Atlantic Surfclam and Ocean Quahog Fishery Performance Report

April 2023

The Mid-Atlantic Fishery Management Council's (Council) Atlantic Surfclam and Ocean Quahog (SCOQ) Advisory Panel (AP) met via webinar on April 13, 2023, to review the Fishery Information Documents and develop the following Fishery Performance Report (FPR). The primary purpose of this report is to contextualize catch histories for the Scientific and Statistical Committee (SSC) and Council by providing information about fishing effort, market trends, environmental changes, and other factors. A series of trigger questions listed below were posed to the AP to generate discussion of observations in these fisheries. Please note: Advisor comments described below are not necessarily consensus or majority statements; in those cases, differences in opinions may be noted.

Advisory Panel members present: Thomas Dameron, Peter Himchak, David O'Neill, Samuel Martin, Jeffrey Pike, Monte Rome, Joe Myers, and David Wallace.

Others present: Jessica Coakley and José Montañez (Council staff), Doug Potts (GARFO), Ed Houde (SSC Member), Matthew Moraller, Ron Larsen, and Will Shoup.

Trigger questions:

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

Critical Issues (not in any priority order)

Requests for Action to Council: The SCOQ advisors have raised several issues in past FPR documents that they would like to see the Council act on. They are concerned about the relevance of this document to the Council and its ability to manage these fisheries if the Council is not responsive to these issues and requests. The advisors request an update from the Council on how their requests are being followed up on or taken up for action.

Georges Bank Biotoxin Closures: Regulations for shellfish safety ("model ordinance regs.") have been updated by the Food and Drug Administration (FDA). However, NOAA Fisheries has not addressed these FDA changes on Georges Bank, which has hampered the ability of the clam fishing industry to access some fishing areas unnecessarily. NOAA Fisheries/GARFO has not yet coordinated with the FDA and acted to modify these unnecessary shellfish safety area closures in a timely manner. The AP requests the Council hold a meeting with NOAA Fisheries

leadership (Regional Administrator or others) and the appropriate public heath safety groups (NOAA Seafood Inspection), and its SCOQ advisors, to discuss prioritizing the implementation of the 2019 model ordinance regs. The advisors and industry are frustrated with the pace of work on this issue and are requesting additional support to expedite this process in this region for these clam fisheries.

Co-occurrence of Surfclam and Quahog: This continues to be an issue of concern for these fisheries given the increased frequency of mixed catches and the advisors concerns about enforcement of the requirements to target these species separately on fishing trips. The advisors are working to address the accountability issue for this fishery (monitoring and enforcement) while working through modifications to the outdated species separation requirement regulations through the SCOQ Species Separation Requirements Amendment under development by the Council.

Research: It is important that the Mid-Atlantic Council, and their representatives on the Habitat Committee and Habitat Plan Development Team (PDT), continue to support any research projects that would increase harvest opportunities within the Great South Channel Habitat Management Area (GSCHMA). The lack of access in this area is a challenge for industry and has negatively impacted catch rates in these fisheries. The advisors would like to see the Councils continue to work on this issue. Industry members are frustrated with their lack of ability to work through the Exempted Fishing Permit (EFP) program. The time components of the access areas (seasonal restrictions for cod) should be revisited. The SCOQ AP recognizes that the Councils have taken initial steps in this discussion, but this continues to be an issue and the industry does not feel it is being properly addressed. The AP requests that the MAFMC make this issue a priority under their responsibilities to the SCOQ Fishery Management Plan. The AP also recommends that the MAFMC follow up with NEFMC to conduct a cross Council workshop to, 1) review the management process in the GSCHMA, 2) better understand what research is being conducted in the area, 3) describe the process for ongoing management of these areas (as things change related to climate), and 4) develop a common understanding what this means for the process of managing these clam access areas in the GSCHMA. It is unclear what is essential for fish habitat in these areas and what data might be needed to address modifications to these clam access/HMA areas going forward. One of the areas that is presently allowed to be fished by clam vessels in the GSCHMA is called the Fishing Rip. This area, although open to fishing, is not a viable location due to the how hard the bottom structure is with boulders; it destroys gear. This highlights the critical nature of collecting and analyzing accurate data to identify effective areas for clam vessels to harvest surfclam.

