FISHERY PROGRAMS ANNUAL REPORT 2022

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SALMON COUNTING FENCE ANNUAL REPORT 2022

Photo of Jason Sparks (Salmon Technician/Monitor) releasing salmon from trap.

The Pabineau First Nation salmon counting fence technicians/monitors commenced assembling the fence in early July and fence was completed on July 21, 2022.

Salmon Technician/Monitor (Percy Kryszko) at Salmon Box Trap during installation

COUNTING FENCE DAILY FISH COUNT 2022

Grilse

Date	Total
21-Jul	0
22-Jul	5
23-Jul	3
24-Jul	1
25-Jul	2
26-Jul	0
27-Jul	1
28-Jul	0
29-Jul	0

Salmon

Total	Accumulative
21-Jul	0
22-Jul	2
23-Jul	1
24-Jul	0
25-Jul	0
26-Jul	0
27-Jul	0
28-Jul	1
29-Jul	0

30-Jul	0
31-Jul	0
1-Aug	0
2-Aug	0
3-Aug	0
4-Aug	0
5-Aug	0
6-Aug	0
7-Aug	2
8-Aug	0
9-Aug	0
10-Aug	2
11-Aug	1
12-Aug	2
13-Aug	2
14-Aug	0
15-Aug	1
16-Aug	0
17-Aug	0
18-Aug	0
19-Aug	2
20-Aug	1
21-Aug	0
22-Aug	0
23-Aug	0
24-Aug	0
25-Aug	0
26-Aug	0
27-Aug	0
28-Aug	2
29-Aug	0
30-Aug	2
31-Aug	0

30-Jul	0
31-Jul	0
1-Aug	1
2-Aug	0
3-Aug	0
4-Aug	0
5-Aug	0
6-Aug	1
7-Aug	0
8-Aug	1
9-Aug	0
10-Aug	1
11-Aug	11
12-Aug	3
13-Aug	2
14-Aug	0
15-Aug	0
16-Aug	1
17-Aug	1
18-Aug	4
19-Aug	7
20-Aug	11
21-Aug	0
22-Aug	1
23-Aug	0
24-Aug	1
25-Aug	0
26-Aug	0
27-Aug	0
28-Aug	2
29-Aug	1
30-Aug	2
31-Aug	0

1-Sep	0
2-Sep	2
3-Sep	0
4-Sep	0
5-Sep	0
6-Sep	1
7-Sep	0
8-Sep	1
9-Sep	0
10-Sep	0
11-Sep	1
12-Sep	0
13-Sep	0
14-Sep	0
15-Sep	0
16-Sep	0
17-Sep	0
18-Sep	1
19-Sep	0
20-Sep	0
21-Sep	2
22-Sep	5
23-Sep	7
24-Sep	0
25-Sep	0
26-Sep	3
27-Sep	4
28-Sep	3
29-Sep	3
30-Sep	5
1-Oct	2
2-Oct	2
3-Oct	0

1-Sep	2
2-Sep	3
3-Sep	4
4-Sep	2
5-Sep	3
6-Sep	2
7-Sep	2
8-Sep	4
9-Sep	2
10-Sep	2
11-Sep	0
12-Sep	0
13-Sep	0
14-Sep	0
15-Sep	1
16-Sep	5
17-Sep	3
18-Sep	7
19-Sep	7
20-Sep	11
21-Sep	5
22-Sep	5
23-Sep	27
24-Sep	0
25-Sep	0
26-Sep	9
27-Sep	14
28-Sep	11
29-Sep	8
30-Sep	0
1-Oct	10
2-Oct	3
3-Oct	1

4-Oct	1
5-Oct	1
6-Oct	1
7-Oct	0
8-Oct	1
9-Oct	1
10-Oct	0
11-Oct	1
12-Oct	0
13-Oct	4
14-Oct	3
15-Oct	7
16-Oct	10
17-Oct	8
18-Oct	6
19-Oct	8
20-Oct	6
21-Oct	3
22-Oct	0
23-Oct	0
24-Oct	5
25-Oct	0
26-Oct	0
27-Oct	5
28-Oct	3
29-Oct	5
30-Oct	4
31-Oct	1
1-Nov	2
2-Nov	2
3-Nov	0
4-Nov	0
5-Nov	1

4-Oct	0
5-Oct	0
6-Oct	0
7-Oct	2
8-Oct	2
9-Oct	0
10-Oct	0
11-Oct	1
12-Oct	1
13-Oct	4
14-Oct	1
15-Oct	1
16-Oct	6
17-Oct	11
18-Oct	9
19-Oct	14
20-Oct	1
21-Oct	0
22-Oct	0
23-Oct	3
24-Oct	16
25-Oct	0
26-Oct	4
27-Oct	3
28-Oct	2
29-Oct	1
30-Oct	1
31-Oct	0
1-Nov	1
2-Nov	0
3-Nov	0
4-Nov	0
5-Nov	0

6-Nov	1	6-Nov	1
7-Nov	2	7-Nov	2
8-Nov	0	8-Nov	0
9-Nov	1	9-Nov	0
10-Nov	0	10-Nov	0
11-Nov	0	11-Nov	0
12-Nov	0	12-Nov	0
TOTAL	164	TOTAL	295

GRAND TOTAL SALMON COUNTING **459**

Daily Broodstock Count 2022

YEAR 2022	BROODSTOCK
21-Jul	0
22-Jul	0
23-Jul	0
24-Jul	0
25-Jul	0
26-Jul	0
27-Jul	0
28-Jul	0
29-Jul	0
30-Jul	0
31-Jul	0
1-Aug	0
2-Aug	0
3-Aug	0

4-Aug	0
5-Aug	0
6-Aug	0
7-Aug	0
8-Aug	0
9-Aug	0
10-Aug	0
11-Aug	0
12-Aug	0
13-Aug	0
14-Aug	0
15-Aug	0
16-Aug	0
17-Aug	0
18-Aug	0
19-Aug	0
20-Aug	0
21-Aug	0
22-Aug	0
23-Aug	0
24-Aug	0
25-Aug	0
26-Aug	0
27-Aug	0
28-Aug	0
29-Aug	1
30-Aug	0
31-Aug	0
1-Sep	2
2-Sep	3
3-Sep	4
4-Sep	2

5-Sep	3
6-Sep	3
7-Sep	2
8-Sep	0
9-Sep	0
10-Sep	2
11-Sep	0
12-Sep	0
13-Sep	0
14-Sep	0
15-Sep	1
16-Sep	5
17-Sep	1
18-Sep	8
19-Sep	7
20-Sep	7
21-Sep	2
22-Sep	5
23-Sep	8
24-Sep	0
25-Sep	0
26-Sep	11
27-Sep	7
28-Sep	3
29-Sep	3
30-Sep	3
1-Oct	0
2-Oct	3
3-Oct	0
4-Oct	1
5-Oct	1
6-Oct	1

7-Oct	1
8-Oct	1
9-Oct	0
10-Oct	0
11-Oct	1
12-Oct	0
13-Oct	0
14-Oct	0
15-Oct	0
16-Oct	2
17-Oct	1
18-Oct	0
19-Oct	0
20-Oct	0
21-Oct	0
22-Oct	0
23-Oct	0
24-Oct	0
25-Oct	0
26-Oct	0
27-Oct	4
28-Oct	2
29-Oct	1
30-Oct	1
31-Oct	1
1-Nov	0
2-Nov	2
3-Nov	0
4-Nov	0
5-Nov	0
6-Nov	0
7-Nov	0

8-Nov	0
9-Nov	0
10-Nov	0
11-Nov	0
12-Nov	0

Broodstock Total	**116**

Counting Fence Encounter:

On August 15, 2022 the Salmon Enhancement monitors observed an “All-Terrain Vehicle (ATV) crossing the Nepisiguit River to Prisk Island and to other side of river.

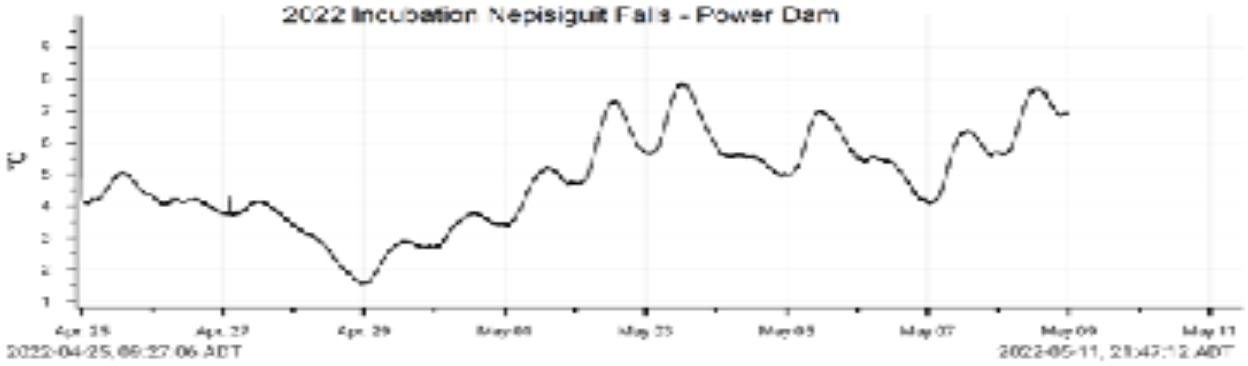
On August 19, 2022 the Salmon Enhancement monitors blocked off the ATV access road (East side) by hammering in 4 angle irons and attaching red mesh to them, and put up a “NO ATV CROSSING RIVER. IT’S AGAINST THE LAW.” sign and a “SMILE YOUR ON CAMERA” sign.
GPS location of barrier is: 47.52755, -65.66630

Encountered several cases of Red Skin Disease and Saprolingia Disease.

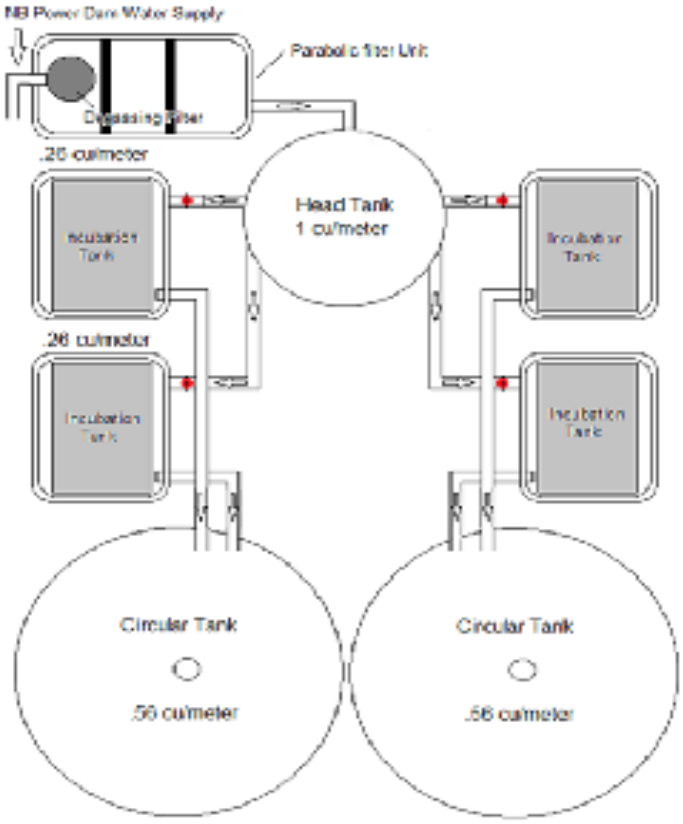
From September 6, 2022 to November 1, 2022 the Salmon Enhancement monitors/technicians discovered 16 dead fish with the disease. The 16 fish were sent to the DFO for necropsy analysis; also, 1 fish was carefully prepared and sent to the pathology laboratory in P.E.I. (DFO Branch). We are still waiting for the pathologist report.

For immediate treatment of the salmon and broodstock tanks, a salt treatment of 5% for 30 minutes was administered as a prevention treatment. It has improved the spread of Saprolingia to other fish.

Stream Side Incubation 2022



Typical Incubation layout



Over many years the NB Power Nepisiguit falls generating station has always been a favored area to do stream side incubation of the Atlantic Salmon (*Salmo salar).* This was always achieved with the collaboration of The Pabineau First Nation and the Nepisiguit Salmon Association.

Installation of the Incubation equipment at Nepisiguit fall, transportation of 40,013 fertilized eyed salmon eggs, daily monitoring of incubation daily activities including, water testing, maintenance. This year's challenge has been significant sedimentation build up from the Nepisiguit River, current investigation with stakeholders is being monitored, TDS has been an import factor in monitoring, pH, water temp, and dissolved oxygen. Also, safety procedures with NB Power and orienteering.

The stream side incubation system was installed on April 22nd. at the Nepisiguit NB Power Dam facilities. Four [4] incubation boxes with a head tank and 2 circular tank and degassing tower were installed including a parabolic filter. All hoses, valves and tanks were refurbished in 2020 with new fittings and valves to facilitate installation and better control of water management, disinfected and operational for the expected eyed eggs that was delivered on April 27th.

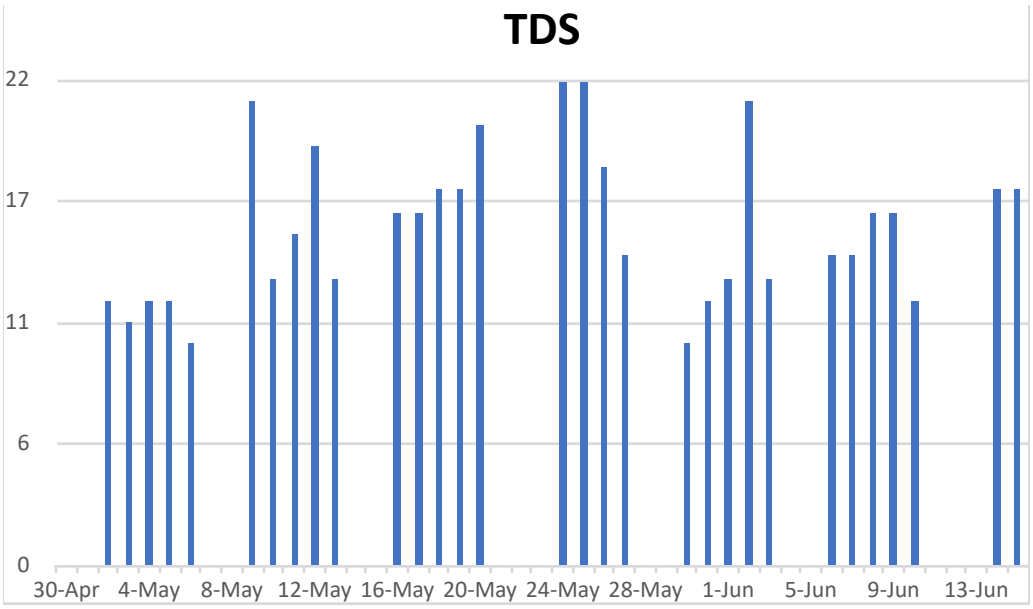
The crew from NB Power installed a dedicated water source which would allow for continuous water flow through the incubation period.

The salmon eyed eggs were placed in incubation boxes, by Pabineau First Nation staff. 10,003 eggs were placed in incubation box #1, 2, 3 & 4 for a total of 40,013 eggs for the Nepisiguit River and its tributaries.

The eggs were monitored through the incubation period, recording of water and air temperature, pH, dissolved oxygen, including egg mortalities and water velocity which was adjusted according to water levels. Also, sedimentation maintenance was an added challenge this year for water quality.

The usual work routine of overseeing and supervising the incubation process was done by visiting the site every day; including weekends.

Over the last two years development of camps on the Nepisiguit River have been erected, these building are built on the edge of the embankment. Excessive sedimentation has been observed in the river, from loose debris and erosion from the building sites in the river. The following graph indicates the TDS (Total dissolved solids) data during that period.



TDS (Total dissolved solids) data

- The following picture timeline demonstrate sedimentation progression.

April 27th Salmon egg delivery day

May 3rd, 2022

May 10th 2022

May 20th 2022

May 27th 2022

In our case, we never had this issue over the years as we have added to our systems a parabolic filter to prevent and reduce sedimentation.

This year we had to clean this filter every day 7 days a week including lower units the incubation tanks.

Nepisiguit Salmon Association volunteers came every weekend to clean the filter.

Picture of Wayne Clowater, just finished cleaning the filter.

Overall, the project was successful with a 99% success rate, but special care had to be applied to insure the life cycle.

On May 10th, 5% of the eggs were hatched and this increased to 100% on May 20th. On June 1st. the first swimming fry has emerged. Monitoring of parameters continued including the removal of any dead eggs to eliminate fungal growth in the incubation boxes and mats.

Total Inventory

Biomass	Fish weight	Total Fish	
7222	0.187	38620	
		38620	Total Fry Stocked
		40013	Total egg inventory
		1393	Total mortality

99% Success rate

1% Mortality rate

This inventory does to include the 2100 eggs that were reserved for the Fish Friends programme, 700 Salmon fry have been released at the Pabineau First Nation counting fence location with the collaboration of Terry Fox elementary, Assumption Academy, Janeville School, Carfour de la Mer, Ecole Trounesol, Domain etudiant adn Nikumi House.

Other fish distribution has not been advised.

This year for the first time for water monitoring data from beginning from egg fertilization stage to 1st. Hatching has been successfully conclusive according to Atlantic salmon development documentation.

A data logger was place within a few days of egg fertilization at the Charlo hatchery in November, then continued tracking during the final incubation period at the NB Power generating station in Nepisiguit falls location.

Note – There is an interruption from the data logger from May 10th, to May 17th. This parameter was done manually from an external thermometer.

Atlantic Salmon Fry Distribution 2022

Biomass	Total Fish	Location
1309 g	7000	Pabineau Brook
1309 g	7000	Gordon Meadow
4604 g	24620	Nepisiguit River
	38620	**Total Fish**

Nepisiguit River Streamside Fertilization Report 2022

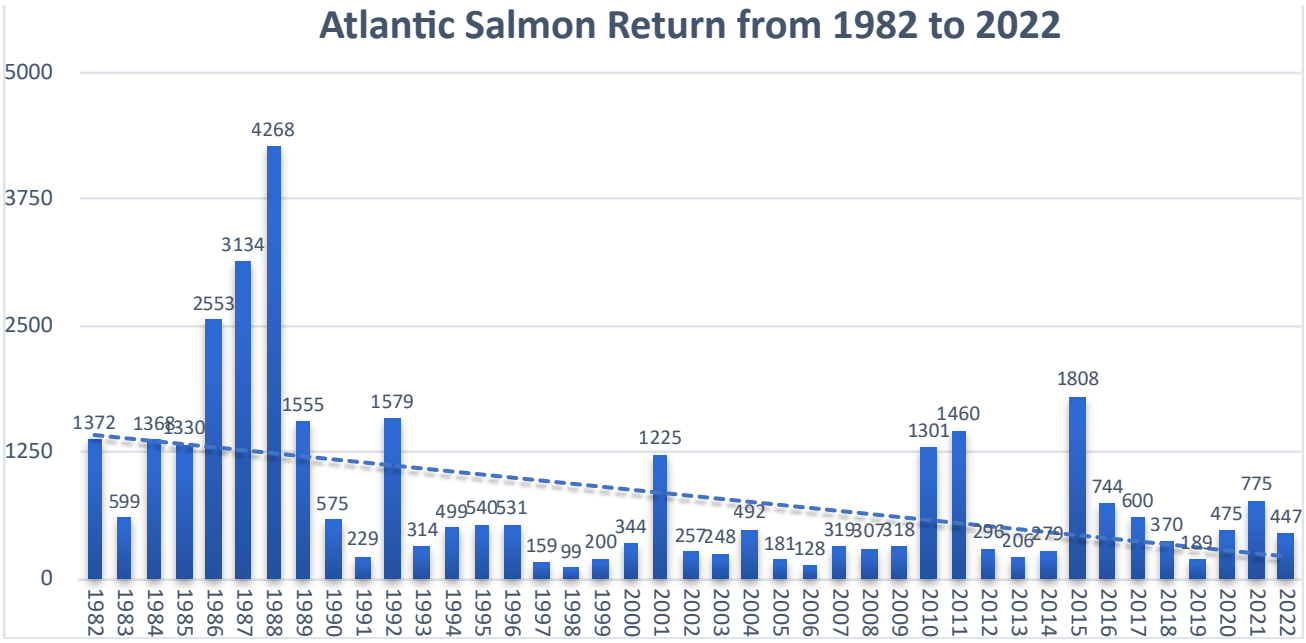
Photo of Michel Poitras (Aquaculture Technician) stripping the eggs from female salmon, and Eric Guinard (Salmon Technician/Monitor) collecting them in white container.

Since 1982 streamside fertilization and incubation has been successful regardless of many challenges, from climate change, increased predations of other species in the Nepisiguit River.

This report will demonstrate the impact and timeline of many activities and changes on the Nepisiguit River. With the implementation of the warm water protocol introduced in 2019, it has made an awareness to the fragile health of the Atlantic salmon regards to warm water.

