



## Mid-Atlantic Fishery Management Council

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# MEMORANDUM

**Date:** April 28, 2017  
**To:** Chris Moore, Executive Director  
**From:** Jessica Coakley and José Montañez, Staff  
**Subject:** Surfclam Management Measures (2018-2020)

## Executive Summary

The Atlantic surfclam resource in the US exclusive economic zone (EEZ) is not overfished and overfishing is not occurring in 2015 (NEFSC 2016). The Atlantic surfclam stock was assessed and peer reviewed in July 2016 at Stock Assessment Workshop (SAW 61). In addition to the stock assessment reports, the Northeast Fishery Science Center (Dan Hennen Pers. Comm., NEFSC 2017) has provided a data update that provides more recent fishery data available. These reports can be referenced for additional detail and are available at: <http://www.mafmc.org/ssc-meetings/2017/may-17-18>.

Last year, specifications were developed for 2017-2018, with the expectation that a new stock assessment could allow 2018 measures to be revised as needed. This year, staff recommend specifications be set for 3 years (2018-2020) based on the new assessment. The staff recommendation for acceptable biological catches (ABCs) for 2018, 2019, and 2020 is 29,363 mt each year. The fishery management plan specifies that the annual catch limit (ACL) equals the ABC. Staff recommend an annual catch target (ACT) = 29,363 mt and a commercial quota of 26,218 mt (3.4 million bushels) for each year, 2018, 2019, and 2020. This is the same ACT and commercial quota that was implemented for the 2014-2018 fishing years. Staff recommend the surfclam minimum size be suspended in 2018, but also recommend that the Council consider the issue of large numbers of small clams appearing in the landings from the Delmarva area.

## Introduction

The Magnuson Stevens Act requires each Council's Scientific and Statistical Committee (SSC) to provide, among other things, 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 this memorandum, information is presented to assist the development of measures for the Council to consider for the 2018-2020 fishery for surfclams. The SSC will recommend an ABC for the surfclam fishery that addresses scientific uncertainty. Based on the SSC recommendations, the Council will make recommendations for ACLs, ACTs, and other implemented measures, and provide those recommendations to the NMFS Northeast Regional Administrator.

## **Review of SSC Recommendations for Fishing Years 2014-2018**

In May 2013, the SSC recommended ABCs for surfclam for fishing years 2014-2016 based on the stock assessment from SAW 56 (February 2013). The SSC recommended that the assessment be considered Level 3 (SSC-modified overfishing limit (OFL) probability distribution) because it provided an acceptable OFL estimate, included estimates of pertinent life history parameters, and explicitly incorporated a substantial amount of available data and also permits uncertainty in input parameters. At that time, the SSC concluded the reference points were proxies (not internally estimated) and the uncertainty estimates of the OFL in the assessment could not be used directly to represent all key sources of uncertainty. The SSC considered surfclam to be a “typical” stock and applied the Council’s risk policy to generate ABCs assuming the uncertainty around the OFL is lognormally distributed with a CV=100%. The SSC met in May 2016 and recommended ABCs for 2017-2018 using the same approaches to extend the fishing year specification until a new stock assessment could be conducted.

<b>Year</b>	<b>OFL (mt)</b>	<b>ABC (mt)</b>	<b>Biomass (mt)</b>	<b>P (overfishing)</b>
<b>2014</b>	81,150	60,313	886,251	36%
<b>2015</b>	75,178	51,804	813,077	33%
<b>2016</b>	71,512	48,197	792,205	32%
<b>2017</b>	69,925	44,469	739,359	29%
<b>2018</b>	70,102	45,524	757,738	30%

At that May 2016 meeting, the SSC noted the principle sources of scientific uncertainty identified in May 2013 still applied:

- a) The  $F = M$  foundation for establishing OFL;
- b) Estimates of  $M$  used in the assessment are uncertain;
- c) Uncertainty over the scales at which regional replenishment occurs and the potential impact of localized depletion;
- d) Absolute biomass is not known, and biomasses are currently scaled to presumed abundance in 1999 to develop reference points; and,
- e) Uncertainty in the fishing mortality rates ( $F$ ), as identified by the SARC external review panel (Houde, et al. 2013). In particular, the comparison of catch to the scaled abundance (see point c above) introduces unquantified uncertainty in estimates of  $F$ . Also, incidental mortality estimates, which are used, in part, to generate fishing mortality rates are poorly described and are not current.

