

2017 Mississippi River Bacteria Sampling

Summary of 2017 Data

Portions of MWMO's reach of the Mississippi River are listed on the MPCA's list of impaired waters for fecal coliform pollution. In 2008, the MPCA changed the bacteria water quality standard from fecal coliform to *E. coli* for bacteria monitoring in Minnesota. The chronic standard for *E. coli* in 2B and 2Bd waters is 126 CFU/100 mL for a monthly geomean of at least five samples. The MPCA *E. coli* acute standard states that *E. coli* cannot exceed 1,260 CFU/100mL in more than 10% of the samples taken in one month. In 2017, three river sites (MR857.6W, MR849.9W, and MR848.1W) exceeded the standard in September, as shown in Table 1. Samples were collected on the first and third Thursday of each month between April through November. Therefore, the small number of samples collected each month greatly affect these results and a monthly geomean is not calculated. Most samples were taken during baseflow conditions with the exception of two sampling dates in May and November in which samples were collected during a rain event. Figures 1-7 show the *E. coli* sample results compared to the MPCA standards and Figure 8 shows all sampling sites together. The *E. coli* sample results and other sampling parameters are presented in more detail in Tables 2-8.

Mississippi River Bacteria Data

Table 1. Sites that exceeded 1,260 MPN/100mL in >10% of samples in a given month for the Mississippi River in 2017.

Month	Sites that exceed 1,260 MPN/100 mL in > 10% of samples
April	None
May	None
June	None
July	None
August	None
September	MR857.6W, MR849.9W, MR848.1W
October	None
November	None

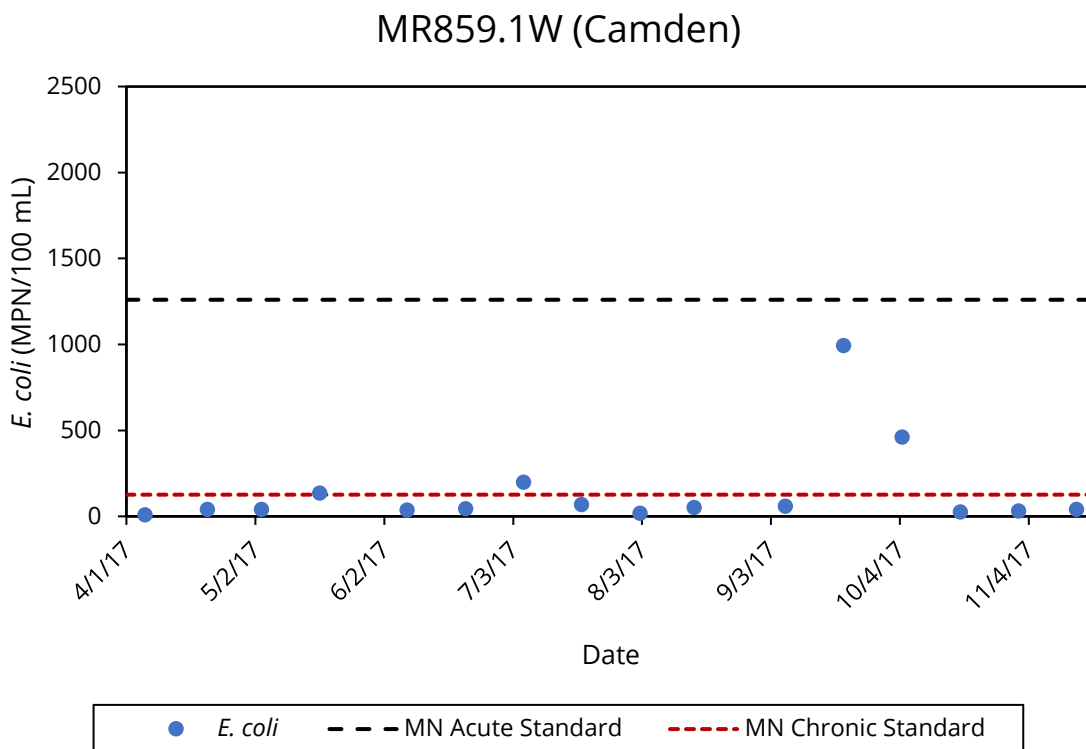


Figure 1. 2017 *E. coli* values at MR859.1W.

