

Table 1.FC. Fish Creek Monitoring Station Information



Station Address: Fish Creek near Point Douglas Road, St. Paul, MN
County: Ramsey
Major Basin: Mississippi River Basin
Watershed: Carver Lake
Drainage Area: 5.09 square miles

Station Operator: Ramsey-Washington-Metro Watershed District

Metropolitan Council Environmental Services Contact Information:

Contact Person: Casandra Champion
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St. Paul, MN 55106
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Watershed District or Watershed Management Organization:

Ramsey-Washington-Metro Watershed District

Station Overview: MCES has supported water quality monitoring of Fish Creek since 1995. The monitoring station is located in St. Paul, Minnesota, 0.2 mile upstream from the creek confluence with the Mississippi River. MCES partners with the Ramsey-Washington-Metro Watershed District to operate the Fish Creek monitoring station. There is no rain gauge at this station; however, precipitation data are obtained from the Minnesota Climatology Working Group, St. Paul Airport Station Number 217386.

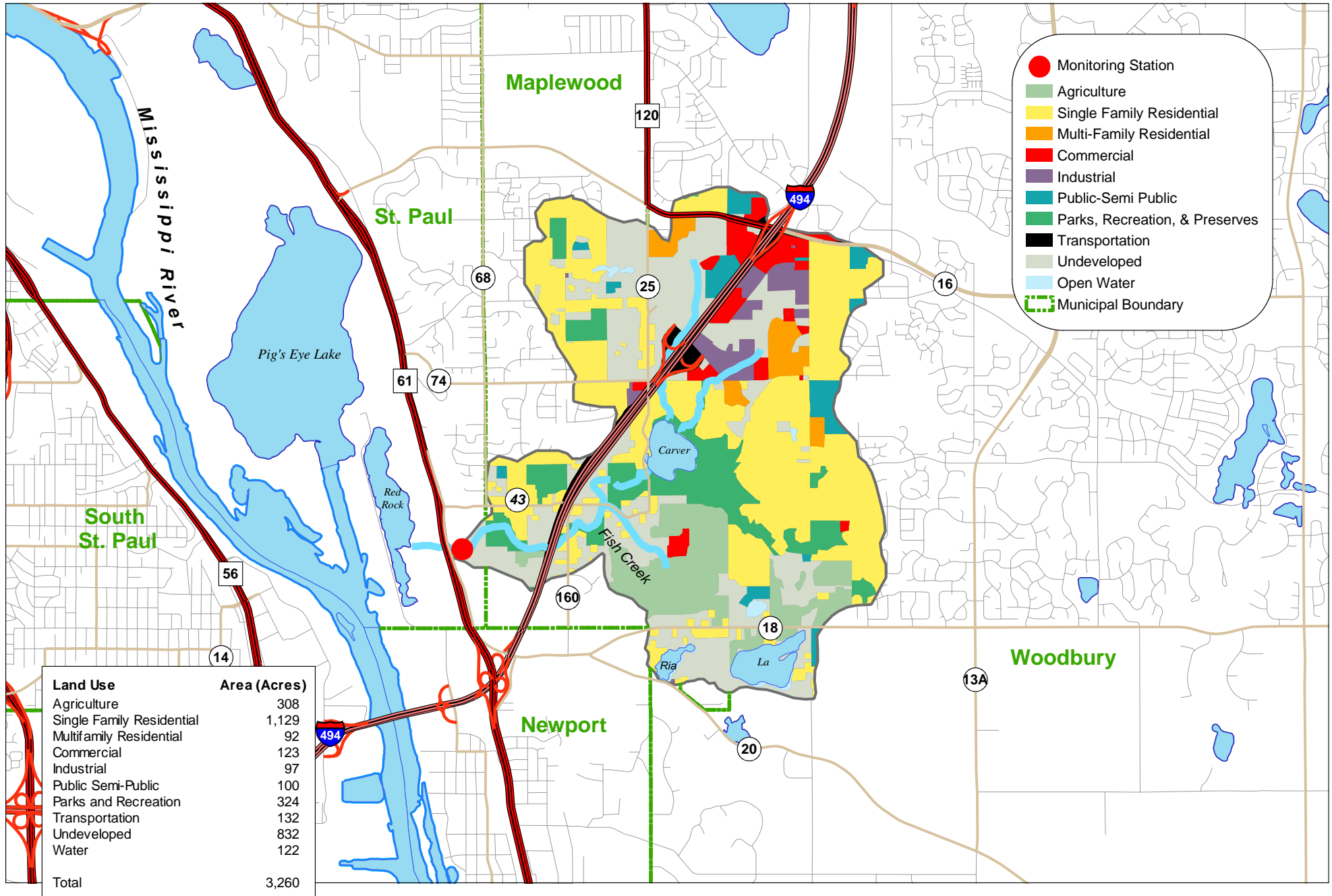
2003 Monitoring Year: Monitoring equipment was installed on April 2, 2003 and removed on December 10, 2003. Daily average flows were estimated prior to April 2 and after December 10. Snowmelt began during the last week of March 2003. The peak daily average flow of 39 cfs occurred on May 12, 2003.

