




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

September 7, 2021

MEMORANDUM FOR: Sarah Bland
Assistant Regional Administrator
for Sustainable Fisheries

FROM: David Gouveia 
Assistant Regional Administrator
for Analysis and Program Support

SUBJECT: Request for Calculation of Atlantic Surfclam Size Distribution

Per your request, my staff has reviewed the landings information and biological sampling data for Atlantic surfclams since the previous size analysis (August 2020 through July 2021), and determined the proportion of surfclams in the fishery smaller than 4.75 inches does not exceed the 30 percent trigger for suspending the minimum size requirement.

Please do not hesitate to contact me with any questions.

cc: Potts, Lanning, Sullivan



Estimated Proportion of Undersized Surfclam Landings for 2021

John Sullivan.
Analysis and Program Support Division
Greater Atlantic Regional Fisheries Office
National Marine Fisheries Service
September 3, 2021

Introduction

The Code of Federal Regulations includes a provision for the suspension of minimum landing size regulations for surfclam (*Spisula solidissima*) [CFR 50, §648.75 (b)(3)]:

“upon recommendation of the Mid-Atlantic Fishery Management Council (MAFMC), the Regional Administrator may suspend annually, by publication in the Federal Register, the minimum shell-height 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 height 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 surfclam landings is conducted to inform any recommendation by the Mid-Atlantic Council to the Regional Administrator concerning surfclam minimum size restrictions. The following report summarizes the analysis of Atlantic surfclam landings in 2021.

Data Sources and Procedures

Samples of surfclam landings were collected from the Georges Bank, New Jersey and DelMarVa stock areas. These samples were not evenly distributed and, therefore, had to be weighted by stock area and volume. The coast-wide distribution of undersized surfclams was then calculated.

The estimate for coast wide undersized surfclams landed was determined by calculating a weighted average proportion of undersized surfclams with equation 1:

$$\hat{P}_c = \left(\sum_{i=1}^n W_j \hat{P}_j \right) \quad (1)$$

where

\hat{P}_c is the estimated coast wide proportion of undersized surfclams landed

W_j is the proportion of landings from stock area j in the coast wide reported landings, as calculated with equation 2:

$$W_j = \frac{L_j}{\sum_1^3 L_j} \quad (2)$$

L_j is the volume landed (bushels) from stock area j

\hat{P}_j is the estimated proportion of undersized surfclams in stock area j , as calculated with equation 3

$$\hat{P}_j = \left(\sum_{i=1}^n w_{ij} p_{ij} \right) \quad (3)$$

w_{ij} is the proportion of the landings of sample i to total landings of all samples from stock area j , as calculated with equation 4:

$$w_{ij} = \frac{l_{ij}}{\sum_{i=1}^n l_{ij}} \quad (4)$$

l_{ij} is the volume (bushels) for sample i from stock area j

p_{ij} is the proportion of undersized surfclams in sample i from stock area j , as calculated with equation 5:

$$p_{ij} = \frac{x_{ij}}{n_{ij}} \quad (5)$$

n_{ij} is the number of surfclams in sample i from stock area j

x_{ij} is the number of surfclams <121 mm in size from sample i of stock area j

Once the coast wide weighted average proportion of undersized surfclams was determined, the coast wide variance of the proportional mean was calculated and used to determine the 95% confidence intervals around that estimate.

The variance estimate for the proportion of undersized coast wide landings was calculated using equation 6:

$$\text{var}(\hat{P}_c) = \sum_{j=1}^3 W_j^2 \times \text{var}(\hat{P}_j) \quad (6)$$

where

W_j is the proportion of all landings from stock area j to the coast wide landings from all three areas (Georges Bank, New Jersey and DelMarVa), as calculated with equation 2

$\text{var}(\hat{p}_j)$ is the variance associated with each stock area j estimated with equation 7:

$$\text{var}(\hat{p}_j) = \sum_{i=1}^n w_{ij}^2 \times \text{var}(\hat{p}_{ij}) \quad (7)$$

w_{ij} is the proportion of the landings of sample i to total landings of all samples from stock area j , as calculated with equation 4

$\text{var}(\hat{p}_{ij})$ is the variance of the proportion of sample i in stock area j estimated with equation 8:

$$\text{var}(\hat{p}_{ij}) = \frac{(p_{ij} \times (1 - p_{ij}))}{n_{ij}} \quad (8)$$

The 2021 sampling period extended from August 1, 2020 through July 31, 2021. Surfclam samples were collected from vessels fishing in Georges Bank statistical areas 521, 522, 525, 526, and 562; in New Jersey statistical areas 612, 613, and 615; and in DelMarVa statistical areas 621 and 622. A total of 96 samples from 22 distinct vessels were used for this analysis of the 2021 sampling period.

