

Abstract:

Walleye (*Sander vitreus*) populations are declining in Wisconsin and neighboring regions, motivating broader interest in walleye biology amidst ecological change. In fishes, growth integrates variation in ecological drivers and provides a signal of changing ecological conditions. We used a 23-year data set of length-at-age from 353 walleye populations across Wisconsin to test whether walleye growth rates changed over time and what ecological factors best predicted these changes. Using hierarchical models, we tested whether spatiotemporal variation in walleye growth was related to adult walleye density (density-dependent effects), water temperature, and largemouth bass (*Micropterus salmoides*) catch per unit effort (CPUE; predator or competitor effects). The average length of young walleye increased over time, and as a result, time to reach harvestable size declined significantly. In contrast, average lengths of older walleye have remained relatively constant over time. Juvenile walleye length-at-age was positively correlated with largemouth bass CPUE and surface water temperatures, but negatively correlated with adult walleye density. Our finding of widespread and long-term changes in walleye growth rates provides additional insights into how inland fisheries are responding to environmental change.

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