Runoff event-based composite sampling began in mid-April 2003 and continued through mid-October. A significant runoff event occurred during the May 9-20, 2003 period. A composite sample collected early in this event (May 9) had the highest total suspended solids (TSS) concentration (372 mg/L) of all 2003 samples.

Seventeen samples were collected for water quality analysis during 2003, including 8 composite samples and 9 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 met the goals of the MCES monitoring work plan.

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

Figure 1.FC. Fish Creek Monitoring Station Location and Watershed Characteristics



0 0.35 0.7 1.4 Miles



Figure 2.FC. Fish Creek 2003 Hydrograph, Precipitation and Sampling Information

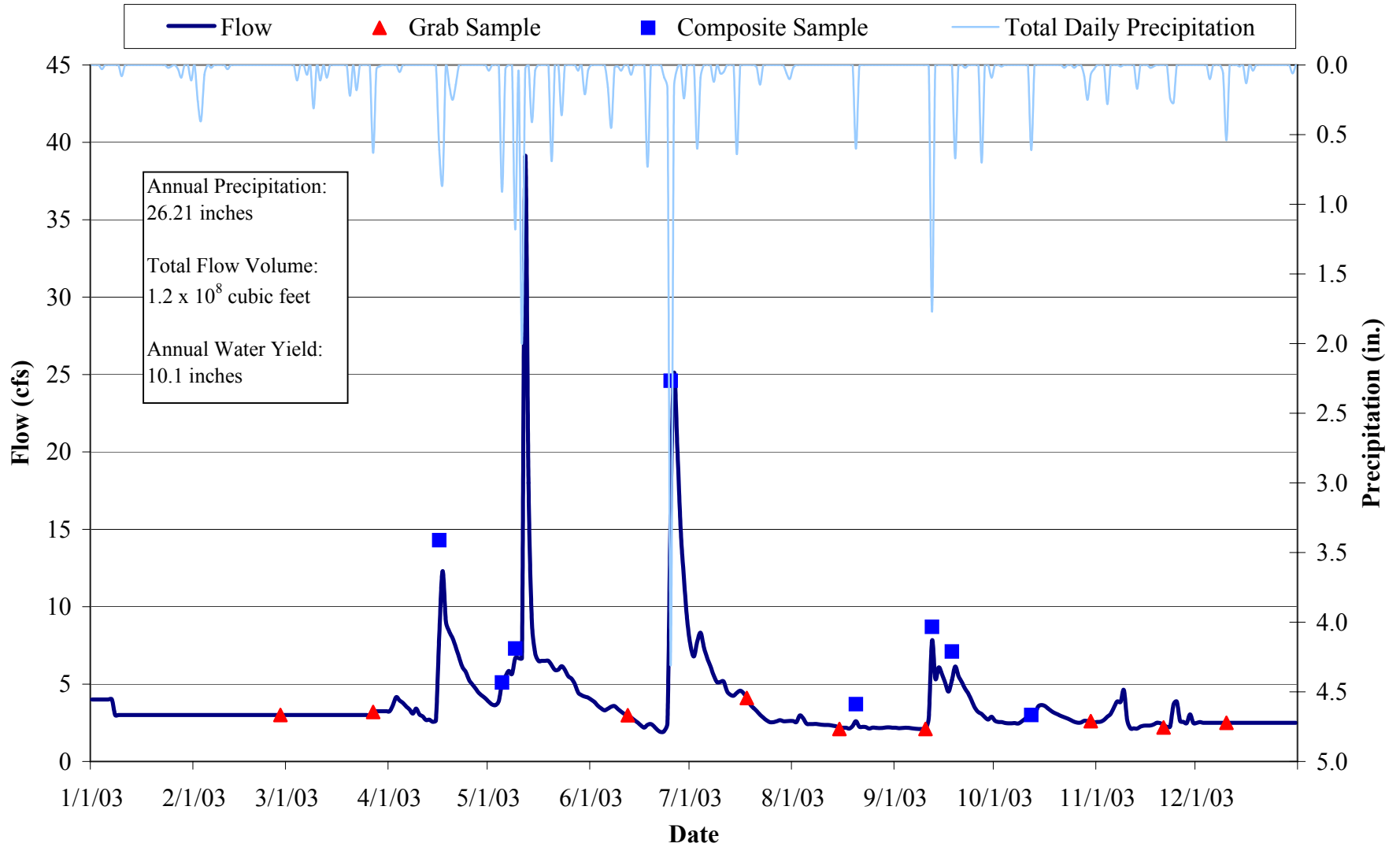


Table 2.FC. Fish Creek 2003 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	17	96	111	21	127	80	116	29
Hardness, mg/L	1	na	na	na	na	na	na	na
Cadmium, ug/L	1	na	na	na	na	na	na	na
Chromium, ug/L	1	na	na	na	na	na	na	na
