including this uncertainty led to a different approach to the data, looking for true departures from expected stable dynamics at the functional group level, and provided insight into which trends were potentially noteworthy. Survey biomass uncertainty is included in each SOE (p. 15-16 MAFMC and p. 16-19 NEFMC).

We experimented with a model-based estimate of uncertainty for survey biomass which accounts for both spatial and temporal sources (VAST; [2]). The results are promising (Fig. 1), and may serve not just as a biomass indicator but also an indicator of distribution shifts for species and functional groups. This method can also potentailly combine the inshore and offshore surveys into a single analysis. If the SSCs and Councils consider this approach promising, we will persue it further for next year.

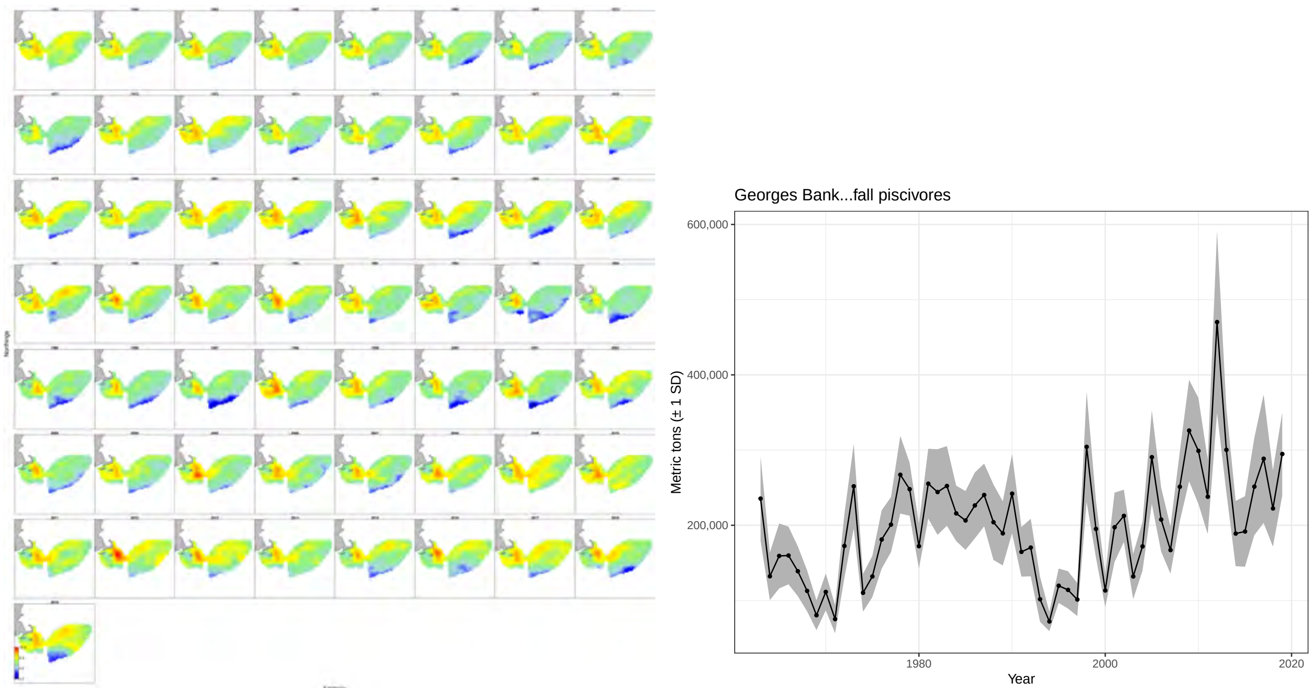

Figure 1: Georges Bank piscivoves biomass and uncertainty as estimated by the VAST model.

Some indicators (e.g. total landings) may have uncertainty which is difficult to calculate (e.g. based on unknown reporting errors). Many other current indicators do not have straightforward uncertainty calculaltions (e.g. diversity indices, anomalies) so we welcome suggestions from the SSC and Council to guide estimation for future reports.

4 Downeast Maine

The NE SSC asked to include downeast ME in future reports, because the Scotian Shelf EPU which includes downeast ME has not been included in previous reports. We felt it was inappropriate to report on the Scotian Shelf EPU, which includes Canadian waters and is an incomplete portion of the full Soctian Shelf. However, this year we recalculated survey biomass using an updated strata set that includes much of downeast ME for the NEFSC (Fig. 2; p. 16-17 NEFMC SOE). Strata were included within an EPU where at least 50% of their area was located. The inshore strata not included in the NEFSC trawl survey biomass are represented in the ME-NH survey (p. 20 NEFMC SOE) Further, fishery catch and revenue data, fishing community data, and recreational indicators have

[1] https://noaa-edab.github.io/tech-doc/survdat.html

always included downeast ME because both fishing statistical areas and human community data include all of ME. Therefore, fishery and fish biomass information reflects much of the area.

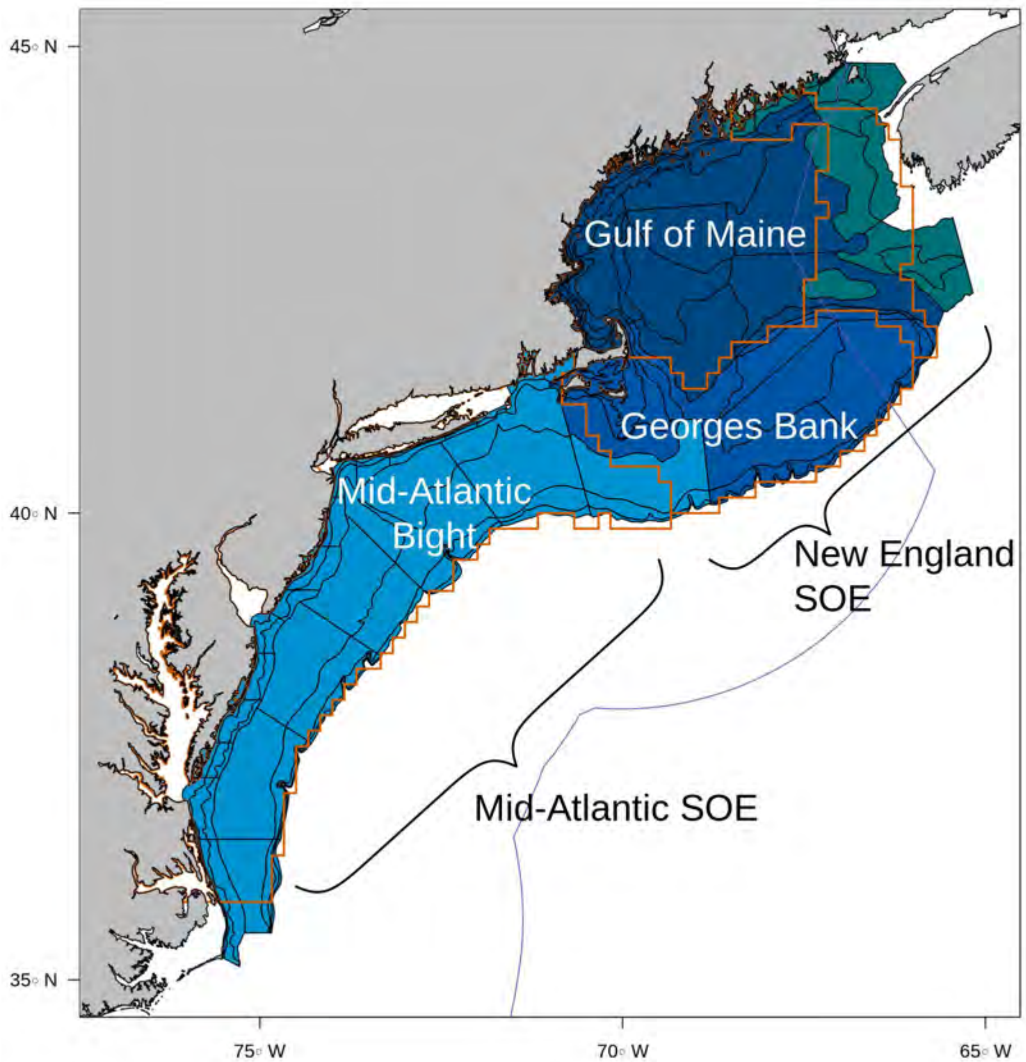

Figure 2: Survey strata mapping to EPUs for biomass estimates

Oceanographic indicators (surface and bottom temperature, phytoplankton, zooplankton) remain at the EPU level. The EPUs were defined based on these characteristics[2] so we are hesitant to alter them for these indicators without a more thorough examination of the EPU definitions in general.

5 Link Zooplankton, Fish Condition

Both Councils have been interested in ecosystem energy flow and how changes in ecosystem productivty link to fishery production. In particular, the NE SSC asked about further links between zooplankton abundance and or community composition to fish condition. Research was initiated during 2019 evaluating statistical relationships between environmental indicators including temperature, depth, and zooplankton community composition and

[2]https://noaa-edab.github.io/tech-doc/epu.html

fish condition. Initial results are noted in each SOE (p. 16-17 MAFMC and p. 20-21 NEFMC). Further work is ongoing to link more of the indicators in the report using both statistical analysis and potentially structural equation modeling as noted on p. 2 of each SOE under "Research Spotlight." This conceptual model shows the full range of potential linkages, but we plan to start with a subset of linkages (Fig. 3). In particular, potential linkages between zooplankton and forage fish energy content (p. 18 MAFMC and p. 23 NEFMC) may also be explored in the upcoming years.

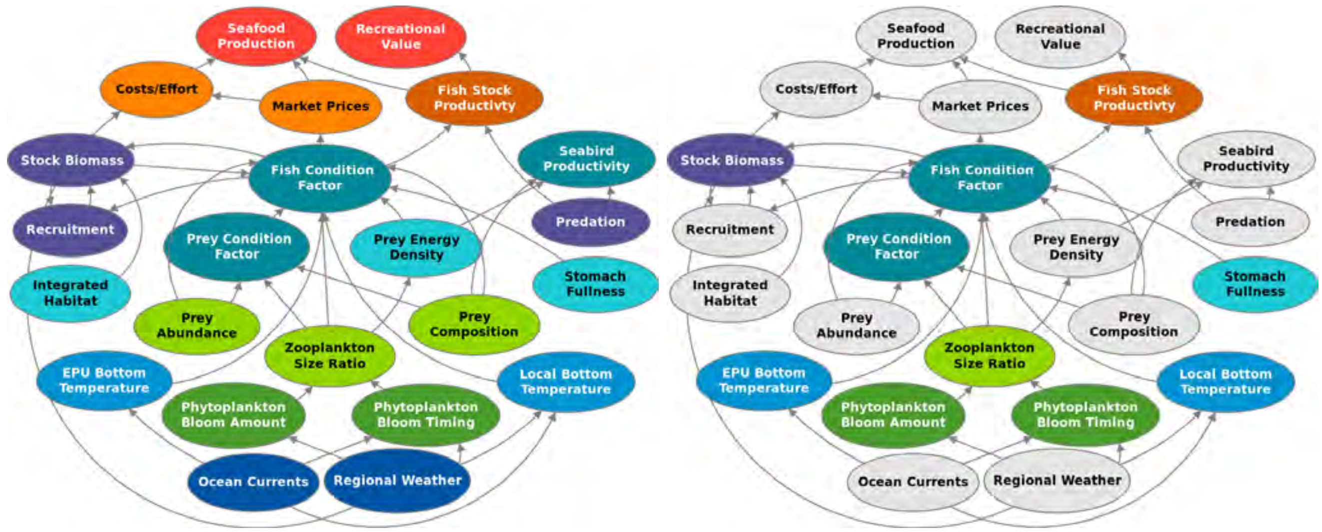

Figure 3: Full set of hypothesized relationships between SOE indicators related to fish condition (left) and subset to be investigated first (right).

6 Ocean Acidification

Both Councils asked for information on ocean acidification (OA). In 2019, NOAA reviewed available OA information and is now finalizing a research plan[3] to address OA comprehensively. Unfortunately, this synthesis was not available in time to include in the 2020 SOE.

The main message of this forthcoming report is that we don't have much of a time series of OA monitoring data for our region yet, but we have been (and will continue) collecting data in the Northeast and that NOAA sees OA monitoring as a priority. There are three main research objectives for 2020-2029 outlined in the report:

1. Document and predict change via monitoring, analysis, and modeling.

2. Characterize and predict biological sensitivity of species and ecosystems.

3. Understand human dimensions and socioeconomic impacts of OA.

Specific work is in progress now and should be available for future SOE reports, including:

- Aleck Wang (WHOI) and Chris Melrose (NEFSC) are working on climatology of spatial and seasonal patterns of carbonate chemistry parameters on the Northeast U.S. Continental Shelf, which will form a critical baseline for future OA indicators.
- Grace Saba (Rutgers) is the lead PI on a new project which is using gliders to characterize OA conditions and to validate/improve OA models for the region.
- There is ongoing experimental work being conducted at the NEFSC Milford lab that we could include if the information is relevant

[3]https://sab.noaa.gov/sites/SAB/Meetings/2019_Documents/Dec_Meeting/2020%20OA%20Research%20Plan%20DRAFT%20External%20Review.pdf

Until a climatology and time series of OA measurements is available for comparison, we can include other information on OA in the SOE as it becomes available. We welcome feedback and suggestions from the SSC and Council on what information would be most useful.

7 Gulf Stream and Labrador Current

Both Councils were interested in large scale ocean current interactions and requested additional information on the Gulf Stream Index and Labrador current. We have expanded this section and included information on both Gulf Stream warm core rings (see point 11) and on the decreasing proportion of Labrador Current water entering the Gulf of Maine in both SOE reports this year (p. 20-22 MAFMC and p. 24-26 NEFMC).

8 Primary Production Source

The NE SSC asked that we include sources for primary production estimates (satellite vs in situ). We have noted in the SOE that primary production and chlorophyll estimates are satellite-derived (p. 25 MAFMC and p. 31 NEFMC), and continue to include full methods in our technical documentation[4].

9 Shellfish Growth

The MAFMC requested that we investigate how shellfish growth and distribution information could be linked to climate indicators and possibly ecosystem productivity. While this request was beyond our capacity to address this year, we are working with Dr. Roger Mann to host his student working on shellfish growth at NEFSC and to facilitate integration of SOE climate indicators with this work later this year or early next.

10 Power Plants

The MAFMC requested that we investigate estuarine condition relative to power plants and plant-driven changes in water temperature. This request was beyond our capacity to address this year. However, we have initiated work on estuarine water quality in general (see point 13).

11 Warm Core Rings

The MA SSC requested information on the frequency and occurrence of Gulf Stream warm core rings. We have added an indicator based on [3], [4],and [5] to both SOE reports (p. 20-21 MAFMC and p. 24-25 NEFMC). We welcome further comments on the utility of this new indicator.

12 Cold Pool Index

The MA SSC requested a cold pool index. We have added an indicator of cold pool temperature to the MAFMC SOE report, because the cold pool was considered most relevant to the MAB EPU (p. 23 MAFMC). However, if the NEFMC is interested in this index (because some managed species such as winter flounder occupy this habitat) we can include it in future NEFMC SOE reports. We welcome further comments on the utility of this new indicator.

[4] https://noaa-edab.github.io/tech-doc/chl-pp.html

13 Estuarine Water Quality

The MAFMC requested information on nutrient inputs and water quality near shore and in estuaries. While the Chesapeake water quality index from the 2019 report was not yet updated by the contributor, we included information on the Chesapeake Bay low salinity event in 2018-2019 with notes on how it affected Chesapeake Bay living resources in the SOE (p. 19-20 MAFMC).

This year we started a collaboration with the National Esturarine Research Reserve (NERR) network to assemble information. Here we provide examples of the types of information available and ask for feedback on what type of information would be most useful.

There are NERRs all around the US (Fig. 4), so the first decision is which ones to include. A reasonable starting point might be all of the NERRs from ME to NC, but other locations may be of interest. Then, status for a certain indicator could be mapped across all of the selected NERRs as in Fig. 4.

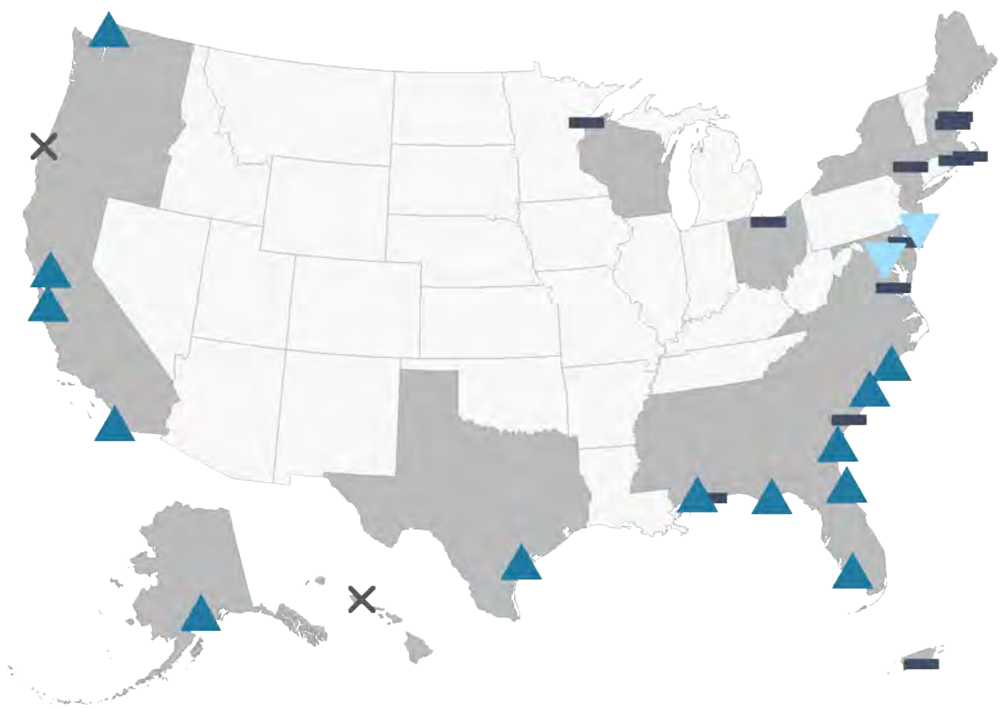

Figure 4: National Estuarine Research Reserve locations in the US, with trend indicators for an example metric: Triangle pointing up = increasing trend; Triangle pointing down = decreasing trend, Flat line = no trend.

Within a particular NERR there may be several sampling locations (Fig. 5), so the next decision would be whether to include many stations or a subset of stations representing certain conditions (or having the longest time series).

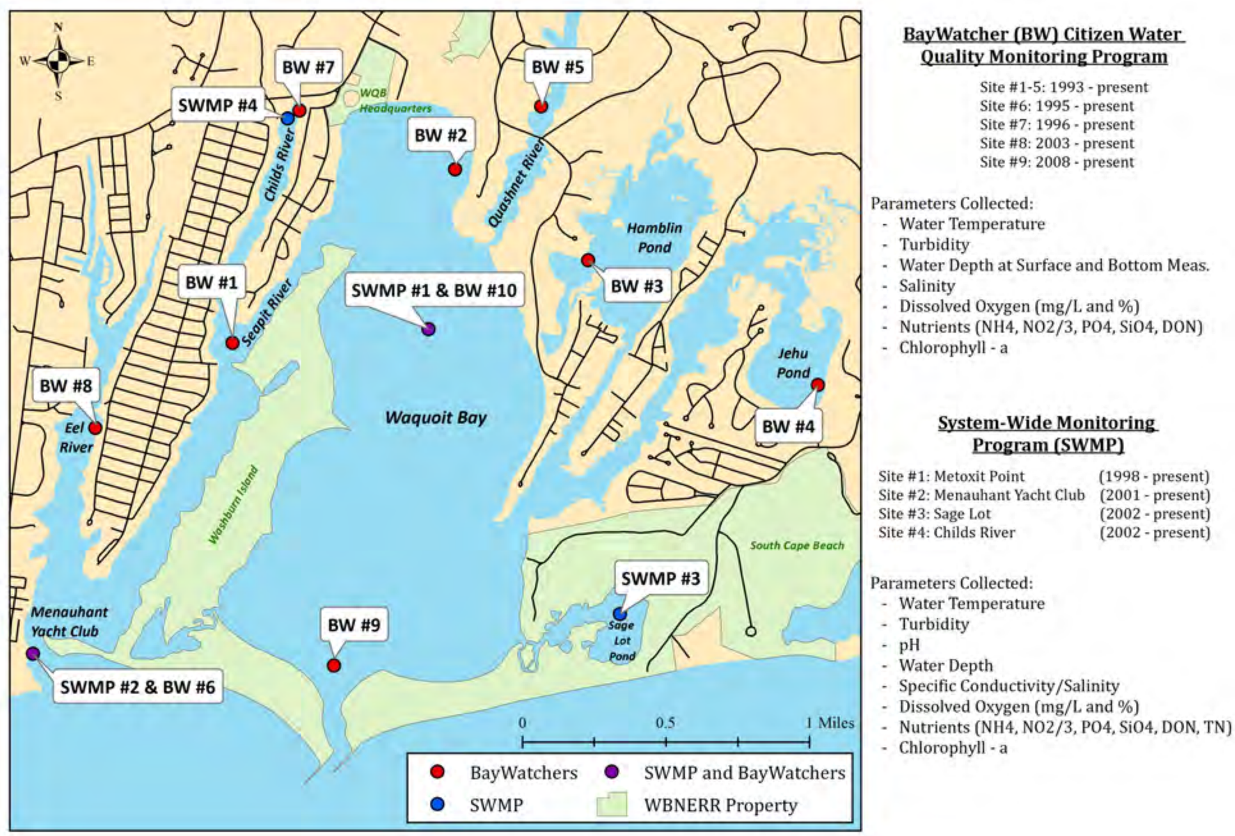

Figure 5: Waquit Bay National Estuarine Research Reserve map with sampling locations.

At each station several types of data are collected, so the next decision is which type of information is most useful for the Councils? For example, multiple indicators could contribute to water quality overall in an area, and could be annual or seasonal (Fig. 6), or a single indicator of nutrient input could be of interest across multiple areas (Fig. 7).

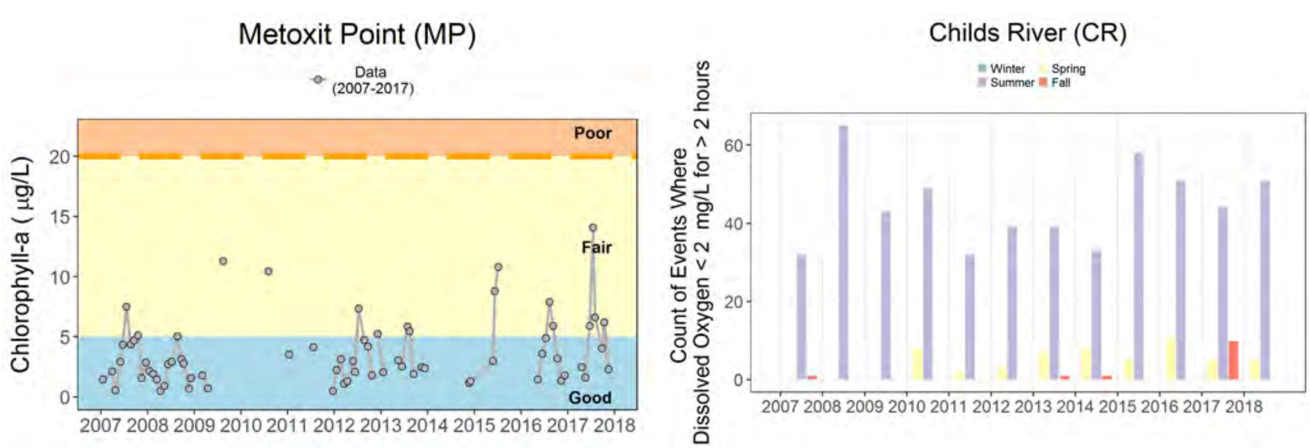

Figure 6: Multiple water quality attributes.

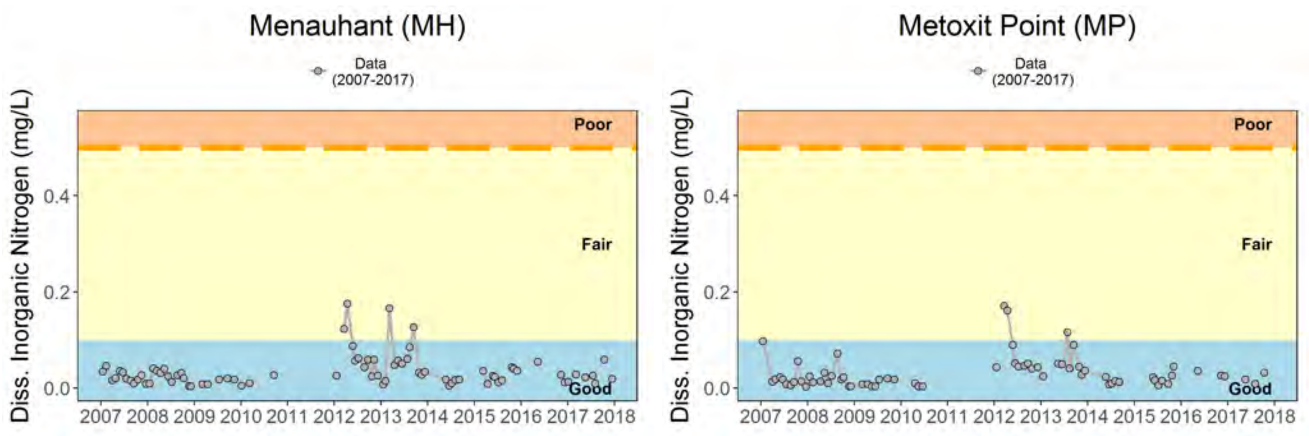

Figure 7: Dissolved Inorganic Nitrogen (DIN) in two locations.

Finally, thresholds for water quality would need to be reviewed (Fig. 7). Several exist and could be used by the Council depending on the ultimate goal for having the indicator.

14 Link Environment and Society

The NEFMC asked for more linkages between environmental and social and economic indicators in the SOE. Two new indicators and the research spotlight linking environmental indicators, fish condition, and fishery economic indicators highlighted under point 5 address this request. The first new indicator places commercial fishery landings in the context of ecosystem produtivity by calculating the primary production required to support landings; it is described in detail below. The second new indicator calculates the probability of occupancy of wind lease areas based on habitat modeling; it is described in detail in point 15.

Primary production required (PPR)

This indicator is included in both SOEs (p. 3-4 MAFMC and NEFMC). It is defined as

$$PPR_t = \sum_{i=1}^{n_t} \left(\frac{landings_{t,i}}{9}\right)\left(\frac{1}{TE}\right)^{TL_i-1}$$

where n_t = number of species in time t, $landings_{t,i}$ = landings of species i in time t, TL_i is the trophic level of species i, TE = Trophic efficiency. The PPR estimate assumes a 9:1 ratio for the conversion of wet weight to carbon and a constant transfer efficiency per trophic level.

We have explored the index in the following ways. Using:

- *A global transfer efficiency of 15% for all species.*

  This gives comparable estimates to methods used in Figure 7.3 of the 2009 Ecosystem Status Report[5] that applied a combination of transfer efficiencies calculated from EMAX food web models[6]. While many studies use a 10% rule of thumb, that is an approximation as well. One adaptation would be to use a different transfer efficienct for the first level. eg. $\left(\frac{1}{TE_1}\right)\left(\frac{1}{TE_2}\right)^{TL_i-2}$. Whatever choices are made, the sensitivity of the index to such changes should be examined.

[5]https://www.nefsc.noaa.gov/publications/crd/crd0911/crd0911.pdf
[6]https://www.nefsc.noaa.gov/publications/crd/crd0615/crd0615.pdf

- *Primary production not lagged with landings.*

  This is probably not realistic. You wouldn't expect to see changes in the landing the same year as changes in primary production. This needs to be explored, either using specific lags in time (which may prove problematic since species lower on the food chain will be effected by shorter lags in time versus species higher up the chain) or by adopting some weighted scheme.

- *A threshold of 80% for landings.*

  It would be a good idea to explore the sensitivity of the index for other threshold levels. Of course the higher the threshold used would imply that less common species will then contribute to the index.

- *Combined vertebrates and invertebrates.*

  The landings in some of the EPUs are dominated by invertebrates (Lobster, Clams) which may play a significant part in driving this index. Creating two additional indices, one for vertebrates and one for invertebrates may be an interesting avenue. This will of course imply the inclusion of many other lesser caught species into the index. It will also involve partitioning the landings into vertebrates and invertebrates.

Other comments

- Some classifications in the commercial fisheries database are not at the species level. Some are Genus, Family or even higher orders, some are just general unclassified. eg. (DOGFISH, UNC, FLATFISH, Argentinidae). Most of these cases are associated with lower landings. However if we increase the threshold and/or split landings into vertebrates and invertebrates we will encounter more of these classifications. They will need to be assigned a trophic level which may cause complications and/ or subjective decision making.
- It is possible for species to drop out of the top x% of the landings and be replaced by other species with a similar trophic level and the index will be somewhat insensitive to this (Fig. 8). The mean trophic level would also be insensitive to such changes. This may or may not be of concern, but it may be worth looking into how often this occurs.

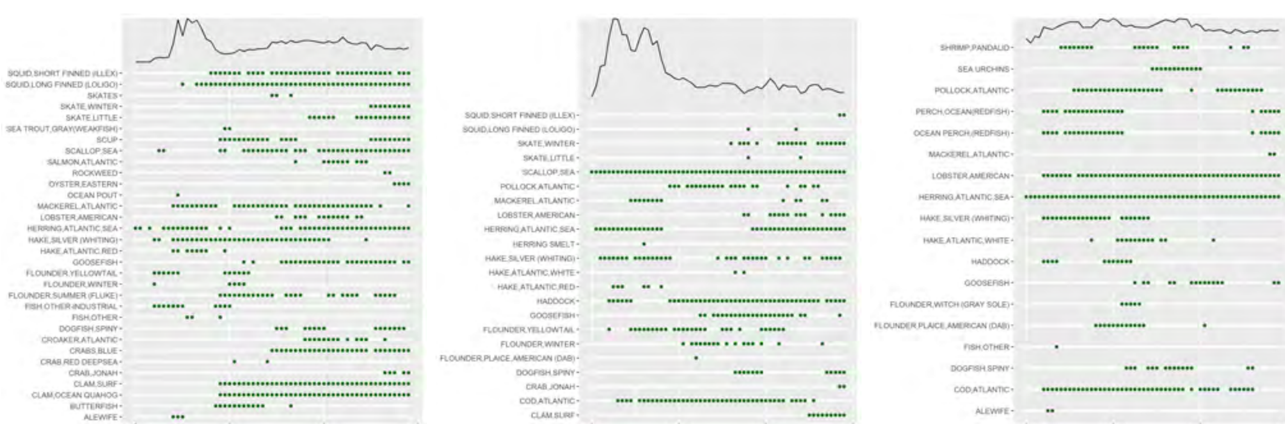

Figure 8: Species included in 80% of landings for each year in the Mid-Atlantic Bight (left), Georges Bank (center), and Gulf of Maine (right).

We welcome feedback for approaches to refine this indicator.

15 Wind Energy Habitat Overlap

The MAFMC requested an index of quantitative overlap of wind energy lease areas and fisheries, in particular to update the EAFM risk assessment (Other ocean uses risk element). A list of species with the highest probability of occupancy in the current and proposed wind lease areas based on habitat modeling is included in both SOEs (p. 8-9

MAFMC and p. 9 NEFMC). This indicator can be refined to meet the needs of both Councils. In future reports we plan to include the overlap of current fisheries with wind lease areas as well.

16 Other Social Science Indicators

The NE SSC asked that we include links to NMFS Social Science indicator websites. These links have been included in both reports (p. 8 MAFMC and p. 9 NEFMC).

17 Management Complexity

The MAFMC asked for indicators of management complexity for use in the EAFM risk assessment. An NEFSC summer student started work on this in 2018, but we have lacked capacity to finish the project since then. If resources allow we will continue the project, and guidance for further indicator developmet is welcome.

18 SAFMC and ASMFC Species

The MAFMC asked that South Atlantic Council and Atlantic States Marine Fisheries Commission-managed species be represented in recreational catch diversity indices. This has been done and the updated indicator is included in both SOE reports (p. 7-8 MAFMC and NEFMC).

In addition, NEFSC survey data was analyzed to determine if South Atlantic Council-managed species have become more common in the survey over time. This indicator has also been included in both SOE reports (p. 14-15 MAFMC and p. 15-16 NEFMC).

19 Conceptual Model Social Elements

The NEFMC requested that social elements from the overview conceptual model shown in presentations be added to the New England conceptual model included in the printed SOE report. While this would be a useful update, all of the previous conceptual models have been replaced by different summary visualizations requested by the Councils (see points 1 and 2).

20 Fish Diet Indicators

Both Councils were interested in indicators related to fish diet data. For example, average weight of diet components by feeding group, and mean stomach weight across feeding guilds were mentioned. We initiated exploratory analysis of diet information this year, and present examples of the types of information available to seek feedback on how the Counicls would like indicators developed further.

On NEFSC surveys, most stomach estimates are taken as a volume measure, but there is a standard conversion included in the diet database that gives an approximate stomach weight. This estimated stomach weight was used to calculate stomach fullness (a ratio of stomach weight to fish weight for non-empty stomach samples). Stomach fullness may be a better measure than absolute stomach weight if combining across species into a feeding guild, otherwise big animals with heavier stomachs will dominate the index. Here, stomach fullness was expressed as an annual anomaly for each species in each region. This shows which species have adequate data for inclusion in a time series, and suggests there are not obvious common stomach fullness anomalies across species. We welcome suggestions to clarify methods and objectives for fish stomach data indicators.

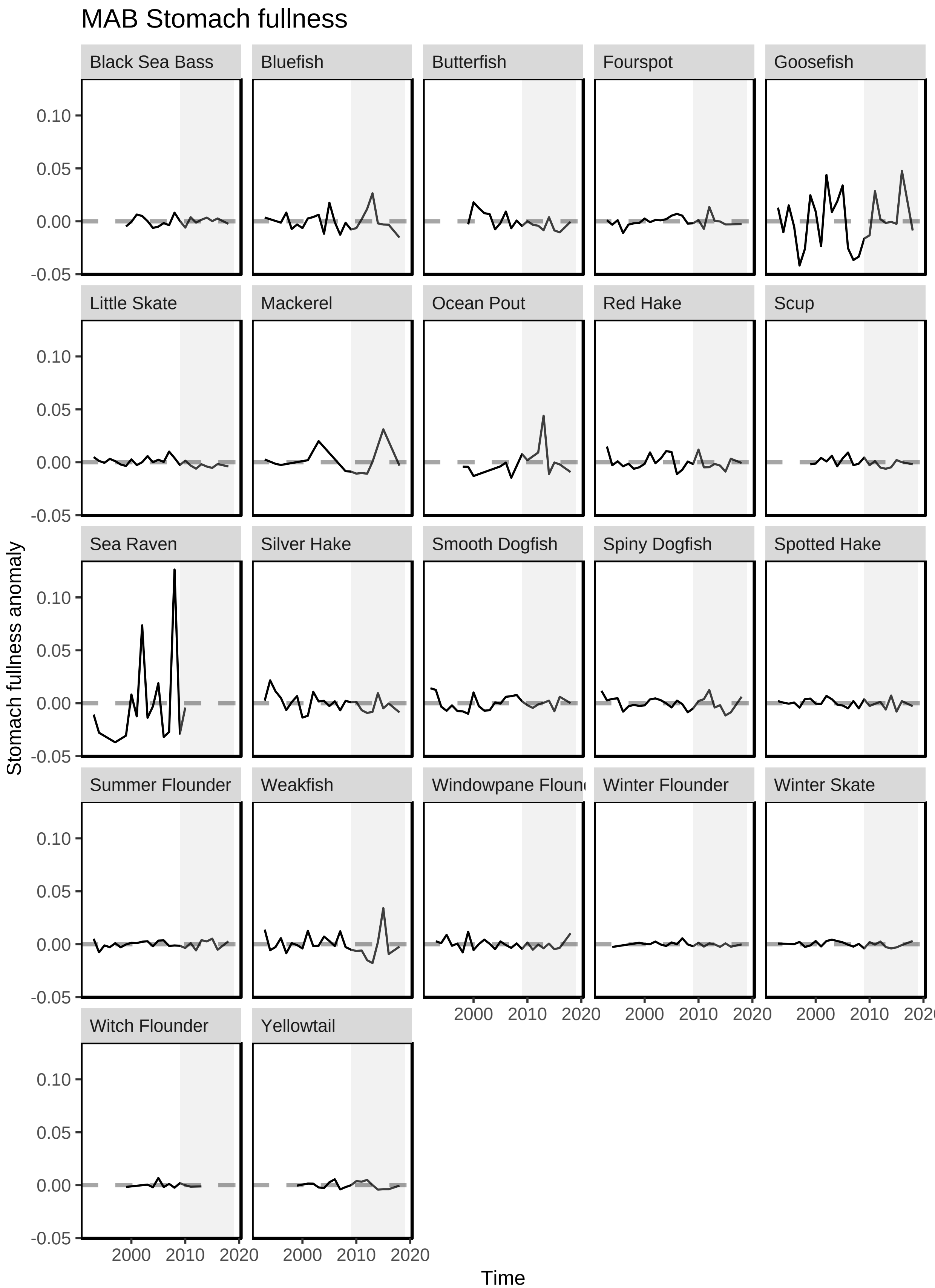

Figure 9: Stomach fullness anomaly in the Mid-Atlantic Bight.

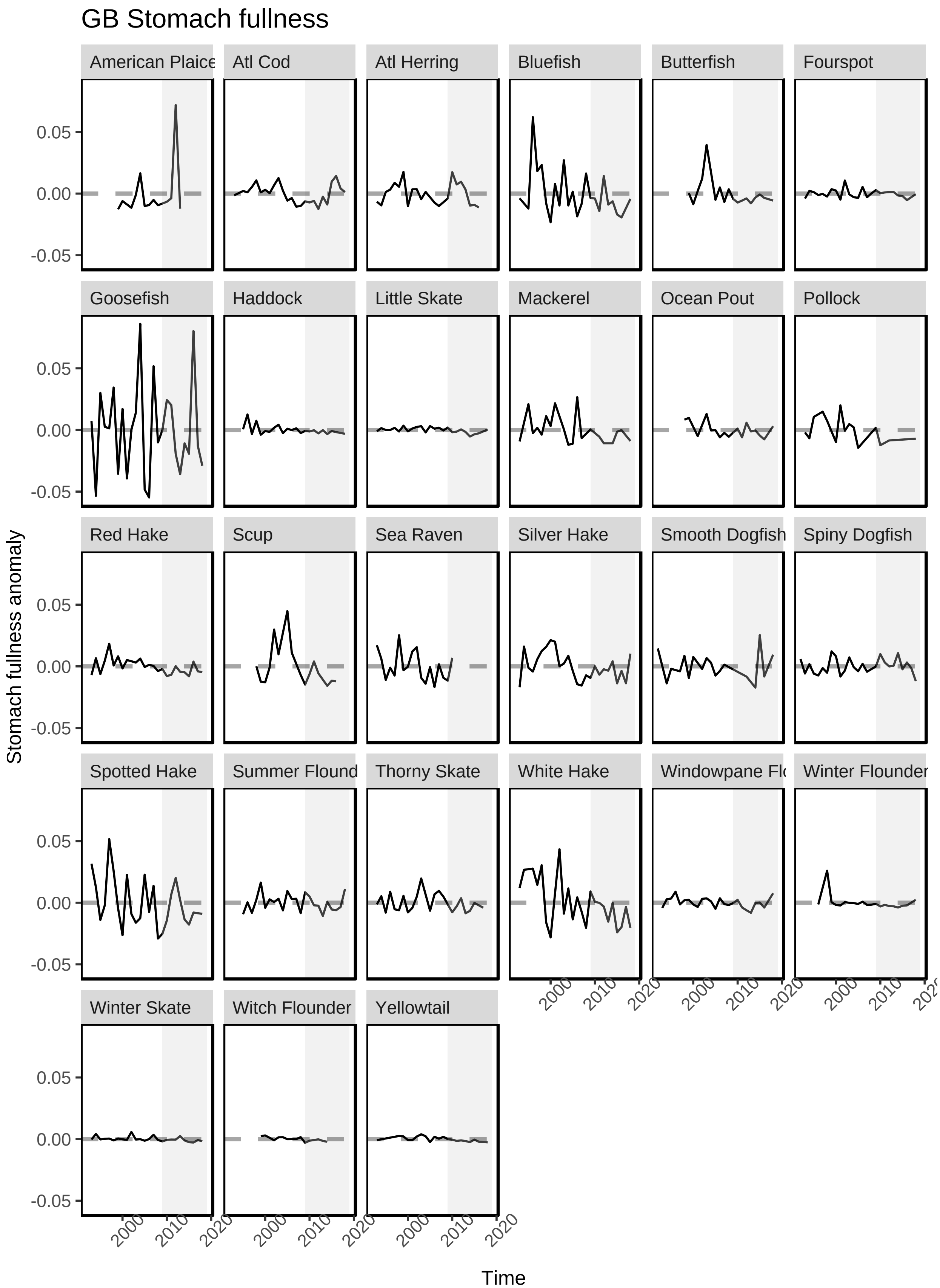

Figure 10: Stomach Fullness Anomaly in New England.

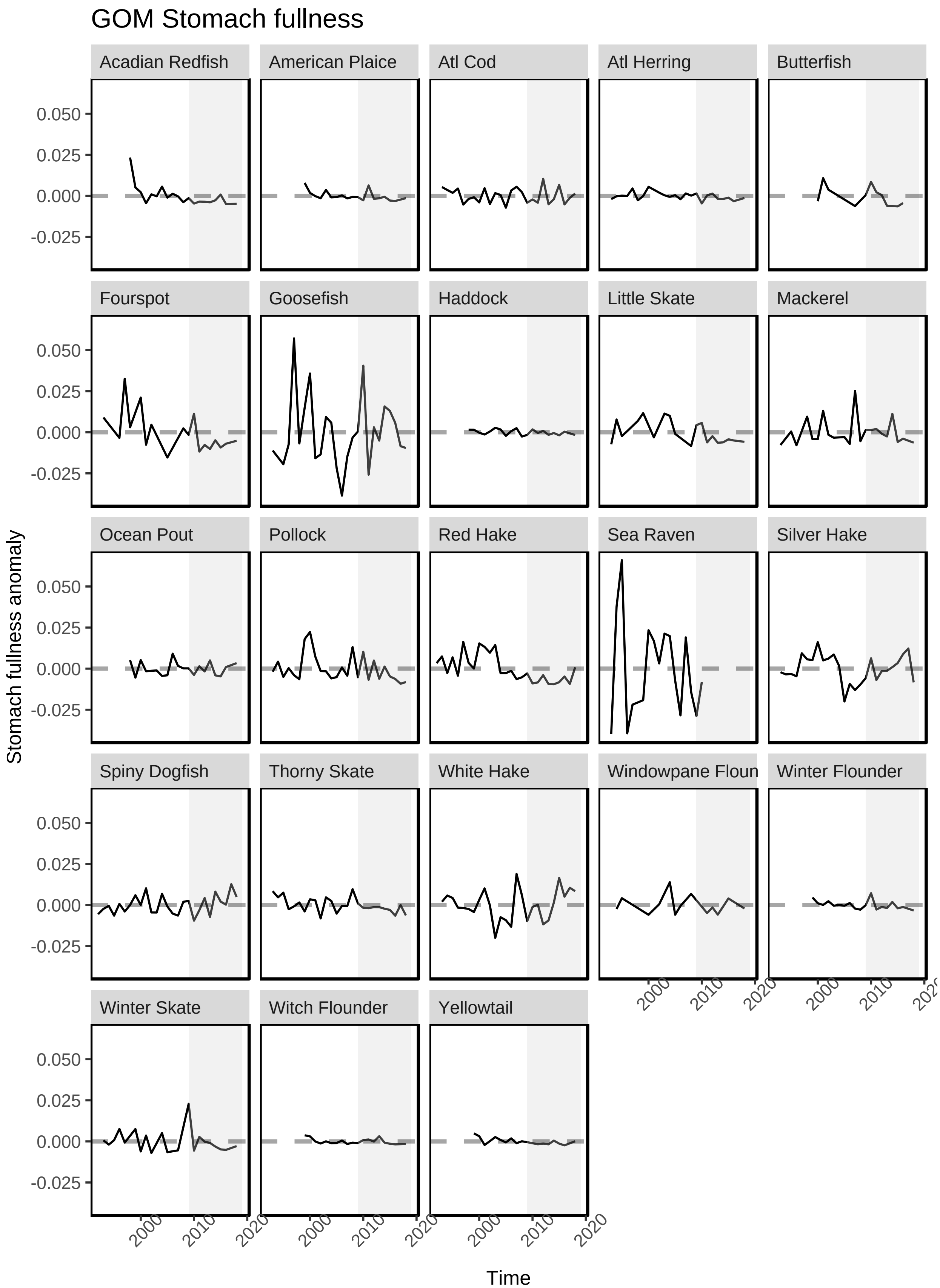

Figure 11: Stomach Fullness Anomaly in New England.

21 Right Whale Calves

The NEFMC requested a North Atlantic Right Whale calf production indicator. This indicator has been added to both SOE reports (p. 10-11 MAFMC and NEFMC).

22 Distinguish Managed Species

The NEFMC requested that managed species be distinguished in the report. Both SOE reports summarize landings as a whole and by Council-managed species in aggregate (p. 4-5 MAFMC and p. 4-6 NEFMC). A table listing which species are managed by which entity is included in each SOE report (Table 4 in both reports). Status of Council-managed species is reported in each SOE (p. 30 MAFMC and p. 38 NEFMC) with jointly managed species indicated.

23 Marine Mammal Consumption

The MAFMC was interested in estimates of marine mammal consumption. While there have been no updated reports of total marine mammal consumption for the US Northeast Shelf ecosystem since 2015 [6], new diet studies are in progress. We included updated information on seal diets in both SOE reports (p. 11-12 MAFMC and NEFMC). Once completed, these diet studies combined with mammal population estimates could be used to update marine mammal consumption estimates.

24 Small Pelagic Abundance

The MAFMC requested indices of small pelagic abundance. While the SOE includes survey biomass estimates of planktivores (p. 15-16 MAFMC and p. 16-20 NEFMC), we would like to improve on these indices. Combining survey information using VAST models as described under point 3 may improve indices for small pelagics, but species not sampled by bottom trawl surveys remain problematic. We welcome feedback on other sources of information to address small pelagic abundance.

Forage energy content is another important consideration which may affect predators as much as fluctuations in abundance. This year we have included initial information on forage energy content in the SOE reports (p. 18 MAFMC and p. 23 NEFMC) which highlights the potential for seasonal and interannual variability in energy content. We plan to develop forage energy content indicators as this time series develops, and welcome feedback on how best to do so.

25 Young of Year Index

The MA SSC was interested in a young of year index from multiple surveys. We have included the fish productivity index in both SOE reports (p. 17-18 MAFMC and p. 21-23 NEFMC), which calculates the number of small fish per biomass of large fish of the same species from NEFSC surveys. This index has been reported previously to MAFMC, and intermittently to NEFMC. We recognize that this is not strictly a young of year index, and it is from a single survey. We seek guidance from the SSC on how to refine this index; would a similar index of small fish numbers to large fish biomass from the NEAMAP survey data be useful? Or would an index of young of year without biomass of larger fish be more useful? If so, how would we best combine species or select species for the index? And should we try to combine surveys or report them separately?

26 Shark Biomass

The MAFMC requested information on biomass of sharks, as fishermen had reported encountering more blacktip, spinner, and sandbar sharks each summer. We were able to obtain catch data from the Highly Migratory Species group at NMFS Headquarters for the past 3 years, and the group is working on assembling a longer time series for future reports. We did not print the 3 year time series in the SOE reports, but visualizations are available along with other commercial landings[7]. To date, we have been unable to get biomass information on sharks at the coastwide level. We welcome suggestions for sources of this information.

27 Trawl Survey Species Diversity

The NE SSC requested a species diversity metric based on NEFSC trawl survey data. We have included such a metric in past reports (2017), but were concerned that apparent differences in diversity prior to and after 2008 may be driven by differences in survey vessels. While species-specific cpue and sizes have calibration coefficents between survey vessels, the number of species captured by the vessels has no known calibration coefficient.

We could calculate diversity indices for Albatross and Bigelow years separately to avoid this issue, and will do so if the Councils would find these separate indices useful.

28 Ecosystem Risk Score

The MAFMC requested work towards an ecosystem-level risk score. This system level score could augment information on individual risk elements already included in the MAFMC EAFM risk assessment, which is updated annually. Multiple indicators could be combined to form an integrated risk score (as discussed by the MAFMC Ecosystem and Ocean Planning Committee when evaluting this EAFM risk assessment), and many integrated scores have been suggested in the scientific literature. We seek further guidance on how best to develop an integrated ecosystem risk score for the MAFMC and NEFMC.

In the meantime, the primary production required to support landings introduced in this year's SOEs (p. 3-4 MAFMC and NEFMC, and see point 14 above) may contribute to an overall ecosystem risk score. While there is no established threshold for primary production required, fisheries would likely pose higher ecosystem risk if they require very high proportions of primary production. We welcome comments and suggestions from the Councils to continue this work.

Similarly, the new SOE marine heat wave indicator (p. 23-25 MAFMC and p. 28-31 NEFMC) may contribute to an overall ecosystem risk score from a climate/environmental perspective, as it measures the frequency of extreme temperature conditions in each EPU which pose risks to ecological and fishing communities. This could be integrated with existing climate vulnerability information and/or other report indicators to assess risk. Ultimately, the Council's objectives for this risk score will determine the components used.

29 Thresholds and Inflection Points

Both Councils have been interested in ecosystem-level thresholds and determining where indicators reach inflection points, suggesting changes in trends of concern. The SOEs include statistical analysis to determine where indicators have significant increasing or decreasing trends. However, based on a recent simulation analysis, we are confident in trend assessment only for time series of 30 years or more [7].

Where evidence is strong for shifts, we have looked at state changes rather than trends. The new Gulf Stream warm core ring indicator (p. 20-21 MAFMC and p. 24-25 NEFMC, and see point 11 above) shows a state change in warm core ring production based on a recent publication [5].