MR857.6W (MPRB Boat Launch)

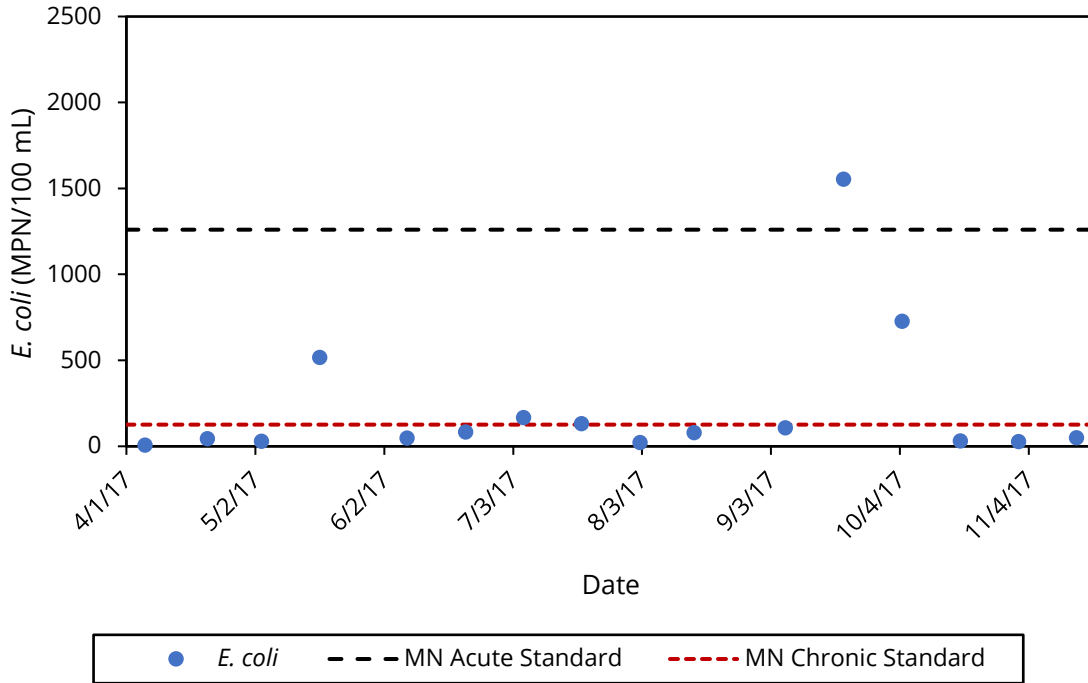


Figure 2. 2017 *E. coli* values at MR857.6W.

MR854.9W (North Loop)

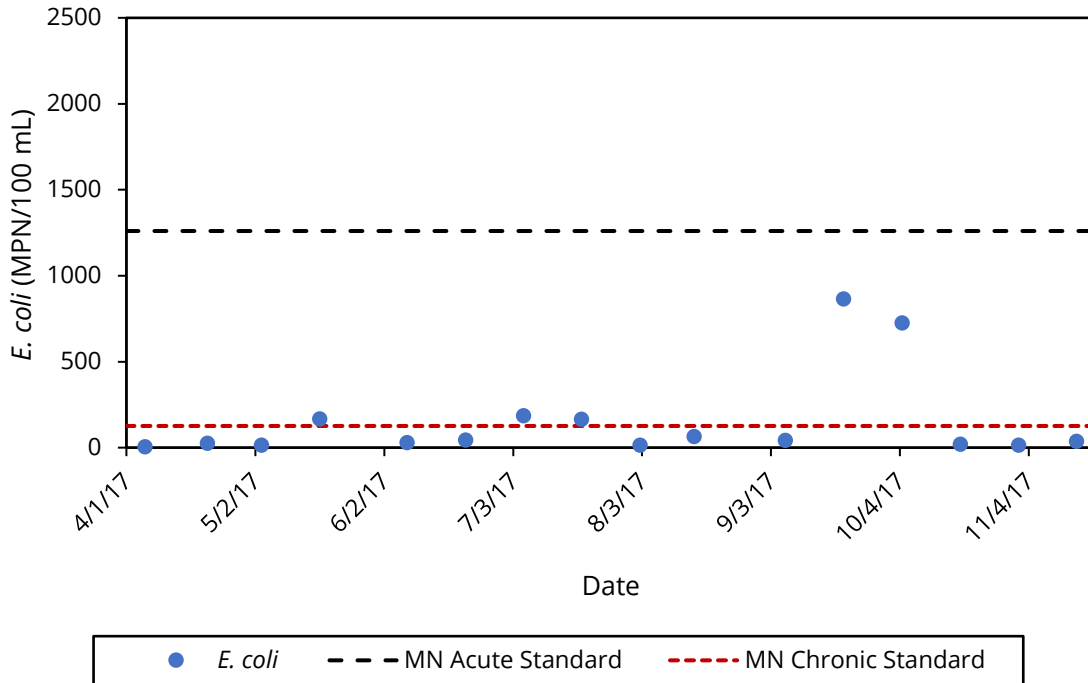


Figure 3. 2017 *E. coli* values at MR854.9W.

