

2019 Mississippi River Bacteria Sampling

Summary of 2019 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 geometric mean 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 2019, two river sites (MR859.1W, MR857.6W) exceeded the standard in June, and five river sites (MR857.6W, MR854.9W, MR852.2E, MR849.9W, 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 October. Therefore, the small number of samples collected each month greatly affect these results and a monthly geometric mean is not calculated. Most samples were taken during baseflow conditions with the exception of four sampling dates in May, June, September, and October, 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 2019.

Month	Sites that exceed 1,260 MPN/100 mL in > 10% of samples
April	None
May	None
June	MR859.1W, MR857.6W
July	None
August	None
September	MR857.6W, MR854.9W, MR852.2E MR849.9W, MR848.1W
October	None

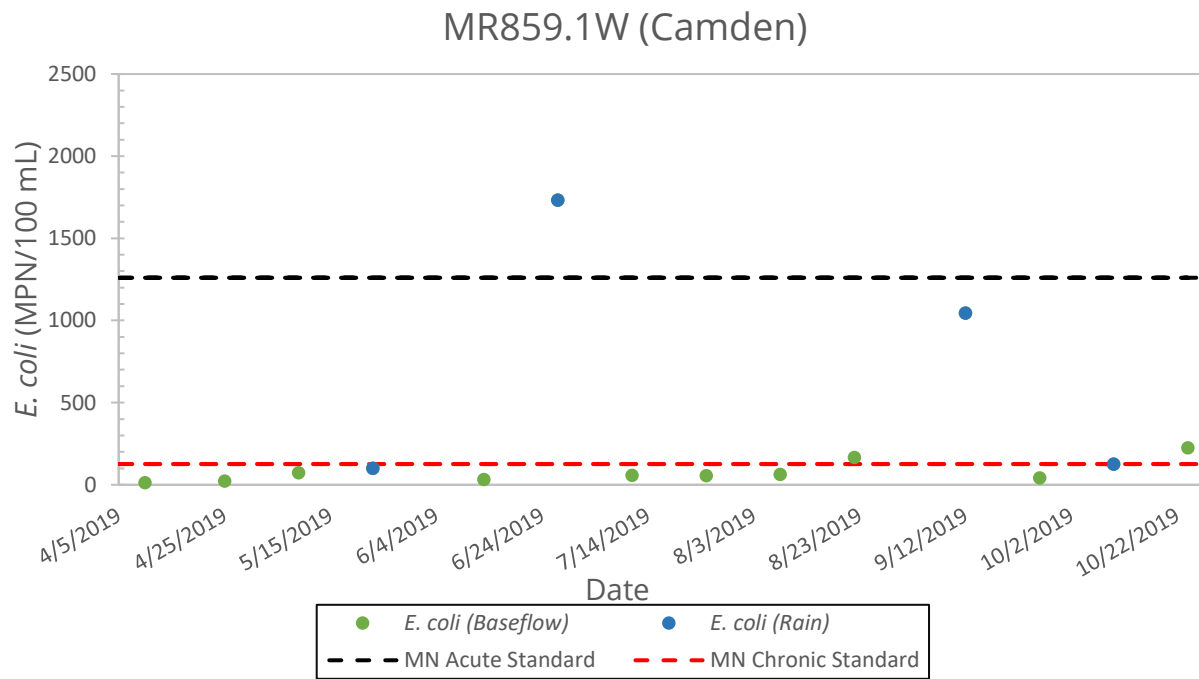


Figure 1. 2019 *E. coli* values at MR859.1W.

MR857.6W (MPRB Boat Launch)

