

2023 Mississippi River Bacteria Sampling

Summary of 2023 Data

Portions of the 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 water quality standard from fecal coliform to *E. coli* for bacteria monitoring in Minnesota. The acute standard states that *E. coli* cannot exceed 1,260 CFU/100 mL in more than 10 percent of the samples taken in one month. 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.

Bacteria samples were collected on the second and fourth Thursday of each month from April through October. Therefore, the small number of samples collected each month greatly affect these results, and a monthly geomean is not calculated. All samples in 2023 were taken during baseflow conditions, with the exception of one sampling event in July and one in October which are both categorized as rain. In 2023, three of the river sites exceeded 1,260 CFU/100 mL on one sampling date in October, as shown in Table 1. This coincided with a rain event on the morning of the sampling.

Figures 1–7 below are split up by site and display the *E. coli* sample results compared to the MPCA standards. Figure 8 displays all sampling sites together. Tables 2–8 show the *E. coli* sample results and other field sampling parameters in more detail.

Mississippi River Bacteria Data

Table 1. Sites that exceeded the MN Acute Standard threshold for *E. coli* (1,260CFU/100mL) in the Mississippi River in 2023.

Month	Sites
April	None
May	None
June	None
July	None
August	None
September	None
October	MR857.6W, MR849.9W, MR848.1W

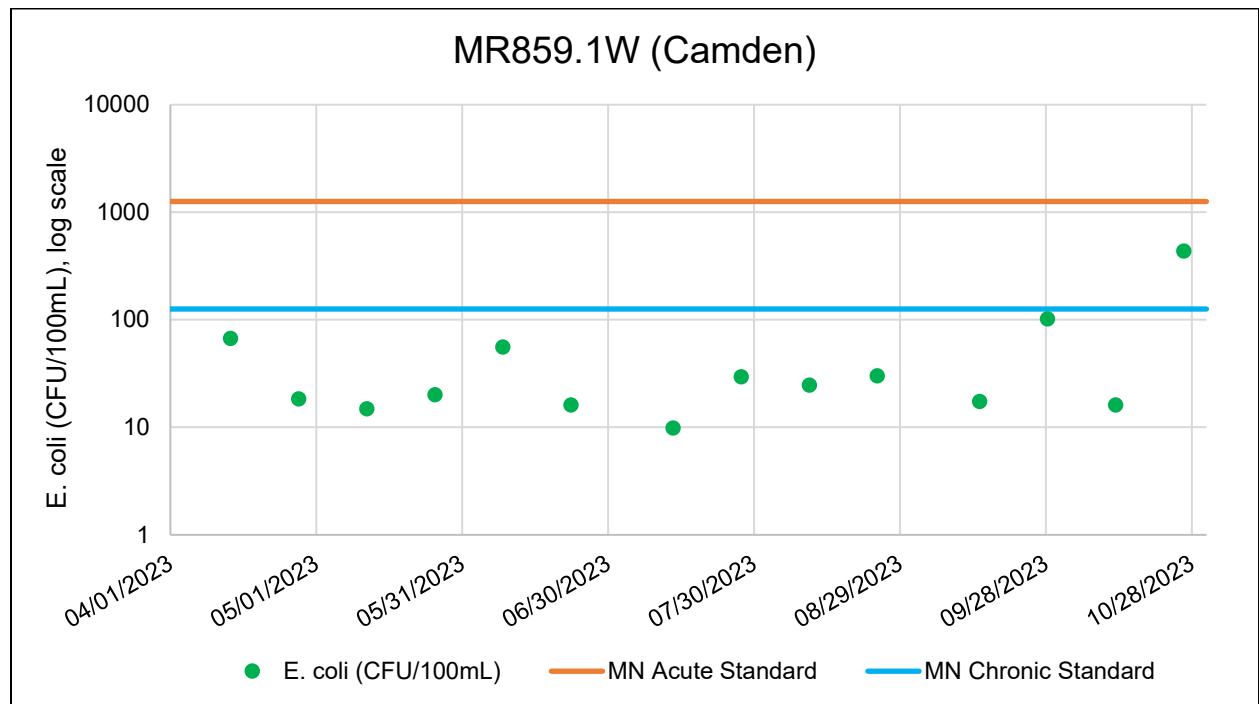


Figure 1. 2023 *E. coli* values at MR859.1W.

