ABTRACT

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Title:	Temporal and Spatial Trends in Marine Biodiversity in Chesapeake Bay, Long Island Sound, and New Hampshire Estuaries
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As climate change and anthropogenic factors become increasingly detrimental to the environment, it is vital to understand ongoing consequences to marine biodiversity and trends from long-term monitoring data. Estuaries are biologically productive and provide nursing grounds and protection for multiple species, yet minimal long-term biodiversity monitoring datasets exist within estuaries. This study began a long-term monitoring biodiversity site in Sandy Point Beach, West Haven, CT and provided recommendations for the continuation of this monitoring site in the central basin of Long Island Sound. This study also examined temporal and spatial trends of marine biodiversity in three estuaries in the northeast U.S. Specifically, a meta-analysis was conducted of biodiversity metrics of data collected from seining in Chesapeake Bay from 1959 to 2021, in Long Island Sound from 1988 to 2019, and in New Hampshire estuaries from 2009 to 2019. Within each estuary, the proportion of each species of the total decadal mean abundance was calculated, as well as the Shannon Weiner Diversity Index to determine any changes in species diversity over time. Abundance, defined here as geometric mean catch, of eight common species among the three estuaries were also compared and linear regressions were conducted to determine overall trends in species abundance over time. The most abundant species within all three estuaries were Atlantic silversides, which comprised at least 17% of the total decadal mean abundance every decade, and up to 76% in some decades. Other common species included Atlantic menhaden and other small forage fish, most likely due to estuaries providing nursing and spawning grounds for these groups of organisms, as well as suitable temperature and salinity conditions. These findings have determined temporal and spatial trends of marine biodiversity in three important estuaries in the northeast U.S., which are essential to monitor impacts of anthropogenic changes to coastal marine ecosystems.