Mid-Atlantic Fishery Management Council
Ocean Quahog Information Document - April 2017

Note: The ocean quahog stock was assessed and peer reviewed in February 2017. The following summarizes some of the information from the stock assessment, but not all; the full assessment reports can be referenced for additional details and are available at: http://www.mafmc.org/ssc-meetings/2017/may-17-18.

Management System

The Fishery Management Plan (FMP) for ocean quahog (*Arctica islandica)* became effective in 1977. The FMP established the management unit as all ocean quahog in the Atlantic Exclusive Economic Zone (EEZ). The FMP is managed by the Mid-Atlantic Fishery Management Council (Council), in conjunction with 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 (Individual Transferable Quotas - ITQs) at the beginning of each calendar year as specified in Amendment 8 to the FMP (1988). In addition to the Federal waters fishery, there is a small fishery prosecuted in the state waters of Maine. The FMP, including subsequent Amendments and Frameworks, is available on the Council website at: http://www.mafmc.org.

Basic Biology

Information on ocean quahog biology can be found in the document titled, "Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Requirements" (Cargnelli et al. 1999). An electronic version is available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh. Additional information on this species is available at the following website: http://www.fishwatch.gov. A summary of the basic biology is provided below.

The ocean quahog is a bivalve mollusk distributed in temperate and boreal waters on both sides of the North Atlantic Ocean. In the Northeast Atlantic, quahogs occur from Newfoundland to Cape Hatteras from depths of about 8 to 400 meters. Ocean quahogs further north occur closer to shore. The US stock resource is almost entirely within the EEZ (3-200 miles from shore), outside of state waters, and at depths between 20 and 80 meters. However, in the northern range, ocean quahogs inhabit waters closer to shore, such that the state of Maine has a small commercial fishery which includes beds within the state's territorial sea ($\leq$ 3 miles). Ocean quahogs burrow in a variety of substrates and are often associated with fine sand.

Ocean quahogs are one of the longest-living, slowest growing marine bivalves in the world. Under normal circumstances, they live to more than 100 years old. Ocean quahogs have been aged well in excess of 200 years. Growth tends to slow after age 20, which corresponds to the size currently harvested by the industry (approximately 3 inches). Size and age at sexual maturity are variable and poorly known. Studies in Icelandic waters indicate that 10, 50, and 90 percent of female ocean quahogs were sexually mature at 40, 64 and 88 mm (1.5, 2.5 and 3.5 inches) shell length or approximately 2, 19 and 61 years of age. Spawning occurs over a protracted interval

from summer through autumn. Free-floating larvae may drift far from their spawning location because they develop slowly and are planktonic for more than 30 days before settling. Major recruitment events appear to be separated by periods of decades.

Based on their growth, longevity and recruitment patterns, ocean quahogs are relatively unproductive and able to support only low levels of fishing. The current resource consists of individuals that accumulated over many decades.

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

Status of the Stock

The ocean quahog stock assessment was peer reviewed and approved for use by management at Stock Assessment Workshop 61 (SAW 63; February 2017). A statistical catch at length model called Stock Synthesis was used. Reports on "Stock Status," including assessment and reference point updates, SAW reports, and Stock Assessment Review Committee (SARC) panelist reports are available online at the NEFSC website: http://www.nefsc.noaa.gov/saw.

The ocean quahog was not overfished in 2016 (Figure 1; NEFSC 2017). Based on SAW/SARC-63 reference points from the 2017 assessment for the stock, estimated $SSB_{2016}/SSB_{Threshold} = 2.04$ (probability overfished < 0.01), where SSB is spawning stock biomass.

Overfishing did not occur in 2016 (Figure 2; NEFSC 2017). Based on SAW/SARC-63 reference points, estimated $F_{2016}/F_{Threshold} = 0.246$ (probability overfishing < 0.01), where F is fishing mortality rate.

There is little information about annual recruitment variability for ocean quahog. Model estimated recruitment has been stable and near unfished recruitment levels since 2000 (NEFSC 2017).

