



Atlantic Surfclam Fishery Information Document

April 2023

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for Atlantic surfclam with an emphasis on 2022. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) databases with fishery-dependent and fishery independent information (i.e., surveys) and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit <https://www.mafmc.org/surfclams-quahogs>.

Key Facts

- There has been no change to the status of the Atlantic surfclam stock. The stock was not overfished and overfishing was not occurring in 2019.
- The total ex-vessel value of the 2022 federal harvest was approximately \$28 million, higher than the \$24 million in 2021.
- In 2021, there were 8 companies reporting purchases of surfclam and/or ocean quahog in 5 states outside of Maine.
- Overall, surfclam landings per unit effort has declined over time as more dense areas are fished down, including declines on Georges Bank. The fishery appears to continue to shift its effort Northward, although they have resumed fishing on clam beds in the Delmarva.

Basic Biology

Information on Atlantic surfclam biology can be found in the document titled, “Essential Fish Habitat Source Document: Surfclam, *Spisula solidissima*, Life History and Habitat Requirements” (Cargnelli et al. 1999).¹ An electronic version is available at the following website: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast>. Additional information on this species is available at the following website: <https://www.fishwatch.gov/>. A summary of the basic biology is provided below.

Atlantic surfclam are distributed along the western North Atlantic Ocean from the southern Gulf of St. Lawrence to Cape Hatteras. Surfclam occur in both the state territorial waters (≤ 3 miles from shore) and within the Exclusive Economic Zone (EEZ; 3-200 miles from shore). Commercial concentrations are found primarily off New Jersey, the Delmarva Peninsula, and on Georges Bank. In the Mid-Atlantic region, surfclam are found from the intertidal zone to a depth of about 60 meters (197 ft), but densities are low at depths greater than 40 meters (131 ft).

The maximum size of surfclam is about 22.5 cm (8.9 inches) shell length, but surfclam larger than 20 cm (7.9 inches) are rare. The maximum age exceeds 30 years and surfclam of 15-20 years of age are common in many areas. Surfclam are capable of reproduction in their first year of life, although full maturity may not be reached until the second year. Eggs and sperm are shed directly into the water column. Recruitment to the bottom occurs after a planktonic larval period of about three weeks.

Atlantic surfclam are suspension feeders on phytoplankton and use siphons which are extended above the surface of the substrate to pump in water. Predators of surfclam include certain species of crabs, sea stars, snails, and other crustaceans, as well as fish predators such cod and haddock.

Status of the Stock

The most recent assessment of the Atlantic surfclam (*Spisula solidissima*) stock is a management track assessment of the existing 2016 benchmark Stock Synthesis (SS) assessment (SAW 61; NEFSC 2017).^{2,3} This management track assessment indicated the stock was not overfished and overfishing was not occurring (Figures 1-2). Retrospective adjustments were not made to the model results. Spawning stock biomass (SSB) in 2019 was estimated to be 1,222 ('000 mt) which is 119% of the biomass target ($SSB_{MSY\ proxy} = 1,027$; Figure 1). The 2019 fully selected fishing mortality was estimated to be 0.036 which is 25.8% of the overfishing threshold proxy ($F_{MSY\ proxy} = 0.141$; Figure 2).

Management System and Fishery Performance

Management

There have been no major changes to the overall management system since the Individual Fishing Quota (ITQ) system was implemented in 1990. The Fishery Management Plan (FMP) for Atlantic surfclam (*Spisula solidissima*) became effective in 1977. The FMP established the management unit as all Atlantic surfclam in the Atlantic EEZ. The FMP is managed by the Mid-Atlantic Fishery Management Council (Council), in conjunction with the NMFS as the Federal implementation and enforcement entity. The primary management tool is the specification of an annual quota, which is allocated to the holders of allocation shares (ITQs) at the beginning of each calendar year as specified in Amendment 8 to the FMP (1988). In addition to the Federal water fishery, there is a small fishery prosecuted in the state waters of New York, New Jersey, and Massachusetts. The FMP, including subsequent Amendments and Frameworks, is available on the Council website at: <https://www.mafmc.org/>.

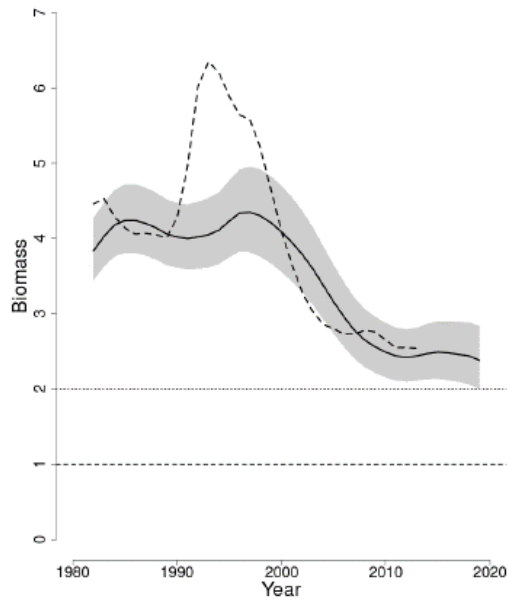


Figure 1. Trends in spawning stock biomass of Atlantic surfclam between 1982 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ ($\frac{1}{2} SSB_{MSY}$ proxy; horizontal dashed line) as well as SSB_{Target} (SSB_{MSY} proxy; horizontal dotted line) based on the 2020 assessment. Units of SSB are the ratio of annual biomass to the biomass threshold ($SSB/SSB_{Threshold}$). The approximate 90% lognormal confidence intervals are shown.³

