

CLIMATE ADAPTATION SCIENCE CENTERS

Formerly known as the Climate Science Centers

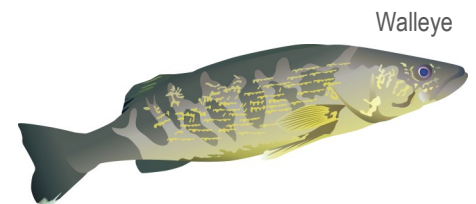
Warmer Waters Could Impact Sport Fishing in Wisconsin

Sport fishing in Wisconsin generates over \$2 billion annually in economic activity. Yet warming temperatures in the state's lakes and streams are *changing habitat conditions*, favoring some fish species while threatening others. *Walleye*, one of the most sought-after species among Wisconsin's anglers and a fish that prefers cooler water, has been declining in numbers over the last 30 years. Conversely, *largemouth bass*, which thrive in warmer waters, have been increasing.

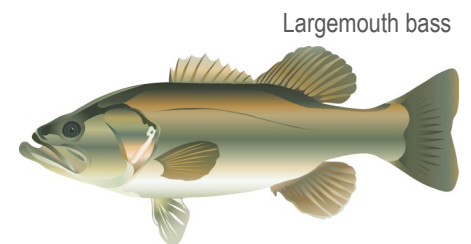
WHAT: The cool-water walleye is in high demand among Wisconsin's anglers. Though the warm-water largemouth bass is also targeted by anglers, it is generally less sought after. To understand how these species will fare under future climate conditions, researchers looked at past and future lake temperatures for thousands of lakes across the state. By modeling historical temperatures, researchers sought to determine whether warming lake temperatures coincided with the observed changes in walleye and largemouth bass populations. This relationship was then used to forecast how these fish species' populations could be expected to change in the future, as temperatures continue to rise.

FINDINGS: *The percentage of Wisconsin's lakes that support walleye is predicted to decline from 10% to less than 4%, while the percentage that will support largemouth bass is predicted to increase from 60 to 89% by the late 21st century.*

Lakes in Wisconsin have gotten warmer over the last 30 years, though some lakes have warmed more than others. Factors such as lake size, depth, and water clarity all impact the degree to which water temperatures change. This means that as temperatures continue to warm, some lakes – and therefore some fish populations – will be affected more than others. Based on modeled future lake temperatures, researchers were able to identify which lakes will likely continue to support walleye, which lakes will become unsuitable for walleye, and which lakes will support largemouth bass by the end of the century.



SIGNIFICANCE: Projecting future changes in sport fish communities is a high priority for fisheries management in the upper Midwest. Currently, millions of dollars are being spent on walleye stocking in Wisconsin. Identifying which lakes will be most resilient to climate change can help managers focus stocking efforts on lakes that have the best chance of supporting walleye populations into the future, ensuring the effective allocation of these funds.



WHO: **PROJECT LEAD:** Northeast Climate Adaptation Science Center, casc.usgs.gov/centers/northeast

PARTNERS: University of Wisconsin-Madison | Wisconsin Department of Natural Resources | Michigan Department of Natural Resources | Minnesota Department of Natural Resources | Rensselaer Polytechnic Institute | USGS Center for Integrated Data Analytics | USGS Wisconsin Water Science Center

STAKEHOLDERS: Wisconsin Department of Natural Resources