2018 Mississippi River Bacteria Sampling

Summary of 2018 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 standard for *E. coli* in 2B and 2Bd waters is 126 CFU/100 mL for a monthly geomean of at least five samples (the chronic standard). 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 2018, none of the river sites exceeded the acute standard, as shown in Table 1. Samples were collected on the second and fourth 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 one sampling date in September in which samples were collected during a rain event and one sampling date in April during a snowmelt event. Figures 1-7 show the *E. coli* sample results compared to the MPCA acute and chronic standards and Figure 8 shows all sampling sites together. The *E. coli* data and other sampling parameters are presented in more detail in Tables 2-8.

Table 1. Sites that exceeded 1,260 MPN/100mL in >10% of samples for the Mississippi River in 2018.

Month	Sites that exceed 1,260 MPN/100 mL in > 10% of samples
April	None
May	None
June	None
July	None
August	None
September	None
October	None
November	None

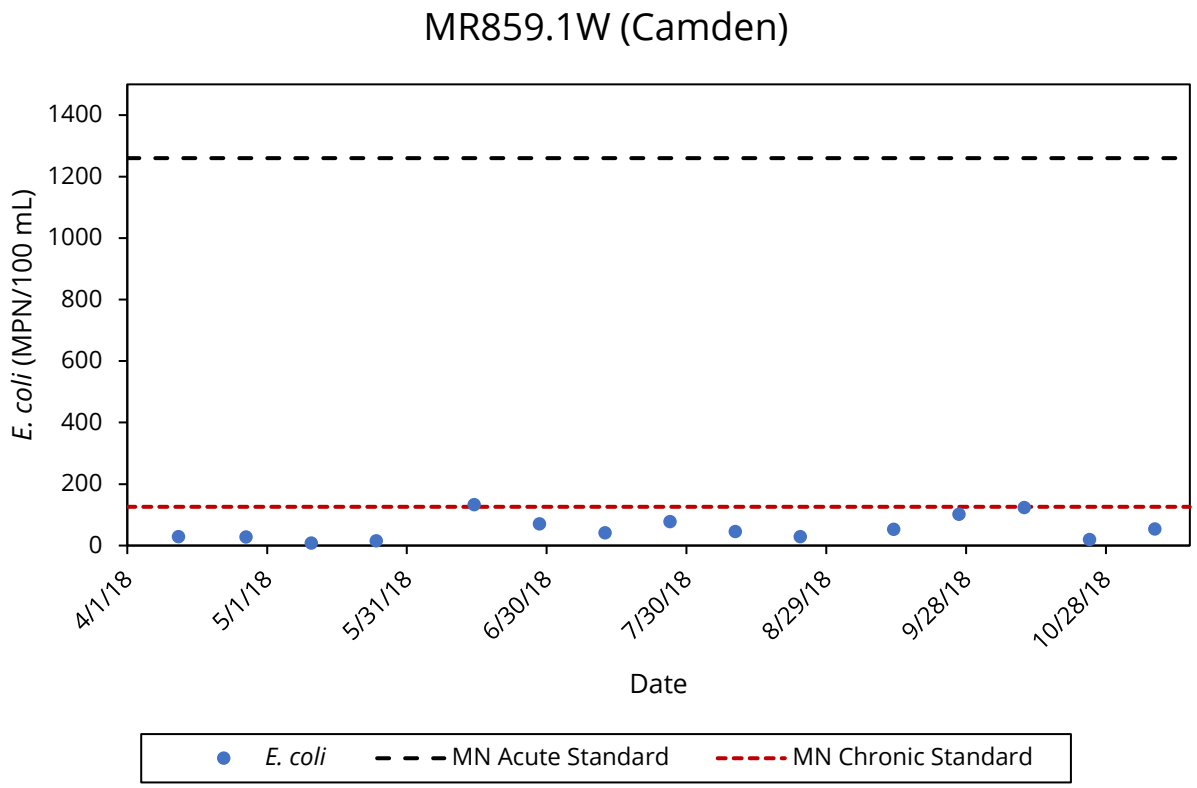

Figure 1. 2018 *E. coli* values at MR859.1W.

