

# Sediment Sources

Root River Field to Stream Partnership

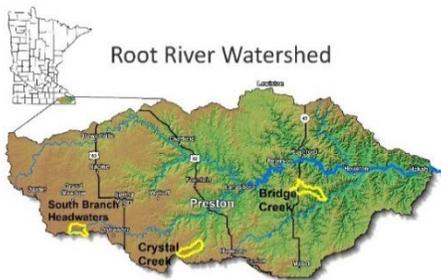


## Background

Sediment is a natural part of river ecosystems. Yet, too much of it can be harmful to the quality and health of a river. It is important to understand the sources of river sediment when making land and water management decisions.

Predicting where sediment is coming from is a difficult task. The Root River watershed is large, nearly the size of Delaware, and determining sources of sediment relies on advanced science and technology.

Scientists from multiple Universities completed a five-year study to help understand the movement of sediment in the Root River Watershed. The figure below summarizes the results of that research. This project was funded by the Minnesota Department of Agriculture's Clean Water Fund Research and Evaluation Program (Clean Water Fund).



## Sediment Sources and Sinks in the Root River Watershed



**Banks**  
43%



**Fields**  
44%

**Hillslopes**  
13%

*Adapted from  
P. Belmont et al (2016)*

**280,000 tons**

2009-2014 average annual sediment load at Mound Prairie



**Cutoffs**

10,000 tons stored annually in meander cutoffs

### Contact:

Kevin Kuehner; Minnesota Department of Agriculture  
507-765-4530, kevin.kuehner@state.mn.us

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Sediment sources can be categorized as either **field** or **non-field** in the Root River watershed system. Sediment movement within the river is driven by erosion in fast moving areas and deposition in slower areas.

### Non-Field Sources

- An estimated, **56%** of the sediment in the Root River is from non-field sources. Non-field sources include soil derived from stream banks and bluffland hill slopes.
  - **43%** of this non-field sediment, found at the watershed outlet, is from near-channel stream bank sources. This soil appears to have been initially derived from agricultural fields, presumably within the past 150 years, but has been temporarily stored in, and reworked from, floodplains and alluvial terraces. Near channel sediment sources are highly sensitive to flow in the mid to lower reaches of the Root River watershed.
  - Other non-farm field sources of soil include bluffland hillslopes and contributes an estimated **13%** of the annual sediment exported from the watershed.

### Field Sources

- Its estimated that **44%** of the annual sediment load measured at the outlet of the Root River near Mound Prairie is derived from agricultural fields within the past two to four decades.

### Sediment Movement and Storage

- A very significant amount of sediment moves through the watershed system but does not make it out. An estimated 500,000 tons of sediment is exchanged annually due to channel widening and migration processes within the floodplain channel system, but is not directly delivered to the outlet.
- About 10,000 tons of soil is stored in historical river cutoff areas (ox-bow lakes).

Each sub-watershed within the Root River Watershed has its own sediment transport story. The full report can be found at the Minnesota Digital Water Research Library by searching:

[An Integrated Sediment Budget for the Root River, Southeastern Minnesota, 2015](#)