Some SOE indicators, such as the new marine heat wave cumulative intensity indicator in the Gulf of Maine (SOE Figure 35 on p. 29 NEFMC) have both significant trends and visually obvious shifts that could reflect a change in state for that indicator, which could be confirmed with further statistical analysis. Work is ongoing to determine statistically where shifts or changepoints across multiple indicators have ocurred, but was not ready for inclusion in this year's reports. We welcome comments and guidance from the Councils on the types of analysis that would be most useful: changepoints for individual indicators, or across many indicators, or both?

[7] https://noaa-edab.github.io/ecodata/human_dimensions

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Introduction

The Council approved an EAFM Guidance Document in 2016 which outlined a path forward to more fully incorporate ecosystem considerations into marine fisheries management[1], and revised the document in February 2019[2]. The Council's stated goal for EAFM is "to manage for ecologically sustainable utilization of living marine resources while maintaining ecosystem productivity, structure, and function." Ecologically sustainable utilization is further defined as "utilization that accommodates the needs of present and future generations, while maintaining the integrity, health, and diversity of the marine ecosystem." Of particular interest to the Council was the development of tools to incorporate the effects of species, fleet, habitat and climate interactions into its management and science programs. To accomplish this, the Council agreed to adopt a structured framework to first prioritize ecosystem interactions, second to specify key questions regarding high priority interactions and third tailor appropriate analyses to address them [1]. Because there are so many possible ecosystem interactions to consider, a risk assessment was adopted as the first step to identify a subset of high priority interactions [2]. The risk elements included in the Council's initial assessment spanned biological, ecological, social and economic issues (Table 1) and risk criteria for the assessment were based on a range of indicators and expert knowledge (Table 2).

This document updates the Mid-Atlantic Council's initial EAFM risk assessment with indicators from the 2020 State of the Ecosystem report and with new analyses by Council Staff for the Management elements. The risk assessment was designed to help the Council decide where to focus limited resources to address ecosystem considerations by first clarifying priorities. Overall, the purpose of the EAFM risk assessment is to provide the Council with a proactive strategic planning tool for the sustainable management of marine resources under its jurisdiction, while taking interactions within the ecosystem into account.

Many risk rankings are unchanged based on the updated indicators for 2020 and the Council's risk criteria. Below, we highlight only the elements where updated information has changed the perception of risk. In addition, we present new indicators based on Council feedback on the original risk analysis that the Council may wish to include in future updates to the EAFM risk assessment.

[1]http://www.mafmc.org/s/EAFM_Guidance-Doc_2017-02-07.pdf
[2]http://www.mafmc.org/s/EAFM-Doc-Revised-2019-02-08.pdf

Table 1: Risk Elements, Definitions, and Indicators Used

Element	Definition	Indicator
Ecological		
Assessment performance	Risk of not achieving OY due to analytical limitations	Current assessment method/data quality
F status	Risk of not achieving OY due to overfishing	Current F relative to reference F from assessment
B status	Risk of not achieving OY due to depleted stock	Current B relative to reference B from assessment
Food web (MAFMC Predator)	Risk of not achieving OY due to MAFMC managed species interactions	Diet composition, management measures
Food web (MAFMC Prey)	Risk of not achieving OY due to MAFMC managed species interactions	Diet composition, management measures
Food web (Protected Species Prey)	Risk of not achieving protected species objectives due to species interactions	Diet composition, management measures
Ecosystem productivity	Risk of not achieving OY due to changing system productivity	Four indicators, see text
Climate	Risk of not achieving OY due to climate vulnerability	Northeast Climate Vulnerability Assessment
Distribution shifts	Risk of not achieving OY due to climate-driven distribution shifts	Northeast Climate Vulnerability Assessment + 2 indicators
Estuarine habitat	Risk of not achieving OY due to threats to estuarine/nursery habitat	Enumerated threats + estuarine dependence
Offshore habitat	Risk of not achieving OY due to changing offshore habitat	Integrated habitat model index
Economic		
Commercial Revenue	Risk of not maximizing fishery value	Revenue in aggregate
Recreational Angler Days/Trips	Risk of not maximizing fishery value	Numbers of anglers and trips in aggregate
Commercial Fishery Resilience (Revenue Diversity)	Risk of reduced fishery business resilience	Species diversity of revenue
Commercial Fishery Resilience (Shoreside Support)	Risk of reduced fishery business resilience due to shoreside support infrastructure	Number of shoreside support businesses
Social		
Fleet Resilience	Risk of reduced fishery resilience	Number of fleets, fleet diversity
Social-Cultural	Risk of reduced community resilience	Community vulnerability, fishery engagement and reliance
Food Production		
Commercial	Risk of not optimizing seafood production	Seafood landings in aggregate
Recreational	Risk of not maintaining personal food production	Recreational landings in aggregate
Management		
Control	Risk of not achieving OY due to inadequate control	Catch compared to allocation
Interactions	Risk of not achieving OY due to interactions with species managed by other entities	Number and type of interactions with protected or non-MAFMC managed species, co-management
Other ocean uses	Risk of not achieving OY due to other human uses	Fishery overlap with energy/mining areas
Regulatory complexity	Risk of not achieving compliance due to complexity	Number of regulations by species
Discards	Risk of not minimizing bycatch to extent practicable	Standardized Bycatch Reporting
Allocation	Risk of not achieving OY due to spatial mismatch of stocks and management	Distribution shifts + number of interests

Table 2: Risk Ranking Criteria used for each Risk Element

Element	Low	Low-Moderate	Moderate-High	High
Assessment performance	Assessment model(s) passed peer review, high data quality	Assessment passed peer review but some key data and/or reference points may be lacking	*This category not used*	Assessment failed peer review or no assessment, data-limited tools applied
F status	F < Fmsy	Unknown, but weight of evidence indicates low overfishing risk	Unknown status	F > Fmsy
B status	B > Bmsy	Bmsy > B > 0.5 Bmsy, or unknown, but weight of evidence indicates low risk	Unknown status	B < 0.5 Bmsy
Food web (MAFMC Predator)	Few interactions as predators of other MAFMC managed species, or predator of other managed species in aggregate but below 50% of diet	*This category not used*	*This category not used*	Managed species highly dependent on other MAFMC managed species as prey
Food web (MAFMC Prey)	Few interactions as prey of other MAFMC managed species, or prey of other managed species but below 50% of diet	Important prey with management consideration of interaction	*This category not used*	Managed species is sole prey and/or subject to high mortality due to other MAFMC managed species
Food web (Protected Species Prey)	Few interactions with any protected species	Important prey of 1-2 protected species, or important prey of 3 or more protected species with management consideration of interaction	Important prey of 3 or more protected species	Managed species is sole prey for a protected species
Ecosystem productivity	No trends in ecosystem productivity	Trend in ecosystem productivity (1-2 measures, increase or decrease)	Trend in ecosystem productivity (3+ measures, increase or decrease)	Decreasing trend in ecosystem productivity, all measures
Climate	Low climate vulnerability ranking	Moderate climate vulnerability ranking	High climate vulnerability ranking	Very high climate vulnerability ranking
Distribution shifts	Low potential for distribution shifts	Moderate potential for distribution shifts	High potential for distribution shifts	Very high potential for distribution shifts
Estuarine habitat	Not dependent on nearshore coastal or estuarine habitat	Estuarine dependent, estuarine condition stable	Estuarine dependent, estuarine condition fair	Estuarine dependent, estuarine condition poor
Offshore habitat	No change in offshore habitat quality or quantity	Increasing variability in habitat quality or quantity	Significant long term decrease in habitat quality or quantity	Significant recent decrease in habitat quality or quantity
Commercial Revenue	No trend and low variability in revenue	Increasing or high variability in revenue	Significant long term revenue decrease	Significant recent decrease in revenue
Recreational Angler Days/Trips	No trends in angler days/trips	Increasing or high variability in angler days/trips	Significant long term decreases in angler days/trips	Significant recent decreases in angler days/trips
Commercial Fishery Resilience (Revenue Diversity)	No trend in diversity measure	Increasing or high variability in diversity measure	Significant long term downward trend in diversity measure	Significant recent downward trend in diversity measure

Table 2: Risk Ranking Criteria used for each Risk Element *(continued)*

Element	Low	Low-Moderate	Moderate-High	High
Commercial Fishery Resilience (Shoreside Support)	No trend in shoreside support businesses	Increasing or high variability in shoreside support businesses	Significant recent decrease in one measure of shoreside support businesses	Significant recent decrease in multiple measures of shoreside support businesses
Fleet Resilience	No trend in diversity measure	Increasing or high variability in diversity measure	Significant long term downward trend in diversity measure	Significant recent downward trend in diversity measure
Social-Cultural	Few (<10%) vulnerable fishery dependent communities	10-25% of fishery dependent communities with >3 high vulnerability ratings	25-50% of fishery dependent communities with >3 high vulnerability ratings	Majority (>50%) of fishery dependent communities with >3 high vulnerability ratings
Commercial	No trend or increase in seafood landings	Increasing or high variability in seafood landings	Significant long term decrease in seafood landings	Significant recent decrease in seafood landings
Recreational	No trend or increase in recreational landings	Increasing or high variability in recreational landings	Significant long term decrease in recreational landings	Significant recent decrease in recreational landings
Control	No history of overages	Small overages, but infrequent	Routine overages, but small to moderate	Routine significant overages
Interactions	No interactions with non-MAFMC managed species	Interactions with non-MAFMC managed species but infrequent, Category II fishery under MMPA; or AMs not likely triggered	AMs in non-MAFMC managed species may be triggered; or Category I fishery under MMPA (but takes less than PBR)	AMs in non-MAFMC managed species triggered; or Category I fishery under MMPA and takes above PBR
Other ocean uses	No overlap; no impact on habitat	Low-moderate overlap; minor habitat impacts but transient	Moderate-high overlap; minor habitat impacts but persistent	High overlap; other uses could seriously disrupt fishery prosecution; major permanent habitat impacts
Regulatory complexity	Simple/few regulations; rarely if ever change	Low-moderate complexity; occasional changes	Moderate-high complexity; occasional changes	High complexity; frequently changed
Discards	No significant discards	Low or episodic discard	Regular discard but managed	High discard, difficult to manage
Allocation	No recent or ongoing Council discussion about allocation	*This category not used*	*This category not used*	Recent or ongoing Council discussion about allocation

Changes from 2019

Ecological risk elements

Decreased Risk: 0

No indicators for existing ecological elements have changed enough to warrant decreased risk rankings according to the Council risk critiera.

Increased Risk: 1

Bluefish biomass (B) status has changed from low-moderate risk (Bmsy > B > 0.5Bmsy) to high risk (B < 0.5Bmsy) based on the new benchmark assessment (Table 4).

Update on Chesapeake Bay water quality

Many important MAFMC managed species use estuarine habitats as nurseries or are considered estuarine and nearshore coastal-dependent (summer flounder, scup, black sea bass, and bluefish), and interact with other important estuarine-dependent species (e.g., striped bass and menhaden). In 2019, we reported on improving water quality in Chesapeake Bay, and suggested that the Council could reconsider high risk ratings for estuarine-dependent species if this trend continues. However, the Chesapeake Bay experienced below average salinity in 2019, caused by the highest precipitation levels ever recorded for the watershed throughout 2018 and 2019. It is unclear how this will affect the overall water quality indicator (which was not updated for the 2020 report because it requires multiple years to update). The new information below suggests that high risk for estuarine-dependent species is still warranted.

Low salinity levels recorded by NOAA Chesapeake Bay Office's Chesapeake Bay Interpretive Buoy System (CBIBS) at Stingray Point showed below-average levels starting in summer 2018 and continuing through spring of 2019 (Fig. 1).

High flows during the winter and spring of Water Year (WY) 2019 came during a critical time of year when the nutrients delivered to the Bay fuel algal blooms, which can cause low dissolved oxygen in the summer. Low dissolved oxygen levels less than 2.0 mg/l (or hypoxia) are harmful to oysters, crabs and fish. The high flows, and associated nutrient loads, during WY 2019 contributed to summer dissolved-oxygen levels in the Bay that were the 3rd lowest recorded in Maryland waters, according to the Maryland Department of Natural Resources[3].

In Maryland, the Spatfall Intensity Index, a measure of oyster recruitment success and potential increase in the population, was 15.0 spat/bu, well below the 34-year median value of 39.8. Blue catfish, an invasive species in the Chesapeake, spread over the last two summers due to the lower salinity levels.

[3] https://www.usgs.gov/center-news/september-hypoxia-report

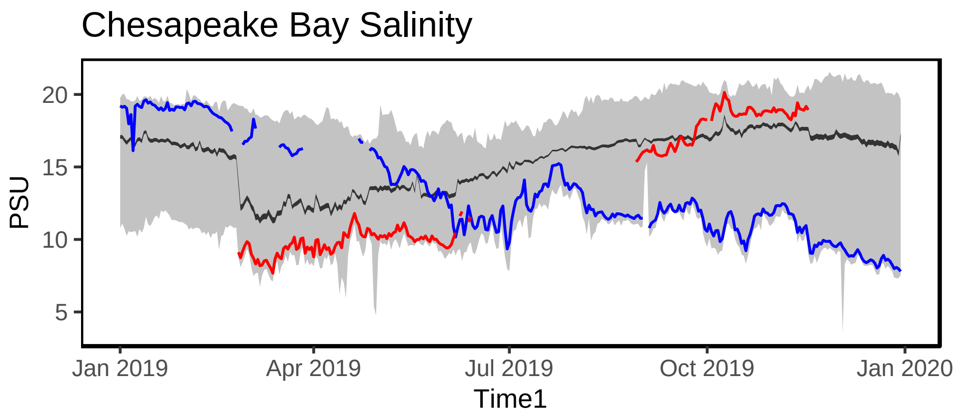

Figure 1: Salinity in Chesapeake Bay throughout 2018 (blue) and 2019 (red) as well as the daily average 2008-2019 (black) and the full observed range 2008-2019 (gray shading).

Economic, Social, and Food production risk elements

Decreased Risk: 0

No indicators for existing economic, social, and food production elements have changed enough to warrant decreased risk rankings according to the Council risk critiera.

Increased Risk: 0

No indicators for existing economic, social, and food production elements have changed enough to warrant increased risk rankings according to the Council risk critiera.

Update on recreational seafood production

Although the risk ranking for recreational seafood production remains at moderate-high based on the continued long term downward trend in this indicator, the most recent data is notable. 2018 recreational seafood landings were the lowest observed since 1982, with a 47% drop year over year (Fig. 2). This drop involved multiple species, including black sea bass, scup, spot, and bluefish, among others and though accompanied by lower recreational effort in 2018, is not fully explained by changes in effort alone. The survey methodology behind these numbers was updated in 2018, and additional years worth of data is needed to understand whether these declines are driven by changes in the precision or other statistical properties of the data.

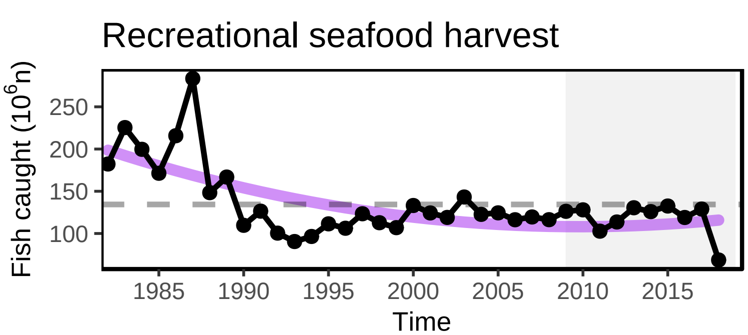

Figure 2: Total recreational seafood harvest in the Mid-Atlantic region.

Potential new indicators

Social-Cultural: Commerical Fishery Engagement

Commerical fishery engagement measures the number of permits, dealers, and landings in a community[4]. The trend in the number of Mid-Atlantic fishing communities that were highly engaged (red bar) in commercial fishing has shown a decrease since 2004 (Fig. 3). Some of the communities that were highly engaged have moved into the moderate (blue bar) or medium-high (green bar) category, and thus the number of moderately to medium-highly engaged communities have increased. Significant changes in engagement scores have also been observed in medium-highly engaged communities. The average engagement score has decreased since 2004. These changes may be driven by the decline in value landed by primary species such as sea scallops in this group of communities.

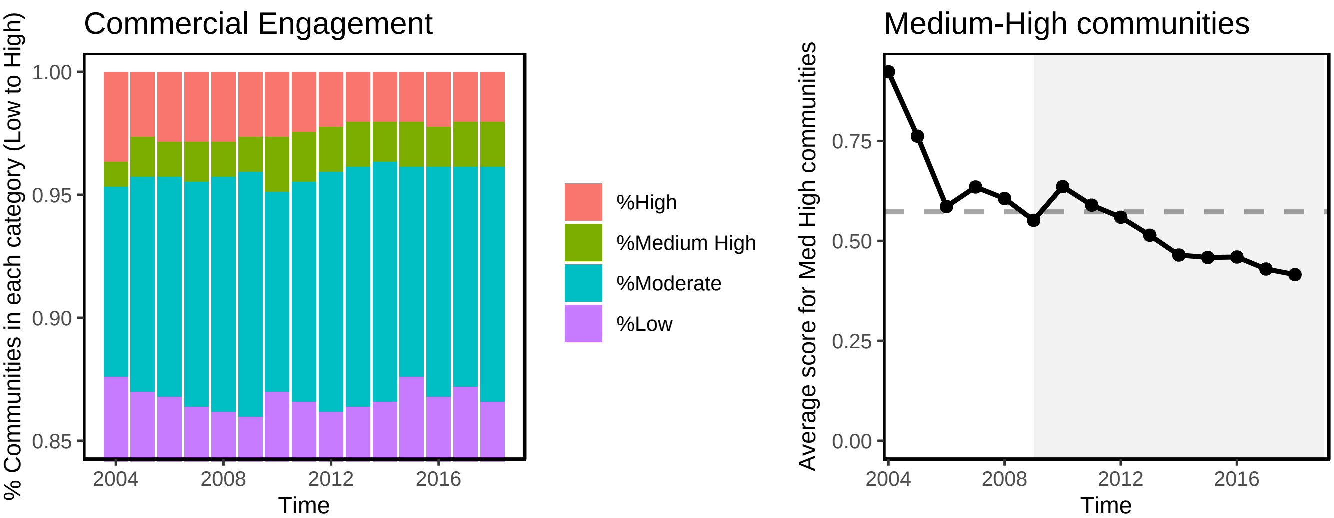

Figure 3: Commercial engagement scores (total pounds landed, value landed, commercial permits, and commercial dealers in a community) for Mid-Atlantic fishing communities, 2004-2018.

Recreational Diversity

Indicators for the diversity of recreational effort (i.e. access to recreational opportunities) by mode (party/charter boats, private boats, shore-based), and diversity of catch (NEFMC, MAFMC, SAFMC, and ASMFC managed species) show different trends. The downward effort diversity trend is driven by party/charter contraction (from a high of 24% of angler trips to 7% currently), with a shift towards shorebased angling. Effort in private boats remained stable between 36-37% of angler trips across the entire series. The long-term decrease in species catch diversity in the Mid-Atlantic states reported last year resulted from aggregation of SAFMC and ASMFC managed species into a single group. With SAFMC and ASMFC species considered individually, there is no long term trend in recreational catch diversity. This implies that recent increases in catch of SAFMC and/or ASMFC managed species is helping to maintain diversity in the same range that MAFMC and NEFMC species supported in the 1990s (Fig. 4).

[4] https://www.fisheries.noaa.gov/national/socioeconomics/social-indicator-definitions#fishing-engagement-and-reliance-indices

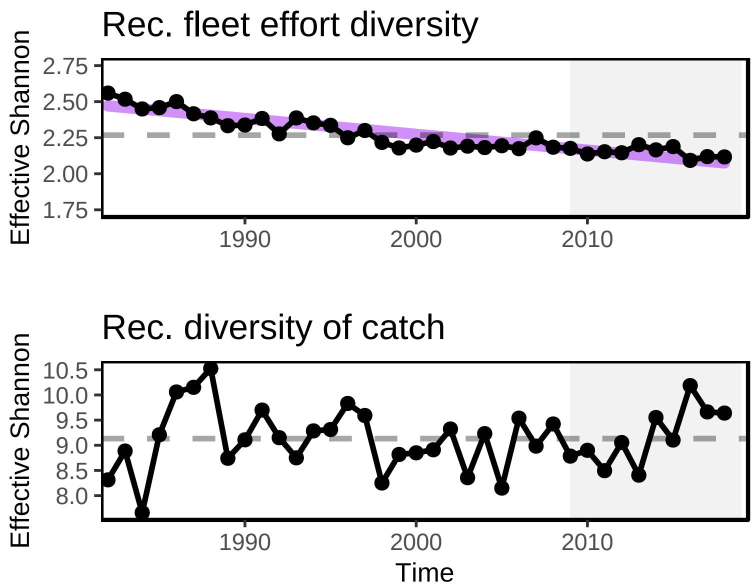

Figure 4: Recreational effort diversity and diversity of recreational catch in the Mid-Atlantic.

We seek Council feedback on whether to include commericial engagement and recreational diversity as an indicators for the EAFM risk assessment, and if so, what risk criteria should be applied to these indicators.

Management risk elements

Management risk elements have not been updated since the original risk assessment was conducted in 2017. Management risk elements contain a mixture of quantitatively (Fishing Mortality Control, Technical Interactions, Discards, and Allocation) and qualitatively (Other Ocean Uses and Regulatory Complexity) calculated rankings. The updated management risk element rankings were conducted by the Council staff lead for a particular species (Table 6).

New rankings for chub mackerel and unmanaged forage

In 2019, the Council approved adding chub mackerel to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan; therefore, an evaluation of chub mackerel management risk has been included for the first time. The rankings for chub mackerel can be found in Table 6 and the justification for each ranking is provided below:

- **Management Control:** first annual landings limit implemented September 2017 and has not been exceeded. Proposed ABC expected to be implemented in 2020 and would represent a liberalization compared to measures implemented in 2017.
- **Technical Interactions:** some marine mammal interactions.
- **Other Ocean Use:** potential loss of access, particularly for mobile gear, due to offshore energy development (wind, gas, oil) in some fishing areas but most fishing far offshore.
- **Regulatory Stability:** simpler regulations than some other species (e.g., commercial possession limit only after ACL is close to being exceeded, no minimum fish size limit, no gear restrictions, no recreational management measures except for permit requirement). Management measures first implemented in 2017, will be revised in 2020.
- **Discards:** the first ABC and ACL are expected to be implemented in 2020 and are not expected to be exceeded based on recent trends in the fisheries. Discards generally make up 6% or less of total catch.
- **Allocation:** the stock is not allocated and there are currently no allocation concerns.

When the first risk assessment was completed in 2017, regulations pertaining to unmanaged forage were just implemented and therefore no rankings were provided for the various management risk elements. Rankings for unmanaged forage species are included for the first time (Table 6) and the justification for each ranking is provided below:

- **Management Control:** no stock assessments or ABCs. Only restriction on catch is a possession limit which was first implemented in Sept 2017. Dealer data for 2018-2019 show no trips exceeding that possession limit.
- **Technical Interactions:** forage ecosystem component (EC) species are not managed with OY and they largely do not have notable directed fisheries; therefore, although interactions with other fishery regulations are possible, these interactions likely have minimal impacts.
- **Other Ocean Use:** potential loss or degradation of habitat due to a variety of other uses, especially in nearshore areas used by many forage species.
- **Regulatory Stability:** only regulations are permit and reporting requirement, possession limit, and transit provisions. First implemented in September 2017 and have remained unchanged.
- **Discards:** forage EC species are not managed with ACLs; therefore, discards do not cause closures or trigger AMs. Targeting of these forage species is small-scale.
- **Allocation**: stocks are not allocated and there are currently no allocation concerns.

Decreased Risk: 5

Summer flounder recreational regulatory complexity risk dropped slightly moving from high to medium-high risk. Frequent changes in size, season and possession limits, significant differences between some states remain, but regulatory stability and year to year consistency has improved somewhat since 2014.

Technical interaction risk within the commercial scup fishery decreased from medium-high to low-medium. No accountability measures (AMs) have been triggered due to other fisheries and the commercial scup fishery is considered a category II fishery.

The recreational Atlantic mackerel allocation risk decreased from high to low. There have been no recent Council discussions regarding potential changes to the recreational Atlantic mackerel allocation and the Council recently changed to a simple deduction of expected recreational catch instead of a set recreational allocation.

The longfin squid allocation risk deceased from high to low. There were some allocation discussions during the development and completion of Amendment 20 in 2018, but the Council is currently not considering any allocation changes.

The commercial spiny dogfish allocation risk dropped from high to low. There are no current discussions to modify the commercial allocation and the ASMFC recently completed an action that has added flexibility to transfer regional quotas and match annual variability and reduced the need for allocation changes.

Increased Risk: 14

Discards in the ocean quahog and surfclam fisheries moved from low risk to medium-high risk. While the ocean quahog and surfclam fisheries are allocated minimal coverage under SBRM as a result of discards comprising a low percent of total catch, the comingling of surfclams and quahogs (trips can not be mixed) has resulted in increased discarding of one species is occurring frequently enough to be raised as a concern.

Commercial summer flounder discard risk increased from medium-high to high. Dead discards as a percentage of commercial catch have increased slightly in recent years due to lower quotas and caused ACLs to be exceeded in some years. Discards can be difficult to control given various reasons for discarding, and some uncertainty and variability in discard estimates remain.

The risk to recreational scup management control increased slightly from low to low-moderate. Recreational scup ACL and RHL underages each year since 2011; however, in 2017 the ACL was exceeded by 1% due to recreational discards.

Recreational and commercial scup allocation risk element changed from low to high. In 2019, the Council and ASMFC initiated an amendment to consider changes to the current 78% commercial/22% recreational split of the total allowable catch.

Risks from other ocean uses to the commercial scup fishery increased from low-medium to medium-high due to the potential for habitat impacts and the loss of access from offshore energy development.

Recreational black sea bass discard risk increased from medium-high to high. There is a high recreational discard rate and ACL overages have occurred for at least the past 4 years due to higher discards than assumed during specifications setting process (considering pre-calibration MRIP estimates).

The risk to commercial black sea bass management control rose appreciably from low-medium to high. Commercial landings are generally very close to quota, but the ACL has been exceeded every year from 2015 to 2018 (likely during earlier years as well) due to higher discards than assumed during specifications setting.

These ACL overages due to higher than projected discards resulted in greater risk from commercial black sea bass discards, with the ranking changing from low-medium to high.

The risk to recreational Atlantic mackerel management control increased slightly from low to low-medium. There have been no ACL overages last 5 years using the appropriate MRIP data and the current recreational measures in place should avoid overages generally. However, the recreational sector has been exceeding its assumed harvest, but the commercial management uncertainty buffer has accommodated these overages.

The risk to shortfin squid (*Illex*) management control increased slightly from low to low-medium. There are no ACL's for this fishery; however, there was a 5% ABC overage in 2018. The current management measures that are in place should generally avoid overages.

Illex allocation risk changed from low to high. The Council is currently considering modifications to the *Illex* permitting system which may have allocation implications amongst participants in the fishery.

The recreational bluefish regulatory complexity risk increased slightly from low to low-medium. Regulations recently changed to ensure the reduced RHL is not exceeded as result of the newly determined overfished status. As the rebuilding plan is implemented, future regulatory changes may also be needed.

Potential new indicators

Other ocean uses: Fish habitat overlap with offshore wind lease areas

Fish habitat modeling based on NEFSC bottom trawl surveys [3] indicates that summer flounder, butterfish, longfin squid, and spiny dogfish are among fish species highly likely to occupy wind energy lease areas (Fig. 5). Habitat conditions for many of these species have become more favorable over time within wind lease areas (increasing trend in probability of occupancy). Table 3 lists the top 5 species in each season most likely to occupy the wind lease areas in the northern, central, and southern portions of the MAB, along with observed trends in probability of occupancy.

Table 3: Species with highest probability of occupancy species each season and area, with observed trends

	Existing - North		Proposed - North		Existing - Mid		Proposed - Mid		Existing - South	
Season	Species	Trend	Species	Trend	Species	Trend	Species	Trend	Species	Trend
Spring	Little Skate	↗	Atlantic Herring		Little Skate	↗	Spiny Dogfish	↗	Spiny Dogfish	↗
Spring	Atlantic Herring	↘	Little Skate	↗	Atlantic Herring	↘	Atlantic Herring	↘	Longfin Squid	↗
Spring	Windowpane	↗	Longhorn Sculpin	↗	Spiny Dogfish	↗	Little Skate	↗	Summer Flounder	↗
Spring	Winter Skate	↗	Windowpane	↗	Windowpane	↗	Alewife	↘	Clearnose Skate	↗
Spring	Longhorn Sculpin	↗	Alewife	↘	Winter Skate	↗	Silver Hake	↗	Spotted Hake	↗
Fall	Butterfish	↗	Butterfish	↗	Summer Flounder	↗	Longhorn Sculpin	↗	Longfin Squid	↘
Fall	Longfin Squid	↗	Fourspot Flounder		Longfin Squid	↗	Little Skate	↗	Northern Searobin	↗
Fall	Summer Flounder	↗	Longhorn Sculpin	↘	Butterfish	↗	Butterfish	↗	Clearnose Skate	↗
Fall	Winter Flounder	↘	Summer Flounder	↗	Smooth Dogfish	↗	Sea Scallop	↗	Butterfish	↗
Fall	Spiny Dogfish	↘	Spiny Dogfish	↘	Windowpane	↗	Fourspot Flounder	↗	Spiny Dogfish/Spotted Hake	↗

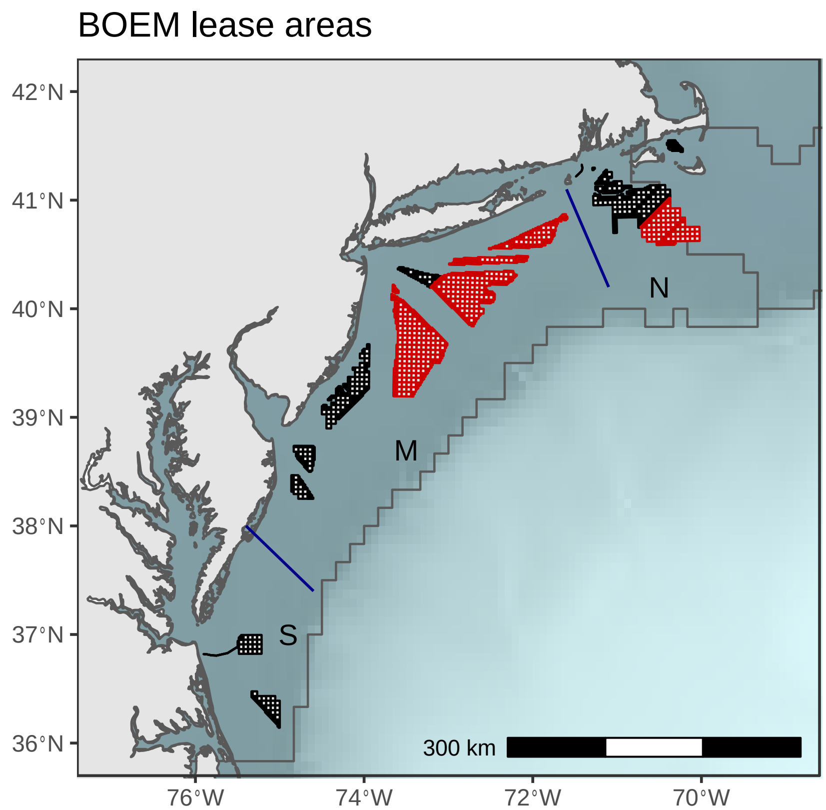

Figure 5: Map of BOEM existing (black) and proposed (red) lease areas as of February 2019.

We seek Council feedback on whether to include information on probability of occupancy in wind lease areas as an indicators for the EAFM risk assessment, and if so, what specific indicators would be most useful and what risk criteria should be applied to these indicators.

Table 4: Species level risk analysis results; l=low risk (green), lm= low-moderate risk (yellow), mh=moderate to high risk (orange), h=high risk (red)

Species	Assess	Fstatus	Bstatus	FW1Pred	FW1Prey	FW2Prey	Climate	DistShift	EstHabitat
Ocean Quahog	l	l	l	l	l	l	h	mh	l
Surfclam	l	l	l	l	l	l	mh	mh	l
Summer flounder	l	l	lm	l	l	l	lm	mh	h
Scup	l	l	l	l	l	l	lm	mh	h
Black sea bass	l	l	l	l	l	l	mh	mh	h
Atl. mackerel	l	h	h	l	l	l	lm	mh	l
Butterfish	l	l	l	l	l	l	l	h	l
Longfin squid	lm	lm	lm	l	l	lm	l	mh	l
Shortfin squid	lm	lm	lm	l	l	lm	l	h	l
Golden tilefish	l	l	lm	l	l	l	mh	l	l
Blueline tilefish	h	h	mh	l	l	l	mh	l	l
Bluefish	l	l	h	l	l	l	l	mh	h
Spiny dogfish	lm	l	lm	l	l	l	l	h	l
Monkfish	h	lm	lm	l	l	l	l	mh	l
Unmanaged forage	na	na	na	l	lm	lm	na	na	na
Deepsea corals	na	na	na	l	l	l	na	na	na

Table 5: Ecosystem level risk analysis results; l=low risk (green), lm= low-moderate risk (yellow), mh=moderate to high risk (orange), h=high risk (red)

System	EcoProd	CommRev	RecVal	FishRes1	FishRes4	FleetDiv	Social	ComFood	RecFood
Mid-Atlantic	lm	mh	h	l	mh	l	lm	h	mh

Table 6: Species and sector level risk analysis results; l=low risk (green), lm= low-moderate risk (yellow), mh=moderate to high risk (orange), h=high risk (red)

Species	MgtControl	TecInteract	OceanUse	RegComplex	Discards	Allocation
Ocean Quahog-C	l	l	lm	l	mh	l
Surfclam-C	l	l	lm	l	mh	l
Summer flounder-R	mh	l	lm	mh	h	h
Summer flounder-C	lm	mh	lm	mh	mh	h
Scup-R	lm	l	lm	mh	mh	h
Scup-C	l	lm	mh	mh	mh	h
Black sea bass-R	h	l	mh	h	h	h
Black sea bass-C	h	lm	h	mh	h	h
Atl. mackerel-R	lm	l	l	l	l	lm
Atl. mackerel-C	l	lm	mh	h	lm	h
Butterfish-C	l	lm	mh	h	mh	l
Longfin squid-C	l	mh	h	h	h	lm
Shortfin squid-C	lm	lm	lm	lm	l	h
Golden tilefish-R	na	l	l	l	l	l
Golden tilefish-C	l	l	l	l	l	l
Blueline tilefish-R	l	l	l	mh	l	h
Blueline tilefish-C	l	l	l	mh	l	h
Bluefish-R	lm	l	l	lm	mh	h
Bluefish-C	l	l	lm	lm	lm	h
Spiny dogfish-R	l	l	l	l	l	l
Spiny dogfish-C	l	mh	mh	mh	lm	mh
Chub mackerel-C	l	lm	lm	lm	l	l
Unmanaged forage	l	l	mh	l	l	l
Deepsea corals	na	na	mh	na	na	na

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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 25, 2020

To: Council

From: Brandon Muffley, Staff

Subject: Update on EAFM activities

Risk Assessment:

The Council's Ecosystem Approach to Fisheries Management (EAFM) guidance document, approved in 2016, provides a structured framework process to incorporate ecosystem considerations in order to evaluate policy choices and trade-offs as they affect FMP species and the broader ecosystem. The first step in the structured framework process includes identifying and prioritizing ecosystem interactions and risks through a comprehensive risk assessment. The Council completed a risk assessment in 2017 to help the Council decide where to focus limited resources to address priority ecosystem considerations in its science and management programs. The risk assessment provides a snapshot of the current risks to meeting the Council's biological, socioeconomic, and management objectives across a variety of factors. The risk assessment was developed and intended to be an adaptive document that is reflective of changing or new science, analysis, and information. For example, many of the indicators and analyses found in the NEFSC Mid-Atlantic State of the Ecosystem report, which is updated annually, were used to form the basis of the Councils risk assessment. Updated assessments, including the comprehensive summary tables, allow the Council to re-evaluate risk on an annual basis, track changes across managed species and sectors, and identify possible management and science priorities.

Relevant sections of the risk assessment were first updated in 2019 utilizing new stock assessment information for Atlantic mackerel and summer flounder and new or updated information contained in the 2019 Mid-Atlantic State of the Ecosystem report[1]. The risk assessment has been updated again in 2020[2] incorporating the recent management track assessment results and the 2020 Mid-Atlantic State of the Ecosystem report. In addition, the management risk elements were updated for all species and sectors, including risk rankings for chub mackerel and unmanaged forage, to reflect recent management actions and outcomes.

[1] The 2019 EAFM Risk Assessment report can be found at: http://www.mafmc.org/briefing/april-2019.
[2] The 2020 EAFM Risk Assessment report is located behind Tab 1 of the April 2020 briefing book.

Summer Flounder Management Strategy Evaluation:

In 2019, the Council completed the development of a conceptual model that considered 16 different high-risk factors affecting summer flounder and its fisheries. Developing conceptual models is the second step in the Council's EAFM structured framework process. The conceptual model and interactive visualization tool identified the key ecosystem elements and their associated linkages, documented available and missing data sources, and scoped out priority summer flounder management questions and objectives in which to focus limited resources.

The extensive and strategic conceptual model scoping process allowed the Council to consider a variety of management questions and identify one priority area for continued evaluation through the development of a management strategy evaluation (MSE). The Council selected the following management question for further development and analysis:

> *Evaluate the biological and economic benefits of minimizing discards and converting discards into landings in the recreational sector. Identify management strategies to effectively realize these benefits.*

When selecting this question, the Council discussed the various management challenges in addressing and reducing regulatory discards, particularly within the recreational sector summer flounder fishery. The Council noted this question has the potential to align efforts and outcomes within the EAFM process and the Councils typical recreational review and management process. In addition, the Council felt this question provided the most tangible benefits to addressing a Council priority and was best fit for an MSE by evaluating the performance of different management options within an ecosystem context.

Building off the information developed during the conceptual model process, the Council will begin conducting an MSE to address the recreational summer flounder discards question and management objectives. Management strategy evaluation is the next, and third, step in the EAFM structured framework process. An MSE will use a simulation model(s) to evaluate different management approaches within an ecosystem context to determine if the outcomes associated with the different approaches achieve management goals and objectives. Clearly identified and defined objectives, performance metrics, and management strategies will be specified by the Council with input and guidance from an extensive stakeholder process. The stakeholder process and engagement will include the Ecosystem and Ocean Planning Committee, the Summer Flounder, Scup and Back Sea Bass Committee, members of the ASMFC Summer Flounder, Scup and Black Sea Bass Management Board, and a variety of Council and ASMFC technical and advisory bodies.

In the fall of 2019, NEFSC staff submitted a proposal for funding in FY2020 to the NOAA Fisheries Office of Sustainable Fisheries Magnuson-Stevens Act Implementation budget line to support a possible Mid-Atlantic Council EAFM management strategy process. These funds are available to support projects at Regional Offices and Science Centers that improve fisheries conservation and management, including improvements to ecosystem-based fisheries management as one of the priority areas for funding. In late January, NEFSC and Council staff were informed the Mid-Atlantic proposal was selected for funding. These funds will be used to support a full-time contract analyst dedicated to this project that will work with Council, GARFO, and NEFSC staff to interact with stakeholders, synthesize available data, develop and run models, and summarize results. This will allow for more rapid model development and implementation to meet management goals and timelines. A contract analyst currently working at the NEFSC has already been identified that has extensive experience with Mid-Atlantic fisheries, recreational data, and economic, ecosystem, and simulation models that will likely be used in the MSE. It is anticipated the contract analyst will begin working on the project by early May. Proposal funds are also available to support, at least in part, an independent facilitator to help with stakeholder engagement, organize workshops, and develop reports summarizing stakeholder and workshop feedback and outcomes.

Council and NEFSC staff are currently working on finalizing membership for an MSE technical/steering workgroup. This workgroup, similar to the conceptual model technical workgroup, will be comprised of staff from the Council, NEFSC, GARFO, ASMFC, NOAA Fisheries, state agencies and members of the SSC and academia. In general, this workgroup will: 1) help develop MSE materials and products, 2) identify stakeholders and outreach opportunities, 3) work closely with and support the contract analyst and independent facilitator, and 4) work with the Council and stakeholders in communicating the goals and outcomes of the MSE. The MSE technical/steering workgroup membership will be finalized in mid-April. Shortly after finalizing membership, the workgroup will meet via webinar to begin planning next steps, timelines, and developing materials for stakeholder engagement and input. It is anticipated the MSE process will take approximately 2 years to complete and provide final results and management alternatives to the Council for consideration. The table below provides a very general overview of MSE tasks/activities and the associated timelines.

Task/Activity	**Timeframe** (subject to change)
Finalize technical/steering committee workgroup membership and initial meeting	April – May 2020
Initial stakeholder meeting(s) and surveys to elicit objectives/performance metrics/uncertainties; data synthesis, initial model development and linking existing models, interim stakeholder meetings	June – December 2020
Simulation testing of management strategies, model refinement as necessary, deliver interim results at stakeholder meetings	January – July 2021
Continue with MSE analysis and stakeholder meetings, as needed; deliver final results	August – December 2021
Council considers potential management alternatives and actions to address recreational summer flounder discards	2022

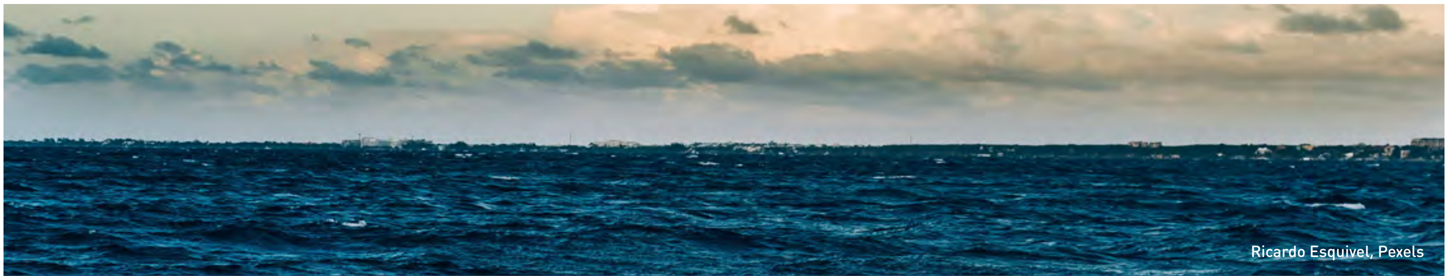
Short-Term Projections Project:

Council staff are co-investigators with a team of scientists (Dr. Malin Pinsky and Dr. Alexa Fredston-Hermonn) from Rutgers University on a research project funded by the Lenfest Ocean

Program that will test new methods and models to predict short-term (the next one to ten years) climate-induced movements of diverse species that better align with management timescales. Project investigators provided an overview of the project methods and potential outcomes to the Ecosystem and Ocean Planning (EOP) Committee and Advisory Panel (AP) in December 2019. The EOP Committee and AP provided a great deal of feedback on the utility of these types of models, candidate species, data availability, and potential outcomes for consideration by research team.

Since that time, limited analysis and base model development (i.e. no candidate species information) has continued as Dr Fredston-Hermonn completed her dissertation and began her post-doctorate work full-time at Rutgers. These efforts will begin to increase over the next several months. In the meantime, a number of other planning activities have taken place and the research team continues to receive additional feedback from stakeholders and Council members, including input from the South Atlantic Council on potential candidate species and data sources. Given some of the feedback from the EOP Committee and AP and in working with the Lenfest Ocean Program, a new outreach flyer was developed to inform the public about the project[3]. As noted in the flyer, the research, including potential candidate species, will be evaluated and updated to reflect feedback and will get underway more earnestly in spring 2020. The research team will continue to look for opportunities to keep the Council, EOP Committee and AP members up to date on project progress and development. An in-person stakeholder meeting in New Jersey was initially being planned for late April; however, given the current national situation with the coronavirus, that meeting has been postponed. The research team is still considering an appropriate time and venue to hold the stakeholder meeting and solicit final initial feedback and it’s also planning for a larger in-person meeting with a more diverse group later in year to present some initial models runs and analysis. It is anticipated this project will conclude sometime in mid-2022.

[3] The new outreach flyer is included behind Tab 1 of the April 2020 Council meeting briefing book.



Ricardo Esquivel, Pexels

PROJECT SUMMARY: SHORT-TERM FORECASTS OF SPECIES DISTRIBUTIONS FOR FISHERIES MANAGEMENT

BACKGROUND: As water temperatures increase along the U.S. east coast, fish and invertebrate species are shifting their ranges, presenting challenges for managers tasked with setting catch limits and, in some fisheries, spatially allocating harvest.

PROJECT GOAL: This research will test a new method for predicting warming-induced movements of diverse species over short timescales (the next one to ten years) that better align with management timescales.

THE METHOD: Unlike previous approaches that use only environmental factors to predict distribution, the new method, called dynamic range modeling, will also factor in the unique population dynamics of individual species, since warming temperatures could affect a species' growth, mortality, movement patterns, and reproductive success. By modeling how these life-history parameters vary geographically along the U.S. Atlantic coast, the researchers may be able to more effectively predict species movements and productivity. The raw data used to fit the models will include species abundance data from state, regional, and federal surveys, as well as high-resolution coastal temperature and dissolved oxygen hindcasts. To validate whether the approach is effective, the team will simulate species distributions from previous years and compare those predictions with actual observed distributions and with predictions that relied only on environmental data.

FOCAL SPECIES FOR THIS RESEARCH: The research team has initially identified four candidate species for which to test the model's effectiveness. The team has solicited feedback from the Mid-Atlantic and South Atlantic Fishery Management Councils and stakeholders regarding other potential candidate species; therefore, the final list of candidate species may change. The researchers selected these species because they represent a broad diversity of life-history strategies, have supporting data available, and are likely susceptible to distribution shifts as a result of changing environmental conditions. *The team did not select these species in order to utilize the outcomes of this research to directly inform current management efforts and actions for those species*.

The four species are:

1. Shortfin squid (*Illex illecebrosus*): Pelagic, short-lived, highly productive, an important forage species, and have a very high potential for distribution change (Hare et al. 2016);

2. Spiny dogfish (*Squalus acanthias*): Demersal, long-lived, low-productivity, seasonal north-south migrations, an important predator, and have a very high potential for distribution change (Hare et al. 2016);

3. Summer flounder (*Paralichthys dentatus*): Demersal, highly productive, seasonal inshore-offshore migrations, and a well-documented northerly range shift since the 1960s; and

4. Grey triggerfish (*Balistes capriscus*): demersal and structure-oriented, and historically present in the Gulf of Mexico and South Atlantic but appearing to shift into the Mid-Atlantic region.

MANAGEMENT RELEVANCE: At its core, this is a scientific study, meant to evaluate and test the use of a new modeling approach for predicting changes in species distribution in the short term. Eventually, depending on how the model performs, movement predictions derived from this technique or similar techniques *could* be used to help inform management discussions concerning:

- Spatial allocation of harvest;
- Advancing an ecosystem approach to fisheries management considerations, since species assemblages and relative abundance may change;
- Population reference points and catch levels; and
- Spatial planning considerations for offshore energy development, by incorporating projected species distributions (not just current distributions).

PROJECT TIMELINE: The three-year project is scheduled to conclude in the spring of 2022, although results and progress will be shared with stakeholders, scientists, managers, and the interested public as they become available.

THE RESEARCH TEAM:

- Principal Investigator: Dr. Malin Pinsky, Rutgers University (malin.pinsky@rutgers.edu)
- Co-Principal Investigator: Brandon Muffley, Mid-Atlantic Fishery Management Council (bmuffley@mafmc.org)
- Post-Doctoral Researcher: Dr. Alexa Fredston-Hermann, Rutgers University (fredstonhermann@ucsb.edu)

Questions, comments, or suggestions? *Please email Emily Knight of the Lenfest Ocean Program at eknight@lenfestocean.org.*

Black Sea Bass, NOAA

REFERENCE:

Hare, J., et al. (2016). A vulnerability assessment of fish and invertebrates to climate change on the northeast U.S. continental shelf. PLoS ONE 11(2): e0146756. https://doi.org/10.1371/journal.pone.0146756.

Scenario Planning for Climate Change
Mid-Atlantic Fishery Management Council Discussion Document, April 2020

During their April 2020 meeting, the Mid-Atlantic Fishery Management Council will discuss initiating a climate change scenario planning process, which is included in the Council's 2020 implementation plan.[1] This discussion document provides introductory information about scenario planning (section 1.0), relevant examples of scenario planning for marine resource management (section 2.0), and a discussion of approaches the Council could consider for such a project in coordination with management partners (section 3.0).

1.0 Introduction to Scenario Planning

1.1 What is Scenario Planning and How is it Used?

Much of the following background information is taken from the National Parks Service (NPS) handbook on climate change scenario planning released in July 2013: "Using Scenarios to Explore Climate Change: A Handbook for Practitioners." As defined in the NPS handbook, scenarios are "a tool that managers can use to test decisions or develop strategy in a context of uncontrollable and uncertain environmental, social, political, economic, or technical factors."

While scenario planning can be used for a wide range of applications, it is well-suited to natural resources management applications in the face of climate change. It provides a structured process for managers to explore and describe multiple plausible futures and to consider how to best adapt and respond to them. It is not a tool for predicting future conditions; rather, scenarios are essentially stories about plausible combinations of future conditions that allow for explicit consideration of uncertainty in future conditions. Scenarios are created in response to a focal question developed based on a major strategic challenge faced by an organization.

Managers can use the resulting scenarios to strategize and prioritize for the future, including by identifying near-term actions that are likely to be beneficial under a range of future conditions and by planning to avoid actions that may reduce flexibility or increase the difficulty of adapting to future conditions. It can also provide insights into data gaps and monitoring needs for changing conditions.

Scenario planning uses "outside in" thinking, which considers broader forces in the world such as societal change, climate and environmental change, and changes in the policy and legal environment, and considers how these drivers that are outside of the organization's control may affect organizational priorities. Scenario planning forces participants to explore their underlying assumptions and perceptions about the range of possible future conditions. It reduces the tendency for managers to become overconfident in their expectations of future conditions, too focused on a limited view of the future, or paralyzed by uncertainty. Scenario thinking provides a way to organize complex information about changing conditions and stimulates creative and innovative thinking about how to prepare for change.

