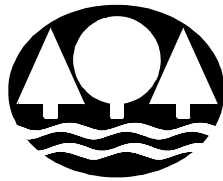


Citizen Stream-Monitoring Program

2004 Report on the Water Quality Of Minnesota Streams



**Minnesota
Pollution
Control
Agency**

**Environmental Analysis & Outcomes Division
May 2005**

Pam Skon prepared this report.

The Minnesota Pollution Control Agency thanks the 2004 Citizen Stream-Monitoring Program volunteers for their efforts in collecting water-quality data. Their commitment and dedication to stream monitoring and protection are greatly appreciated.

Special thanks to the following people for their contributions to this report:

Manuscript Review: Laurie Sovell
Doug Hall

Data Entry: Andrea Ebner
Jan Eckart
Jean Garvin
Jennifer Holstad
Joanne Singsaas
Pam Skon

Cover Photo: Mike Nordin

Cover Design: Peggy Hicks

On the Cover: Photograph by CSMP volunteer Mike Nordin. The photo was taken looking upstream from his monitoring location on the Sucker River in September 2004.

TABLE OF CONTENTS

| | |
|--|----|
| List of Figures..... | 2 |
| List of Tables..... | 2 |
| Introduction..... | 3 |
| Ecoregions and Stream Water Quality..... | 4 |
| Section 1. How CSMP Volunteers Collect and Use Data..... | 5 |
| What CSMP Volunteers Measure..... | 5 |
| Putting CSMP Data to Work..... | 8 |
| Section 2. Summary of 2004 CSMP Data..... | 9 |
| Stream Monitoring Results..... | 9 |
| Rainfall Monitoring Results..... | 14 |
| Section 3. 2003 Volunteer Survey Results..... | 17 |
| Section 4. Monitors in Action: Red River Basin River Watch..... | 19 |
| Useful Definitions | 23 |
| Appendix 1. Minnesota Drainage Basins & Major Watersheds Map and Key..... | 24 |
| Appendix 2. Summary of 2004 CSMP Data Collected with 60 cm Transparency Tube..... | 28 |
| Appendix 3. Summary of 2004 CSMP Data Collected with 100 cm Transparency Tube..... | 76 |

LIST OF FIGURES

| | |
|---|----|
| Figure 1. Increase in CSMP Volunteers and Sites, 1998 – 2004..... | 4 |
| Figure 2. Minnesota’s Seven Ecoregions. Mapped by U.S. EPA..... | 4 |
| Figure 3. Low Water Transparency Influences on Fish Health..... | 6 |
| Figure 4. CSMP Rain Gauge..... | 7 |
| Figure 5. CSMP Stream Stage Measurement..... | 7 |
| Figure 6. Number of 2004 CSMP Sites in Each Major Drainage Basin..... | 11 |
| Figure 7. 2004 Map of Average Transparency Readings..... | 12 |
| Figure 8. Percentage of CSMP Sites Across 5 Categories of Average Transparency..... | 13 |
| Figure 9a. 2004 Water Year Precipitation Map..... | 15 |
| Figure 9b. 2004 Departure from Normal Precipitation Map..... | 16 |
| Figure 10. Survey Question 1..... | 17 |
| Figure 11. Survey Question 2..... | 18 |
| Figure 12. Survey Question 3..... | 18 |
| Figure 13. Survey Question 4..... | 18 |

LIST OF TABLES

| | |
|--|---|
| Table 1. Interquartile Range of Concentrations for Least-Impacted Streams..... | 5 |
|--|---|

Introduction

The Minnesota Pollution Control Agency's (MPCA) Citizen Stream-Monitoring Program (CSMP) began in 1998. The CSMP was designed to give individuals across Minnesota an opportunity for involvement in a simple, yet meaningful stream-monitoring program that provides data management and interpretation. 2004 marked the CSMP's sixth full monitoring season. A total of 347 volunteers submitted data collected from 597 sites across the state. Of those sites, 100 were added to the program from the Red River Basin River Watch Program (See Section 4 for more details). Growth of the program improved this year, with 129 more sites than 2003, and an additional 22 volunteers (Figure 1). Of the 347 volunteers in the program, 70 were new to the program in 2004.

The CSMP uses a collaborative approach to stream monitoring by partnering with citizen volunteers who live on or near a stream, and who are interested in water quality. Any person or group willing to devote a small amount of time and energy to conduct simple stream visits on a regular basis can participate in the CSMP. Volunteers receive a transparency tube, rain gauge, data sheets, and instructions for taking measurements. Once enrolled, participants visit an established spot once per week from April to September on a nearby stream to measure Stream Transparency, Water Level (Stage), Appearance, and Recreational Suitability. In addition to weekly stream measurements, rainfall is recorded daily. Volunteers are also encouraged to monitor immediately

after large rainfall events whenever possible to track the effects of rainfall runoff on their stream. At the end of each monitoring season, volunteers submit data to the MPCA. An annual report summarizes data collected by volunteers statewide, and is sent to volunteers and other interested parties.

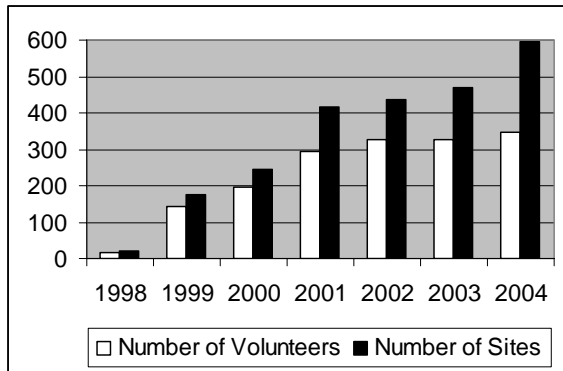
This report summarizes data collected by volunteers during 2004. The first section describes what CSMP volunteers do and gives examples of how participants are using CSMP data. Section 2 presents a summary of volunteer data from the 2004 monitoring season. Section 3 provides feedback on the 2003 volunteer survey. An in-depth look at the Red River Basin River Watch Program can be found in Section 4. The Appendices contain data summaries for each site monitored.

CSMP Goals:



- Collect valuable water-quality data by expanding statewide stream-monitoring
- Provide a basic program for anyone interested in stream-monitoring
- Complement existing citizen efforts
- Facilitate awareness of water-quality issues & promote *shared goals*

Figure 1. Increase in CSMP Volunteers and Sites, 1998 – 2004



Ecoregions and Stream Water Quality

The U.S. Environmental Protection Agency has divided the continental United States into ecoregions based on soils, geomorphology, land use, and potential natural vegetation. In Minnesota, this results in seven fairly distinct ecoregions (Figure 2). For example, the Northern Lakes and Forests ecoregion (NLF) is predominately forested with numerous lakes and is located in the northeastern part of Minnesota. The Western Corn Belt Plains ecoregion (WCBP), located in the southern third of Minnesota, has rolling terrain and is extensively cultivated for row crop farming. The ecoregion framework provides a good basis for evaluating differences and similarities in Minnesota's streams. "Least-impacted" streams, which are felt to be representative and reflect expected water quality for a region, were sampled by the

MPCA to characterize stream conditions for each ecoregion (McCollor and Heiskary 1993). The results provide a baseline with which to compare streams. In other words, the least-impacted streams are the yardsticks by which we measure other streams. Table 1 lists the typical total phosphorus, total suspended solids, and turbidity values for least-impacted streams in six ecoregions.

Figure 2. Minnesota's Seven Ecoregions. Mapped by USEPA.

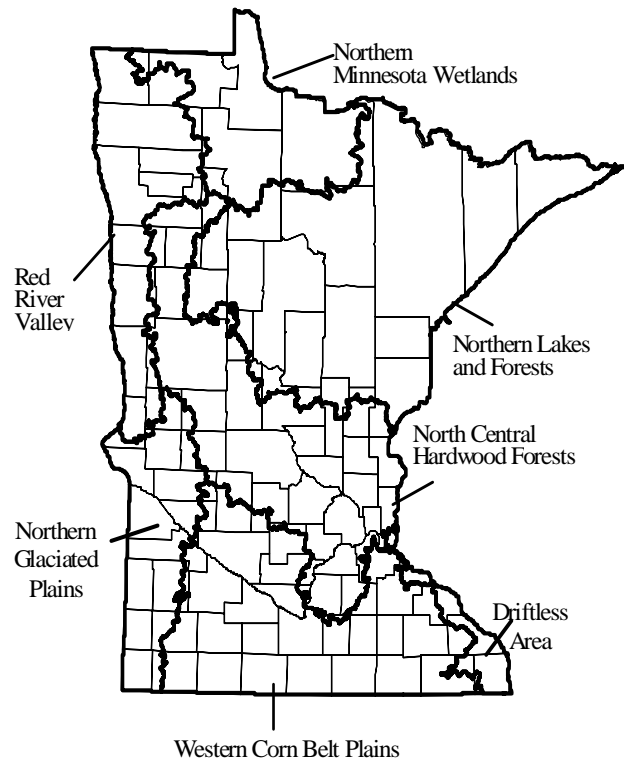


Table 1. Interquartile Range of Concentrations for Least-Impacted Streams in Minnesota by Ecoregion.¹ Distributions of annual data from 1970-1992 (McCollor and Heiskary, 1993; note 1 mg/L = 1 ppm = 1,000 ppb)

| Region/ Percentile | Total Phosphorus (mg/L) | | | Total Suspended Solids (mg/L) | | | Turbidity (NTU) | | |
|-----------------------|----------------------------|------|------|----------------------------------|------|------|--------------------|------|------|
| | 25% | 50% | 75% | 25% | 50% | 75% | 25% | 50% | 75% |
| NLF | 0.02 | 0.04 | 0.05 | 1.8 | 3.3 | 6.0 | 1.7 | 2.5 | 4.3 |
| NMW | 0.04 | 0.06 | 0.09 | 4.8 | 8.6 | 16.0 | 4.1 | 6.0 | 10.0 |
| NCHF | 0.06 | 0.09 | 0.15 | 4.8 | 8.8 | 16.0 | 3.0 | 5.1 | 8.5 |
| NGP | 0.09 | 0.16 | 0.25 | 11.0 | 34.0 | 63.0 | 5.6 | 15.0 | 23.5 |
| RRV | 0.11 | 0.19 | 0.30 | 11.0 | 28.0 | 59.0 | 6.0 | 12.0 | 23.0 |
| WCBP | 0.16 | 0.24 | 0.33 | 10.0 | 27.0 | 61.0 | 5.2 | 12.0 | 22.0 |

Section 1. How CSMP Volunteers Collect and Use Data

What CSMP Volunteers Measure

Stream Water Transparency

Stream transparency is an indirect measure of the amount of *dissolved* and *suspended* materials present in water. For most bodies of water, the amount of solids suspended in the water is the most important factor: the more suspended materials, the lower the water transparency. In lakes, the majority of suspended solids are algae. In streams and rivers, soil particles (predominantly silts and clays) have a stronger influence on transparency as water flows downstream, carrying and depositing this sediment. A good example of dissolved material affecting transparency is the tea color caused by organic material of some northern, bog-influenced lakes and streams.

Tracking water transparency is like monitoring your blood pressure because it tells us about the health of a stream.

Changes in transparency tell us when key water pollutants are present.

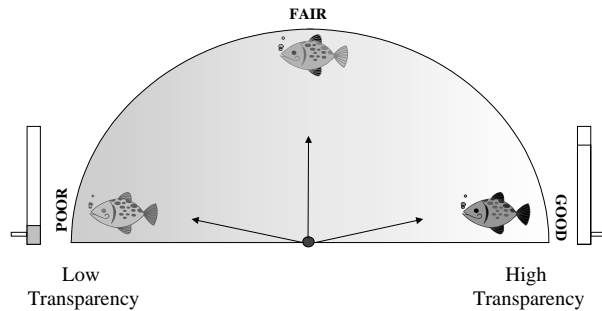
In general, a low transparency reading reflects a large amount of sediment (excessive soil material) or other suspended material like algae in the water. Too much sediment in the water is a significant pollutant itself, whether it is suspended in the water column or deposited on stream bottoms. Suspended sediment reduces light penetration needed for the growth of beneficial aquatic plants. It also interferes with the ability of fish to see and capture their prey (Figure 3).

A stream bottom is described as ‘embedded’ when smaller rocks such as gravel and cobble are surrounded or buried in clay, fine silt or sand. When a stream bottom is embedded, fewer fish and aquatic insects are able to survive. Less diverse assemblages of fish and insect species are also found in embedded streams. When a stream bottom

¹ Interquartile range is determined by sorting measures from lowest to highest and represents those measures between the 25th and 75th percentiles.

is embedded from deposited sediment that has washed downstream, fish eggs become smothered, keeping them from getting the oxygen needed to survive.

Figure 3. Low Water Transparency Influences Fish Health



Deposited sediment also clogs spaces between rocks where insects like to live (Waters 1995). Reduced insect habitat from excess sediment leads to fewer species of fish that depend on insects for food.

Finally, sediment may have pollutants attached to it such as phosphorus and petroleum products. These pollutants degrade the quality of flowing water, as well as downstream lakes or reservoirs.

Because of these effects of excessive sediment on streams, the MPCA sets limits on the discharge of suspended solids to waters, and has “standards” for turbidity, which should not be exceeded in flowing waters. Turbidity is defined as “an optical property of water resulting in a loss of light transmission from absorption or scattering” (Dieter 1990). Highly turbid water has low transparency.

High algae concentrations, which also reduce transparency, occur at lower flows in larger rivers with high nutrient concentrations. Algae contribute dissolved oxygen to the river through the process of photosynthesis while they are living, but

deplete oxygen when they die and decompose on the bottom of the river. Excessive nutrients and algae in rivers have been linked to dissolved oxygen levels too low to support a healthy fish community.

The Transparency Tube

The transparency tube was developed in Australia for measuring stream water clarity. The clear plastic tube is 2 feet long x 1½-inch wide, with a release valve at the bottom. A stopper inserted at the bottom is painted black and white, so that when you look down into the tube a distinct symbol is visible. To measure water clarity, the tube is filled with water



collected from a stream or river. Looking down into the tube, water is released through the valve until the black and white symbol is visible. The depth of the water when the symbol becomes visible is recorded in centimeters, marked on the side of the tube. If the symbol is visible when the tube is full, the

transparency reading is “>60 centimeters.” A greater transparency reading reflects higher water clarity.

Transparency is a meaningful measure of water quality because people can see it change, and easily understand how it reflects stream condition. A citizen once described his long-term goal for a river in these terms: “I want to be able to see my toes when I’m standing knee-deep in the water.” By using transparency as its central measure, the CSMP provides a tool that will allow citizens to track progress toward identified water-quality goals for their streams.

Precipitation and Stream Stage

Some rainfall eventually makes its way to streams. Rainfall can affect a stream’s

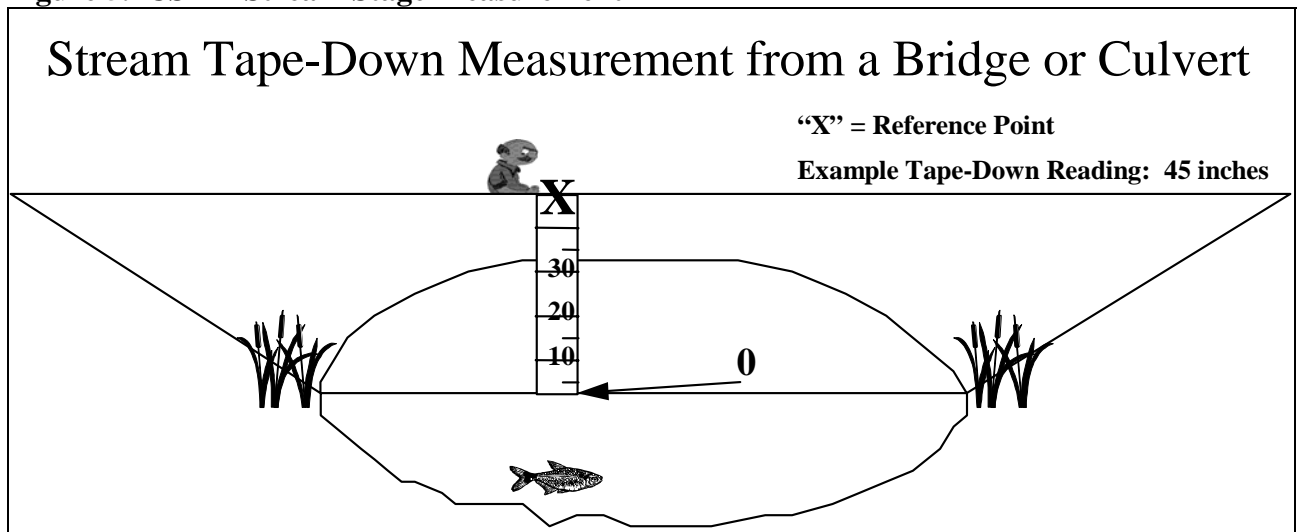
water level or “stage” by increasing the amount and rate at which water flows through stream channels (Figure 5).

Figure 4. CSMP Rain Gauge



Water quality changes in response to precipitation as a result of management practices used on the surrounding land. For example, in an area with too little vegetation to keep the soil in place, rainfall can influence stream-water transparency. It does this by carrying sediment and other materials to streams over land in runoff or underground through urban and rural subsurface drainage systems. By recording rainfall on a daily basis and simultaneously measuring transparency and stream water level, volunteers and the MPCA can determine the connections among these factors (Figure 4).

Figure 5. CSMP Stream Stage Measurement



Appearance and Recreational Suitability

CSMP volunteers rank water appearance on a color scale that ranges from “crystal clear” to “green AND muddy.” Appearance information provides insight on the possible causes of low transparency readings. A low transparency reading in conjunction with a cloudy appearance may reflect high levels of suspended sediment in the water, whereas a green tint suggests that algae growth may be reducing water clarity.

Stream recreational suitability rankings range from 1-5, where 1 is “beautiful; couldn’t be better” and 5 is “swimming and aesthetic enjoyment of the stream nearly impossible.” Recreational suitability rankings help us decipher connections between people’s perception of stream water quality and what they measure (e.g. precipitation and transparency measurements).

Putting CSMP Data to Work



Data submitted by CSMP volunteers are entered into the U.S. Environmental Protection Agency’s water-quality

STORage and RETrieval database (STORET). Data from the CSMP greatly augment current stream water-quality information, and enhance our general understanding of Minnesota stream conditions. Data collected by volunteers can help identify water-quality problems, prioritize areas for additional research, and track progress toward improvement.

On the local level, a number of Minnesota Counties are using CSMP data as a baseline for understanding water quality.

Watershed projects and lake associations have used transparency tube data collected by CSMP volunteers to identify sources of sediment to downstream waterbodies.

For example, in 2004, four volunteers within the Sauk River Watershed District (SRWD) monitored 12 stream sites on Hoboken, Silver and Ashley Creeks that enter Big Sauk Lake. In addition to transparency data, volunteers also collect chemistry data (as part of the SRWD’s program). At the end of the season, the SRWD entered volunteer chemical and transparency data and created graphs that show potential ‘areas of concern’ on those creeks. One such area caught the District’s attention and along with the volunteers collecting data in 2005, the District will be doing more extensive data collection on the ‘site of concern’ to determine trend analysis and land use change potential.

Transparency tube readings are good predictors of turbidity, or the murkiness of stream water. The relationship between transparency tube data and turbidity readings has been developed specific to Minnesota streams. In general, low transparency readings indicate high turbidity.

Why is this important? Minnesota has a water quality standard for turbidity. If a certain number of turbidity readings exceed this standard, the stream is listed as “impaired.” Using both transparency tube and turbidity data, it is possible to determine if a river is impaired and needs to undergo improvement via land management changes such as buffer strips, upland erosion control, wetland restoration, or native plant restoration.

Since the inception of the program, the Minnesota Pollution Control Agency has

envisioned using CSMP data in the agency's biennial report to congress on water quality. The MPCA will use CSMP transparency tube data to help determine surface water impairments for the first time in 2006. The initial review of the data is currently underway.

Minnesota has 92,000 river miles. Currently, only 8% or about 7,000 river miles have been assessed for water quality impairments. Using CSMP data in this way will greatly increase the percentage of river miles assessed for turbidity impairments in Minnesota.

Section 2. Summary of 2004 CSMP Data

Stream Monitoring Results

From April to September 2004, 347 volunteers monitored 597 sites on streams and rivers across Minnesota. Volunteers monitored streams in every major river basin in the state except for the Missouri River Basin (Figure 6). Of the 84 major watersheds in the state, CSMP volunteers monitored 52.² The Cannon River watershed had the highest number of sites monitored, at 54. Coming in second with 38 sites was the Red Lake River Watershed, and tied for third, with 37 sites each, were the St. Croix (Stillwater) watershed and the Mississippi River (St. Cloud) watershed.

On a basin scale, the largest increase in CSMP participation was seen in the Red River Basin, where 107 sites were added during 2004. The St. Croix River Basin came in a second, with 28 new sites.

A summary of stream transparency and rain monitoring data for each site is found in Appendix 2 and 3. Sites are not listed in the appendices if only rain data was submitted. Appendix 2 contains data for 60 centimeter tubes and Appendix 3 for 100 centimeter

tubes. Each table contains mean, minimum, and maximum transparencies, and the number of ">60 cm" and ">100 cm" readings calculated for each site. If volunteers collected data using **both** the 60 and 100 cm tubes, be sure to check **both** Appendix 2 and Appendix 3 to see all of the data collected. Data in both appendices are sorted first by basin, then by watershed (specifically by its numeric code, the hydrologic unit code or HUC), and then by CSMP site number.

Figure 7 shows average transparency readings at each site throughout the state. There is a general trend of increasing average stream transparency from southwestern to northeastern Minnesota.

Finer soils and more intensive land use, such as agriculture, are generally more common in the southern and western portions of the state, where average transparency is lower. Higher transparencies are found in the generally forested northeastern part of the state.

A total of 9,140 transparency readings were taken with the 60 centimeter (cm) transparency tube during 2004, an increase from 2003, when 8,545 readings were taken. Volunteers located where water is typically clearer than 60 cm (northeastern MN and

² A watershed is the area of land drained by a given stream; a basin is made up of many watersheds. For example, the Crow River and Rum River watersheds are part of the Upper Mississippi River Basin.

many headwaters regions) have a 100-centimeter tube. Volunteers reported 1,007 readings taken with the longer tube at 121 different sites (see Appendix 3). This is a significant increase from 2003, when 149 readings were taken at 20 sites. Of the total readings, 42% were greater than 100 centimeters – the symbol at the bottom was visible when the longer tube was full. Every reading taken at 13 of the 121 sites was greater than 100 centimeters. Conversely, 85 of the 121 sites, or 70%, had average transparencies between 60 and 100 centimeters. This suggests that the longer tube was effective at nearly 3/4 of the sites where it was used.

Norman Penner again took the largest number of transparency readings, totaling 108, at his site designated as CSMP 327 on the Watonwan River in Watonwan County. Fifteen of his readings were taken in response to a rain event. Dean Kjerland, monitoring the Cannon River in Rice County took 99 transparency readings at site CSMP 856. Norman Zacharias, monitoring site CSMP 209, took 92 readings this past season. His site is located on West Crooked Creek in Pine County.

A transparency reading of zero (virtually no transparency) was recorded at 21 sites. Eighteen of these sites also had readings that were 50 cm or greater at some point during the monitoring season. This suggests that transparency fluctuates greatly at these sites, most likely in response to rainfall.

The lowest average transparency reading for 2004 was 6 cm at site CSMP0943. This site is located on the Red River of the North in Polk County, and was monitored by the Climax High School, as part of the Red River River Watch Program.

For sites with lower average transparency (e.g. less than 20 cm), it will be important to determine if transparency is consistently low throughout the monitoring season, or if declines are in response to rainfall events with quick recovery of transparency. Sites with consistently low transparency may require more in-depth monitoring to determine what may be causing low readings.

Water clarity is quite good at a majority of the river locations that were monitored in the state. Figure 8 shows the percentage of sites in each of 5 categories of average transparency. An average transparency of 41 centimeters or greater was found at 58% of CSMP sites during 2004. This translates into a majority of the sites monitored falling into the “Good” or “Excellent” water quality categories. This is a slight decrease from 62% of sites in these three categories last year. There was a slight decline in the number of sites in the “Good” and “Poor” categories and an increase in the number of sites in the “Fair” category. The greater than 60 category was split for 2004. Research done in Ohio using, among other tubes, the MPCA transparency tube, indicated that a break between 60-92 cm and >92 cm was appropriate. At approximately 92 cm, the levels of total suspended solids in the water (in milligrams per liter or ppm) become undetectable (less than 5 mg/L) in lab analysis (Anderson and Davic, 2004).

The detection of any significant trend or change in average transparency for individual sites will require 8-10 years of data. We encourage CSMP volunteers to keep monitoring the same site from year to year so that we eventually have enough data to detect changes at individual sites over time.

