Fish shrinking as ocean temperatures rise

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Gulf Menhaden have shrunk in body size by about 15 percent over the past 65 years, according to a new study by LSU Boyd Professor R. Eugene Turner. Credit: Garold W. Sneegas via Fishes of Texas website.

One of the most economically important fish is shrinking in body weight, length and overall physical size as ocean temperatures rise, according to new research by LSU Boyd Professor R. Eugene Turner published today. The average body size of Menhaden—a small, silver fish—caught off the coasts from Maine to Texas—has shrunk by about 15 percent over the past 65 years.

Menhaden make up about one-half of the Atlantic and Gulf of Mexico

fish harvest and had a dockside value of about $129 million in 2013. They are coastal species that spawn offshore and move to estuaries where juveniles grow to one- and two-year old fish. The air and sea surface temperature off the Atlantic coast and the Gulf of Mexico has steadily increased, especially in estuaries, where heat exchange occurs efficiently between air and sea. Adult menhaden return offshore where they are harvested with purse seine nets.

Menhaden are a significant food source for birds, seals, whales, striped bass and other animals. Therefore, the consequences of Menhaden shrinking in body size extend throughout the food web.

Turner calculated the weight and length changes of these fish using data collected by the National Marine Fisheries Service. From 1955 to 2008, about 495,000 Atlantic menhaden were collected by the agency. From 1964 to 2010, about 510,000 Gulf of Mexico menhaden were collected. The data shows a decline in annual weight and length among 3-, 4- and 5-year-old fish. For example, a 4-year-old fish captured in 2010 weighed 11 percent less than a 4-year-old fish captured in 1987.

"These changes are closely related to variations in the annual air temperature, which we used as a proxy for water temperature, for fish on both coasts," Turner said. "As the Earth's atmosphere and oceans continue to warm, the future of menhaden, it seems, will be even smaller."

More information: Smaller size-at-age menhaden with coastal warming and fishing intensity, DOI: 10.1002/geo2.44 , onlinelibrary.wiley.com/doi/10.1002/geo2.44/full

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