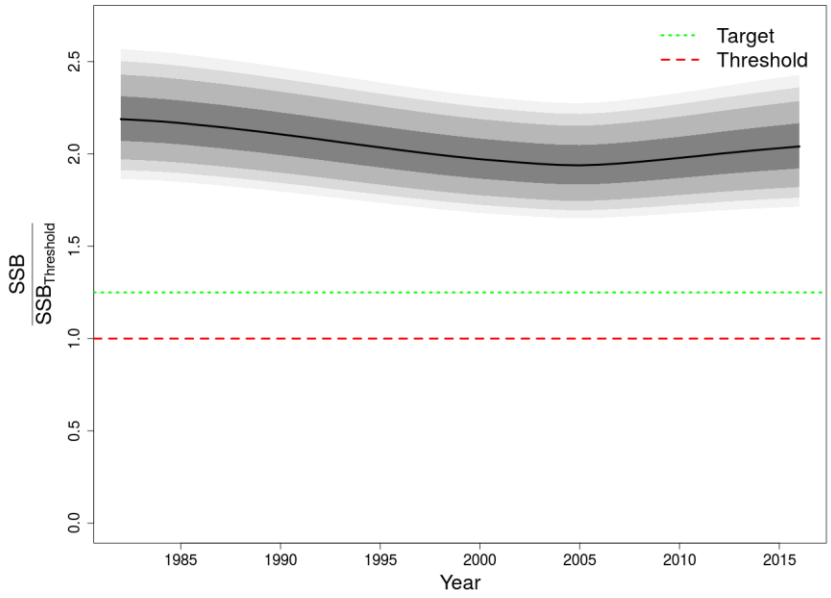

Figure 1. Trends in relative spawning stock biomass ($SSB/SSB_{Threshold}$) for the whole ocean quahog stock during 1982-2016 (NEFSC 2017). The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The green short-dash line at $SSB/SSB_{Threshold}$ = 1.25 is the management target. The red long-dash line at $SSB/SSB_{Threshold}$ = 1 is the level that defines an overfished stock.

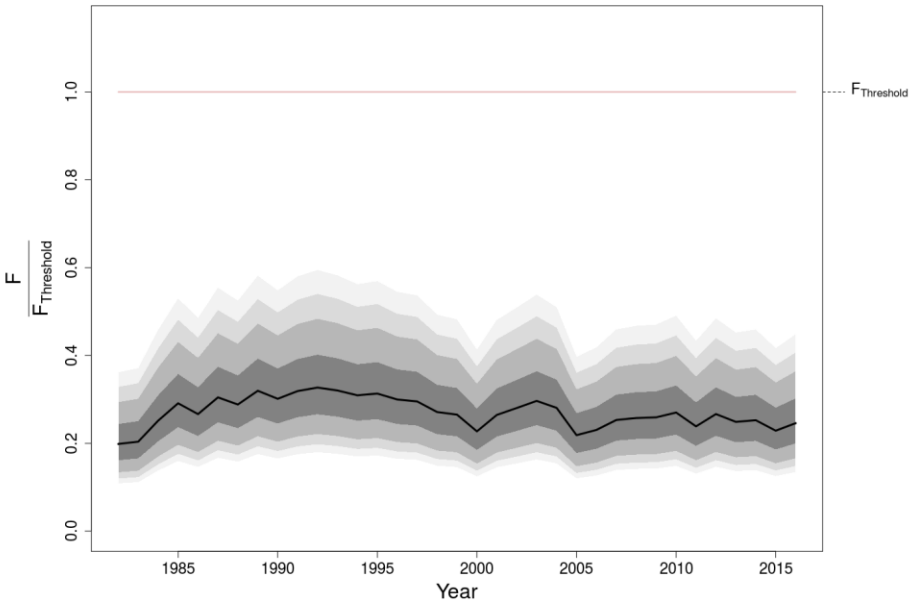

Figure 2. Trends in relative fishing mortality $F/F_{Threshold}$ for ocean quahog stock 1982-2016 (NEFSC 2017). The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The solid line at $F/F_{Threshold}$ = 1 is the new fishing mortality threshold reference point.

Description of the Fishery and Market

The commercial fishery for ocean quahog in Federal waters is prosecuted with large vessels and hydraulic dredges, and is very different from the small Maine fishery prosecuted with small vessels (35-45 ft) targeting quahogs for the local fresh, half shell market. Ocean quahog landings and commercial quotas are given below in Table 1 and Figure 3.

Table 1. Federal Ocean Quahog Quotas and Landings: 1998 - 2018.