Within NOAA Fisheries' six-step process toward a climate-ready approach to fisheries management (Karp et. al 2018; 2019), structured scenario planning is identified as a planning strategy to manage fisheries under changing conditions. This would follow other steps such as

[1] http://www.mafmc.org/s/Final-MAFMC-2020-Implementation-Plan_2020-02-11.pdf

understating the drivers of change and conducting climate vulnerability and risk assessments. Thus, scenario planning would be a logical follow up to the Northeast region climate vulnerability assessment (Hare et al. 2016) and the Mid-Atlantic Ecosystem Approach to Fisheries Management (EAFM) risk assessment (Gaichas et al. 2018) and its updates.

1.2 Scenario Planning Process

The NPS handbook for scenario planning outlines a five-step process involving one or more workshops organized by a core group of individuals and attended by key stakeholders. In advance of the workshop(s), core team members interview workshop participants and stakeholders to understand the assumptions, perspectives, and important management challenges associated with climate change. The participants and core team then identify specific questions or issues to explore using scenarios. The phases of this process are summarized below. Additional details are described in the NPS handbook (National Park Service 2013).

Timelines of these processes can vary widely depending on the details, but a guideline from the NPS handbook of possible lengths for each stage of the process in a one-workshop and two-workshop processes are shown in Figure 1.

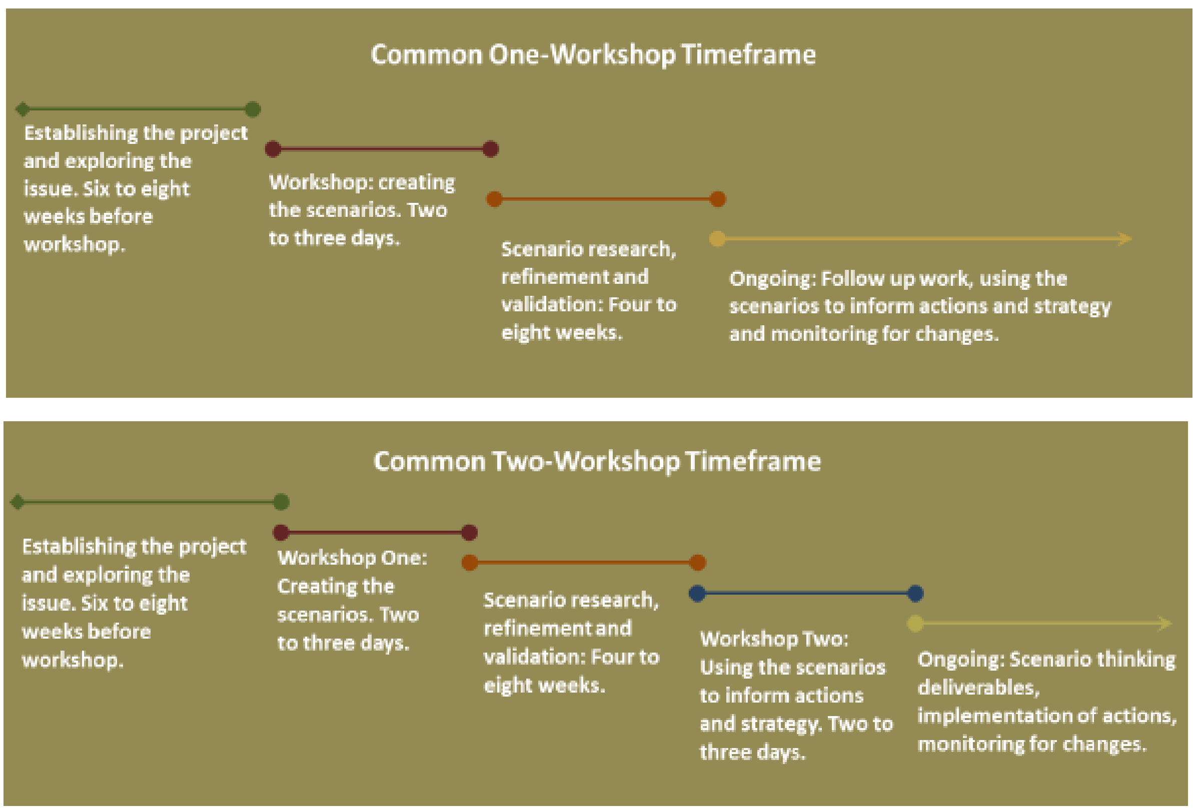


Figure 1: Common timeframes for one and two workshop processes. Source: National Parks Service, 2013 (Appendix III).

1.2.1 Phase 1: Orientation

During the orientation phase, the organization learns about scenario planning and establishes the purpose of the project, including identifying the issue or question to be explored using scenarios. Desired outcomes and goals should be identified, and a core team should be established to steer the project work. Bringing in an experienced facilitator to guide the process would be beneficial at this stage.

In many cases this phase includes stakeholder interviews to inform development of a focal question or issue. The goal of these interviews is to obtain perspectives from a wide range of stakeholders on major factors causing uncertainty in the fisheries, such as their underlying assumptions and beliefs about these drivers. This phase also involves planning and developing a schedule for the rest of the process and identifying likely participants.

1.2.2 Phase 2: Exploration

During this phase, the core team and subject matter experts (from academia, agencies, or the private sector) prepare research to inform scenario building, including identification of external "driving forces" and uncertainties that may affect the focal question. Driving forces tend to be those social, economic, political, or environmental factors that are important to the focal question, and that the organization cannot control. In climate change scenarios, this often includes a mixture of climate variables (e.g., ocean temperatures, pH, storm frequency) and sociopolitical factors (policy, legal framework, funding, market forces and trends, etc.).

Materials and background information should be provided to workshop participants to inform discussions at the workshop(s). Ideally, some time is spent prior to the workshop (via webinars or other means) orienting workshop participants to scenario planning and the driving forces, so that workshop time can be spent mostly on the scenario development process.

1.2.3 Phase 3: Synthesis (Scenario Creation)

The goal of the synthesis phase is to produce a small number of plausible, relevant, and challenging scenarios using the critical forces and impacts identified during the exploration phase. This phase usually begins with a workshop, where the core team and participants build scenarios using driving forces and select three to five final scenarios.

This phase would likely include a discussion of the degree of uncertainty around each driving force, i.e., which driving forces are the most uncertain, and which have the potential to change quickly or dramatically. The idea behind this discussion is to identify assumptions being made by participants and create a shared understanding of which elements are more vs. less certain.

There are several methods for building scenarios, but a typical and relatively simple method is using a 2x2 matrix process. This method considers two driving forces (ideally separate categories of drivers such as one social/political and one ecological) that present a spectrum of uncertainty. Overlapping these two spectrums of uncertainty produces a matrix with four quadrants with four possible scenarios, as shown below.

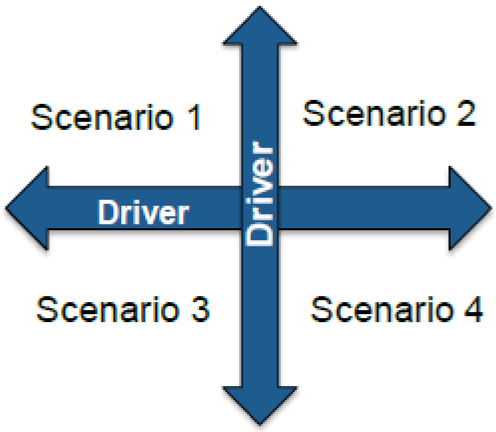


Figure 2: A common structure for scenario development where a 2x2 matrix is developed using two different driving forces, resulting in four scenarios to consider for further development.

After working through several of these quadrants with different uncertain drivers, the group would select their top plausible and relevant scenarios for further exploration and discussion. Once scenarios are identified, the group should work through and document potential impacts or effects that could occur within each scenario.

The impacts identified here will be incorporated into scenario "narratives" that will be used to drive further conversations about how to consider these scenarios in planning and prioritizing activities. Additional follow up work after the workshop includes reviewing scenarios with experts for plausibility and consistency.

1.2.4 Phase 4: Application

During the application phase, participants explore the scenario narratives developed in phase 3 to develop actions and strategies in response to the implications of the scenarios. Participants discuss the implications of each scenario to determine commonalities or patterns among scenarios, or if implications differ significantly between the scenarios.

At this stage, the organization can identify actions that it could take to prepare for and adapt to various scenarios, including actions that could be taken now to better adapt to future conditions, or actions to avoid to make future adaptation more successful. This stage could also identify process or structural changes that could better position the organization for operating under future conditions. Essentially, at this stage, the organization asks the questions, "If we knew this would be the future, what actions would we take now?" and "What actions would we avoid?" The scenario process can be used to inform the development of longer-term strategies beyond the scenarios, to identify which strategies are robust against various future conditions and to highlight areas of risk.

1.2.5 Phase 5: Monitoring

The final phase involves monitoring various indicators of the scenarios over time, collecting new information on uncertainties, and adjusting strategies as conditions evolve. The scenario planning process can be revisited if needed based on how conditions change.

Products of the process can include sets of indicators and warning signals for continued research and monitoring, as well as workshop deliverables describing the scenarios, implications, actions, indicators to monitor, and monitoring strategies.

2.0 Examples of Marine Resource Scenario Planning Initiatives

2.1 Atlantic Salmon

NOAA Fisheries undertook a scenario planning exercise for Atlantic salmon, which are highly vulnerable to climate change in the Northeast Atlantic. The project objectives were:

1) Better understand challenges of managing Atlantic salmon in a changing climate
2) Identify and discuss potential management actions and research activities that can be undertaken to increase understanding of drivers of Atlantic salmon productivity and resilience
3) Increase collaborations and coordination related to species recovery
4) Explore how scenario planning can be used to support decisions.

The focal question was: **"How can the effects of climate change impact the Atlantic Salmon Gulf of Maine Distinct Population Segment over the next 75 years?"** The 75-year time frame was selected to align with the Atlantic Salmon Recovery Plan.

Participants included experts in Atlantic salmon science or management, climate, watersheds, and fish physiology. Webinars and several small group discussions via phone were conducted in the summer of 2017 followed by a two-day face to face workshop in Portland, Maine to build the scenario narratives and discuss their management implications (Figure 3).

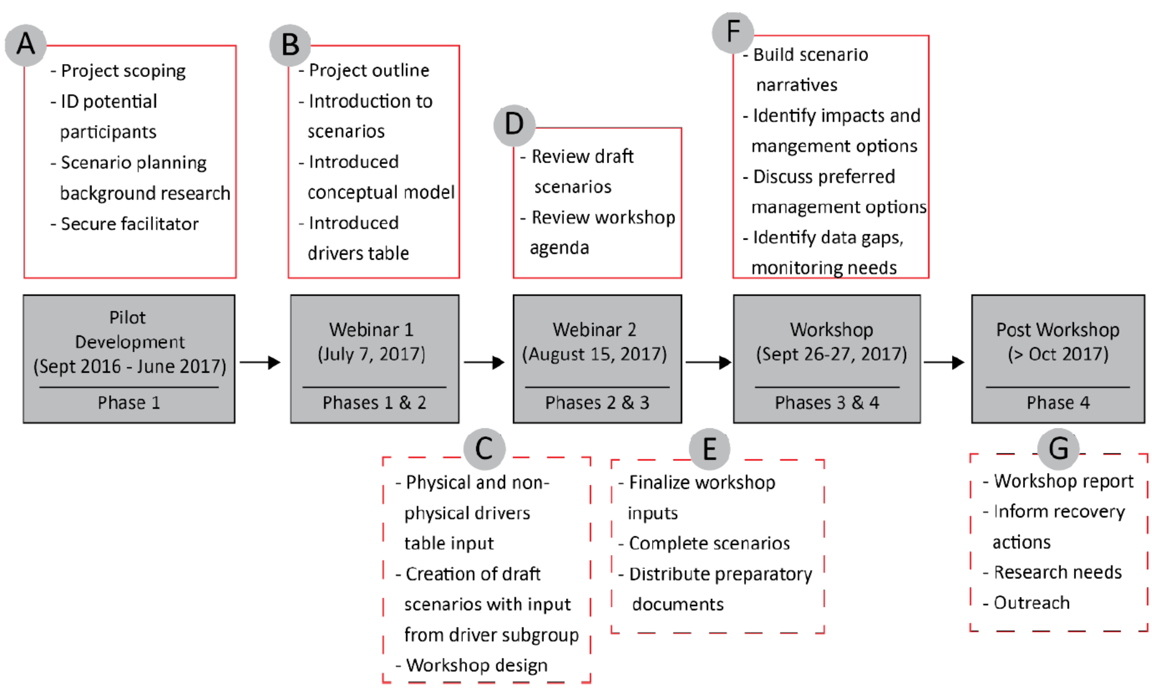


Figure 3: Process outline for Atlantic salmon scenario planning exercise. Source: Borggaard et al. 2019.

Scenarios were developed for Atlantic salmon following the 2x2 matrix method, considering 1) a warmer future that was either wetter or drier based on the uncertainty around future changes in precipitation and seasonality impacts on stream flow and 2) higher or lower freshwater accessibility based on future changes to fish passage and stream access. This matrix resulted in the four scenarios shown in Figure 4.

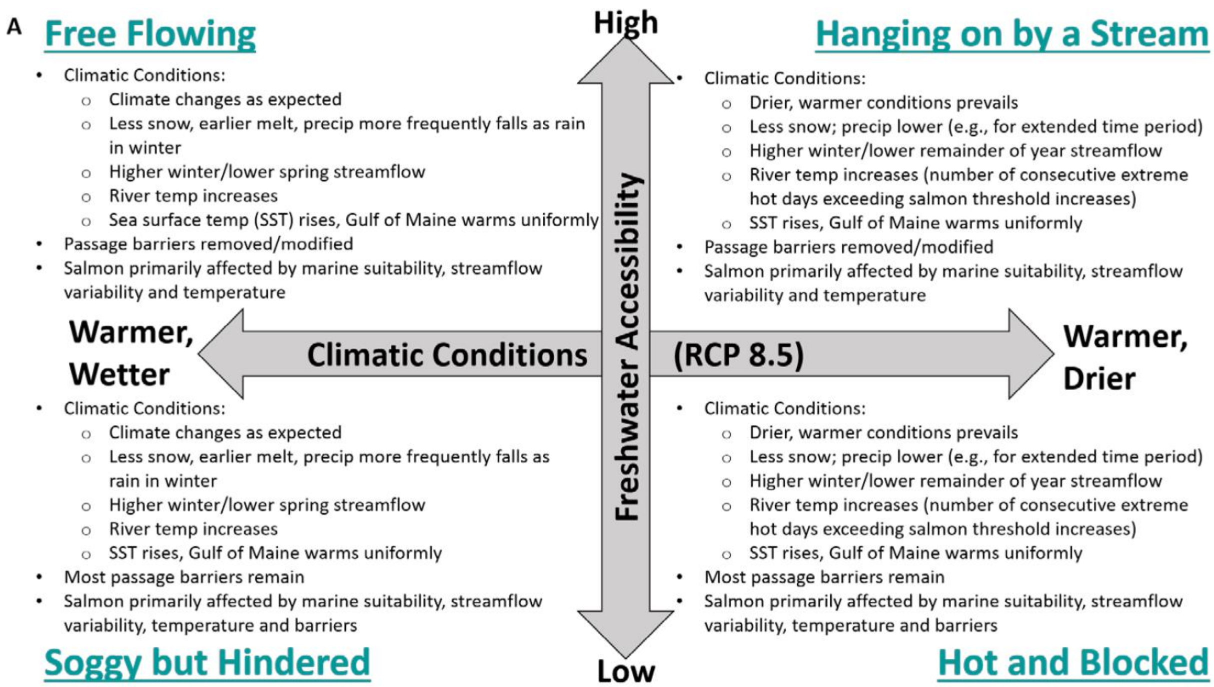


Figure 4: Atlantic salmon scenarios developed in 2017 process. Source: Borggaard et al. 2019.

At the workshop, conversations extended beyond scenario building and into the application stage, where participants discussed what actions NOAA Fisheries and others could take to prepare for each of these four futures. The outcome of this process was the identification of high priority research and management actions to further collaborations and efforts to recover this species. Several identified action items are now completed or underway such as the incorporation of high priority climate -related items into the revised Atlantic Salmon Recovery Plan (USFWS and NMFS 2019) and NOAA funded projects to 1) conduct a range-wide habitat analysis/mapping of key attributes of the physical environment important to Atlantic salmon and synthesis of life stage specific quantitative thresholds; and 2) to map Gulf of Maine Distinct Population Segment Atlantic salmon cold water refugia under a changing climate. Additional detail on these recommendations can be found in Borggaard et al. 2019.

2.2 Resilient Fisheries Rhode Island Project

In 2015, a group of Rhode Island fishermen received a NOAA Saltonstall-Kennedy grant to design environmental change adaptation strategies for Rhode Island's commercial fishing industry, known as the Resilient Fisheries Rhode Island Project. This project culminated in the publication of the "Rhode Island Commercial Fisheries Blueprint for Resilience" (Resilient Fisheries RI 2018).

Part of this project involved a scenario planning process, conducted via a full-day workshop in February 2017, facilitated by the consulting firm Futures Strategy Group. This workshop was attended by forty-five fishermen from Rhode Island ports, representing a variety of fisheries and gear types. Participants were split into breakout groups and given four scenarios characterized by different combinations of environmental and sociopolitical conditions. The scenarios in this case had been created ahead of time by the project coordinators and the consulting firm, based on feedback received in interviews and workshops during earlier stages of the project. Each group's mandate was to develop strategies that the Rhode Island fishing industry can start advocating for in the present to help the industry thrive in 2025-2030, if their scenario were to play out in the real world. The four scenarios considered by the breakout groups were the following:

- ***High climate variability ("Global Weirding") and a "Do It Yourself" Governance Structure:*** Chaotic climate trends, with greatly variable water temperatures, salinity, dissolved oxygen, and pH, with no apparent trends. Small government from a new third party, with policies influenced by the Silicon Valley high-tech industry. Higher business investment with higher competitive pressure.
- ***Global Cooling & Eutrophication, with a "Second Wind" socio-political environment:*** Natural cooling cycles counteract effects of greenhouse gas emissions. Salinity is increasing; coastal areas are experiencing increasing eutrophication and more anoxic events. The U.S. economy is growing with a new wave of technological innovation, with much closer relations between government and industry.
- ***Anthropogenic Warming with a "Long Plateau" economy:*** Higher water temperatures primarily driven by manmade greenhouse gas emissions. Lower salinity due to the melting of glaciers and polar ice caps. Lower dissolved oxygen and more frequent anoxic events. Ocean acidification (lower pH) is also occurring. The U.S. economy is sluggish and opportunities are limited, with fewer affluent households. Tough protectionism and government programs are keeping a lid on frustration.
- ***Natural Warming and a "Next Big Thing" new economy:*** Water temperatures have continued to rise due to natural cycles like the North Atlantic Oscillation Lower salinity due to the melting of glaciers and polar ice caps. Lower dissolved oxygen and more frequent anoxic events. Ocean pH has remained relatively constant. A new economy is developing based on cheap renewable energy but is causing many economic uncertainties.

After discussing the implications of these scenarios, participants proposed a series of strategies for fishing communities to adapt to the potential futures described in the scenarios. These strategies represent a spectrum ranging from those that the fishing industry can implement on its own to those that require varying degrees of action by other parties. Strategies identified include "low hanging fruit" that the fishing industry can begin to implement on its own in the short term, as well as strategies for collective industry organizing, local and niche marketing, public relations, workforce development, and methods to promote adaptive science and management. Additional detail on the outcomes of this process can be found in Schumann et al. 2017.

2.3 North Atlantic Right Whale

NMFS conducted a scenario planning exercise for North Atlantic Right Whale recovery. The purpose of this scenario planning exercise was to explore future conditions for right whales throughout their range and develop possible options to address those conditions to improve recovery. The focal question was "**What will affect/influence the recovery of right whales**

throughout their range over the next 60 years?" Participants include federal experts from NMFS, the Marine Mammal Commission, and the National Ocean Service. The summary of this scenario planning exercise is still in progress, but during the April Council meeting, NMFS will provide a general summary and some highlights of this effort.

2.4 Pacific Council Scenario Planning Exercise

As part of their ongoing Climate and Communities Initiative pursuant to their Fishery Ecosystem Plan, the Pacific Fishery Management Council initiated a scenario planning process in late 2018. In March 2019, the Council adopted shifting stock availability (including shifting distribution) across species, fishery management plans, and communities across the West Coast as the topic for a climate change scenario planning exercise. This exercise was intended to help the Council define the tools, products, and processes necessary to plan for potential future ecosystem states resulting from climate variability and climate change. The Council formed an Ad Hoc Climate and Communities Core Team ("Core Team") to drive the project and hired Jonathan Star of Scenario Insight to facilitate the process.

Core team members participated in a workshop in May 2019 to learn scenario planning principles and plan the project. Interviews were then conducted with stakeholders and Council advisory bodies, asking open ended questions encouraging respondents to think about the future. The focal question developed for this process was identified as **"How will West Coast fishing communities be affected by climate-related shifting stock availability and other developments between now and 2040?"** A preliminary list of driving forces was then developed by the Core Team with input from the Council's SSC, Committees, and Advisory Subpanels. A list of 21 driving forces[2] shaping West Coast fishing communities to 2040 was finalized prior to a January 2020 scenario building workshop in Garden Grove, CA. This workshop brought together more than 80 participants from different components of the fisheries and fisheries management.

The two-day workshop began with background presentations on the driving forces, followed by breakout group discussions attempting to build "sketch" scenarios from combinations of important driving forces, to familiarize participants with the driving forces and the process of scenario building. The second day involved more focused scenario development, where participants identified two critical uncertainties of interest as 1) climate variability (more vs. less frequent dramatic climate variability) and 2) species abundance and availability (greater or lesser availability of Council managed species to the fisheries). This framework led to the development of four scenarios for further discussion (Figure 5). Participants broke into four groups to discuss how these scenarios might play out for species and fisheries managed under the Council's four FMPs, and also considered how market and other socioeconomic and political forces may interact with future conditions.

The outcomes of the workshop included the four draft scenarios described below, to be further refined and validated in the next steps of the process.

[2] The summary of driving forces is available at: https://www.pcouncil.org/documents/2020/02/cci-workshop-driving-forces-summary.pdf/.

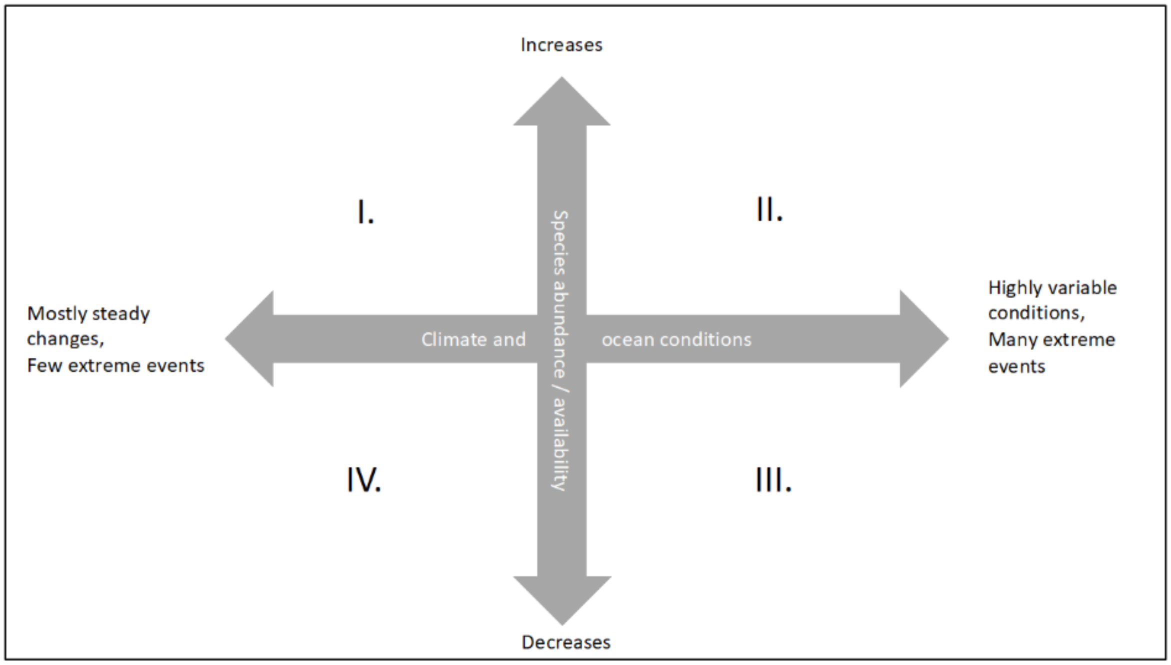


Figure 5: Framework for scenarios developed at January 2020 Pacific Council scenario building workshop. Source: PFMC, 2020.

I. Changing ocean conditions, moderate unpredictability, relatively few extreme events, coupled with high and/or increasing stock abundance. West coast fishing is supported through trade policies, a shift in societal values, and increasing consumer demand for wild caught fish.

II. Rapidly changing ocean conditions, high unpredictability, and frequent and intense extreme events coupled with high and/or increasing stock abundance for some species. Greater investment in, and use of, data monitoring technologies, helping fishing communities prepare for surprises.

III. Rapidly changing ocean conditions, high unpredictability, and low/declining stock abundance. Difficult circumstances compounded by market conditions (consolidation, ageing of the fleet, and declines in demand) leading to a hollowing out of the fishing industry.

IV. Changing ocean conditions, moderate unpredictability, relatively few extreme events, coupled with low/declining stock abundance. Aquaculture and other commercial ocean uses become more popular, changing the dynamic and make-up of fishing communities.

The workshop concluded with a discussion of next steps. Additional work is needed to validate the above scenarios as well as "deepen" the narrative surrounding each scenario to help make them as useful as possible. The planned next steps for the Pacific Council include using scenarios to generate ideas about how to effectively plan and prepare for the future. A "focal group" process is proposed to solicit ideas from a series of conversations with a range of stakeholders.

Mid-Atlantic Council staff is following the developments of the Pacific Council's process and plans to coordinate with them on lessons learned. Additional information about their Climate and Communities Initiative and their scenario planning exercise can be found at: https://www.pcouncil.org/actions/climate-and-communities-initiative/.

3.0 Potential East Coast Scenario Planning Exercise

In November 2019, the Northeast Regional Coordinating Committee (NRCC) discussed a potential climate change scenario planning process for the East Coast. Diane Borggaard of GARFO's Protected Resources Division presented an overview of scenario planning and NMFS scenario planning efforts. The NRCC generally agreed to move forward with a region-wide scenario planning initiative as a way to explore jurisdictional and governance issues related to shifting stocks. The NRCC also agreed to form a planning team/working group to explore East Coast scenario planning. This group would include representatives from all NRCC partners (Mid-Atlantic and New England Councils, ASMFC, GARFO, and NEFSC) as well as representatives from NMFS Headquarters, the Southeast Regional Office, the Southeast Fisheries Science Center, and the South Atlantic Fishery Management Council. The NRCC discussed that at a future meeting, this group would put together a proposal for the NRCC to review and decide how to move forward.

Additional NRCC and Council discussions are needed regarding the Council role in this process, in particular whether the Council would prefer to undertake a Council-focused scenario planning effort in parallel to a broader East Coast effort, if the Council would lead a broader East Coast effort, or if the NRCC working group would take the lead on an East Coast effort. There are tradeoffs associated with these approaches. Given that climate change and related species distribution changes will impact all management partners, and that adaptation will require strong coordination, it would be beneficial to involve all major partner organizations on the East Coast in some manner. However, the expected outcomes of this process, including broader planning strategies and specific management actions may be easier to identify and prioritize within one or two organizations as opposed to many organizations. Regardless of the approach selected, close coordination and continued communication between the Council, the NRCC and other management partners will be needed. Efforts should be made to minimize duplicative efforts, attempt to align expected outcomes, and consider resources available to each partner organization.

Below are some questions for the Council to consider regarding a potential path forward:

- **Who should lead the organizations through the process?** Given the nature of scenario planning and the limited expertise and experience among staff and partners, it may be beneficial to contract with a facilitator with experience in scenario planning for climate change and natural resources management.
- **Who should participate on a core team?** Depending on the approach taken, the core team could be the NRCC working group, or could be another group of individuals representing managers, staff, and technical experts from various partner organizations. In general, the core team would be responsible for: 1) developing the strategic challenge and focal question to be addressed, with input from the participating organizations and other stakeholders, 2) gathering stakeholder input prior to a scenario building workshop, 3) identifying and recruiting workshop participants, 4) planning workshop logistics and workshop sessions, and 5) producing meeting materials.
- **Who should participate in the broader process (i.e., interviews and workshops)?** Scenario planning should engage stakeholders who provide diverse perspectives and expertise. A broader range of perspectives can help challenge assumptions and illuminate blind spots. This phase would involve identifying fishery participants, decision makers, experts, and creative thinkers to participate in addition to core team members.

- **How should we determine our goals and refine the focal question?** A successful scenario planning exercise should have a clearly identified set of goals and expected outcomes developed toward the beginning of the process. The process is centered around a question (or questions) regarding the plausible futures we are trying to explore. As described in phase 1 of the process above, the core team should assemble stakeholder input to identify a specific strategic challenge or question that the process will seek to address. Example questions could include things like "How might climate change driven species distribution shifts influence Council and NMFS governance and management of fisheries over the next 25 years?" or "How might climate change drive ecological and socioeconomic fishery changes over the next 25 years?"
- **What time horizon should be considered?** A scenario planning process should identify how far into the future to consider in the development of scenarios. Do we want to develop scenarios that consider possible conditions in 10 years, 20 years, 30 years, or more? The time frame needs to be long enough to sufficiently consider longer term uncertainties and changes in conditions but should be short enough that near-term actions and strategies would still be relevant to influencing responses to future conditions.
- **What is the intersection with other ecosystem and climate initiatives?** While this scenario building process would be largely independent of other Mid-Atlantic Council EAFM initiatives, a scenario planning exercise could draw on past, current, and planned EAFM efforts, as well as other climate related initiatives in the Greater Atlantic and South Atlantic (if applicable) regions. For example, insight from the EAFM risk assessment could be used to identify and refine driving forces that may be appropriate to consider in a scenario planning exercise. In addition, similar to the way that a conceptual model was developed to identify priority management questions and objectives for a Management Strategy Evaluation for summer flounder, a simplified conceptual model framework could be used to synthesize the links between climate, other environmental factors, and species response (this type of conceptual model was used during development of the Atlantic salmon scenario planning exercise). This scenario planning exercise would be intended to advance and support the Council's EAFM framework without duplicating the efforts of other climate and ecosystem related efforts.

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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 27, 2020

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: Scoping Plan for Black Sea Bass Commercial Allocation Amendment

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Management Board (Board) are working on a joint amendment/addendum to consider changes to the allocations of the black sea bass commercial quota among states and to consider whether these allocations should be added to the Council's FMP. The state allocations are currently included only the Commission's FMP. More information on this developing action is available at: http://www.mafmc.org/actions/bsb-commercial-allocation.

Following discussions at the February 2020 Council meeting, Council leadership agreed to move forward with one webinar scoping hearing on this amendment. An extensive scoping period with multiple hearings is not recommended as many potential alternatives for this amendment have already been partially developed and discussed at multiple public meetings, including eight Council and/or Board meetings and one Advisory Panel meeting.

The proposed webinar scoping meeting will provide an additional formal public comment opportunity prior to finalization of a range of alternatives, which is planned for the June 2020 joint Council and Board meeting.

During their upcoming April 2020 meeting, the Council will be asked to approve a scoping document for this amendment. A draft scoping document is attached. The example alternatives included in the draft document are based on the recommendations of the Commission's Plan Development Team. Council staff advise against making notable changes to these alternatives until after considering scoping comments and additional Plan Development Team input during a future joint meeting with the Board. As this is a joint action, it is preferable for notable changes to the types of alternatives under consideration to be made after joint discussions between the Council and Board.

Black Sea Bass
Commercial State Allocation
Amendment/Addendum

***DRAFT** Scoping Document*

March 2020

What is scoping?

Scoping is the process of identifying issues, potential impacts, and a reasonable range of alternatives associated with fisheries management actions. It provides an early opportunity for the public to make suggestions and raise concerns about developing actions and helps determine which management alternatives are further developed and analyzed.

This action is unique in that development of certain management alternatives began before the action was formally initiated. These alternatives have already been discussed at several public meetings; however, the final range of alternatives to be considered has not yet been identified. The scoping process will provide an additional opportunity for the public to provide input on the alternatives currently under consideration, as well as other potential management approaches, before the final range of management alternatives is approved.

Please comment on which types of alternatives may or may not be useful or practical for meeting the goal of this action and explain your reasoning. Please also comment on any other relevant issues that should be considered regarding this action.

Contents

List of acronyms and abbreviations

ASMFC or Commission	Atlantic States Marine Fisheries Commission
Board	The ASMFC's Summer Flounder, Scup, and Black Sea Bass Management Board
FMP	Fishery Management Plan
ITQ	Individual Transferable Quota
MAFMC or Council	Mid-Atlantic Fishery Management Council
NMFS	National Marine Fisheries Service

1) Introduction

The Atlantic States Marine Fisheries Commission (Commission or ASFMC) and the Mid-Atlantic Fishery Management Council (Council or MAFMC) jointly manage commercial black sea bass fisheries from Maine through Cape Hatteras, North Carolina. The Council develops regulations for federal waters while the Commission and member states develop regulations for state waters. The National Marine Fisheries Service (NMFS) serves as the federal implementation and enforcement agency.

As described in more detail below, the Commission and Council are seeking public input on a management action to consider potential modifications to the allocations of the black sea bass commercial quota among the states of Maine through North Carolina. This action will also consider whether the state allocations should be included in both the Commission and Council's Fishery Management Plans (FMPs). Currently, the state allocations are only included in the Commission's FMP.

2) What are the current state allocations of the black sea bass commercial quota and how were they developed?

The black sea bass commercial quota is managed on a coastwide basis in federal waters. In state waters, it is allocated among the states of Maine through North Carolina using the percentages shown in Table 1. These percentages were loosely based on landings data from 1980-2001.

These allocations are currently managed through the Atlantic States Marine Fisheries Commission's Summer Flounder, Scup, and Black Sea Bass FMP. They are not currently included in the Council's FMP; however, the Council was closely involved in their initial development.

State quota allocations for black sea bass were first proposed by the Council and Commission in 1996 through Amendment 9 to the FMP; however, the National Marine Fisheries Service disapproved this aspect of the amendment due to implementation and enforcement concerns. The Commission and Council considered state quota allocations a second time through Amendment 13, which was approved by both groups in 2002. Of all the quota options considered in Amendment 13, a state-by-state quota system implemented through state and federal regulations was preferred by both the Council and Commission. However, the National Marine Fisheries Service Regional Administrator at the time stated that such a system could not be monitored effectively at the federal level with the then current monitoring methods due to low allocations in some states. (Many of these concerns have subsequently been resolved with changes to how commercial landings are reported.) In response to this advice, the Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) approved the allocations shown in Table 1 and both the Council and Board approved an annual coastwide quota system for federal waters. The approved state allocations were presented as a compromise to account for higher landings (especially in northern states) in years not considered through Amendment 13 analysis (i.e., 1998-2001) and concerns about equity. It was initially intended that these allocations would be in place for 2003 and 2004, with the potential for revisions for 2005. The Commission's Addendum XII (2004) extended their use through 2006 and Addendum XIX (2007) extended their use indefinitely.

Table 1: Current allocations of the black sea bass commercial quota among states.

State	Percent of Coastwide Quota
Maine	0.5 %
New Hampshire	0.5 %
Massachusetts	13.0 %
Rhode Island	11.0 %
Connecticut	1.0 %
New York	7.0 %
New Jersey	20.0 %
Delaware	5.0 %
Maryland	11.0 %
Virginia	20.0 %
North Carolina	11.0 %

3) Why are the Commission and Council considering changes to these allocations?

As shown in Table 1, under the current allocations, 67% of the annual coastwide quota is divided among the states of New Jersey through North Carolina and 33% is divided among the states of New York through Maine. As previously stated, these allocations were loosely based on historical landings from 1980-2001 and were approved in 2002.

As shown in Figure 1, the black sea bass stock assessment shows that spawning stock biomass in the northern region (i.e., approximately Maine through Hudson Canyon) has greatly increased since 2002, while the amount of biomass in the southern region (i.e., approximately south of Hudson Canyon through Cape Hatteras) has not greatly changed. Although the state allocations were never based on distribution of the stock, some northern region states have noted that changes in availability and distribution have made it increasingly difficult to constrain landings to their current allocations.

In response to these concerns, in August 2018, the Board formed a Commercial Black Sea Bass Working Group to identify specific management issues related to changes in stock distribution and abundance and to develop potential management strategies for further consideration. They later formed a Plan Development Team to perform additional technical analysis of approaches recommended by the Board for further consideration. In October 2019, after considering the Working Group recommendations and Plan Development Team analysis, the Board initiated Draft Addendum XXXIII. In December 2019, the Council initiated a complementary amendment. Both the addendum and amendment will consider whether changes should be made to the state allocations and whether these allocations should be managed under both the Commission and Council FMPs, rather than only under the Commission's FMP as is currently the case.

Goals of Management Action

- Consider adjusting the current commercial black sea bass allocations using current distribution and abundance of black sea bass as one of several adjustment factors to achieve more balanced access to the resource. These adjustment factors will be identified as the development process moves forward.
- Consider whether the state allocations should continue to be managed only under the Commission's FMP or wether they should be managed under both the Commission and Council FMPs.

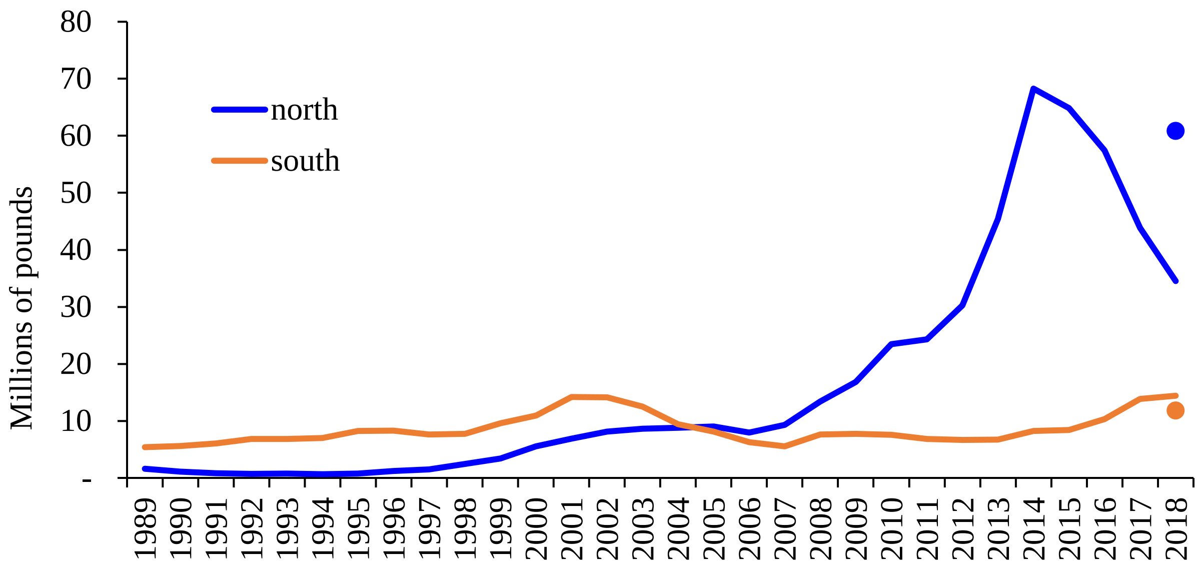

Figure 1. Black sea bass spawning stock biomass by region from the 2019 Operational Assessment Update. Open marks represent retro-adjusted values (used to set catch limits). Source: Personal communication with Northeast Fishery Science Center.

4) Potential management alternatives

This joint addendum/amendment is unique in that much analysis was done before the Council and Board formally initiated a management action. Typically, they would first agree on a goal statement and then carry out a public scoping process before deciding on the types of management alternatives to be further analyzed and considered. However, some Board members wished to better understand how the allocations might change before initiating an action to consider such changes. For this reason, the Commercial Black Sea Bass Working Group and Plan Development Team have already begun to consider several potential management approaches. These approaches are described in more detail below.

The approaches listed below have not yet been approved by the Board and Council for inclusion in the final range of alternatives. **The goal of this scoping process is to provide one additional formal public comment opportunity before the Council and Board agree to the final range of management alternatives**. They are expected to approve a final range of alternatives after considering public comments and additional Plan Development Team analysis during their June 2020 joint meeting. An additional public comment period will be held later in 2020 to solicit input on preferred alternatives for implementation.

Please provide comments on which approaches should or should not be considered through this action. Please also provide comments on the specific sub-options which should be considered.

A. No action

This alternative would maintain the current state allocation percentages (Table 1).

B. Increase Connecticut's allocation as a standalone action or before applying other changes listed below

This alternative would increase Connecticut's 1% allocation to 5% as a standalone option or prior to applying other alternatives listed below. The rationale behind this alternative is that the increased biomass off Connecticut has made it increasingly difficult to constrain landings to their 1% allocation. Five percent was chosen as the revised allocation (or initial allocation, depending on other alternatives chosen) so that Connecticut's allocation (or initial allocation) does not exceed that of any other states except for Maine and New Hampshire, which have very low black sea bass landings.

Please comment on the suitability of any of the options listed in this document, as well as other options that may be appropriate, and describe your reasoning.

The Commission and Council will approve a range of alternatives for further consideration after reviewing public comments.

This alternative was proposed by a Board member from Connecticut who suggested achieving the 4% increase in Connecticut's allocation through the following steps:

1) Leave the New York and Delaware allocations (or initial allocations, depending on other alternatives) unchanged. This is based on the assumption that New York has experienced a similar increase in black sea bass abundance in state waters as Connecticut. Delaware's current allocation is 5%. This option does not seek to make Connecticut's allocation (or initial allocation) larger than any other state with the exception of Maine and New Hampshire.
2) Move 1/2 of Maine and New Hampshire quotas to Connecticut.
3) Move allocation from Massachusetts, Rhode Island, New Jersey, Maryland, Virginia, and North Carolina to Connecticut. The amount moved from each state would be proportional to that state's current percent allocation.

The resulting allocations (or initial allocations) by state are shown in Table 2.

Table 2: Current and revised state allocations under the proposal provided by a Connecticut Board member to increase Connecticut's allocation to 5%.

State	Current allocation	Change in allocation	New allocation
ME	0.5%	-0.2500%	0.2500%
NH	0.5%	-0.2500%	0.2500%
MA	13.0%	-0.5291%	12.4709%
RI	11.0%	-0.4477%	10.5523%
CT	1.0%	4.0000%	5.0000%
NY	7.0%	0.0000%	7.0000%
NJ	20.0%	-0.8140%	19.1860%
DE	5.0%	0.0000%	5.0000%
MD	11.0%	-0.4477%	10.5523%
VA	20.0%	-0.8140%	19.1860%
NC	11.0%	-0.4477%	10.5523%

C. Dynamic adjustments to regional allocations (DARA)

This is formulaic approach that aims to balance stability for the fishery, based on historical allocations, with gradual allocation adjustments based on regional shifts in resource distribution. Through incremental adjustments over time, the state allocations become less dependent on the historical allocations and more dependent on regional resource distribution. As the name implies, this is a dynamic approach and the allocations would be updated on a regular basis based on parameters determined by the Board and Council. Example parameters suggested by the Plan Development Team are described below.

Please provide comments on the appropriateness of this approach in general, as well as recommendations for specific sub-options to consider under each parameter listed below.

Regional configurations

The DARA approach accounts for regional shifts in black sea bass distribution. The regions would be defined by the Council and Board. Two potential options recommended by the Plan Development Team for consideration are listed below. Under both options, Maine and New Hampshire's allocations would remain unchanged as they have not declared an interest in the fishery.

- Two region approach: 1) MA-NY and 2) NJ-NC. These regions roughly align with those used for the stock assessment.
- Three region approach: 1) MA-NY, 2) NJ, and 3) DE-NC. Under this option, New Jersey would be its own region, acknowledging its unique position straddling the two regions defined in the stock assessment. This option would be computationally more complicated than the previous option, which could pull distribution information directly from the stock assessment.

Frequency of adjustments to allocations

Under the DARA approach, the allocations would change on a regular basis, for example, every year, every other year, or a different frequency. The Board and Council would determine the frequency of changes.

Maximum change in allocations per adjustment

The Council and Board could set parameters to limit the scale of the change in allocations per adjustment. This could help provide more stability in the allocations or could transition them more quickly to allocations based more heavily on resource distribution, depending on the priorities of the Board and Council. For example, they could limit the percent allocation that can shift from one region to another each time the allocations are adjusted. They could also restrict how quickly the transition to allocations based more heavily on resource distribution should occur.

Final weighting values for historical allocations vs. resource distribution

Under the DARA approach, the Council and Board would agree to the final relative weights of the historical allocations and current distribution information in determining allocations. For example, final relative weights of 50% historical allocations and 50% distribution information would ultimately result in allocations based equally on these two factors. Final relative weights of 10% historical allocations and 90% distribution information would result in allocations that are mostly based on distribution information.

D. Trigger approach

Under this allocation approach, a minimum level of coastwide quota would be established as a "trigger" for changing the allocations to the states (e.g., 3 million pounds, 4 million pounds, or a different value). The coastwide quota would be distributed to the states in two steps:

1) The amount of coastwide quota up to and including the trigger would be distributed to the states according to the base allocations (described in more detail below).
2) Remaining quota above the trigger (surplus quota) would then be distributed either
    a. Evenly among all states, or
    b. Divided among regions (see page 7 for examples of how the regions could be defined) in proportion to the most current information on regional spawning stock biomass distribution. The regional surplus quota would then be divided among states within a region either
        i. Evenly, or
        ii. In proportion to their base allocations

The Council and Commission are interested in public input on questions such as:

Should the state allocations change? If so, how?

How frequently should they change and based on what factors?

Should the transition to new allocations occur gradually? If so, what's the appropriate timeframe for the transition?

Should the allocations be based all or in part on regional biomass distribution information?

If the allocations should be based on a combination of historical allocations and resource distribution information, what is the appropriate relative importance of these two pieces of information?

The goal of collecting public input at this stage is to help the Commission and Council determine a reasonable range of management alternatives for further consideration and evaluation.

An additional public comment period will be held at a later date to help the Council and Commission decide on preferred alternatives for implementation.

Other options for distribution of quota above the trigger may also be considered.

The Board and Council may also consider options for either static base allocations (i.e., each year the quota up to and including the trigger would be allocated according to the historical allocations) or dynamic base allocations (e.g., the quota up to and including the trigger would be allocated according to the final state allocation from the previous year).

E. Percentage of quota distributed based on historical allocations

Under this approach, a certain percentage of the coastwide quota (e.g., 25%, 50%, 75%) would be allocated to states based on the historical allocations. The remaining quota could then be distributed in a number of ways, including but not limited to:

1) Evenly among all states, or
2) Divided among regions (see page 7 for examples of how the regions could be defined) in proportion to the most current information on regional spawning stock biomass distribution. It would then be divided among states within a region either
    a. Evenly, or
    b. In proportion to their historical allocations

F. Other approaches

The Council and Board intend to approve a final range of alternatives during their June 2020 joint meeting. This final range of alternatives may include approaches not described in this document. If you wish to recommend that they consider other approaches, please provide as much detail as possible on your recommended approach and explain your reasoning

G. Inclusion in the Council's FMP

The state allocations are currently included in the Commission's FMP, but not the Council's FMP. This amendment/addendum will consider whether the allocations should be added to the Council's FMP. This would allow both the Council and Commission to have a voting role in any future changes to these allocations. This would not result in any other notable changes to how the fisheries are managed, monitored, or carried out unless the Council and Commission decide to consider alternatives for other specific changes.

5) How to provide scoping comments

The Council and Commission are in the early stages of developing this amendment/addendum. You will have additional opportunities to provide comments; however, now is the best time to provide input and raise concerns about the management alternatives which may be considered.

Attend the scoping hearing

One webinar public scoping hearing will be held on *DATE AND TIME TBD*. Scoping hearings provide an opportunity to learn more about developing management actions, ask questions, and provide verbal and/or written comments.

Submit written comments

You may submit written comments through one of the following methods:

1) **Online** at: http://www.mafmc.org/comments/bsb-com-allocation-amendment
2) **Email** to: jbeaty@mafmc.org
3) **Mail or Fax** to:

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
Fax: 302-674-5399

Written comments must be received by 11:59 pm Eastern Daylight Time on *DATE TBD*.

Please include "black sea bass commercial allocation amendment/addendum" in the subject line if using email or fax, or on the outside of the envelope if submitting written comments.

All comments, regardless of submission method, will be shared with the Commission and Council and will be made publicly available on their respective websites. It is not necessary to submit the same comments to both the Council and Commission or through multiple channels.

Stay informed

For additional information and updates on development of this action, please visit: http://www.mafmc.org/actions/bsb-commercial-allocation.

The Council and Commission will publish announcements about future opportunities for public comment in the Federal Register and at www.mafmc.org and www.asmfc.org.

If you have any questions, please contact:

- Julia Beaty, Mid-Atlantic Fishery Management Council, at jbeaty@mafmc.org or 302-526-5250, or
- Caitlin Starks, Atlantic States Marine Fisheries Commission, at cstarks@asmfc.org or 703-842-0740.

6) Next steps

Table 3 describes the major expected next steps in development of this action. Announcements of relevant public meetings will be posted to the Council and Commission websites (www.mafmc.org and www.asmfc.org).

After development and consideration of management alternatives and analysis of their impacts, the Commission and Council will choose preferred alternatives for implementation. Commission decisions are final and not subject to an additional rulemaking process. The Council will submit their recommendations to the National Marine Fisheries Service for review and consideration for approval. Approved management measures will be implemented through publication of proposed and final rules in the Federal Register, which will include additional public comment periods. However, if the Council recommends no changes to the Council FMP (e.g., if they decide not to add the state allocations to the Council FMP), then these federal rulemaking steps will not occur.

While there will be additional opportunities for public comment on this amendment/addendum, the scoping period is particularly important for assisting the Council and Commission in determining the range of alternatives which may or may not be included in this action.

Table 3: Expected timeline for amendment/addendum next steps. This timeline is subject to change.

