



Photo credit Dan Johnson

Bassett Creek Water Quality Summary

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who is the

Metropolitan Council?



planning



established
in 1967
by the state
legislature

housing



wastewater & water

- Our mission is to foster efficient and economic growth for a prosperous metropolitan region.
 - Thrive MSP 2040
 - Water Resource Policy Plan
- We provide:
 - Transit services and planning
 - Wastewater treatment
 - Regional planning assistance for 189 communities
- MCES is the area-wide water quality planning agency under Section 208 of the Clean Water Act.

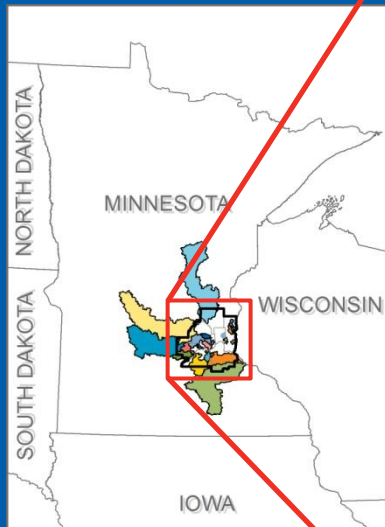


MCES Stream Monitoring Program

Established in the late 1980's to determine the extent of non-point source pollution, to help with the development of TMDL plans, and to measure progress toward achievement of water quality standards.

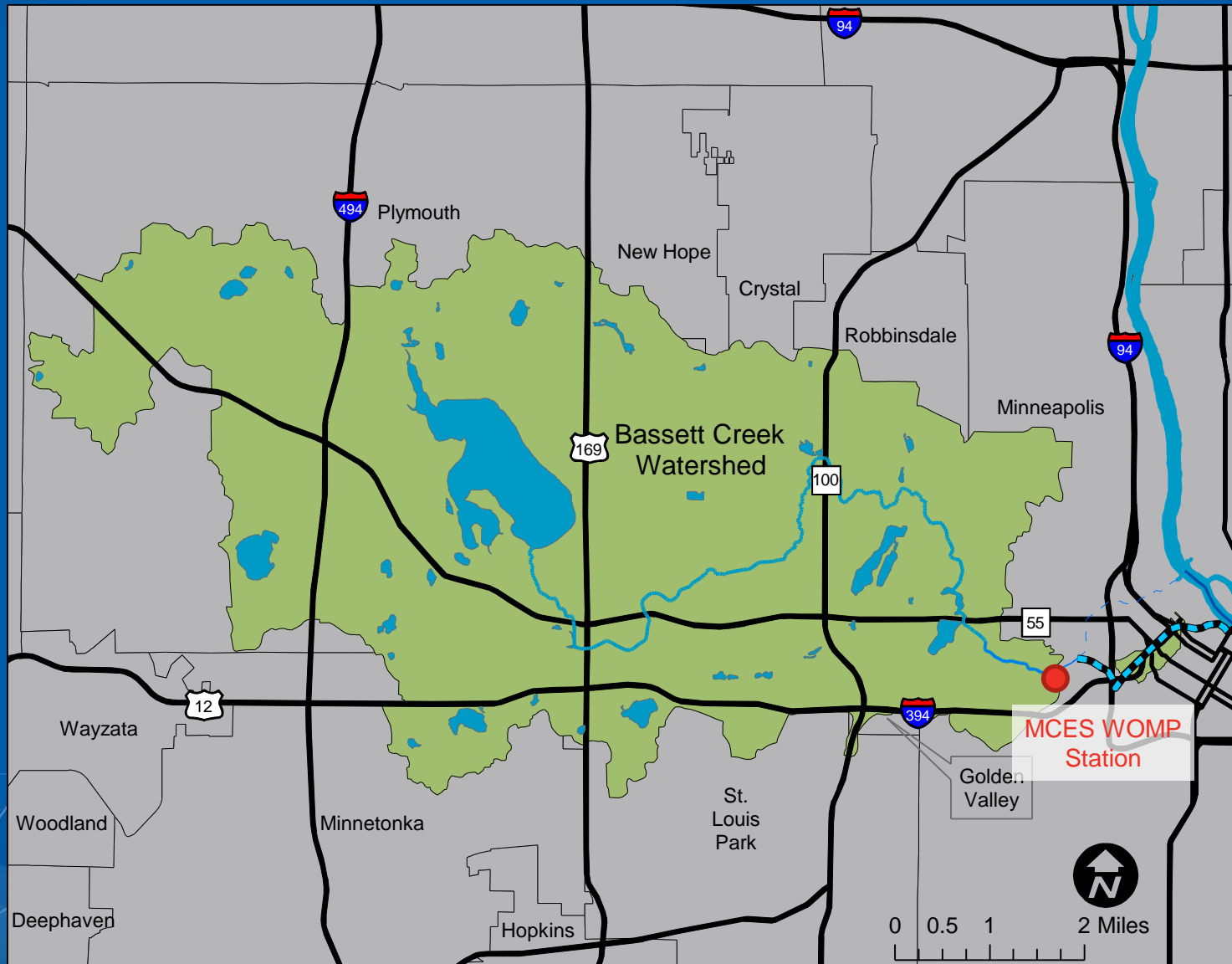


MCES Stream Monitoring Sites



- 23 Stream Sites
- Diverse in land use, hydrology, size, etc.
- Data records range from 14-26 years

