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2022 Monitoring Executive Summary

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Contributing Authors

Jim Rudolph, *Water Resources Specialist*
Udai Singh, *Water Resources Director*
Brian Jastram, *Monitoring and Instrumentation Specialist*
Mary Thelen, *Environmental Specialist*
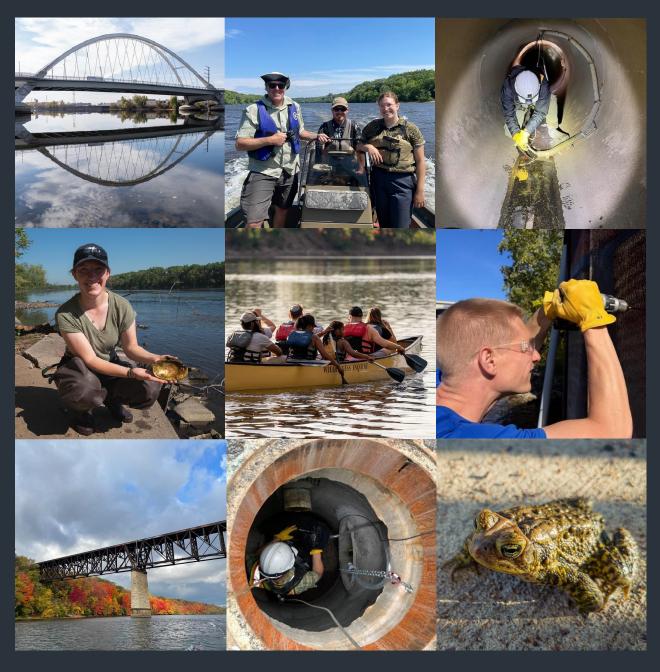Eva Hanson, *Environmental Specialist*

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Executive Summary

The Mississippi Watershed Management Organization's Monitoring team has completed another successful and active year of monitoring the watershed and is pleased to share the results of their work. The Monitoring section of the MWMO website has been updated with the latest precipitation, stormwater, river water quality, river bacteria, and lake monitoring data from 2022. Data summaries from previous years can also be found on those pages.

Each year, MWMO monitoring staff publish monitoring data results and summaries in the monitoring section of the website in lieu of a compiled report. This change has been made to make the data results more accessible and understandable. Current and past reports are available on the MWMO website at mwmo.org/monitoring-and-reports/water-quality-monitoring.

The MWMO monitors water quality in the watershed's stormwater drainage system, the Mississippi River, lakes, and wetlands. Within these systems, major factors influencing water quality include the amount of precipitation, timing of precipitation events, and land use practices in the watershed. Long-term monitoring is necessary to characterize the impact of various land use practices on surface water runoff within the MWMO and, ultimately, the Mississippi River. Water quality in the Mississippi River is also influenced by precipitation and land use practices in the entire Mississippi River basin upstream of the MWMO. Long-term monitoring of the river will aid the understanding of upstream weather patterns and land use impacts on the MWMO watershed.

The 2022 monitoring season included collection of precipitation data from eleven monitoring locations, collection of bacteria and other water quality samples from seven locations in the Mississippi River, collection of water quantity and/or water quality data from eight stormwater outfall sites draining to the Mississippi River and one stormwater pipe at the jurisdictional boundary of the Cities of Saint Anthony Village and Minneapolis, and collection of water quality samples from seven stormwater best management practices. The Anoka Conservation District (ACD) collected water elevation data at Sullivan Lake and Highland Lake for the MWMO.

As previously mentioned, MWMO monitoring staff collected precipitation data across the MWMO watershed. In 2022, the average total rainfall was 20.23 inches and the location with the most rainfall in one month was the Waite Park Elementary School rain gauge with 6.28 inches in August. January had the lowest average precipitation (0.18 inches), and the highest average precipitation was in August (5.21 inches).

Portions of the 14-mile stretch of the Mississippi River in the MWMO are listed on the Federal Clean Water Act's Section 303(d) list of impaired waters for fecal coliform. The Minnesota Pollution Control Agency (MPCA) has moved from a fecal coliform standard to an *Escherichia coliform* (*E. coli)* standard; therefore, all fecal coliform impairments are now evaluated with *E. coli* data. Long-term monitoring of both the river and the stormwater drainage system is necessary to evaluate *E. coli* inputs from within the watershed compared to those inputs from

upstream sources. The MPCA initiated the Upper Mississippi River Bacteria Total Maximum Daily Load (TMDL) Project in 2008 to develop daily *E. coli* load limits for the Mississippi River. In 2014, the MPCA released its Upper Mississippi River Bacteria TMDL Study and Protection Plan. This document designated the stretch of the Mississippi River within the MWMO as a Protection Reach and deferred it for a TMDL study. Within the MWMO, the Mississippi River is divided by the Saint Anthony Falls into two reaches for classification. Above the Saint Anthony Falls, the river has a water use classification of 2Bd (aquatic life and recreation and source of drinking water). Below the Saint Anthony Falls, the water use classification is 2B (aquatic life and recreation). The chronic standard for *E. coli* in 2B and 2Bd waters is 126 CFU/100 mL for a monthly geomean of at least five samples. The MPCA *E. coli* acute standard states that *E. coli* cannot exceed 1,260 CFU/100mL in more than 10 percent of the samples taken in one month. In 2022, 106 river samples were collected April through October. No river sites exceeded the acute standard for any samples taken in 2022. All seven river sites exceeded the chronic standard in May, four in June, and two sites in October. Sampling in May, June and October occurred a day after a rain event.