In terms of MSA reauthorization, stronger requirements to review the Essential Fish Habitat (EFH) designations and any associated management measures (e.g., gear restricted areas, habitat closures) should be included in the statute to ensure these provisions are more responsive to the climate-related changes to the quality of the fish habitat, as well as changing conditions in the clam fisheries and other fisheries the Council manages.

Research should support a structure of ongoing EFH/Habitat Management Area (HMA) review that is responsive to new data collection, regardless of the source, and climate-driven species distributional changes. The development of a question driven process to periodically review

EFH/HMA status is needed and is not presently in place. In addition, the advisors note that HMAs tend to remain static, and dynamic range shifts of species occur, which can make the use of static HMA areas problematic.

Access to Fishing Grounds: The development of wind energy and aquaculture areas, protected marine areas and historic monuments, and other offshore ocean uses have become an even more critical issue for our industry. All these activities have the potential to reduce safe access to historically used fishing ground resulting in a greater concentration of fishing effort in smaller areas. There is a tremendous amount of overlap between the wind leases areas, wind call areas, and the current and potential future surfclam fishing grounds. This also has the potential to impact fishery independent survey operations.

Other Important Issues

The SCOQ AP would like to request that Fishery Management Act Teams (FMATs) be conveyed jointly with the AP for issues related to these fisheries.

Quotas

The advisors would like to see status quo quotas and the suspension of the surfclam minimum size limit for the upcoming fishing years. Surfclam are not overfished and overfishing is not occurring (in 2019). The quotas are set on the best available science and not necessarily economic conditions, and should continue to be set in that manner.

Market/Economic Conditions

In 2022, the Atlantic Surfclam and Ocean Quahog Fisheries were recertified through the Marine Stewardship Council (MSC). The MSC Fisheries Standard is used to assess if a fishery is well-managed and sustainable. To become MSC certified, fisheries voluntarily apply to be assessed against the MSC Fishery Standard. Fisheries are assessed by an independent, third-party auditor (not the MSC) and must prove they meet all three principles of the standard.

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 – those vessels are now fishing out of Cape May, NJ. There are some landings out of Wildwood, NJ. Most of the fleet is fishing out of Pt. Pleasant and Atlantic City, NJ, Oceanview, NY, and New Bedford and Fairhaven, MA. Hyannis, MA (surfclam only) landings have been reduced over the last few months. Cape Charles, VA is a revived port of landings targeting surfclam off the Virginia coast. Trucking costs and the distance needed to travel to harvest clams has put greater economy on scale and location.

Increasing foreign imports and foreign competition puts a constraint on price, and the price cannot be increased to absorb all the additional costs and still be competitive in the marketplace. Clearwater (clam company in Canada) has been sold to a new syndicate, so it has gone from a public to private entity – they are selling their product in the U.S. at a cheaper price and it is competing with domestic product. This is exerting additional pressure on the marketplace. The

limits to demand for clams in the market is driven by many market factors including foreign seafood competition, other products in the marketplace (e.g. chicken, etc.), shifting toward healthier market products (e.g. clam sushi, etc. versus a fried or cream-based product), and competition with other ingredients, as clams typically are not a center of the plate product. There are also some complicating factors related to U.S. relationships with China and the EU/Europe in terms of marketing and sales of clams, tariff, and sanitation equivalency issues. Massachusetts and Washington State clam landings can export now to certain European markets if on the FDA register – as other states are added, federal clams landed in those states could also export to Europe. There are two federal growing areas that are on the EU list – looking to expand the listing of approved federal waters for clams landed in Massachusetts. Exports for surfclam will be limited because there are not enough surfclam to meet domestic demand.