Bassett Creek Monitoring Site



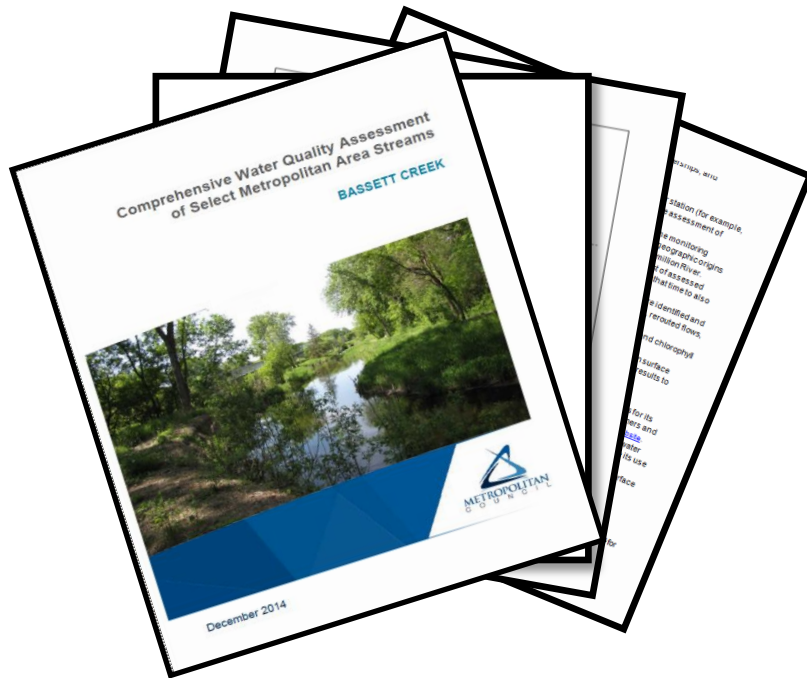
Comprehensive WQ Assessment of Select Metropolitan Area Streams

- Provides a base of technical information
- Supports sound decisions by the Council, state agencies, local watershed management organizations, conservation districts, and county and city governments

Goals:

- Compile and assess data for period of collection
- Compile landscape and pollutant source data for regression model
- Draw conclusions about possible effects on flow and water quality
- Assess water quality in metro area streams in a **consistent** manner to allow direct comparisons from stream-to-stream and stream-to-river
- Make watershed-specific recommendations for future monitoring and assessment activities, partnerships, and other potential actions

Bassett Creek Section Contents



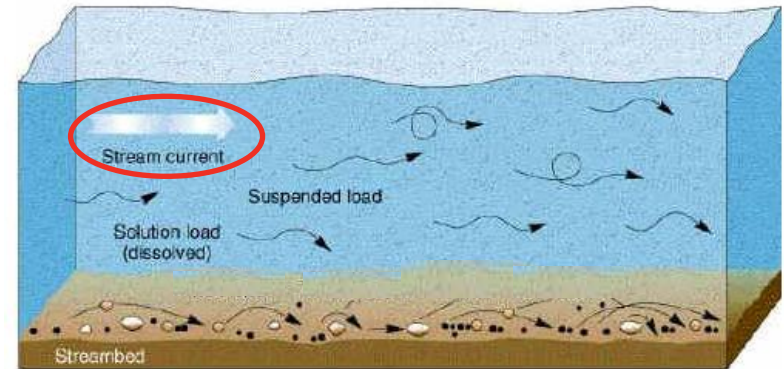
- Introduction
- Partnerships
- Monitoring Station, Stream, and Watershed Description
- Water Quality Impairments
- **Hydrology**
- **QWTrend Analysis**
- Flow and Load Duration Curves
- **Pollutant Loads**
- Biological Monitoring
- **Metro-wide Comparisons**
- Conclusions & Recommendations

For more information, please see the Bassett Creek Section in the *Comprehensive Water Quality Assessment of Select Metropolitan Area Streams* at:
www.metrocouncil.org/streams

Hydrology: flow in a stream

Why is measuring flow important?

Stream flow, or the rate of water flowing in a stream, affects aquatic life and the ecosystem. High flows can lead to flooding, erosion, and the transport of pollutants.



Hydrology

How much water is in Bassett Creek?

- Bassett Creek has an average flow rate of 25 cubic feet per second.
- At this rate, it would take 10 days to fill the Target Center in Minneapolis.



<http://blogs.mprnews.org/stadium-watch/2013/02/15/mortenson-wins-vikings-stadium-contract-8-other-sports-venues-theyve-built/>

Hydrology

Where does the water in Bassett Creek come from?

