

PROJECT UPDATE #3

October-2007



- ◆ August-October Project Overview
- ◆ Project Evaluation
- ◆ Reimbursement Requests
- ◆ Final Report
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◆ PROJECT OVERVIEW ◆

From August through October, all of the volunteer sites were monitored, though fewer sites were monitored in September and October than August. Two new sites near Lake Herman were added in October to help identify streams contributing high fecal bacteria observed at one sample location in the north part of the lake.

Project Sample Sites: 60 total

29 sites in 7 lakes:

- Kampeska- 2
- Pelican- 4
- Campbell- 9
- Herman- 6
- Madison- 4
- Round- 1
- Brant- 3

31 sites in river & creeks:

- Central Big Sioux- 26
- Lake Herman tribs- 3
- Lake Madison tribs- 2

Volunteers: 32 people actively monitored sites during the sampling season; and 30 monitors submitted data in August, 23 monitors submitted data in September, and 22 people submitted data in October.

Volunteer Water Samples Cultured:

- Watertown Minilab- 16
- Brookings Minilab- 60
- Madison Minilab- 53
- TOTAL- 129**

TABLE 1. E. COLI CONCENTRATIONS (CFU/100 mL) IN VOLUNTEER SAMPLES

LAKE	Sample Site ID	August		September		October	
		Coliscan Easygel	3M Petrifilm	Coli	Petri	Coli	Petri
Brant	BLT9		0				
	BLT10		0				
	LBRA1		0				
Campbell	LCAM1	0, 50	0, 100	240	200	80	0
	LCAM2	33	0	100	0	20, 20	0, 0
	LCAM3	33	0	0, 200	0, 0	40	100
	LCAM4					20	100
	LCAM5	0, 0	0, 0	20	0		
	LCAM7	0, 0, 0	0, 0, 0			80, 160	200, 0
	LCAM8	0	0	20	0		
	LCAM9			125, 125	400, 100	480, 600	300, 500
	9606B	40	0	520	700	180	100
Herman	LH1A		0	1,880	1,500; 800	1,820	600, 500
	LH1A N						100
	LH1A W						1,200
	LH1B		0		1,100		400
	LMT1		0		100		0
	LHER1	20, 0	0, 0	80			0
	LHER2	120, 0	0, 0	60			0
	LHER3		0				
4306B	0	0, 0, 0					
Kampeska	LKAM1	0, 0		0		40	
	9508C	20, 140		120			
Madison	LMT6	no flow			100, 200		
	LMAD1		0		0		0
	LMAD3		0, 0		0		0
	LMAD4		0				200, 0
	BLT8	no flow		no flow			
	4309A		0, 0		0		
Pelican	LPEL1	50, 50				0	
	LPEL4	0				20	
	LPEL5	0				40	
	9517B	0				40	
Round	LROU1		0, 0		0		

Bacteriological results, organized by lake name and site ID, are shown in Table 1 for all samples submitted by volunteers in August, September, and October. Data is graphed in Figure 1 (enclosed). Lab or field blanks are not included, but all the blank samples continued to culture no bacteria.

About half (53%) of the volunteer samples cultured from August - October contained **no** *E. coli* bacteria. About 13% of the cultures exceeded the EPA recommendation for intense swimming use (red bold font in Table 1) and 6% of the cultures exceeded the guidelines for infrequent swimming use.

Samples taken in August had very low levels of *E. coli* concentrations but concentrations increased in September and October. By month, the percent of cultures with **no** *E. coli* bacteria was:

- August- 81%
- September- 33%
- October- 28%

About 18% (6 of 34) of the sample sites had one or more samples that exceeded the EPA recommendation for single sample maximum (red bold font in Table 1), similar to June and July conditions. Samples with high bacteria levels came from tributaries to Lake Herman or sites in and near the shore of Lake Campbell.

Samples from LH1A cultured the highest *E. coli* numbers and prompted sampling at upstream sites (LH1A N and LH1A W) to determine which streams were the main sources of the *E. coli* bacteria. Preliminary results suggest that a stream flowing from the west contained the highest *E. coli* "load." Volunteers at Lake Herman demonstrated how project

methods might be used to quickly track the general location of *E. coli* bacteria in a watershed.

