

**Review of conductivity, measure of salts, in the Norwalk River
See attached Harbor Watch Reports**

Range of mean conductivity measured in ($\mu\text{mho/cm}$)

2021: 1390 - 465

2020: 1190 - 420

2012: 835 - 304

2007: 775 - 225

Appendix 10: Norwalk River

Table A10.1. GPS coordinates and site locations for the Norwalk River.

Site Name	Latitude	Longitude	Site location notes	River Name
Norwalk 23	41.29005	-73.49349	22 South Street	Unnamed Tributary
Norwalk 21	41.29444	-73.48843	68 Farmingville Road	Ridgefield Brook
Norwalk 19	41.31672	-73.49001	Limestone Road	Ridgefield Brook
Norwalk 15	41.30870	-73.46884	Stonehenge Road	Norwalk River
Norwalk 13	41.26550	-73.44079	787 Branchville Road	Norwalk River
Norwalk 9.5	41.24590	-73.43409	Old Mill Road	Norwalk River
Norwalk 9	41.20354	-73.43094	School Road	Norwalk River
Norwalk 6	41.18341	-73.42276	187 Danbury Road	Norwalk River
Norwalk 4	41.14349	-73.42669	10 Glover Avenue	Norwalk River
Norwalk 1	41.11947	-73.41701	40 Cross Street	Norwalk River

Table A10.2. Norwalk River *E. coli* concentrations (MPN/100mL), geometric means, and % of samples exceeding the CT DEEP single sample maximum (Rainfall data: City of Norwalk Rain Gauge, Bill Mooney, Personal Communication October 20, 2021).

	5/5/2021	5/27/2021	6/10/2021	6/24/2021	7/14/2021	7/21/2021	8/5/2021	8/18/2021	9/8/2021	9/15/2021	Geomean	% exceeding SSM
Norwalk 23	168	1414	68	65	82	64	43	248	70	144	120	10%
Norwalk 21	172	299	186	172	291	261	166	162	185	143	197	0%
Norwalk 19	116	15	12	12	35	12	12	14	206	72	28	0%
Norwalk 15	91	133	46	214	132	52	24	42	57	91	73	0%
Norwalk 13	111	44	98	91	111	387	192	435	150	135	141	0%
Norwalk 9.5	68	24	93	91	123	135	69	166	105	81	86	0%
Norwalk 9	75	127	114	326	179	105	172	263	70	114	137	0%
Norwalk 6	82	117	205	112	112	75	88	122	108	166	114	0%
Norwalk 4	114	179	308	142	148	76	45	48	106	119	110	0%
Norwalk 1	186	436	206	130	199	166	68	308	133	210	183	0%
Weather	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Dry	Dry		

Table A10.3. Norwalk River mean water temperature, dissolved oxygen, and conductivity for each site.

	Mean Water Temp (°C)	Mean Dissolved Oxygen (mg/L)	Mean Conductivity (µmho/cm)
Norwalk 23	18.7	8.77	1390
Norwalk 21	18.9	3.85	1007
Norwalk 19	20.9	6.86	815
Norwalk 15	19.9	8.85	806
Norwalk 13	20.4	8.27	490
Norwalk 9.5	20.5	8.41	524
Norwalk 9	19.0	9.15	482
Norwalk 6	19.5	8.54	476
Norwalk 4	19.9	9.52	516
Norwalk 1	20.7	9.11	465

	5/4/2020	5/21/2020	6/1/2020	6/16/2020	7/14/2020	7/28/2020	8/12/2020	8/27/2020	9/8/2020	9/24/2020	Geomean	% exceeding SSM
Norwalk 23	23	76	166	124	166	113	137	816	1414	30	141	20%
Norwalk 21	16	105	435	291	206	1046	770	1300	167	152	255	30%
Norwalk 19	12	22	3	29	49	14	10	4	5	2	10	0%
Norwalk 15	30	42	153	272	130	26	15	43	18	36	49	0%
Norwalk 13	47	69	161	173	172	178	75	106	132	120	113	0%
Norwalk 9.5	32	22	579	53	80	65	114	172	93	63	82	10%
Norwalk 9	37	83	99	291	196	192	816	488	105	488	192	10%
Norwalk 6	23	131	236	488	162	238	548	N/A	86	81	155	0%
Norwalk 4	47	73	240	185	238	411	238	N/A	81	57	136	0%
Norwalk 1	101	68	155	155	96	93	137	N/A	179	85	113	0%
Weather	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Dry	Dry		