- The water in Bassett Creek is primarily surface water runoff from rain or snowmelt.
- The flow in Bassett Creek is heavily influenced by discharge from Medicine Lake and storm sewers.



Photo credit Dan Johnson

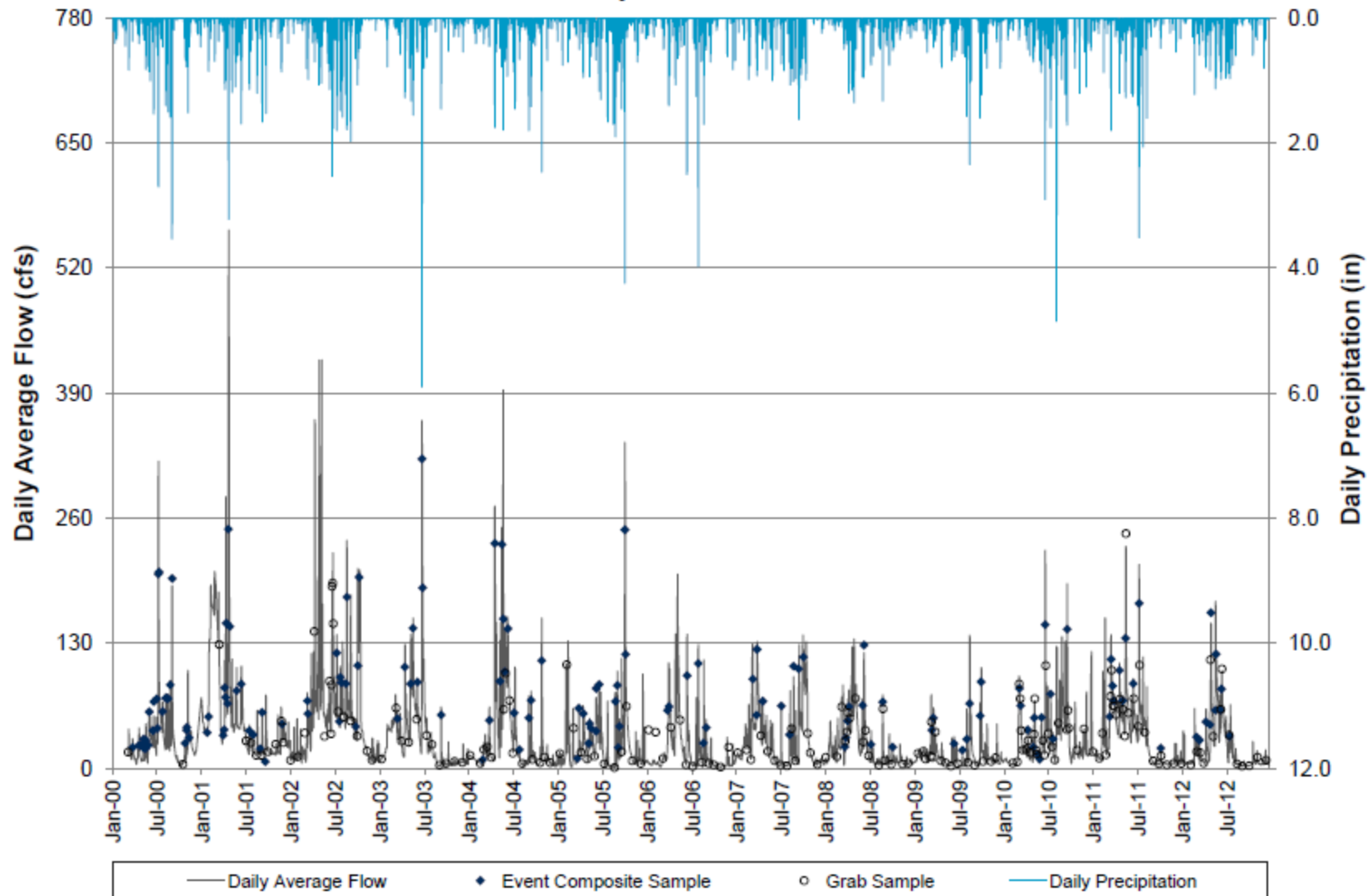
Hydrology

How is flow it estimated?

- We continuously monitor stream water level and velocity.
- We (MCES & partners) take manual, discrete flow measurements.
- We make a correlation to create a continuous record of flow.