Figure 6. Number of 2004 CSMP Sites in each Major Drainage Basin

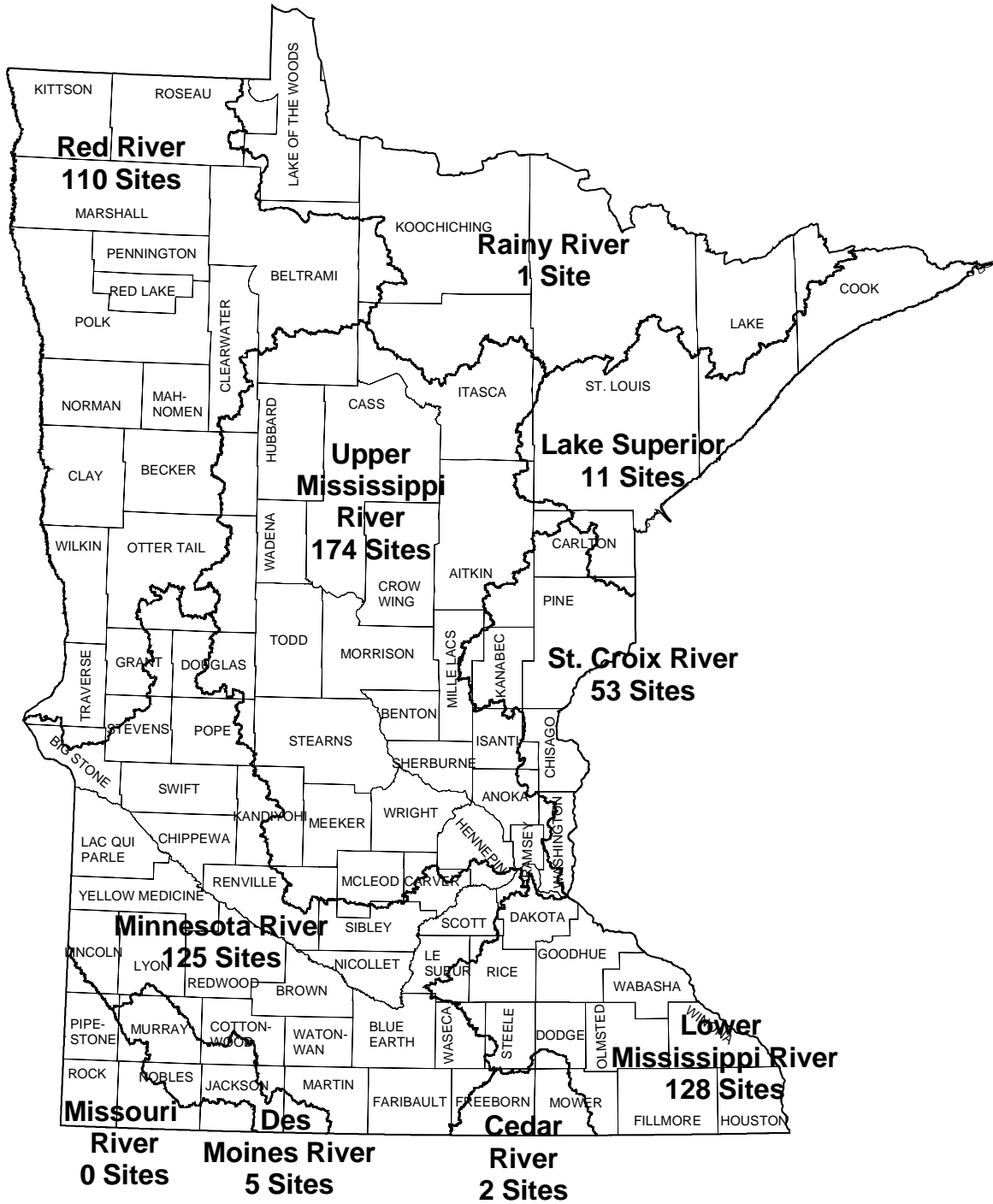


Figure 7. 2004 Average Transparency Readings

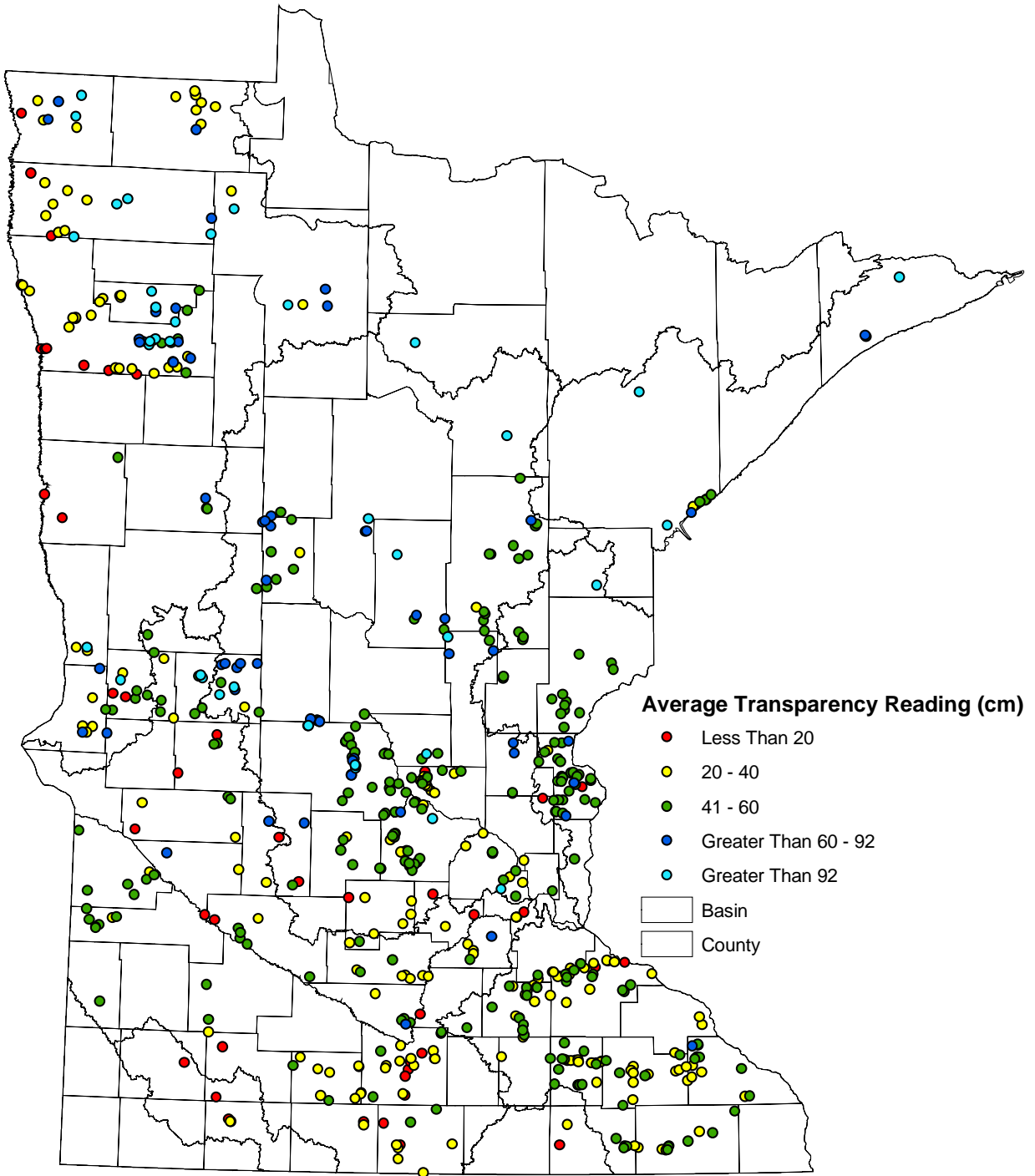
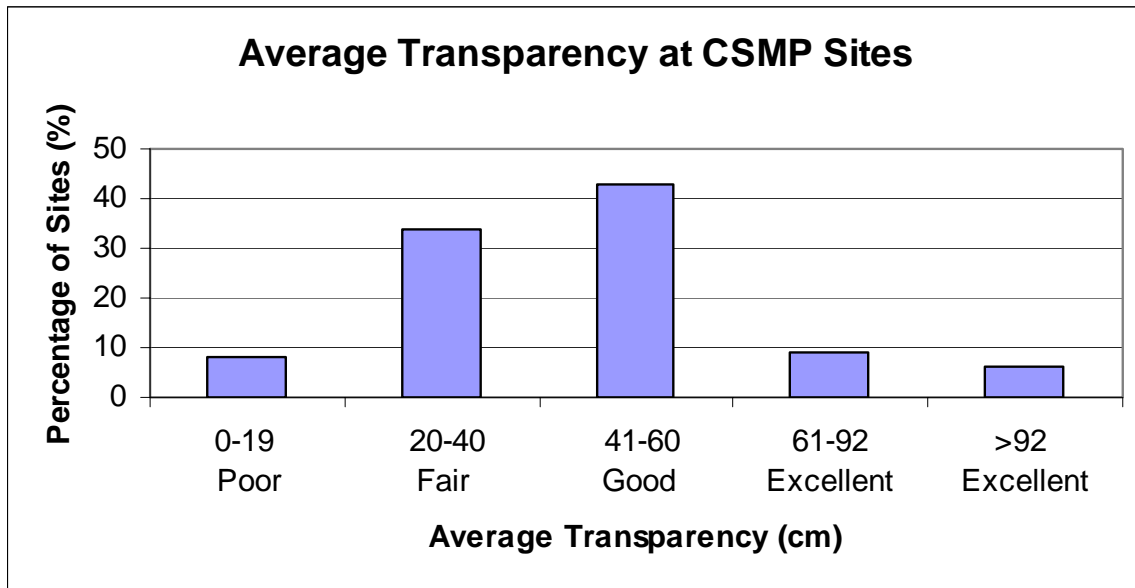


Figure 8. Percentage of CSMP Sites across 5 Categories of Average Transparency



Rainfall Monitoring Results



The amount, duration, and intensity of rainfall can greatly influence stream conditions. Greater precipitation can lead to more runoff and sediment reaching streams, which causes lower transparency readings. The 2004 monitoring season saw most parts of the state return to ‘normal’ rainfall levels, with ranges between ± 2 inches of normal (Figure 9a). However, southeastern and northwestern Minnesota experienced very wet seasons, with 8 to 12 inches of rainfall above normal (Figure 9b). The southeast portions of the state experienced severe flooding in September. Across most of Minnesota, stream and river conditions likely returned to their ‘normal’ flow levels, after a very dry 2003.

Total rainfall amounts recorded by CSMP volunteers varied greatly (See Appendix 2 and 3). Variation within watersheds may reflect the highly variable nature of rainfall across the landscape. It is also possible that some rainfall was not recorded, leading to incomplete reports. The number of rain readings reported is listed in Appendix 2 and 3 to give an idea of how often rainfall was measured for a site.

Casey Sautter reported the highest total amount of rainfall (42.18 inches), with 86 days of precipitation for 2004 at his site on the South Branch of the Root River in Fillmore County (CSMP 289). Bruce Schmoll, monitoring on Dodge Center Creek in Dodge County recorded 40.01 inches of rain at site CSMP 135. In Wright County, Lowell Schrupp recorded 39.9 inches of rainfall at his site CSMP 528 on Silver Creek.

In 2004, 170 sites did not report any rain amounts. This is a large increase from 2003, when 77 sites didn’t report rainfall. It

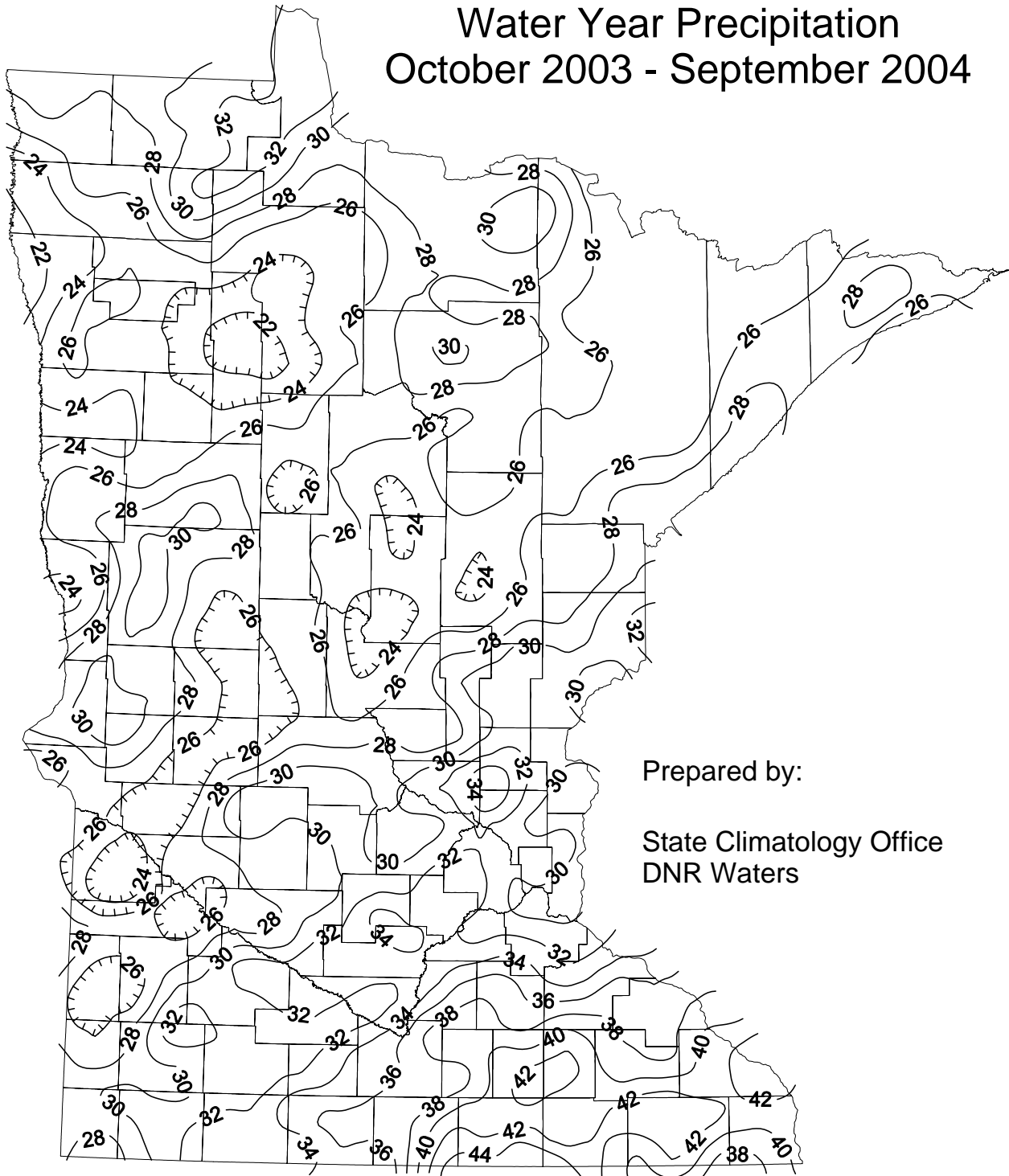
is important to note that this increase can be attributed to the large amount of transparency data received from the Red River River Watch Program schools. Rainfall is not one of the parameters that schools in that program monitor.

We encourage you to record daily rainfall amounts whenever possible. Rainfall is one of the most influential things affecting stream water quality. For example, “non-point source pollution”, pollution from diffuse sources such as urban and

agricultural impacts, is closely linked to rainfall events. Changes in water quality that typically follow large rainfalls include increased bacteria, turbidity and nutrients, and lower transparency. Rainfall amounts recorded along with transparency and water level data give you a general picture of how your stream changes in response to varying amounts of precipitation. In general, the more impacted a watershed and/or river is, the more significantly it will change in response to rainfall.

Figure 9a. 2004 Water Year Precipitation Map

Water Year Precipitation October 2003 - September 2004



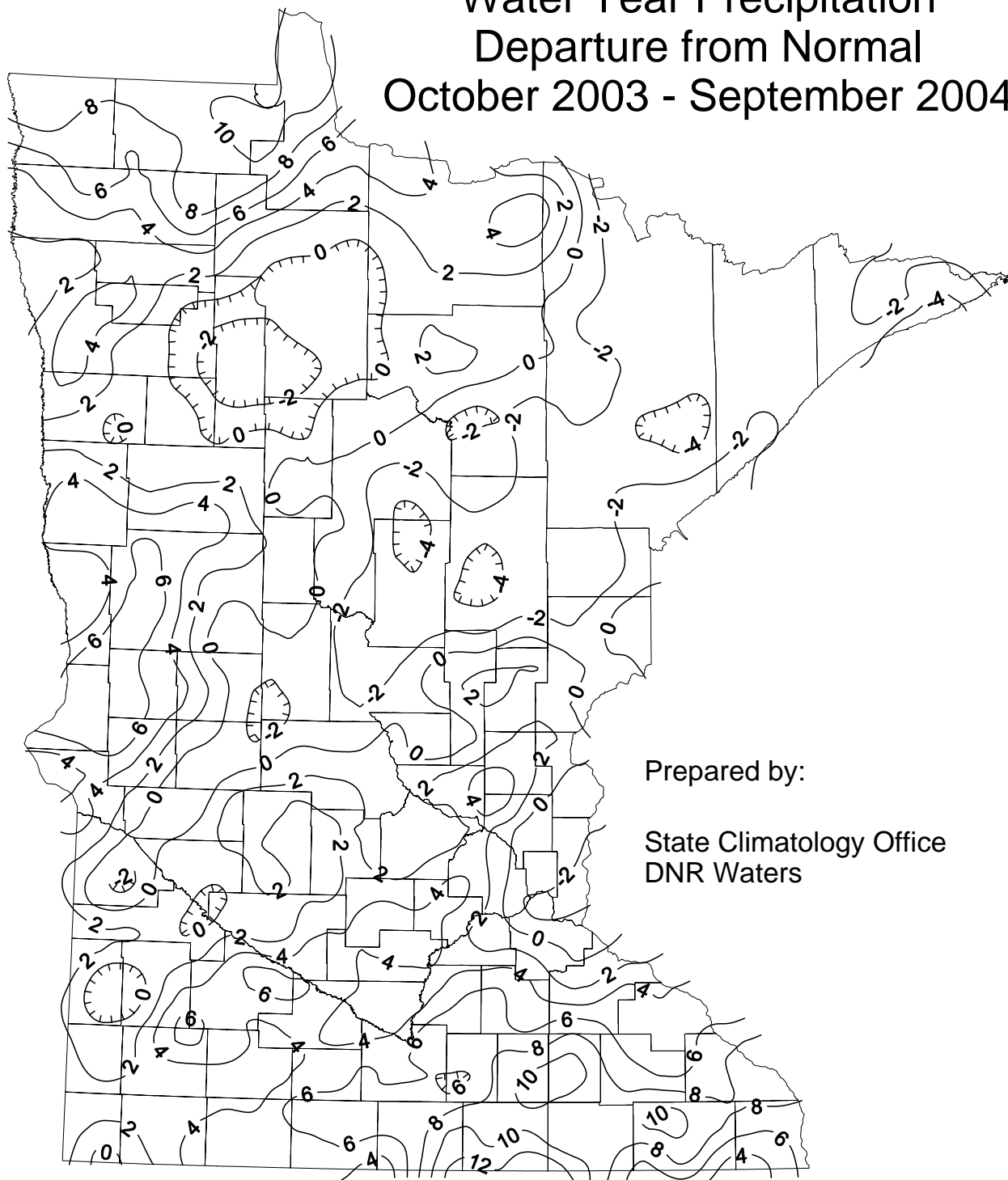
Prepared by:

State Climatology Office
DNR Waters

values are in inches

Figure 9b. 2004 Departure from Normal Precipitation Map

Water Year Precipitation Departure from Normal October 2003 - September 2004



Prepared by:

State Climatology Office
DNR Waters

values are in inches

Section 3. 2003 Volunteer Survey Results

Volunteers were asked several questions to help CSMP staff better understand what attracts volunteers to the program, who is a CSMP volunteer, and what volunteers would like to see change in the program. Fifty-six volunteers responded to the survey.

The first question asked volunteers why they decided to monitor. Volunteers could choose from the following responses: something new to try, concern for stream health, as a way to care for the stream, or other. The majority of those who responded to the survey indicated that concern for stream health (63%) was the driving factor in their decision to monitor (Figure 10).

The second question asked volunteers to indicate what has been the most useful or fulfilling part of their CSMP involvement. Six options were available for survey respondents to choose from: knowledge about stream health, being an active participant, local use of data, state use of data, personal use of data, or other. Volunteers indicated that gaining knowledge about the stream health (39%) and being an active participant (33%) were most important to volunteers (Figure 11).

The third question asked volunteers what they would like to see added to the program. Respondents could choose from: the addition of different types of monitoring (such as the addition of chemical or biological monitoring in an advanced program), more communication (increased frequency of newsletters, e-newsletters, etc.), or other. The majority (73%) indicated that an advanced program with additional parameters (chemistry or biological) would be of interest to CSMP volunteers (Figure 12).

The final question asked volunteers to describe themselves. CSMP staff are interested in learning what kind of people are in the program, in hopes of improving recruitment and retention of our volunteers. Those surveyed chose from the following options: landowner, recreational user, member of an environmental group, participant of a watershed project, or other (Figure 13). Volunteers considered themselves to be landowners (37%) first and foremost, and then recreational users of the waterbodies (21%). Many volunteers also considered themselves to be participants in a watershed group (20%) or members of an environmental group (16%).

Figure 10. Survey Question 1

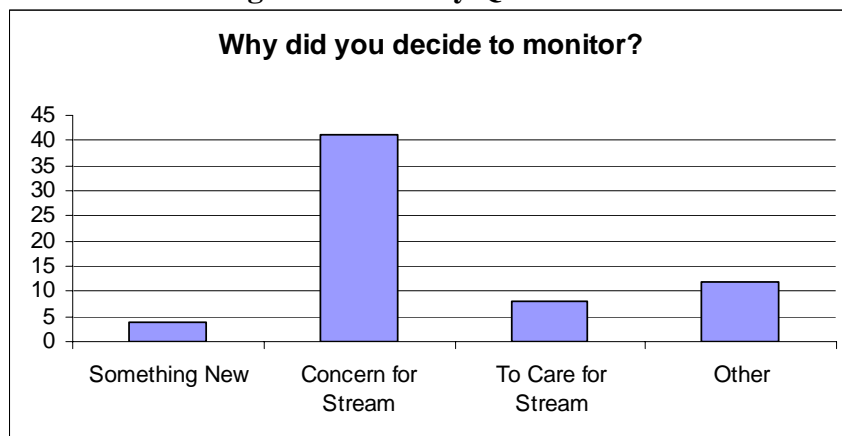


Figure 11. Survey Question 2

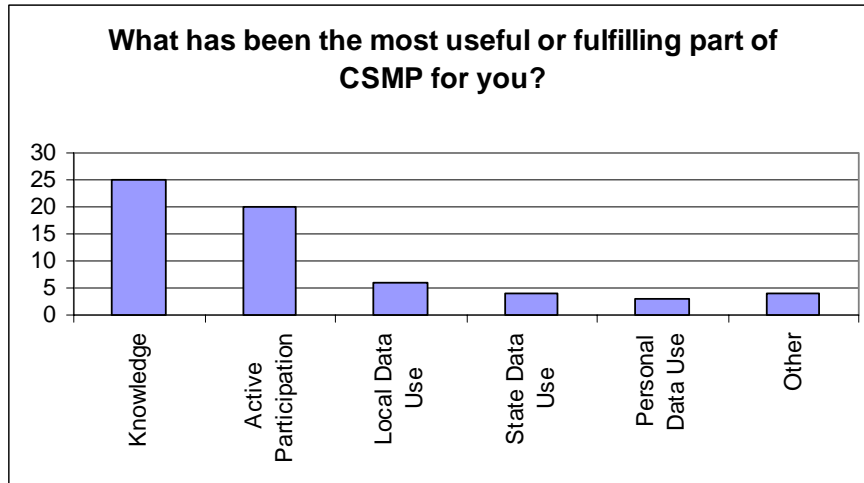


Figure 12. Survey Question 3

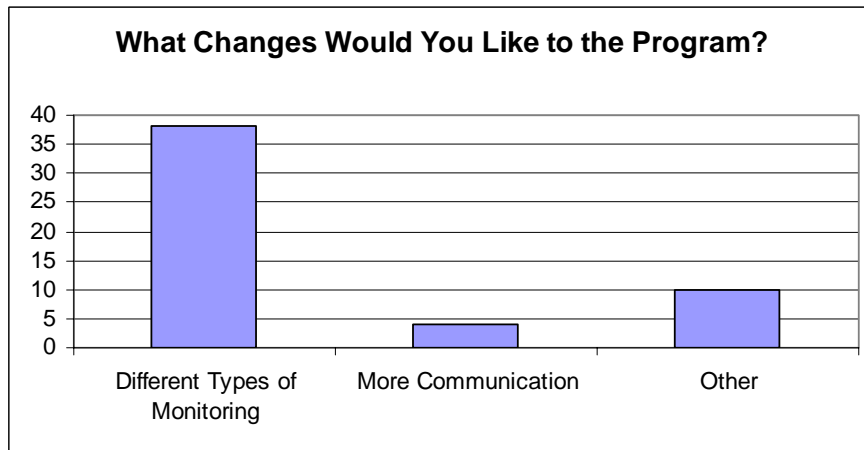
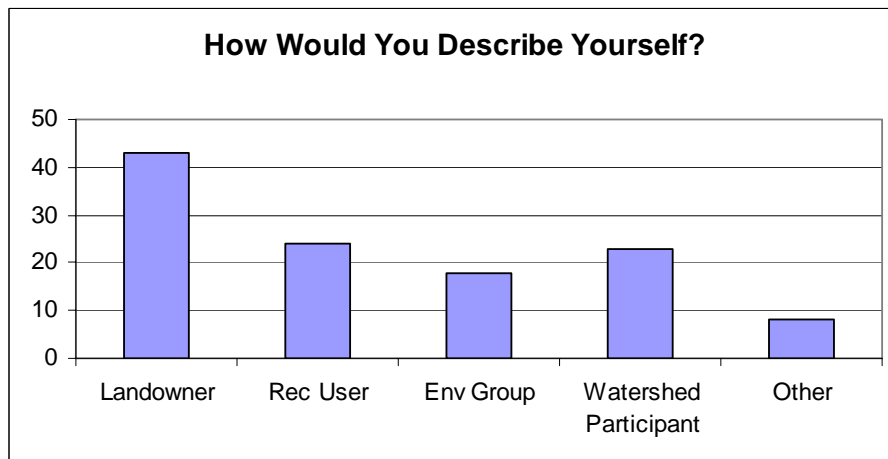


Figure 13. Survey Question 4



Section 4. Monitors in Action: Red River Basin River Watch

New to the CSMP this year are 19 schools that participate in the Red River Basin River Watch Program. Students monitor sites across the Red River Basin during the spring and fall, with some schools monitoring during the summer months as well. With historically low participation in the CSMP in the Red River Basin, the program is really receiving a boost with the help of the River Watch Program, with the addition of 97 sites in 2004!

Coordinators Wayne Goeken and Danni Halvorson work closely with the schools, which monitor CSMP parameters as well as collect a variety of chemical and physical parameters. The following pages detail how the program got its start, its continual evolution, and what's ahead in the future.



Students from the Fertile High School River Watch Team monitoring transparency in the Sand Hill River Watershed.

History

The Red River Basin River Watch Program (RRBRW) celebrated its 10 Year Anniversary in 2004. With the support of a Minnesota Board of Water and Soil Resources (BWSR) Challenge Grant, the RRBRW program began in 1995 with four schools on the Sand Hill River. The program has grown to involve nearly 30 schools

monitoring over 150 sites on rivers, streams, creeks, and major drainage ditches throughout northwest Minnesota.

The genesis of the RRBRW program is a great example of need meeting opportunity. In the early 1990's, the Sand Hill Watershed District (SHWD) tried unsuccessfully to undertake a major water project in the watershed. According to Wayne Goeken, River Watch coordinator, a key stumbling block was a lack of baseline data to support the application for necessary project permits. This experience alerted the SHWD managers of the importance of baseline monitoring data.

Hearing about the efforts of another River Watch program – at the Mississippi River Headwaters Board – Wayne saw an opportunity for gathering baseline data and raising residents' awareness of water quality issues. He met several times with Mississippi River Headwaters Board staff, who helped him sort through the monitoring purpose and goals, and also provided initial training. Support from the SHWD managers – who saw the program as a means of obtaining the baseline data they needed for future projects – and the BWSR Challenge Grant provided the other elements needed to create the Red River Basin River Watch program.

The program was developed with two specific goals in mind:

1. To develop a baseline of data using standard scientific methods to generate reliable, quality data that is comparable between sampling organizations and rivers, and
2. To provide students and citizens with hands-on opportunities that will foster a greater awareness and understanding of their local

watersheds and the Red River Basin in general.

How It Works

Monitoring sites are selected in consultation with local watershed district and soil and water conservation district managers to represent different reaches of rivers and tributaries. Schools conduct monthly monitoring of three to seven sites – generally from April or May through October or November. Students take a variety of field measurements including air and water temperature, conductivity, dissolved oxygen, pH, turbidity, transparency, and river stage. They also record general observations of vegetation and other conditions in the watershed that could influence water quality.

Historically, students collected water samples and performed the chemical analyses in the classroom. More recently the program has moved towards the use of field meters and laboratories certified by the Minnesota Department of Health. This shift from student analysis to the use of certified labs was made as labs could be more efficient, to improve decision-maker confidence in the data, and to encourage its use in water quality management efforts.

Program participants have used turbidimeters (a field instrument which measures turbidity – the scattering of light) all along, but began using transparency tubes along with turbidimeters in 1999. Transparency readings in the lake plain portion of the Red River Valley tend to be very low, while readings in the eastern headwaters portion of the basin often exceed the original 60 cm tube length. The 100 cm tube was added to the program in 2002 for

occasions when the 60 cm tube wasn't long enough.



Students from Win E Mac High School measure transparency in the Red Lake River Watershed.

Data is managed through a combination of centralized coordination and individual school efforts. The Red River Watershed Management Board maintains a master data set of all the results, which are entered into an Excel spreadsheet and returned to the participating schools for review and analysis. This allows the Board to ensure proper entry and also make adjustments necessary for more thorough statistical analysis. The data are also submitted to the MPCA for inclusion in the national water quality database STORET. Future plans involve creating a web-based on-line data entry and retrieval system to allow for wider access. The web site will include interactive maps of the sampling sites, background information, monitoring data, and a report card on site conditions. Some schools also maintain their own web pages that include their data along with photos of the sites and their sampling teams in action.



Win E Mac High School River Watch Students utilizing a 100 cm transparency tube to measure clarity in the Red Lake River Watershed.

As more samples are analyzed, the resulting data provide a basis for comparison by students and local resource managers – a means of beginning to assess the health of their rivers and contributing watersheds. For example, River Watch monitoring results help provide baseline information useful in assessing flood damage reduction projects being advanced in the region.

What's Next

As the program evolves and builds on its premise of “sound science and citizen involvement,” partnerships are strengthening at the local level. As results of initial baseline watershed monitoring are analyzed, more directed research partnerships are emerging between local resource managers and school districts to better understand specific local conditions. On a much broader scale, efforts are underway to raise awareness of how local conditions are connected to the health of the greater Red River Basin as monitoring and education linkages are being made with North Dakota and Manitoba schools and resource managers.

