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Documenting Environmental and Oceanic Variability in the Down East Coastal Region of the Gulf of Maine using the long-lived bivalve *Arctica islandica*

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The Gulf of Maine (GoM) is currently undergoing rapid environmental and ecological changes and this system is projected to become increasingly stressed in the coming decades. Thus understanding past spatial and temporal conditions of this region is key to understanding how future environmental changes and extreme events may impact fisheries and ecosystem dynamics in the GoM. Changes in the physical and chemical variations in the shells of mollusks can be used as a powerful proxy for studying past climates and environments. In this study, we used the growth and geochemistry signatures in the long-lived marine bivalve *Arctica islandica* collected from the Down East coastal region in the Gulf of Maine (Jonesport, ME) to evaluate past climatic and hydrographic variability in the northwestern North Atlantic Ocean. The recent collection of shells extends a previously developed master shell growth chronology by 11 years and now spans from 1954 to 2020 CE. Based on visual crossdating techniques, shell growth variability is highly coherent among the population indicating that environmental conditions are driving growth. Variability in annually resolved shell growth increments and stable oxygen isotope values are largely related to sea surface temperatures (SSTs) and water mass properties of the Eastern Maine Coastal Current. This master shell growth chronology and annually-resolved isotope series will fill data gaps prior to instrumental records and allow us to better understand the spatial oceanographic variability in the GoM.