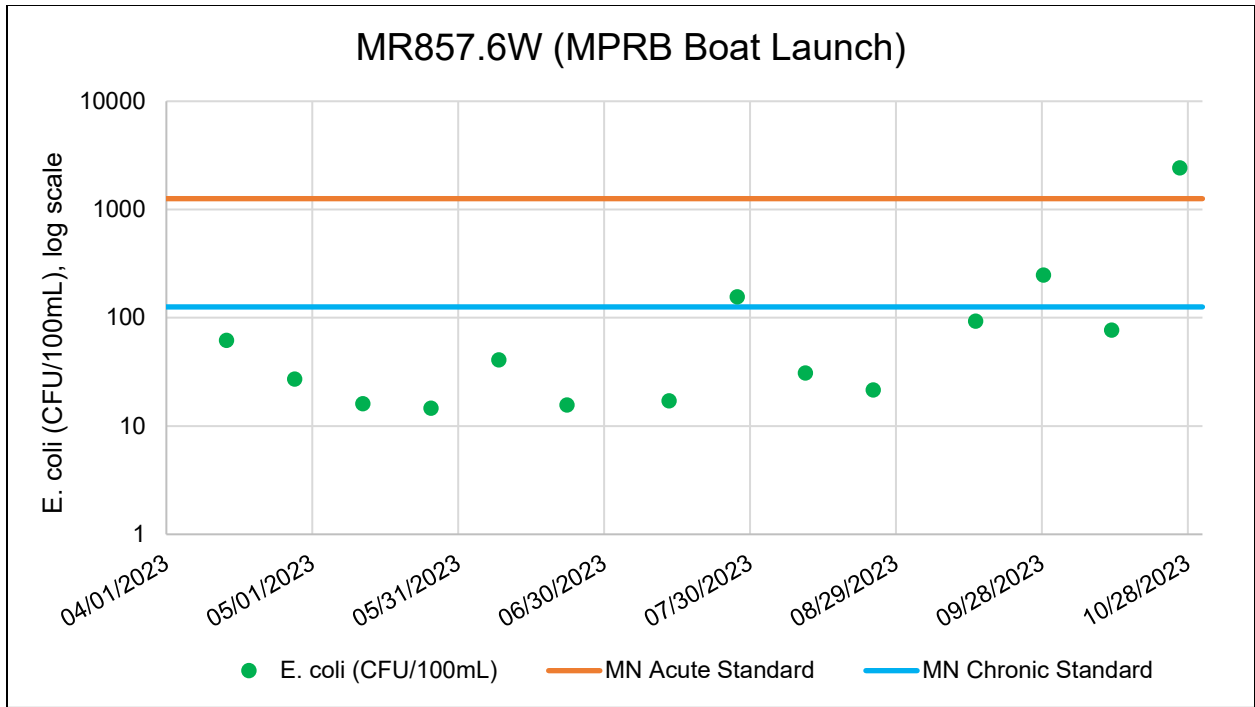


Figure 2. 2023 *E. coli* values at MR857.6W.

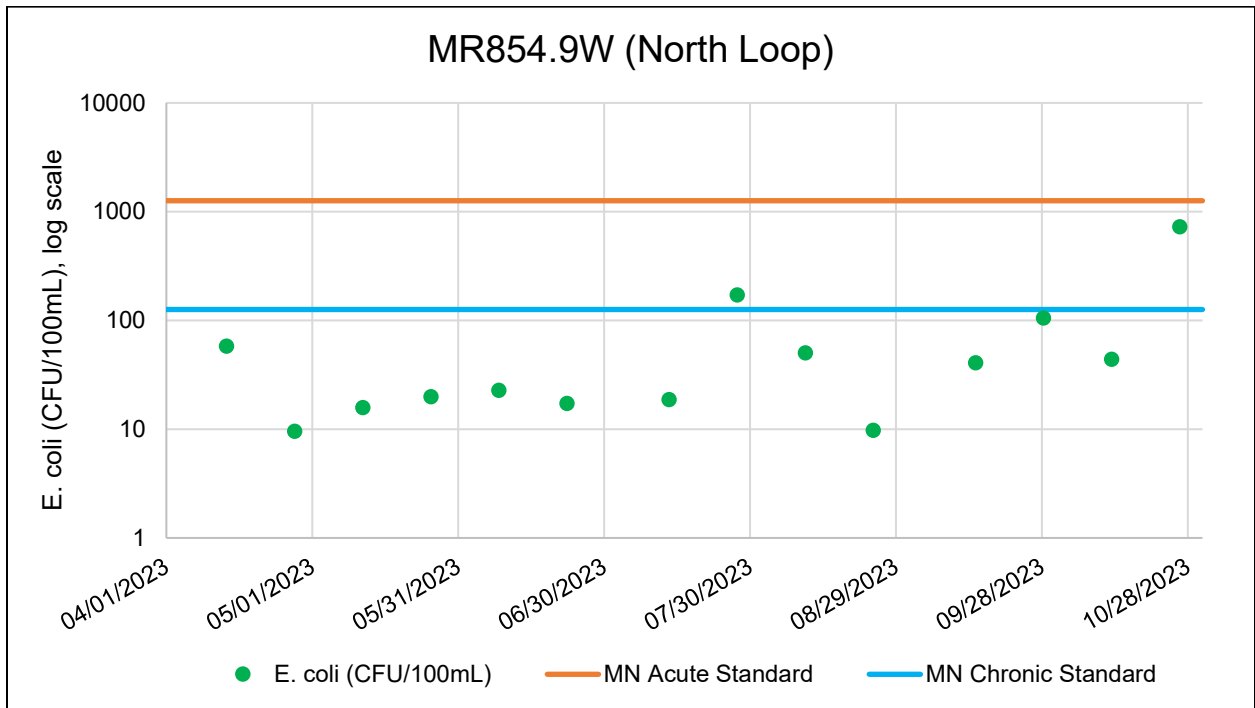


Figure 3. 2023 *E. coli* values at MR854.9W.

