



ATLANTIC SURFLCLAM (*SPISULA SOLIDISSIMA*) POPULATION DEMOGRAPHICS AND DISTRIBUTION ALONG THE MIDDLE ATLANTIC BIGHT

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Room 3200, IRB1 4111 Monarch Way

The Atlantic surfclam (*Spisula solidissima*) is a long-lived benthic biomass dominant organism, on the Middle Atlantic Bight (MAB) continental shelf between 10 and 50 m depths. Trends in population specific growth and mortality rates were analyzed using four decades of age and length observations from NOAA stock surveys from the 1980s to 2010s in six survey regions in the MAB. Atlantic surfclam growth rates and asymptotic lengths were estimated from observations using the von Bertalanffy model. Analysis showed that Atlantic surfclam median asymptotic length in the southern MAB was smaller, 88 mm, relative to asymptotic lengths of 110 mm to 141 mm in the northern regions. Asymptotic lengths in the southern region declined by 35% over the four decades. Constant and age-dependent specific mortality rates were estimated with the relationship in Hoenig (1985) and a hyperbolic tangent relationship based on change in number with age, respectively. The decadal averaged specific mortality rate over all regions (0.20 y^{-1}) is consistent with mortality rate estimates from literature, but considerable variability was obtained within and between survey regions. The highest mortality rates (0.18 yr^{-1} to 0.58 yr^{-1}) were associated with the southern regions, where the surfclam population age distributions were skewed to younger ages. Estimated growth and mortality rates were used in a population dynamics model for surfclams to assess reasons for alongshelf gradients in population density. Comparison of simulations with observations showed that age-dependent mortality is the primary cause of the gradient in surfclam population density. The trends in growth and mortality are reflective of warming bottom water. These results have implications for projecting Atlantic surfclam responses to a warming habitat