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# Dissolved nitrogen (nitrate and ammonium) in surface and groundwater at ECU Meadowbrook Farm, Madison County, Kentucky


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## **GEOLOGY**

Dissolved nitrogen (nitrate and ammonium) in surface and groundwater at EKU Meadowbrook Farm, Madison County, Kentucky. REID E. BUSKIRK, HUNTER R. EVANS, WALTER S. BOROWSKI, JONATHAN, M. MALZONE Department of Geosciences, Eastern Kentucky University, Richmond KY 40475.

Agricultural activities often contaminate watersheds with excess nutrients, leading to poor water quality and eutrophication. Eastern Kentucky University's Meadowbrook Farm is no exception, and contributes dissolved nitrogen into the Muddy Creek watershed. To assess concentrations of dissolved nitrogen compounds, we sampled waters draining from the farm: springs, runoff, and subsurface pipe drainage as well as Muddy Creek. These water samples were collected on eight days from May through August 2016 under a variety of weather conditions. We measured dissolved nitrate and ammonium using the standard cadmium reduction and sodium hypochlorite methods via colorimetric spectrophotometry with an accuracy and precision ~0.1 mg/L.

Nitrate was usually the dominant nitrogen compound, higher ammonium levels occurred only sporadically. Typically, nitrate levels were <2 mg/L with largest values from 7 to 14.3 mg/L. There were few differences in nitrate concentrations in water samples from different sources. However, springs sometimes had higher nitrate concentrations than Muddy Creek and runoff samples. Tributary 6E, draining off-farm areas to the east, consistently had the highest levels of dissolved nitrate relative to other sources. Ammonium values were generally between 0 and 0.5 mg/L. Concentration spikes between 2.0 and 4.3 mg/L occurred, but from no consistent source.

We generally did not see consistent patterns of increasing or decreasing nitrate and ammonium concentration with respect to sample type, nor any firm connection with rainfall events. However, in one instance two days after a significant rainfall, higher nitrate and ammonium values were observed in all sample types.

*Kentucky Academy of Science meeting, November 4-5, 2016, Louisville, Kentucky*