

Table 1.RUM. Rum River Monitoring Station Information



Station Address: 2117 First Avenue, Anoka, MN 55303
County: Anoka
Major Basin: Mississippi River Basin
Watershed: Rum River
Drainage Area: 1,552 square miles

Station Operator: Anoka 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:

Station Overview: MCES has supported water quality monitoring of the Rum River since 1996. The Rum River flows from Lake Mille Lacs through Mille Lacs, Isanti, and Anoka Counties. The monitoring station was moved to its present location in 2000 and began operation in April 2001. The monitoring station is located at the Rum River Dam in Anoka, Minnesota, 0.5 mile upstream from the river confluence with the Mississippi River. MCES partners with the Anoka County Soil and Water Conservation District to operate the Rum River monitoring station. The rating curve at this location is based on

the empirical formulas for the dam and sluice gate control structures. The rain gauge at this monitoring station collects rainfall data; however, supplemental winter precipitation data are obtained from the Minnesota Climatology Working Group, St. Francis Station Number 211390.

2003 Monitoring Year: Daily average flows were estimated during the January-April 2003 period, using the baseflow regression method and data from the USGS flow gauge at St. Francis, MN, about 15 miles upstream from the Anoka monitoring station. Snowmelt began during the last week of March 2003. A peak daily average flow of 5,374 cfs was recorded on April 26, 2003, during a spring runoff event with combined snowmelt and rainfall. At the St. Francis gauge, the highest recorded daily average flow is 10,100 cfs, as measured in 1965 and 1969.

Runoff event-based composite sampling began in mid-March 2003 and continued through mid-September. A series of spring runoff events occurred during the April 10 - June 24, 2003 period. A composite sample collected on the falling limb of a large and extended (mid-April to early May) spring runoff event had the highest TSS concentration (50 mg/L) of all 2003 samples.

Fourteen samples were collected for water quality analysis during 2003, including 7 composite samples and 7 grab samples. 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). The 2003 sampling scheme did not meet the goals of the MCES monitoring work plan. Baseflow conditions were probably well characterized by the grab samples collected; however ice near the dam prevents baseflow sampling during the winter months. More composite samples should have been collected to better characterize all runoff events. Necessary adjustments to the sampling scheme will be made prior to the 2004 monitoring year.

