

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
Address: 2400 Childs Road
St. Paul, MN 55106
Phone: 651-602-8745
E-mail: casandra.champion@metc.state.mn.us

Watershed District or Watershed Management Organization:

Station Overview: MCES has supported water quality monitoring of the Rum River since 1996. 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. The rating curve at this location is based on the empirical formulas for the dam and sluice gate control structures. The Rum River flows from Lake Mille Lacs through Mille Lacs, Isanti, and Anoka Counties. 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.

2002 Monitoring Year: Daily average flows were estimated during the January-April 2002 period, using 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 2002. A peak daily average flow of 6,047 cfs was recorded on April 18, 2002, during the spring runoff event. At the St. Francis gauge, the highest recorded daily average flow is 10,100 cfs, as measured in 1965 and 1969. The Rum River flow at Anoka overtopped the dam sluice gate during the April 16-17, June 27 – July 3, and July 16-20 periods. During these periods, flow was not captured by the empirical rating curve formula and the overflow was estimated by assuming the top of the sluice gate acted as a sharp-crested weir. This assumption may have resulted in a slight underestimation of the flow, which could explain discrepancies between the Anoka and St. Francis gauging stations.

Runoff event-based composite sampling began in mid-April 2002 and continued through mid-September. A fairly small period of runoff occurred during the June 18 - July 10, 2002 period. Rum River flow peaked at 2,420 cfs on July 2. The rising limb of this runoff event, from June 12 to July 2, contributed the highest total suspended solids (TSS) concentrations of the year. A grab sample collected on this rising hydrograph had the highest TSS concentration (64 mg/L) of all 2002 samples.

Thirteen samples were collected for water quality analysis during 2002, including five composite samples and eight 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 2002 sampling scheme did not meet the goals of the MCES monitoring work plan. More samples should have been collected to better characterize all runoff events, as well as baseflow conditions. Necessary adjustments to the sampling scheme will be made prior to the 2003 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

