Minnesota River Turbidity TMDL

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Minnesota River

What are the sediment sources?

Why do we care about it?

What are we doing now?

How is it related to Lake Pepin?
Minnesota River – Where is it located?

18 reaches
9 on major tributaries
9 on the mainstem

Legend
- 18 Impaired Reaches in TMDL
- Down Stream, Affected Reaches
- Major Rivers
- Modeled Watershed
- Metro Area
What are the sediment sources?

- Ravines
- Banks/Bluffs
- Upland
Minnesota River – What are we doing now?

Spatial scope of HSPF model

Graphic by Tetra Tech
What is modeling and what does it tell us?

- Looks at **big picture**
- Way to **calculate potential results** of change without making the change
- Can **limit results** to technically-achievable practices
- Can help **determine high-leverage practices**
Modeling & the Minnesota River

Based on modeling, some practices are more effective.

There are choices/alternatives.

The larger community must decide.
Modeling example 1

- **Perennial vegetation**
  - Increase in each watershed
  - Redistribution to lower reaches (except in Yellow Medicine and Hawk Creek)

- **Controlled drainage**: <1% slope

- **Water storage**
  - On-field storage of runoff
  - About half of the first 2 inches
Modeling example 2

Example 1 practices *plus*

- Reduce bed, bank, bluff contributions
  - Earthen benches – against steep walls
  - Grade control measures
  - Vegetative management

*Using*

- Proven & tested ecological engineering concepts
- Existing materials and resources
Goal for Minnesota River

Mainstem Minnesota River 100 mg/l

Compare to

- Western watersheds 50 mg/l
- Redwood & Cottonwood 70 mg/l
- Southern watersheds 90 mg/l

Concentration-based target;
Accounts for variability in flow
Total suspended solids used as surrogate for 25 NTUs
Some practices are more effective than others

(Example: Le Sueur River Load Duration Curve)
Implementation choices/alternatives

Examples

<table>
<thead>
<tr>
<th>Year</th>
<th>Crop residue</th>
<th>Eliminate open tile intakes</th>
<th>Perennial vegetation at watershed mouths</th>
<th>Ravine BMPs</th>
<th>In-line ditch treatment</th>
<th>Store runoff</th>
<th>Channel stability/Rehabilitate bluffs</th>
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- **Groundwork**
- **Implementation**
- **Continued implementation**
The larger community must settle on some critical balances.
What’s next. . .

Preliminary EPA review

Public notice

EPA approval

Develop implementation plan coordinated with Lake Pepin TMDL
What’s next. . .

Implementation plan

• Adjust focus from TMDL study to implementation planning
• Identify and engage stakeholders
• Determine high leverage actions
• Identify action steps over 30 years
• Identify performance measures
Summary

Based on modeling, some practices are more effective.

There are choices/alternatives.

The larger community must decide.