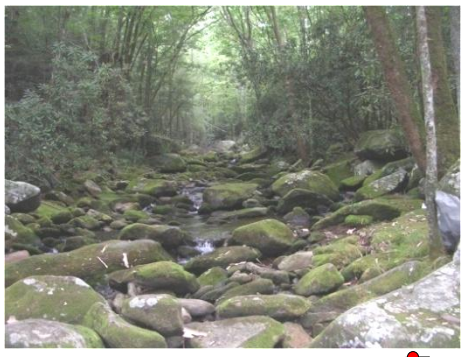
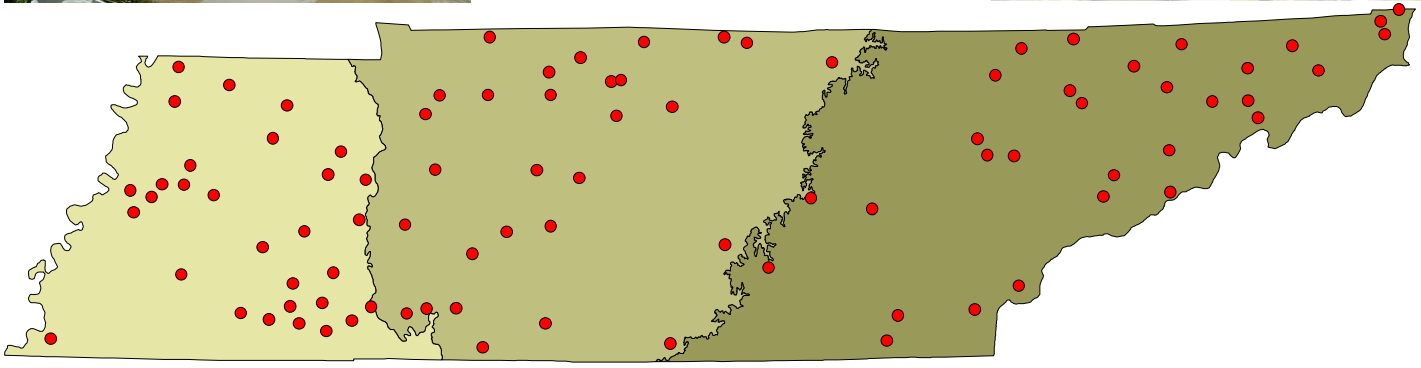
2007-8 PROBABILISTIC MONITORING OF WADEABLE STREAMS IN TENNESSEE

Volume 5: Pathogens

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Volume 5 – Pathogens

By

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Chattanooga EFO	Dick Urban	Johnson City EFO	Jeff Horton
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The Tennessee Department of Health (TDH) Environmental Microbiology Laboratories in Nashville, Jackson and Knoxville analyzed the *E. coli* samples. The director of the TDH microbiology laboratory is Jim Gibson.

Cover photos of sample sites were provided by Water Pollution Control staff biologists. *E. coli* photo source: Rowett Institute.

1. INTRODUCTION

a. Project Summary

The 2007-8 study is a probabilistically-based survey of wadeable streams in Tennessee that builds upon EPA's 2004 Wadeable Streams Assessment survey of the nation's streams (USEPA, 2006). Biological, bacteriological, physical, and chemical data from a random sub-sampling of Tennessee streams will be extrapolated to all wadeable streams in Tennessee. These data will provide a baseline to which future efforts can be compared, thus providing an opportunity for scientifically valid trend analysis.

The state was divided into three divisions based on level 3 ecoregions (Griffith et al, 1997). There were 30 sites randomly selected in west, middle and east Tennessee for a total of 90 sites throughout the state. This report was broken down into six separate volumes. More information on the study design and randomized site selection can be found in Volume 2 of this report series.

This volume provides detail on pathogen levels using *E. coli* as an indicator. *E. coli* data are presented, compared to the water quality criterion, and contrasted for each of the three divisions. The purpose of this volume is only to present statistical comparisons of data and not assessments of use support which is presented in Volume 1 of this report series. Data are provided in the appendix.

b. Pathogen Monitoring

Pathogens are disease-causing organisms such as bacteria or viruses that can pose an immediate and serious health threat if ingested. The presence of pathogens in water affects the public's ability to safely swim, wade, and fish in streams. Pathogens can enter waterways through septic systems, sewage overflows, storm water, sewage treatment plants, urban runoff, and livestock.

The *E. coli* group is used as an indicator for the presence of pathogens. This group of bacteria is commonly found in the lower intestine of warm-blooded animals. They are capable of surviving for brief periods of time in the environment, making them a good indicator of pathogen contamination. For comparison to water quality criteria, five *E. coli* samples were collected within a 30-day period at each probabilistic monitoring site. Samples were collected from July through October 2007 following TDEC's *Quality System Standard Operating Procedure for the Chemical and Bacteriological Sampling of Surface Water* (TDEC, 2006). Samples were delivered to the state laboratory within six hours following collection in the field. They were analyzed using the EPA approved Colilert method (IDEXX Laboratories, Inc). This method detects the presence of enzymes produced by total fecal coliform bacteria and *E. coli* and quantifies the most probable number (MPN) of bacteria detected. The MPN refers to the number of Colony Forming Units (CFU) per 100 ml sample.

All streams in Tennessee are classified for recreational use, which includes the public's ability to swim, wade, and safely eat fish they catch. According to Tennessee's general

water quality criteria for recreation, which is the most stringent for pathogen levels, the concentration of the *E. coli* group shall not exceed 126 CFU per 100 ml as a geometric mean of five samples collected within 30 days (Tennessee Water Quality Control Board, 2007).

The geometric mean is an average calculated by multiplying a set of values and taking the *n*th root, where *n* is the number of values. A geometric mean, unlike an arithmetic mean, tends to dampen the effect of very high or low values, which might bias the mean if a straight average (arithmetic mean) were calculated. In addition to the geomean criterion, the concentration of the *E. coli* group in any individual sample shall not exceed 941 CFU per 100 ml. This report compares *E. coli* data to those criteria. For high quality waters such as Exceptional Tennessee Waters, Outstanding Natural Resource Waters, and state scenic rivers, the criterion for a single sample is 487 CFU per 100 ml.

Some of the samples were diluted with sterile water, which allows for quantification of higher concentrations of pathogens. This was done at the discretion of the field offices if they suspected the stream to have high concentrations of *E. coli*. Some of the geomeans that passed criteria may have been higher if the samples that were above the maximum detection limit for the Colilert method (2,420 CFU per 100ml) had used a dilution when determining the concentrations. A dilution with the ratio of 1 part sample to10 parts sterile water would allow for the *E. coli* concentrations to be quantified up to 24,200 CFU per 10ml.

2. PATHOGEN RESULTS

Statewide, there were 40 WSA sites (45%) that did not meet criteria for the use of recreation (Figure 1). Percentages are based on 88 sites instead of 90 since two sites in the eastern division were not sampled for *E. coli* due to dry conditions during the sampling period. The geomean criterion was exceeded at 36 of the 88 sites sampled. The individual sample criterion was exceeded at least once at over half of these sites. Four additional sites failed because of high single values. The number of sites failing to meet criteria was fairly evenly distributed across the state divisions (Figure 2). However, *E. coli* levels in east Tennessee sites tended to be more variable (Figure 3).

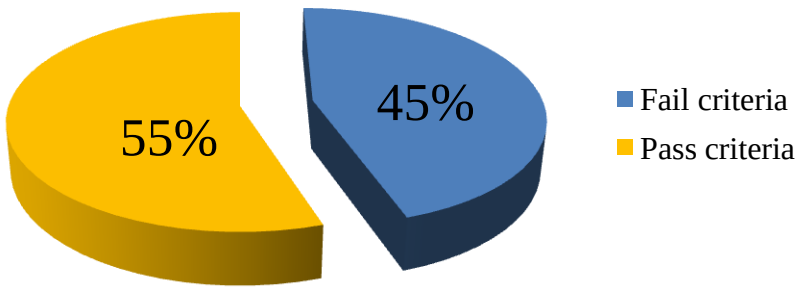

Figure 1: Comparison of Tennessee probabilistic data to *E. coli* water quality criteria for recreation (Compares to both geomean and single sample criteria).