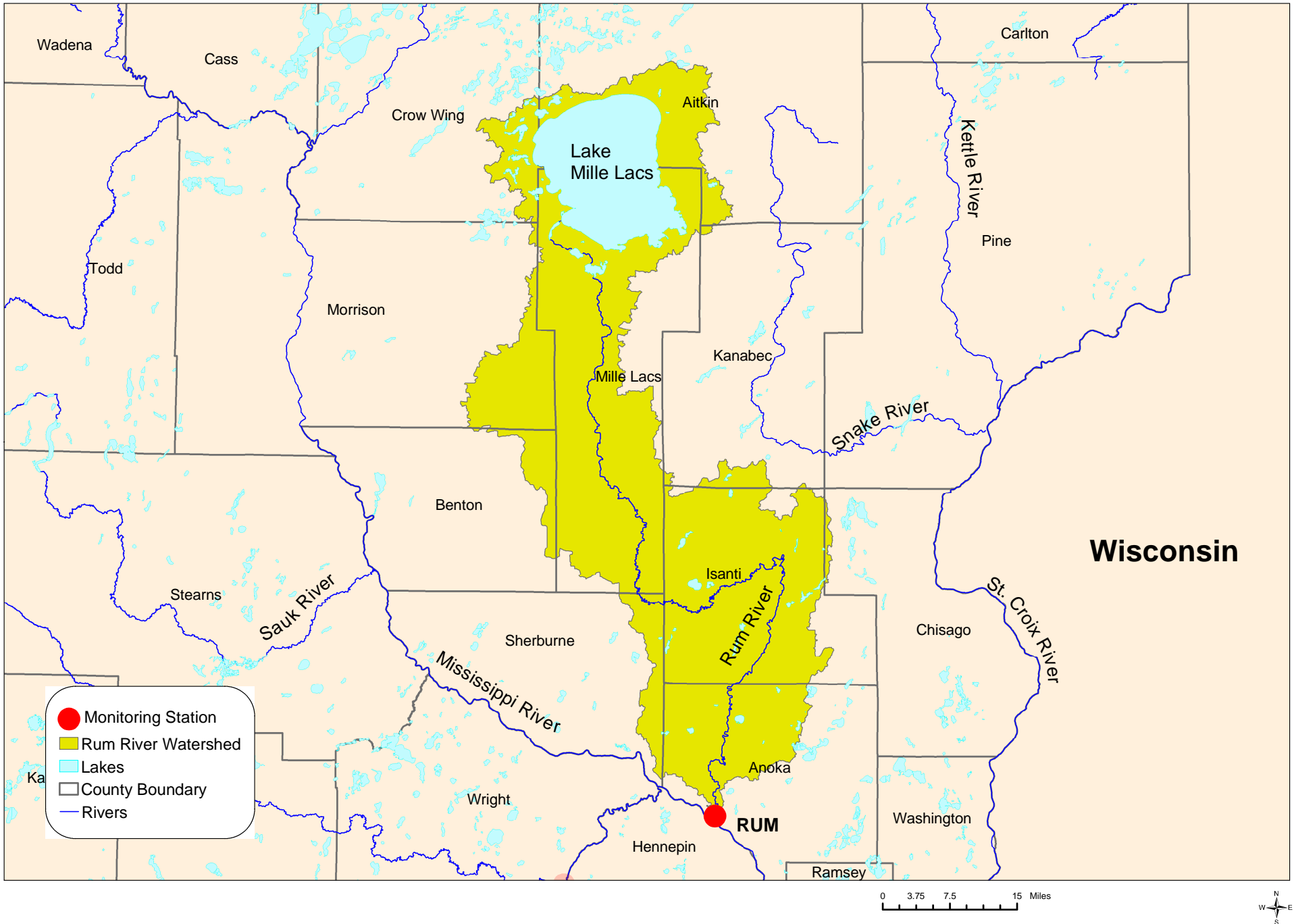


Figure 2.RUM. Rum River 2002 Hydrograph, Precipitation and Sampling Information

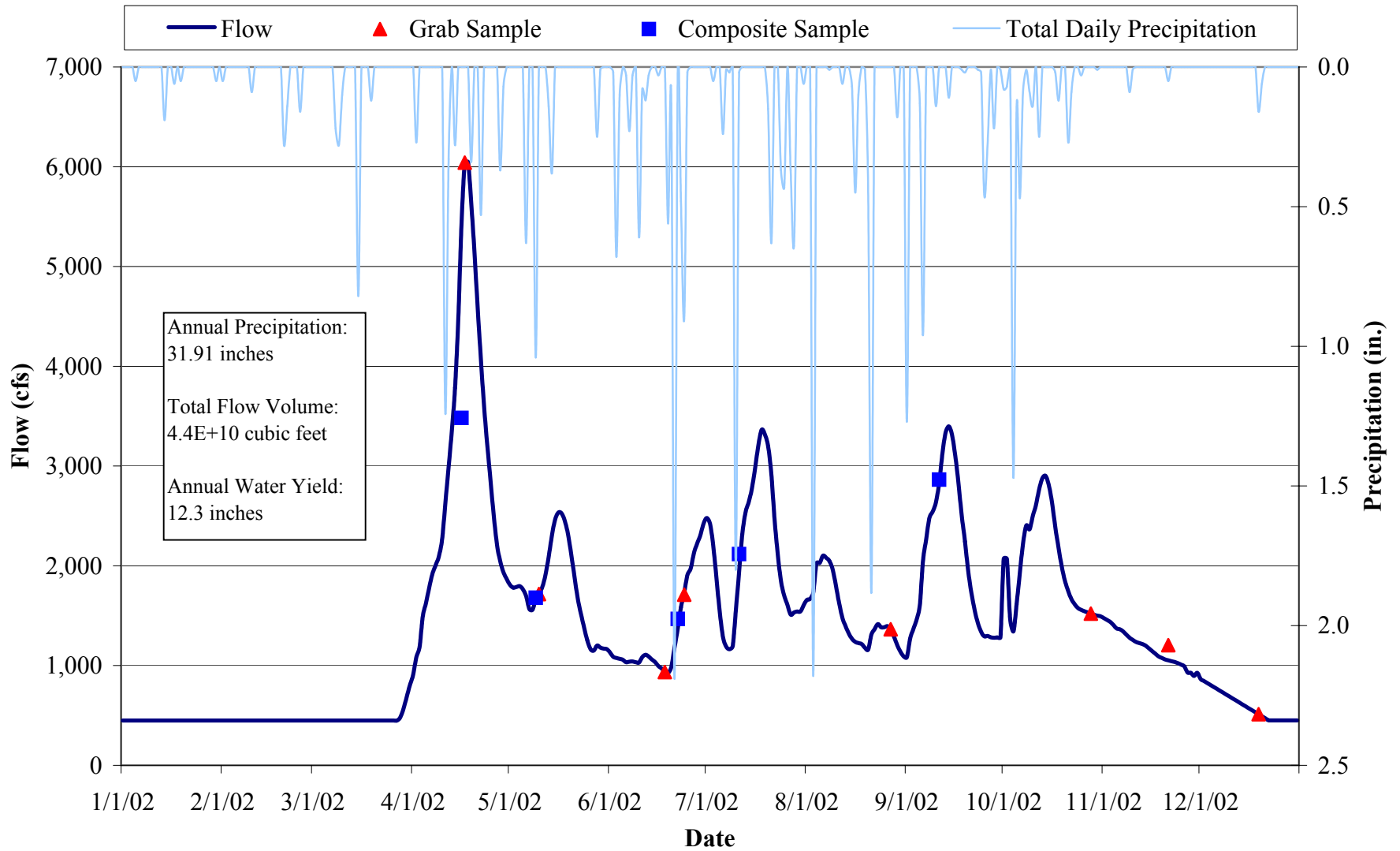


Table 2.RUM. Rum River 2002 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	13	10	11	6	14	8	12	2
Hardness, mg/L	13	128	134	58	162	126	143	29
Cadmium, ug/L	13	0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1
Chromium, ug/L	13	0.6	0.6	0.2	1.2	0.4	0.8	0.3
Copper, ug/L	13	2.5	2.2	1.0	5.1	1.3	3.7	1.4
Lead, ug/L	13	0.6	0.5	0.1	1.4	0.3	1.0	0.4
Nickel, ug/L	13	2.1	2.1	1.4	3.0	1.8	2.4	0.5
Zinc, ug/L	13	6.1	4.6	2.6	23.8	3.2	6.5	5.6
Total Kjeldahl Nitrogen, mg/L	13	0.90	0.92	0.55	1.40	0.65	1.10	0.27
Total Nitrate Nitrogen, mg/L	13	0.46	0.46	0.05	0.85	0.33	0.64	0.21
Total Phosphorus, mg/L	13	0.13	0.14	0.03	0.22	0.07	0.18	0.06
Total Dissolved Phosphorus, mg/L	13	0.05	0.06	0.01	0.10	0.03	0.08	0.03
Total Suspended Solids, mg/L	13	24	18	5	64	8	38	18
Volatile Suspended Solids, mg/L	13	7	7	2	16	4	8	4
Turbidity, NTU	13	8	5	3	18	4	13	5

N: Sample Count

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

STD: Standard Deviation

Table 3.RUM. Rum River 2002 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	35,800	72	6	26
Total Phosphorus	189	0.38	0.03	0.14
Total Dissolved Phosphorus	76.7	0.15	0.01	0.06
Total Nitrate Nitrogen	715	1.44	0.12	0.51

* 2002 Annual Loading Information is provisional and may be subject to minor revisions.