Copper, ug/L	1	na	na	na	na	na	na	na
Lead, ug/L	1	na	na	na	na	na	na	na
Nickel, ug/L	1	na	na	na	na	na	na	na
Zinc, ug/L	1	na	na	na	na	na	na	na
Total Kjeldahl Nitrogen, mg/L	17	0.94	0.59	0.21	2.10	0.40	1.70	0.69
Total Nitrate Nitrogen, mg/L	17	0.93	0.88	0.22	2.00	0.54	1.24	0.48
Total Phosphorus, mg/L	17	0.25	0.10	0.02	0.92	0.06	0.36	0.27
Total Dissolved Phosphorus, mg/L	17	0.09	0.04	0.01	0.37	0.03	0.11	0.10
Total Suspended Solids, mg/L	17	74	16	1	372	2	111	112
Volatile Suspended Solids, mg/L	17	11	3	1	44	1	19	14
Turbidity, NTU	17	29	5	1	170	2	44	45

na: Data are insufficient to calculate these statistics.

N: Sample Count

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

STD: Standard Deviation

Table 3.FC. Fish Creek 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	189	116	11	51
Total Phosphorus	0.82	0.50	0.05	0.22
Total Dissolved Phosphorus	0.33	0.20	0.02	0.09
Total Nitrate Nitrogen	3.44	2.11	0.21	0.92

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

Figure 3.FC. Fish Creek 2003 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