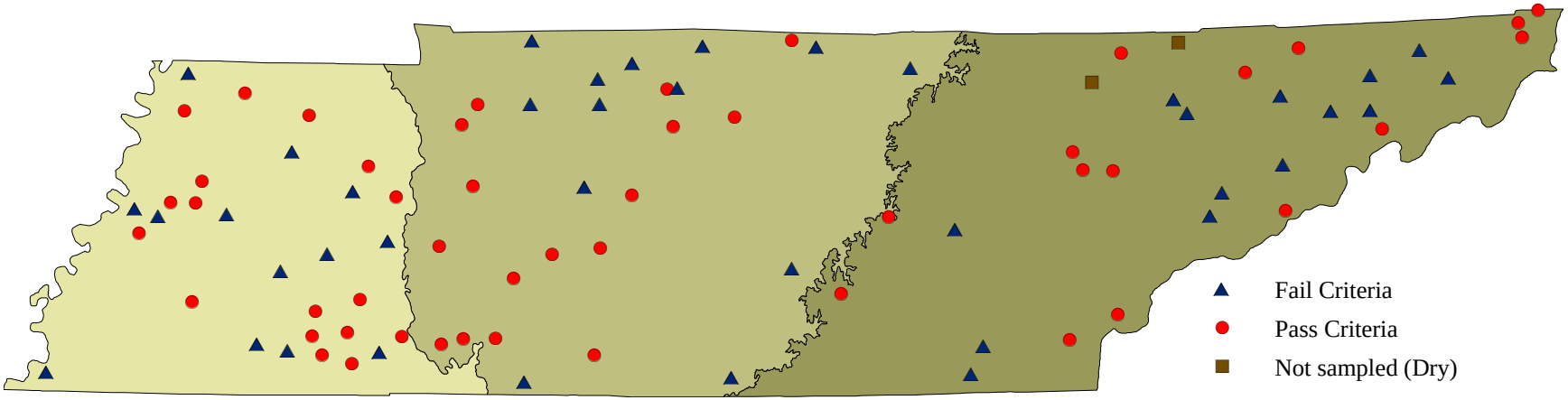

Figure 2: Location of sites that failed *E. coli* water quality criteria for the classified use of recreation.

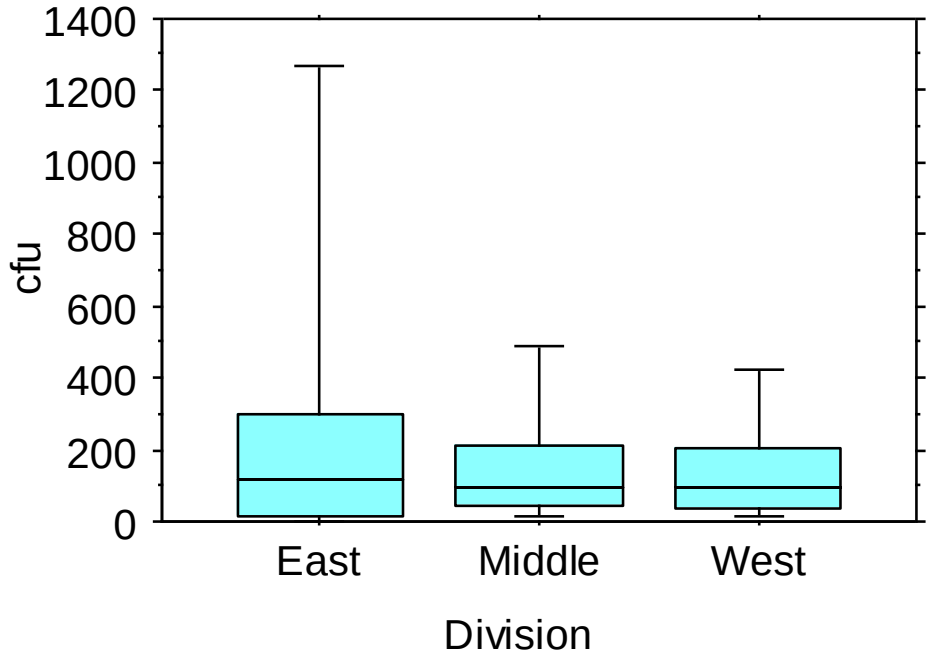

Figure 3: Comparison of *E. coli* geomean data at 2007 probabilistic sites.

Biologist Kim Sparks collects a bacteriological sample for analysis in middle Tennessee. Samples must be delivered to the laboratory within six hours of collection. *Photo provided by the Nashville Environmental Field Office.*

a. West Tennessee

West Tennessee had 13 sites (43%) that failed to meet criteria for the use of recreation (Figure 4). *E. coli* geomeans were above the criterion at twelve streams. One site (HAWKI002.1CR) met the geomean criterion but exceeded the criterion for an individual sample (Table 1). Ten percent of the samples (three sites in the Southeastern Plains and Hills) had very low levels with geomeans less than ten.

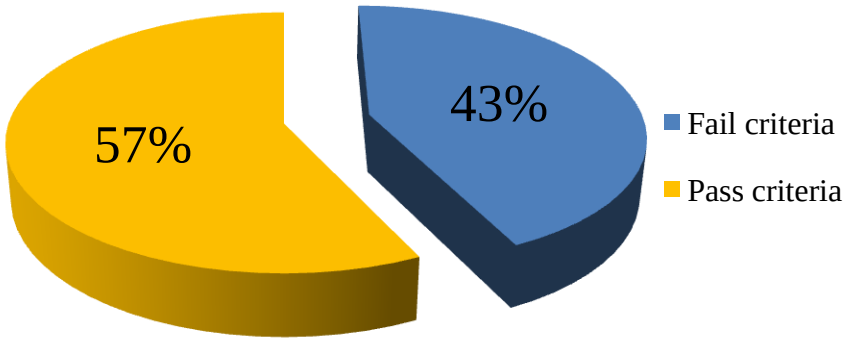

Figure 4: Comparison of west Tennessee probabilistic data to *E coli* water quality criteria for recreation.

Cold Creek in the Bluff Hills ecoregion (74a) of west Tennessee had the highest measured *E. coli* levels in the state for both its geomean and an individual sample. However, dilutions were not run at all sites in the study that were above method ranges.

Photo provided by Jackson Environmental Field Office.

Table 1: West Tennessee *E. coli* geomeans and highest individual values.

Division	Station ID	Ecoregion	*E. Coli* Geomean	Highest *E. coli* Value	Number of *E. coli* Samples
West	COLD006.3LE	74a	15728*	>24190*[d]	5
	TISDA1T1.2LE	74b	2992*	12997*[d]	5
	CYPRE002.1CK	74b	462*	1986*	5
	KERR000.4HD	65j	379*	1986*	5
	CANE001.4SH	74b	301*	3873*[d]	5
	ROSE001.3MC	65e	213*	1120*	5
	SFCUB009.5DE	65e	210*	299	5
	HAYES003.3HR	65e	205*	>2420*	5
	MFORK1T1.5HE	65e	203*	291	5
	NREEL000.4OB	74a	171*	291	5
	SFFDE1T0.7MN	65e	151*	1413*	5
	BEAR002.1WY	65e	131*	273	5
	HROCK002.4CR	65e	114	613	5
	HYDE002.7LE	74b	104	649	5
	STOKE004.9CK	74b	96	135	5
	CYPRE005.9OB	74b	95	260	5
	HAWKI002.1CR	65e	81	>2420*	5
	CROOK005.0MC	65e	80	166	5
	POND013.8CK	74b	79	866	5
	SFMUD003.8MC	65e	69	770	5
	HALLS001.7LE	74b	65	816	5
	CLOVE1T0.5OB	74a	41	77	5
	HURRI007.4HE	65e	34	649	5
	TAR003.0CS	65e	26	46	5
	POPLA014.7HY	74b	24	48	5
	BIRDS012.3BN	65e	18	32	5
	SMITH003.5HD	65j	17	33	5
	OWL003.7HD	65e	6	33	5
	THOMP000.2WY	65e	4	38	5
	CYPRE023.8MC	65e	1	4	5

* Value exceeds the general water quality criteria 1200-4-3 for the classified use of recreation.

> Value exceeds the count range for the Colilert Method.

[d] The lab used a 1:10 dilution of the original sample.

b. Middle Tennessee

Middle Tennessee also had 13 sites (43%) that failed to meet criteria for recreation (Figure 5). The geomeans were above the criterion at ten sites. Sites in middle Tennessee were more likely to have individual samples exceed criteria. Three sites had geomeans within the criterion but had individual samples exceeding 941 CFU (Table 2). Two sites exceeded pathogen criteria for both recreation and fish and aquatic life. Only seven percent of samples (two sites, both in the Western Highland Rim in Wayne County) had very low bacteria levels with geomeans less than 10.

