

**BUILDING BETTER BUFFERS: DESIGNING VARIABLE
WIDTH RIPARIAN BUFFERS FOR CONCENTRATED FLOW**

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ABSTRACT: Current riparian buffer standards have been designed to trap and filter sediment and nutrients in shallow, dispersed sheet flow from adjacent row-crop agricultural fields. Buffers work well under these hydrologic conditions, trapping upwards of 60 to 90% of the incoming sediment and nutrients. However, recent research in southern Illinois has shown that the vast majority (80 to 100%) of surface runoff from agricultural fields is in a concentrated form when it reaches riparian buffers. Current static width riparian buffers are not designed to handle concentrated flow. Thus, most of the sediment and nutrients transported via concentrated flow pass through the buffers and are deposited into surface waters. Through a funded USDA NRCS Conservation Innovation Grant, we are designing and evaluating an innovative alternative for riparian buffers to handle concentrated flow: variable width buffers. The premise is to have wider buffer widths where concentrated flow enters the buffer and narrower buffer widths where sheet flow or no flow enters the buffer. With this new design, a net decrease in buffer area is likely compared to traditional buffer designs. Three row-crop agricultural sites have been selected along first order agricultural streams in southern Illinois for riparian buffer implementation. In summer 2011, the sites will be surveyed to establish a detailed digital elevation model of each site to quantify drainage areas for all concentrated flow paths. In fall 2011, buffers will be planted with stiff-stemmed native grasses, including switchgrass (*Panicum virgatum* L.), to help break up concentrated flow and deposit sediment. It is anticipated that larger concentrated flow paths will need a stabilization structure to help control erosion in the concentrated flow channels as vegetation becomes established.

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