Figure BS-8: Bassett Creek Daily Average Flow, Sample Flow, and Precipitation, 2000-2012*

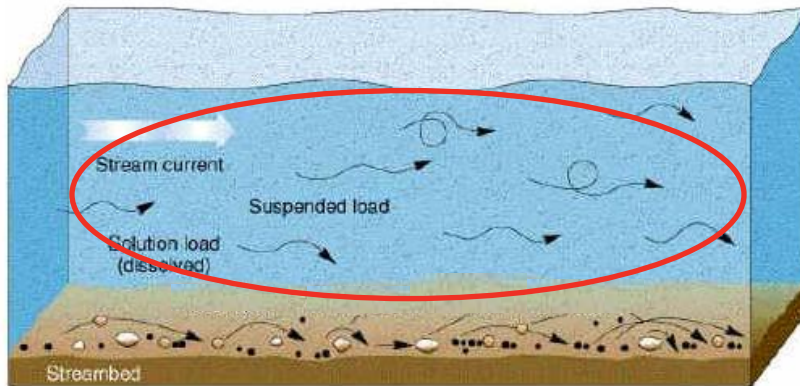


*Precipitation record was acquired from NWS COOP stations: 214884-Lower St. Anthony Falls and 215838-New Hope

Concentration

What is concentration?

Ratio of mass of pollutant to volume of water.



Why do we measure it?

- Harmful to aquatic life (fish, insects, etc.) in the stream.
- Affects enjoyment of aquatic recreation.

Concentration Trends

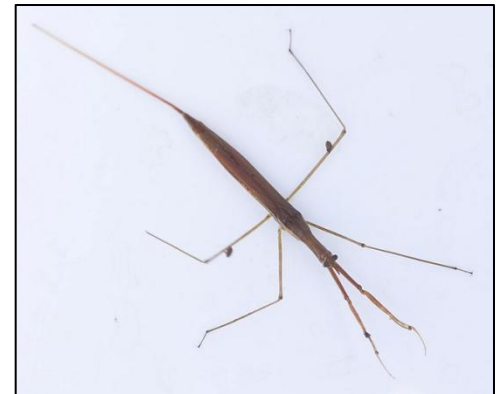
What is a concentration trend?

Concentration trends show the changes in a creek's water quality over time. The trend in concentration is flow-adjusted, so large storm events/droughts do not influence the trend.

Concentration Trends

Why do we estimate trends?

Changes in stream concentrations affect the creatures that live in the water (fish, insects, etc.). Changes in the trends show us how land management and water quality improvement projects may affect these populations – and the creek as a whole.



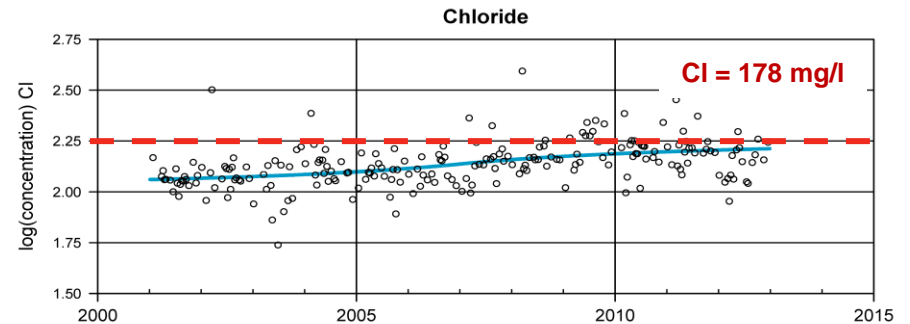
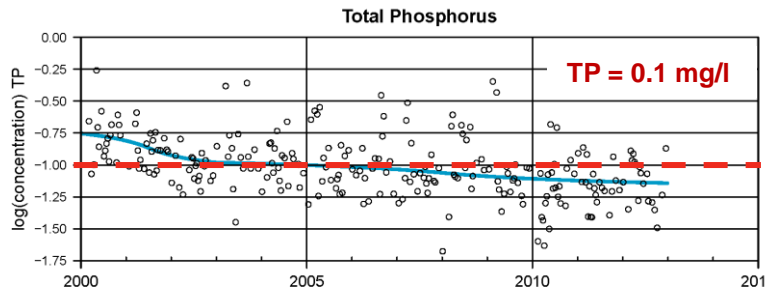
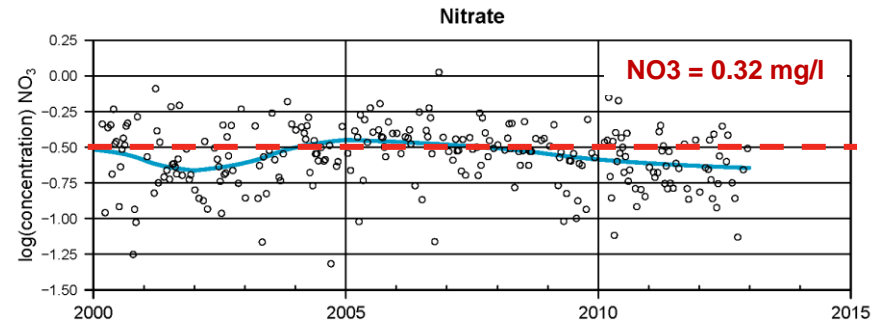
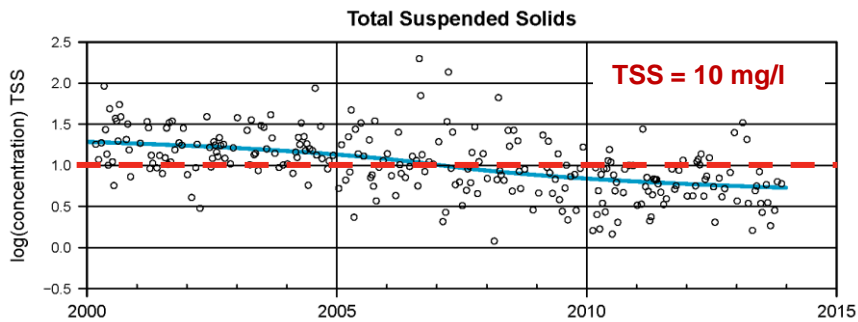
Concentration Trends

