

11-2015


Patterns of anthropogenic nutrient contaminants in the Otter Creek watershed, Madison County, Kentucky

Elijah D. Wolfe
Eastern Kentucky University

Walter S. Borowski
Eastern Kentucky University

Jacob L. Robin
Eastern Kentucky University

Follow this and additional works at: https://encompass.eku.edu/fs_research

 Part of the [Biogeochemistry Commons](#), [Environmental Health and Protection Commons](#), [Environmental Indicators and Impact Assessment Commons](#), and the [Environmental Monitoring Commons](#)

Recommended Citation

Wolfe, Elijah D., W.S. Borowski, Jacob L. Robin, 2015, Patterns of anthropogenic nutrient contaminants in the Otter Creek watershed, Madison County, Kentucky. Kentucky Academy of Science, 101st Annual Meeting, Northern Kentucky University, November 13-14 2015, pg. 35.

This Conference Presentation is brought to you for free and open access by Encompass. It has been accepted for inclusion in EKU Faculty and Staff Scholarship by an authorized administrator of Encompass. For more information, please contact Linda.Sizemore@eku.edu.

**Patterns of anthropogenic nutrient contaminants in the Otter Creek watershed,
Madison County, Kentucky.**

ELIJAH D. WOLFE, WALTER S. BOROWSKI, and JACOB L. ROBIN
Department of Geosciences, Eastern Kentucky University.

We measured nutrient concentrations within the Otter Creek watershed (Madison County, Kentucky) to: (1) discover levels of anthropogenic contaminants affecting the water quality; (2) compare these measurements to a national data set; and (3) identify nutrient sources. The watershed mainly drains rural land characterized by cattle grazing, but also drains the town of Richmond. We sampled throughout the watershed to gain a representative perspective of nutrient levels and specifically targeted localities of suspected anthropogenic nutrient sources. Water samples were passed through a 0.45 µm filter, placed in pre-acidified vials, and measured one to two days after collection. Nutrients – ammonium, nitrate, and phosphate – were measured colorimetrically using the sodium hypochlorite, cadmium reduction, and ascorbic acid methods, respectively.

Nutrients within the watershed show distinctively different concentration patterns. Ammonium and phosphate levels remain low for all sampling days. Higher ammonium concentrations are sporadic, but higher phosphate levels persist along Dreaming Creek, which drains Richmond. Nitrate consistently shows higher concentration levels of 4 to 7 mg/L and generally falls with the 25 to 50 percentile range as compared to impacted streams nationally. We sampled the watershed before and after a significant rain event. Ammonium and phosphate values changed little, but much larger amounts of nitrate entered Otter Creek afterward.

We attribute higher nutrient values to several sources. A sewage treatment plant is a definite point source for nitrate and to lesser extent for phosphate. High nutrient values in Dreaming Creek are likely due leaky sewage pipes. The major non-point source is from cattle pasture.

*Kentucky Academy of Science, 101st Annual Meeting, Northern Kentucky University,
November 13-14 2015, pg. 35.*