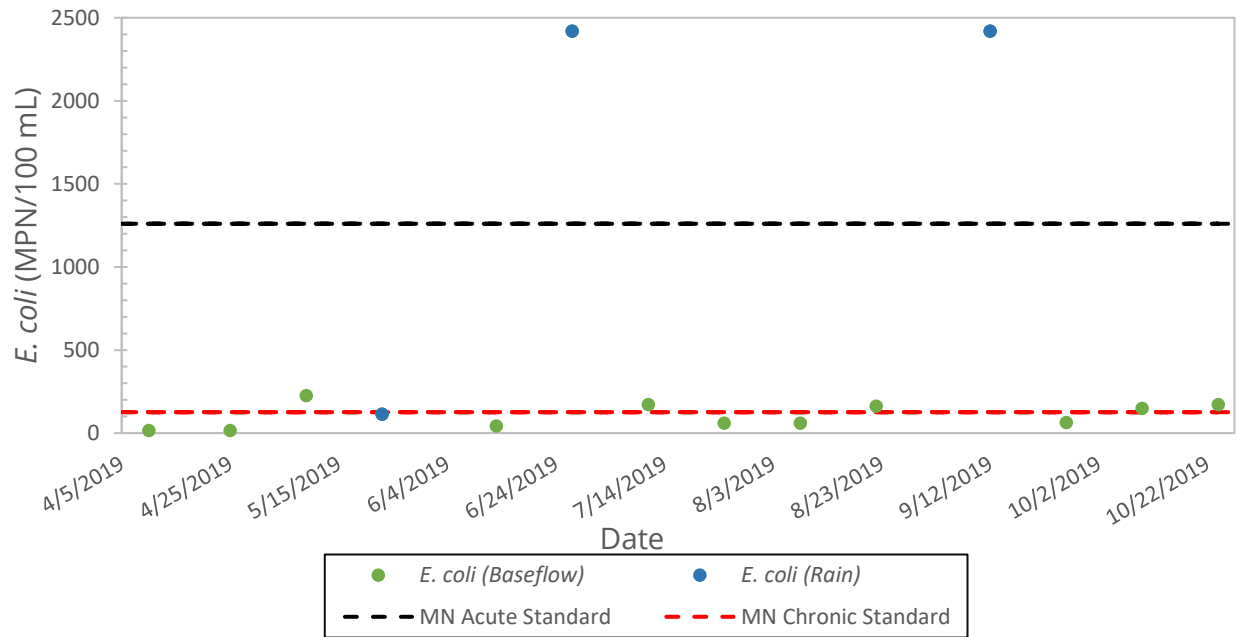


Figure 2. 2019 *E. coli* values at MR857.6W.

MR854.9W (North Loop)

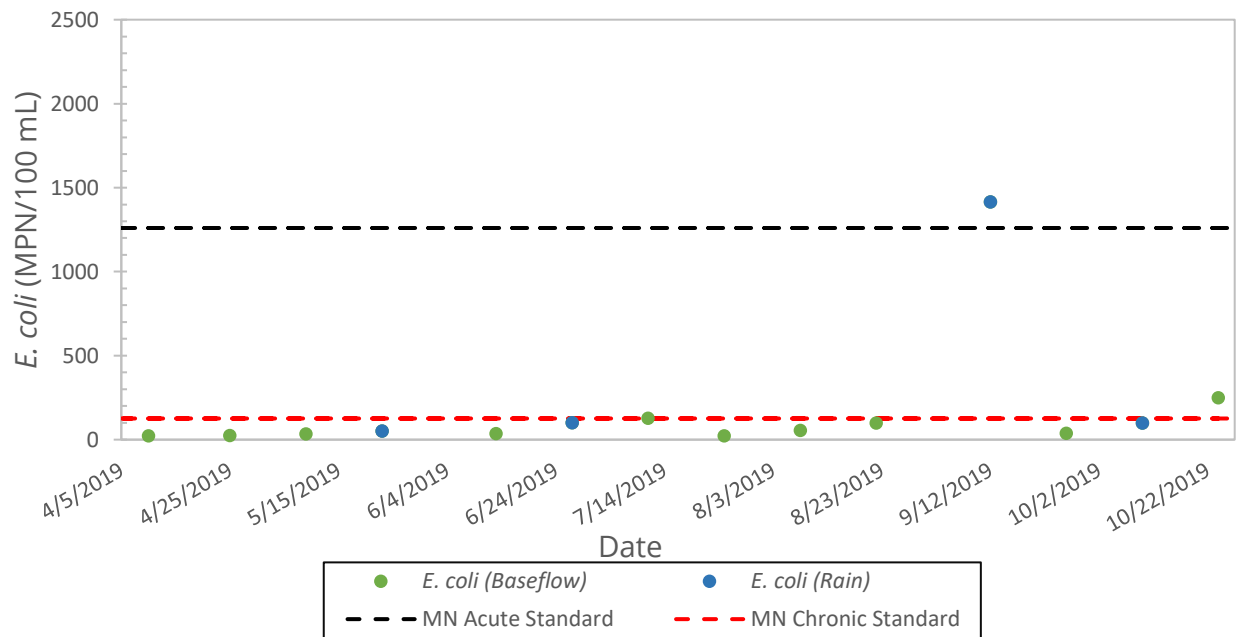


Figure 3. 2019 *E. coli* values at MR854.9W.