MR853.5E (SAFL)

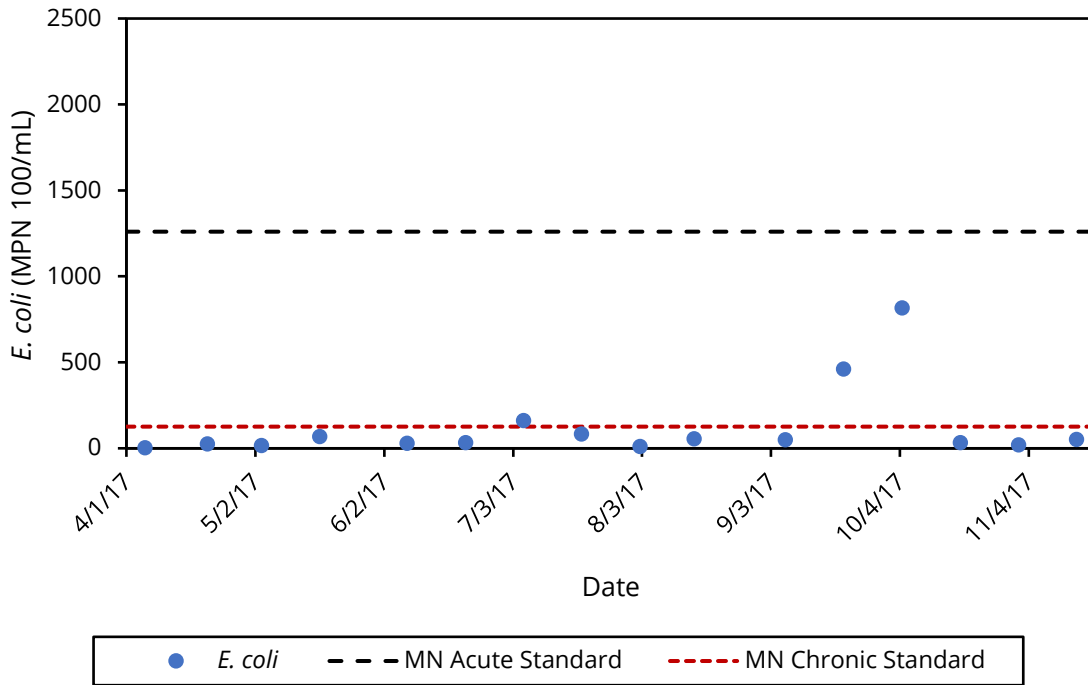


Figure 4. 2017 *E. coli* values at MR853.5E.

MR852.2E (University of Minnesota Boat Launch)

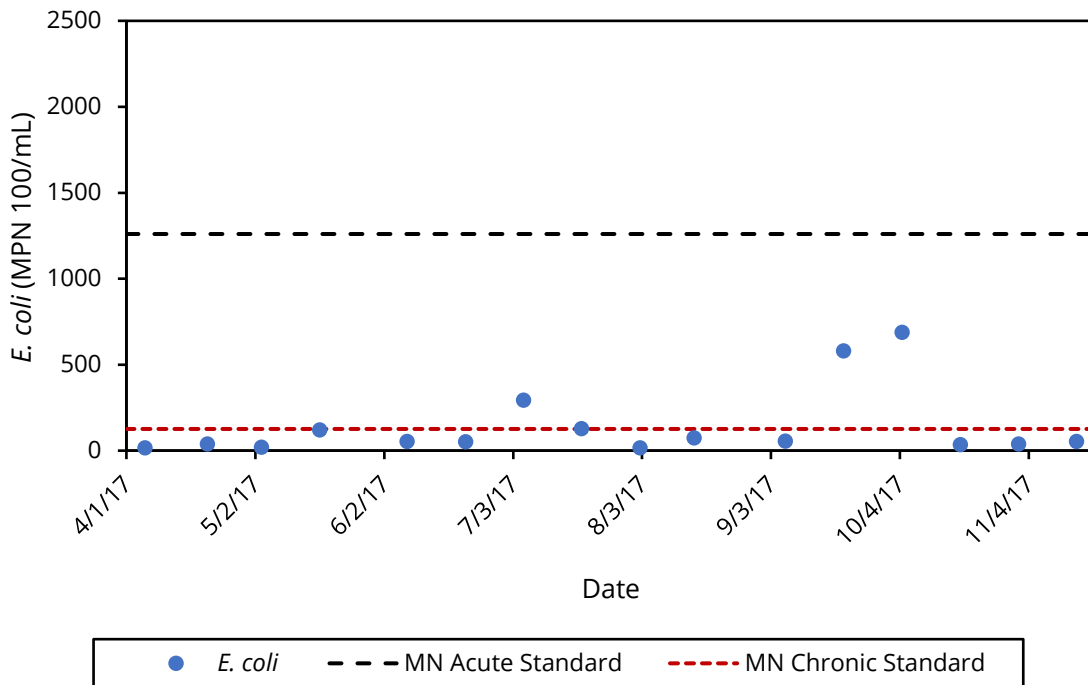


Figure 5. 2017 *E. coli* values at MR852.2E.