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

Figure 1. RUM. Rum River Monitoring Station Location and Watershed

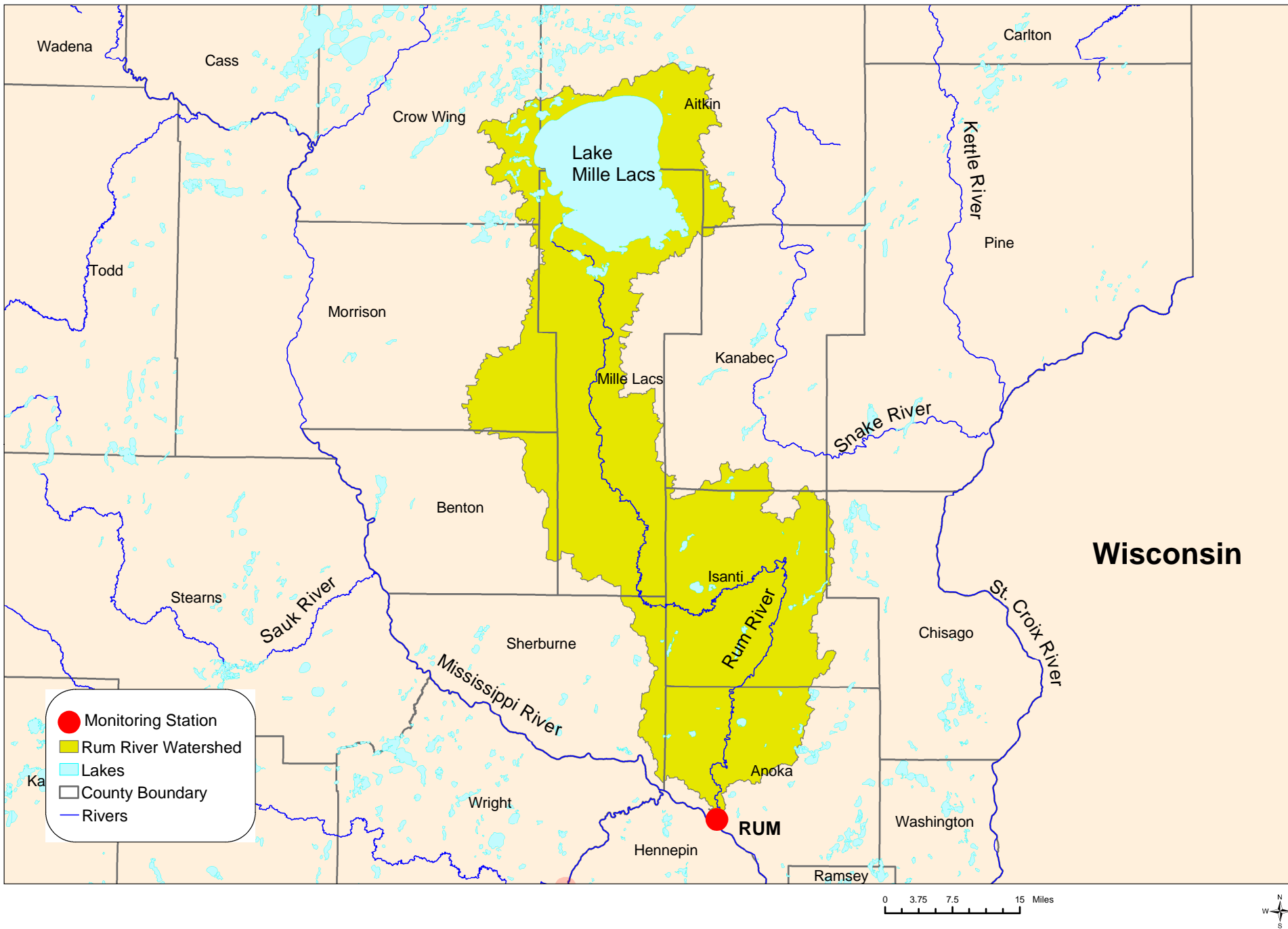


Figure 2.RUM. Rum River 2003 Hydrograph, Precipitation and Sampling Information

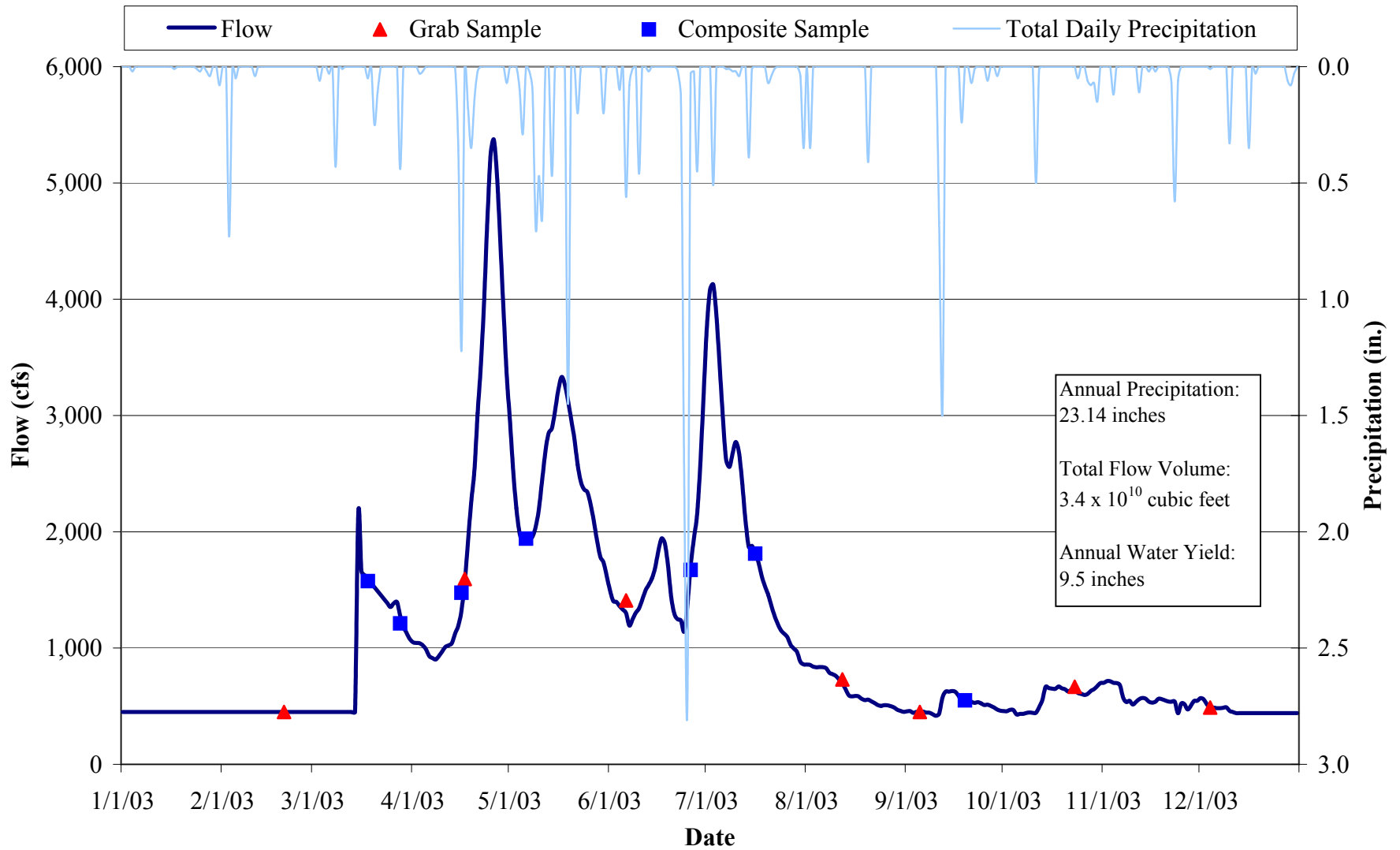


Table 2.RUM. Rum River 2003 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	13	14	14	3	18	12	16	8
Hardness, mg/L	4	158	155	25	188	137	183	136
Cadmium, ug/L	4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium, ug/L	4	0.5	0.5	0.1	0.6	0.4	0.6	0.3
Copper, ug/L	4	1.3	1.3	0.2	1.5	1.1	1.5	1.1
Lead, ug/L	4	0.5	0.4	0.3	0.9	0.3	0.8	0.3
Nickel, ug/L	4	1.6	1.6	0.4	2.1	1.3	2.0	1.2
Zinc, ug/L	4	3.8	3.8	0.4	4.2	3.4	4.2	3.3
Total Kjeldahl Nitrogen, mg/L	13	0.92	0.99	0.36	1.40	0.53	1.25	0.37
Total Nitrate Nitrogen, mg/L	13	0.45	0.35	0.28	0.84	0.21	0.73	0.03
Total Phosphorus, mg/L	13	0.22	0.15	0.19	0.63	0.09	0.29	0.05
Total Dissolved Phosphorus, mg/L	14	0.07	0.04	0.07	0.23	0.04	0.07	0.02
Total Suspended Solids, mg/L	14	21	20	11	50	13	28	9
Volatile Suspended Solids, mg/L	14	7	6	3	13	4	8	3
Turbidity, NTU	14	6	5	2	10	4	6	3

N: Sample Count

25%, 75%: 25th and 75th Percentiles

STD: Standard Deviation

Table 3.RUM. Rum River 2003 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)
Total Suspended Solids	24,600	50	5	23
Total Phosphorus	221	0.44	0.05	0.21
Total Dissolved Phosphorus	51.5	0.10	0.01	0.05
Total Nitrate Nitrogen	431	0.87	0.09	0.40

* 2003 Annual Loading Information is provisional and may be subject to minor revisions.

