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GEOLOGY

Limiting nutrient contaminants from agricultural non-point sources: Nutrient monitoring at EKU's Meadowbrook Farm, Madison County, Kentucky.

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Sources of contamination to U.S. waterways have largely shifted from industrial, point sources to agricultural and other non-point sources associated with common human activities. EKU's Meadowbrook Farm explores best-practices in agriculture and animal husbandry that not only act to increase the efficiency of farm operations, but also to limit environmental effects such as the eutrophication of its neighboring watershed.

We recently started a collaboration with the Farm and the EKU Department of Agriculture, which are developing methods to sequester phosphorus and thus limit nutrient export to the adjacent Muddy Creek watershed. Our task is to quantify the amount of phosphorus (mainly as orthophosphate, PO_4^{3-}) and other nutrients (ammonium, NH_4^+ ; nitrate, NO_3^-) leaving the Farm at key points of egress both before and after sequestration efforts begin. We will then compare initial phosphorus export estimates to those obtained after sequestration begins in order to characterize its utility and effectiveness. Phosphorus export will be directly related to runoff and rainfall events that vary considerably from season-to-season and from year-to-year. We aim to monitor phosphorus (and nitrogen) concentrations over a period of 2-3 years both before and after phosphorus sequestration begins, establishing a monitoring period of 4 to 6 years total. Some preliminary results are given by Buskirk et al., Evans et al., and Kelley et al. at this conference.

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