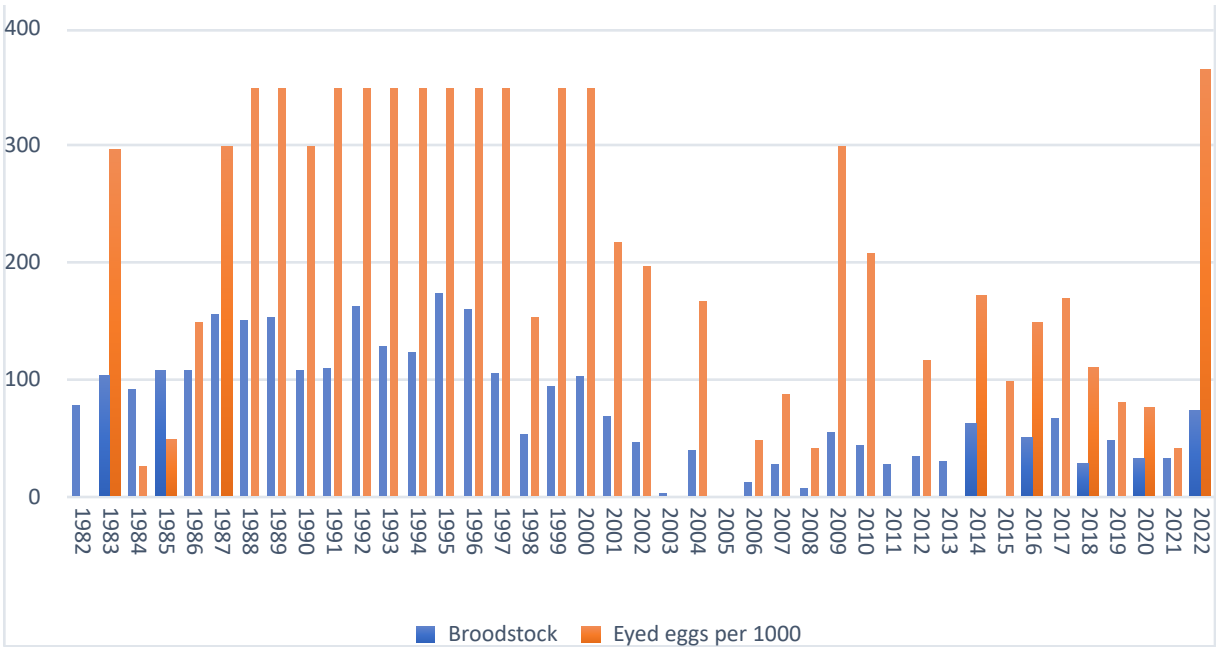
In a simple context, when the water is warm the dissolved oxygen is reduced, therefore creating an additional stress on the migrating Atlantic salmon in our rivers. As anadromous fish it returns to its original spawning grounds of hatching.

The graph indicated below, demonstrates Atlantic salmon return on the Nepisiguit River.



The blue dotted line indicates a trend that is very concerning to the returns of Atlantic salmon on the Nepisiguit River. With additional factors challenging this issue can usually be resolved by increased stocking, and efficiently stocking in key areas to better increase the survival rate of the Atlantic salmon fry distribution. Also increasing the spawning yield in respect of the trending Atlantic salmon return.

The next graph below indicates the brood stock vs eyed egg yield over the years. (Indicated in green are the green eggs yielded in 2022)



Total Broodstock used vs Total eyed egg yeild

Again, this year Pabineau First Nation has effectively and successfully conducted a true stream side fertilization on the Nepisiguit River. Equipment has been strategically placed, including 2 – 5000L. fish tanks, 1 sand filter, 1 oxygen generator, 1 chiller unit, 1.5 hp. Water pump with spare, 2 – 2000 lbs oxygen tanks with diffusers. Also, as a backup unit of another gas pump, and a 5000w gas generator in case of emergencies.

Water parameters were taken three times a day to ensure the brood stock's well-being on site. The onsite schedule crew was verifying all units every hour on shift work.

This simple reason was to assure the health of the Atlantic salmon, closely monitoring and selecting the brood stock for spawning in the fall of 2022. And safely returning the Salmon back to the river after stripping and milking the selected fish on hand.

Our Section 56 permit required us to hold 29 female salmon and 29 male salmon in the brood stock tanks.

This year was very successful due to better management and efficiency of spawning and fertilization without compromising fish health in the holding tanks. A total of 364,353 green eggs were harvested for the 2022 streamside fertilization project.

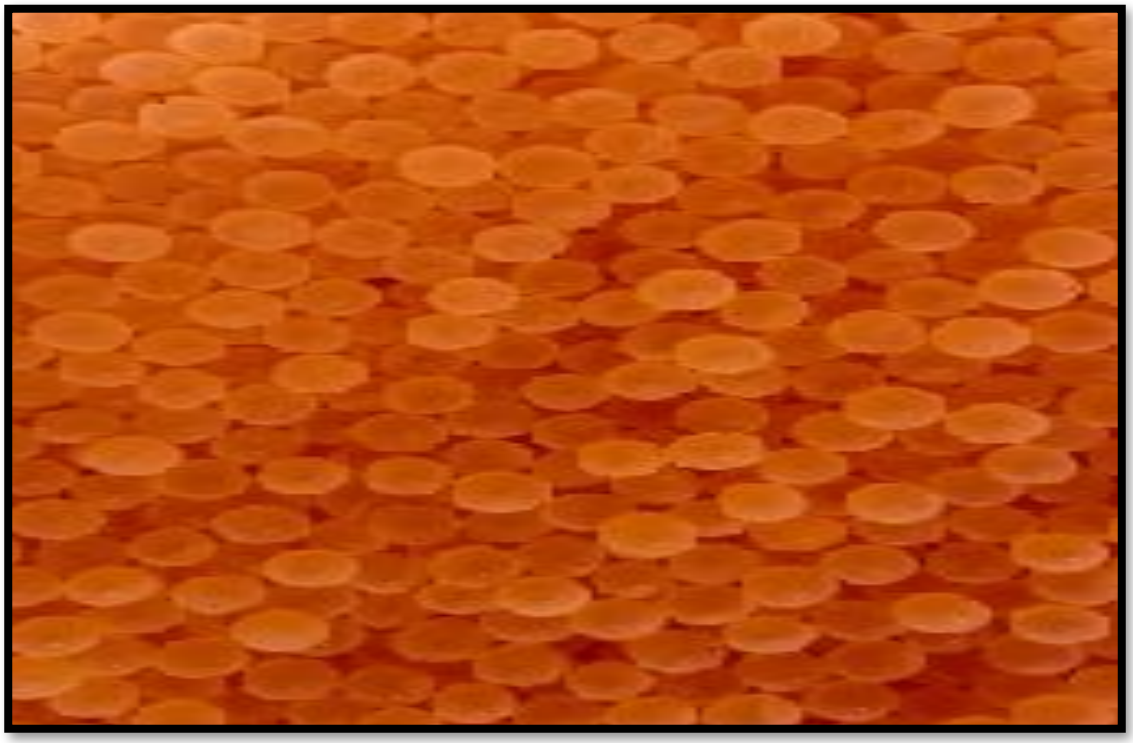
Once the eggs were harvested from the brood stock, they were fertilized and rinsed, then the hardening period permitted them to safely transfer to the hatchery for the winter period to the Miramichi Salmon Enhancement Center.

2022 Pabineau First Nation spawning results

Date	Lenth - cm.	Weight - gr.	Total ml. Retrieved	Total Egg Yeild	Salmon egg yeild per Kg.
10 24 2022	78	4100			
	80	4350			
	79	4300			
	80	4732			
	Biomass	17482	3900	32053	1833
10 26 2022	83	5155			
	87	5300			
	90	7754			
	81	5275			
	90	6700			
	81	5137			
	74	4581			
	80	5050			
	Biomass	44952	10200	81600	1815
10 31 2022	90	9145			
	74	7007			
	80	5045			
	98	8848			
	81	5025			
	77	3839			
	78	4500			
	78	4584			
	96	8068			
	81	4455			
	100	7905			
	76	3941			
	Biomass	72362	15700	125600	1736
11 02 2022	78	4410			
	102	10346			
	79	3677			
	80	4263			
	80	4943			
	Biomass	27639	3520	44000	1592
11 07 2022	84	4491			
	82	5320			
	79	4006			
	83	5228			
	82	4510			
	93	7018			
	86	5478			
	Biomass	36051	9200	73600	2042
10 10 2022					
	100	9003			
	Biomass	9003	1950	7500	833
Total		198486	44470	364353	1836

Pabineau First Nation Streamside Fertilization Site

SALMON EGGS



Little River Water Quality Assessment 2022

Pabineau First Nation has conducted and extensive water quality assessment for the Little River, located in the north eastern part of New-Brunswick. This consisted of 9 station, LR-1 to LR-17 is referred to the main stem, NB-1 to NB-13 is referred to the north branch, and SB-1 to SB-6 is referred to the south branch. (**Figure 1**)

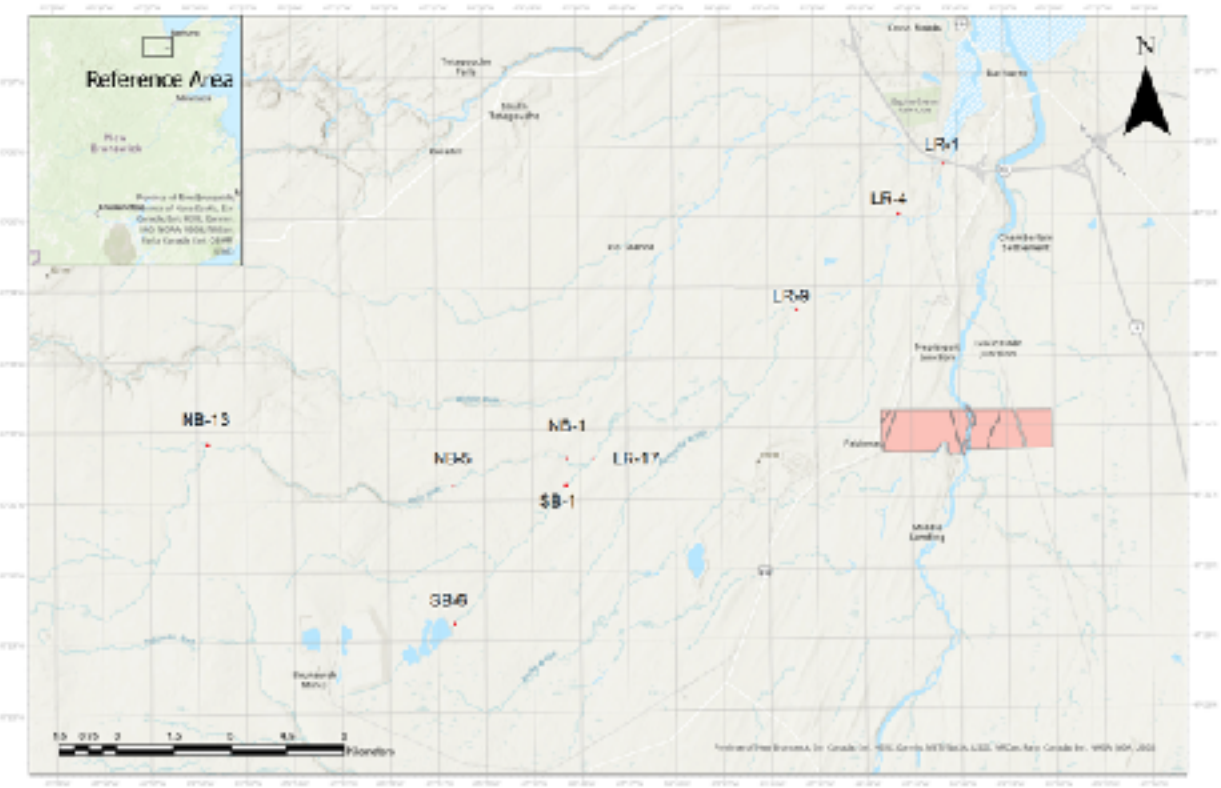


Figure 1 – Little River

Water quality readings were recorded with a ‘’Horiba U-50’’ multi parameter provided from Pabineau First Nation. This unit measured the following parameters, Temperature, pH, dissolved oxygen, salinity, conductivity, ORP, turbidity, and TDS.

The following parameter definitions are as follows;

- **Temperature;** indicated water temperature in degree Celsius.

- **pH;** a figure expressing the acidity or alkalinity of a solution on a logarithmic scale on which 7 is neutral, lower values are more acid and higher values more alkaline.

- **D.O.-mg./l;** Dissolved oxygen or "DO" means the concentration of oxygen dissolved in effluent, expressed in mg /l or as percent saturation, where saturation is the maximum amount of oxygen that can theoretically be dissolved in water at a given altitude and temperature.

- **Salinity;** is the saltiness or amount of salt dissolved in a body of water, called saline water . It is usually measured in g/L or g/kg (grams of salt per liter/kilogram of water; the indicated measurements are in ppt. equal to ‰).

- **Conductivity mS/cm;** the conductivity of water is a measure of the capability of water to pass electrical flow. This ability is directly dependent on the concentration of conductive ions present in the water. These conductive ions are originated due to inorganic materials such as chlorides, alkalis, carbonate and sulfides compounds and dissolved salts. Higher the number mS/cm the higher the conductivity of the water capacity.

- **ORP mV;** stands for oxidation-reduction potential, which is a measure, in millivolts, of the tendency of a chemical substance to oxidize or reduce another chemical substance.

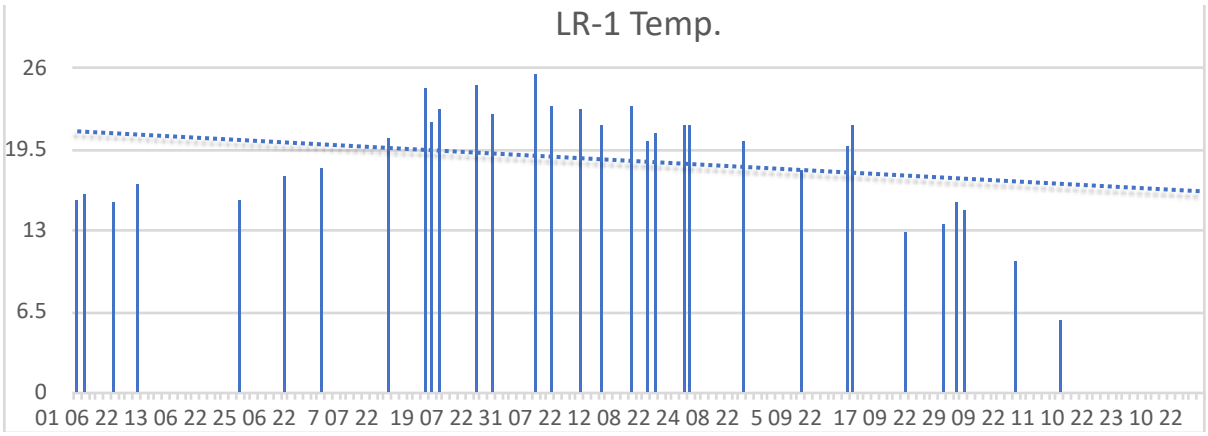
- **Turbidity NTU;** Turbidity is commonly measured using a nephelometer which uses a light beam (source beam) and a light detector (usually at a 90° angle) set to one side of the source beam. The units from a calibrated nephelometer are called Nephelometric Turbidity Units (NTU).

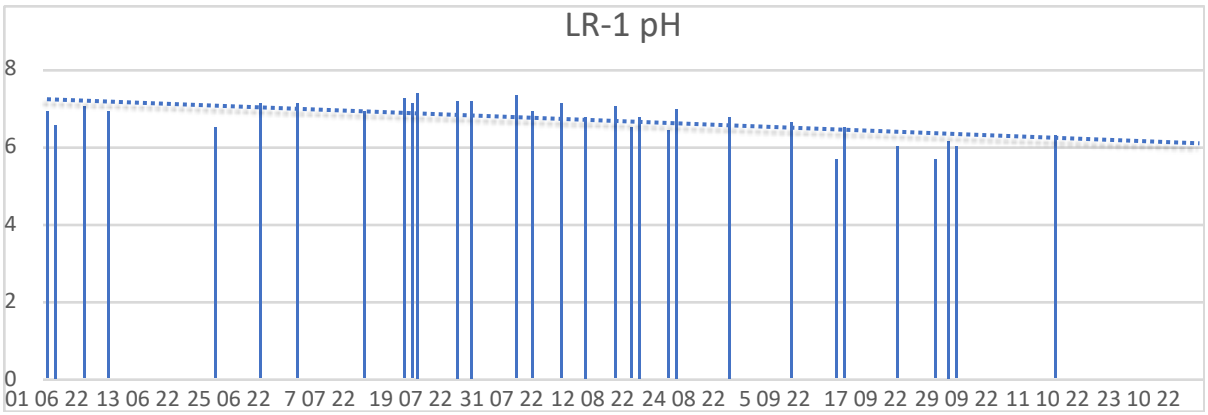
- **TDS;** Total dissolved solids (TDS) are the amount of organic and inorganic materials, such as metals, minerals, salts, and ions, dissolved in a particular volume of water; TDS are essentially a measure of anything dissolved in water that is not an H2O molecule. Example g/l = grammes of solids per litre.

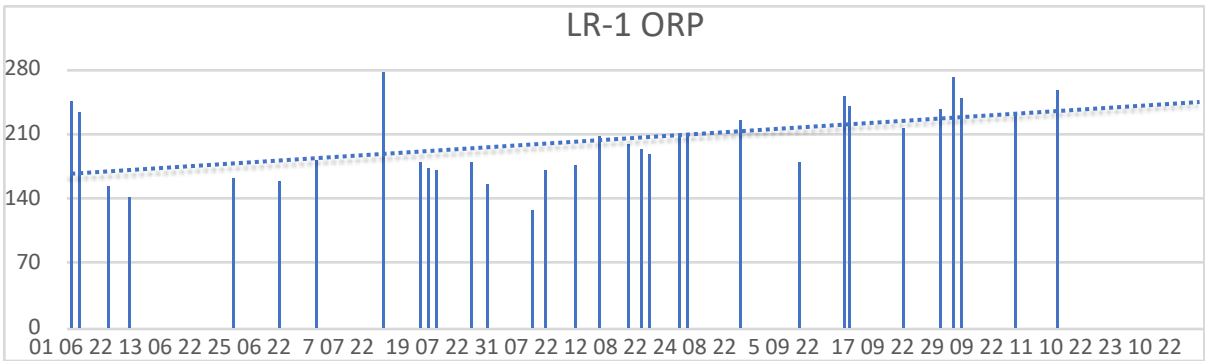
Water quality data readings for location LR-1

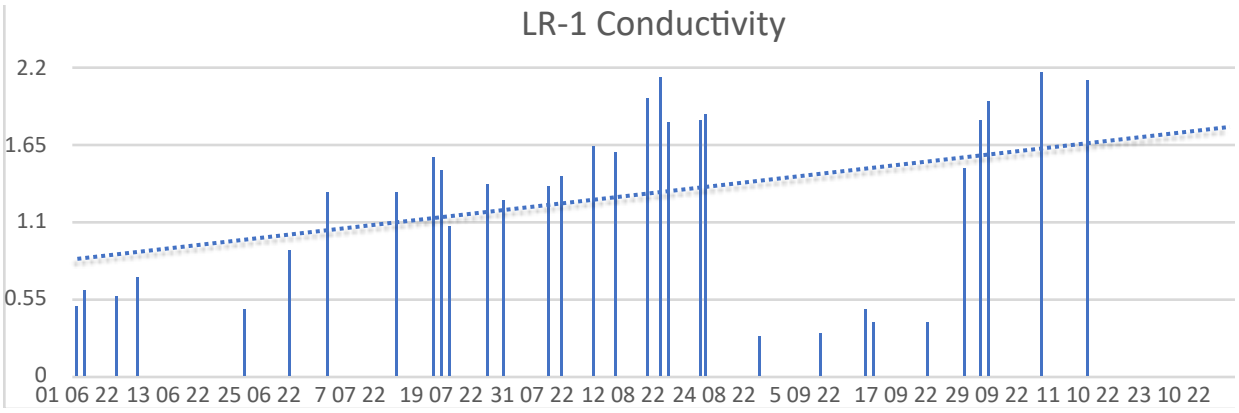
2022 Water Quality Data LR-1

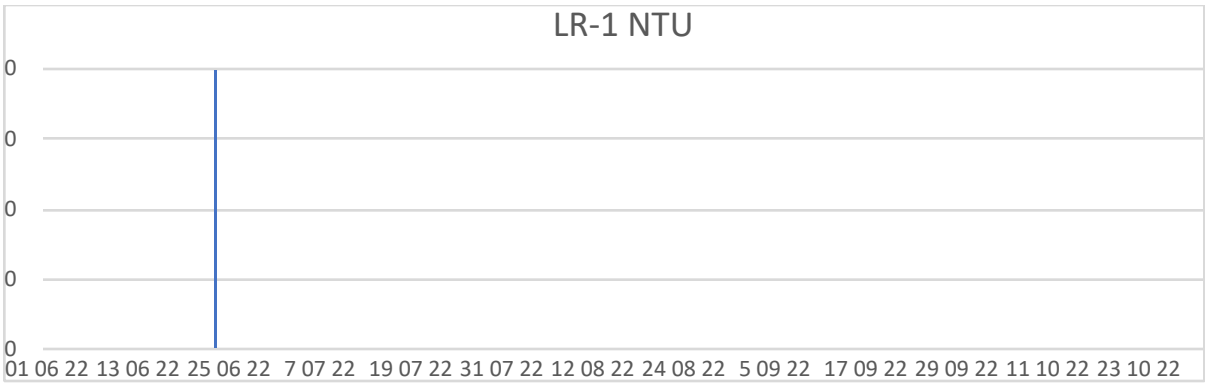
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	2:10 PM	LR1	15.49	6.88	247	0.448	0	101.07	10.09	0.324	0.2		
02-Jun	1:20	LR1	15.93	6.53	235	0.614	0	108.4	10.72	0.393	0.3		
06-Jun	1:34	LR1	15.32	7.02	153	0.579	0	104.9	10.51	0.37	0.3		
09-Jun	1:42	LR1	16.87	6.9	143	0.704	0	103.55	10.04	0.451	0.3		
22-Jun	10:15	LR1	15.57	6.47	162	0.487	0.2	99.34	9.9	0.316	0.2		Cleaning of overpass
29-Jun	9:40	LR1	17.37	7.08	158	0.904	0	99.74	9.57	0.578	0.4		
04-Jul	10:30	LR1	17.99	7.13	182	1.32	0	88.67	8.4	0.848	0.7		
13-Jul	10:50	LR1	20.5	6.89	278	1.31	0	106.82	9.62	0.84	0.7		
18-Jul	1:25	LR1	24.42	7.25	179	1.56	0	89.44	7.47	0.997	0.8		
19-Jul	2:27	LR1	21.81	7.14	173	1.48	0	81.12	7.12	0.949	0.7		Rain
20-Jul	1:30	LR1	22.76	7.4	171	1.07	0	106.64	9.19	0.687	0.5		464 TDS
25-Jul	2:10	LR1	24.7	7.2	180	1.37	0	84.01	6.98	0.877	0.7		608 TDS
27-Jul	1:39	LR1	22.34	7.21	156	1.27	0	93	8.08	0.815	0.6		
02-Aug	1:40	LR1	25.51	7.31	127	1.36	0	89.92	7.36	0.87	0.7		
04-Aug	1:24	LR1	23.06	6.9	171	1.44	0	93.94	8.05	0.956	0.7		
08-Aug	2:05	LR1	22.75	7.13	177	1.65	0	91.19	7.86	1.05	0.8		
11-Aug	2:45	LR1	21.41	6.78	208	1.6	0	100.95	8.93	1.03	0.8		
15-Aug	2:39	LR1	22.94	7.04	199	1.98	0	85.93	7.38	1.27	1		
17-Aug	1:31	LR1	20.29	6.5	194	2.15	0	104.94	9.49	1.38	1.1		
18-Aug	2:50	LR1	20.87	6.75	187	1.82	0	97.2	8.69	1.17	0.9		
22-Aug	11:00	LR1	21.43	6.46	209	1.84	0	97.6	8.63	1.18	0.9		
23-Aug	1:51	LR1	21.51	7.01	209	1.88	0	92.65	8.18	1.2	1		Low level and flow
30-Aug	10:30	LR1	20.17	6.77	225	0.291	0	91.34	8.28	0.189	0.1		
07-Sep	2:01	LR1	17.86	6.65	179	0.313	0	99.6	9.46	0.204	0.1		
13-Sep	11:19	LR1	19.77	5.69	253	0.487	0	89.31	8.16	0.315	0.2		
14-Sep	2:00	LR1	21.42	6.51	239	0.385	0	92.94	8.22	0.251	0.2		
21-Sep	10:56	LR1	12.87	6	218	0.392	0	100.27	10.6	0.225	0.2		
26-Sep	2:22	LR1	13.49	5.7	237	1.5	0	97.15	10.13	0.96	0.7		
28-Sep	2:25	LR1	15.23	6.15	273	1.84	0	90.85	9.12	1.17	0.9		
29-Sep	1:50	LR1	14.74	6	248	1.97	0	111.38	11.3	1.26	1		
06-Oct	1:40	LR1	10.5	N/A	231	2.18	0	111.84	12.48	1.4	1.1		
12-Oct	10:50	LR1	5.93	6.32	257	2.13	0	89.75	11.19	1.36	1.1		

