

2022 DNREC Integrated Water Report Data Submission

Waterbody: White Clay Creek Watershed

Location: New Castle, County DE

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White Clay Wild and Scenic River Stream Watch Monitoring Program
Water Quality Report submitted to DNREC October 13, 2021

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Please see [The White Clay Creek Watershed Water Quality Monitoring Plan](#) for more detail on each site and information on how we collect and process data.

White Clay Wild and Scenic River Stream Watch Monitoring Program

The mission of the Stream Watch Monitoring Program is to improve knowledge of stream conditions based on water quality trends measured over time at both fixed and temporary sites and to increase citizen and municipal engagement in water resource protection. (whiteclay.org)

White Clay Wild and Scenic River Stream Watch Monitoring Program - Delaware Sites

SiteID	Latitude	Longitude	State	Location	Sensor Station ID (DRWI nomenclature), additional notes
WCCDE28	39.777369	-75.694072	DE	Hickory Hill at Erikson Ave	SL132 (BCM2S), owned by White Clay Watershed Association
WCCDE29	39.746	-75.67807	DE	Northpointe Main on Mill Creek	
WCCDE30	39.74594	-75.67869	DE	Northpointe Trib to Mill Creek	
WCCDE31	39.715027	-75.71883	DE	Middle Run Main Stem	
WCCDE32	39.71495	-75.719061	DE	Middle Run Trib to Main Stem below Papermill Road	SL157 (BCMR1S), owned by White Clay Watershed Association, upstream of recreational bacteria sampling site
WCCDE37	39.693055	-75.757165	DE	Fairfield Run	
WCCDE38	39.689917	-75.753979	DE	Bogey's Run/Blue Hen Creek	
WCCDE39	39.691034	-75.749116	DE	Jenney's Run	
WCCDE40	39.692284	-75.725169	DE	Main @ Kirkwood & A Street	
WCCDE42	39.70679	-75.694949	DE	Lower Pike Creek	
WCCDE44	39.72092	-75.73202	DE	Middle Run Trib to Main Stem above Papermill Roa	BCMR1N (BCMR2S), owned by White Clay Watershed Association



Stream Monitoring Sites in the White Clay Creek Watershed



Map produced by the University of Delaware Water Resources Center, Dec. 2019.

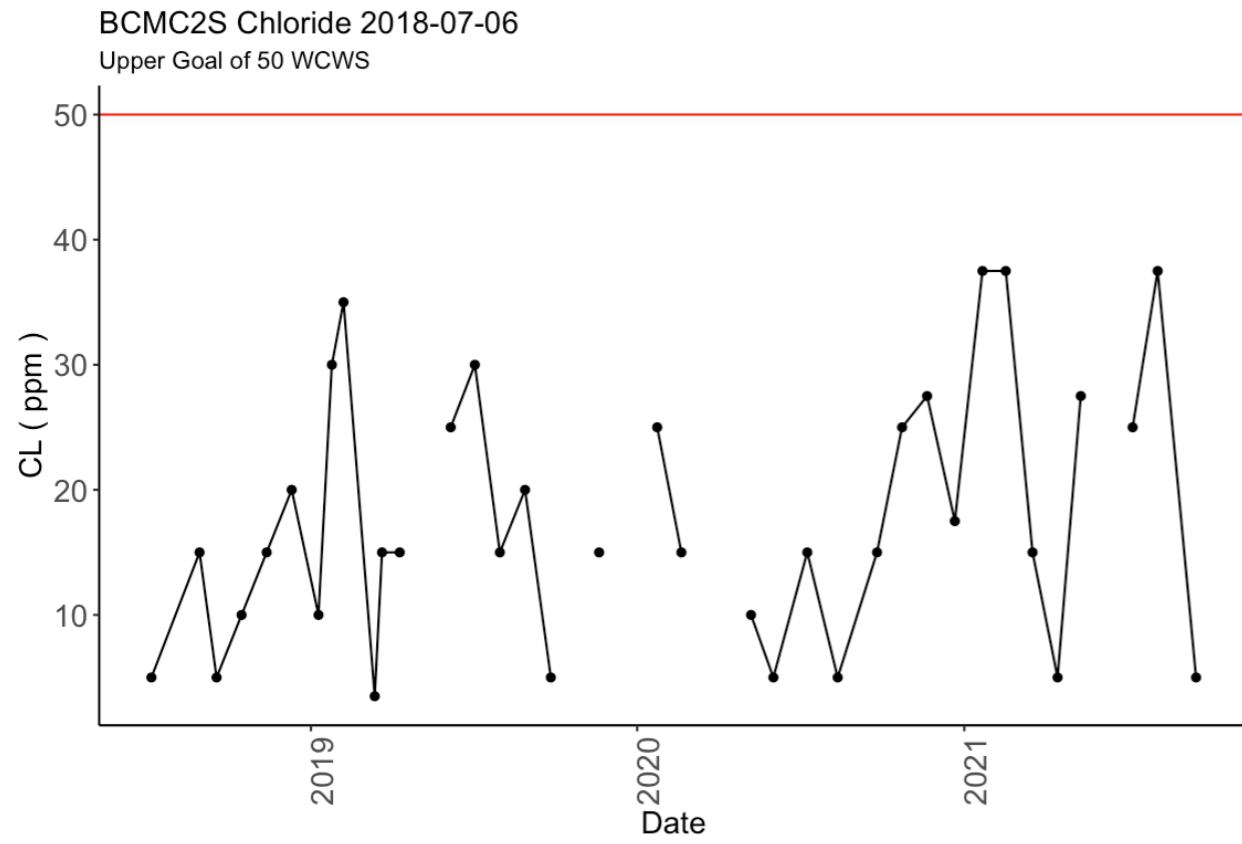
Ours to Enjoy. Ours to Protect.

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of all data points for Chlorides (CL), Nitrates (NO3N), Orthophosphate (OP), Total Suspended Solids (TSS) taken at baseflow (baseflow defined as <0.25" rain in 48 hour period).

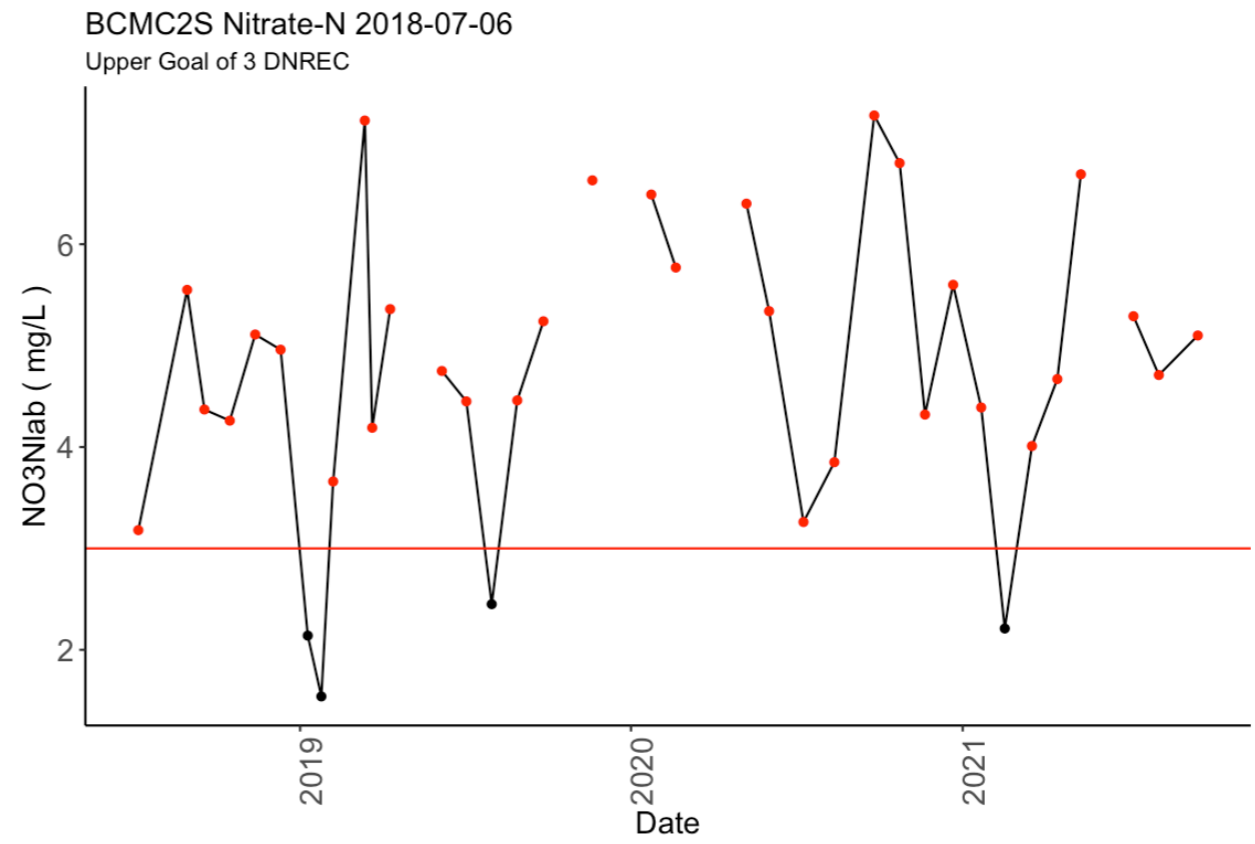
Date Range 7/6/2018-10/04/2021. Exceedance of standards (red line) indicates impairment.

Hickory Hill (Mill Creek, DE) (SL132, WCCDE28, BCMC2S)



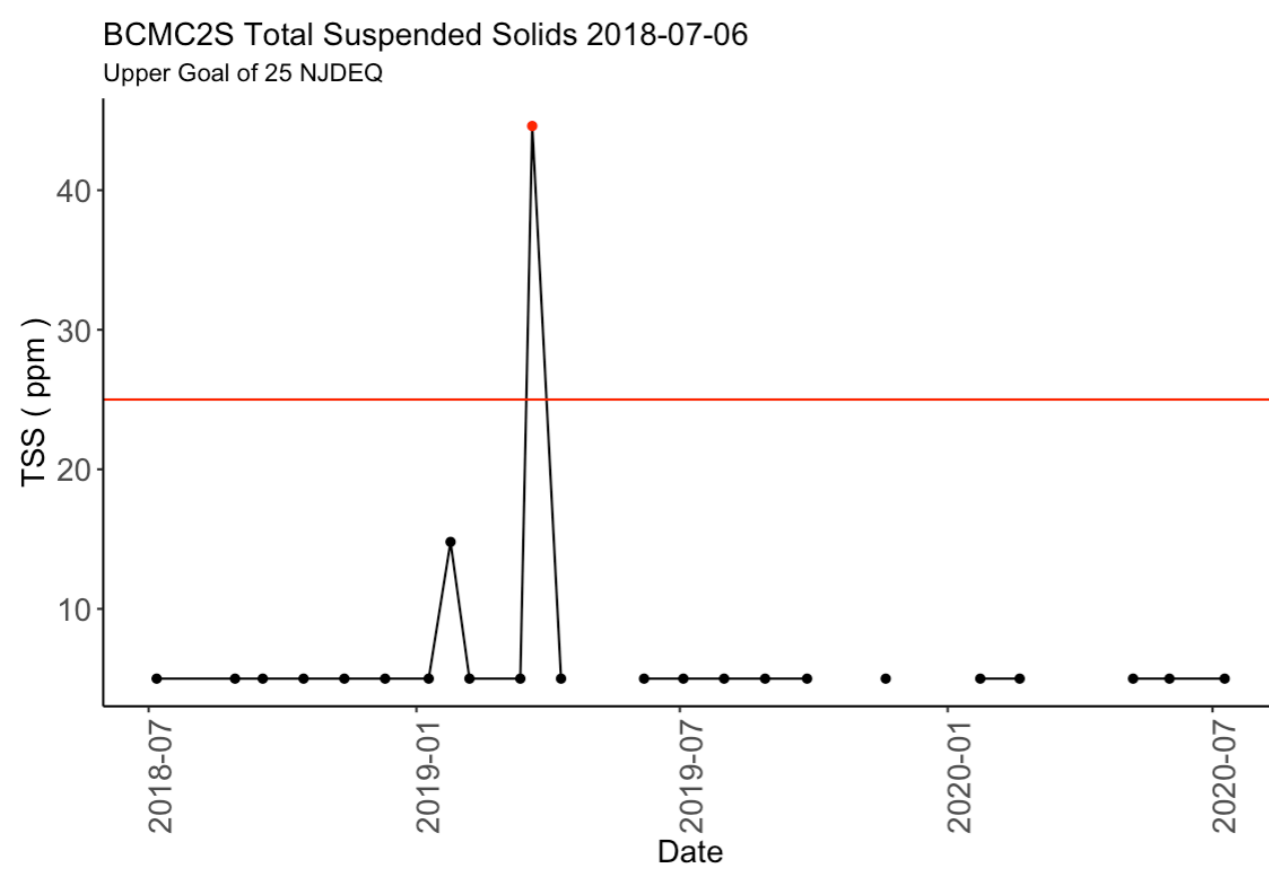
Annual Averages Chlorides (CL) at Base Flow Only

Site	Parameter	Date	Reading
SL132	CL_Y	2018-12-31	11.67
SL132	CL_Y	2019-12-31	18.21
SL132	CL_Y	2020-12-31	16.00
SL132	CL_Y	2021-12-31	23.75



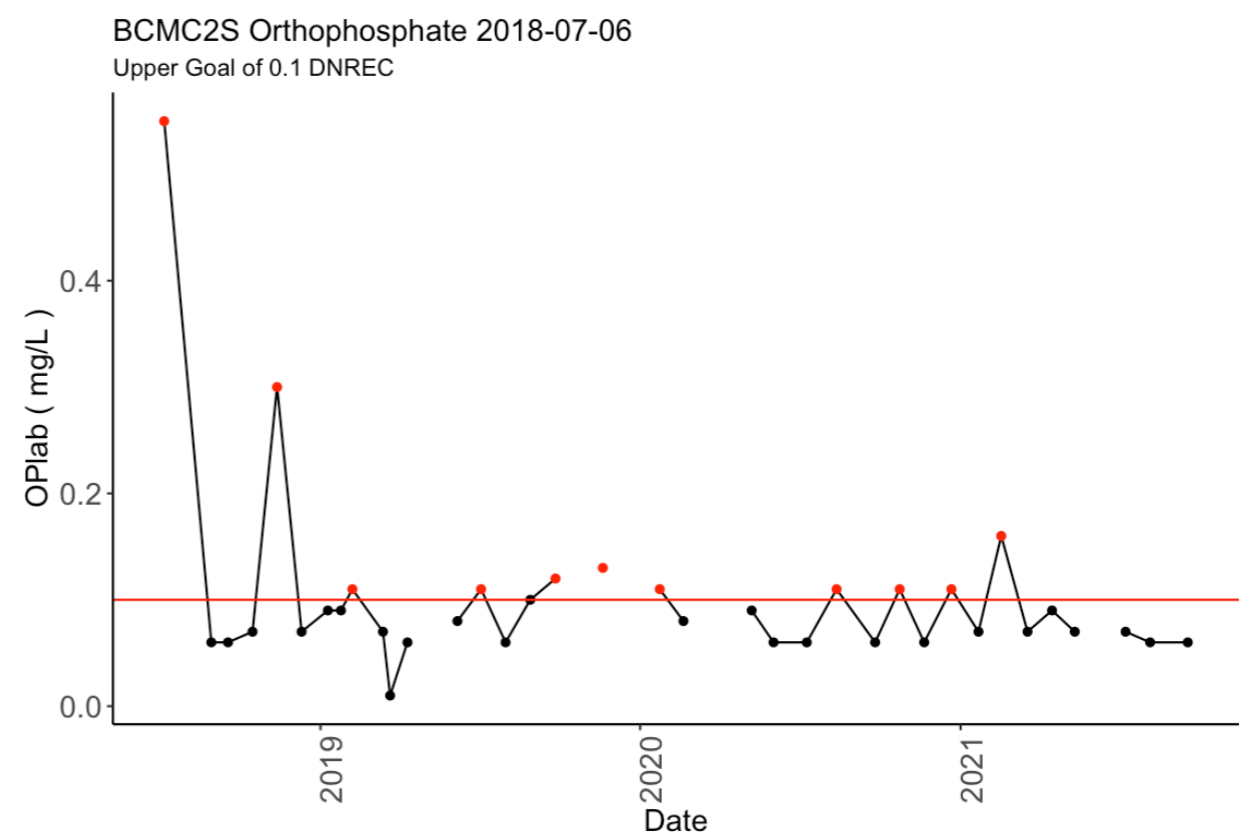
Annual Averages Nitrate (NO3N)