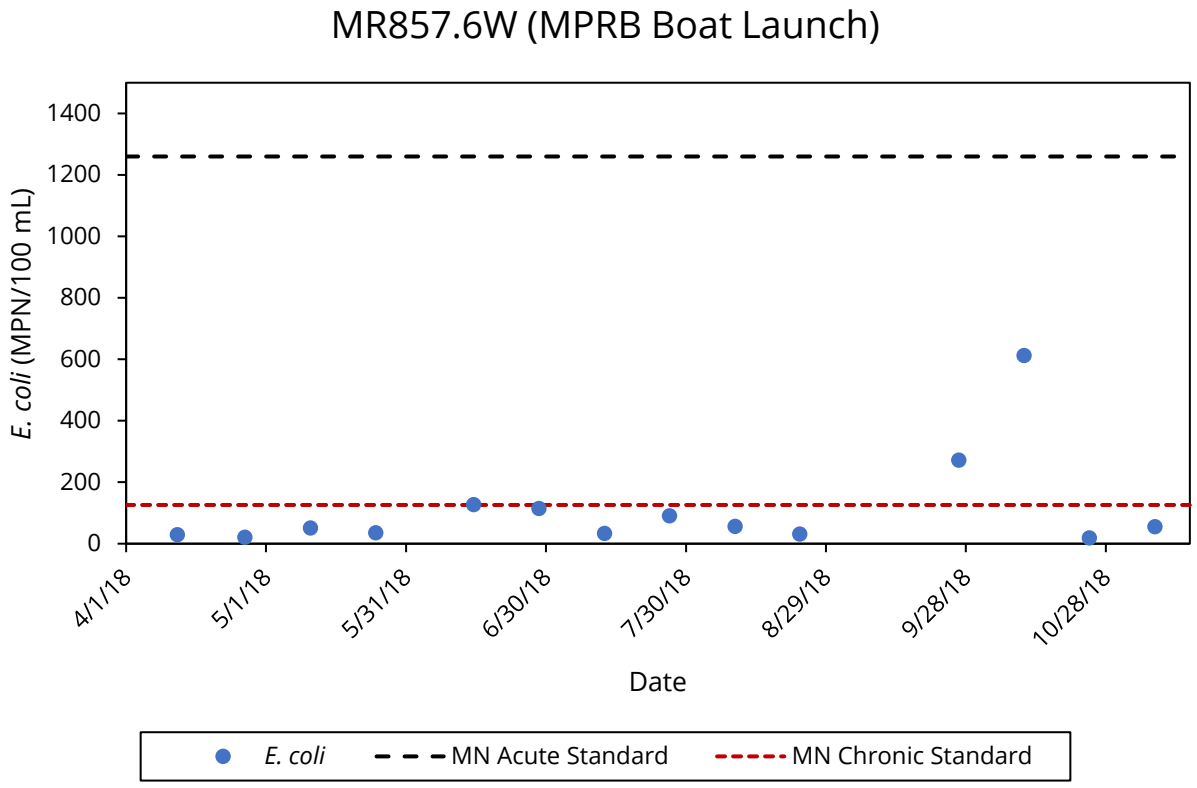

Figure 2. 2018 *E. coli* values at MR857.6W.

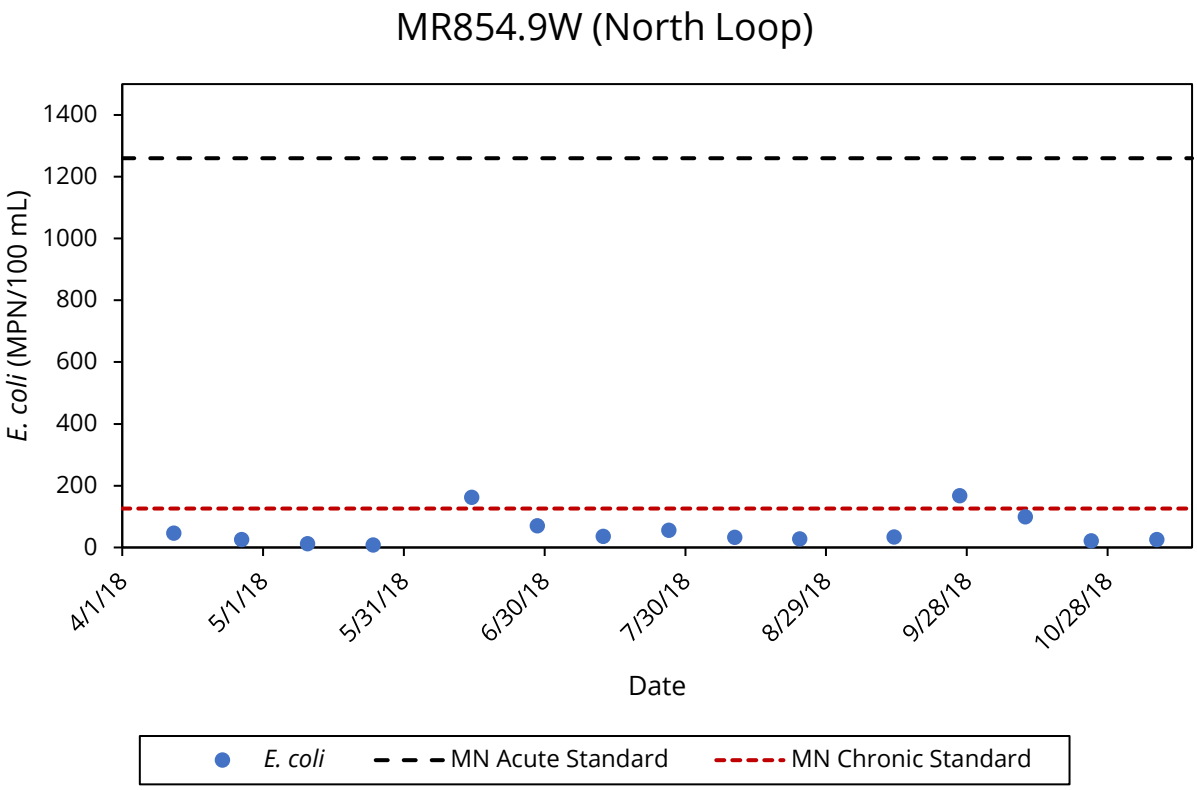

Figure 3. 2018 *E. coli* values at MR854.9W.

