

Zumbro River Watershed TMDLs Update

November 28, 2007

Background

Zumbro River Watershed

The Zumbro River watershed encompasses more than 900,000 acres of agricultural and urban lands that drain through the three forks of the Zumbro River. The watershed includes parts of Olmsted, Dodge, Goodhue, Rice, Wabasha, and Steele Counties, as well as the rapidly growing City of Rochester. The watershed is known for its diversity of landscape, ranging from deep fertile glacial-tills, to steep loess soils of the bluffs. Much of the watershed is in the Karst region, with exposed sedimentary bedrock and complex groundwater systems. The basin includes a variety of cold, cool and warmwater streams, and numerous recreational waters.

Impaired Waters

The Zumbro River watershed includes fourteen separate impaired waters (excluding mercury/PCB and fecal coliform listings), according to the final 2006 303(d) list of impaired waters. For thirteen of those listings, the affected use is aquatic life, and the pollutant or stressor is turbidity; all but two of those were added in 2006 as a result of analysis of Citizen Stream Monitoring Program (CSMP) transparency data. Lake Zumbro is also impaired, due to excessive nutrient concentrations; the affected use is aquatic recreation.

While these are different impairments, the aquatic recreation problem in Lake Zumbro is intimately tied to the aquatic life problems in the tributary stream reaches. It is thought that sediment is the driver behind both impairments: as a first order pollutant of the streams, and as a carrier of a pollutant (excess nutrients) to Lake Zumbro. For this reason, many common management strategies would address both of these affected uses. Thus, this project will provide one report that will detail Total Maximum Daily Loads for all of the turbidity impairments *and* for the excess nutrient impairment in the Zumbro River watershed. To complete this project, the MPCA has contracted with Barr Engineering, Inc. Barr has Extensive past and present experience relevant to both the impairments in the Zumbro watershed and its local landscape (<http://www.barr.com/>).

Further Background

For general information regarding TMDLs and impaired waters:
<http://www.pca.state.mn.us/water/tmdl/index.html>

For a summary of TMDL activity in the Lower Mississippi Basin:
<http://www.pca.state.mn.us/water/basins/lowermiss/lowermiss-tmdl.html>

For an impaired waters map that includes the Zumbro watershed:
<http://www.pca.state.mn.us/publications/maps/tmdl-lm-conv-06.pdf>

This is not an official document or letter, nor is it a complete project capsule or summary. It's an informal update. For fact sheets and further information specific to the Zumbro River Watershed TMDLs, please contact:

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Current Progress

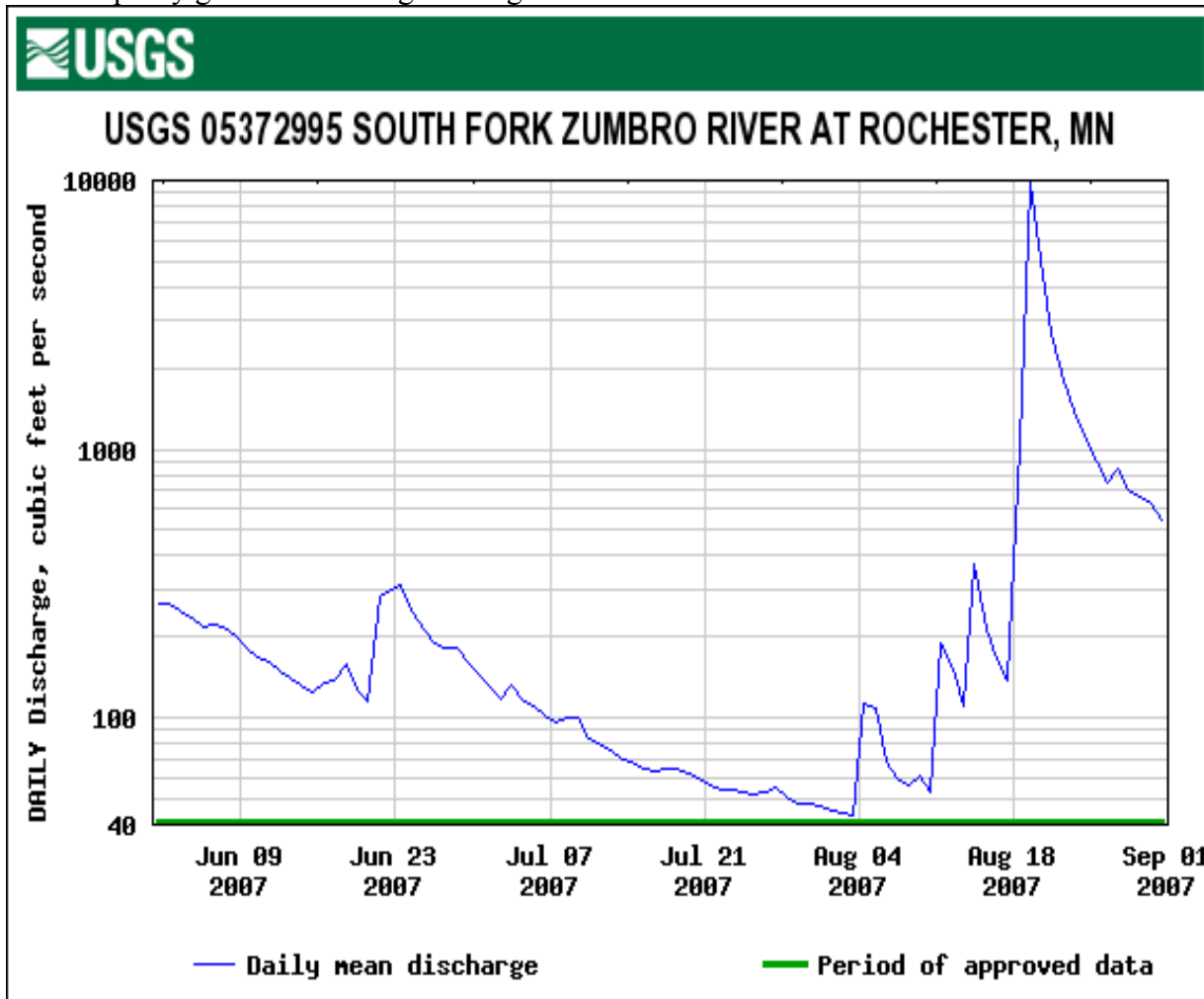
This will be just a quick update...