Two types of data were used in the analysis: (1) landings information and (2) biological sampling data. Surfclam landings data were collected as part of the Greater Atlantic Regional Fisheries Office mandatory reporting requirements. Vessel and dealer permit holders reported landed volume (bushels), vessel permit number, and fishing location, as well as other information from each vessel trip. This information provided landings data for the principle stock areas. Stakeholder Engagement Division (SED) field staff collected biological samples from selected vessels upon docking. Each sample consisted of shell height measurements from approximately 30 randomly selected individual surfclams. Fishing location of the sampled catch was recorded by SED field staff from information reported by the vessel operators. For length records that lacked area fished information, area fished was determined from the vessel log report for the trip or from the most recent available surfclam log report that included area fished for a particular vessel. Volume of the catch from which the sample was derived was pulled from vessel clam log data for the sampled trip. Oracle tables (sfocpr and sfocvr in the sfclam schema on the nero oracle server) were used to query and match vessel trip landings by date and permit

number. If vessel clam log data could not be matched to a sampled trip, dealer-reported volume information for the sampled trip was used. There were several instances where a sampled trip lacked volume landed information from either the vessel clam logs or dealer reports. The volume of these unmatched samples was estimated using the average number of bushels of surfclams landed on all trips by that vessel in fishing year 2021.

Landings information from the principal stock areas indicated that New Jersey landings made up approximately 43% of the coast wide catch. The remaining 57% of the catch came from the DelMarVa and Georges Bank stock areas (Table 1).

Table 1. FY2021 Landings of surfclams reported by vessels August 1, 2020 – July 31, 2021.

Stock area	Reported Landings (bushels) August, 2020 - July, 2021	Meat weight of reported landings (lbs.)	Percent of reported landings
Georges Bank	519,421	8,830,157	34.7%
New Jersey	646,270	10,986,590	43.1%
DelMarVa	332,448	5,651,616	22.2%
Grand Total	1,498,139	25,468,363	100.0%

The nominal length distribution of all biological samples obtained from August 1, 2020 – July 31, 2021 indicated that the majority of surfclams sampled were equal to or larger than 121 mm. The mean length of the coast wide samples was 137 mm (Figure 1).

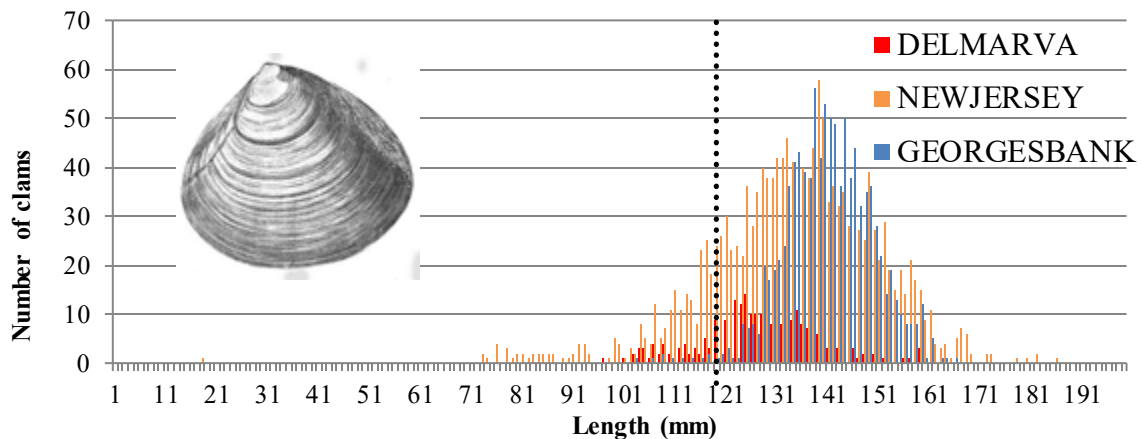


Figure 1. Length frequency distribution of surfclams from dockside sampling for FY2021. The dashed vertical line separates surfclams above and below 121 mm.

The 96 samples used in this analysis contained 2876 measured surfclams, of which 332 individual surfclams were undersized. 10 of the 96 samples collected had 30% or more

undersized surfclams; 7 of those samples came from the New Jersey's stock area, 2 came from DelMarVa, no samples with 30% or more undersized surfclams came from the George's Bank stock area (Table 2).

Table 2. Description of the 96 individual surfclam samples collected in 2021, with the proportion of undersized surfclams in each sample.