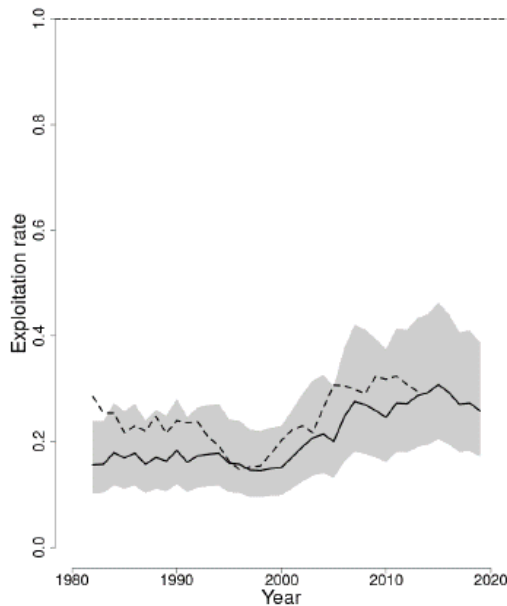


Figure 2. Trends in the fully selected fishing mortality (F_{Full}) of Atlantic surf-clam between 1982 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding $F_{Threshold}$ (F_{MSY} proxy=0.141; horizontal dashed line), based on the 2020 assessment. Units of fishing mortality are the ratio of annual F to the F threshold ($F/F_{Threshold}$). The approximate 90% lognormal confidence intervals are shown.³

Commercial Fishery

The commercial fishery for surfclam in Federal waters is prosecuted with large vessels and hydraulic dredges. Surfclam landings and commercial quotas, and overall landings per unit effort are given in Table 1 and Figures 3-5. Because of recent database changes, the following sources were used for landings and are reflected in the tables and figures. Total landings for 1965-1981 are from NEFSC (2003) and other years were from a dealer database (CFDBS). CAMS landings are the CAMS LNDLB landings converted to mt. EEZ landings for 1965-1982 are from NEFSC (2003) while later years are from a logbook database (SFOQVR). Landings for state waters are approximated as total landings – EEZ landings and may not accurately reflect state landings. All calculations use the CAMS LNDLB values for total landings. The distribution of the fishery has changed over time, as shown in Figures 6-8, with a shift to increased landings in Southern New England and Georges Bank areas, although fishing has increased in an area off the Delmarva.

Figure 9 provides the distribution of surfclam landings in “important” ten minute squares (TMSQ). Important means that a square ranked in the top 10 TMSQ for total landings during any five-year period (1980-1984, 1985-1989, ...). Data for 2022 are incomplete and preliminary and included in the last time block. Additional information of the length composition of port sampled surfclam, and their associated sample sizes by area, are available in the stock assessment reports and management track assessment provided.³

Non-target species are those caught incidentally and they may be retained or discarded. The estimated bycatch of non-targeted species by the surfclam and ocean quahog fisheries is based on observer data, which is very limited. The dominant bycatch species generally include sea scallops, skates, monkfish, stargazers, crabs, and snails. The surfclam fishery also discards ocean quahog, and the ocean quahog fishery discards surfclam.

The Greater Atlantic Regional Fisheries Office reviews landings information and biological sampling data for surfclams each year. In the regulations, the Regional Administrator may suspend the surfclam minimum size at the request of the Council, if the data indicate that 30 percent or less of the surfclams landed are smaller than 4.75 inches (12.065 cm). An estimated 27.6 percent of the coast wide surfclam landings to date in 2022 (August 2021 through July 2022) were undersized. The lower and upper 95 percent confidence bounds for this estimate were 25.4 percent and 29.8 percent.

Port and Community Description

Communities from Maine to Virginia are involved in the harvesting and processing of surfclam and ocean quahog. For surfclam and ocean quahog, there used to be occasional landings in Ocean City, MD, but with fuel prices and trucking issues they are not occurring anymore. It used to be significant but is no longer. Cape May and Wildwood, NJ are no longer significant. Most of the fleet is fishing out of Point Pleasant and Atlantic City, NJ, Oceanview, NY, and New Bedford and Fairhaven, MA. Hyannis, MA (surfclam only) landings have been recently reduced. Cape Charles, VA is a revived port of landings targeting surfclams off the Virginia coast. Trucking costs and the distance needed to travel to harvest clams has put greater economy on scale and location.

Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City and Point Pleasant, New Jersey, and New Bedford, Massachusetts. There are also landings in Ocean City, Maryland, and the Jonesport and Beals Island areas of Maine. Additional

information on "Snapshots of Human Communities and Fisheries in the Northeast" can be found at: <https://fish.nefsc.noaa.gov/read/socialsci/communitySnapshots.php>.

Table 1. Federal surfclam catch limits and landings: 2018-2024. Landings for state waters can be approximated as total landings – EEZ landings and may not accurately reflect state landings.

Year	OFL (mt)	ABC/ACL (mt)	Total Landings ^d (mt meats; w/state waters)	Total CAMS Landings ^e (mt meats w/state waters)	EEZ Landings (mt meats)	EEZ Landings ^{a,f} ('000 bu)	EEZ Quota ('000 bu)	% Quota Harvested
2018	Not specified ^b	29,363 ^b	17,114	17,169	16,287	2,112	3,400	62%
2019	74,281 ^c	56,419 ^c	16,502	16,899	14,986	1,943	3,400	57%
2020	74,110 ^c	56,289 ^c	12,897	16,480	12,034	1,561	3,400	46%
2021	51,361	47,919	13,055	13,266	12,785	1,658	3,400	49%
2022	48,202	44,522	343 ^g	12,378	11,813	1,532	3,400	45%
2023	45,959	42,237	NA	NA	NA	NA	3,400	NA
2024	44,629	40,946	NA	NA	NA	NA	3,400	NA

^a1 surfclam bushel is approximately 17 lb. ^b Revised previous 2018 values due to new stock assessment. ^c Revised previous 2019-2020 values due to new analyses. ^d Total landings for 2018-2022 were from a dealer database (CFDBS). ^e CAMS landings for 2018-2022 are the CAMS LNDLB landings converted to mt. ^f EEZ landings for 2018-2022 are from a logbook database (SFOQVR). ^g Not up to date/accurate.