MR849.9W (Lake Street Bridge)

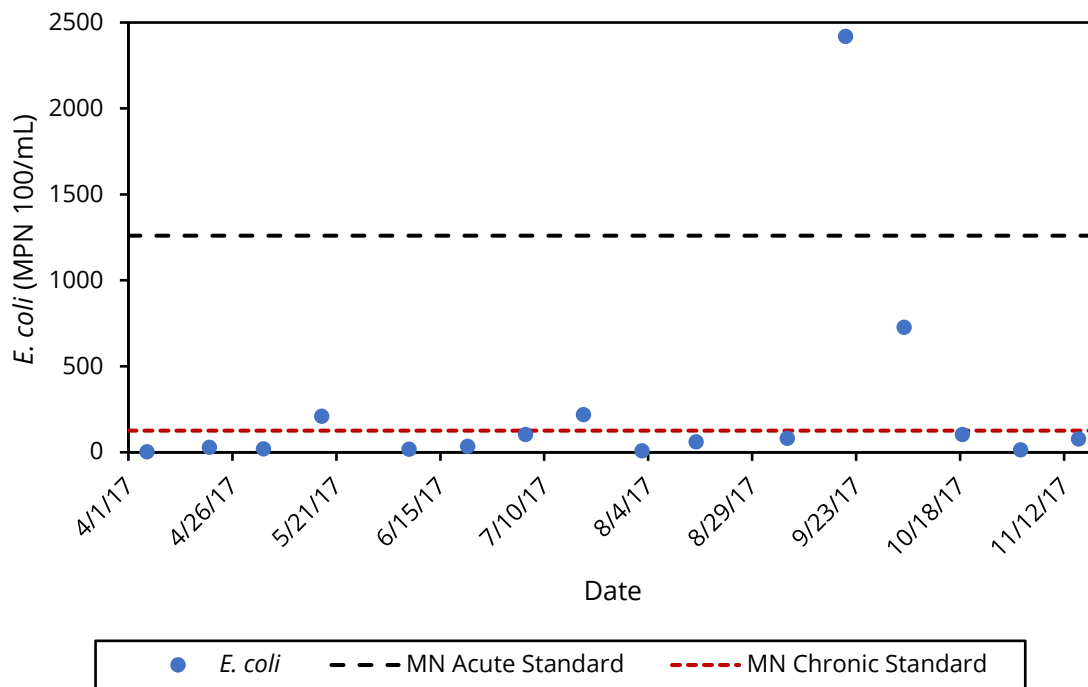


Figure 6. 2017 *E. coli* values at MR849.9W.

MR848.1W (4300 West River Parkway)

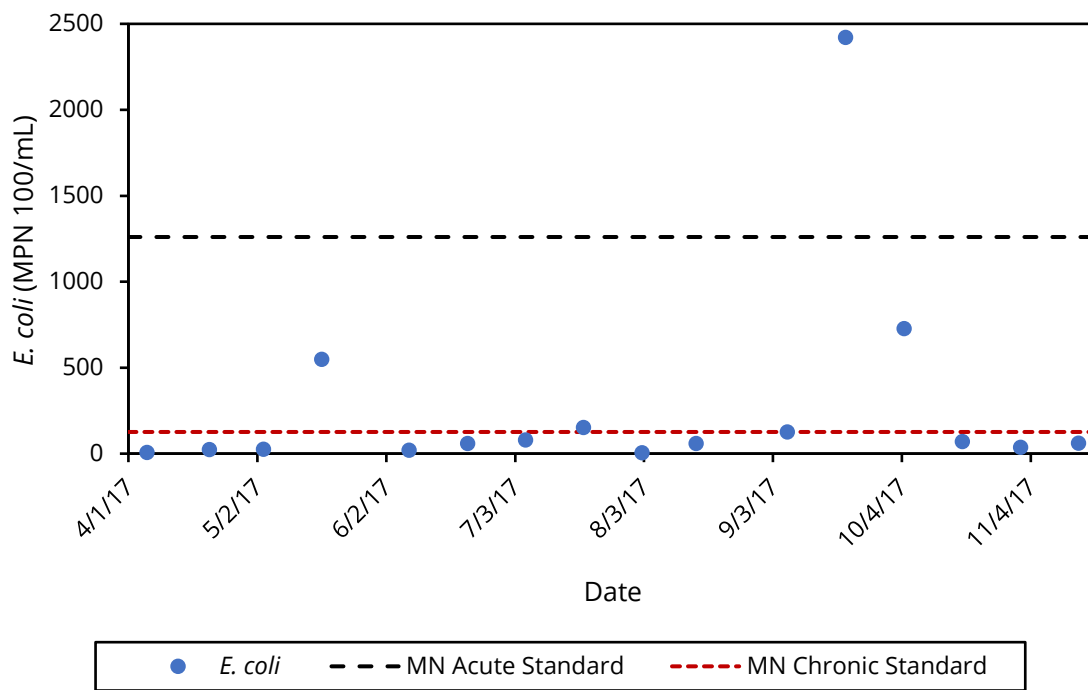


Figure 7. 2017 *E. coli* values at MR848.1W.