In 2022 the Bumble Bee Seafoods clam processing factory in Cape May experienced continued difficulty in securing the volume of clams needed to meet demand. While clam deliveries to the plant picked up in the later portion of 2022 due to improved weather conditions and availability of crew and vessels, for the first quarter of 2023 the plant is still making up for 2022 orders. Clam supply continues to slowly improve but at a drastically higher cost.

Environmental Conditions

Many species (including surfclam and ocean quahog) are moving northward and into deeper waters. This movement is temperature driven. Historically, about half the quota for quahog used to be taken in the Southern area. Surfclam are increasing in these Southern areas, possibly because of the faster growth rates for surfclam settling when compared to quahog. The natural shift in the stock distribution northwards has driven the movement of the fishery. For more details, see the Surfclam Fishery Information Document. The co-occurrence of surfclam and ocean quahog has led to issues for the industry because of the current specific separation requirements for fishing vessels.

General Fishing Trends

The landings per unit effort (LPUE) is not indicative of stock abundance because it only reflects the fishing occurring in a few ten-minute squares (see Fishery Information Documents). The LPUE has leveled off in recent years. Vessels fishing in Nantucket Shoals, which tend to be smaller vessels, are operating on seasonal closures and must fish in other areas when access is not available. Two fishing vessels were granted an EFP to operate in Closed Area II Scallop Access Area for– this activity will harvest and test clams in this area for Paralytic Shellfish Poisoning.

Fleet Capacity

Fleet capacity continues to stay static. The overall quotas are not being harvested. The driving factors are not from the marketplace. The issues are related to an inability to catch the quota to meet demand. While some processors indicated they are unable to demand the prices at which the products are sold because of contractual agreements, because the vendors essentially dictate the prices to the processors, other have indicated that in the current high demand environments

that consumers/purchasers are willing to pay more for the product and are negotiable. Fishing restrictions and regulations have limited the amount of capitalization that can be done in this fishery. The fleet continues to age, and there have been limited new builds, which has resulted in increased maintenance time spent to refurbish vessels.

Optimum Yield (OY)

The industry was comfortable with a maximum OY (maximum quota) of 3.4 million bushels for surfclam in terms of production. For ocean quahog a maximum OY of 6 million bushels is reasonable in terms of production. Considerations for optimum yield should be a priority. The industry/management should try to achieve those levels of production; regulations/closures such as Nantucket Shoals for surfclam and Georges Bank for quahogs have impacted the ability to achieve OY to meet demand. Regulations for shellfish (model ordinance) on Georges Bank have hampered the ability to access some of these areas unnecessarily; NMFS has not acted and removed some of these closures and worked with the FDA on this issue in a timely manner.

Wind Development

The clam advisors are concerned about the BOEM (Bureau of Ocean Energy Management) wind farm leasing process and potential impacts to historically important fishing areas. The industry's opportunities to engage with developers on wind array siting relative to the most productive clam fishing beds has not been productive.

This resistance in cooperation lends to the notion that the clam fishery and the ocean wind developers cannot coexist as the developers have made no attempt to give the clam industry any consideration in their layout of their arrays and the spacing between the turbines which will make it unsafe for clam vessels to work within wind farms. Siting is critical in terms of ensuring reasonable fishing access. It has been the experience of the clam industry that any communications by BOEM, wind energy developers, or state regulators is purely perfunctory and true mitigation efforts will not be made. The need for a safe transit zone for fishing vessels between the abutting Atlantic Shores and Ocean Wind 1 Wind Energy Areas is a priority.

In the New England and Mid-Atlantic region, offshore wind development is out of control. The industry feels that no matter how hard they try to engage with developers on these issues, their input is not being considered or incorporated into the siting and development process. The spatial and operation requirements of the fishery (considering things like weather, tides, safety, etc.) need to be accounted for to ensure access to the wind arrays, but at present that is not happening. These arrays become de-facto Marine Protected Areas and the Councils and industry have nothing to say about how the fishing grounds are managed within the arrays. **Unlike finfish, clams do not move, so once the vessels cannot fish in an area those resources are lost to the fishery and the value it brings to the economy. These areas are also likely to be lost to survey data further impacting the biomass estimates of the fishery**.