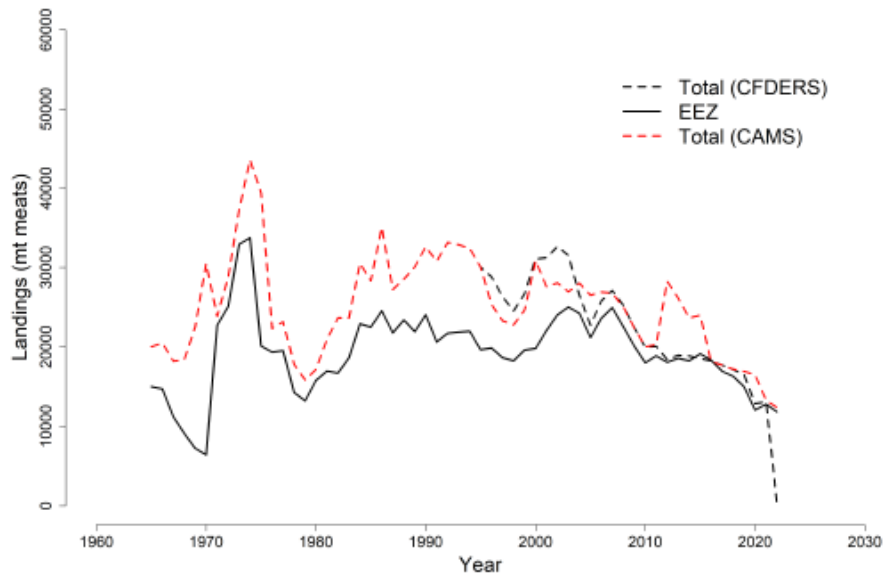


Figure 3. Surfclam landings (total and EEZ) during 1965-2022. EEZ landings for 1965-1982 are from NEFSC (2003) while later years are from a logbook database (SFOQVR). Total CAMS landings are the CAMS LNDLB landings converted to mt.⁴

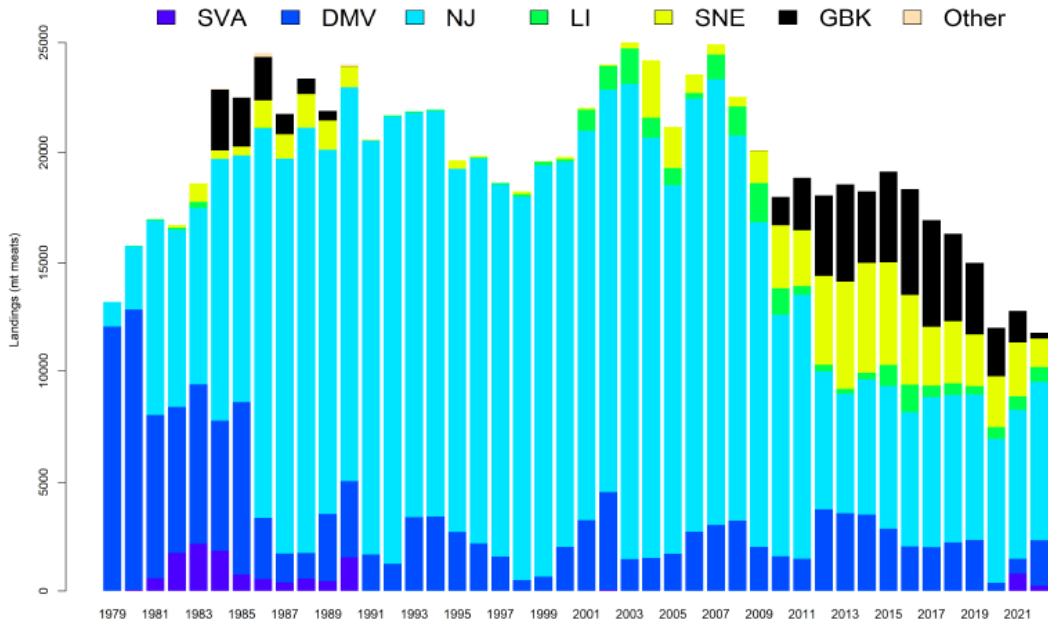


Figure 4. Surfclam landings from the US EEZ during 1979-2022. Landings are from are from a logbook database (SFOQVR).⁴

