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

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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.

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