Table A8.3. Norwalk River mean water temperature, dissolved oxygen, and conductivity for each site

	Mean water temperature (°C)	Mean dissolved oxygen (mg/L)	Mean conductivity (µS)
Norwalk 23	18.5	9.62	1199
Norwalk 21	18.6	6.36	871
Norwalk 19	21.0	7.44	659
Norwalk 15	19.5	9.04	636
Norwalk 13	20.8	9.23	501
Norwalk 9.5	20.4	8.78	458
Norwalk 9	18.6	9.21	418
Norwalk 6	19.0	9.19	429
Norwalk 4	20.2	10.21	449
Norwalk 1	21.2	10.03	420

Figure 5 Maximum, geomean, and minimum conductivity values for twelve sites in the Norwalk River watershed from October 2011 through April 2012

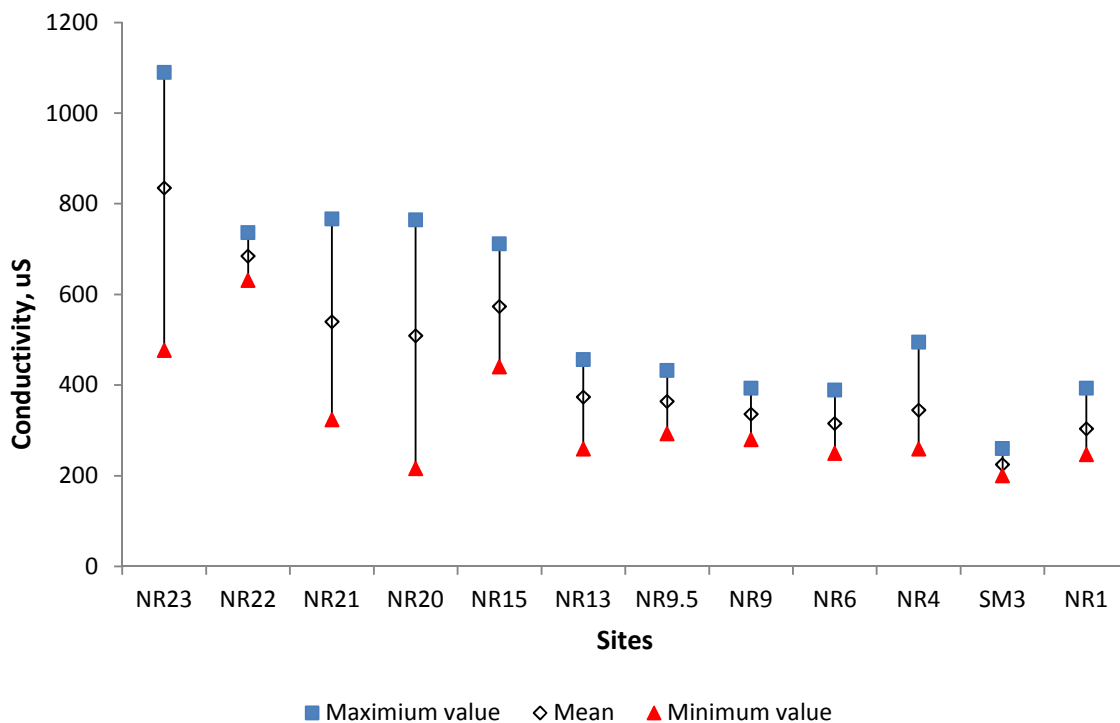


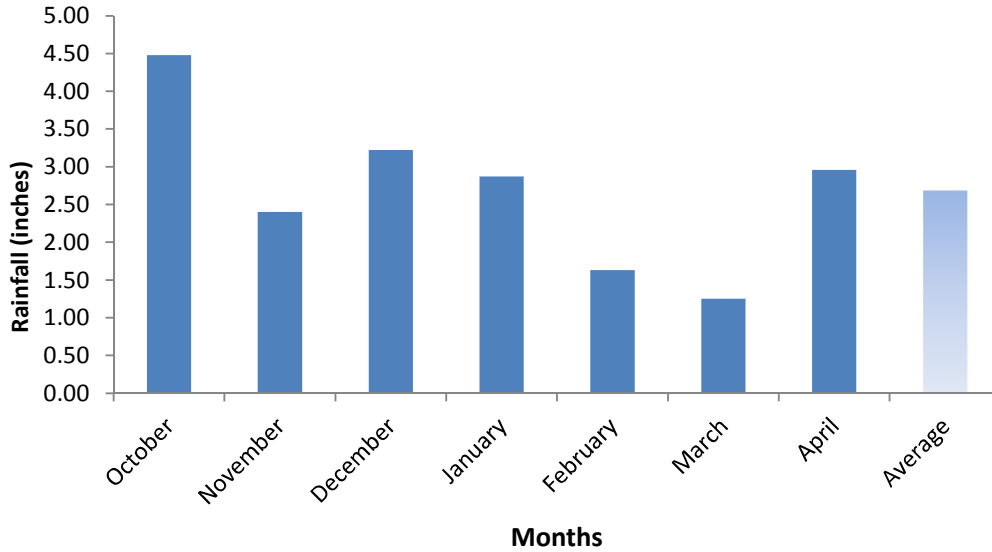
Table 2 Observed *E. coli* counts on each sampling date, geomeans, and % frequency exceeding 576 CFUs/100mLs for each site in the Norwalk River watershed during the October 2011 through April 2012 monitoring period

Sites	10/20/2011	11/17/2011	12/15/2011	1/26/2012	2/16/2012	3/15/2012	4/19/2012	Geomean	%frequency over 576 colonies/10 OmLs
NR23	330	1400	116	112	16	10	68	94	14.29%
NR22	4000	10000	7800	2100	33000	5900	1000	5363	100.00%
NR21	160	1080	52	32	480	78	56	129	14.29%
NR20	470	1600	100	60	600	124	24	187	28.57%
NR15	130	340	44	12	8	14	1	22	0.00%
NR13	120	440	20	24	40	490	500	114	0.00%
NR9.5	160	300	48	8	4	48	12	33	0.00%
NR9	260	260	12	12	44	28	580	68	14.29%
NR6	250	240	56	44	24	28	28	60	0.00%
NR4	350	440	44	8	8	52	28	49	0.00%
SM3	320	340	92	8	18	8	4	33	0.00%
NR1	340	780	64	20	34	26	44	75	0.00%
Rainfall (in.)	0.68	0.76	0.28	0.24	0.20	0.14	0.04		
Days prior	1	1	7	0	0	2	0		

