

Table 1.CM. Carnelian-Marine Outlet Monitoring Station Information



Station Address: Little Carnelian Lake Outlet near Partridge Road, Stillwater, MN
County: Washington
Major Basin: St. Croix River Basin
Watershed: Carnelian Marine Watershed
Drainage Area: 30.05 square miles

Station Operator: Washington County Soil and Water Conservation District

Metropolitan Council Environmental Services Contact Information:

Contact Person: Casandra Champion
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Watershed District or Watershed Management Organization:

Carnelian Marine Watershed District

Station Overview: MCES has supported water quality monitoring of the Little Carnelian Lake Outlet since 1995. The monitoring station is located near Stillwater, Minnesota, about three miles upstream from the stream confluence with the St. Croix River. This stream flows from the outlet of Little Carnelian Lake and drains a large Washington County chain of lakes.

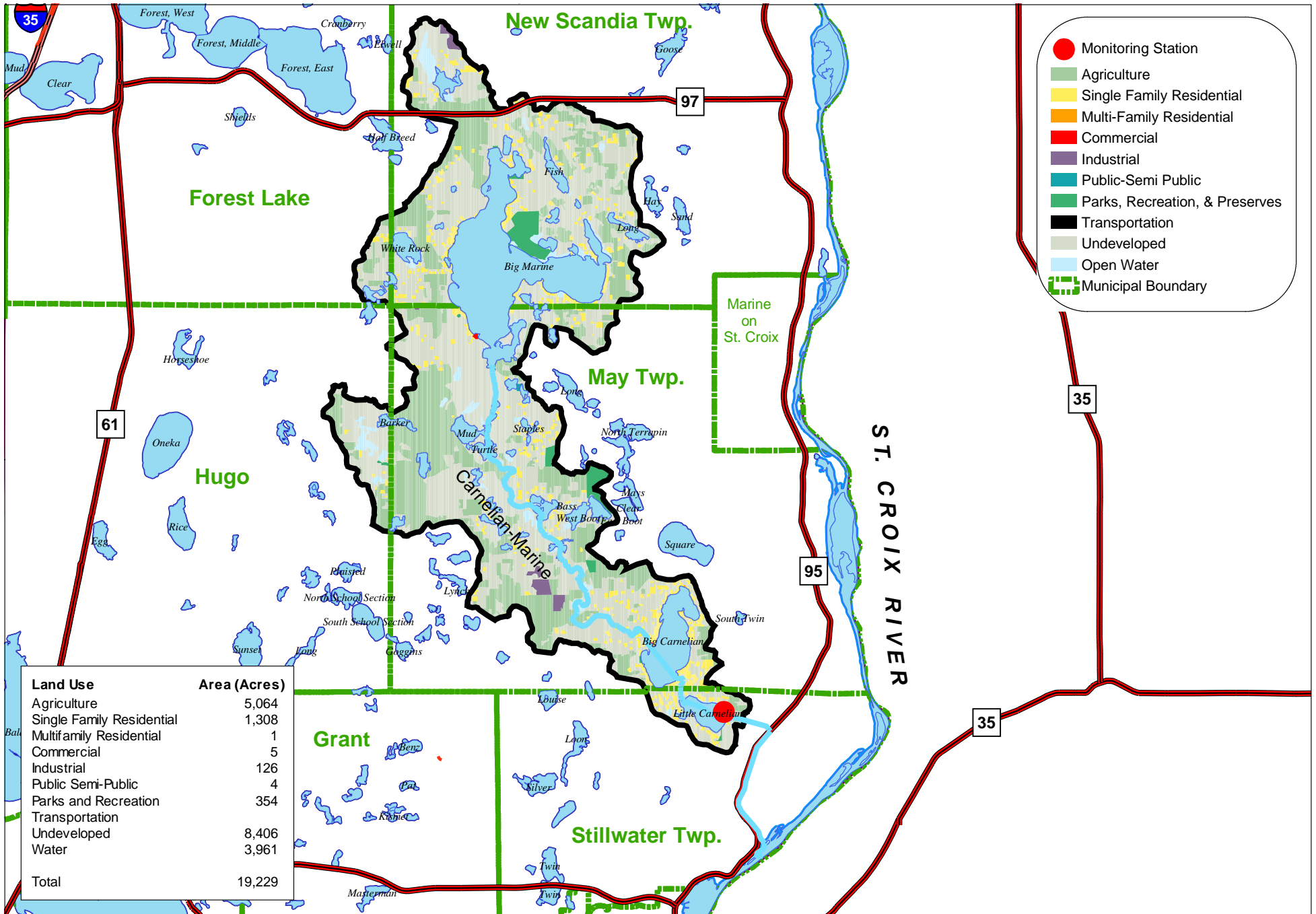
Composite samples for water chemistry analysis are not collected at this station because runoff events tend to be long and lake-attenuated, and therefore easily characterized by grab samples. There is no rain gage at this station.

