

Water Quality Monitoring – Streams

Stream Monitoring

Water quality information collected by the Stream Monitoring Program is needed to help determine compliance with MN water quality standards, to determine the extent of nonpoint source pollution, to help with the development of TMDL (Total Maximum Daily Load) plans, and to measure progress toward achievement of water quality standards as BMPs are implemented.

Currently, there are twenty-four automated stream monitoring stations located around the Twin Cities.

Why the Metropolitan Council?

The MCES Stream Monitoring Program was initiated in the late 1980s. Point source pollution controls alone were insufficient to attain the water quality goals of the Federal Clean Water Act.

Since then, the stream monitoring program has grown for several reasons:

- It is relevant to the Metropolitan Council's regional planning and modeling efforts.
- It promotes local resource stewardship and decision making.
- It is mandated by state law (MN Statute 473.157) to establish target pollutant loads for each watershed.

The stream monitoring [Quality Assurance Program Plan](#) (PDF) (updated 1/11) provides a detailed description of the program's purpose, procedures, methods and quality assurance objectives.

Station Locations

Stream monitoring stations are located near watershed outlets to effectively measure the mass, or non-point source pollutant “load”, that the tributary streams transport to the major rivers (Minnesota, Mississippi, and St. Croix).

Key rivers, streams, creeks and ditches are sampled during significant runoff events and during base flow conditions to help determine the sources and extent of non-point sources of pollution.

Minnesota River Basin

Station	County	Closest City	Drainage Area	Watershed	Established	Cooperator/ Operator
Bevens Creek, BE 2.0	Carver	Carver	130.9 sq. mi.	Bevens Creek	1989	MCES
Bevens Creek, BE 5.0	Carver	Cologne	90.2 sq. mi.	Bevens Creek	1992	MCES
Bluff Creek, BL 3.5	Carver	Chanhassen	8.9 sq. mi.	Bluff Creek	1991	MCES
Carver Creek, CA 1.7	Carver	Carver	83.5 sq. mi.	Carver Creek	1989	MCES
Credit River, CR 0.9 sq. mi.	Scott	Savage	51.4 sq. mi.	Credit River	1989	MCES
Eagle Creek, EA 0.8	Scott	Savage	3.4 sq. mi.	Lower MN River	1999	Lower MN River Watershed Dist./Scott Soil and Water Cons. Dist.
Nine Mile Creek, NM 1.8	Hennepin	Bloomington	38.3 sq. mi.	Nine Mile Creek	1989	MCES
Riley Creek, RI 1.3	Hennepin	Eden Prairie	13.0 sq. mi.	Riley Creek	1999	City of Eden Prairie/ Barr Engineering
Sand Creek, SA 8.2	Scott	Jordan	254.8 sq. mi.	Sand Creek	1990	MCES

Mississippi River Basin

Station	County	Closest City	Drainage Area	Watershed	Established	Cooperator/ Operator
Bassett Creek, BS 1.9	Hennepin	Minneapolis	43.0 sq. mi.	Bassett Creek	2000	Bassett Creek Watershed Mgmt Commission/Wenck Associates Inc. Engineering and Consulting
Battle Creek, BA 0.1	Ramsey	St. Paul	11.7 sq. mi.	Battle Creek	1995	Ramsey Washington Metro Watershed District
Beltline Interceptor, BT 0.5	Ramsey	St. Paul	28.0 sq. mi.	Keller-Phalen	1995	Ramsey Washington Metro Watershed District
Cannon River, CN 11.9	Goodhue	Welch	1,340 sq. mi.	Cannon River	1999	Dakota County SWCD
Crow River, CS 23.1	Wright	Rockford	2,620 sq. mi.	Crow River	1999	Wright County SWCD
Fish Creek, FC 0.2	Ramsey	St. Paul	5.1 sq. mi.	Fish Creek	1995	Ramsey Washington Metro Watershed District
Minnehaha Creek, MH 1.7	Hennepin	Minneapolis	181.0 sq. mi.	Minnehaha Creek	1999	MCES
Rum River, RUM 0.5	Anoka	Anoka	1,552 sq. mi.	Rum River	1996	Anoka Conservation District
South Fork of the Crow River, CWS 20.3	Carver	Mayer	1,136.6 sq. mi.	Crow River	2001	Carver County Env. Services
Vermillion River, VR 2.0	Dakota	Hastings	327.0 sq. mi.	Vermillion River	1995	Dakota County SWCD