Site	Parameter	Date	Reading
SL132	NO3Nlab_Y	2018-12-31	4.57
SL132	NO3Nlab_Y	2019-12-31	4.34
SL132	NO3Nlab_Y	2020-12-31	5.51
SL132	NO3Nlab_Y	2021-12-31	4.63



Annual Averages Total Suspended Solids (TSS)

Site	Parameter	Date	Reading
SL132	TSS_Y	2018-12-31	5.00
SL132	TSS_Y	2019-12-31	9.12
SL132	TSS_Y	2020-12-31	5.00



Annual Averages Orthophosphate (OP)

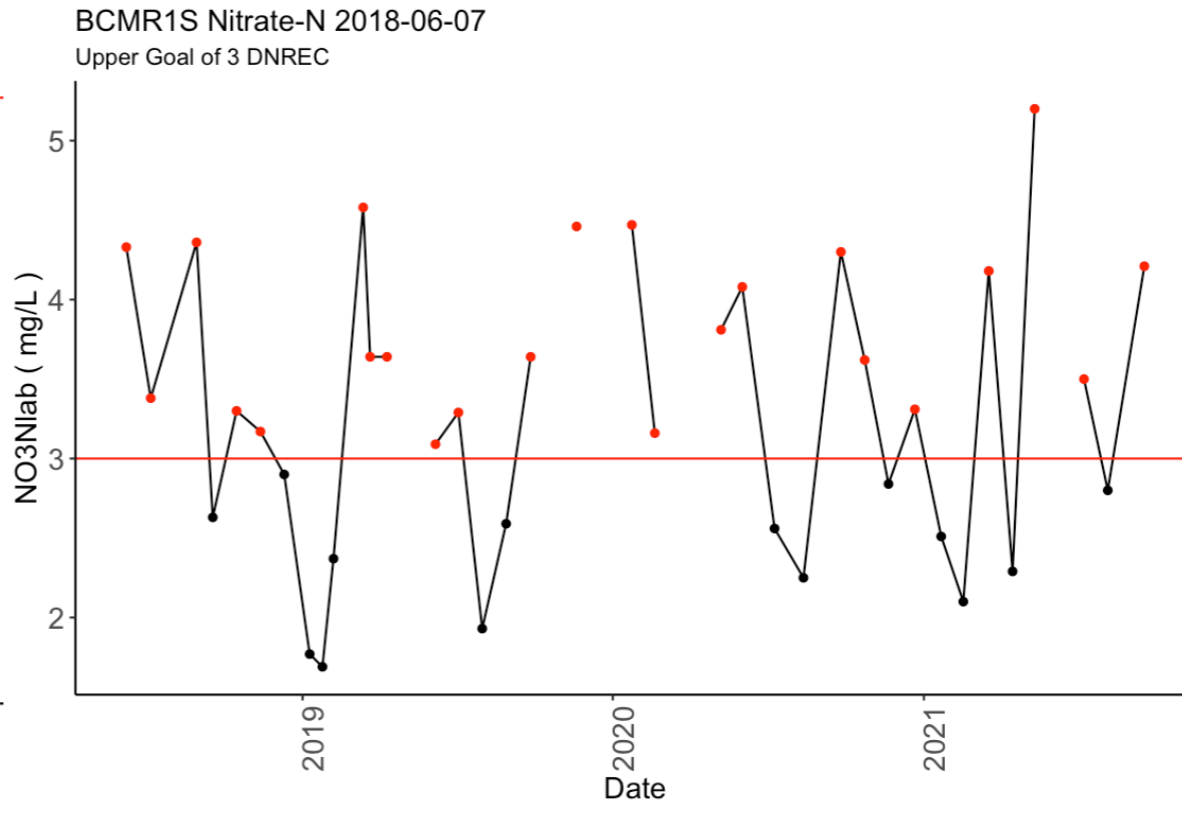
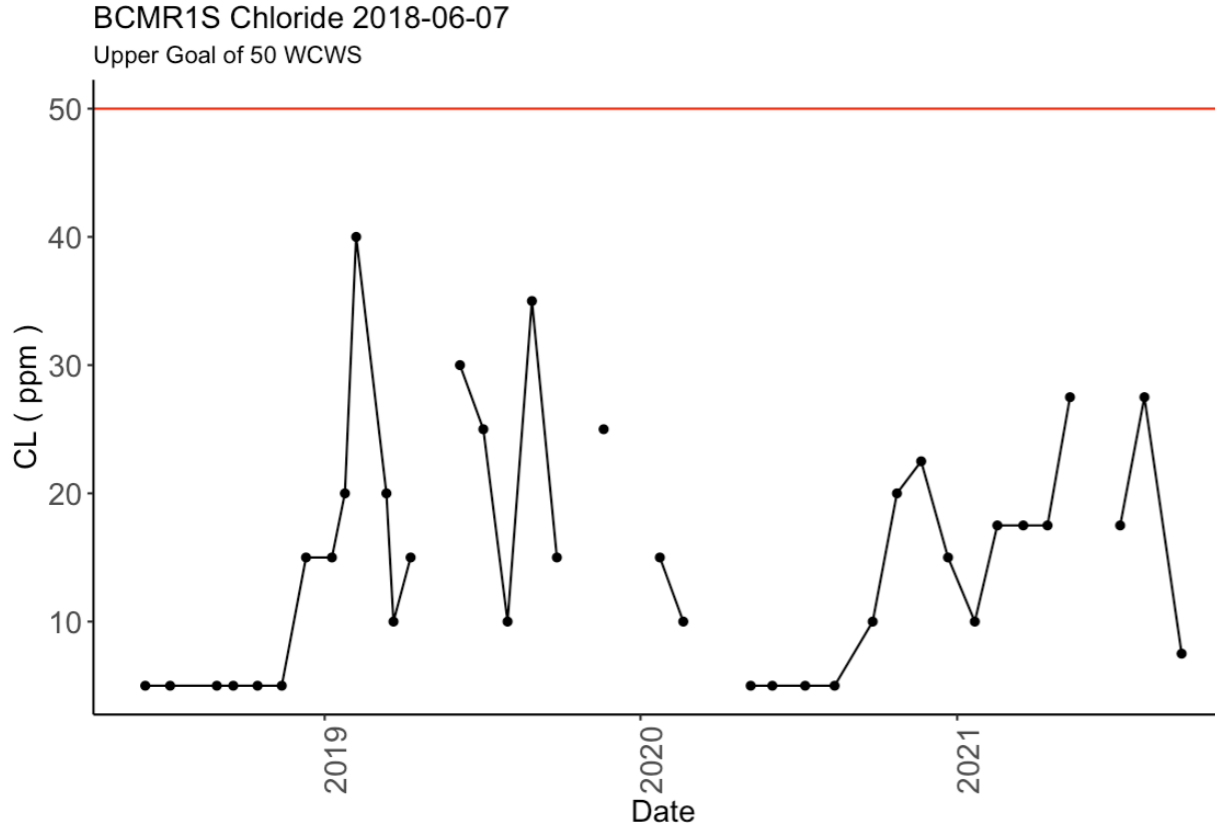
Site	Parameter	Date	Reading
SL132	OPlab_Y	2018-12-31	0.18
SL132	OPlab_Y	2019-12-31	0.09
SL132	OPlab_Y	2020-12-31	0.08
SL132	OPlab_Y	2021-12-31	0.08

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of all data points for Chlorides (CL), Nitrates (NO3N), Orthophosphate (OP), Total Suspended Solids (TSS) taken at baseflow (baseflow defined as <0.25" rain in 48 hour period).

Date Range 7/6/2018-10/04/2021. Exceedance of standards (red line) indicates impairment.

Tributary to Middle Run Below Paper Mill Road (SL157, WCCDE32, BCMR1S)

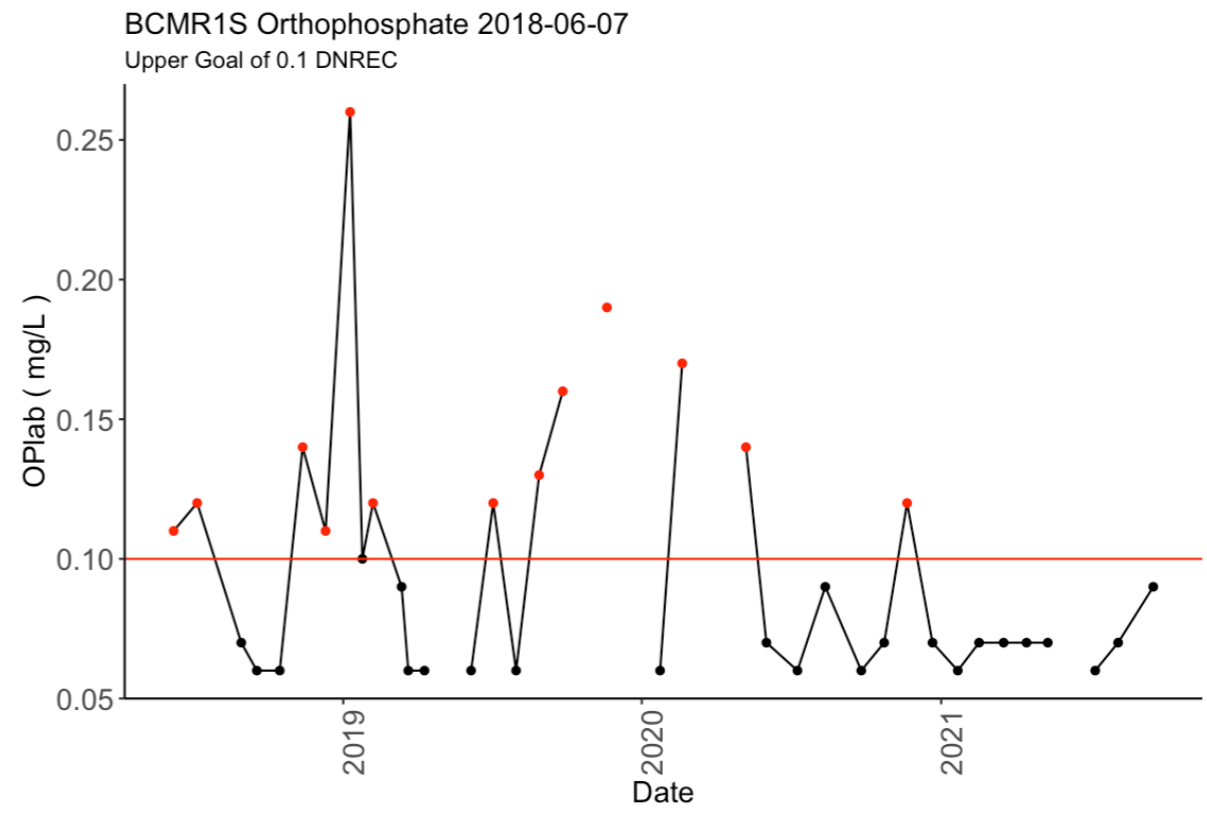
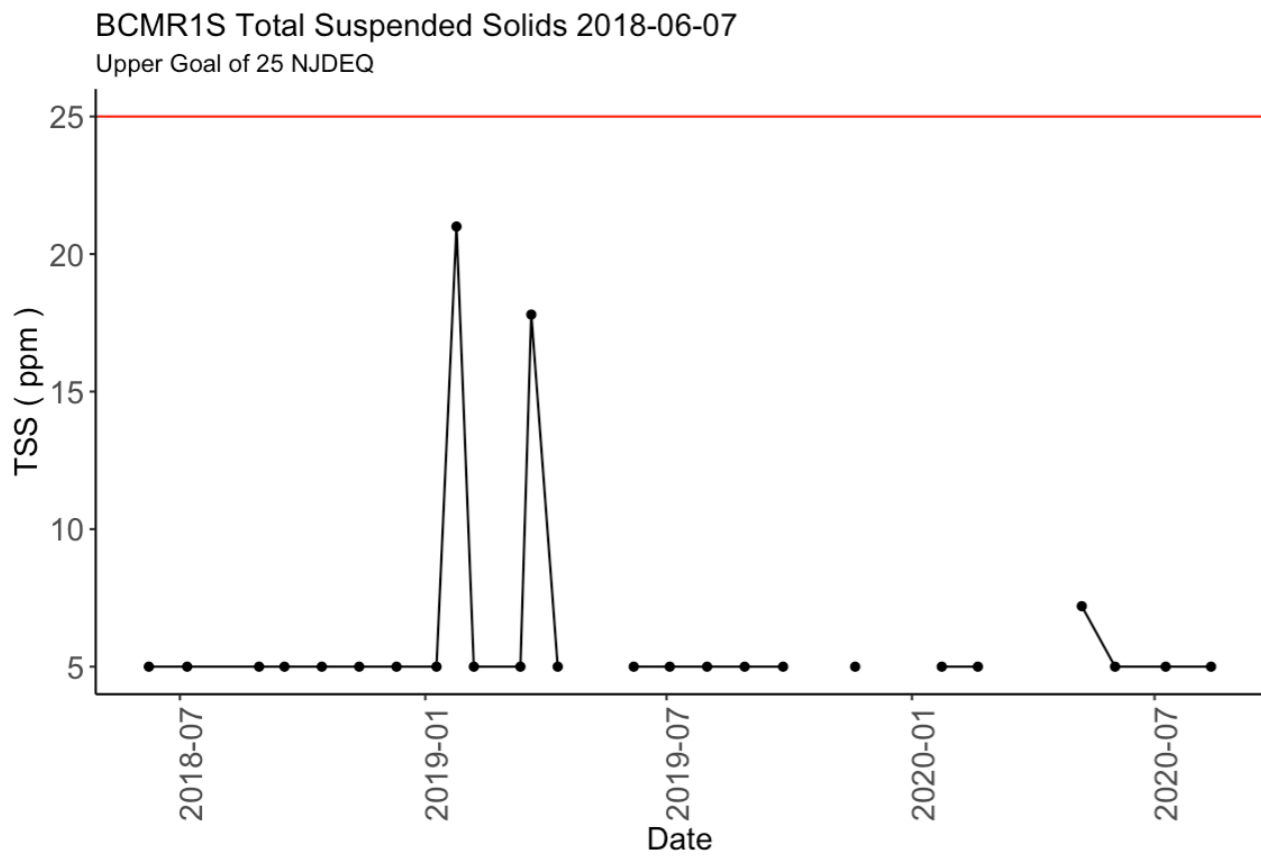


Annual Averages Chlorides (CL)

Site	Parameter	Date	Reading
SL157	CL_Y	2018-12-31	6.43
SL157	CL_Y	2019-12-31	21.67
SL157	CL_Y	2020-12-31	11.25
SL157	CL_Y	2021-12-31	17.81

Annual Averages Nitrates (NO3N)

Site	Parameter	Date	Reading
SL157	NO3Nlab_Y	2018-12-31	3.44
SL157	NO3Nlab_Y	2019-12-31	3.06
SL157	NO3Nlab_Y	2020-12-31	3.44
SL157	NO3Nlab_Y	2021-12-31	3.35



Annual Averages Total Suspended Solids (TSS)

Site	Parameter	Date	Reading
SL157	TSS_Y	2018-12-31	5.00
SL157	TSS_Y	2019-12-31	7.40
SL157	TSS_Y	2020-12-31	5.37

Annual Averages Orthophosphate (OP)