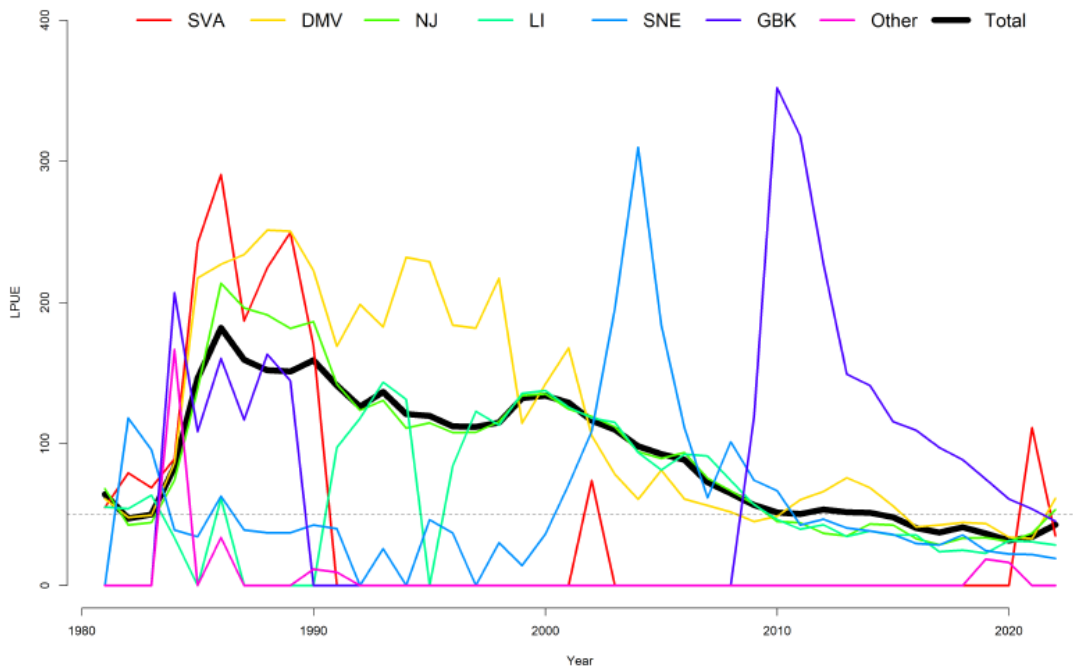


Figure 5. Nominal landings per unit effort (LPUE in bushels landed per hour fished) for surfclam, by region, during 1981-2022. LPUE is total landings in bushels divided by total fishing effort, as calculated from a logbook database (SFOQVR).⁴

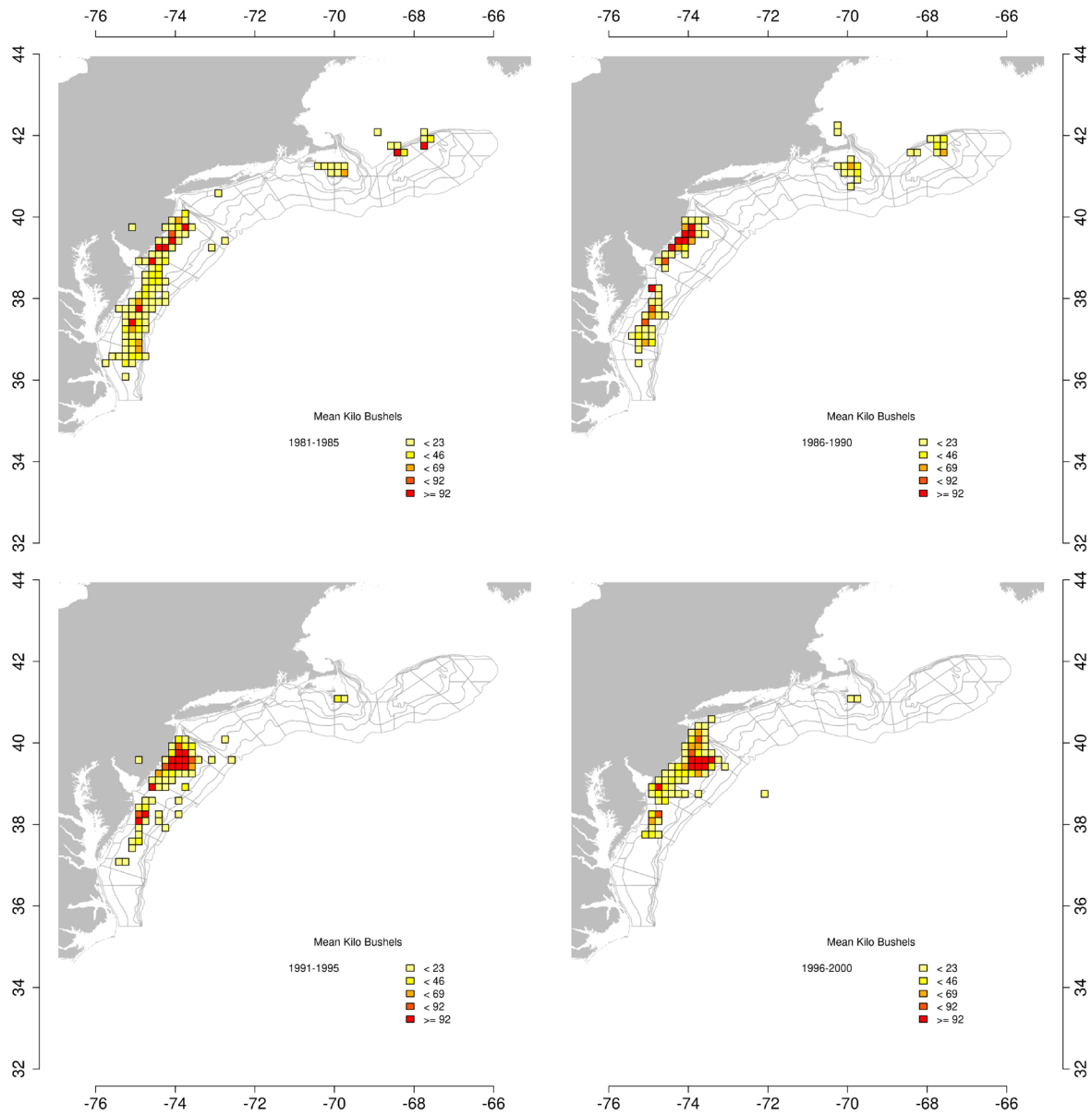


Figure 6. Average surfclam landings by ten-minute squares over time, 1981-2000 calculated from a logbook database (SFOQVR). Only squares where more the 5 kilo bushels were caught are shown.⁴