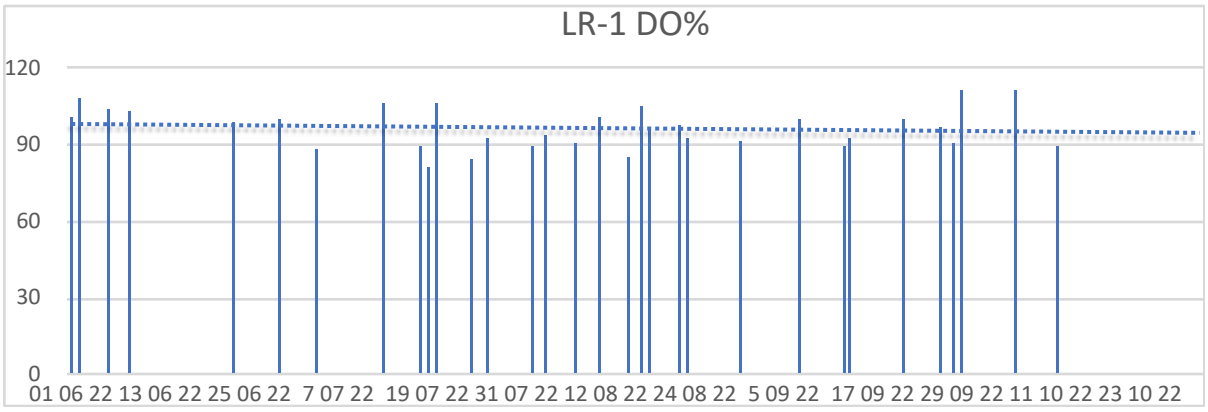

LR-1 Temp.
26
19.5
13
6.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

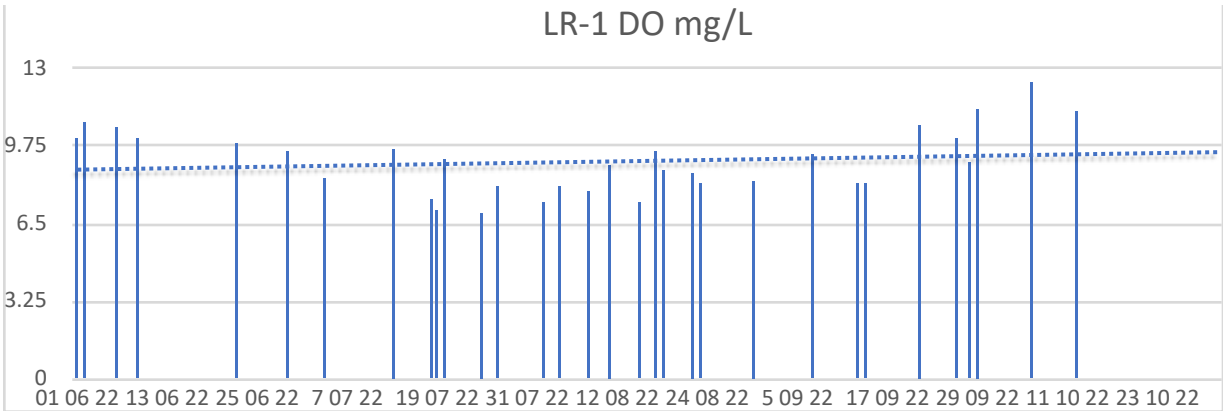

LR-1 pH
8
6
4
2
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

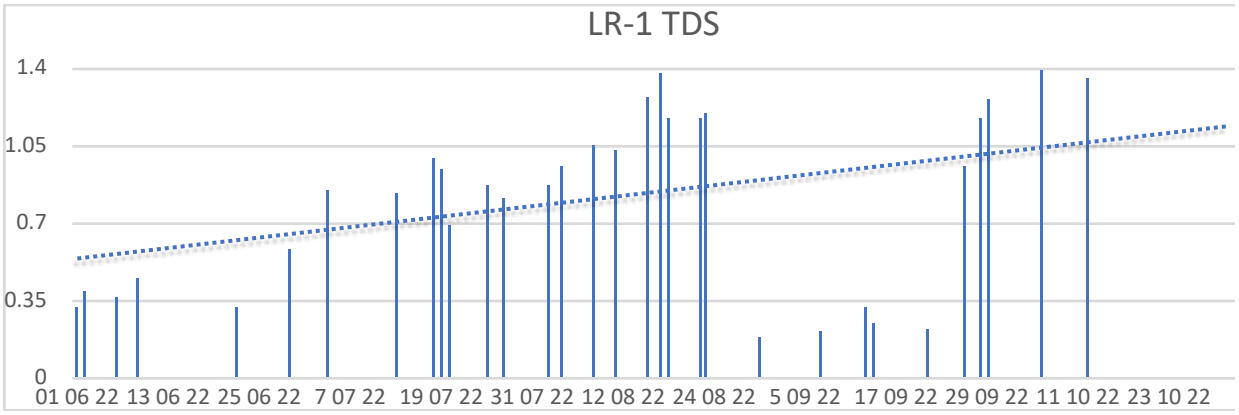

LR-1 ORP
280
210
140
70
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

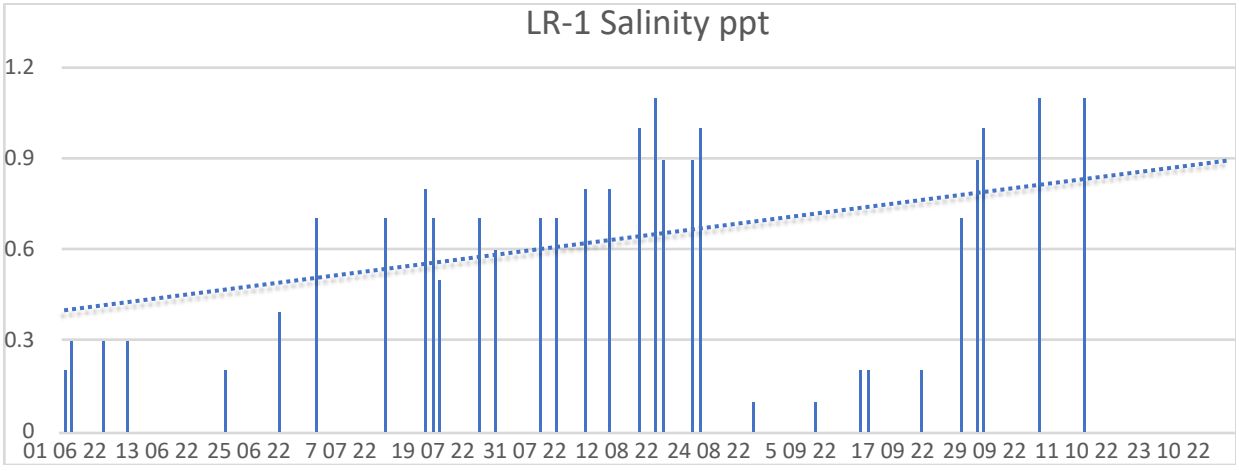

LR-1 Conductivity
2.2
1.65
1.1
0.55
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-1 NTU
0
0
0
0
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-1 DO%
120
90
60
30
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-1 DO mg/L
13
9.75
6.5
3.25
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

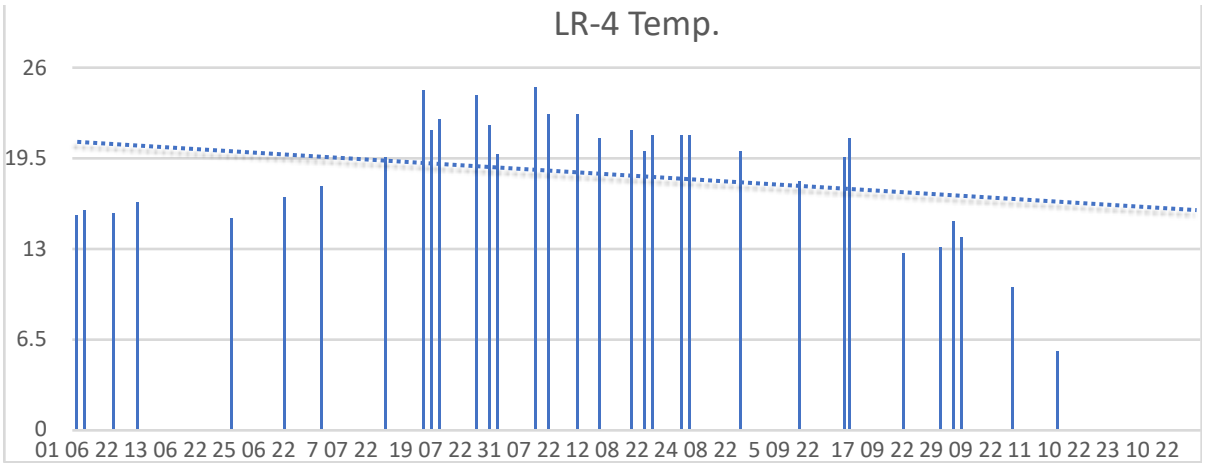

LR-1 TDS
1.4
1.05
0.7
0.35
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

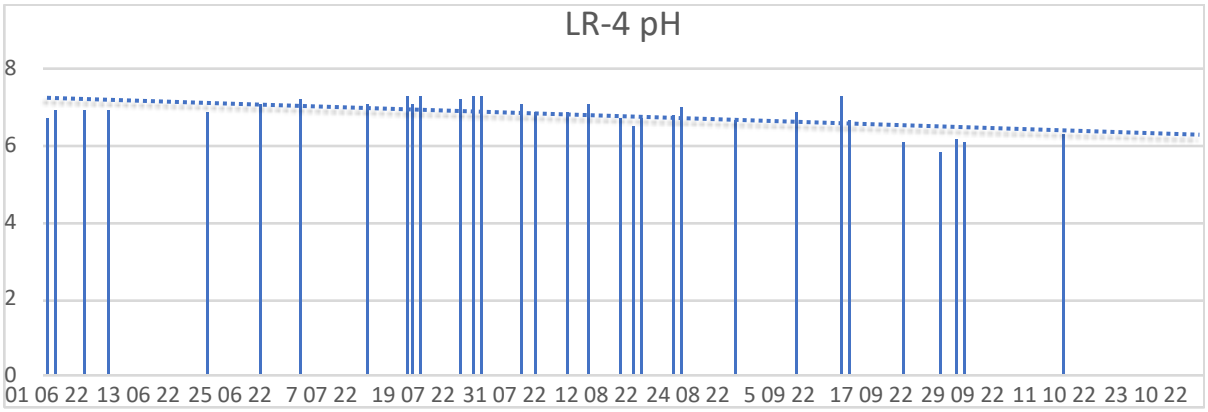

LR-1 Salinity ppt
1.2
0.9
0.6
0.3
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

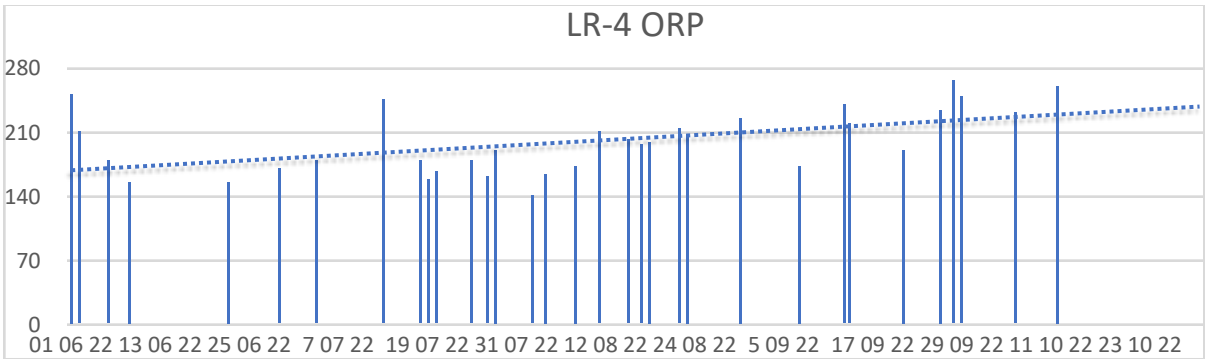
- Water quality data readings for location LR-4

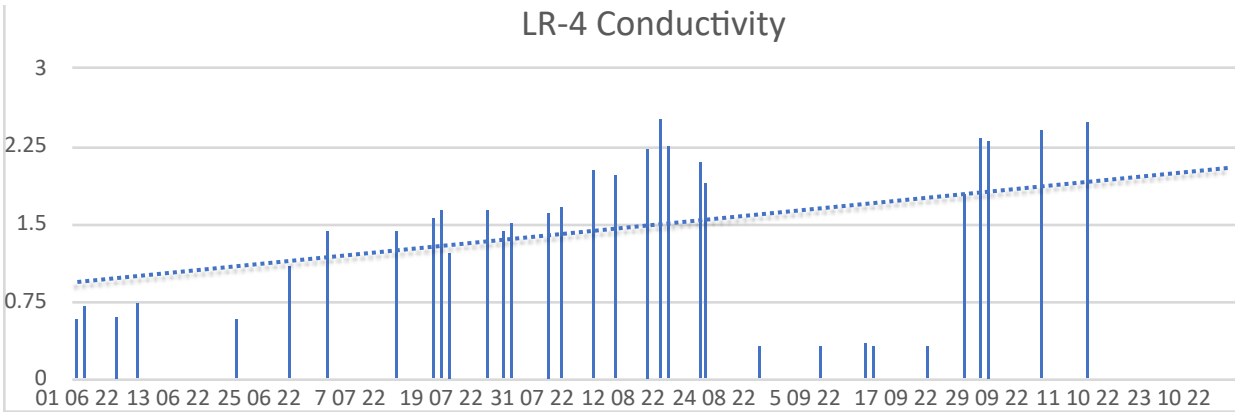
2022 Water Quality Data LR-4

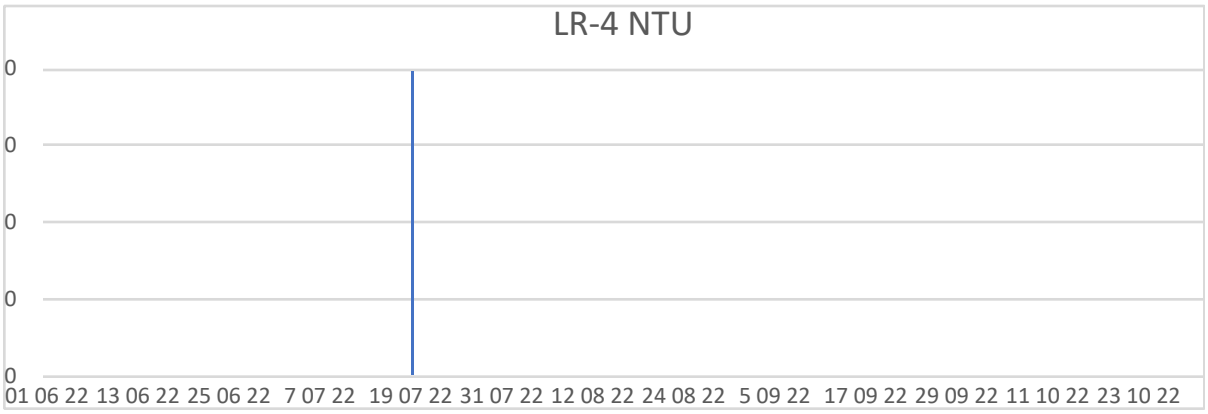
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	######	LR4	15.53	6.72	253	0.58	0	90.83	9.06	0.371	0		
02-Jun	1:30	LR4	15.81	6.93	212	0.707	0	98.44	9.76	0.452	0.3		
06-Jun	1:50	LR4	15.58	6.92	180	0.595	0	104.68	10.43	0.381	0.3		
09-Jun	1:52	LR4	16.46	6.84	157	0.731	0	99.6	9.76	0.468	0.4		
22-Jun	10:20	LR4	15.17	6.87	156	0.562	0	96.3	9.68	0.36	0.3		
29-Jun	10:00	LR4	16.86	7.1	173	1.1	0	102.91	9.98	0.702	0.5		
04-Jul	11:00	LR4	17.53	7.18	181	1.42	0	91.08	8.71	0.91	0.7		
13-Jul	11:06	LR4	19.72	7.04	246	1.42	0	98.72	8.89	0.911	0.7		
18-Jul	1:40	LR4	24.14	7.1	179	1.72	0	83.49	7.01	1.1	0.9		
19-Jul	2:40	LR4	21.53	7.1	159	1.62	0.3	81.36	7.18	1.04	0.8		Rain
20-Jul	1:45	LR4	22.29	7.3	170	1.22	0	88.77	7.72	0.782	0.6		502 TDS
25-Jul	2:26	LR4	24.13	7.2	179	1.63	0	83.36	7	1.04	0.8		661 TDS
27-Jul	1:45	LR4	22.04	7.25	163	1.42	0	83.88	7.33	0.91	0.7		
28-Jul	11:15	LR4	19.9	7.3	191	1.51	0	88.44	8.06	0.966	0.8		
02-Aug	1:55	LR4	24.65	7.1	143	1.6	0	85.74	7.13	1.02	0.8		
04-Aug	1:45	LR4	22.63	6.88	167	1.66	0	91.55	7.91	1.06	0.8		
08-Aug	2:34	LR4	22.75	6.84	175	2.02	0	88.4	7.62	1.24	1		
11-Aug	2:57	LR4	21.01	7.06	211	1.96	0	91.41	8.15	1.26	1		
15-Aug	2:50	LR4	21.48	6.75	205	2.22	0	89.54	7.91	1.42	1.1		
17-Aug	1:44	LR4	20.08	6.52	199	2.51	0	93.82	8.52	1.61	1.3		
18-Aug	3:03	LR4	21.27	6.7	200	2.26	0	88.72	7.87	1.45	1.2		
22-Aug	11:14	LR4	21.21	6.76	214	2.1	0	89.3	7.93	1.34	1.1		
23-Aug	2:00	LR4	21.21	7	209	1.9	0	92	8.17	1.21	1		Low level and flow
30-Aug	10:45	LR4	20.03	6.64	228	0.315	0	91.2	8.29	0.205	0.1		
07-Sep	2:13	LR4	18.02	6.84	174	0.328	0	101.4	9.6	0.213	0.2		
13-Sep	11:33	LR4	19.59	7.24	241	0.335	0	85.82	7.87	0.217	0.2		
14-Sep	2:16	LR4	21.02	6.63	222	0.306	0	95.13	8.48	0.199	0.1		
21-Sep	11:11	LR4	12.73	6.07	191	0.325	0	91	9.65	0.211	0.2		
26-Sep	2:37	LR4	13.12	5.8	235	1.78	0	90.75	9.54	1.14	0.9		
28-Sep	2:30	LR4	15.02	6.17	269	2.33	0	87.27	8.8	1.49	1.2		
29-Sep	2:00	LR4	13.84	6.06	251	2.3	0	97.52	10.09	1.47	1.2		
06-Oct	1:50	LR4	10.32	N/A	233	2.4	0	98.34	11.02	1.59	1.2		
12-Oct	11:05	LR4	5.61	6.31	261	2.48	0	89.98	11.31	1.59	1.2		