MR853.5E (Saint Anthony Falls Laboratory)

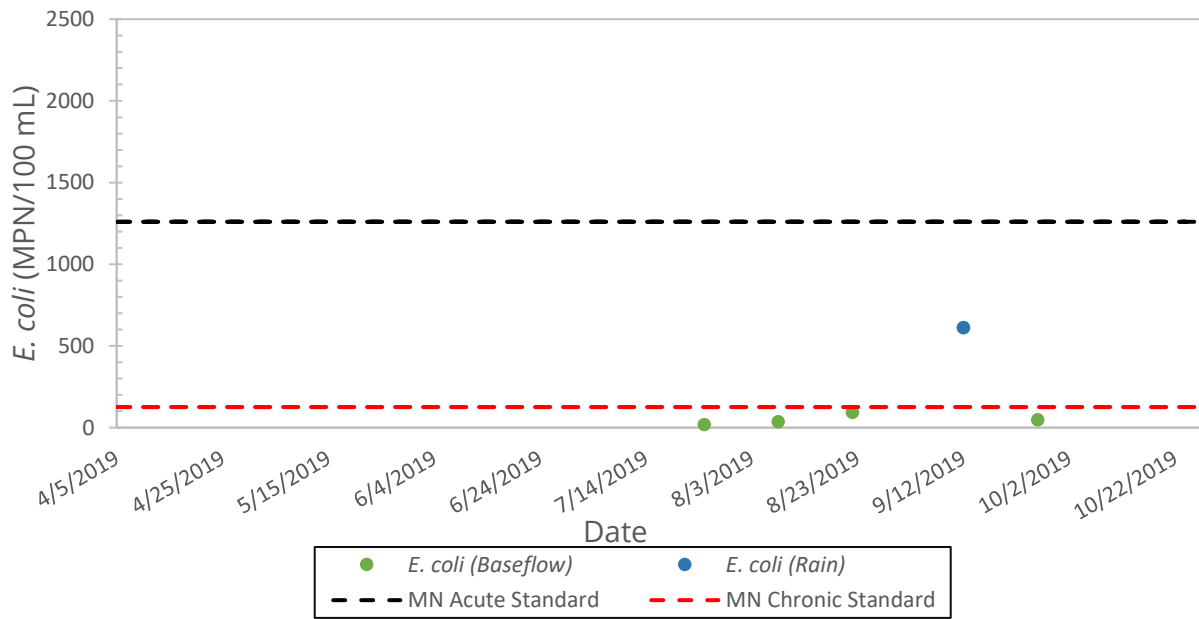


Figure 4. 2019 *E. coli* values at MR853.5E.

MR852.2E (UMN Boat Launch)