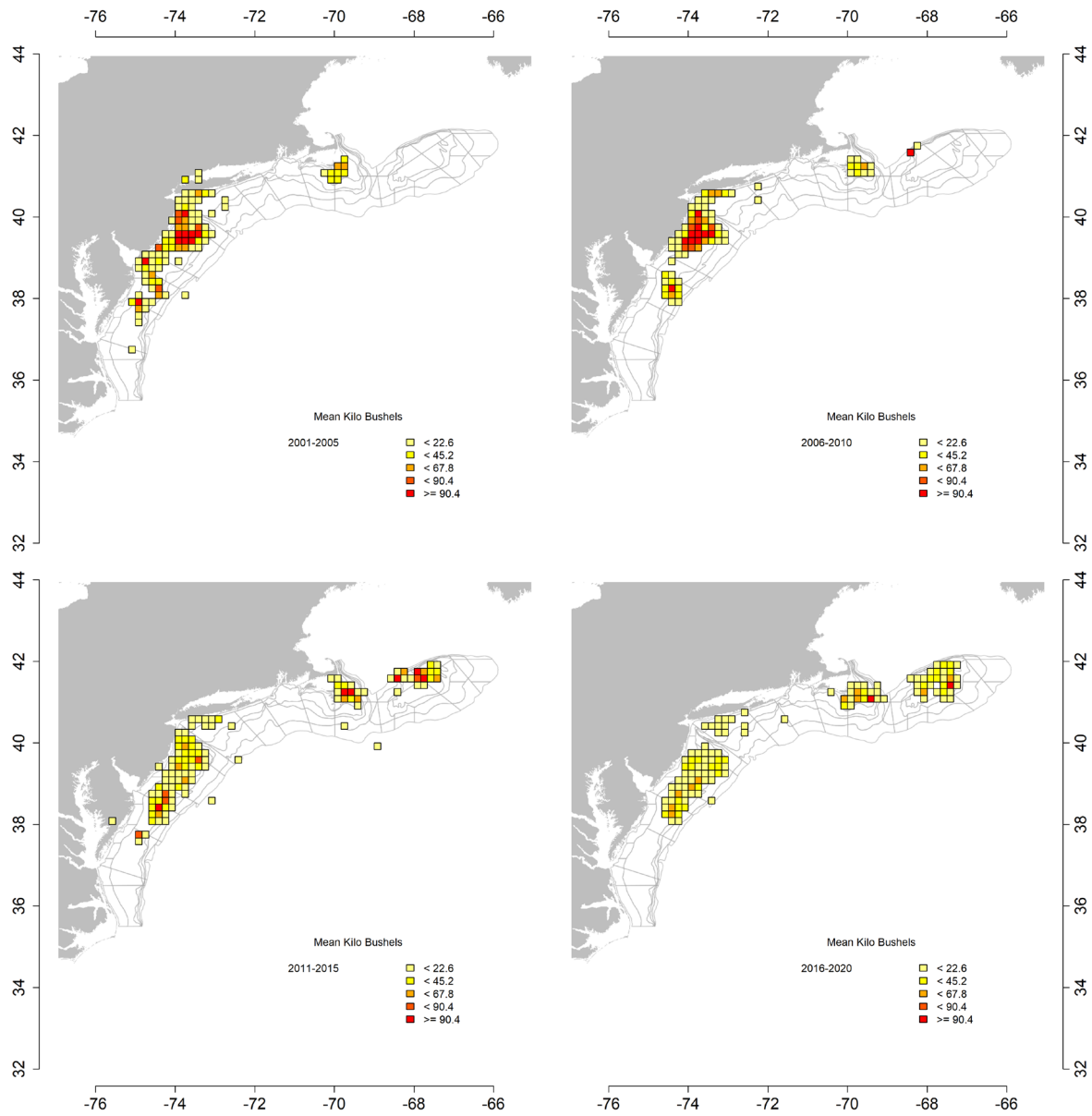


Figure 7. Average surfclam landings by ten-minute squares over time, 2001-2020 calculated from a logbook database (SFOQVR). Only squares where more the 5 kilo bushels were caught are shown.⁴

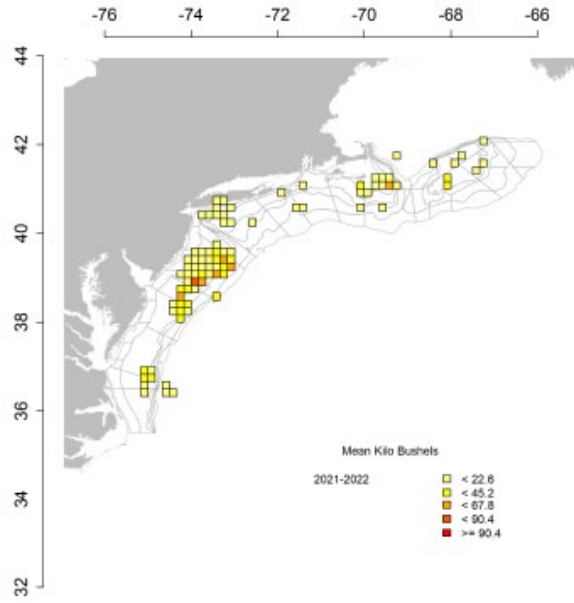


Figure 8. Average surfclam landings by ten-minute squares over time, 2021-2022 calculated from a logbook database (SFOQVR). Only squares where more the 5 kilo bushels were caught are shown.⁴

