

Bioturbation by the Invasive Rusty Crayfish (*Orconectes rusticus*) Affects Turbidity and Nutrients: Implications for Harmful Algal Blooms

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Eutrophication and harmful algal blooms (HABS) are serious anthropogenic stressors impacting water quality and aquatic ecosystems worldwide. Although anthropogenic nutrient loading is a primary factor driving the rise in HABS, aquatic bioturbators may also contribute to the resuspension of nutrients and sediment into the water column and exacerbate HABS. Bioturbators are benthic organisms that rework bottom sediments in aquatic ecosystems through their daily activities, and can contribute to HABS by stirring up and resuspending nutrients and cyanobacteria cells (algae). The rusty crayfish (*Orconectes rusticus*) is one such freshwater bioturbator that has established itself as an invasive species in central Ohio. The objective of this study was to examine the effect of crayfish density (low, high and no crayfish control) on turbidity and nutrient concentrations in a controlled laboratory experiment. Results indicate that the presence of crayfish significantly increased turbidity and nutrient concentrations (nitrogen & phosphorous) in the water column relative to the no crayfish control. Additionally, turbidity and nutrient concentrations were significantly higher in the high density crayfish treatment. Together, this suggests that through its daily activities, *O. rusticus* is causing a marked resuspension of sediments in the water column. This implies that through their role as bioturbators, *O. rusticus* may indeed be exacerbating algae growth by agitating previously-settled nutrients that can further feed the growth of HABS.