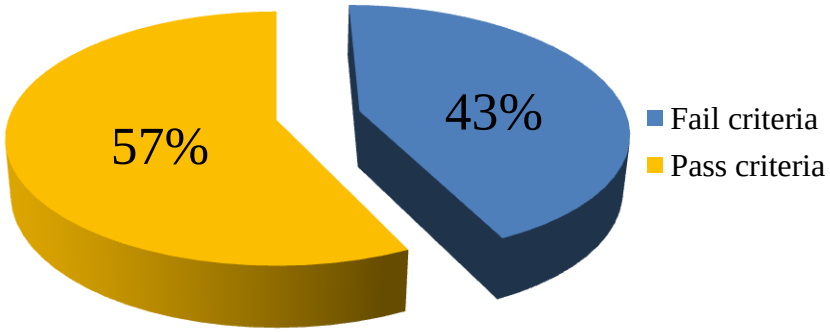

Figure 5: Comparison of middle Tennessee probabilistic data to *E. coli* water quality criteria for recreation.

West Fork Hickory Creek in Coffee County had the highest single value for *E. coli* in the middle division. It was the only site in middle TN that had a sample above the count range for the Colilert method without a dilution.

Photo provided by Columbia Environmental Field Office.

Table 2: Middle Tennessee *E. coli* geomeans and highest individual values.

Division	Station ID	Ecoregion	*E. Coli* Geomean	Highest *E. coli* Value	Number of *E. coli* Samples
Middle	BSPRI003.9CH	71f	795*	1986*	5
	WFHICK007.0CE	71g	725*	>2420*	5
	MILLE007.3RN	71e	520*	1986*	5
	WFRED010.7MT	71e	406*	687	5
	LBART006.5DI	71f	354*	1120*	5
	ROBIN000.6FR	71f	284*	1986*	4+
	SULPH036.0RN	71e	245*	488	5
	TRACE003.5CY	71g	208*	914	5
	SHARP014.4WI	71f	145*	411	5
	CFORK003.4SR	71g	137*	248	5
	RUTHE007.4MY	71h	125	261	5
	SCAMP008.3SR	71h	114	1553*	5
	WATSO002.3WI	71h	112	261	5
	BEAGL008.3OV	71g	108	1203*	5
	WELLS007.6HO	71f	96	201	5
	DIXON000.4LW	71f	94	1300*	5
	SCOTT000.9DA	71h	90	210	5
	SPRIN009.0WS	71i	82	228	4+
	LONG004.9MA	71g	75	190	5
	WHITE013.5HU	71f	71	153	5
	CATHE001.5MY	71h	64	308	5
	PRUN000.1GS	71h	55	178	5
	CANE004.5VA	71h	46	132	5
	TUMBL003.8HU	71f	35	97	5
	CHISH015.4LW	71f	34	93	5
	DRAKE011.8SR	71h	23	47	5
	NFLICK002.0PE	71f	18	65	5
	BRUSH001.1LS	71f	16	127	5
	BUNDR000.6WE	71f	8	30	5
	GREEN016.2WE	71f	2	36	5

* Value exceeds the general water quality criteria 1200-4-3 for the classified use of recreation.

\> Value exceeds the count range for the Colilert Method.

+ Geomean calculated from 4 samples due to lack of flow.

c. East Tennessee

East Tennessee had an equal number of sites passing and failing criteria, however two sites (seven percent) were not sampled due to lack of flow (Figure 6). The geomeans were above the criterion at 14 of the WSA streams. Eight of these streams also had pathogen levels above the 941 CFU criterion for a single sample (Table 3).

The most variability between sites was seen in this division. Although more streams failed criteria in this division, this area of the state also had the most streams with extremely low levels of bacteria. Horse Creek in Greene County had the lowest levels in the state with no *E coli* found in any sample. Twenty percent of the streams had geomeans less than ten. All of these were in the Blue Ridge Mountains with the exception of Laurel Creek in the Cumberland Plateau.

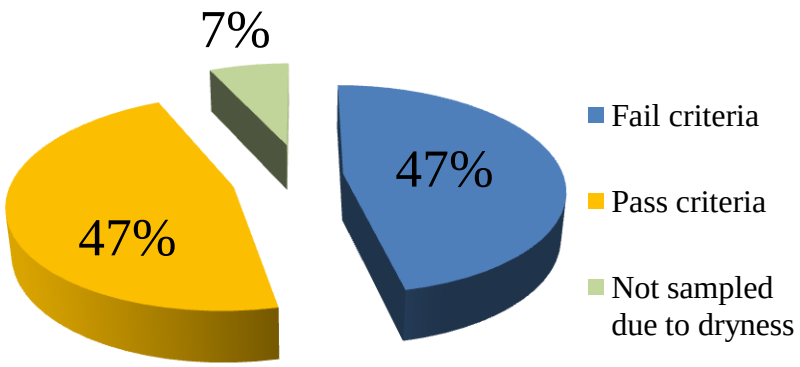

Figure 6: Comparison of east Tennessee probabilistic data to *E. coli* water quality criteria for recreation.

Horse Creek in the Blue Ridge Mountains had the lowest *E. coli* levels in the state.

Photo provided by Johnson City Field Office.

Table 3: East Tennessee *E. coli* geomeans and highest individual values.

Division	Station ID	Ecoregion	*E. Coli* Geomean	Highest *E. coli* Value	Number of *E. coli* Samples
EAST	FALL003.2HA	67f	2325*	>2419*	5
	GRASS005.1GE	67f	1650*	17850*[d]	5
	CANDI033.1BR	67g	1268*	>2419*	5
	CLEAR001.3GE	67f	988*	1414*	5
	GAMMO000.7SU	67f	859*	>2420*	5
	SEQUA101.2BL	68b	403*	1986*	5
	FALL001.5UN	67f	344*	649	5
	CANDI017.1BR	67f	285*	770	5
	GAP000.1CT	67f	229*	2590*[d]	5
	BFLAT018.0UN	67f	218*	1553*	5
	RIPLE001.5GE	67f	215*	411	5
	COVE003.8SV	66g	212*	365	5
	SINKI003.0CO	67g	183*	613	5
	MIDDL001.2SV	67g	132*	345	5
	TOWEE005.9PO	66g	119	326	5
	BEAVE008.9KN	67f	103	435	5
	EFPOP007.3RO	67f	97	141	5
	BYRD001.5HS	67f	49	111	5
	POPLA000.1MG	69d	30	61	5
	INDIA003.7GR	67f	26	47	5
	HICK008.4CA	69e	15	40	5
	LAURE006.3JO	66e	12	52	5
	CORN002.5JO	66f	5	38	5
	TELLI040.5MO	66g	5	38	5
	COSBY012.2CO	66g	1	2	5
	LAURE002.5GY	68a	1	3	5
	BIRCH000.6JO	66e	<1	<1	5
	HORSE007.0GE	66e	<1	<1	5
	OTOWN008.9CL	69e	DRY		
	TITUS1T0.1CA	69e	DRY		

* Value exceeds the general water quality criteria 1200-4-3 for the classified use of recreation.

\> Value exceeds the count range for the Colilert Method.

[d] The lab used a 1:10 dilution of the original sample.

3. TARGETED VS. PROBABILISTIC PATHOGEN MONITORING

During the WSA pathogen monitoring period (July to November 2007), *E. coli* samples were collected at 208 streams as part of the WPC's regular targeted monitoring program (Table 4). Some streams had more than one station. There were 274 targeted monitoring stations during the WSA pathogen monitoring period (Table 5). Statewide, targeted monitoring results were similar to probabilistic data with 44% of sites failing to meet criteria (Figure 7). However, results were less evenly distributed across divisions. East Tennessee was the most comparable. This division also monitored approximately twice as many streams and generally had more stations on each stream. More targeted streams in middle Tennessee met criteria while targeted streams in west Tennessee were more likely to fail. Over half of the streams targeted for monitoring are already known to be impaired for pathogens.

Targeted monitoring is conducted year round. When all data collected during the July 2007 through June 2008 monitoring year are included, the number of streams failing to meet criteria increased in middle and especially west Tennessee. These streams were more likely to exceed criteria in the spring than in the fall.