Figure 3.RUM. Rum River 2003 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

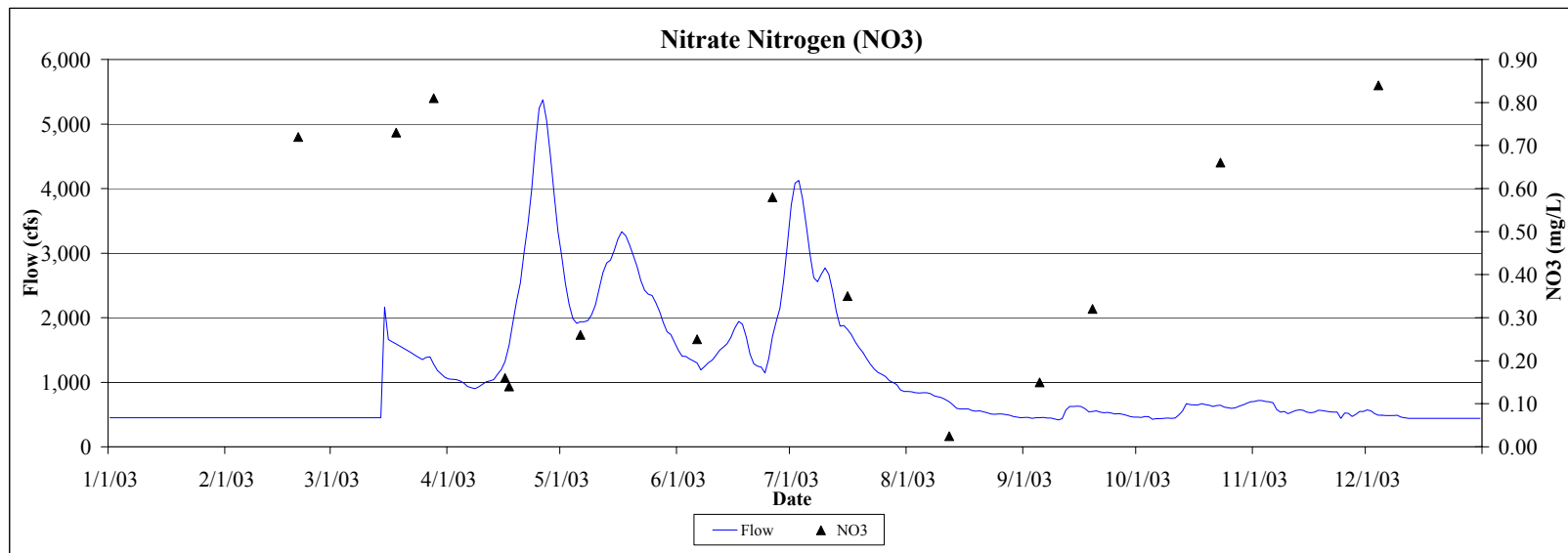
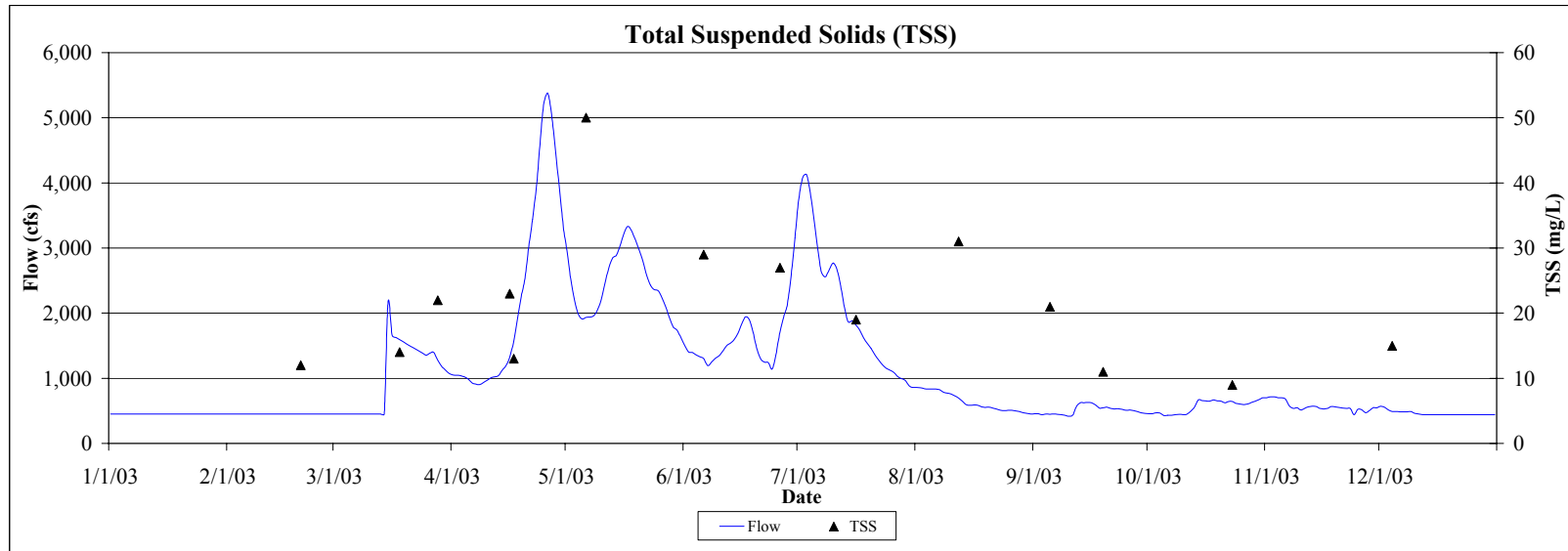