## **Stock Status and Biological Reference Points**

The Atlantic surfclam stock assessment was peer reviewed and approved for management at SAW 61 (NEFSC 2016, 2017). A statistical catch at age and length model called SS3 was used and incorporated age and length structure, and was conducted as two assessment area pieces and then combined (NEFSC 2016, 2017). More detailed descriptions of the stock assessment are available in the SAW 61 documents (i.e., summary, report, SARC panel reviews) available at: <http://www.nefsc.noaa.gov/saw>.

New SAW 61 biological reference points were developed and revised from the prior SAW. The new reference points are ratios rather than absolute values. This approach allows for conclusions about the status of the surfclam stock despite substantial uncertainty in the actual biomass of the stock.

- $SSB/SSB_{Target} = 2$  is the new biomass target (or  $SSB_{MSY-Proxy}$ ), where  $SSB_{Target}$  is calculated as  $SSB_0/2$ ,
- $SSB/SSB_{Threshold} = 1$  is the new minimum stock size threshold which defines overfished status, where  $SSB_{Threshold}$  is calculated as  $SSB_0/4$ ,
- $F/F_{Threshold} = 1$  is the new fishing mortality threshold which defines overfishing, where  $F_{threshold}$  is calculated as 4.136 times the mean  $F$  during 1982-2015.

The Atlantic surfclam stock was not overfished in 2015 (NEFSC 2016). Based on recommended reference points for the whole stock which use spawning stock biomass (SSB), estimated  $SSB_{2015}/SSB_{Threshold} = 2.54$  (probability overfished < 0.01). Overfishing did not occur in 2015 (NEFSC 2016). Based on new recommended reference points, estimated  $F_{2015}/F_{Threshold} = 0.295$  (probability overfished < 0.01).

**Basis for 2018-2020 ABC Recommendation**

Staff recommend measures be developed for 3-years.

Projections from the SAW 61 report (NEFSC 2016) provided estimates of OFLs for 2018-2020 (NEFSC 2016). If the SSC considered surfclam to be a typical stock and applied the previous methods that include an SSC-modified OFL probability distribution and an assumed lognormal OFL distribution with a CV = 100%, the ABCs would be calculated as given here.

<b>Year</b>	<b>OFL (mt)</b>	<b>ABC (mt)</b>	<b>SSB/SSB<sub>Threshold</sub> (ratio)</b>	<b>P (overfishing)</b>
<b>2018</b>	74,859	60,623	2.9	40%
<b>2019</b>	74,260	60,138	3.0	40%
<b>2020</b>	74,131	60,034	3.2	40%

However, staff does not recommend using the prior approaches to determine the OFL and ABC because the absolute estimates of spawning stock biomass, fishing mortality, and recruitment, are not considered reliable based on this assessment, and there is additional uncertainty due to combining these estimates for the northern and southern areas to produce whole stock estimates.

The assessment results are robust with respect to stock status, and suggest that the current catch levels are reasonable. Therefore, staff recommends setting the ABC based on maintaining catch levels that allow for the 26,218 mt quota which has been in place since 2004. Staff recommend an ABC = 29,363 each year for 2018-2020, which is the commercial quota of 26,218 mt plus an additional 12% for incidental mortality. Since 2010, the fishery has landed between 68% and 72% of the total commercial quota, and

the fishery has not landed 100% of the quota since 2003. The industry has indicated they are market limited.

<b>Staff Recommended</b>				
<b>Year</b>	<b>OFL (mt)</b>	<b>ABC (mt)</b>	<b>SSB/SSB<sub>Threshold</sub> (ratio)</b>	<b>P (overfishing)</b>
<b>2018</b>	Not Specified <sup>1</sup>	29,363	2.9	low
<b>2019</b>		29,363	3.1	low
<b>2020</b>		29,363	3.2	low

### Other Management Measures

#### *Catch and Landings Limits*

In the FMP, the ABC=ACL=TAC and the Council specifies an ACT that accounts for management uncertainty and other relevant factors (Figure 1). Discards are assumed to be zero; however, there is an incidental fishing mortality rate of 12% that applies to landings (commercial quota).