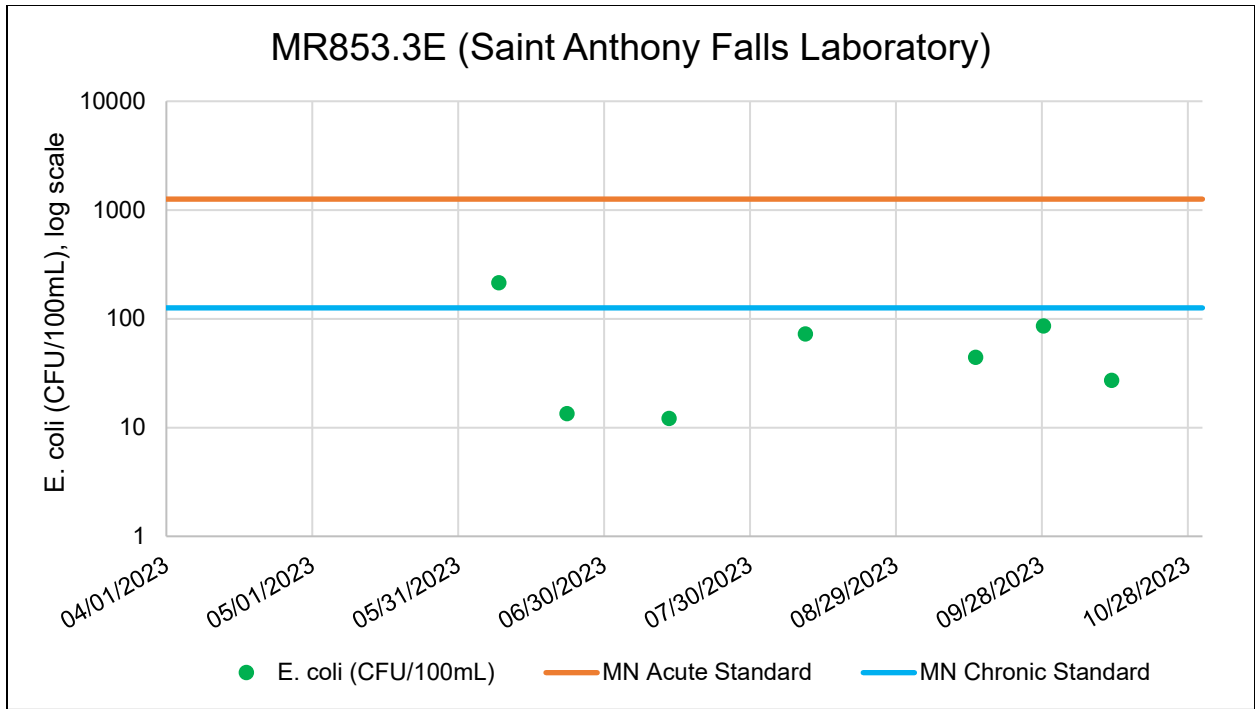


Figure 4. 2023 *E. coli* values at MR853.3E.