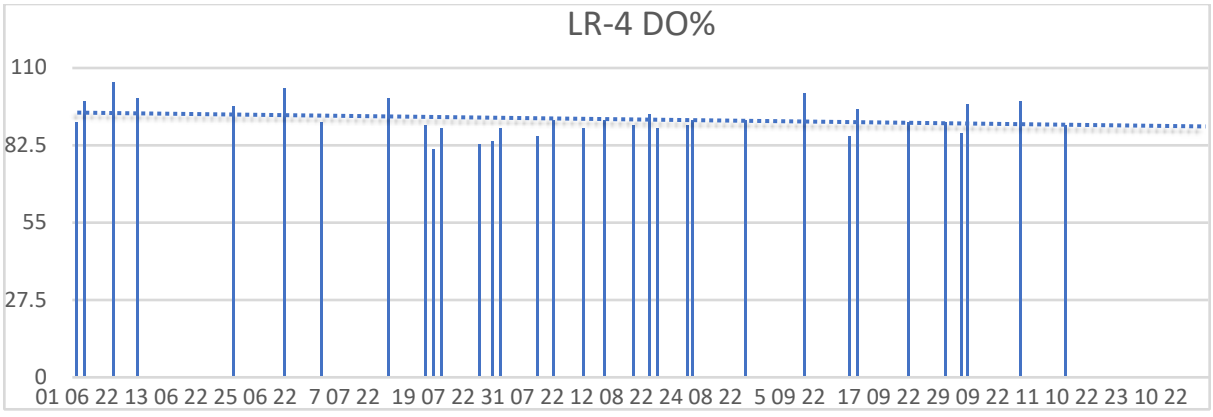

LR-4 Temp.
26
19.5
13
6.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

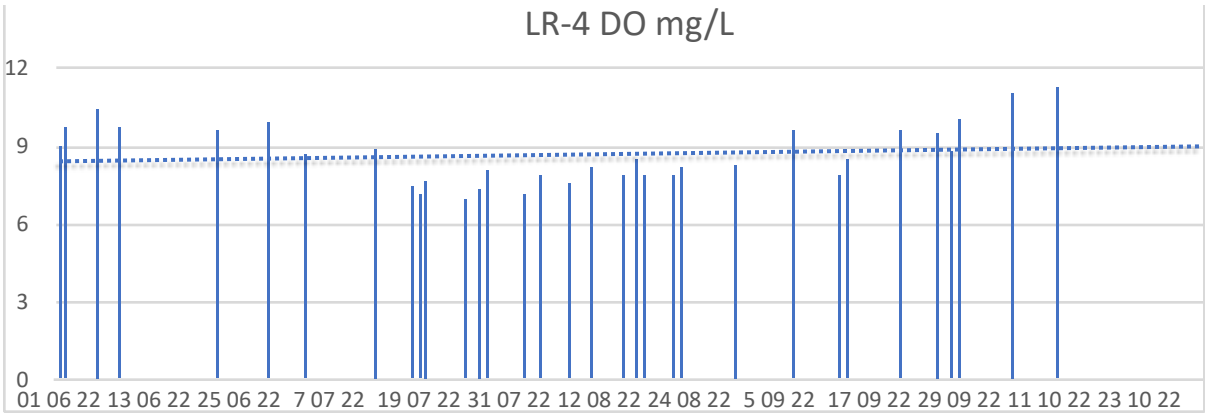

LR-4 pH
8
6
4
2
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

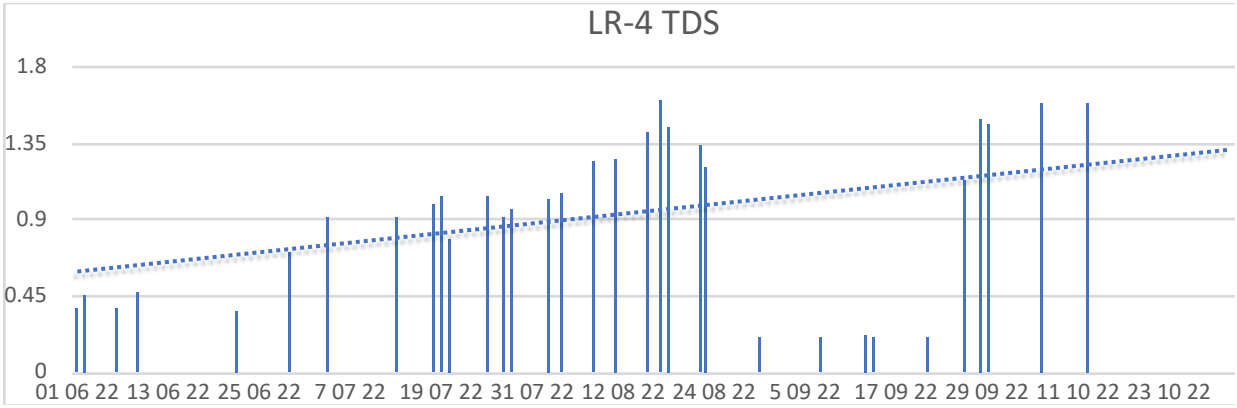

LR-4 ORP
280
210
140
70
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

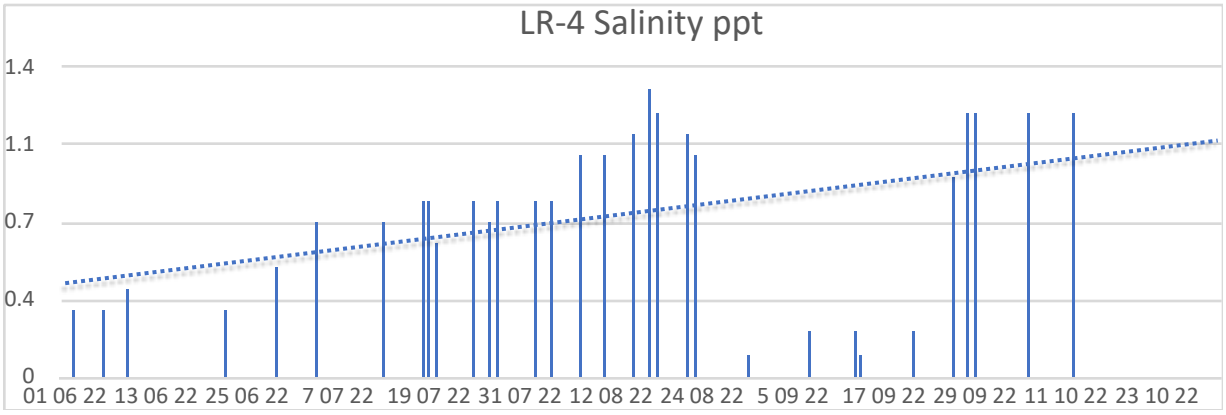

LR-4 Conductivity
3
2.25
1.5
0.75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-4 NTU
0
0
0
0
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-4 DO%
110
82.5
55
27.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-4 DO mg/L
12
9
6
3
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

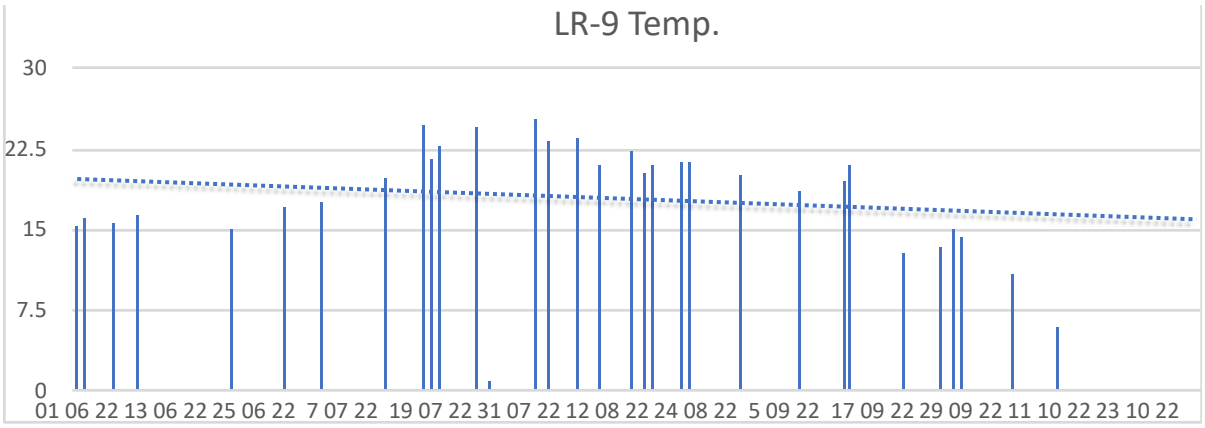

LR-4 TDS
1.8
1.35
0.9
0.45
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

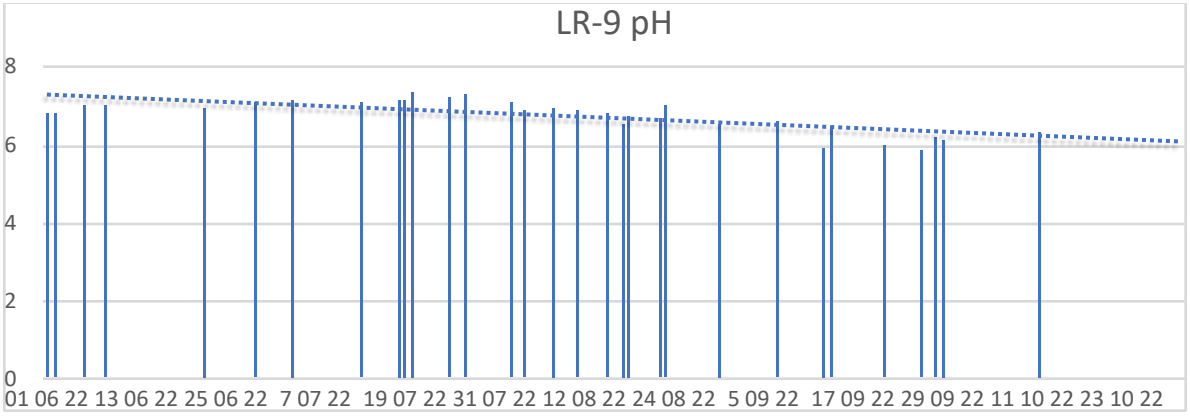

LR-4 Salinity ppt
1.4
1.1
0.7
0.4
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

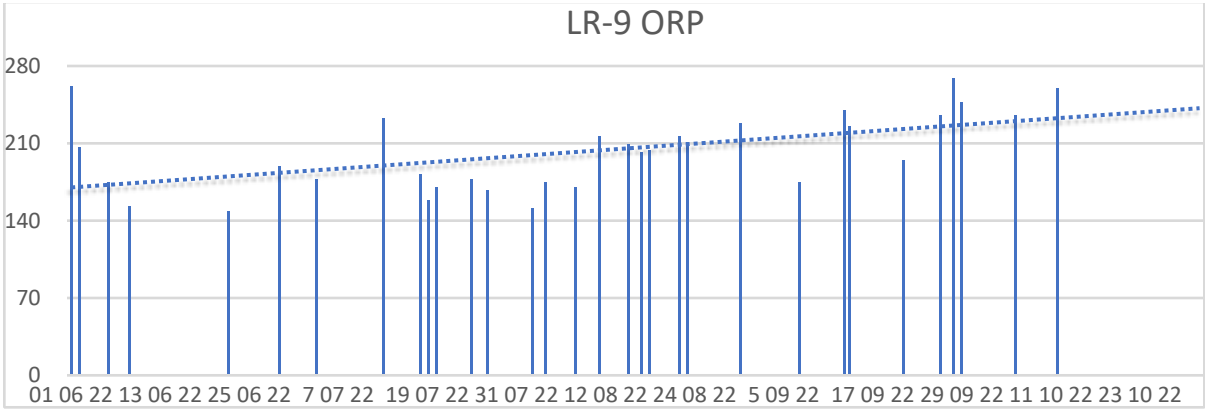
- Water quality data readings for location LR-9

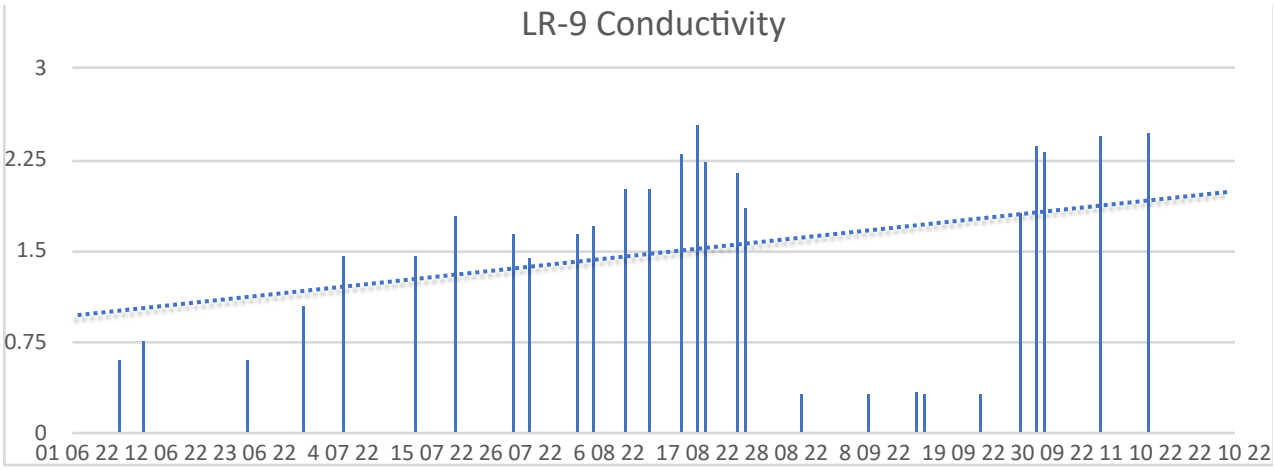
2022 Water Quality Data LR-9

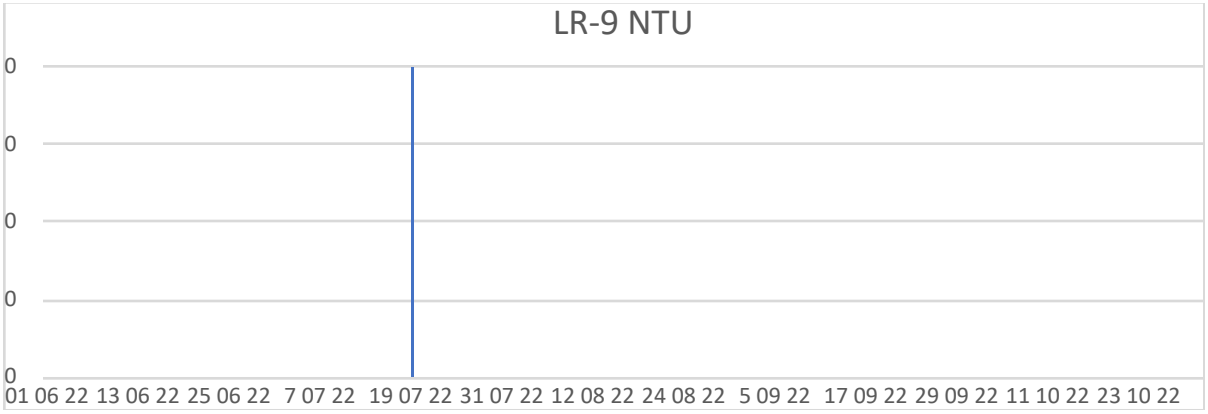
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	######	LR9	15.33	6.84	262	0.613	0	93.44	9.36	0.392	0		Data Logger # 12407667
02-Jun	1:40	LR9	16.03	6.83	207	0.746	0	98.7	9.74	0.478	0.4		
06-Jun	2:01	LR9	15.56	7.05	175	0.622	0	98.32	9.8	0.398	0.3		
09-Jun	2:00	LR9	16.37	7.03	154	0.762	0	93.08	9.12	0.467	0.3		
22-Jun	10:30	LR-9	15.2	6.95	150	0.607	0	95.07	9.55	0.388	0.3		
29-Jun	10:13	LR9	17	7.07	191	1.06	0	92.35	8.93	0.676	0.5		
04-Jul	11:17	LR9	17.69	7.16	179	1.47	0	87.71	8.36	0.944	0.7		
13-Jul	11:12	LR9	19.76	7.1	234	1.47	0	95.41	8.73	0.938	0.7		
18-Jul	1:49	LR9	24.74	7.19	184	1.79	0	78.29	6.5	1.15	0.9		
19-Jul	2:50	LR9	21.54	7.16	160	1.7	0.2	83.19	7.34	1.09	0.9		Rain
20-Jul	1:55	LR9	22.87	7.35	171	1.24	0	86.39	7.43	0.793	0.6		515 TDS
25-Jul	2:35	LR9	24.45	7.25	179	1.65	0	82.42	6.88	1.06	0.8		678 TDS
27-Jul	1:57	LR9	22:38	7.29	168	1.45	0	84.67	7.35	0.931	0.7		
02-Aug	2:00	LR9	25.31	7.12	151	1.63	0	84.23	6.92	1.05	0.8		
04-Aug	1:58	LR9	23.26	6.91	177	1.7	0	84.58	7.22	1.09	0.9		
08-Aug	2:46	LR9	23.43	6.95	171	2.02	0	85.32	7.26	1.29	1		
11-Aug	3:05	LR9	21.07	6.87	216	2.01	0	83.77	7.46	1.29	1		
15-Aug	2:58	LR9	22.33	6.8	210	2.29	0	83.78	7.28	1.46	1.2		
17-Aug	1:55	LR9	20.25	6.54	202	2.54	0	84.75	7.67	1.63	1.3		
18-Aug	3:15	LR9	21.03	6.75	206	2.23	0	89.32	7.96	1.43	1.1		
22-Aug	11:21	LR9	21.31	6.71	218	2.15	0	88.57	7.85	1.37	1.1		
23-Aug	2:11	LR9	21.41	7.03	213	1.86	0	86.82	7.68	1.19	0.9		Low level and flow
30-Aug	10:55	LR9	20.18	6.58	229	0.324	0	84.85	7.69	0.211	0.2		
07-Sep	2:20	LR9	18.55	6.63	175	0.336	0	91.08	8.53	0.22	0.2		123 TDS
13-Sep	11:44	LR9	19.56	5.97	242	0.34	0	85.12	7.81	0.221	0.2		
14-Sep	2:22	LR9	21.01	6.47	227	0.317	0	82.78	7.38	0.206	0.2		
21-Sep	11:35	LR9	12.81	6.01	196	0.336	0	86.34	9.14	0.219	0.2		
26-Sep	2:42	LR9	13.25	5.9	237	1.81	0	87.19	9.14	1.16	0.9		
28-Sep	2:46	LR9	15.15	6.21	269	2.37	0	87.91	8.84	1.52	1.2		
29-Sep	2:15	LR9	14.31	6.17	249	2.33	0	91.3	9.35	1.49	1.2		
06-Oct	2:05	LR9	10.84	N/A	236	2.44	0	92.77	10.27	1.56	1.2		
12-Oct	11:10	LR9	5.98	6.37	260	2.48	0	89.06	11.09	1.59	1.2		

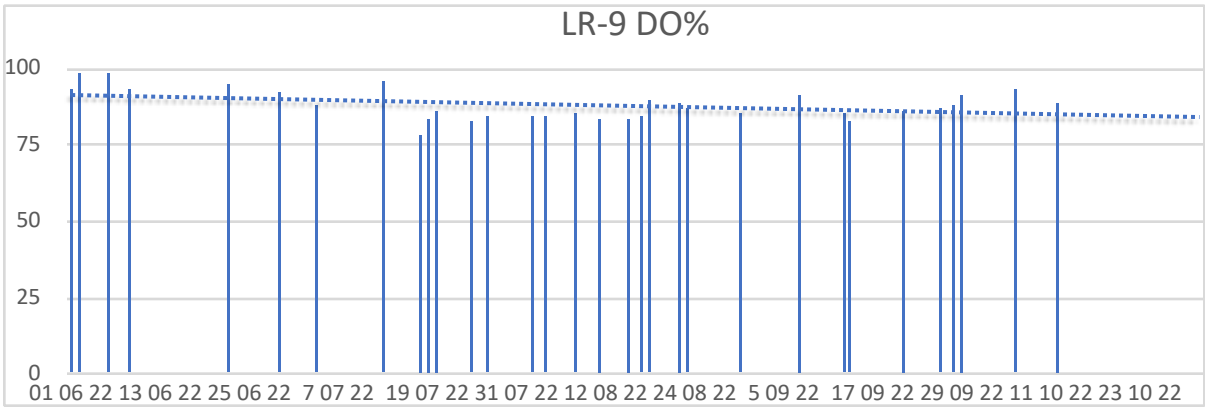

LR-9 Temp.
30
22.5
15
7.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

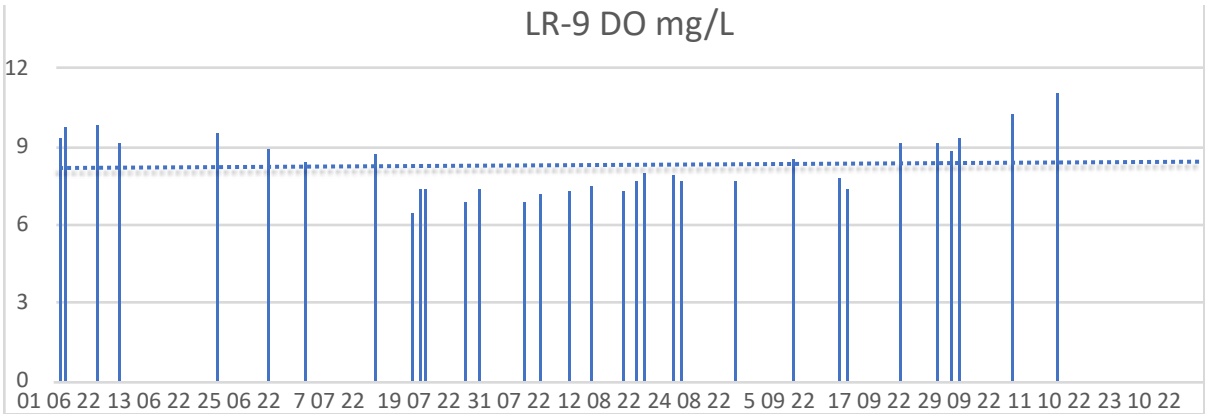

LR-9 pH
8
6
4
2
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

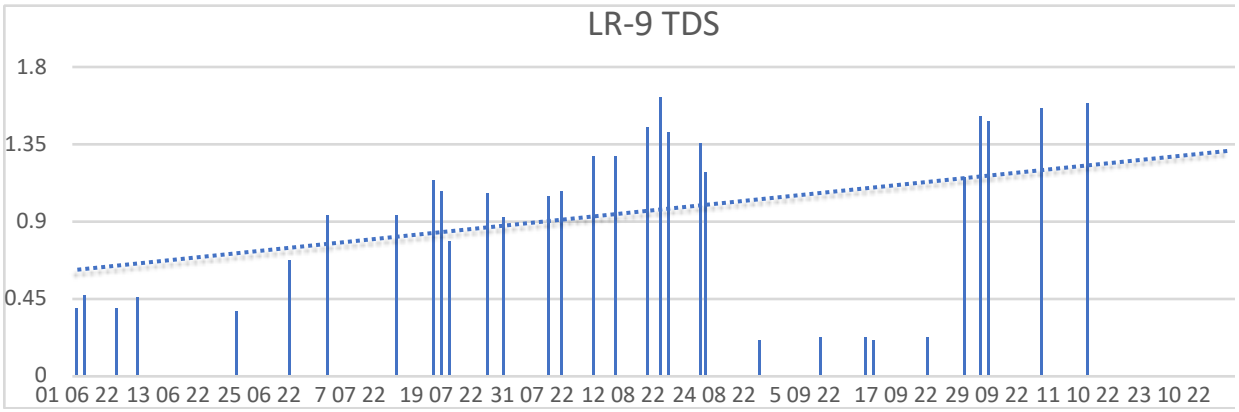

LR-9 ORP
280
210
140
70
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

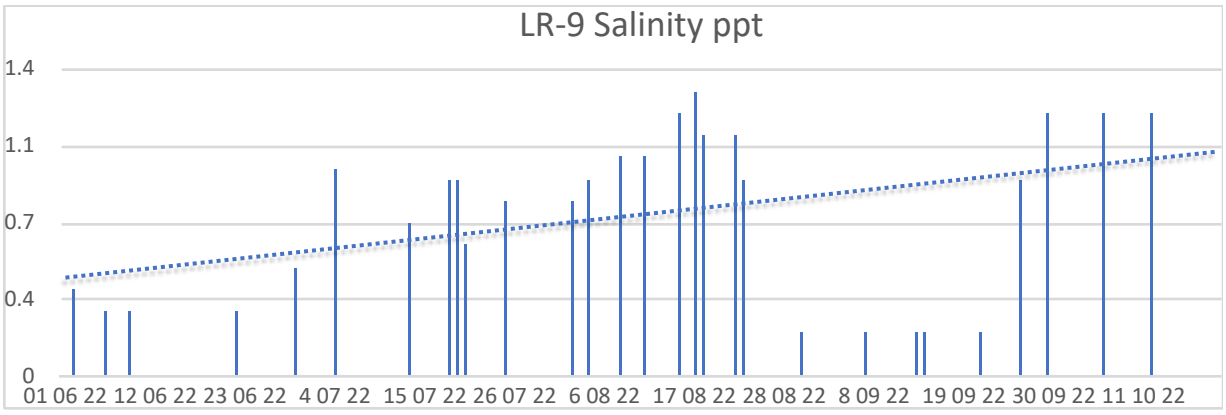

LR-9 Conductivity
3
2.25
1.5
0.75
0
01 06 22 12 06 22 23 06 22 4 07 22 15 07 22 26 07 22 6 08 22 17 08 22 28 08 22 8 09 22 19 09 22 30 09 22 11 10 22 22 10 22