In targeted monitoring, many of the *E. coli* sites were individual samples instead of sets of five collected to calculate a geometric mean (Figure 8). Individual samples were generally collected quarterly or monthly. Only one-fourth of the targeted sites had sufficient data to calculate a geometric mean. Therefore the 941 CFU individual sample criterion was used for comparison at the majority of sites.

The number of sites sampled and the frequency of sampling varied across divisions which may account for some of the discrepancy in results. Collecting five samples within 30 days is labor-intensive and difficult to implement in a large-scale targeted monitoring program. The six hour holding time makes it difficult to collect multiple sites or combine with biological sampling or flow measurements. Often, monitoring is focused on known or suspected problem areas. According to the 2006 305(b) report on the status of water quality in Tennessee, only 25% of streams in the state have sufficient pathogen data to be assessed for recreation (Denton et al, 2006). Thirty six percent of assessed stream miles are considered impaired by pathogens. This is substantially lower than indicated by probabilistic monitoring. Note: although the 2008 305(b) report has been published, it includes data from the probabilistic study and is not an appropriate comparison.

The addition of probabilistic bacteriological monitoring to the targeted program would help equalize effort between divisions and allow for statewide trend analyses. It would enable a broader range of streams to be assessed and help locate unsuspected problem areas. However, targeted monitoring would remain necessary on streams known to be impaired. Based on the targeted monitoring data, to be most effective, probabilistic monitoring may need to be conducted in two seasons (high and low flow).

Table 4: Summary of *E. coli* data collected at targeted monitoring streams for July 2007 through June 2008.

Region	No. of streams July-Nov 2007	No. of streams failing criteria July-Nov 2007	No. of streams July 07-June 08	No. of streams failing criteria July 07-June 08
West	49	24	52	39
Middle	54	14	58	21
East	105	54	119	58
Total	208	92	219	118

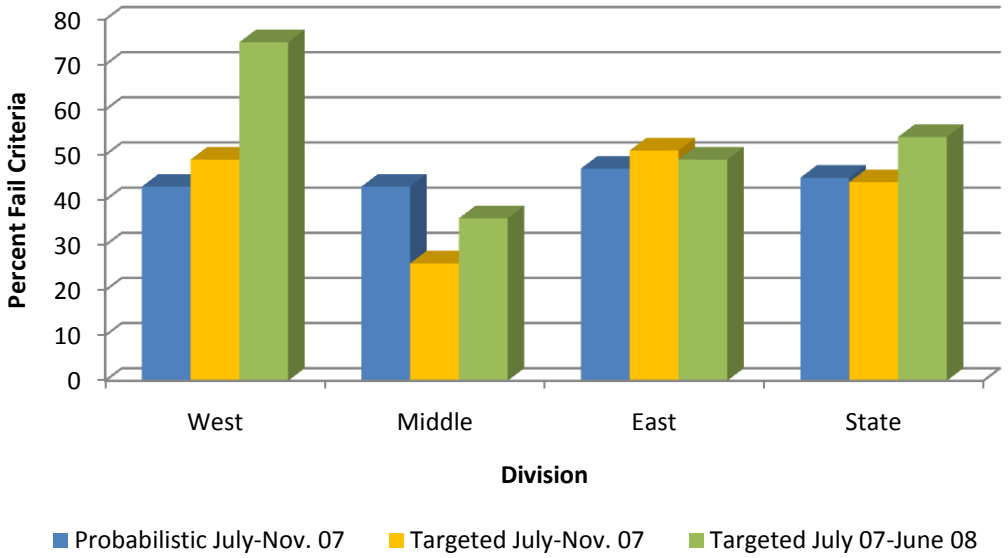

Figure 7: Comparison of probabilistic and targeted *E. coli* data in 2007. Targeted data is based on number of streams and may include multiple stations. Over half of targeted streams are on known impaired waters.

Table 5: Number of targeted monitoring stations for July 2007 through June 2008. Individual stations may include multiple samples. Geomean stations indicate that a minimum of five samples were collected within 30 days although additional samples may also have been collected.

Region	Total no. of stations July-Nov 2007	No. of geomean stations July-Nov 2007	Total no. of stations July 07–June 08	No. of geomean stations July 07-June 08
West	69	5	71	16
Middle	71	13	79	17
East	134	36	147	44
Total	274	54	297	77

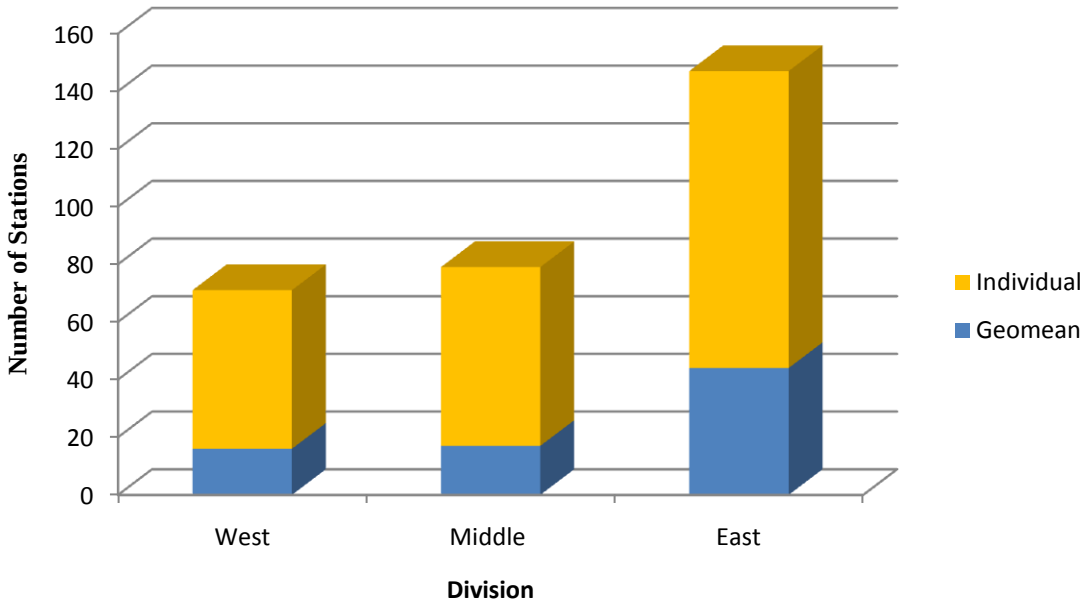

Figure 8: Number and type of targeted *E. coli* stations collected July 2007 through June 2008. Individual stations may include multiple samples. Geomean stations indicate that a minimum of five samples were collected within 30 days although additional samples may also have been collected.

Drought conditions prevented bacteriological sampling of Old Town Creek in East Tennessee.

Photo provided by Knoxville Environmental Field Office.

4. SUMMARY

The results of the probabilistic monitoring for pathogens show that about 45% of the streams sampled exceeded Tennessee's recreation criteria. It is important to note that the criteria for recreation are the most stringent of all the classified uses.

The three divisions of the state had about the same number of streams with elevated pathogens, although East Tennessee had a slightly higher percentage of streams failing to meet criteria. West Tennessee tended to have the highest concentrations of *E. coli* and middle Tennessee generally had the lowest. The middle division also had the fewest number of individual samples with an unacceptable concentration of *E. coli.*

Statewide, targeted monitoring results were similar to probabilistic data with 45% of sites failing to meet criteria. However, results were less evenly distributed across divisions. East Tennessee was the most comparable. In this division we also monitored over twice as many streams and generally had more stations on each stream. More targeted streams in middle Tennessee met criteria while targeted streams in west Tennessee were more likely to fail.

Targeted pathogen monitoring efforts in the past have not been as consistent as the WSA project as far the number of samples collected at each site, especially getting five in the time frame needed for geomean calculations. Due to the number of samples and a short holding time it is not feasible to monitor pathogens at a high percentage of streams. Targeted monitoring generally focuses on known problem areas.

A probabilistic monitoring approach allows the division to put a much more consistent amount of effort into the repeated sampling of a broader cross-section of streams, resulting in a better understanding of pathogen levels across the state. This approach also allows for trend analysis. However, targeted sampling is necessary to monitor impaired waters.