All River Sites

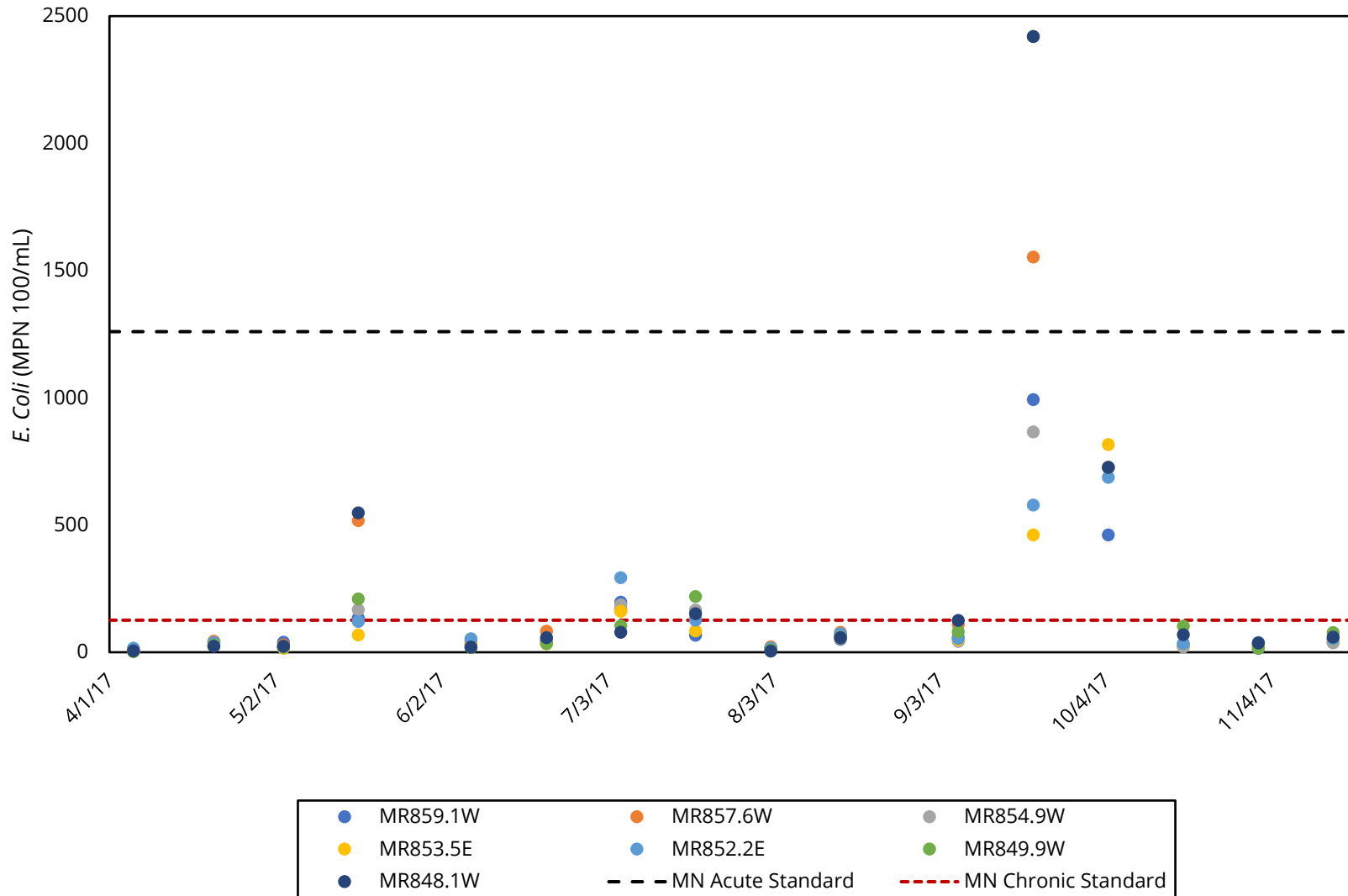


Figure 8. 2017 *E. coli* values at all sites.