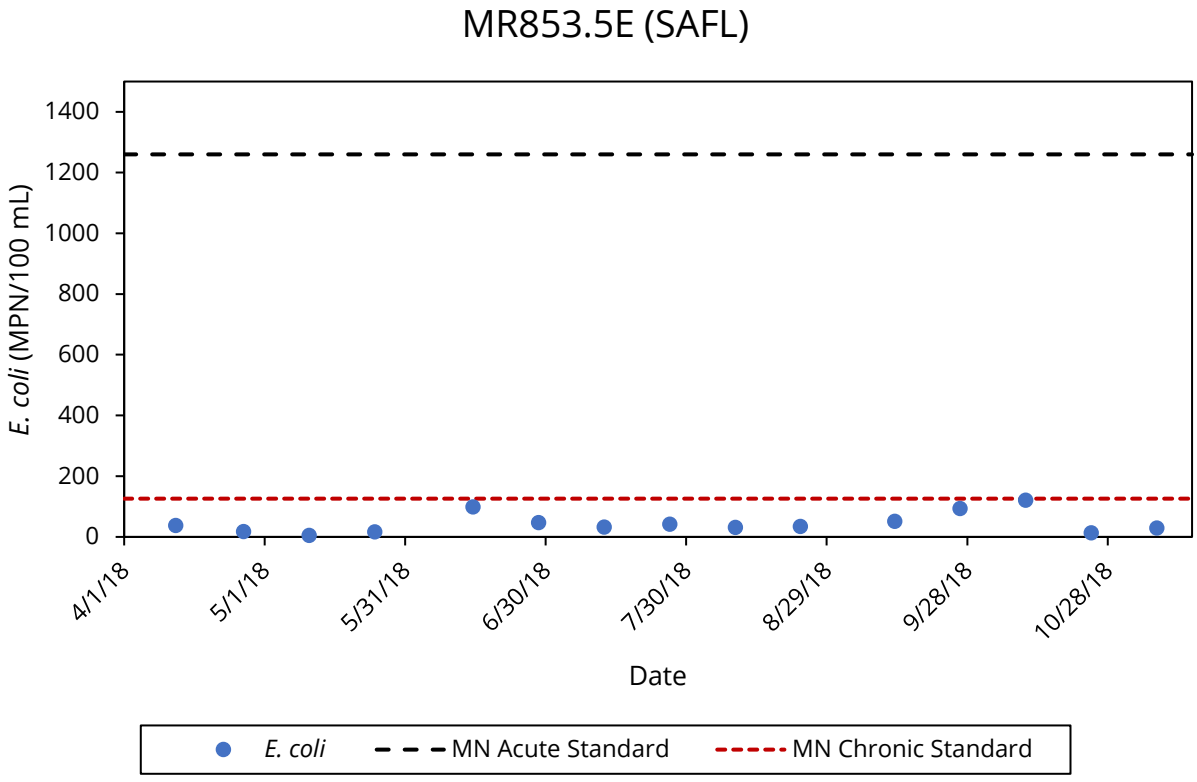

Figure 4. 2018 *E. coli* values at MR853.5E.

