



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

## MEMORANDUM

**Date:** May 8, 2018  
**To:** Chris Moore  
**From:** Julia Beaty  
**Subject:** Chub mackerel assessment and ABCs

In 2017, the Council issued a request for proposals for a chub mackerel stock assessment. However, based on the recommendations of a review panel of Council and NEFSC staff and an SSC member, the Council ultimately decided not to fund an assessment.

The review panel agreed that given the extreme data limitations for chub mackerel, even a data limited modeling approach would likely produce highly uncertain results, which could prove risky for setting management measures.

Significant concerns regarding the ability to quantitatively assess the status of the chub mackerel stock include:

- **Low and sporadic catches in fisheries independent surveys**
  - Northeast Fisheries Science Center (NEFSC) bottom trawl survey
    - There are no records of chub mackerel caught in the spring NEFSC bottom trawl survey during 1963-2016.
    - Chub mackerel are periodically encountered in the fall NEFSC bottom trawl survey. Most of these catches occurred south of the Hudson Shelf Valley in warm water temperatures (i.e. generally higher than about 20°C/68°F; personal communication, John Manderson, Michele Traver, and Chris Tholke; Figure 1 and Figure 2).
  - State trawl surveys
    - Catches in state fisheries-independent surveys are rare.
  - Larval surveys
    - The Chub Mackerel Amendment Fishery Management Action Team agreed that a larval survey may be the most appropriate fishery-independent index of abundance, given that recruitment is likely a main driver of abundance.
    - Through 2016, the ECOMON survey collected 67 chub mackerel larvae from North Carolina through southern New England.
    - During 1983 - 2014, the Southeast Fisheries Science Center collected 1,748 chub mackerel larvae throughout the Gulf of Mexico (Figure 3).

- **The influence of factors other than abundance on fishery catch per unit effort (CPUE)**
  - Catch in the mid-Atlantic and southern New England appears to be influenced by factors such as the availability of substitute species (especially *Illex* squid), temperature, price, and market demand.
  - Due to the significant overlap with the *Illex* squid fishery, it can be difficult to determine which trips targeted chub mackerel, as opposed to *Illex* squid.
  - Directed fishing effort on chub mackerel was generally very low until about 2013 and has been variable since that time.
  - Chub mackerel landings in the southeast may be largely incidental.<sup>i</sup>
- **Limited data on growth and maturity in U.S. Atlantic waters**
  - The only known information on age, length, and maturity for chub mackerel in U.S. Atlantic waters is included in Daley (2018).<sup>ii</sup>
  - With additional funding, additional data on age, length, and maturity could be collected from existing sampling programs, such as the NEFSC and state trawl surveys, the southeast Trip Interview Program, and the observer program.
- **Uncertainty regarding stock structure in U.S. waters**
  - In the eastern Atlantic Ocean, chub mackerel are found from southern New England, through the Gulf of Mexico, in the Caribbean, and off South America.
  - No studies on stock structure in U.S. waters have been conducted.
  - Studies from other regions (e.g. Europe and Africa) suggest based on differences in morphology, spawning seasons, and/or sizes at maturity that sub-stocks may exist; however, the species is genetically uniform across wide areas (e.g. the eastern Mediterranean Sea, the Ivory Coast, and South Africa).<sup>iii</sup>

The Council is developing an amendment to add chub mackerel as a stock in the Mackerel, Squid, and Butterfish Fishery Management Plan. This necessitates adoption of an acceptable biological catch (ABC) level. Given the lack of a stock assessment and the data limitations described above, the ABC may need to be specified based on catch history.

Tables 1-3 include information on commercial and recreational landings and discards for three different regions. This information could be used to inform development of an ABC. Information on three different regions is provided because the Council has not yet selected a preferred management unit for chub mackerel.

For more information on chub mackerel fisheries, see the 2018 Chub Mackerel Fishery Information Document, available at: <http://www.mafmc.org/actions/chub-mackerel-amendment>.