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APPENDIX A

E. coli Data for the Wadeable Streams Sites

(Station location information is provided in volume 2 of this report series)

Table A-1: *E. coli* Data for the Wadeable Streams Sites

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
BEAGL008.3OV	Middle	71g	05130105	10-09-2007	1203	108
BEAGL008.3OV	Middle	71g	05130105	10-10-2007	167	
BEAGL008.3OV	Middle	71g	05130105	10-11-2007	62	
BEAGL008.3OV	Middle	71g	05130105	10-15-2007	31	
BEAGL008.3OV	Middle	71g	05130105	10-16-2007	38	
BEAR002.1WY	West	65e	08010203	07-30-2007	122	131
BEAR002.1WY	West	65e	08010203	07-31-2007	252	
BEAR002.1WY	West	65e	08010203	08-02-2007	34	
BEAR002.1WY	West	65e	08010203	08-06-2007	273	
BEAR002.1WY	West	65e	08010203	08-07-2007	135	
BEAVE008.9KN	East	67F	06010207	07-31-2007	435	103
BEAVE008.9KN	East	67F	06010207	08-07-2007	61	
BEAVE008.9KN	East	67F	06010207	08-13-2007	93	
BEAVE008.9KN	East	67F	06010207	08-21-2007	56	
BEAVE008.9KN	East	67F	06010207	08-28-2007	84	
BFLAT018.0UN	East	67F	06010104	09-05-2007	365	218
BFLAT018.0UN	East	67F	06010104	09-12-2007	93	
BFLAT018.0UN	East	67F	06010104	09-17-2007	81	
BFLAT018.0UN	East	67F	06010104	09-25-2007	114	
BFLAT018.0UN	East	67F	06010104	10-03-2007	1553	
BIRCH000.6JO	East	66e	06010102	09-19-2007	<1	<1
BIRCH000.6JO	East	66e	06010102	09-25-2007	<1	
BIRCH000.6JO	East	66e	06010102	10-03-2007	<1	
BIRCH000.6JO	East	66e	06010102	10-09-2007	<1	
BIRCH000.6JO	East	66e	06010102	10-11-2007	<1	
BIRDS012.3BN	West	65e	06040005	07-17-2007	32	18
BIRDS012.3BN	West	65e	06040005	07-18-2007	30	
BIRDS012.3BN	West	65e	06040005	07-19-2007	14	
BIRDS012.3BN	West	65e	06040005	07-23-2007	12	
BIRDS012.3BN	West	65e	06040005	07-24-2007	13	
BRUSH001.1LS	Middle	71f	06040004	09-26-2007	6	16
BRUSH001.1LS	Middle	71f	06040004	10-03-2007	12	
BRUSH001.1LS	Middle	71f	06040004	10-04-2007	11	
BRUSH001.1LS	Middle	71f	06040004	10-08-2007	127	
BRUSH001.1LS	Middle	71f	06040004	10-09-2007	10	
BSPRI003.9CH	Middle	71f	05130202	08-08-2007	980	795
BSPRI003.9CH	Middle	71f	05130202	08-16-2007	365	
BSPRI003.9CH	Middle	71f	05130202	08-20-2007	579	
BSPRI003.9CH	Middle	71f	05130202	08-28-2007	770	
BSPRI003.9CH	Middle	71f	05130202	08-30-2007	1986	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
BUNDR000.6WE	Middle	71f	06040001	09-26-2007	5	
BUNDR000.6WE	Middle	71f	06040001	10-03-2007	1	
BUNDR000.6WE	Middle	71f	06040001	10-04-2007	12	8
BUNDR000.6WE	Middle	71f	06040001	10-08-2007	30	
BUNDR000.6WE	Middle	71f	06040001	10-09-2007	22	
BYRD001.5HS	East	67f	06010205	09-18-2007	111	
BYRD001.5HS	East	67f	06010205	09-24-2007	79	
BYRD001.5HS	East	67f	06010205	10-02-2007	23	49
BYRD001.5HS	East	67f	06010205	10-08-2007	38	
BYRD001.5HS	East	67f	06010205	10-10-2007	38	
CANDI017.1BR	East	67F	06020002	09-18-2007	194	
CANDI017.1BR	East	67F	06020002	09-25-2007	248	
CANDI017.1BR	East	67F	06020002	10-03-2007	770	285
CANDI017.1BR	East	67F	06020002	10-10-2007	330	
CANDI017.1BR	East	67F	06020002	10-15-2007	155	
CANDI033.1BR	East	67G	06020002	09-18-2007	727	
CANDI033.1BR	East	67G	06020002	09-25-2007	2419	
CANDI033.1BR	East	67G	06020002	10-03-2007	1483.5	1268
CANDI033.1BR	East	67G	06020002	10-10-2007	1203	
CANDI033.1BR	East	67G	06020002	10-15-2007	1046	
CANE001.4SH	West	74b	08010211	08-07-2007	14	
CANE001.4SH	West	74b	08010211	08-14-2007	411	
CANE001.4SH	West	74b	08010211	08-21-2007	>2420	301
CANE001.4SH	West	74b	08010211	08-28-2007	3873	
CANE001.4SH	West	74b	08010211	09-04-2007	46	
CANE004.5VA	Middle	71H	05130108	10-09-2007	91	
CANE004.5VA	Middle	71H	05130108	10-10-2007	53	
CANE004.5VA	Middle	71H	05130108	10-11-2007	132	46
CANE004.5VA	Middle	71H	05130108	10-15-2007	28	
CANE004.5VA	Middle	71H	05130108	10-16-2007	12	
CATHE001.5MY	Middle	71h	06040003	10-04-2007	82	
CATHE001.5MY	Middle	71h	06040003	10-08-2007	4	
CATHE001.5MY	Middle	71h	06040003	10-10-2007	93	64
CATHE001.5MY	Middle	71h	06040003	10-15-2007	113	
CATHE001.5MY	Middle	71h	06040003	10-17-2007	308	
CFORK003.4SR	Middle	71g	05110002	08-08-2007	236	
CFORK003.4SR	Middle	71g	05110002	08-16-2007	88	
CFORK003.4SR	Middle	71g	05110002	08-20-2007	99	137
CFORK003.4SR	Middle	71g	05110002	08-28-2007	96	
CFORK003.4SR	Middle	71g	05110002	08-30-2007	248	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
CHISH015.4LW	Middle	71f	06030005	10-04-2007	16	34
CHISH015.4LW	Middle	71f	06030005	10-08-2007	31	
CHISH015.4LW	Middle	71f	06030005	10-10-2007	38	
CHISH015.4LW	Middle	71f	06030005	10-15-2007	27	
CHISH015.4LW	Middle	71f	06030005	10-17-2007	93	
CLEAR001.3GE	East	67F	06010108	09-18-2007	1209.5	988
CLEAR001.3GE	East	67F	06010108	09-24-2007	1414	
CLEAR001.3GE	East	67F	06010108	10-02-2007	1300	
CLEAR001.3GE	East	67F	06010108	10-08-2007	488	
CLEAR001.3GE	East	67F	06010108	10-10-2007	866	
CLOVE1T0.5OB	West	74A	08010202	07-16-2007	61	41
CLOVE1T0.5OB	West	74A	08010202	07-17-2007	77	
CLOVE1T0.5OB	West	74A	08010202	07-19-2007	58	
CLOVE1T0.5OB	West	74A	08010202	07-23-2007	11	
CLOVE1T0.5OB	West	74A	08010202	07-24-2007	40	
COLD006.3LE	West	74a	08010100	07-02-2007	>24192	15728
COLD006.3LE	West	74a	08010100	07-05-2007	290900	
COLD006.3LE	West	74a	08010100	07-09-2007	10140	
COLD006.3LE	West	74a	08010100	07-10-2007	8164	
COLD006.3LE	West	74a	08010100	07-11-2007	19863	
CORN002.5JO	East	66f	06010103	09-19-2007	38	5
CORN002.5JO	East	66f	06010103	09-25-2007	6	
CORN002.5JO	East	66f	06010103	10-03-2007	7	
CORN002.5JO	East	66f	06010103	10-09-2007	1	
CORN002.5JO	East	66f	06010103	10-11-2007	3	
COSBY012.2CO	East	66G	06010106	09-04-2007	1	1
COSBY012.2CO	East	66G	06010106	09-11-2007	1	
