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MISSISSIPPI
WATERSHED
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ORGANIZATION

2023 Monitoring Executive Summary





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2023 Monitoring Executive Summary

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Suggested Citation

Mississippi Watershed Management Organization. (2024). 2023 Monitoring Executive Summary. MWWMO Watershed Bulletin 2024-2. 8 pp.

Front Cover

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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 2023. 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](#).

The MWMO monitors water quality in the watershed's stormwater drainage system, the Mississippi River, lakes, wetlands, and green stormwater infrastructure (GSI) practices. 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 2023 monitoring season included collection of precipitation data from ten monitoring locations, collection of bacteria and other water quality samples from seven locations in the Mississippi River, collection of flow data at 10 stormwater locations and water quality samples from nine stormwater locations, and collection of water quality samples from three 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 2023, the average total rainfall was 28.1 inches and the location with the most rainfall in one month was the Towerside rain gauge with 6.64 inches in September.

November had the lowest average precipitation (0.10 inches) August had the highest average precipitation (4.15 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 coli* (*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 water use 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 geometric mean 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 2023, 91 river samples were collected between April through October. Samples at three sites on October 26, 2023 exceeded the acute standard. An additional single site visit in June, five site visits in July, three in September, and three in October exceeded the chronic standard. Sampling in July 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 between April and November and once per month in January, February, March, and December. MWMO monitoring staff collected 114 river water quality samples in 2023. 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 between April and November. MWMO monitoring staff recorded a total change of 11.3 feet at the MWMO river gage over the year, and the river rose 7.7 feet higher and dropped 3.6 feet lower than the five-year average elevation of 800 feet. Water levels at all sites peaked in late April during spring flooding.

The MWMO continued monitoring the water quantity and water quality of the watershed's stormwater drainage system. In 2023, the MWMO had 10 flow monitoring stations deployed in eight 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. The MWMO also monitored baseflow, snow-melt, and rain events in nine stormwater tunnels draining to the Mississippi River. In 2023, MWMO staff collected 159 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 2023, the MWMO monitored the effectiveness of a number of 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 reuse system (Minneapolis); [Minneapolis Sculpture Garden water reuse system](#); Lowry Underground Sand Filter (Minneapolis); [Eighth Street Stormwater Planters](#) (Minneapolis); 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, MWMO Stormwater Park, Jackson Pond, and Lowry Sand Filter. At Eighth Street Stormwater Planters, water level is measured in each of the five planters to calculate stormwater infiltration rate and estimate stormwater treatment. At Edison High School, water level is measured in the parking lot tree trench and tank level, inflow, and outflow are monitored for the reuse system. Tank level is measured at Towerside and the Sculpture Garden. Staff collected a total of 51 water quality samples from best management practices.

MWMO staff collect water quality and biological samples at the Kasota Ponds once every five years. The last time samples were collected was 2021, and the next time the MWMO will collect samples is in 2026. Prior to 2018, water quality samples were collected yearly. See the [2008 – 2017 Summary Report](#) on the MWMO website for more information. In 2021, 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 2023 between May and November. Lake levels were measured 22 times at Highland Lake and 27 times at Sullivan Lake. Sullivan Lake water levels fluctuated by 2.36 feet, primarily staying within the water levels commonly observed in the lake, despite drought conditions. However, in mid-October the water level rose to its highest level observed since records began in 1992, likely due to a number of small to medium sized rain events during that time period. Highland Lake water levels fluctuated by 0.51 feet, and spent the entire year below or right at the Ordinary High-Water Level. Detailed summaries of these data are located on the [Lake Monitoring page](#) of the website.

2023 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)