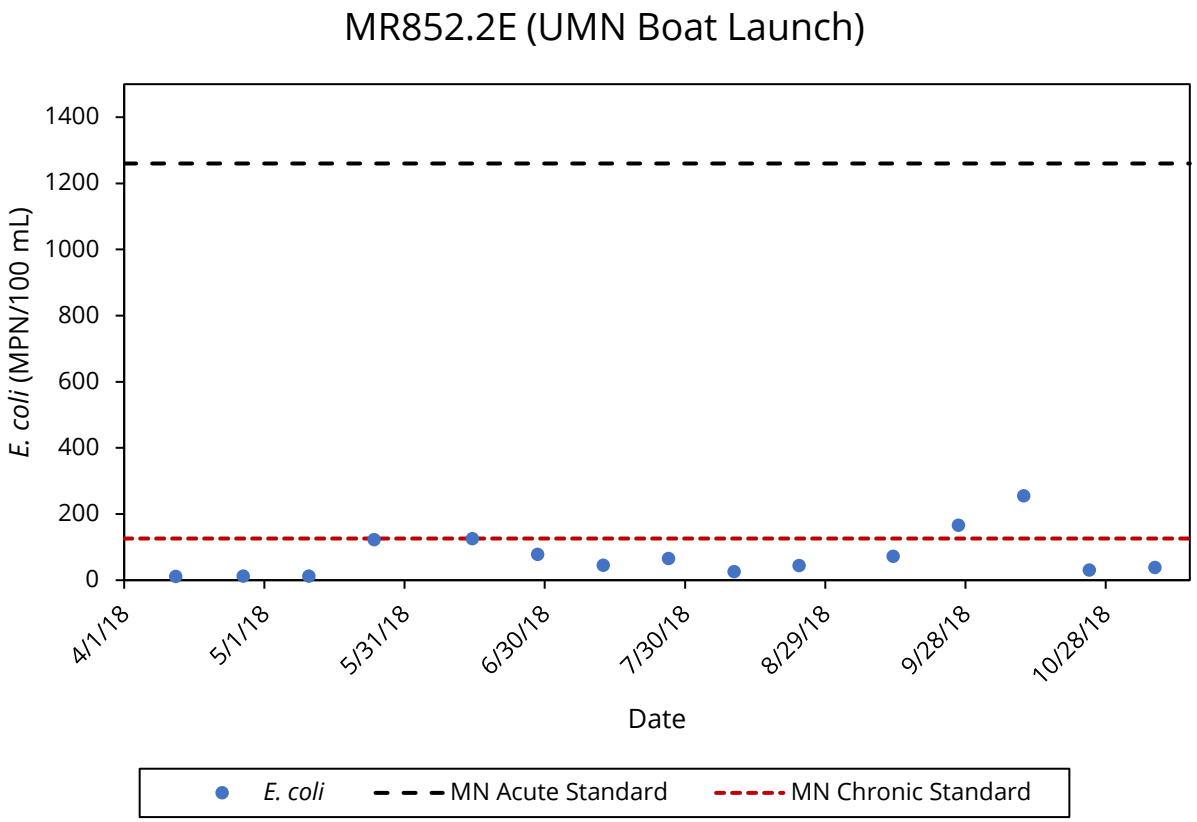

Figure 5. 2018 *E. coli* values at MR852.2E.

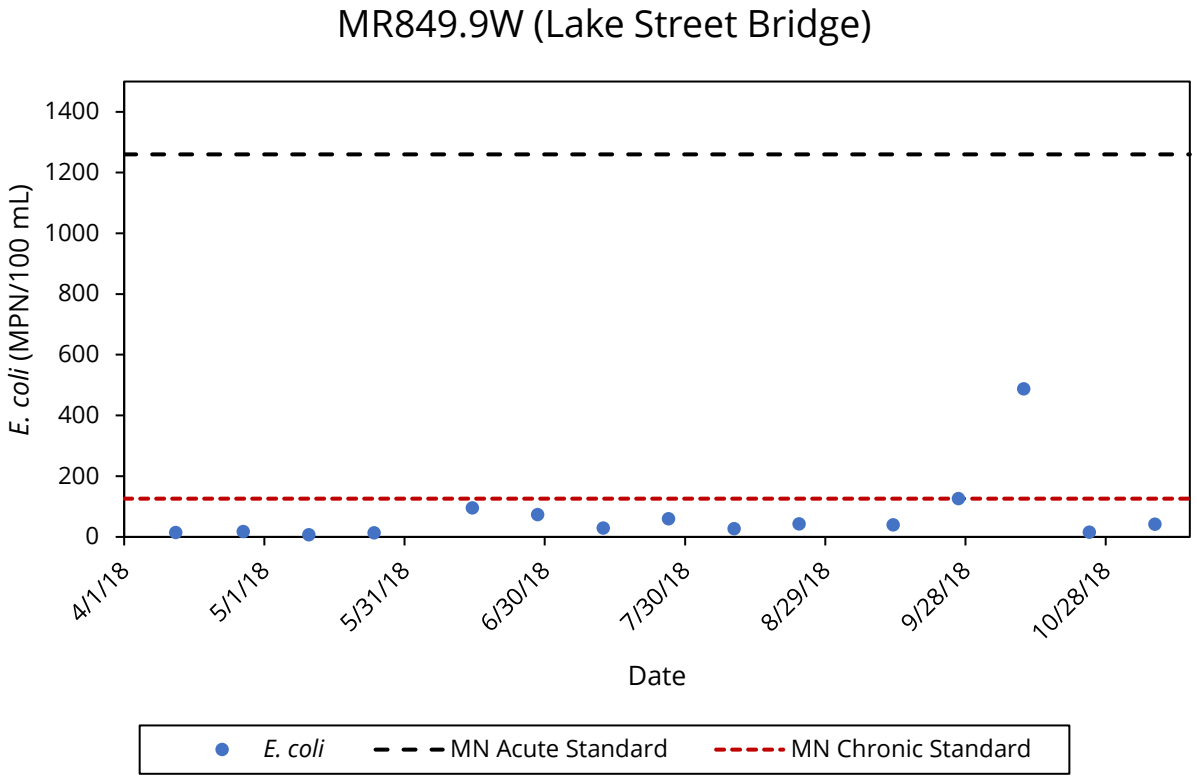

Figure 6. 2018 *E. coli* values at MR849.9W.