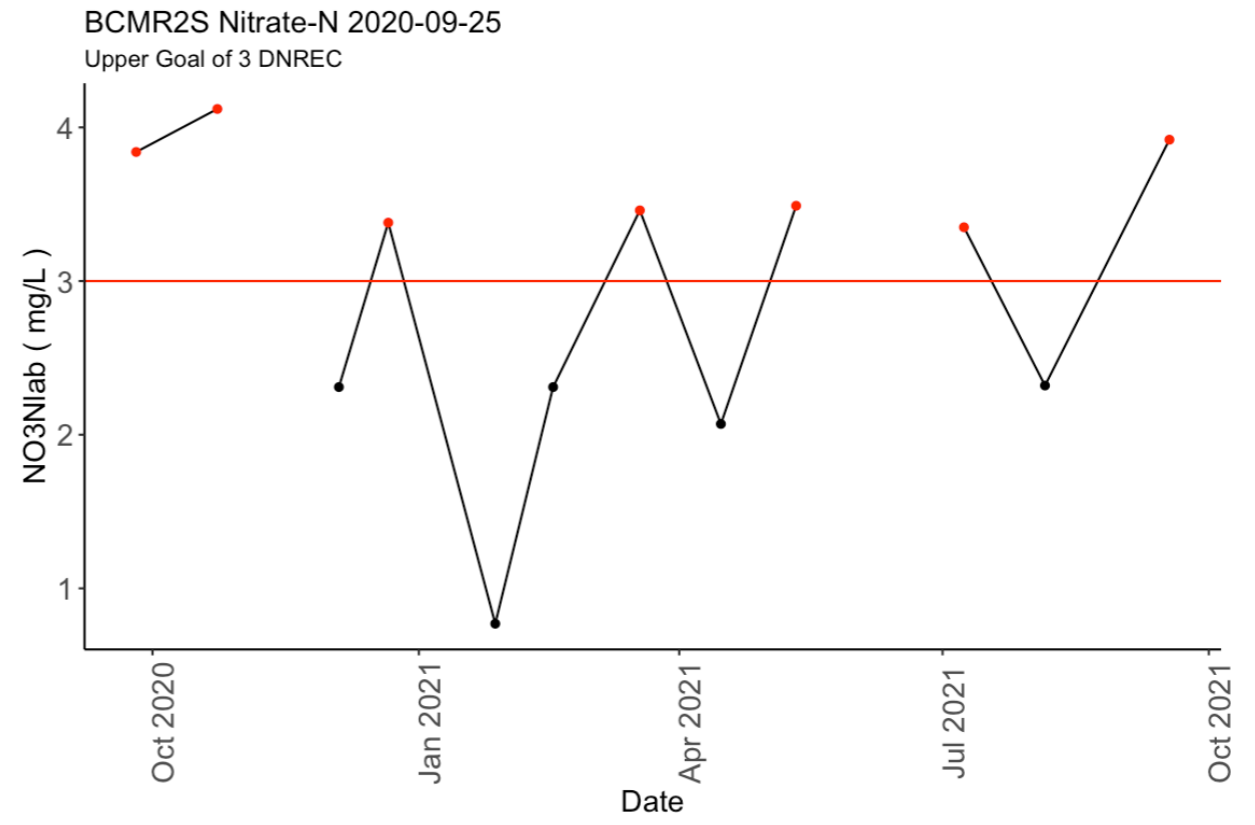
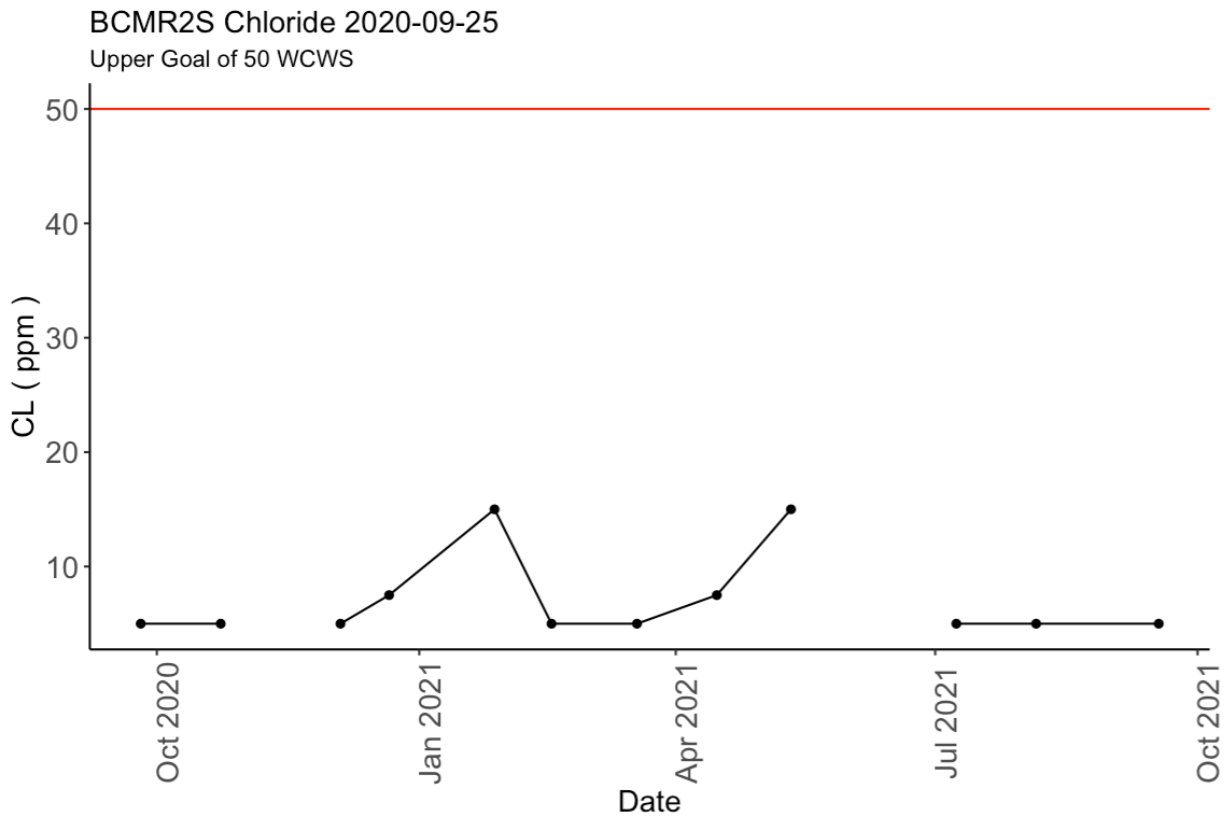
Site	Parameter	Date	Reading
SL157	OPlab_Y	2018-12-31	0.10
SL157	OPlab_Y	2019-12-31	0.12
SL157	OPlab_Y	2020-12-31	0.09
SL157	OPlab_Y	2021-12-31	0.07

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of all data points for Chlorides (CL), Nitrates (NO3N), Orthophosphate (OP), Total Suspended Solids (TSS) taken at baseflow (baseflow defined as <0.25" rain in 48 hour period)..

Date Range 7/6/2018-10/04/2021. Exceedance of standards (red line) indicates impairment.

UT Middle Run Above Papermill Road (BCMR2S, WCCDE44, BCMR1N)

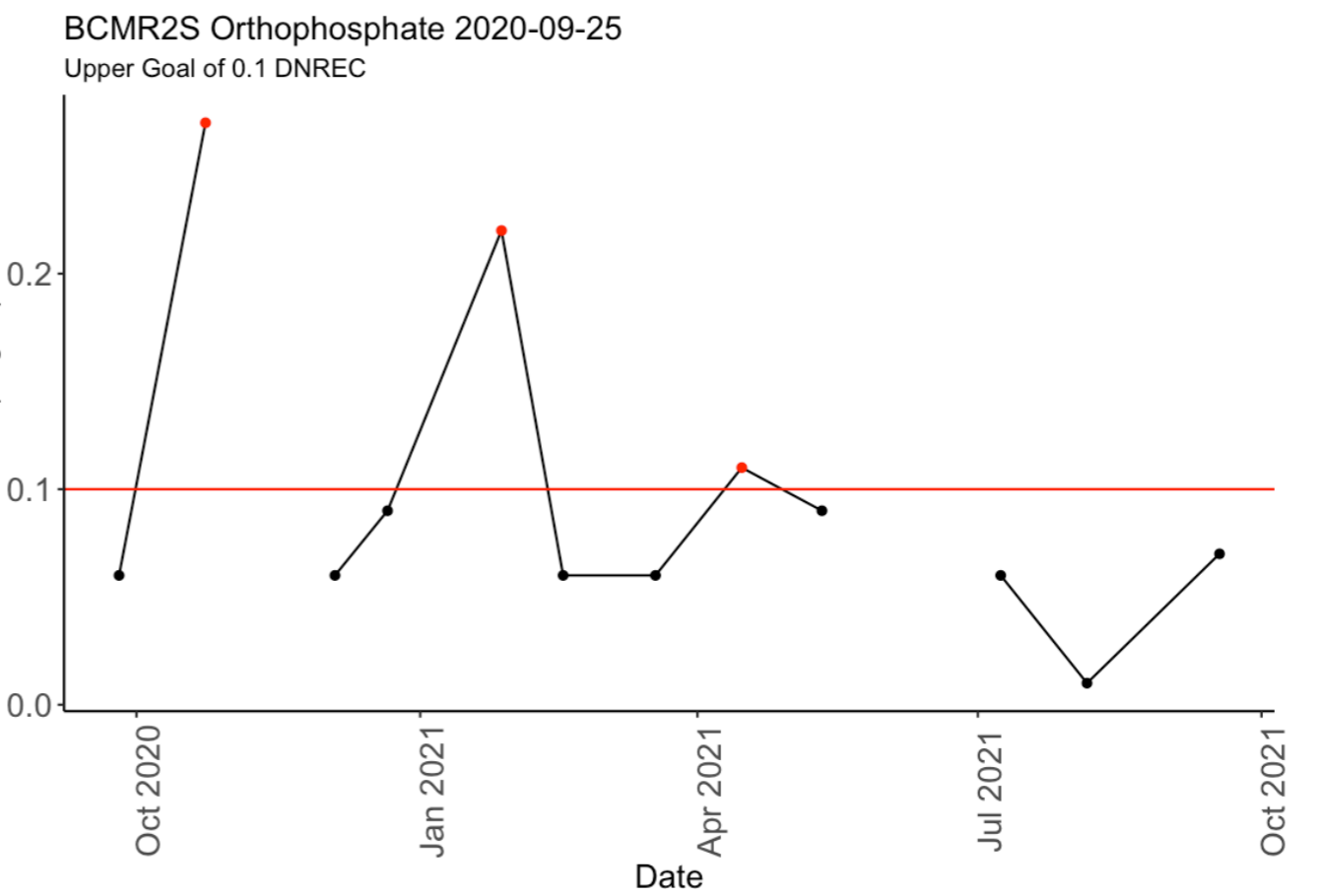
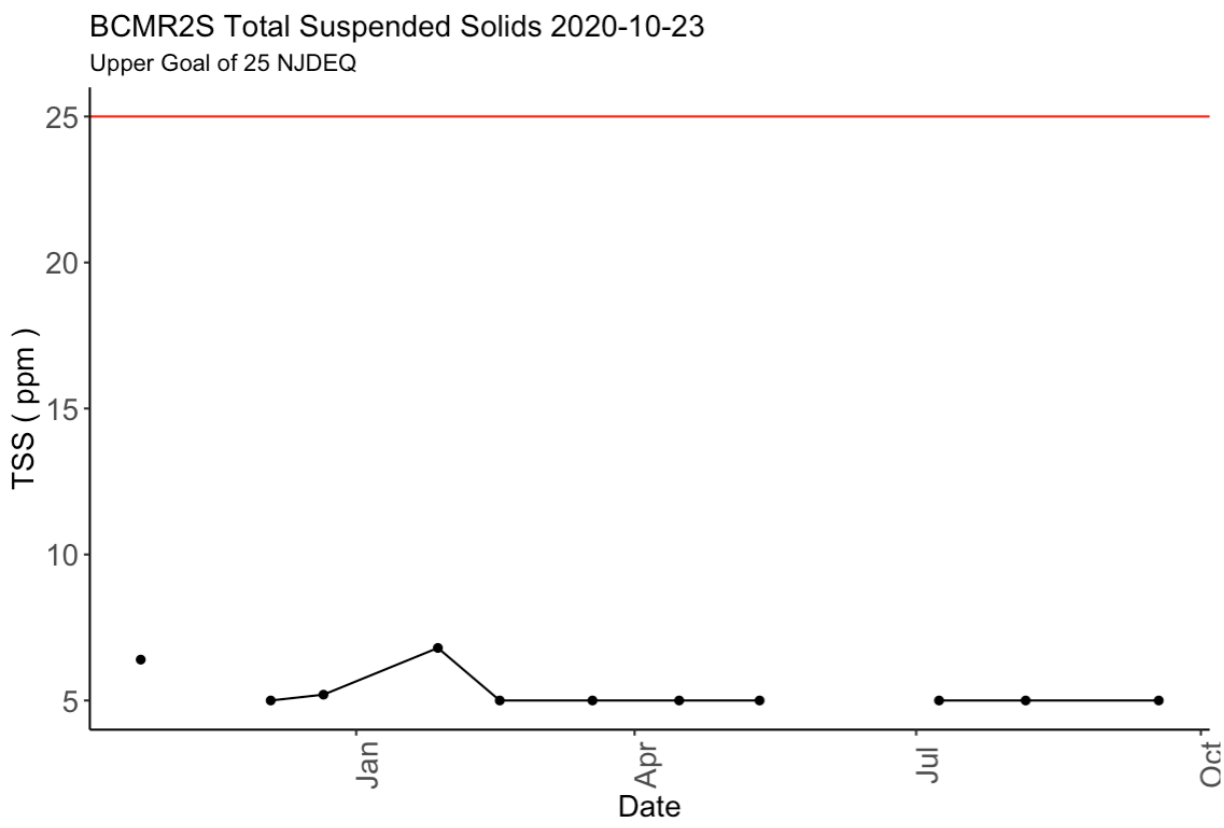


Annual Averages Chlorides (CL)

Site	Parameter	Date	Reading
BCMR2S	CL_Y	2020-12-31	5.62
BCMR2S	CL_Y	2021-12-31	7.81

Annual Averages Nitrate (NO3N)

Site	Parameter	Date	Reading
BCMR2S	NO3Nlab_Y	2020-12-31	3.41
BCMR2S	NO3Nlab_Y	2021-12-31	2.71



Annual Averages Total Suspended Solids (TSS)

Site	Parameter	Date	Reading
BCMR2S	TSS_Y	2020-12-31	5.53
BCMR2S	TSS_Y	2021-12-31	5.22