April/May 2020	Council scoping hearings and comment period
June 2020	Council and Board review scoping comments and Plan Development Team recommendations before approving range of alternatives and draft addendum document
Late summer/early fall 2020	Public hearings
December 2020	Council and Board take final action (i.e., chose preferred alternatives for implementation)
January 2021	Implementation of changes through Commission's FMP
Early though mid-2021	Federal rulemaking and comment periods
Late 2021/Early 2022	Effective date of changes to Council FMP (if any)

7) Stock status

According to the 2019 operational stock assessment, the black sea bass stock was not overfished, and overfishing was not occurring in 2018. Spawning stock biomass in 2018 was estimated to be about 2.4 times the target level and fishing mortality was about 9% below the threshold level that defines overfishing. The 2011 year class (i.e., those fish spawned in 2011) was the largest black sea bass year class since at least 1989. The 2015 year class was also well above average; however, the 2017 year class is 72% below the 1989-2017 average.

8) Commercial fishery trends and socioeconomic information

The following information is based on commercial fishery dealer data, the most recent stock assessment, federal vessel trip reports, and input from fishermen and dealers.[1]

From 2009-2018, the total amount of commercial black sea bass landings from Maine through North Carolina caught in the northern region increased steadily, with the greatest increases occurring during 2015 - 2017. During 2009-2018, the amount of commercial black sea bass landings which were caught in the southern region was generally stable (Figure 2).

Commercial black sea bass landings have been constrained by a coastwide (i.e., Maine through Cape Hatteras, North Carolina) commercial quota since 1998, and state allocations were first implemented in 2003. Coastwide landings tend to closely follow the quotas, which from 1998-2019 ranted from a low of 1.09 million pounds in 2009 to a high of 4.12 million pounds in 2017.

Since 1998, on average commercial discards constituted 17% of total commercial removals. Over the last five years (2014-2018)[2] discards averaged 33% of total commercial removals. Discards in recent years were likely influenced by high availability coupled with quota and minimum fish size limitations.

Black sea bass are a valuable commercial species. Total ex-vessel value averaged $12.07 million per year during 2017-2019. In some fisheries, ex-vessel price tends to decrease with increases in landings. However, during 2010-2019, the opposite occurred for black sea bass. During these years, the average annual ex-vessel black sea bass price per pound tended to increase with increases in landings (Figure 3). Landings have generally increased over time as the quotas increased; therefore, the relationship between price and landings could reflect increased market demand over time rather than a causal relationship between price and landings. This is not to say that sudden increases of black sea bass on the market do not cause decreases in price. Some fishermen and dealers have said that temporary price drops can occur at both the local and regional levels due to increases in the coastwide quota, state-specific seasonal openings, or individual trawl trips with high landings, all of which can be inter-related. These sudden price drops are often temporary and the price usually rises again.

During 2009-2018, bottom trawl gear tended to account for a higher proportion of total commercial landings and pots/traps tended to account for a lesser proportion of total commercial landings in years with higher quotas, compared to years with lower quotas. For example, the lowest quotas during 2009-2018 occurred during 2009-2012. During those years, bottom trawl gear accounted for around 38-44% of total commercial black sea bass landings and pots/traps accounted for about 33-39% (depending on the year). In comparison, the highest quotas occurred

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[1] Input was provided by 6 individuals who primarily identify as fishermen and 4 individuals who represent two commercial fish dealers. Collectively, these 10 individuals are from 5 states and use three different gear types (i.e., bottom otter trawl, pot/trap, and hand line). Their input is not intended to be a representative sample of the commercial black sea bass fishery as a whole. Their input was solicited to provide context to trends shown in the data and to document relevant information that is not captured in the available data.

[2] 2019 discard estimates were not available at the time of writing this document.

during 2016-2018 when around 52-61% of total commercial black sea bass landings could be attributed to bottom trawl gear and around 21-26% to pot/trap gear. Some fishermen have said trawlers are better able to take advantage of increases in quota as they can land higher volumes than vessels using pot/trap gear. This can be especially beneficial when the price of black sea bass drops (usually temporarily) in response to sudden increases of fish on the market. For this reason, changes to the quota allocations in some states could impact the relative contribution of different gear types to the fishery.

As previously stated, each state develops management measures (e.g., possession limits, minimum fish sizes, and open/closed seasons) which are intended to achieve but not exceed their allocation. The states have taken different approaches to managing their commercial black sea bass fisheries. For example, Maryland, Delaware, and Virginia use an Individual Transferable Quota (ITQ) system. The differing allocations and management approaches along the coast have resulted in different management measures across the states. Many fishermen and dealers say they take these differences into account when deciding when to fish, where to sell fish, and what price to offer for fish. For example, the price offered by local dealers may be higher when neighboring states are closed. Alternatively, some fishermen and dealers in comparatively low allocation states say they generally do not make business decisions based on black sea bass. Due to the low allocations in some states, black sea bass provides supplemental income for these fishermen and dealers. For these reasons, the economic impacts of any changes in the state allocations will vary in part based on how states adjust their management measures in response to any changes. For example, an increase in the possession limit could have different impacts than an extension of the open season. ITQ fishermen may be impacted differently than non-ITQ fishermen. Pot/trap fishermen may be impacted differently than trawl fishermen.

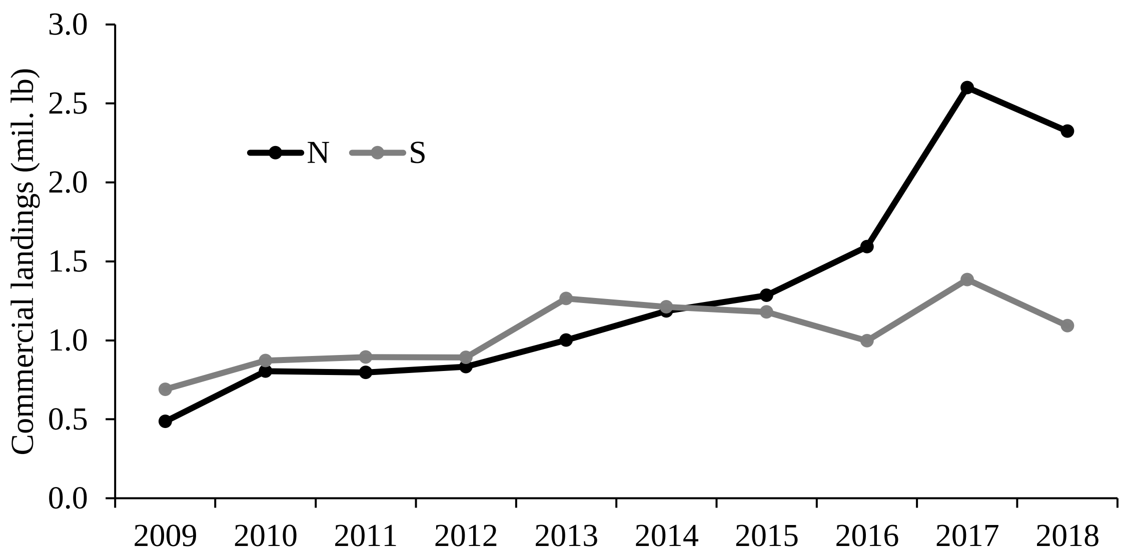

Figure 2: Total commercial black sea bass landings, 2009-2018, ME-NC, by region of catch location (North or South). Region is assigned based on statistical area of catch using the delineation defined in the stock assessment. Landings with an unknown statistical area were assigned to region based on the state of landing. Data source: dealer AA tables provided by the Northeast Fisheries Science Center.

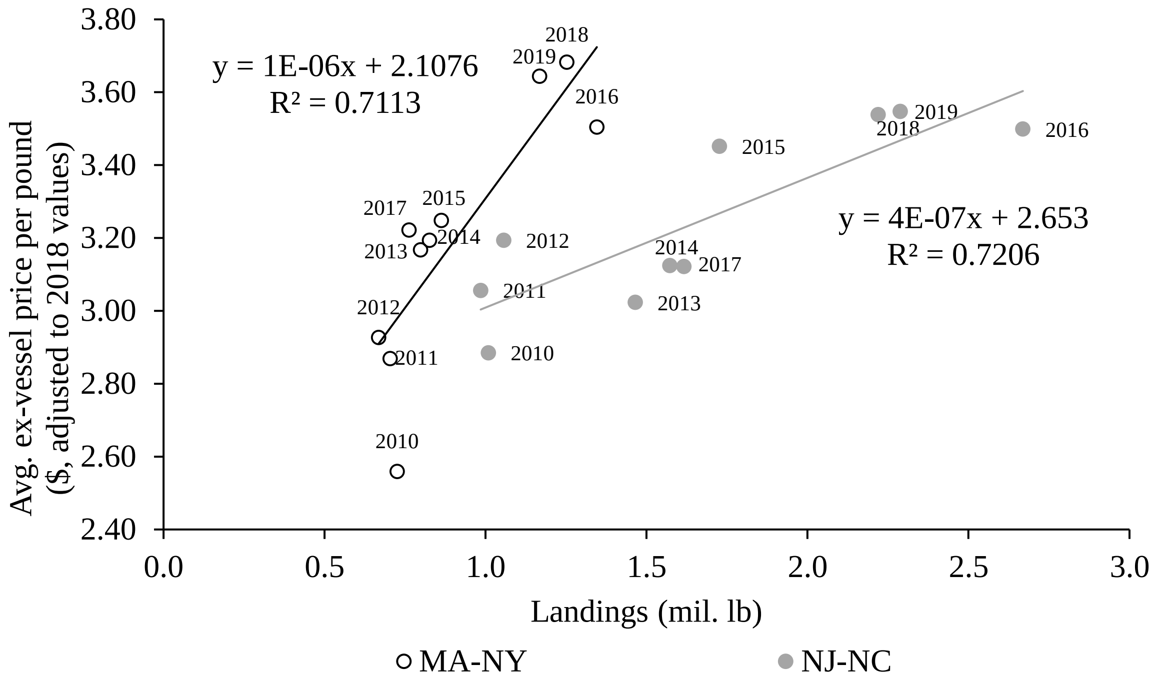

Figure 3: Average annual ex-vessel price per pound for black sea bass compared to annual black sea bass commercial landings by region (MA-NY and NJ-NC), 2010-2019, with associated linear relationship. Prices for 2010-2017 are adjusted to 2018 values based on the Gross Domestic Product Price Deflator. 2019 values are not adjusted. Data source: dealer data (CFDERS), provided by the NOAA Fisheries Greater Atlantic Regional Fisheries Office Analysis and Program Support Division.

9) Additional resources

- More information on this developing management action is available at: http://www.mafmc.org/actions/bsb-commercial-allocation.
- Fishery information documents, describing trends in the fisheries as well as a brief overview of management measures, can be found at: http://www.mafmc.org/sf-s-bsb.
- The Council Fishery Management Plan and subsequent amendments and framework action documents are available at: http://www.mafmc.org/sf-s-bsb.
- The Commission Fishery Management Plan and subsequent amendment and addendum documents are available at the following link: http://www.asmfc.org/species/black-sea-bass
- The most recent stock assessment information can be found at: http://www.mafmc.org/s/Operational-Assessments-for-Black-Sea-Bass_Scup_Bluefish.pdf

South Atlantic Fishery Bulletin

Bringing Fishing News to You

FB20-012
FISHERY BULLETIN ISSUE DATE: February 24, 2020
CONTACT: Southeast For-Hire Electronic Reporting Program,
ser.electronicreporting@noaa.gov, 1-833-707-1632

NOAA Fisheries Announces New For-Hire Electronic Reporting Requirements in the Atlantic

KEY MESSAGE:

NOAA Fisheries is implementing the final rule for the South Atlantic For-Hire Reporting Amendment. The final rule establishes electronic reporting requirements for vessels with a federal charter/headboat permit for Atlantic coastal migratory pelagics, Atlantic dolphin and wahoo, or South Atlantic snapper-grouper and modifies the reporting deadline for headboats.

WHEN RULE WILL TAKE EFFECT:

- The rule will be effective on September 1, 2020.

WHAT THIS MEANS:

- The final rule requires weekly electronic reporting for charter fishermen and modifies the reporting deadline for headboats starting September 1, 2020.
- The requirements for weekly electronic reporting apply to charter vessels with a federal charter vessel/headboat permit for Atlantic Coastal Migratory Pelagics, or Atlantic dolphin and wahoo, or South Atlantic snapper-grouper species.
- Charter fishermen must report information such as trip start and end dates and times, species kept and discarded, fishing location, depth fished, hours fished, and charter fee.
- Electronic reports from charter fishermen are due by Tuesday following the end of each reporting week, which runs from Monday through Sunday.
- Charter fishermen can report using their computer, smartphone, and tablets with access to the internet. Reporting must be through software approved by NOAA Fisheries. NOAA Fisheries will send information on how to download the software in a future Fishery Bulletin.
- ***No action is required by charter fishermen at this time. NOAA Fisheries will send more information in the spring/summer of 2020. If you have questions, please call 1-833-707-1632.***

- Headboat vessels with a federal charter vessel/headboat permit for Atlantic Coastal Migratory Pelagics, or Atlantic dolphin and wahoo, or South Atlantic snapper-grouper species will continue to submit reports to the Southeast Headboat Survey but will be required to submit electronic fishing reports by Tuesday following a reporting week, rather than by Sunday.

FORMAL *FEDERAL REGISTER* NAME/NUMBER: 85 FR 10331, published February 24, 2020.

This bulletin serves as a Small Entity Compliance Guide, complying with section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996.

FREQUENTLY ASKED QUESTIONS (FAQs)

What is changing?
This final rule implements new electronic reporting requirements for charter fishermen. Starting September 1, 2020, **owners or operators of a charter vessel** with a federal charter/headboat permit for Atlantic coastal migratory pelagics, or Atlantic dolphin and wahoo, or South Atlantic snapper-grouper, are required **to submit electronic fishing reports weekly** by 11:59 p.m., local time, the Tuesday following a reporting week. These regulations are a condition of the permit and are required regardless of target species or location of fishing.

The final rule also changes the day that **headboats** are required to submit an electronic fishing report from Sunday to Tuesday, **reducing the time when reports are due from seven to two days following a fishing week**. Headboat reports are due by 11:59 p.m., local time, the Tuesday following a reporting week. This change will make the reporting day for the headboat component consistent with the reporting day for charter component.

Why is NOAA Fisheries requiring weekly electronic reporting in the Atlantic?
The South Atlantic Fishery Management Council and NOAA Fisheries are taking the first steps to improve data collection procedures in order to obtain more timely, accurate, and useful data for management.

When are the requirements effective?
The reporting change for headboats is effective on September 1, 2020. Charter fishermen must begin reporting electronically on September 1, 2020. However, South Atlantic federal for-hire owners or operators who also have a Gulf of Mexico (Gulf) federal charter/headboat permit will not be required to report under this final rule until the Gulf reporting requirements are effective. More information on the Gulf reporting requirements, including effective date, will be distributed soon.

What type of information is required to be submitted?
Charter vessels will be required to submit information such as the following:

- trip start and end dates,
- trip start and end times,
- end port,
- vessel and captain identification,
- number of anglers,
- number of crew,
- method of fishing,
- hours fished,
- primary depth fished,
- species kept,
- species discarded,
- charter fee,
- fuel used, and
- fuel price per gallon

These core data elements may be modified in the future through coordination with the South Atlantic Fishery Management Council. This information is required to be reported regardless of where the vessel is fishing and what is being harvested. If a vessel does not go fishing in a particular week, a no-fishing report must be filed through the system. All reports must be filed electronically through approved software.

Why do I need to report economic information?
Information on charter fee, amount of fuel used, and fuel price per gallon will be used to obtain better economic information on the federal for-hire sector. This information can be used for evaluating the value of federal for-hire fisheries, measuring the economic impacts of management actions on federal for-hire fishermen and businesses, and determining the impacts of fishery disasters on fishermen and fishing communities due to catastrophic events, such as hurricanes.

How will charter fishermen submit the weekly electronic reports?
Charter fishermen will report through the use of a computer, tablet, or smartphone with access to the internet. These devices will need to have software approved by the Southeast For-Hire Electronic Reporting program.

How will charter fishermen obtain the software and learn how to use it?
Software that has been approved by the Southeast For-Hire Electronic Reporting Program will be posted on the NOAA Fisheries Southeast Regional Office's website at a future date. Outreach sessions will be held to explain the reporting program software and requirements.

Will there be new requirements for charter fishermen in the Gulf?
NOAA Fisheries has approved a for-hire electronic reporting program in the Gulf for charter vessels and headboats. If the requirements in the final rule do not change from the proposed rule, the owner or operator of a vessel with a Gulf for-hire permit for reef fish or coastal migratory pelagic species would be required to hail-out for each trip, electronically report before

offloading after each trip, and permanently affix a positioning device onboard the vessel that transmits vessel location.

I have a Gulf charter/headboat permit and a South Atlantic charter/headboat permit. Do I have to submit multiple reports?
No. An owner or operator of a charter vessel or headboat that has been issued federal charter vessel/headboat permits for applicable fisheries in both the South Atlantic and the Gulf would be required to submit a report under the Gulf program's more stringent requirements, when the Gulf program is implemented.

How do I find more information about the Gulf requirements?
If the final rule publishes for the Gulf electronic for-hire program, all Gulf federal for-hire owners and operators will receive a letter and informational packet explaining the requirements. Also, informational sessions will be held around the Gulf, which will provide more information on meeting the requirements. To read about the Gulf amendment and other information, please visit our website at:

https://www.fisheries.noaa.gov/action/gulf-mexico-modifications-charter-vessel-and-headboat-reporting-requirements.

I have a NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO) charter/headboat permit and a South Atlantic charter/headboat permit. Do I have to submit multiple reports?
Some approved software for the Southeast For-Hire Electronic Reporting Program will allow one report to satisfy requirements of multiple programs. A list of vendors approved for use in multiple reporting programs will be posted to our website by summer 2020. Please note: it is the responsibility of the permit holder to ensure that they meet the timing requirements of the more restrictive permit. For example, NOAA Fisheries GARFO for-hire permits require reporting every 48 hours. If you are reporting to GARFO on a software application that is not approved for use in the Southeast For-Hire Electronic Reporting program, you may need to submit multiple reports.

I often catch highly migratory species (HMS) while on charter/headboat trips. Do I have to submit a separate report?
Some approved software for the Southeast For-Hire Electronic Reporting Program will allow one report to satisfy both programs. A list of vendors approved for use in multiple reporting programs will be posted to our website by summer 2020. Please note: it is the responsibility of the permit holder to ensure that they meet the timing requirements of the more restrictive permit. For example, HMS requires reporting of certain species within 24 hours. If you are reporting to HMS on a software application that is not approved for use in the Southeast For-Hire Electronic Reporting Program, you may need to submit multiple reports.

I have been submitting my state reports for South Carolina, using the VESL system. Can I use that system for these reports?
The Southeast For-Hire Electronic Reporting program is working with VESL to develop a form that can be used for both federal and state requirements. If the form is approved, it can be used

to satisfy federal reporting requirements and will be found on our list of approved software on our website by summer 2020.

Does this rule implement a video monitoring requirement for charter vessels?

No.

How do I get started?
No action is required by charter fishermen at this time. Beginning in summer 2020, NOAA Fisheries will mail a For-Hire Reporting toolkit to each permit holder. The tool-kit will provide information on which software providers are approved for use, how to create user accounts, and resources for how to actually submit a report. Please ensure the Permits Office at the NOAA Fisheries Southeast Regional Office has your correct address on file. Additionally, NOAA Fisheries staff will be holding outreach sessions throughout the region to give hands-on training to interested fishermen. These outreach sessions will be announced in the tool-kit materials and on our website in summer 2020.

Do I need to keep reporting to Marine Recreational Information Program (MRIP)?
Yes. For federally permitted vessels, the MRIP For-Hire Survey will continue. Side by side comparisons between data collection methods are necessary to evaluate the need for calibration of the catch and effort time series. NOAA Fisheries will need to certify the new data collection methods and develop a transition plan to replace current MRIP surveys of federally permitted charter vessels.

Where can I find more information on the reporting requirements implemented by this rule?

- The For-Hire Reporting Amendment, rule, and additional resources about the reporting program can be found online at the NOAA Fisheries Southeast Regional Office Web site at: https://www.fisheries.noaa.gov/southeast/southeast-electronic-reporting-technologies or at https://www.fisheries.noaa.gov/action/south-atlantic-modifications-charter-vessel-and-headboat-reporting-requirements?utm_medium=email&utm_source=govdelivery.
- **Any questions regarding reporting requirements should be directed to the Southeast Regional Office, Saint Petersburg, Florida at 1-833-707-1632, or by email at SER.ElectronicReporting@noaa.gov.**

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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 26, 2020

To: Council

From: Matthew Seeley, Staff

Subject: Review of 2021 Blueline Tilefish Specifications

As part of the 2019-2021 multi-year specification process for blueline tilefish, the Scientific and Statistical Committee (SSC) and Tilefish Monitoring Committee (MC) reviewed the most recent information to recommend 2021 specifications and management measures. Given recent fishery performance, no action is required to maintain the previously recommended specifications.

The following materials are enclosed:

1. Blueline Tilefish MC Summary (March 2020)
2. SSC Report – See Committee Reports – Tab 7 (March 2020)
3. Staff ABC Recommendation Memo to Chris Moore (February 2020)
4. Blueline Tilefish Fishery Performance Report (February 2020)
5. Blueline Tilefish Fishery Information Document (February 2020)

2021 Recommended Specifications

Specification	Recreational	Commercial
ABC	100,520 lbs	
ACLs	73,380 lbs	27,140 lbs
ACTs	73,380 lbs	27,140 lbs
TALs	71,912 lbs	26,869 lbs

Tilefish Monitoring Committee
2021 Blueline Tilefish Recommendations – Webinar Meeting Summary

March 2020

The Mid-Atlantic Fishery Management Council's (Council) Tilefish Monitoring Committee (MC) met via webinar on March 24, 2020 to review the most recent information to determine whether modifications to the current 2021 specifications are warranted. The primary purpose of this report is to summarize the Tilefish MC recommendations for the 2021 blueline tilefish specifications. Please note: MC comments described below are not necessarily consensus or majority statements.

Committee Members present: John Maniscalco (NYSDEC), Dan Farnham (Commercial), Paul Nitschke (NEFSC), Doug Potts (GARFO), Jeff Brust (NJ DFW), José Montañez and Matt Seeley (Council Staff).

Others present: Michael Auriemma (NJ DFW) and Laurie Nolan (Council Member).

Discussion

The MC was presented with a summary of the Scientific and Statistical Committee (SSC) deliberations of the March 2020 SSC meeting, where the SSC reviewed the 2020 Blueline Tilefish Advisory Panel Fishery Performance Report and the 2020 Blueline Tilefish Fishery Information Document. The SSC recommended no changes to the previously set blueline tilefish ABC of 100,520 pounds (45.60 mt) for 2021. Following this recommendation, the MC discussed different components of blueline tilefish catch and recent fishery trends to review 2021 management measures.

Monitoring Committee Comments and Recommendations

Annual Catch Targets and Landings Limits and Basis for Derivation

The recommendations in this section were in review of 2021 management measures originally set in 2018 for 2019-2021. The MC recommended the annual catch limit (ACL) equal the annual catch target (ACT; no adjustment for management uncertainty)[1] of 73,380 pounds (33.28 mt) for the recreational sector and 27,140 pounds (12.31 mt) for the commercial sector for 2020. The MC recommended a 2% and 1% reduction for recreational and commercial discards, respectively, which defines the total allowable landings (TAL). The recommended recreational

[1] The MC discussed industry concerns related to recreational blueline tilefish landings. The MC believes that the limited data available outside of MRIP is the best available science. The MC will continue to monitor this issue.

TAL is 71,912 pounds (32.62 mt) for 2021. The recommend commercial TAL is 26,869 pounds (12.19 mt) for 2021. All catch and landings limits are shown in Table 1.

Recreational Management Measures

The MC recommended no changes to the current recreational management measures. The recreational season is May 1 – October 31 with bag limits set at 7 fish for U.S. Coast Guard inspected vessels, 5 fish for uninspected vessels, and 3 fish for private vessels. The MC recommended to not use MRIP numbers to estimate recreational harvest of blueline tilefish as the intercepts are continuously low for (e.g. rare event species).

There is currently no system set in place to monitor the recreational ACL. In 2020, Council staff presented the blueline tilefish MRIP estimates and estimates generated using a multiplier identified in the 2016 Delphi method[2] to aid discussion. Also, an average weight of 3.65 pounds was used to estimate blueline tilefish landings and is consistent with the approach taken in Amendment 6 to the Tilefish Fishery Management Plan (FMP).

The MC questioned whether MRIP detectability issues for estimating blueline private recreational catch and harvest have improved enough to warrant the use of the MRIP survey in monitoring the recreational component. The MC recommends using the Delphi percentage of 105.16% of charter vessel landings to estimate landings for the private angler (Table 2). This is an interim fix to not having private recreational landings and will be used until more data is available or an improved method is developed. Party/charter landings will continue to be monitored using the most updated VTRs to assess the catch and landings in numbers of fish since MRIP estimates are consistently associated with very high percent standard errors. Overall recreational fishery performance is presented in Table 3 detailing the MC recommendations.

The MC shares the SSC's concern over the poorly described level of recreational catch for blueline tilefish. The MC notes that recreational effort and landings by party/charter vessels have increased in recent years and that private vessel activity has the potential to greatly alter total landings. Therefore, there is need for collection of recreational data that would help the monitoring component of the fishery. The MC supports the permitting and reporting requirements for tilefish that have been approved under Amendment 6 to the Tilefish FMP, which includes new permitting and reporting requirements for private recreational vessels (for both tilefish species). These measures are scheduled to be implemented by May 1, 2020.

Commercial Management Measures

The MC recommended no changes to the commercial trip limit which starts at 500 pounds per trip on January 1 of the fishing year until 70% (18,808 pounds or 8.53 mt) of the commercial

[2] The Delphi method was run in 2016 and offered recreational landings for charter, headboat, and private anglers. The Delphi method was used to develop a recreational time series for blueline tilefish through extrapolation of survey results. A ratio was used to back calculate private recreational landings in relation to charter landings from vessel trip reports. This method had been peer reviewed and accepted as best available science by SEDAR 50 (https://sedarweb.org/sedar-50) and further recommended by the MC.

TAL has been met. Then, the commercial trip limit may be reduced to 300 pounds per trip for the remaining 30% (8061 pounds or 3.66 mt) of the commercial TAL. Increasing the trip limit offered a greater chance of reaching optimum yield, while the reduction to 300 pounds at 70% of the TAL offered a buffer to reduce the likelihood of exceeding the commercial TAL and further spreads landings throughout the year.

Discards

The MC recommended no changes to the 2% recreational and 1% commercial reduction from ACT to TAL regarding blueline tilefish discards. The current measures were developed using the average percentage of discards from 2011-2015. According to VTR data, discards in the recreational and commercial fisheries were both ~1%. Due to the uncertainty in landings within the recreational fishery and the continued increased trip limit for the commercial fishery, the MC recommended a status quo reduction from the ACT to TAL.

Other

The MC indicated that the following research recommendations be included in the Council's research priorities for tilefish. Collect representative discard and kept length frequency data for golden and blueline tilefish in the for-hire fishery. The MC indicated that improvements in the mean weight estimates are needed for more accurate catch estimation in the recreational fishery, which will also improve monitoring/management of golden and blueline tilefish. Furthermore, collection of catch per unit effort data may be very important and will help with tracking this stock.

Table 1. Summary of SSC and MC recommendation for catch and landings limits for blueline tilefish for 2019-2021.

Specification	Recreational	Commercial
ABC	100,520 lbs (45.60 mt)	
ACLs	73,380 lbs (33.28 mt)	27,140 lbs (12.31 mt)
ACTs	73,380 lbs (33.28 mt)	27,140 lbs (12.31 mt)
TALs	71,912 lbs (32.62 mt)	26,869 lbs (12.19 mt)

Table 2. Recreational time series for ME-VA (numbers of fish) from 2003-2015 constructed from the Delphi Method (Memo to Chris Moore from Jason Didden on February 23, 2016).

Year	Charter VTR	Headboat VTR	Adjusted Charter (5.99X)	Adjusted Headboat (1.40X)	Private (105.16% of Charter)	Total landings	Total Catch (2% Discards)
2003	Confidential but low - 2003-2006 data averaged for annual total amounts					211	215
2004						211	215
2005						211	215
2006						211	215
2007	500	2,498	2,995	3,495		6,490	6,623
2008	216	391	1,294	547		1,841	1,878
2009	313	3,861	1,875	5,402		7,277	7,426
2010	159	2,127	952	2,976		3,928	4,009
2011	324	3,261	1,941	4,563	2,041	8,544	8,719
2012	381	9,670	2,282	13,530	2,400	18,212	18,584
2013	711	11,127	4,259	15,569	4,479	24,306	24,802
2014	983	14,866	5,888	20,800	6,192	32,881	33,552
2015	1,798	11,636	10,770	16,281	11,326	38,377	39,160

Table 3. Recreational time series for ME-VA from 2015-2020 using the VTRs and Delphi-estimated private recreational estimates and a 3.65-pound average weight multiplier. *Private rental estimates are presented for comparison purposes and are not incorporated in the total values.

	Party - VTR (Numbers)	Charter – VTR (# of fish)	*Private Rental (MRIP # of fish)	Private Rental (Delphi - # of fish 105.16% of charter)	Total (Numbers)	Total (Pounds)
2015	**12,138**	**2,253**	4,663	**2,369**	**16,760**	**61,174**
2016	**13,476**	**2,017**	116,833	**2,121**	**17,614**	**64,291**
2017	**8,564**	**1,600**	12,122	**1,683**	**11,847**	**43,242**
2018	**4,702**	**7,730**	2,989	**8,129**	**20,561**	**75,048**
2019	**3,183**	**7,528**	4,839	**7,916**	**18,627**	**67,989**

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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: February 21, 2020

To: Dr. Chris Moore, Executive Director

From: Matthew Seeley, Staff

Subject: 2021 Blueline Tilefish Specifications Review

Summary

As part of the 2019-2021 multi-year specifications process for blueline tilefish, the Scientific and Statistical Committee (SSC), Tilefish Monitoring Committee, and Council will review the most recent information to determine whether modifications to the current 2021 specifications are warranted. The 2021 Acceptable Biological Catch (ABC) recommended in 2018 by the SSC for the Mid-Atlantic management area was 100,520 pounds (45.60 mt). Based on recent fishery performance, Council staff recommend status quo blueline tilefish specifications for 2021.

Introduction

The Magnuson-Stevens Act requires each Council's SSC to provide, among other things, ongoing scientific advice for fishery management decisions, including recommendations for ABCs. The SSC recommends ABCs to the Mid-Atlantic Fishery Management Council (Council) that address scientific uncertainty such that overfishing is unlikely to occur per the Council's risk policy. The Council's ABC recommendations to NMFS for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. As such, the SSC's ABC recommendations form the upper limit for catches of Council-managed species.

Once the SSC meets and decides on an ABC, the Tilefish Monitoring Committee will convene to discuss if changes to other management measures should be recommended. These measures include annual catch limits (ACL), annual catch targets, discard calculations, management measures and accountability measures. The Council will then make recommendations to the National Marine Fisheries Service (NMFS) Northeast Regional Administrator based on the SSC and Monitoring Committee recommendations.

Regulatory Review

In June of 2015 emergency regulations were put into place in the Mid-Atlantic to temporarily constrain fishing effort on the blueline tilefish stock. These regulations consisted of a 300-pound commercial trip limit and a recreational seven fish bag limit and were extended through the 2016 fishing year.

In 2016, based on the output of the DLM Toolkit, which simulates stock responses to different harvest strategies, the SSC recommended a 2017 blueline tilefish ABC of 87,031 pounds as meeting the Council's risk policy to best avoid overfishing when guidance from a standard stock assessment is not available. This toolkit has been used previously by the SSC to develop ABC recommendations for black sea bass and Atlantic mackerel. Details on the analysis and rationale of the SSC can be found in the working group's report, available here[1] (see subcommittee report and SSC presentation). This document also notes that due to the limited information on recreational blueline tilefish catch, the recreational catch histories used in the toolkit resulted from a Delphi Approach workshop with fishermen to develop an approximation of 2015 recreational catch. Then, a time series was created based on the Delphi Approach estimate and other available data.

In Spring 2017 the SSC recommended a status quo ABC of 87,031 pounds for 2018. Specifications were only recommended for one year as the 50th Southeast Data, Assessment, and Review benchmark assessment was anticipated to be completed late in 2017, which could change the biological reference points.

The SEDAR 50 benchmark assessment for blueline tilefish occurred in late 2017. Within the assessment, blueline tilefish were split into two separate stocks, north and south of Cape Hatteras, North Carolina. ABC recommendations were set for the region south of Cape Hatteras (not overfished, overfishing not occurring), but data limitations restricted an ABC recommendation for the region north of Cape Hatteras, which encompasses part of the South Atlantic and the Mid-Atlantic management areas. To assist in developing an ABC recommendation, the Mid- and South Atlantic Councils/SSCs, as well as staff from the Northeast and Southeast Fisheries Science Centers developed a joint subcommittee to rerun the DLMTool for the region north of Cape Hatteras. The results were partitioned at the Council boundaries using coastwide catch data from the pilot tilefish survey funded by the MAFMC out of SUNY Stony Brook.

Biological Reference Points, Stock Status, and Projections

At the March 2018 SSC meeting, the SSC reviewed the output from the most recent blueline tilefish DLMTool runs (as recommended by the Joint Mid- and South Atlantic Blueline Tilefish Subcommittee) as well as the output from the SEDAR 50 benchmark stock assessment and provided recommendations for annual OFL and ABC levels for 2019-2021[2]. The SSC also concluded that the MSY estimate based on the DLMTool analysis for the region north of Cape Hatteras is an estimate of the OFL, not the ABC (as recommended by the joint subcommittee), which enabled the SSC to use the P* approach and the Council's risk policy in setting ABC specifications. This was considered a reasonable recommendation for 2019-2021 (with annual reviews) due to limited data and broad uncertainties (e.g. max age, short time series, no estimate of recruitment, etc.) within the fishery. Since the SSC lacked information on the estimate of stock

[1] http://www.mafmc.org/briefing/april-2016

[2] The March 2018 SSC meeting report is available at: http://www.mafmc.org/ssc.

biomass relative to B_{MSY}, a ratio of $B/B_{MSY} = 1$ was applied as a default value for the P* (i.e., P* = 0.4 under the MAFMC's risk policy). The SSC also assumed a typical life history (similar to golden tilefish). Based on this application of the Council's risk policy, the resulting SSC-recommended ABC was 179,500 pounds for 2019-2021 for the region north of Cape Hatteras. The SSC then followed the recommendation of the joint Mid- and South Atlantic Blueline Tilefish Subcommittee to allocate 56% of that ABC to the MAFMC (VA/NC border – north) and 44% to the South Atlantic Fishery Management Council. The basis for this percentage breakdown came from the catch results and random stratified design of the Pilot Blueline Tilefish Longline Survey (SUNY Stony Brook-Frisk et al. 2018). Using the 56% allocation, the MAFMC ABC for 2019-2021 is 100,520 pounds.

Landings

Commercial dealer landings through 2019 are presented in Table 1. Commercial landings (Maine-Virginia) were generally very low (less than 20,000 pounds) throughout the time series except for 2013-2015, when regulations south of Virginia, the lack of regulations in federal waters from Virginia north, and the lack of state regulations in New Jersey drove effort northward and into New Jersey. Following implementation of Amendment 6 to the Tilefish Fishery Management Plan, landings remain constrained within the ACLs. In 2018, the Council approved an increase in trip limit from 300 to 500 pounds. However, a trigger to reduce the commercial trip limit back to 300 pounds was implemented to assist in ensuring the ACL was not exceeded within this new data limited fishery. As indicated by the advisors, this approach worked well in 2019 because there was an opportunity for fishermen to target more fish without creating a large directed fishery.

Recreational catch described by combined party/charter vessel trip reports (VTRs) is reported in Table 2. Reported catch and discards have remained consistent since 2012. Previous work with the advisors and other blueline tilefish recreational fishermen has suggested VTR reporting compliance began to encompass at least the primary headboats in 2012. Private recreational angler landings are available from the Marine Recreational Information Program, but blueline tilefish intercepts are rare occurrences and the estimates are often associated with very high percent standard errors. As an alternative approach to estimating private angler performance, the Monitoring Committee previously recommended using the Delphi[3] percentage of 105.16% of charter vessel landings to estimate private angler landings. This approach will be revisited again at the upcoming March Monitoring Committee meeting. Finally, pounds are estimated using a 3.65 pound accepted average weight (Amendment 6 to the Tilefish FMP) (Table 3).

OFL/ABC Recommendations

Following the approach detailed above (section: Biological Reference Points, Stock Status, and Projections), in 2018, **the SSC recommended an ABC of 100,520 pounds (45.60 mt)** to the Mid-

[3] The Delphi method was run in 2016 and offered recreational landings for charter, headboat, and private anglers. The Delphi method was used to develop a recreational time series for blueline tilefish through extrapolation of survey results. A ratio was used to back calculate private recreational landings in relation to charter landings from vessel trip reports. This method had been peer reviewed and accepted as best available science by SEDAR 50 and further recommended by the MC in 2019.

Atlantic management area for 2019-2021. Considering this recommendation and recent fishery performance, **Council staff recommend no changes to the current specifications for the 2021 fishing year.**

Private Recreational Permitting and Reporting

To improve tilefish management, the Greater Atlantic Regional Fisheries Office (GARFO) is initiating private recreational permitting and reporting for tilefish anglers. This action was approved in late 2017, but with delayed implementation. A final rule is expected to be published by May 1, 2020 in line with the opening of the recreational blueline tilefish fishing season. Extensive outreach will be provided by GARFO and the Council leading up to the final rule.

Table 1. Commercial blueline tilefish landings (live weight) from Maine-Virginia. Source: NMFS unpublished dealer data.

Year	Landings (Pounds)
2000	2,446
2001	955
2002	269
2003	7,601
2004	5,829
2005	2,032
2006	3,039
2007	20,459
2008	8,749
2009	9,635
2010	8,360
2011	8,182
2012	9,624
2013	26,780
2014	217,016
2015	73,668
2016	14,203
2017	11,485
2018	13,083
2019	22,483

Table 2. Blueline tilefish party/charter VTR landings and reported discards from Maine-Virginia, 2012-2019. Source: NMFS unpublished VTR data.

Year	Number of Trips	Catch (Numbers of Fish)	Reported Discards (Numbers of Fish)
2012	103	10,051	338
2013	120	11,838	128
2014	138	15,849	254
2015	170	14,391	292
2016	158	15,493	246
2017	129	10,164	115
2018	221	12,432	99
2019	167	10,711	176

Table 3. Recreational blueline tilefish catch (ME-VA) using VTRs (party/charter) and estimating private/rental with assumed weights (Delphi – 105.16% of charter). The grey boxes represent the private rental estimates staff recommend using for a given year. Pounds are generated using an accepted average weight of 3.65 pounds (Amendment 1 to the Tilefish FMP).

	Party (Numbers)	Charter (Numbers)	Private Rental (MRIP-Numbers)	Private Rental (Delphi - Numbers)	Total (Numbers)	Total (Pounds)
2015	12,138	2,253	4,663	2,369	19,054	69,547
2016	13,476	2,017	116,833	2,121	132,326	482,990
2017	8,564	1,600	12,122	1,683	22,286	81,344
2018	4,702	7,730	2,989	8,129	20,561	75,048
2019	3,183	7,528	4,839	7,916	18,627	67,989

Blueline Tilefish Fishery Performance Report

February 2020

The Mid-Atlantic Fishery Management Council's (Council) Tilefish Advisory Panel (AP) met via webinar on February 20, 2020 to review the Fishery Information Document and develop the following Fishery Performance Report. The primary purpose of this report is to contextualize catch histories by providing information about fishing effort, market trends, environmental changes, and other factors. A series of trigger questions listed below were posed to the AP to generate discussion of observations in the blueline tilefish fishery. Please note: Advisor comments described below are not necessarily consensus or majority statements.

Advisory Panel members present: Fred Akers (Private), David Arbeitman (Bait and tackle), Ron Callis (Private), Dan Farnham (Commercial), Carl Forsberg (For-hire), Gregory Hueth (Private/For-hire), and Michael Johnson (Fisherman).

Others present: Paul Nitschke (NEFSC), Laurie Nolan (Council Member), Doug Potts (GARFO), Paul Rago (SSC), John Boreman (SSC), Andy Loftus (Loftus Consulting), Matthew Seeley (Council Staff), and José Montañez (Council Staff).

Trigger questions

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
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?

Factors Influencing Catch

AP members confirmed that no major changes have been observed for blueline tilefish in terms of catch rates/composition. Once blueline tilefish limits are met, recreational trips search for other targets (often golden tilefish). However, there is a sense from some AP members that the fishery restrictions are/will be benefiting recreational catch per unit effort.

When targeting other species, trip limits restrict commercial fishermen from targeting areas where blueline tilefish are present. The increase in trip limit to 500 pounds from 300 pounds was beneficial because the areas where advisors interact with blueline tilefish usually results in healthy interactions with other species. Some trips went over 300 pounds, but not regularly targeting blueline tilefish. Very localized in heavy concentrations especially in the Hudson Canyon. At times, it is hard to get away from the bluelines when targeting golden and it’s nice to be able to not have to discard any bluelines especially when catching more goldens. Trip limits do not seem to be causing discarding issues. The Council should consider implementing a trigger to keep more than 500 pounds of blueline tilefish when targeting large quantities of golden tilefish that result in high incidental landings of bluelines. However, do not create a situation where people are going to direct on them since the commercial quota is so low.

AP members indicated that the majority of the time they target blueline tilefish they land the recreational trip limits. They also indicated that the 3 fish limit is definitely limiting. Additionally, the seasonal closure at October 31 could potentially depress catch and effort, which may be beneficial to the stock. Often AP members try to target golden and find that blueline abundance is limiting.

Regulations are keeping harvest where they should be since we currently to not have an accepted stock assessment in the Mid-Atlantic. Advisors agreed that they want to see how the current specifications and management measures play out since this is still a newly managed fishery in the Mid-Atlantic.

Recreational effort decreased this year as it does not make economic sense to target blueline tilefish when tuna are not present. Moderate tuna availability in deeper water translates into the highest effort (enough tuna to create effort, but not so much as to occupy interest for a whole trip). Tuna fishing was good in the Hudson until about October, but AP members could not speak to locations much further south. When compared to 2018, tuna fishing (which leads to tilefish fishing) was better, but still not great.

Market/Economic Conditions

Advisors indicated that in New York (Hunts Point) they were receiving approximately $2.85 per pound, and occasionally as high as $3.00 per pound for larger fish. Advisors remain confident that there is continued demand for blueline tilefish, but this demand is driven by low and sporadic supply.

Management Issues

To avoid regulatory discarding, anglers often shift effort away from blueline tilefish once the limit is reached. Small amounts of discards do occur as incidental interactions when targeting golden tilefish. But multiple advisors indicated they often know where blueline tilefish are and they know how to avoid them. Thus, the trip limit did not really affect the incidental fishery.

AP members advocate to maintain the 3 (private), 5 (U.S. Coast Guard *uninspected* vessel), 7 (U.S. Coast Guard *inspected* vessel) bag limits in place since there is currently limited reporting for private anglers and we are still learning how the fishery responds to management in the Mid-Atlantic. Additionally, head boat captains indicated that if bag limits drop lower than **7 fish** the head boat community will have greater difficulty filling their trips. They confirmed that the larger bag limit is necessary to encourage anglers to come out.

Some AP members would like the Council to consider a higher trip limit for longer recreational trips, structured after Gulf of Mexico regulations (makes filling trips easier). Other AP members were concerned about the impact of higher recreational limits on the overall fishery especially given low ABC and recreational catch uncertainty. Advisors want to avoid creating a directed fishery especially with the uncertainty of the overall stock.

Regarding the recreational measures in Amendment 6 to the Tilefish FMP: Advisors recommended multi-day considerations for head boat trips. Following this recommendation, one advisor recommended staying with the current system as it is very important to keep the recreational and commercial sector within the ABC.

For-hire advisors indicated they would like to see captain and crew included in the bag limits.

Hurricanes and shifts in climate conditions drastically reduced the number of days (effort) vessels were able to fish.

Research Priorities

Discussion focused on the need to improve the understanding of biological and life history traits. Specifically, age validation, maturity, post-release mortality, and movement. One advisor stated that a defined sampling program has the potential to hit on multiple priorities. For example, developing a tagging program (using applied and natural tags) offers insight into movement, age, maturity, and habitat preference. Additionally, no recommendations were provided on future fishery dependent or independent surveys. More bluelines now than 6 years ago. Bluelines are in places they have never been before in waters as shallow as 60-80 feet.

One AP member indicated that it was beneficial the Pilot Tilefish Survey was completed, so it could be compared to the results from the ongoing tilefish survey work being conducted by Coonamessett Fam Foundation (Developing a method for assessing tilefish stocks using a baited underwater video system).

The AP remained unanimous in their recommendation that permitting and reporting be developed for private recreational anglers. This information will offer insight into the impacts private anglers have on the recreational fishery for catch/landings and effort. Furthermore, the Council approved private permitting and reporting requirements for tilefish in 2017 through Amendment 6 to the Tilefish Fishery Management Plan (FMP) (added blueline tilefish to the FMP) and are now awaiting implementation. One advisor suggested that NMFS target the HMS permit holders to identify the greater private recreational tilefish community.

MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

Blueline Tilefish Fishery Information Document

February 2020

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for blueline tilefish with an emphasis on 2019. Data sources for Fishery Information Documents are generally from 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/tilefish/.

Key Facts

- There has been no change to the unknown stock status for blueline tilefish since the 2017 assessment.
- ABC = 100,520 lbs, Commercial TAL = 26,869 lbs, Recreational TAL = 71,912 lbs
- The commercial fishery is open year-round with a trip limit of 500 pounds gutted (heads and fins attached) weight that will be reduced back to 300 pounds once 70% of the quota has been landed.
- The recreational fishery is open from May 1 – October 31. Bag limits are as follows: private vessels: 3-fish, for-hire vessel (no USCG inspection): 5-fish, for-hire vessel (with USCG inspection): 7-fish.
- Commercial landings increased by 72% from 2018 to 2019 (13,083 to 22,483 pounds) while the price per pound increased by ~14% from $2.32 to $2.64 from 2018 to 2019.
- In 2019, party/charter anglers reported a ~31% increase in catch compared to 2018 (5,393 to 7,064 pounds).

Basic Biology

Blueline tilefish are primarily distributed from Campeche, Mexico northward through the Mid-Atlantic.[1] Several recently-completed studies suggest that blueline tilefish from the eastern Gulf of Mexico through the Mid-Atlantic are comprised of one genetic stock.[2] This homogenous stock inhabits the shelf edge and upper slope reefs at depths of 150-840 feet (46-256 m) and temperatures between 59-73°F (15-23°C) where they are considered opportunistic predators that feed on prey associated with substrate (crabs, shrimp, fish, echinoderms, polychaetes, etc.).[3,4] They are sedentary in nature and burrow into sandy areas in close association with rocky outcroppings.[5]

Blueline tilefish are long-lived fish reaching sizes up to about 36 inches (91 cm) and exhibit dimorphic growth with males attaining larger size-at-age than females. Males are predominant in the size categories greater than 26 inches (66 cm) fork length. Blueline tilefish are classified as indeterminate spawners, with up to 110 spawns per individual based on the estimates of a spawning event every 2 days during a protracted spawning season from approximately February through November. Additionally, an aging workshop conducted to support the blueline tilefish assessment has called into question the ability to accurately age blueline tilefish, so previous age determinations may no longer be accurate.[5]

Status of the Stock

Prior to management of blueline tilefish in the Mid-Atlantic, NMFS listed blueline tilefish as overfished, but not overfishing from the Southeast Data, Assessment, and Review (SEDAR) 32 conducted in 2013.[6] More recently, updated stock status information was identified through the 2017 benchmark assessment, SEDAR 50. Genetic work conducted for SEDAR 50 suggests a genetically homogenous population off the entire Atlantic coast yet does not suggest what catch may be appropriate off various parts of the coast. In SEDAR 50, the blueline tilefish stock was split in two, north and south of Cape Hatteras to allow each Council (Mid and South Atlantic) to set their own specifications. The stock south of Cape Hatteras was determined to be not overfished with overfishing not occurring. The assessment did not provide stock status information relevant to the Mid-Atlantic management area due to insufficient data.

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council or MAFMC) established management of blueline tilefish north of the Virginia/North Carolina border through Amendment 6 to the Tilefish Fishery Management Plan. In 2016, initial measures were set using a data limited approach and the Delphi Method.[7]

Following the 2017 SEDAR 50 assessment where no recommendations were made for the region north of Cape Hatteras, which extends beyond the Council management areas of the Virginia/North Carolina border, the MAFMC and South Atlantic Fishery Management Council (SAFMC) formed a joint blueline tilefish subcommittee. The subcommittee used the Data Limited Toolkit to develop acceptable biological catch (ABC) recommendations for the respective Scientific and Statistical Committees (SSC). This offered an opportunity to partition blueline tilefish ABCs that crossed the two management areas (north of Cape Hatteras). *The MAFMC SSC developed the 2019-2021 blueline tilefish ABC recommendation of 100,520 pounds at its March 2018 meeting.* The SAFMC's SSC recently proposed blueline tilefish ABCs of 233,968 for 2020-2022.[8]

In the Mid-Atlantic, commercial vessels can fish year-round and are limited to 500 pounds gutted (heads and fins attached) weight until 70% of the quota (Commercial Total Allowable Landings = 26,869 pounds) has been landed, then the trip limit is reduced to 300 pounds gutted (heads and fins attached) weight.

The recreational blueline tilefish season is open from May 1 through October 31 and the possession limit depends on the type of vessel being used (Recreational Total Allowable Landings = 71,912 pounds). Anglers fishing from private vessels are allowed to keep up to three blueline tilefish per person per trip. Anglers fishing from a for-hire vessel that has been issued a valid federal Tilefish Party/Charter Permit but does not have a current U.S. Coast Guard safety inspection sticker can retain up to five blueline tilefish per person per trip. Finally, anglers on for-hire vessels that have both a valid federal Tilefish Party/Charter Permit and a current U.S. Coast Guard safety inspection sticker can retain up to seven blueline tilefish per person per trip.

Commercial Fishery

Commercial landings (in Maine-Virginia) were generally very low (less than 20,000 pounds) throughout the time series except for 2013-2015, when regulations south of Virginia, the lack of regulations in federal waters from Virginia north, and the lack of state regulations in New Jersey drove effort northward and into New Jersey (Figure 1 and Table 1). Further breakdown by year/state may violate data confidentiality rules (especially for 2016 and 2017). In 2019, 1,984 individuals held federal commercial tilefish permits (valid for both golden and blueline tilefish) and landed 21,272 pounds (Table 2).