COSBY012.2CO	East	66G	06010106	09-18-2007	<1	
COSBY012.2CO	East	66G	06010106	09-20-2007	<1	
COSBY012.2CO	East	66G	06010106	09-25-2007	2	
COVE003.8SV	East	66g	06010107	09-04-2007	105	212
COVE003.8SV	East	66g	06010107	09-11-2007	326	
COVE003.8SV	East	66g	06010107	09-18-2007	179	
COVE003.8SV	East	66g	06010107	09-20-2007	365	
COVE003.8SV	East	66g	06010107	09-25-2007	192	
CROOK005.0MC	West	65e	08010207	08-20-2007	165.5	80
CROOK005.0MC	West	65e	08010207	08-21-2007	55.5	
CROOK005.0MC	West	65e	08010207	08-23-2007	151	
CROOK005.0MC	West	65e	08010207	09-13-2007	51	
CROOK005.0MC	West	65e	08010207	09-17-2007	45	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
CYPRE002.1CK	West	74b	08010204	07-02-2007	1203	
CYPRE002.1CK	West	74b	08010204	07-09-2007	37	
CYPRE002.1CK	West	74b	08010204	07-11-2007	1986	462
CYPRE002.1CK	West	74b	08010204	07-12-2007	435	
CYPRE002.1CK	West	74b	08010204	07-16-2007	548	
CYPRE005.9OB	West	74b	08010202	07-16-2007	36	
CYPRE005.9OB	West	74b	08010202	07-19-2007	133	
CYPRE005.9OB	West	74b	08010202	07-23-2007	34	95
CYPRE005.9OB	West	74b	08010202	07-24-2007	260	
CYPRE005.9OB	West	74b	08010202	07-30-2007	179	
CYPRE023.8MC	West	65e	08010205	08-20-2007	1	
CYPRE023.8MC	West	65e	08010205	08-21-2007	<1	
CYPRE023.8MC	West	65e	08010205	08-23-2007	1	1
CYPRE023.8MC	West	65e	08010205	08-27-2007	3.5	
CYPRE023.8MC	West	65e	08010205	08-28-2007	3	
DIXON000.4LW	Middle	71F	06030005	10-04-2007	1300	
DIXON000.4LW	Middle	71F	06030005	10-08-2007	23	
DIXON000.4LW	Middle	71F	06030005	10-10-2007	66.5	94
DIXON000.4LW	Middle	71F	06030005	10-15-2007	60	
DIXON000.4LW	Middle	71F	06030005	10-17-2007	62	
DRAKE011.8SR	Middle	71H	05130201	08-09-2007	16	
DRAKE011.8SR	Middle	71H	05130201	08-16-2007	12	
DRAKE011.8SR	Middle	71H	05130201	08-20-2007	21	23
DRAKE011.8SR	Middle	71H	05130201	08-28-2007	47	
DRAKE011.8SR	Middle	71H	05130201	08-30-2007	31	
EFPOP007.3RO	East	67f	06010207	07-31-2007	141	
EFPOP007.3RO	East	67f	06010207	08-07-2007	101	
EFPOP007.3RO	East	67f	06010207	08-13-2007	72	97
EFPOP007.3RO	East	67f	06010207	08-21-2007	60	
EFPOP007.3RO	East	67f	06010207	08-28-2007	140	
FALL001.5UN	East	67F	06010205	09-05-2007	99	
FALL001.5UN	East	67F	06010205	09-12-2007	649	
FALL001.5UN	East	67F	06010205	09-17-2007	474.5	344
FALL001.5UN	East	67F	06010205	09-25-2007	649	
FALL001.5UN	East	67F	06010205	10-03-2007	243.5	
FALL003.2HA	East	67f	06010104	09-05-2007	>2419	
FALL003.2HA	East	67f	06010104	09-12-2007	2419	
FALL003.2HA	East	67f	06010104	09-17-2007	1986	2325
FALL003.2HA	East	67f	06010104	09-25-2007	2419	
FALL003.2HA	East	67f	06010104	10-03-2007	2419	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
GAMMO000.7SU	East	67F	06010102	09-18-2007	344	859
GAMMO000.7SU	East	67F	06010102	09-24-2007	1414	
GAMMO000.7SU	East	67F	06010102	10-02-2007	2419	
GAMMO000.7SU	East	67F	06010102	10-08-2007	687	
GAMMO000.7SU	East	67F	06010102	10-10-2007	579	
GAP000.1CT	East	67f	06010103	09-19-2007	150	229
GAP000.1CT	East	67f	06010103	09-25-2007	238	
GAP000.1CT	East	67f	06010103	10-03-2007	99	
GAP000.1CT	East	67f	06010103	10-09-2007	488	
GAP000.1CT	East	67f	06010103	10-11-2007	365	
GRASS005.1GE	East	67f	06010108	09-18-2007	2419	1650
GRASS005.1GE	East	67f	06010108	09-24-2007	17850	
GRASS005.1GE	East	67f	06010108	10-02-2007	1120	
GRASS005.1GE	East	67f	06010108	10-08-2007	518	
GRASS005.1GE	East	67f	06010108	10-10-2007	488	
GREEN016.2WE	Middle	71f	06040004	09-26-2007	4	2
GREEN016.2WE	Middle	71f	06040004	10-03-2007	<1	
GREEN016.2WE	Middle	71f	06040004	10-04-2007	1	
GREEN016.2WE	Middle	71f	06040004	10-08-2007	36	
GREEN016.2WE	Middle	71f	06040004	10-09-2007	1	
HALLS001.7LE	West	74b	08010205	07-02-2007	816	65
HALLS001.7LE	West	74b	08010205	07-09-2007	59	
HALLS001.7LE	West	74b	08010205	07-10-2007	17	
HALLS001.7LE	West	74b	08010205	07-11-2007	31	
HALLS001.7LE	West	74b	08010205	07-12-2007	47	
HAWKI002.1CR	West	65e	08010203	07-17-2007	17	81
HAWKI002.1CR	West	65e	08010203	07-18-2007	26	
HAWKI002.1CR	West	65e	08010203	07-19-2007	>2420	
HAWKI002.1CR	West	65e	08010203	07-23-2007	72	
HAWKI002.1CR	West	65e	08010203	07-24-2007	46	
HAYES003.3HR	West	65e	08010208	11-05-2007	88	205
HAYES003.3HR	West	65e	08010208	11-06-2007	128	
HAYES003.3HR	West	65e	08010208	11-07-2007	32	
HAYES003.3HR	West	65e	08010208	11-08-2007	411	
HAYES003.3HR	West	65e	08010208	11-14-2007	>2420	
HICKO008.4CA	East	69E	05130101	10-03-2007	14	15
HICKO008.4CA	East	69E	05130101	10-08-2007	12	
HICKO008.4CA	East	69E	05130101	10-15-2007	12	
HICKO008.4CA	East	69E	05130101	10-22-2007	40	
HICKO008.4CA	East	69E	05130101	10-29-2007	10	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
HORSE007.0GE	East	66E	06010108	09-18-2007	<1	
HORSE007.0GE	East	66E	06010108	09-24-2007	<1	
HORSE007.0GE	East	66E	06010108	10-02-2007	<1	1
HORSE007.0GE	East	66E	06010108	10-08-2007	<1	
HORSE007.0GE	East	66E	06010108	10-10-2007	<1	
HROCK002.4CR	West	65E	06040005	07-30-2007	25	
HROCK002.4CR	West	65E	06040005	07-31-2007	69	
HROCK002.4CR	West	65E	06040005	08-02-2007	57	114
HROCK002.4CR	West	65E	06040005	08-06-2007	613	
HROCK002.4CR	West	65E	06040005	08-07-2007	313	
HURRI007.4HE	West	65E	06040001	11-06-2007	35	
HURRI007.4HE	West	65E	06040001	11-07-2007	9	
HURRI007.4HE	West	65E	06040001	11-08-2007	5	34
HURRI007.4HE	West	65E	06040001	11-14-2007	42	
HURRI007.4HE	West	65E	06040001	11-15-2007	649	
HYDE002.7LE	West	74b	08010208	07-02-2007	649	
HYDE002.7LE	West	74b	08010208	07-05-2007	46	
HYDE002.7LE	West	74b	08010208	07-09-2007	22	103
HYDE002.7LE	West	74b	08010208	07-10-2007	62	
HYDE002.7LE	West	74b	08010208	07-11-2007	291	