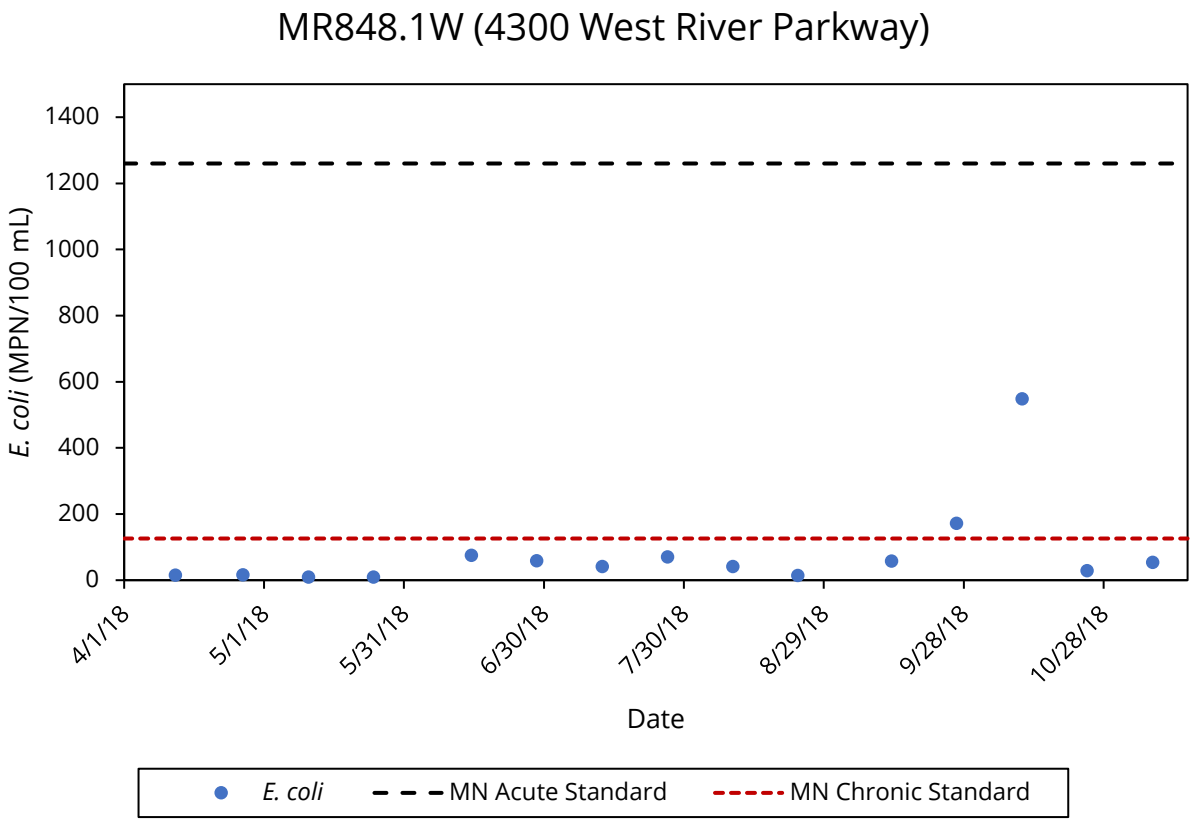

Figure 7. 2018 *E. coli* values at MR848.1W.