We are currently wrapping up the first monitoring season. This entails:

- (1) Pulling equipment from the field for calibration and maintenance.
- (2) Merging field notes with laboratory data logged at the Minnesota Department of Health.
- (3) Examining data and planning for improvements to be implemented in the 2008 field season.

Notes:

We lost one DTS-12 turbidity sensor to the August floods. Nine of ten managed to hold in their mounts though – that is pretty good considering the magnitude of that event.



There are four new turbidity listings proposed in the draft 2008 impaired waters list (<http://www.pca.state.mn.us/water/tmdl/tmdl-303dlist.html>) – all of which will be “wrapped into” the current TMDL efforts.

Barr Engineering has completed stream cross-section work and sediment sampling at the ten project monitoring stations in the basin. This information will be used to understand current channel stability, and in many cases will provide a comparison to past surveys. An examination of particles sizes in the depositional bars of the streams and computed shear stresses for their respective reaches will help to determine if the channel is degrading, aggrading or stable.

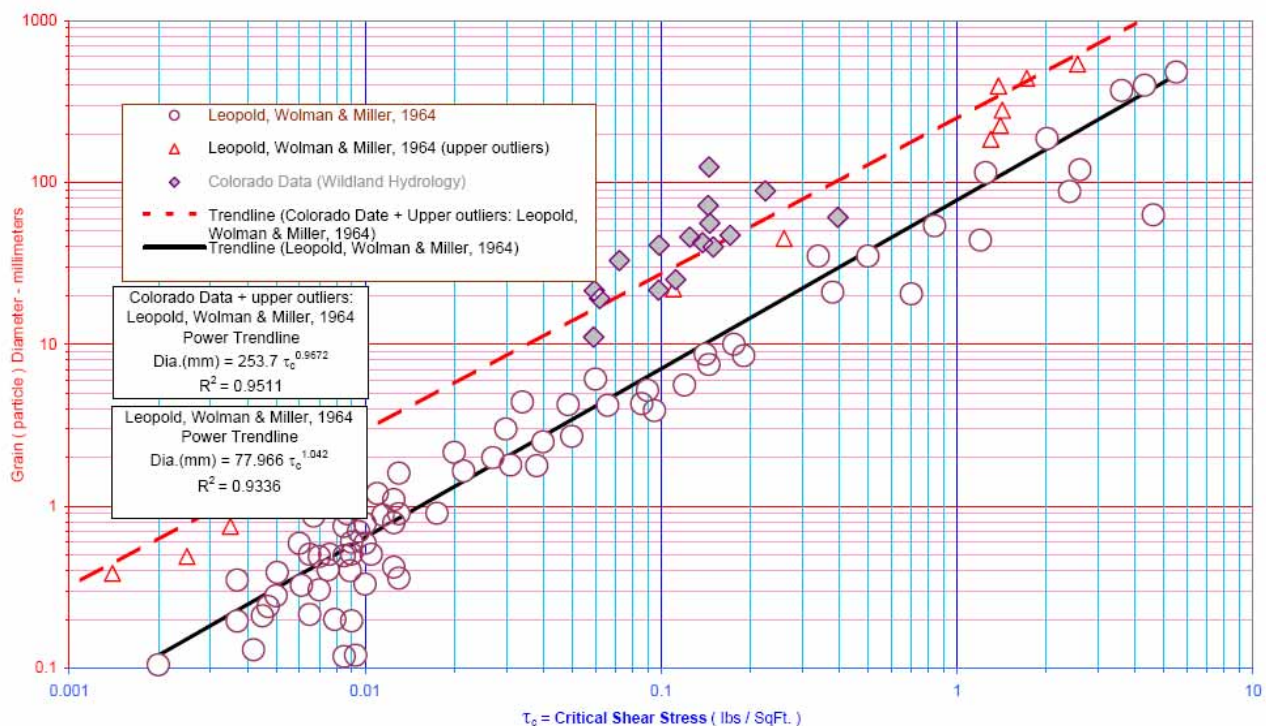


Figure 126. Critical Shear Stress (τ_c : Range .001 to 10) Required to Initiate Movement of Grains (particles), revised for Colorado Rivers.

Bill Thompson and Justin Watkins visited Winona State University last week, to meet with staff that have been supporting this TMDL work. They have a great sediment lab in their geology department, and they've been computing suspended sediment concentrations to pair with our grab sample turbidity, TSS, TSVS and DTS-12 continuous turbidity data. Suspended sediment concentration is a whole-sample value expressed in weight per total volume of water collected – as compared to TSS (total suspended solids) which computes a weight per volume of a subsample of the original sample. To best understand sediment dynamics in a system, SSC should be included in the sample suite.

Their method for SSC is pretty intense. They desiccate the filters before running water through, and they require three consecutive weighings of the filter (an hour or more apart) that all fall within 0.0002 grams of one another. The same requirement is applied after the sample has passed through the filter, to make sure that moisture is not part of the final weight value. Thanks to Winona State for your great contribution to this work.