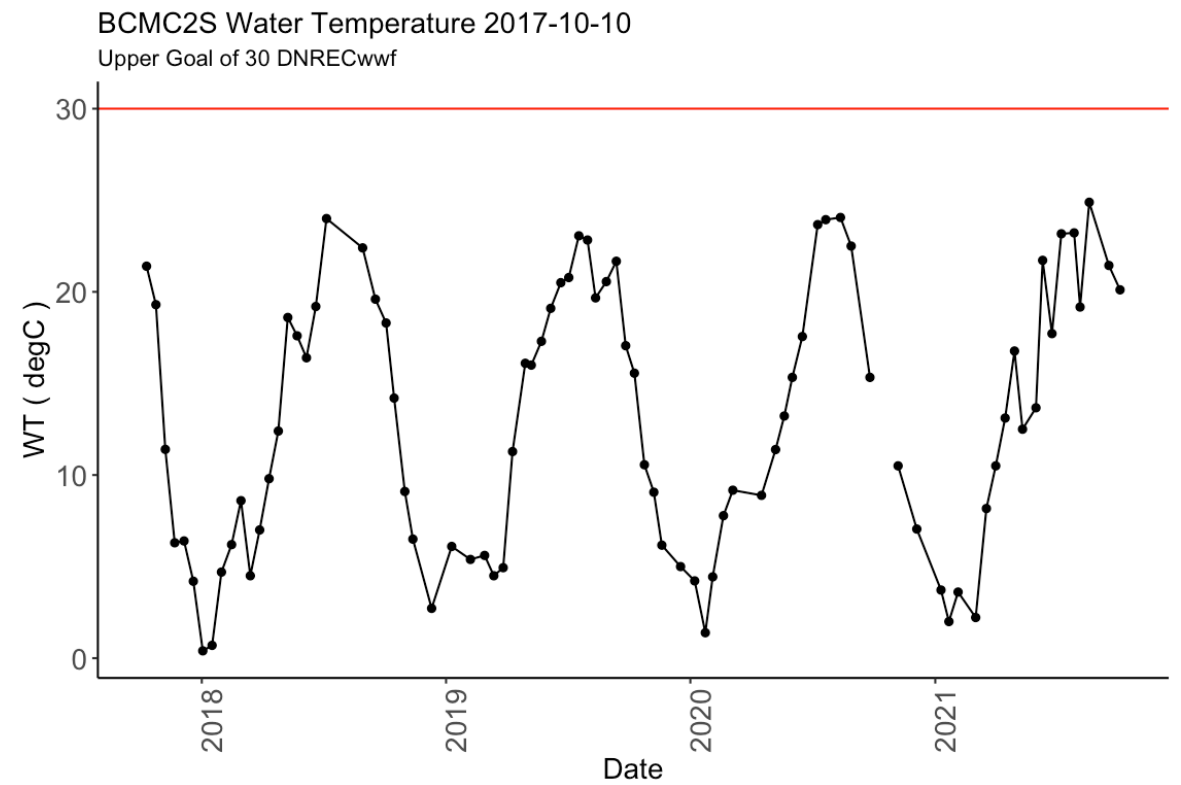
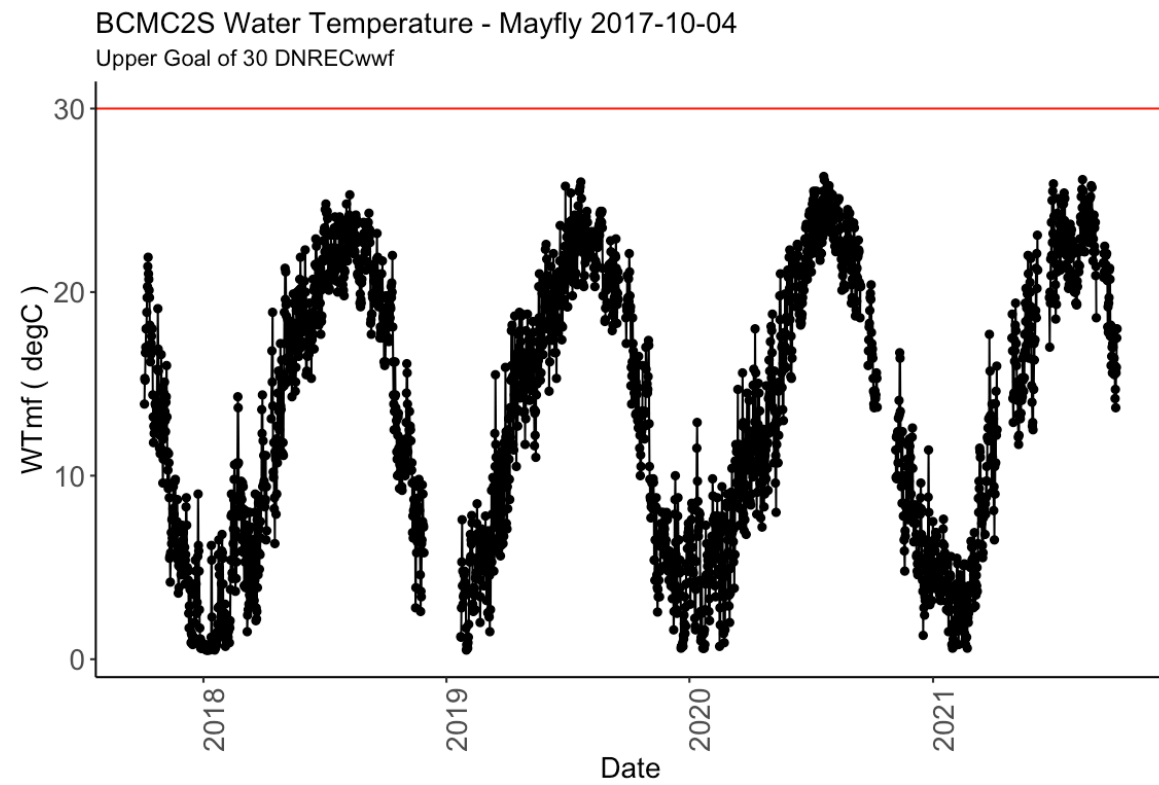
Annual Averages Orthophosphate (OP)

Site	Parameter	Date	Reading
BCMR2S	OPlab_Y	2020-12-31	0.12
BCMR2S	OPlab_Y	2021-12-31	0.08

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of Conductivity and Water Temperature taken by in-stream continuous data loggers (left) and hand measurements (right). Date Range 10/15/2017-10/04/2021.

Mill Creek at Hickory Hill Water Temperature Sensor Readings (30 min averages) (left) and Bimonthly Field Readings (right) (SL132, WCCDE28, BCME2S)



Monthly Mean Water Temperature (degC) taken from continuous sensor readings

Site	Parameter	Date	Reading
SL132	WTmf_M	2017-10-15	15.60
SL132	WTmf_M	2017-11-15	8.40
SL132	WTmf_M	2017-12-15	3.60
SL132	WTmf_M	2018-01-15	1.90
SL132	WTmf_M	2018-02-15	5.60
SL132	WTmf_M	2018-03-15	6.00
SL132	WTmf_M	2018-04-15	11.60
SL132	WTmf_M	2018-05-15	17.60
SL132	WTmf_M	2018-06-15	19.40
SL132	WTmf_M	2018-07-15	22.10
SL132	WTmf_M	2018-08-15	22.50
SL132	WTmf_M	2018-09-15	20.40
SL132	WTmf_M	2018-10-15	14.50
SL132	WTmf_M	2018-11-15	8.80
SL132	WTmf_M	2019-01-15	3.30
SL132	WTmf_M	2019-02-15	4.80
SL132	WTmf_M	2019-03-15	7.50
SL132	WTmf_M	2019-04-15	14.00
SL132	WTmf_M	2019-05-15	16.80
SL132	WTmf_M	2019-06-15	19.70
SL132	WTmf_M	2019-07-15	22.70
SL132	WTmf_M	2019-08-15	22.00
SL132	WTmf_M	2019-09-15	20.00
SL132	WTmf_M	2019-10-15	15.10
SL132	WTmf_M	2019-11-15	6.70
SL132	WTmf_M	2019-12-15	4.40
SL132	WTmf_M	2020-01-15	4.60
SL132	WTmf_M	2020-02-15	5.70

Bimonthly Water Temperature Reading (degC) (taken by hand in the field)

Site	Parameter	Date	Time	Reading
SL132	WT	2017-10-10	11:58	21.40
SL132	WT	2017-10-24	11:54	19.30
SL132	WT	2017-11-07	11:36	11.40
SL132	WT	2017-11-21	12:30	6.30
SL132	WT	2017-12-05	11:18	6.40
SL132	WT	2017-12-19	9:15	4.20
SL132	WT	2018-01-02	11:40	0.40
SL132	WT	2018-01-16	9:15	0.70
SL132	WT	2018-01-30	9:28	4.70
SL132	WT	2018-02-14	13:13	6.20
SL132	WT	2018-02-28	13:00	8.60
SL132	WT	2018-03-14	13:05	4.50
SL132	WT	2018-03-28	12:39	7.00
SL132	WT	2018-04-11	13:46	9.80
SL132	WT	2018-04-25	9:23	12.40
SL132	WT	2018-05-09	13:22	18.60
SL132	WT	2018-05-23	11:14	17.60
SL132	WT	2018-06-06	10:18	16.40
SL132	WT	2018-06-20	9:54	19.20
SL132	WT	2018-07-06	9:48	24.00
SL132	WT	2018-08-29	9:06	22.40
SL132	WT	2018-09-17	10:16	19.60
SL132	WT	2018-10-03	10:20	18.30
SL132	WT	2018-10-15	10:27	14.20
SL132	WT	2018-10-31	9:59	9.10
SL132	WT	2018-11-12	10:04	6.50
SL132	WT	2018-12-10	10:25	2.72

SL132	WTmf_M	2020-03-15	9.50
SL132	WTmf_M	2020-04-15	11.50
SL132	WTmf_M	2020-05-15	15.90
SL132	WTmf_M	2020-06-15	20.70
SL132	WTmf_M	2020-07-15	24.10
SL132	WTmf_M	2020-08-15	22.80
SL132	WTmf_M	2020-09-15	20.40
SL132	WTmf_M	2020-10-15	14.80
SL132	WTmf_M	2020-11-15	10.40
SL132	WTmf_M	2020-12-15	5.80
SL132	WTmf_M	2021-01-15	4.30
SL132	WTmf_M	2021-02-15	3.20
SL132	WTmf_M	2021-03-15	8.70
SL132	WTmf_M	2021-04-15	12.30
SL132	WTmf_M	2021-05-15	16.10
SL132	WTmf_M	2021-06-15	20.60
SL132	WTmf_M	2021-07-15	22.70
SL132	WTmf_M	2021-08-15	22.70
SL132	WTmf_M	2021-09-15	19.70
SL132	WTmf_M	2021-10-15	15.90

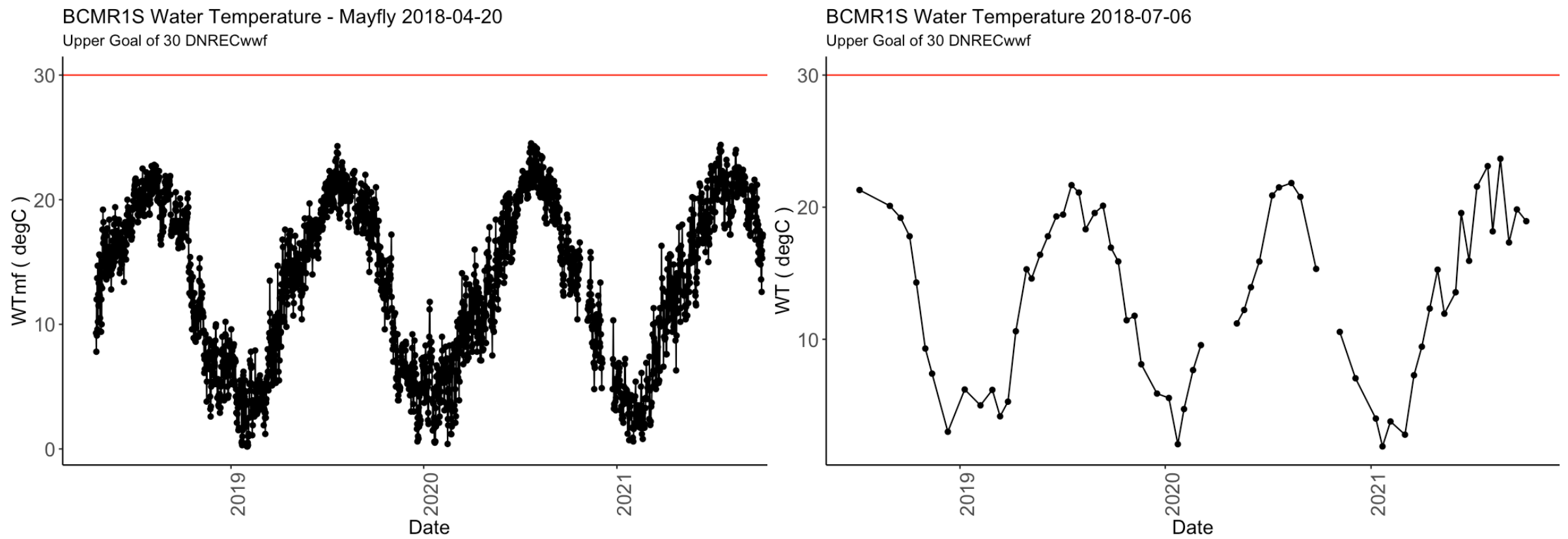
SL132	WT	2019-01-09	10:15	6.10
SL132	WT	2019-02-06	9:49	5.39
SL132	WT	2019-02-27	13:33	5.61
SL132	WT	2019-03-13	9:20	4.50
SL132	WT	2019-03-27	9:35	4.94
SL132	WT	2019-04-10	8:49	11.28
SL132	WT	2019-04-29	10:12	16.10
SL132	WT	2019-05-08	9:55	16.00
SL132	WT	2019-05-23	12:49	17.30
SL132	WT	2019-06-06	9:45	19.10
SL132	WT	2019-06-21	11:35	20.50
SL132	WT	2019-07-03	9:52	20.78
SL132	WT	2019-07-18	10:25	23.06
SL132	WT	2019-07-31	9:35	22.83
SL132	WT	2019-08-12	9:50	19.67
SL132	WT	2019-08-28	13:40	20.56
SL132	WT	2019-09-12	9:57	21.67
SL132	WT	2019-09-26	9:54	17.06
SL132	WT	2019-10-09	11:08	15.56
SL132	WT	2019-10-24	9:22	10.56
SL132	WT	2019-11-07	10:31	9.06
SL132	WT	2019-11-19	9:57	6.17
SL132	WT	2019-12-17	9:41	5.00
SL132	WT	2020-01-07	11:24	4.22
SL132	WT	2020-01-23	9:24	1.39
SL132	WT	2020-02-03	10:08	4.44
SL132	WT	2020-02-19	11:07	7.78
SL132	WT	2020-03-04	11:53	9.17
SL132	WT	2020-04-16	8:50	8.89
SL132	WT	2020-05-07	10:10	11.39
SL132	WT	2020-05-20	9:54	13.22
SL132	WT	2020-06-01	9:50	15.33
SL132	WT	2020-06-16	9:44	17.56
SL132	WT	2020-07-09	8:25	23.67
SL132	WT	2020-07-21	8:38	23.94
SL132	WT	2020-08-12	9:03	24.06
SL132	WT	2020-08-28	8:11	22.50
SL132	WT	2020-09-25	9:40	15.33
SL132	WT	2020-10-09		13.50
SL132	WT	2020-11-06	10:05	10.50
SL132	WT	2020-12-04	9:10	7.05
SL132	WT	2021-01-09	12:45	3.72
SL132	WT	2021-01-21	8:50	2.00
SL132	WT	2021-02-04	1:20	3.61
SL132	WT	2021-03-02	8:55	2.22
SL132	WT	2021-03-18	9:50	8.17
SL132	WT	2021-04-01	9:10	10.50
SL132	WT	2021-04-15	9:58	13.11

SL132	WT	2021-04-29	9:56	16.77
SL132	WT	2021-05-11	9:48	12.50
SL132	WT	2021-05-31	11:30	13.67
SL132	WT	2021-06-10	10:40	21.72
SL132	WT	2021-06-24	10:00	17.72
SL132	WT	2021-07-08	9:36	23.17
SL132	WT	2021-07-27	11:42	23.22
SL132	WT	2021-08-05	9:44	19.17
SL132	WT	2021-08-19	2:07	24.89
SL132	WT	2021-09-17	10:26	21.44
SL133	WT	2021-10-04	2:05	20.11

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of Conductivity and Water Temperature taken by in-stream continuous data loggers (left) and hand measurements (right). Date Range 4/01/2018-10/04/2021.