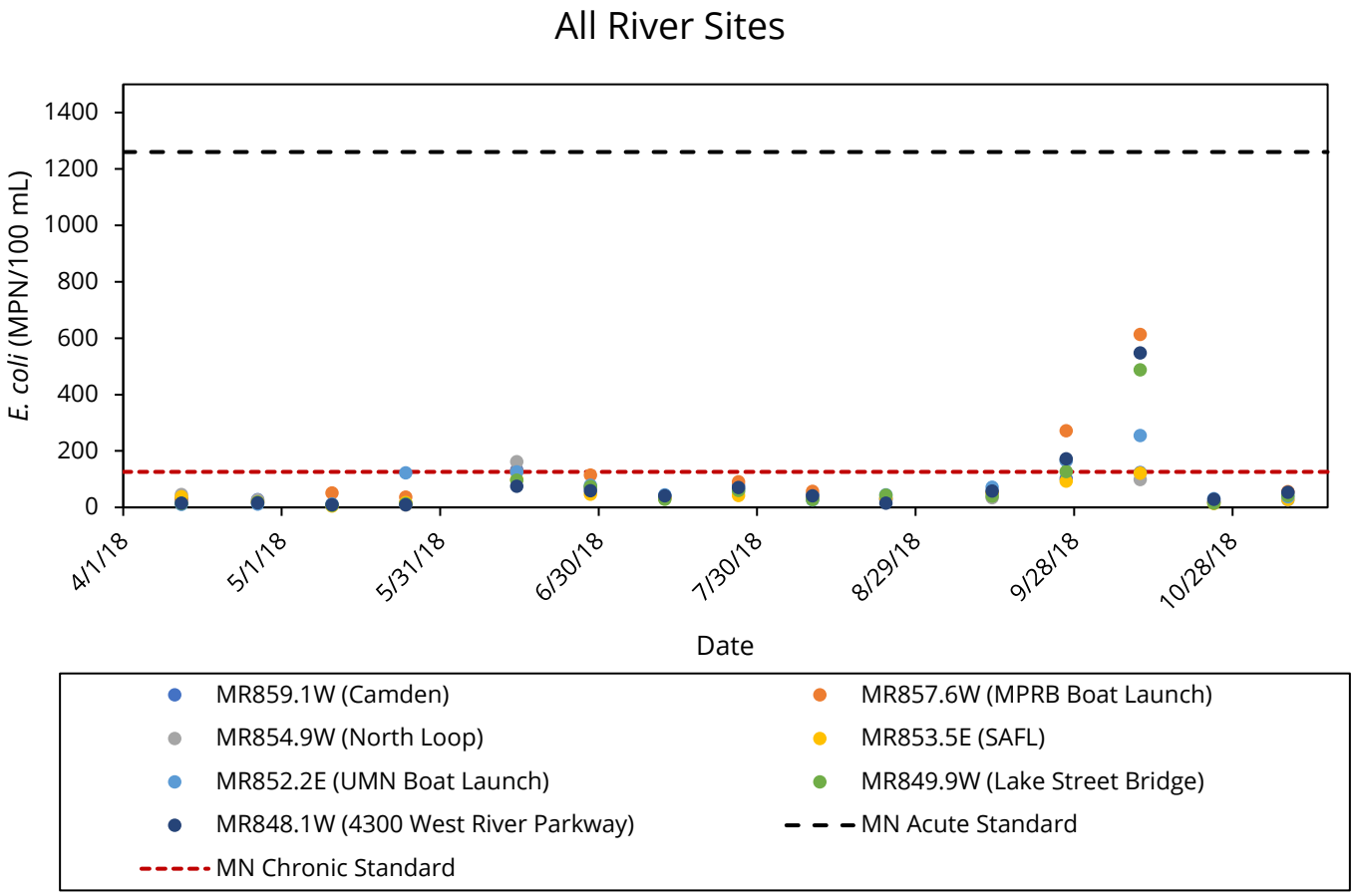

Figure 8. 2018 *E. coli* values at all sites.

Table 2. 2018 Mississippi River site MR859.1W (Camden) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR859.1W	04/12/2018 11:45	Base	40	298.1	15.24	8.4	0.23	477.5	> 100	5.3	29.0
MR859.1W	04/26/2018 11:13	Melt	55	200.9	13.32		0.15	304.1		7.2	28.0
MR859.1W	05/10/2018 11:55	Base	53	321.1	11.21	8.1	0.19	385.1	69	16.3	8.0
MR859.1W	05/24/2018 11:20	Base	83	388.3	11.27	8.7	0.20	421.7	52	20.9	15.0
MR859.1W	06/14/2018 11:10	Base	75	381.8	8.49	7.8	0.19	403.5	46	22.2	133.0
MR859.1W	06/28/2018 10:55	Base	80	412.2	8.52	7.8	0.20	426.1	43	23.3	71.0
MR859.1W	07/12/2018 12:25	Base	84	489.2	8.18	8.1	0.23	473.9	51	26.7	41.0
MR859.1W	07/26/2018 11:25	Base	63	382.7	8.49	8.0	0.19	395.1	45	23.4	78.0
MR859.1W	08/09/2018 12:15	Base	80	451.2	8.94	8.8	0.21	442.0	44	26.1	46.0
MR859.1W	08/23/2018 09:30	Base	69	370.5	8.53	8.5	0.19	391.5	56	22.2	29.0
MR859.1W	09/12/2018 11:55	Base	77	401.0	9.78	8.6	0.20	423.9	70	22.2	53.0
MR859.1W	09/26/2018 11:43	Base	55	366.6	8.69	8.3	0.21	440.3	49	16.2	102.0
MR859.1W	10/10/2018 11:45	Rain	47	314.7	9.86	8.3	0.21	433.5	90	10.7	124.0
MR859.1W	10/24/2018 11:35	Base	44	294.7	12.69	8.0	0.22	449.3	56	7.0	20.0
MR859.1W	11/07/2018 12:00	Base	31	248.1	13.23	7.4	0.19	398.6	88	5.2	54.0

Table 3. 2018 Mississippi River site MR857.6W (MPRB Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR857.6W	04/12/2018 11:25	Base	40	366.6	14.35	8.2	0.29	591.0	> 100	5.1	30.0
MR857.6W	04/26/2018 10:55	Melt	55	218.4	13.86		0.16	330.3	51	7.3	21.0
MR857.6W	05/10/2018 11:30	Base	52	372.0	10.86	7.8	0.22	449.1	73	16.0	51.0
MR857.6W	05/24/2018 11:05	Base	83	451.9	10.55	8.6	0.24	494.0	55	20.5	36.0
MR857.6W	06/14/2018 10:50	Base	75	420.8	8.68	7.6	0.21	446.5	49	22.0	127.0
MR857.6W	06/28/2018 10:35	Base	80	438.4	8.40	7.8	0.22	455.1	40	23.1	115.0
MR857.6W	07/12/2018 11:50	Base	83	524.0	8.03	8.0	0.25	511.0	63	26.3	34.0
MR857.6W	07/26/2018 11:05	Base	63	406.5	8.45	7.9	0.20	421.0	51	23.3	90.5
MR857.6W	08/09/2018 12:00	Base	80	447.8	9.25	8.7	0.21	440.9	48	25.8	57.0
MR857.6W	08/23/2018 08:55	Base	64	396.3	7.97	8.3	0.20	424.1	53	21.6	32.0
MR857.6W	09/26/2018 11:08	Base	52	394.1	9.41	8.2	0.23	484.3	39	15.3	272.0
MR857.6W	10/10/2018 11:35	Rain	46	311.7	9.98	8.1	0.21	439.1	68	9.8	613.0
MR857.6W	10/24/2018 11:15	Base	44	314.5	12.62	8.3	0.23	482.6	70	6.8	19.0
MR857.6W	11/07/2018 11:40	Base	31	268.7	13.14	7.2	0.21	433.7	89	5.1	56.0