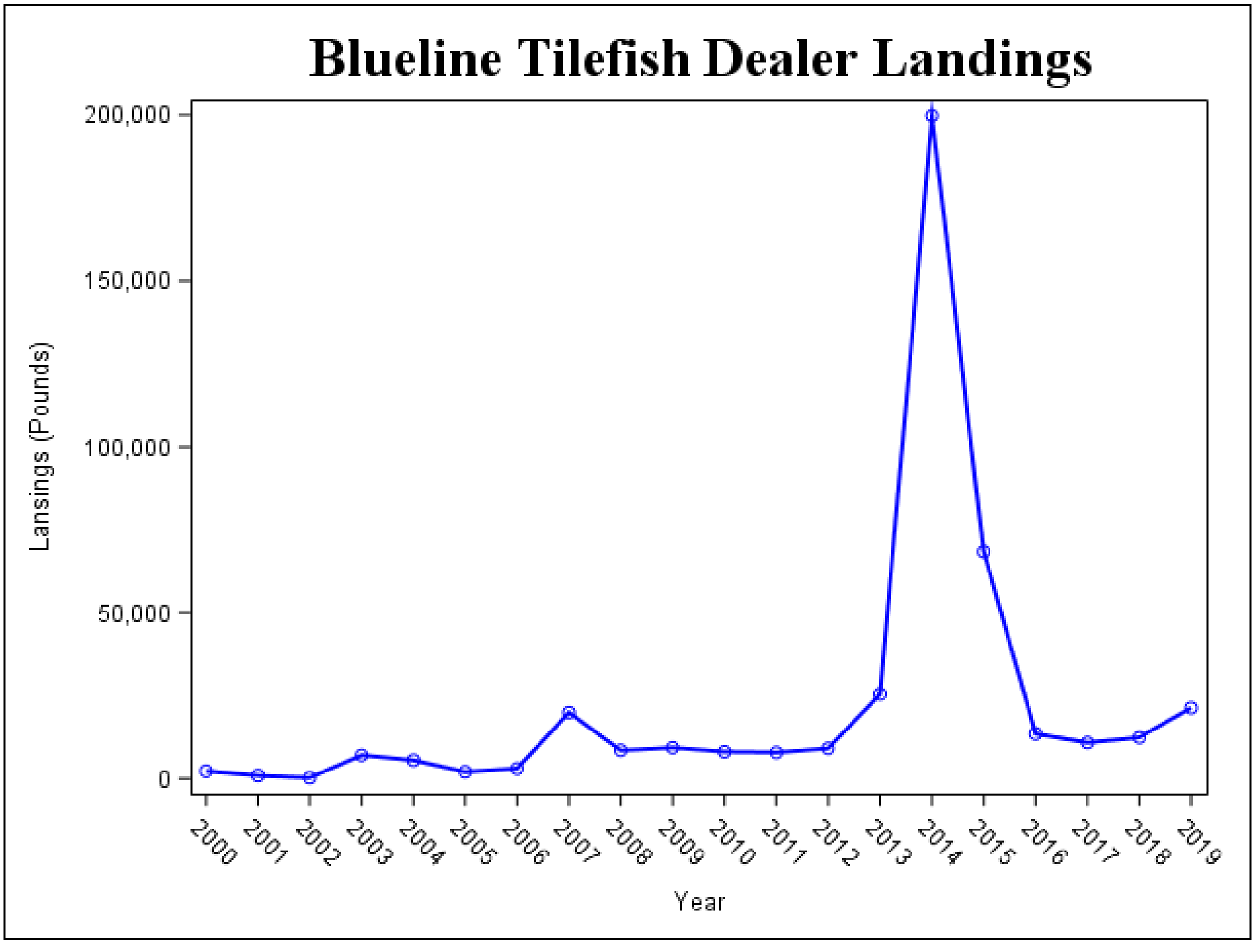

Figure 1. Commercial blueline tilefish landings (live weight) from Maine-Virginia, 2000-2019. Source: NMFS unpublished dealer data.

Table 1 and Table 2. Commercial blueline tilefish landings (live weight) from Maine-Virginia, 2000-2019 (Table 1)and 2019 by state (Table 2). Source: NMFS unpublished dealer data. Confidential means less than 3 vessels landed blueline tilefish.

(1)

Year	Pounds
2000	2,446
2001	955
2002	269
2003	7,601
2004	5,829
2005	2,032
2006	3,039
2007	20,459
2008	8,749
2009	9,635
2010	8,360
2011	8,182
2012	9,624
2013	26,780
2014	217,016
2015	73,668
2016	14,203
2017	11,485
2018	13,083
2019	22,483

(2)

State	Pounds (2019)
CT	Confidential
DE	Confidential
MD	Confidential
MA	Confidential
NJ	4,650
NY	4,120
RI	3,069
VA	10,257
Total	22,483

Aggregate landings from the 2000-2019 time-series are approximately 64% from bottom longline, with most of the remaining landings coming from bottom trawl and handline. Over half of all landings in the time series were bottom longline into New Jersey in 2013-2015 prior to Mid-Atlantic management. Landings from all other gear types are low and variable from year to year. The breakdown of commercial landings by gear for 2019 are presented in Table 3.

Table 3. Commercial blueline tilefish landings (live weight) by gear in 2019 from Maine-Virginia. Source: NMFS unpublished dealer data.

Gear	Pounds	Percent
Bottom Trawl	8,574	38%
Handline	6,056	27%
Bottom Longline	4,563	20%
Unknown	2,164	10%
Gill Net	713	3%
Midwater Trawl	362	2%
Pot/Trap	51	<1%
Total	22,483	100%

Statistical Areas 626, 632, 616, 622 and 621 accounts for the majority of catch from 1994-2019 (Figure 2 and Table 4) and 2019 as the terminal year. A further breakdown by year/area may violate data confidentiality rules.

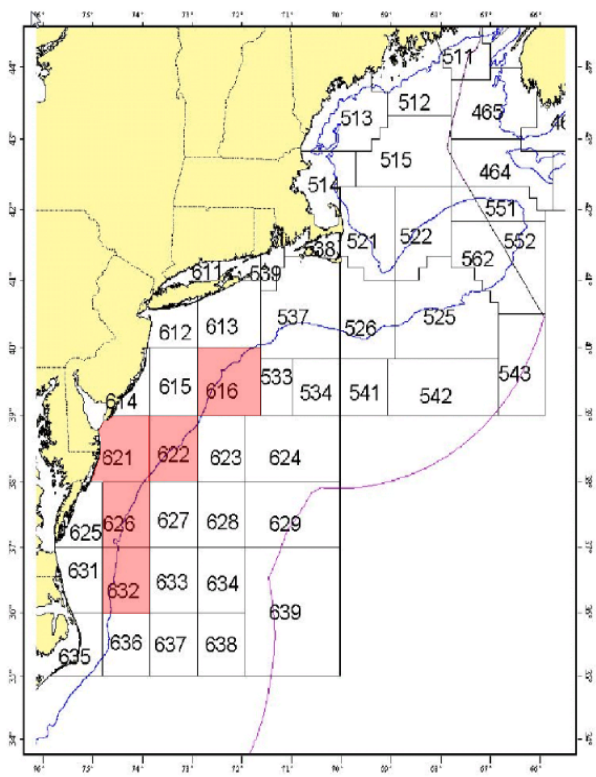

Figure 2. NMFS statistical areas accounting for Landings of more than 10,000 blueline tilefish identified with commercial vessel trip reports (VTRs), 1994-2019. Source: NMFS unpublished VTR data.

Table 4. Top statistical areas summarizing blueline tilefish landings in numbers of fish from Maine-Virginia for 1994-2019. Source: NMFS unpublished VTR data.

Stat Area	1994 to 2019 (Pounds)
626	223,489
632	48,264
616	36,975
622	29,679
621	27,686

Commercial blueline tilefish ex-vessel revenues (nominal) and price (inflation adjusted to 2018 dollars) are described in Figures 3 and 4. Since blueline tilefish have been managed by the Council (secretarial interim action in 2016), the ex-vessel value has averaged $39,188 at approximately $2.52 per pound. For 2019, the ex-vessel value was $59,401 at $2.64 per pound.

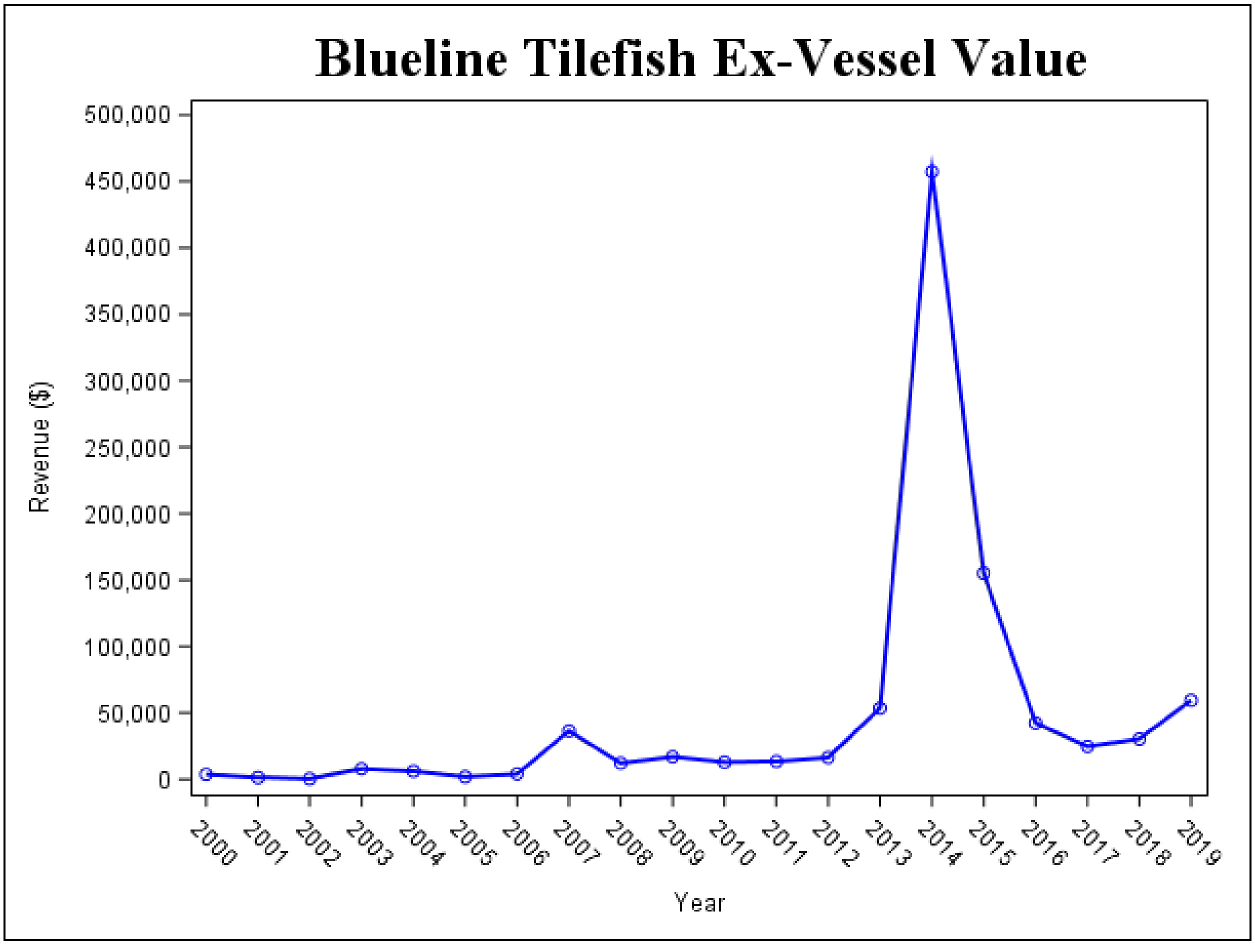

Figure 3. Ex-vessel revenues for blueline tilefish, Maine to Virginia combined, 2000-2019. Source: NMFS unpublished dealer data.

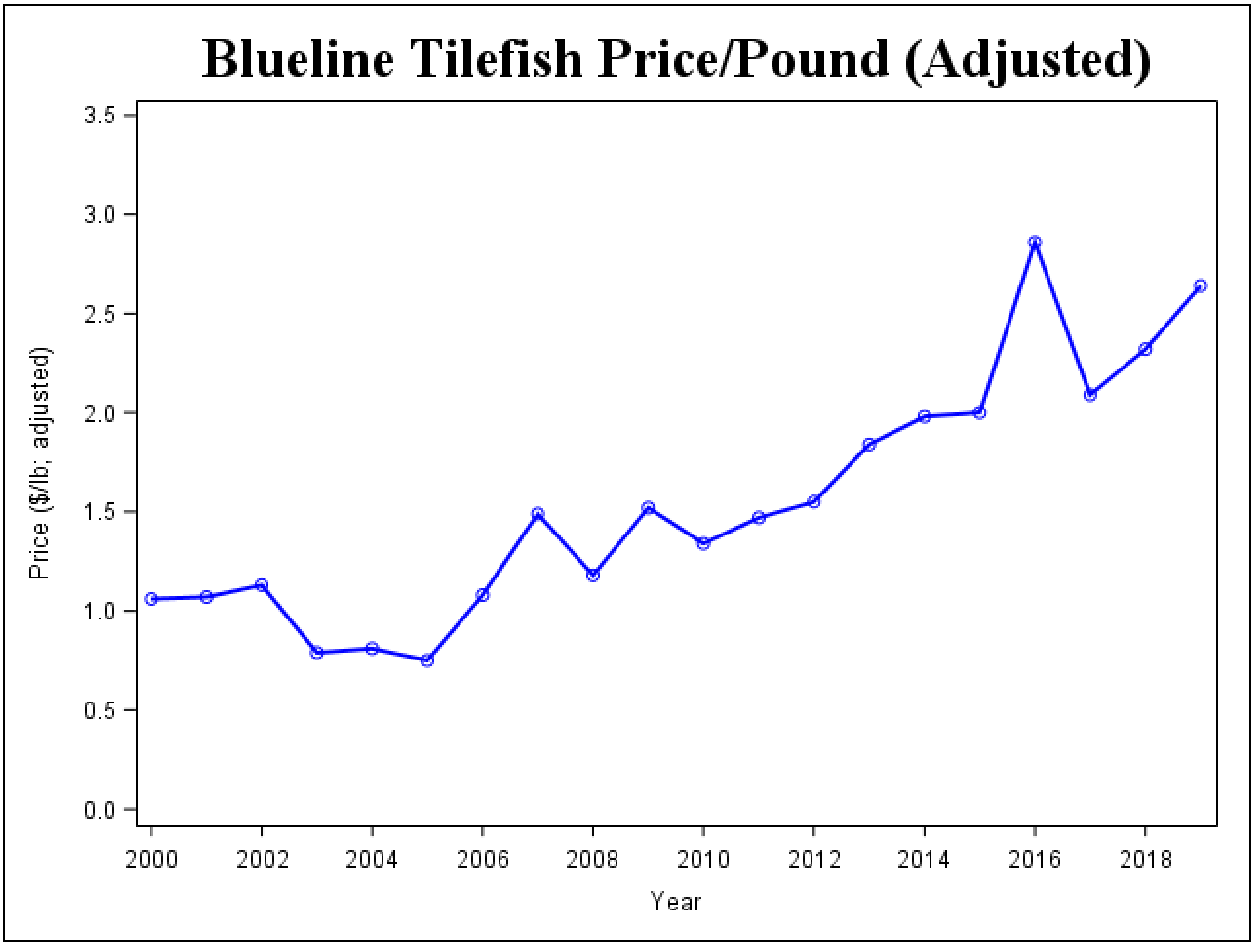

Figure 4. Price for blueline tilefish, Maine through Virginia combined, 2000-2019. Note: Price data have been adjusted by the GDP deflator indexed for 2018 (2019 – unadjusted). Source: NMFS unpublished dealer data.

Recreational Fishery

In 2019, 579 tilefish permits were issued to party/charter vessels within the relatively small recreational fishery where the only mandatory reporting is a VTR. Stakeholders believe that VTR reporting compliance for blueline tilefish has been low, especially historically and for charter vessels. Table 4 provides the available VTR reports for blueline tilefish since 2012, when previous work with the advisors and other blueline tilefish recreational fishermen has suggested VTR reporting compliance began to encompass at least the primary head boats. Additionally, blueline tilefish intercepts in the MRIP are an exceedingly rare event (Table 5).

Table 4. Blueline tilefish party/charter VTR landings and reported discards from Maine-Virginia, 2012-2019. Source: NMFS unpublished VTR data.

Year	Number of Trips	Catch (Numbers of Fish)	Reported Discards (Numbers of Fish)
2012	103	10,051	338
2013	120	11,838	128
2014	138	15,849	254
2015	170	14,391	292
2016	158	15,493	246
2017	129	10,164	115
2018	221	12,432	99
2019	167	10,711	176

Table 5. Recreational blueline tilefish re-calibrated MRIP estimates (2019 – preliminary) by state and mode. Source: NMFS unpublished MRIP data.

Year	State	MRIP[1] (Numbers of fish)	Mode
2015	DE	4,663	Private/Rental
2016	MD	46,106	Private/Rental
2016	NJ	9,924	Private/Rental
2016	VA	1,222	Charter
2016	VA	60,803	Private/Rental
2017	VA	12,122	Private/Rental
2018	DE	19	Charter
2018	MD	11	Party
2018	VA	2,373	Charter
2018	VA	2,989	Private/Rental
2019	MD	4,839	Private/Rental
2019	VA	2,225	Charter

Currently, there is no average weight that can be applied to blueline tilefish across the coast as average weights vary significantly. Thus, recreational catch is summarized in numbers of fish. MRIP reported 4,839 blueline tilefish landed through the private/rental mode and the VTRs presented 10,711 fish caught via the for-hire fleet. Total recreational removals are then estimated to be 15,550 fish. Catch in pounds is then estimated using a range of accepted weights (3-6 pounds from NY to NC, as indicated by the tilefish advisors) across the coast (Table 6).

[1] Re-calibrated MRIP numbers are presented for reference. They should not be directly compared to the current or past ABCs as the re-calibrated MRIP numbers have not yet been incorporated into any assessment.

To improve tilefish management and reporting, the Greater Atlantic Regional Fisheries Office (GARFO) is initiating recreational reporting for private tilefish anglers. This action was approved in late 2017, but with delayed implementation. A final rule is expected to be published by May 1, 2020 in line with the opening of the recreational blueline tilefish fishing season. Extensive outreach will be provided by GARFO and the Council leading up to the final rule.

Table 6. Coastwide recreational blueline tilefish catch using VTRs (party/charter) and MRIP (private/rental) with assumed weights.

	3 Pounds	4 Pounds	5 Pounds	6 Pounds
2015	57,162	76,216	95,270	114,324
2016	396,978	529,304	661,630	793,956
2017	66,858	89,144	111,430	133,716
2018	46,263	61,684	77,105	92,526
2019	46,650	62,200	77,750	93,300

In 2019, Monitoring Committee members questioned whether MRIP detectability issues for estimating blueline tilefish private recreational harvest have improved enough to warrant the use of the MRIP survey in monitoring the recreational component. To monitor the recreational fishery, the MC recommended using the Delphi[2] percentage of 105.16% of charter vessel landings to estimate landings for the private angler. However, staff recommends using the MRIP estimates for 2015-2017, which represents the time when regulations were in development. This is an interim fix to not having private recreational landings and will be used until more data is available or an improved method is developed. Party/charter landings will continue to be monitored using the most updated VTRs to assess the catch and landings in numbers of fish (Table 7).

Table 7. Recreational blueline tilefish catch (ME-VA) using VTRs (party/charter) and estimating private/rental with assumed weights (Delphi – 105.16% of charter). The grey boxes represent the private rental estimates staff recommend using for a given year. Pounds are generated using an accepted average weight of 3.65 pounds (Amendment 1 to the Tilefish FMP).

	Party (Numbers)	Charter (Numbers)	Private Rental (MRIP-Numbers)	Private Rental (Delphi - Numbers)	Total (Numbers)	Total (Pounds)
2015	12,138	2,253	4,663	2,369	19,054	69,547
2016	13,476	2,017	116,833	2,121	132,326	482,990
2017	8,564	1,600	12,122	1,683	22,286	81,344
2018	4,702	7,730	2,989	8,129	20,561	75,048
2019	3,183	7,528	4,839	7,916	18,627	67,989

[2] The Delphi method was run in 2016 and offered recreational landings for charter, headboat, and private anglers. The Delphi method was used to develop a recreational time series for blueline tilefish through extrapolation of survey results. A ratio was used to back calculate private recreational landings in relation to charter landings from vessel trip reports. This method had been peer reviewed and accepted as best available science by SEDAR 50 and further recommended by the MC.

References

[1] Dooley J.K. 1978. Systematic and biology of the tilefishes (Perciformes: Branchiostegidae and Malacanthidae), with description of two new species. NOAA Tech. Rep. NMFS 411. NOAA, National Marine Fisheries Service. 78 p.

[2] http://sedarweb.org/sedar-50-data-workshop.

[3] Sedberry, G.R. and Pashuk, O. and Wyanski, D.M. and Stephen, J.A. and Weinbach, P. (2006) Spawning locations for Atlantic reef fishes off the southeastern U.S. In: Proceedings of the Gulf and Caribbean Fisheries Institute, 57, pp. 463-514.

[4] Ross, J. L., G. R. Huntsman. 1982. Age, growth, and mortality of blueline tilefish from North Carolina and South Carolina. Transactions of the American Fisheries Society 111:585-592.

[5] SEDAR. 2017. SEDAR 50 – Atlantic Blueline Tilefish Assessment Report. SEDAR, North Charleston SC. 542 pp. available online at: http://sedarweb.org/sedar-50.

[6] SEDAR. 2013. SEDAR 32 – South Atlantic blueline tilefish Stock Assessment Report. SEDAR, North Charleston SC. 378 pp. available online at: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=32.

[7] Southwick and Associates 2016. Estimated Catch of Blueline Tilefish in the Mid-Atlantic Region. Application of the Delphi Survey Process. Available at: http://www.mafmc.org/ssc-meetings/2016/march-15-16.

[8] Draft Abbreviated Framework Amendment 3 to the FMP for the Snapper grouper Fishery of the South Atlantic Region. Annual Catch Limit and Annual Catch Target Adjustment for South Atlantic Blueline Tilefish. South Atlantic Fishery Management Council. November 2010.

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Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 26, 2020

To: Council

From: José Montañez, Staff

Subject: Golden Tilefish Specifications for 2021 and 2022 Interim

The following materials are enclosed for Council consideration of the 2021-2022 golden tilefish management measures.

The following materials are enclosed on this subject:

1) Report of the March 2020 Meeting of the MAFMC Tilefish MC
2) March 2020 SSC Report – See Committee Reports Tab
3) Golden Tilefish Fishery Performance Report (February 2020)
4) Golden Tilefish Fishery Information Document, Council Staff (February 2020)
5) Golden Tilefish Data Update, NEFSC (February 2020)
6) Staff Recommendation Memo to Chris Moore (March 2020)

Tilefish Monitoring Committee
2021 Golden Tilefish Recommendations

March 2020

The Mid-Atlantic Fishery Management Council's (Council) Tilefish Monitoring Committee (MC) met via webinar on March 24, 2020 to review the most recent information and make recommendations for the 2021 and 2022 golden tilefish specifications. The primary purpose of this report is to summarize the MC recommendations from this meeting. Please note: MC comments described below are not necessarily consensus or majority statements.

Attendees: José Montañez and Matthew Seeley (Council Staff), Douglas Potts (GARFO), Jeff Brust (NJDFW), Dan Farnham (Golden Tilefish Fishing Industry), John Maniscalco (NYSDEC), and Paul Nitschke (NEFSC).

Others in attendance: Laurie Nolan (Golden Tilefish Fishing Industry and Council Member) and Michael Auriemma (NJDFW).

Discussion: The MC was presented with a summary of the Scientific and Statistical Committee (SSC) deliberations of the March 2020 SSC meeting, where the SSC reviewed the Golden Tilefish Data Update, the 2020 Golden Tilefish Fishery Performance Report, and the 2020 Golden Tilefish Fishery Information Document. Based on the updated information presented, the SSC recommended *status quo* ABCs for 2021 and 2022 (interim). The SSC indicated that no compelling evidence from either the data update or recent fishing trends suggested the need to change the current ABC. The SSC noted that this is a textbook example of an equilibrium fishery, with stable catches, high constant prices, stable seasonal supply, and low levels of discards. Past assessments have revealed that the fishery depends on the periodic recruitment of year classes. As a result, the catch per unit effort (CPUE) is characterized by cycles of increasing and decreasing stanzas. Currently much of the fishery is dependent on the 2013 year class and, based on historical patterns, further increases in CPUE are expected. Lastly, the SSC also took into consideration that the 2021 management track assessment would then be used to revise the interim 2022 specifications and set specifications for the 2023 and 2024 fishing seasons. The golden tilefish recommended ABC for each year 2021 and 2022 is 1.636 million pounds (742 mt). The MC discussed the different components of the golden tilefish catch and recent fishery trends.

The Monitoring Committees' Comments and Recommendations

Annual Catch Targets and Landings Limits and Basis for Derivation

The recommendations in this section were made for the next two years (2021 and 2022 interim). The MC endorses the management measures recommended by staff for 2021-2022. The Tilefish MC recommended no reduction in catch from the annual catch limit (ACL) when deriving annual catch targets (ACTs). Therefore, no adjustment for management uncertainty was deemed necessary. This would result in an individual fishing quota (IFQ) ACT and an incidental ACT of 1.554 million pounds (705 mt; 95% of the ACL) and 0.082 million pounds (37 mt; 5% of the ACL) for each 2021 and 2022. The committee recommended the total allowable landings (TAL) for the incidental sector be reduced by 0.011 million pounds (5 mt)[1] from the incidental ACT. No discard adjustment was required for the IFQ sector (directed fishery). The recommended ITQ total allowable landings (TAL) is 1.554 million pounds (705 mt) and the incidental TAL is 0.070 million pounds (32 mt) for each 2021 and 2022.

The MC shares the SSC's concern over the poorly described level of recreational catch for golden tilefish, and recreational catch is currently unaccounted for within the stock assessment. However, it was noted that the new recreational fishing permitting and reporting initiative under Amendment 6 to the Tilefish Fishery Management Plan may improve quality of estimates.

Relevant Sources of Management Uncertainty

Past sector-specific performance and catch performance can be used as a basis for qualifying management uncertainty (implementation error), and as an indicator of future availability to achieve the 2021-2022 ACTs. The commercial fishery landings performance has been in line with expectations and the MC recommends that an adjustment to address this aspect of management uncertainty is not necessary. The MC noted that IFQ vessels have been landing nearly the entirety of the IFQ in 2018 and 2019 fishing years. Furthermore, since the IFQ system became effective, golden tilefish landings are closely scrutinized. The incidental fishery landed approximately 22,000 pounds (31% of their allocation) in 2019 fishing year, and this year the landings trajectory is slightly behind when compared to last year's landings trajectory.

Commercial Discards

Development of a time series of discards was not done in the assessment model since discarding was considered negligible and information on discards do not exist for most of the time series. Very low or insignificant discards were estimated in other fisheries (incidental tilefish fisheries). There is higher uncertainty (high CVs) on some of the low recent discard estimates since the discarding of tilefish is a rare event on observed trips. Therefore, an average of several years was used to judge the recent relative magnitude of discarding in other fisheries. Following the flowchart for golden tilefish catch and landings

[1] According to the "Discard Estimation, Precision, and Sample Size Analysis" conducted by the NEFSC, an average of 11,524 pounds (5.22 mt) were discarded for the 2015-2019 period (mostly large/small mesh trawls and gillnets). Available at https://nefsc.noaa.gov/fsb/SBRM/

limit, the MC adjusted the incidental TAL from the incidental ACT using average annual discards for 2015-2019 as presented in “Discard Estimation, Precision, and Sample Size Analysis” conducted by the NEFSC (0.011 million pounds or 5 mt).[1] The MC also discussed that the directed commercial fishery (IFQ fishery) did not generate discards.

Other Management Measures

Incidental Trip Limit

The MC did not recommend changes to the current 500-pounds whole weight (458-pounds gutted) incidental trip limit. The MC noted that for 2018, 84% (61,254/72,752 pounds) of the incidental quota was landed and in 2019, 31% (22,246/72,752 pounds) of the incidental quota was landed.

Recreational Bag Limit

The MC discussed the overall increase in recreational landings from 2007-2018 and those landings to potentially becoming significant. However, it was noted that the number of fish landed by the party/charter sector decreased significantly in 2019. The MC expressed concern about the increase in effort in the recreational fishery in recent years and the fact that we do not have a good understanding of the magnitude of those landings.

The MC shares the SSC’s concerns over the poorly described level of recreational catch of golden tilefish, which is currently unaccounted for within the stock assessment The MC will continue to monitor the recreational catch in the fishery. The MC is hopeful that the recreational data collection requirements (for blueline and golden tilefish) under Amendment 6 will provide additional information regarding tilefish landings in the recreational fishery. The MC also indicated that the fishery is performing well and no changes to the recreational management measures (i.e., 8-fish per angler per trip) are required at the moment. However, the MC indicated that when more recreational data is available (i.e., under the new recreational fishing permitting and reporting initiative), recreational measures may need to be reevaluated and stock assessment implications considered.

Other Issues

An industry member inquired about the possibility to allow for a onetime roll-over of unused quota from 2020 to 2021 due to the difficulties the fishery is experiencing as a consequence of COVID-19. It was indicated that boats are not fishing as tilefish prices have drastically decreased due to lack of product demand. The price of tilefish has decreased so drastically in the past month that fishermen cannot afford fishing. A small roll-over of unused quota (e.g., 5% to 10%) will allow the industry to potentially recoup lost earnings due to COVID-19. This is a one-time request due to extraneous circumstances and not to be construed as a permanent roll-over of unused quota.

A MC member indicated that the current reduction in effort due to COVID-19 may provide a positive biological outcome as less fish will likely be taken during the summer spawning season. This would likely mitigate any adverse biological impacts of a small quota roll-over from 2020 to 2021.

The MC did not make any specific recommendations regarding the roll-over issue but recommended this be further investigated by the Council and GARFO.

Table 1. Staff recommendation for catch and landings limits for golden tilefish for 2021 and 2022 (interim) compared to 2020 measures.

	2020 (Current)	2021	2022 (interim)	Basis (2021-2022)
OFL	2.290 m lb (1,039 mt)	NA	NA	NA
ABC	1.636 m lb (742 mt)	1.636 m lb (742 mt)	1.636 m lb (742 mt)	Staff recommendation, based on recent fishing trends and scheduled 2021 management track assessment update
ABC % of OFL	72%	NA	NA	
ACL	1.636 m lb (742 mt)	1.636 m lb (742 mt)	1.636 m lb (742 mt)	ABC = ACL
IFQ ACT	1.554 m lb (705 mt)	1.554 m lb (705 mt)	1.554 m lb (705 mt)	IFQ 95% of ACL Incidental 5% of ACL. Deduction for management uncertainty = 0
Incidental ACT	0.082 m lb (37 mt)	0.082 m lb (37 mt)	0.082 m lb (37 mt)	
IFQ Discards	0	0	0	Discards in the IFQ fishery are prohibited
Incidental Discards	0.009 m lb (4 mt)	0.011 m lb (5 mt)	0.011 m lb (5 mt)	Avg. discard (2015-2019) mostly sm/lg mesh OT and Gillnet gear
IFQ TAL	1.554 m lb (705)	1.554 m lb (705 mt)	1.554 m lb (705 mt)	IFQ ACT - IFQ Discards
Incidental TAL	0.072 m lb (33 mt)	0.070 m lb (32 mt)	0.070 m lb (32 mt)	Incidental ACT - Incidental Discards

Golden Tilefish Fishery Performance Report

February 2020

The Mid-Atlantic Fishery Management Council's (Council) Tilefish Advisory Panel (AP) met via webinar on February 20, 2020 to review the Fishery Information Document and develop the following Fishery Performance Report. The primary purpose of this report is to contextualize catch histories by providing information about fishing effort, market trends, environmental changes, and other factors. A series of trigger questions listed below were posed to the AP to generate discussion of observations in the golden tilefish fishery. Please note: Advisor comments described below are not necessarily consensus or majority statements.

Advisory Panel members present:

Fred Akers (Private), David Arbeitman (Bait and tackle), Ron Callis (Private), Dan Farnham (Commercial), Carl Forsberg (For-hire), Gregory Hueth (Private/For-hire), and Michael Johnson (Fisherman).

Others present: Paul Nitschke (NEFSC), Laurie Nolan (Council Member), Doug Potts (GARFO), Paul Rago (SSC), John Boreman (SSC), Andy Loftus (Loftus Consulting), Matthew Seeley (Council Staff), and José Montañez (Council Staff).

Trigger questions:

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
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?

Market/Economic Conditions

Prices continue to be stable in all market categories. Tilefish prices have remained stable because the tilefish industry continues to coordinate times of landings to avoid market gluts and market floods and spread tilefish landings throughout the year. The ability to do this has improved since IFQs came into place.

Golden tilefish caught in the Mid-Atlantic region are mostly sold as gutted fish (95% of fish sold). Traditionally, most tilefish landings were sold to the Korean markets. Due to marketing efforts, tilefish has become a popular item. They are regularly found on restaurant menus rather than an occasional "specials." Local fish markets, as well as grocery stores like Whole Foods, carry tilefish. Businesses like Sea to Table, a door-to-door seafood delivery service, have also helped spread the word on what a great eating fish tilefish are. Having a steady year-round supply of tilefish has influenced the positive market development for this product.

Extra-large fish have been marketed as 25+ pound fish in both New York and New Jersey in past years. However, more recently (since around 2016), New Jersey has changed the extra-large to 20+ pounds fish. This may explain some of the small increase in extra-large market category landings that has been observed in the last few years. AP members reported that extra-large fish continues to be worth as much as large fish.

Fishing trip expenses continue to rise (e.g., gear, bait, ice, tackle, and food). Due to the high cost of operations, tilefish vessels fish as close to home port as possible. For example, the cost of squid used for bait has doubled. *Illex* cost is $1.00 to $1.50/pound. While the domestic squid season/landings have been good, low foreign landings and high demand are expected to keep squid prices at the current high level or even higher.

Environmental Conditions

The industry has observed no tilefish aggregation changes due to changes in water temperatures, in contrast with what they observe with other fishes. The temperatures where golden tilefish are found seem stable due to extreme depth. (Note: tilefish are generally found in rough bottom, small burrows, and sheltered areas at bottom water temperatures ranging from 48.2ºF to 57.2ºF [9°C to 14°C], generally in depths between 328 and 984 ft [100 to 300 m]).

Dogfish interaction reduces tilefish catches and strongly affects where people fish. The dogfish are so thick now, when fishermen encounter them, they have no choice but to move to other fishing areas. The dogfish interaction used to be about two or three months in the winter. However, in the last seven years, dogfish presence is about eight months, and extends to June. Additionally, in the last couple of years, after the dogfish have left the tilefish fishing grounds, fishermen are encountering smooth dogfish which are bigger animals, more robust, and harder to release. The interaction with smooth dogfish is not such a big problem when compared to the dogfish interactions. Additionally, skate interactions reduce tilefish catches as well; this is limited to the winter period. Skates can severely damage tilefish gear. When fishermen encounter skates, they move to other fishing areas.

Staff asked the AP members to comment on the timing of the 2020 golden tilefish survey which is scheduled to be conducted May 22 to June 4, 2020. Staff specifically asked about the potential for high dogfish interactions which could adversely affect the survey results. Advisors indicated that it is possible that there may be large quantities of dogfish still around during that time period. They also indicated that lobster gear may also be still deployed in potential survey areas during May/June and will not be moved inshore until later on. They recommended that it may be more advisable to conduct the survey in June/July. Paul Nitschke (NEFSC) will be in contact with industry members to assess fishery interactions with dogfish prior to initiating the survey.

Adverse weather conditions (e.g., storms, rough seas, high winds, and tide) can impact fishing operations. Severe winter conditions experienced in the Northeast in 2013-2019 significantly affected the effectiveness of tilefish fishing operations/practices, resulting in longer fishing trips. Some advisors indicated that in 2019, winter conditions arrived early in October and Northeast winds affected fishing operations towards the end of the 2019 fishing year. Some boats were not able to leave the docks and boats that were offshore could not fish (forcing them to relocate to the west). In addition, with the arrival of early winter conditions, dogfish and skates interactions also increased. These factors resulted in a small underage in landings for the 2019 fishing year.

Recreational and commercial fishermen continue to see aggregations of fish in small areas in the spring/summer-time around the Wilmington canyon (>80 to 90 fathoms).

Commercial fishermen indicated that they continue to see aggregations of large fish in all canyons in the Mid-Atlantic region. Landings for the 2019 fishing year were slightly lower than for the 2018 fishing year.

Two AP members representing the recreational fishery indicated that the amount of large fish aggregations in some southern Mid-Atlantic canyons (e.g., Washington, Baltimore, Poor Man’s, Wilmington, and Norfolk) have decreased in size. They also indicated that a higher percentage of their catch is comprised of smaller fish.

Some AP members reported that in the northern canyons they have seen smaller size classes move into larger size classes, when compared to 2 or 3 years ago. Their observations of a strong year class moving through the fishery are similar to those seen by the commercial fleet.

Management Issues

The number of tilefish vessels participating in the fishery was steady since the onset of the IFQ management system. Currently, three vessels constitute the vast bulk of the landings (~ 70% of the landings/IFQ allocation). New Jersey currently holds 30% of the allocation.

The implementation of the IFQ system has particularly benefited those in the former "part-time" and "tier 2" vessel categories of the old limited access program. These vessels can plan their fishing activities throughout the year, rather than being forced into a derby fishery on November 1 (start of the fishing year) if they plan to harvest tilefish in a given year. These vessels participate in several fisheries (e.g., monkfish, scallop, and swordfish) and the IFQ system allows them to "fill in" tile fishing when it works best for them. Under the IFQ system, the former "part-time, tier 2, and full-time" vessels are working closely with each other and dealers to avoid landing large quantities of tilefish at the same time and avoid drastic price reductions.

One panel member indicated that even smaller participants in the tilefish IFQ fishery (smaller in terms of IFQ allocation and/or boat size) have greatly benefited from the IFQ management system as they can better plan their fishing operations (fish when and where they need to) and the fact that tilefish prices are relatively good and stable, and in fact, a large proportion of their ex-vessel revenues come from tilefish can be attributed to the IFQ program.

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them to "fill in" tile fishing when it works best for them. Under the IFQ system, the former "part-time, tier 2, and full-time" vessels are working closely with each other and dealers to avoid landing large quantities of tilefish at the same time and avoid drastic price reductions.

General Fishing Trends

AP members observed a new year class coming into the fishery in 2019. Specifically, they have seen larger landings in the extra small size category (<2 pounds). They have also seen a wide range of fish landed in terms of size and weight when compared to the year before.

AP members pointed out that for the last six winter seasons (January-March, 2013-2019) fishing practices have been impacted by severe weather resulting in longer fishing trips than on average. Severe winter conditions in the last five years have made fishing less productive. In 2019, winter like conditions started earlier (October). While severe weather conditions affect all fishing boats, smaller boats are particularly susceptible to severe winter and wind conditions.

Industry indicated that they experience an increase in CPUE in 2019. Fishing has gotten better, outside/external conditions affecting fishery have gotten worse: 1) dogfish interactions in 2019 continued to be high but at the same level seen in 2018, 2) skates interactions increased in 2019 when compared to 2018 (increased size of skates and numbers). Also, interaction with smooth dogfish (e.g., encountering more animals and further east), 3) weather in 2019 continued to be poor, winter started earlier in 2019 (October) when compared to 2018 conditions, 4) they are catching more fish and fishing is improving.

Industry tries to fish as close to port as possible. Basically, fishing in the same areas to maintain low trip expenses. Increasing operating costs keep people from going further out and searching. Industry also indicated that due to recent Northeast Canyons and Seamounts Marine National Monument closures, they do not have access to fishing grounds in the Oceanographer, Gilbert, and Lydonia canyons.

Fishermen are not moving around much as they are finding a healthy mix of animals in traditional fishing grounds. However, there are areas that are thought to have more quantities of larger fish than smaller fish that could be targeted if needed.

AP members indicated that they have observed a new development regarding gear interaction with other fisheries between Block and Atlantic canyons. They reported to have seen more crab gear in the wintertime, which caused tilefish boats to be pushed out of that area. Also, reported an increase in lobster gear/boat interactions in the summer. In general, industry members are observing more gear competition throughout the year.

AP members have also observed more trawling traffic in the Hudson canyon area, especially when *loligo* availability is high and prices are robust. When trawling activity increases in the Hudson area, tilefish boats are pushed out of that area.

Other Issues

Constant harvest strategy worked well in rebuilding the fishery. Industry would like to get back to a constant ACL in the future given healthy trends in the catch. Industry does not want to see a different ACL every year.

Consider implementing golden tilefish specifications for a longer time period if possible (e.g., 5 year specifications cycle).

One headboat captain indicated that five or six headboats[1] directly fish for golden tilefish but not 100% or full time. Some AP members commented that while the headboat participation in the golden tilefish recreational fishery appears stable they have seen an increase in participation by recreational private boats (July through September) and that private golden tilefish recreational landings are not recorded (and potential sale of fish recreationally caught).

Another AP member indicated that while there are five headboats that fish for tilefish (both blueline and golden) in the mid-Atlantic they have a limited number of dedicated tilefish trips throughout the season (summertime). For example, the boat that has the largest number of trips scheduled during the year (a boat Point Pleasant) has about 24 scheduled trips per year and not all trips are conducted (i.e., taking 50 to 60% of scheduled trips) and in some instances not all of them are full. The other four boats have substantially less tilefish trips scheduled per year.

Industry members indicated that for-hire trips targeting golden tilefish went down in 2019. This decreased in effort was due to weather factors. Also, improved tuna and swordfish fishing conditions in 2019 when compared to 2018 also caused less trips targeting golden tilefish.

Panel members raised concerns and questioned the tilefish catches reported in the NMFS recreational statistics database as they are inaccurate and unreliable. It was recommended that this type of data is not be used for the management of this species. AP members also stated that recreational values reported under the vessel trip report (VTR) data seems to be more realistic of tilefish catches. It was also indicated that electronic VTR need to be implemented as this may improve data collection.

AP members indicated that Captains and crew should be included in the comingled bag limit (recreational possession limit) for a trip. In other words, the Captain and Crew should also be allotted a bag limit.

AP members are concerned about the fishermen targeting golden tilefish under the incidental limit rules. Some of the vessels engaging in this practice do not have the required permitting requirements to sell fish and do not have the Coast Guard Safety requirements needed to be in compliance with Federal regulations as applicable to commercial vessels.

[1] Two from New Jersey, one from New York, one from Ocean City, MD (direct tilefish but only a few times per year), and 1 from Rudee Inlet, VA.

AP members indicated that the landings monitoring program of the IFQ system is very reliable. In all, there is good accountability mechanisms to track landings in the directed commercial fishery (IFQ vessel) and VTR data (commercial and recreational vessels). However, there is concern that directed incidental trips (non-otter trawl vessels) may be missing. In addition, there is no accurate information of catch/landings by private recreational anglers.

Some AP members would like the Council to consider a differential trip limit (for-hire vs private) and longer recreational trips. In addition, they suggested that the Council considers recreational management strategies (e.g., longer recreational trips, multi-day bag limits), structured after the Gulf of Mexico regulations (would make filling trips easier). Multi-day bag limits are important because a hand full of boats target tilefish in January-February when the black sea bass season is closed and while they do not catch much tilefish, this management change could help their business sell more trips. These management changes could be considered when a quota liberalization is on the table (quota going up).

Some AP members would like the Council to consider a recreational allocation.

Some AP members indicated concerns about relaxing recreational regulations (as they could potentially lead to higher recreational landings) while the commercial quota could remain at status quo levels or potentially decrease in the future.

A commercial AP member expressed concerns over increasing any effort, bag limit or quota in the fishery at this time. They felt it would be unfair to allow for an increase in effort/bag limit in the recreational sector while maintaining status quo for the commercial sector.

A recreational AP member articulated that, it should be noted that the commercial sector, pre-IFQ, were the ones that brought the tilefish stock to its knees, not the recreational sector. The commercial sector has 100% of the quota between IFQ and Incidental fisheries. Recreational fishing has always been de minimis. If it were not, AP member assumes that there would be a significant recreational allocation. To say that the three players that catch 70% of the IFQ or the handful of others that make up the remaining 30% would be harmed by allowing a few more recreational fish in the for-hire industry seems preposterous. The fact that those who have 100% of the quota have suffered cutbacks should not constrain the recreational angling public from catching a few extra fish. This is particularly true in the for-hire fleet where reporting is mandatory.

Recreational AP members indicated that the for-hire fishery (more significantly the headboat fishery) seems to be losing more trips due to weather conditions. The commercial sector complains of losing trips to weather but drift fishing for tilefish requires even better weather. In fact, near pristine conditions for both small boats and headboats are required and the loss of trips is far greater than that of the commercial fleet.

Some commercial AP members were very concerned about the tilefish landings by the private/rental mode that are not reported. It is possible that these landings are very high and we have no way to account for them. Since we do not have available information regarding the "true" recreational landings, we should not consider recreational liberalizations.

The AP was unanimous in their recommendation that permitting and reporting be developed for private recreational anglers. This information will offer insight into the impacts private anglers have on the recreational fishery for catch/landings and effort. Furthermore, the Council approved private permitting and reporting requirements for tilefish in 2017 through Amendment 6 to the Tilefish Fishery Management Plan (FMP) (added blueline tilefish to the FMP) and are now awaiting implementation.

Research Priorities

Consider the possibility of collecting detailed spatial fishing information from industry to better assess stock status. In addition, consider collecting biological information (e.g., age, length, sex) from golden tilefish directed trips.

Golden Tilefish Fishery Information Document

February 2020

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for golden tilefish with an emphasis on 2019. Data sources for Fishery Information Documents are generally from 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/tilefish/.

Key Facts

- There has been no change to the status of the golden tilefish stock in 2019; the stock is not overfished and overfishing is not occurring.
- In 2019, 1.4 million pounds (landed weight) of golden tilefish were landed with an ex-vessel value (revenues) of $5.4 million. This represented a decrease in golden tilefish landings of approximately <1% and an increase in ex-vessel value of 10%, respectively, when compared to 2018. For 2019, the mean price for golden tilefish was $3.81 per pound, which represents a 15% increase from 2018 ($3.31 per pound).
- According to VTR data, party/charter vessel landed 2,733 golden tilefish in 2019. This represented a 62% decrease from 2018 (7,101 fish landed).

Basic Biology

The information presented in this section can also be found in the Tilefish Fishery Management Plan (FMP) (MAFMC, 2001; http://www.mafmc.org/fisheries/fmp/tilefish). Golden tilefish (*Lopholatilus chamaeleonticeps*; tilefish from this point forward in this section) are found along the outer continental shelf and slope from Nova Scotia, Canada to Surinam on the northern coast of South America (Dooley 1978 and Markle et al. 1980) in depths of 250 to 1500 feet. In the southern New England/mid-Atlantic area, tilefish generally occur at depths of 250 to 1200 feet and at temperatures from 48°F to 62°F or 8.9°C to 16.7°C (Nelson and Carpenter 1968; Low et al. 1983; Grimes et al. 1986).

Katz et al. (1983) studied stock structure of tilefish from off the Yucatan Peninsula in Mexico to the southern New England region using both biochemical and morphological information. They identified two stocks – one in the mid-Atlantic/southern New England and the other in the Gulf of Mexico and the south of Cape Hatteras.

Tilefish are shelter seeking and perhaps habitat limited. There are indications that at least some of the population is relatively nonmigratory (Turner 1986). Warme et al. (1977) first reported that tilefish occupied excavations in submarine canyon walls along with a variety of other fishes and invertebrates, and they referred to these areas as "pueblo villages." Valentine et al. (1980) described tilefish use of scour depressions around boulders for shelter. Able et al. (1982) observed tilefish use of vertical burrows in Pleistocene clay substrates in the Hudson Canyon area, and Grimes et al. (1986) found vertical burrows to be the predominant type of shelter used by tilefish in the mid-Atlantic/southern New England region. Able et al. (1982) suggested that sediment type might control the distribution and abundance of the species, and the longline fishery for tilefish in the Hudson Canyon area is primarily restricted to areas with Pleistocene clay substrate (Turner 1986).

Males achieve larger sizes than females, but do live as long (Turner 1986). The largest male reported bu Turner was 44.1 inches at 20 years old, and the largest female was 39 years at 40.2 inches FL (fork length). The oldest fish was a 46 year old female of 33.5 inches, while the oldest male was 41.3 inches and 29 years. On average, tilefish (sexes combined) grow about 3.5 to 4 inches FL per year for the first four years, and thereafter growth slows, especially for females. After age 3, mean last back-calculated lengths of males were larger than those of females. At age 4, males and females averaged 19.3 and 18.9 inches FL, respectively, and by the tenth year males averaged 32.3 while females averaged 26.4 inches FL (Turner 1986).

The size of sexual maturity of tilefish collected off New Jersey in 1971-73 was 24-26 inches TL (total length) in females and 26-28 inches TL in males (Morse 1981). Idelberger (1985) reported that 50% of females were mature at about 20 inches FL, a finding consistent with studies of the South Atlantic stock, where some males delayed participating in spawning for 2-3 years when they were 4-6 inches larger (Erickson and Grossman 1986). Grimes et al. (1988) reported that in the late 1970s and early 1980s, both sexes were sexually mature at about 19-26 inches FL and 5-7 years of age; the mean size at 50% maturity varied with the method used and between sexes. Grimes et al. (1986) estimated that 50% of the females were mature at about 19 inches FL using a visual method and about 23 inches FL using a histological method. For males, the visual method estimated 50% maturity at 24 inches FL while the histological method estimated 50% maturity at 21 inches FL. The visual method is consistent with NEFSC (Northeast Fisheries Science Center) estimates for other species (O'Brien et al. 1993). Grimes et al. (1988) reported that the mean size and age of maturity in males (but not females) was reduced after 4-5 years of heavy fishing effort. Vidal (2009) conducted an aging study to evaluate changes in growth curves since 1982, the last time the reproductive biology was evaluated by Grimes et al. (1988). Histological results from Vidal's study indicate that size at 50% maturity was 18 inches for females and 19 inches for males (NEFSC 2009).