How is it estimated?

- We monitor streamflow.
- We collect water samples to determine the pollutant concentration.
- Once we have 10 years of data, we use the USGS QWTREND program to help us estimate trends.



Bassett Creek Concentration Trends



○ Trend+Residual — Trend

Bassett Creek Concentration Trends

Last 5 Years

| Parameter | Water Quality | Percent Change |
|------------------------|---------------|----------------|
| Total Suspended Solids | ↑ | -30% |
| Total Phosphorus | ↑ | -17% |
| Nitrate | ↑ | -27% |
| Chloride | ↓ | 13% |

Bassett Creek Concentration Trends

What activities may have influence trends?

- Minnesota Phosphorus Lawn Fertilizer Law (2002): restricts the use of phosphorus fertilizers on lawns
- Water quality pond and infiltration area construction
- Streambank restoration
- Medicine Lake herbicide treatment for curlyleaf pondweed
- Increased application of winter de-icers and build up of chloride in Medicine Lake

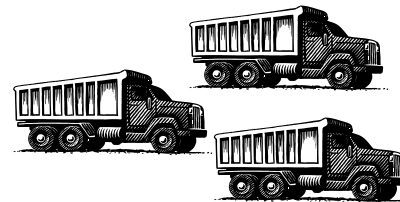
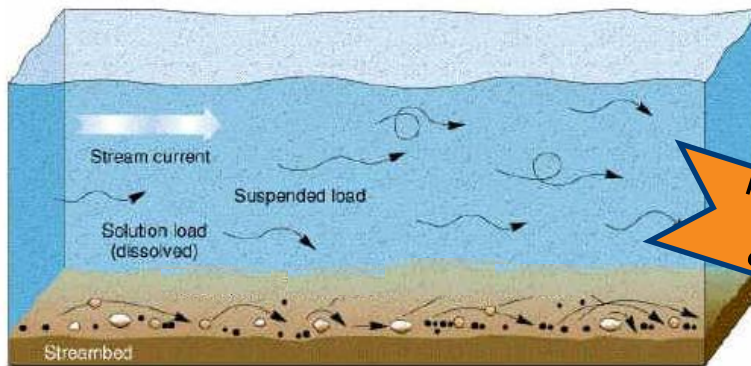


Photo credit: BCWMC

Pollutant Loads

What is a load?

A pollutant load is the total weight of a pollutant transported by water over a set time period (for example, a month or year).



Pollutant Loads

Why do we estimate loads?

This tells us the amount of pollutants that are leaving the Bassett Creek Watershed and entering the Mississippi River.