Table 4. 2018 Mississippi River site MR854.9W (North Loop) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR854.9W	04/12/2018 11:00	Base	40	289.6	13.13	8.1	0.23	469.6	79	4.9	46
MR854.9W	04/26/2018 10:31	Melt	55	190.8	13.10		0.14	289.9	51	7.1	26.0
MR854.9W	05/10/2018 11:00	Base	52	297.4	10.68	7.8	0.17	358.8	77	16.0	12.0
MR854.9W	05/24/2018 10:45	Base	82	365.1	9.57	8.6	0.19	400.5	49	20.4	8.0
MR854.9W	06/14/2018 10:25	Base	72	356.1	8.71	7.6	0.18	374.9	50	22.4	162.0
MR854.9W	06/28/2018 10:50	Base	81	381.9	8.38	8.2	0.19	394.8	45	23.3	70.0
MR854.9W	07/12/2018 10:40	Base	82	449.6	8.03	7.9	0.21	435.8	61	26.7	36.0
MR854.9W	07/26/2018 10:40	Base	62	354.1	8.39	7.9	0.17	363.8	54	23.6	56.0
MR854.9W	08/09/2018 11:05	Base	81	404.0	8.80	8.3	0.19	398.1	61	25.8	33.0
MR854.9W	08/23/2018 11:25	Base	75	378.0	9.05	8.3	0.19	391.9	42	23.1	28.0
MR854.9W	09/12/2018 11:00	Base	74	369.7	8.95	8.5	0.19	393.3	69	21.9	34.0
MR854.9W	09/26/2018 10:47	Base	50	328.9	9.51	8.3	0.19	395.1	49	16.2	167.0
MR854.9W	10/10/2018 11:15	Rain	46	295.7	10.38	8.4	0.19	403.4	55	11.0	99.0
MR854.9W	10/24/2018 10:50	Base	43	261.6	13.28	8.2	0.19	402.8	73	6.6	21.0
MR854.9W	11/07/2018 11:10	Base	30	227.8	13.24	7.3	0.18	366.6	83	5.2	26.0

Table 5. 2018 Mississippi River site MR853.5E (SAFL) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR853.5E	04/12/2018 10:35	Base	40	278.8	12.83	8.1	0.22	453.2	> 100	4.8	38.0
MR853.5E	04/26/2018 10:14	Melt	54								18.0
MR853.5E	05/10/2018 10:50	Base	50								5.0
MR853.5E	05/24/2018 10:20	Base	83	344.9	9.01	8.5	0.18	380.2	59	20.1	17.0
MR853.5E	06/14/2018 09:55	Base	72	327.5	8.99	7.5	0.17	346.5	44	22.1	99.0
MR853.5E	06/28/2018 10:25	Base	80	340.7	8.32	8.3	0.17	352.4	33	23.3	47.0
MR853.5E	07/12/2018 10:15	Base	80	402.7	8.2	8	0.19	390.3	49	26.7	32.0
MR853.5E	07/26/2018 10:15	Base	62	326.8	8.6	7.8	0.16	335.5	47	23.6	42.0
MR853.5E	08/09/2018 10:05	Base	79	383.3	8.17	8.2	0.18	381.8	56	25.2	31.0
MR853.5E	08/23/2018 10:40	Base	73	364.4	8.68	8.1	0.18	381.9	73	22.6	34.0
MR853.5E	09/12/2018 10:20	Base	72	353.8	8.85	8.5	0.18	380.1	62	21.4	51.5
MR853.5E	09/26/2018 10:30	Base	50	328.9	9.51	8.3	0.19	395.1	37	16.2	93.0
MR853.5E	10/10/2018 10:50	Rain	45	284.0	10.96	8.4	0.19	388.9	80	10.9	121.0
MR853.5E	10/24/2018 10:25	Base	40	224.5	13.68	8.2	0.17	346.3	69	6.6	13.5
MR853.5E	11/07/2018 10:45	Base	30	205.2	13.46	7.2	0.16	331.6	93	5.0	29.0

Table 6. 2018 Mississippi River site MR852.2E (UMN Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR852.2E	04/12/2018 10:10	Base	40	294.7	14.15	8.0	0.23	478.6	> 100	4.9	11.0
MR852.2E	04/26/2018 09:51	Melt	50	176.1	14.01		0.13	267.9	41	7.1	12.0
MR852.2E	05/10/2018 10:25	Base	51	277.3	10.97	7.6	0.16	334.5	67	16.1	12.0
MR852.2E	05/24/2018 09:55	Base	80	353.0	9.51	8.5	0.19	389.5	58	20.1	123.0
MR852.2E	06/14/2018 09:30	Base	72	339.2	9.44	7.4	0.17	360.0	47	22.0	126.0
MR852.2E	06/28/2018 09:55	Base	79	357.5	8.41	8.1	0.18	371.0	45	23.1	78.0
MR852.2E	07/12/2018 09:35	Base	79	402.0	8.47	7.8	0.19	391.4	49	26.4	45.0
MR852.2E	07/26/2018 09:55	Base	62	325.5	9.12	7.8	0.16	334.3	50	23.6	66.0
MR852.2E	08/09/2018 09:45	Base	77	390.5	8.70	8.0	0.19	391.4	53	24.9	26.0
MR852.2E	08/23/2018 09:55	Base	70	379.9	8.71	8.0	0.19	395.1	39	23.0	44.0
MR852.2E	09/12/2018 09:45	Base	72	363.2	9.57	8.4	0.19	393.3	59	21.0	72.0
MR852.2E	09/26/2018 10:03	Base	50	343.1	9.98	8.2	0.20	411.9	37	16.3	166.0
MR852.2E	10/10/2018 10:05	Rain	45	291.2	11.45	8.2	0.19	398.4	77	10.9	255.0
MR852.2E	10/24/2018 10:00	Base	37	229.5	14.41	8.2	0.17	353.3	68	6.7	31.0
MR852.2E	11/07/2018 10:10	Base	30	208.0	13.74	7.2	0.16	334.6	93	5.2	38.0

