

Importance of Stream Bed and Bank Erosion in Phosphorus Transport

Issue: There is a growing body of evidence that much of the sediment and P delivered to surface waters from agricultural landscapes originates from stream bed and bank erosion. The need to better understand this topic of legacy phosphorus was identified as a research need in the Iowa Nutrient Reduction Strategy and highlighted in comments about the strategy.

Objective: This project, initiated in 2011, is conducted within the Onion Creek Watershed, a tributary to Squaw Creek in Boone and Story counties. Specific objectives are to measure watershed sediment flux; estimate sediment (and P) from stream bank erosion, gully erosion, sheet and rill erosion and any other sources in the watershed; and evaluate the effectiveness of conservation practices established as components of the Onion Creek Watershed Project in reducing sediment flux.

Approach: A permanent water quality sampling site, equipped with a portable sampling unit, has been established near the outlet of the Onion Creek Watershed. A detailed field survey of riparian land use and severely eroding banks was conducted in 2011. Stream bank recession rates are estimated using erosion pins installed in a randomly selected subset of severely eroding banks along reaches within each land use classification. Total P loss from stream banks is estimated by combining total soil loss with average stream bank soil P concentration. Phosphorus adsorption/desorption studies on intact cores will be related to the key sediment characteristics that are likely to control P retention and release.

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