Additional information on the program can be found at the Center for Watershed Education's website: <http://www.tri-college.org/watershed/riverwatchmain.htm>

Bibliography

- Anderson, P. and R.D. Davic. 2004. Use of transparency tubes for rapid assessment of total suspended solids and turbidity in streams. *Lake and Reservoir Management*. 20(2):110-120.
- Dieter, C.D. 1990. Causes and effects of water turbidity: a selected annotated bibliography. South Dakota State University, South Dakota Cooperative Wildlife Research Unit, Technical Bulletin 5, Brookings.
- McCollor, S. and S. Heiskary 1993. Selected water-quality characteristics of the seven ecoregions of Minnesota. Minnesota Pollution Control Agency. St. Paul, MN.
- Waters, T.F. 1995. Sediment in Streams: sources, biological effects and control. American Fisheries Society Monograph 7. American Fisheries Society. Bethesda, Maryland.



**The song of the river ends not at her banks but in the hearts of those
who have loved her.**

Buffalo Joe



Boundaries don't protect rivers, people do.

Aristotle



Some Useful Definitions

Chlorophyll – the molecule found in algae that provides pigmentation (color).

Drainage Basin – the area of land drained by a number of rivers or streams.

Ecoregion – geographic areas that are distinguished from others by ecological characteristics such as climate, soils, geology, and vegetation.

Eutrophication – the natural and artificial addition of nutrients to a water body, which may lead to depleted oxygen concentrations. Eutrophication is a natural process that is frequently accelerated and intensified by human activities.

Geomorphology – the study of the evolution and configuration of landforms.

Hypolimnion – the cool, dense layer of water found at greater lake depths.

Macrophyte – rooted or free-floating large aquatic plants found in wetlands, lakes, and streams.

Oligotrophy – term used to describe the condition of a lake that is characterized by clear blue water, low nutrient levels, and Secchi-disk transparencies of over 8 meters. Oligotrophic lakes are generally deep with relatively small drainage areas.

Photosynthesis – the process by which green plants synthesize carbohydrates from carbon dioxide and water using light as an energy source and releasing oxygen as a byproduct.

Stream Discharge – quantity of stream flow per unit of time. Stream discharge is calculated by multiplying stream velocity (V) by stream cross-sectional area (A) so that $Q=VA$, where Q = discharge ($m^3/second$); V = velocity (m/s); and A = cross section (m^2).

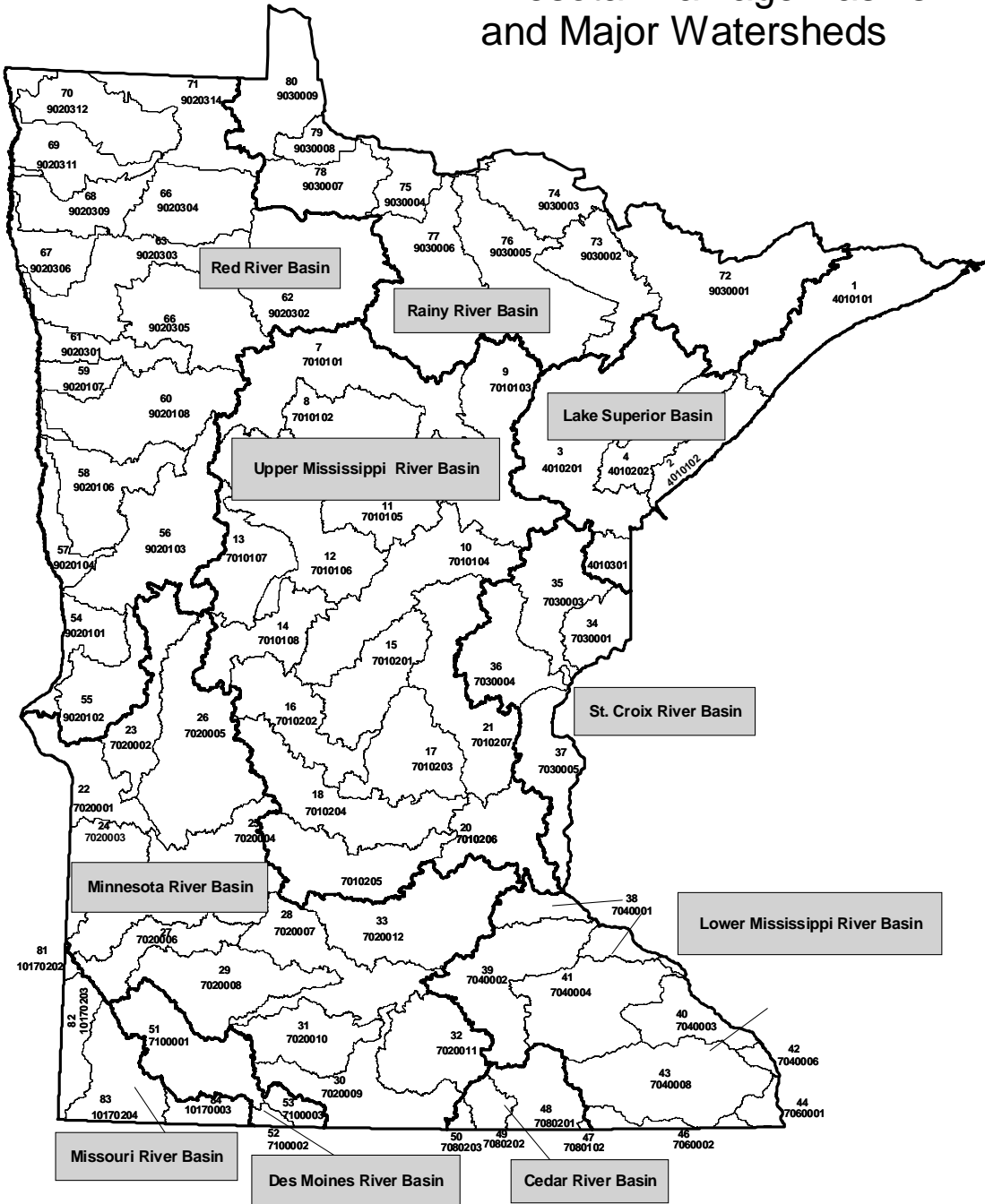
Trophic – refers to the nutrient production level of a water body.

Turbidity – murkiness or cloudiness of water, indicating the presence of suspended sediments, dissolved solids, natural or man-made chemicals, algae, etc.

Watershed – the area of land drained by a particular river or stream system, which when added together make up a drainage basin.

Appendix 1. Minnesota Drainage Basins & Major Watersheds Map and Key

Minnesota Drainage Basins and Major Watersheds



Key to Minnesota Drainage Basins and Major Watersheds

Lake Superior Basin = Drainage Basin Name
04010101 = Hydrologic Unit Code
(1) = DNR Major Watershed number
- Lake Superior (North) = Watershed Name

Lake Superior Basin

04010101 (1) – Lake Superior (North)
04010102 (2) – Lake Superior (South)
04010201 (3) – St. Louis River
04010202 (4) – Cloquet River
04010301 (5) – Nemadji River

Upper Mississippi River Basin

07010101 (7) – Mississippi (Headwaters – Lake Winnibigoshish)
07010102 (8) – Leech Lake River
07010103 (9) – Mississippi (Grand Rapids)
07010104 (10) – Mississippi River (Brainerd)
07010105 (11) – Pine River
07010106 (12) – Crow Wing River
07010107 (13) – Redeye River (Leaf River)
07010108 (14) – Long Prairie River
07010201 (15) – Mississippi River (Sartell)
07010202 (16) – Sauk River
07010203 (17) – Mississippi River (St. Cloud)
07010204 (18) – North Fork Crow River
07010205 (19) – South Fork Crow River
07010206 (20) – Mississippi River
07010207 (21) – Rum River

Minnesota River Basin

07020001 (22) – Minnesota River (Headwaters)
07020002 (23) – Pomme de Terre River
07020003 (24) – Lac Qui Parle River
07020004 (25) – Minnesota River (Granite Falls)
07020005 (26) – Chippewa River
07020006 (27) – Redwood River
07020007 (28) – Minnesota River (Mankato)
07020008 (29) – Cottonwood River
07020009 (30) – Blue Earth River
07020010 (31) – Watonwan River
07020011 (32) – Le Sueur River
07020012 (33) – Minnesota River (Shakopee)

St. Croix River Basin

07030001 (34) – St. Croix River (Upper)
07030003 (35) – Kettle River
07030004 (36) – Snake River
07030005 (37) – St. Croix River (Stillwater)

Key to Minnesota Drainage Basins and Major Watersheds (Continued)

| |
|---|
| <p>Lake Superior Basin = Drainage Basin Name 04010101 = Hydrologic Unit Code (1) = DNR Major Watershed number - Lake Superior (North) = Watershed Name</p> |
|---|

Lower Mississippi River Basin

07040001 (38) – Mississippi River and Lake Pepin (Red Wing)
07040002 (39) – Cannon River
07040003 (40) – Mississippi River (Winona)
07040004 (41) – Zumbro River
07040006 (42) – Mississippi River (La Crescent)
07040008 (43) – Root River
07060001 (44) – Mississippi River (Reno)
07060002 (46) – Upper Iowa River

Cedar River Basin

07080201 (48) – Cedar River
07080202 (49) – Shell Rock River
07080203 (50) – Winnebago River (Lime Creek)

Des Moines River Basin

07100001 (51) – West Fork Des Moines River (Headwaters)
07100002 (52) – West Fork Des Moines River (Lower)
07100003 (53) – East Fork Des Moines River

Missouri River Basin

10170202 (81) – Big Sioux River (Medary Creek)
10170203 (82) – Big Sioux River (Pipestone)
10170204 (83) – Rock River
10230003 (84) – Little Sioux River

Red River Basin

09020101 (54) – Bois De Sioux River
09020102 (55) – Mustinka River
09020103 (56) – Otter Tail River
09020104 (57) – Red River of the North (Headwaters)
09020106 (58) – Buffalo River
09020107 (59) – Marsh River
09020108 (60) – Wild Rice River
09020301 (61) – Sandhill River
09020302 (62) – Upper and Lower Red Lake
09020303 (63) – Red Lake River
09020304 (65) – Thief River
09020305 (66) – Clearwater River
09020306 (67) – Grand Marais Creek (Red River of the North)
09020309 (68) – Snake River
09020311 (69) – Tamarac River (Red River of the North)
09020312 (70) – Two Rivers
09020314 (71) – Roseau River

Key to Minnesota Drainage Basins and Major Watersheds (Continued)

| |
|---|
| <p>Lake Superior Basin = Drainage Basin Name 04010101 = Hydrologic Unit Code (1) = DNR Major Watershed number - Lake Superior (North) = Watershed Name</p> |
|---|

Rainy River Basin

09030001 (72) – Rainy River
09030002 (73) – Vermillion River
09030003 (74) – Rainy River (Rainy Lake)
09030004 (75) – Rainy River (Manitou)
09030005 (76) – Little Fork River
09030006 (77) – Big Fork River
09030007 (78) – Rapid River
09030008 (79) – Rainy River (Baudette)
09030009 (80) – Lake of the Woods

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LAKE SUPERIOR DRAINAGE BASIN

Lake Superior (North) Watershed (Hydrologic Unit Code – HUC – 04010101)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------|----------|--------|-----------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Matt Farley | CSMP0637 | Cook | Mistletoe Creek | 5/6 - 10/12 | 60 | 60 | 60 | 8 | 8 | 17.13 | 1 | 67 | |
| Matt Farley | CSMP0638 | Cook | Caribou Creek | 5/6 - 10/12 | 60 | 59 | 60 | 8 | 7 | 17.13 | 1 | 67 | |

Lake Superior (South) Watershed (HUC 04010102)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Timothy Musick | CSMP0024 | St Louis | Lester R W of Lester R Rd nr Moose Mtn in Duluth | 5/17 - 9/16 | 29 | 10 | 51 | 8 | 0 | 19.15 | 12 | 52 | |
| Mike Nordin | CSMP0685 | St Louis | Schmidt Ck at Old US 61 T51N/R12W/Sec 17 | 9/16 - 9/29 | 38 | 21 | 56 | 6 | 0 | 2.92 | 6 | 17 | 55.2 |
| Mike Nordin | CSMP0698 | St Louis | Sucker River @ Old US 61 T51N/R12W/Sec 4 | 9/16 - 9/16 | 56 | 56 | 56 | 1 | 0 | 2.92 | 6 | 17 | 55.7 |
| Kevin Stroom | CSMP0853 | St Louis | French River @ Co Hwy 50 | 4/17 - 7/11 | 51 | 17 | 60 | 7 | 5 | 14.57 | 6 | 27 | 62.8 |
| Kevin Stroom | CSMP0854 | St Louis | Talmadge River @ Co Rd 281 | 4/15 - 5/31 | 55 | 34 | 60 | 9 | 5 | 14.57 | 10 | 27 | 58.1 |

UPPER MISSISSIPPI RIVER DRAINAGE BASIN

Mississippi (Grand Rapids) Watershed (HUC 07010103)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------|----------|--------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Janet Smude | CSMP0313 | Aitkin | Sandy River, Hwy 65 N of McGregor | 3/29 - 10/25 | 53 | 34 | 60 | 10 | 2 | | 0 | 0 | 48.8 |
| Janet Smude | CSMP0702 | Aitkin | Minnewawa Creek @ Hwy 65 N of McGregor | 3/29 - 10/25 | 53 | 43 | 60 | 10 | 3 | | 0 | 0 | 49.2 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi (Grand Rapids) Watershed (HUC 07010103)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------|----------|--------|---------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Janet Smude | CSMP0703 | Aitkin | Ditch 5 @ Hwy 210 E | 3/29 - 10/25 | 53 | 19 | 60 | 10 | 5 | | 0 | 0 | 45.5 |
| Janet Smude | CSMP0704 | Aitkin | Savanna River T50N R23W Sec. 24 | 3/29 - 10/25 | 60 | 60 | 60 | 10 | 10 | | 0 | 0 | 51.3 |
| Janet Smude | CSMP0705 | Aitkin | Prairie River @ 140th Ave/Pl | 3/29 - 10/25 | 59 | 53 | 60 | 10 | 6 | | 0 | 0 | 49.4 |
| Janet Smude | CSMP0706 | Aitkin | Prairie River @ 145th Ave/Pl | 3/29 - 10/25 | 57 | 45 | 60 | 10 | 2 | | 0 | 0 | 49.7 |

Mississippi (Brainerd) Watershed (HUC 07010104)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|-----------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Bert & Irene Johnson | CSMP0244 | Crow Wing | Nokasippi River | 5/8 - 10/14 | 60 | 60 | 60 | 6 | 6 | 17.65 | 4 | 135 | 55.8 |
| Lawrence Fulton | CSMP0381 | Aitkin | Fleming Lake inlet, "Twp Rd-32" (north end) | 6/23 - 7/11 | 60 | 60 | 60 | 2 | 0 | | 1 | 0 | |
| Lawrence Fulton | CSMP0382 | Aitkin | Fleming Lake inlet, "CR 5" (NE end) | 7/11 - 9/7 | 46 | 33 | 58 | 2 | 0 | | 2 | 0 | |
| Bert & Irene Johnson | CSMP0699 | Crow Wing | SE Trib to Upper S Long Lake "Paradise 12" | 5/8 - 10/14 | 47 | 27 | 60 | 5 | 3 | 17.65 | 3 | 135 | 48.7 |

Pine River Watershed (HUC 07010105)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------|----------|--------|----------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Don Van Vorst | CSMP0252 | Cass | Pine River | 4/10 - 10/2 | 60 | 60 | 60 | 26 | 26 | 22.91 | 0 | 51 | 59.4 |
| Don Van Vorst | CSMP0253 | Cass | Unnamed tributary to Norway Lake | 4/10 - 10/2 | 60 | 60 | 60 | 20 | 20 | 22.91 | 0 | 51 | 54.8 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Crow Wing River Watershed (HUC 07010106)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------|----------|---------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Chuck Tritz | CSMP0348 | Hubbard | Shell River | 4/29 - 10/2 | 55 | 33 | 60 | 22 | 14 | 20.02 | 8 | 175 | |
| Denise Ratchke | CSMP0671 | Wadena | Cat Creek @ CSAH-26 Bridge | 4/21 - 10/4 | 34 | 23 | 43 | 29 | 0 | 20.41 | 14 | 193 | |
| Kyle Petterson | CSMP0688 | Wadena | Blueberry River in Menahga | 3/2 - 10/21 | 60 | 60 | 60 | 7 | 7 | 21 | 4 | 196 | |
| Melvin W. Messer | CSMP0787 | Wadena | Shell River @ CSAH-24 Shell City Bridge | 4/14 - 10/27 | 60 | 58 | 60 | 27 | 26 | | 13 | 0 | 59.4 |
| Leafwin Lindblom | CSMP0832 | Hubbard | Shell R at US 71, 3.5 mi N of Menahga | 9/25 - 10/25 | 60 | 60 | 60 | 4 | 4 | 4.15 | 1 | 41 | 48.5 |
| Leafwin Lindblom | CSMP0833 | Wadena | Kettle River at CR-156 (county line) | 9/25 - 10/25 | 60 | 60 | 60 | 4 | 4 | 4.15 | 1 | 41 | 46.5 |
| Leafwin Lindblom | CSMP0834 | Wadena | Blueberry River at Co Rd 16 (384th St) | 9/25 - 10/25 | 60 | 60 | 60 | 4 | 4 | 4.15 | 1 | 41 | 48.5 |

Redeye River (Leaf River) Watershed (HUC 07010107)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Mike Smith | CSMP0088 | Otter Tail | Oak Creek | 3/29 - 10/25 | 60 | 55 | 60 | 36 | 35 | 23.73 | 8 | 68 | 53.6 |
| Lorraine Lajeunesse | CSMP0250 | Wadena | Redeye River | 5/3 - 10/22 | 60 | 60 | 60 | 12 | 0 | 18.77 | 11 | 26 | |
| Anne Oldakowski | CSMP0258 | Wadena | Leaf River @ CSAH 20 bridge, 2 Mi N of Wadena | 6/10 - 9/25 | 60 | 60 | 60 | 8 | 8 | 22.78 | 1 | 252 | 68.6 |
| Maxine & Alfie Erickson | CSMP0667 | Wadena | Leaf River, T135N R35W Sec. 23 | 4/7 - 10/27 | 58 | 45 | 60 | 23 | 0 | 19.69 | 10 | 32 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Redeye River (Leaf River) Watershed (HUC 07010107)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------|----------|--------|---------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Jerry Siegel | CSMP0681 | Wadena | Red Eye River @ Hwy 71, Sebekka | 4/1 - 10/29 | 58 | 47 | 60 | 33 | 0 | 23.71 | 12 | 73 | 55.8 |
| Kari Tomperi | CSMP0683 | Wadena | Union Creek in Wadena | 5/21 - 11/3 | 58 | 54 | 60 | 14 | 5 | 9.26 | 5 | 30 | 55.5 |

Long Prairie River Watershed (HUC 07010108)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Dean Jahnke & Harold Dellwo | CSMP0101 | Douglas | Ditch 23 | 6/18 - 8/30 | 60 | 60 | 60 | 5 | 0 | 25.86 | 2 | 63 | |
| Veronica Stans | CSMP0109 | Douglas | Stormy Creek | 6/10 - 9/10 | 60 | 60 | 60 | 3 | 3 | | 0 | 0 | |
| Dennis E. Cin | CSMP0395 | Douglas | Douglas Co. Ditch 6 | 5/30 - 6/17 | 60 | 60 | 60 | 4 | 4 | 21.23 | 3 | 55 | |
| Billie Jo Jones | CSMP0458 | Douglas | Spirits Creek | 4/22 - 9/24 | 50 | 12 | 60 | 20 | 0 | 21.76 | 15 | 180 | 54.6 |
| Jerald Fulton | CSMP0460 | Douglas | Srping Lake inlet to Lake Miltona | 4/30 - 10/10 | 60 | 60 | 60 | 10 | 10 | 24.16 | 2 | 57 | 64.0 |
| Jerald Fulton | CSMP0461 | Douglas | Unnamed trib. To Lake Miltona, "Dittberner Cr" | 4/30 - 10/10 | 60 | 60 | 60 | 10 | 10 | 24.16 | 2 | 57 | 64.9 |
| Jack Anderson | CSMP0511 | Douglas | Inlet to Lake Miltona from Lake Irene | 5/18 - 9/24 | 60 | 60 | 60 | 10 | 10 | 22.08 | 3 | 184 | 60.8 |
| Don Heesen | CSMP0829 | Douglas | Trib to Lake Irene, off CR-64 | 5/18 - 10/3 | 60 | 60 | 60 | 15 | 15 | 26.01 | 9 | 64 | 57.2 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi (Sartell) Watershed (HUC 07010201)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------------|----------|----------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Connie Jendro | CSMP0026 | Morrison | Two Rivers | 3/25 - 10/24 | 58 | 30 | 60 | 33 | 25 | 19.22 | 19 | 45 | |
| Dale & LeAnn Sachs | CSMP0526 | Stearns | Two Rivers River, Inlet to Two Rivers Lake | 6/6 - 9/25 | 42 | 35 | 49 | 3 | 0 | 15.85 | 2 | 33 | 69.0 |
| Aletha Tomlyanovich | CSMP0643 | Stearns | Spunk Creek from Upper to Middle Spunk Lake | 5/18 - 10/25 | 59 | 55 | 60 | 7 | 0 | 22.99 | 7 | 84 | |
| Bill & Bev Simon | CSMP0662 | Stearns | Lower Spunk Creek T125N R30W Sec 21 | 4/5 - 10/11 | 60 | 60 | 60 | 31 | 0 | 20.39 | 6 | 190 | |
| Joe & Barb Lang | CSMP0674 | Stearns | Gully @ Co Rd 154 & Pelican Lake Rd | 4/4 - 10/28 | 57 | 13 | 60 | 17 | 0 | 22.23 | 9 | 167 | |
| John R. Baker | CSMP0694 | Stearns | Farm Drainage Ditch to Upper Spunk Lake | 6/2 - 8/4 | 60 | 60 | 60 | 8 | 8 | 22 | 3 | 206 | |
| John R. Baker | CSMP0695 | Stearns | Spunk Creek on Ct Rd 9 | 4/26 - 10/18 | 60 | 60 | 60 | 21 | 21 | 22 | 7 | 206 | |
| Ron Czajkowski | CSMP0701 | Stearns | So. Branch Two Rivers | 4/4 - 11/5 | 52 | 20 | 60 | 36 | 0 | 25.98 | 12 | 77 | |
| Stearns County Environmental Services | CSMP0726 | Stearns | Watab Creek in Sartell Park in Sartell, MN | 5/12 - 9/28 | 51 | 30 | 60 | 14 | 0 | 16.28 | 11 | 17 | |
| Stearns County Environmental Services | CSMP0763 | Stearns | Co Ditch 13 @ 2 1/2 St & 12th Ave | 5/12 - 8/10 | 53 | 43 | 60 | 12 | 0 | 16.28 | 10 | 17 | |
| Stearns County Environmental Services | CSMP0764 | Stearns | Watab River at 19th Ave in Sartell | 5/12 - 9/28 | 55 | 45 | 60 | 14 | 0 | 16.28 | 11 | 17 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi (Sartell) Watershed (HUC 07010201)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Dale & LeAnn Sachs | CSMP0863 | Stearns | Trib to Two R Lake .4 mi E of 205th Ave "Site 2" | 6/6 - 9/25 | 44 | 38 | 53 | 3 | 0 | 15.85 | 2 | 33 | 69.0 |
| Dale & LeAnn Sachs | CSMP0864 | Stearns | Trib to Two R Lake .5 mi E of 205th Ave "Site 3" | 6/6 - 9/25 | 44 | 40 | 50 | 3 | 0 | 15.85 | 2 | 33 | 69.0 |
| Dale & LeAnn Sachs | CSMP0865 | Stearns | Trib to Two R Lake .3 mi S of 390th St "Site 4" | 6/6 - 9/25 | 43 | 38 | 46 | 3 | 0 | 15.85 | 2 | 33 | 69.7 |
| Dale & LeAnn Sachs | CSMP0866 | Stearns | Trib to Two R Lake .8 mi E of CR-10 "Site 5" | 6/6 - 9/25 | 42 | 37 | 46 | 3 | 0 | 15.85 | 2 | 33 | 70.3 |
| Dale & LeAnn Sachs | CSMP0867 | Stearns | Two R Lake Outlet .5 mi E of 400th St "Site 6" | 6/6 - 9/25 | 45 | 43 | 47 | 3 | 0 | 15.85 | 2 | 33 | 70.7 |
| Dale & LeAnn Sachs | CSMP0868 | Stearns | Trib to Two R Lake .3 mi W of 185th Ave "Site 7" | 6/6 - 9/25 | 36 | 35 | 39 | 3 | 0 | 15.85 | 2 | 33 | 70.7 |

Sauk River Watershed (HUC 07010202)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------|----------|--------|--------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Gene Waldorf | CSMP0090 | Todd | Fish Creek, "a" | 5/31 - 8/1 | 56 | 45 | 60 | 4 | 3 | 14.89 | 0 | 26 | |
| Gene Waldorf | CSMP0091 | Todd | Fish Creek, "b" | 5/31 - 8/1 | 58 | 51 | 60 | 4 | 3 | 14.89 | 0 | 26 | |
| Jeanine Renard | CSMP0092 | Todd | Fish Creek | 4/15 - 9/28 | 55 | 45 | 60 | 24 | 12 | 14.99 | 22 | 22 | |
| Gene Waldorf | CSMP0184 | Todd | Unnamed tributary to Fish Creek, "c" | 5/31 - 7/7 | 60 | 60 | 60 | 2 | 2 | 14.89 | 0 | 26 | |
| Gene Waldorf | CSMP0185 | Todd | Fish Creek, "d" | 5/31 - 8/1 | 50 | 20 | 60 | 4 | 3 | 14.89 | 0 | 26 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Sauk River Watershed (HUC 07010202)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------------|----------|---------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Harold Podolske | CSMP0457 | Douglas | Gulden Lake inlet | 4/5 - 9/24 | 59 | 45 | 60 | 19 | 0 | 21.27 | 8 | 54 | |
| Mike Stewart | CSMP0520 | Stearns | Browns Lk Outlet Just W of MN-22, | 3/25 - 10/28 | 52 | 4 | 60 | 70 | 9 | 51.89 | 46 | 386 | |
| Joe & Sandy Folwarski | CSMP0520 | Stearns | Browns Lk Outlet Just W of MN-22, | 3/25 - 10/28 | 52 | 4 | 60 | 70 | 9 | 51.89 | 46 | 386 | |
| Joe Chovan | CSMP0522 | Stearns | Inlet to Big Fish Lake | 5/17 - 10/5 | 60 | 55 | 60 | 14 | 13 | 24.51 | 2 | 54 | 62.9 |
| Joe Chovan | CSMP0523 | Stearns | Outlet to Big Fish Lake | 5/17 - 10/5 | 60 | 60 | 60 | 14 | 14 | 24.51 | 2 | 54 | 69.2 |
| Joel Ampe | CSMP0554 | Stearns | Mill Creek | 6/4 - 6/4 | 60 | 60 | 60 | 1 | 0 | 27.74 | 10 | 58 | |
| Smith Lake Association | CSMP0803 | Douglas | Unnamed Trib to Smith Lake, SW corner | 6/20 - 9/15 | 28 | 11 | 59 | 12 | 0 | 14.49 | 2 | 48 | 72.3 |
| Mike Stewart | CSMP0850 | Stearns | Inlet to Cedar Island Lk off Edgeview Rd | 5/16 - 10/28 | 51 | 15 | 60 | 17 | 12 | 27.72 | 11 | 198 | |
| Don Haller | CSMP0851 | Stearns | Little Birch Lk Outlet (Adley Ck) | 5/26 - 10/28 | 59 | 56 | 60 | 6 | 4 | | 0 | 0 | |
| Don Haller | CSMP0852 | Todd | Trib to Little Birch Lake "Prairie Creek" | 5/26 - 10/28 | 60 | 60 | 60 | 6 | 6 | | 0 | 0 | |