Table 7. 2018 Mississippi River site MR849.9W (Lake Street Bridge) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR849.9W	04/12/2018 09:45	Base	40	288.4	13.28	7.8	0.23	472.1	> 100	4.6	14.0
MR849.9W	04/26/2018 09:28	Melt	49	184.5	13.44		0.13	288.9	44	7.3	18.0
MR849.9W	05/10/2018 09:45	Base	49	283.8	10.55	7.5	0.16	341.7	60	16.1	7.5
MR849.9W	05/24/2018 09:30	Base	77	348.2	9.42	8.5	0.19	385.8	57	19.9	13.0
MR849.9W	06/14/2018 09:00	Base	72	344.7	9.12	7.4	0.17	364.9	54	22.1	96.0
MR849.9W	06/28/2018 09:35	Base	78	357.0	8.85	8.2	0.18	369.8	37	23.2	74.0
MR849.9W	07/12/2018 09:10	Base	79	422.1	8.43	7.8	0.20	409.7	58	26.6	29.0
MR849.9W	07/26/2018 09:20	Base	62	339.8	8.73	7.7	0.17	347.3	55	23.9	60.0
MR849.9W	08/09/2018 09:10	Base	77	389.6	8.50	7.9	0.19	391.5	36	24.7	27.0
MR849.9W	08/23/2018 09:25	Base	68	372.2	8.80	7.9	0.18	382.5	50	23.6	43.0
MR849.9W	09/12/2018 09:20	Base	69	362.7	9.53	8.4	0.19	390.8	70	21.2	40.0
MR849.9W	09/26/2018 09:39	Base	48	337.1	9.56	8.1	0.19	404.2	44	16.3	126.5
MR849.9W	10/10/2018 09:45	Rain	46	284.7	11.55	8.2	0.19	389.3	77	10.9	488.0
MR849.9W	10/24/2018 09:30	Base	36	243.4	14.51	8.3	0.18	373.1	74	6.8	15.0
MR849.9W	11/07/2018 09:45	Base	30	218.4	13.20	7.3	0.17	350.4	94	5.3	42.0

Table 8. 2018 Mississippi River site MR848.1W (4300 West River Parkway) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling conditions	Air Temperature (°F)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Specific Conductivity (µS/cm)	Transparency (cm)	Water Temperature (°C)	*E. coli* (CFU/100 mL)
MR848.1W	4/12/2018 9:15	Base	40	291.4	13.83	7.7	0.23	471.8	> 100	5.0	15.5
MR848.1W	4/26/2018 9:10	Melt	45	187.7	13.15		0.14	282.3	44	7.4	16.0
MR848.1W	5/10/2018 9:10	Base	49	285.2	10.49	7.5	0.16	342.4	62	16.3	9.5
MR848.1W	5/24/2018 9:05	Base	77	348.3	9.40	8.5	0.19	386.4	51	19.8	9.0
MR848.1W	6/14/2018 8:30	Base	71	343.2	9.04	7.5	0.17	365.2	48	21.9	75.0
MR848.1W	6/28/2018 9:05	Base	75	357.3	8.50	8.2	0.18	370.4	27	23.2	59.0
MR848.1W	7/12/2018 8:45	Base	78	421.8	8.28	7.6	0.19	409.5	55	26.6	41.0
MR848.1W	7/26/2018 8:50	Base	61	336.3	8.65	7.3	0.16	344.0	46	23.8	70.0
MR848.1W	8/9/2018 8:45	Base	74	390.2	8.13	7.5	0.19	390.8	41	24.9	41.0
MR848.1W	8/23/2018 9:00	Base	63	369.4	8.69	7.8	0.18	379.7	43	23.6	14.5
MR848.1W	9/12/2018 8:55	Base	67	361.8	9.06	8.3	0.19	387.6	66	21.5	58.0
MR848.1W	9/26/2018 9:11	Base	48	338.2	9.96	8.0	0.20	404.7	60	16.4	172.0
MR848.1W	10/10/2018 9:25	Rain	44	322.4	11.47	8.3	0.21	437.1	78	11.3	548.0
MR848.1W	10/24/2018 9:05	Base	33	243.9	16.26	8.5	0.18	373.4	72	6.8	29.0
MR848.1W	11/7/2018 9:10	Base	30	218.7	13.16	7.8	0.17	349.3	> 100	5.4	54.0