UT Tributary to Middle Run below Papermill Road Water Temperature Sensor Readings (30 min averages) (left) and Bimonthly Field Readings (right) (SL157, WCCDE32, BCMR1S)



Monthly Mean Water Temperature (degC) taken from continuous sensor readings

Site	Parameter	Date	Reading
SL157	WTmf_M	2018-04-15	11.60
SL157	WTmf_M	2018-05-15	15.60
SL157	WTmf_M	2018-06-15	17.50
SL157	WTmf_M	2018-07-15	20.20
SL157	WTmf_M	2018-08-15	20.50
SL157	WTmf_M	2018-09-15	18.70
SL157	WTmf_M	2018-10-15	14.10
SL157	WTmf_M	2018-11-15	8.40
SL157	WTmf_M	2018-12-15	6.20
SL157	WTmf_M	2019-01-15	4.20
SL157	WTmf_M	2019-02-15	4.30
SL157	WTmf_M	2019-03-15	6.70
SL157	WTmf_M	2019-04-15	12.70
SL157	WTmf_M	2019-05-15	15.10
SL157	WTmf_M	2019-06-15	18.00
SL157	WTmf_M	2019-07-15	21.00
SL157	WTmf_M	2019-08-15	20.40
SL157	WTmf_M	2019-09-15	18.40
SL157	WTmf_M	2019-10-15	14.50
SL157	WTmf_M	2019-11-15	7.40
SL157	WTmf_M	2019-12-15	4.90
SL157	WTmf_M	2020-01-15	4.80
SL157	WTmf_M	2020-02-15	5.40
SL157	WTmf_M	2020-03-15	8.60
SL157	WTmf_M	2020-04-15	10.60
SL157	WTmf_M	2020-05-15	13.80
SL157	WTmf_M	2020-06-15	18.30
SL157	WTmf_M	2020-07-15	21.70
SL157	WTmf_M	2020-08-15	21.10

Bimonthly Water Temperature (degC) Reading (taken by hand in the field)

Site	Parameter	Date	Time	Reading
SL157	WT	2018-07-06	10:02	21.30
SL157	WT	2018-08-29	8:38	20.10
SL157	WT	2018-09-17	9:46	19.20
SL157	WT	2018-10-03	9:45	17.80
SL157	WT	2018-10-15	10:03	14.30
SL157	WT	2018-10-31	9:30	9.30
SL157	WT	2018-11-12	9:37	7.40
SL157	WT	2018-12-10	9:56	3.00
SL157	WT	2019-01-09	9:40	6.20
SL157	WT	2019-02-06	9:24	5.00
SL157	WT	2019-02-27	13:05	6.17
SL157	WT	2019-03-13	8:57	4.17
SL157	WT	2019-03-27	9:17	5.28
SL157	WT	2019-04-10	8:30	10.61
SL157	WT	2019-04-29	9:50	15.30
SL157	WT	2019-05-08	9:30	14.60
SL157	WT	2019-05-23	12:23	16.40
SL157	WT	2019-06-06	9:15	17.80
SL157	WT	2019-06-21	11:05	19.30
SL157	WT	2019-07-03	9:25	19.44
SL157	WT	2019-07-18	10:00	21.67
SL157	WT	2019-07-31	9:15	21.11
SL157	WT	2019-08-12	9:25	18.33
SL157	WT	2019-08-28	13:10	19.56
SL157	WT	2019-09-12	9:27	20.11
SL157	WT	2019-09-26	9:30	16.94
SL157	WT	2019-10-09	10:45	15.89

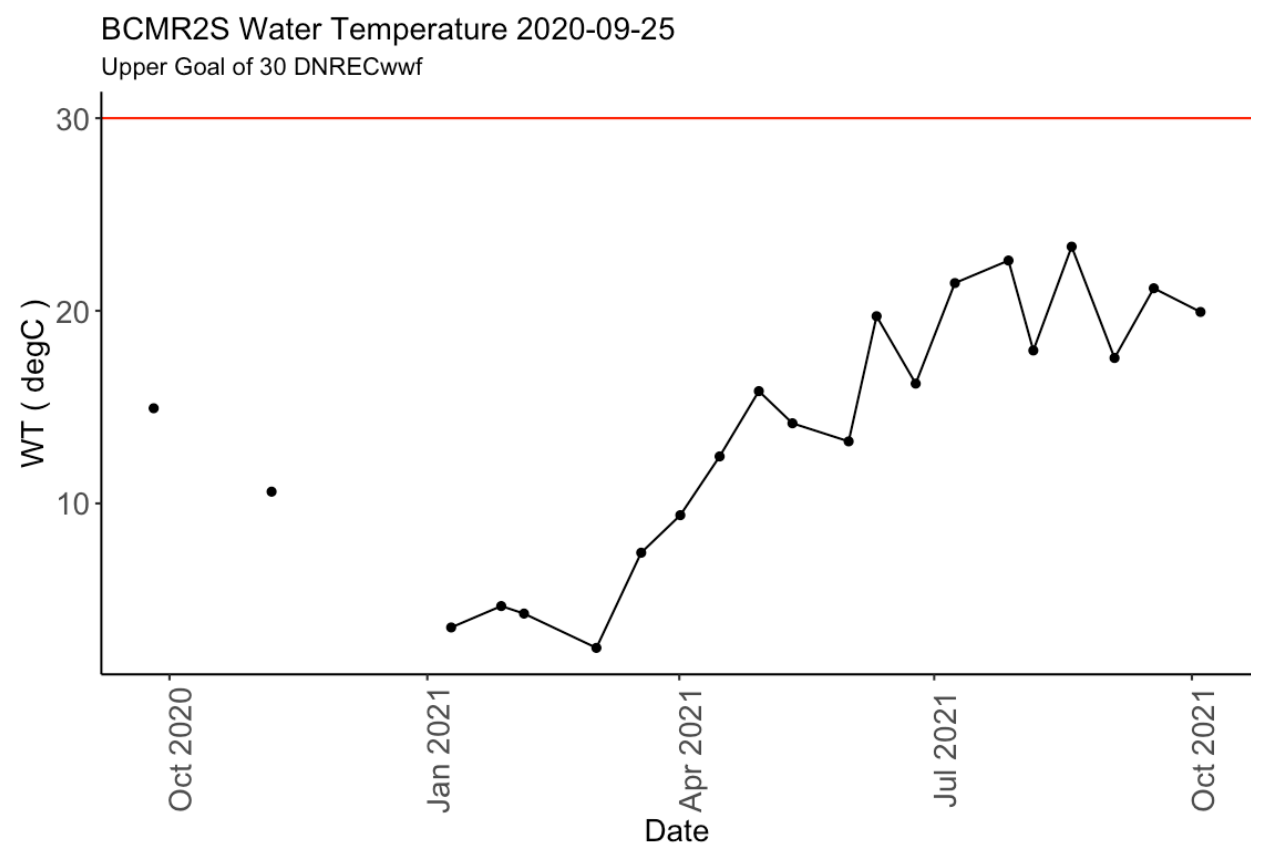
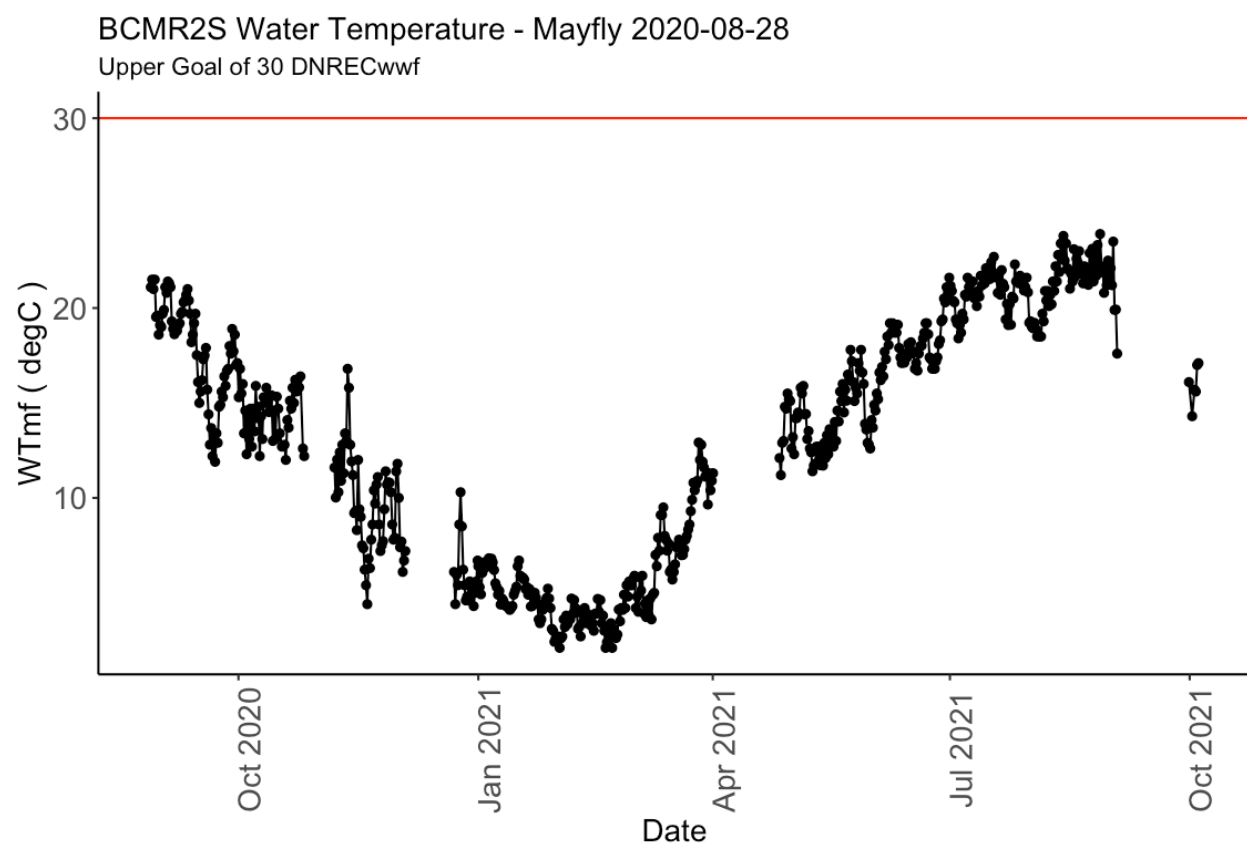
SL157	WTmf_M	2020-09-15	17.60
SL157	WTmf_M	2020-10-15	14.10
SL157	WTmf_M	2020-11-15	10.00
SL157	WTmf_M	2020-12-15	5.80
SL157	WTmf_M	2021-01-15	3.90
SL157	WTmf_M	2021-02-15	2.90
SL157	WTmf_M	2021-03-15	7.90
SL157	WTmf_M	2021-04-15	11.80
SL157	WTmf_M	2021-05-15	14.50
SL157	WTmf_M	2021-06-15	18.40
SL157	WTmf_M	2021-07-15	21.00
SL157	WTmf_M	2021-08-15	21.10
SL157	WTmf_M	2021-09-15	18.60
SL157	WTmf_M	2021-10-15	15.40

SL157	WT	2019-10-24	9:01	11.44
SL157	WT	2019-11-07	10:07	11.78
SL157	WT	2019-11-19	9:33	8.11
SL157	WT	2019-12-17	9:12	5.89
SL157	WT	2020-01-07	11:03	5.56
SL157	WT	2020-01-23	9:05	2.06
SL157	WT	2020-02-03	9:45	4.72
SL157	WT	2020-02-19	10:41	7.67
SL157	WT	2020-03-04	11:29	9.56
SL157	WT	2020-05-07	9:36	11.20
SL157	WT	2020-05-20	9:20	12.22
SL157	WT	2020-06-01	9:19	13.94
SL157	WT	2020-06-16	9:11	15.89
SL157	WT	2020-07-09	7:55	20.89
SL157	WT	2020-07-21	8:20	21.50
SL157	WT	2020-08-12	8:35	21.83
SL157	WT	2020-08-28	7:48	20.78
SL157	WT	2020-09-25	9:10	15.33
SL157	WT	2020-10-09		13.83
SL157	WT	2020-11-06	9:24	10.56
SL157	WT	2020-12-04	8:22	7.05
SL157	WT	2021-01-09	12:07	4.00
SL157	WT	2021-01-21	8:24	1.89
SL157	WT	2021-02-04	12:45	3.78
SL157	WT	2021-03-02	8:20	2.78
SL157	WT	2021-03-18	9:20	7.28
SL157	WT	2021-04-01	8:30	9.44
SL157	WT	2021-04-15	9:24	12.33
SL157	WT	2021-04-29	9:25	15.27
SL157	WT	2021-05-11	9:22	11.94
SL157	WT	2021-05-31	10:50	13.56
SL157	WT	2021-06-10	10:06	19.56
SL157	WT	2021-06-24	9:18	15.94
SL157	WT	2021-07-08	9:10	21.56
SL157	WT	2021-07-27	12:10	23.11
SL157	WT	2021-08-05	9:13	18.17
SL157	WT	2021-08-19	1:22	23.67
SL157	WT	2021-09-03	8:45	17.33
SL157	WT	2021-09-17	9:10	19.83
SL157	WT	2021-10-04	1:30	18.94

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of Conductivity and Water Temperature taken by in-stream continuous data loggers (left) and hand measurements (right). Date Range 9/01/2020-10/04/2021.

UT Tributary to Middle Run above Papermill Road Water Temperature Sensor Readings (30 min averages) (left) and Bimonthly Field Readings (right) (WCCDE44, BCMR2S, aka BCMR1N)



Monthly Mean Water Temperature (degC) taken from continuous

Site	Parameter	Date	Reading
BCMR1N	WTmf_M	2020-08-15	20.40
BCMR1N	WTmf_M	2020-09-15	17.60
BCMR1N	WTmf_M	2020-10-15	14.30
BCMR1N	WTmf_M	2020-11-15	10.10
BCMR1N	WTmf_M	2020-12-15	6.30
BCMR1N	WTmf_M	2021-01-15	4.90
BCMR1N	WTmf_M	2021-02-15	3.60
BCMR1N	WTmf_M	2021-03-15	7.80
BCMR1N	WTmf_M	2021-04-15	13.50
BCMR1N	WTmf_M	2021-05-15	14.10
BCMR1N	WTmf_M	2021-06-15	17.80
BCMR1N	WTmf_M	2021-07-15	20.90
BCMR1N	WTmf_M	2021-08-15	21.30
BCMR1N	WTmf_M	2021-09-15	19.40
BCMR1N	WTmf_M	2021-10-15	16.10

Bimonthly Water Temperature (degC) Reading (taken by hand in the field)

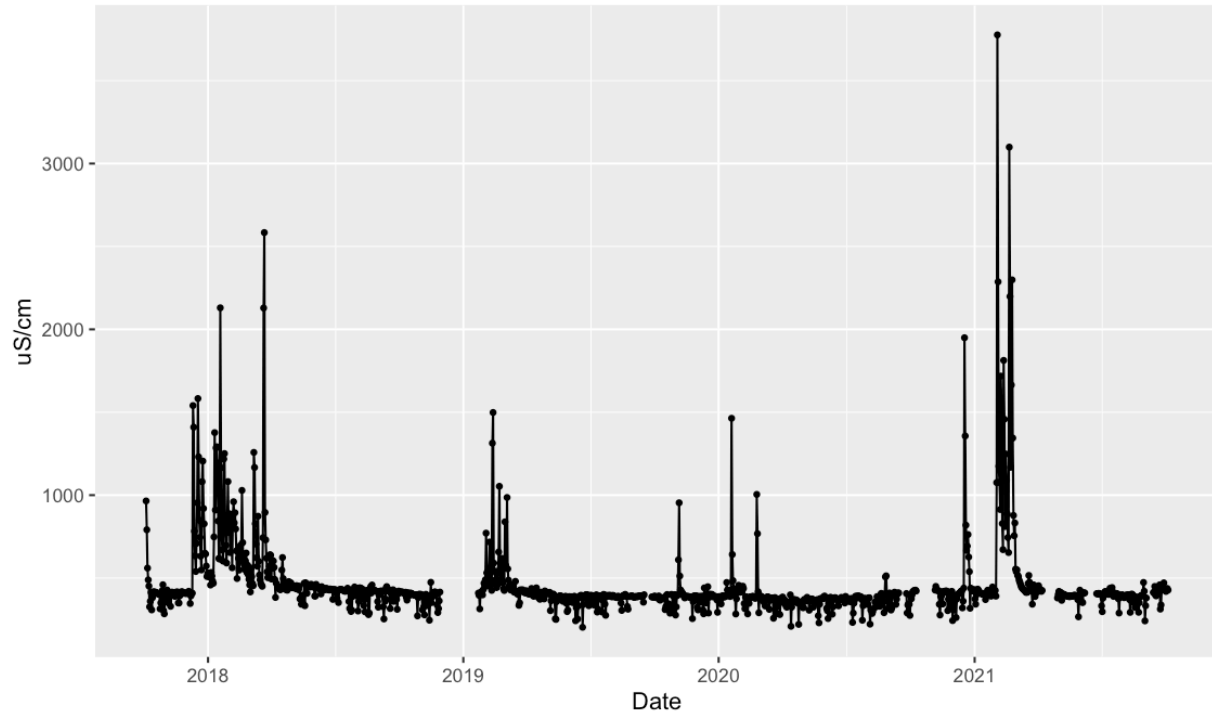
Site	Parameter	Date	Time	Reading
BCMR1N	WT	2020-09-25	8:29	14.94
BCMR1N	WT	2020-10-09		13.61
BCMR1N	WT	2020-11-06	9:45	10.61
BCMR1N	WT	2021-01-09	12:22	3.56
BCMR1N	WT	2021-01-27	9:24	4.67
BCMR1N	WT	2021-02-04	12:30	4.28
BCMR1N	WT	2021-03-02	8:35	2.50
BCMR1N	WT	2021-03-18	9:30	7.44
BCMR1N	WT	2021-04-01	8:43	9.39
BCMR1N	WT	2021-04-15	9:36	12.44
BCMR1N	WT	2021-04-29	9:35	15.83
BCMR1N	WT	2021-05-11	9:28	14.16
BCMR1N	WT	2021-05-31	11:05	13.22
BCMR1N	WT	2021-06-10	10:15	19.72
BCMR1N	WT	2021-06-24	9:30	16.22
BCMR1N	WT	2021-07-08	9:16	21.44
BCMR1N	WT	2021-07-27	12:20	22.61
BCMR1N	WT	2021-08-05	9:21	17.94
BCMR1N	WT	2021-08-19	1:42	23.33
BCMR1N	WT	2021-09-03	9:00	17.55
BCMR1N	WT	2021-09-17	9:20	21.17
BCMR1N	WT	2021-10-04	1:45	19.94

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of Conductivity and Water Temperature taken by in-stream continuous data loggers (left) and hand measurements (right). Date Range 10/15/2017-10/04/2021.