Figure 4.RUM. Rum River 2003 Hydrograph with Total and Dissolved Phosphorus Concentrations

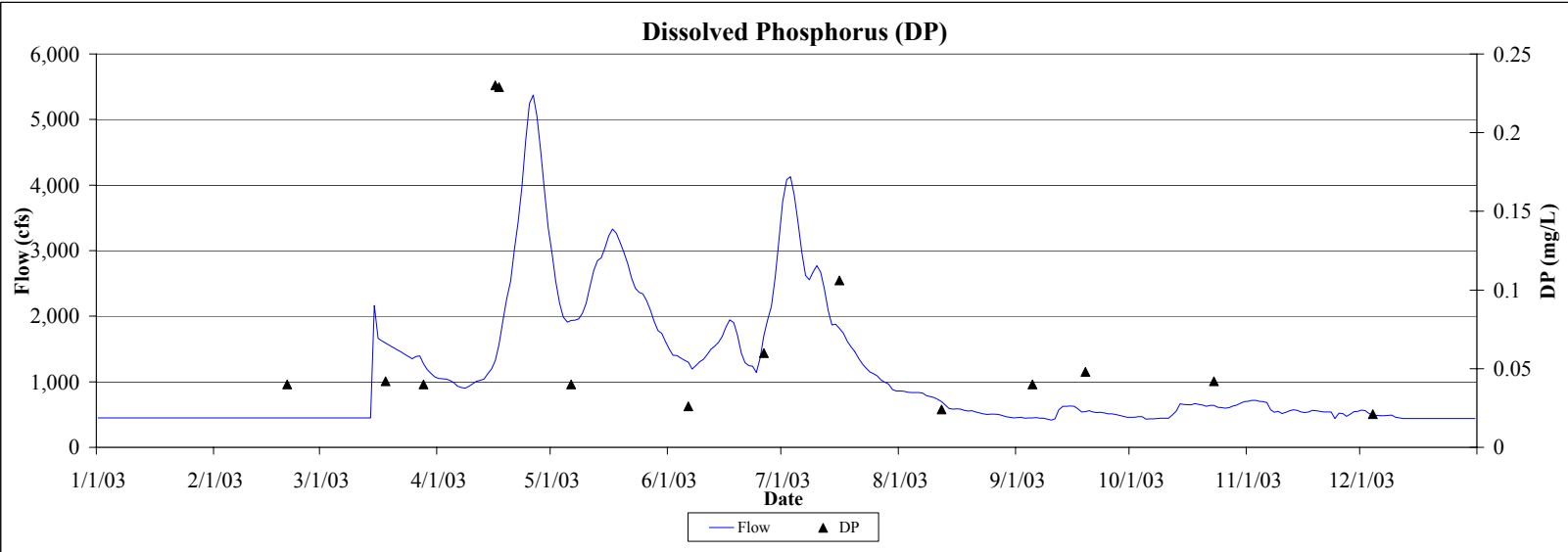
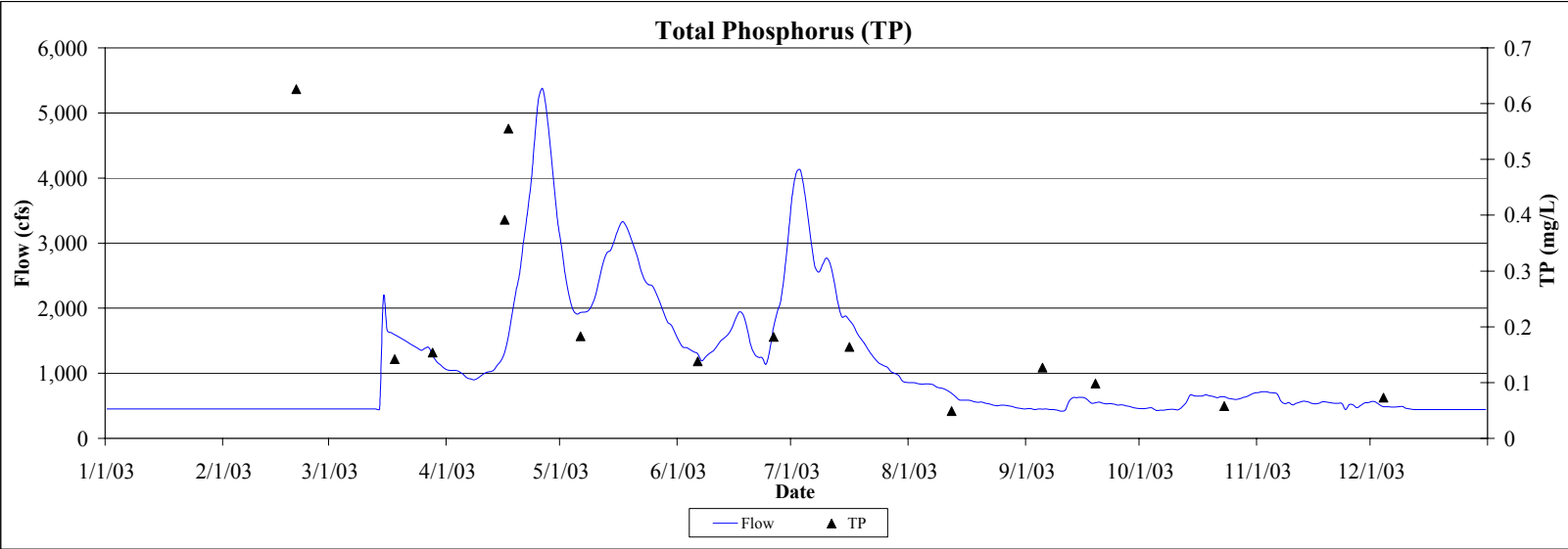


