

The Summer Undergraduate Research Fellowship (SURF) Symposium
2 August 2018
Purdue University, West Lafayette, Indiana, USA

Estimating watershed residence times in artificially-drained landscapes and relation to nutrient concentrations

Emma J. Beck, Dr. Lisa Welp, and Alexandra L. Meyer
Department of Earth, Atmospheric, and Planetary Sciences, Purdue University, West Lafayette, IN

ABSTRACT

Nutrient runoff from agricultural lands feeds harmful algae blooms that create a variety of problems in freshwater ecosystems. In order to reduce the effects of this nutrient runoff, Best Management Practices (BMPs) are being put in place in agricultural lands. Most of these BMPs focus on slowing down the flow of water through the watershed to give nutrient concentrations time to deplete before the water flows to the stream or river. However, the effectiveness of these BMPs are highly unknown and the process of monitoring nutrient runoff is often complex and costly. The data in this study consists of 7 years of existing water stable isotope data and 9 years of nutrient concentrations collected by volunteers of the nonprofit Wabash River Enhancement Corporation (WREC). Samples are taken twice a year (spring and fall) across a fairly large area draining into the Wabash river. We use stable isotopes, deuterium and oxygen-18 as a proxy for residence times and correlate these residence times with land use and nutrient concentrations.

KEYWORDS

Watershed, residence times, stable isotopes, nutrients, best management practices