Nothing is known about the diets and feeding habits of tilefish larvae, but they probably prey on zooplankton. The examination of stomach and intestinal contents by various investigators reveal that tilefish feed on a great variety of food items (Collins 1884, Linton 1901a and 1901b, and Bigelow and Schroeder 1953). Among those items identified by Linton (1901a and 1901b) were several species of crabs, mollusks, annelid worms, polychaetes, sea cucumbers, anemones, tunicates and fish bones. Bigelow and Schroeder (1953) identified shrimp, sea urchins and several species of fishes in tilefish stomachs. Freeman and Turner (1977) reported examining nearly 150 tilefish ranging in length from 11.5 to 41.5 inches. Crustaceans were the principal food items of tilefish with squat lobster (*Munida*) and spider crabs (*Euprognatha*) the most important crustaceans. The authors report that crustaceans were the most important food item regardless of the size of tilefish, but that small tilefish fed more on mollusks and echinoderms than larger tilefish. Tilefish burrows provide habitat for numerous other species of fish and invertebrates (Able et al. 1982 and Grimes et al. 1986) and in this respect, they are similar to "pueblo villages" (Warme et al. 1977).

Able et al. (1982) and Grimes et al. (1986) concluded that a primary function of tilefish burrows was predator avoidance. The NEFSC database only notes goosefish as a predator. While tilefish are sometimes preyed upon by spiny dogfish and conger eels, by far the most important predator of tilefish is other tilefish (Freeman and Turner 1977). It is also probable that large bottom-dwelling sharks of the genus *Carcharhinus*, especially the dusky and sandbar, prey upon free swimming tilefish.

Status of the Stock

There has been no change to the status of the golden tilefish stock in 2019; the stock is not overfished and overfishing is not occurring.

Biological Reference Points

The biological reference points for golden tilefish were updated during the 2017 stock assessment update (Nitschke 2017), as a result of a change to the recruitment penalty used in the assessment model (i.e., likelihood constant turned off).[1] The fishing mortality threshold for golden tilefish is $F_{38\%}$ (as $F_{MSY\ proxy}$) = 0.310, and $SSB_{38\%}$ ($SSB_{MSY\ proxy}$) is 21 million pounds (9,492 mt).

Stock Status

The last assessment update was completed in February 2017. Fishing mortality in 2016 was estimated at F=0.249; 20% below the fishing mortality threshold of F=0.310 ($F_{MSY\ proxy}$). SSB in 2016 was estimated at 18.69 million pounds (8,479 mt), and was at 89% of the biomass target ($SSB_{MSY\ proxy}$). As such, the golden tilefish stock was not overfished and overfishing was not occurring in 2016, relative to the newly updated biological reference points.

Data Update

The NEFSC is developing a golden tilefish data update through 2019. The update will contain recent trends in the golden tilefish fishery, including, commercial landings, catch per unit effort, and commercial landings by market category (size composition). The update will be posted at the Council's website (http://www.mafmc.org/) as soon as it is available.

Management System and Fishery Performance

Management

There have been no changes to the overall golden tilefish management system since the Individual Fishing Quota (IFQ) system was implemented in 2009 (Amendment 1). However,

[1] Incorporation of likelihood constants into the objective function can cause biases in assessment models. This bias can result in reductions in the estimated recruitment and biomass. For additional details see: Nitschke 2017; Golden Tilefish, *Lopholatilus chamaeleonticeps*, stock assessment update through 2016 in the Middle Atlantic-Southern New England Region. NMFS/NEFSC, Woods Hole, MA. Available at: http://www.mafmc.org/council-events/2017/march-2017-ssc-meeting.

Framework 2 to the Tilefish FMP (implemented in 2018) made several changes to the management system intended to improve and simplify the administration of the golden tilefish fishery. These changes include removing an outdated reporting requirement, proscribing allowed gear for the recreational fishery, modifying the incidental trip landings, requiring commercial golden tilefish be landed with the head attached, and revising how assumed discards are accounted for when setting harvest limits.

The commercial golden tilefish fisheries (IFQ and incidental) are managed using catch and landings limits, commercial quotas, trip limits, gear regulations, permit requirements, and other provisions as prescribed by the FMP. While there is no direct recreational allocation, Amendment 1 implemented a recreational possession limit of eight golden tilefish per angler per trip, with no minimum fish length. Golden tilefish was under a stock rebuilding strategy beginning in 2001 until it was declared rebuilt in 2014. The Tilefish FMP, including subsequent Amendments and Frameworks, are available on the Council website at: http://www.mafmc.org/fisheries/fmp/tilefish.

Commercial Fishery

In 2019, 1.4 million pounds (landed weight) of golden tilefish were landed with an ex-vessel value (revenues) of $5.4 million. This represented a decrease in golden tilefish landings of approximately <1% and an increase in ex-vessel value of 10%, respectively, when compared to 2018. For 2019, the mean price for golden tilefish (unadjusted) was $3.81 per pound, this represented a 15% increase from 2018 ($3.31 per pound).

For the 1970 to 2019 calendar years, golden tilefish landings have ranged from 128 thousand pounds live weight (1970) to 8.7 million pounds (1979). For the 2001 to 2018 period, golden tilefish landings have averaged 1.8 million pounds live weight, ranging from 1.1 (2016) to 2.5 (2004) million pounds. In 2019, commercial golden tilefish landings were 1.5 million pounds live weight (Figure 1).

The principal measure used to manage golden tilefish is monitoring via dealer weighout data that is submitted weekly. The directed fishery is managed via an IFQ program. If a permanent IFQ allocation is exceeded, including any overage that results from golden tilefish landed by a lessee in excess of the lease amount, the permanent allocation will be reduced by the amount of the overage in the subsequent fishing year. If a permanent IFQ allocation overage is not deducted from the appropriate allocation before the IFQ allocation permit is issued for the subsequent fishing year, a revised IFQ allocation permit reflecting the deduction of the overage will be issued. If the allocation cannot be reduced in the subsequent fishing year because the full allocation had already been landed or transferred, the IFQ allocation permit would indicate a reduced allocation for the amount of the overage in the next fishing year.

A vessel that holds an Open Access Commercial/Incidental Tilefish Permit can possess up to 500 pounds live weight (455 pounds gutted) at one time without an IFQ Allocation Permit. If the incidental harvest exceeds 5 percent of the TAL for a given fishing year, the incidental trip limit of 500 pounds may be reduced in the following fishing year.

Table 1 summarizes the golden tilefish management measures for the 2005-2020 fishing years (FYs). Commercial golden tilefish landings have been below the commercial quota specified each year since the Tilefish FMP was first implemented except for FY 2003/2004 (not shown in

Table 1), and 2010. In 2003 and 2004, the commercial quota was exceeded by 0.3 (16%) and 0.6 (31%) million pounds respectively.[2]

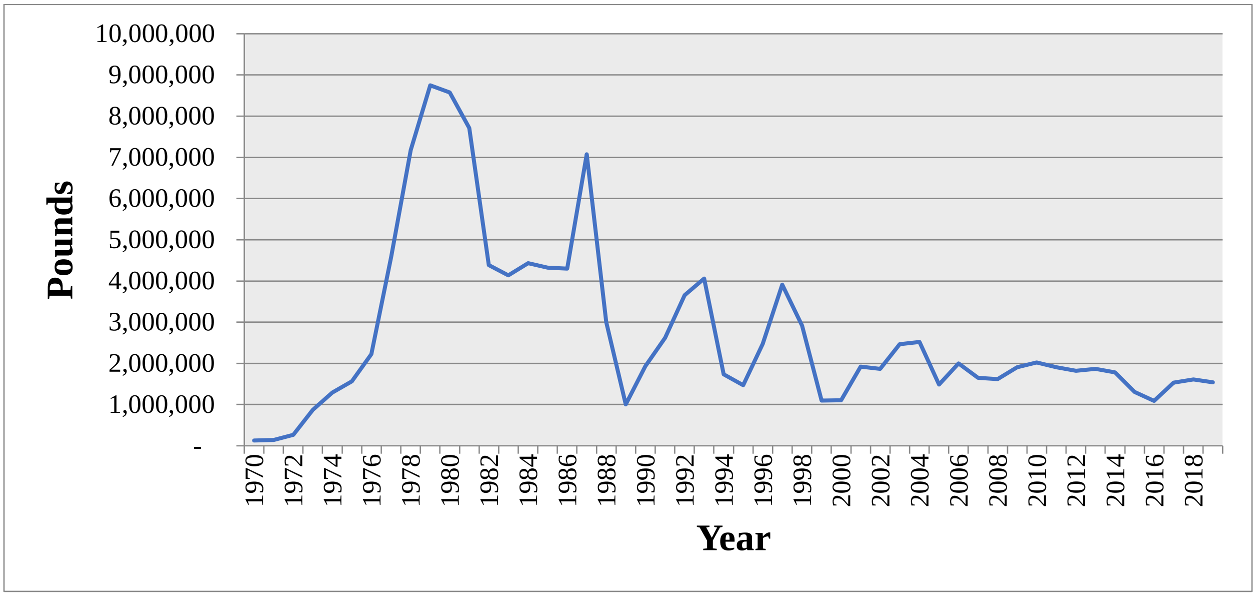

Figure 1. Commercial U.S. Golden Tilefish Landings (live weight) from Maine-Virginia, 1970-2019 (calendar year). Source: 1970-1993 Tilefish FMP; 1994-2018 NMFS unpublished dealer data.

Golden tilefish are primarily caught by longline and bottom otter trawl. Based on dealer data from 2015-2019, the bulk of the golden tilefish landings are taken by longline gear (97%) followed by bottom trawl gear (2%). No other gear had any significant commercial landings. Minimal catches were also recorded for hand line and gillnets (Table 2).

[2] As a result of the decision of the Hadaja v. Evans lawsuit, the permitting and reporting requirements for the FMP were postponed for close to a year (May 15, 2003 through May 31, 2004). During that time period, it was not mandatory for permitted golden tilefish vessels to report their landings. In addition, during that time period, vessels that were not part of the golden tilefish limited entry program also landed golden tilefish.

Table 1. Summary of management measures and landings for fishing year 2005-2020.

Management Measures	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
ABC (m lb)	-	-	-	-	-	-	-	-	2.013	2.013	1.766	1.898	1.898	1.636	1.636	1.636
TAL (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887	1.627	1.627	1.627
Com. quota- (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887	1.627	1.626	1.626
Com. landings	1.497	1.898	1.777	1.672	1.887	1.997	1.946	1.856	1.839	1.830	1.354	1.060	1.487	1.626	1.562	-
Com. overage/underage (m lb)	-0.498	-0.097	-0.218	-0.323	-0.108	+0.002	-0.049	-0.139	-0.156	-0.165	-0.401	-0.827	-0.401	<-0.001	-0.064	-
Incidental trip limit (lb)	133	300	300	300	300	300	300	500	500	500	500	500	500	500	500	500
Rec. possession limit	-	-	-	-	-	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]

[a] Fishing year 2005 (November 1, 2004 – October 31, 2005). [b] Eight fish per person per trip.

Table 2. Golden tilefish commercial landings ('000 pounds live weight) by gear, Maine through Virginia, 2015-2019 (calendar year).

Gear	Pounds	Percent
Otter Trawl Bottom, Fish	143	2.0
Otter Trawl Bottom, Other	1	*
Gillnet, Anchored/Sink/Other	17	*
Lines Hand	23	*
Lines Long Set with Hooks	6,885	97.3
Pot & Trap	1	*
Dredge, other	*	*
Unknown, Other Combined Gears	4	*
All Gear	7,074	100.0

Note: * = less than 1,000 pounds or less than 1 percent. Source: NMFS unpublished dealer data.

Approximately 56 percent of the landings for 2019 were caught in statistical area 537; statistical area 616 had 38 percent; statistical areas 539 and 613 each had 2 percent (Table 3). NMFS statistical areas are shown in Figure 2.

For the 1999 to 2019 period, commercial golden tilefish landings are spread across the years with no strong seasonal variation (Tables 4 and 5). However, in recent years, a slight downward trend in the proportion of golden tilefish landed during the winter period (November-February) and a slight upward trend in the proportion of golden tilefish landed during the May-June period are evident when compared to earlier years (Table 5).

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Table 3. Golden tilefish percent landings by statistical area and year, 1996-2019 (calendar year).

Year	525	526	537	539	612	613	616	622	626	Other
1996	0.05	5.21	64.04	0.39	*	1.09	27.81	0.01	-	1.40
1997	0.03	0.67	79.51	0.02	*	2.59	16.41	0.01	*	0.74
1998	1.26	2.19	81.95	0.04	0.02	5.45	8.55	*	*	0.53
1999	0.97	0.22	55.79	0.02	0.22	3.71	36.60	0.02	0.02	0.43
2000	0.36	3.79	46.10	0.01	0.05	2.36	43.94	0.47	0.14	2.78
2001	0.23	3.09	23.92	*	0.01	3.16	68.96	*	0.10	0.52
2002	0.12	8.73	35.86	0.07	0.01	18.50	36.54	0.02	0.02	0.14
2003	0.88	1.81	38.48	0.10	-	11.85	46.51	0.05	0.05	0.26
2004	1.03	2.59	62.85	0.05	5.28	0.70	25.95	0.03	0.06	1.66
2005	0.12	0.25	62.99	0.02	0.03	6.11	25.68	0.03	0.20	4.56
2006	*	1.54	64.30	0.50	1.24	0.71	30.09	0.04	0.05	1.53
2007	0.02	0.42	57.61	0.01	-	5.53	33.93	0.85	0.45	1.18
2008	1.09	0.06	44.07	0.01	-	4.62	46.94	2.05	0.02	1.14
2009	2.17	0.01	42.62	1.30	0.04	4.37	46.12	1.34	1.16	0.88
2010	0.01	0.01	57.14	0.55	0.02	8.39	32.83	0.69	0.04	0.31
2011	0.02	*	53.06	0.01	-	3.12	39.98	0.31	0.06	3.44
2012	0.01	0.01	52.54	0.03	*	0.58	43.92	0.20	0.10	2.62
2013	*	0.67	56.22	1.06	0.03	0.68	35.39	1.21	4.59	0.16
2014	0.01	0.52	49.36	1.89	0.01	1.29	42.85	2.67	0.35	1.06
2015	3.06	0.98	30.00	2.55	-	0.01	55.02	2.34	5.53	1.50
2016	1.03	4.77	32.33	0.01	-	0.98	54.50	0.17	5.81	0.39
2017	0.01	5.45	27.73	2.69	0.01	0.94	55.33	0.16	5.49	2.19
2018	*	1.65	46.99	3.27	-	0.06	41.18	0.57	6.13	0.15
2019	0.01	1.38	55.55	1.86	-	1.69	38.40	0.07	0.33	0.70
All	0.49	1.85	53.80	0.62	0.43	3.71	36.31	0.49	1.06	1.22

Note: - = no landings; * = less than 0.01 percent. Source: NMFS unpublished VTR data.

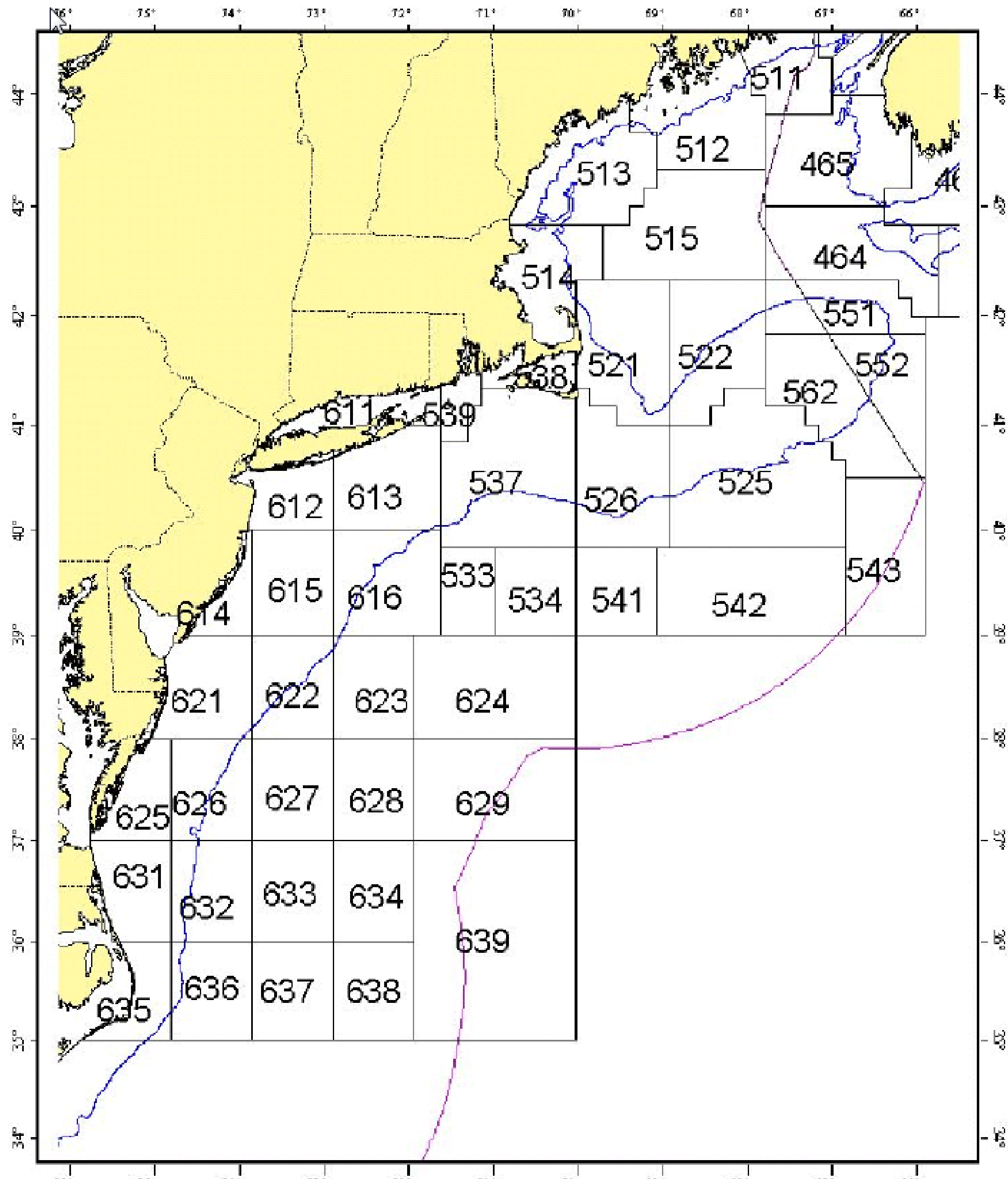

Figure 2. NMFS Statistical Areas.

Table 4. Golden tilefish commercial landings (1,000 live weight) by month and year, Maine through Virginia, 1999-2019 (calendar year).

Year	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1999	118	114	124	103	93	91	55	106	83	59	77	75	1,096
2000	52	105	159	101	107	99	34	91	42	107	96	112	1,105
2001	107	151	159	188	153	179	177	157	156	156	161	176	1,920
2002	143	232	257	144	164	117	107	141	148	146	68	200	1,866
2003	183	181	295	254	209	185	152	180	210	202	189	223	2,463
2004	197	355	514	332	132	77	113	119	183	187	120	189	2,519
2005	127	159	235	168	33	57	92	129	96	94	141	158	1,487
2006	159	245	324	108	127	142	86	138	129	141	169	228	1,996
2007	122	118	192	147	141	96	131	133	125	174	77	189	1,646
2008	235	206	202	173	124	123	62	90	101	90	109	104	1,619
2009	90	145	185	200	219	211	184	157	156	127	94	134	1,902
2010	128	152	274	216	195	157	149	157	156	186	119	137	2,025
2011	152	95	269	234	203	137	160	127	120	194	65	150	1,905
2012	145	114	141	204	150	129	156	201	184	217	39	138	1,818
2013	106	119	174	245	226	193	152	152	126	169	74	126	1,863
2014	114	93	146	183	187	233	214	172	134	153	46	102	1,777
2015	68	70	144	128	181	146	130	127	123	89	41	62	1,308
2016	43	52	91	93	88	119	150	127	91	112	68	64	1,089
2017	110	55	68	193	195	187	128	134	105	180	47	133	1,535
2018	81	135	125	194	149	213	165	148	134	103	64	98	1,607
2019	91	106	131	130	234	163	131	137	158	119	40	96	1,536
Total	2,570	3,002	4,209	3,737	3,312	3,054	2,727	2,924	2,749	3,005	1,903	2,892	36,082
Avg. 10-19	104	99	156	182	181	168	153	148	132	152	60	111	1,646

Source: NMFS unpublished dealer data.

Table 5. Percent of golden tilefish commercial landings (live weight) by month and year, Maine through Virginia, 1999-2019 (calendar year).

Year	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1999	10.75	10.38	11.28	9.41	8.50	8.29	4.99	9.66	7.55	5.36	6.98	6.86	100.00
2000	4.68	9.48	14.41	9.13	9.67	8.95	3.05	8.26	3.78	9.71	8.70	10.18	100.00
2001	5.59	7.88	8.30	9.77	7.95	9.32	9.24	8.16	8.13	8.11	8.40	9.14	100.00
2002	7.64	12.43	13.76	7.70	8.78	6.28	5.74	7.57	7.92	7.85	3.63	10.70	100.00
2003	7.44	7.33	11.98	10.31	8.47	7.52	6.18	7.32	8.52	8.19	7.68	9.05	100.00
2004	7.81	14.11	20.42	13.20	5.25	3.06	4.47	4.74	7.26	7.43	4.76	7.49	100.00
2005	8.54	10.70	15.78	11.28	2.24	3.82	6.16	8.66	6.44	6.32	9.46	10.60	100.00
2006	7.95	12.30	16.22	5.39	6.38	7.10	4.33	6.93	6.46	7.06	8.46	11.41	100.00
2007	7.43	7.15	11.67	8.93	8.58	5.85	7.94	8.08	7.61	10.60	4.68	11.47	100.00
2008	14.53	12.72	12.47	10.68	7.68	7.58	3.81	5.59	6.25	5.55	6.73	6.42	100.00
2009	4.72	7.62	9.74	10.50	11.52	11.08	9.66	8.26	8.22	6.69	4.93	7.04	100.00
2010	6.33	7.51	13.51	10.67	9.62	7.73	7.37	7.75	7.69	9.17	5.90	6.75	100.00
2011	7.96	4.96	14.13	12.26	10.66	7.20	8.40	6.66	6.31	10.18	3.42	7.87	100.00
2012	7.98	6.28	7.74	11.23	8.24	7.08	8.60	11.05	10.13	11.94	2.15	7.58	100.00
2013	5.67	6.39	9.34	13.17	12.14	10.37	8.18	8.17	6.75	9.07	3.97	6.78	100.00
2014	6.42	5.26	8.21	10.32	10.51	13.12	12.05	9.65	7.54	8.62	2.58	5.72	100.00
2015	5.21	5.38	10.98	9.79	13.87	11.16	9.91	9.72	9.40	6.97	3.12	4.73	100.00
2016	3.95	4.80	8.40	8.51	8.12	10.96	13.77	11.65	7.42	10.31	6.20	5.91	100.00
2017	7.14	3.58	4.46	12.57	12.71	12.19	8.32	8.72	6.87	11.72	3.05	8.69	100.00
2018	5.26	8.77	8.12	12.63	9.74	13.86	10.72	9.65	8.72	6.70	4.18	6.38	100.00
2019	5.94	6.88	8.55	8.47	15.26	10.65	8.51	8.92	10.27	7.78	2.62	6.25	100.00
Total	7.12	8.32	11.66	10.36	9.18	8.46	7.56	8.10	7.62	8.33	5.27	8.02	100.00

Source: NMFS unpublished dealer data.

Commercial golden tilefish landings (landed weight) have ranged from 1.0 million pounds in 2016 (calendar year) to 2.3 million pounds in 2004 from 1999-2019. Commercial golden tilefish ex-vessel revenues have ranged from $2.5 million in 2000 to $5.9 million in 2013 from 1999-2019. In 2019, 1.4 million pounds of tilefish were landed with an ex-vessel value (revenues) of $5.4 million.

From 1999-2018, the mean price for golden tilefish (adjusted) has ranged from $1.10 per pound in 2004 to $4.06 per pound in 2016 (Figure 3). For 2019, the mean price for golden tilefish (unadjusted) was $3.81 per pound.

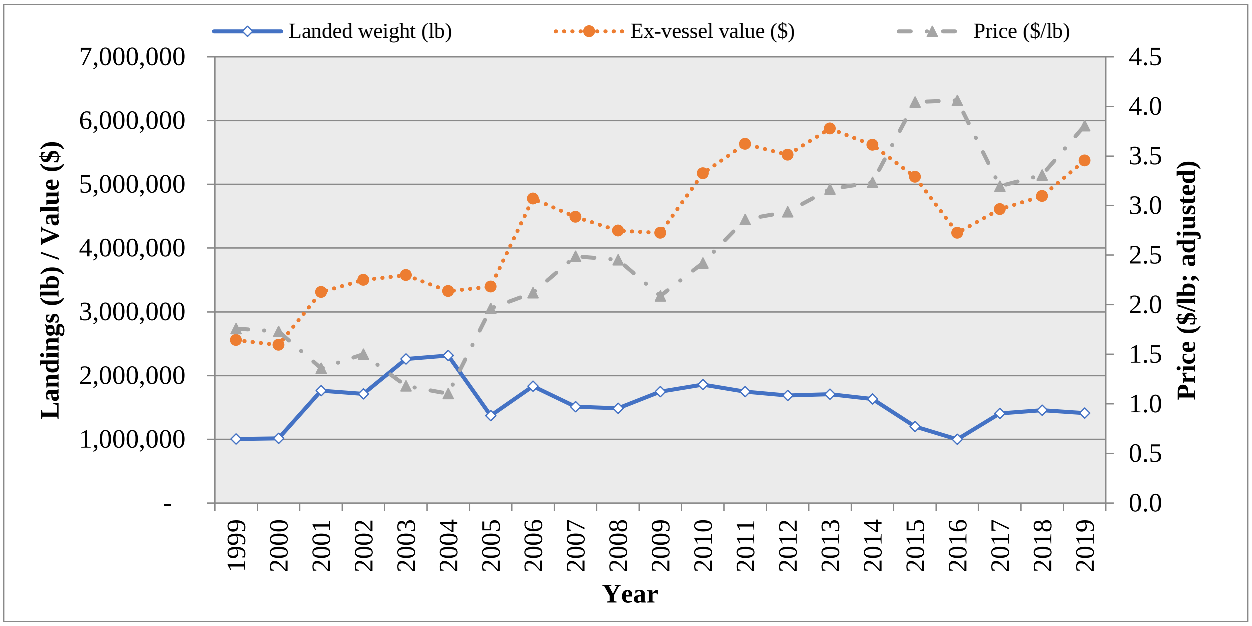

Figure 3. Landings (landed weight), ex-vessel value, and price for golden tilefish, Maine through Virginia combined, 1999-2019 (calendar year). Note: Price data have been adjusted by the GDP deflator indexed for 2018. (2019 – unadjusted as GDP deflator for that year was not available when this figure was produced.) Source: NMFS unpublished dealer data.

The 2015 through 2019 coastwide average ex-vessel price per pound for all market categories combined was $3.72. Price differential indicates that larger fish tend to bring higher prices (Table 6). Nevertheless, even though there is a price differential for various sizes of golden tilefish landed, golden tilefish fishermen land all fish caught as the survival rate of discarded fish is very low (L. Nolan 2006; Kitts et al. 2007). Furthermore, Amendment 1 to the Tilefish FMP prohibited the practice of highgrading (MAFMC 2009).

Table 6. Landings, ex-vessel value, and price of golden tilefish by size category, from Maine thought Virginia, 2015-2019 (calendar year).

Market category	Landed weight (pounds)	Value ($)	Price ($/pound)	Approximate market size range (pounds)
Extra large	330,664	151,711	4.58	> 25
Large	1,533,249	7,678,687	5.01	7 – 24
Large/medium[a]	790,054	3,383,838	4.28	5 – 7
Medium	1,800,409	6,360,181	3.53	3.5 – 5
Small or kittens	1,779,704	4,669,761	2.62	2 – 3.5
Extra small	203,740	456,816	2.24	< 2
Unclassified	56,048	125,515	2.24	– – –
All	6,493,848	24,187,509	3.72	– – –

[a]Large/medium code was implemented on May 1, 2016. Prior to that, golden tilefish sold in the large/medium range were sold as unclassified fish. Source: NMFS unpublished dealer data.

The ports and communities that are dependent on golden tilefish are fully described in Amendment 1 to the FMP (section 6.5; MAFMC 2009; found at http://www.mafmc.org/fisheries/fmp/tilefish). Additional information on "Community Profiles for the Northeast US Fisheries" can be found at https://www.nefsc.noaa.gov/read/socialsci/communitySnapshots.php.

To examine recent landings patterns among ports, 2018-2019 NMFS dealer data are used. The top commercial landings ports for golden tilefish are shown in Table 7. A “top port” is defined as any port that landed at least 10,000 pounds of golden tilefish. Ports that received 1% or greater of their total revenue from golden tilefish are shown in Table 8.

Table 7. Top ports of landing (live weight) for golden tilefish, based on NMFS 2018-2019 dealer data (calendar year). Since this table includes only the “top ports,” it may not include all of the landings for the year.

Port	2018		2019	
	Landings (pounds)	# Vessels	Landings (pounds)	# Vessels
Montauk, NY	985,037 (977,049)	16 (3)	909,882 (906,163)	16 (3)
Barnegat Light/Long Beach, NJ	403,583 (403,583)	5 (5)	398,374 (398,374)	5 (5)
Hampton Bays, NY	171,220 (C)	5 (C)	201,246 (C)	5 (C)
Point Judith, RI	30,669 (0)	62 (0)	5,763 (C)	5 (C)

[a]Values in parentheses correspond to IFQ vessels. Note: C = Confidential. Source: NMFS unpublished dealer data.

Table 8. Ports that generated 1% or greater of total revenues from golden tilefish, 2015-2019 (calendar year).

Port	State	Ex-vessel revenue all species combined	Ex-vessel revenue golden tilefish	Golden tilefish contribution to total port ex-vessel revenues
East Hampton	NY	192,455	105,709	55%
Ocean City	NJ	25,018	4,565	18%
Montauk	NY	85,288,503	13,766,717	16%
Hampton Bays	NY	30,239,738	3,448,598	11%
Barnegat & Barnegat Light/Long Beach	NJ	127,124,297	6,357,297	5%
Lynnhaven	VA	419,638	20,183	5%
Shinnecock	NY	5,476,653	243,972	4%

Source: NMFS unpublished dealer data.

In 2018 there were 76 federally permitted dealers who bought golden tilefish from 138 vessels that landed this species from Maine through Virginia. In addition, 49 dealers bought golden tilefish from 106 vessels in 2019. These dealers bought approximately $4.9 and $5.4 million of golden tilefish in 2018 and 2019, respectively, and are distributed by state as indicated in Table 9. Table 10 shows relative dealer dependence on golden tilefish.

Table 9. Dealers reporting buying golden tilefish, by state in 2018-2019 (calendar year).

Number of dealers	MA		RI		CT		NY		NJ		VA		Other	
	'18	'19	'18	'19	'18	'19	'18	'19	'18	'19	'18	'19	'18	'19
	8	4	13	8	10	9	20	16	16	8	4	C	4	4

Note: C = Confidential. Source: NMFS unpublished dealer data.

Table 10. Dealer dependence on golden tilefish, 2015-2019 (calendar year).

Number of dealers	Relative dependence on tilefish
69	<5%
4	5%-10%
1	10% - 25%
3	25% - 50%
2	50% - 75%
1	90%+

Source: NMFS unpublished dealer data.

According to VTR data, none to very little (0.03%) discarding was reported by longline vessels that targeted golden tilefish from 2017-2019 (Table 11). In addition, the 2014 golden tilefish stock assessment (NEFSC 2014) and stock assessment update (Nitschke 2017) indicate that golden tilefish discards in the trawl and longline fishery appear to be a minor component of the catch.

Table 11. Catch disposition for directed golden tilefish trips[a], Maine through Virginia, 2017, 2018, and 2019 (calendar year).

(2017)

Common name	Kept pounds	% species	% total	Discarded pounds	% species	% total	Total pounds	Disc: Kept ratio
GOLDEN TILEFISH	1,177,980	100.00%	93.47%	0	0.00%	0.00%	1,177,980	0.00
SPINY DOGFISH	60,462	100.00%	4.80%	0	0.00%	0.00%	60,462	0.00
SMOOTH DOGFISH	10,774	100.00%	0.85%	0	0.00%	0.00%	10,774	0.00
CONGER EEL	3,166	86.36%	0.25%	500	13.64%	43.03%	3,666	0.16
BLUELINE TILEFISH	2,798	100.00%	0.22%	0	0.00%	0.00%	2,798	0.00
YELLOWFIN TUNA	1,573	97.22%	0.12%	45	2.78%	3.87%	1,618	0.03
BLACK BELLIED ROSEFISH	980	99.80%	0.08%	2	0.20%	0.17%	982	0.00
SILVER HAKE (WHITING)	779	100.00%	0.06%	0	0.00%	0.00%	779	0.00
MAKO SHORTFIN SHARK	435	100.00%	0.03%	0	0.00%	0.00%	435	0.00
DOLPHIN FISH	333	86.95%	0.03%	50	13.05%	4.30%	383	0.15
BLUEFIN TUNA	251	100.00%	0.02%	0	0.00%	0.00%	251	0.00
ANGLER	173	100.00%	0.01%	0	0.00%	0.00%	173	0.00
BARRELFISH	151	100.00%	0.01%	0	0.00%	0.00%	151	0.00
BLACK SEA BASS	119	100.00%	0.01%	0	0.00%	0.00%	119	0.00
BLACKFIN TUNA	92	100.00%	0.01%	0	0.00%	0.00%	92	0.00
WRECKFISH	87	100.00%	0.01%	0	0.00%	0.00%	87	0.00
SUMMER FLOUNDER	50	100.00%	0.00%	0	0.00%	0.00%	50	0.00
MAKO SHARK	31	100.00%	0.00%	0	0.00%	0.00%	31	0.00
FISH OTHER	17	100.00%	0.00%	0	0.00%	0.00%	17	0.00
RED HAKE	2	0.40%	0.00%	500	99.60%	43.03%	502	250.00
POLLOCK	0	0.00%	0.00%	65	100.00%	5.59%	65	--
ALL SPECIES	1,260,253	99.91%	100.00%	1,162	0.09%	100.00%	1,261,415	0.00

[a] Directed trips for golden tilefish were defined as trips comprising 75 percent or more by weight of golden tilefish landed. Number of trips = 120. Source: NMFS unpublished VTR data.

(2018)

Common name	Kept pounds	% species	% total	Discarded pounds	% species	% total	Total pounds	Disc: Kept ratio
GOLDEN TILEFISH	1,247,057	100.00%	94.55%	0	0.00%	--	1,247,057	0.00
SPINY DOGFISH	58,560	100.00%	4.44%	0	0.00%	--	58,560	0.00
SMOOTH DOGFISH	6,321	100.00%	0.48%	0	0.00%	--	6,321	0.00
CONGER EEL	2,386	100.00%	0.18%	0	0.00%	--	2,386	0.00
BLUELINE TILEFISH	2,213	100.00%	0.17%	0	0.00%	--	2,213	0.00
DOLPHIN FISH	458	100.00%	0.03%	0	0.00%	--	458	0.00
SILVER HAKE (WHITING)	438	100.00%	0.03%	0	0.00%	--	438	0.00
SILVER HAKE (WHITING)	438	100.00%	0.03%	0	0.00%	--	438	0.00
BLACK BELLIED ROSEFISH	370	100.00%	0.03%	0	0.00%	--	370	0.00
SKATES OTHER	298	100.00%	0.02%	0	0.00%	--	298	0.00
BLUEFISH	217	100.00%	0.02%	0	0.00%	--	217	0.00
ANGLER	133	100.00%	0.01%	0	0.00%	--	133	0.00
YELLOWFIN TUNA	60	100.00%	0.00%	0	0.00%	--	60	0.00
WHITE HAKE	27	100.00%	0.00%	0	0.00%	--	27	0.00
TRIGGERFISH	20	100.00%	0.00%	0	0.00%	--	20	0.00
ALL SPECIES	1,318,996	100.00%	100.00%	0	0.00%	--	1,318,996	0.00

[a] Directed trips for golden tilefish were defined as trips comprising 75 percent or more by weight of golden tilefish landed. Number of trips = 93. Source: NMFS unpublished VTR data.

(2019)

Common name	Kept pounds	% species	% total	Discarded pounds	% species	% total	Total pounds	Disc: Kept ratio
GOLDEN TILEFISH	1,316,702	100.00%	95.87%	0	0.00%	--	1,316,702	0.00
SPINY DOGFISH	41,605	100.00%	3.03%	0	0.00%	--	41,605	0.00
SMOOTH DOGFISH	5,315	100.00%	0.39%	0	0.00%	--	5,315	0.00
BLUELINE TILEFISH	3,551	100.00%	0.26%	0	0.00%	--	3,551	0.00
CONGER EEL	2,134	100.00%	0.16%	0	0.00%	--	2,134	0.00
YELLOWFIN TUNA	2,086	100.00%	0.15%	0	0.00%	--	2,086	0.00
BIG EYE TUNA	734	100.00%	0.05%	0	0.00%	--	734	0.00
SAND TILEFISH	506	100.00%	0.04%	0	0.00%	--	506	0.00
DOLPHIN FISH	455	100.00%	0.03%	0	0.00%	--	455	0.00
ANGLER	119	100.00%	0.01%	0	0.00%	--	119	0.00
SKATES OTHER	80	100.00%	0.01%	0	0.00%	--	80	0.00

ALBACORE TUNA	50	100.00%	0.00%	0	0.00%	--	50	0.00
BLACK BELLIED ROSEFISH	44	100.00%	0.00%	0	0.00%	--	44	0.00
SILVER HAKE (WHITING)	43	100.00%	0.00%	0	0.00%	--	43	0.00
SHKIPJACK TUNA	24	100.00%	0.00%	0	0.00%	--	24	0.00
BLACK SEA BASS	9	100.00%	0.00%	0	0.00%	--	9	0.00
ALL SPECIES	1,373,457	100.00%	100.00%	0	0.00%	--	1,373,457	0.00

[a] Directed trips for golden tilefish were defined as trips comprising 75 percent or more by weight of golden tilefish landed. Number of trips = 92. Source: NMFS unpublished VTR data.

Golden tilefish incidental commercial fishery landings in FY 2020 are slightly behind FY 2019 landings for the same time period (Figure 4; for data reported through January 22, 2020). Incidental golden tilefish commercial landings for the last six fishing years are shown in Table 12.

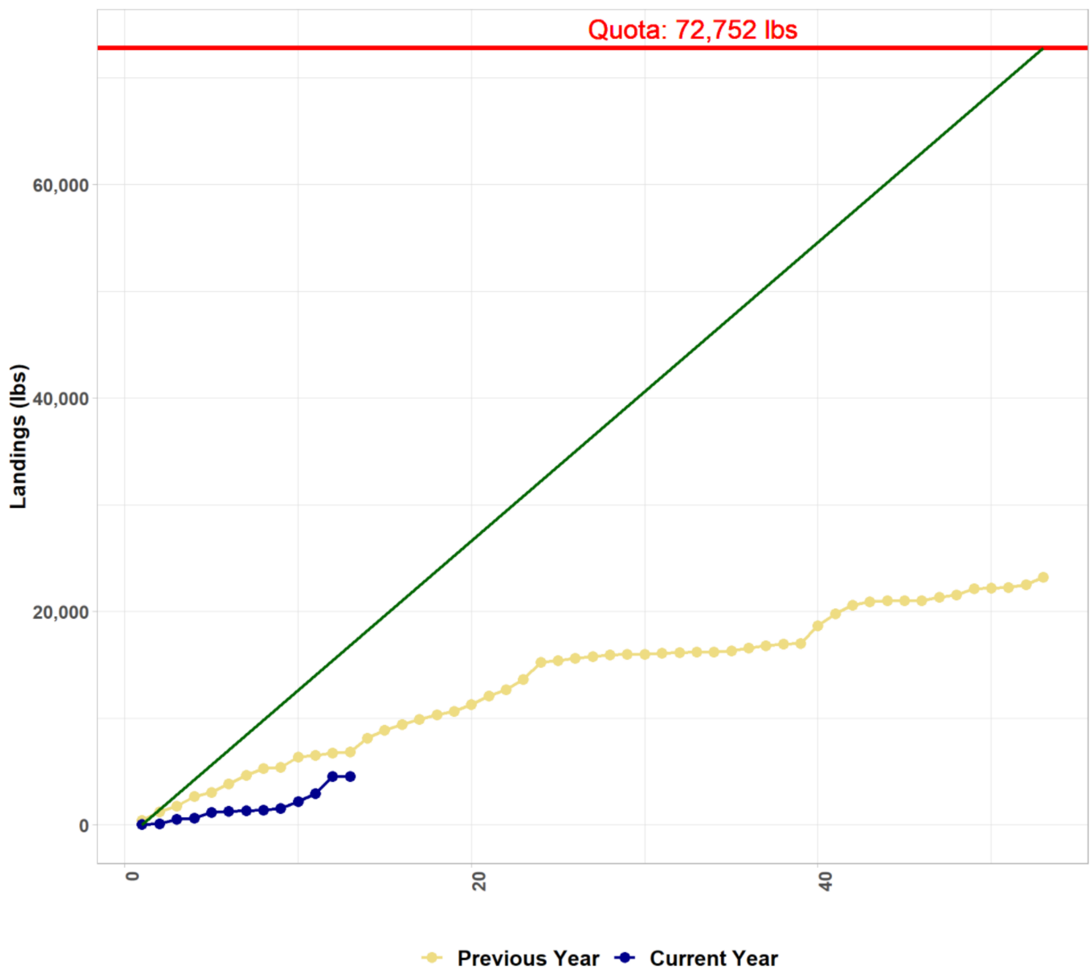

Figure 4. Incidental commercial landings for 2020 fishing year (FY) to date (for data reported through January 22, 2020). Blue Line = FY 2020, Yellow Line = FY 2019.
Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/quota-monitoring-greater-atlantic-region.

Table 12. Incidental golden tilefish commercial landings for fishing year 2013-2019.

Fishing year	Landings (pounds)	Incidental quota (pounds)	Percent of quota landed (%)
2013	36,442	99,750	37
2014	44,594	99,750	45
2015	18,839	87,744	21
2016	20,929	94,357	22
2017	60,409	94,357	64
2018	61,254	72,752	84
2019	22,246	72,752	31

Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/quota-monitoring-greater-atlantic-region.

Recreational Fishery

According to vessel trip report (VTR) data, party/charter vessel landed 2,733 golden tilefish in 2019. This represented a 62% decrease from 2018 (7,101 fish landed).

A small recreational fishery briefly occurred during the mid-1970's, with less than 100,000 pounds landed annually (MAFMC 2001). Subsequent recreational catches have been low for the 1982 - 2019 period, ranging from zero for most years to approximately 213,000 fish in 2010 according to NMFS recreational statistics (Table 13). In 2019, approximately 11,000 fish were landed.

VTR data indicates that the number of golden tilefish kept by party/charter vessels from Maine through Virginia is low, ranging from 81 fish in 1996 to 8,297 fish in 2015 (Table 14). Mean party/charter effort ranged from less than one fish per angler in 1999 throughout 2002 and 2005 to approximately eight fish per angler in the late 1990s, averaging 2.8 fish for the 1996-2019 period.

According to VTR data, for the 1996-2019 period, the largest amount of golden tilefish caught by party/charter vessels were made by New Jersey vessels (48,499; average = 2,021), followed by New York (12,513; average = 521), Virginia (1,057; average = 44), Delaware (846; average = 35), Massachusetts (496; average = 21), and Maryland (495; average = 24; Table 15). The number of golden tilefish discarded by recreational anglers is low. According to VTR data, on average, approximately 6 fish per year were discarded by party/charter recreational anglers for the 1996-2019 period (135 discarded fish in total). The quantity of golden tilefish discarded by party/charter recreational anglers ranged from zero in most years to 60 in 2015.

Recreational anglers typically fish for golden tilefish when tuna fishing especially during the summer months (Freeman, pers. comm. 2006). However, some for-hire vessels from New Jersey and New York are golden tilefish fishing in the winter months (Caputi pers. comm. 2006). In addition, recreational boats in Virginia are also reported to be fishing for golden tilefish (Pride pers. comm. 2006). However, it is not known with certainty how many boats may be targeting golden tilefish. Nevertheless, accounting for information presented in the Fishery Performance Reports (2012-2014) and a brief internet search conducted by Council Staff in 2014 indicates that there have been approximately 10 headboats actively engaged in the tilefish fishery in the Mid-Atlantic canyons in recent years. It is estimated that approximately 4 of these boats conducted direct tilefish fishing trips, while the other 6 boats may have caught tilefish while targeting tuna/swordfish or fishing for assorted deep water species. In addition, it appears that recreational interest onboard headboats for tilefish has increased in the last few years as seen in the FPRs, internet search conducted by Council staff, and recent VTR recreational party/charter statistics (MAFMC 2014).

Anglers are highly unlikely to catch golden tilefish while targeting tuna on tuna fishing trips. However, these boats may fish for golden tilefish at any time during a tuna trip (i.e., when the tuna limit has been reached, on the way out or on the way in from a tuna fishing trip, or at any time when tuna fishing is slow). While fishing for tuna recreational anglers may trawl using rod and reel (including downriggers), handline, and bandit gear.[3] Rod and reel is the typical gear used in the recreational golden tilefish fishery. Because golden tilefish are found in relatively deep waters, electric reels may be used to facilitate landing (Freeman and Turner 1977).

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[3] Bandit gear is a vertical hook and line gear with rods attached to the vessel when in use. Manual, electric, or hydraulic reels may be used to retrieve lines.

Table 13. Recreational golden tilefish data from the NMFS recreational statistics databases, 1982-2019 (calendar year).

Year	Landed no. A and B1				Released no. B2			
	Party/charter		Private/rental		Party/charter		Private/rental	
1982	0		2,225	(102.0)	0		0	
1983	0		0		0		0	
1984	0		0		0		0	
1985	0		0		0		0	
1986	0		0		0		0	
1987	0		0		0		0	
1988	0		0		0		0	
1989	0		0		0		0	
1990	0		0		0		0	
1991	0		0		0		0	
1992	0		0		0		0	
1993	0		0		0		0	
1994	555	(101.6)	0		0		0	
1995	0		0		0		0	
1996	1,765	(80.5)	0		0		0	
1997	0		0		0		0	
1998	0		0		0		0	
1999	0		0		0		0	
2000	0		0		0		0	
2001	98	(101.4)	0		0		0	
2002	0		122,443	(85.7)	0		8,163	(85.7)
2003	967	(75.2)	0		0		0	
2004	55	(102.2)	0		0		0	
2005	0		0		0		0	
2006	471	(103.7)	0		0		0	
2007	1,837	(71.4)	0		0		0	
2008	0		0		0		0	
2009	168	(89.8)	0		0		0	
2010	4,754	(81.9)	213,382	(98.4)	0		0	
2011	0		0		0		0	
2012	0		0		0		0	
2013	1,145	(0)	0		0		0	
2014	0		0		0		0	
2015	0		0		0		0	
2016	0		26,691	(70.4)	0		0	
2017	0		59,413	(59.4)	0		0	
2018	7,925	(80.3)	893	(102.9)	4	(106.8)	0	
2019	0		10,503	(64.4)	0		0	

Source: Recreational Fisheries Statistics Queries: https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index. PSE (proportional standard error) values in parenthesis expresses the standard error of an estimate as a percentage of the estimate and is a measure of precision. A PSE value greater than 50 indicates a very imprecise estimate. 2019 values are preliminary.

Table 14. Number of golden tilefish kept by party/charter anglers and mean effort from Maine through Virginia, 1996-2019 (calendar year).

Year	Number of golden tilefish kept	Mean effort
1996	81	1.4
1997	400	7.5
1998	243	8.1
1999	91	0.4
2000	147	0.5
2001	172	0.7
2002	774	0.9
2003	991	1.6
2004	737	1.2
2005	498	0.9
2006	477	1.2
2007	1,077	1.2
2008	1,100	1.3
2009	1,451	1.3
2010	1,866	2.0
2011	2,938	3.4
2012	6,424	2.8
2013	6,560	3.2
2014	6,958	3.1
2015	8,297	4.2
2016	5,919	4.1
2017	7,014	4.6
2018	7,101	3.9
2019	2,733	3.4
All	64,049	2.8

Source: NMFS unpublished VTR data.

Table 15. Number of golden tilefish caught by party/charter vessels by state, 1996-2019 (calendar year).

Year	NH	MA	RI	CT	NY	NJ	DE	MD	VA	All
1996	0	0	0	0	81	0	0	0	0	81
1997	0	0	0	0	400	0	0	0	0	400
1998	0	0	102	0	141	0	0	0	0	243
1999	0	0	1	0	88	0	0	2	0	91
2000	0	0	0	0	108	39	0	0	0	147
2001	0	0	0	0	122	51	0	0	0	173
2002	0	0	0	0	401	373	0	0	0	774
2003	0	0	3	0	86	902	0	0	0	991
2004	0	0	0	0	12	628	0	0	104	744
2005	0	0	72	0	82	318	14	0	16	502
2006	0	0	0	0	265	65	2	133	12	477
2007	0	0	0	0	447	459	88	5	80	1,079
2008	0	0	3	0	488	545	22	32	10	1,100
2009	0	0	0	0	720	675	18	7	31	1,451
2010	0	0	0	0	595	1,194	19	23	48	1,879
2011	0	496	0	0	720	1,654	60	5	14	2,949
2012	0	0	1	0	1,116	5,146	42	23	98	6,426
2013	0	0	0	0	1,900	4,568	39	12	41	6,560
2014	0	0	0	3	957	5,716	180	40	73	6,969
2015	14	0	0	0	637	7,376	100	56	174	8,357
2016	0	0	0	0	676	5,073	69	43	67	5,928
2017	0	0	0	0	424	6,373	118	76	38	7,029
2018	0	0	0	0	1,202	5,573	46	87	193	7,101
2019	0	0	0	0	845	1,771	29	30	58	2,733
All	14	496	182	3	12,513	48,499	846	574	1,057	64,184

Source: NMFS unpublished VTR data.