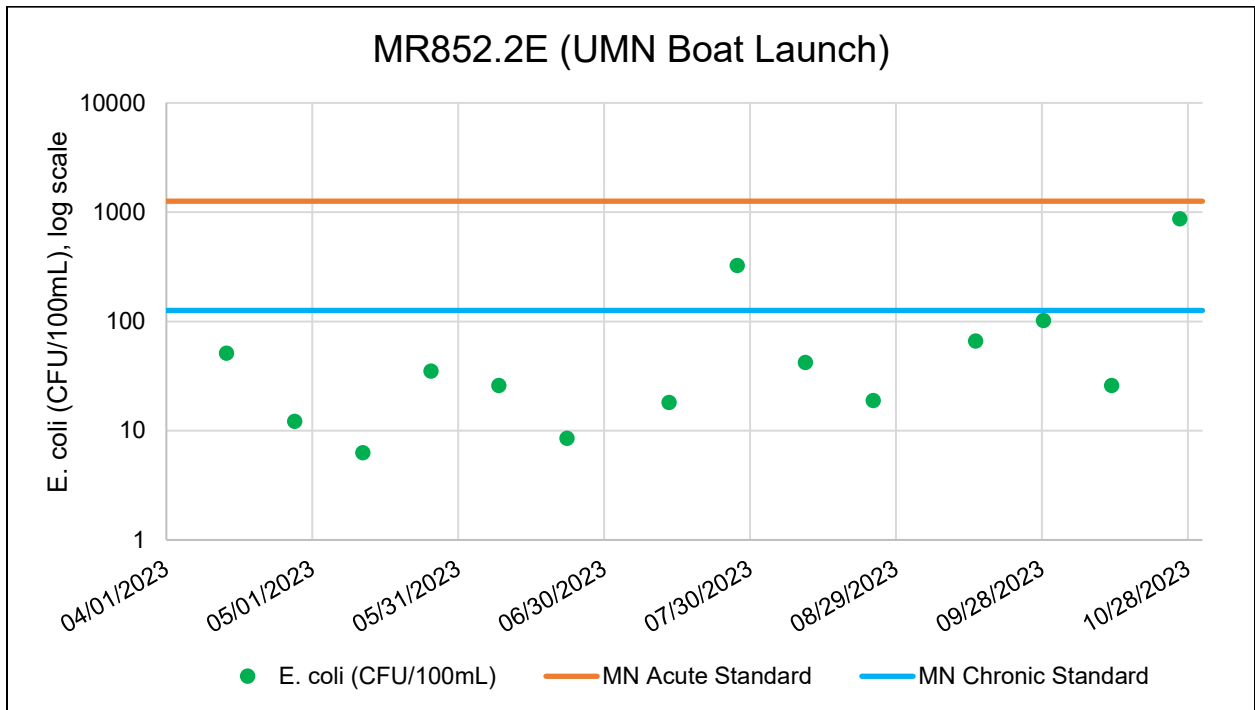


Figure 5. 2023 *E. coli* values at MR852.2E.

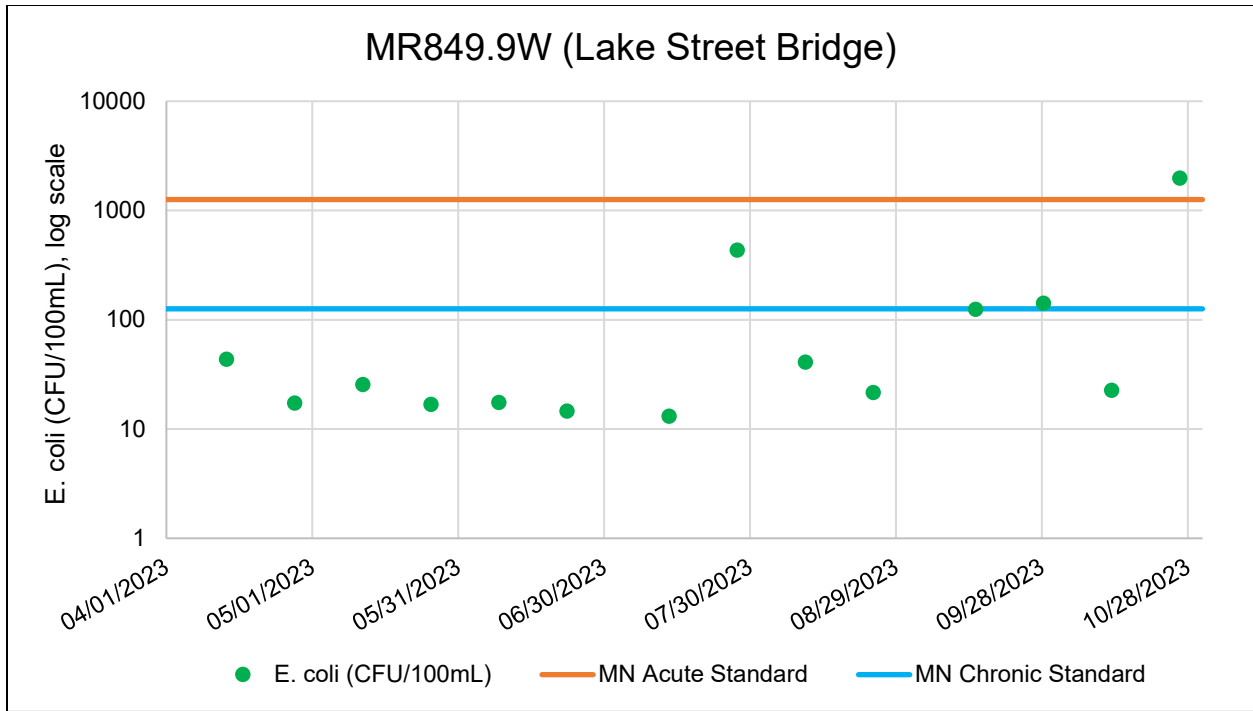


Figure 6. 2023 *E. coli* values at MR849.9W.