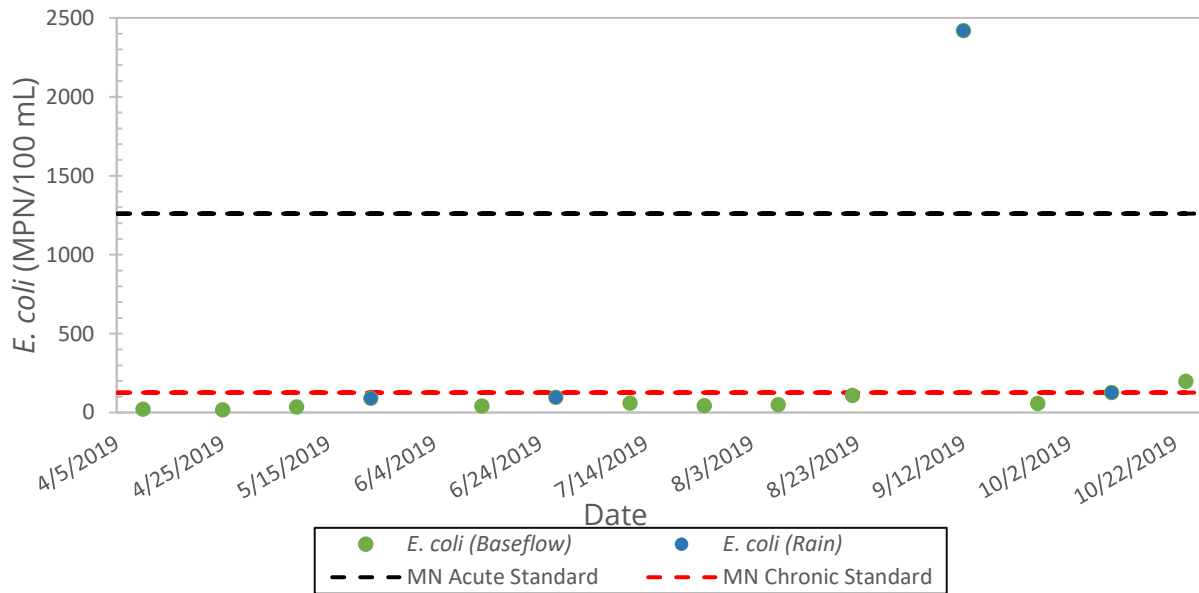


Figure 5. 2019 *E. coli* values at MR852.2E.

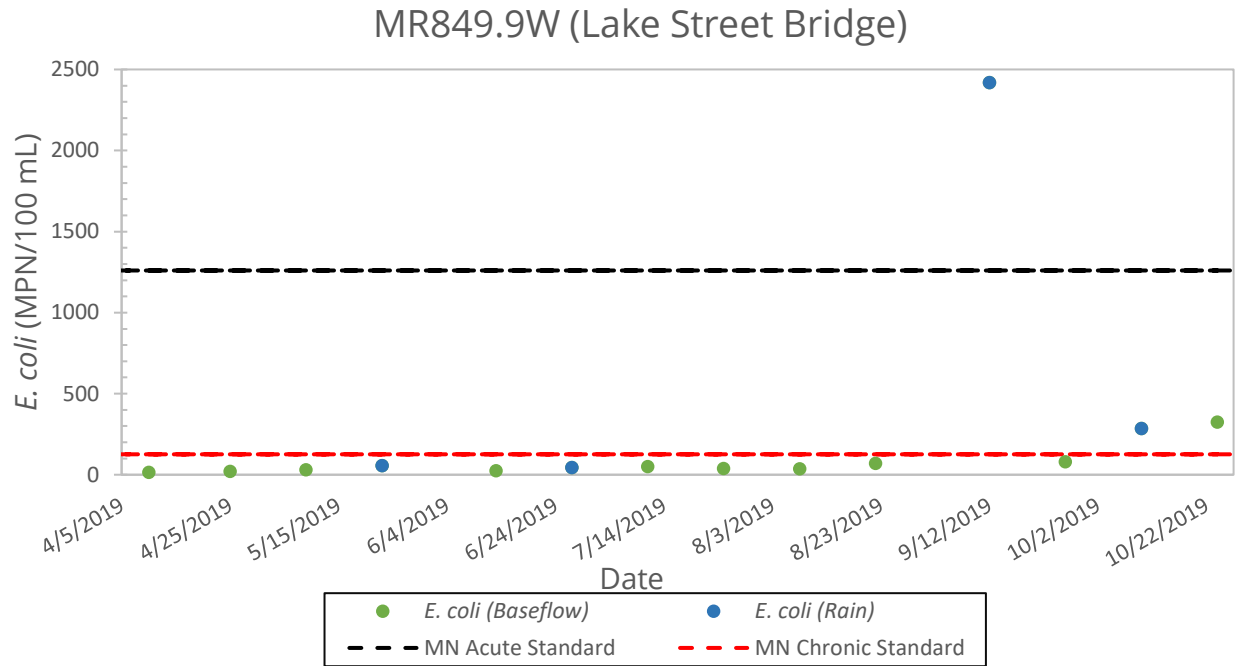


Figure 6. 2019 *E. coli* values at MR849.9W.