LR-9 NTU
0
0
0
0
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


LR-9 DO%
100
75
50
25
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22



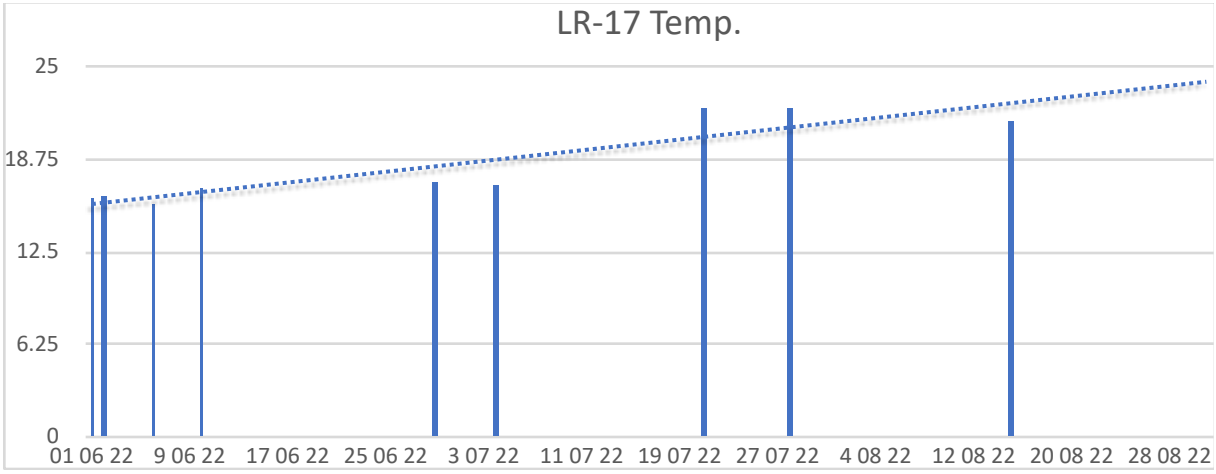


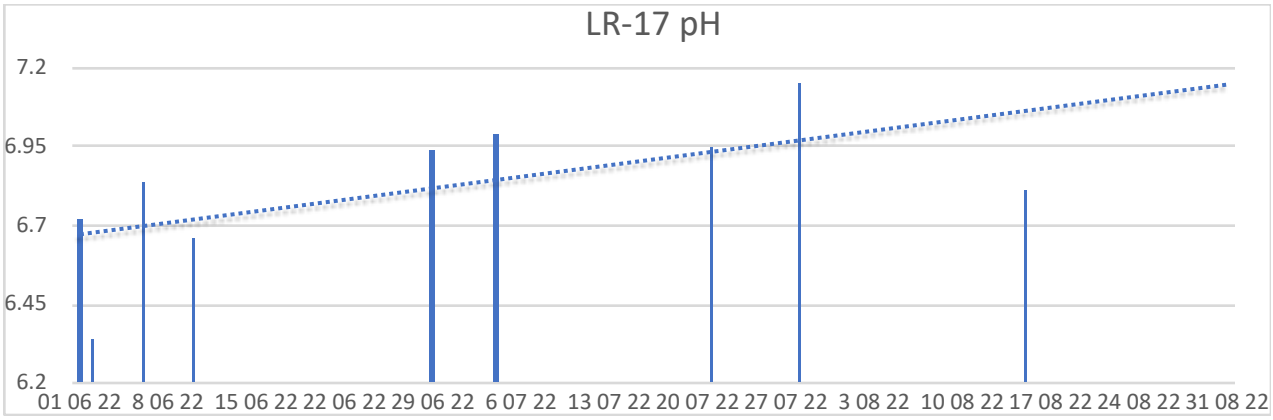


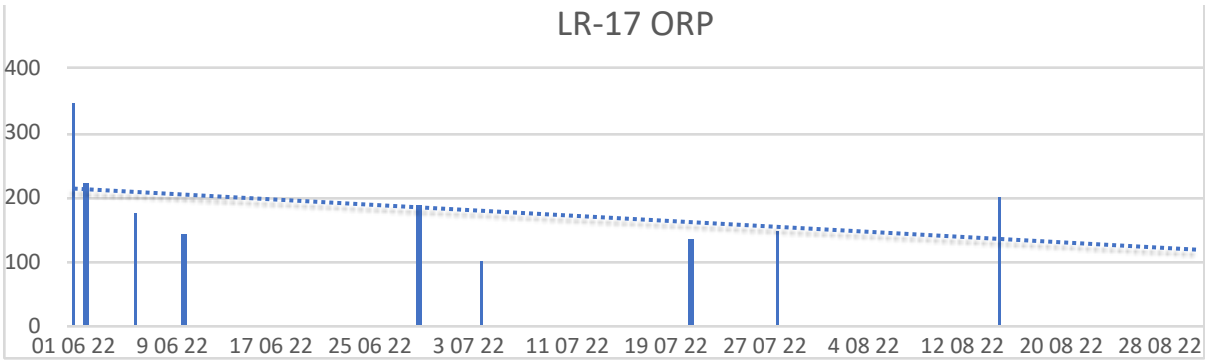
- Water quality data readings for location LR-17

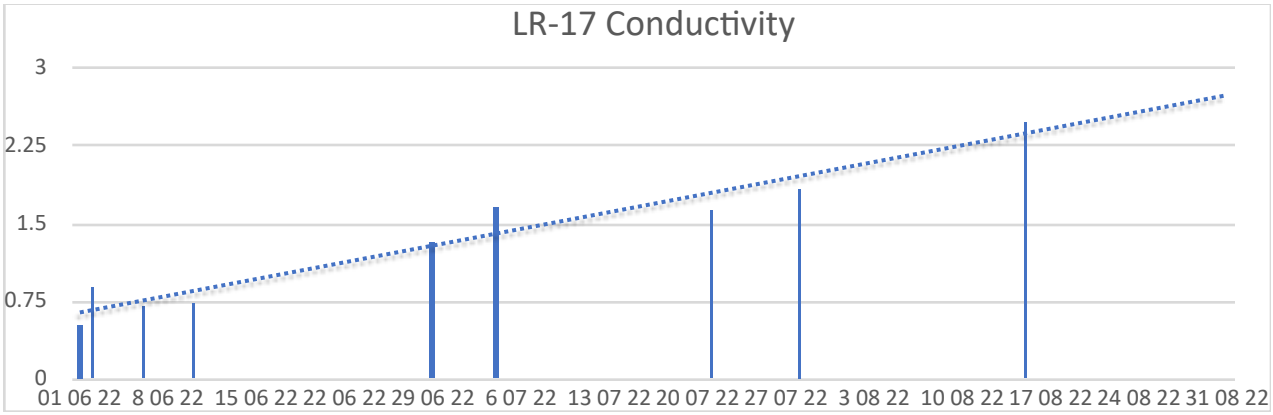
2022 Water Quality Data LR-17

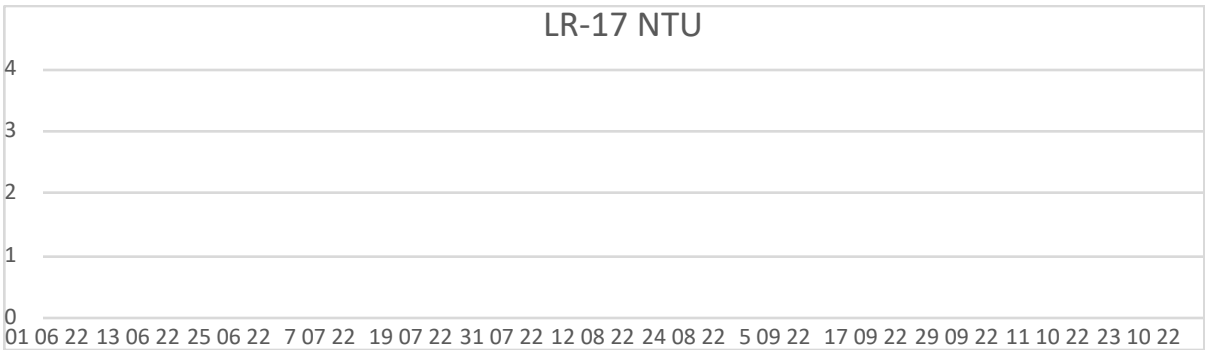
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	3:30	LR17	16.12	6.72	344	0.521	0	91.57	9.02	0.384	0		
02-Jun	2:30	LR17	16.31	6.34	222	0.881	0	102.95	10.1	0.564	0.4		
06-Jun	2:35	LR17	15.72	6.84	175	0.691	0	100.46	9.98	0.442	0.3		
10-Jun	2:00	LR17	16.86	6.66	145	0.739	0	102.29	9.92	0.473	0.4		
29-Jun	11:03	LR17	17.13	6.94	189	1.32	0	94.37	9.1	0.843	0.7		
04-Jul	10:10	LR17	17.05	6.99	103	1.66	0	106.22	10.26	1.06	0.8		
21-Jul	2:40	LR17	22.25	6.95	134	1.62	0	100.2	8.72	1.04	0.8		1081 TDS
28-Jul	2:15	LR17	22.34	7.15	149	1.83	0	92.66	8.05	1.17	0.9		
15-Aug	2:05	LR17	21.32	6.81	203	2.48	0	97.27	8.62	1.59	1.3		

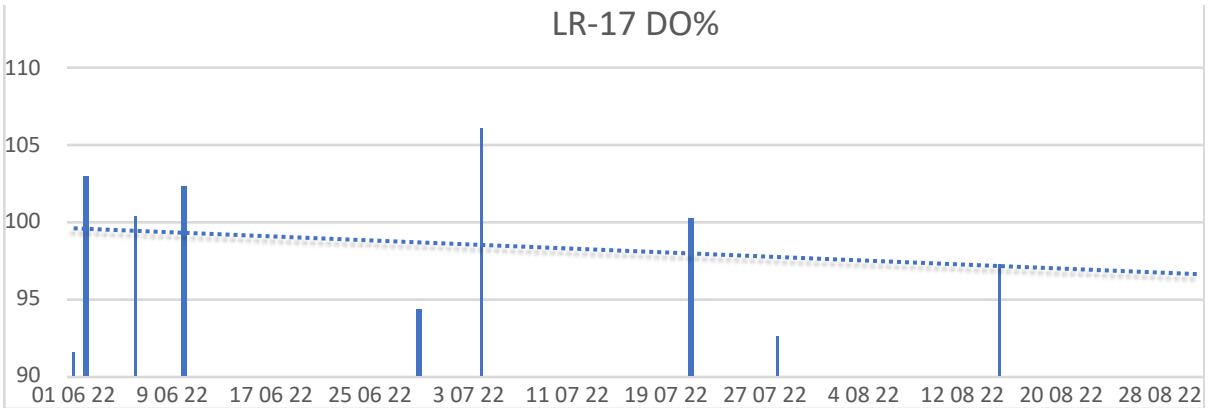


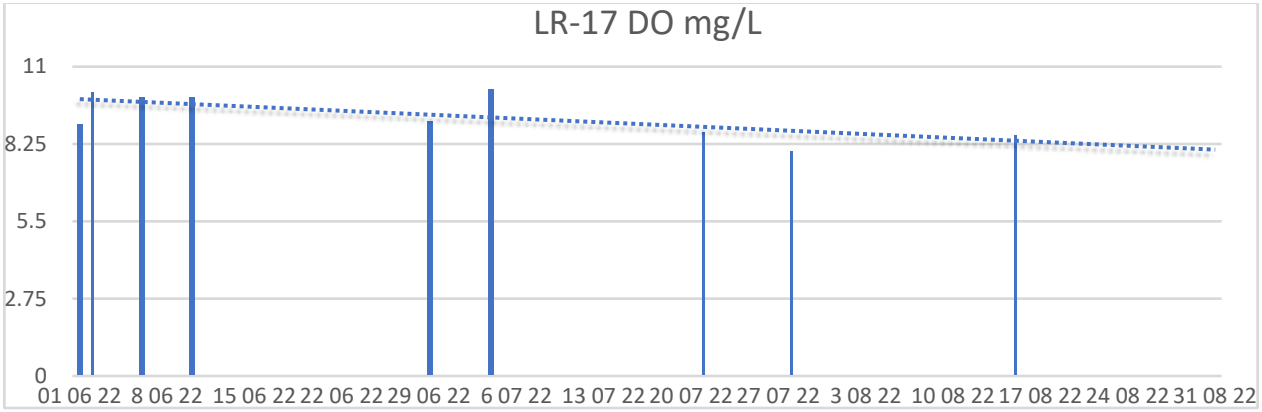


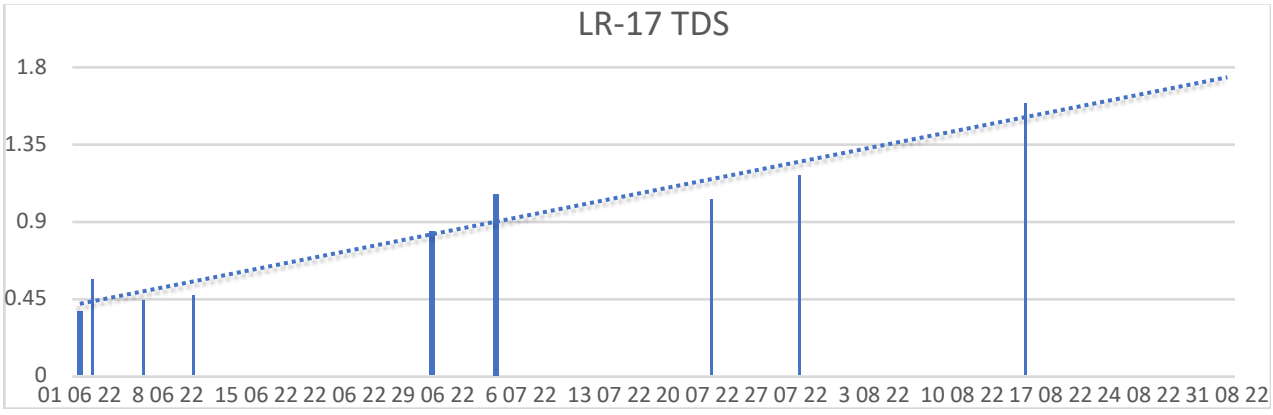

LR-17 ORP
400
300
200
100
0
01 06 22
9 06 22
17 06 22
25 06 22
3 07 22
11 07 22
19 07 22
27 07 22
4 08 22
12 08 22
20 08 22
28 08 22

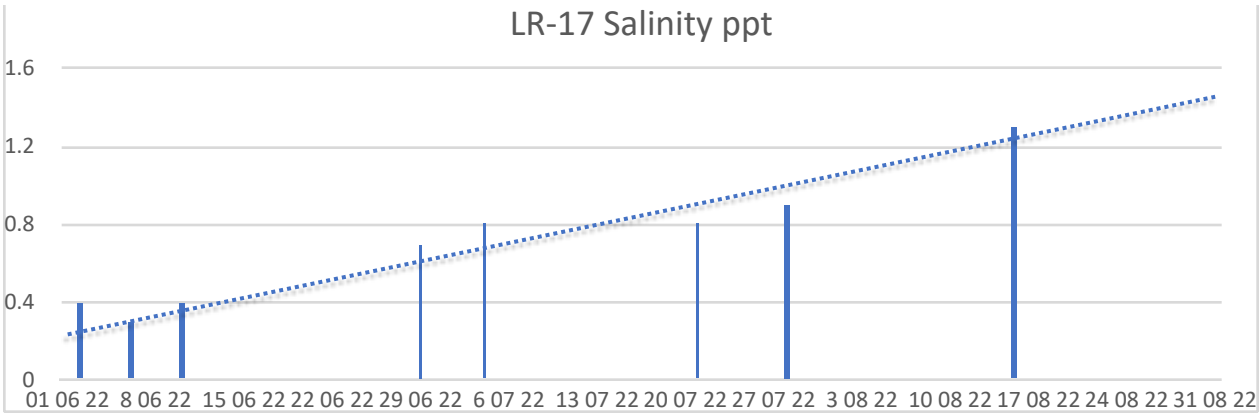

LR-17 Conductivity
3
2.25
1.5
0.75
0
01 06 22
8 06 22
15 06 22
22 06 22
29 06 22
6 07 22
13 07 22
20 07 22
27 07 22
3 08 22
10 08 22
17 08 22
24 08 22
31 08 22


LR-17 NTU
4
3
2
1
0
01 06 22
13 06 22
25 06 22
7 07 22
19 07 22
31 07 22
12 08 22
24 08 22
5 09 22
17 09 22
29 09 22
11 10 22
23 10 22


LR-17 DO%
110
105
100
95
90
01 06 22
9 06 22
17 06 22
25 06 22
3 07 22
11 07 22
19 07 22
27 07 22
4 08 22
12 08 22
20 08 22
28 08 22


LR-17 DO mg/L
11
8.25
5.5
2.75
0
01 06 22
8 06 22
15 06 22
22 06 22
29 06 22
6 07 22
13 07 22
20 07 22
27 07 22
3 08 22
10 08 22
17 08 22
24 08 22
31 08 22

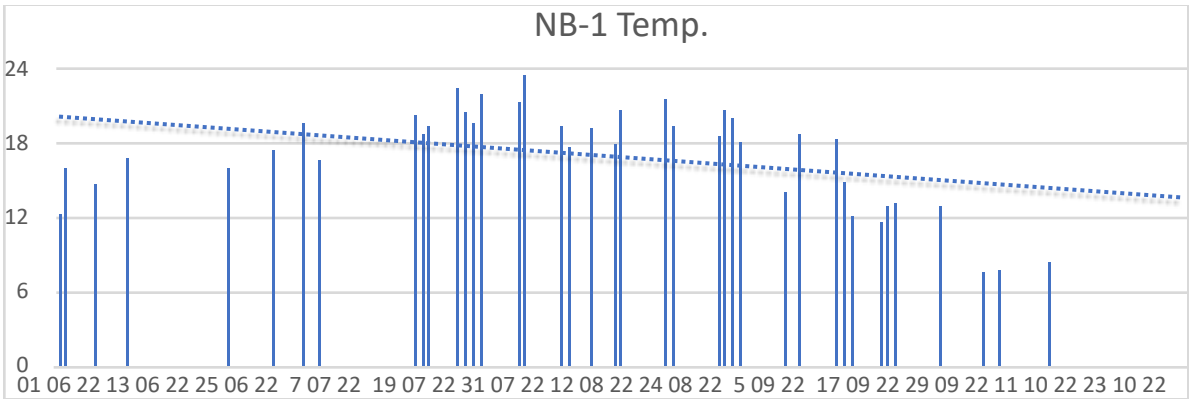

LR-17 TDS
1.8
1.35
0.9
0.45
0
01 06 22
8 06 22
15 06 22
22 06 22
29 06 22
6 07 22
13 07 22
20 07 22
27 07 22
3 08 22
10 08 22
17 08 22
24 08 22
31 08 22