Table 2. 2017 Mississippi River site MR859.1W (Camden) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity ($\mu\text{S}/\text{cm}$)	Dissolved	Salinity (ppt)	Specific	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)	
			Temperature ($^{\circ}\text{F}$)		Oxygen (mg/L)		pH		Conductivity ($\mu\text{S}/\text{cm}$)		Temperature ($^{\circ}\text{C}$)
MR859.1W	04/05/2017 11:50	Base	48	273.3	13.09	8.4	0.19	391.8	79	9.2	7
MR859.1W	04/20/2017 12:05	Base	43	317.7	11.94	8.2	0.21	434.2	60	11.0	40
MR859.1W	05/03/2017 12:10	Base	55	282.0	13.57	8.1	0.19	399.7	60	9.6	40
MR859.1W	05/17/2017 10:55	Rain	63						52		135
MR859.1W	06/07/2017 12:05	Base	77	465.0	10.04	8.2	0.23	482.6	56	23.1	36
MR859.1W	06/21/2017 13:15	Base	75	454.9	10.23	8.2	0.22	468.6	41	23.5	44
MR859.1W	07/05/2017 11:05	Base	75						79		197
MR859.1W	07/19/2017 10:30	Base	78	418.5	8.56	8.1	0.20	411.7	77	25.9	67
MR859.1W	08/02/2017 11:45	Base	75						51		17
MR859.1W	08/15/2017 11:50	Base	70	420.5	10.93	8.4	0.20	443.5	63	22.3	51
MR859.1W	09/06/2017 11:15	Base	65						66		59
MR859.1W	09/20/2017 11:35	Base	70	389.8	9.37	8.1	0.21	428.4	66	20.3	993
MR859.1W	10/04/2017 12:00	Base	54	278.5	11.10	7.5	0.16	341.9	35	15.3	461
MR859.1W	10/18/2017 12:05	Base	60	425.0	10.65	7.9	0.30	556.3	77	12.6	25
MR859.1W	11/01/2017 11:55	Base	34	307.2	14.58	7.6	0.24	502.8	> 100	4.6	31
MR859.1W	11/15/2017 10:30	Rain	30	286.3	13.93	8.2	0.23	486.4	> 100	3.5	39

Table 3. 2017 Mississippi River site MR857.6W (MPRB Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity ($\mu\text{S}/\text{cm}$)	Dissolved	Salinity (ppt)	Specific	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)	
			Temperature ($^{\circ}\text{F}$)		Oxygen (mg/L)		Conductivity ($\mu\text{S}/\text{cm}$)		Temperature ($^{\circ}\text{C}$)		
MR857.6W	04/05/2017 11:40	Base	48	317.9	12.98	8.3	0.22	455.3	79	9.2	6
MR857.6W	04/20/2017 11:50	Base	43	342.2	11.70	8.0	0.23	469.8	62	10.8	44
MR857.6W	05/03/2017 11:55	Base	55	315.4	13.17	8.1	0.22	447.1	64	9.6	29
MR857.6W	05/17/2017 11:15	Rain	63						64		517
MR857.6W	06/07/2017 11:45	Base	77	513.0	9.72	8.1	0.26	537.0	65	22.7	47
MR857.6W	06/21/2017 13:00	Base	75	496.7	10.47	8.1	0.25	510.2	43	23.6	83
MR857.6W	07/05/2017 10:45	Base	75						76		167
MR857.6W	07/19/2017 10:10	Base	78	425.3	7.92	8.0	0.20	425.0	66	25.2	132
MR857.6W	08/02/2017 11:25	Base	75						45		22
MR857.6W	08/15/2017 11:33	Base	70	433.9	9.80	8.2	0.20	464.3	66	21.6	79
MR857.6W	09/06/2017 11:05	Base	60						66		108
MR857.6W	09/20/2017 11:15	Base	70	436.1	9.10	8.0	0.23	483.8	88	19.8	1553
MR857.6W	10/04/2017 11:45	Base	53	276.2	10.44	7.4	0.16	340.6	35	15.1	727
MR857.6W	10/18/2017 11:45	Base	60	449.8	10.57	7.9	0.30	590.6	78	12.5	31
MR857.6W	11/01/2017 11:35	Base	33	344.1	14.70	7.4	0.27	568.1	> 100	4.4	27
MR857.6W	11/15/2017 10:15	Rain	30	343.5	13.53	8.1	0.28	580.0	> 100	3.7	49

Table 4. 2017 Mississippi River site MR854.9W (North Loop) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity (µS/cm)	Dissolved	pH	Salinity (ppt)	Specific	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)
			Temperature (°F)		Oxygen (mg/L)			Conductivity (µS/cm)		Temperature (°C)	
MR854.9W	04/05/2017 11:15	Base	45	258.9	12.73	8.4	0.18	369.9	73	9.3	6
MR854.9W	04/20/2017 11:30	Base	43	296.1	11.41	8.1	0.19	403.3	54	11.1	26
MR854.9W	05/03/2017 10:30	Base	55	265.7	13.15	7.9	0.18	379.6	52	9.3	16
MR854.9W	05/17/2017 11:05	Rain	60	362.3	8.63	8.1	0.19	403.1	47	19.7	167
MR854.9W	06/07/2017 11:00	Base	75	426.2	9.07	8.1	0.21	442.0	57	23.1	30
MR854.9W	06/21/2017 11:15	Base	70	422.6	8.88	8.2	0.21	435.7	61	23.4	45
MR854.9W	07/05/2017 11:35	Base	76	422.1	7.52	8.1	0.20	418.5	75	25.5	186
MR854.9W	07/19/2017 11:20	Base	78	409.0	7.80	8.1	0.19	399.4	78	26.3	166
MR854.9W	08/02/2017 10:50	Base	75						43		16
MR854.9W	08/15/2017 11:07	Base	70	412.1	9.12	8.2	0.20	436.5	56	22.1	66
MR854.9W	09/06/2017 10:40	Base	60						60		43
MR854.9W	09/20/2017 10:50	Base	68	377.6	9.24	8.0	0.20	419.7	94	19.7	866
MR854.9W	10/04/2017 11:15	Base	52	263.4	10.86	7.4	0.16	323.9	30	15.2	727
MR854.9W	10/18/2017 11:05	Base	60	403.1	10.58	7.9	0.30	529.1	80	12.5	20
MR854.9W	11/01/2017 11:10	Base	33	286.2	15.13	7.4	0.23	468.5	> 100	4.6	15
MR854.9W	11/15/2017 10:02	Rain	30	265.5	13.79	8.2	0.22	453.5	> 100	3.3	37