Figure 3.RUM. Rum River 2002 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

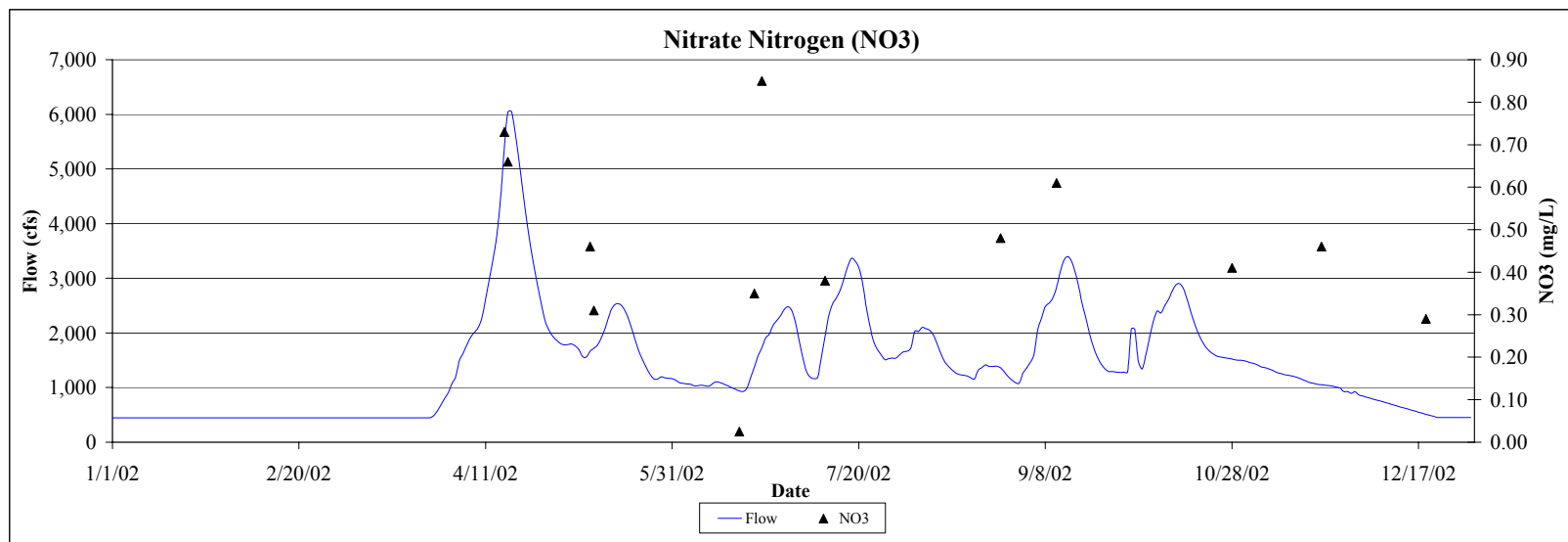
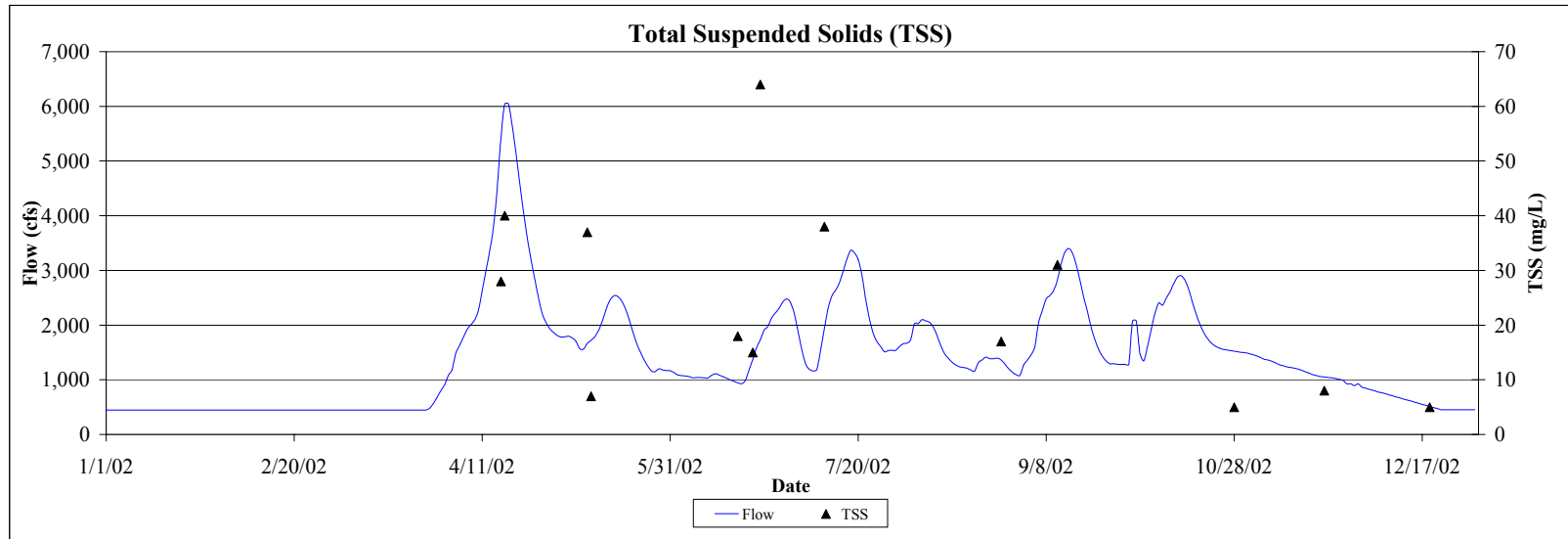