St. Croix River Basin

Station	County	Closest City	Drainage Area	Watershed	Established	Cooperator/ Operator
Browns Creek, CR 0.3	Washington	Stillwater	34.1 sq. mi.	Browns Creek	1997	Browns Creek Watershed Dist./Washington Conservation Dist.
Silver Creek, SI 0.7	Washington	Stillwater	7.6 sq. mi.	Silver Creek	1998	Carnelian Marine Watershed Dist./Washington Conservation Dist.
Valley Creek, VA 1.0	Washington	Afton	62.0 sq. mi.	Valley Creek	1999	Valley Branch Watershed Dist./Washington Conservation Dist.

Water Quality Variables Analyzed

Metropolitan Council Environmental Services monitors streams in the Twin Cities Metro Area and Mankato Area for a variety of water quality variables (listed on the right). These variables are not always analyzed at all sites all of the time. The variables and sample frequency depends on the sample condition and water quality concern.

Sample Collection

Stream samples are collected on a regular basis during base flow conditions. In the winter, monthly grab samples are obtained. In the spring, summer and fall, sample frequency increases to twice a month. Depending on specific site conditions, additional grab samples might be taken to help further characterize water quality. Along with these base flow grab samples, composite samples are collected by the automatic samplers during storm runoff events. Samples are collected by the automatic sampler on an equal-flow increment (EFI) basis. With EFI sampling, composite samples are collected throughout the event, with discrete sub-samples representing equal volumes of flow.



The photo above shows Equal Flow Increment samples collected from the Le Sueur River in June 2001. The two jars are poured into the bigger plastic jug, to create a "composite" sample. From the big plastic jug, the composite samples are poured into labeled lab bottles. These sample bottles are then transported to the MCES analytical laboratory, which conducts water chemistry analysis on all stream monitoring samples obtained (grab samples and event composite samples).

Stream Water Quality Variables Analyzed

- Temperature
- Dissolved Oxygen
- BOD 5-day
- BOD Ultimate
- CBOD 5-day
- CBOD Ultimate
- Total Organic Carbon
- pH
- Total Alkalinity
- Bicarbonate
- Carbonate
- Fecal Coliform Bacteria

- Turbidity
 - Total Suspended Solids
 - Volatile Suspended Solids
 - Total Dissolved Solids
 - Total Kjeldahl Nitrogen
 - Total Nitrate/Nitrite Nitrogen
 - Ammonia Nitrogen
 - Total Phosphorus
 - Total Dissolved Phosphorus
 - Ortho Phosphate
 - Chlorophyll-a, Total
 - Chlorophyll-a, Pheophytin-corrected
 - Conductivity
 - Calcium
 - Magnesium
 - Potassium
 - Sodium
 - Chloride
 - Sulfate
 - Hardness
 - Metals:
 - Aluminum
 - Cadmium
 - Chromium
 - Copper
 - Iron
 - Lead
 - Manganese
 - Nickel
 - Zinc
 - Volatile Organics
- (Not all parameters are monitored at all sites)

Streams Contact Information

For further information on the following streams, please contact Scott Haire via [email](#) or at 651.602.8747, or Mike Ahlf via [email](#) or at 651.602.8082.

- Bevens Creek – Carver
- Bluff Creek – Carver
- Carver Creek – Carver
- Credit River – Scott
- Nine Mile Creek – Hennepin
- Sand Creek - Scott

For further information on the following streams, please contact Casandra Champion via [email](#) or at 651.602.8745.

- Battle Creek – Ramsey
- Beltline Interceptor – Ramsey
- Browns Creek – Washington
- South Fork of the Crow River – Carver
- Fish Creek – Ramsey
- Rum River – Anoka
- Silver Creek – Washington
- Vermillion River – Dakota

For further information on the following streams, please contact Leigh Harrod via [email](#) or at 651.602.8085.

- Bassett Creek – Hennepin
- Cannon River – Goodhue
- Crow River – Washington
- Eagle Creek – Scott
- Minnehaha Creek – Hennepin
- Riley Creek – Hennepin
- Valley Creek – Washington