Mississippi (St. Cloud) Watershed (HUC 07010203)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------|----------|-----------|----------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| George Kydd | CSMP0222 | Sherburne | Briggs Creek, "1B" | 4/16 - 9/25 | 60 | 60 | 60 | 25 | 22 | 29.26 | 10 | 224 | 54.7 |
| George Kydd | CSMP0223 | Sherburne | Briggs Creek, "1A" | 4/16 - 9/25 | 60 | 60 | 60 | 25 | 23 | 29.26 | 10 | 224 | 54.7 |
| George Kydd | CSMP0224 | Sherburne | Rice Creek at CSAH 6 | 4/16 - 9/11 | 15 | 8 | 31 | 24 | 0 | 29.26 | 9 | 224 | 63.0 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi (St. Cloud) Watershed (HUC 07010203)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|-----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| George Kydd | CSMP0225 | Sherburne | Elk River at Co. Rd. 61 | 4/16 - 9/11 | 56 | 32 | 60 | 24 | 18 | 29.26 | 9 | 224 | 59.8 |
| George Kydd | CSMP0227 | Sherburne | Rice Creek at CSAH 16 | 4/16 - 9/11 | 31 | 14 | 55 | 24 | 0 | 29.26 | 9 | 224 | 60.9 |
| George Kydd | CSMP0228 | Sherburne | Elk River at CSAH 6 | 4/16 - 9/11 | 51 | 37 | 60 | 24 | 1 | 29.26 | 9 | 224 | 60.1 |
| George Kydd | CSMP0229 | Sherburne | Rush Lake outlet | 4/16 - 9/11 | 28 | 8 | 53 | 24 | 0 | 29.26 | 9 | 224 | 65.6 |
| Sandy Stai | CSMP0230 | Sherburne | Elk River at Co. Rd. 53 | 5/5 - 10/21 | 22 | 7 | 54 | 25 | 0 | 21.22 | 10 | 167 | 51.1 |
| Sandy Stai | CSMP0231 | Sherburne | Elk River at State Hwy. 25 | 5/5 - 10/21 | 20 | 7 | 47 | 25 | 0 | 21.22 | 10 | 167 | 50.7 |
| Karen Durant | CSMP0515 | Wright | Fish Creek, T122N R27W sec. 13 | 5/25 - 5/25 | 51 | 51 | 51 | 1 | 0 | 22.05 | 10 | 143 | |
| Karen Durant | CSMP0516 | Wright | Unnamed Tributary to Fish Lake, T122N/R26W/S18 | 10/29 - 10/29 | 35 | 35 | 35 | 1 | 0 | 22.05 | 10 | 143 | |
| Lowell Schrupp | CSMP0528 | Wright | Silver Creek @ 134th St. | 4/9 - 10/26 | 58 | 52 | 60 | 22 | 0 | 39.9 | 14 | 57 | |
| Fran & Mil Voelker | CSMP0561 | Stearns | Watab River at Sartell | 3/29 - 7/11 | 56 | 28 | 60 | 14 | 0 | 24.56 | 5 | 195 | |
| Robert Bock | CSMP0635 | Sherburne | Elk River @ CSAH 23 | 4/8 - 10/23 | 30 | 10 | 59 | 29 | 0 | 33.7 | 2 | 84 | |
| Sandy Stai | CSMP0652 | Sherburne | Elk R @ 7290 107th Lane | 5/5 - 10/21 | 24 | 8 | 53 | 25 | 0 | 21.22 | 10 | 167 | 51.7 |
| Sandy Stai | CSMP0653 | Sherburne | Elk River at CR-55 | 5/5 - 10/21 | 60 | 60 | 60 | 25 | 10 | 21.22 | 9 | 167 | 41.0 |
| Dan Thole | CSMP0663 | Benton | St. Francis River | 4/3 - 11/1 | 55 | 18 | 60 | 45 | 37 | 26.89 | 24 | 212 | |
| George Kydd | CSMP0675 | Sherburne | Briggs Bayou @ County Road 16 | 4/16 - 9/11 | 48 | 21 | 60 | 24 | 2 | 29.26 | 9 | 224 | 62.6 |
| George Kydd | CSMP0676 | Sherburne | Rice Creek @ 42nd Street | 4/16 - 9/11 | 24 | 12 | 52 | 24 | 0 | 29.26 | 9 | 224 | 60.8 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi (St. Cloud) Watershed (HUC 07010203)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------------|----------|-----------|-----------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| US FWS Sherburne Refuge | CSMP0677 | Sherburne | St Francis River T35N R27W Sec 10 | 4/14 - 9/30 | 53 | 34 | 60 | 24 | 12 | 25.28 | 0 | 180 | 65.3 |
| US FWS Sherburne Refuge | CSMP0678 | Sherburne | St Francis River T35N R27W Sec 18 | 4/14 - 9/30 | 36 | 20 | 58 | 24 | 0 | 25.28 | 0 | 180 | 64.6 |
| US FWS Sherburne Refuge | CSMP0679 | Sherburne | St Francis River T35N R28W Sec 9 | 4/14 - 9/30 | 58 | 33 | 60 | 24 | 20 | 25.28 | 0 | 180 | 63.0 |
| Don Winkelman Sr. | CSMP0697 | Benton | Stony Brook | 4/6 - 7/15 | 59 | 50 | 60 | 9 | 0 | 20.77 | 5 | 36 | |
| Stearns County Environmental Services | CSMP0765 | Stearns | Neenah Ck at Co Rd 136 | 5/12 - 9/28 | 59 | 50 | 60 | 15 | 0 | 11.74 | 12 | 14 | |
| Stearns County Environmental Services | CSMP0766 | Stearns | Luxemburg Ck at 43rd Ave | 5/12 - 9/28 | 56 | 45 | 60 | 14 | 0 | 10.55 | 10 | 13 | |
| Stearns County Environmental Services | CSMP0767 | Stearns | Johnson Ck at CR 7 | 5/12 - 9/23 | 56 | 40 | 60 | 15 | 0 | 10.5 | 13 | 13 | |
| Stearns County Environmental Services | CSMP0768 | Stearns | Fairhaven Ck at CR44 | 5/12 - 9/28 | 45 | 28 | 60 | 16 | 0 | 11.34 | 12 | 13 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi (St. Cloud) Watershed (HUC 07010203)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------------|----------|----------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Stearns County Environmental Services | CSMP0769 | Stearns | Theil Ck at inlet to Lake Marie | 6/14 - 9/28 | 60 | 60 | 60 | 8 | 0 | 11.34 | 6 | 13 | |
| Stearns County Environmental Services | CSMP0770 | Stearns | Three Mile Ck at Co Rd 44 | 5/12 - 9/28 | 60 | 60 | 60 | 14 | 0 | 10.02 | 11 | 13 | |
| Stearns County Environmental Services | CSMP0771 | Stearns | Plum Ck at CR 75 | 6/17 - 9/28 | 60 | 60 | 60 | 8 | 0 | 9.69 | 5 | 13 | |
| Stearns County Environmental Services | CSMP0772 | Stearns | St Augusta Ck at CR 75 | 5/12 - 9/28 | 43 | 25 | 60 | 15 | 0 | 10.9 | 11 | 14 | |
| Jon & Delores Roeder | CSMP0777 | Stearns | Clearwater R btn Clearwater and Grass Lake | 5/18 - 10/11 | 60 | 60 | 60 | 29 | 29 | 20.09 | 16 | 147 | |
| Paul Pagel | CSMP0785 | Hennepin | Elm Creek @ Dock, Upstream of Dam | 4/22 - 10/24 | 53 | 20 | 60 | 12 | 7 | 26.11 | 1 | 70 | 59.6 |
| George Schneider | CSMP0827 | Hennepin | Elm Creek @ dock S of CSAH 30 in Maple Grove | 5/12 - 10/18 | 38 | 9 | 54 | 15 | 0 | 25.05 | 7 | 69 | 72.1 |
| Dan Goeman | CSMP0855 | Wright | Silver Creek off of 143rd St @ outlet to Locke Lk | 7/18 - 10/9 | 37 | 32 | 42 | 14 | 0 | | 0 | 0 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

North Fork Crow River Watershed (HUC 07010204)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---|----------|--------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Litchfield WWTP Plant Operator (Jerry Lanz) | CSMP0191 | Meeker | Jewitts Creek | 4/2 - 11/24 | 56 | 40 | 60 | 32 | 0 | 32.92 | 15 | 78 | 59.0 |
| Litchfield WWTP Plant Operator (Jerry Lanz) | CSMP0192 | Meeker | No. Fork Crow River | 4/2 - 11/24 | 35 | 20 | 60 | 31 | 0 | 32.92 | 15 | 78 | 60.4 |
| Walt Barlow | CSMP0193 | Wright | No. Fork Crow River | 4/25 - 10/31 | 44 | 18 | 60 | 27 | 8 | 29.2 | 9 | 71 | |
| Mark D. Miller | CSMP0194 | Wright | No. Fork Crow River, 5 mi N Howard Lake | 4/30 - 10/29 | 28 | 9 | 57 | 19 | 0 | 28.82 | 7 | 51 | |
| Wallace W. McCurdy | CSMP0195 | Wright | No. Fork Crow River | 4/5 - 11/1 | 34 | 7 | 60 | 30 | 1 | 27.62 | 22 | 52 | |
| Torney Marshall | CSMP0196 | Wright | Crow River | 5/26 - 8/22 | 23 | 15 | 32 | 8 | 0 | 25.46 | 2 | 52 | |
| Gabe Davidson | CSMP0201 | Wright | No. Fork Crow River | 4/2 - 11/12 | 39 | 20 | 60 | 30 | 0 | 31.1 | 16 | 41 | |
| Bob Schwingler | CSMP0254 | Meeker | Unnamed tributary to Manuella Lake | 4/13 - 9/29 | 53 | 10 | 60 | 34 | 21 | 23.47 | 16 | 173 | 58.3 |
| Lee G. Miska | CSMP0422 | Meeker | Collinwood Lake So. Inlet (from Maple Lake) | 3/22 - 10/25 | 38 | 25 | 60 | 32 | 0 | 28.86 | 15 | 219 | |
| Carol R. Marjapori | CSMP0423 | Wright | Crow River, "intersection of CR 3 and 37" | 4/4 - 9/26 | 28 | 2 | 49 | 20 | 0 | 20.14 | 10 | 47 | 60.8 |
| Richard P. Gehlen | CSMP0428 | Meeker | Silver Creek | 4/30 - 10/17 | 47 | 40 | 52 | 10 | 0 | 25.99 | 4 | 229 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

North Fork Crow River Watershed (HUC 07010204)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|--------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Holly Martini | CSMP0519 | Wright | Crow River | 5/1 - 10/31 | 26 | 19 | 38 | 14 | 0 | 24.68 | 3 | 182 | |
| James E. Moy | CSMP0547 | Wright | Twelve Mile Creek @ CSAH 8 | 4/28 - 9/30 | 44 | 20 | 60 | 16 | 4 | 22.7 | 6 | 163 | 62.4 |
| James E. Moy | CSMP0548 | Wright | Twelve Mile Creek @ RR BR N of Hwy 12 | 4/14 - 9/30 | 49 | 10 | 60 | 19 | 10 | 22.7 | 4 | 163 | 57.3 |
| James E. Moy | CSMP0549 | Wright | Twelve Mile Creek @ T118N R27W Sec. 12 | 4/14 - 9/30 | 48 | 16 | 60 | 19 | 10 | 22.7 | 6 | 163 | 57.6 |
| James E. Moy | CSMP0550 | Wright | Dutch Lake outlet @ T118N R27W Sec. 11 | 4/14 - 9/30 | 37 | 16 | 60 | 17 | 5 | 22.7 | 6 | 163 | 56.7 |
| James E. Moy | CSMP0551 | Wright | Twelve Mile Creek @ 82nd St. | 4/21 - 9/30 | 49 | 25 | 60 | 16 | 6 | 22.7 | 6 | 163 | 60.7 |
| James E. Moy | CSMP0552 | Wright | Dutch Lake outlet @ T118N R27W Sec. 2 | 4/14 - 9/30 | 24 | 10 | 46 | 18 | 0 | 22.7 | 6 | 163 | 61.3 |
| James E. Moy | CSMP0553 | Wright | Twelve Mile Creek @ CR 107 | 4/21 - 9/30 | 47 | 15 | 60 | 16 | 8 | 22.7 | 6 | 163 | 60.6 |
| Herman Wittsack | CSMP0737 | Wright | Unnamed trib to French Lake (at backyard bridge) | 6/2 - 9/22 | 44 | 39 | 47 | 3 | 0 | 22.88 | 3 | 168 | |
| Herman Wittsack | CSMP0738 | Wright | CD 16 at 45th St NW | 5/17 - 9/22 | 24 | 8 | 39 | 5 | 0 | 22.88 | 5 | 168 | |
| Herman Wittsack | CSMP0739 | Wright | Dan's Lake outlet at CSAH 37 to French Lake | 5/17 - 6/12 | 41 | 30 | 48 | 3 | 0 | 22.88 | 3 | 168 | |
| Herman Wittsack | CSMP0740 | Wright | French Creek at Oliver Avenue | 5/17 - 9/23 | 46 | 33 | 50 | 7 | 0 | 22.88 | 5 | 168 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

North Fork Crow River Watershed (HUC 07010204)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---|----------|--------|-------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Litchfield WWTP Plant Operator (Jerry Lanz) | CSMP0741 | Meeker | Jewett Creek at CSAH 1 S of CSAH 11 | 4/2 - 11/24 | 60 | 54 | 60 | 29 | 0 | 32.92 | 14 | 78 | 59.8 |
| Curt Forst | CSMP0744 | Wright | Howard Lake - Golf course ditch | 5/17 - 10/30 | 57 | 44 | 60 | 6 | 3 | 26.28 | 6 | 74 | |
| Curt Forst | CSMP0745 | Wright | Howard Lake - N wetland | 5/17 - 10/30 | 48 | 24 | 60 | 3 | 2 | 26.28 | 3 | 74 | |

North Fork Crow River Watershed (HUC 07010204)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|-----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Roger Berggren | CSMP0096 | McLeod | So. Fork Crow River, "Co. Rd. 9" | 4/23 - 10/25 | 22 | 14 | 40 | 25 | 0 | 27.37 | 5 | 42 | |
| Roger Berggren | CSMP0097 | McLeod | So. Fork Crow River, "Co. Rd. 14" | 4/23 - 10/25 | 19 | 4 | 40 | 25 | 0 | 27.37 | 6 | 42 | |
| Gary Schreifels | CSMP0187 | McLeod | Buffalo Creek | 4/1 - 11/4 | 27 | 6 | 60 | 28 | 1 | 32.26 | 9 | 61 | 60.1 |
| Roger Berggren | CSMP0396 | McLeod | So. Fork Crow River, "Bluff St. Bridge" | 4/23 - 10/25 | 21 | 11 | 40 | 25 | 0 | 27.37 | 5 | 42 | |
| Alex Krengel | CSMP0424 | Carver | So. Fork Crow River | 4/12 - 10/31 | 11 | 4 | 31 | 22 | 0 | 30.7 | 4 | 65 | |
| Erik Homme | CSMP0542 | Kandiyohi | So. Fork Crow River @ Co. Rd. 17 | 5/28 - 7/22 | 15 | 13 | 17 | 4 | 0 | 15.17 | 2 | 147 | |
| Karen de Boer | CSMP0712 | McLeod | Buffalo Cr SE of Brownnton @ Nature Ave & 65th | 3/28 - 11/6 | 26 | 9 | 60 | 26 | 1 | 31.27 | 4 | 234 | 61.2 |
| Karen de Boer | CSMP0713 | McLeod | Buffalo Creek N of Plato @ Co Rd 74 | 3/28 - 11/6 | 25 | 9 | 60 | 32 | 1 | 31.27 | 9 | 234 | 61.1 |
| Loren Engelby | CSMP0857 | Kandiyohi | Co Dt 24A @ CSAH 8 (Lakeview St) in Lk Lillian | 6/7 - 9/22 | 49 | 22 | 60 | 10 | 5 | 24.7 | 4 | 52 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi River Watershed (HUC 07010206)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Louise Hotka | CSMP0001 | Hennepin | Mississippi River | 4/5 - 9/28 | 27 | 17 | 39 | 20 | 0 | 22.99 | 7 | 193 | |
| Donald Sovell | CSMP0030 | Hennepin | Minnehaha Creek | 4/19 - 11/18 | 49 | 17 | 60 | 27 | 4 | 27.69 | 18 | 201 | 62.4 |
| Todd Biewen | CSMP0035 | Hennepin | Bassett Creek at Winnetka Ave. | 4/23 - 11/11 | 48 | 27 | 60 | 12 | 4 | 27.8 | 6 | 65 | |
| Terry Brennan | CSMP0089 | Anoka | Rice Creek | 4/25 - 10/29 | 40 | 25 | 51 | 5 | 0 | 15.12 | 2 | 32 | |
| Mary Moreira | CSMP0559 | Hennepin | Shingle Creek @ 45th Ave. N. | 4/11 - 9/15 | 42 | 12 | 60 | 22 | 5 | 25.01 | 8 | 92 | 62.7 |
| Mary Moreira | CSMP0560 | Hennepin | Bassett Creek @ Dresden Ln. near Bassett Cr. Rd. | 4/11 - 9/17 | 39 | 10 | 60 | 23 | 4 | 25.01 | 9 | 92 | 62.0 |
| Eric P. Herrera | CSMP0664 | Ramsey | Battle Creek | 5/10 - 11/19 | 60 | 57 | 60 | 15 | 14 | 2.25 | 7 | 6 | 63.5 |
| Paul Pagel | CSMP0786 | Hennepin | Elm Ck downstream of Dam T119N/R22W/S10 | 4/22 - 10/24 | 57 | 33 | 60 | 11 | 4 | 26.11 | 1 | 70 | 57.1 |

Rum River Watershed (HUC 07010207)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------|----------|-----------|----------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Bruce Odenbach | CSMP0158 | Crow Wing | Garrison Creek | 5/19 - 11/17 | 60 | 60 | 60 | 7 | 7 | | 2 | 0 | 60.3 |
| Janet Smude | CSMP0158 | Crow Wing | Garrison Creek | 5/19 - 11/17 | 60 | 60 | 60 | 7 | 7 | | 2 | 0 | 60.3 |
| Janet Smude | CSMP0159 | Crow Wing | Seguchie Creek | 4/4 - 11/17 | 60 | 60 | 60 | 38 | 7 | 22.28 | 6 | 214 | 60.8 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Rum River Watershed (HUC 07010207)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------------|----------|------------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Ted Kostecka | CSMP0159 | Crow Wing | Seguchie Creek | 4/4 - 11/17 | 60 | 60 | 60 | 38 | 7 | 22.28 | 6 | 214 | 60.8 |
| Janet Smude | CSMP0160 | Aitkin | Peterson Creek | 4/5 - 11/17 | 60 | 59 | 60 | 8 | 5 | | 3 | 0 | 55.3 |
| Janet Smude | CSMP0161 | Mille Lacs | Anderson Lake outlet/ Thaines /Malone Creek | 5/19 - 11/7 | 60 | 60 | 60 | 7 | 7 | | 3 | 0 | 60.1 |
| Janet Smude | CSMP0162 | Aitkin | Borden Creek | 4/5 - 11/17 | 59 | 48 | 60 | 8 | 5 | | 3 | 0 | 55.2 |
| Janet Smude | CSMP0163 | Aitkin | Seventeen Creek | 5/19 - 11/17 | 55 | 42 | 60 | 7 | 4 | | 3 | 0 | 55.7 |
| Janet Smude | CSMP0261 | Mille Lacs | Cedar Creek | 5/19 - 11/7 | 60 | 60 | 60 | 7 | 6 | | 3 | 0 | 58.6 |
| Caron Gibson | CSMP0263 | Isanti | Rum River | 4/21 - 11/9 | 44 | 26 | 60 | 19 | 0 | 31.19 | 7 | 52 | |
| Caron Gibson | CSMP0264 | Isanti | Owl Creek (Co. Ditch 15) | 4/21 - 11/9 | 38 | 5 | 60 | 20 | 0 | 31.19 | 8 | 52 | |
| Janet Smude | CSMP0272 | Aitkin | Reddy Creek | 5/19 - 11/17 | 28 | 19 | 38 | 7 | 0 | | 3 | 0 | 58.0 |
| Janet Smude | CSMP0314 | Aitkin | Mormon Creek / Co Ditch 36 | 5/19 - 11/17 | 59 | 55 | 60 | 7 | 5 | | 3 | 0 | 59.7 |
| Jim & Sherry Kaiserlik | CSMP0378 | Isanti | Stanchfield Creek, "Site 1" "NORTH" | 5/10 - 10/29 | 60 | 60 | 60 | 20 | 20 | 29.22 | 12 | 59 | 62.3 |
| Jim & Sherry Kaiserlik | CSMP0379 | Isanti | Stanchfield Creek, "Site 2" "SOUTH" | 5/10 - 10/29 | 60 | 60 | 60 | 20 | 20 | 29.22 | 12 | 59 | 63.1 |
| Carolyn S Dullum | CSMP0821 | Chisago | Unnamed Outlet from Johason Lk at CSAH 10 | 6/27 - 9/30 | 42 | 3 | 60 | 19 | 8 | 10.13 | 9 | 18 | |
| Janet Smude | CSMP0828 | Mille Lacs | Rum River at Ogechie Lake Dam in State Park | 5/19 - 11/17 | 60 | 60 | 60 | 7 | 7 | | 3 | 0 | 60.3 |

42

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN

Minnesota River (Headwaters) Watershed (HUC 07020001)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------|----------|---------------|--------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| David Ulrich | CSMP0596 | Lac qui Parle | N. Fork Yellowbank River | 4/25 - 9/18 | 55 | 8 | 60 | 11 | 10 | 23.18 | 1 | 69 | |

Pomme de Terre River Watershed (HUC 07020002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------------|----------|-----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Norma Wojtalewicz | CSMP0361 | Swift | Pomme de Terre River "Hering St. RR BR" | 4/1 - 10/31 | 19 | 8 | 35 | 22 | 0 | 23.26 | 13 | 196 | |
| Gerald & Mary Erickson | CSMP0369 | Ottertail | Pomme de Terre River | 4/13 - 10/25 | 60 | 55 | 60 | 23 | 22 | 28.38 | 8 | 200 | 61.3 |
| Berthold Koosmann | CSMP0370 | Swift | Pomme de Terre River | 4/16 - 10/18 | 21 | 10 | 51 | 27 | 0 | 24.79 | 12 | 58 | |
| Don Dally | CSMP0603 | Grant | Pelican Creek, T130N R41W Sec. 16 | 5/18 - 10/27 | 32 | 21 | 50 | 12 | 0 | 24.1 | 2 | 214 | 62.6 |
| Don Dally | CSMP0604 | Grant | Pomme de Terre River @ CR-51 | 5/18 - 10/27 | 49 | 34 | 53 | 12 | 0 | 24.1 | 2 | 214 | 63.4 |
| Don Dally | CSMP0605 | Grant | Pomme de Terre River @ CR-47 | 5/18 - 10/27 | 41 | 31 | 53 | 12 | 0 | 24.1 | 2 | 214 | 63.5 |
| Don Dally | CSMP0606 | Grant | Pomme de Terre River @ Twp. Rd. T128N R41W Sec. 29 | 5/18 - 10/27 | 41 | 29 | 50 | 12 | 0 | 24.1 | 1 | 214 | 64.4 |
| Don Dally | CSMP0710 | Grant | Pomme de Terre River @ T127 R41 S18 | 5/18 - 10/27 | 44 | 28 | 53 | 12 | 0 | 24.1 | 2 | 214 | 64.2 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Lac Qui Parle River Watershed (HUC 07020003)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|-----------------|---|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Allen J. Krueger | CSMP0098 | Yellow Medicine | Lac Qui Parle River | 5/17 - 9/22 | 53 | 15 | 60 | 21 | 14 | 8.19 | 11 | 9 | 64.9 |
| Allen J. Krueger | CSMP0372 | Yellow Medicine | Lac Qui Parle River, CR-D8 | 5/16 - 9/22 | 24 | 2 | 60 | 22 | 2 | 7 | 11 | 8 | 66.1 |
| Brad Olson | CSMP0466 | Lac qui Parle | Lac qui Parle River | 5/21 - 11/10 | 29 | 10 | 50 | 12 | 0 | 20.16 | 7 | 23 | |
| Dustin & Jeff Johnson | CSMP0467 | Lac qui Parle | County Ditch 34 | 4/25 - 11/7 | 54 | 24 | 60 | 15 | 11 | 3.5 | 4 | 1 | |
| Burton Hendrickson | CSMP0470 | Lac qui Parle | Cobb Creek | 4/21 - 11/1 | 42 | 25 | 56 | 9 | 0 | | 8 | 0 | |
| Eugene Eilers | CSMP0589 | Yellow Medicine | Canby Creek, T114N R45W Sec. 2 | 4/18 - 10/29 | 53 | 10 | 60 | 21 | 0 | 23.59 | 4 | 65 | |
| Robert Welker | CSMP0591 | Yellow Medicine | Canby Creek @ Canby Park | 4/15 - 11/3 | 59 | 44 | 60 | 13 | 12 | 25.84 | 3 | 59 | |
| Robert Welker | CSMP0592 | Yellow Medicine | Canby Creek @ MN-68 | 4/15 - 11/3 | 58 | 38 | 60 | 13 | 12 | 25.84 | 3 | 59 | |
| Manley Torstenson | CSMP0593 | Yellow Medicine | Lazarus Creek | 4/19 - 9/13 | 54 | 35 | 60 | 11 | 0 | 25.03 | 3 | 51 | 63.1 |
| Manley Torstenson | CSMP0594 | Yellow Medicine | Florida Creek | 4/19 - 9/13 | 48 | 20 | 60 | 11 | 0 | 25.03 | 1 | 51 | 65.8 |
| David Ulrich | CSMP0595 | Lac qui Parle | Lac qui Parle River, T117N R43W Sec. 21 | 4/22 - 9/22 | 45 | 12 | 60 | 23 | 3 | 23.18 | 10 | 69 | |
| David A. Craigmile | CSMP0631 | Lac qui Parle | Co. Ditch 34 | 4/1 - 10/1 | 60 | 49 | 60 | 40 | 0 | 18.88 | 12 | 39 | |
| Paul Wymar | CSMP0780 | Lac Qui Parle | Tenmile Ck at 220th St T117N/R42W/S1 | 4/13 - 10/6 | 54 | 10 | 60 | 33 | 21 | 17.11 | 11 | 60 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Minnesota River (Granite Falls) Watershed (HUC 07020004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------------|----------|-----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Steve & Chris Hettig | CSMP0037 | Renville | Sacred Heart Creek, T114N\R37W\S24 Site 3 | 4/7 - 9/13 | 52 | 8 | 60 | 17 | 1 | 22.82 | 1 | 169 | |
| Joseph Rolling | CSMP0291 | Lincoln | Lake Benton outlet | 4/21 - 9/29 | 56 | 25 | 60 | 10 | 7 | 20.43 | 2 | 67 | |
| Glenn Simons | CSMP0401 | Kandiyohi | Halvorson Slough inlet | 4/21 - 9/16 | 19 | 8 | 34 | 6 | 0 | 28.67 | 4 | 90 | 58.9 |
| Lowell Bratsch | CSMP0625 | Renville | West Fork Beaver Creek | 4/14 - 10/25 | 26 | 4 | 42 | 21 | 0 | 24.05 | 9 | 227 | |
| Virginia Homme | CSMP0627 | Renville | Hawk Creek | 5/25 - 7/12 | 16 | 4 | 31 | 6 | 0 | | 5 | 0 | |
| Steve & Chris Hettig | CSMP0628 | Renville | Sacred Heart Creek, T115N\R37W\S35 Site 1 | 4/7 - 9/13 | 52 | 28 | 60 | 17 | 7 | 22.82 | 1 | 169 | |
| Donald Knott | CSMP0630 | Kandiyohi | Hawk Creek, T118N R36W Sec. 19 | 4/17 - 8/26 | 33 | 16 | 46 | 19 | 0 | 22.88 | 9 | 44 | |
| Steve & Chris Hettig | CSMP0640 | Renville | Sacred Heart Creek, T114N\R37W\S12 Site 2 | 4/7 - 9/13 | 56 | 42 | 60 | 17 | 4 | 22.82 | 1 | 169 | |
| Joyce & Gerry Lewison | CSMP0758 | Chippewa | Minnesota River @ MN Falls, T115N/R39W/S12 | 5/2 - 9/30 | 16 | 0 | 24 | 12 | 0 | 19.53 | 4 | 155 | |
| Tom & Roxanne Breitzkreutz | CSMP0759 | Renville | Timms Creek | 4/15 - 11/25 | 54 | 9 | 60 | 8 | 7 | 25.3 | 4 | 69 | |
| Randy Feifarek | CSMP0846 | Kandiyohi | Co. Ditch 8 2.5 miles NW of Blomkest | 4/18 - 8/18 | 35 | 20 | 50 | 10 | 0 | 18.4 | 6 | 22 | |