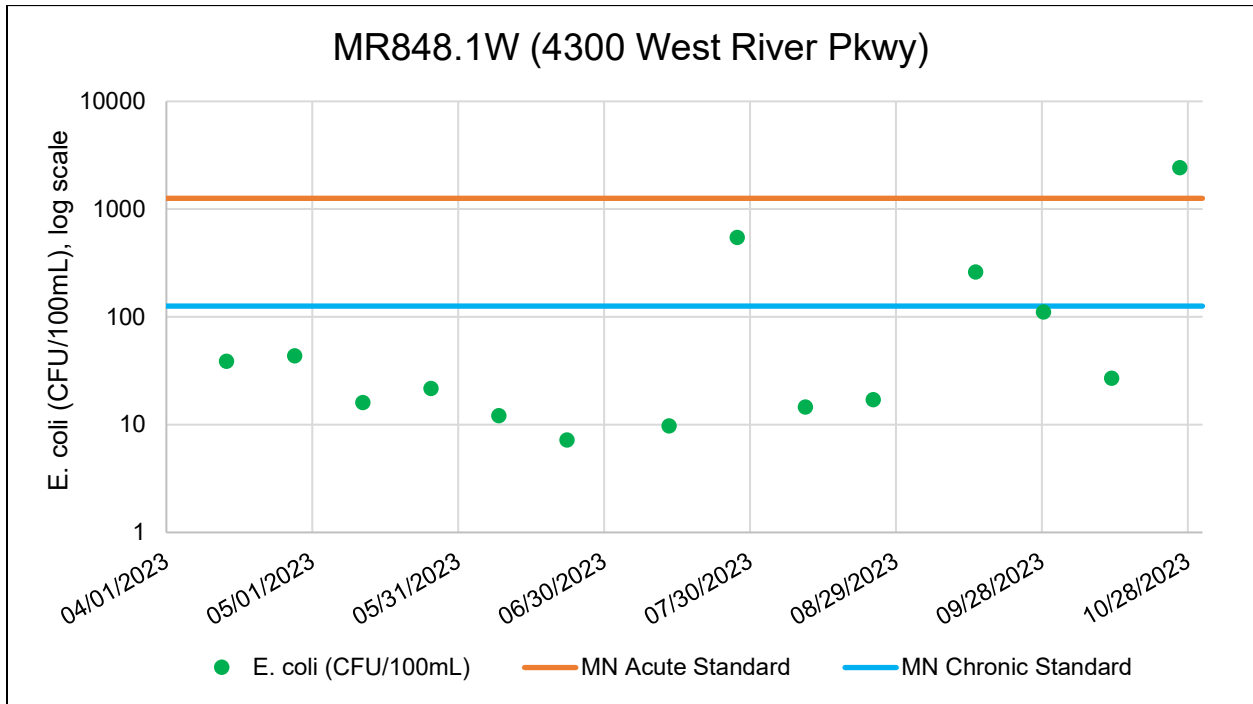


Figure 7. 2023 *E. coli* values at MR848.1W.