Figure 4.RUM. Rum River 2002 Hydrograph with Total and Dissolved Phosphorus Concentrations

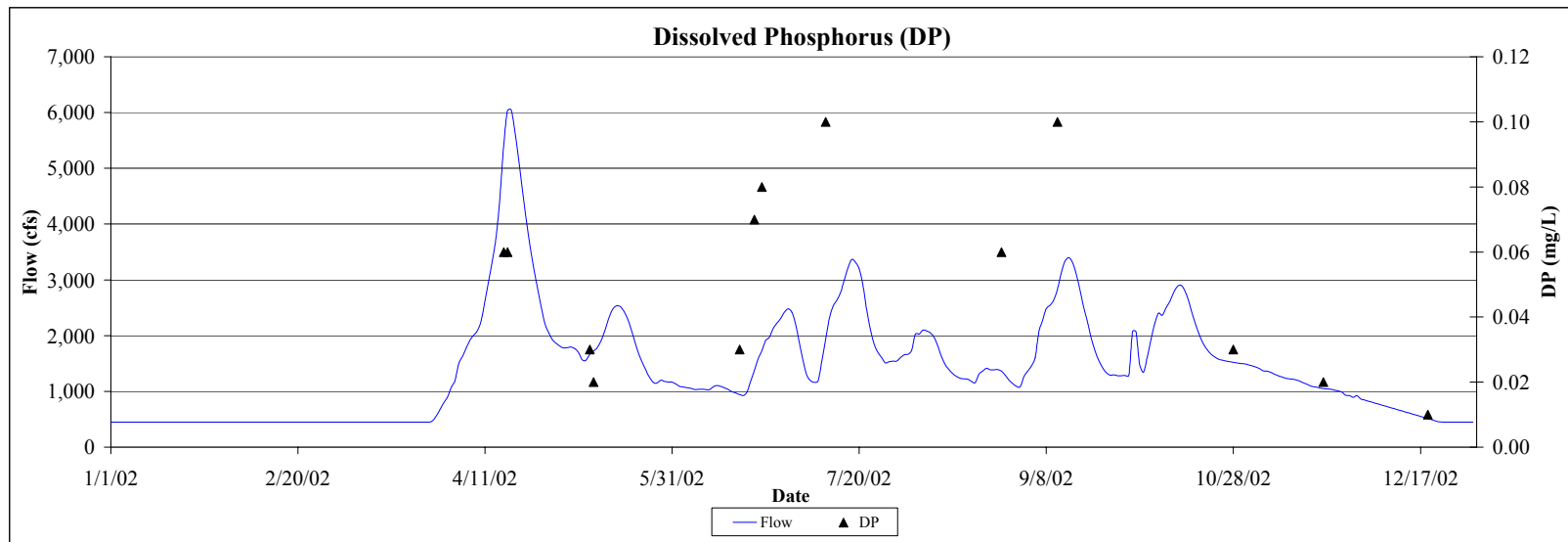
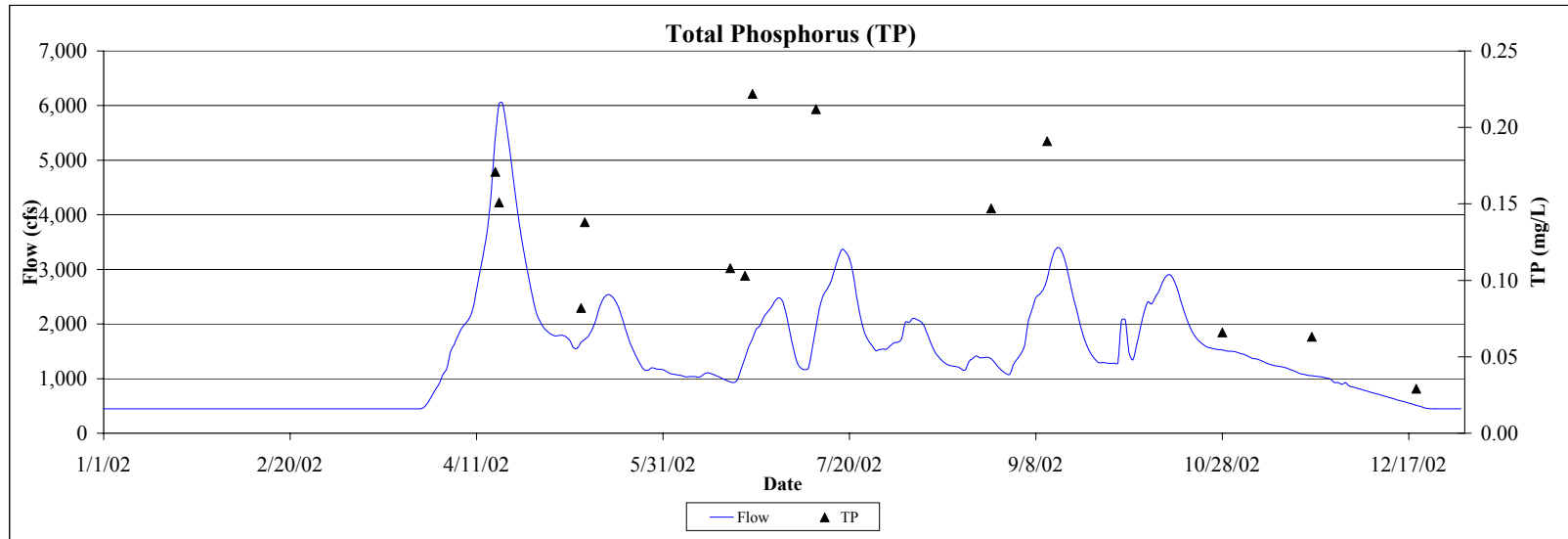


Table 4.RUM. Rum River: Comparison of 2001-2002 Hydrology and Water Chemistry

	2001	2002
Hydrology		
Total Precipitation (in)	25.61	37.21
Water Yield (in)	9.6	12.3
Total Volume (cf)	3.5E+10	4.4E+10
Annual Load (tons)		
Solids, Total Suspended	29,900	35,800
Phosphorus, Total	167	189
Phosphorus, Total Dissolved	71.4	76.7
Nitrogen, Total Nitrate	569	715
Annual Yield (lbs/acre)		
Solids, Total Suspended	60	72
Phosphorus, Total	0.34	0.38
Phosphorus, Total Dissolved	0.14	0.15
Nitrogen, Total Nitrate	1.15	1.44
Annual Normalized Yield (lbs/acre/in of water)		
Solids, Total Suspended	6	6
Phosphorus, Total	0.03	0.03
Phosphorus, Total Dissolved	0.01	0.01
Nitrogen, Total Nitrate	0.12	0.12
Flow-Weighted Mean Concentration (mg/L)		
Solids, Total Suspended	28	26
Phosphorus, Total	0.15	0.14
Phosphorus, Total Dissolved	0.07	0.06
Nitrogen, Total Nitrate	0.52	0.51