

Zumbro River Watershed TMDLs Update

July 10, 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

Nearly all project activity to date has been focused on collecting data for use in the forthcoming modeling effort that will be the core of the TMDL work. The following bullets outline the project monitoring effort:

- (1) To best understand sediment and nutrient loading in the basin, good continuous flow records are critical. With that in mind, we have partnered with the Minnesota Department of Natural Resources to utilize six of their existing flood warning gauges as project monitoring locations. In addition, the DNR will be gauging the flows into and out of Lake Zumbro. There are also two USGS flow gauging sites in the watershed, and one managed by Dodge County – these, along with the lake and tailwater elevation data recorded by Rochester Public Utilities will provide very useful records to this project.
- (2) At most of these flow gauging sites we're collecting grab samples in an effort to characterize pollutant concentrations at various flows and during different seasons. Sediment and nutrient related parameters – total suspended solids, turbidity, phosphorus and nitrogen – are all being examined. Good grab sample coverage will allow for computation of loads for each of these pollutants.
- (3) To further and better document pollutant loads, we have deployed turbidity sensors at ten monitoring sites. These sensors can compute and record turbidity values without the manual guidance of a person at the site. They are mounted beneath the surface of the water, and set to record continuously, typically every 10-15 minutes. These time-series records will be invaluable to this TMDL effort in that they will provide for more accurate estimates of pollutant loading, given the many-fold more data points that will be available and the tough-to-grab-sample events that will be captured. The sensors are made by Forest Technology Systems. For more info: <http://www.ftsinc.com/>. Also: <http://www.ftsinc.com/Brochures/Dynamic%20Turbidity%20Monitoring%20-%20DTS%2012%20Benefits.pdf>

The following are some photo highlights of the 2007 field season to date:

The Middle Fork Zumbro River just upstream of Lake Zumbro.



Lee Ganske of MPCA collecting a grab sample during snowmelt.



Kim Johannsen of Barr Engineering measuring discharge.



MPCA crew and Lake Zumbro volunteer sampling the lake.



Looking into the eyes of a DTS-12 (turbidity sensor). The rugged wiper cleans the lenses regularly to prevent fouling by periphyton.



DTS-12 paired with a Druck pressure transducer (stage monitoring device) – ready to be deployed.



