

Recent Nitrogen Mass Balances in the Midwest Cornbelt. (A05-david113042-Oral)

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Abstract:

Nitrogen mass balances are useful to assess inputs, outputs, and changes in soil pools in agricultural watersheds. Considering the state of Illinois as a watershed, we have updated previous mass balances of N using recent fertilizer inputs and crop production, and refining N sinks such as in-stream denitrification. With recent declines in N fertilizer usage and near record corn and soybean production, net anthropogenic N inputs to Illinois declined from ~ 400000 tons yr⁻¹ (1989 to 1999) to ~175000 tons yr⁻¹ the last two years. Much of this N is exported from the state by rivers, and previous work assumed as much as 35% of the annual N load was lost to denitrification during stream transport. Our recent work suggests that in-stream denitrification removes considerably less than that, probably ~1-2% of the annual load. Therefore, other sinks, such as field denitrification or soil N pools, must be larger than previously believed. Although the net inputs have declined recently, greater stream flow has led to a large riverine N flux. A measurable decrease in riverine N may occur after additional years of reduced net anthropogenic N inputs, which depends on crop yields remaining high.

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