# FALL 1963-2016

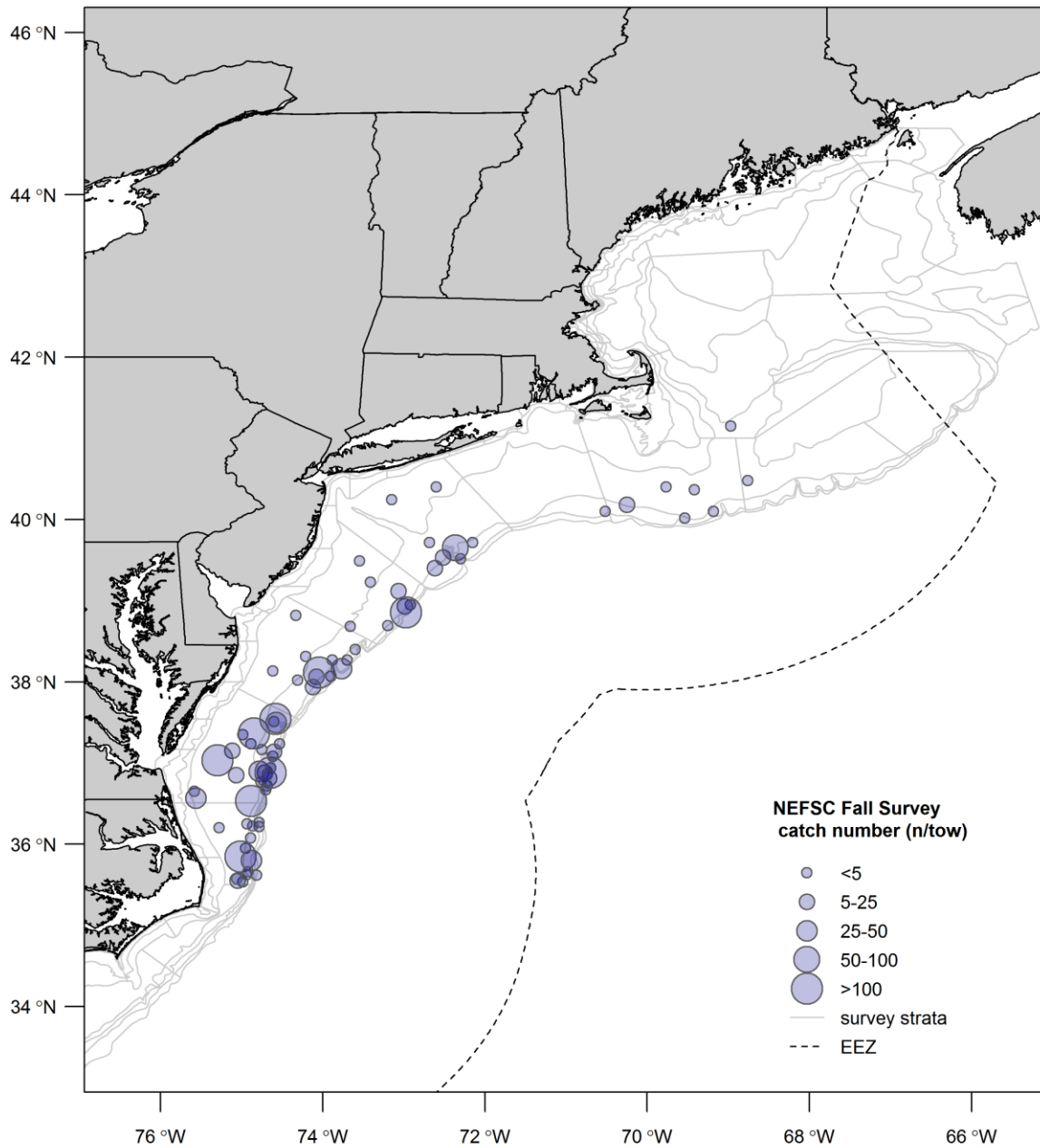


Figure 1: NEFSC fall survey chub mackerel catch in numbers per tow, 1963-2016 (source: Michele Traver and Chris Tholke, personal communication).