INDIA003.7GR	East	67F	06010205	11-08-2007	23	
INDIA003.7GR	East	67F	06010205	11-13-2007	47	
INDIA003.7GR	East	67F	06010205	11-14-2007	32	26
INDIA003.7GR	East	67F	06010205	11-19-2007	14	
INDIA003.7GR	East	67F	06010205	12-03-2007	25	
KERR000.4HD	West	65J	06040001	08-07-2007	504.5	
KERR000.4HD	West	65J	06040001	08-08-2007	77.5	
KERR000.4HD	West	65J	06040001	08-09-2007	1414	379
KERR000.4HD	West	65J	06040001	08-13-2007	1986	
KERR000.4HD	West	65J	06040001	08-14-2007	71.5	
LAURE002.5GY	East	68A	05130108	04-30-2008	<1	
LAURE002.5GY	East	68A	05130108	05-06-2008	<1	
LAURE002.5GY	East	68A	05130108	05-08-2008	1	1
LAURE002.5GY	East	68A	05130108	05-13-2008	<1	
LAURE002.5GY	East	68A	05130108	05-15-2008	3	
LAURE006.3JO	East	66E	06010102	11-07-2007	11	
LAURE006.3JO	East	66E	06010102	11-13-2007	8	
LAURE006.3JO	East	66E	06010102	11-19-2007	12	12
LAURE006.3JO	East	66E	06010102	11-27-2007	52	
LAURE006.3JO	East	66E	06010102	11-28-2007	5	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
LBART006.5DI	Middle	71f	05130205	08-06-2007	236	
LBART006.5DI	Middle	71f	05130205	08-14-2007	238	
LBART006.5DI	Middle	71f	05130205	08-15-2007	162	354
LBART006.5DI	Middle	71f	05130205	08-21-2007	548	
LBART006.5DI	Middle	71f	05130205	08-28-2007	1120	
LONG004.9MA	Middle	71g	05110002	10-09-2007	190	
LONG004.9MA	Middle	71g	05110002	10-10-2007	79	
LONG004.9MA	Middle	71g	05110002	10-11-2007	68	75
LONG004.9MA	Middle	71g	05110002	10-15-2007	48	
LONG004.9MA	Middle	71g	05110002	10-16-2007	47	
MFORK1T1.5HE	West	65e	08010205	07-17-2007	291	
MFORK1T1.5HE	West	65e	08010205	07-18-2007	173	
MFORK1T1.5HE	West	65e	08010205	07-19-2007	228	203
MFORK1T1.5HE	West	65e	08010205	07-23-2007	184	
MFORK1T1.5HE	West	65e	08010205	07-24-2007	162	
MIDDL001.2SV	East	67G	06010107	09-04-2007	145	
MIDDL001.2SV	East	67G	06010107	09-11-2007	345	
MIDDL001.2SV	East	67G	06010107	09-18-2007	64	132
MIDDL001.2SV	East	67G	06010107	09-20-2007	79	
MIDDL001.2SV	East	67G	06010107	09-25-2007	157	
MILLE007.3RN	Middle	71E	05130206	08-08-2007	147	
MILLE007.3RN	Middle	71E	05130206	08-16-2007	770	
MILLE007.3RN	Middle	71E	05130206	08-20-2007	488	520
MILLE007.3RN	Middle	71E	05130206	08-28-2007	345	
MILLE007.3RN	Middle	71E	05130206	08-30-2007	1986	
NFLIC002.0PE	Middle	71f	06040001	09-26-2007	11	
NFLIC002.0PE	Middle	71f	06040001	10-03-2007	48	
NFLIC002.0PE	Middle	71f	06040001	10-04-2007	25	18
NFLIC002.0PE	Middle	71f	06040001	10-08-2007	65	
NFLIC002.0PE	Middle	71f	06040001	10-09-2007	2	
NREEL000.4OB	West	74a	08010202	07-16-2007	261	
NREEL000.4OB	West	74a	08010202	07-17-2007	194	
NREEL000.4OB	West	74a	08010202	07-19-2007	61	171
NREEL000.4OB	West	74a	08010202	07-23-2007	161	
NREEL000.4OB	West	74a	08010202	07-24-2007	291	
OWL003.7HD	West	65e	06040001	08-20-2007	33	
OWL003.7HD	West	65e	06040001	08-21-2007	3	
OWL003.7HD	West	65e	06040001	08-23-2007	2	6
OWL003.7HD	West	65e	06040001	08-27-2007	11	
OWL003.7HD	West	65e	06040001	08-28-2007	3	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
POND013.8CK	West	74b	08010205	07-09-2007	112	79
POND013.8CK	West	74b	08010205	07-10-2007	26	
POND013.8CK	West	74b	08010205	07-11-2007	866	
POND013.8CK	West	74b	08010205	07-12-2007	66	
POND013.8CK	West	74b	08010205	07-16-2007	19	
POPLA000.1MG	East	69D	06010207	07-31-2007	53	30
POPLA000.1MG	East	69D	06010207	08-07-2007	61	
POPLA000.1MG	East	69D	06010207	08-13-2007	51	
POPLA000.1MG	East	69D	06010207	08-21-2007	18	
POPLA000.1MG	East	69D	06010207	08-28-2007	8	
POPLA014.7HY	West	74b	08010208	08-06-2007	60	24
POPLA014.7HY	West	74b	08010208	08-07-2007	23	
POPLA014.7HY	West	74b	08010208	08-09-2007	5	
POPLA014.7HY	West	74b	08010208	08-13-2007	26	
POPLA014.7HY	West	74b	08010208	08-14-2007	48	
PRUN000.1GS	Middle	71h	06030004	10-09-2007	649	NA
PRUN000.1GS	Middle	71h	06030004	10-10-2007	472	NA
PRUN000.1GS	Middle	71h	06030004	10-17-2007	204.5	NA
PRUN000.1GS	Middle	71h	06030004	10-29-2007	816	NA
PRUN000.1GS	Middle	71h	06030004	10-22-2008	107	55
PRUN000.1GS	Middle	71h	06030004	11-04-2008	27	
PRUN000.1GS	Middle	71h	06030004	11-05-2008	78	
PRUN000.1GS	Middle	71h	06030004	11-18-2008	178	
PRUN000.1GS	Middle	71h	06030004	11-19-2008	13	
RIPLE001.5GE	East	67F	06010108	09-18-2007	140	215
RIPLE001.5GE	East	67F	06010108	09-24-2007	245.5	
RIPLE001.5GE	East	67F	06010108	10-02-2007	161	
RIPLE001.5GE	East	67F	06010108	10-08-2007	411	
RIPLE001.5GE	East	67F	06010108	10-10-2007	204	
ROBIN000.6FR	Middle	71f	06030003	10-09-2007	1986	284
ROBIN000.6FR	Middle	71f	06030003	10-10-2007	411	
ROBIN000.6FR	Middle	71f	06030003	10-17-2007	120	
ROBIN000.6FR	Middle	71f	06030003	10-29-2007	66	
ROSE001.3MC	West	65e	08010207	08-06-2007	1120	213
ROSE001.3MC	West	65e	08010207	08-07-2007	770	
ROSE001.3MC	West	65e	08010207	08-09-2007	53	
ROSE001.3MC	West	65e	08010207	08-13-2007	82	
ROSE001.3MC	West	65e	08010207	08-14-2007	118	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
RUTHE007.4MY	Middle	71H	06040003	10-04-2007	206	
RUTHE007.4MY	Middle	71H	06040003	10-08-2007	78	
RUTHE007.4MY	Middle	71H	06040003	10-10-2007	82	125
RUTHE007.4MY	Middle	71H	06040003	10-15-2007	87	
RUTHE007.4MY	Middle	71H	06040003	10-17-2007	261	
SCAMP008.3SR	Middle	71H	05130201	08-08-2007	93	
SCAMP008.3SR	Middle	71H	05130201	08-16-2007	84	
SCAMP008.3SR	Middle	71H	05130201	08-20-2007	31	114
SCAMP008.3SR	Middle	71H	05130201	08-28-2007	51	
SCAMP008.3SR	Middle	71H	05130201	08-30-2007	1553	
SCOTT000.9DA	Middle	71h	05130203	10-01-2007	210	
SCOTT000.9DA	Middle	71h	05130203	10-02-2007	201	
SCOTT000.9DA	Middle	71h	05130203	10-09-2007	53	90
SCOTT000.9DA	Middle	71h	05130203	10-10-2007	47	