45

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Chippewa River Watershed (HUC 07020005)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Allan Olk | CSMP0454 | Douglas | Freeborn Lake inlet 'Site 1' | 6/14 - 8/3 | 60 | 58 | 60 | 6 | 0 | | 0 | 0 | 68.2 |
| Glen Matejka | CSMP0486 | Douglas | Chippewa River @ Little Chippewa Lk outlet | 4/1 - 10/8 | 56 | 50 | 60 | 16 | 0 | 50.33 | 45 | 255 | |
| Bob Reynolds | CSMP0486 | Douglas | Chippewa River @ Little Chippewa Lk outlet | 4/1 - 10/8 | 56 | 50 | 60 | 16 | 0 | 50.33 | 45 | 255 | |
| Nancy Messner | CSMP0488 | Pope | Chippewa River @ CR-2 | 4/6 - 9/30 | 16 | 8 | 31 | 23 | 0 | 22.7 | 4 | 58 | |
| Edgar Persons | CSMP0495 | Grant | Chippewa River @ sec. 36, Land Twp | 3/28 - 9/25 | 20 | 14 | 32 | 8 | 0 | 27.67 | 5 | 52 | |
| Leon Sawyer | CSMP0499 | Pope | Lake Ann outlet | 6/7 - 10/4 | 9 | 2 | 15 | 20 | 0 | 24.99 | 4 | 70 | 63.2 |
| Leon Sawyer | CSMP0500 | Pope | Trapper's Run Creek @ 260th Ave. Culvert | 4/6 - 10/4 | 56 | 23 | 60 | 30 | 26 | 24.99 | 7 | 70 | 59.3 |
| Leon Sawyer | CSMP0501 | Pope | Lake Pelican outlet | 4/6 - 10/4 | 50 | 30 | 60 | 30 | 16 | 24.99 | 7 | 70 | 62.0 |
| Barney Lilly | CSMP0622 | Swift | Shakopee Creek | 4/6 - 9/24 | 20 | 3 | 45 | 39 | 0 | 21.4 | 19 | 47 | |
| Orvin Gronseth | CSMP0775 | Swift | Mud Ck at CSAH 33, Kerkhoven Twp | 4/25 - 10/24 | 50 | 32 | 60 | 42 | 6 | 28.86 | 6 | 59 | |
| Orvin Gronseth | CSMP0776 | Swift | Spring Ck at Sec 17, Kerhoven Twp | 4/25 - 9/11 | 59 | 49 | 60 | 11 | 0 | 25.08 | 4 | 53 | |

Redwood River Watershed (HUC 07020006)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|---------|-------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Daniel Swedzinski | CSMP0357 | Redwood | Clear Creek | 4/1 - 9/15 | 42 | 6 | 60 | 35 | 21 | 27.34 | 23 | 177 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Minnesota River (Mankato) Watershed (HUC 07020007)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Robert Kaukola | CSMP0148 | Renville | Fort Ridgely Creek | 4/2 - 10/29 | 45 | 3 | 60 | 29 | 5 | 32.37 | 3 | 82 | 55.4 |
| Mary Hollingsworth | CSMP0543 | Blue Earth | Minneopa Creek at St. Park Entrance | 4/6 - 10/10 | 31 | 5 | 60 | 44 | 5 | 28.96 | 0 | 201 | |
| Don & Mary Javurek | CSMP0633 | Le Sueur | Minnesota River @ MN-22 bridge | 3/30 - 10/17 | 13 | 0 | 22 | 31 | 0 | 26.78 | 6 | 196 | |
| Shirley Anderson | CSMP0661 | Blue Earth | Minneopa Creek T108 R28W Sec. 31 | 4/3 - 10/3 | 50 | 8 | 60 | 19 | 0 | 28.12 | 5 | 38 | |
| Richard Muesing | CSMP0672 | Nicollet | Seven Mile Creek (Co Dt 24) at Timber Lane | 4/18 - 8/30 | 60 | 60 | 60 | 15 | 15 | | 5 | 0 | |
| Karie Evrist | CSMP0672 | Nicollet | Seven Mile Creek (Co Dt 24) at Timber Lane | 4/18 - 8/30 | 60 | 60 | 60 | 15 | 15 | | 5 | 0 | |
| Terry Bovee | CSMP0773 | Sibley | Rush River at 312th St, Sec 15, Henderson Twp | 3/18 - 8/20 | 25 | 0 | 60 | 19 | 5 | 26.96 | 5 | 212 | |
| Terry Bovee | CSMP0774 | Sibley | Rush River @ MN-93 | 3/18 - 8/20 | 33 | 2 | 60 | 38 | 10 | 28.01 | 17 | 214 | |
| Richard Muesing | CSMP0841 | Nicollet | Seven Mile Creek @ bridge in Co Park | 4/12 - 11/22 | 54 | 6 | 60 | 28 | 23 | 27.25 | 8 | 48 | 59.5 |
| Richard Muesing | CSMP0842 | Nicollet | Co.Ditch 46A @ 411th Ave. culvert | 4/12 - 11/22 | 57 | 28 | 60 | 28 | 24 | 27.25 | 9 | 48 | 61.4 |
| Richard Muesing | CSMP0843 | Nicollet | Co. Ditch 46A @ CSAH 13 | 4/12 - 11/22 | 56 | 16 | 60 | 28 | 25 | 27.25 | 9 | 48 | 60.6 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Cottonwood River Watershed (HUC 07020008)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|------------|---------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Robert Schultz | CSMP0356 | Redwood | Plum Creek | 4/2 - 11/5 | 44 | 1 | 60 | 32 | 18 | 30.81 | 4 | 214 | |
| Richard Van Hecke | CSMP0359 | Cottonwood | Pell Creek | 4/7 - 7/26 | 37 | 6 | 60 | 20 | 7 | 20.19 | 8 | 35 | |
| Steve Iverson | CSMP0360 | Cottonwood | Dutch Charley | 4/9 - 9/30 | 19 | 2 | 54 | 21 | 0 | 27.31 | 8 | 81 | |

Blue Earth River Watershed (HUC 07020009)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Richard Tomlinson | CSMP0617 | Martin | JD No. 3 (Spring Brook), T103N R29W Sec. 8 | 4/22 - 10/29 | 39 | 15 | 60 | 14 | 0 | 27.12 | 8 | 46 | |
| Richard Tomlinson | CSMP0618 | Martin | Elm Creek, T109N R29W Sec. 5 | 4/22 - 10/29 | 14 | 7 | 50 | 14 | 0 | 27.12 | 8 | 46 | |
| Pam Fuhrman | CSMP0654 | Faribault | Elm Creek, T103N R28W Sec. 5 | 3/24 - 6/14 | 19 | 2 | 42 | 12 | 0 | 21.44 | 3 | 112 | 60.5 |
| Orville Goemann | CSMP0655 | Faribault | East Br. Blue Earth River, T102 R24W Sec. 8 | 4/5 - 9/29 | 25 | 4 | 60 | 35 | 4 | 35.76 | 15 | 38 | |
| Robert Worner | CSMP0659 | Faribault | Blue Earth River, T102N R27W Sec. 18 | 3/28 - 10/12 | 27 | 4 | 60 | 66 | 0 | 34.23 | 15 | 204 | |
| Kay Bogan | CSMP0660 | Faribault | East Br. Blue Earth River, T102N R27W Sec. 16 | 4/7 - 10/6 | 16 | 5 | 33 | 27 | 0 | 30.08 | 11 | 53 | |
| Thomas Sanders | CSMP0715 | Blue Earth | Willow Creek 6 mi W of Amboy | 4/4 - 9/19 | 50 | 21 | 60 | 25 | 15 | 27.28 | 8 | 193 | |
| Bernie Stevermer | CSMP0782 | Faribault | Blue Earth R at W 14th St Bridge | 4/15 - 9/24 | 26 | 4 | 60 | 23 | 1 | 27.8 | 10 | 178 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Blue Earth River Watershed (HUC 07020009)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|------------|-------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Laurie Ristau | CSMP0783 | Faribault | Blue Earth R at County Highway 4 | 4/15 - 9/24 | 27 | 2 | 60 | 23 | 2 | 27.8 | 10 | 178 | |
| Barbara L Baker | CSMP0790 | Faribault | JD 13 East of MN-254 T101N/R26W/S35 | 3/25 - 9/25 | 36 | 2 | 60 | 41 | 0 | 34 | 29 | 61 | 56.4 |
| Richard Kruger | CSMP0792 | Blue Earth | Blue Earth R @ Co Rd 34 | 4/13 - 9/21 | 21 | 4 | 60 | 14 | 3 | | 7 | 0 | 64.0 |

Watonwan River Watershed (HUC 07020010)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------------|----------|------------|-------------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| David Raney | CSMP0243 | Watonwan | No. Fork Watonwan River | 4/2 - 11/26 | 40 | 3 | 60 | 51 | 21 | 36.05 | 12 | 91 | 61.4 |
| Steve Dieteman | CSMP0267 | Blue Earth | Watonwan River | 4/1 - 11/17 | 25 | 2 | 60 | 34 | 0 | 30.64 | 8 | 47 | 64.1 |
| Wilbert Oberdieck | CSMP0287 | Watonwan | Perch Creek | 4/4 - 9/26 | 35 | 2 | 60 | 31 | 0 | 17.66 | 6 | 31 | |
| Dustin Menssen | CSMP0322 | Watonwan | Butterfield Creek | 4/11 - 11/4 | 20 | 4 | 60 | 13 | 0 | 24.58 | 9 | 43 | |
| Richard Enger | CSMP0326 | Watonwan | St. James Creek | 4/27 - 10/29 | 23 | 10 | 35 | 22 | 0 | 25.58 | 10 | 49 | |
| Norman H. Penner | CSMP0327 | Watonwan | Watonwan River | 4/29 - 10/30 | 41 | 4 | 60 | 80 | 28 | 25.52 | 15 | 205 | |
| Bernhardt & Sharon Schwardt | CSMP0330 | Watonwan | Willow Creek | 4/1 - 10/29 | 45 | 5 | 60 | 37 | 18 | | 10 | 0 | |
| Harold D Eichman | CSMP0331 | Blue Earth | Perch Creek, 121st St. | 4/2 - 10/21 | 29 | 0 | 60 | 45 | 7 | 34.36 | 25 | 68 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Watowan River Watershed (HUC 07020010)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Harold D Eichman | CSMP0332 | Blue Earth | Perch Creek "CSAH 24" | 4/2 - 10/21 | 30 | 0 | 60 | 44 | 7 | 31.68 | 25 | 67 | |
| Ken & Carol Bratland | CSMP0375 | Watowan | So. Fork Watowan River | 4/4 - 10/24 | 35 | 5 | 60 | 30 | 5 | 28.51 | 3 | 229 | |
| Nick Kunz | CSMP0788 | Watowan | Watowan R T107N/R30W/S25 'Site 2' | 4/9 - 9/30 | 20 | 6 | 39 | 29 | 0 | 28.59 | 12 | 57 | |
| Nick Kunz | CSMP0789 | Watowan | Watowan R 400 yds downstream of ditch 'Site 1' | 4/1 - 9/30 | 21 | 6 | 40 | 33 | 0 | 28.59 | 13 | 57 | |

Le Sueur River Watershed (HUC 07020011)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Tom Hausenbauer | CSMP0149 | Blue Earth | LeSueur River | 4/5 - 10/14 | 24 | 4 | 60 | 19 | 1 | 30.6 | 7 | 26 | |
| Duane Mettler | CSMP0150 | Blue Earth | unnamed tributary to Duck Lake (5 foot culvert) | 3/3 - 9/22 | 48 | 0 | 60 | 20 | 0 | 22.09 | 12 | 13 | |
| Duane Mettler | CSMP0151 | Blue Earth | tile outlet to Duck Lake (12" tile) | 3/3 - 9/22 | 55 | 0 | 60 | 22 | 0 | 22.09 | 14 | 13 | |
| Joe Dwyer | CSMP0383 | Blue Earth | Unn trib to Duck Lake '#3' | 5/21 - 9/17 | 21 | 10 | 40 | 8 | 0 | 32.82 | 8 | 45 | |
| Kari Christnagel | CSMP0714 | Blue Earth | Maple River 5 Mi S of Mankato T107/R27W/S13 | 3/24 - 10/30 | 19 | 1 | 60 | 48 | 0 | | 23 | 0 | |
| Dave Jackson | CSMP0718 | Blue Earth | Maple River @ T107N, R27W, S12 | 3/28 - 10/29 | 25 | 1 | 60 | 86 | 0 | 29.42 | 6 | 70 | |
| Linda L Johnson | CSMP0719 | Blue Earth | Providence Creek (JD 49) T105N, R27W, S15 | 4/1 - 10/28 | 34 | 5 | 59 | 29 | 0 | 33.26 | 8 | 228 | |
| Linda L Johnson | CSMP0720 | Blue Earth | Rice Creek @ Co Rd 151 T105N, R27W, S15 | 4/1 - 10/28 | 15 | 4 | 34 | 30 | 0 | 33.26 | 8 | 228 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Le Sueur River Watershed (HUC 07020011)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Garry & Bill Fay | CSMP0721 | Blue Earth | Maple R 5 mi N of Good Thunder T107N, R27W, S35 | 6/5 - 10/9 | 10 | 2 | 26 | 11 | 0 | 21.5 | 6 | 131 | |
| Ronald Gower | CSMP0722 | Blue Earth | Maple R .5 mi S of Good Thunder T106/R27W/S10 | 4/15 - 10/2 | 16 | 1 | 31 | 16 | 0 | 25.05 | 7 | 17 | |
| Matt & Bryan Croce | CSMP0724 | Faribault | County Ditch 3/4 mi S of MN Lake T104N, R25W | 4/3 - 9/19 | 58 | 35 | 60 | 27 | 17 | 25.81 | 5 | 125 | |
| Bernie Stevermer | CSMP0781 | Faribault | Judicial Ditch 1/County Ditch 3 @ MN-109 Bridge | 3/30 - 9/29 | 41 | 7 | 60 | 57 | 21 | 32.33 | 27 | 55 | |
| Richard Kruger | CSMP0791 | Blue Earth | Cobb R at CSAH 16 | 4/13 - 9/21 | 20 | 6 | 60 | 14 | 3 | | 7 | 0 | 63.6 |
| Richard Kruger | CSMP0793 | Blue Earth | Le Sueur River @ Co Rd 90 | 4/13 - 9/21 | 19 | 5 | 60 | 15 | 3 | | 7 | 0 | 63.8 |
| St. Claire High School | CSMP0794 | Blue Earth | Le Sueur R @ CSAH 28, 'Bridge by Post Office' | 4/13 - 9/28 | 24 | 8 | 45 | 12 | 0 | 32.15 | 5 | 79 | |
| St. Claire High School | CSMP0795 | Blue Earth | Le Sueur R @ Schalow St Culvert | 4/13 - 9/28 | 28 | 7 | 60 | 13 | 0 | 32.15 | 5 | 79 | |
| Smith Lake Association | CSMP0795 | Blue Earth | Le Sueur R @ Schalow St Culvert | 4/13 - 9/28 | 28 | 7 | 60 | 13 | 0 | 32.15 | 5 | 79 | |
| Kari Christnagel | CSMP0848 | Blue Earth | Watowan River (Outlet) at CSAH-13 | 3/22 - 10/25 | 24 | 6 | 48 | 61 | 0 | 29.67 | 41 | 44 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Minnesota River (Shakopee) Watershed (HUC 07020012)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Kim Borman | CSMP0107 | Scott | unnamed tributary from Spring to Prior Lake | 4/2 - 5/26 | 60 | 60 | 60 | 5 | 5 | 15.98 | 2 | 108 | |
| Mark Hiles | CSMP0284 | McLeod | High Island Creek @ CSAH 7 | 4/16 - 10/26 | 36 | 6 | 60 | 30 | 5 | 29.06 | 5 | 57 | |
| Mark Hiles | CSMP0286 | McLeod | High Island Creek @ Co. Rd. 57 | 4/16 - 10/26 | 43 | 6 | 60 | 30 | 10 | 29.06 | 5 | 57 | |
| Georgiann & Ted Keyport | CSMP0334 | Carver | Chaska Creek | 5/9 - 9/19 | 13 | 5 | 46 | 17 | 0 | 16.53 | 8 | 109 | |
| Shirley Schoenbauer | CSMP0336 | Scott | Sand Creek "CSAH 8" | 4/4 - 10/10 | 24 | 7 | 60 | 9 | 1 | 25.6 | 5 | 37 | |
| Shirley Schoenbauer | CSMP0337 | Scott | Raven Stream "CR-64" | 4/4 - 10/10 | 36 | 11 | 60 | 8 | 3 | 25.6 | 5 | 37 | |
| Bernard Sobczak | CSMP0380 | Scott | Raven Stream "St. Benedict" | 4/15 - 9/30 | 41 | 6 | 60 | 32 | 11 | 24.09 | 20 | 187 | 59.1 |
| Dick Duerre | CSMP0693 | Hennepin | Minnesota River 75 ft upst of Black Dog L outlet | 4/17 - 9/13 | 8 | 2 | 15 | 15 | 0 | 25.05 | 6 | 138 | |
| Harry Sloom | CSMP0752 | Sibley | Mid Br Rush River @ Co Rd 25 (8RS) | 3/20 - 8/1 | 47 | 5 | 60 | 21 | 13 | 20 | 11 | 150 | |
| David Ruehling | CSMP0753 | Sibley | Co Dtch 55 near Beatty Lake (10T) | 4/12 - 7/31 | 48 | 30 | 60 | 8 | 0 | 5.78 | 5 | 31 | |
| Kevin Pioske | CSMP0754 | Sibley | Mid Br Rush River @ Co Rd 9 (13T) | 4/1 - 7/25 | 36 | 4 | 60 | 24 | 0 | | 0 | 0 | |
| Mike & Jim Pfarr | CSMP0755 | Sibley | S Br Rush River @ Co Rd 18 (11T) | 4/1 - 7/28 | 25 | 0 | 55 | 12 | 0 | 18.13 | 6 | 25 | |
| Mike & Jim Pfarr | CSMP0756 | Sibley | Rush River @ 401st Ave (15T) | 4/1 - 7/28 | 25 | 0 | 50 | 12 | 0 | 18.13 | 7 | 25 | |
| Leon Lang | CSMP0779 | Sibley | Mid Br Rush R at 571 Ave | 4/10 - 10/5 | 36 | 21 | 49 | 16 | 0 | 27.23 | 7 | 43 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

MINNESOTA RIVER DRAINAGE BASIN (Continued)

Minnesota River (Shakopee) Watershed (07020012)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|----------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Amy Reus | CSMP0796 | Scott | Sand Creek @ Rice Street in Jordan | 9/17 - 10/6 | 21 | 13 | 29 | 3 | 0 | 2.59 | 1 | 44 | 58.7 |
| Dick Duerre | CSMP0797 | Dakota | Black Dog Lake Outlet to MN River | 4/17 - 9/13 | 8 | 3 | 13 | 15 | 0 | 25.05 | 6 | 138 | |
| Henry Krueger | CSMP0799 | Carver | Bevens Creek at CR 53 S of Cologne | 3/6 - 11/1 | 37 | 11 | 60 | 39 | 7 | 30.19 | 7 | 74 | 60.9 |
| Stephen M Kile | CSMP0830 | Hennepin | Minnesota R @ Lyndale Ave (Sorenson Boat Landing) | 9/10 - 11/14 | 20 | 5 | 40 | 11 | 0 | 19.02 | 3 | 157 | 58.4 |
| Lowell Danner Sr. | CSMP0840 | Dakota | Minnesota River @ Cedar Ave. Br (Hwy 77) | 4/26 - 11/15 | 14 | 0 | 23 | 26 | 0 | 20.8 | 6 | 199 | 62.4 |
| Rachel Scheurer | CSMP0849 | Nicollet | Co Ditch 40A 6 Mi SE of Lafayette, T111N/R29W/S23 | 5/2 - 10/10 | 34 | 6 | 60 | 39 | 11 | 20.43 | 21 | 32 | |

ST. CROIX RIVER DRAINAGE BASIN

St. Croix River (Upper) Watershed (HUC 07030001)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------|----------|--------|--------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| John Berens | CSMP0207 | Pine | West Crooked Creek | 4/18 - 10/23 | 41 | 0 | 60 | 29 | 8 | 25.31 | 4 | 28 | |
| Dick & Bev Karbo | CSMP0209 | Pine | West Crooked Creek | 4/4 - 10/31 | 56 | 10 | 60 | 50 | 42 | 24.54 | 21 | 212 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

ST. CROIX RIVER DRAINAGE BASIN (Continued)

Kettle River Watershed (HUC 07030003)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------|----------|--------|--------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Don Del Greco | CSMP0845 | Pine | Unn Trib to Kettle River N of MN-123 | 6/30 - 10/30 | 58 | 42 | 60 | 20 | 17 | 14.09 | 19 | 28 | 64.3 |

Snake River Watershed (HUC 07030004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------|----------|---------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Bill Anderson | CSMP0208 | Pine | Snake River | 4/13 - 9/15 | 60 | 52 | 60 | 20 | 19 | 22.94 | 17 | 51 | 64.2 |
| Lawrence Lundgren | CSMP0213 | Pine | Mission Creek | 4/19 - 10/7 | 58 | 39 | 60 | 24 | 20 | 23.74 | 11 | 34 | |
| Janet Smude | CSMP0366 | Aitkin | Bear Creek "4th St., McGrath" | 4/5 - 11/29 | 59 | 44 | 60 | 19 | 17 | | 3 | 0 | 49.8 |
| Janet Smude | CSMP0367 | Aitkin | Snake River "MN-18" | 4/5 - 11/29 | 60 | 52 | 60 | 19 | 17 | | 3 | 0 | 51.8 |
| Dan & Betty Wilkens | CSMP0557 | Kanabec | Knife River, North Site Sec. 21 | 4/8 - 11/10 | 58 | 42 | 60 | 24 | 18 | 28.45 | 5 | 70 | 58.7 |
| Dan & Betty Wilkens | CSMP0558 | Kanabec | Knife River, South Site sec. 28 | 4/8 - 11/5 | 57 | 34 | 60 | 23 | 19 | 28.45 | 4 | 70 | 59.1 |
| Jerry Trent | CSMP0641 | Pine | Inlet to Cross Lk, W 'Heitman Ck' | 5/28 - 9/7 | 56 | 41 | 60 | 7 | 5 | 21.01 | 2 | 147 | 61.2 |
| Ed Doberstein | CSMP0646 | Pine | Snake River @ T39N R20W Sec. 27 | 4/17 - 10/13 | 59 | 50 | 60 | 34 | 19 | 24.78 | 17 | 32 | 62.7 |
| Jerry Trent | CSMP0650 | Pine | Inlet to Cross Lk, N 'Cross Ck @ Co Rd 125' | 5/28 - 9/7 | 47 | 5 | 60 | 8 | 4 | 21.01 | 2 | 147 | 63.4 |
| Jerry Trent | CSMP0673 | Pine | Inlet to Cross Lk, E 'Bun Ck' | 5/28 - 9/7 | 50 | 5 | 60 | 7 | 4 | 21.01 | 3 | 147 | 62.8 |

54

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

ST. CROIX RIVER DRAINAGE BASIN (Continued)

Snake River Watershed (HUC 07030004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------|----------|--------|-------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Wayne Brogren | CSMP0743 | Pine | Pokegama Creek @ Hwy 14 bridge | 4/21 - 9/26 | 56 | 30 | 60 | 14 | 2 | 15.26 | 1 | 21 | 63.7 |
| Susan M Smith | CSMP0784 | Aitkin | Snake River @ McGrath T43N R23W S16 | 7/22 - 10/14 | 55 | 40 | 60 | 10 | 6 | 11.61 | 9 | 11 | 56.7 |

St. Croix River (Stillwater) Watershed (HUC 07030005)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Greg & Lisa Maurer | CSMP0166 | Chisago | No. Branch Sunrise River at MN95, "site B" | 6/12 - 9/24 | 56 | 47 | 60 | 11 | 7 | 11.95 | 1 | 24 | |
| Gene Paul | CSMP0172 | Chisago | Sunrise River | 5/8 - 9/17 | 58 | 47 | 60 | 15 | 12 | 20.07 | 0 | 41 | |
| Mary Schmitz | CSMP0173 | Chisago | So. Branch Sunrise River | 5/7 - 10/18 | 48 | 28 | 60 | 16 | 6 | 28.21 | 6 | 68 | |
| Dave Banta | CSMP0216 | Pine | Rock Creek | 4/19 - 9/30 | 50 | 10 | 60 | 26 | 14 | 20.34 | 12 | 135 | |
| Bob Kessen | CSMP0269 | Chisago | West Branch Sunrise River | 3/31 - 9/28 | 45 | 24 | 60 | 30 | 4 | 19.32 | 9 | 178 | |
| Gene Walton | CSMP0270 | Chisago | Unnamed Tributary to Goose Lake | 4/19 - 11/1 | 59 | 55 | 60 | 14 | 11 | 30.18 | 4 | 193 | |
| Dayle DeClercq | CSMP0346 | Chisago | Teacher Creek "South Chisago Lakes Township" | 4/5 - 9/27 | 48 | 40 | 60 | 17 | 0 | 23.16 | 15 | 191 | |
| Vickie Meehan | CSMP0349 | Chisago | Lawrence Creek | 5/2 - 6/29 | 55 | 40 | 60 | 9 | 0 | 20.21 | 3 | 44 | |
| Scott Sardeson | CSMP0350 | Chisago | West Branch Sunrise River/Typo Creek | 4/20 - 8/6 | 14 | 7 | 22 | 8 | 0 | 21.76 | 3 | 32 | |
| Laura & Ken Corbin-Geisen | CSMP0351 | Chisago | North Branch Sunrise River | 3/30 - 8/16 | 58 | 44 | 60 | 13 | 10 | | 5 | 0 | |
| Mike Peplinski | CSMP0368 | Chisago | Chisago County Ditch 7 | 4/5 - 7/3 | 55 | 27 | 60 | 10 | 0 | 17.95 | 4 | 36 | 70.4 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

ST. CROIX RIVER DRAINAGE BASIN (Continued)

St. Croix River (Stillwater) Watershed (HUC 07030005)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|------------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Jeff Lien | CSMP0521 | Washington | Browns Creek | 4/14 - 11/18 | 57 | 45 | 60 | 31 | 0 | 23.36 | 14 | 30 | 57.9 |
| Jim Schroeder | CSMP0568 | Chisago | Sunrise River @ pool #3 outlet | 5/8 - 9/15 | 57 | 46 | 60 | 13 | 6 | 20.89 | 2 | 174 | |
| Sharon Johnson | CSMP0805 | Chisago | Hay Creek 1.5 mi SW of Sunrise T35N/R20W/S7 | 5/17 - 9/20 | 53 | 25 | 60 | 23 | 13 | 23.87 | 8 | 37 | |
| Sharon Johnson | CSMP0806 | Chisago | Co Dt 3 upstream of Sunrise River | 6/2 - 7/5 | 29 | 16 | 42 | 7 | 0 | 23.87 | 2 | 37 | |
| Frank Lind | CSMP0807 | Chisago | Rush Creek at CSAH 30 | 6/28 - 10/23 | 45 | 13 | 54 | 18 | 0 | 16.05 | 15 | 17 | |
| Steve Blomquist | CSMP0808 | Chisago | Unknown Trib at 355th St T34N/R20W/S2 | 9/6 - 9/23 | 14 | 5 | 22 | 2 | 0 | 12.4 | 2 | 70 | |
| Eric Aaland | CSMP0809 | Chisago | Sunrise River at Hemmingway Ave | 8/1 - 9/18 | 41 | 32 | 52 | 5 | 0 | 7.5 | 0 | 17 | |
| Eric Gustafson | CSMP0810 | Chisago | Trib to N Br Sunrise River S of 372nd St | 6/23 - 10/15 | 60 | 60 | 60 | 12 | 0 | 14.17 | 8 | 36 | |
| Sharon Darling | CSMP0811 | Chisago | Rush Creek at Blueberry Trail | 7/19 - 9/26 | 60 | 60 | 60 | 3 | 3 | 6.61 | 0 | 12 | |
| Donald & Sandra Wintz | CSMP0812 | Chisago | Dry Creek at Reed Avenue, N of CSAH 16 | 6/17 - 10/3 | 54 | 37 | 60 | 14 | 6 | 12.15 | 4 | 37 | |
| Bruce Boxeth | CSMP0813 | Chisago | Co Ditch 3 at Keystone Avenue | 7/6 - 10/3 | 42 | 13 | 60 | 11 | 1 | 4.48 | 4 | 4 | 63.0 |
| Kirk McElhinney | CSMP0814 | Chisago | Dry Ck at Reed Avenue & 375th St | 6/19 - 9/12 | 47 | 9 | 60 | 11 | 6 | 8.78 | 4 | 97 | |
| Mary Christopherson | CSMP0815 | Chisago | N Br Sunrise River at Trulson Rd | 7/5 - 9/22 | 51 | 36 | 60 | 5 | 3 | 10.45 | 3 | 87 | |
| Charles Schultz | CSMP0816 | Chisago | S Br Sunrise R at US-61 | 6/13 - 9/21 | 58 | 36 | 60 | 11 | 6 | 5.97 | 4 | 26 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