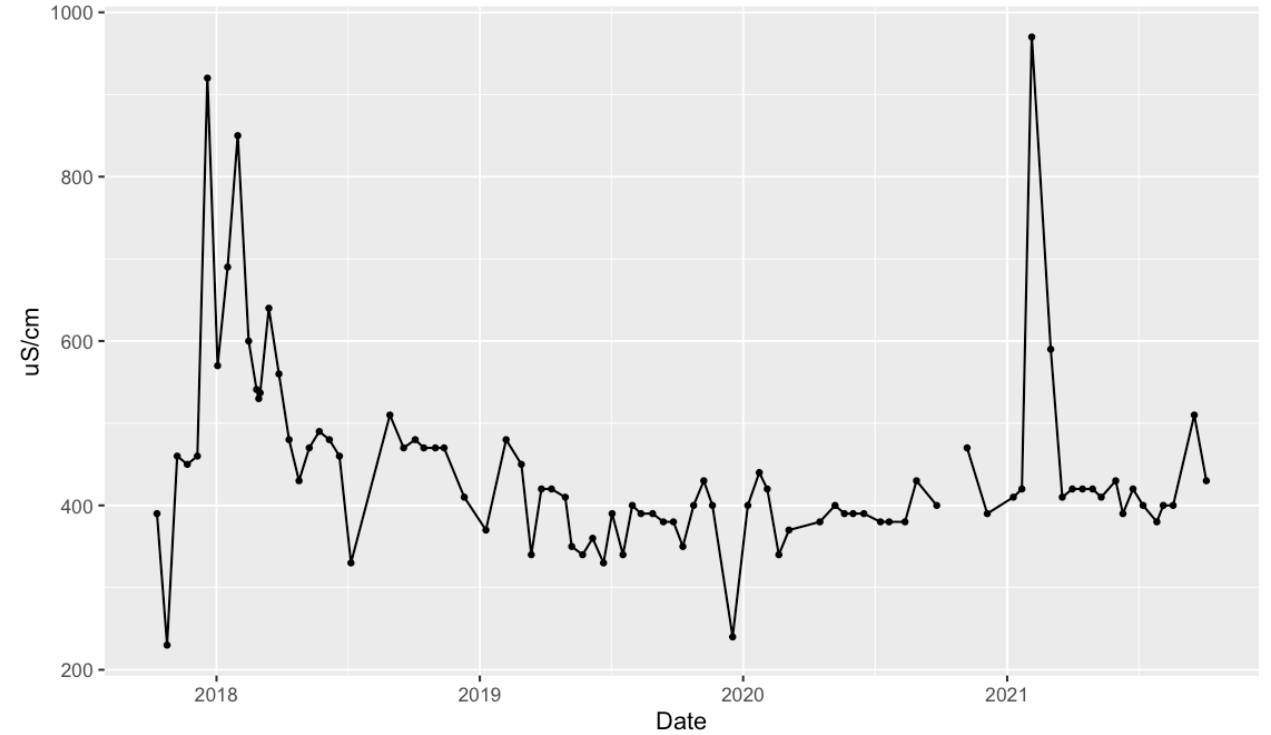
Mill Creek at Hickory Hill Daily Mean Conductivity Sensor Readings (left) and Bimonthly Hand Readings (right) (WCCDE28, SL132, aka BCMC2S)

BCMC2S Conductivity - Day Mean 2017-10-04



BCMC2S CNDmf_D Conductivity - Day Mean, 2017-10-04

BCMC2S Conductivity 2017-10-10



BCMC2S CND Conductivity, 2017-10-10

Monthly Mean Conductivity (uS/cm) taken from continuous sensor readings.

Site	Parameter	Date	Reading
SL132	CNDmf_M	2017-10-15	423.60
SL132	CNDmf_M	2017-11-15	400.30
SL132	CNDmf_M	2017-12-15	732.30
SL132	CNDmf_M	2018-01-15	851.80
SL132	CNDmf_M	2018-02-15	682.10
SL132	CNDmf_M	2018-03-15	740.90
SL132	CNDmf_M	2018-04-15	489.10
SL132	CNDmf_M	2018-05-15	427.70
SL132	CNDmf_M	2018-06-15	430.10
SL132	CNDmf_M	2018-07-15	408.00
SL132	CNDmf_M	2018-08-15	397.30
SL132	CNDmf_M	2018-09-15	391.20
SL132	CNDmf_M	2018-10-15	399.20
SL132	CNDmf_M	2018-11-15	367.60
SL132	CNDmf_M	2019-01-15	407.90
SL132	CNDmf_M	2019-02-15	604.00
SL132	CNDmf_M	2019-03-15	468.20
SL132	CNDmf_M	2019-04-15	406.80
SL132	CNDmf_M	2019-05-15	369.30
SL132	CNDmf_M	2019-06-15	361.30
SL132	CNDmf_M	2019-07-15	374.00
SL132	CNDmf_M	2019-08-15	382.90
SL132	CNDmf_M	2019-09-15	386.80
SL132	CNDmf_M	2019-10-15	366.40
SL132	CNDmf_M	2019-11-15	415.30
SL132	CNDmf_M	2019-12-15	373.40
SL132	CNDmf_M	2020-01-15	443.60
SL132	CNDmf_M	2020-02-15	416.20

Bimonthly Water Conductivity (uS/cm) reading (taken by hand in the field)

Site	Parameter	Date	Time	Reading
SL132	CND	2017-10-10	11:58	390.00
SL132	CND	2017-10-24	11:54	230.00
SL132	CND	2017-11-07	11:36	460.00
SL132	CND	2017-11-21	12:30	450.00
SL132	CND	2017-12-05	11:18	460.00
SL132	CND	2017-12-19	9:15	920.00
SL132	CND	2018-01-02	11:40	570.00
SL132	CND	2018-01-16	9:15	690.00
SL132	CND	2018-01-30	9:28	850.00
SL132	CND	2018-02-14	13:13	600.00
SL132	CND	2018-02-25	NA	541.00
SL132	CND	2018-02-28	13:00	530.00
SL132	CND	2018-03-02	NA	537.00
SL132	CND	2018-03-14	13:05	640.00
SL132	CND	2018-03-28	12:39	560.00
SL132	CND	2018-04-11	13:46	480.00
SL132	CND	2018-04-25	9:23	430.00
SL132	CND	2018-05-09	13:22	470.00
SL132	CND	2018-05-23	11:14	490.00
SL132	CND	2018-06-06	10:18	480.00
SL132	CND	2018-06-20	9:54	460.00
SL132	CND	2018-07-06	9:48	330.00
SL132	CND	2018-08-29	9:06	510.00
SL132	CND	2018-09-17	10:16	470.00
SL132	CND	2018-10-03	10:20	480.00
SL132	CND	2018-10-15	10:27	470.00

SL132	CNDmf_M	2020-03-15	360.10
SL132	CNDmf_M	2020-04-15	345.30
SL132	CNDmf_M	2020-05-15	357.00
SL132	CNDmf_M	2020-06-15	360.20
SL132	CNDmf_M	2020-07-15	362.60
SL132	CNDmf_M	2020-08-15	362.20
SL132	CNDmf_M	2020-09-15	369.10
SL132	CNDmf_M	2020-10-15	410.50
SL132	CNDmf_M	2020-11-15	388.80
SL132	CNDmf_M	2020-12-15	528.10
SL132	CNDmf_M	2021-01-15	405.00
SL132	CNDmf_M	2021-02-15	1374.30
SL132	CNDmf_M	2021-03-15	449.60
SL132	CNDmf_M	2021-04-15	425.80
SL132	CNDmf_M	2021-05-15	391.40
SL132	CNDmf_M	2021-06-15	399.20
SL132	CNDmf_M	2021-07-15	394.90
SL132	CNDmf_M	2021-08-15	382.40
SL132	CNDmf_M	2021-09-15	402.80
SL132	CNDmf_M	2021-10-15	429.80

SL132	CND	2018-10-31	9:59	470.00
SL132	CND	2018-11-12	10:04	470.00
SL132	CND	2018-12-10	10:25	410.00
SL132	CND	2019-01-09	10:15	370.00
SL132	CND	2019-02-06	9:49	480.00
SL132	CND	2019-02-27	13:33	450.00
SL132	CND	2019-03-13	9:20	340.00
SL132	CND	2019-03-27	9:35	420.00
SL132	CND	2019-04-10	8:49	420.00
SL132	CND	2019-04-29	10:12	410.00
SL132	CND	2019-05-08	9:55	350.00
SL132	CND	2019-05-23	12:49	340.00
SL132	CND	2019-06-06	9:45	360.00
SL132	CND	2019-06-21	11:35	330.00
SL132	CND	2019-07-03	9:52	390.00
SL132	CND	2019-07-18	10:25	340.00
SL132	CND	2019-07-31	9:35	400.00
SL132	CND	2019-08-12	9:50	390.00
SL132	CND	2019-08-28	13:40	390.00
SL132	CND	2019-09-12	9:57	380.00
SL132	CND	2019-09-26	9:54	380.00
SL132	CND	2019-10-09	11:08	350.00
SL132	CND	2019-10-24	9:22	400.00
SL132	CND	2019-11-07	10:31	430.00
SL132	CND	2019-11-19	9:57	400.00
SL132	CND	2019-12-17	9:41	240.00
SL132	CND	2020-01-07	11:24	400.00
SL132	CND	2020-01-23	9:24	440.00
SL132	CND	2020-02-03	10:08	420.00
SL132	CND	2020-02-19	11:07	340.00
SL132	CND	2020-03-04	11:53	370.00
SL132	CND	2020-04-16	8:50	380.00
SL132	CND	2020-05-07	10:10	400.00
SL132	CND	2020-05-20	9:54	390.00
SL132	CND	2020-06-01	9:50	390.00
SL132	CND	2020-06-16	9:44	390.00
SL132	CND	2020-07-09	8:25	380.00
SL132	CND	2020-07-21	8:38	380.00
SL132	CND	2020-08-12	9:03	380.00
SL132	CND	2020-08-28	8:11	430.00
SL132	CND	2020-09-25	9:40	400.00
SL132	CND	2020-10-09		410.00
SL132	CND	2020-11-06	10:05	470.00
SL132	CND	2020-12-04	9:10	390.00
SL132	CND	2021-01-09	12:45	410.00
SL132	CND	2021-01-21	8:50	420.00
SL132	CND	2021-02-04	1:20	970.00
SL132	CND	2021-03-02	8:55	590.00

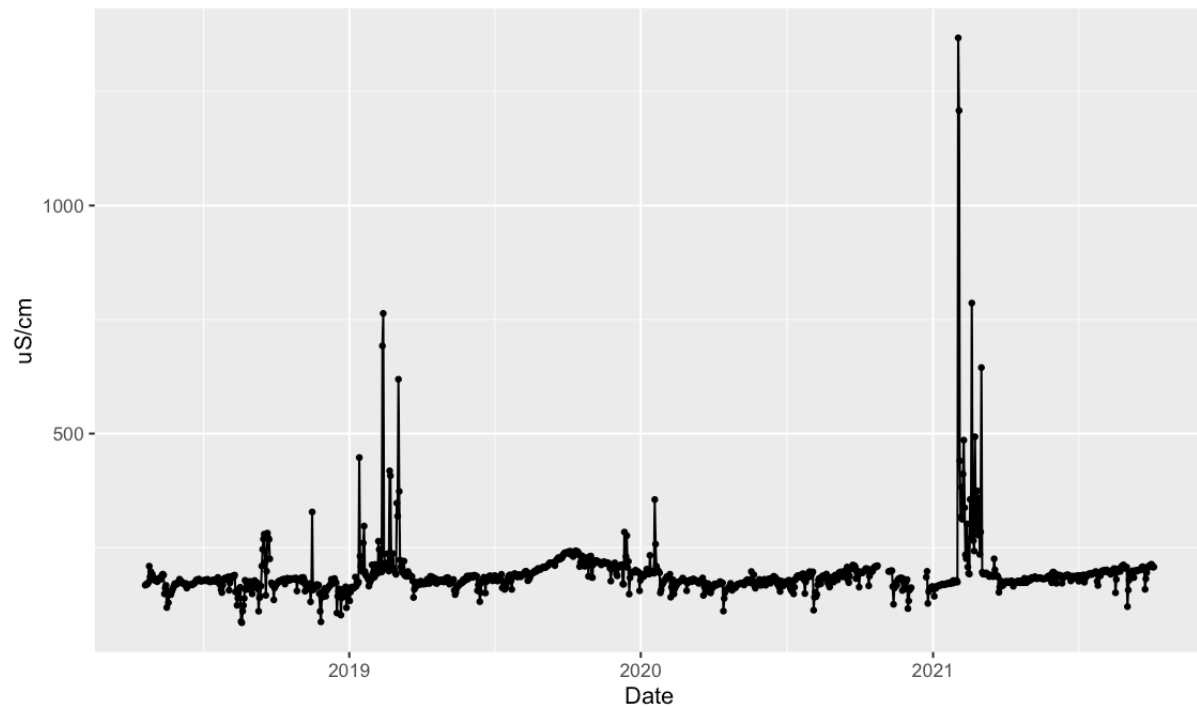
SL132	CND	2021-03-18	9:50	410.00
SL132	CND	2021-04-01	9:10	420.00
SL132	CND	2021-04-15	9:58	420.00
SL132	CND	2021-04-29	9:56	420.00
SL132	CND	2021-05-11	9:48	410.00
SL132	CND	2021-05-31	11:30	430.00
SL132	CND	2021-06-10	10:40	390.00
SL132	CND	2021-06-24	10:00	420.00
SL132	CND	2021-07-08	9:36	400.00
SL132	CND	2021-07-27	11:42	380.00
SL132	CND	2021-08-05	9:44	400.00
SL132	CND	2021-08-19	2:07	400.00
SL132	CND	2021-09-17	10:26	510.00
SL132	CND	2021-10-04	2:05	430.00

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of Conductivity and Water Temperature taken by in-stream continuous data loggers (left) and hand measurements (right). Date Range 5/15/2017-10/04/2021.

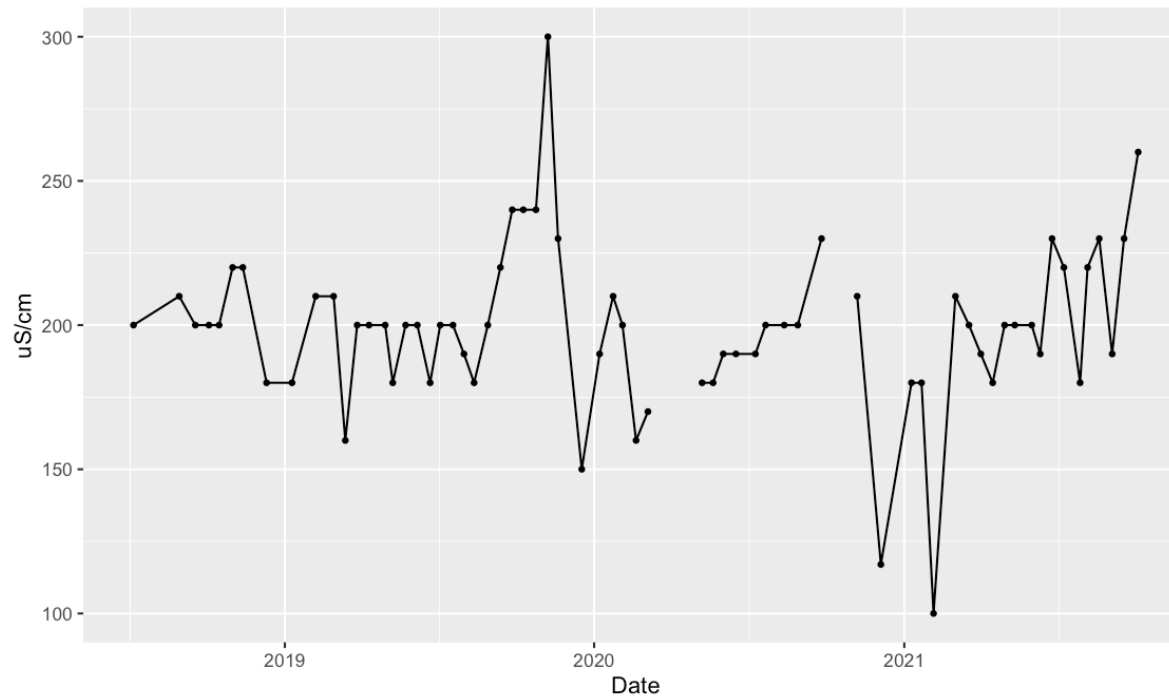
UT Tributary to Middle Run below Papermill Road Daily Mean Conductivity Sensor Readings (left) and Bimonthly Hand Readings (right) SL157, WCCDE32, BCMR1S)

BCMR1S Conductivity - Day Mean 2018-04-20



BCMR1S CNDmf_D Conductivity - Day Mean, 2018-04-20

BCMR1S Conductivity 2018-07-06



BCMR1S CND Conductivity, 2018-07-06

Monthly Mean Conductivity (uS/cm) taken from continuous sensor readings.