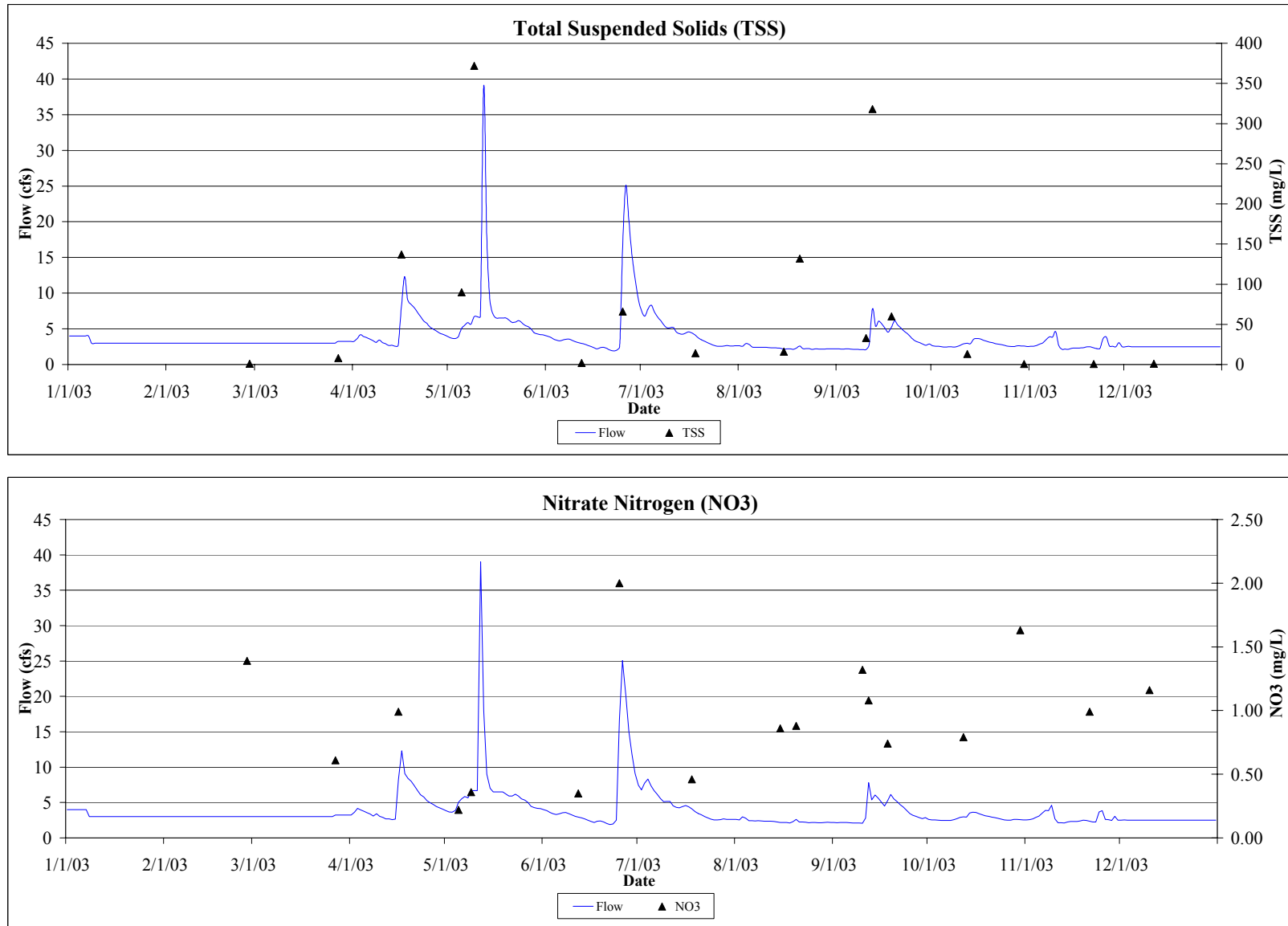


Figure 4.FC. Fish Creek 2003 Hydrograph with Total and Dissolved Phosphorus Concentrations