2001 Monitoring Year: The Little Carnelian Lake Outlet usually does not flow year around. In 2001, stream flow began on April 8 and ceased on September 1. The peak daily average flow of 44 cfs occurred on April 25, 2001. Between April 29 and May 21, stage was artificially elevated by debris at the weir. Daily average flows during this period were estimated from an upstream gaging station at the outlet of Big Carnelian Lake.

Fourteen grab samples were collected for water chemistry analysis during 2001. The MCES annual water quality monitoring plan includes 12 monthly baseflow (“non-event”) grab samples and approximately 10 to 15 flow-weighted composite samples collected during all runoff events in the open-water season (March-November). However, the MCES sampling scheme is modified for this monitoring station because of its unique hydrologic situation.

For additional stream monitoring information and monitoring methods regarding this site, see www.metrocouncil.org/environment/RiversLakes.

Figure 1.CM. Carnelian-Marine Monitoring Station Location and Watershed Characteristics



0 0.5 1 2 Miles



Figure 2.CM. Carnelian Marine Outlet 2001 Hydrograph with Sampling Information

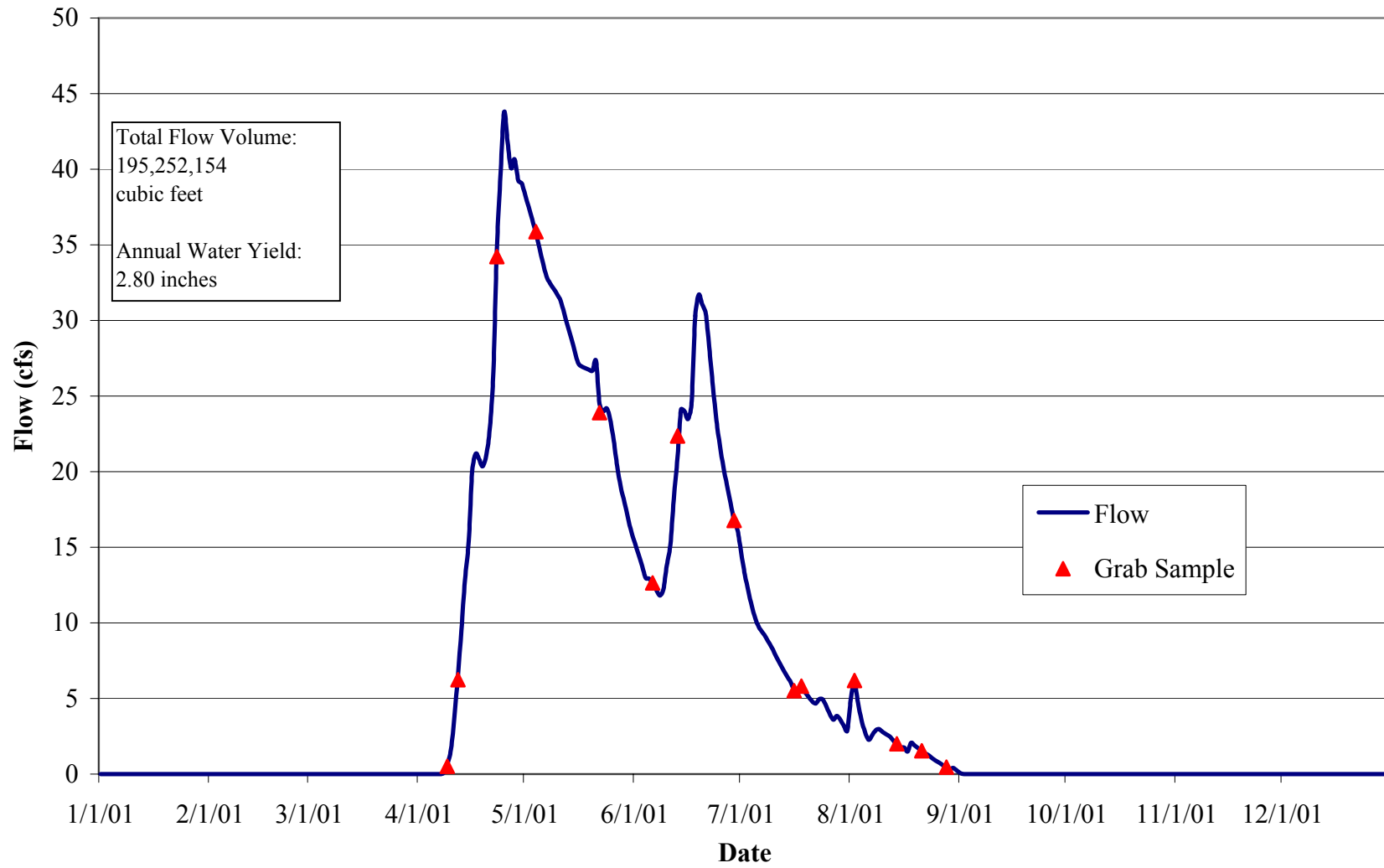