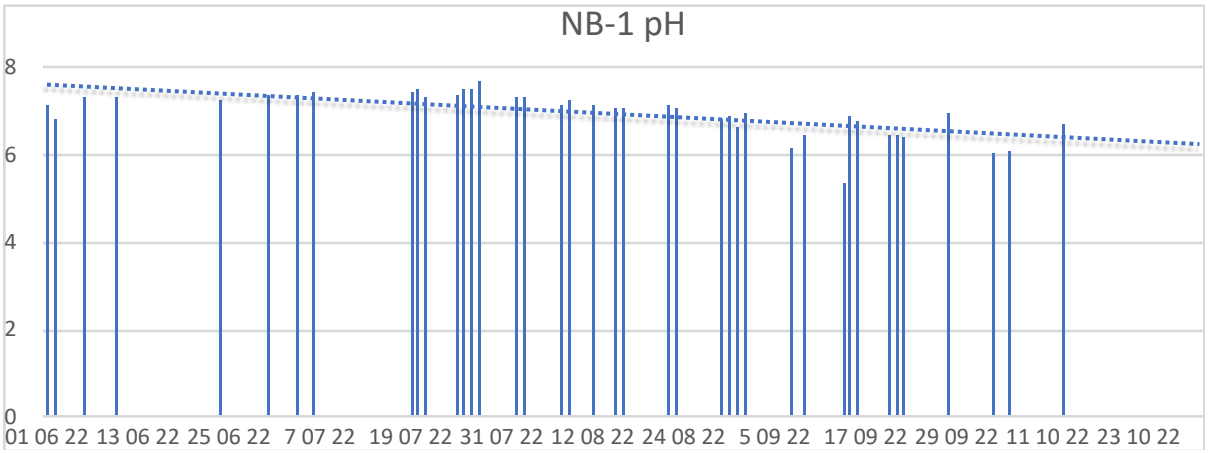


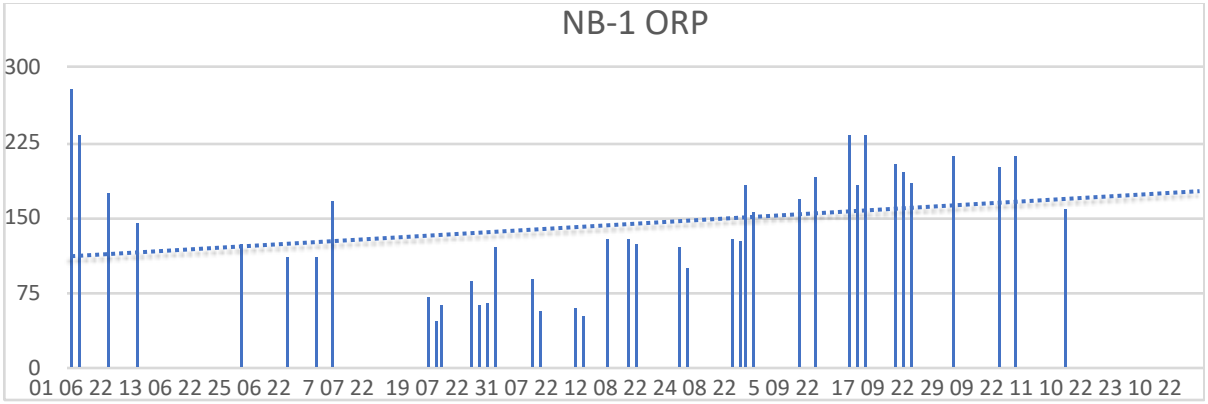
- Water quality data readings for location NB-1

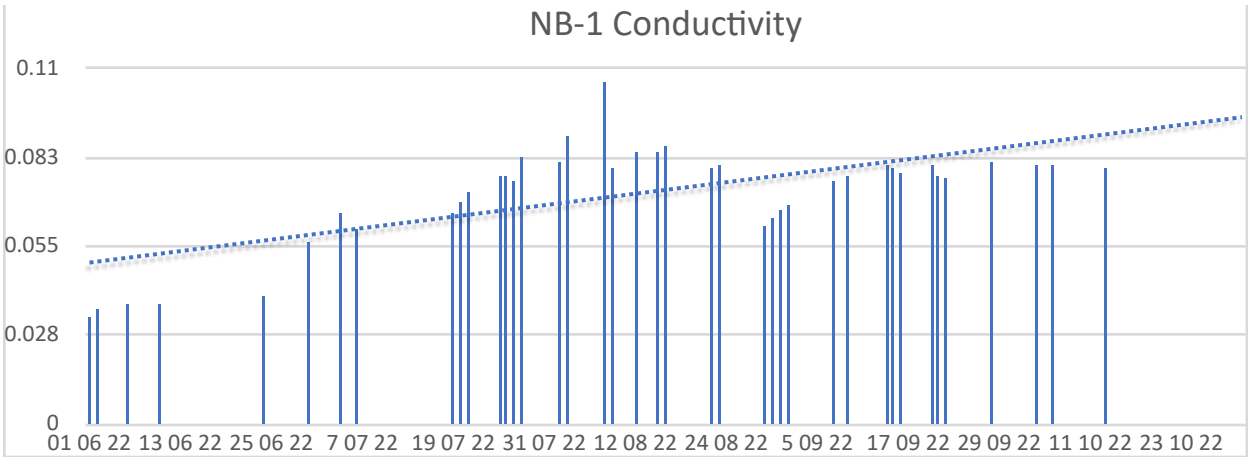
2022 Water Quality Data NB-1

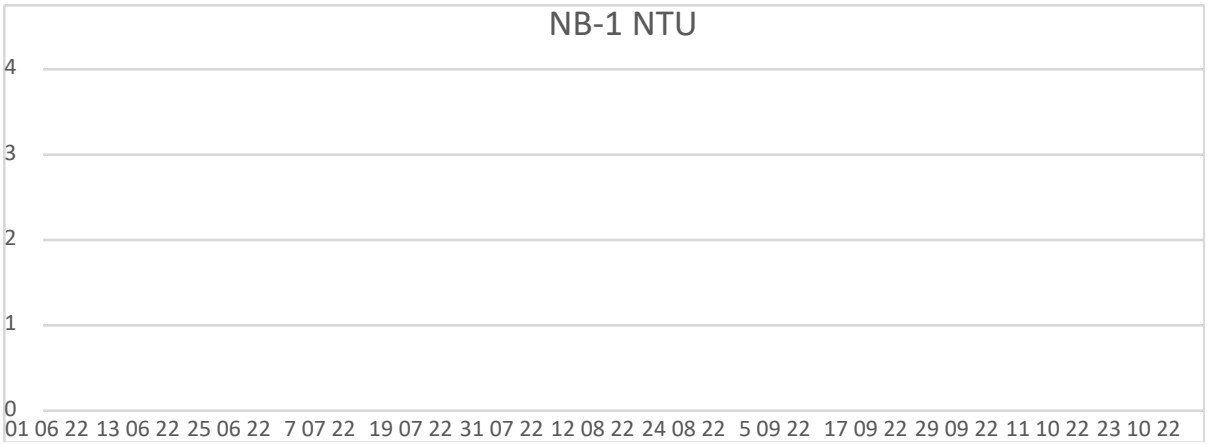
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	11:36	NB1	12.4	7.15	278	0.033	0	96.69	10.33	0.022	0		
02-Jun	2:55	NB1	15.96	6.81	234	0.036	0	96.12	9.5	0.067	0		
06-Jun	3:00	NB1	14.67	7.3	174	0.037	0	95.07	9.66	0.024	0		
10-Jun	2:20	NB1	16.82	7.35	146	0.037	0	97.06	9.42	0.024	0		
24-Jun	11:01	NB1	15.94	7.24	124	0.04	0	88.29	8.73	0.028	0		
30-Jun	11:12 AM	NB-1	17.41	7.38	111	0.056	0	89.49	8.58	0.037	0		
04-Jul	2:44	NB1	19.68	7.4	112	0.065	0	89.8	8.22	0.042	0		
06-Jul	11:20	NB1	16.52	7.43	168	0.06	0	80.17	7.83	0.039	0		
19-Jul	11:55	NB1	20.33	7.45	72	0.065	0	81.56	7.37	0.042	0		Rain
20-Jul	11:30	NB1	18.73	7.51	47	0.069	0	82.95	7.74	0.045	0		31 TDS
21-Jul	11:15	NB1	19.4	7.34	64	0.072	0	79.63	7.33	0.047	0		31 TDS
25-Jul	12:05	NB1	22.43	7.4	87	0.077	0	85.55	7.42	0.041	0		32 TDS
26-Jul	11:30	NB1	20.52	7.54	63	0.077	0	82.54	7.43	0.05	0		
27-Jul	11:25	NB1	19.67	7.51	67	0.075	0	78.97	7.23	0.049	0		
28-Jul	2:40	NB1	22.03	7.7	123	0.083	0	90.73	7.93	0.054	0		
02-Aug	11:35	NB1	21.34	7.32	90	0.081	0	79.02	7	0.052	0		
03-Aug	3:11	NB1	23.43	7.31	59	0.089	0	80.62	6.86	0.058	0		
08-Aug	11:25	NB1	19.34	7.15	62	0.106	0	83.11	7.66	0.069	0		
09-Aug	2:53	NB1	17.78	7.25	54	0.079	0	77.46	7.37	0.051	0		
12-Aug	11:39	NB1	19.16	7.15	131	0.084	0	84.33	7.88	0.054	0		
15-Aug	11:32	NB1	17.96	7.07	130	0.084	0	83.55	7.92	0.055	0		
16-Aug	2:15	NB1	20.7	7.1	124	0.086	0	106.58	9.56	0.056	0		
22-Aug	3:10	NB1	21.59	7.17	122	0.079	0	83.72	7.38	0.051	0		
23-Aug	11:33	NB1	19.38	7.07	101	0.08	0	82.42	7.59	0.052	0		Low level and flow
29-Aug	3:00	NB1	18.65	6.86	130	0.061	0	87.85	8.21	0.04	0		
30-Aug	3:00	NB1	20.63	6.87	126	0.064	0	86.28	7.75	0.041	0		
31-Aug	2:52	NB1	20.15	6.64	183	0.066	0	79.95	7.25	0.043	0		
01-Sep	11:50	NB1	18.14	6.97	157	0.068	0	83.12	7.85	0.044	0		30 TDS
07-Sep	11:29	NB1	13.96	6.18	170	0.075	0	84.21	8.69	0.049	0		34 TDS
09-Sep	2:45	NB1	18.8	6.46	192	0.077	0	82.43	7.68	0.05	0		
14-Sep	11:30	NB1	18.31	5.37	233	0.08	0	80.97	7.62	0.052	0		
15-Sep	11:40	NB1	15	6.93	183	0.079	0	81.38	8.21	0.052	0		
16-Sep	11:32	NB1	12.17	6.75	234	0.078	0	84.74	9.1	0.051	0		
20-Sep	3:05	NB1	11.73	6.47	204	0.08	0	86.66	9.4	0.052	0		
21-Sep	2:50	NB1	13	6.47	197	0.077	0	85.76	9.04	0.05	0		
22-Sep	3:00	NB1	13.24	6.43	185	0.076	0	85.94	9.01	0.049	0		
28-Sep	11:51	NB1	13.06	6.95	211	0.081	0	82.36	8.67	0.052	0		
04-Oct	12:05	NB1	7.56	6.03	201	0.08	0	87.54	10.48	0.052	0		
06-Oct	11:24	NB1	7.71	6.11	211	0.08	0	84.43	10.07	0.052	0		
13-Oct	11:09	NB1	8.47	6.74	159	0.079	0	83.64	9.73	0.051	0		

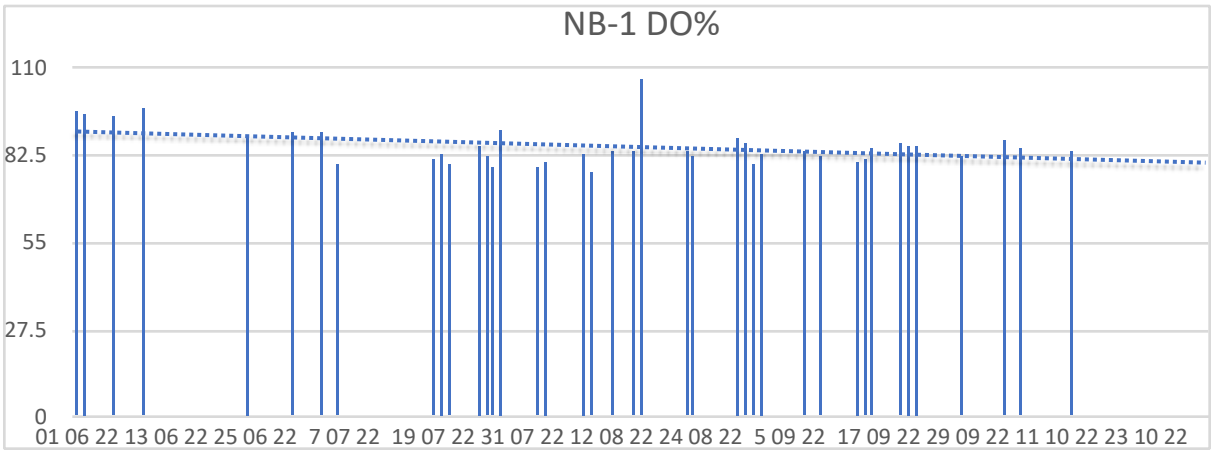

NB-1 Temp.
24
18
12
6
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

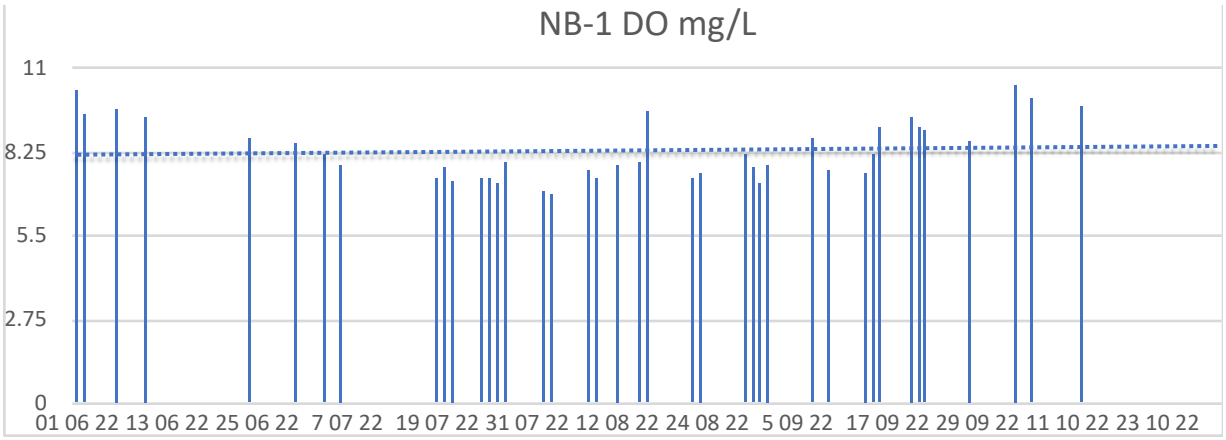

NB-1 pH
8
6
4
2
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

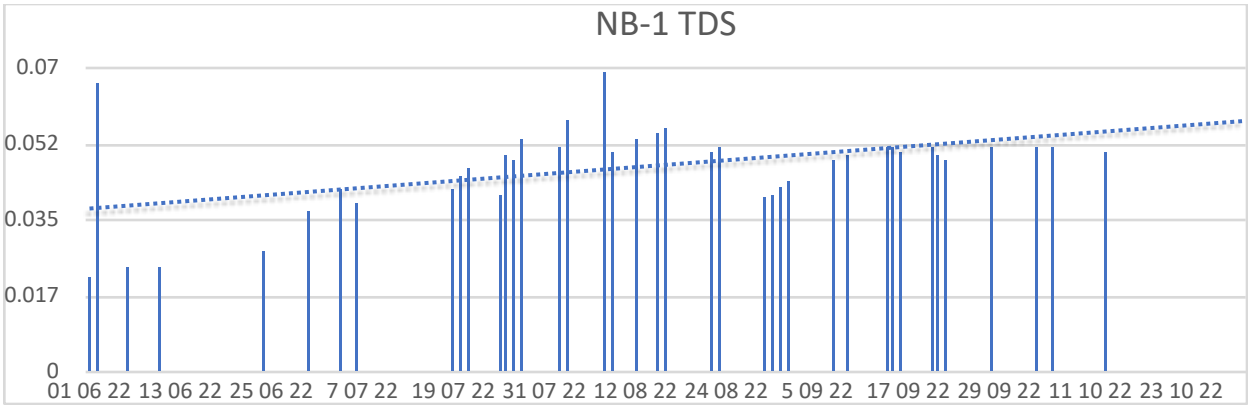

NB-1 ORP
300
225
150
75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

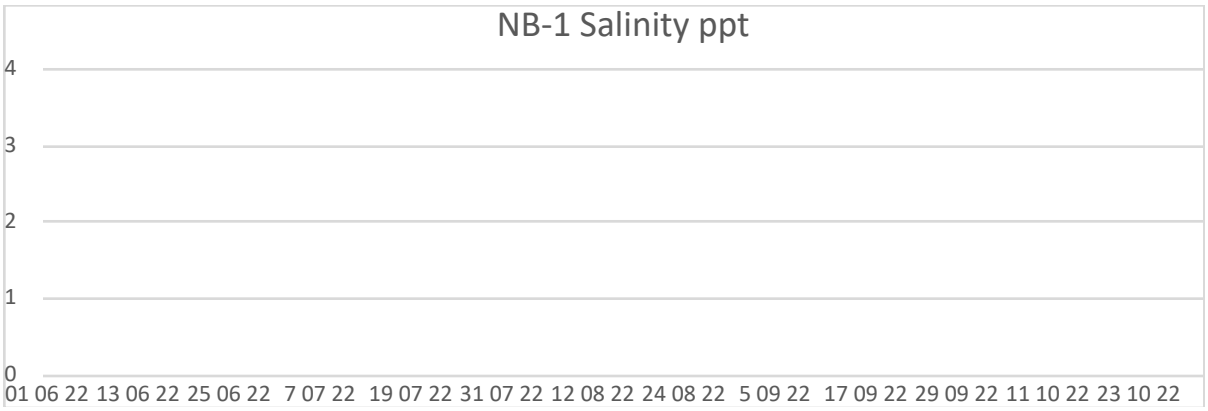

NB-1 Conductivity
0.11
0.083
0.055
0.028
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-1 NTU
4
3
2
1
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-1 DO%
110
82.5
55
27.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-1 DO mg/L
11
8.25
5.5
2.75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

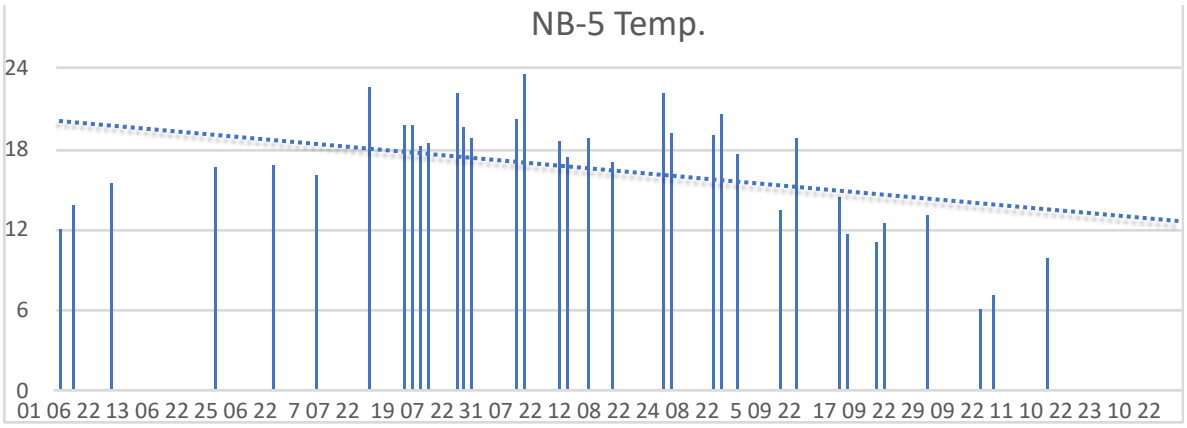

NB-1 TDS
0.07
0.052
0.035
0.017
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

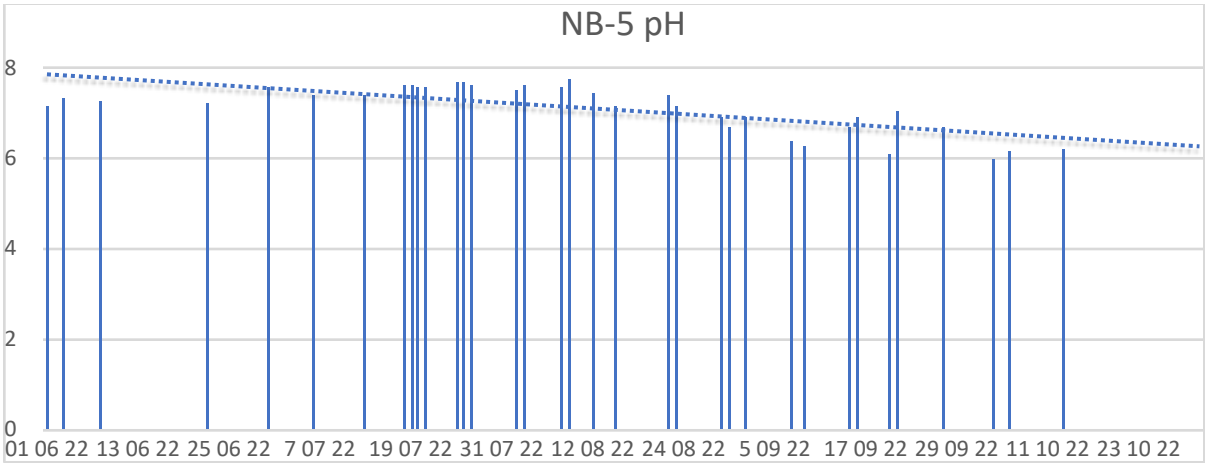

NB-1 Salinity ppt
4
3
2
1
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

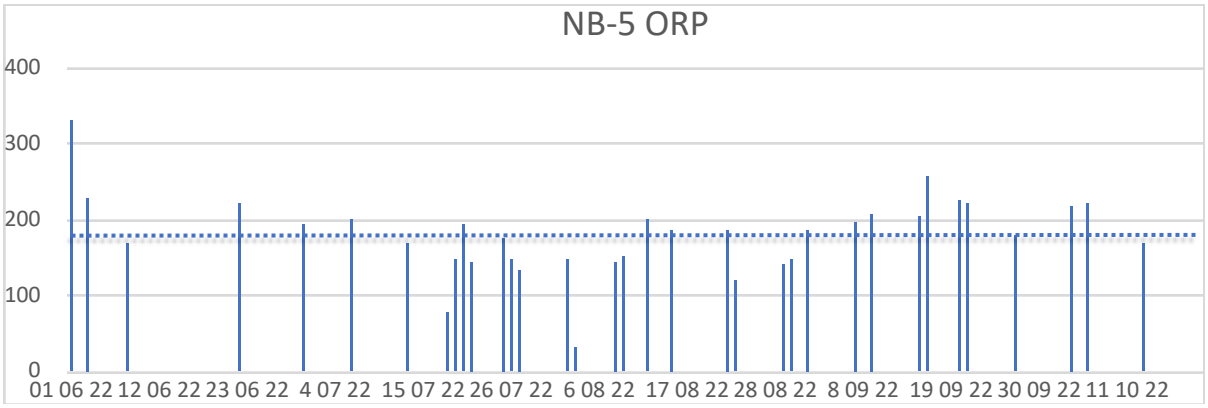
- Water quality data readings for location NB-5

