

Quantifying shifts in spawning phenology and recruitment in Wisconsin fishes

The goal of this project is to test for phenological shifts in spawning of sport fishes around Wisconsin, and if occurring, understand what may be driving these shifts and determine their potential implications for recruitment.

TIMELINE

Launch: July, 2019

Completion: June, 2022

FUNDING

Federal Aid in Sportfish
Restoration

DNR PARTNER BUREAU

Fisheries Management

EXTERNAL STAKEHOLDERS

Great Lakes Indian Fish and
Wildlife Commission
Wisconsin Initiative on Climate
Change Impacts
USGS

Fish recruitment is an important but complex issue in fisheries management. Understanding the conditions that determine when fish spawn and identifying the developmental windows during which recruitment is set will improve our mechanistic understanding of fish recruitment and aid in predicting how fish populations will fare under future environmental conditions.

This study works extensively with collaborators to construct a comprehensive database of fish spawning phenology and recruitment levels for as many Wisconsin sport fishes as possible, in addition to timeseries of important environmental variables like ice-on and ice-off dates, water temperature, and water clarity.

To identify environmental triggers for spawning and important critical periods with the strongest influence on recruit production, we divide ecological variables into all possible time windows leading up to an important event (e.g., spawning, measurement of recruitment), and determine which variables and time frames substantially influenced the fisheries' response. The recruitment database developed would be made available to stakeholders to assess how recruitment varies among lake types.



Key Points

- » We hypothesize that the timing of spawning will have generally shifted earlier in the spring and later in the fall for spring and fall spawning species, respectively, driven by earlier spring warming and the later onset of winter.
- » We also predict that shifts in spawning phenology will have negative effects on recruitment as larvae are produced out of synch with important ecological events that promote their survival, such as spring plankton blooms.
- » This project will produce multiple peer-reviewed manuscripts assessing patterns in spawning phenology, the importance of phenology to recruitment, and spatio-temporal patterns in recruitment dynamics across species.

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