Surfclam landings for important 10-minute squares

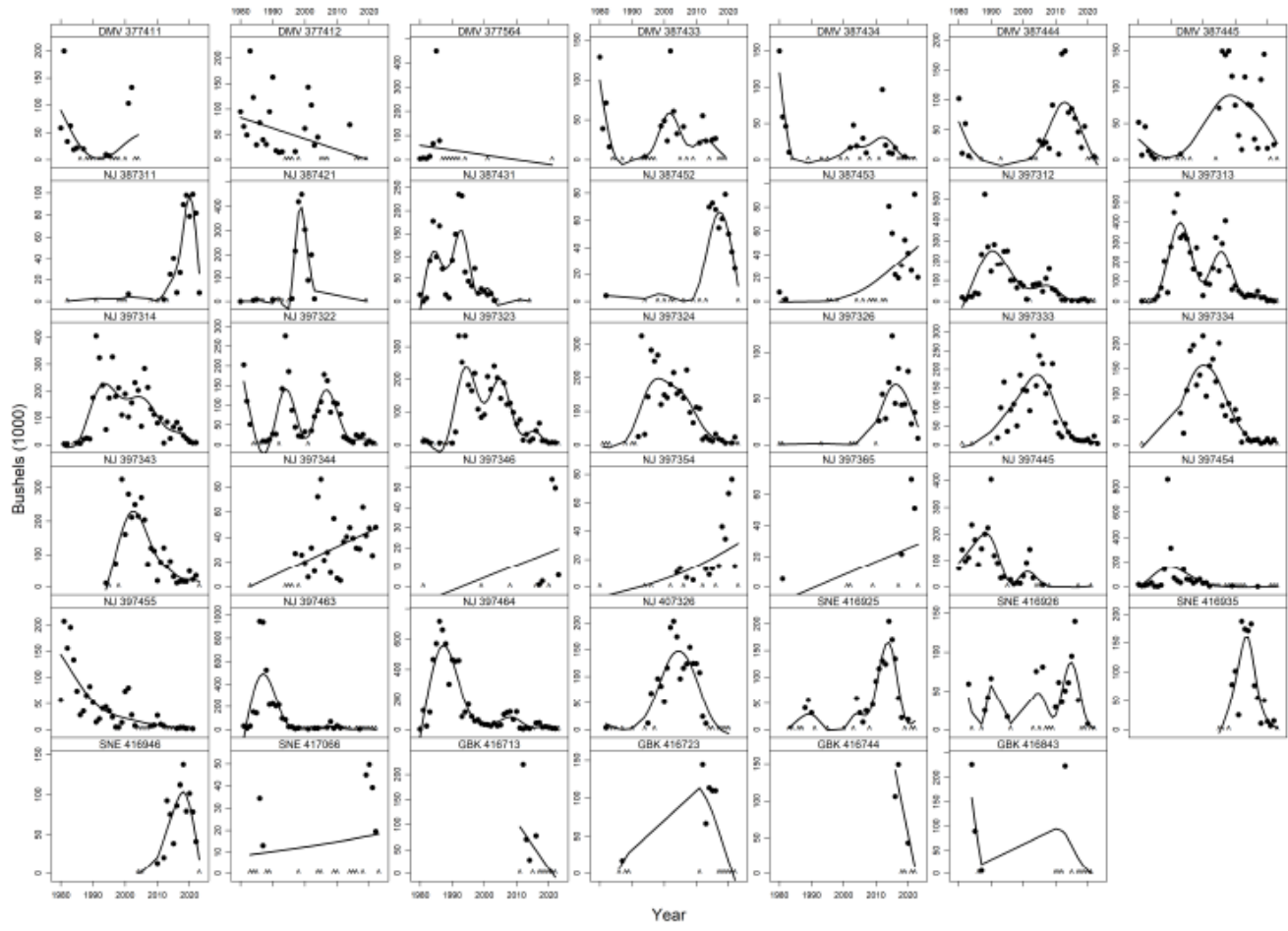


Figure 9. Annual surfclam landings in "important" ten minute squares (TNMS) during 1980-2022 based on logbook data. Important means that a square ranked in the top 10 TNMS for total landings during any five-year period (1980-1984, 1985-1989, ...). Data for 2022 are incomplete and preliminary. To protect the privacy of individual firms, data are not plotted if the number of vessels is less than 2. Instead, a "^" is shown on the x-axis to indicate where data are missing. The solid dark line is a spline intended to show trends. The spline was fit too all available data, including data not plotted.⁴

Federal Fleet Profile

The total number of vessels participating in the surfclam fishery has remained relatively stable in the recent decade, however there were fewer vessels harvesting surfclam or surfclam and ocean quahog in 2022 (Table 2). The average ex-vessel price of surfclams reported by processors was \$17.84 in 2022, higher than the \$14.88 per bushel seen in 2021. The total ex-vessel value of the 2021 federal harvest was approximately \$28 million, which is higher than \$24 million in 2021. Industry has described several factors that have affected their industry in their fishery performance reports. The distribution of LPUE in bushels per hour over time is shown in Figures 10-12.

Processing Sector

Even though this document describes the surfclam fishery, the information presented in this section regarding the processing sector is for both surfclam and ocean quahog as some of these facilities purchase/process both species.

In 2022, there were 8 companies reporting purchases of surfclam and/or ocean quahog in 5 states outside of Maine. Employment data for these specific firms are not available.

In 2022, these companies bought approximately \$28 million worth of surfclam and \$21 million worth of ocean quahog.

Area Closures

Areas can be closed to surfclam fishing if the abundance of small clams in an area meets certain threshold criteria. This small surfclam closure provision was applied during the 1980's with three area closures (off Atlantic City, NJ, Ocean City, MD, and Chincoteague, VA), with the last of the three areas reopening in 1991.

Fishing areas can also be closed for public health related issues due to environmental degradation or the toxins that cause paralytic shellfish poisoning (PSP). PSP is a public health concern for surfclam. PSP is caused by saxitoxins, produced by the alga *Alexandrium fundyense* (red tide). Surfclam on Georges Bank were not fished from 1990 to 2008 due to the risk of PSP. There was light fishing on Georges Bank in years 2009-2011 under an exempted fishing permit and LPUE in that area was substantially higher (5-7 times higher) than in other traditional fishing grounds, although those LPUEs have recently declined.