# FALL 1963-2016

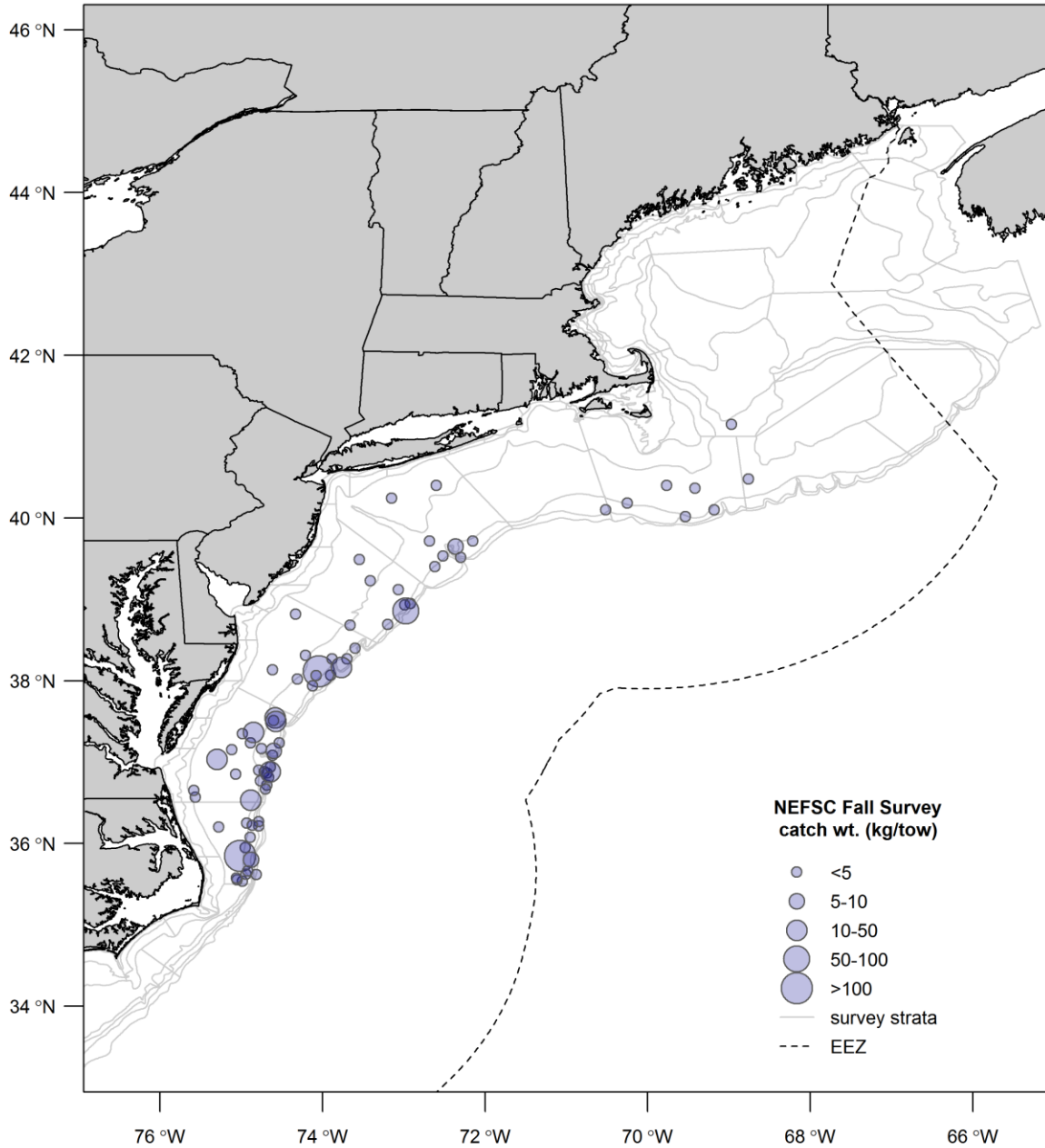


Figure 2: NEFSC fall survey chub mackerel catch in weight per tow (kg), 1963-2016 (source: Michele Traver and Chris Tholke, personal communication).