ST. CROIX RIVER DRAINAGE BASIN (Continued)

St. Croix River (Stillwater) Watershed (HUC 07030005)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Craig Johnson | CSMP0817 | Chisago | Unn Trib to Sunrise R @ Poor Farm Rd "Hay Ck" | 7/11 - 9/25 | 57 | 52 | 60 | 13 | 0 | 9.42 | 7 | 18 | |
| Kay Winchell | CSMP0818 | Chisago | Goose Ck at 450th Street T36N/R21W/S20 | 7/17 - 9/19 | 53 | 38 | 60 | 10 | 3 | 9.55 | 3 | 25 | |
| Diane E Green | CSMP0819 | Chisago | Goose Ck off end of Golden Ave in Harris, MN | 8/1 - 10/1 | 57 | 44 | 60 | 15 | 8 | 10.19 | 10 | 64 | 61.2 |
| Bill & Millie Peters | CSMP0820 | Chisago | Rush Ck at Evergreen Ave, T37N/R21W/S19 | 7/1 - 9/25 | 59 | 52 | 60 | 13 | 10 | 11.52 | 7 | 91 | |
| Becky Johnson | CSMP0822 | Chisago | Goose Creek at Cedarcrest Trail | 7/3 - 9/18 | 34 | 25 | 48 | 8 | 0 | 8.14 | 1 | 14 | |
| Monica Kinny | CSMP0823 | Chisago | Trib Little Comfort Lk @ Itasca Avenue | 6/28 - 9/20 | 60 | 60 | 60 | 14 | 14 | 7.53 | 4 | 108 | |
| Kelly Lamwers | CSMP0825 | Chisago | S Br Sunrise River at Kettle River Road | 7/9 - 9/24 | 55 | 50 | 60 | 7 | 3 | 6.47 | 1 | 11 | |
| Bob Kessen | CSMP0826 | Chisago | W Br Sunrise R at Sunrise Drive | 5/9 - 9/28 | 41 | 21 | 60 | 23 | 4 | 19.32 | 7 | 178 | |
| Monica Brueske | CSMP0869 | Chisago | Sunrise River at 260th Street leaving Comfort Lk | 6/12 - 9/29 | 59 | 50 | 60 | 10 | 3 | 8.41 | 4 | 26 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN

Mississippi River and Lake Pepin (Red Wing) Watershed (HUC 07040001)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------|----------|---------|----------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Richard Diercks | CSMP0080 | Goodhue | Wells Creek | 3/25 - 10/28 | 49 | 0 | 60 | 32 | 0 | 30.54 | 8 | 244 | 56.4 |
| Stanley Klair | CSMP0081 | Goodhue | Wells Creek | 7/1 - 9/23 | 59 | 50 | 60 | 12 | 0 | 36.4 | 3 | 214 | 54.9 |
| Stanley Klair | CSMP0082 | Goodhue | unnamed tributary to Wells Creek | 7/1 - 9/23 | 55 | 40 | 60 | 12 | 0 | 36.4 | 3 | 214 | 50.4 |
| Harry Roberts & Tim Smith | CSMP0104 | Goodhue | Wells Creek | 5/27 - 9/30 | 29 | 1 | 48 | 16 | 0 | | 15 | 0 | 62.8 |
| Richard Crooks | CSMP0711 | Goodhue | Little River at Carlson Island | 4/21 - 10/12 | 15 | 6 | 30 | 24 | 0 | 19.57 | 1 | 30 | 55.0 |

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|---------|---------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Rose Ann Steenhoek | CSMP0033 | Rice | Prairie Creek | 3/3 - 9/15 | 35 | 8 | 60 | 29 | 5 | 27.95 | 10 | 60 | 58.1 |
| Mrs. B-J Norman | CSMP0044 | Goodhue | Belle Creek | 3/3 - 11/20 | 42 | 1 | 60 | 35 | 15 | 24.69 | 9 | 231 | 54.3 |
| Richard Fetterly | CSMP0070 | Rice | Straight River | 4/2 - 9/22 | 37 | 4 | 60 | 27 | 9 | 28.53 | 6 | 133 | 61.7 |
| Alden McCutchan | CSMP0099 | Goodhue | Little Cannon River | 4/16 - 10/21 | 26 | 1 | 60 | 34 | 6 | 32.16 | 24 | 53 | |
| Cathy Larson | CSMP0111 | Rice | Cannon River | 4/4 - 9/24 | 26 | 4 | 60 | 42 | 3 | 28.61 | 27 | 183 | 66.8 |
| Cathy Larson | CSMP0112 | Rice | Wolf Creek | 4/4 - 9/24 | 25 | 2 | 60 | 42 | 3 | 28.61 | 26 | 183 | 66.2 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Rodney R. Helgeson | CSMP0182 | Rice | Rice Creek, Decker Ave. | 3/26 - 10/28 | 45 | 0 | 60 | 38 | 0 | 31.23 | 10 | 104 | 57.1 |
| Ann Lundstrom | CSMP0247 | Dakota | Chub Creek | 4/6 - 9/8 | 41 | 9 | 53 | 14 | 0 | 25.66 | 2 | 161 | 67.9 |
| Joyce E. Moorhouse | CSMP0259 | Goodhue | Prairie Creek | 4/30 - 9/10 | 33 | 9 | 54 | 5 | 0 | 28.19 | 1 | 188 | 68.0 |
| Justin Watkins | CSMP0292 | Rice | Straight River @ Walking Bridge | 3/1 - 12/8 | 33 | 4 | 60 | 38 | 9 | 13.92 | 5 | 31 | 58.0 |
| Gary R Mogren | CSMP0292 | Rice | Straight River @ Walking Bridge | 3/1 - 12/8 | 33 | 4 | 60 | 38 | 9 | 13.92 | 5 | 31 | 58.0 |
| Justin Watkins | CSMP0293 | Dakota | Cannon River @ Canada Ave. | 3/1 - 10/13 | 20 | 6 | 51 | 18 | 0 | | 0 | 0 | 63.5 |
| Richard Fetterly | CSMP0296 | Rice | Rush Creek | 4/2 - 9/22 | 42 | 2 | 60 | 26 | 14 | 28.53 | 5 | 133 | 59.4 |
| Steven Larson | CSMP0340 | Goodhue | Cannon R @ abandoned Rd, 5 mi NW of Red Wing | 3/26 - 10/29 | 32 | 3 | 60 | 36 | 6 | 56.89 | 16 | 272 | 63.1 |
| Chuck Butler | CSMP0340 | Goodhue | Cannon R @ abandoned Rd, 5 mi NW of Red Wing | 3/26 - 10/29 | 32 | 3 | 60 | 36 | 6 | 56.89 | 16 | 272 | 63.1 |
| Carmen Dorr | CSMP0341 | Rice | Cannon River | 4/21 - 10/5 | 54 | 40 | 60 | 8 | 5 | 31.06 | 0 | 149 | 64.1 |
| David Baldini | CSMP0503 | Steele | Judicial Ditch 1 @ CSAH 18 | 4/20 - 11/30 | 37 | 28 | 48 | 24 | 0 | | 8 | 0 | |
| John Holden | CSMP0504 | Rice | Cannon River | 3/28 - 10/2 | 23 | 2 | 55 | 25 | 0 | 34.38 | 23 | 46 | |
| Lynn Sanborn | CSMP0505 | Rice | Cannon River @ Hulet Ave., Faribault | 3/1 - 10/27 | 38 | 5 | 60 | 98 | 2 | 56.13 | 39 | 343 | 63.3 |
| Marcia Hetletvedt | CSMP0505 | Rice | Cannon River @ Hulet Ave., Faribault | 3/1 - 10/27 | 38 | 5 | 60 | 98 | 2 | 56.13 | 39 | 343 | 63.3 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Justin Watkins | CSMP0505 | Rice | Cannon River @ Hulet Ave., Faribault | 3/1 - 10/27 | 38 | 5 | 60 | 98 | 2 | 56.13 | 39 | 343 | 63.3 |
| Justin Watkins | CSMP0506 | Goodhue | Cannon River @ Cannon Falls Park (9th St) | 3/25 - 10/13 | 26 | 13 | 48 | 22 | 0 | | 0 | 0 | 62.2 |
| Justin Watkins | CSMP0508 | Dakota | Chub Creek @ Randolph | 3/1 - 6/18 | 31 | 23 | 47 | 4 | 0 | | 0 | 0 | 53.8 |
| John Schumacher | CSMP0608 | Dakota | Trout Brook at 280th St/Walking Bridge | 2/27 - 6/9 | 32 | 1 | 60 | 14 | 5 | 27.63 | 2 | 264 | 54.1 |
| Justin Watkins | CSMP0608 | Dakota | Trout Brook at 280th St/Walking Bridge | 2/27 - 6/9 | 32 | 1 | 60 | 14 | 5 | 27.63 | 2 | 264 | 54.1 |
| Steve Collins | CSMP0609 | Goodhue | Little Cannon River | 2/16 - 11/3 | 46 | 2 | 60 | 16 | 10 | | 7 | 0 | 51.6 |
| Dick Dalton | CSMP0611 | Goodhue | Little Cannon River, T112 R18W Sec. 24 | 4/14 - 10/27 | 49 | 5 | 60 | 28 | 19 | 27.68 | 7 | 51 | |
| Katy Gillispie | CSMP0612 | Rice | Prairie Creek, T111N R19W Sec. 24 | 3/2 - 10/30 | 26 | 2 | 60 | 39 | 0 | 31.18 | 19 | 250 | 53.5 |
| Charley Skinner | CSMP0614 | Rice | Union Lake Inlet | 4/2 - 11/15 | 60 | 50 | 60 | 22 | 21 | | 19 | 0 | 60.6 |
| Charley Skinner | CSMP0615 | Rice | Heath Creek, Union Lake Outlet | 4/2 - 11/15 | 21 | 15 | 33 | 22 | 0 | | 19 | 0 | 63.0 |
| Willie Peters | CSMP0636 | Rice | Straight River @ Mud Creek | 3/7 - 11/20 | 47 | 3 | 60 | 25 | 14 | | 5 | 0 | |
| Gita Ghei | CSMP0651 | Goodhue | Cannon River, 13 mi NW of Red Wing on Co Rd 46 | 3/31 - 10/30 | 29 | 8 | 60 | 20 | 3 | | 12 | 0 | |
| Bruce R Johnson | CSMP0665 | Goodhue | Pine Creek T112N R017W Sec. 5 | 5/14 - 9/15 | 60 | 60 | 60 | 13 | 0 | 29.67 | 3 | 44 | |
| Roy Wangen | CSMP0669 | Le Sueur | Cannon River at LeSueur Co 12 Bridge | 5/21 - 10/8 | 58 | 30 | 60 | 19 | 0 | 26.57 | 15 | 143 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Steven Larson | CSMP0725 | Goodhue | Spring Creek at Industrial Rd. | 4/7 - 10/29 | 39 | 5 | 60 | 20 | 5 | 28.29 | 7 | 199 | 57.8 |
| Peg Schwendeman | CSMP0727 | Dakota | Chub Creek at Cty Rd 83 (Dixie Road) | 3/27 - 9/21 | 40 | 17 | 60 | 16 | 5 | 24.06 | 6 | 60 | 60.1 |
| Justin Watkins | CSMP0728 | Goodhue | Belle Creek @ ATV bridge (Gaging Station) | 3/1 - 9/15 | 17 | 0 | 51 | 13 | 0 | | 0 | 0 | 58.4 |
| Jan Montez | CSMP0729 | Goodhue | Little Cannon River @ MN Park in Cannon Falls | 3/1 - 10/17 | 27 | 0 | 60 | 24 | 0 | 16.65 | 1 | 18 | 53.1 |
| Justin Watkins | CSMP0729 | Goodhue | Little Cannon River @ MN Park in Cannon Falls | 3/1 - 10/17 | 27 | 0 | 60 | 24 | 0 | 16.65 | 1 | 18 | 53.1 |
| Justin Watkins | CSMP0730 | Goodhue | Cannon River @ CSAH 7 at Welch | 3/1 - 10/13 | 25 | 0 | 60 | 23 | 0 | | 0 | 0 | 62.3 |
| Justin Watkins | CSMP0731 | Goodhue | Pine Ck @ Goodhue- Dakota Co line (280th St) | 3/1 - 5/20 | 22 | 8 | 60 | 5 | 1 | | 0 | 0 | 56.9 |
| Duean Thompson | CSMP0732 | Goodhue | Belle Creek @ White Rock Trail Bridge | 4/25 - 10/11 | 44 | 3 | 60 | 24 | 10 | | 3 | 0 | 59.9 |
| Duean Thompson | CSMP0733 | Goodhue | Belle Creek @ 352nd St | 4/25 - 10/11 | 38 | 1 | 60 | 24 | 5 | | 3 | 0 | 62.2 |
| John Schumacher | CSMP0734 | Dakota | Trout Brook east branch off Miesville Trail Cty 91 | 2/27 - 5/20 | 49 | 7 | 60 | 5 | 4 | 27.28 | 1 | 263 | 45.6 |
| John Schumacher | CSMP0735 | Dakota | Trout Brook west branch off Meisville Trail Cty 91 | 2/27 - 5/20 | 48 | 7 | 60 | 5 | 3 | 27.28 | 1 | 263 | 47.6 |
| Andrew D. Murray Sr. | CSMP0736 | Rice | unnamed trib. to Cannon River, T111N/R20W/S22 | 3/25 - 9/15 | 48 | 2 | 60 | 15 | 9 | 5.09 | 10 | 4 | 47.8 |
| Jan Montez | CSMP0742 | Goodhue | Cannon River 1/4 mi dwnst of Byllesby Dam | 4/13 - 10/17 | 42 | 19 | 60 | 23 | 0 | 16.65 | 7 | 18 | 38.0 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|--------|---|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Dean Kjerland | CSMP0856 | Rice | Cannon @ Water St S Bridge, Northfield | 4/12 - 8/18 | 26 | 3 | 56 | 99 | 0 | | 33 | 0 | |
| Robert Nicholson | CSMP0858 | Rice | Spring Ck S of Woodley St, UPST of Pond "site 1" | 4/5 - 10/19 | 45 | 5 | 60 | 28 | 13 | 29.28 | 10 | 45 | 56.6 |
| Robert Nicholson | CSMP0859 | Rice | Spring Ck W of Spring Ck Rd, Dwnst of Pond "Site 2" | 4/5 - 10/19 | 38 | 8 | 60 | 28 | 6 | 29.28 | 10 | 45 | 60.3 |
| Jeanette Fetterly | CSMP0860 | Rice | Straight River at Tonka Park in Faribault, MN | 4/6 - 9/27 | 41 | 11 | 60 | 10 | 4 | | 4 | 0 | 66.3 |
| Phyllis Bongard | CSMP0861 | Rice | Straight R at 227th St E | 4/17 - 11/4 | 42 | 3 | 60 | 27 | 0 | | 6 | 0 | 64.5 |

Mississippi River (Winona) Watershed (HUC 07040003)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|--------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Jim Clark | CSMP0371 | Winona | Gilmore Creek | 3/27 - 10/27 | 56 | 4 | 60 | 28 | 26 | 37.3 | 9 | 52 | 56.5 |
| Linda Dahl | CSMP0437 | Winona | Beaver Creek, "MN-74" | 3/23 - 9/19 | 55 | 3 | 60 | 27 | 20 | | 4 | 0 | 58.2 |
| Linda Dahl | CSMP0438 | Winona | Whitewater River, "CSAH-30" | 3/23 - 8/30 | 35 | 1 | 60 | 23 | 5 | | 0 | 0 | 59.0 |
| Linda Dahl | CSMP0439 | Winona | S Fk Whitewater R @ CSAH-26 | 3/23 - 9/30 | 42 | 1 | 60 | 26 | 6 | | 3 | 0 | 58.6 |
| Linda Dahl | CSMP0440 | Winona | Whitewater R @CSAH-26 | 3/23 - 8/30 | 40 | 4 | 60 | 23 | 5 | | 0 | 0 | 58.7 |
| Linda Dahl | CSMP0441 | Winona | No. Fork Whitewater River, "MN-74" | 3/23 - 8/30 | 42 | 4 | 60 | 23 | 6 | | 0 | 0 | 59.0 |
| Linda Dahl | CSMP0442 | Winona | Middle Fork Whitewater River, "MN-74" | 3/23 - 8/30 | 47 | 6 | 60 | 23 | 9 | | 0 | 0 | 59.3 |
| Bob & Matt Wiskow | CSMP0443 | Winona | So. Fork Whitewater River, "Twp. Rd. 17" | 4/28 - 10/4 | 38 | 4 | 60 | 29 | 9 | 35.39 | 12 | 214 | 62.5 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi River (Winona) Watershed (HUC 07040003)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|---------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Bob & Matt Wiskow | CSMP0444 | Winona | So. Fork Whitewater River | 4/28 - 10/5 | 38 | 6 | 60 | 29 | 8 | 35.39 | 12 | 214 | 62.8 |
| Gwen Ahern | CSMP0445 | Winona | No. Fork Whitewater River, "Carley Park" | 4/12 - 7/19 | 27 | 2 | 60 | 9 | 2 | 30.51 | 4 | 51 | 57.9 |
| Dave Palmquist | CSMP0446 | Winona | Mid Fork Whitewater R E of MN-74 @ State Park | 4/23 - 10/1 | 34 | 2 | 60 | 21 | 9 | 33.62 | 10 | 25 | 62.0 |
| Paul Chick, Sr. | CSMP0447 | Olmsted | No. Fork Whitewater River off 72nd St NE | 4/1 - 10/2 | 47 | 1 | 60 | 18 | 8 | 30.62 | 7 | 51 | 62.2 |
| Willis van Norman | CSMP0451 | Olmsted | Mid Fork Whitewater R 1/2 mi N of CR-152 | 4/1 - 10/15 | 38 | 0 | 60 | 47 | 16 | 32.59 | 20 | 61 | 56.6 |
| Linda Dahl | CSMP0572 | Winona | S Fk Whitewater R @ Lamberton Mill Rd | 3/23 - 9/30 | 34 | 3 | 60 | 34 | 3 | | 12 | 0 | 60.4 |
| Isaiah Benike | CSMP0577 | Olmsted | Middle Fork Whitewater River @ CSAH 9 | 3/25 - 8/16 | 31 | 0 | 60 | 19 | 2 | 30.23 | 12 | 39 | 57.3 |
| William Johnson | CSMP0588 | Olmsted | Mid Fk Whitewater R @ CSAH 10 Bridge #55513 | 3/29 - 10/12 | 32 | 10 | 60 | 24 | 0 | | 9 | 0 | 58.7 |
| Paul Rohowetz | CSMP0798 | Wabasha | Snake Ck at US-61, 4 MI S of Kellogg | 4/29 - 7/4 | 30 | 8 | 46 | 6 | 0 | 20.81 | 2 | 30 | 58.2 |
| Bill Durkin | CSMP0862 | Winona | Beaver Ck off Whitewater Twp Rd 1 | 9/16 - 10/12 | 60 | 60 | 60 | 10 | 10 | 1.48 | 6 | 5 | 57.4 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN

Zumbro River Watershed (HUC 07040004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|---------|-------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Alan & Judy Hoffman | CSMP0045 | Olmsted | Zumbro River | 5/29 - 10/2 | 26 | 4 | 56 | 13 | 0 | 30.19 | 7 | 136 | |
| Paul & Greg Thompson | CSMP0049 | Olmsted | Cascade Creek | 5/5 - 9/29 | 31 | 5 | 60 | 20 | 0 | 35.49 | 5 | 49 | 66.1 |
| Matthew Feirer | CSMP0114 | Olmsted | So. Branch Zumbro River | 4/19 - 9/28 | 36 | 3 | 60 | 19 | 7 | 33.58 | 11 | 214 | |
| Ell Heusinkveld | CSMP0123 | - | So. Branch Middle Fork Zumbro River | 4/1 - 10/2 | 32 | 2 | 60 | 24 | 4 | 32.61 | 10 | 47 | 59.8 |
| Martin Miller | CSMP0125 | Dodge | Stuccy Creek | 4/25 - 7/19 | 39 | 9 | 60 | 10 | 3 | 33.93 | 5 | 42 | |
| Martin Miller | CSMP0126 | Dodge | So. Branch Middle Fork Zumbro River | 4/25 - 7/19 | 31 | 5 | 60 | 10 | 0 | 33.93 | 5 | 42 | |
| Dean Schrandt | CSMP0133 | Dodge | Dodge Center Creek, "605th St." | 4/26 - 10/15 | 36 | 9 | 55 | 10 | 0 | 34.13 | 2 | 80 | |
| Bruce Schmoll | CSMP0135 | Dodge | Dodge Center Creek | 3/31 - 10/22 | 46 | 4 | 60 | 47 | 28 | 40.01 | 28 | 64 | 57.9 |
| Carole Toquam | CSMP0137 | Dodge | Ripley Ditch | 4/1 - 9/15 | 43 | 0 | 60 | 18 | 0 | 34.95 | 9 | 28 | 57.6 |
| Janet Helder | CSMP0142 | Dodge | Masten Creek | 3/26 - 9/21 | 46 | 2 | 60 | 41 | 23 | | 22 | 0 | 62.4 |
| Mark Gamm | CSMP0232 | Dodge | So. Branch Middle Fork Zumbro River | 5/27 - 9/19 | 37 | 11 | 60 | 13 | 0 | | 4 | 0 | 67.4 |
| Jeanine Vorland | CSMP0233 | Dodge | So. Branch Middle Fork Zumbro River | 5/10 - 9/15 | 56 | 40 | 60 | 9 | 7 | 36.59 | 4 | 201 | |
| Nicole Hrtanek | CSMP0234 | Dodge | So. Branch Middle Fork Zumbro River | 5/14 - 8/17 | 39 | 10 | 60 | 9 | 4 | 27.39 | 5 | 30 | |
| Bob & Elle Smith | CSMP0235 | Dodge | Middle Fork Zumbro River | 4/7 - 10/3 | 56 | 34 | 60 | 10 | 5 | | 4 | 0 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Zumbro River Watershed (HUC 07040004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|---------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Dean Schrandt | CSMP0236 | Dodge | So. Branch Middle Fork Zumbro R @ 142nd Ave. | 4/26 - 10/15 | 49 | 18 | 60 | 10 | 0 | 34.18 | 2 | 62 | |
| Dean Schrandt | CSMP0237 | Dodge | So. Branch Middle Fork Zumbro R @ 150th Ave. | 4/26 - 10/15 | 48 | 16 | 60 | 10 | 0 | 34.18 | 2 | 62 | |
| Dean Schrandt | CSMP0238 | Dodge | So. Branch Middle Fork Zumbro R @ 160th Ave. | 4/26 - 10/15 | 28 | 12 | 44 | 10 | 0 | 34.18 | 2 | 62 | |
| Dean Schrandt | CSMP0239 | Dodge | So. Branch Middle Fork Zumbro R @ 170th Ave. | 4/26 - 10/15 | 33 | 12 | 60 | 10 | 0 | 34.18 | 2 | 62 | |
| Dean Schrandt | CSMP0240 | Dodge | So. Branch Middle Fork Zumbro R @ 185th Ave. | 4/26 - 10/15 | 31 | 10 | 60 | 10 | 0 | 34.13 | 2 | 80 | |
| Dean Schrandt | CSMP0241 | Dodge | So. Branch Middle Fork Zumbro R @ 195th Ave. | 4/26 - 10/15 | 33 | 6 | 55 | 10 | 0 | 34.13 | 2 | 80 | |
| Bernard Nigon | CSMP0266 | Olmsted | Cascade Creek | 4/4 - 10/14 | 52 | 5 | 60 | 51 | 39 | 32.67 | 32 | 42 | |
| Eric Porcher | CSMP0343 | Olmsted | Unn trib. To Bear Creek | 4/3 - 10/23 | 25 | 1 | 60 | 48 | 1 | 39.74 | 17 | 193 | |
| Eric Porcher | CSMP0344 | Olmsted | Bear Creek | 4/3 - 10/23 | 44 | 4 | 60 | 49 | 13 | 39.74 | 17 | 193 | |
| Paul Rohowetz | CSMP0363 | Wabasha | Gorman Creek | 4/29 - 7/4 | 33 | 4 | 60 | 6 | 1 | 20.81 | 1 | 30 | 63.5 |
| Dean Schrandt | CSMP0373 | Dodge | So. Branch Middle Fork Zumbro River @ 272 Ave | 4/26 - 10/15 | 40 | 18 | 60 | 10 | 0 | 36.03 | 2 | 53 | |
| Don Hesper | CSMP0419 | Dodge | Milliken Creek | 4/4 - 9/12 | 45 | 6 | 60 | 33 | 17 | 26.01 | 15 | 64 | 64.9 |
| Eric Porcher | CSMP0512 | Olmsted | Willow Creek @ MN-63 | 4/9 - 10/23 | 39 | 2 | 60 | 36 | 4 | 34.53 | 13 | 240 | |
| John Weiss | CSMP0680 | Olmsted | So. Fork Middle Branch Zumbro R in Oxbow Park | 4/16 - 10/10 | 47 | 9 | 60 | 25 | 14 | 33.69 | 12 | 210 | 61.1 |
| Paul & Cathy Moenning | CSMP0690 | Dodge | Salem Creek 210th Ave 1/2 mi N of 690th St | 4/4 - 10/20 | 54 | 9 | 60 | 8 | 0 | | 1 | 0 | 58.3 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Zumbro River Watershed (HUC 07040004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|--------|---|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Paul & Cathy Moenning | CSMP0691 | Dodge | Salem Creek 200th Ave 1/8 mi N of 690th St | 4/4 - 10/20 | 55 | 14 | 60 | 10 | 0 | | 1 | 0 | 58.2 |
| Paul & Cathy Moenning | CSMP0692 | Dodge | Salem Creek 4 Miles N of Hayfield | 4/4 - 10/20 | 60 | 60 | 60 | 7 | 0 | | 0 | 0 | 51.7 |
| Andy Ness | CSMP0804 | Dodge | Salem Ck at 260th Ave | 5/12 - 6/9 | 33 | 3 | 60 | 10 | 1 | | 10 | 0 | 56.0 |

