Analysis of trends in fish assemblages in Narragansett Bay, RI/MA

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Estuarine fish are highly valued resources that are affected by several factors, including climate, landscape, pollution, and fishing pressure. Here, we examine patterns of variability in estuarine fish assemblages in Narragansett Bay, an estuary located in Rhode Island and Massachusetts, through time. We used data collected in a trawl survey conducted by the Rhode Island Department of Environmental Management for the years 1980 – 2012, separated by season, and grouped by upper, middle, and lower sections of the Bay. Our explanatory data included temperature, wind, precipitation, river flow, nitrogen load, cormorant abundance and regional-scale climate variability over the same time period. There was high variability in fish species abundance across sites and through time; with climate variables associated with trends in some species. Nitrogen loads increased and then decreased through the time period , and a shift in fish species composition associated with nitrogen load could be detected. A systems-level understanding of the historic trends in fish assemblages in relation to multiple stressors can support the management of the valued finfish species and the whole estuarine system.