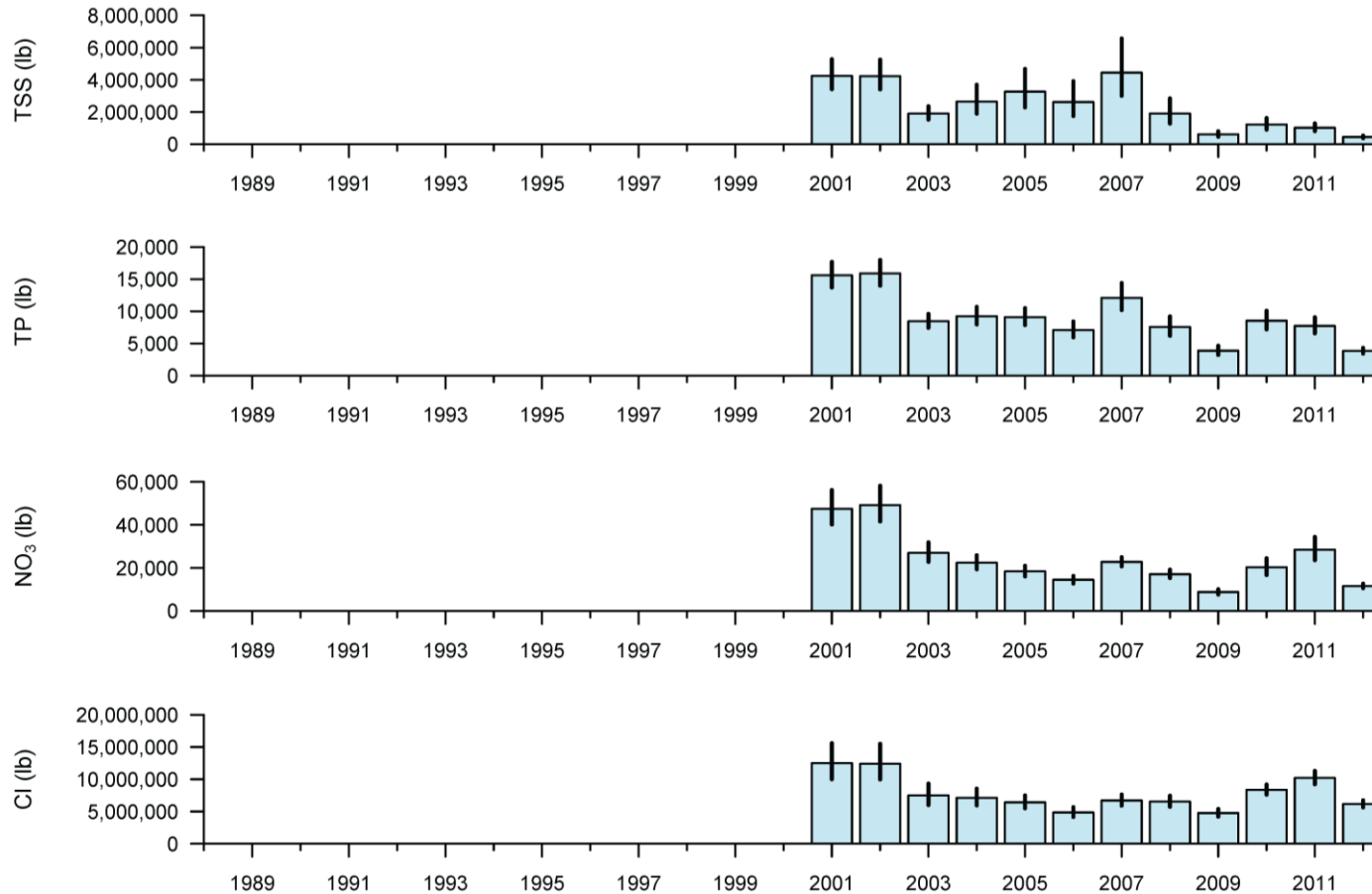
Photo credit: Friends of the Mississippi River

Pollutant Loads

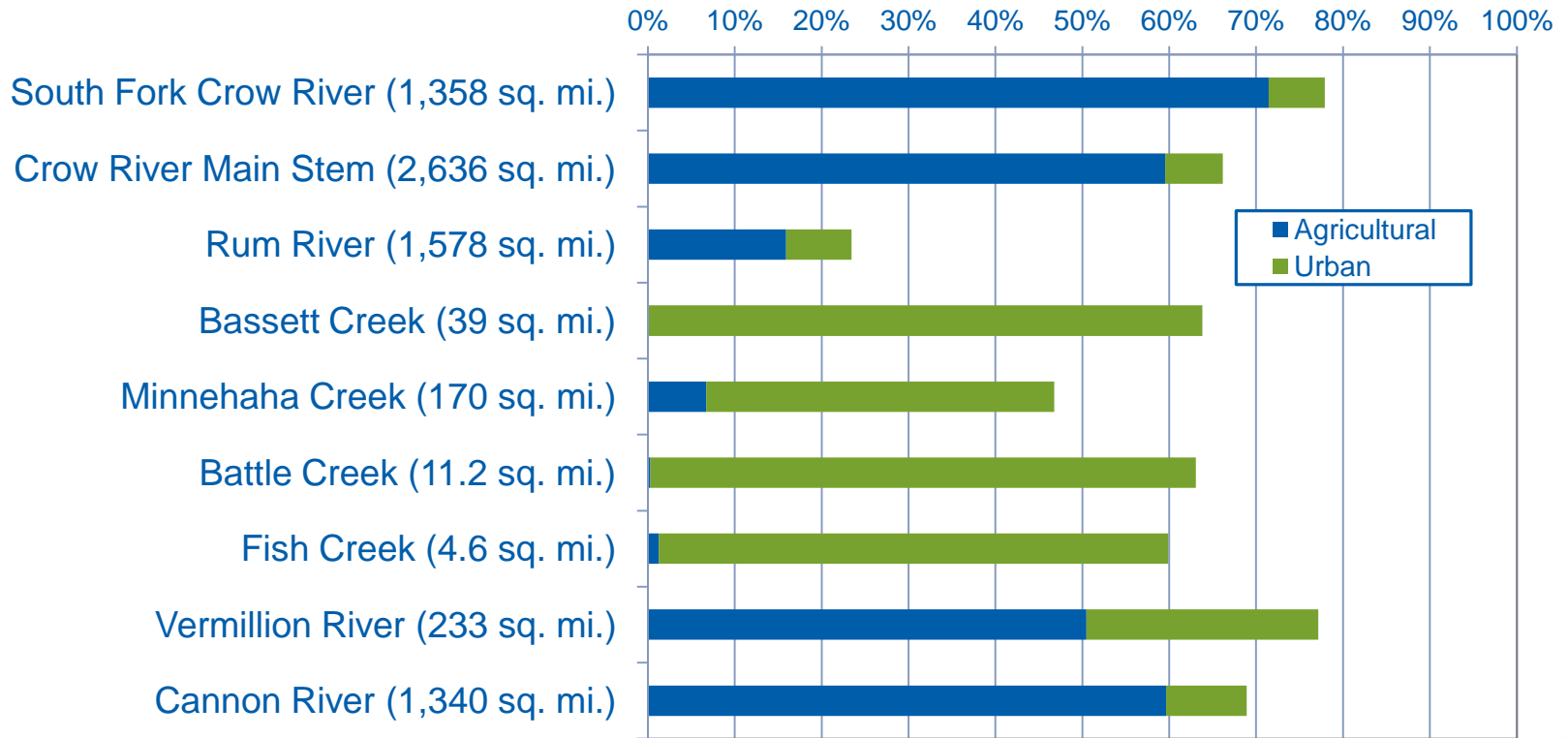
How is it estimated?