Table 3 Conductivity ranges for twelve sites in the Norwalk River watershed from October 2011 through April 2012

	NR23	NR22	NR21	NR20	NR15	NR13	NR9.5	NR9	NR6	NR4	SM3	NR1
Max value	1090	737	767	765	712	457	433	393	389	495	261	394
Min value	476	631	324	216	440	259	293	280	250	259	200	247
Range	614	106	443	549	272	198	140	113	139	236	61	147
Mean	835	685	540	509	573	374	364	336	316	345	225	304

Figure 6 Rainfall for the monitoring period October 2011 through April 2012



Discussion: Monthly rainfall averaged at 2.69in/month which is below the normal average of 4.5in/month (Figure 6). Elevated *E. coli* counts were observed on days that received over 0.6 inches (Table 2).

E. coli bacteria levels at site NR22 had a geomean of 5363 CFU/100mLs (Figure 3, Table 2). These elevated counts are observed during winter months when based on NPDES permit requirements, the Ridgefield Wastewater Treatment Plant's ultraviolet lights for sanitizing the effluent stream can be turned off from September through May. The treatment plant extends the length of time they keep their lights on beyond permit regulations, turning them off in mid-October and turning them back on mid-April. During the months when the UV lights are on, Harbor Watch has observed regular *E. coli* counts of zero every week (Harbor Watch Records). The two immediate downstream sites, NR 21 and NR20, have observed elevated *E. coli* bacteria counts above the CT DEEP criterion for a class B river of <126CFUs/100mLs as well. It is possible that these counts are directly related to the impact from the wastewater treatment plant effluent.