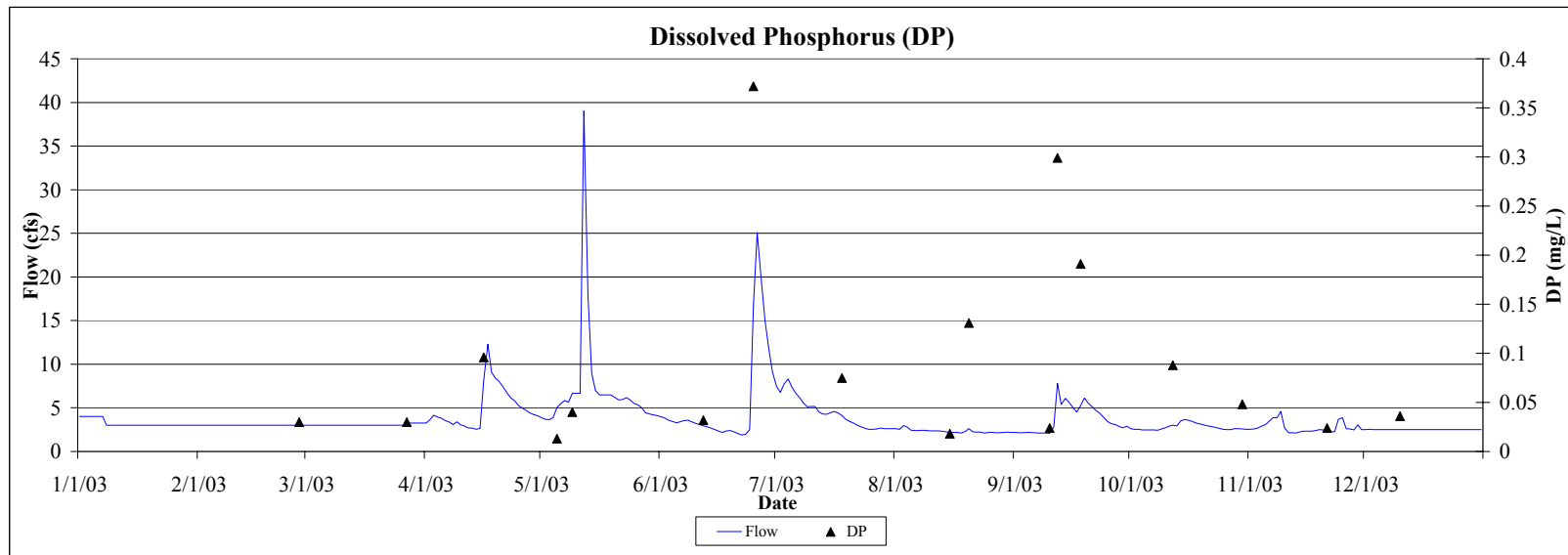
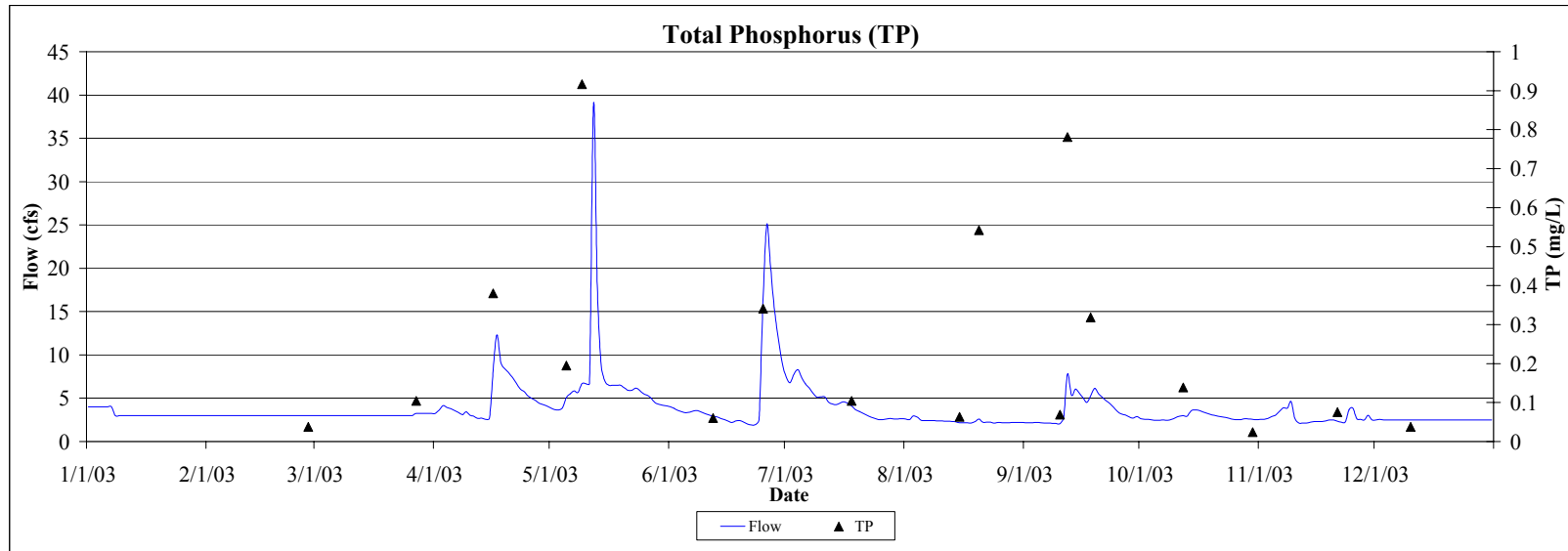