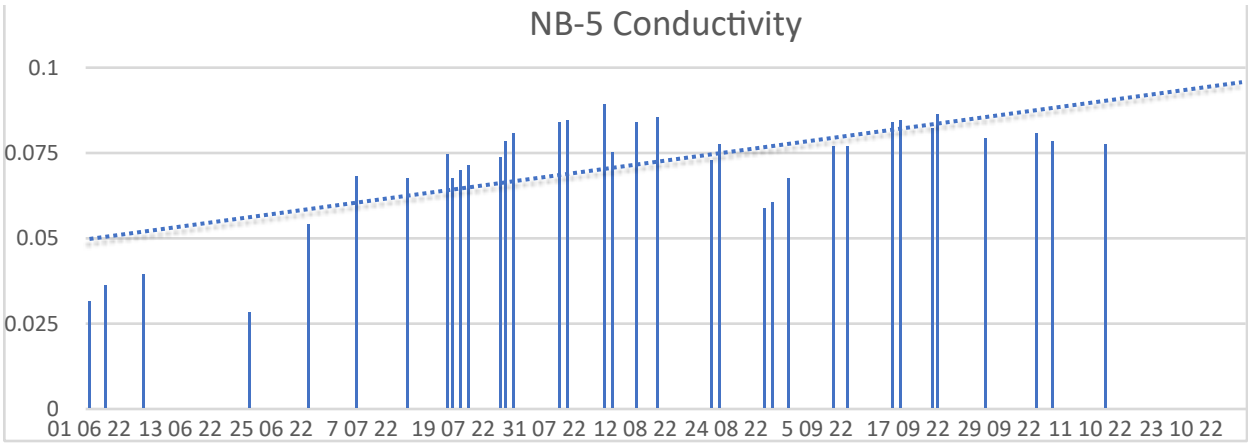
2022 Water Quality Data NB-5

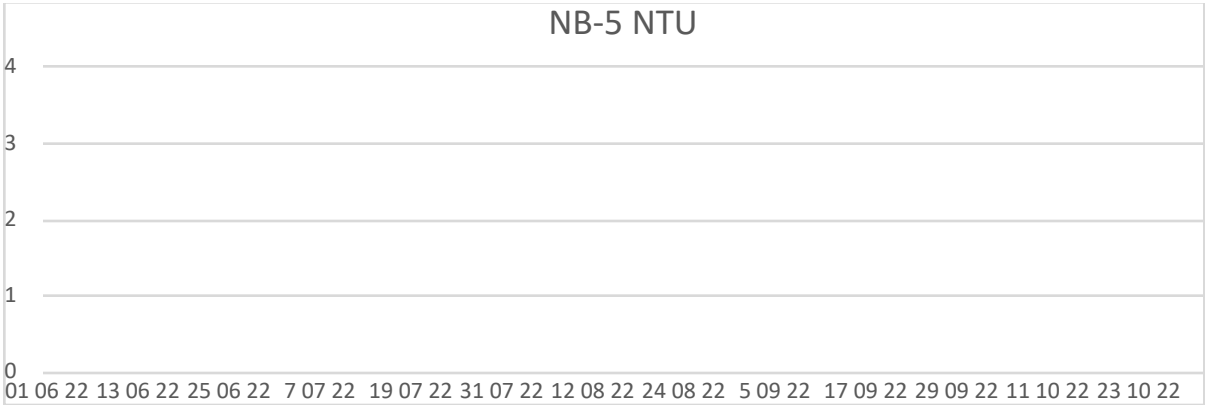
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	11:07	NB5	12.12	7.15	332	0.032	0	98.59	10.66	0.021	0		
03-Jun	11:05	NB5	13.8	7.33	229	0.037	0	93.19	9.65	0.024	0		
08-Jun	11:24	NB5	15.4	7.3	169	0.04	0	94.18	9.42	0.026	0		
22-Jun	2:43	NB5	16.56	7.2	221	0.029	0	99.09	9.67	0.019	0		
30-Jun	10:50	NB5	16.83	7.6	194	0.055	0	88.93	8.63	0.036	0		
06-Jul	11:03	NB5	16.14	7.41	202	0.062	0	86.03	8.47	0.04	0		
13-Jul	2:16	NB5	22.63	7.4	168	0.068	0	91.44	7.9	0.044	0		
18-Jul	10:50	NB5	19.75	7.65	78	0.075	0	104.91	9.59	0.049	0		
19-Jul	11:25	NB5	19.78	7.66	148	0.068	0	84.94	7.76	0.044	0		Rain
20-Jul	10:50	NB5	18.27	7.6	194	0.07	0	88.33	8.32	0.046	0		32 TDS
21-Jul	10:50	NB5	18.36	7.6	143	0.072	0	79.63	7.33	0.047	0		30TDS
25-Jul	11:30	NB5	22.13	7.7	177	0.074	0	89.88	7.84	0.048	0		32 TDS
26-Jul	11:06	NB5	19.56	7.71	149	0.079	0	83.59	7.67	0.051	0		
27-Jul	10:55	NB5	18.84	7.61	134	0.081	0	87	8.1	0.053	0		
02-Aug	11:05	NB5	20.23	7.5	148	0.084	0	86.59	7.84	0.055	0		
03-Aug	2:30	NB5	23.59	7.61	31	0.085	0	93.83	7.96	0.055	0		
08-Aug	11:05	NB5	18.69	7.55	145	0.09	0	86.52	8.08	0.059	0		
09-Aug	2:36	NB5	17.45	7.75	152	0.076	0	85.92	8.23	0.05	0		
12-Aug	11:11	NB5	18.8	7.47	199	0.084	0	89.08	8.3	0.055	0		
15-Aug	11:05	NB5	17	7.14	186	0.086	0	84.49	8.17	0.056	0		
22-Aug	2:41	NB5	22.12	7.4	185	0.073	0	94.56	8.25	0.048	0		
23-Aug	11:15	NB5	19.2	7.15	120	0.078	0	86.67	8.01	0.051	0		Low level and flow
29-Aug	2:33	NB5	18.93	6.95	142	0.059	0	88.99	8.27	0.039	0		
30-Aug	2:37	NB5	20.69	6.71	148	0.061	0	87.61	7.86	0.041	0		
01-Sep	11:30	NB5	17.55	6.95	188	0.068	0	72.39	6.92	0.044	0		29 TDS
07-Sep	11:07	NB5	13.41	6.41	198	0.077	0	90.18	9.42	0.05	0		31 TDS
09-Sep	2:15	NB5	18.88	6.3	209	0.077	0	87.61	8.15	0.05	0		
15-Sep	11:19	NB5	14.54	6.7	204	0.084	0	88.33	9	0.054	0		
16-Sep	11:11	NB5	11.72	6.91	258	0.085	0	89.04	9.66	0.056	0		
20-Sep	2:45	NB5	11.11	6.12	225	0.083	0	92.89	10.22	0.054	0		
21-Sep	2:35	NB5	12.51	7.04	221	0.087	0	93.08	9.92	0.057	0		
27-Sep	11:34	NB5	13.1	6.7	179	0.08	0	90.04	9.47	0.052	0		
04-Oct	11:45	NB5	6.19	5.97	217	0.081	0	91.63	11.35	0.053	0		
06-Oct	11:00	NB5	7.13	6.17	221	0.079	0	87.94	10.64	0.051	0		
13-Oct	10:55	NB5	9.95	6.21	170	0.078	0	90.06	10.18	0.085	0		

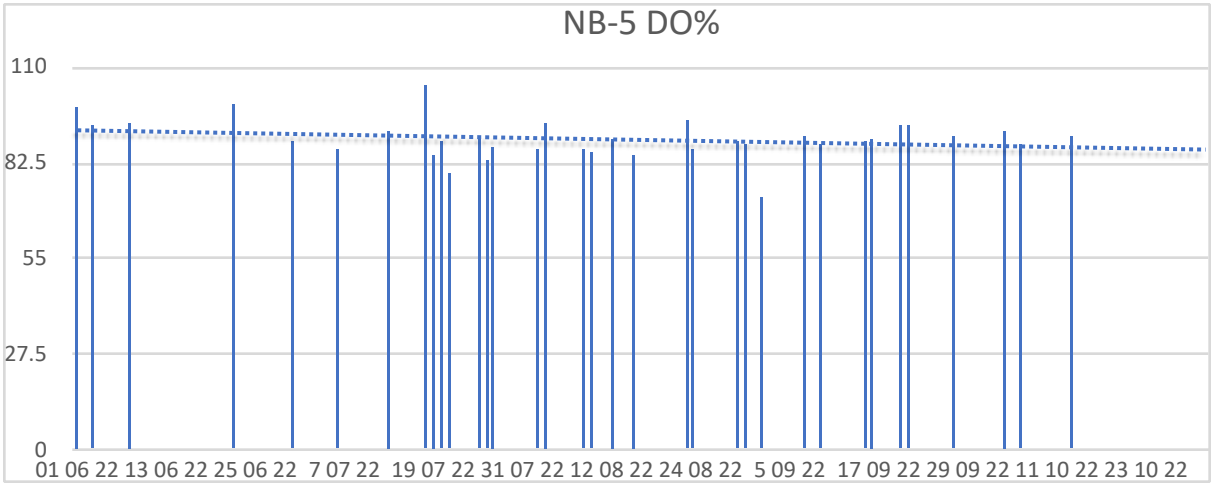

NB-5 Temp.
24
18
12
6
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

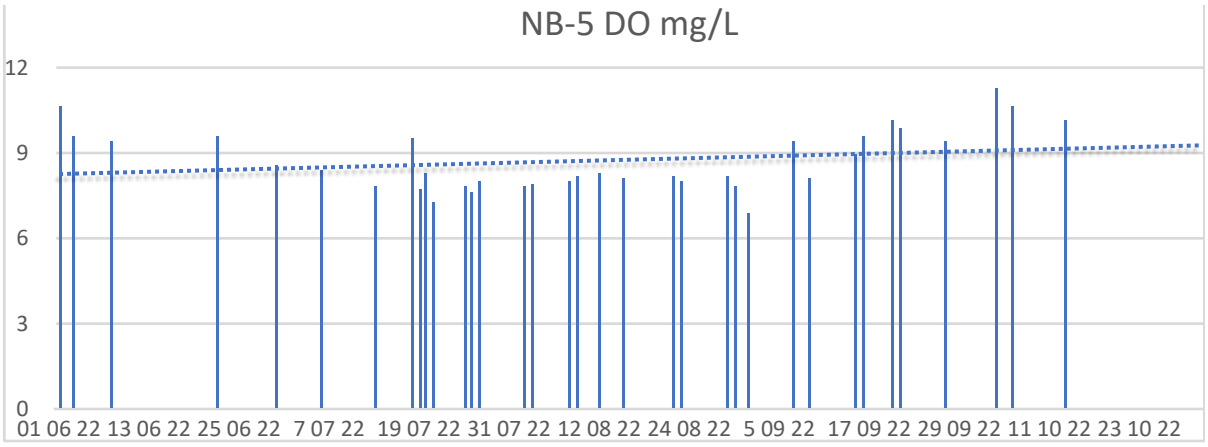

NB-5 pH
8
6
4
2
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

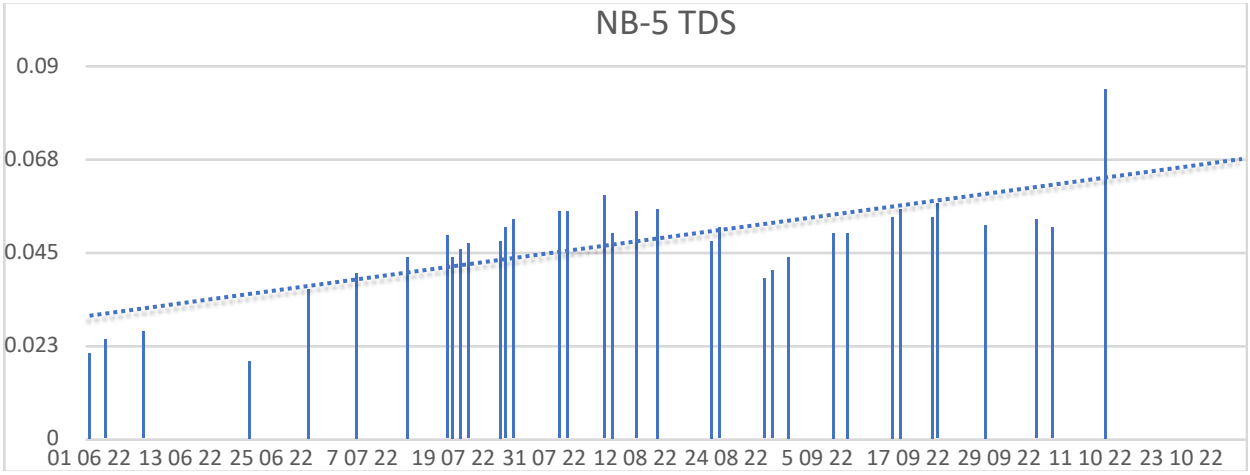

NB-5 ORP
400
300
200
100
0
01 06 22 12 06 22 23 06 22 4 07 22 15 07 22 26 07 22 6 08 22 17 08 22 28 08 22 8 09 22 19 09 22 30 09 22 11 10 22

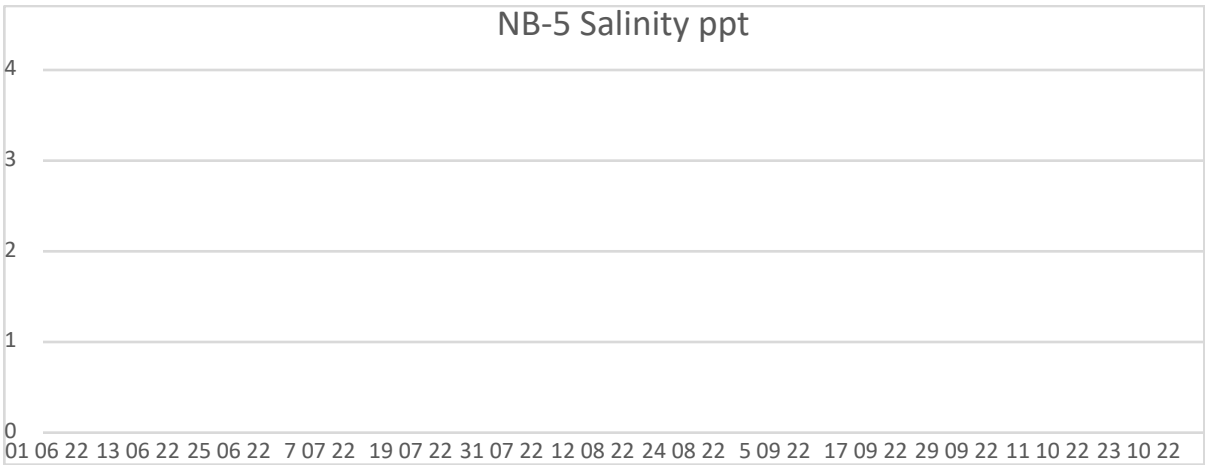

NB-5 Conductivity
0.1
0.075
0.05
0.025
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-5 NTU
4
3
2
1
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-5 DO%
110
82.5
55
27.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-5 DO mg/L
12
9
6
3
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

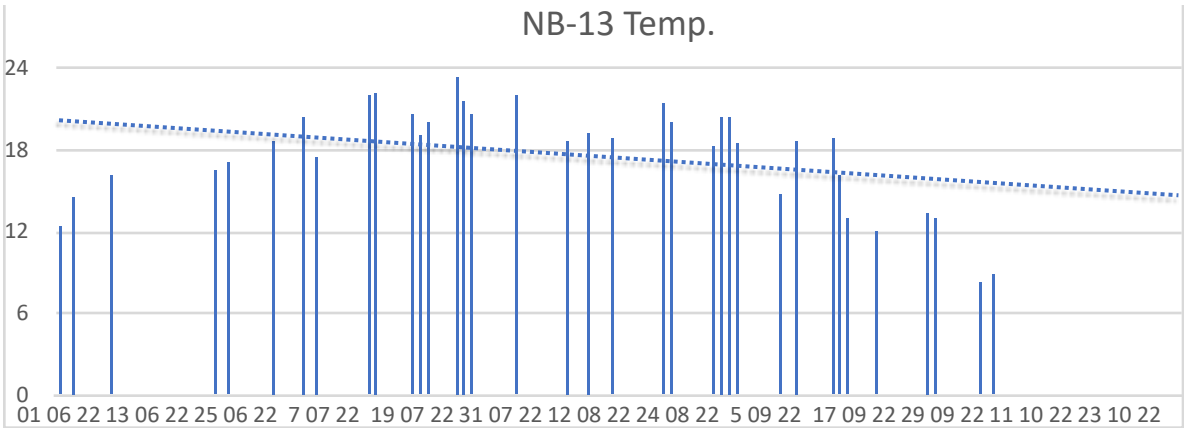

NB-5 TDS
0.09
0.068
0.045
0.023
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

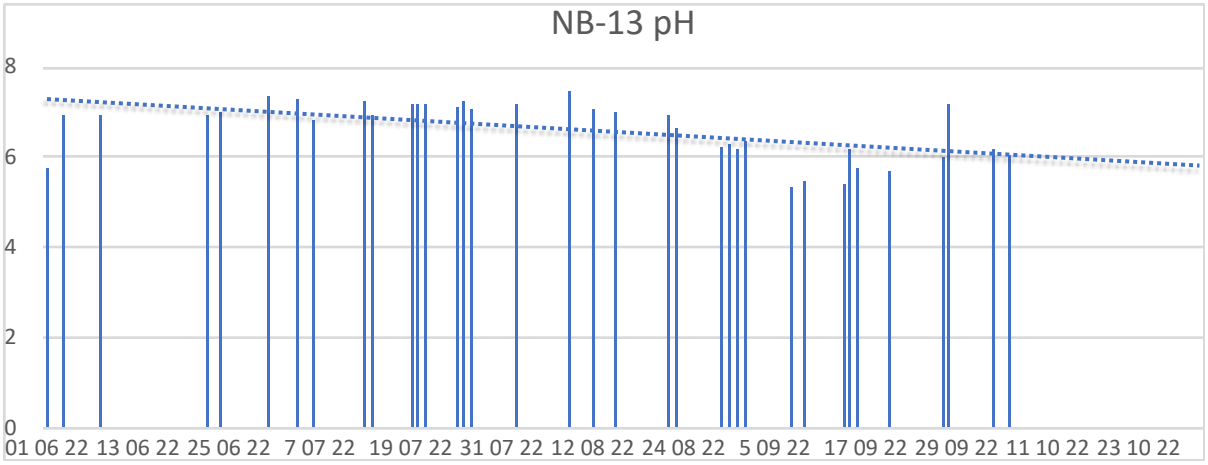

NB-5 Salinity ppt
4
3
2
1
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

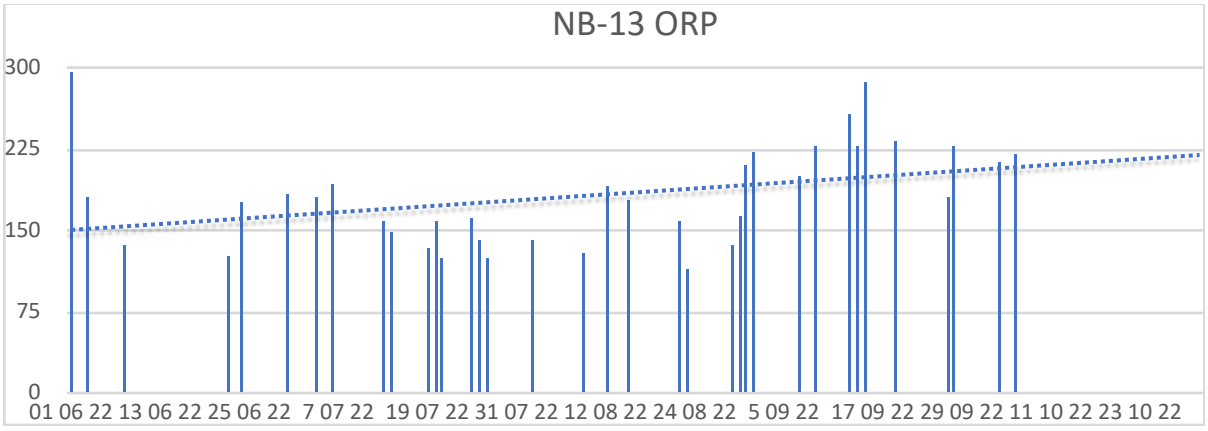
- Water quality data readings for location NB-13