The Greater Atlantic Regional Fisheries Office reopened a portion of Georges Bank to the harvest of surfclam and ocean quahog beginning January 1, 2013 (77 FR 75057, December 19, 2012) under its authority in 50 CFR 648.76. Harvesting vessels must adhere to the adopted testing protocol from the National Shellfish Sanitation Program.

New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2 (OHA2) implemented measures that restricted access to the Great South Channel and Georges Shoal Habitat Management Areas. The surfclam fishery and mussel dredge fishery can operate in specific exemption areas year-round or seasonally in specific exemption areas. For additional information see: <https://www.fisheries.noaa.gov/action/habitat-clam-dredge-exemption-framework>.

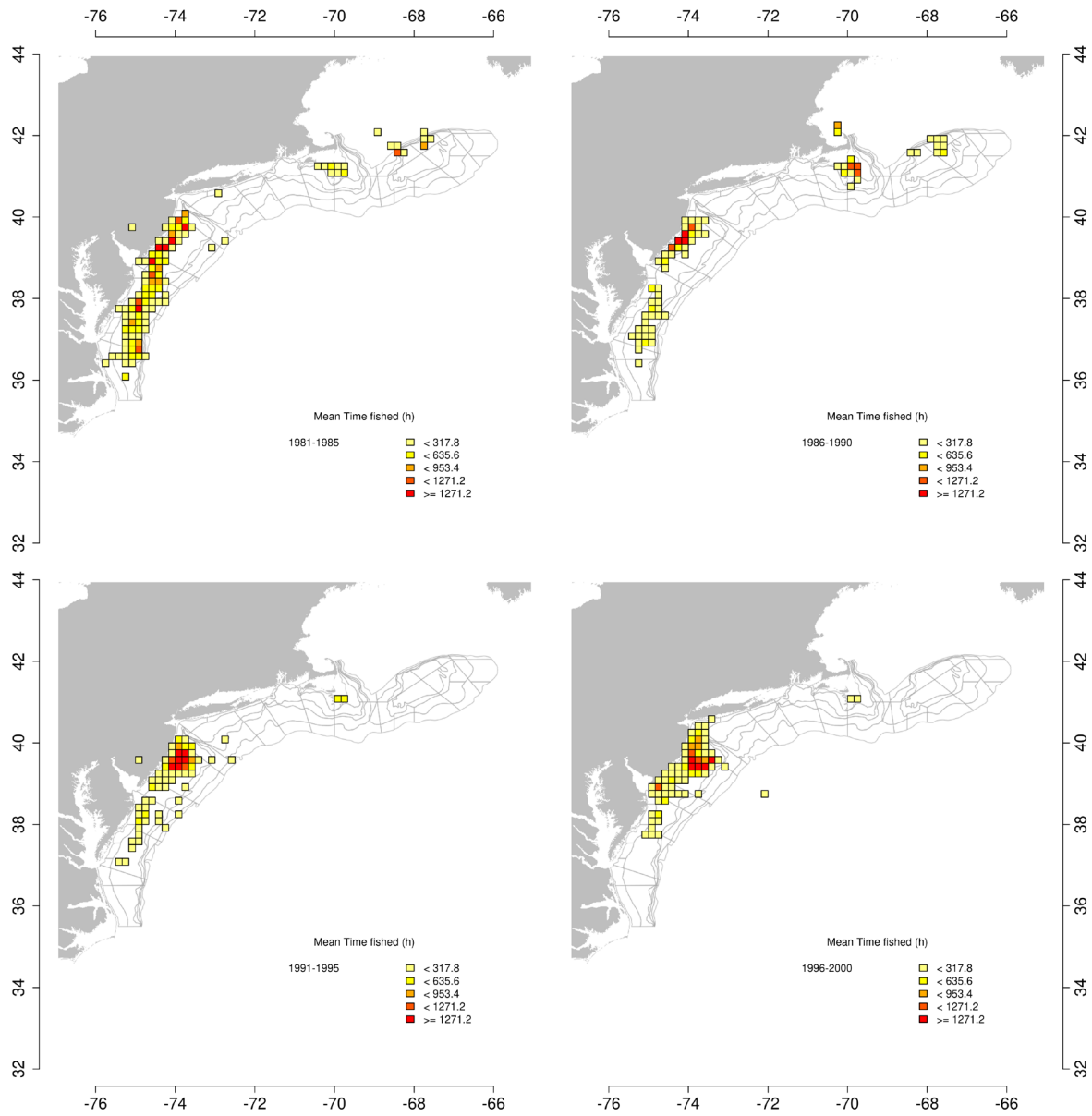


Figure 10. Average surfclam landings per unit effort (LPUE; bu. h^{-1}) by ten-minute squares over time, 1981-2000, as calculated from a logbook database (SFOQVR). Only squares where more the 5 kilo bushels were caught are shown.⁴