Table 5. 2017 Mississippi River site MR853.5E (SAFL) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity (µS/cm)	Dissolved	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)	
			Temperature (°F)		Oxygen (mg/L)				Temperature (°C)		
MR853.5E	04/05/2017 10:20	Base	45	241.6	11.90	8.2	0.17	344.6	56	9.4	4
MR853.5E	04/20/2017 11:10	Base	42	266.1	11.35	8.2	0.17	362.1	51	11.1	26
MR853.5E	05/03/2017 10:10	Base	55								16
MR853.5E	05/17/2017 10:15	Rain	60	320.6	8.79	8.0	0.17	356.4	56	19.7	68
MR853.5E	06/07/2017 10:35	Base	75	383.6	8.93	8.1	0.19	400.9	43	22.7	29
MR853.5E	06/21/2017 10:25	Base	70	394.4	8.79	8.0	0.20	412.6	35	22.7	33
MR853.5E	07/05/2017 10:55	Base	76	404.3	8.07	8.1	0.19	404.5	63	25.0	161
MR853.5E	07/19/2017 11:15	Base	76	398.8	8.48	8.4	0.20	395.1	69	25.5	84
MR853.5E	08/02/2017 10:35	Base	75						65		11
MR853.5E	08/15/2017 10:40	Base	70	400.6	8.90	8.1	0.20	425.0	60	22.0	56
MR853.5E	09/06/2017 10:05	Base	60						63		49
MR853.5E	09/20/2017 10:25	Base	68	365.2	9.46	8.0	0.20	408.6	78	19.4	461
MR853.5E	10/04/2017 10:50	Base	51								816
MR853.5E	10/18/2017 10:45	Base	60								33
MR853.5E	11/01/2017 10:50	Base	33								20
MR853.5E	11/15/2017 09:38	Rain	30	244.6	14.73	8.1	0.20	418.5	> 100	3.2	51

Table 6. 2017 Mississippi River site MR852.2E (UMN Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity (µS/cm)	Dissolved	pH	Salinity (ppt)	Specific	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)
			Temperature (°F)		Oxygen (mg/L)			Conductivity (µS/cm)		Temperature (°C)	
MR852.2E	04/05/2017 09:55	Base	45	254.8	13.16	8.2	0.17	362.5	70	9.4	16
MR852.2E	04/20/2017 10:20	Base	41	277.6	12.11	8.0	0.18	375.4	56	11.4	38
MR852.2E	05/03/2017 09:50	Base	55	231.8	13.36	7.8	0.16	330.6	66	9.3	20
MR852.2E	05/17/2017 09:55	Rain	60	318.4	9.19	8.0	0.17	354.2	53	19.7	121
MR852.2E	06/07/2017 10:10	Base	75	389.5	9.56	8.1	0.20	407.8	43	22.6	53
MR852.2E	06/21/2017 09:15	Base	70	395.4	9.22	7.9	0.20	418.2	37	22.2	51
MR852.2E	07/05/2017 09:55	Base	76	407.1	8.81	8.0	0.20	409.8	57	24.6	294
MR852.2E	07/19/2017 10:05	Base	76	402.5	9.27	8.3	0.20	399.0	67	25.5	127
MR852.2E	08/02/2017 10:10	Base	75						49		16
MR852.2E	08/15/2017 10:20	Base	65	413.6	9.04	8.2	0.20	438.2	46	22.1	73
MR852.2E	09/06/2017 09:50	Base	60						55		55
MR852.2E	09/20/2017 10:05	Base	68	365.8	10.06	7.9	0.20	411.4	83	19.2	579
MR852.2E	10/04/2017 10:20	Base	50	255.3	11.21	7.3	0.15	313.2	27	15.3	687
MR852.2E	10/18/2017 10:20	Base	55	359.6	11.07	7.9	0.20	474.8	69	12.3	34
MR852.2E	11/01/2017 10:25	Base	32	266.2	14.23	7.4	0.21	434.7	> 100	4.7	38
MR852.2E	11/15/2017 09:25	Rain	30	254.4	14.56	8.1	0.21	433.5	> 100	3.4	52