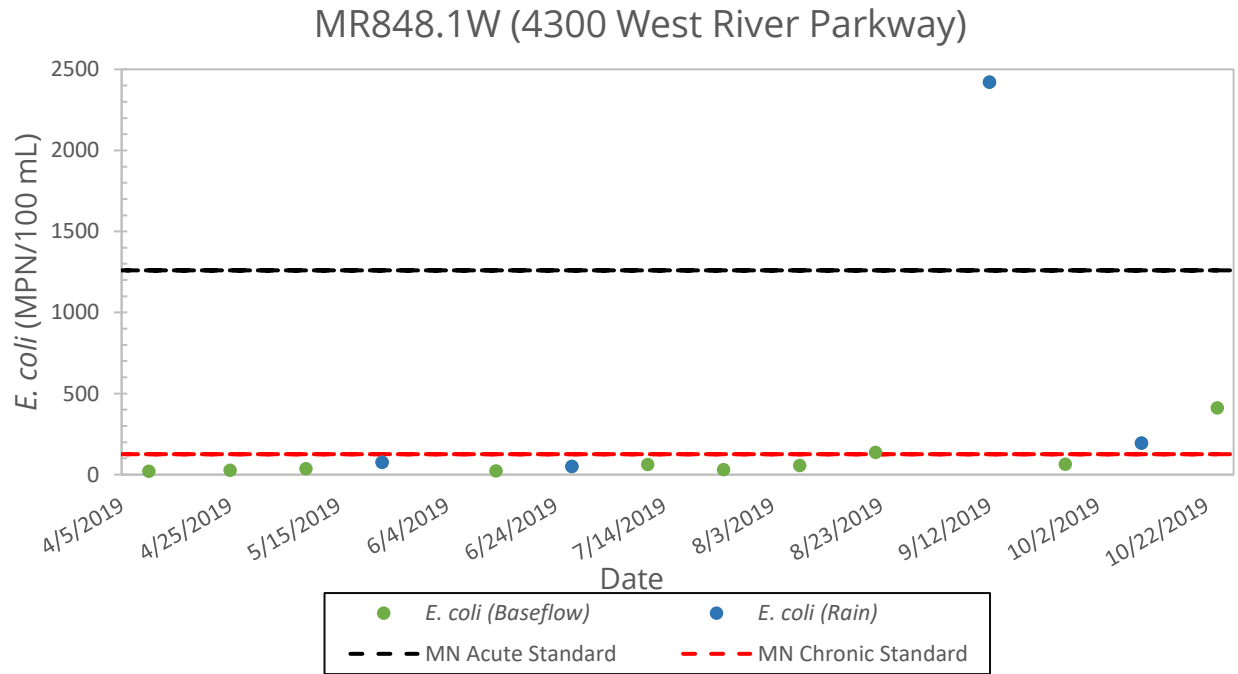


Figure 7. 2019 *E. coli* values at MR848.1W.