Site	Parameter	Date	Reading
SL157	CNDmf_M	2018-04-15	182.80
SL157	CNDmf_M	2018-05-15	167.50
SL157	CNDmf_M	2018-06-15	173.00
SL157	CNDmf_M	2018-07-15	176.60
SL157	CNDmf_M	2018-08-15	158.60
SL157	CNDmf_M	2018-10-15	177.80
SL157	CNDmf_M	2018-12-15	155.60
SL157	CNDmf_M	2019-01-15	195.20
SL157	CNDmf_M	2019-02-15	262.90
SL157	CNDmf_M	2019-03-15	213.90
SL157	CNDmf_M	2019-04-15	176.10
SL157	CNDmf_M	2019-05-15	174.30
SL157	CNDmf_M	2019-06-15	178.10
SL157	CNDmf_M	2019-07-15	181.10
SL157	CNDmf_M	2019-08-15	194.80
SL157	CNDmf_M	2019-09-15	221.20
SL157	CNDmf_M	2019-10-15	227.60
SL157	CNDmf_M	2019-11-15	212.80
SL157	CNDmf_M	2019-12-15	201.10
SL157	CNDmf_M	2020-01-15	197.60
SL157	CNDmf_M	2020-02-15	173.70
SL157	CNDmf_M	2020-03-15	171.00
SL157	CNDmf_M	2020-04-15	162.80
SL157	CNDmf_M	2020-05-15	174.00
SL157	CNDmf_M	2020-06-15	175.40
SL157	CNDmf_M	2020-07-15	178.70
SL157	CNDmf_M	2020-08-15	175.20
SL157	CNDmf_M	2020-09-15	194.30
SL157	CNDmf_M	2020-10-15	198.80

Bimonthly Water Conductivity (uS/cm) reading (taken by hand in the field).

Site	Parameter	Date	Time	Reading
SL157	CND	2018-07-06	10:02	200.00
SL157	CND	2018-08-29	8:38	210.00
SL157	CND	2018-09-17	9:46	200.00
SL157	CND	2018-10-03	9:45	200.00
SL157	CND	2018-10-15	10:03	200.00
SL157	CND	2018-10-31	9:30	220.00
SL157	CND	2018-11-12	9:37	220.00
SL157	CND	2018-12-10	9:56	180.00
SL157	CND	2019-01-09	9:40	180.00
SL157	CND	2019-02-06	9:24	210.00
SL157	CND	2019-02-27	13:05	210.00
SL157	CND	2019-03-13	8:57	160.00
SL157	CND	2019-03-27	9:17	200.00
SL157	CND	2019-04-10	8:30	200.00
SL157	CND	2019-04-29	9:50	200.00
SL157	CND	2019-05-08	9:30	180.00
SL157	CND	2019-05-23	12:23	200.00
SL157	CND	2019-06-06	9:15	200.00
SL157	CND	2019-06-21	11:05	180.00
SL157	CND	2019-07-03	9:25	200.00
SL157	CND	2019-07-18	10:00	200.00
SL157	CND	2019-07-31	9:15	190.00
SL157	CND	2019-08-12	9:25	180.00
SL157	CND	2019-08-28	13:10	200.00
SL157	CND	2019-09-12	9:27	220.00
SL157	CND	2019-09-26	9:30	240.00
SL157	CND	2019-10-09	10:45	240.00
SL157	CND	2019-10-24	9:01	240.00
SL157	CND	2019-11-07	10:07	300.00

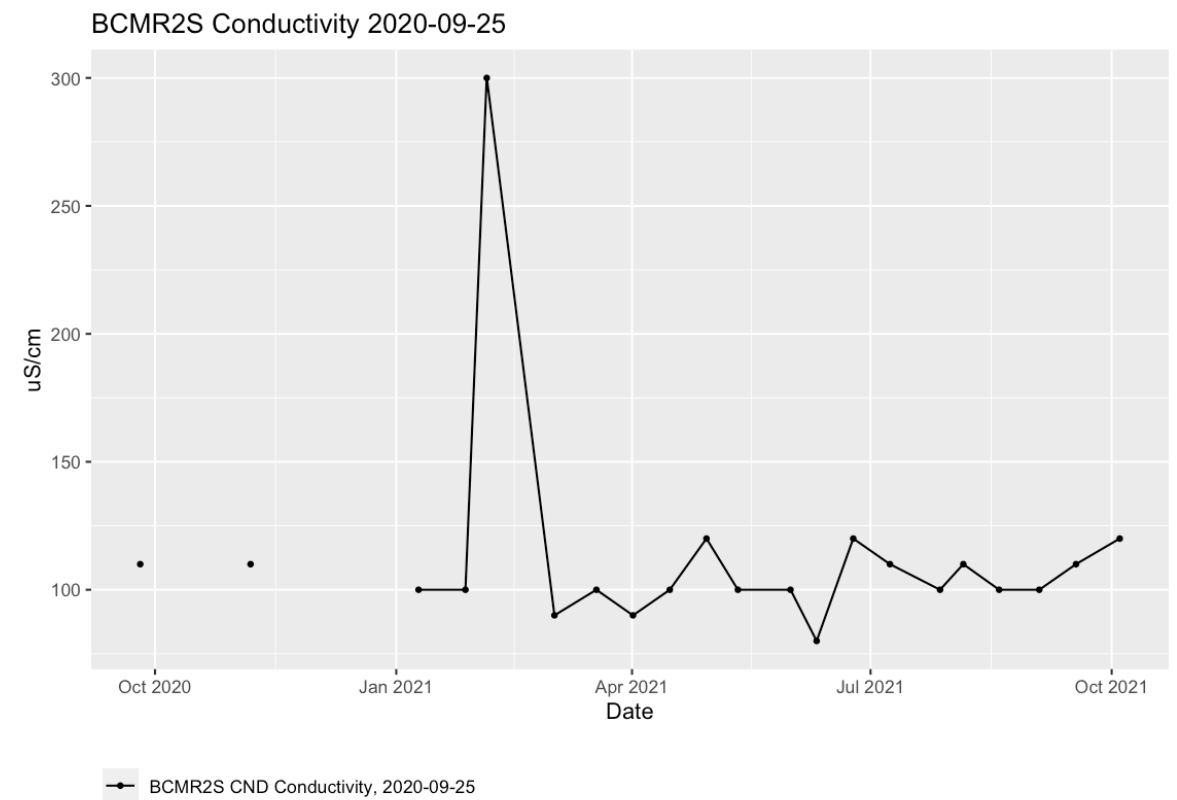
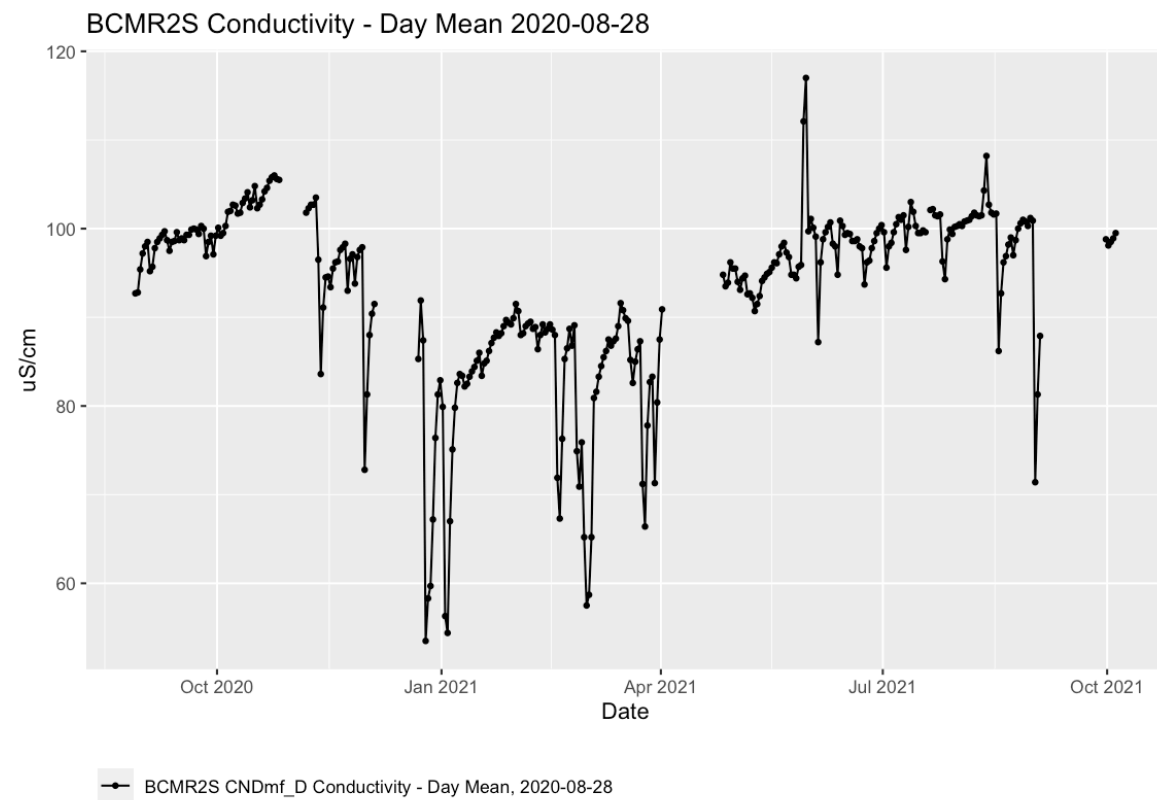
SL157	CNDmf_M	2020-11-15	174.30
SL157	CNDmf_M	2020-12-15	159.30
SL157	CNDmf_M	2021-01-15	168.90
SL157	CNDmf_M	2021-02-15	420.30
SL157	CNDmf_M	2021-03-15	185.90
SL157	CNDmf_M	2021-04-15	175.10
SL157	CNDmf_M	2021-05-15	183.90
SL157	CNDmf_M	2021-06-15	185.90
SL157	CNDmf_M	2021-07-15	188.50
SL157	CNDmf_M	2021-08-15	198.90
SL157	CNDmf_M	2021-09-15	194.20
SL157	CNDmf_M	2021-10-15	210.10

SL157	CND	2019-11-19	9:33	230.00
SL157	CND	2019-12-17	9:12	150.00
SL157	CND	2020-01-07	11:03	190.00
SL157	CND	2020-01-23	9:05	210.00
SL157	CND	2020-02-03	9:45	200.00
SL157	CND	2020-02-19	10:41	160.00
SL157	CND	2020-03-04	11:29	170.00
SL157	CND	2020-05-07	9:36	180.00
SL157	CND	2020-05-20	9:20	180.00
SL157	CND	2020-06-01	9:19	190.00
SL157	CND	2020-06-16	9:11	190.00
SL157	CND	2020-07-09	7:55	190.00
SL157	CND	2020-07-21	8:20	200.00
SL157	CND	2020-08-12	8:35	200.00
SL157	CND	2020-08-28	7:48	200.00
SL157	CND	2020-09-25	9:10	230.00
SL157	CND	2020-10-09		260.00
SL157	CND	2020-11-06	9:24	210.00
SL157	CND	2020-12-04	8:22	117.00
SL157	CND	2021-01-09	12:07	180.00
SL157	CND	2021-01-21	8:24	180.00
SL157	CND	2021-02-04	12:45	100.00
SL157	CND	2021-03-02	8:20	210.00
SL157	CND	2021-03-18	9:20	200.00
SL157	CND	2021-04-01	8:30	190.00
SL157	CND	2021-04-15	9:24	180.00
SL157	CND	2021-04-29	9:25	200.00
SL157	CND	2021-05-11	9:22	200.00
SL157	CND	2021-05-31	10:50	200.00
SL157	CND	2021-06-10	10:06	190.00
SL157	CND	2021-06-24	9:18	230.00
SL157	CND	2021-07-08	9:10	220.00
SL157	CND	2021-07-27	12:10	180.00
SL157	CND	2021-08-05	9:13	220.00
SL157	CND	2021-08-19	1:22	230.00
SL157	CND	2021-09-03	8:45	190.00
SL157	CND	2021-09-17	9:10	230.00
SL157	CND	2021-10-04	1:30	260.00

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphic presentation of Conductivity and Water Temperature taken by in-stream continuous data loggers (left) and hand measurements (right). Date Range 5/15/2017-9/17/2021.

UT Tributary to Middle Run above Papermill Road Daily Mean Conductivity Sensor Readings (left) and Bimonthly Hand Readings (right) (WCCDE44, BCMR2S, BCMR1N)



Monthly Mean Conductivity (uS/cm) taken from continuous sensor readings.

Site	Parameter	Date	Reading
BCMR1N	CNDmf_M	2020-08-15	94.70
BCMR1N	CNDmf_M	2020-09-15	98.70
BCMR1N	CNDmf_M	2020-10-15	102.90
BCMR1N	CNDmf_M	2020-11-15	95.70
BCMR1N	CNDmf_M	2020-12-15	77.30
BCMR1N	CNDmf_M	2021-01-15	82.80
BCMR1N	CNDmf_M	2021-02-15	84.20
BCMR1N	CNDmf_M	2021-03-15	81.60
BCMR1N	CNDmf_M	2021-04-15	94.50
BCMR1N	CNDmf_M	2021-05-15	96.20
BCMR1N	CNDmf_M	2021-06-15	98.30
BCMR1N	CNDmf_M	2021-08-15	100.00
BCMR1N	CNDmf_M	2021-09-15	82.00
BCMR1N	CNDmf_M	2021-10-15	98.90

Bimonthly Water Conductivity (uS/cm) reading (taken by hand in the field).

Site	Parameter	Date	Time	Reading
BCMR1N	CND	2020-09-25	8:29	110.00
BCMR1N	CND	2020-10-09		100.00
BCMR1N	CND	2020-11-06	9:45	110.00
BCMR1N	CND	2021-01-09	12:22	100.00
BCMR1N	CND	2021-01-27	9:24	100.00
BCMR1N	CND	2021-02-04	12:30	300.00
BCMR1N	CND	2021-03-02	8:35	90.00
BCMR1N	CND	2021-03-18	9:30	100.00
BCMR1N	CND	2021-04-01	8:43	90.00
BCMR1N	CND	2021-04-15	9:36	100.00
BCMR1N	CND	2021-04-29	9:35	120.00
BCMR1N	CND	2021-05-11	9:28	100.00
BCMR1N	CND	2021-05-31	11:05	100.00
BCMR1N	CND	2021-06-10	10:15	80.00
BCMR1N	CND	2021-06-24	9:30	120.00
BCMR1N	CND	2021-07-08	9:16	110.00
BCMR1N	CND	2021-07-27	12:20	100.00
BCMR1N	CND	2021-08-05	9:21	110.00
BCMR1N	CND	2021-08-19	1:42	100.00
BCMR1N	CND	2021-09-03	9:00	100.00
BCMR1N	CND	2021-09-17	9:20	110.00
BCMR1N	CND	2021-10-04	1:45	120.00

White Clay Wild and Scenic River Stream Watch Monitoring Program

Statistics for Bacteria Enterococcus (ENT) during the summer recreational season at Baseflow (baseflow defined as <0.25" rain in 48 hour period) . Five samples were collect at each site within a 30 day period during the summer season (2016-2021)

The geometric mean averaged over entire sampling period. Exceedances of standards noted in red indicate impairment.