The Council needs to consider the biological impacts on the fishery itself, and other cumulative environmental effects that may occur. These should include things like productivity of the resource, larval displacement, scour and sediment suspension, hydrographic changes, and effects

of sounds and other pressures on the zooplankton community (which includes food for clams). In addition, in water structures from offshore wind or other types of closures (e.g., GSCHMA) will result in vessels having to travel further and having a larger carbon footprint.

Science and Research Initiatives

Industry continues to fund research with the Science Center for Marine Fisheries (SCeMFiS), an industry, university, and National Science Foundation (NSF) supported research center and that has several completed, ongoing and recently funded research projects: http://scemfis.org.

Active projects that have been funded over 2022 address HMA, impacts from wind energy areas (WEA) and understanding the extent and future of commingled clam grounds. Two projects on HMAs aim to improve the ability of clam companies to discuss HMA access to commercial fisheries using models on sea water temperature on cod spawning and association of charismatic biota occupation of hard bottom. A project to assess stranded capital and capital devaluation, such as vessels and portside facilities because of wind energy development. An interactive GIS tool to characterize clam distribution aims to improve the ability to target fishing effort and inform the ongoing management efforts on commingled landings.

Ongoing requests for proposals by the members of the SCEMFIS Industry Advisory Board (IAB) in the SCOQ industry continue to focus on projects focusing on wind energy areas, comingled clam harvests, clam survey improvement, climate change impacts, and improving dredge efficiency. These include not only traditional research projects led by University researchers, but also opportunities for graduate student interns, community college instructors and veterans of the armed forces to embed with member companies and the Northeast Fisheries Science Center.

In addition, it is noted that there is an EFP application that has been submitted to NMFS to conduct multibeam sonar work, benthic sled sampling, etc. in the Great South Channel Habitat Management Area. There are two entities participating in that submitting EFP.

Research Priorities

The AP feels that MAFMC and NEFSC needs to consider how the fisheries independent surveys will take place within wind energy arrays once constructed.

Suggested Revisions to the Public Hearing Document for the Council's SCOQ Species Separation Requirements Amendment

6.1.1.1.2 Ocean Quahog

"Growth tends to slow after age 20"

> *Ocean quahog growth rate slows as the animal ages, but not in a von-Bertalanffy way, as the animal never stops growing. The best growth curve to use is Tanaka, but we have a modified von-Bertalanffy that also does ok. See: "A growth model for Arctica islandica: the performance of Tanaka and the temptation of von Bertalanffy – can the two coexist?"*

J.M.Klinck, E.N. Powell, K.M. Hemeon, J.R. Sower, D.R. Hennen (in press Journal of Shellfish Research). Furthermore, growth rates have increased over the last 150 years by a factor of 2-4, depending on location. These data are available in a dissertation by Hemeon and a thesis by Sower available on the SCEMFIS website: see also, Pace, S.M., E.N. Powell, R. Mann. 2018. Two-hundred-year record of increasing growth rates for ocean quahogs (Arctica islandica) from the northwestern Atlantic Ocean. J. Exp. Mar. Biol. Ecol. 503:8-22.

"Major recruitment events appear to be separated by periods of decades."

This statement originally made by Mann and Powell based on the number of observed small animals south of Hudson Canyon has turned out to be of limited value. Recent detailed evaluations by Pace, Hemeon, and Sower have shown that recruitment is relatively routine yearly over much of the range of the stock from Georges Bank to New Jersey, with occasional periods of lower or higher recruitment as might be expected by year-to-year variation. For details, see Pace, S.M., E.N. Powell, R. Mann, M.C. Long. 2017. Comparison of age-frequency distributions for ocean quahogs Arctica islandica}on the western Atlantic US continental shelf. Mar. Ecol. Prog. Ser. 585:81-98; Hemeon, K.M., E.N. Powell, S.M. Pace, R. Mann, T.E. Redmond. 2023. Population dynamics of Arctica islandica off Long Island (USA): an analysis of sex-based demographics and regional comparisons. Mar. Biol. 170:34; Hemeon, K.M., E.N. Powell, S.M. Pace, T.E. Redmond, R. Mann. 2021. Population dynamics of Arctica islandica}at Georges Bank (USA): an analysis of sex-based demographics. J. Mar. Biol. Assoc. U. K. 101:1003-1018; and Sower, J.R., E.N. Powell, R. Mann, K.M. Hemeon, S.M. Pace, T.E. Redmond. 2023. Examination of spatial heterogeneity in population age frequency and recruitment in the ocean quahog (Arctica islandica Linnaeus 1767). Mar. Biol. 170:38.

