



SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES

GRADUATE EXIT SEMINAR

NOEL SCHMITZ

The combined effects of temperature, hypoxia, and turbidity on predator-prey interactions between Smallmouth Bass and Round Goby



Climate change intensifies environmental stress in aquatic ecosystems, impacting fish behavior and predator-prey interactions. Lake Erie specifically faces rising temperatures, hypoxia, and increased turbidity, threatening sport fisheries, including Smallmouth Bass. As ectotherms, fish metabolic rate will increase with ambient temperature. However, hypoxia requires fish to compensate for low oxygen availability, for example, by decreasing activity, thus imposing conflicting effects under future climate conditions. Our research examined the combined impacts of temperature, hypoxia, and algal turbidity on Smallmouth Bass (*Micropterus dolomieu*) foraging behaviors and Round Goby (*Neogobius melanostomus*) prey anti-predator behaviors. We also explored potential individual variation in Smallmouth Bass foraging. Results showed individual variation in Smallmouth Bass foraging, which is potentially advantageous for acclimating to changing water conditions under future climate change. However, their predatory success is hindered by projected climate change conditions, leading to physiological stress and depleted energy reserves. In contrast, Round Goby anti-predator behaviors remained unaffected by treatment conditions, likely due to their broad tolerance ranges. Yet, goby behaviors were significantly influenced by preceding bass foraging behaviors, indicating a behavioral feedback response. These findings have critical implications for freshwater fish and lentic ecosystem management, emphasizing the need for an adaptive, ecosystem-based approach to address the complexity of changing conditions in aquatic ecosystems.

Advisors: Dr. Lauren Pintor and Dr. Suzanne Gray

Wednesday, January 3, 2024

1:00 P.M.

Location: Kottman Hall 333

Join the seminar via Zoom:

<https://osu.zoom.us/j/91614212704?pwd=d1piTIBhek1QcEJIRGdTYmhXQVFjZz09>

Meeting ID: 916 1421 2704

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