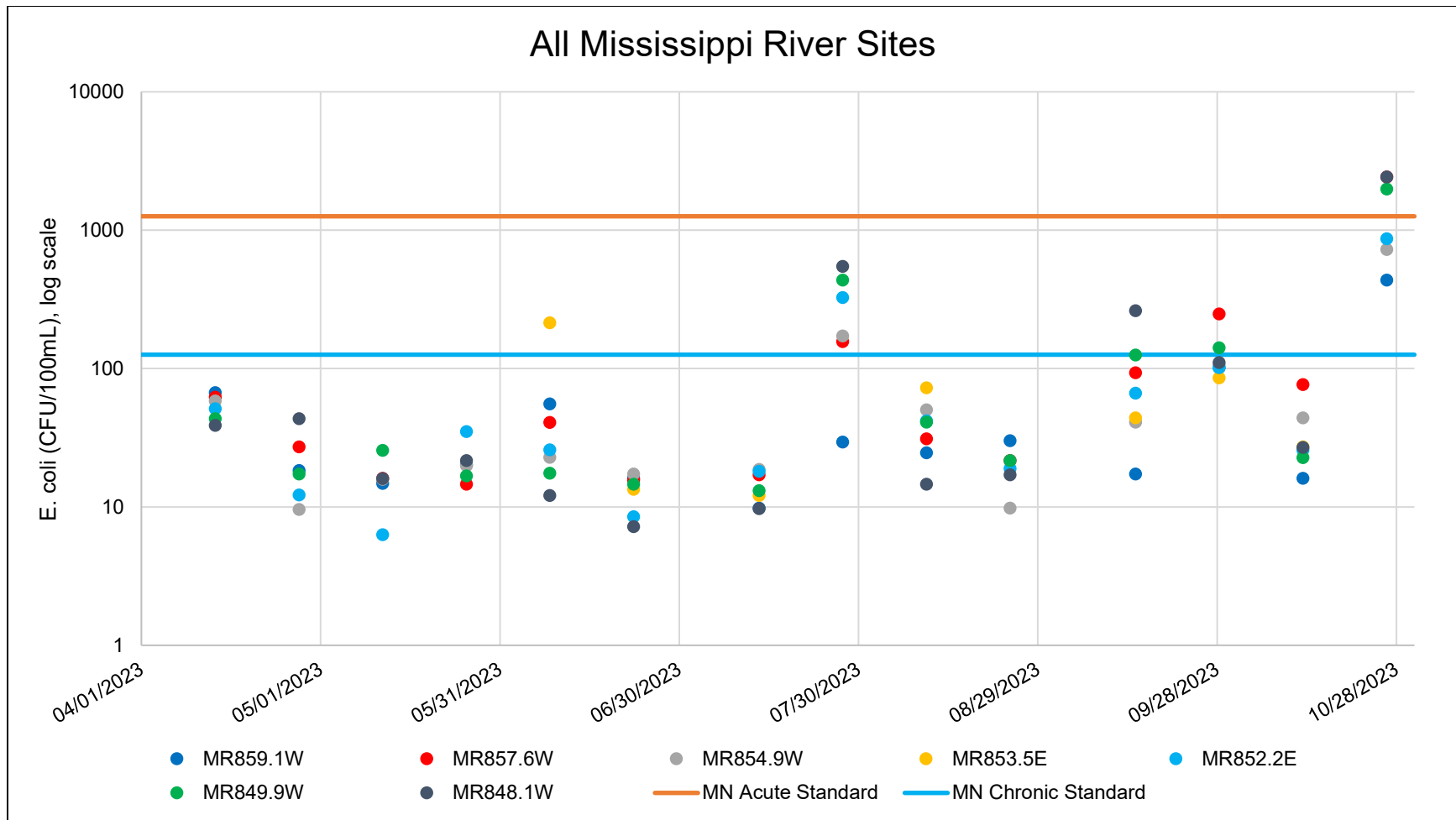


Figure 8. 2023 *E. coli* values for all Mississippi River sites.

Table 2. 2023 Mississippi River site MR859.1W (Camden) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR859.1W	04/13/2023 11:30	Base	5.2	13.14	365.9	227.3	0.18	7.9	27	67.0
MR859.1W	04/27/2023 10:55	Base	6.8	12.77	328.7	214.7	0.16	8.1	43	18.3
MR859.1W	05/11/2023 10:55	Base	16.2	10.53	352.3	293.1	0.17	8.2	53	14.8
MR859.1W	05/25/2023 11:25	Base	19.2	10.27	427.7	380.5	0.21	8.3	58	20.1
MR859.1W	06/08/2023 11:05	Base	24.3	10.24	434.7	428.8	0.21	8.6	50	55.6
MR859.1W	06/22/2023 11:20	Base	26.6	9.65	453.6	467.7	0.22	8.4	>100	16.1
MR859.1W	07/13/2023 10:55	Base	23.5	9.63	438.8	426.3	0.21	8.5	94	9.8
MR859.1W	07/27/2023 11:15	Rain	27.8	8.92				8.6	78	29.5
MR859.1W	08/10/2023 11:00	Base	24.7	9.37	448.4	445.7	0.21	8.7	72	24.6
MR859.1W	08/24/2023 10:20	Base	25.8	7.79	444.7	451.6	0.21	8.7	73	30.1
MR859.1W	09/14/2023 11:10	Base	19.2	10.13	457.1	406.7	0.22	8.6	>100	17.3
MR859.1W	09/28/2023 10:50	Base	19.1	9.03	463.4	411.2	0.22	8.2	>100	101.4
MR859.1W	10/12/2023 11:10	Base	13.1	10.95	445.5	344.7	0.22	8.6	>100	16.1
MR859.1W	10/26/2023 10:25	Rain	13.2	10.08	406.5	315.2	0.20	8.2	>100	435.2