Site ID	Site Description	Sampling Years	Samples Taken	Enterococcus GeoMean (MPN)	DNREC Standard for Primary Contact ENT (MPN)
WCCDE28	Hickory Hill at Erikson Ave	2016-2021	35	1363	100
WCCDE29	Northpointe Main on Mill Creek	2016-2021	35	833	100
WCCDE30	Northpointe Trib to Mill Creek	2016-2021	35	821	100
WCCDE31	Middle Run Main Stem	2016-2021	35	1017	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2016-2021	35	612	100
WCCDE37	Fairfield Run	2018-2021	20	1138	100
WCCDE38	Bogey's Run/Blue Hen Creek	2018-2021	20	1390	100
WCCDE39	Jenney's Run	2018-2021	20	1396	100
WCCDE40	Main @ Kirkwood & A Street	2018-2021	20	719	100
WCCDE42	Lower Pike Creek	2019-2021	15	1062	100

White Clay Wild and Scenic River Stream Watch Monitoring Program

Statistics for Bacteria Enterococcus (ENT) during the summer recreational season at Baseflow (baseflow defined as <0.25" rain in 48 hour period) . Five samples were collect at each site within a 30 day period during the summer season (2016-2021)

Geometric Means separated by 30 day sampling period. Exceedances of standards noted in red indicate impairment.

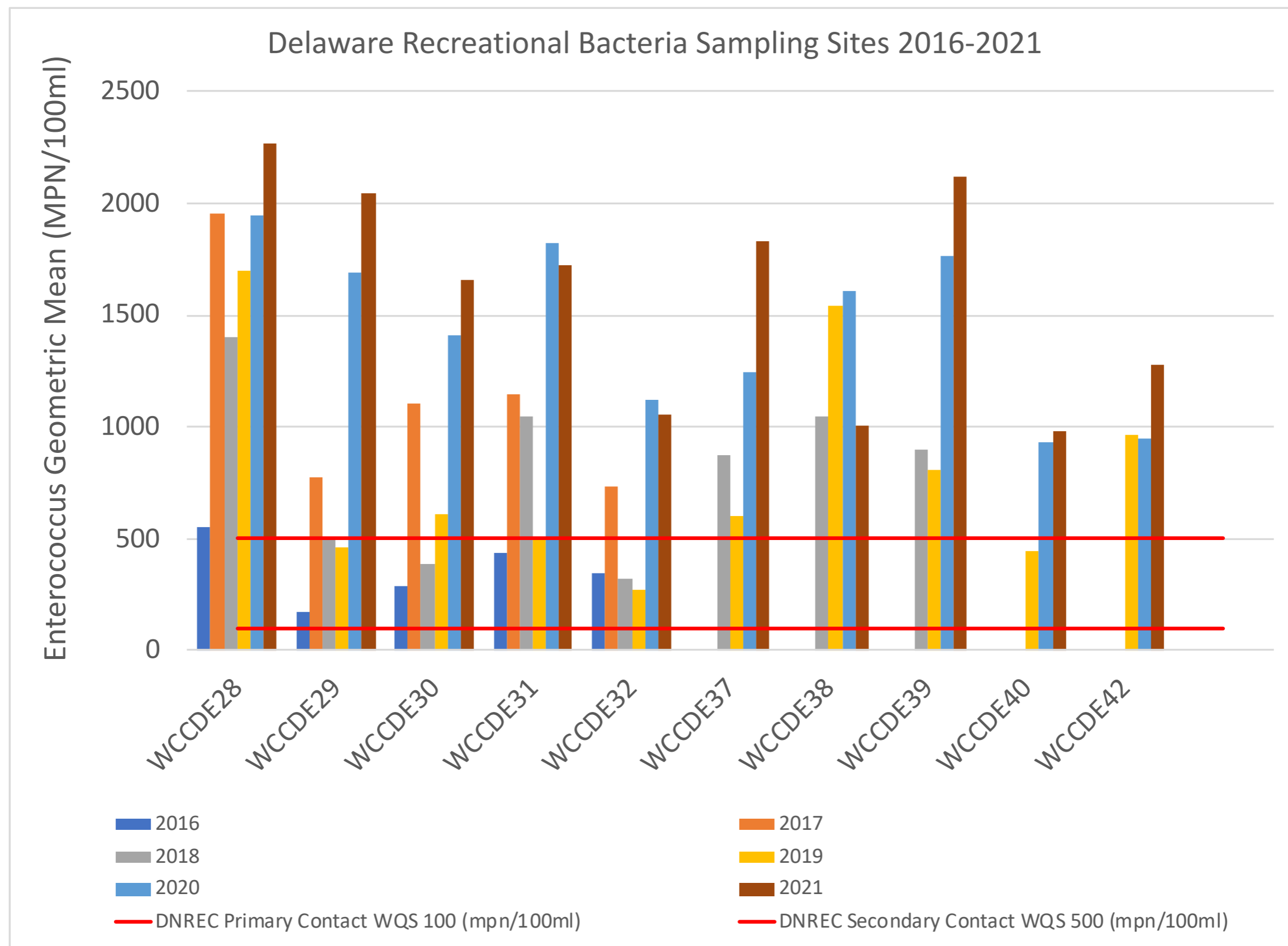
Site ID	Site Description	Sampling Month	Samples Taken	Enterococcus GeoMean (MPN)	DNREC Standard for Primary Contact ENT (MPN)
WCCDE28	Hickory Hill at Erikson Ave	2016-08-04	5	423.60	100
WCCDE28	Hickory Hill at Erikson Ave	2016-08-25	5	678.30	100
WCCDE28	Hickory Hill at Erikson Ave	2017-08-10	5	1956.60	100
WCCDE28	Hickory Hill at Erikson Ave	2018-07-03	5	576.00	100
WCCDE28	Hickory Hill at Erikson Ave	2019-08-05	5	1696.30	100
WCCDE28	Hickory Hill at Erikson Ave	2020-07-27	5	1947.04	100
WCCDE28	Hickory Hill at Erikson Ave	2021-08-04	5	2263	100
WCCDE29	Northpointe Main on Mill Creek	2016-08-04	5	81.20	100
WCCDE29	Northpointe Main on Mill Creek	2016-08-25	5	270.50	100
WCCDE29	Northpointe Main on Mill Creek	2017-08-10	5	774.50	100
WCCDE29	Northpointe Main on Mill Creek	2018-07-17	5	504.00	100
WCCDE29	Northpointe Main on Mill Creek	2019-08-05	5	463.10	100
WCCDE29	Northpointe Main on Mill Creek	2020-07-27	5	1693.10	100
WCCDE29	Northpointe Main on Mill Creek	2021-08-04	5	2046	100
WCCDE30	Northpointe Trib to Mill Creek	2016-08-04	5	120.80	100
WCCDE30	Northpointe Trib to Mill Creek	2016-08-25	5	463.20	100
WCCDE30	Northpointe Trib to Mill Creek	2017-08-10	5	1103.20	100
WCCDE30	Northpointe Trib to Mill Creek	2018-07-17	5	386.40	100
WCCDE30	Northpointe Trib to Mill Creek	2019-08-05	5	609.30	100
WCCDE30	Northpointe Trib to Mill Creek	2020-07-27	5	1406.70	100
WCCDE30	Northpointe Trib to Mill Creek	2021-08-04	5	1657	100
WCCDE31	Middle Run Main Stem	2016-08-04	5	166.30	100

Site ID	Site Description	Sampling Month	Samples Taken	Enterococcus GeoMean (MPN)	DNREC Standard for Primary Contact ENT (MPN)
WCCDE31	Middle Run Main Stem	2016-08-25	5	711.30	100
WCCDE31	Middle Run Main Stem	2017-08-10	5	1145.50	100
WCCDE31	Middle Run Main Stem	2018-07-17	5	1046.10	100
WCCDE31	Middle Run Main Stem	2019-08-05	5	505.60	100
WCCDE31	Middle Run Main Stem	2020-07-27	5	1824.70	100
WCCDE31	Middle Run Main Stem	2021-08-04	5	1721	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2016-08-04	5	199.00	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2016-08-25	5	494.90	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2017-08-10	5	731.90	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2018-07-12	5	407.30	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2019-08-05	5	270.70	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2020-07-27	5	1120.38	100
WCCDE32	Middle Run Trib to Main Stem just above confluence	2021-08-04	5	1058	100
WCCDE37	Fairfield Run	2018-07-17	5	874.20	100
WCCDE37	Fairfield Run	2019-08-05	5	603.70	100
WCCDE37	Fairfield Run	2020-07-27	5	1243	100
WCCDE37	Fairfield Run	2021-08-04	5	1830	100
WCCDE38	Bogey's Run/Blue Hen Creek	2018-07-17	5	1405.10	100
WCCDE38	Bogey's Run/Blue Hen Creek	2019-08-05	5	1540.60	100
WCCDE38	Bogey's Run/Blue Hen Creek	2020-07-27	5	1608.1	100
WCCDE38	Bogey's Run/Blue Hen Creek	2021-08-04	5	1008	100
WCCDE39	Jenney's Run	2018-07-17	5	899.30	100
WCCDE39	Jenney's Run	2019-08-05	5	807.20	100
WCCDE39	Jenney's Run	2020-07-27	5	1760.8	100
WCCDE39	Jenney's Run	2021-08-04	5	2117	100
WCCDE40*	Main @ Kirkwood & A Street	2018-07-30	5	516.81	100
WCCDE40	Main @ Kirkwood & A Street	2019-08-05	5	442.30	100
WCCDE40	Main @ Kirkwood & A Street	2020-07-27	5	934.6	100
WCCDE40	Main @ Kirkwood & A Street	2021-08-04	5	981	100
WCCDE42	Lower Pike Creek	2019-08-05	5	964.90	100
WCCDE42	Lower Pike Creek	2020-07-27	5	944.9	100
WCCDE42	Lower Pike Creek	2021-08-04	5	1275	100

*5 samples over a 30 day period

White Clay Wild and Scenic River Stream Watch Monitoring Program

Graphical presentation of fecal bacteria concentrations, Enterococcus (ENT) during summer recreational seasons (2016-2021) at baseflow (baseflow defined as <0.25" rain in 48 hour period) . A minimum of five samples were collected at each site within a 30 day period during the summer season and geometric means were recorded. Exceedance of DNREC Primary Recreation Standard (red line) indicates impairment.



Recreational Bacteria (Enterococcus) Geometric Means MPN/100ml 2016-2021

Site Name	Site ID	2016	2017	2018	2019	2020	2021
Hickory Hill at Erikson Ave WCC1	WCCDE28	551	1957	576	1696	1947	2263
Northpointe Main on Mill Creek	WCCDE29	176	775	504	463	1693	2046
Northpointe Trib to Mill Creek	WCCDE30	292	1103	386	609	1407	1657
Middle Run Main Stem	WCCDE31	439	1146	1046	506	1825	1721
Middle Run Trib to Main Stem	WCCDE32	347	732	407	271	1120	1058
Fairfield Run	WCCDE37	NA	NA	874	604	1243	1830
Bogy's Run/Blue Hen Creek	WCCDE38	NA	NA	1405	1541	1608	1008
Jenney's Run	WCCDE39	NA	NA	899	807	1761	2117
Main @ Kirkwood & A Street	WCCDE40	NA	NA	517	442	935	981
Lower Pike Creek	WCCDE42	NA	NA	NA	965	945	1275

Bacteria Sampling Procedure

Equipment for field sampling

- Instructions
- 125-ml sample bottles (1 per site unless taking replicate or blank) or 1000ml Whirlpack bags if using Stroud Lab.
- Cooler and ice packs
- Field Data Sheets (One per site)
- Chain of Custody Form (All samples collected on same day can be placed on one chain of custody sheet.) Most private labs will require this, Stroud does not for bacteria sampling.
- Ball point pen, pencil
- Sharpie (permanent marker in clipboard)
- Extra bottle/bag at sampling site where replicates ~~and blanks~~ are performed and a small backpack or pouch for storing the extra bottles.
- Waders, boots or old sneakers that can get wet.
- Rubber or non-powdered latex/plastic gloves (optional)
- ~~- Distilled water (This is essentially purified water, free of any bacteria. You will need one for every 10 samples.~~
- Hand sanitizer (optional)

Before sampling

Check Precipitation. We are looking for less than .25 inches in the previous 48 hours. Visit: <http://www.deos.udel.edu/>

Data>current conditions AND

Data>daily summaries

I look at data for Hockessin VFC (there are two do not use the Mt Cuba station) and Newark White Clay Creek

Plan to sample the furthest downstream site first and then move to the upstream sites.

1. Fill out the Field Data Sheet, including weather information. There will be one Field Data Sheet for all of the sampling sites. Please add DO (dissolved Oxygen), Temperature, and Conductivity measurements to each Field Sheet.
2. Fill out the Lab Form. You can place ALL samples collected that day on ONE lab form.
3. Make sure that sample bottle is labeled with a black indelible ink pen BEFORE getting it wet. For example,

Name of responsible organization:

WCWA

Test(s) to be run:

E. coli, NO3N, etc.

Stream Name:

White Clay Creek

Date:

08082012

Site ID:

SL157

Time (military time):

1320

Samplers Name:

Kelly Jacobs

Collecting the sample:

1. Try to sample mid-channel, mid-depth. Avoid stagnant water and eddies. Face upstream.

2. Do not disturb the bottom sediment. Do not collect sediment in your stream sample. If sediment is disturbed, stand in the stream and wait a period of time for the sediment to wash downstream.
3. Remove the caps from the bottle just before filling with stream water. **Make sure nothing – including your fingers – comes into contact with the inside surfaces of the bottle or cap.** Wear gloves if necessary.
4. DO NOT rinse the 125-ml bottles! (When you receive the bottles they already contain a small amount of chemical fixative that needs to stay in the sample. For this reason, the bottles cannot be rinsed.) If the bottle have a pill at the bottom, leave that in the bottle when you sample.
5. Hold the uncapped bottle near the base with the **opening facing directly downward at the water**. Then plunge the bottle, open end first, below the water surface and collect the water sample from 8-12” beneath the surface, but not against the substrate. If the stream is not that deep, collect the sample at mid-depth, if possible. Do this by turning the submerged bottle into the current and away from you, in an upstream dipping motion.
6. Try to leave a little air space in the bottle, but not more than one inch. If the bottle comes up completely full, simply pour off the excess water to about the shoulder or the bottom of the threads on the neck.
7. Recap the bottle and immediately place it into the cooler with ice.

Collecting Blanks and Replicates

For every 10 water samples you collect and send to a lab for analysis, you will also need to collect one “replicate” ~~plus one “blank” sample~~ at a site. (If you sample all sites in one day there should be one blank and one replicate) Only indicate the fact that the sample is a blank or replicate on the field sheet.

For our sampling the number 15 was chosen for the blank and 16 was chosen for the replicate. Note only the field sheet which site the replicate was taken at.

Submitting a Blank:

- ~~1. At the sampling site write "B" on label of bottle and label the bottle for **Test: E. coli** and the field/lab sheets after the date (for example: 05022012-B)~~
- ~~2. **Fill the sample bottle with the sterile water provided by the lab in the sterile water bottle. Do not simply label and submit the sterile water bottle!** Discard empty sterile water bottle.~~
- ~~3. Indicate on the Field Data Sheet if the sample is a blank.~~

Submitting a Replicate:

1. At the sampling site write "R" on the label and field/lab sheets for Replicate after unique site ID letter (for example: 05022012-R), Indicate on the Field Data Sheet that this is a replicate and note **which site the replicate was taken at**. For this example, the replicate was collected at Site 12. Label one additional 125 mL bottle with the code (05022012-R) for the replicate E. coli sample.
2. Take both the sample bottle and the bottle for the replicate to the place in the stream where you will be sampling (mid-channel). It is helpful to have a pocket or small pack/pouch to store the extra bottle while filling each sample, avoiding any contamination.
3. Follow procedure above for taking a sample (steps 1-7) but fill both bottles.

ALL samples need to go on ice immediately and should be brought to the lab within 6 hours from sampling time.

If using Brandywine Science Center:

Take the samples with the Lab sheet to: Brandywine Science Center located at: 204 Line Road in Kennett Square Pennsylvania. 610-444-9850

Lab Hours: M-F 9am-5pm

Sign the Chain of Custody sheet and have the person taking the samples at the lab sign the sheet also.

Leave the Chain of Custody sheet with the samples at the lab. Please provide my email (mpc@whiteclay.org) to the lab.

INVOICING: All tests should be invoiced to White Clay Creek Watershed Association care of Shane Morgan, 182 Sawmill Road, Landenberg, PA 19350 – they can be emailed to mpc@whiteclay.org. Have them call me with any questions: 484-716-6836.

Return the Field sheets to me or scan and send to:

mpc@whiteclay.org

****Remember to get replacement 125-ml sterile sampling bottles when you bring the first samples into lab if using DEP lab. Stroud and DNS will accept sterile 1000ml whirlpack bags for their testing, all other procedures should be followed.**

NOTE: in 2016 we discontinued blanks and only do replicates for quality control.