"ocean quahog are relatively unproductive and able to support only low levels of fishing."

Ocean quahogs live for a long time. Recent relatively direct estimates of mortality rates (see the above papers) are consistent with the value long used in the stock assessment. Fishing mortality rates are consistently lower than the natural mortality rate. Furthermore, the present assessment presumes a growth rate typical of animals born in the early 1800s. This has been shown to underestimate by a considerable degree the growth rates observed recently. Recent estimates summarized by Sower (see her thesis) show that growth rates have increased by 2-4 times, depending on location relative to the estimate originally used; that is, the species is much more resilient to overfishing than presently estimated in the assessment. We note that a recent workshop to evaluate needed research for ocean quahogs identified the issue of changing growth rate over time as one of the primary research needs in addressing uncertainty in the assessment. At present the assessment is distinctly precautionary in using growth rates typical of early 19th century animals.

7.5.4.2.2 Global Climate Change

“The distributional vulnerability of surfclam was ranked as "high," as surfclam mortality is higher at higher temperatures”

> *At the time that Hare summarized species vulnerabilities to climate change, the estimate was defensible as we did not know the ability of this species to change its range boundaries. Much more information is available now and this information shows that surfclams change their range rapidly in response to increasing temperatures, with significant responses on 5-year time scales. See Powell, E.N., J.M. Trumble, R.L. Mann, M.C. Long, S.M. Pace, J.R. Timbs, K.M. Kuykendall. 2020. Growth and longevity in surfclams east of Nantucket: range expansion in response to the post-2000 warming of the North Atlantic. Cont. Shelf Res. 195:#104059; and Evaluation of the degree of co-occurrence of Atlantic surfclams (Spisula solidissima) and ocean quahogs (Arctica islandica) in the expanding Northwestern Atlantic boreal/temperate ecotone: implications for their fisheries. Stephanie L. Stromp, Eric N. Powell, Roger Mann (in press, J. Shellfish Res.). The surprisingly high resilience of the species to climate change is noteworthy; recent unpublished projections for the remainder of the century suggest an increase biomass, rather than a decrease. Surfclams are likely to be winners rather than losers.*

“Also similar to surfclam, the distributional vulnerability was ranked as “high” as growth slows at higher temperatures. Ocean quahog was determined to have a “very high” biological sensitivity to climate due to population growth rate, sensitivity to ocean acidification, adult mobility, slow growth, from calcium carbonate shell, and adults are sessile (Hare et al. 2016).”

> *This is also the expectation based on the Hare analysis, recognizing the long age span of individuals and relatively slow growth. Recent information, however, has suggested that ocean quahogs are more resilient to climate change than other boreal animals due to their ability to estimate and thus escape high late-summer temperatures. This is the reason why little evidence of range recession exists and, in fact, is the reason why the overlap between surfclams and ocean quahogs has increased so dramatically in the last half-decade. The dynamics of ocean quahog range shifts are discussed in a thesis by LeClaire (see SCEMFIS website), which shows that range recessions occur on half-century time scales or longer. Thus, little evidence of a range shift would be expected over the ~40-yr NMFS survey time series, even if sample density was sufficient to resolve the inshore range boundary, which is unlikely: see Powell, E.N., R. Mann. 2016. How well do we know the infaunal biomass of the continental shelf? Cont. Shelf Res. 115:27-32. Thus, we should not be surprised that the species as of today shows little response to rising temperatures in the northwestern Atlantic.*