All Mississippi River Sites

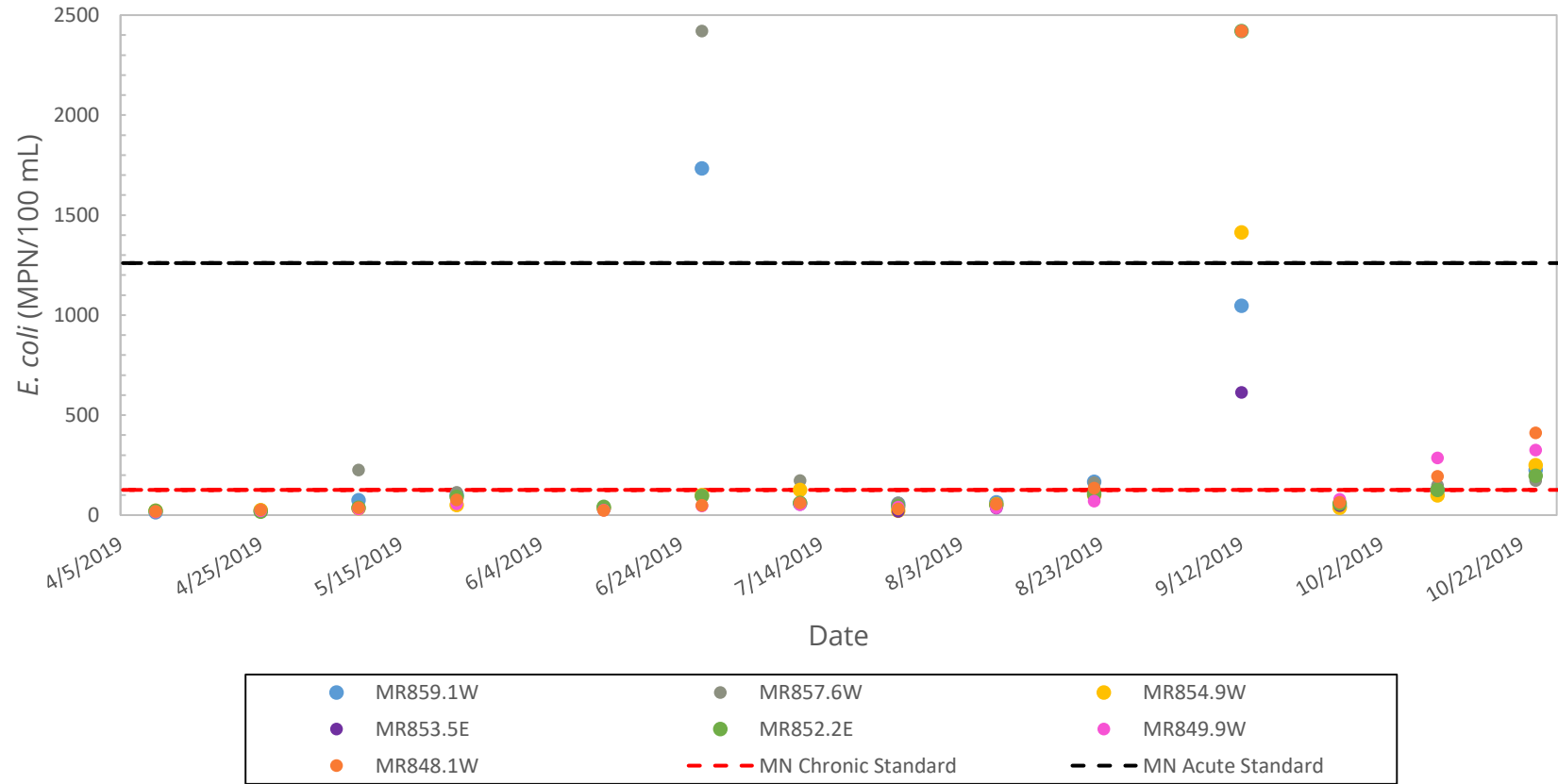


Figure 8. 2019 *E. coli* values for all Mississippi River sites.

Table 2. 2019 Mississippi River site MR859.1W (Camden) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR859.1W	04/10/2019 11:05	Base	203.0	13.16	8.0	0.15	323.3	47	5.5	14
MR859.1W	04/25/2019 11:15	Base	260.7	11.56	7.8	0.17	351.3	65	11.5	23
MR859.1W	05/09/2019 11:00	Base	260.8	11.78	7.5	0.18	363.8	75	10.2	74
MR859.1W	05/23/2019 10:15	Rain	295.6	10.90	7.4	0.19	383.8	50	13.0	101
MR859.1W	06/13/2019 10:20	Base	467.3	9.56	7.7	0.25	516.0	54	20.0	33
MR859.1W	06/27/2019 10:15	Rain	425.8	8.45	7.4	0.22	454.7	44	21.7	1733
MR859.1W	07/11/2019 10:00	Base	459.1	8.60	7.5	0.23	470.7	41	23.7	58
MR859.1W	07/25/2019 10:00	Base	487.9	8.25	7.4	0.23	488.5	44	24.9	56
MR859.1W	08/08/2019 09:20	Base	502.0	9.18	7.3	0.24	501.0	61	25.0	64
MR859.1W	08/22/2019 10:15	Base	476.6	9.37	7.3	0.24	494.0	37	23.2	166
MR859.1W	09/12/2019 10:50	Rain	394.4	9.39	7.3	0.22	458.7	52	17.7	1046
MR859.1W	09/26/2019 10:35	Base	410.7	9.84	7.7	0.23	470.8	57	18.3	42
MR859.1W	10/10/2019 10:00	Rain	300.1	10.97	7.3	0.19	393.7	50	12.6	126
MR859.1W	10/24/2019 10:00	Base	264.2	12.76	7.4	0.19	393.1	46	7.8	225

Table 3. 2019 Mississippi River site MR857.6W (MPRB Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR857.6W	04/10/2019 10:50	Base	235.2	12.92	7.9	0.18	374.4	51	5.5	15
MR857.6W	04/25/2019 11:00	Base	305.8	11.46	7.6	0.20	411.3	61	11.6	16
MR857.6W	05/09/2019 10:35	Base	289.6	11.48	7.6	0.20	409.6	35	9.7	225
MR857.6W	05/23/2019 10:00	Rain	323.7	10.74	7.2	0.20	422.4	89	12.8	113
MR857.6W	06/13/2019 10:05	Base	562.0	9.67	7.6	0.31	628.0	66	19.5	42
MR857.6W	06/27/2019 10:05	Rain	554.0	8.38	7.3	0.29	594.0	51	21.5	2420
MR857.6W	07/11/2019 09:45	Base	522.0	8.47	7.4	0.26	540.0	47	23.3	172
MR857.6W	07/25/2019 09:45	Base	540.0	8.16	7.4	0.26	547.0	66	24.3	61
MR857.6W	08/08/2019 09:10	Base	499.6	8.70	7.3	0.24	502.0	66	24.7	60
MR857.6W	08/22/2019 10:00	Base	454.5	8.87	7.2	0.23	479.1	63	22.3	162
MR857.6W	09/12/2019 10:35	Rain	326.1	9.33	7.3	0.19	387.0	37	16.8	2420
MR857.6W	09/26/2019 10:15	Base	438.8	9.73	7.6	0.25	506.0	64	18.0	64
MR857.6W	10/10/2019 09:50	Rain	333.0	10.71	7.3	0.21	435.5	70	12.7	148
MR857.6W	10/24/2019 09:50	Base	284.5	12.58	7.2	0.21	426.1	51	7.6	172