Table 3. 2023 Mississippi River site MR857.6W (MPRB Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR857.6W	04/13/2023 11:10	Base	5.2	13.13	365.4	227.0	0.18	7.9	31	62.0
MR857.6W	04/27/2023 11:15	Base	7.1	12.68	381.1	250.5	0.18	8.1	47	27.2
MR857.6W	05/11/2023 10:25	Base	16.5	10.53	388.9	325.5	0.19	8.2	60	16.1
MR857.6W	05/25/2023 11:00	Base	19.1	10.25	446.1	395.6	0.22	8.2	64	14.6
MR857.6W	06/08/2023 10:40	Base	23.8	9.87	447.2	437.0	0.21	8.5	53	40.8
MR857.6W	06/22/2023 11:00	Base	26.0	9.38	482.0	491.6	0.23	8.4	>100	15.6
MR857.6W	07/13/2023 10:40	Base	23.1	8.88	458.8	442.0	0.22	8.5	>100	17.1
MR857.6W	07/27/2023 10:30	Rain	27.5	6.82	454.6	476.3	0.22	8.4	92	156.5
MR857.6W	08/10/2023 10:45	Base	24.6	8.52	465.6	461.7	0.22	8.6	72	31.0
MR857.6W	08/24/2023 09:55	Base	25.8	6.89	458.3	465.8	0.22	8.7	47	21.6
MR857.6W	09/14/2023 10:45	Base	19.0	9.77	484.8	429.5	0.23	8.5	>100	93.2
MR857.6W	09/28/2023 10:30	Base	18.4	8.48	461.8	403.4	0.22	8.0	>100	248.1
MR857.6W	10/12/2023 10:55	Base	12.7	10.67	504.0	386.0	0.25	8.5	35	76.7
MR857.6W	10/26/2023 10:10	Rain	12.7	9.83	383.6	293.3	0.19	8.2	68	>2419.6

Table 4. 2023 Mississippi River site MR854.9W (North Loop) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR854.9W	04/13/2023 10:25	Base	5.2	12.96	355.4	220.9	0.17	7.9	29	58.3
MR854.9W	04/27/2023 10:15	Base	6.8	12.75	318.5	207.5	0.15	8.1	47	9.6
MR854.9W	05/11/2023 10:05	Base	16.1	10.35	326.9	271.1	0.16	8.2	56	15.8
MR854.9W	05/25/2023 10:30	Base	19.0	9.89	389.6	344.6	0.19	8.3	70	19.9
MR854.9W	06/08/2023 10:15	Base	24.3	9.03	415.8	410.1	0.20	8.4	54	22.8
MR854.9W	06/22/2023 10:35	Base	26.2	7.41	454.6	465.4	0.22	8.3	68	17.3
MR854.9W	07/13/2023 10:00	Base	24.5	8.52	432.9	428.5	0.21	8.5	92	18.7
MR854.9W	07/27/2023 10:10	Rain	29.5	9.51	438.5	476.5	0.21	8.7	72	172.0
MR854.9W	08/10/2023 10:25	Base	26.2	10.33	451.7	462.0	0.22	8.7	59	50.4
MR854.9W	08/24/2023 09:30	Base	27.8	9.59	435.2	458.1	0.21	8.8	64	9.8
MR854.9W	09/14/2023 09:50	Base	20.9	10.87	459.9	424.1	0.22	8.7	79	41.0
MR854.9W	09/28/2023 10:15	Base	19.3	8.92	472.0	420.1	0.23	8.1	>100	105.4
MR854.9W	10/12/2023 10:00	Base	13.0	9.94	457.7	353.0	0.22	8.4	97	44.1
MR854.9W	10/26/2023 09:50	Rain	13.2	9.83	417.5	323.5	0.20	8.3	85	727.0

Table 5. 2023 Mississippi River site MR853.5E (SAFL) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR853.5E	06/08/2023 09:50	Base	23.7	8.47	409.0	398.8	0.20	8.4		214.2
MR853.5E	06/22/2023 10:10	Base	26.3	8.24	444.7	456.1	0.21	8.4	>100	13.4
MR853.5E	07/13/2023 09:40	Base	24.8	8.34	429.3	427.6	0.21	8.6	80	12.1
MR853.5E	08/10/2023 08:15	Base	25.2	8.16	446.8	448.7	0.21	8.6	55	72.7
MR853.5E	09/14/2023 09:30	Base	20.2	9.03	461.8	419.3	0.22	8.6	76	44.1
MR853.5E	09/28/2023 09:55	Base	19.4	9.25	463.6	413.7	0.22	8.3	>100	85.7
MR853.5E	10/12/2023 09:45	Base	14.2	10.22	436.3	346.2	0.21	8.6	97	27.2

Table 6. 2023 Mississippi River site MR852.2E (UMN Boat Launch) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR852.2E	04/13/2023 09:40	Base	5.3	13.56	341.4	213.2	0.16	7.9	16	51.2
MR852.2E	04/27/2023 09:35	Base	6.7	13.28	283.7	184.5	0.14	8.2	46	12.2
MR852.2E	05/11/2023 09:40	Base	16.1	10.59	305.3	253.2	0.15	8.2	50	6.3
MR852.2E	05/25/2023 09:55	Base	18.8	10.30	367.0	323.7	0.18	8.3	60	35.0
MR852.2E	06/08/2023 09:20	Base	23.6	9.12	410.2	399.1	0.20	8.4	50	25.9
MR852.2E	06/22/2023 09:45	Base	26.5	8.57	459.9	473.4	0.22	8.4	94	8.5
MR852.2E	07/13/2023 09:10	Base	24.9	8.47	440.4	439.6	0.21	8.6	81	18.1
MR852.2E	07/27/2023 09:20	Rain	27.9	7.89	447.3	472.4	0.21	8.6	67	325.5
MR852.2E	08/10/2023 09:45	Base	25.1	8.22	460.8	461.7	0.22	8.6	64	42.0
MR852.2E	08/24/2023 09:10	Base	26.7	8.12	454.4	469.3	0.22	8.8	61	18.9
MR852.2E	09/14/2023 09:05	Base	20.1	9.06	475.7	431.4	0.23	8.6	55	66.3
MR852.2E	09/28/2023 09:00	Base	19.3	8.79	478.4	425.9	0.23	8.2	90	101.7
MR852.2E	10/12/2023 09:25	Base	14.0	11.01	452.6	357.1	0.22	8.6	95	25.8
MR852.2E	10/26/2023 09:20	Rain	13.1	10.73	410.0	317.0	0.20	8.3	80	866.4