MWMO staff began collecting water quality samples from the Mississippi River in 2014. The purpose of monitoring the water quality of the Mississippi River is to establish baseline water quality data within the watershed that can be used for understanding characteristics of the river and how they may change over time. Water quality measurements and samples were collected at seven sites, twice per month April through November and once per month January, February, March, and December. MWMO monitoring staff collected 132 river water quality samples in 2022. Sampling locations in the Mississippi River and within the MWMO's boundaries were selected to represent three distinct reaches of the river. Each site is located within, at the beginning of, or at the end of a river reach. Samples were collected from the middle of the river at three feet below the water surface and were analyzed for nutrients, sediment, inorganics, organics, and metals. MWMO staff also recorded river water elevation data April through November. MWMO monitoring staff recorded a total change of 6.27 feet at the MWMO river gage, and the river rose 2.5 feet higher and about 3.5 feet lower than the five-year average elevation of 800 feet. MWMO staff continued to collect bathymetric data on the Mississippi River between Lock and Dam 1 and the Canadian Pacific Railway (CPR) Bridge in line with North 41st Avenue. The purpose of collecting Mississippi River bathymetric data is to provide baseline data on the shape and condition of the river bed and how it changes over time.

The MWMO continued monitoring water quantity and water quality of the watershed's stormwater drainage system by monitoring baseflow, snow-melt, and rain events in nine stormwater tunnels draining to the Mississippi River. In 2022, MWMO staff collected 277 stormwater quality samples. Samples were analyzed for nutrients, sediment, *e. coli,* inorganics, organics, and metals. Water quality standards do not exist for stormwater; therefore, data were not compared to standards. The MWMO will continue to monitor stormwater drainage systems to develop a record of baseline data with which to characterize stormwater quality within the watershed. The MWMO also provides stormwater data to the MPCA for TMDL projects within the watershed. In 2022, the MWMO had twelve monitoring stations deployed in nine monitored

subwatersheds. Due to high river levels, two of the outfall monitoring locations, 6UMN and 4PP, were under river water for about two months in the spring.

In 2022, the MWMO monitored the effectiveness of several best management practices (BMPs) within the watershed. The monitored BMPs include: St. Anthony Regional Treatment and Research System (SART), Jackson Pond Iron-Enhanced Sand Filter Bench (Columbia Heights), Edison High School Green Campus parking lot tree trench and athletic field underground storage tank (Minneapolis), Minneapolis Sculpture Garden water reuse system, and the MWMO Stormwater Park and Learning Center and its Media Filter Beds (Minneapolis). MWMO monitoring staff collect stormwater flow, volume, and water quality data at SART, Edison High, MWMO Stormwater Park, and Jackson Pond. At Eighth Street Stormwater Planters, water level is measured in each of the five planters to calculate stormwater infiltration rate and estimate stormwater treatment. Tank level is measured at Towerside and the Sculpture Garden. Staff collected a total of 62 water quality samples from best management practices.

MWMO staff collect samples at the Kasota Ponds once every three years. The last time samples were collected was 2021. In 2021, MWMO staff collected 11 samples (one per month) at each of the Kasota Ponds, for a total of 33 samples. Samples were not collected in February due to unsafe ice conditions. Water quality samples were analyzed for nutrients, sediment, chloride, and metals. MWMO collects water quality and biological data once every five years. Prior to 2018, water quality samples were collected yearly. See the 2008 – 2017 Summary Report on the MWMO website for more information. During June and July, the Kasota Ponds wetlands were sampled for macroinvertebrate and aquatic plant assemblages. These data were used to assess the health of the Kasota Ponds wetlands relative to other wetlands in the state and to establish baseline records for the wetlands. The macroinvertebrate assemblages of the Kasota Ponds indicate that the wetlands are in poor health, though Index of Biological Integrity (IBI) scores show slight improvement at two of the ponds (KP East and KP West) compared to 2016 sampling, while KP North remained the same. Aquatic plant assessments showed all three wetlands to remain in poor health relative to other wetlands in the state of Minnesota.

The MWMO contracted with the ACD to conduct water level monitoring activities on Sullivan Lake and Highland Lake in Columbia Heights. Regular water level monitoring was conducted in 2022 between May and November. Lake levels were measured 23 times at Highland Lake and Sullivan Lake. Sullivan Lake water levels fluctuated by about two and a half feet in response to rainfall. Highland Lake had an overall water level change of 0.64 feet between lowest and highest recorded level and was below the Ordinary High-Water Level for about three months. Detailed summaries of these data are located on the Lake Monitoring page of the website.

2022 Monitoring Data (Links)

- Precipitation (PDF)

- Stormwater water quality and water quantity (located under site descriptions)

- River water quality (PDF)

- River elevation data (PDF)

- River bacteria (PDF)

- Sullivan and Highland Lakes (PDF)