The Bacteria Monitoring Project is interpreting lab results using EPA-recommended standards for *E. coli* concentration. Recommendations are based on the intensity of swimming use:

- ◆ Intense (designated beach)- ≤235 CFU
- ◆ Moderate- ≤298
- ◆ Light- ≤410
- ◆ Infrequent- ≤576

SOUTH DAKOTA RECREATIONAL WATER STANDARDS ARE BASED ON FECAL COLIFORM BACTERIA, NOT E. COLI.
South Dakota recreational water standards apply May 1 through September 30.

TABLE 2. STREAM <i>E. COLI</i> CONCENTRATIONS (CFU/100 mL)							
Central Big Sioux Watershed Streams							
Site ID	Stream Name	August		September		October	
		Coli	Petri	Coli	Petri	Coli	Petri
R4	Big Sioux River			550, 300	300, 100	560	400
R6	Big Sioux River					1,725; 1,675	2,100; 1,200
R19	Big Sioux River	2,300	1,900				
R20	Big Sioux River	1,000	900				
T1	North Deer Ck.					2,250	2,700
T2	North Deer Ck.					5,625	9,700
T3	Six Mile Ck.			175, 100	300, 100	225	200
T4	Six Mile Ck.			3,000	4,600	4,500	2,200
T5	Six Mile Ck.			850	700	3,750	4,300
T11	Spring Ck.			2,625	3,800	12,750	9,500
T12	Flandreau Ck.					2,020	2,200
T13	Jack Moore Ck.					5,700; 5,400	4,700; 5,900
T37	Stray Horse Ck.	0	0				
T40	Hidewood Ck.	800	800				
T41	Hidewood Ck.	2,600	1,000				

Table 2 shows culture results for samples collected from streams in the Central Big Sioux Watershed. *E. coli* bacteria concentrations in streams remained **much higher** than samples collected from the lakes. Stream samples were collected from 15 sites and 48 cultures were prepared.

About 93% of the sites and 83% of the cultures exceeded the EPA-recommended standard for frequent immersion recreation (red bold font). About 80% of the sites and 71% of the cultures exceeded the EPA-recommended standard for infrequent immersion recreation. Only 4% of the cultures contained **no** *E. coli*.

About 21% of the samples were collected under wet weather conditions and 80% of cultures prepared after wet weather conditions exceeded the EPA recommendation for frequent and infrequent immersion recreation.



**Rick Bauer sampling Lake Campbell
Which one is the field blank?**

PROJECT EVALUATION

It's test time! One of the purposes of the project was to educate participants about water quality, watershed processes, and monitoring techniques. Please take the post-test and mail to Jeanne in the enclosed envelope. You don't need to put your name on the test because the project is the measuring group, not individual, changes.

The post-test is your chance to provide feedback. What changes would improve the program? What did you learn? Would your neighbors be interested in the project results? What are your other concerns about the lake's water quality or natural resources?

REIMBURSEMENT REQUESTS

Please submit the Reimbursement Request Form, with receipts, if you would like to be paid for mileage, postage, or other expenses related to the project. The form was included in the training packet you got in the spring. Send the form and receipts to Jeanne by November 15. Please call if you need a form.

FINAL REPORT

Data collection ended on the last day of October. The next step is to examine all the information and prepare a final report. The report will compare *E. coli* concentrations from the different methods used to culture bacteria. The overall quality of the information and methods will be checked by analyzing the data from blank, split, and duplicate samples. The project information will be examined for trends or patterns over time, within lakes, and between lakes. All volunteers will get a copy of the final report by February 2008.

WHAT'S NEXT?

A grant provided supplies for the Bacteria Monitoring Project for one year. Individuals or lake associations that want to continue monitoring their lake for water clarity or *E. coli* bacteria should contact Jeanne. The bacteria culture medium is ~\$1.75 per test.

If you are done monitoring, please return your equipment to the minilabs in Madison, Brookings, or Watertown.


Contact Information-
 Jeanne Fromm
 605/688-6611 edwdd3@brookings.net



Rick is holding the field blank with his ring hand.