Table 2.CM. Carnelian-Marine Outlet 2001 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Hardness, mg/L	3	81	na	20	116	na	na	na
Cadmium, ug/L	4	0.1	na	0.1	0.1	na	na	na
Chromium, ug/L	4	0.5	na	0.5	0.5	na	na	na
Copper, ug/L	4	1.6	na	0.7	2.4	na	na	na
Lead, ug/L	4	0.5	na	0.5	0.5	na	na	na
Nickel, ug/L	4	0.7	na	0.5	0.9	na	na	na
Zinc, ug/L	4	1.0	na	1.0	2.0	na	na	na
Nitrogen, Total Kjeldahl, mg/L	14	0.40	0.40	0.20	0.70	0.30	0.50	0.10
Nitrogen, Total Nitrate, mg/L	13	0.19	0.09	0.05	1.36	0.05	0.17	0.35
Phosphorus, Total, mg/L	14	0.03	0.03	0.01	0.07	0.01	0.03	0.02
Phosphorus, Total Dissolved, mg/L	7	0.01	0.01	0.01	0.02	0.01	0.01	0.00
Solids, Total Suspended, mg/L	14	3	2	2	9	2	4	2
Solids, Volatile Suspended, mg/L	14	2	2	2	4	2	2	1
Turbidity, NTU	3	1	na	1	1	na	na	na

na: Data are insufficient to calculate these statistics.

Table 3.CM. Carnelian-Marine Outlet 2001 Annual Loading Information* for Suspended Solids and Nutrients

Variable	Annual Load (tons)	Annual Yield (lbs/acre)	Annual Normalized Yield (lbs/acre/in of water)	Flow Weighted Mean Concentration (mg/L)
Solids, Total Suspended	15	2	1	3
Phosphorus, Total	0.17	0.02	0.01	0.03
Phosphorus, Total Dissolved	0.06	0.01	0.00	0.01
Nitrogen, Total Nitrate	0.96	0.10	0.04	0.16

* 2001 Annual Loading Information is provisional and may be subject to minor revisions.