

**MAFMC Briefing book contribution, February 2023**

**Subject: Overlap of range of surfclams and ocean quahogs in the mid-Atlantic.**

**Short testimony by Roger Mann, Virginia Institute of Marine Science**

Warming of the Mid-Atlantic continental shelf has resulted in a range shift of the Atlantic surfclam, *Spisula solidissima*, north and offshore into waters still occupied by ocean quahogs (*Arctica islandica*). As a consequence, a region of transition between two biological communities now exists over much of the offshore range of the surfclam in which surfclams and ocean quahogs co-occur. This is a region supporting fisheries for both species. Regulations prohibit fishers from landing both species in the same catch, limiting fishing to locations where the target species can be sorted on deck. Fishery access to the overlap region is vital as CPUEs have declined over the core of the surfclam's range. An at-sea survey sampling 50+ stations in the overlap region was conducted in September 2021 with the purpose of mapping fishable concentrations of surfclams and ocean quahogs. Size frequency and density data of both species were assessed along with environmental parameters. Species overlap between surfclams and ocean quahogs was most prominent in the 40-55-m depth range, where mean surfclam length declined by 40 mm compared to shallower waters. Density of surfclams shifted within this depth from surfclam dominant in <40 m to ocean quahog dominant in >60 m. Atlantic surfclam length increased with increasing summer bottom water temperature while densities remained stable, indicative of proportionately larger but fewer animals in warmer inshore waters. The importance of bottom water temperature in determining surfclam distribution revealed larger clams alongside high temperatures and shallow depths and small clams at deeper depths and lower temperature. Ocean quahog size metrics and densities, on the other hand, remain relatively unresponsive to both temperature and invading Atlantic surfclam populations. Ocean quahogs

increase in size with higher latitude. Large ocean quahogs, in particular, exhibit a distinct correlation with high latitude. The lack of response in ocean quahogs during the last decade to changing environmental variables may be due to their long lifespan in comparison to surfclams and the ability of ocean quahogs to avoid high fall temperatures through burrowing resulting in a much slower offshore movement of the species' range. All indications are that this overlap will persist for an extended period into the future, possibly decades, as will the associated fishing mixed catch problem. This analysis emphasizes the potential for long term economic disruption of fisheries as climate change pushes surfclams further into the range of the ocean quahog and highlights the need for discussions of regulatory changes related to mixed catches and on-board sorting of the clam species.

This synopsis will be accompanied by a short Powerpoint of data from the aforementioned 2021 survey and a video presentation including commentary from scientists implementing the survey, vessel captains, and processors.