Table 4. 2019 Mississippi River site MR854.9W (North Loop) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR854.9W	04/10/2019 10:25	Base	193.6	13.18	8.0	0.15	308.3	55	5.5	21
MR854.9W	04/25/2019 10:40	Base	248.3	11.48	7.5	0.16	335.4	64	11.4	24
MR854.9W	05/09/2019 10:00	Base	245.6	11.59	7.5	0.16	342.5	78	10.2	34
MR854.9W	05/23/2019 09:35	Rain	278.7	10.78	7.2	0.17	361.5	81	13.0	50
MR854.9W	06/13/2019 09:45	Base	438.4	9.54	7.7	0.23	483.2	67	20.1	35
MR854.9W	06/27/2019 09:50	Rain	438.2	8.51	7.6	0.22	460.4	57	22.5	101
MR854.9W	07/11/2019 09:25	Base	431.2	8.48	7.5	0.21	441.5	36	23.8	126
MR854.9W	07/25/2019 09:30	Base	448.6	8.06	7.4	0.21	445.9	57	25.3	22
MR854.9W	08/08/2019 08:40	Base	441.2	8.14	7.1	0.21	436.8	55	25.5	54
MR854.9W	08/22/2019 09:35	Base	420.0	8.68	7.2	0.21	433.2	61	23.4	99
MR854.9W	09/12/2019 10:15	Rain	372.4	9.25	7.3	0.21	425.8	59	18.4	1414
MR854.9W	09/26/2019 09:50	Base	383.2	9.71	7.7	0.21	439.6	69	18.3	37
MR854.9W	10/10/2019 09:30	Rain	287.0	10.92	7.5	0.18	376.4	50	12.6	99
MR854.9W	10/24/2019 09:30	Base	251.6	12.69	7.3	0.18	375.2	52	7.8	249

Table 5. 2019 Mississippi River site MR853.5E (SAFL) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR853.5E	07/25/2019 09:10	Base	421.6	8.20	7.4	0.20	419.2	54	25.3	19
MR853.5E	08/08/2019 08:25	Base	425.8	8.19	7.2	0.20	422.9	65	25.4	36
MR853.5E	08/22/2019 09:10	Base	407.1	8.75	7.2	0.20	421.7	43	23.2	93
MR853.5E	09/12/2019 09:45	Rain	369.8	9.44	7.2	0.20	422.1	57	18.5	613
MR853.5E	09/26/2019 09:30	Base	335.3	9.58	7.8	0.18	384.4	54	18.3	48

Table 6. 2019 Mississippi River site MR852.2E (UMN Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR852.2E	04/10/2019 09:40	Base	180.1	13.61	7.9	0.14	285.9	59	5.6	21
MR852.2E	04/25/2019 09:45	Base	224.4	11.83	7.4	0.15	303.3	58	11.4	17
MR852.2E	05/09/2019 09:20	Base	226.2	11.70	7.4	0.15	314.8	72	10.3	36
MR852.2E	05/23/2019 09:00	Rain	252.9	10.92	7.0	0.16	328.1	70	13.0	91
MR852.2E	06/13/2019 09:05	Base	409.1	9.85	7.4	0.22	450.5	54	20.2	41
MR852.2E	06/27/2019 08:50	Base	428.5	9.21	7.4	0.22	449.9	52	22.5	96
MR852.2E	07/11/2019 08:50	Base	388.8	9.01	7.4	0.19	399.0	42	23.7	61
MR852.2E	07/25/2019 08:55	Base	432.6	8.96	7.4	0.21	431.3	57	25.2	44
MR852.2E	08/08/2019 08:10	Base	434.6	9.09	7.0	0.21	434.8	54	25.0	50
MR852.2E	08/22/2019 08:50	Base	418.5	9.22	7.3	0.21	434.2	65	23.1	108
MR852.2E	09/12/2019 09:20	Rain	345.1	9.98	7.1	0.19	396.7	52	18.2	2420
MR852.2E	09/26/2019 09:00	Base	345.3	9.91	7.9	0.19	395.0	57	18.4	57
MR852.2E	10/10/2019 08:50	Rain	251.9	11.38	7.6	0.16	330.2	62	12.6	126
MR852.2E	10/24/2019 09:00	Base	230.7	13.19	7.5	0.16	343.2	44	7.8	197