Table 7. 2023 Mississippi River site MR849.9W (Lake Street Bridge) physical parameters and *E. coli* sample data.

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR849.9W	04/13/2023 09:15	Base	5.5	13.49	354.7	222.8	0.17	8.0	20	43.5
MR849.9W	04/27/2023 09:10	Base	6.7	13.70	300.1	195.1	0.14	8.1	48	17.3
MR849.9W	05/11/2023 09:20	Base	16.3	10.58	315.3	262.8	0.15	8.2	50	25.6
MR849.9W	05/25/2023 09:30	Base	18.8	10.07	373.3	328.8	0.18	8.2	54	16.8
MR849.9W	06/08/2023 08:55	Base	23.9	9.02	413.5	404.6	0.20	8.5	51	17.5
MR849.9W	06/22/2023 09:20	Base	27.0	8.38	456.8	474.6	0.22	8.4	>100	14.6
MR849.9W	07/13/2023 08:50	Base	24.1	8.16	445.1	437.5	0.21	8.6	75	13.1
MR849.9W	07/27/2023 09:00	Rain	27.2	6.80	430.7	449.0	0.21	8.5	61	435.2
MR849.9W	08/10/2023 09:20	Base	25.8	8.04	464.3	471.6	0.22	8.6	73	41.0
MR849.9W	08/24/2023 08:40	Base	26.8	7.53	460.4	476.6	0.22	8.8	70	21.6
MR849.9W	09/14/2023 08:45	Base	20.1	9.47	477.2	432.8	0.23	8.6	72	125.0
MR849.9W	09/28/2023 08:35	Base	18.9	8.11	474.4	419.6	0.23	8.1	>100	141.4
MR849.9W	10/12/2023 09:00	Base	14.0	10.57	452.8	358.1	0.22	8.6	84	22.7
MR849.9W	10/26/2023 09:00	Rain	13.1	10.58	388.2	300.1	0.19	8.3	55	1986.3

Table 8. 2023 Mississippi River site MR848.1W (4300 West River Parkway) physical parameters and *E. coli* sample data

Station	Sampling Time	Sampling Conditions	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	Conductivity (µS/cm)	Salinity (ppt)	pH	Transparency (cm)	<i>E. coli</i> (CFU/100 mL)
MR848.1W	04/13/2023 08:55	Base	6.2	9.67	363.8	232.9	0.17	8.0	33	38.8
MR848.1W	04/27/2023 08:50	Base	6.7	13.51	299.9	194.9	0.14	8.2	46	43.5
MR848.1W	05/11/2023 09:00	Base	16.4	10.41	318.4	266.3	0.15	8.2	56	16.0
MR848.1W	05/25/2023 09:00	Base	18.8	9.96	372.9	328.6	0.18	8.3	63	21.6
MR848.1W	06/08/2023 08:30	Base	24.3	8.42	412.3	406.9	0.20	8.5	34	12.1
MR848.1W	06/22/2023 09:00	Base	26.4	8.17	454.7	467.1	0.22	8.4	88	7.2
MR848.1W	07/13/2023 08:30	Base	24.0	7.54	448.0	439.3	0.21	8.5	76	9.7
MR848.1W	07/27/2023 08:35	Rain	27.2	7.26	423.1	441.0	0.20	8.5	54	547.5
MR848.1W	08/10/2023 08:50	Base	25.3	8.31	467.3	469.7	0.22	8.6	72	14.6
MR848.1W	08/24/2023 08:20	Base	26.6	8.38	447.8	461.1	0.21	8.8	70	17.1
MR848.1W	09/14/2023 08:25	Base	20.0	9.83	479.8	434.3	0.23	8.6	60	261.3
MR848.1W	09/28/2023 08:15	Base	19.2	8.14	469.6	417.3	0.23	8.0	>100	110.6
MR848.1W	10/12/2023 08:40	Base	13.4	10.30	458.2	356.9	0.22	8.4	92	26.9
MR848.1W	10/26/2023 08:40	Rain	13.0	10.61	427.9	330.2	0.21	8.3		2419.6