Year	EEZ Landings (mt meats)	EEZ Landings[a] ('000 bu)	EEZ Quota ('000 bu)	% Harvested
1998	17,897	3,946	4,000	99%
1999	17,381	3,832	4,500	85%
2000	14,723	3,246	4,500	72%
2001	17,069	3,763	4,500	84%
2002	17,947	3,957	4,500	88%
2003	18,815	4,148	4,500	92%
2004	17,655	3,892	5,000	78%
2005	13,635	3,006	5,333	56%
2006	14,273	3,147	5,333	59%
2007	15,564	3,431	5,333	64%
2008	15,727	3,467	5,333	65%
2009	15,710	3,463	5,333	65%
2010	16,289	3,591	5,333	67%
2011[b]	14,332	3,160	5,333	59%
2012[b]	15,864	3,497	5,333	66%
2013[b]	14,721	3,245	5,333	61%
2014[c]	14,498	3,196	5,333	60%
2015[c]	13,639	3,007	5,333	56%
2016[c]	9,542[e]	2,104[e]	5,333	39% [e]
2017[d]	NA	NA	5,333	NA
2018[d]	NA	NA	5,333	NA

[a] 1 ocean quahog bushel is approximately 10 lb. [b] The Scientific and Statistical Committee (SSC) recommended an overfishing limit (OFL) for 2011-2013 = 34,800 mt, and an acceptable biological catch (ABC) = 26,100 mt. [c] For 2014-2016, the SSC did not recommend an OFL. They recommended a constant ABC of 26,100 mt, for 2014-2016. [d] For 2017-2018, the SSC did not recommend an OFL. They recommended a constant ABC of 26,100 mt, for 2017-2018. [e] Preliminary 2016 data. Source: NMFS clam vessel logbook reports (NEFSC 2017).

The distribution of the fishery has changed over time, with the bulk of the fishery from 1980-1990 being prosecuted off the Delmarva, to now being prosecuted in more Northern areas (Figures 3). Surfclams on Georges Bank were not fished from 1990 to 2008 due to the risk of paralytic shellfish poisoning (PSP).[1]

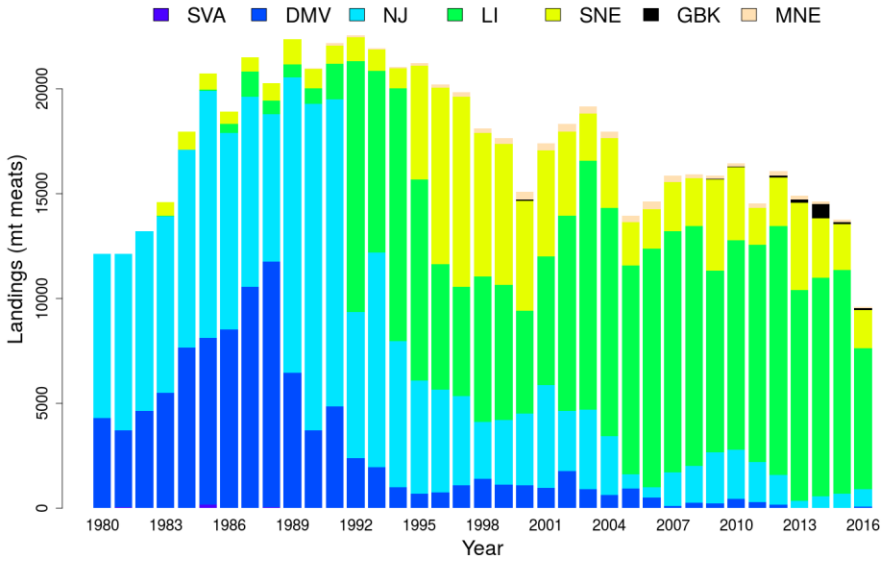

Figure 3. Landings for ocean quahogs by region during 1980-2016 (NEFSC 2017). Regions from north to south are abbreviated with MNE for Maine, GBK for Georges Bank, SNE for Southern New England, LI for Long Island, NJ for New Jersey, DMV for Delmarva, and SVA for Southern Virginia.

Port and Community Description

When Amendment 13 to the FMP was developed, the Council hired Dr. Bonnie McCay and her associates at Rutgers University to describe the ports and communities that are associated with the surfclam and ocean quahog fisheries. The researchers did an extensive job characterizing the three main fisheries (non-Maine ocean quahog, Maine ocean quahog, and surfclam). The McCay team characterizations of the ports and communities are based on government census and labor statistics and on observations and interviews carried out during the late 1990s and in the fall of 2001. The description of the fishing gear, areas fished, etc. are fully described in Amendment 13. Communities from Maine to Virginia are involved in the harvesting and processing of surfclams and ocean quahogs. 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. The small scale Maine fishery is entirely for ocean quahogs, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclams and ocean

[1] See Area Closure section for additional information.

quahogs, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products.