The downstream sites, NR15 through NR1, all meet the CT DEEP criteria for *E. coli* bacteria (Figure 3, Table 2). A possible reason for this is that cold weather and lack of precipitation created conditions which bacteria could not live long and reduced runoff into the river. Only site NR9 exceeded the secondary CT DEEP single sample maximum (SSM) standard of <10% over 576 CFU/100mL when bacteria counts on 4/19/12 were observed at 580 CFU/100mLs. Site NR13 also saw an elevated *E. coli* count of 500 CFU/100mLs on 4/19/12, but not elevated enough to cause the site to fail the SSM. These counts may be affected by a tributary, Branchville Brook that enters the river just above NR13. During November 2011, Harbor Watch identified a cesspool leaking into Branchville Brook just upstream of where the brook enters the Norwalk River. Ridgefield Town authorities were informed of the cesspool and observed elevated bacteria counts, and remediation efforts are in effect. A more detailed report of the findings in Branchville Brook can be found in the 2011-2012 NR13 Watershed Report (Harbor Watch Records).

With the exception of two individual readings on October 20, 2011, all sites had observed dissolved oxygen readings above 5mg/L (Figure 4). This is to be expected during the cold months. The two readings that dip below 5mg/L at sites NR21 and NR 20 could be attributed to the wastewater treatment plant effluent and due to the water having to travel through a swamp which slows its movement (Figure 1).

Figure 3 Maximum, geomean and minimum value for conductivity at 12 sampling sites in the Norwalk River Watershed from May 2007 through September 2007

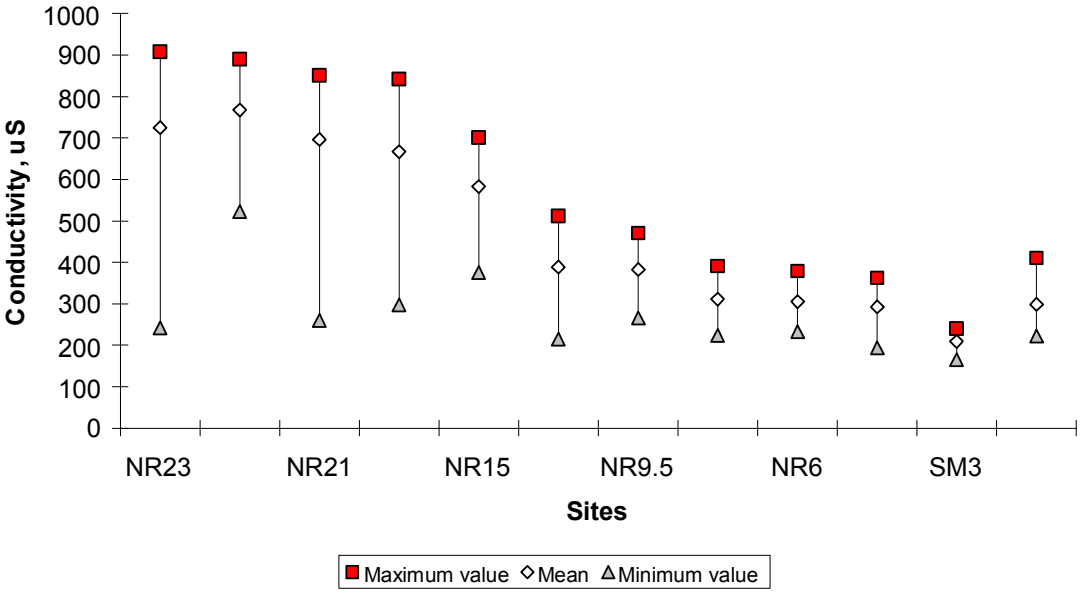


Figure 4 Comparison of monthly rainfall (inches) from May to September for years 2006 and 2007