Table 7. 2017 Mississippi River site MR849.9W (Lake Street Bridge) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity (µS/cm)	Dissolved	Salinity (ppt)	Specific	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)	
			Temperature (°F)		Oxygen (mg/L)		pH		Conductivity (µS/cm)		Temperature (°C)
MR849.9W	04/05/2017 09:30	Base	45	252.0	12.77	8.1	0.17	358.5	73	9.4	3
MR849.9W	04/20/2017 09:45	Base	41	280.8	12.59	7.9	0.18	378.8	66	11.5	29
MR849.9W	05/03/2017 09:35	Base	55	248.3	13.60	7.8	0.17	353.3	54	9.4	20
MR849.9W	05/17/2017 09:35	Rain	60	327.1	9.34	8.2	0.17	364.5	54	19.6	210
MR849.9W	06/07/2017 09:50	Base	75	402.5	9.35	8.1	0.20	421.1	38	22.7	18
MR849.9W	06/21/2017 09:05	Base	70	401.7	9.22	7.9	0.20	425.5	54	22.1	34
MR849.9W	07/05/2017 09:30	Base	76	416.2	7.77	8.1	0.20	414.9	70	25.2	104
MR849.9W	07/19/2017 09:45	Base	76	407.3	9.15	8.4	0.20	114.6	59	25.7	219
MR849.9W	08/02/2017 09:50	Base	75						48		9
MR849.9W	08/15/2017 09:58	Base	65	416.1	9.35	8.3	0.20	436.0	53	22.6	60
MR849.9W	09/06/2017 09:27	Base	60						60		81
MR849.9W	09/20/2017 09:35	Base	66	360.3	8.93	8.0	0.19	403.7	66	19.4	2420
MR849.9W	10/04/2017 09:45	Base	49	258.6	11.13	7.2	0.15	317.4	32	15.3	727
MR849.9W	10/18/2017 09:45	Base	55	377.6	10.82	7.9	0.20	491.9	63	12.7	103
MR849.9W	11/01/2017 10:00	Base	32	274.8	14.42	7.4	0.22	449.9	81	4.6	15
MR849.9W	11/15/2017 09:13	Rain	30	253.3	14.03	7.8	0.21	433.4	> 100	3.2	78

Table 8. 2017 Mississippi River site MR848.1W (4300 West River Parkway) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air	Conductivity (µS/cm)	Dissolved	pH	Salinity (ppt)	Specific	Transparency (cm)	Water	<i>E. coli</i> (CFU/100 mL)
			Temperature (°F)		Oxygen (mg/L)			Conductivity (µS/cm)		Temperature (°C)	
MR848.1W	04/05/2017 09:05	Base	45	251.4	13.23	8.1	0.17	357.7	80	9.4	6
MR848.1W	04/20/2017 09:25	Base	41	282.0	12.87	8.3	0.18	378.9	60	11.6	24
MR848.1W	05/03/2017 09:15	Base	55	245.5	14.43	7.7	0.17	352.0	52	9.1	24
MR848.1W	05/17/2017 09:05	Rain	60	327.1	9.34	8.2	0.17	364.5	67	19.6	548
MR848.1W	06/07/2017 09:25	Base	75	401.3	9.54	8.1	0.20	421.0	46	22.5	20
MR848.1W	06/21/2017 08:45	Base	70	403.1	8.95	8.0	0.20	426.6	43	22.1	58
MR848.1W	07/05/2017 09:20	Base	76	420.5	7.76	8.0	0.02	416.0	65	25.6	79
MR848.1W	07/19/2017 09:25	Base	76	410.2	8.85	8.4	0.20	402.2	58	26.1	152
MR848.1W	08/02/2017 09:30	Base	75						55		5
MR848.1W	08/15/2017 09:35	Base	65	408.7	8.79	8.3	0.20	426.0	49	22.8	58
MR848.1W	09/06/2017 09:07	Base	60						60		125
MR848.1W	09/20/2017 09:10	Base	70	359.2	9.24	8.1	0.19	401.6	62	19.5	2420
MR848.1W	10/04/2017 09:15	Base	48	259.5	11.15	7.2	0.15	317.9	29	15.4	727
MR848.1W	10/18/2017 09:15	Base	55	373.9	10.47	7.5	0.20	477.8	76	13.6	69
MR848.1W	11/01/2017 09:30	Base	32	270.8	15.55	7.4	0.21	442.6	> 100	4.7	36
MR848.1W	11/15/2017 08:55	Rain	30	252.7	14.04	7.2	0.21	433.7	> 100	3.2	60