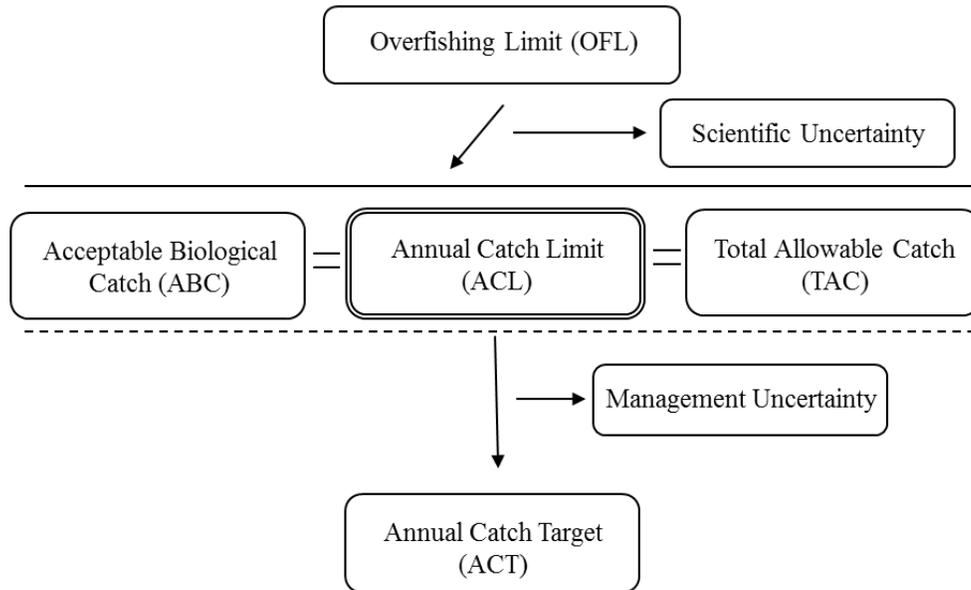
Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Because this is an ITQ fishery, and clams cannot be landed without cage tags, the implementation uncertainty is generally considered to be insignificant.

Catch is defined as the sum of landings, a 12% incidental mortality applied to landings, and discards (which are assumed to be 0). The ACL is equal to the ABC as prescribed in the FMP.

Staff recommend the ACT for each year of 2018-2020, be set at 29,363 mt, which results in a commercial quota of 26,218 mt (3.40 million bushels). This is the same ACT and commercial quota that was implemented for the 2014-2018 fishing years.

<sup>1</sup> OFL cannot be specified given current state of knowledge.

### Atlantic Surfclam Flowchart



**Figure 1. Atlantic surfclam catch limit structure.**

#### *Surfclam Minimum Size*

In the regulations it states that, "Upon recommendation of the MAFMC, the [NMFS] Regional Administrator [RA] may suspend annually, by publication in the Federal Register, the minimum shell-length standard, unless discard, catch, and survey data indicate that 30 percent of the surfclams are smaller than 4.75 inches (12.065 cm) and the overall reduced shell length is not attributable to beds where the growth of individual surfclams has been reduced because of density dependent factors."

Each year an analysis of the size composition of the landings is developed to inform the RA regarding minimum size regulations. The report titled, "Estimated Proportion of Undersized Surfclam Landings for 2016" (Hermsen 2016), indicates that:

An estimated 14.4% of the coast wide surfclam landings to date in 2016 were undersized. The lower and upper 95% confidence intervals (CI) for this estimate were 13.5% and 15.3%. However, it should be noted that there are regional differences. In the Delmarva statistical areas, the estimated percent of undersized clams in the landings is 31.3% (95% CI of 30.0-31.8%), New Jersey is 10.7% (95% CI of 10.6-10.7%), and Georges Bank is 8.7% (95% CI of 8.6-8.8%).

Staff recommend continued suspension of the minimum shell-length standard for 2018 given that the coastwide 30% threshold for suspension was not triggered. However, the Council should carefully review this information next year and consider issues related to the large numbers of undersized clams that are appearing in the landings in the Delmarva area.

### *Small Surfclam Areas*

The regulations state that, the "[NMFS] Regional Administrator [RA] may close an area to surfclams and ocean quahog fishing if he/she determines, based on logbook entries, processors' reports, survey cruises, or other information, that the area contains surfclams of which:

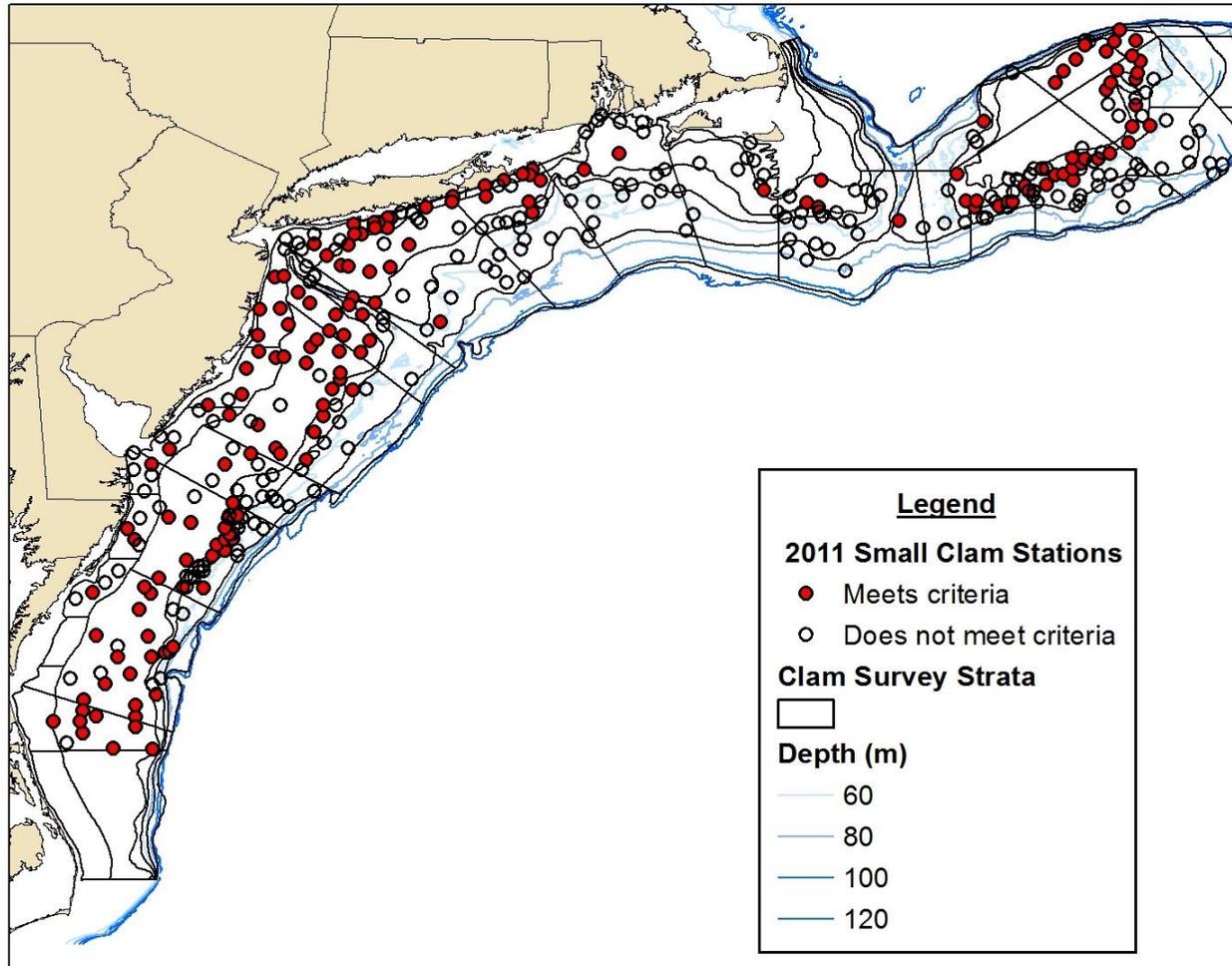
- (i) Sixty percent or more are smaller than 4.5 inches (11.43 cm); and
- (ii) Not more than 15 percent are larger than 5.5 inches (13.97 cm) in size."

The last time this provision was applied was during the 1980's with three area closures (Atlantic City, NJ, Ocean City, MD, and Chincoteague, VA), with the last of the three areas reopening in 1991.