Root River Watershed (HUC 07040008)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Bob & Eloda Wood | CSMP0012 | Fillmore | So. Branch Root River | 4/26 - 10/30 | 34 | 5 | 60 | 8 | 0 | 33.82 | 7 | 38 | 59.1 |
| Johannah Vreeman | CSMP0014 | Fillmore | So. Branch Root River | 4/19 - 5/26 | 37 | 20 | 60 | 3 | 0 | 29.83 | 4 | 35 | 58.3 |
| Carol Kohn | CSMP0016 | Mower | So. Branch Root River | 4/30 - 10/31 | 36 | 3 | 58 | 8 | 0 | 26.03 | 2 | 47 | 64.9 |
| Tom Schmitz | CSMP0019 | Fillmore | So. Branch Root River, "Historic bridge" | 3/29 - 10/28 | 42 | 4 | 60 | 18 | 0 | 38.3 | 9 | 49 | 52.8 |
| Tom Schmitz | CSMP0020 | Fillmore | So. Branch Root River, "New bridge" Co Rd 118 | 3/29 - 10/28 | 44 | 5 | 60 | 18 | 0 | 29.47 | 9 | 69 | 53.3 |
| Tom Schmitz | CSMP0021 | Fillmore | Forestville Creek | 3/29 - 10/28 | 43 | 3 | 60 | 18 | 0 | 38.3 | 9 | 49 | 51.7 |
| Tom Schmitz | CSMP0022 | Fillmore | Canfield Creek | 3/29 - 10/28 | 47 | 4 | 60 | 18 | 0 | 38.3 | 9 | 49 | 49.9 |
| Karol Krahn | CSMP0036 | Mower | Mower Co. JD 1 | 4/4 - 10/17 | 52 | 5 | 60 | 30 | 24 | 36.4 | 9 | 186 | 59.0 |
| Ron Olson | CSMP0051 | Olmsted | N Br Root River 2.25 Mi W of Stewartville | 4/15 - 6/17 | 41 | 7 | 60 | 6 | 3 | 16.22 | 2 | 49 | 60.0 |
| Carol Kohn | CSMP0179 | Fillmore | So. Br Root R @ Co. Rd. 1 | 4/30 - 10/31 | 33 | 4 | 55 | 8 | 0 | 26.03 | 2 | 47 | 64.4 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Root River Watershed (HUC 07040008)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------|----------|----------|---|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Donna Rasmussen | CSMP0256 | Fillmore | So. Branch Root River | 4/8 - 9/24 | 41 | 2 | 60 | 17 | 9 | 35.72 | 6 | 62 | 58.2 |
| Karol Krahn | CSMP0257 | Fillmore | So. Branch Root River | 4/4 - 10/17 | 54 | 8 | 60 | 24 | 20 | 36.4 | 9 | 186 | 57.8 |
| Casey Sautter | CSMP0289 | Fillmore | So. Branch Root River | 5/18 - 8/22 | 38 | 9 | 60 | 5 | 1 | 42.18 | 0 | 86 | 60.5 |
| Larry Mierau | CSMP0347 | Fillmore | Rush Creek | 3/21 - 10/25 | 42 | 5 | 60 | 28 | 0 | 35.55 | 0 | 61 | |
| Vic Ormsby | CSMP0392 | Winona | Unn trib. to Money Creek ("Wiscoy West Line") | 5/10 - 10/25 | 54 | 30 | 60 | 22 | 12 | 32.63 | 1 | 68 | 44.6 |
| Vic Ormsby | CSMP0393 | Winona | Money Creek ("Zephyr Community") | 5/10 - 10/25 | 33 | 0 | 60 | 22 | 0 | 32.63 | 1 | 68 | 47.6 |
| Stephen A. Erickson | CSMP0525 | Fillmore | Gibbon Creek (Holt twp, sec 21) | 4/17 - 10/30 | 55 | 7 | 60 | 25 | 22 | 35.77 | 15 | 71 | 53.0 |
| Karol Krahn | CSMP0575 | Mower | So. Branch Root River @ CSAH 14 | 4/4 - 10/17 | 53 | 5 | 60 | 30 | 25 | 36.4 | 9 | 186 | 59.8 |
| Ron Olson | CSMP0649 | Olmsted | N Br Root River 2 mi NE of Stewartville | 4/16 - 6/17 | 40 | 8 | 60 | 6 | 2 | 16.22 | 2 | 49 | 59.7 |
| Larry & Judy Wagner | CSMP0801 | Mower | Deer Creek at Grand Meadow Twp Sec. 36 | 4/1 - 10/25 | 58 | 37 | 60 | 24 | 19 | 36.28 | 2 | 98 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

CEDAR DES MOINES RIVER DRAINAGE BASIN

Cedar River Watershed (HUC 07080201)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------|----------|--------|---------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Bob Goetz | CSMP0246 | Mower | Turtle Creek | 4/9 - 10/11 | 14 | 6 | 30 | 36 | 0 | 35.29 | 24 | 138 | 66.1 |
| Rick & Cheri Webber | CSMP0342 | Mower | Roberts Creek | 5/3 - 8/9 | 24 | 0 | 60 | 8 | 0 | 26.55 | 7 | 22 | |

West Fork Des Moines River (Headwaters) Watershed (HUC 07100001)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------------|----------|------------|-----------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Kristin Peltola | CSMP0408 | Murray | West Fork Des Moines River | 5/1 - 7/26 | 15 | 2 | 22 | 7 | 0 | 22.9 | 3 | 187 | |
| Duane & Jan Voit | CSMP0409 | Cottonwood | West Fork Des Moines River | 4/10 - 6/30 | 12 | 4 | 21 | 14 | 0 | 8.36 | 7 | 15 | |
| Kelli Daberkow | CSMP0566 | Jackson | Okabena Creek, T103N R37W Sec. 9 | 4/13 - 8/10 | 21 | 3 | 36 | 10 | 0 | 24.14 | 4 | 45 | |
| Kelli Daberkow | CSMP0567 | Jackson | Division Creek, T103N R37W Sec. 3 | 4/13 - 8/10 | 17 | 3 | 30 | 10 | 0 | 24.14 | 4 | 45 | |
| Kelli Daberkow | CSMP0639 | Jackson | Jack Creek | 4/13 - 8/10 | 13 | 3 | 20 | 10 | 0 | 24.14 | 4 | 45 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN

Bois De Sioux River Watershed (HUC 09020101)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|----------|---|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Campbell High School | CSMP0949 | Wilkin | Rabbit R @ Co Rd 4 in Campbell "Bds27" | 9/27 - 10/5 | 27 | 23 | 30 | 2 | 0 | | 0 | 0 | 55.4 |
| Herman High School | CSMP0950 | Grant | Mustinka R @ CSAH-13 6 mi NE of Herman "Bds01" | 4/27 - 4/27 | 54 | 54 | 54 | 1 | 0 | | 0 | 0 | 54.1 |
| Herman High School | CSMP0951 | Grant | Mustinka R @ CSAH-8 8 Mi NE of Herman "Bds02" | 4/27 - 4/27 | 60 | 60 | 60 | 1 | 0 | | 0 | 0 | 50.3 |
| Herman High School | CSMP0952 | Grant | CD-8 @ MN-27, 3.4 mi W of Herman "Bds11" | 4/27 - 4/27 | 44 | 44 | 44 | 1 | 0 | | 0 | 0 | 68.7 |
| Wheaton High School | CSMP0954 | Traverse | 12 Mi Ck, E Br @ CR-6 3.4 mi E of Dumont "Bds16" | 4/28 - 10/26 | 35 | 9 | 58 | 4 | 0 | | 0 | 0 | 64.2 |
| Wheaton High School | CSMP0955 | Traverse | 12 Mi Ck, E Br @ CR-62, 3 mi SE of Dumont "Bds18" | 4/28 - 9/8 | 36 | 28 | 44 | 2 | 0 | | 0 | 0 | 55.3 |
| Herman High School | CSMP0957 | Traverse | 5 Mi Ck @ MN-27, 6 mi W of Herman "Bds23" | 4/27 - 4/27 | 44 | 44 | 44 | 1 | 0 | | 0 | 0 | 72.5 |
| Herman High School | CSMP0959 | Grant | Mustinka R @ Mustinka Dam NE of Herman "Bds33" | 4/27 - 4/27 | 12 | 12 | 12 | 1 | 0 | | 0 | 0 | 52.6 |
| Wheaton High School | CSMP0960 | Traverse | 12 Mi Ck, W Br @ CR-6 nr Dumont "Bds34" | 4/28 - 4/28 | 25 | 25 | 25 | 1 | 0 | | 0 | 0 | 55.3 |
| Wheaton High School | CSMP0961 | Traverse | 12 Mi Ck @ CR-14, 7.4 mi NE of Wheaton "Bds5" | 4/28 - 10/26 | 23 | 16 | 36 | 5 | 0 | | 0 | 0 | 60.7 |
| Campbell High School | CSMP0964 | Wilkin | Rabbit R @ US-75, 5 mi NW of Campbell "RAB1" | 4/28 - 10/5 | 24 | 21 | 29 | 3 | 0 | | 0 | 0 | 57.3 |
| Campbell High School | CSMP0965 | Wilkin | Stiner Ck @ CSAH-34, E of Ulen "Bds30" | 9/27 - 9/27 | 60 | 60 | 60 | 1 | 0 | | 0 | 0 | 64.2 |

89

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Bois De Sioux River Watershed (HUC 09020101)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Campbell High School | CSMP0968 | Wilkin | Buffalo R, S Br @ CSAH-10, SE of Sabin "BdS51" | 9/27 - 9/27 | 19 | 19 | 19 | 1 | 0 | | 0 | 0 | 61.3 |
| Wheaton High School | CSMP0969 | Traverse | Lat 3 of JD-2 @ CR-42. ESE of Tintah "BdS5Up" | 6/24 - 10/26 | 25 | 16 | 34 | 2 | 0 | | 0 | 0 | 56.3 |

Mustinka River Watershed (HUC 09020102)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|--------|------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Herman High School | CSMP0948 | Grant | Mustinka R @ CSAH 9 NW of Norcross | 4/27 - 4/27 | 15 | 15 | 15 | 1 | 0 | | 0 | 0 | 58.9 |

Otter Tail River Watershed (HUC 09020103)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------|----------|--------|--------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Bill Purdy | CSMP0271 | Becker | Little Toad Lake inlet - UPSTREAM | 5/24 - 9/21 | 33 | 11 | 60 | 16 | 0 | 24.8 | 4 | 42 | 58.8 |
| Maribeth & Andy Lee | CSMP0374 | Becker | Unnamed trib. To Height of Land Lake | 3/27 - 11/20 | 60 | 60 | 60 | 34 | 34 | 24.59 | 16 | 78 | |
| Bill Purdy | CSMP0684 | Becker | Little Toad Lake Inlet - DOWNSTREAM | 5/24 - 9/21 | 50 | 21 | 60 | 18 | 0 | 24.8 | 4 | 42 | 58.0 |

Red River of the North (Headwaters) Watershed (HUC 09020104)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-------------|----------|--------|-------------|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Gary Brekke | CSMP0007 | Clay | Red River | 3/31 - 10/27 | 12 | 4 | 20 | 31 | 0 | 19.33 | 0 | 111 | 61.0 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Sandhill River Watershed (HUC 09020301)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|--------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Gary Lee | CSMP0835 | Polk | Sand Hill R at CSAH 1 | 4/8 - 11/1 | 29 | 18 | 60 | 8 | 1 | 24.51 | 2 | 90 | 57.6 |
| Fertile High School | CSMP0873 | Polk | Sand Hill R @ Fertile Sand Hills Nat Ctr Rd "FB15" | 5/26 - 11/4 | 30 | 11 | 49 | 2 | 0 | | 0 | 0 | 51.4 |
| Climax High School | CSMP0882 | Polk | Sand Hill R on US 75, in Climax "SH1" | 4/19 - 10/18 | 16 | 9 | 40 | 5 | 0 | | 0 | 0 | 50.9 |
| Climax High School | CSMP0934 | Polk | Sand Hill R @ MN-9, .5 mi S of Beltrami "Belt10" | 5/20 - 5/20 | 13 | 13 | 13 | 1 | 0 | | 0 | 0 | 50.1 |
| Win-E-Mac High School | CSMP0935 | Polk | CD-16 @ CSAH 31, 5 mi SE of McIntosh "CD16" | 4/6 - 4/6 | 35 | 35 | 35 | 1 | 0 | | 0 | 0 | 32.0 |
| Climax High School | CSMP0936 | Polk | Sand Hill R @ MN-220 nr Climax "CL20" | 5/20 - 9/17 | 10 | 7 | 11 | 3 | 0 | | 0 | 0 | 53.6 |
| Fertile High School | CSMP0937 | Polk | Sand Hill R @ CSAH-1, 1 mi E of Fertile "FB10" | 5/26 - 11/4 | 31 | 13 | 48 | 2 | 0 | | 0 | 0 | 51.7 |
| Fertile High School | CSMP0938 | Polk | Sand Hill R @ 350th Ave SW, "FB20" | 11/4 - 11/4 | 11 | 11 | 11 | 1 | 0 | | 0 | 0 | 52.3 |
| Fosston High School | CSMP0939 | Polk | Sand Hill R @ 200th St SE "Fos20" | 5/19 - 7/28 | 33 | 30 | 35 | 2 | 0 | | 0 | 0 | 54.0 |
| Fertile High School | CSMP0941 | Polk | Sand Hill R @ CSAH-1, 5 mi E of Fertile "Lewis" | 5/26 - 11/4 | 30 | 4 | 56 | 4 | 0 | | 0 | 0 | 50.9 |
| Fertile High School | CSMP0942 | Polk | Sand Hill R @ CSAH-10 "Rindal" | 10/30 - 11/4 | 12 | 3 | 20 | 2 | 0 | | 0 | 0 | 51.0 |
| Climax High School | CSMP0943 | Polk | Red R @ CSAH 7, 2.2 mi W of Climax "RR10" | 5/20 - 10/18 | 6 | 4 | 11 | 4 | 0 | | 0 | 0 | 58.2 |
| Win-E-Mac High School | CSMP0945 | Polk | Sand Hill R @ 120th St SE "WEM20" | 4/6 - 6/16 | 38 | 23 | 46 | 3 | 0 | | 0 | 0 | 51.9 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Red Lake River Watershed (HUC 09020303)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Crookson High School | CSMP0870 | Polk | Red Lk R at Polk Co 11 "GEN" | 9/28 - 10/27 | 33 | 18 | 48 | 2 | 0 | | 0 | 0 | 58.4 |
| EGF - Sacred Heart High School | CSMP0875 | Polk | Red River at 1st St SE in EGF "Point" | 4/22 - 11/19 | 9 | 3 | 15 | 5 | 0 | | 0 | 0 | 50.4 |
| Crookson High School | CSMP0877 | Polk | Red Lk R at Woodland Ave in Crookston "Sam" | 7/29 - 10/27 | 27 | 17 | 46 | 3 | 0 | | 0 | 0 | 59.3 |
| Crookson High School | CSMP0878 | Polk | Burnham Ck at Twp Rd(Sec 14,15 Andover Twp) "BC" | 9/28 - 10/27 | 30 | 28 | 32 | 2 | 0 | | 0 | 0 | 56.6 |
| Red Lake High School | CSMP0879 | Beltrami | Mud Ck @ Red Lk Hatchery in Redby | 7/28 - 7/28 | 20 | 20 | 20 | 1 | 0 | | 0 | 0 | 57.6 |
| EGF - Sacred Heart High School | CSMP0881 | Polk | Red Lake R at MN 220 "RL1" | 4/22 - 11/19 | 20 | 12 | 31 | 5 | 0 | | 0 | 0 | 49.3 |
| EGF - Sacred Heart High School | CSMP0887 | Polk | Red R at Demers Ave in EGF | 4/22 - 11/19 | 9 | 3 | 15 | 5 | 0 | | 0 | 0 | 50.0 |
| Red Lake Falls High School | CSMP0888 | Red Lake | Clearwater R at Klondike Br in Red Lk Falls "CLE1" | 4/22 - 11/4 | 32 | 20 | 45 | 2 | 0 | | 0 | 0 | 47.1 |
| Red Lake Falls High School | CSMP0893 | Red Lake | Little Black R at CR 18 "BL10" | 4/22 - 11/4 | 27 | 15 | 40 | 4 | 0 | | 0 | 0 | 46.5 |
| EGF - Sacred Heart High School | CSMP0899 | Polk | Red Lk R on 2nd Ave NE "Murray" | 4/22 - 11/19 | 20 | 10 | 34 | 5 | 0 | | 0 | 0 | 49.5 |
| Crookson High School | CSMP0903 | Polk | Red Lk R at US 75 truck bypass "75By" | 7/29 - 10/27 | 29 | 18 | 48 | 3 | 0 | | 0 | 0 | 59.7 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Red Lake River Watershed (HUC 09020303)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Crookson High School | CSMP0904 | Polk | Red Lk R at Broadway Ave in Crookston "Bdwy" | 9/28 - 10/27 | 24 | 21 | 28 | 2 | 0 | | 0 | 0 | 59.5 |
| Red Lake Falls High School | CSMP0905 | Red Lake | Red Lk R at RR Bridge in Red Lk Falls "RL10" | 9/28 - 11/4 | 39 | 30 | 48 | 2 | 0 | | 0 | 0 | 47.9 |
| Red Lake Falls High School | CSMP0906 | Red Lake | Red Lk R at CR 3, w of Red Lk Falls "RL20" | 4/22 - 11/4 | 31 | 16 | 39 | 4 | 0 | | 0 | 0 | 48.3 |
| Grygla High School | CSMP0910 | Beltrami | Moose R on Forest Rd, 12 mi NE of Grygla "Moose" | 4/6 - 4/6 | 26 | 26 | 26 | 1 | 0 | | 0 | 0 | 50.1 |
| Fosston High School | CSMP0932 | Polk | Poplar R @ Co Rd 30, 1.5 mi W of Fosston "Pop20" | 6/22 - 7/28 | 22 | 6 | 38 | 2 | 0 | | 0 | 0 | 55.9 |
| Win-E-Mac High School | CSMP0947 | Polk | JD-73 @ 75th St SE, 4.4 mi W of Erskine "JD73" | 7/14 - 7/14 | 60 | 60 | 60 | 1 | 1 | | 0 | 0 | 60.3 |
| Red Lake Falls High School | CSMP0963 | Red Lake | "Sportsmens" | 11/4 - 11/4 | 28 | 28 | 28 | 1 | 0 | | 0 | 0 | 45.5 |

Clearwater River Watershed (HUC 09020305)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|------------|----------|------------|--|-------------------|------|-----|-----|----|------|------------|-------------|-----|-----------|
| Gary Lee | CSMP0836 | Polk | Lost River at township rd N of CSAH 33 | 4/8 - 11/1 | 55 | 24 | 60 | 8 | 6 | 16.4 | 2 | 163 | |
| Gary Lee | CSMP0837 | Pennington | Clearwater R at Co Rd 27 | 4/8 - 11/1 | 43 | 19 | 60 | 8 | 3 | 16.4 | 2 | 163 | 55.1 |
| Gary Lee | CSMP0838 | Polk | Hill R at CSAH 35 | 4/8 - 11/1 | 58 | 45 | 60 | 8 | 6 | 14.42 | 2 | 157 | 54.5 |
| Gary Lee | CSMP0839 | Polk | Poplar R at CSAH 8 | 4/8 - 11/1 | 53 | 29 | 60 | 8 | 5 | 22.24 | 2 | 168 | 54.5 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Snake River Watershed (HUC 09020309)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|----------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Allyn & Sarah Roley | CSMP0242 | Marshall | Swift Coulee | 4/30 - 10/24 | 38 | 4 | 60 | 30 | 7 | 18.39 | 8 | 52 | |
| Stephen High School | CSMP0872 | Marshall | Middle R at CSAH 4 in Argyle "MRA" | 5/14 - 9/16 | 28 | 4 | 56 | 4 | 0 | | 0 | 0 | 54.9 |
| Warren High School | CSMP0912 | Marshall | Snake R @ 5th St in Warren "5th St" | 4/30 - 10/20 | 25 | 9 | 55 | 4 | 0 | | 0 | 0 | 54.2 |
| Newfolden High School | CSMP0915 | Marshall | Middle R @ Co Rd 39 "OM" | 5/18 - 5/18 | 20 | 20 | 20 | 1 | 0 | | 0 | 0 | 51.8 |
| Warren High School | CSMP0919 | Marshall | Snake R @ 210th St NW "RR" | 4/30 - 10/20 | 18 | 6 | 40 | 4 | 0 | | 0 | 0 | 54.9 |
| Warren High School | CSMP0928 | Marshall | Snake R @ CSAH-34, 3 mi NE of Warren "Morkassel" | 4/30 - 9/20 | 28 | 9 | 43 | 3 | 0 | | 0 | 0 | 53.7 |

Tamarac River (Red River of the North) Watershed (HUC 09020311)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------|----------|----------|------------------------------------|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Stephen High School | CSMP0916 | Marshall | Tamarac R 1 mi N of Co Hwy 5 "6MC" | 4/27 - 10/20 | 14 | 2 | 39 | 7 | 0 | | 0 | 0 | 53.9 |
| Stephen High School | CSMP0917 | Marshall | Tamarac R @ 390th Ave NW "GC" | 4/27 - 10/20 | 23 | 2 | 53 | 7 | 0 | | 0 | 0 | 55.5 |
| Stephen High School | CSMP0918 | Marshall | Tamarac R @ CSAH 34 "Hwy34" | 5/14 - 7/22 | 35 | 7 | 50 | 3 | 0 | | 0 | 0 | 52.8 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 2. Summary of 2004 CSMP Data Collected with 60-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Two Rivers Watershed (HUC 09020312)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|---------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Hallock High School | CSMP0896 | Kittson | Two R, South Branch, at US 59 "T08" | 4/14 - 4/14 | 40 | 40 | 40 | 1 | 0 | | 0 | 0 | 48.0 |
| Lancaster High School | CSMP0920 | Kittson | N Br Two R @ CoRd 69 8 mi w of Lancaster "T02A" | 4/14 - 10/28 | 25 | 13 | 36 | 6 | 0 | | 0 | 0 | 56.9 |
| Hallock High School | CSMP0926 | Kittson | Two R S Br @ Twp Rd 1.5 mi SE of Hallock "Dopers" | 4/14 - 9/16 | 34 | 16 | 53 | 2 | 0 | | 0 | 0 | 45.1 |
| Hallock High School | CSMP0929 | Kittson | Two R Mid Br @ Twp Rd 6.5 MI W of Hallock "Plaines | 9/16 - 9/16 | 12 | 12 | 12 | 1 | 0 | | 0 | 0 | 61.6 |

Roseau River Watershed (HUC 09020314)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>60 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|--------|--|-------------------|------|-----|-----|----|------|------------|-------------|----|-----------|
| Roseau High School | CSMP0883 | Roseau | Hay Ck at Co Rd 28 "HAY1" | 4/12 - 10/27 | 23 | 14 | 37 | 4 | 0 | | 0 | 0 | 47.8 |
| Roseau High School | CSMP0884 | Roseau | Hay Ck at Twp Rd 1.25 mi dnst of MN 11 "HAY2" | 4/12 - 10/27 | 40 | 20 | 54 | 4 | 0 | | 0 | 0 | 47.5 |
| Roseau High School | CSMP0885 | Roseau | Roseau R at Co Rd 10 "RC10" | 4/12 - 10/27 | 31 | 18 | 50 | 3 | 0 | | 0 | 0 | 43.2 |
| Roseau High School | CSMP0922 | Roseau | Roseau R @ Center St in Roseau "CSt" | 4/12 - 5/19 | 28 | 21 | 35 | 2 | 0 | | 0 | 0 | 50.7 |
| Roseau High School | CSMP0923 | Roseau | Roseau R @ Old RR Bridge nr Malung Town Hall "Mal" | 4/12 - 5/19 | 35 | 35 | 36 | 2 | 0 | | 0 | 0 | 47.9 |
| Roseau High School | CSMP0924 | Roseau | Roseau R @ MN-310 "RR310" | 4/12 - 5/19 | 31 | 29 | 33 | 2 | 0 | | 0 | 0 | 48.9 |
| Roseau High School | CSMP0925 | Roseau | Sprague Ck @ MN-310 "SCr" | 4/12 - 10/27 | 33 | 15 | 51 | 4 | 0 | | 0 | 0 | 47.6 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>60: Number of transparency readings greater than 60 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Events: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

LAKE SUPERIOR DRAINAGE BASIN

Lake Superior (North) Watershed (Hydrologic Unit Code – HUC – 04010101)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|------------------------|----------|--------|-----------------|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Eleanor & Donald Lease | CSMP0079 | Cook | No. Brule River | 4/24 - 10/2 | 100 | 100 | 100 | 12 | 12 | 14.31 | 3 | 65 | 61.1 |

Lake Superior (South) Watershed (HUC 04010102)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|----------------|----------|----------|---|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Timothy Musick | CSMP0024 | St Louis | Lester R W of Lester R R d nr Moose Mtn in Duluth | 5/18 - 9/7 | 84 | 80 | 88 | 4 | 0 | 19.15 | 12 | 52 | |
| Mike Nordin | CSMP0698 | St Louis | Sucker River @ Old US 61 T51N/R12W/Sec 4 | 9/17 - 9/29 | 96 | 92 | 100 | 5 | 2 | 2.92 | 6 | 17 | 55.7 |
| Kari Jacobson | CSMP0844 | St Louis | Lester River In Lester Park N of Duluth | 7/29 - 10/24 | 92 | 52 | 100 | 15 | 11 | 10.82 | 11 | 87 | |
| Kevin Stroom | CSMP0853 | St Louis | French R @ Co Hwy 50 | 6/6 - 9/18 | 93 | 39 | 100 | 9 | 8 | 14.57 | 6 | 27 | 62.8 |
| Kevin Stroom | CSMP0854 | St Louis | Talmadge R @ Co Rd 281 | 5/15 - 8/24 | 80 | 38 | 100 | 9 | 3 | 14.57 | 10 | 27 | 58.1 |

St. Louis River Watershed (HUC 04010201)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|--------------|----------|----------|---|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| John Nyhus | CSMP0249 | St Louis | Embarrass River @ CSAH 20, 4 mi SE of Gilbert | 5/29 - 10/20 | 100 | 100 | 100 | 19 | 19 | 15.95 | 6 | 65 | |
| Mary Pulford | CSMP0831 | St Louis | Keene Creek E of Okerstrom Rd | 4/17 - 11/20 | 98 | 68 | 100 | 26 | 0 | 24.07 | 2 | 193 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN

Mississippi (Grand Rapids) Watershed (HUC 07010103)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------------|----------|--------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Doug & Barb Veit David & Ann Lewis | CSMP0800 | Itasca | Swan River at CSAH 21 T55N/R24W/S20 | 4/5 - 10/31 | 95 | 51 | 100 | 50 | 41 | 23.30 | 22 | 66 | 61.0 |
| Pearl L. Michelson | CSMP0847 | Aitkin | Mississippi R at boat launch 1 mi N of Jacobson | 7/13 - 11/26 | 60 | 40 | 94 | 13 | 0 | | 2 | 0 | |

Mississippi (Brainerd) Watershed (HUC 07010104)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|-----------|---|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Bert & Irene Johnson | CSMP0244 | Crow Wing | Nokasippi River | 5/8 - 10/14 | 99 | 96 | 100 | 6 | 5 | 17.65 | 4 | 135 | 55.8 |
| Bert & Irene Johnson | CSMP0699 | Crow Wing | SE Trib to Upper S Long Lake "Paradise 12" | 5/8 - 10/14 | 68 | 27 | 100 | 6 | 2 | 17.65 | 3 | 135 | 48.7 |

Pine River Watershed (HUC 07010105)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------|----------|-----------|---------------|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Greg & Mary Johnson | CSMP0025 | Cass | Pine River | 4/11 - 10/21 | 100 | 100 | 100 | 27 | 27 | 19.37 | 6 | 49 | 63.8 |
| Joe & Catherine O'Donnell | CSMP0251 | Crow Wing | Pelican Brook | 4/27 - 9/16 | 100 | 100 | 100 | 22 | 22 | 17.73 | 5 | 171 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Long Prairie River Watershed (HUC 07010108)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|------------------|----------|---------|---|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Joseph R. Gondek | CSMP0459 | Douglas | Kruegers Slough inlet to Lake Le Homme Dieu | 4/18 - 9/26 | 100 | 100 | 100 | 16 | 16 | 21.36 | 3 | 169 | |
| Ken Tuedt | CSMP0463 | Douglas | Inlet to Lake Brophy, "2" | 4/19 - 10/11 | 97 | 94 | 98 | 26 | 0 | 23.91 | 8 | 60 | |
| Jack Anderson | CSMP0511 | Douglas | Inlet to Lake Miltona from Lake Irene | 10/11 - 10/31 | 100 | 100 | 100 | 2 | 2 | 22.08 | 3 | 184 | 60.8 |

Mississippi River (Sartell) Watershed (HUC 07010201)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------|----------|---------|----------------------------------|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Miles Rychman | CSMP0544 | Stearns | So. Fork Watab River | 4/20 - 10/29 | 100 | 100 | 100 | 21 | 0 | 37.50 | 5 | 222 | |
| Miles Rychman | CSMP0545 | Stearns | Inlet to Big Watab Lake (NE end) | 4/20 - 10/29 | 100 | 100 | 100 | 19 | 0 | 37.50 | 5 | 222 | |
| Miles Rychman | CSMP0546 | Stearns | Inlet to Big Watab Lake (NW end) | 4/20 - 10/29 | 100 | 100 | 100 | 19 | 0 | 37.50 | 5 | 222 | |