Table 4.RUM. Rum River: Comparison of 2001-2003 Hydrology and Water Chemistry

	2001	2002	2003
Hydrology			
Total Precipitation (inches)	25.61	37.21	23.14
Water Yield (inches)	9.6	12.3	9.5
Total Volume (cubic feet)	3.5×10^{10}	4.4×10^{10}	3.4×10^{10}
Annual Load (tons)			
Total Suspended Solids	29,900	35,800	24,600
Total Phosphorus	167	189	221
Total Dissolved Phosphorus	71.4	76.7	51.5
Total Nitrate Nitrogen	569	715	431
Annual Yield (lbs/acre)			
Total Suspended Solids	60	72	50
Total Phosphorus	0.34	0.38	0.44
Total Dissolved Phosphorus	0.14	0.15	0.10
Total Nitrate Nitrogen	1.15	1.44	0.87
Annual Normalized Yield (lbs/acre/inch of water)			
Total Suspended Solids	6	6	5
Total Phosphorus	0.03	0.03	0.05
Total Dissolved Phosphorus	0.01	0.01	0.01
Total Nitrate Nitrogen	0.12	0.12	0.09
Flow-Weighted Mean Concentration (mg/L)			
Total Suspended Solids	28	26	23
Total Phosphorus	0.15	0.14	0.21
Total Dissolved Phosphorus	0.07	0.06	0.05
Total Nitrate Nitrogen	0.52	0.51	0.40