- We monitor streamflow.
- We collect water samples to determine the pollutant concentration.
- Stream Flow x Pollutant Concentration = Pollutant Load
- We use the US Army Corps of Engineers Flux32 program to help us estimate loads.

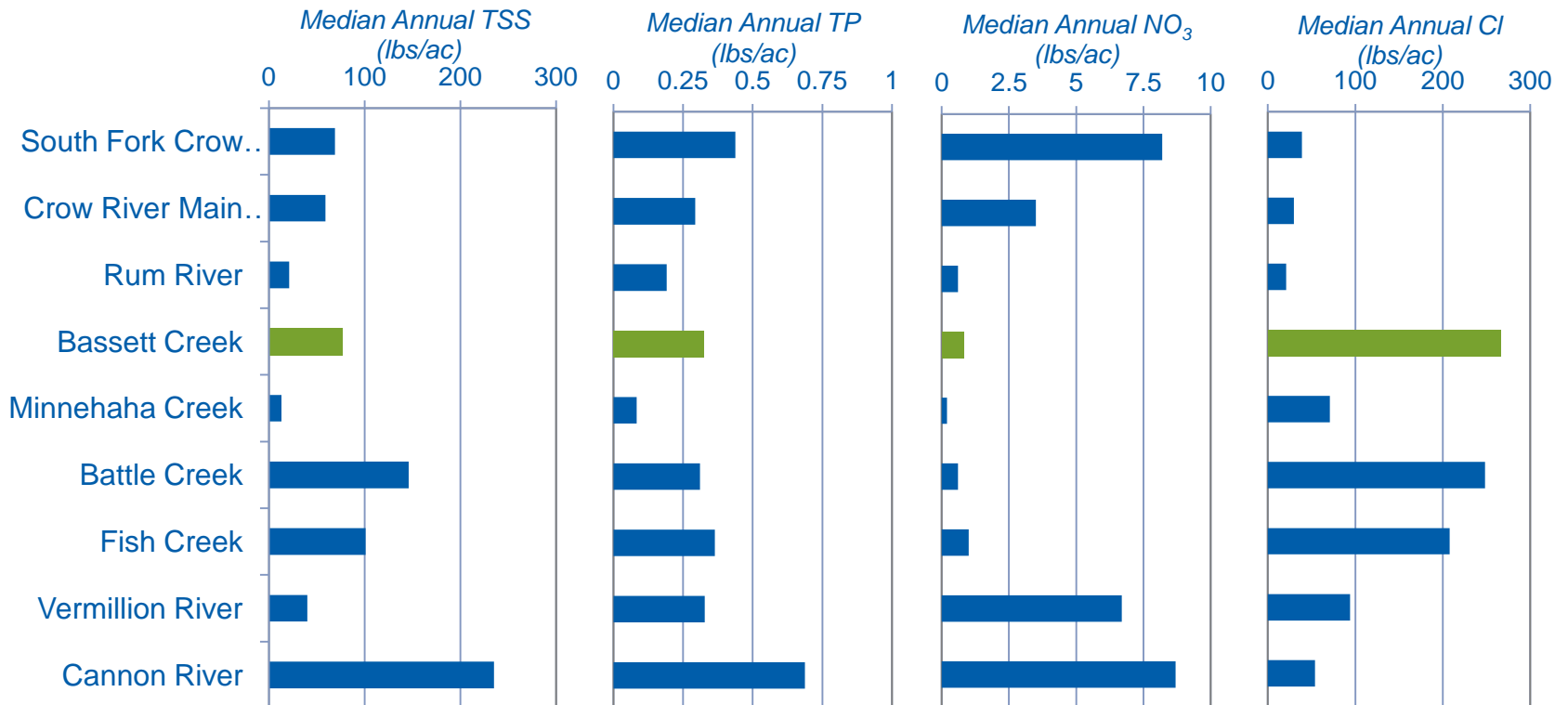
Bassett Creek Pollutant Loads



How does Bassett Creek Compare to Other MCES Monitored Mississippi Tributaries?