Additional information on "Community Profiles for the Northeast US Fisheries" can be found at: http://www.nefsc.noaa.gov/read/socialsci/communityProfiles.html.

Federal Fleet Profile

The total number of vessels participating in the ocean quahog fisheries outside the state of Maine has experienced a downward trend as the fisheries moved beyond a market crisis in 2005 where major users of clam meats reduced their purchases from industry and stopped advertising products like clam chowder in the media. Industry members reported that imported meat from Canada and Vietnam contributed to an oversupply of clam meats in the marketplace. The costs to vessels harvesting clams has increased due to the rising costs of insurance; industry has also indicated price of diesel fuel in conjunction with distance traveled to fish is a big factor determining trip cost. Trips harvesting quahogs have also increased in length as catch rates have declined steadily. The 30 or so vessels that reported landings during 2004 and 2005 has consolidated over time into fewer vessels. The Maine ocean quahog fleet numbers started to decline when fuel prices soared in mid-2008, and a decline in the availability of smaller clams consistent with the market demand (i.e., half-shell market), and totaled 8 vessels in 2016 (Table 2).

Table 2. Federal Fleet Profile, 2007 through 2016.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-Maine Vessels Harvesting BOTH surfclams & ocean quahogs	9	8	8	12	12	13	7	7	6	8
Non-Maine Vessels Harvesting only ocean quahogs	8	10	7	9	7	6	9	9	10	9
Total Non-Maine Vessels	17	18	15	21	19	19	16	16	16	17
Maine Ocean Quahog Vessels	24	22	19	15	13	12	11	9	8	8

Source: NMFS clam vessel logbooks.

The average ex-vessel price of non-Maine ocean quahogs reported by processors in 2016 was $7.17 per bushel, a few cents higer than the 2015 price ($7.12 per bushel). In 2016, about 3.0 million bushels of non-Maine ocean quahog, almost identical to 2015. The total ex-vessel value of the 2015 federal harvest outside of Maine was approximately $22 million, slightly higher than the $21 million in 2015.

In 2016, the Maine ocean quahog fleet harvested a total of 36,760 Maine bushels, a 68% decrease from the 121,373 bushels harvested in 2006, and an 12% decrease from the prior year (2015; 41,611 bushels). Average prices for Maine ocean quahogs have declined substantially over the past 10 years. In 2003, there were very few trips that sold for less than $37.00 per Maine bushel, and the mean price was $40.66. Prices have since been lower; industry has indicated it was the result of aggressive price cutting. In 2016, the mean price was $31.90 per Maine bushel. The value of the 2016 harvest reported by the purchasing dealers totaled $1.18 million, a decrease of 76% when compared to 2003.

Processing Sector

Even though this document describes the ocean quahog fisheries, the information presented in this section regarding the processing sector is for both surfclams and ocean quahogs as some of these facilities purchase/process both species. In 2016, there were 9 companies reporting purchases of surfclams and/or ocean quahogs from the industrial fisheries outside of Maine. They were distributed by state as indicated in Table 3. Employment data for these specific firms are not available. In 2015, these companies bought approximately $22 million worth of ocean quahogs and $31 million worth of surfclams.

Area Closures

Fishing areas can also be closed for public health related issues due to environmental degradation or the toxins that cause PSP. PSP is a public health concern for surfclams. PSP is caused by saxitoxins, produced by the alga *Alexandrium fundyense* (red tide). Surfclams 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. The Greater Atlantic Regional Fisheries Office reopened a portion of Georges Bank to the harvest of surfclams and ocean quahogs 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.

Table 3. Companies that reported buying ocean quahogs and surfclams (from NMFS surfclam/ocean quahog dealer report database) in 2016.

Number of Companies	MA	Other
	7	2

References

Cargnelli, L., S. Griesbach, D. Packer, and E. Weissberger. 1999. Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Characteristics. NOAA Tech. Memo. NMFS-NE-148.

Northeast Fisheries Science Center. 2017. 63rd Northeast Regional Stock Assessment Workshop (63rd SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-09; 28 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications.