Dr. Daryl Dwyer, Associate Professor in the Department of Environmental Sciences at University of Toledo completed a small Ohio Water Resources Center funded project via Ohio Water Development subaward. The project, “Determining Components for a Phosphorus Interceptor to Reduce Harmful Algal Blooms in the Western Lake Erie Basin”, investigates a way to capture phosphorous from agricultural tile drainage prior to entering ditches and tributaries.

Harmful Algal Blooms in Lake Erie appear closely linked to agricultural nutrients, specifically nitrogen (N) and soluble phosphorus (SP) within agricultural tile drainage. Dr. Dwyer’s students investigated local and cheaply sourced materials that may be used in a simple nutrient interceptor for tile drainage, including zebra mussel shells, quarry-derived limestone and water treatment plant residuals. Water treatment plant residuals showed the fastest sorption capacity in batch experiments and therefore were chosen for flow through trials. In 300-minute trials, water treatment plant residuals allowed for continuous removal of phosphorous (Figure 1) and a 10 – 15% reduction in phosphorous levels (Figure 2).

Researcher Profile: Dr. Daryl Dwyer’s research objectives encompass modeling and understanding the interactions of soil, water, and plants and restoring converted or degraded sites to native habitat with sustainable design as a remediation goal.

![Figure 1 Austin Bartos, student intern at the Lake Erie Center, the University of Toledo, setting up his nutrient interceptor.](image1)

![Figure 2 Average reduction of phosphorus (mg/L; red line) and average percent reduction of phosphorus (%; blue line) of spiked tile drainage water (2.5 mg P/L) calculated for each effluent sample for the nutrient interceptor trials.](image2)