Table 7. 2019 Mississippi River site MR849.9W (Lake Street Bridge) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR849.9W	04/10/2019 09:15	Base	187.8	13.38	7.9	0.14	296.3	64	5.8	15
MR849.9W	04/25/2019 09:30	Base	235.0	11.75	7.1	0.15	316.8	58	11.5	21
MR849.9W	05/09/2019 08:50	Base	235.3	11.68	7.2	0.16	326.8	72	10.3	31
MR849.9W	05/23/2019 08:40	Rain	266.5	11.13	7.0	0.17	344.8	54	13.1	57
MR849.9W	06/13/2019 08:50	Base	419.6	9.80	7.4	0.22	461.4	65	20.3	24
MR849.9W	06/27/2019 08:30	Base	437.9	8.81	7.4	0.22	458.9	67	22.6	45
MR849.9W	07/11/2019 08:35	Base	410.8	8.96	7.4	0.20	420.2	45	23.8	51
MR849.9W	07/25/2019 08:35	Base	436.3	8.51	7.4	0.21	434.9	48	25.2	39
MR849.9W	08/08/2019 07:55	Base	434.4	8.93	7.1	0.21	432.9	61	25.2	36
MR849.9W	08/22/2019 08:30	Base	418.3	8.81	7.4	0.21	434.2	58	23.1	70
MR849.9W	09/12/2019 08:55	Rain	341.2	9.54	7.1	0.19	392.2	62	18.2	2420
MR849.9W	09/26/2019 08:40	Base	359.5	10.06	8.2	0.20	410.1	57	18.5	79
MR849.9W	10/10/2019 08:30	Rain	268.2	11.38	8.0	0.17	350.5	49	12.7	285
MR849.9W	10/24/2019 08:40	Base	242.1	13.12	7.6	0.17	359.2	52	7.9	325

Table 8. 2019 Mississippi River site MR848.1W (4300 West River Parkway) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	<i>E. coli</i> (CFU/100 mL)
MR848.1W	04/10/2019 08:50	Base	189.5	13.45	8.3	0.14	298.6	65	5.9	19
MR848.1W	04/25/2019 09:10	Base	237.7	11.46	7.7	0.15	319.5	58	11.6	26
MR848.1W	05/09/2019 08:15	Base	238.3	11.57	7.5	0.16	330.1	45	10.5	36
MR848.1W	05/23/2019 08:15	Rain	272.8	10.94	7.3	0.17	352.7	77	13.1	76
MR848.1W	06/13/2019 08:20	Base	420.8	9.67	7.4	0.22	461.7	46	20.4	23
MR848.1W	06/27/2019 08:05	Base	435.0	8.77	7.4	0.22	457.2	62	22.5	50
MR848.1W	07/11/2019 08:20	Base	411.8	8.83	7.7	0.20	421.4	42	23.8	61
MR848.1W	07/25/2019 08:10	Base	433.0	8.40	7.7	0.21	433.2	50	25.0	31
MR848.1W	08/08/2019 07:35	Base	436.6	8.50	7.2	0.21	432.0	47	25.6	55
MR848.1W	08/22/2019 08:10	Base	418.1	8.66	8.0	0.21	432.9	45	23.2	135
MR848.1W	09/12/2019 08:35	Rain	356.4	9.39	7.5	0.20	406.8	61	18.5	2420
MR848.1W	09/26/2019 08:15	Base	360.0	9.94	8.7	0.20	410.4	45	18.6	64
MR848.1W	10/10/2019 08:00	Rain	273.6	11.27	8.8	0.17	357.6	66	12.7	194
MR848.1W	10/24/2019 08:10	Base	241.8	12.95	8.5	0.17	358.3	44	8.0	411