How do Bassett Creek Loads Compare to Other MCES Monitored Mississippi Tributaries?



What Metropolitan Council Can Provide You

Now

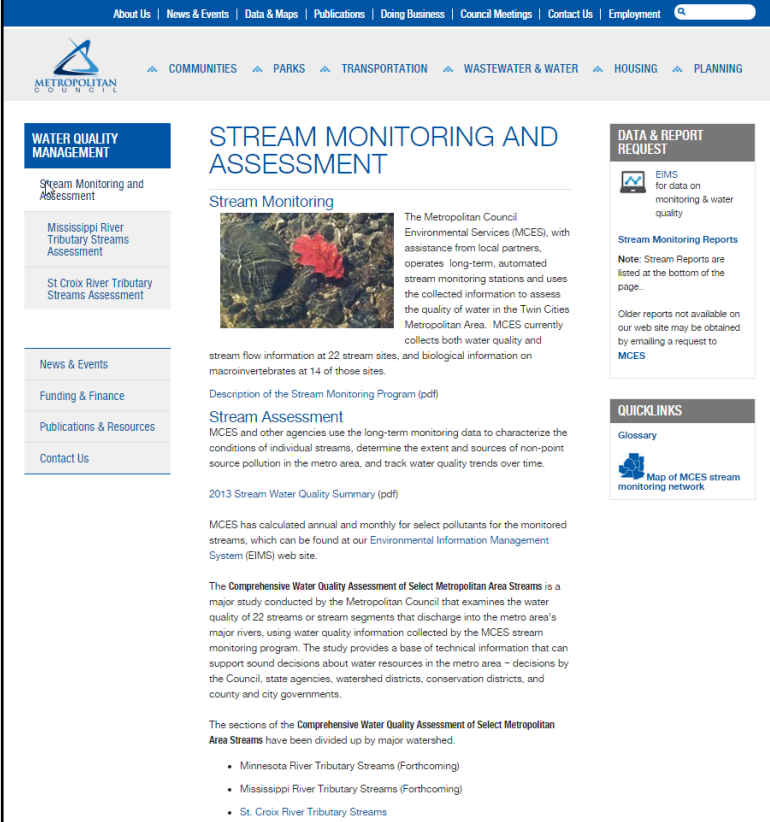
Bassett Creek section and factsheet
Please use/distribute!

Yearly

- Stream Water Quality Summary
- Calculated loads
- Regional Water Quality Assessment

Future

- Trends updated in 5 years
- Special studies (TBD with your input)



The screenshot displays the Metropolitan Council website's 'Stream Monitoring and Assessment' page. The page features a navigation bar at the top with links for 'About Us', 'News & Events', 'Data & Maps', 'Publications', 'Doing Business', 'Council Meetings', 'Contact Us', and 'Employment'. Below the navigation bar is a search bar and a secondary navigation menu with links for 'COMMUNITIES', 'PARKS', 'TRANSPORTATION', 'WASTEWATER & WATER', 'HOUSING', and 'PLANNING'. The main content area is titled 'STREAM MONITORING AND ASSESSMENT' and includes a sub-section for 'Stream Monitoring'. A photograph of a stream with a red flower in the foreground is shown. Text on the page describes the Metropolitan Council Environmental Services (MCES) program, which operates long-term, automated stream monitoring stations to assess water quality. It mentions that MCES currently collects both water quality and biological information at 22 stream sites and macroinvertebrates at 14 of those sites. A 'Description of the Stream Monitoring Program (pdf)' and a 'Stream Assessment' section are also visible. The 'Stream Assessment' section explains that MCES and other agencies use long-term monitoring data to characterize stream conditions and track water quality trends. A '2013 Stream Water Quality Summary (pdf)' is listed. The page also includes a 'Data & Report Request' section with a link to the Environmental Information Management System (EIMS) and a 'QUICKLINKS' section with a 'Glossary' and a 'Map of MCES stream monitoring network'. A sidebar on the left contains a 'WATER QUALITY MANAGEMENT' section with links for 'Stream Monitoring and Assessment', 'Mississippi River Tributary Streams Assessment', and 'St Croix River Tributary Streams Assessment'. Below this is a 'News & Events' section with links for 'Funding & Finance', 'Publications & Resources', and 'Contact Us'.

How else can we partner with you?

Questions?

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METROPOLITAN
C O U N C I L

For more information, please see the Bassett Creek
Section in the *Comprehensive Water Quality Assessment*
of Select Metropolitan Area Streams at:

www.metrocouncil.org/streams