Sauk River Watershed (HUC 07010202)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|---------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Dick & Nita Anderson | CSMP0095 | Stearns | Little Birch Lake Outlet (Zinniel Creek) | 4/20 - 10/11 | 100 | 100 | 100 | 38 | 38 | | 31 | 0 | |
| Joel Ampe | CSMP0554 | Stearns | Mill Creek | 6/4 - 10/30 | 89 | 75 | 100 | 16 | 0 | 27.74 | 10 | 58 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

UPPER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Mississippi River (St. Cloud) Watershed (HUC 07010203)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------------------------|----------|--------|--|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Gene & Betty Pundsack | CSMP0117 | Benton | Stony Brook in SW quarter of Sec 10, "site 2" | 5/14 - 10/6 | 99 | 73 | 100 | 19 | 18 | 28.52 | 5 | 44 | |
| Karen Durant | CSMP0515 | Wright | Fish Creek, T122N R27W sec. 13 | 4/13 - 10/29 | 95 | 51 | 100 | 18 | 12 | 22.05 | 10 | 143 | |
| Karen Durant | CSMP0516 | Wright | Unnamed Tributary to Fish Lake, T122N/R26W/S18 | 4/13 - 9/27 | 100 | 95 | 100 | 17 | 16 | 22.05 | 10 | 143 | |
| Marty Posthumus & Pattie Roggenkamp | CSMP0541 | Wright | Unnamed tributary to Birch Lake | 4/7 - 9/10 | 100 | 100 | 100 | 6 | 0 | 25.90 | 2 | 43 | 65.1 |

North Fork Crow River Watershed (HUC 07010204)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------|----------|-----------|------------------------------|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Ruth Schaefer | CSMP0320 | Kandiyohi | Middle Fork Crow River, CR-2 | 5/4 - 9/24 | 86 | 61 | 100 | 9 | 0 | 19.62 | 3 | 44 | |

Mississippi River Watershed (HUC 07010206)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|----------|-----------------|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Warren Westphal | CSMP0029 | Hennepin | Minnehaha Creek | 7/26 - 9/28 | 100 | 100 | 100 | 3 | 3 | 0.73 | 0 | 21 | |

Monitoring Period: Period over which transparency readings were taken
Mean: Average stream transparency in centimeters
Min: Minimum transparency reading in centimeters
Max: Maximum transparency reading in centimeters
NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters
Total Rain: Amount of rain reported over entire season in inches
Rain Event: Number of transparency readings taken immediately after major rainfall
NR: Number of rain gauge readings recorded, includes number of 0's recorded
Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

Rum River Watershed (HUC 07010207)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|------------|----------|------------|------------------------------|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Eric North | CSMP0164 | Mille Lacs | Little Whitefish Lake outlet | 4/2 - 10/24 | 100 | 100 | 100 | 23 | 0 | 15.24 | 16 | 25 | |

MINNESOTA RIVER DRAINAGE BASIN

Chippewa River Watershed (HUC 07020005)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|--------------|----------|-----------|--|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Bob Reynolds | CSMP0486 | Douglas | Chippewa River @ Little Chippewa Lk outlet | 4/13 - 10/1 | 99 | 80 | 100 | 43 | 0 | 50.33 | 45 | 255 | |
| Glen Matejka | CSMP0486 | Douglas | Chippewa River @ Little Chippewa Lk outlet | 4/13 - 10/1 | 99 | 80 | 100 | 43 | 0 | 50.33 | 45 | 255 | |
| Deb Nelson | CSMP0492 | Kandiyohi | Shakopee Creek @ CR-29 | 4/21 - 9/11 | 91 | 44 | 100 | 10 | 6 | 24.91 | 6 | 70 | |
| Bob Reynolds | CSMP0496 | Douglas | Chippewa Lk outlet @ CR-7 | 4/13 - 10/1 | 100 | 100 | 100 | 43 | 0 | 24.37 | 43 | 59 | |
| Bob Reynolds | CSMP0497 | Douglas | Devils Lk outlet | 4/13 - 10/1 | 100 | 100 | 100 | 43 | 0 | 24.37 | 43 | 59 | |
| Paul Wymar | CSMP0502 | Chippewa | County Ditch 21 | 3/29 - 9/21 | 78 | 15 | 100 | 15 | 0 | 17.11 | 11 | 60 | 63.7 |

Le Sueur River Watershed (HUC 07020011)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------|----------|------------|---|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Linda L Johnson | CSMP0719 | Blue Earth | Providence Creek (JD 49) T105N, R27W, S15 | 4/15 - 4/15 | 62 | 62 | 62 | 1 | 0 | 33.26 | 8 | 228 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

ST. CROIX RIVER DRAINAGE BASIN

Kettle River Watershed (HUC 07030003)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|---------|------------------|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Sandy Wentkiewicz | CSMP0023 | Carlton | Moose Horn River | 4/24 - 10/23 | 100 | 100 | 100 | 21 | 21 | 21.03 | 8 | 214 | 64.5 |

St. Croix River (Stillwater) Watershed (HUC 07030005)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------------|----------|---------|---------------|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Linda Christianson & Cecilia Strother | CSMP0352 | Chisago | Sunrise River | 4/6 - 10/31 | 80 | 40 | 100 | 23 | 4 | 26.15 | 11 | 205 | 63.7 |
| Linda Christianson & Cecilia Strother | CSMP0353 | Chisago | Dry Creek | 4/6 - 6/7 | 53 | 40 | 61 | 3 | 0 | 26.15 | 2 | 205 | 64.3 |

LOWER MISSISSIPPI RIVER DRAINAGE BASIN

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|----------------|----------|--------|--------------------------------------|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Gary R Mogren | CSMP0292 | Rice | Straight River @ Walking Bridge | 3/25 - 10/13 | 87 | 75 | 100 | 3 | 1 | 13.92 | 5 | 31 | 58.0 |
| Justin Watkins | CSMP0292 | Rice | Straight River @ Walking Bridge | 3/25 - 10/13 | 87 | 75 | 100 | 3 | 1 | 13.92 | 5 | 31 | 58.0 |
| Justin Watkins | CSMP0293 | Dakota | Cannon River @ Canada Ave. | 4/27 - 4/27 | 80 | 80 | 80 | 1 | 0 | | 0 | 0 | 63.5 |
| Justin Watkins | CSMP0505 | Rice | Cannon River @ Hulet Ave., Faribault | 4/27 - 4/27 | 70 | 70 | 70 | 1 | 0 | 56.13 | 39 | 343 | 63.3 |

Monitoring Period: Period over which transparency readings were taken
Mean: Average stream transparency in centimeters
Min: Minimum transparency reading in centimeters
Max: Maximum transparency reading in centimeters
NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters
Total Rain: Amount of rain reported over entire season in inches
Rain Event: Number of transparency readings taken immediately after major rainfall
NR: Number of rain gauge readings recorded, includes number of 0's recorded
Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Cannon River Watershed (HUC 07040002)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-------------------|----------|---------|---|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Lynn Sanborn | CSMP0505 | Rice | Cannon River @ Hulet Ave., Faribault | 4/27 - 4/27 | 70 | 70 | 70 | 1 | 0 | 56.13 | 39 | 343 | 63.3 |
| Marcia Hetletvedt | CSMP0505 | Rice | Cannon River @ Hulet Ave., Faribault | 4/27 - 4/27 | 70 | 70 | 70 | 1 | 0 | 56.13 | 39 | 343 | 63.3 |
| Justin Watkins | CSMP0506 | Goodhue | Cannon River @ Cannon Falls Park (9th St) | 3/1 - 3/1 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 62.2 |
| Justin Watkins | CSMP0507 | Goodhue | Prairie Creek @ 310th St. | 3/1 - 6/18 | 34 | 10 | 100 | 5 | 1 | | 0 | 0 | 54.3 |
| Justin Watkins | CSMP0508 | Dakota | Chub Creek @ Randolph | 4/27 - 4/27 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 53.8 |
| Justin Watkins | CSMP0608 | Dakota | Trout Brook at 280th St/Walking Bridge | 3/16 - 10/13 | 94 | 55 | 100 | 22 | 14 | 27.63 | 2 | 264 | 54.1 |
| John Schumacher | CSMP0608 | Dakota | Trout Brook at 280th St/Walking Bridge | 3/16 - 10/13 | 94 | 55 | 100 | 22 | 14 | 27.63 | 2 | 264 | 54.1 |
| Justin Watkins | CSMP0728 | Goodhue | Belle Creek @ ATV bridge (Gaging Station) | 4/2 - 10/13 | 85 | 49 | 100 | 12 | 4 | | 0 | 0 | 58.4 |
| Jan Montez | CSMP0729 | Goodhue | Little Cannon River @ MN Park in Cannon Falls | 4/8 - 10/13 | 96 | 90 | 100 | 8 | 3 | 16.65 | 1 | 18 | 53.1 |
| Justin Watkins | CSMP0729 | Goodhue | Little Cannon River @ MN Park in Cannon Falls | 4/8 - 10/13 | 96 | 90 | 100 | 8 | 3 | 16.65 | 1 | 18 | 53.1 |
| Justin Watkins | CSMP0730 | Goodhue | Cannon River @ CSAH 7 at Welch | 8/24 - 8/24 | 75 | 75 | 75 | 1 | 0 | | 0 | 0 | 62.3 |
| Justin Watkins | CSMP0731 | Goodhue | Pine Ck @ Goodhue Dakota Co line (280th St) | 3/22 - 10/13 | 93 | 68 | 100 | 20 | 7 | | 0 | 0 | 56.9 |

Monitoring Period: Period over which transparency readings were taken
Mean: Average stream transparency in centimeters
Min: Minimum transparency reading in centimeters
Max: Maximum transparency reading in centimeters
NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters
Total Rain: Amount of rain reported over entire season in inches
Rain Event: Number of transparency readings taken immediately after major rainfall
NR: Number of rain gauge readings recorded, includes number of 0's recorded
Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

LOWER MISSISSIPPI RIVER DRAINAGE BASIN (Continued)

Zumbro River Watershed (HUC 07040004)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|------------|----------|---------|---|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Don Hesper | CSMP0419 | Dodge | Milliken Creek | 6/13 - 6/13 | 66 | 66 | 66 | 1 | 0 | 26.01 | 15 | 64 | 64.9 |
| John Weiss | CSMP0680 | Olmsted | So. Fork Middle Branch Zumbro R in Oxbow Park | 6/27 - 10/10 | 90 | 35 | 100 | 13 | 9 | 33.69 | 12 | 210 | 61.1 |

RED RIVER DRAINAGE BASIN

Bois De Sioux River Watershed (HUC 09020101)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|----------------------|----------|----------|---|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Campbell High School | CSMP0949 | Wilkin | Rabbit R @ Co Rd 4 in Campbell "Bds27" | 4/28 - 4/28 | 94 | 94 | 94 | 1 | 0 | | 0 | 0 | 55.4 |
| Wheaton High School | CSMP0953 | Traverse | 12 Mi Ck, E Br @ CSAH-18 "BdS13" | 4/28 - 4/28 | 83 | 83 | 83 | 1 | 0 | | 0 | 0 | 67.6 |
| Wheaton High School | CSMP0955 | Traverse | 12 Mi Ck, E Br @ CR-62, 3 mi SE of Dumont "BdS18" | 10/26 - 10/26 | 78 | 78 | 78 | 1 | 0 | | 0 | 0 | 55.3 |
| Wheaton High School | CSMP0956 | Traverse | 12 Mi Ck, W Br @ CR-62, 2 mi SE of Dumont "BdS19" | 4/28 - 10/26 | 89 | 86 | 92 | 2 | 0 | | 0 | 0 | 54.7 |
| Campbell High School | CSMP0958 | Wilkin | Rabbit R @ MN-9, 1.5 mi N of Campbell "Bds28" | 9/27 - 9/27 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 61.5 |
| Wheaton High School | CSMP0960 | Traverse | 12 Mi Ck, W Br @ CR-6 nr Dumont "Bds34" | 10/26 - 10/26 | 70 | 70 | 70 | 1 | 0 | | 0 | 0 | 55.3 |
| Campbell High School | CSMP0966 | Wilkin | N Lat 1 of JD-12 @ CR-41 10 mi SE of Tintah "Bds39" | 9/27 - 9/27 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 60.0 |
| Campbell High School | CSMP0967 | Wilkin | JD-12 @ 2nd St in Tintah "BdS44" | 9/27 - 9/27 | 85 | 85 | 85 | 1 | 0 | | 0 | 0 | 61.1 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Sandhill River Watershed (HUC 09020301)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|--------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Fertile High School | CSMP0873 | Polk | Sand Hill R @ Fertile Sand Hills Nat Ctr Rd "FB15" | 8/25 - 9/22 | 100 | 100 | 100 | 2 | 2 | | 0 | 0 | 51.4 |
| Climax High School | CSMP0934 | Polk | Sand Hill R @ MN-9, .5 mi S of Beltrami "Belt10" | 10/18 - 10/18 | 73 | 73 | 73 | 1 | 0 | | 0 | 0 | 50.1 |
| Win-E-Mac High School | CSMP0935 | Polk | CD-16 @ CSAH 31, 5 mi SE of McIntosh "CD16" | 5/4 - 5/4 | 81 | 81 | 81 | 1 | 0 | | 0 | 0 | 32.0 |
| Climax High School | CSMP0936 | Polk | Sand Hill R @ MN-220 nr Climax "CL20" | 10/18 - 10/18 | 39 | 39 | 39 | 1 | 0 | | 0 | 0 | 53.6 |
| Fertile High School | CSMP0937 | Polk | Sand Hill R @ CSAH-1, 1 mi E of Fertile "FB10" | 8/25 - 9/22 | 81 | 75 | 87 | 2 | 0 | | 0 | 0 | 51.7 |
| Fertile High School | CSMP0938 | Polk | Sand Hill R @ 350th Ave SW, "FB20" | 5/26 - 9/22 | 85 | 56 | 100 | 3 | 2 | | 0 | 0 | 52.3 |
| Fosston High School | CSMP0939 | Polk | Sand Hill R @ 200th St SE "Fos20" | 4/20 - 10/29 | 78 | 62 | 100 | 4 | 0 | | 0 | 0 | 54.0 |
| Fosston High School | CSMP0940 | Polk | Sand Hill R @ 345th Ave SE, "Fos5" | 4/20 - 10/29 | 52 | 42 | 62 | 4 | 0 | | 0 | 0 | 52.5 |
| Fertile High School | CSMP0941 | Polk | Sand Hill R @ CSAH-1, 5 mi E of Fertile "Lewis" | 9/22 - 9/22 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 50.9 |
| Fertile High School | CSMP0942 | Polk | Sand Hill R @ CSAH-10 "Rindal" | 5/26 - 9/22 | 88 | 63 | 100 | 3 | 2 | | 0 | 0 | 51.0 |
| Win-E-Mac High School | CSMP0944 | Polk | Sand Hill R @ 185th St SE, "WEM10" | 4/6 - 10/29 | 69 | 46 | 100 | 8 | 0 | | 0 | 0 | 53.2 |
| Win-E-Mac High School | CSMP0945 | Polk | Sand Hill R @ 120th St SE "WEM20" | 7/14 - 10/19 | 100 | 100 | 100 | 3 | 3 | | 0 | 0 | 51.9 |
| Fosston High School | CSMP0962 | Polk | "Hill River Out" | 7/28 - 10/29 | 66 | 43 | 96 | 3 | 0 | | 0 | 0 | 58.2 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Red Lake River Watershed (HUC 09020303)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------|----------|----------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Crookson High School | CSMP0870 | Polk | Red Lk R at Polk Co 11 "GEN" | 7/29 - 8/23 | 84 | 68 | 100 | 2 | 0 | | 0 | 0 | 58.4 |
| Fosston High School | CSMP0871 | Polk | Poplar R at Polk Co 6 "Pop10" | 4/20 - 10/29 | 82 | 40 | 100 | 6 | 0 | | 0 | 0 | 55.1 |
| Red Lake Co Central High School | CSMP0874 | Red Lake | Lost R at Red Lake Co Hwy 5 "OK 20" | 10/20 - 12/15 | 80 | 59 | 100 | 2 | 0 | | 0 | 0 | 36.8 |
| Win-E-Mac High School | CSMP0876 | Polk | Maple Creek at Hwy 10, inlet to Maple Lk "MapleIn" | 6/16 - 10/19 | 82 | 53 | 100 | 4 | 2 | | 0 | 0 | 61.6 |
| Crookson High School | CSMP0877 | Polk | Red Lk R at Woodland Ave in Crookston "Sam" | 8/23 - 8/23 | 64 | 64 | 64 | 1 | 0 | | 0 | 0 | 59.3 |
| Crookson High School | CSMP0878 | Polk | Burnham Ck at Twp Rd(Sec 14,15 Andover Twp) "BC" | 7/29 - 8/23 | 88 | 76 | 100 | 2 | 0 | | 0 | 0 | 56.6 |
| Red Lake High School | CSMP0879 | Beltrami | Mud Ck @ Red Lk Hatchery in Redby | 4/22 - 10/26 | 84 | 54 | 100 | 6 | 3 | | 0 | 0 | 57.6 |
| Win-E-Mac High School | CSMP0880 | Polk | Inlet to Bee Lk on CR 34, S of Erskine "BeeIn" | 4/6 - 10/19 | 100 | 100 | 100 | 6 | 6 | | 0 | 0 | 50.9 |
| Red Lake Falls High School | CSMP0888 | Red Lake | Clearwater R at Klondike Br in Red Lk Falls "CLE1" | 5/5 - 9/28 | 69 | 63 | 74 | 2 | 0 | | 0 | 0 | 47.1 |
| Red Lake Co Central High School | CSMP0889 | Red Lake | Clearwater R at CR 126 "PL10" | 10/20 - 12/15 | 98 | 96 | 100 | 2 | 0 | | 0 | 0 | 36.8 |
| Win-E-Mac High School | CSMP0890 | Polk | Badger Ck at CR208, 2 mi NW of US 59 & 2 Bad8 | 4/6 - 10/19 | 93 | 72 | 100 | 6 | 4 | | 0 | 0 | 52.5 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Red Lake River Watershed (HUC 09020303)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------|----------|----------|---|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Win-E-Mac High School | CSMP0891 | Polk | Maple Ck at Hwy 10, outlet to Maple Lk "MapleOut" | 6/16 - 10/19 | 79 | 66 | 100 | 4 | 1 | | 0 | 0 | 62.9 |
| Win-E-Mac High School | CSMP0892 | Polk | Inlet to Mitchell Lk at Hwy 2 "MitchIn" | 6/16 - 10/19 | 66 | 43 | 88 | 4 | 0 | | 0 | 0 | 61.9 |
| Red Lake Co Central High School | CSMP0894 | Red Lake | Lost R @ CR 119, 2 mi N of Brooks "PL30" | 10/20 - 12/15 | 95 | 90 | 100 | 2 | 0 | | 0 | 0 | 42.3 |
| Red Lake Co Central High School | CSMP0895 | Red Lake | Hill R at CR 119, .5 mi N of Brooks "PL40" | 10/20 - 12/15 | 92 | 84 | 100 | 2 | 0 | | 0 | 0 | 40.2 |
| Red Lake High School | CSMP0900 | Beltrami | Battle Ck @ Indian Serviced Rd 19 "Battle" | 4/22 - 10/26 | 88 | 57 | 100 | 7 | 4 | | 0 | 0 | 57.8 |
| Red Lake High School | CSMP0901 | Beltrami | Blackduck R on CR 23 "BlkDuck" | 4/22 - 10/26 | 88 | 66 | 100 | 7 | 3 | | 0 | 0 | 56.2 |
| Red Lake High School | CSMP0902 | Beltrami | Pike Ck at DNR Gaging Station in Red Lake "Pike" | 4/22 - 10/26 | 93 | 53 | 100 | 7 | 6 | | 0 | 0 | 54.9 |
| Crookson High School | CSMP0903 | Polk | Red Lk R at US 75 truck bypass "75By" | 8/23 - 8/23 | 85 | 85 | 85 | 1 | 0 | | 0 | 0 | 59.7 |
| Crookson High School | CSMP0904 | Polk | Red Lk R at Broadway Ave in Crookston "Bdwy" | 7/29 - 8/23 | 82 | 64 | 100 | 2 | 0 | | 0 | 0 | 59.5 |
| Red Lake Falls High School | CSMP0905 | Red Lake | Red Lk R at RR Bridge in Red Lk Falls "RL10" | 4/22 - 5/5 | 84 | 68 | 100 | 2 | 0 | | 0 | 0 | 47.9 |
| Grygla High School | CSMP0907 | Marshall | JD-11 at Co Rd 54 in Grygla "D11" | 4/6 - 11/9 | 92 | 79 | 100 | 6 | 0 | | 0 | 0 | 52.0 |
| Grygla High School | CSMP0908 | Beltrami | Mud R at JD-11 outlet (Moose R Impnd) "Dike" | 4/6 - 11/9 | 100 | 100 | 100 | 6 | 0 | | 0 | 0 | 49.0 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Red Lake River Watershed (HUC 09020303)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------------------|----------|----------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Grygla High School | CSMP0909 | Marshall | CD-20 at Co Rd 54, S of Grygla "MarCD20" | 4/6 - 11/9 | 95 | 81 | 100 | 6 | 0 | | 0 | 0 | 49.7 |
| Grygla High School | CSMP0910 | Beltrami | Moose R on Forest Rd, 12 mi NE of Grygla "Moose" | 5/3 - 11/9 | 99 | 94 | 100 | 5 | 0 | | 0 | 0 | 50.1 |
| Red Lake Co Central High School | CSMP0911 | Red Lake | Hill R @ Twp Rd S of jct of MN-92 & CR-8 "OK30" | 10/20 - 12/15 | 100 | 100 | 100 | 2 | 0 | | 0 | 0 | 42.0 |
| Win-E-Mac High School | CSMP0931 | Polk | Poplar R @ 240th Ave SE "WinPop" | 4/6 - 10/29 | 94 | 60 | 100 | 9 | 4 | | 0 | 0 | 53.0 |
| Fosston High School | CSMP0932 | Polk | Poplar R @ Co Rd 30, 1.5 mi W of Fosston "Pop20" | 4/20 - 10/29 | 90 | 75 | 100 | 4 | 0 | | 0 | 0 | 55.9 |
| Win-E-Mac High School | CSMP0933 | Polk | Badger Ck 3 mi E of Erskine "Oak15" | 4/6 - 5/4 | 57 | 35 | 78 | 2 | 0 | | 0 | 0 | 36.4 |
| Win-E-Mac High School | CSMP0946 | Polk | Bee Lake Outlet @ Cameron Lk Rd "BeeOut" | 6/16 - 10/19 | 100 | 100 | 100 | 4 | 4 | | 0 | 0 | 61.2 |
| Win-E-Mac High School | CSMP0947 | Polk | JD-73 @ 75th St SE, 4.4 mi W of Erskine "JD73" | 9/14 - 10/19 | 97 | 94 | 100 | 2 | 1 | | 0 | 0 | 60.3 |
| Red Lake Falls High School | CSMP0963 | Red Lake | "Sportsmens" | 4/22 - 9/28 | 91 | 72 | 100 | 3 | 0 | | 0 | 0 | 45.5 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Snake River Watershed (HUC 09020309)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|----------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Stephen High School | CSMP0872 | Marshall | Middle R at CSAH 4 in Argyle "MRA" | 4/27 - 10/20 | 90 | 70 | 100 | 3 | 2 | | 0 | 0 | 54.9 |
| Warren High School | CSMP0886 | Marshall | JD-25 SE of 280th Ave and 210th St Intsec. "AVO" | 4/30 - 10/20 | 95 | 80 | 100 | 4 | 3 | | 0 | 0 | 53.7 |
| Newfolden High School | CSMP0913 | Marshall | Middle R @ CSAH 28 in Newfolden "M1" | 4/16 - 10/18 | 99 | 94 | 100 | 4 | 3 | | 0 | 0 | 52.2 |
| Newfolden High School | CSMP0914 | Marshall | Middle R @ Co Rd 30 "MCC30" | 4/16 - 10/18 | 96 | 82 | 100 | 4 | 3 | | 0 | 0 | 51.2 |
| Newfolden High School | CSMP0915 | Marshall | Middle R @ Co Rd 39 "OM" | 4/16 - 10/18 | 100 | 100 | 100 | 3 | 3 | | 0 | 0 | 51.8 |
| Warren High School | CSMP0928 | Marshall | Snake R @ CSAH-34, 3 mi NE of Warren "Morkassel" | 10/20 - 10/20 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 53.7 |

Tamarac River (Red River of the North) Watershed (HUC 09020311)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|---------------------|----------|----------|-----------------------------|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Stephen High School | CSMP0918 | Marshall | Tamarac R @ CSAH 34 "Hwy34" | 4/27 - 10/20 | 75 | 62 | 100 | 4 | 1 | | 0 | 0 | 52.8 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RED RIVER DRAINAGE BASIN (Continued)

Two Rivers Watershed (HUC 09020312)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|-----------------------|----------|---------|--|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Hallock High School | CSMP0896 | Kittson | Two R, South Branch, at US 59 "T08" | 9/16 - 10/19 | 95 | 90 | 100 | 2 | 1 | | 0 | 0 | 48.0 |
| Lancaster High School | CSMP0897 | Kittson | Two R, N Br at Twp Rd .5 Mi NW of Lancaster "TO3A" | 4/14 - 10/28 | 84 | 50 | 100 | 6 | 3 | | 0 | 0 | 56.8 |
| Lancaster High School | CSMP0898 | Kittson | Two R, N Br at McKinley Twp Rd, Sec 32 "T04" | 4/14 - 10/28 | 100 | 100 | 100 | 6 | 6 | | 0 | 0 | 55.8 |
| Hallock High School | CSMP0926 | Kittson | Two R S Br @ Twp Rd 1.5 mi SE of Hallock "Dopers" | 10/19 - 10/19 | 100 | 100 | 100 | 1 | 1 | | 0 | 0 | 45.1 |
| Hallock High School | CSMP0927 | Kittson | Two R Mid Br @ Twp Rd, 3 Mi SE of Hallock "JOC" | 4/14 - 10/19 | 80 | 54 | 100 | 3 | 1 | | 0 | 0 | 46.1 |
| Hallock High School | CSMP0930 | Kittson | Two R Mid Br @ Twp Rd .5 Mi w of CSAH-15 "T10A" | 4/14 - 10/19 | 99 | 97 | 100 | 3 | 2 | | 0 | 0 | 44.3 |

Roseau River Watershed (HUC 09020314)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|--------------------|----------|--------|---|-------------------|------|-----|-----|----|-------|------------|-------------|----|-----------|
| Roseau High School | CSMP0921 | Roseau | E Br Roseau R at Co Rd 126 "7MC" | 4/12 - 10/27 | 81 | 60 | 100 | 4 | 1 | | 0 | 0 | 48.3 |
| Roseau High School | CSMP0922 | Roseau | Roseau R @ Center St in Roseau "CSt" | 6/15 - 6/15 | 90 | 90 | 90 | 1 | 0 | | 0 | 0 | 50.7 |
| Roseau High School | CSMP0923 | Roseau | Roseau R @ Old RR Brg nr Malung Town Hall "Mal" | 6/15 - 10/27 | 84 | 73 | 95 | 2 | 0 | | 0 | 0 | 47.9 |
| Roseau High School | CSMP0924 | Roseau | Roseau R @ MN-310 "RR310" | 6/15 - 10/27 | 78 | 74 | 83 | 2 | 0 | | 0 | 0 | 48.9 |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature

Appendix 3. Summary of 2004 CSMP Data Collected with 100-cm Transparency Tube

RAINY RIVER DRAINAGE BASIN

Big Fork River Watershed (HUC 09030006)

| Volunteers | Site | County | Stream Name | Monitoring Period | Mean | Min | Max | NT | N>100 | Total Rain | Rain Events | NR | Mean Temp |
|------------|----------|--------|-----------------|-------------------|------|-----|-----|----|-------|------------|-------------|-----|-----------|
| Nancy Shaw | CSMP0517 | Itasca | Bowstring River | 5/30 - 10/3 | 99 | 90 | 100 | 17 | 15 | 18.35 | 7 | 129 | |

Monitoring Period: Period over which transparency readings were taken

Mean: Average stream transparency in centimeters

Min: Minimum transparency reading in centimeters

Max: Maximum transparency reading in centimeters

NT: Number of transparency readings taken

N>100: Number of transparency readings greater than 100 centimeters

Total Rain: Amount of rain reported over entire season in inches

Rain Event: Number of transparency readings taken immediately after major rainfall

NR: Number of rain gauge readings recorded, includes number of 0's recorded

Mean Temp: Average stream temperature