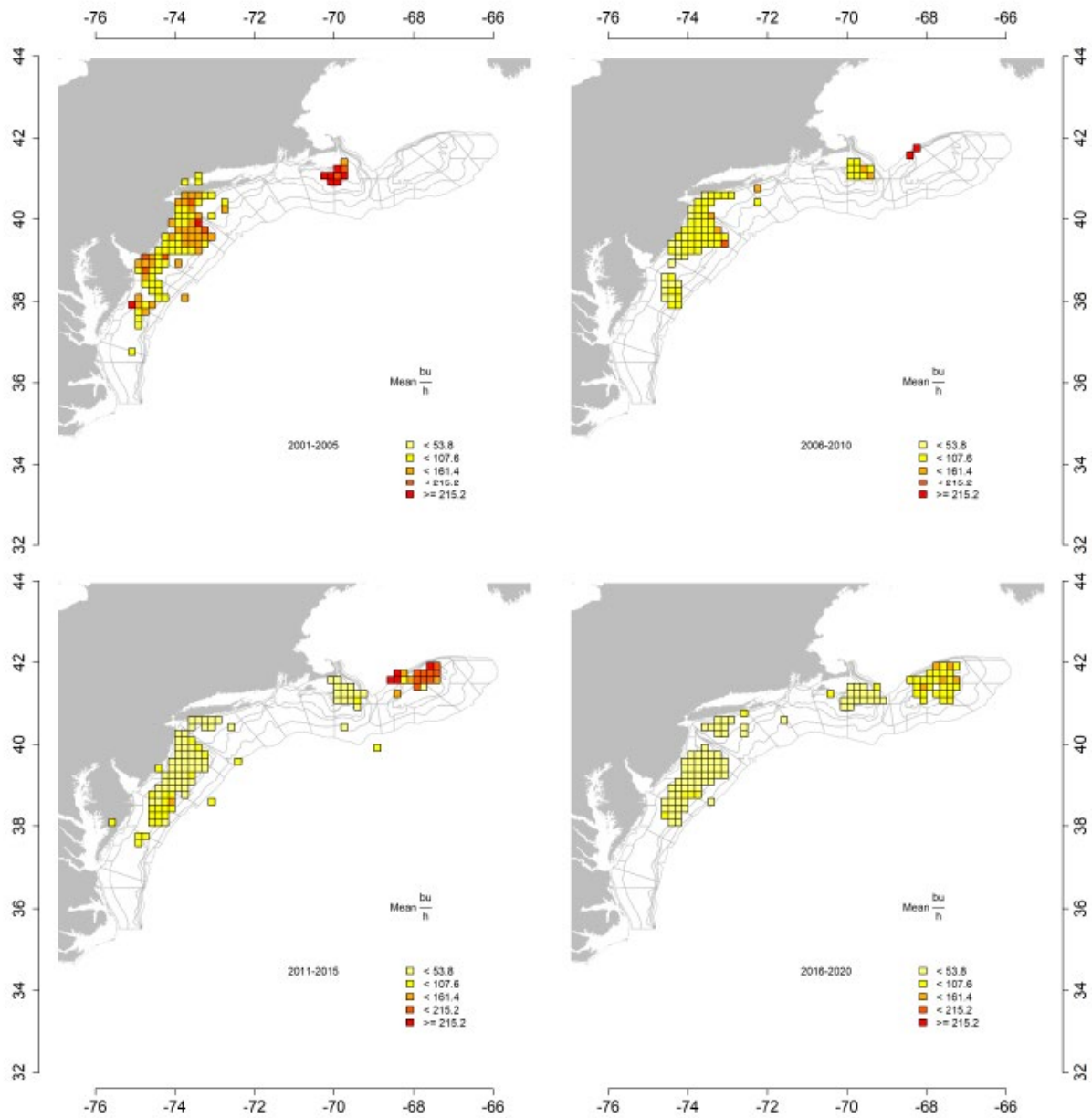


Figure 11. Average surfclam landings per unit effort (LPUE; bu. h⁻¹) by ten-minute squares over time, 2001-2020, as calculated from a logbook database (SFOQVR). Only squares where more the 5 kilo bushels were caught are shown.⁴

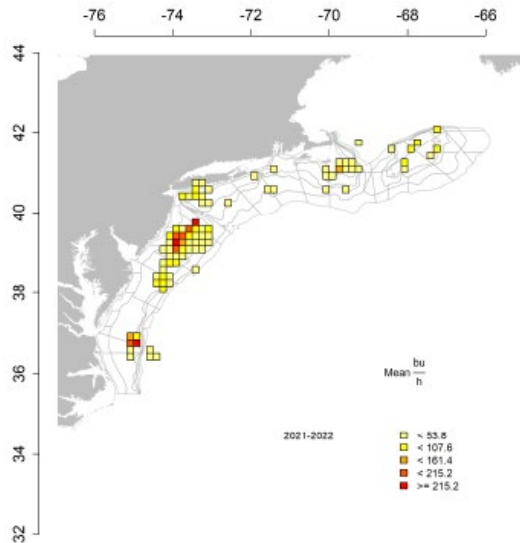


Figure 12. Average surfclam landings per unit effort (LPUE; bu. h-1) by ten-minute squares over time, 2021-2022, as calculated from a logbook database (SFOQVR). Only squares where more the 5 kilo bushels were caught are shown.⁴

Table 2. Federal fleet profile, 2012 through 2022.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Harvesting BOTH surfclam & ocean quahog	13	7	7	6	8	14	8	7	8	10	5
Harvesting only surfclam	29	33	31	31	30	26	31	36	35	31	28
Total Vessels	42	40	38	37	38	40	39	43	43	41	33

Source: NMFS clam vessel logbooks.

References

1. Cargnelli, L., S. Griesbach, D. Packer, and E. Weissberger. 1999. Essential Fish Habitat Source Document: Atlantic Surfclam, *Spisula solidissima*, Life History and Habitat Characteristics. NOAA Tech. Memo. NMFS-NE-142.
2. Northeast Fisheries Science Center. 2016. 61st Northeast Regional Stock Assessment Workshop (61st SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 16-13; 26 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://www.nefsc.noaa.gov/publications>.
3. Hennen, Dan. Personal Communication. June 14, 2020. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.
4. Hennen, Dan. Personal Communication. March 27, 2023. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.