Sample Number	Stock Area	Number of surfclams in sample	Proportion of undersized surfclams*	Volume of catch (bushels)
1	DelMarVa	30	0.07	960
2	DelMarVa	30	0.03	960
3	DelMarVa	30	0.23	928
4	DelMarVa	30	0.03	960
5	DelMarVa	30	0.30	960
6	DelMarVa	30	0.23	1024
7	DelMarVa	30	0.03	1440
8	DelMarVa	30	0.20	1024
9	DelMarVa	30	0.90	3584
10	Georges Bank	30	0.00	640
11	Georges Bank	30	0.03	3008
12	Georges Bank	30	0.07	3008
13	Georges Bank	30	0.00	3524
14	Georges Bank	30	0.00	3040
15	Georges Bank	30	0.00	1952
16	Georges Bank	30	0.00	3840
17	Georges Bank	30	0.00	2400
18	Georges Bank	30	0.00	4288
19	Georges Bank	30	0.00	992
20	Georges Bank	30	0.00	3296
21	Georges Bank	30	0.00	4160
22	Georges Bank	30	0.03	896
23	Georges Bank	29	0.00	2080
24	Georges Bank	30	0.00	3680
25	Georges Bank	30	0.00	4800
26	Georges Bank	30	0.00	1472
27	Georges Bank	30	0.00	2400
28	Georges Bank	30	0.00	2496
29	Georges Bank	30	0.23	1024
30	Georges Bank	30	0.00	2880
31	Georges Bank	30	0.00	2880
32	Georges Bank	30	0.00	3776

33	Georges Bank	30	0.00	4064
34	Georges Bank	30	0.00	4104
35	Georges Bank	30	0.00	3552
36	Georges Bank	30	0.00	2496
37	Georges Bank	30	0.00	2624
38	Georges Bank	29	0.00	2624
39	Georges Bank	29	0.00	2432
40	Georges Bank	30	0.00	1344
41	Georges Bank	30	0.00	3524
42	Georges Bank	30	0.00	3456
43	Georges Bank	30	0.00	3648
44	New Jersey	30	0.13	736
45	New Jersey	30	0.27	704
46	New Jersey	30	0.17	1024
47	New Jersey	30	0.13	768
48	New Jersey	30	0.23	960
49	New Jersey	30	0.07	1024
50	New Jersey	30	0.13	960
51	New Jersey	30	0.20	960
52	New Jersey	30	0.33	960
53	New Jersey	30	0.23	960
54	New Jersey	30	0.03	704
55	New Jersey	30	0.00	992
56	New Jersey	30	0.13	1408
57	New Jersey	30	0.13	960
58	New Jersey	30	0.03	1408
59	New Jersey	30	0.40	1536
60	New Jersey	30	0.03	1344
61	New Jersey	30	0.10	1344
62	New Jersey	30	0.30	800
63	New Jersey	30	0.03	480
64	New Jersey	30	0.23	960
65	New Jersey	30	0.07	960
66	New Jersey	30	0.33	1472
67	New Jersey	30	0.17	1408
68	New Jersey	30	0.00	576
69	New Jersey	30	0.17	1120
70	New Jersey	30	0.00	576
71	New Jersey	30	0.07	3244
72	New Jersey	30	0.00	512
73	New Jersey	29	0.21	960

74	New Jersey	30	0.00	608
75	New Jersey	30	0.13	1792
76	New Jersey	30	0.10	480
77	New Jersey	30	0.07	768
78	New Jersey	30	0.27	3072
79	New Jersey	30	0.30	2400
80	New Jersey	30	0.13	960
81	New Jersey	30	0.27	1760
82	New Jersey	30	0.07	1376
83	New Jersey	30	0.13	544
84	New Jersey	30	0.07	960
85	New Jersey	30	0.00	768
86	New Jersey	30	0.13	896
87	New Jersey	30	0.47	1408
88	New Jersey	30	0.13	864
89	New Jersey	30	0.23	960
90	New Jersey	30	1.00	2080
91	New Jersey	30	0.07	960
92	New Jersey	30	0.10	896
93	New Jersey	30	0.43	1888
94	New Jersey	30	0.00	736
95	New Jersey	30	0.17	704
96	New Jersey	30	0.07	640

*samples with more than 30% undersized surfclams are highlighted.

Estimation Results

An estimated 16.9% of the coast wide surfclam landings to date in 2021 were undersized. The lower and upper 95% confidence bounds for this estimate were 16.2% and 17.6%. These estimates are below the 30% maximum that would preclude the Regional Administrator from suspending the minimum shell height standard (Table 3).

Table 3. Proportional distribution of 2021 undersized surfclams by area and coast-wide.

Area	Estimated percentage of surfclams <121 mm	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Georges Bank	0.6%	0.6%	0.6%
New Jersey	19.9%	19.7%	20.0%
DelMarVa	36.6%	36.3%	37.0%
Coast-wide*	16.9%	16.2%	17.6%

* weighted mean