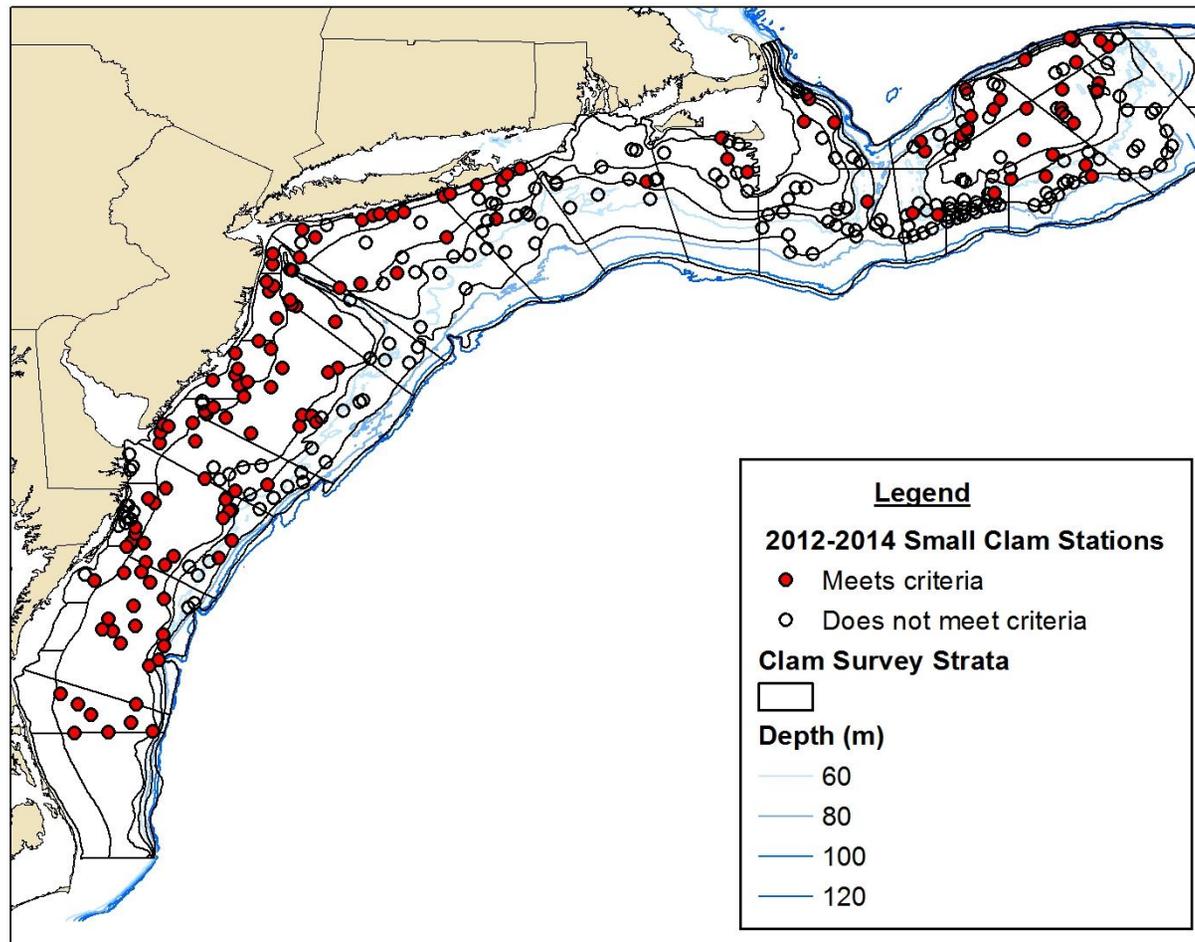
An analysis of surfclam size distribution has been provided by the NEFSC (Dan Hennen Pers. Comm., NEFSC 2017). Because the commercial fishing gear selects for larger clams and does not sample small clams well, fishery-dependent data would not be representative of the proportions at size in an area. The fishery-independent clam survey conducted by the NEFSC uses a dredge design which captures smaller surfclams, has randomly selected stations within each survey strata, and provide a sample of the proportions of small (<4.5 inches), large (> 4.5 inches and <5.5 inches), and extra-large clams (>5.5 inches) in the sampling strata. Stations within each strata that were candidates for the criteria listed in the regulations (see i and ii above) from the 2011, 2012-2014, and 2015-2016 clam surveys were mapped (Figures 2, 3, and 4).

In addition, industry has indicated that in 2015 they implemented two large, voluntary closures off Ocean City, MD and Point Pleasant, NJ (250 square miles) to protect small surfclams and to maximize their use of the resource. Details on the location of these closures have not been provided by industry and are unknown.