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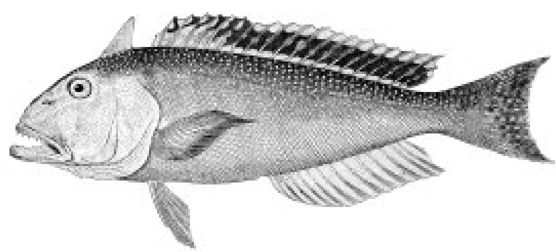
Golden Tilefish, *Lopholatilus chamaeleonticeps,* data update through 2019 in the Middle Atlantic-Southern New England Region



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Reported 2019 landings in the commercial fishery were 697 mt, a decrease of 4% from 2018, and 94% of the 2019 total allowable landings (Table 1; Figure 1).

Commercial landings per unit effort is the only index of abundance for golden tilefish. Landings per unit of effort in 2019 increased relative to 2018 as predicted from growth of the strong 2013 year class.

Tracking of the strong 2013 year class is also reflected in the landings market category proportions and the landings at length distributions (Tables 2 and 3; Figures 2 and 3).

Table 1. Landings of tilefish in live metric tons from 1915-2019. Landings in 1915-1972 are from Freeman and Turner (1977), 1973-1989 are from the general canvas data, 1990-1993 are from the weighout system, 1994-2003 are from the dealer reported data, and 2004-2019 is from Dealer electronic reporting. - indicates missing data. * Preliminary 2019 landings data retrieved on 2/6/20.

year	mt	year	mt	year	mt
1915	148	1960	1,064	2005	676
1916	4,501	1961	388	2006	907
1917	1,338	1962	291	2007	749
1918	157	1963	121	2008	737
1919	92	1964	596	2009	864
1920	5	1965	614	2010	922
1921	523	1966	438	2011	864
1922	525	1967	50	2012	834
1923	623	1968	32	2013	846
1924	682	1969	33	2014	814
1925	461	1970	61	2015	593
1926	904	1971	66	2016	494
1927	1,264	1972	122	2017	695
1928	1,076	1973	394	2018	728
1929	2,096	1974	586	2019	*697
1930	1,858	1975	710		
1931	1,206	1976	1,010		
1932	961	1977	2,082		
1933	688	1978	3,257		
1934	-	1979	3,968		
1935	1,204	1980	3,889		
1936	-	1981	3,499		
1937	1,101	1982	1,990		
1938	533	1983	1,876		
1939	402	1984	2,009		
1940	269	1985	1,961		
1941	-	1986	1,950		
1942	62	1987	3,210		
1943	8	1988	1,361		
1944	22	1989	454		
1945	40	1990	874		
1946	129	1991	1,189		
1947	191	1992	1,653		
1948	465	1993	1,838		
1949	582	1994	786		
1950	1,089	1995	666		
1951	1,031	1996	1,121		
1952	964	1997	1,810		
1953	1,439	1998	1,342		
1954	1,582	1999	525		
1955	1,629	2000	506		
1956	707	2001	874		
1957	252	2002	851		
1958	672	2003	1,130		
1959	380	2004	1,215		

Table 2. Total commercial dealer and vessel trip report (VTR) landings in live mt and the commercial catch-per-unit effort (CPUE) data used for tilefish. Dealer landings before 1990 are from the general canvas data. CPUE data from 1979 to the first half of 1994 are from the NEFSC weighout database, while data in the second half of 1994 to 2019 are from the vtr system (below the dotted line). Effort data are limited to longline trips which targeted tilefish (= or >75% of the landings were tilefish) and where data existed for the days absent. Nominal CPUE series are calculated using landed weight per days absent minus one day steam time per trip. Da represents days absent.

	Weighout		Commerical CPUE data subset								
year	& Dealer landings	vtr landings	interview landings	No. interviews	% interview trips	No. vessels	subset landings	days absent	No. trips	da per trip	nominal cpue
1979	3,968		0.0	0	0.0%	20	1,807	1,187	330	3.6	1.93
1980	3,889		0.8	1	0.3%	18	2,153	1,390	396	3.5	1.99
1981	3,499		35.0	4	1.2%	21	1,971	1,262	333	3.8	1.95
1982	1,990		90.7	13	5.7%	18	1,267	1,282	229	5.6	1.10
1983	1,876		85.8	16	8.9%	21	1,013	1,451	179	8.1	0.73
1984	2,009		140.1	25	18.2%	20	878	1,252	138	9.1	0.72
1985	1,961		297.1	64	30.6%	25	933	1,671	209	8.0	0.59
1986	1,950		120.7	31	16.5%	23	767	1,186	188	6.3	0.71
1987	3,210		198.5	38	18.5%	30	1,014	1,343	206	6.5	0.82
1988	1,361		148.2	30	19.4%	23	422	846	154	5.5	0.56
1989	454		92.8	11	15.7%	11	165	399	70	5.7	0.46
1990	874		32.4	8	11.9%	11	241	556	68	8.2	0.45
1991	1,189		0.8	3	2.8%	7	444	961	107	9.0	0.48
1992	1,653		58.0	9	8.6%	13	587	969	105	9.2	0.62
1993	1,838		71.9	11	10.5%	10	571	959	105	9.1	0.61
1994	-		0	0	0.0%	7	127	385	42	9.2	0.34
1994	786	30				4	53	150	18	8.3	0.37
1995	666	547				5	466	954	99	9.6	0.50
1996	1,121	865				8	822	1,318	134	9.8	0.64
1997	1,810	1,439				6	1,427	1,332	133	10.0	1.09
1998	1,342	1,068				9	1,034	1,517	158	9.6	0.70
1999	525	527				10	516	1,185	133	8.9	0.45
2000	506	446				11	421	932	110	8.5	0.47
2001	874	705				8	691	1,046	116	9.0	0.68
2002	851	724				8	712	951	114	8.3	0.78
2003	1,130	790				7	788	691	101	6.8	1.22
2004	1,215	1,153				12	1,136	811	134	6.1	1.54
2005	676	808				11	802	470	93	5.1	1.95
2006	907	870				12	852	682	105	6.5	1.35
2007	749	710				12	691	727	101	7.2	1.01
2008	737	675				14	672	1,119	124	9.0	0.62
2009	864	812				12	800	1,106	130	8.5	0.75
2010	922	871				11	853	694	108	6.4	1.33
2011	864	822				9	781	517	89	5.8	1.68
2012	834	799				12	795	651	100	6.5	1.32
2013	846	844				11	796	831	112	7.4	1.02
2014	814	790				13	716	961	120	8.0	0.78
2015	593	593				12	515	920	111	8.3	0.58
2016	494	491				11	381	806	98	8.2	0.49
2017	695	690				9	578	785	91	8.6	0.76
2018	728	724				8	612	638	85	7.5	1.02
2019	697	695				8	628	604	85	7.1	1.11

Table 3. Landings (metric tons) by market category. A large-medium (lg/med) code was developed in 2013 and 2014. Smalls and Kittens were combined since these categories possess similar size fish. Xs is extra small and xl is extra large.

year	xs	small & kittens	medium	lg/med	large	xl	unclassified	total
1990	0	38	103	-	46	0	687	874
1991	0	59	154	-	85	0	891	1189
1992	0	330	88	-	86	0	1,149	1653
1993	0	368	206	-	66	4	1,193	1838
1994	0	19	89	-	54	7	617	786
1995	0	99	88	-	91	2	386	666
1996	0	592	149	-	156	2	221	1121
1997	0	1,130	260	-	111	2	307	1810
1998	0	475	700	-	103	6	58	1342
1999	0	181	201	-	106	8	29	525
2000	0	210	153	-	115	8	20	506
2001	0	564	161	-	124	6	19	874
2002	0	369	311	-	128	3	40	851
2003	0	776	171	-	144	5	35	1130
2004	20	397	523	-	129	9	137	1215
2005	0	18	335	-	149	1	173	676
2006	1	16	233	-	369	1	287	907
2007	3	96	142	-	397	4	106	749
2008	17	149	195	-	299	17	60	737
2009	35	334	179	-	226	28	61	864
2010	16	269	373	-	166	17	81	922
2011	6	142	339	-	216	10	152	864
2012	8	95	308	-	285	17	121	834
2013	19	138	281	14	290	21	82	846
2014	13	227	195	88	238	47	5	814
2015	12	92	160	84	186	57	2	593
2016	42	93	75	65	172	44	3	494
2017	35	299	132	43	152	26	9	696
2018	7	285	231	70	108	20	6	728
2019	5	110	292	130	139	16	5	697

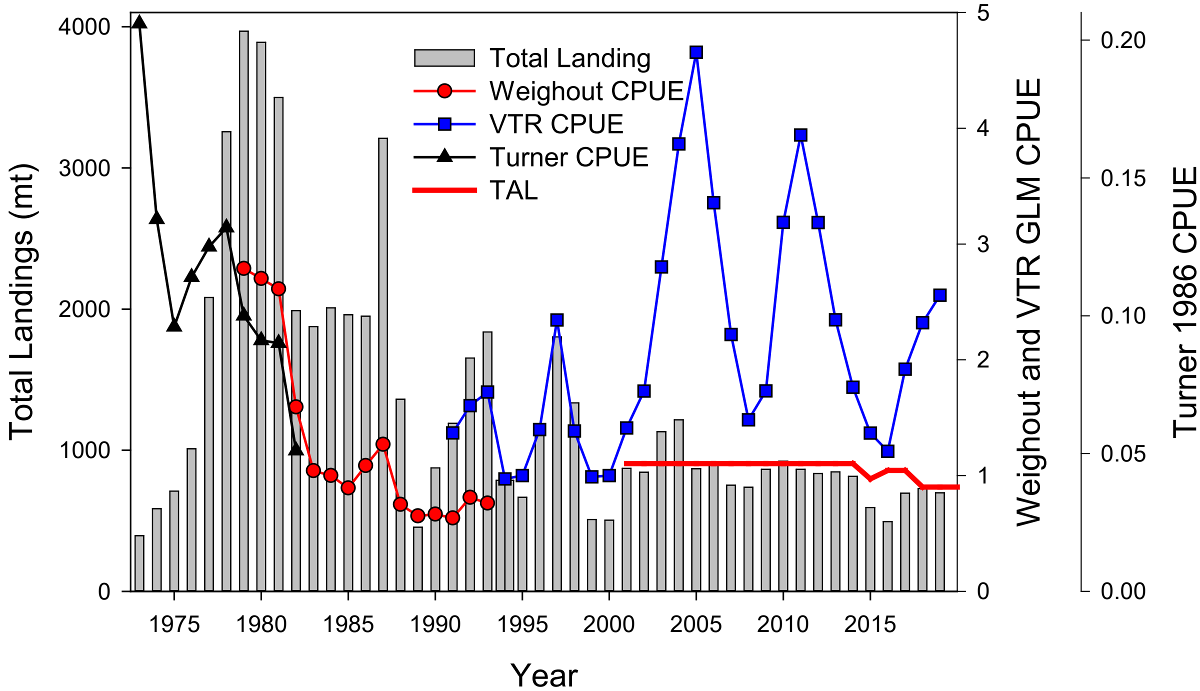

Figure 1. GLM CPUE for the Weighout and VTR data split into two series with additional New York logbook CPUE data from three vessels (1991-1994) added to the VTR series. Four years of overlap between Turner's and the Weighout CPUE series can also be seen. ASAP relative changes in qs amount CPUE series were not incorporated into the plot. Assumed total landings are also shown. Landings in 2005 were taken from the IVR system. Red line is the TAL.

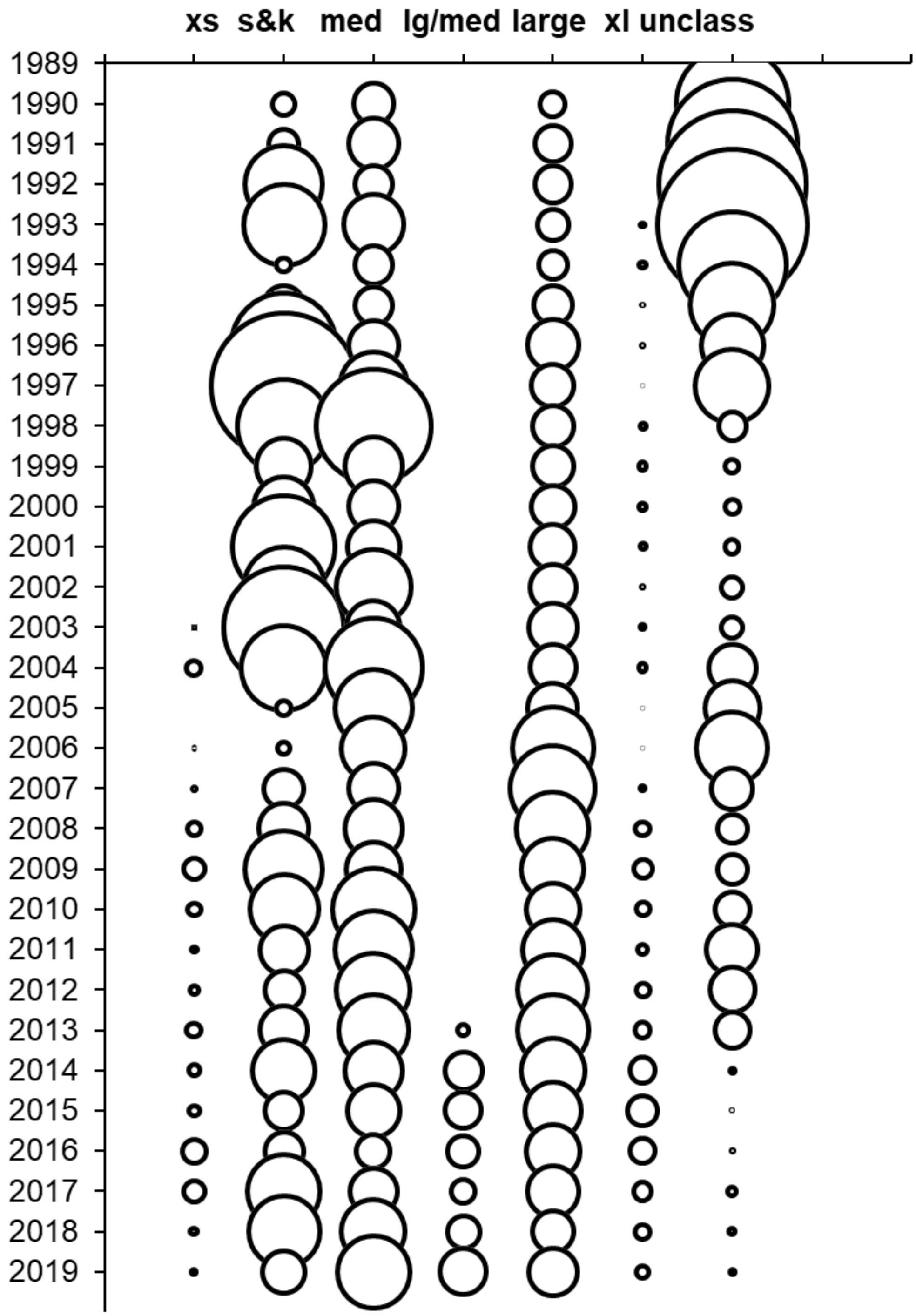

Figure 2. Bubble plot of Golden tilefish landings by market category. Large-medium market category code was added in 2013 and 2015. Smalls and Kittens (s&k) were combined since these categories possess similar size fish.

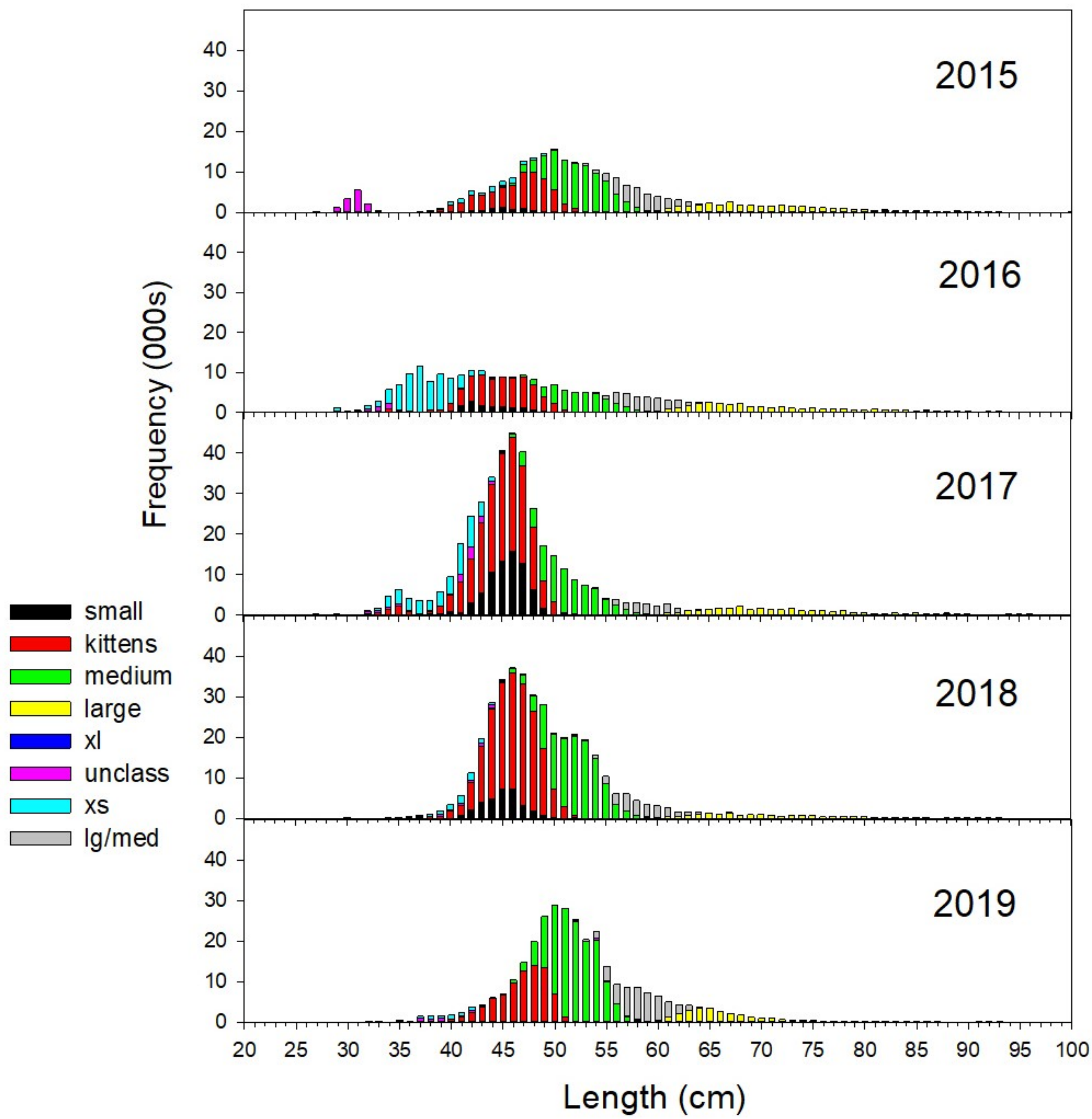

Figure 3. Expanded length frequency distributions from 2015 to 2019. No lengths for extra small (xs) exist in 2013 and smalls in 2019. Kittens lengths were used to characterize the extra small category in 2013 and smalls in 2019. Unclassifieds in 2015 are based on two samples. **Y-axis scales is fixed.**

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

MEMORANDUM

Date: March 2, 2020

To: Chris Moore, Executive Director

From: José Montañez, Staff

Subject: Golden Tilefish Management Measures (2021 and 2022 interim)

Executive Summary

Our current 3-year specifications cycle (2018-2019-2020) ends with the 2020 fishing year (November 1, 2019 to October 31, 2020). Given the new stock assessment process the Northeast Regional Coordinating Council recently approved, the next management track assessment update for golden tilefish is currently scheduled for 2021. Therefore, the Council will need approve 2021 specifications using information contained in the 2020 NEFSC data update (Nitschke 2020). Additional relevant information about fishery performance and past management measures is presented in the 2020 Golden Tilefish Fishery Information Document prepared by Council staff and the 2020 Fishery Performance Report developed by the Council Tilefish Advisory Panel. Staff also recommend the Council set interim 2022 specifications because of potential timing constraints with the 2021 management track assessment. Specifically, if a peer review is needed for the 2021 management track assessment (peer review scheduled for June 2021), the Council will likely have to take final action in August of 2021; this may not provide adequate administrative time to have specifications in place for the 2022 fishing year which starts November 1, 2021. The 2021 management track assessment would then be used to revise the interim 2022 specifications and set specifications for the 2023 and 2024 fishing seasons.

Based on the results of the 2017 stock assessment update, the tilefish resource is not overfished and overfishing is not occurring in assessment terminal year (2016; Nitschke 2017).[1] The 2016 stock is at 89% of the accepted reference point (SSB_{MSY} proxy = $SSB_{38\%}$). The fishing mortality rate (F) in 2016 was 0.249, 20% below the fishing mortality threshold reference point $F_{MSY\ proxy} = F_{38\%} = 0.310$.[2]

There are no fishery independent surveys available for this stock, so commercial catch per unit effort (CPUE) is relied upon for indications of population abundance. CPUE can be generally explained with evidence of strong incoming year classes that track through the landings size composition over time. The

[1] Nitschke, P. 2017. Golden Tilefish, Lopholatilus chamaeleonticeps, stock assessment update through 2016 in the Middle Atlantic-Southern New England Region. NMFS/NEFSC, Woods Hole, MA. Found online at http://www.mafmc.org/council-events/2017/march-2017-ssc-meeting.

[2] See discussion under biological reference points section for further details.

2020 golden tilefish data update (Nitschke 2020) indicates that the CPUE in 2019 increased relative to 2018 as predicted from growth of a strong 2013 year class. Lastly, commercial Advisory Panel (AP) members reported an increase in the landings of extra-small tilefish (< 2 pounds) towards the last quarter of 2019 and the beginning of 2020. AP members also reported a wide range of fish landed in terms of size and weight when compared to the year before. According to AP member's observations, a new year class may have started to enter the fishery recently.

Staff recommends specifications be set for 2 years (i.e., 2021 and interim 2022). Staff recommends the acceptable biological catch (ABC) for each year be set at the *status quo* level or 1.636 million pounds (742 mt)[3]. This ABC has been in place since 2018 fishing year. Setting ABCs at the *status quo* level would provide for continued stability and allow for the fishery to continue to operate efficiently in 2021 and 2022, while the Council waits for the results of the 2021 management track assessment which will be used to revise the 2022 specifications and set specifications for the 2023 and 2024 fishing seasons. Given recent fishery and biological trends, there is no indication that the recommended *status quo* ABC for 2021 and 2022 would negatively affect the tilefish stock given recent fishery trends.

The FMP specifies that the annual catch limit (ACL) equals the ABC. After considering relevant sources of management uncertainty, 5 percent of the annual catch target (ACT) is allocated to the incidental sector of the fishery and the remaining 95 percent to the individual fishing quota (IFQ) sector. Staff recommends an IFQ ACT of 1.554 million pounds (705 mt) and an incidental ACT of 0.082 million pounds (37 mt) for each year. After removing projected incidental discards, the resulting IFQ total allowable landings (TAL) is 1.554 million pounds (705 mt) and the resulting incidental TAL is 0.070 million pounds (32 mt) for each year. These values, when compared to current ACTs and TALs are consistent for the IFQ fishery and near identical for the incidental fishery.

Staff do not recommend any changes to the current recreational possession limit (8-fish per angler per trip with no minimum size), or incidental trip limit (500 pounds live weight or 455 pounds gutted weight).

Introduction

The Magnuson-Stevens Act (MSA) requires each Council's SSC (Scientific and Statistical Committee) to provide ongoing scientific advice for fishery management decisions, including recommendations for ABC, preventing overfishing, and maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. In addition, the Monitoring Committee (MC) established by the Fishery Management Plan (FMP) is responsible for developing recommendations for management measures designed to achieve the recommended catch limits.

Multi-year specifications may be set for golden tilefish for up to three years at a time. The SSC must recommend ABCs that addresses scientific uncertainty, while the MC must recommend ACTs that address management uncertainty. Based on the SSC and MC recommendations, the Council will make a recommendation to the National Marine Fisheries Service (NMFS) Greater Atlantic Regional

[3] 1 mt = 2,204.6226 lb.

Administrator. In this memorandum, information is presented to assist the SSC and MC in developing recommendations for the Council to consider for the 2021-2022 fishing years for golden tilefish.

Additional relevant information about fishery performance and past management measures is presented in the 2020 Golden Tilefish Fishery Information Document prepared by Council staff and the 2020 Fishery Performance Report developed by the Council Tilefish Advisory Panel. The NMFS Northeast Fisheries Science Center provided a data update (through 2019) for golden tilefish to support this specifications process (Nitschke 2020). [4]

Catch and Landings Update

Commercial landings (calendar year) from 1970 to 2019 are presented graphically in Figure 1 of the 2020 Golden Tilefish Fishery Information Document (FID; MAFMC 2020) and landings for fishing years (FYs) 2005 through 2019 are presented in Table 1. Except for FY 2010 commercial golden tilefish landings have been below the commercial quota specified each year since the IFQ system was first implemented in 2009.

Commercial discards are described in the FID (page 15). According to VTR data, very little (< 0.03%) discarding was reported by longline vessels that targeted tilefish for the 2017 through 2019 period (Table 11 of the FID). According to the “Discard Estimation, Precision, and Sample Size Analysis” conducted by the Northeast Fisheries Science Center (NEFSC), discard estimations for commercial fisheries (mostly large/small mesh trawls and gillnets) appears to be low (several metric tons per gear type).[5] For the last five years (2015-2019), on average 11,524 pounds (5.22 mt) of tilefish were discarded.

Recreational catches and landings are described in the FID (pages 18-22). A small recreational fishery briefly occurred during the mid-1970's, with less than 100,000 pounds annually (MAFMC 2000). Recreational catches have been low for the 1982 - 2019 period, ranging from zero for most years to approximately over 200,000 fish in 2010 according to NMFS recreational statistics (Table 13 of the FID). VTR data indicates that the number of tilefish caught by party/charter vessels from Maine through Virginia is low, ranging from 81 fish in 1996 to 8,297 fish in 2015 (Table 14 of the FID). On average, 2,700 tilefish were caught by party/charter vessels during the 1996-2019 period. In 2019, party/charter boats reported 2,733 fish landed, a 62% decrease from 2018 (7,101 fish landed). However, recreational catches have been traditionally considered an insignificant component of the removals and not included into the assessment. To improve tilefish management and reporting, the Greater Atlantic Regional Fisheries Office (GARFO)

[4] These documents are available at: http://www.mafmc.org/council-events/2020/march-ssc-meeting.
[5] 2015-2019 Discard Estimation, Precision, and Sample Size Analysis available at: http://www.nefsc.noaa.gov/femad/fsb/SBRM/.

Table 1. Summary of management measures and landings for FY[a] 2005-2020.

Management Measures	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
ABC (m lb)	-	-	-	-	-	-	-	-	2.013	2.013	1.766	1.898	1.898	1.636	1.636	1.636
TAL (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887	1.627	1.627	1.627
Com. quota- (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887	1.627	1.626	1.626
Com. landings	1.497	1.898	1.777	1.672	1.887	1.997	1.946	1.856	1.839	1.830	1.354	1.060	1.487	1.626	1.562	-
Com. overage/underage (m lb)	-0.498	-0.097	-0.218	-0.323	-0.108	+0.002	-0.049	-0.139	-0.156	-0.165	-0.401	-0.827	-0.401	<-0.001	-0.064	-
Incidental trip limit (lb)	133	300	300	300	300	300	300	500	500	500	500	500	500	500	500	500
Rec. possession limit	-	-	-	-	-	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]	8[b]

[a] FY 2005 (November 1, 2001 - October 31, 2002).
[b] Eight fish per angler per trip.

is initiating recreational reporting for private tilefish anglers. This action was approved in late 2017, but with delayed implementation. A final rule is expected to be published by May 1, 2020. Extensive outreach will be provided by GARFO and the Council leading up to the final rule.

Review of SSC Recommendations from March 2017

In March 2017, the SSC met to recommend an ABC for tilefish for FYs 2018, 2019, and 2020. The SSC deemed that the golden tilefish benchmark stock assessment (SAW/SARC 58; NEFSC 2014)[6] was a Level 3 assessment.

Based on the results of the 2017 stock assessment update, the Golden Tilefish resource is not overfished and overfishing is not occurring in assessment terminal year (2016). In 2016, the stock was at 89% of the accepted reference point ($SSB_{MSYproxy} = SSB_{38\%}$) and the fishing mortality rate (F) in 2016 was 0.249, 20% below the fishing mortality threshold reference point $F_{MSY\ proxy} = F_{38\%} = 0.310$.

The SSC accepted the overfishing limit (OFL) estimate provided in the assessment, and determined the level of uncertainty of OFL in the assessment requires an SSC-specified coefficient of variation (CV) of 100%. The SSC maintained its 2014 determination based on consistency between input data and model dynamics, the available model diagnostics, and the lack of a pathological retrospective pattern.

Based on the $F_{MSY\ proxy}$ of F=0.31 ($F_{38\%}$), the SSC identified an overfishing limit (OFL) for golden tilefish for 2018, 2019, and 2020 of 2.332 million pounds (1,058 mt; P*=0.34), 2.420 million pounds (1,098 mt; P*0.32), and 2.290 million pounds (1,039 mt; P*0.34), respectively.

The SSC recommends a three-year ABC specification using the Council's revised approach to its risk policy, which seeks to maintain consistency in catch advice. The average ABC over the three-year period (ABC = 1.635 million pounds or 742 mt) was calculated based on the $F_{MSY\ proxy}$, an assumed lognormal coefficient of variability around OFL of 100%, the assumption that the ABC is taken each year, and applying the Council's risk policy for a typical life history. This ABC was then applied for each year of the three-year specification period to calculate the related OFLs and P*s.

The SSC identified the following to be the most significant sources of uncertainty associated with determination of OFL and ABC:

- Reliance on fishery-dependent data in the assessment.
- Reliability of the $F_{MSY\ proxy}$ and its relationship to potential SPR-based reference points.
- The dome-shape selectivity curve that makes a strong assumption about the presence of older fish in the population, for which strong empirical evidence is lacking.

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[6] Northeast Fisheries Science Center. 2014. 58th Northeast Regional Stock Assessment Workshop (58th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-04; 784 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://nefsc.noaa.gov/publications/.

- The extent of site fidelity of individuals, uncertainty in the stock range and distribution, and the consequences of the newly closed areas on stock dynamics that increase uncertainty and potential bias in assessment results.
- The lack of reliable recreational catch information.
- The use of a pooled age-length key that may lead to misspecification of age structure and reduced ability to both follow and estimate the size of year classes.
- The lack of a recruitment index that places a heavy burden on the estimation of past recruitments from size composition in the landings.

Biological Reference Points

The biological reference points for golden tilefish were updated during the 2017 stock assessment update, as a result of a change to the recruitment penalty used in the assessment model (i.e., likelihood constant turned off).[7] The fishing mortality threshold for golden tilefish is $F_{38\%}$ (as $F_{MSY\ proxy}$) = 0.310, and $SSB_{38\%}$ ($SSB_{MSY\ proxy}$) is 21 million pounds (9,492 mt).

Stock Status

The last full assessment update was completed in February 2017. This update indicates that the golden tilefish stock was not overfished and overfishing was not occurring in 2016, relative to the newly updated biological reference points. Fishing mortality in 2016 was estimated at F=0.249; 20% below the fishing mortality threshold of F=0.310 ($F_{MSY\ proxy}$). SSB in 2016 was estimated at 18.69 million pounds (8,479 mt), and was at 89% of the biomass target ($SSB_{MSY\ proxy}$).

2020 Data Update

Commercial landings per unit effort is the only index of abundance for golden tilefish. Landings per unit of effort in 2019 increased relative to 2018 as predicted from growth of the strong 2013 year class.

Tracking of the strong 2013 year class is also reflected in the landings market category proportions and the landings at length distributions (Tables 2 and 3, and Figures 2 and 3, of the 2020 data update).[8]

[7] Incorporation of likelihood constants into the objective function can cause biases in assessment models. This bias can result in reductions in the estimated recruitment and biomass. For additional details see: Nitschke, P. 2017. Golden Tilefish, *Lopholatilus chamaeleonticeps*, stock assessment update through 2016 in the Middle Atlantic-Southern New England Region. NMFS/NEFSC, Woods Hole, MA. Available at: http://www.mafmc.org/council-events/2017/march-2017-ssc-meeting.

[8] Nitschke, P. 2020. Golden Tilefish, Lopholatilus chamaeleonticeps, data update through 2019 in the Middle Atlantic-Southern New England Region NMFS/NEFSC, Woods Hole, MA. 8 pp. Found online at http://www.mafmc.org/council-events/2020/march-ssc-meeting.

<u>Advisory Panel Fishery Performance Report</u>

Some relevant key points of the 2020 Fishery Performance Report for consideration include:

- Fishermen are not moving around much as they are finding a healthy mix of animals in traditional fishing grounds.
- Industry members have observed a new year class coming into the fishery in 2019. Specifically, they have seen larger landings in the extra-small size category. They have also seen a wide range of fish landed in terms of size and weight when compared to the year before.
- Industry indicated that they experience an increase in CPUE in 2019. Fishing has gotten better, outside/external conditions affecting fishery have gotten worse. In general terms, it was reported that these factors may have impacted CPUE:
    1. Dogfish interactions in 2019 continued to be high but at the same level seen in 2018
    2. Skates interactions increased in 2019 when compared to 2018 (increased size of skates and numbers)
    3. Smooth dogfish have increased in recent years (e.g., encountering more animals and further east)
    4. Weather in 2019 continued to be poor, winter started earlier in 2019 (October) when compared to 2018 conditions
    5. Catching more fish and fishing is improving.
- Dogfish, skate, and smooth dogfish interactions affect fishing practices.
- Severe winter conditions experienced in the Northeast in 2013-2019 significantly affected the effectiveness of tilefish operations/practices, resulting in longer fishing trips.
- Constant harvest strategy worked well in rebuilding the fishery. Industry would like to get back to a constant ACL in the future given healthy trends in the catch. Industry does not want to see different ACL every year.
- Industry members indicated that for-hire trips targeting golden tilefish went down in 2019. This decreased in effort was due to weather factors. Also, improved tuna and swordfish fishing conditions in 2019 when compared to 2018 also caused less trips targeting golden tilefish.
- Consider implementing golden tilefish specifications for a longer time period if possible (e.g., 5 year specifications cycle).
- Some AP members would like the Council to consider a differential trip limit (for hire vs private) and longer recreational trips. In addition, they suggested that the Council considers recreational management strategies (e.g., longer recreational trips), structured after the Gulf of Mexico regulations.
- Some AP members would like the Council to consider a recreational allocation.
- Some AP members indicated concerns about relaxing recreational regulations (as they could potentially lead to higher recreational landings) while the commercial quota could remain at *status quo* levels or potentially decrease in the future.
- All commercial AP members expressed concerns over increasing any effort, bag limit or quota in the fishery at this time. They felt it would be unfair to allow for an increase in effort/bag limit in the recreational sector while maintaining *status quo* for the commercial sector.

Basics for 2021-2022 ABC Recommendation

Our current 3-year specifications cycle (2018-2019-2020) ends with the 2020 fishing year (November 1, 2019 to October 31, 2020). Given the stock assessment process and timing changes the Northeast Regional Coordinating Council recently approved, the next management track assessment update for golden tilefish is currently scheduled for 2021. Therefore, the Council will need approve 2021 specifications utilizing information contained in the 2020 NEFSC data update (Nitschke 2020) and additional relevant information about fishery performance and past management measures is presented in the 2020 Golden Tilefish Fishery Information Document prepared by Council staff and the 2020 Fishery Performance Report developed by the Council Tilefish Advisory Panel. Staff also recommend the Council set interim 2022 specifications because of potential timing constraints with the 2021 management track assessment. If a peer review is needed for the 2021 management track assessment (peer review scheduled for June 2021), the Council will likely have to take final action in August of 2021; this may not provide adequate administrative time to have specifications in place for the 2022 fishing year which starts November 1, 2021. By having default specifications already in place for 2022, we would be in a much better position to implement new specifications for the next specifications cycle after November 1, 2021. The 2021 management track assessment would then be used to revise the interim 2022 specifications and set specifications for the 2023 and 2024 fishing seasons. Lastly, the Council will use the results from the next research track stock assessment for golden tilefish, currently scheduled for spring of 2024, to set specifications for the 2025-2026-2027 multi-year specifications cycle.

Given the stock status from the last full assessment update completed in February 2017, the 2020 NEFSC data update and recent fishing trends, setting ABC at the current *status quo* level for 2021 and 2022 (interim) would allow the fishery to continue to operate efficiently while not likely negatively impacting the status of the stock.

Staff recommend measures be developed for 2-years, to provide for continued stability in the fishery and markets. This will also provide management measures to be in place until the 2021 management track assessment update in completed.

Staff recommend ABCs for 2021 and 2022 (interim) at the *status quo* level. The recommended ABC in each 2021 and 2022 (interim) is 1.636 million pounds (742 mt) to provide for continued stability in the fishery and markets (Table 2).

Other Management Measures

Annual specification process - the MC shall review the ABC recommendation of the SSC, golden tilefish landings and discards information, and any other relevant available data to determine if the golden tilefish ACL and ACT and/or TAL for the IFQ and/or incidental sectors of the fishery require modification to respond to any changes to the golden tilefish stock's biological reference points or to ensure any applicable rebuilding schedule is maintained. The MC will consider whether any additional management measures or revisions to existing measures are necessary to ensure that the IFQ and/or incidental TAL will not be exceeded. Based on that review, the MC will recommend golden tilefish ACL, ACTs, and TALs to the Council.

Annual Catch Limits

As defined in the Framework Adjustment 2 to the Tilefish FMP, ABC is equivalent to the total allowable catch (ACL; Figure 1). Table 2 shows the ACLs associated with the staff recommendations for ABC based on *status quo* level for tilefish.

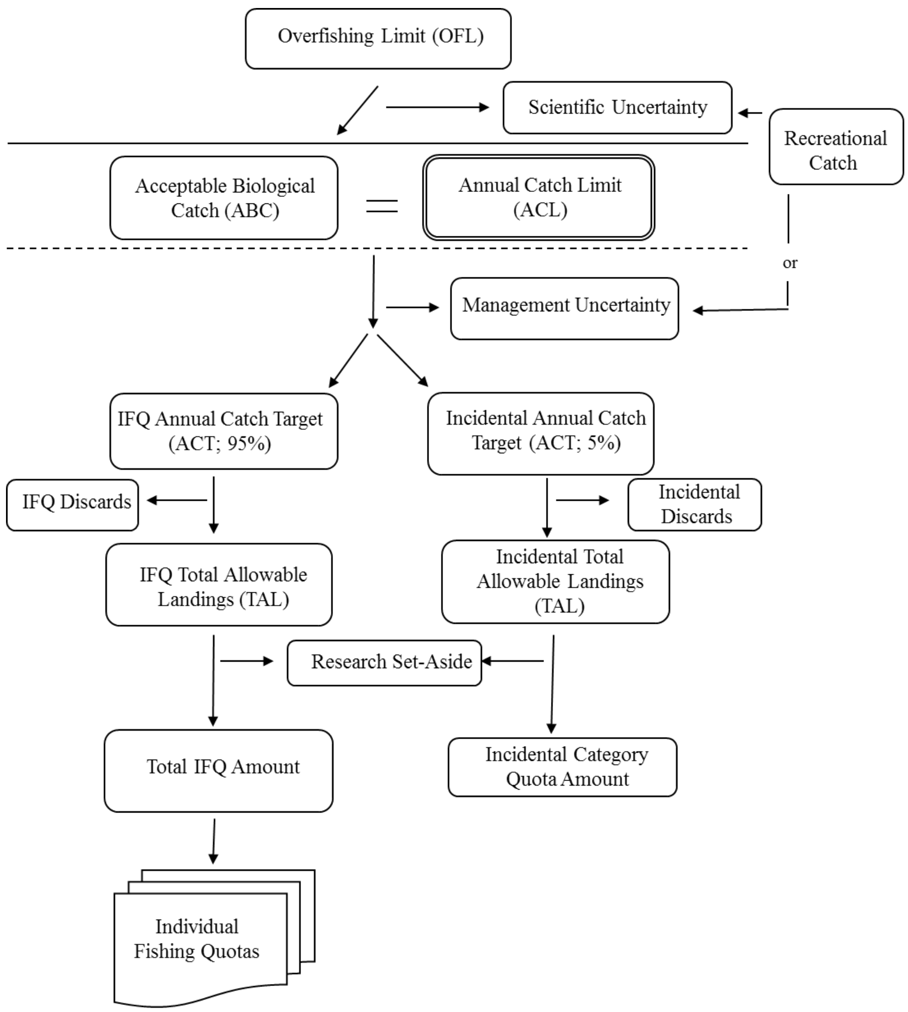

Figure 1. Flowchart for tilefish catch and landings limits.

Table 2. Staff recommendation for catch and landings limits for golden tilefish for 2021 and 2022 (interim) compared to 2020 measures.

	2020 (Current)	2021	2022 (interim)	Basis (2021-2022)
OFL	2.290 m lb (1,039 mt)	NA	NA	NA
ABC	1.636 m lb (742 mt)	1.636 m lb (742 mt)	1.636 m lb (742 mt)	Staff recommendation, based on recent fishing trends and scheduled 2021 management track assessment update
ABC % of OFL	72%	NA	NA	
ACL	1.636 m lb (742 mt)	1.636 m lb (742 mt)	1.636 m lb (742 mt)	ABC = ACL
IFQ ACT	1.554 m lb (705 mt)	1.554 m lb (705 mt)	1.554 m lb (705 mt)	95% ACL
Incidental ACT	0.082 m lb (37 mt)	0.082 m lb (37 mt)	0.082 m lb (37 mt)	5% ACL
IFQ Discards	0	0	0	Discards in the IFQ fishery are prohibited
Incidental Discards	0.009 m lb (4 mt)	0.011 m lb (5 mt)	0.011 m lb (5 mt)	Avg. discard (2015-2019) mostly sm/lg mesh OT and Gillnet gear
IFQ TAL	1.554 m lb (705)	1.554 m lb (705 mt)	1.554 m lb (705 mt)	IFQ ACT - IFQ Discards
Incidental TAL	0.072 m lb (33 mt)	0.070 m lb (32 mt)	0.070 m lb (32 mt)	Incidental ACT - Incidental Discards

Annual Catch Targets

The Tilefish MC is responsible for recommending ACTs for the IFQ and incidental sectors of the fishery, which are intended to account for management uncertainty, for the Council to consider. The ACTs, technical basis for ACTs considerations, sources of management uncertainty should be described and technical approaches to mitigating these sources of uncertainty should be defined and provided to the Council. The relationship between the ACTs and other catch/landing components are given in Figure 1.

Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Management uncertainty can occur because of a lack of sufficient information about the catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or discards) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels).

Staff recommend the MC consider past specific landings performance, as a basis for quantifying management uncertainty (i.e., implementation error) and as an indicator of future ability to achieve catch target when developing the 2021-2022 ACT recommendation for the IFQ and incidental sectors

(Table 2). The MC should also consider the potential imprecision/variability in expected observed commercial and recreational catch[9] to ensure the ACLs are not exceeded.

The tilefish fishery is managed via an IFQ system and managers believe that all tilefish commercial landings values under this program are reliable. The IFQ monitoring system is timely and successful in managing the landings. The commercial landings performance for the last nine years has been near or below the commercial quotas. The recreational catch is minimal. Staff recommend no reduction in catch from the ACL. The recommended ACTs in each 2021 and 2022 are 1.554 million pounds (705 mt) for the IFQ fishery and 0.082 million pounds (37 mt) for the incidental fishery (Table 2).

Total Allowable Landings

Management uncertainty can occur because of insufficient information about discards (Figure 1). Development of a time series of discards was not done in the assessment model since discarding was considered negligible and information on discards do not exist for most of the time series. Therefore, discards have not been included in the assessment due to the high uncertainty associated with the discard estimates over the time series. Very low or insignificant discards have been estimated for recent years according to the discard estimation, precision, and sample size analysis conducted by the NEFSC (see page 3 for additional information). There is higher uncertainty (CVs) on the low recent discard estimates since the discarding of tilefish is a rare event on observed trips. Therefore, an average of several years was used to judge recent relative magnitude of discarding for this fishery. For the last five years (2015-2019), on average 11,524 pounds (5.22 mt) of tilefish were discarded according to the discard estimation, precision, and sample size analysis conducted by the NEFSC. Commercial discards are not generated by the IFQ fishery due to the fact that all fish caught (given the standard hook size/type use by the industry) are marketable. In addition, even though there is a price differential for various sizes of golden tilefish landed, golden tilefish fishermen land all fish caught as the survival rate of discarded fish is very low (Nolan, pers. comm. 2006; Kitts et al. 2007). Furthermore, Amendment 1 to the Tilefish FMP prohibited the practice of highgrading (MAFMC 2009). It is estimated that most of the discards that have occurred in recent years have been by large/small mesh trawls and gillnets used by the incidental fishery. Staff recommends a reduction in catch from the incidental ACT to account for discards in that component of the fishery. Staff recommends no reduction in catch from the IFQ ACT. The recommended IFQ TAL is 1.554 million pounds (705 mt) and the resulting incidental TAL is 0.070 million pounds (32 mt) for each 2021 and 2022 (Table 2).

Recreational Bag Limit

A recreational bag limit was implemented under Amendment 1 in 2009 (MAFMC 2009). Current regulations require an 8-fish recreational bag-size limit per angler per trip. This limit was set at the upper range of mean effort observed during the 1996-2005 period. VTR data indicates that mean effort for the 2006 to 2019 period has ranged from 1.2 to 4.6 fish per angler. The recreational bag limit may be changed through specifications based on the recommendations of the MC. Staff does not recommend any changes to the recreational bag limit.

[9] Recreational tilefish trips appear to be limited and a minor component of the catch as indicated in the FID, the FPR, and the 2017 Golden Tilefish Assessment Update (Nitschke 2017).

Incidental Trip Limit

The current 500 pound incidental trip limit has been in place since 2012. Fishing regulations state that if the incidental harvest exceeds the incidental TAL for a given fishing year, the incidental trip limit specified may be reduced in the following fishing year. In addition, the harvest of the tilefish incidental TAL monitoring is based on dealer reports and other available information, and determines the date when the incidental tilefish TAL has been landed. The Regional Administrator publishes a notice in the Federal Register notifying vessel and dealer permit holders that, effective upon a specific date, the incidental tilefish fishery is closed (in-season closure of the incidental fishery) for the remainder of the fishing year. Golden tilefish incidental commercial fishery landings in FY 2020 are slightly behind FY 2019 landings for the same time period (Figure 4 of the FID; for data reported through January 22, 2020). Incidental golden tilefish commercial landings for the last six years are shown in Table 3. Staff does not recommend any changes to the incidental trip limit.

Table 3. Incidental golden tilefish commercial landings for fishing year 2013-2019.

Fishing year	Landings (pounds)	Incidental quota (pounds)	Percent of quota landed (%)
2013	36,442	99,750	37
2014	44,594	99,750	45
2015	18,839	87,744	21
2016	20,929	94,357	22
2017	60,409	94,357	64
2018	61,254	72,752	84
2019	22,246	72,752	31

Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/quota-monitoring-greater-atlantic-region.

2020 Golden Tilefish Survey Update

The Council, in collaboration with industry and the NEFSC are in the process of conducting a fishery-independent bottom longline survey for the Mid-Atlantic Golden tilefish stock. The 2020 survey design was developed using the findings from the pilot golden and blueline tilefish survey conducted in the summer of 2017 by SUNY Stony Brook. The goal of this 2020 initial bottom longline survey design is to develop an abundance index for the golden tilefish stock.

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

MEMORANDUM

Date: March 24, 2020

To: Michael P. Luisi, Chairman, MAMFC

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

Subject: Report of the March 2020 SSC Meeting

The SSC met in Baltimore on the 9th and 10th of March, 2020 to address the following topics: (1) review relevant data for golden tilefish, specifications for 2021 fishing year and interim recommendations for 2022; (2) review relevant data on blueline tilefish and previously recommended 2021 ABC; (3) review Northeast Fisheries Science Center's (NEFSC) State of the Ecosystem (SOE) for 2019 and its responses to previous suggestions, and provide further review comments; (4) review 2020-2024 stock assessment schedule, initial topics for 2025, and implementation details of new assessment plan; (5) review Marine Recreational Information Program (MRIP) summary of design changes and calibration methods with a focus on Bluefish; (6) review implications of Council decisions to revise risk policy; and under Other Business, (7) address internal details for SSC leads on species, election of a vice-Chair, review progress of the Illex Working Group, and discuss participation in the National SSC meeting (Attachment 1).

A total of 17 SSC members participated in the meeting on March 9th and 15 members on March 10th (Attachment 2); a quorum of members was present both days. Concerns about the spread of the novel corona virus, and guidance from universities and agencies to curtail non-essential travel led a large fraction of the SSC to participate remotely via webinar. With ample support of Council staff the technical issues of off-site participation were minimal, although some sessions ran longer than anticipated.

The meeting opened with a recognition of the leadership of John Boreman who served as Chair of the SSC for over a decade and who did much to create the positive culture of scientific rigor and collegiality that characterizes the SSC. Tom Miller, who has served as vice Chair over this same period, was also recognized for his leadership and unique ability to arbitrate difficult discussions on setting ABCs. Newly appointed SSC members were also recognized: Alexei Sharov, MD DNR; Geret DePiper, NEFSC; Jorge Holzer, University of Maryland; and Gavin Fay, University of Massachusetts-Dartmouth. A large number of participants from the Council, Council staff, NEFSC and GARFO staff, NMFS Headquarters staff, industry, and the general public attended the meeting either in person or remotely. Documents referenced in this report can be accessed via the SSC's meeting website (http://www.mafmc.org/ssc-meetings/2020/march-10-11).

Golden Tilefish

Jose Montañez (Council Staff) provided an overview of the current status of the stock, the fishery, and management for Golden Tilefish. A data update was provided by Paul Nitschke (NEFSC). Additional relevant information about fishery performance and past management measures was presented in the 2020 Golden Tilefish Fishery Information Document prepared by Council staff and the 2020 Fishery Performance Report developed by the Council Tilefish Advisory Panel.