Table 4.FC. Fish Creek: Comparison of 2001-2003 Hydrology and Water Chemistry

	2001	2002	2003
Hydrology			
Total Precipitation (inches)	31.55	41.22	26.21
Water Yield (inches)	10.1	14.6	10.1
Total Volume (cubic feet)	1.2×10^8	1.7×10^8	1.2×10^8
Annual Load (tons)			
Total Suspended Solids	65	109	189
Total Phosphorus	0.53	0.94	0.82
Total Dissolved Phosphorus	0.30	0.52	0.33
Total Nitrate Nitrogen	3.09	5.17	3.44
Annual Yield (lbs/acre)			
Total Suspended Solids	40	67	116
Total Phosphorus	0.33	0.58	0.50
Total Dissolved Phosphorus	0.18	0.32	0.20
Total Nitrate Nitrogen	1.90	3.17	2.11
Annual Normalized Yield (lbs/acre/inch of water)			
Total Suspended Solids	3	5	11
Total Phosphorus	0.02	0.04	0.05
Total Dissolved Phosphorus	0.01	0.02	0.02
Total Nitrate Nitrogen	0.13	0.22	0.21
Flow-Weighted Mean Concentration (mg/L)			
Total Suspended Solids	17	20	51
Total Phosphorus	0.14	0.17	0.22
Total Dissolved Phosphorus	0.08	0.10	0.09
Total Nitrate Nitrogen	0.83	0.96	0.92

Table 5.FC. Fish Creek 2003 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 9/30/2003

Class	Order	Family	Common Name	Organism Count
Arthropoda	Amphipoda		Scuds	1
Hirudinea			Leeches	2
Insecta	Coleoptera	Dryopidae	Longtoed Water Beetles	1
Insecta	Coleoptera	Elmidae	Riffle Beetles	54
Insecta	Coleoptera	Noteridae	Burrowing Water Beetles	1
Insecta	Diptera	Chironomidae	Midges	220
Insecta	Diptera	Simuliidae	Black Flies	3
Insecta	Diptera	Tipulidae	Crane Flies	8
Insecta	Diptera		True Flies	4
Insecta	Ephemeroptera	Baetidae	Small Minnow Mayflies	91
Insecta	Hemiptera	Gerridae	Water Striders	1
Insecta	Odonata	Calopterygidae	Broadwinged Damselflies	1
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	4

Macroinvertebrate Taxa Metrics

Total Taxa	13
EPT Taxa	2
% EPT Taxa	15
Diptera Taxa	4
% Diptera Taxa	31
Mean Tolerance Value	5.3

Macroinvertebrate Organism Metrics

Total Individuals	391
EPT Individuals	95
% EPT Individuals	24
Diptera Individuals	235
% Diptera Individuals	60
Chironomidae Individuals	220
% Chironomidae Individuals	56

Water Quality

Degree of Organic Pollution

Family-Level Biotic Index	5.2	Good	Some Organic Pollution
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