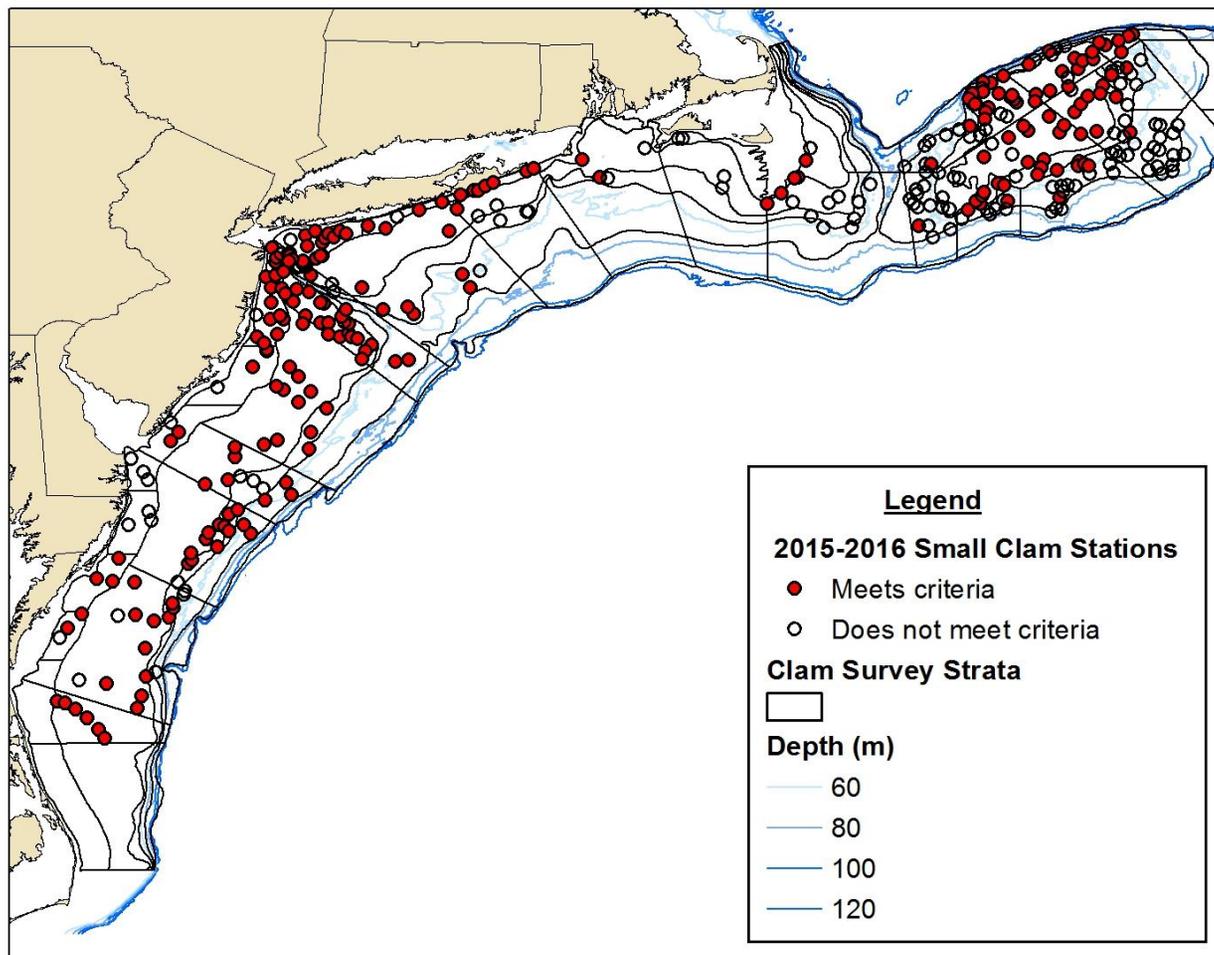
This information is presented so the Council can monitor changes in the distribution of surfclam size composition over time and determine if a closure is appropriate. Staff recommend the Council continue to monitor these spatial differences in the fishery.



**Figure 2. 2011 NEFSC Clam survey stations where surfclams sampled met the small clam area criteria. Source: Dan Hennen Pers. Comm., NEFSC 2017.**



**Figure 3. 2012-2014 NEFSC Clam survey stations where surfclams sampled met the small clam area criteria. Note: Although the selectivity was corrected for the new survey vessel/dredge used starting in 2012, this may not be exactly comparable to 2011 (Figure 1). Source: Dan Hennen Pers. Comm., NEFSC 2017.**



**Figure 4. 2015-2016 NEFSC Clam survey stations where surfclams sampled met the small clam area criteria. Note: Although the selectivity was corrected for the new survey vessel/dredge used starting in 2012, this may not be exactly comparable to 2011 (Figure 1). Source: Dan Hennen Pers. Comm., NEFSC 2017.**

## **References**

Hennen, Dan. Personal Communication. March 15, 2017. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

Hermesen, Jay. 2016. Estimated Proportion of Undersized Surfclam Landings for 2016. NOAA Fisheries Greater Atlantic Region Fisheries Office report dated August 30, 2016.

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