Owing to the implementation of the new stock assessment review process approved by the Northeast Regional Coordinating Council (NRCC), a management track stock assessment will not be available until June 2021, at the earliest. The previous stock assessment update, conducted in 2017, provided the basis for ABCs through October 31, 2020. As a result, the SSC was asked to recommend an ABC for 2021 and an interim ABC for 2022. The interim 2022 ABC is expected to be replaced with recommended Overfishing Limits (OFL) and resultant ABCs following the June 2021 assessment update. The 2021 management track assessment would then be used to revise the interim 2022 specifications and set specifications for the 2023 and 2024 fishing seasons. The interim 2022 measures also provide a placeholder in the event that there is insufficient administrative time for Council approval and Regional Office rulemaking for the start of the 2022 fishing year (i.e., Nov. 1, 2021).

The SSC noted the difficulties of this process from the perspective of scientific uncertainty, wherein ABCs in 2022 are being set by model results from 2017. However, the expected joint availability of results from a 2021 assessment update and the 2020 cooperative fishery independent golden tilefish longline survey was reassuring to the SSC.

No compelling evidence from either the data update or the reports from the Advisory Panel (AP) suggested the need to change the current ABC. The SSC noted that this is a textbook example of an equilibrium fishery, with stable catches, high constant prices, stable seasonal supply, and low levels of discards. Past assessments have revealed that the fishery depends on the periodic recruitment of year classes. As a result, the CPUE is characterized by cycles of increasing and decreasing stanzas. Currently much of the fishery is dependent on the 2013 year class and, based on historical patterns, further increases in CPUE are expected.

Members questioned whether the observed progression of modal landings size was consistent with expected growth rates. Paul Nitschke suggested that the progression of landings by market class were in fact consistent with predicted growth rates. The AP noted the increasing presence of smaller fish in the landings, particularly during the last quarter of 2019, but their importance as evidence of improved recruitment will await the stock assessment update. Recruiting year classes take up to 4-5 years to enter the fishery so it is difficult to establish their strength before then. Model projections can be sensitive to this fact since the population is “pre-loaded” with a string of “average” year classes. To clarify, there are no routinely-collected fishery-independent measures of tilefish of any size. Fishery LPUE is used to calibrate the model, but it applies best to those size ranges that are fully available to the fishery. Smaller fish are not fully recruited and the process of recruiting into the fishery may vary by year and location. To allow for projections of future population size and landings based on the terminal year, the modeled population uses a function of the estimated historical recruitments as a surrogate until they can be validated by the LPUE data.

Recreational landings are a small but imprecisely measured component of total removals. Intercepts of recreationally-caught Golden Tilefish are rare and PSEs often exceed 80%. Recreational fishermen landing Golden Tilefish will be required to begin reporting landings in mid-2020, so the quality of such landings is expected to improve. Staff noted that recreational landings are strongly influenced by weather conditions since the fishing takes place offshore. Moreover, fishing activity is often inversely proportional to success rates on tuna and swordfish trips; Golden Tilefish serve as an alternative target.

Questions were asked about the low level of discards. Hook size, as a means of excluding undersized fish, was suggested, but there was limited evidence of this from analyses conducted as part of the fishery independent tilefish longline survey in 2017. Moreover, all size classes of Golden Tilefish are marketable and there is also no minimum size. Full retention of landings is the norm within the fishery. High grading is not allowed.

The SSC commented on the utility of the Advisory Panel Report as a way of summarizing industry perspective and incorporating potential ecosystem effects into catch consideration. The AP noted that abundance of both Spiny and Smooth Dogfish often interfere with catches of Golden Tilefish. Poor weather was also noted as a factor influencing catch rates. Finally, it was noted that high prices of *Illex* squid as bait was leading to other cost saving measures, such as fishing closer to home ports. Collectively, these observations help integrate management of Golden Tilefish with other species managed by the Council and with state of the ecosystem observations.

Following this general discussion, the SSC addressed the Terms of Reference for Golden Tilefish. Responses by the SSC to the Terms of Reference (in *italics*) provided by the MAFMC are as follows:

For Golden Tilefish, the SSC will provide a written statement that identifies the following for the 2021 fishing year (November 1, 2020 – October 31, 2021) and interim 2022 fishing year:

1) *The appropriateness of the staff recommendation to implement status quo ABC specifications for the 2021 fishing season and interim status quo 2022 specifications until revised specifications can be implemented based on the results of a management track stock assessment to be completed in early/mid 2021. If status quo is inappropriate, specify an alternative ABC for 2021 and interim ABC for 2022 and provide any supporting information used to make this determination;*

The SSC reviewed the documentation prepared by MAFMC Staff, the AP, and the NEFSC.

The SSC agrees with the MAFMC Staff recommendation for *status quo* ABC in 2021 and 2022 at a level of **742 mt (1.636 million lb)**.

The SSC expressed concerns about the interim measures for 2022 with respect to their uncertainty. These positive and negative factors include:

- No major evidence commercial and recreational fisheries that stock conditions have changed substantially.
- Absence of direct evidence of new recruitment.
- An observed a decline in recreational harvest but explained by decline in effort due to weather. Overall, the Committee expressed concerns about precision of recreational catch but noted that a new recreational fishing permitting and reporting initiative may improve quality of estimates.
- CPUE in the commercial fishery has been increasing over the past 4-5 years.

2) *Provide any relevant data and/or assessment considerations for the 2021 management track assessment.*

   The SSC recommends the following factors for consideration in the 2021 management track assessment:

   - New survey results will be incorporated into assessment.
   - Use of an aggregate age length key should be reconsidered. Perhaps consider an age and length-based model. (It was noted that this often requires a full benchmark assessment.)
   - In the meantime, continue use of contemporary age length keys and enhance use, if possible.
   - Review new data on recreational data derived from mandatory permitting and reports.
   - Consider adding MRIP and recreational VTR data to assessment. Comprehensive review of all sources of estimated removals (e.g., discards, too).

Information Sources considered by the SSC (all found on the March 2020 SSC meeting page at http://www.mafmc.org/ssc-meetings/2020/march-10-11):

1. Staff Memo--Golden Tilefish Management Measures (2021 and 2022 interim)
2. Golden Tilefish, *Lopholatilus chamaeleonticeps,* data update through 2019 in the Middle Atlantic-Southern New England Region.
3. Golden Tilefish Fishery Information Document
4. Golden Tilefish Fishery Performance Report
5. Presentation by Staff

Blueline Tilefish

Matt Seeley (Council staff) summarized the current status of management and the most recent AP Fishery Performance Report for Blueline Tilefish.

The SSC expressed concern about the precision of recreational harvest estimates for blueline tilefish. Like Golden Tilefish, Blueline Tilefish are infrequently observed in intercept angler interviews and have even higher PSEs. Estimates of average weight per landed fish (3.65 lb) are based on such interviews and extensive field work by a Ph.D. student at Old Dominion

University, but concerns were expressed that this may be an underestimate given that these are often catches from vessels that were initially targeting larger tuna and billfish species. Using a Delphi Process (i.e., expert judgement) recreational landings for private angler landings are estimated as 105.16% of charter vessel landings. Large discrepancies in the 2016 estimates derived from MRIP were observed. It is expected this method will be supplanted as better MRIP information becomes available. In addition, as noted with golden tilefish, beginning in mid-2020 all private recreational vessels targeting blueline tilefish will need a permit and report all tilefish catch. This new recreational program will provide for comprehensive recreational tilefish information.

The portion of the stock north of Cape Hatteras, NC is jointly managed with the South Atlantic Fishery Management Council. The MAFMC is allocated 56% of the overall ABC determined jointly by the MAFMC and SAFMC. It was noted that the SEFSC is initiating a comprehensive longline survey in 2020 that should provide additional information on the relative abundance in both management areas.

The 2021 Acceptable Biological Catch (ABC) recommended in 2018 by the SSC for the Mid-Atlantic management area was **100,520 pounds (45.60 mt)**. Based on recent fishery performance, Council staff recommend *status quo* specifications for Blueline Tilefish for 2021. The SSC found no compelling evidence for a change. The SSC made the following recommendations:

- The SSC noted that continuation of the existing policy is appropriate given availability of data and reports of the AP.
- The SSC expressed concern about the average size used in recreational catch, noting that fishermen look for larger fish when going offshore. Uncertainty from MRIP numbers, as well as average weight observed in the longline survey, should be considered in future analyses.

Information Sources considered by the SSC: (all found on the March 2020 SSC meeting page at http://www.mafmc.org/ssc-meetings/2020/march-10-11):

1. Staff memo – Review of 2021 Blueline Tilefish measures
2. 2020 Blueline Tilefish Advisory Panel Fishery Performance Report
3. 2020 Blueline Tilefish Fishery Information Document
4. Staff presentation

2020 State of the Ecosystem Report

Sarah Gaichas presented the 2020 State of the Ecosystem Report, Mid-Atlantic edition, and a summary report of the responses by the Ecosystem Dynamics and Assessment Branch (EDAB, NEFSC) to questions and comments raised from both the New England and Mid-Atlantic Councils. Both Councils had comments and requests regarding the 2019 SOE Report. EDAB staff binned the comments into 29 different categories and Dr. Gaichas focused her presentation on these items. The SSC greatly appreciated the thorough response to earlier concerns and followed up with a detailed discussion period. Details of the presentation and discussion follow.

Dr. Gaichas began with a general overview of the SOE report and provided some background on its evolution. The report now features a pithy one-page summary of nine key ecosystem attributes and a stylized graphic featuring a research spotlight.

Requests for a "report card" and improved graphics had been addressed throughout the report. Report cards represent a synthesis of multiple indicators over space and/or time. Each indicator has an associated measure of precision that directly relates to the detection of trends and apparent interventions. SSC members noted that some changes, such as inconsistencies in timing of survey monitoring, are not easily encapsulated by design-based estimators. Model-based estimators of survey quantities (e.g., VAST model) may prove useful, but work is ongoing. Changes in underlying environmental conditions could conflate detection of trends in abundance with phenological changes.

The EDAB is beginning to include time series from NEAMAP surveys as part of its species time series. It was noted that NEAMAP (inshore) and the NEFSC bottom trawl surveys have been mostly non-overlapping since the introduction of the FSV Bigelow, but that the Albatross time series could be post stratified to reveal trends comparable current NEAMAP inshore estimates. To the extent practical, error bars are shown on indicators; however, these bars can become visually complicated. Comments about the uncertainty of commercial landings were raised, recognizing that such landings are ostensibly a census. Estimating landings uncertainty by EDAB is beyond current capabilities (e.g., this is often an enforcement issue), but inclusion of uncertainty in discards (catch = landings + discards) may be useful. It was noted that the implied uncertainty of catch in stock assessment models is given by "effective sample size." Such measures may be useful for SOE. The Population Dynamics Branch (NEFSC) has used data from at-sea observers to estimate total landings, and such an approach may ultimately provide a cross check on the census estimates. Autoregressive models are currently employed for some analyses but it was noted that more generalized ARIMA models may provide additional insights on uncertainty. In the longer term, implementation of a probability-based sampling design for port sampling may better characterize uncertainty of derived quantities like numbers landed by age group.

The SOE has attempted to link changes in fish condition factor to underlying zooplankton abundance. A Gaussian network model, used for Blue Crab in Chesapeake Bay may be useful. It was also noted that many stock assessments have highlighted decreasing weights-at-age and changes in age specific maturation rates; such changes can provide additional context for the fish condition analyses. Dr. Gaichas noted that an index of energy density of herring was currently being developed and may be available next year.

With respect to changes in primary productivity, the source of the underlying data was clarified and methods for quantifying cumulative changes were discussed. A recent paper co-authored by our newest SSC member was also noted. [Hardison, S., Perretti, C. T., DePiper, G. S., and Beet, A. 2019. A simulation study of trend detection methods for integrated ecosystem assessment. ICES Journal of Marine Science, 76: 2060–2069.]

Questions about warm core rings and cold pool phenology were addressed in separate, but related discussions. Both metrics are changing annually and the number of warm core rings on the shelf appears to be increasing. Timing of cold pool should be carefully examined with respect to stratification and its breakdown in the fall.

Estuarine water quality monitoring is being enhanced via a partnership with the National Estuarine Research Reserve. Concerns were expressed about the difficulties of distilling metrics in areas which, by definition, change on a diel time scale. In Chesapeake Bay the extent of the hypoxic zone and TDML have been monitored successfully. Partnerships with other monitoring groups in Delaware Bay, Long Island Sound, and the NC sounds will be helpful.

A metric of primary production to support landings was developed based on general properties of trophic dynamic conversion efficiencies. Species are grouped at different trophic levels. Dr. Gaichas noted that this measure relies heavily on broad measures of trophic energy conversion efficiencies, but that the metric may have value as the fraction of primary production required by various species groups changes over time.

Both Councils have devoted considerable analyses to understand the implications of wind energy development. A habitat model used in the SOE to estimate overlap of proposed developments with fish habitats was questions by an SSC member because it relies primarily on results of bottom trawl data. Other data sources, such as VTR data, may be useful; see http://portal.midatlanticocean.org/ as an example. The SSC recommended that BOEM require collection of requisite data in the vicinity of proposed lease areas.

Along similar lines of identifying additional data streams, it was noted by the SSC that the VIMS longline shark survey might further augment the estimates from the NEFSC shark survey.

Measurement of small pelagic abundance and small fish in general (i.e., young-of-year (YOY)) were discussed next. Measures of forage fish density should also recognize species that are abundant but often poorly captured in bottom trawl surveys (especially sand lance). For YOY a wide range of state surveys have been monitoring near shore and estuarine habitats for decades.

The SSC expressed concerns about proposed measures of trawl species diversity noting that the Bigelow and Albatross nets have different selectivities for small fish and fish higher in the water column. Separate indices should be computed for each vessel-based series.

Following the specific concerns about various metrics, the SSC addressed the broader questions of how to use these data in setting ABCs within the Council's risk policy. The SSC noted that, ideally, the linkage of SOE with the appropriate level of OFL CV could become a regular part of future analyses. It was noted that understanding potential causal links (first principles) and dependencies among metrics would be an important step prior to developed aggregate measures. Stock assessments already incorporate some of these metrics, including trends in overall catch, biological factors (e.g., growth, maturation), and trends in recruitment. Determining the degree of overlap between risks incorporated into stock assessment models, with risks defined by measures apart from the model, could be a worthy topic of investigation. A suggestion was made to include such a discussion on the agenda for a future SSC meeting.

Numerous SSC members commended Dr. Gaichas's presentation and the open and transparent manner in which the SOE has evolved in response to inputs from various partners. Ultimately, the link of SOE to management rests with linking indices to the general objectives of fishery management under MSA. Additional policy considerations, such as unmanaged forage fish, deep sea corals, and wind energy development will ultimately be added to the list of general objectives.

2020 – 2025 Stock Assessment Schedule

The SSC reviewed the proposed schedule for management and research track assessments. It was noted by MAFMC staff that the research track assessments for the next three years are fixed and unlikely to change. The SSC noted that the proposed methodological/topical reviews have a different audience than the single stock assessments. Furthermore, the SSC noted that the management track assessments are still evolving in terms of their scope and the potential consequences of status change in these types of assessments.

The SSC expressed some concerns about the scope of potential topics for the 2025 Research Track assessments. In particular, some of these topics are clearly in the realm of management strategy evaluations. Such topics have been addressed extensively in the literature. Their utility for managers and the SSC might be best served in an actual MSE evaluation rather than addressed at a theoretical level and through a research track assessment process. The SSC suggested that a focused effort on collection of information for data poor species now might be more beneficial than waiting five years to determine what the time series might be.

Marine Recreational Information Program (MRIP) Q&A

John Foster and Rob Andrews from the NOAA Fisheries Office of Science and Technology (S&T) gave a detailed four-part presentation on the: (1) statistical basis of the revised MRIP survey of fishing effort: (2) overall survey design and estimation methods: and (3) methods used to calibrate the historical data to current estimates. The latter task is essential for stock assessments, wherein an accurate and consistent estimate of removals is a prerequisite. Finally, (4) Dr. Foster presented an in-depth analysis of how the revisions affected the catch estimates for Bluefish. The presentation was requested by the SSC and motivated by apparent contrasts in the updated assessments for Summer Flounder, Black Sea Bass, and Bluefish in 2019. Specifically, the trend comparisons between old and recalibrated values appeared to be less dramatic than those observed for the other species. The presentations were well attended on the webinar.

Due to the complex technical nature of the presentations, questions from the onsite participants and SSC members on the webinar were allowed after each section. The number and extent of the questions led to the meeting running longer than expected.

Part 1

Rob Andrews began with a detailed overview of the differences between the Coastal Household Telephone Survey (CHTS) and the new Fishery Effort Survey (FES). These measures of effort are used to scale results angler intercept surveys to total catch. The CHTS was known to be a biased estimator of fishing effort for a variety of reasons, most notably due to the increasing use of cell phones rather than land lines. Contemporary FES estimates of fishing effort were three to five times higher than CHTS estimates for private-boat and shore-based fishing modes.

However, these ratios were likely much smaller prior to introduction of cell phones and caller ID. Comparisons also revealed a more persistent source of bias known as the "gatekeeper" effect, where the person most likely to answer the phone may not have been the most knowledgeable about the household's actual fishing activity. Finally, comparisons revealed that households with landlines were significantly older and had fewer children than households with cell phones only. Collectively these trends and large differences mandated change to the CHTS.

During the presentation it was noted that some fishing effort is difficult to actually observe because it takes place on, or departs from private docks. The SSC followed up on the issue of "hidden" effort requesting clarification of the term. MRIP staff noted that although it is hidden, it is measured in the FES. Another question concerned the potential for a "gatekeeper" effect in the FES. While such potential exists, it was considered to be lower than that in the CHTS because the mail survey is more likely to be read by a larger number of household members and because there are several follow-up letters. Several questions expressed concerns about associated economic trends, and their utility for assessing time varying bias in the CHTS.

Part 2

John Foster led this discussion on the statistical basis of the Access Point Angler Intercept Program (APAIS). This survey provides a spatially-distributed estimate of angler catch rates in six two-month waves and three angler fishing modes (shore, private boat, party charter). The overall survey is a complex stratified clustered multistage design. A primary focus of this survey is estimation of the probability of inclusion of the Primary Stage Unit (PSU). Historically, these inclusion probabilities were either imprecisely estimated or not applied properly in the estimation process. There was some effect on the mean, but a greater influence on the variance of the estimates. From 2004 onward it was possible to revise the estimators to include the new information. Prior to 2004 the information was insufficient to apply the corrections.

Part 3

The improved methodologies in the FES and APAIS unquestionably led to more accurate estimates of recreational landings. However, this begs the question of how to utilize the historical information. Calibration approaches were developed for FES and APAIS by a team of statistical consultants. The methodologies were reviewed by panels from National Research Council and the American Statistical Association, and two independent peer review panels. The FES to CHTS calibration was based on a method of small area estimation known as the Fay-Herriot method. The recalibration or updating of the sampling weights in the APAIS was based on a method known as "raking," which iteratively reweights samples based on known marginal totals for certain domains, such as household status, kind of day (week day vs weekend), and so forth.

The joint effects of these calibrations led to larger differences in the shore mode estimates (~3-4X) for Bluefish, Black Sea Bass, and Summer Flounder. In the private boat mode, increases were between 1.5 and 2X. The largest fraction of these changes was due to the change in estimated fishing effort.

Since the relative proportions of landings by mode varies by species, one would not expect the changes to be uniform across species.

Part 4

John Foster guided the SSC through a stepwise deconstruction of these effects on recreational catch estimates for Bluefish. The purpose was to illustrate procedures that could be used by stock assessment scientists and reviewers to identify potential causes for differences between MRFSS and MRIP estimates. Bluefish recreational catches were summarized three ways: 1) uncalibrated series "BASE;" 2) adjusted for APAIS calibration only "ACAL;" and 3) fully adjusted for APAIS and FES calibration "FCAL." Comparisons revealed relatively close agreement between the BASE and ACAL series with slight differences in relative variability. Catches prior to 1990 exhibited higher levels of variation all series. ACAL series were typically higher than BASE and had higher variation, presumably by the improved weighting in the ACAL series. In contrast, the FCAL series was consistently higher that the ACAL and BASE series. Moreover, the series divergence increased beginning about 2005 when cell phone usage began to increase significantly in US households. To better see the joint and single effects, times series were standardized to their means.

Importantly, the joint effects of the calibration factors can be compared to the base estimates by using the old MRFSS methods. Since most of the changes in scale of changes are induced by the FES calibration, the effects of the APAIS change alone are relatively minor, on an annual basis at the regional level. This does not preclude, however, larger changes within smaller spatial or temporal units. John Foster indicated that the software he developed for the presentation could be modified by users to interrogate the data at finer scales if appropriate for a given stock.

The presentations generated considerable discussion by SSC members and participants. Several questions centered on the use of cell phone usage as the primary covariate for degradation of the CHTS over time. The SSC noted that it might be useful to incorporate the uncertainty in the covariate itself as part of the calibration. MRIP staff noted that many factors were considered as candidate measures, but also noted that cell phone usage had the largest impact and support from studies in other disciplines that had used but discarded random digit dialing telephone surveys.

Several times during the presentation the presenters noted that the MRIP was continuously conducting pilot surveys to address perceived needs of constituents. Many of these studies were ultimately used in the calibration and validation of the FES and APAIS. However, it was noted that at some point the utility of such studies diminishes. Moreover, continuous revisions of the MRIP estimates poses difficulties for stock assessments and for regulation. Regulations for future fisheries need to be in the same "currency" and the stock assessments that produced the OFLs.

One SSC member observed that fishery independent surveys not only collect baseline information but also serve as a platform for additional research by universities and other partners. Could such a system also be implemented in the MRIP? S&T staff suggested that this would be difficult owing to the need to adhere to a rigid probability sample design, but it may be possible on a case-by-case basis. It was also noted that, because MRIP deals with human subjects rather than fish, there is much regulatory oversight of the survey methods by OMB.

Other topics addressed by the SSC included consideration of rare events and pulse fisheries and their impacts on estimation. Specialized programs can be instituted for individual species, but one has to be careful not to distort other sampling efforts.

Later discussion focused on how the improved understanding of the calibration process would influence the SSC's choice of the OFL CV. The calibration process typically increases population scale but may also increase uncertainty. This is not universally true, since retrospective patterns in stock assessment models are often induced by a time varying pattern in a quantity thought to be estimated properly (e.g., natural mortality, discards, or landings). As an example, inclusion of the revised MRIP data reduced the retrospective pattern, and therefore the uncertainty in the summer flounder stock assessment.

The SSC thanked John Foster and Rob Andrews for their special efforts to address issues specifically of interest to the MAFMC SSC. The presentations and the webinar record of the presentations and discussion will be valuable for other analysts and SSCs.

Risk Policy Update

Council staff gave an update on changes to the risk policy that were recently recommended by the Council. The Council approved a new risk policy that was a hybrid approach to two of the alternatives considered (Alternatives 2 and 8). The new risk policy seeks to prevent stocks from being overfished by reducing the probability of overfishing as stock size falls below the target biomass, while also allowing for increased risk under higher stock biomass conditions, particularly at very high levels such as those currently found with Scup and Black Sea Bass. The Council also recommended removing the typical/atypical species distinction currently included in the risk policy. If approved by GARFO, it is anticipated the new risk policy will be implemented for the start of 2021. The 2020 management track assessments for Butterfish, Atlantic Mackerel, Surfclam, and Ocean Quahog will use the new risk policy when setting ABC recommendations. The SSC will also revisit previously approved 2021 specifications for Summer Flounder, Scup, Black Sea Bass, Bluefish, and Spiny Dogfish and re-approve 2021 ABCs utilizing the new risk policy. The SSC requested they be provided the final biological and economic management strategy evaluation (MSE) results that analyze the hybrid alternative selected by the Council (the current reports did not include this analysis since the hybrid approach selected by the Council was not specifically analyzed).

Other Business

<u>Assessment Oversight Panel (AOP)</u>: The AOP, consisting of the chairs from the New England and Mid Atlantic SSC, a member of the ASMFC Assessment Science Committee, and the Chief of Population Dynamics Branch, met on February 25th to review the assessment plans for Management Track assessments. Specifically, the AOP reviews the scope of the updated assessments and recommends the appropriate level of external peer review. The AOP follows guidelines set by the NRCC which prescribe admissible changes for each level of external peer review. A report on the meeting is being prepared by NEFSC.

<u>National Scientific Coordination Subcommittee (SCS):</u> Every two years the Council Coordination Committee (CCC) organizes a theme-oriented meeting of all the Council's SSCs.

The purpose of the meetings is to allow for the exchange of ideas and approaches across council as well as to address themes of national significance. The North Pacific Council will host the seventh National meeting of the SCS in Sitka, Alaska, August 4-6, 2020. The themes will be application of ecosystem indicators into stock assessments, consideration of interacting species, and the assessment of species exhibiting distributional changes. Sarah Gaichas will be one of the keynote speakers. Travel for two to three non-federal individuals from each SSC will be supported by the CCC. Regional case studies for the various themes have been solicited. A list of representatives from the MAFMC SSC will be developed over the next month.

Illex Working Group review of progress: The Working Group has been meeting via conference call every two weeks since late November to review progress on a list of nine short-term tasks. These tasks have included detailed analyses of fisheries CPUE data from VTR and real-time weekly monitoring, spatial patterns evinced in VMS data, estimation of *Illex* habitat, potential magnitude of fishing mortality, analyses of size frequency from industry supplied data, and methods for detecting changes in fishing patterns in real time. Working papers will be developed and delivered to the SSC in advance of its May meeting. A full day of this SSC meeting may be devoted to consideration of the Working Group reports and making *Illex* ABC recommendations.

Election of Vice Chair: After more than a decade of faithful service, Tom Miller is stepping down as Vice Chair of the SSC. No amount of fiscal or physical persuasion has been sufficient to reverse his decision. The SSC will be electing a new Vice Chair in May.

Species Leads. The SSC assigns members to serve as species leads for each stock managed stock and for special programs such as ecosystem-based fishery management. Species leads are responsible for maintaining an in-depth knowledge of the stock's fishery and assessment, as well as leading discussions when the SSC sets ABCs for the species. A list of current species leads will be circulated and opportunities for swapping among SSC members will be offered. Each stock also has a lead social scientist to address cultural and economic issues associated with the species.

ATTACHMENT 1

Mid-Atlantic Fishery Management Council

Scientific and Statistical Committee Meeting

March 10 – 11, 2020

Royal Sonesta Harbor Place

550 Light Street, Baltimore, MD, 21202

AGENDA

Tuesday, March 10, 2020

1:00 Welcome/Overview of meeting agenda (P. Rago)

1:10 Golden Tilefish ABC specifications for the 2021 fishing year and interim 2022 specifications (J. Montañez)
- Review of staff memo and 2021 and 2022 ABC recommendations
- SSC 2021 and interim 2022 Golden Tilefish ABC recommendations

2:30 Blueline tilefish data and fishery update; review of previously recommended 2021 ABC (M. Seeley)

3:30 NEFSC 2020 Mid-Atlantic State of the Ecosystem Report (S. Gaichas)
- Update of Council's EAFM Risk Assessment
- Update on EAFM summer flounder conceptual model and management strategy evaluation

5:00 2020-2024 stock assessment schedule and updates (Rago/Muffley)

5:30 Adjourn

Wednesday, March 11, 2020

8:30 Marine Recreational Information Program (MRIP) question and answer session
- Review and discussion on response to SSC questions (MRIP staff)
- Open Q&A

11:00 Update on changes to the Council risk policy (Muffley)

11:45 Other business
- *Illex* workgroup update

12:30 Adjourn

ATTACHMENT 2

MAFMC Scientific and Statistical Committee

March 10 – 11, 2020

Meeting Attendance

Name	Affiliation
SSC Members in Attendance:	
Paul Rago (SSC Chairman)	NOAA Fisheries (retired)
Tom Miller (SSC Vice-Chairman, via webinar)	University of Maryland – CBL
Ed Houde (via webinar)	University of Maryland – CBL (emeritus)
Dave Secor (via webinar, March 10th only)	University of Maryland – CBL
John Boreman (via webinar)	NOAA Fisheries (retired)
Geret DePiper	NOAA Fisheries NEFSC
Lee Anderson	University of Delaware (emeritus)
Jorge Holzer	University of Maryland
Yan Jiao	Virginia Tech University
Rob Latour	VIMS
Brian Rothschild (via webinar, March 10th only)	Univ. of Massachusetts – Dartmouth (emeritus)
Olaf Jensen (via webinar)	Rutgers University
Sarah Gaichas	NOAA Fisheries NEFSC
Mike Wilberg (via webinar)	University of Maryland – CBL
Alexei Sharov	Maryland Dept. of Natural Resources
Mike Frisk (via webinar)	Stony Brook University
Mark Holliday (via webinar)	NOAA Fisheries (retired)
Others in attendance:	
José Montañez	MAFMC staff
Matt Seeley (March 10th only)	MAFMC staff
Brandon Muffley	MAFMC staff
G. Warren Elliott	MAFMC Vice-Chair
Paul Nitschke (via webinar, March 10th only)	NOAA Fisheries NEFSC
Rob Andrews	NOAA Fisheries – MRIP
John Foster	NOAA Fisheries – MRIP
Greg DiDomenico	GSSA
Megan Lapp	SeaFreeze
Dave Bard	NOAA Fisheries – MRIP
Scott Ward	Fifth Estate Communications
Catherine Kriksten	NOAA Fisheries – MRIP
Katherine Popacostas	NOAA Fisheries - MRIP

2020 Planned Council Meeting Topics

Updated 3/23/20

April 2020 Council Meeting: April 7-8, 2020 (Webinar)

- Climate Change Scenario Planning: Introduction to Scenario Planning and Plan for Potential East Coast/Mid-Atlantic Scenario Planning Exercise
- Blueline Tilefish 2021 Specifications Review
- Golden Tilefish 2021-2022 Specifications
- 2020 Mid-Atlantic State of the Ecosystem Report and Risk Assessment Update
- ~~EAFM Updates: Risk Assessment and Summer Flounder Management Strategy Evaluation~~ (summer flounder MSE updates moved to October; risk assessment update combined with State of the Ecosystem Report)
- Black Sea Bass Commercial State Allocation Amendment: Review Scoping Plan and Document

May 2020 Council Meeting: May X*, 2020 (Webinar)

**Please note that the in-person joint Council/Board meeting has been cancelled. Council and Commission staff are working to develop an agenda for a joint webinar on May 5, 6, or 7. Date, time, and agenda details will be posted at https://www.mafmc.org/council-events/may-2020-joint-mafmc-asmfc-meeting as soon as possible.*

- ~~Black Sea Bass Commercial State Allocation Amendment: Review scoping comments and approve range of alternatives~~ (moved to June)
- Summer Flounder, Scup, and Black Sea Bass Commercial/Recreational Allocation Amendment: Review Scoping Comments and Discuss Potential Management Alternatives
- ~~Summer Flounder Commercial/Recreational Allocation Study: Update~~ (moved to June)
- Bluefish Allocation and Rebuilding Amendment: Review Supplemental Scoping Comments and Discuss Potential Management Alternatives
- ~~Recreational Reform Initiative: Update~~ (moved to June)

June 2020 Council Meeting: June 16-18, 2020 (Virginia Beach, VA)

- Black Sea Bass Commercial State Allocation Amendment: Review scoping comments and approve range of alternatives
- Summer Flounder Commercial/Recreational Allocation Study: Update
- Recreational Reform Initiative: Update
- Unmanaged Landings Update
- Update on Habitat Activities
- *Illex* Working Group: Review Findings
- 2021-2023 *Illex* Squid Specifications
- *Illex* Permitting & MSB FMP Goals Amendment: Final Action
- Summer Flounder, Scup, and Black Sea Bass Commercial/Recreational Allocation Amendment: Refine Draft Range of Alternatives (Summer Flounder, Scup, And Black Sea Bass Committee Meeting of the Whole with ~~Subset of~~ Commission's Board)

- Bluefish Allocation and Rebuilding Amendment: Refine Draft Range of Alternatives (Bluefish Committee Meeting of the Whole with ~~Subset of~~ Commission's Board)
- Updates on Offshore Wind Projects

August 2020 Council Meeting: August 10-13, 2020 (Philadelphia, PA)

- Summer Flounder, Scup, and Black Sea Bass 2021 Specifications: Review
- Commercial Scup Discards and Gear Restricted Areas: Review
- Summer Flounder, Scup, and Black Sea Bass Commercial/Recreational Allocation Amendment: Approve Range of Alternatives
- ~~Black Sea Bass Commercial State Allocation Amendment: Final Action~~ (moved to December)
- Bluefish 2021 Specifications: Review
- Bluefish Allocation and Rebuilding Amendment: Approve Range of Alternatives
- Recreational Reform Initiative: Update
- Black Sea Bass February Recreational Fishery: Review
- Atlantic Surfclam And Ocean Quahog 2021-2026 Specifications
- Mackerel and Butterfish 2021-2022 Specifications
- River Herring and Shad Cap (RH/S) (Mackerel) for 2021-2022
- Longfin Squid (Including Butterfish Cap) 2021-2023 Specifications

October 2020 Council Meeting: October 6-8, 2020 (Riverhead, NY)

- 2021 Implementation Plan: Discuss Draft Deliverables
- Research Priorities Update: Tracking Progress to Address Priorities
- Review 2021 Spiny Dogfish Specifications
- Surfclam and Ocean Quahog Commingling Issue: Update
- Surfclam Genetic Study: Update
- Joint Council-SSC meeting
- Final Report on HMS Diet Study
- Chub Mackerel 2021 Specifications: Review
- EAFM Updates: Summer Flounder Management Strategy Evaluation and other EAFM activities

December 2020 Council Meeting: December 14-17, 2020 (Baltimore, MD)

- 2021 Implementation Plan: Approve
- Summer Flounder, Scup, and Black Sea Bass 2021 Recreational Management Measures: Develop and Approve
- Summer Flounder, Scup, And Black Sea Bass Commercial/Recreational Allocation Amendment: Approve Public Hearing Document
- Black Sea Bass Commercial State Allocation Amendment: Final Action
- Bluefish Allocation and Rebuilding Amendment: Approve Public Hearing Document
- Recreational Reform Initiative: Update
- Update on Habitat Activities
- Review RH/S White Papers

Mid-Atlantic Fishery Management Council

2020 Council Meeting Topics At-a-Glance

	April 7-8 Webinar	May X Webinar	June 16-18 VA Beach, VA	Aug 10-13 Philadelphia, PA	Oct 6-8 Riverhead, NY	Dec 14-17 Baltimore, MD
Mackerel, Squid, Butterfish (MSB) *and* **River Herring and Shad (RH/S)**			• *Illex* Permitting & MSB Goals Amd: Final Action • *Illex* Working Group: Review Findings • *Illex* Squid 2021-2023 Specs	• Mackerel and Butterfish 2021-2022 specs • RH/S Cap (Mackerel) for 2021-2022 • Longfin Squid 2021-2023 Specs (Including Butterfish Cap)	• Chub Mackerel 2021 Specs Review	• Review RH/S White Papers
Summer Flounder, Scup, Black Sea Bass (SF/S/BSB)	• BSB Com State Allocation Amd: Review Scoping Plan and Doc	• SF/S/BSB Com/Rec Allocation Amd: Review Scoping Comments and Discuss Potential Alternatives	• SF/S/BSB Com/Rec Allocation Amd: Refine Draft Range of Alternatives (Joint Committee/ Board Mtg) • Black Sea Bass Commercial State Allocation Amendment: Review scoping comments and approve range of alternatives • Summer Flounder Commercial/Recreational Allocation Study: Update • Recreational Reform Initiative: Update	• SF/S/BSB Com/Rec Allocation Amd: Approve Range of Alternatives • SF/S/BSB 2021 Specs Review • BSB February Rec Fishery: Review • Commercial Scup Discards and GRAs: Review • Rec Reform Initiative: Update		• SF/S/BSB Com/Rec Allocation Amd: Approve Public Hearing Doc • SF/S/BSB 2021 Recreational Mgmt Measures • Rec Reform Initiative: Update • BSB Com State Allocation Amd: Final Action
Bluefish		• Bluefish Amd: Review Scoping Comments and Discuss Potential Alternatives	• Bluefish Amd: Refine Draft Range of Alternatives (Joint Committee/ Board mtg)	• Bluefish Amd: Approve Range of Alternatives • Bluefish 2021 Specs Review		• Bluefish Amd: Approve Public Hearing Doc
Tilefish	• Blueline Tilefish 2021 Specs Review • Golden Tilefish 2021 Specs					
Atlantic Surfclam and Ocean Quahog (SC/OQ)				• SC/OQ 2021-2026 Specs	• SC/OQ Commingling Issue: Update • Surfclam Genetic Study: Update	
Spiny Dogfish					• Spiny Dogfish 2021 Specs Review	

	April 7-8 Webinar	May X Webinar	June 16-18 VA Beach, VA	Aug 10-13 Philadelphia, PA	Oct 6-8 Riverhead, NY	Dec 14-17 Baltimore, MD
Science Issues					• Research Priorities Update • Joint Council-SSC Meeting	
Other	• Climate Change Scenario Planning: Intro and Plan for Potential East Coast/Mid-Atlantic Exercise • 2020 Mid-Atlantic State of the Ecosystem Report and Risk Assessment Update		• Unmanaged landings update • Update on Habitat Activities • Updates on Offshore Wind Projects		• Review 2020 Implementation Progress and Discuss 2021 Draft Deliverables • HMS Diet Study: Final Report • EAFM Updates: Summer Flounder Management Strategy Evaluation and other EAFM activities	• 2021 Implementation Plan: Approve • Update on Habitat Activities

Acronyms/Abbreviations

Amd	Amendment
BSB	Black Sea Bass
Com/Rec	Commercial/Recreational
Com	Commercial
Doc	Document
EAFM	Ecosystem Approach to Fisheries Management
FMP	Fishery Management Plan
GARFO	NOAA Fisheries Greater Atlantic Regional Fisheries Office
GRAs	Gear Restricted Areas
HMS	Highly Migratory Species
Mgmt	Management
MSB	Mackerel, Squid, Butterfish
MSE	Management Strategy Evaluation
Mtg	Meeting
NEFSC	Northeast Fisheries Science Center
Pres	Presentation
Rec	Recreational
RH/S	River Herring and Shad
SC/OQ	Atlantic Surfclam and Ocean Quahog
SF/S/BSB	Summer Flounder, Scup, Black Sea Bass
Specs	Specifications
SSC	Scientific and Statistical Committee

Actions Referenced in this Document

- **BSB Com State Allocation Amd:** Black Sea Bass Commercial State Allocation Amendment
- **Bluefish Amd:** Bluefish Allocation and Rebuilding Amendment
- **Rec Reform Initiative:** Recreational Management Reform Initiative
- **SF-S-BSB Com/Rec Allocation Amd:** Summer Flounder, Scup, Black Sea Bass Commercial/Recreational Allocation Amendment
- ***Illex* Permitting & MSB Goals Amd:** *Illex* Permitting and Mackerel, Squid, Butterfish FMP Goals and Objectives Amendment

Status of Council Actions Under Development

AS OF 3/23/20

FMP	Action	Description	Status	Staff Lead
Mackerel, Squid, Butterfish	MSB FMP Goals/Objectives and *Illex* Permits Amendment	This action will consider modifications to the *Illex* permitting system as well as revisions to the goals and objectives for the MSB FMP. http://www.mafmc.org/actions/illex-permitting-msb-goals-amendment	Five public hearing webinars will be held between March 30 and April 13. Final action is anticipated in June 2020.	Didden
Summer Flounder, Scup, Black Sea Bass	Commercial/ Recreational Allocation Amendment	This joint MAFMC/ASMFC amendment will reevaluate and potentially revise the commercial and recreational sector allocations for summer flounder, scup, and black sea bass. This action was initiated in part to address the allocation-related impacts of the revised recreational data from MRIP. http://www.mafmc.org/actions/sfsbsb-allocation-amendment	Scoping hearings and a comment period were held in February and March. The Council and Board will consider scoping comments and identify the scope of the action via webinar in early May.	Beaty/Coutre/ Dancy
	Black Sea Bass Commercial State Allocation Amendment	This joint MAFMC/ASMFC action will consider adjusting the allocations of the black sea bass commercial quota among states and whether the allocations should be managed jointly by the Council and Commission.	The Council will review a scoping document and scoping plan in April 2020. The Council and Board plan to discuss next steps for this action during their joint meeting in June 2020.	Beaty
Bluefish	Bluefish Allocation and Rebuilding Amendment	This joint MAFMC/ASMFC amendment considers potential revisions to the allocation of Atlantic bluefish between the commercial and recreational fisheries and the commercial allocations to the states. This action will also review the goals and objectives of the bluefish FMP and the quota transfer processes and establish a rebuilding plan for bluefish. http://www.mafmc.org/actions/bluefish-allocation-amendment	The Council held a second round of scoping hearings February 13 -March 4. The Council and Board will consider scoping comments and identify the scope of the action via webinar in early May.	Seeley
Omnibus	Omnibus Amendment for Data Modernization	This amendment will address the regulatory changes needed to fully implement the Agency's Fishery-Dependent Data Initiative.	The Council last received an update at the October 2018 meeting.	GARFO/ NEFSC

FMP	Action	Description	Status	Staff Lead
Non-FMP	Golden and Blueline Tilefish Private Recreational Permitting and Reporting Issues	This action will develop permitting and reporting regulations for private recreational tilefish vessels. The action was approved in a final rule amending the golden tilefish FMP to include blueline tilefish in November 2017 with delayed implementation.	The proposed rule for tilefish recreational permitting and reporting is expected to publish in the Federal Register on January 29, 2020 with a comment period through February 28, 2020. Implementation and outreach are expected by May 1, 2020.	GARFO lead MAFMC Contact: Seeley
	Recreational Reform Initiative	This is a joint initiative with the Atlantic States Marine Fisheries Commission to develop strategies to increase management flexibility and stability for jointly managed recreational fisheries (i.e., black sea bass, summer flounder, scup, and bluefish).	A steering committee has met several times to prioritize specific topics to address. The Council and Board will receive an update during their joint meeting in June 2020.	Beaty

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

As of 3/23/2020

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."

Status	Amendment/Framework	Action Number	Council Approval	Initial Submission	Final Submission	NOA Published	Proposed Rule Published	Approval/ Disapproval Letter	Final Rule Published	Regs Effective	Notes
Open	Atlantic Mackerel Rebuilding Framework	MSB FW 13	8/13/18	9/27/18	2/28/19	N/A	6/7/19		10/30/19	11/29/19	
Complete	Summer Flounder, Scup, and Black Sea Bass Framework on Conservation Equivalency, Block Island Sound Transit, and Slot Limits	SFSBSB FW 14	12/11/18	3/21/19	5/8/19	N/A	8/8/19		11/19/19	12/30/19	
Open	Summer Flounder Commercial Issues and Goals and Objectives Amendment	TBD	3/6/19	3/17/20							
Open	Chub Mackerel Amendment	MSB AM 21	3/7/19	5/31/19	10/25/19		3/9/20				
Open	Excessive Shares Amendment	TBD	12/9/19								
Open	Omnibus Risk Policy Framework	TBD	12/9/19								Workgroup is updating analyses to evaluate the modified alternative recommended by the Council
Open	Omnibus Commercial eVTR Framework	TBD	MAFMC: 12/11/19; NEFMC: 1/29/20	3/4/20							

Timeline and Status of Current and Upcoming Specifications for MAFMC Fisheries

As of 3/23/20

Current Specifications	Year(s)	Council Approval	Initial Submission	Final Submission	Proposed Rule	Final Rule	Regs Effective	Notes
Golden Tilefish	2018-2020	4/11/17	6/5/17	8/16/17	9/7/17	11/7/17	11/2/17	2019 specs were reviewed in April 2018. No changes were recommended.
Surfclam and Ocean Quahog	2018-2020	6/6/17	8/14/17	9/22/17	12/8/17	2/6/18	3/8/18	2020 specs were reviewed in June 2019. No changes were recommended.
Longfin Squid and Butterfish	2018-2020	6/7/17		8/24/17	12/13/17	3/1/18	4/2/18	2019 specs were reviewed in October 2018. No changes were recommended.
Illex Squid	2019-2021	10/3/18	12/4/18	2/11/19	5/1/19	8/2/19	8/1/19	
Atlantic Mackerel (MSB FW 13)	2019-2021	8/13/18	9/27/18	2/28/19	6/7/19	10/30/19	11/29/19	
Atlantic Mackerel (including RH/S cap)	2020	6/5/19	8/22/19	9/30/19	12/17/19	2/27/20	2/27/20	
Chub mackerel	2020-2022	3/7/19	5/31/19	10/25/19	3/9/20			
Scup	2020	3/7/19	6/11/19	7/24/19	7/26/19	10/9/19	1/1/20	Interim specs to be replaced as soon as possible after results of 2019 operational assessment are available
Scup	2020-2021	10/8/19	1/15/20	3/5/20				Revised specifications based on the 2019 operational stock assessment
Blueline Tilefish	2019-2021	4/11/18	8/17/18	10/24/18	11/19/18	2/12/19	2/12/19	
Bluefish	2020	3/7/19	6/11/19	7/24/19	7/26/19	10/9/19	1/1/20	Interim specs to be replaced as soon as possible after results of 2019 operational assessment are available.
Bluefish	2020-2021	12/10/19	1/23/20					
Summer Flounder	2020-2021	3/6/19	6/25/19	7/18/19	7/26/19	10/9/19	1/1/20	
Black Sea Bass	2020	3/7/19	6/11/19	7/24/19	7/26/19	10/9/19	1/1/20	Interim specs to be replaced as soon as possible after results of 2019 operational assessment are available
Black Sea Bass	2020-2021	10/9/19	1/15/20	3/5/20				Revised specifications based on the 2019 operational stock assessment
Spiny Dogfish	2019-2021	10/2/18	11/30/18	3/5/19	3/29/19	5/15/19	5/15/19	In multi-year specs

Recreational Management Measures

Current Management Measures	Year(s)	Council Approval	Initial Submission	Final Submission	Proposed Rule	Final Rule	Regs Effective	Notes
Summer flounder recreational measures	2020	12/10/19	1/22/20	1/22/20				Rulemaking required each year to continue use of conservation equivalency
Black sea bass recreational measures	2020	2/14/18	3/5/18	4/10/18	4/11/18	5/31/18	5/31/18	Reviewed in 2019. No changes from prevous year's measures.
Scup recreational measures	2020	12/10/14	3/20/15		5/5/15	6/19/15	6/19/15	Reviewed in 2019. No changes from prevous year's measures.
Bluefish recreational measures	2020	12/10/19	1/23/20					

South Atlantic Fishery Management Council

News Release

FOR IMMEDIATE RELEASE
March 6, 2020

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Federal Fisheries Managers Address Broad Range of Issues During Meeting This Week

This week's meeting of the South Atlantic Fishery Management Council in Jekyll Island, Georgia reflected the diversity of issues involved in managing fisheries in federal waters in the Southeast. During the meeting the Council developed recommendations on measures proposed in the Florida Keys National Marine Sanctuary, approved an amendment to modify transit provisions for shrimp vessels during cold-weather closures, addressed designating Special Management Zone areas off the coasts of the Carolinas, and received updates on the 2020 red snapper season, shark depredation, and wind farms.

The Council received presentations from the Florida Fish and Wildlife Conservation Commission (FWC) as well as the Florida Keys National Marine Sanctuary regarding proposed measures in the Sanctuary's *Restoration Blueprint* affecting fishing within the South Atlantic Council's portion of the Sanctuary. The proposed measures include expansion of the Sanctuary boundaries, modifying designated marine zones where fishing would be restricted or prohibited, eliminating baitfish permits, and prohibiting fish feeding activities. FWC held a series of stakeholder workshops in January 2020 and has developed recommendations based on input received at the workshops and other meetings. After reviewing the FWC recommendations, the Council discussed their role in the process and began drafting a letter to provide formal comments to the superintendent of the Florida Keys National Marine Sanctuary by mid-March. A final copy of the letter will be posted on the Council's website as part of the March 2020 meeting materials.

Council members voted to approve Amendment 11 to the Shrimp Fishery Management Plan that would modify current transit provisions for commercial shrimp vessels during cold-weather closures. The Council created the cold-weather closures and associated transit provisions to protect overwintering shrimp. During the most recent cold-weather closure for penaeid shrimp (brown, pink, and white shrimp) in 2018, shrimp fishermen indicated that gear stowage requirements were no longer feasible and asked that they be adjusted. Working together with members of the Council's advisory panels to find a solution, the amendment would modify the gear stowage requirements within the transit provisions. The amendment must undergo Secretarial review before the measures may be implemented.

At the request of state marine resource agencies in North Carolina and South Carolina, the Council is considering designating a series of artificial reef sites within federal waters (3 miles or greater) offshore of each state as Special Management Zones. Amendment 34 to the Snapper Grouper Fishery Management Plan would designate 30 artificial reef sites off of North Carolina and four sites off of South Carolina, where gear restrictions would be put into place for fishermen targeting species in the snapper grouper management complex. The Council approved the amendment for public hearings to be held via webinar prior to the June Council meeting. The hearings will be publicized as details become available.

(Continued)

Other Items

The Council received an update from NOAA Fisheries regarding a possible recreational season for red snapper in the South Atlantic of three days beginning the second Friday in July. The number of fishing days is determined by NOAA Fisheries each year. The 2020 opening is contingent on changing current regulations that prohibit opening the season for three days or less. The Council approved Snapper Grouper Regulatory Amendment 33 in December 2019 requesting the minimum number of days requirement be eliminated. The amendment is currently under review by NOAA Fisheries. Read more.

The Council also received a presentation from NOAA Fisheries Highly Migratory Species Division addressing concerns about shark depredation. The presentation acknowledged growing concerns about the impacts of shark depredation on fishing activities and outlined the challenges in addressing the concerns, including data needed to quantify shark encounters by fishermen. Council members also received an update on the status of the Kitty Hawk Wind Farm project proposed off the east coast of North Carolina, took action to table proposed changes for commercial Spanish mackerel trip limits in the northern zone, moved forward with developing an amendment to designate bullet mackerel and frigate mackerel as Ecosystem Component Species and began preliminary discussions of allocations. For additional meeting details, view the interactive Story Map for the March Council meeting or visit the Council's website at: https://safmc.net/safmc-meetings/council-meetings/ for committee reports and other meeting materials.

The next meeting of the South Atlantic Fishery Management Council is scheduled for June 8-12, 2020 in Key West, Florida.

The South Atlantic Fishery Management Council, one of eight regional councils, conserves and manages fish stocks from three to 200 miles offshore of North Carolina, South Carolina, Georgia and east Florida.