SCOTT000.9DA	Middle	71h	05130203	10-29-2007	57	
SEQUA101.2BL	East	68b	06020004	09-12-2007	649	
SEQUA101.2BL	East	68b	06020004	09-17-2007	276	
SEQUA101.2BL	East	68b	06020004	09-20-2007	1986	403
SEQUA101.2BL	East	68b	06020004	09-24-2007	179	
SEQUA101.2BL	East	68b	06020004	10-03-2007	167	
SFCUB009.5DE	West	65e	06040001	07-17-2007	172	
SFCUB009.5DE	West	65e	06040001	07-18-2007	210	
SFCUB009.5DE	West	65e	06040001	07-19-2007	172	210
SFCUB009.5DE	West	65e	06040001	07-23-2007	219	
SFCUB009.5DE	West	65e	06040001	07-24-2007	299	
SFFDE1T0.7MN	West	65e	08010205	08-15-2007	43	
SFFDE1T0.7MN	West	65e	08010205	08-16-2007	1413	
SFFDE1T0.7MN	West	65e	08010205	08-20-2007	140	151
SFFDE1T0.7MN	West	65e	08010205	08-21-2007	326	
SFFDE1T0.7MN	West	65e	08010205	08-22-2007	28	
SFMUD003.8MC	West	65E	06040001	11-05-2007	83	
SFMUD003.8MC	West	65E	06040001	11-06-2007	44	
SFMUD003.8MC	West	65E	06040001	11-07-2007	28	69
SFMUD003.8MC	West	65E	06040001	11-08-2007	20	
SFMUD003.8MC	West	65E	06040001	11-14-2007	770	
SHARP014.4WI	Middle	71f	05130204	10-01-2007	240	
SHARP014.4WI	Middle	71f	05130204	10-02-2007	411	
SHARP014.4WI	Middle	71f	05130204	10-09-2007	133	145
SHARP014.4WI	Middle	71f	05130204	10-10-2007	61	
SHARP014.4WI	Middle	71f	05130204	10-29-2007	81	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
SINKI003.0CO	East	67G	06010106	09-04-2007	130	183
SINKI003.0CO	East	67G	06010106	09-11-2007	96	
SINKI003.0CO	East	67G	06010106	09-18-2007	613	
SINKI003.0CO	East	67G	06010106	09-20-2007	102	
SINKI003.0CO	East	67G	06010106	09-25-2007	261	
SMITH003.5HD	West	65j	06040001	08-07-2007	33	17
SMITH003.5HD	West	65j	06040001	08-08-2007	30	
SMITH003.5HD	West	65j	06040001	08-09-2007	18	
SMITH003.5HD	West	65j	06040001	08-13-2007	20	
SMITH003.5HD	West	65j	06040001	08-14-2007	4	
SPRIN009.0WS	Middle	71i	05130201	10-01-2007	24	73
SPRIN009.0WS	Middle	71i	05130201	10-02-2007	101	
SPRIN009.0WS	Middle	71i	05130201	10-09-2007	52	
SPRIN009.0WS	Middle	71i	05130201	10-29-2007	228	
STOKE004.9CK	West	74B	08010204	07-02-2007	135	96
STOKE004.9CK	West	74B	08010204	07-09-2007	99	
STOKE004.9CK	West	74B	08010204	07-10-2007	72	
STOKE004.9CK	West	74B	08010204	07-11-2007	112	
STOKE004.9CK	West	74B	08010204	07-12-2007	77	
SULPH036.0RN	Middle	71E	05130206	10-22-2007	228	245
SULPH036.0RN	Middle	71E	05130206	10-30-2007	291	
SULPH036.0RN	Middle	71E	05130206	10-31-2007	236	
SULPH036.0RN	Middle	71E	05130206	11-01-2007	488	
SULPH036.0RN	Middle	71E	05130206	11-07-2007	115	
TAR003.0CS	West	65E	08010205	08-20-2007	12	26
TAR003.0CS	West	65E	08010205	08-23-2007	36	
TAR003.0CS	West	65E	08010205	08-27-2007	46	
TAR003.0CS	West	65E	08010205	08-28-2007	22	
TAR003.0CS	West	65E	08010205	08-21-2007	29	
TELLI040.5MO	East	66G	06010204	11-06-2007	13	5
TELLI040.5MO	East	66G	06010204	11-08-2007	1	
TELLI040.5MO	East	66G	06010204	11-15-2007	45	
TELLI040.5MO	East	66G	06010204	11-27-2007	3	
TELLI040.5MO	East	66G	06010204	11-29-2007	2	
THOMP000.2WY	West	65e	08010207	07-30-2007	38	4
THOMP000.2WY	West	65e	08010207	07-31-2007	9	
THOMP000.2WY	West	65e	08010207	08-02-2007	<1	
THOMP000.2WY	West	65e	08010207	08-06-2007	2	
THOMP000.2WY	West	65e	08010207	08-07-2007	2.75	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
TISDA1T1.2LE	West	74b	08010205	07-02-2007	7701	
TISDA1T1.2LE	West	74b	08010205	07-05-2007	2755	
TISDA1T1.2LE	West	74b	08010205	07-09-2007	12997	2992
TISDA1T1.2LE	West	74b	08010205	07-10-2007	556	
TISDA1T1.2LE	West	74b	08010205	07-11-2007	1565	
TOWEE005.9PO	East	66g	06020002	09-18-2007	66	
TOWEE005.9PO	East	66g	06020002	09-25-2007	205	
TOWEE005.9PO	East	66g	06020002	10-03-2007	21	119
TOWEE005.9PO	East	66g	06020002	10-10-2007	326	
TOWEE005.9PO	East	66g	06020002	10-15-2007	261	
TRACE003.5CY	Middle	71G	05110002	09-20-2007	231	
TRACE003.5CY	Middle	71G	05110002	10-09-2007	914	
TRACE003.5CY	Middle	71G	05110002	10-10-2007	127	208
TRACE003.5CY	Middle	71G	05110002	10-11-2007	291	
TRACE003.5CY	Middle	71G	05110002	10-15-2007	50	
TUMBL003.8HU	Middle	71F	06040003	08-06-2007	28	
TUMBL003.8HU	Middle	71F	06040003	08-14-2007	15.5	
TUMBL003.8HU	Middle	71F	06040003	08-15-2007	96.5	35
TUMBL003.8HU	Middle	71F	06040003	08-21-2007	25	
TUMBL003.8HU	Middle	71F	06040003	08-28-2007	49	
WATSO002.3WI	Middle	71h	05130204	10-01-2007	140	
WATSO002.3WI	Middle	71h	05130204	10-02-2007	54	
WATSO002.3WI	Middle	71h	05130204	10-09-2007	231	112
WATSO002.3WI	Middle	71h	05130204	10-10-2007	140	
WATSO002.3WI	Middle	71h	05130204	10-29-2007	71	
WELLS007.6HO	Middle	71F	05130205	08-06-2007	51	
WELLS007.6HO	Middle	71F	05130205	08-14-2007	61	
WELLS007.6HO	Middle	71F	05130205	08-15-2007	105	96
WELLS007.6HO	Middle	71F	05130205	08-21-2007	201	
WELLS007.6HO	Middle	71F	05130205	08-28-2007	125	
WFHIC007.0CE	Middle	71G	05130107	10-09-2007	816	
WFHIC007.0CE	Middle	71G	05130107	10-10-2007	613	
WFHIC007.0CE	Middle	71G	05130107	10-23-2007	1986	724
WFHIC007.0CE	Middle	71G	05130107	10-24-2007	435	
WFHIC007.0CE	Middle	71G	05130107	10-25-2007	461	

Table A-1 Cont.

Station ID	Division	Eco-region	HUC	Date	*E. Coli* CFU	*E. coli* CFU Geomean
WFRED010.7MT	Middle	71e	05130206	08-06-2007	308	406
WFRED010.7MT	Middle	71e	05130206	08-14-2007	687	
WFRED010.7MT	Middle	71e	05130206	08-15-2007	548	
WFRED010.7MT	Middle	71e	05130206	08-21-2007	276	
WFRED010.7MT	Middle	71e	05130206	08-28-2007	344	
WHITE013.5HU	Middle	71f	06040005	08-06-2007	47	71
WHITE013.5HU	Middle	71f	06040005	08-14-2007	70	
WHITE013.5HU	Middle	71f	06040005	08-15-2007	58	
WHITE013.5HU	Middle	71f	06040005	08-21-2007	153	
WHITE013.5HU	Middle	71f	06040005	08-28-2007	61	