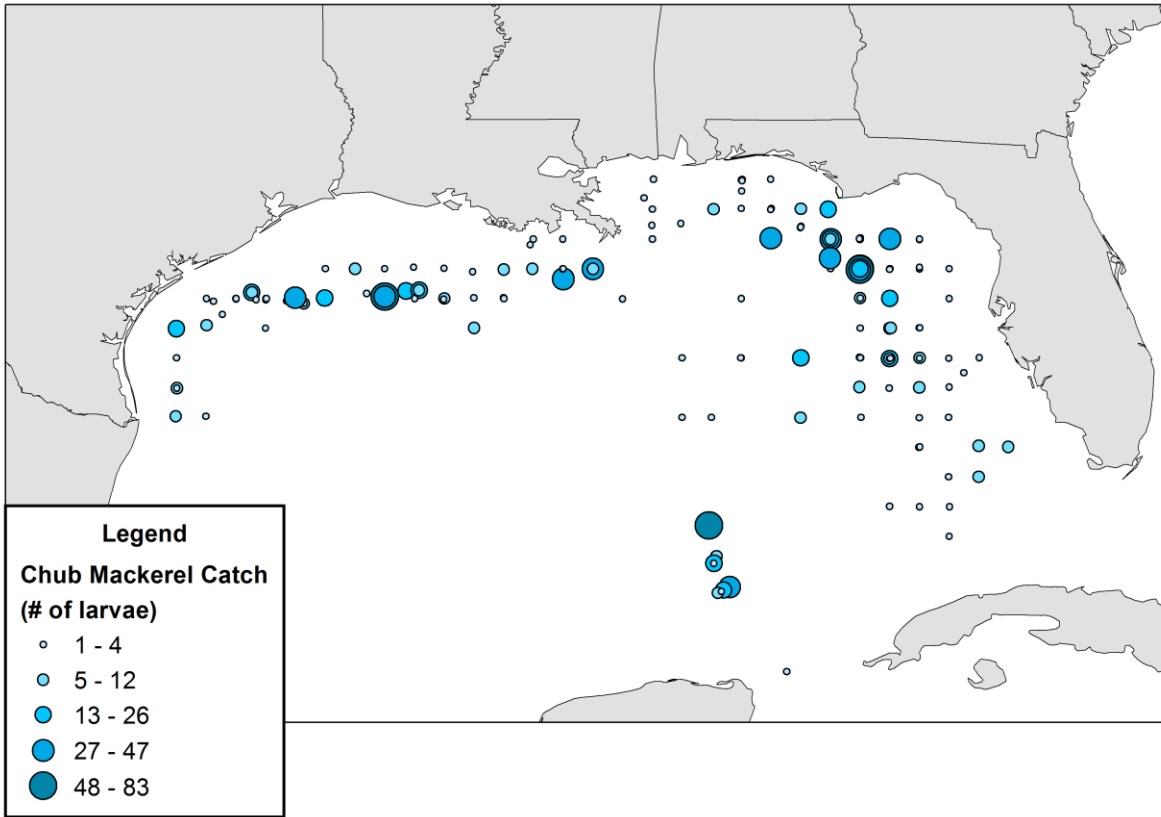


Figure 3: Southeast Fisheries Science Center larval survey catches of chub mackerel larvae, 1983-2014.

Table 1: Average commercial and recreational chub mackerel landings, in pounds, by region. Data from 2017 are not included because they were not available for all regions at the time of writing this document.

<b>Time Period</b>	<b>ME-NC</b>	<b>ME-FL</b>	<b>ME-TX</b>
<b>2002-2016</b> (15 years)	674,399	676,936	776,518
<b>2007-2016</b> (10 years)	962,708	966,462	1,041,802
<b>2012-2016</b> (5 years)	1,882,744	1,883,241	1,976,277
<b>2013-2015</b> (top 3 and basis for Unmanaged Forage Amendment Measures)	2,878,810	2,879,439	2,966,221

Table 2: Percent of commercial chub mackerel catch that was discarded, based on NEFOP and northeast vessel trip report (VTR) data.

<b>Years</b>	<b>NEFOP Discard %</b>	<b>VTR Discard %</b>
<b>2002-2016</b> (15 years)	10%	3%
<b>2007-2016</b> (10 years)	10%	3%
<b>2012-2016</b> (5 years)	10%	3%
<b>2013-2015</b>	10%	3%

Table 3: Recreational discard rates by year and region, according to the Marine Recreational Information Program. Years with no reported discarded chub mackerel are not shown.

<b>Year</b>	<b>Region</b>	<b>Estimated discard rate</b>
<b>2002</b>	GULF OF MEXICO	7%
<b>2003</b>	GULF OF MEXICO	100%
<b>2004</b>	GULF OF MEXICO	1%
<b>2010</b>	GULF OF MEXICO	13%
<b>2012</b>	MID-ATLANTIC	100%
<b>2014</b>	MID-ATLANTIC	17%
<b>2016</b>	MID-ATLANTIC	16%
<b>2017</b>	NORTH ATLANTIC	8%
<b>2017</b>	MID-ATLANTIC	63%
<b>2017</b>	GULF OF MEXICO	1%

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<sup>i</sup> For more information, see the 2018 Chub Mackerel Fishery Information Document, available at: <http://www.mafmc.org/actions/chub-mackerel-amendment>

<sup>ii</sup> Daley, T. 2018. Growth and reproduction of Atlantic chub mackerel (*Scomber colias*) in the Northwest Atlantic. Master's thesis. University of Southern Mississippi.

<sup>iii</sup> Cerna, F. and G. Plaza. 2014. Life history parameters of chub mackerel (*Scomber japonicus*) from two areas off Chile. *Bulletin of Marine Science*. 90(3):833-848.

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