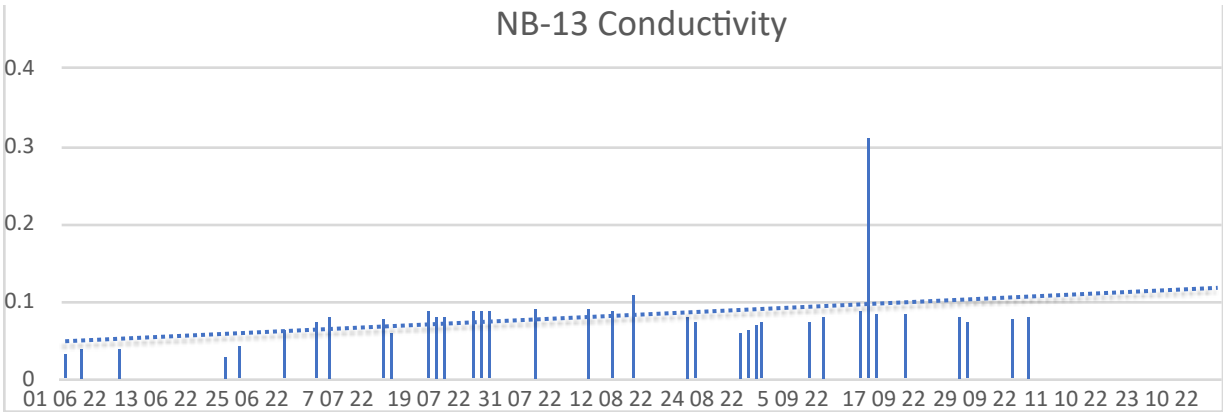
2022 Water Quality Data NB-13

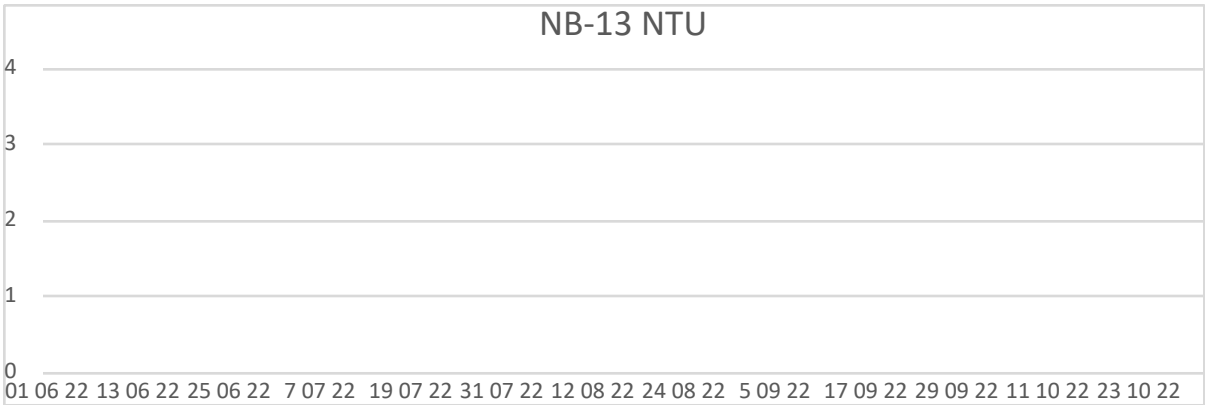
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	10:42	NB13	12.46	5.77	297	0.033	0	84.64	9.03	0.021	0		Data Logger # 12407668
03-Jun	10:45	NB13	14.5	6.92	182	0.041	0	85.6	8.73	0.027	0		
08-Jun	11:00	NB13	16.11	6.94	136	0.041	0	85.46	8.42	0.027	0		
22-Jun	2:17	NB-13	16.49	6.92	127	0.03	0	90.55	8.85	0.019	0		
24-Jun	10:30	NB13	17.04	7.02	176	0.043	0	80.22	7.75	0.028	0		
30-Jun	10:23	NB13	18.6	7.34	183	0.064	0	79.31	7.42	0.042	0		
04-Jul	2:10	NB13	20.49	7.3	181	0.074	0	79.49	7.16	0.048	0		
06-Jul	10:35	NB13	17.57	6.85	193	0.079	0	71.69	6.85	0.051	0		
13-Jul	1:54	NB13	22.12	7.24	160	0.077	0	73.24	6.39	0.05	0		
14-Jul	2:00	NB13	22.3	6.95	148	0.061	0	80.28	6.98	0.041	0		Electrofishing
19-Jul	11:00	NB13	20.71	7.19	134	0.087	0	66.9	6	0.057	0		Rain
20-Jul	10:30	NB13	19.07	7.2	160	0.08	0	67.45	6.25	0.052	0		39 TDS
21-Jul	10:25	NB13	20.08	7.15	125	0.082	0	74.11	6.73	0.053	0		39 TDS
25-Jul	10:50	NB13	23.3	7.1	161	0.089	0	67.41	5.75	0.058	0		Rep.Data Logger # 21011195
26-Jul	10.46	NB13	21.54	7.21	141	0.089	0	61.09	5.39	0.058	0		
27-Jul	10:35	NB13	20.75	7.07	124	0.089	0	63.5	5.69	0.058	0		
02-Aug	10:35	NB13	21.97	7.15	142	0.09	0	70.63	6.18	0.059	0		
09-Aug	2:15	NB13	18.69	7.45	129	0.092	0	71.85	6.71	0.06	0		
12-Aug	10:54	NB13	19.35	7.05	191	0.086	0	73.58	6.78	0.056	0		
15-Aug	10:40	NB13	18.98	6.98	178	0.108	0	75.62	7.02	0.07	0		
22-Aug	1:56	NB13	21.39	6.95	159	0.082	0	79.1	7	0.054	0		
23-Aug	10:53	NB13	20.04	6.66	115	0.074	0	76.33	6.67	0.048	0		Low level and flow
29-Aug	2:09	NB13	18.34	6.25	137	0.061	0	76.23	7.17	0.04	0		
30-Aug	2:11	NB13	20.43	6.29	165	0.063	0	69.75	6.29	0.041	0		
31-Aug	2:20	NB13	20.38	6.17	210	0.07	0	66.69	6.02	0.046	0		
01-Sep	11:00	NB13	18.49	6.35	223	0.072	0	66.34	6.22	0.047	0		30 TDS
07-Sep	10:46	NB13	14.85	5.34	200	0.075	0	69.46	7.03	0.049	0		35 TDS
09-Sep	2:10	NB13	18.79	5.46	228	0.079	0	72.86	6.79	0.052	0		
14-Sep	10:43	NB13	18.96	5.41	258	0.088	0	64.82	6.02	0.057	0		
15-Sep	10:56	NB13	16.22	6.18	227	0.312	0	75.08	7.38	0.206	0.2		
16-Sep	10:53	NB13	13.02	5.75	287	0.085	0	67.48	7.11	0.056	0		
20-Sep	2:30	NB13	12.02	5.68	232	0.085	0	70.53	7.6	0.055	0		
27-Sep	11:14	NB13	13.32	6.01	180	0.08	0	75.96	7.95	0.052	0		
28-Sep	11:18	NB13	12.95	7.15	227	0.075	0	73.44	7.75	0.05	0		
04-Oct	11:24	NB13	8.25	6.17	212	0.078	0	74.93	8.82	0.051	0		
06-Oct	10:44	NB13	8.97	6.07	221	0.079	0	72.09	8.34	0.051	0		

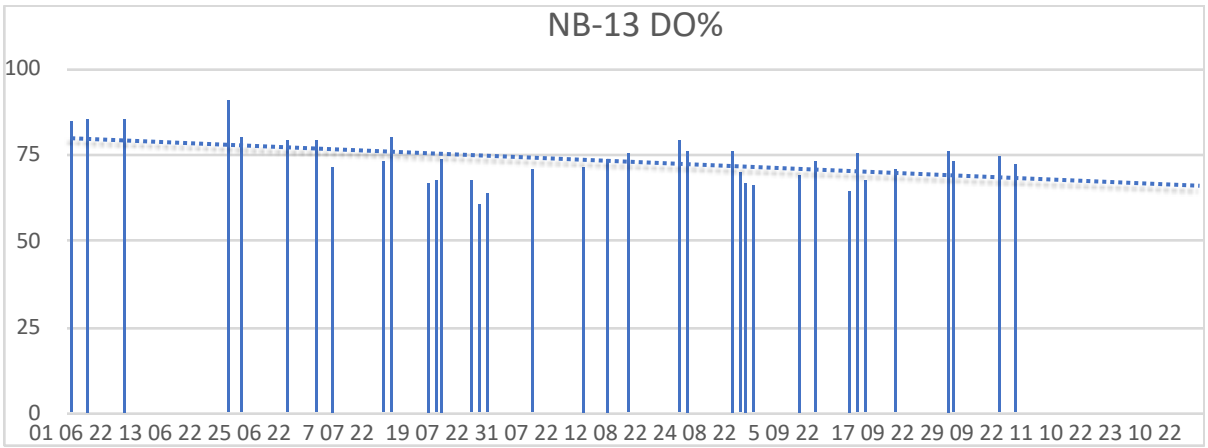

NB-13 Temp.
24
18
12
6
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

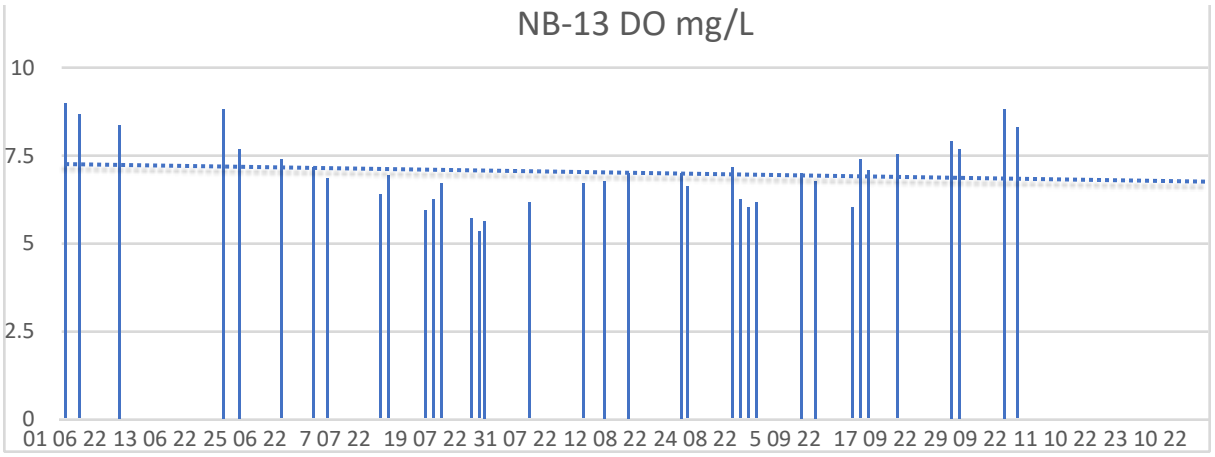

NB-13 pH
8
6
4
2
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

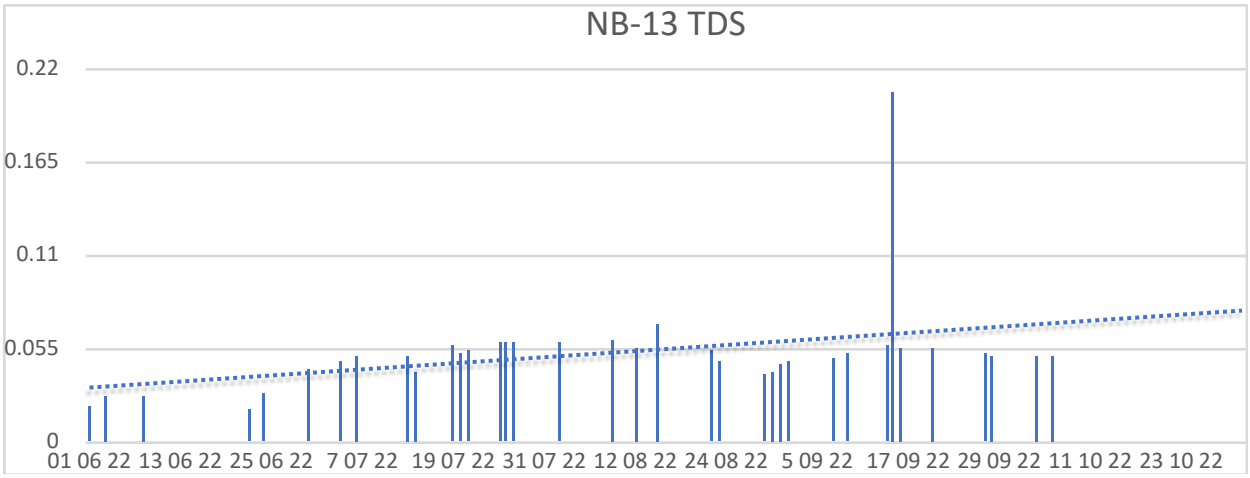

NB-13 ORP
300
225
150
75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

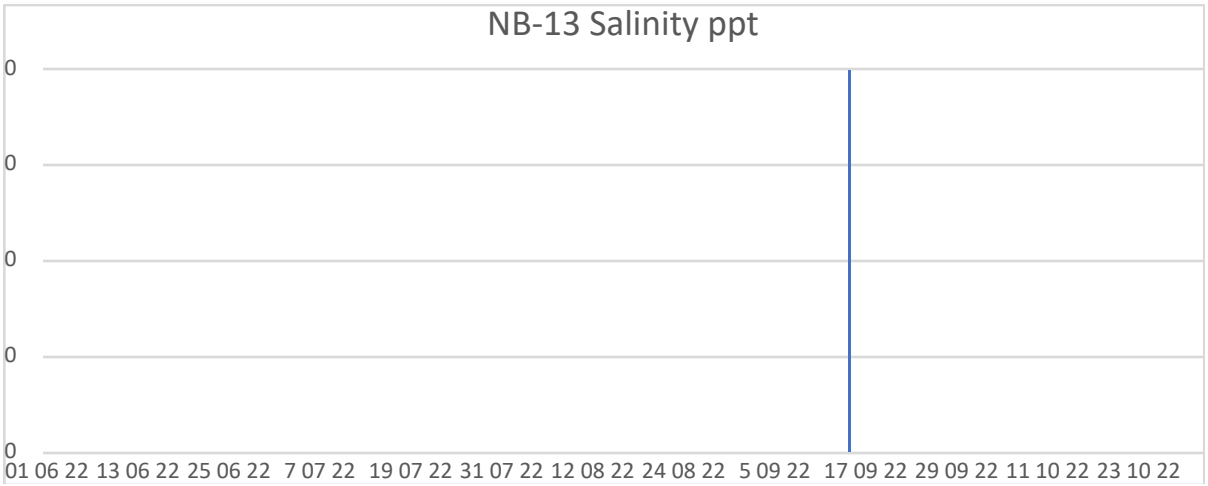

NB-13 Conductivity
0.4
0.3
0.2
0.1
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-13 NTU
4
3
2
1
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-13 DO%
100
75
50
25
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


NB-13 DO mg/L
10
7.5
5
2.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

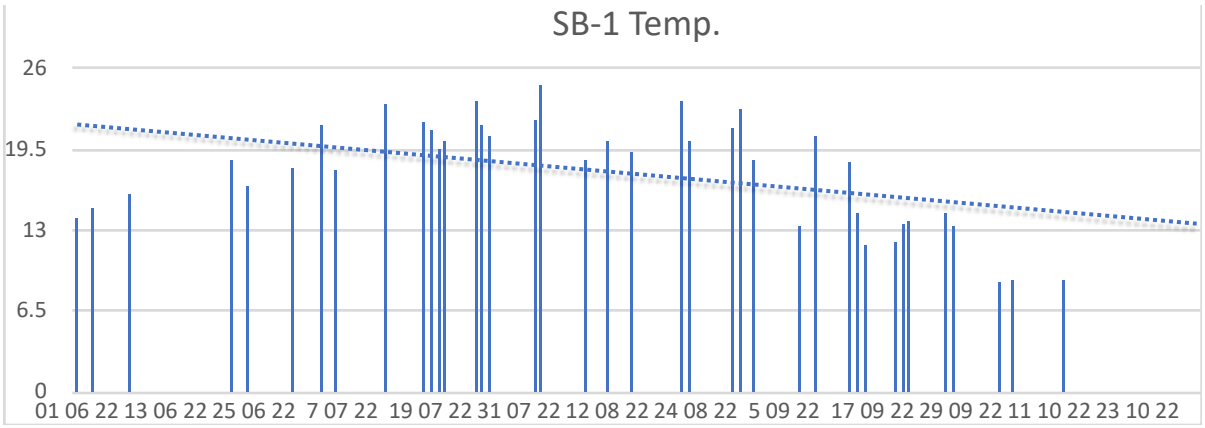

NB-13 TDS
0.22
0.165
0.11
0.055
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

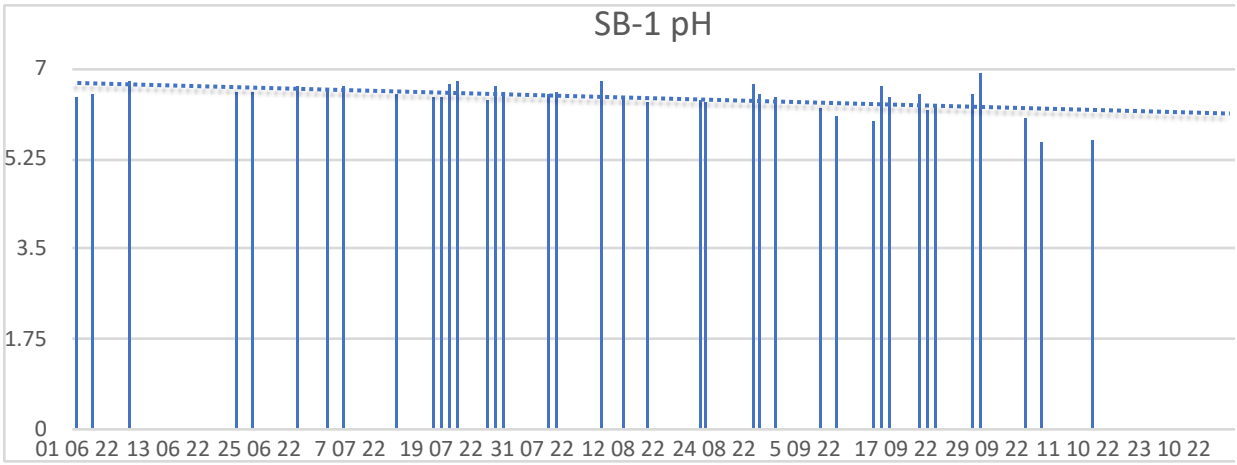

NB-13 Salinity ppt
0
0
0
0
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

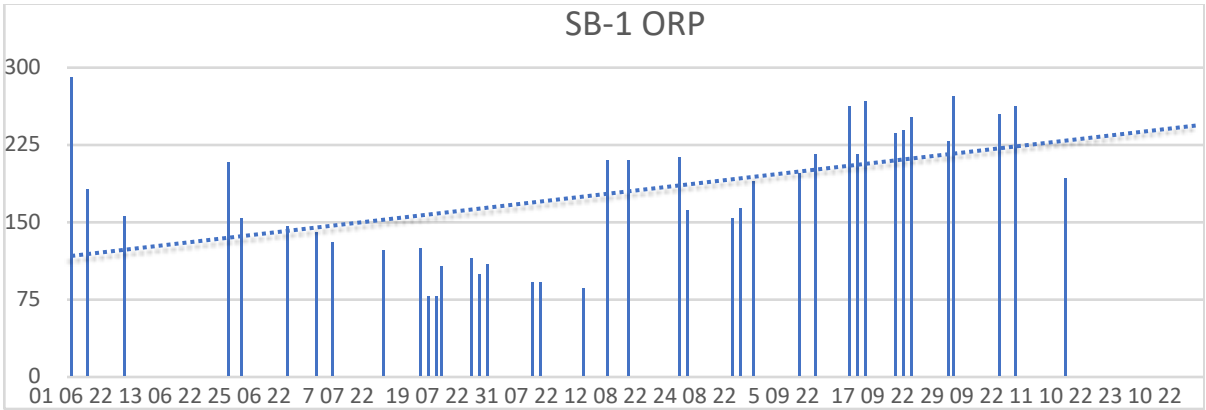
- Water quality data readings for location SB-1

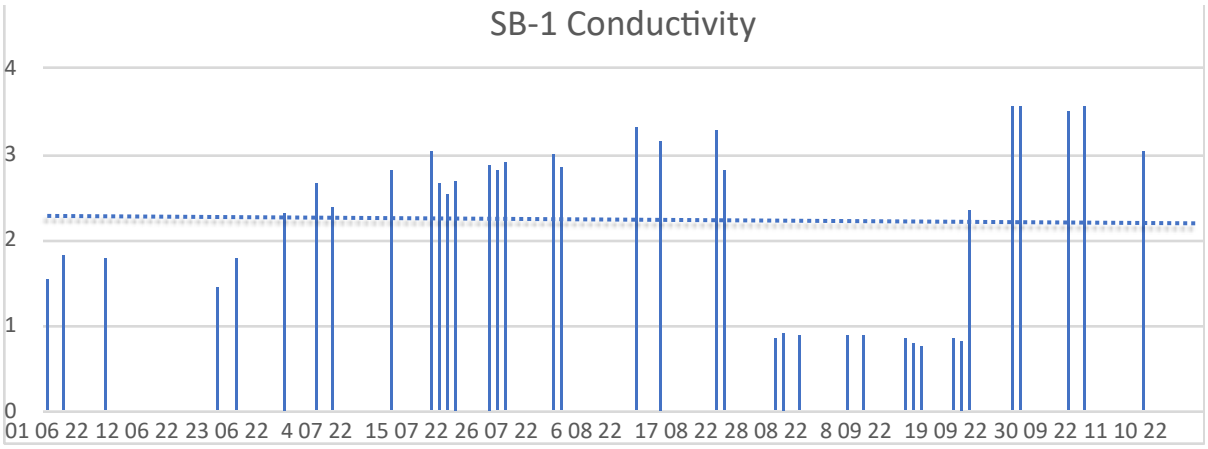
2022 Water Quality Data SB-1

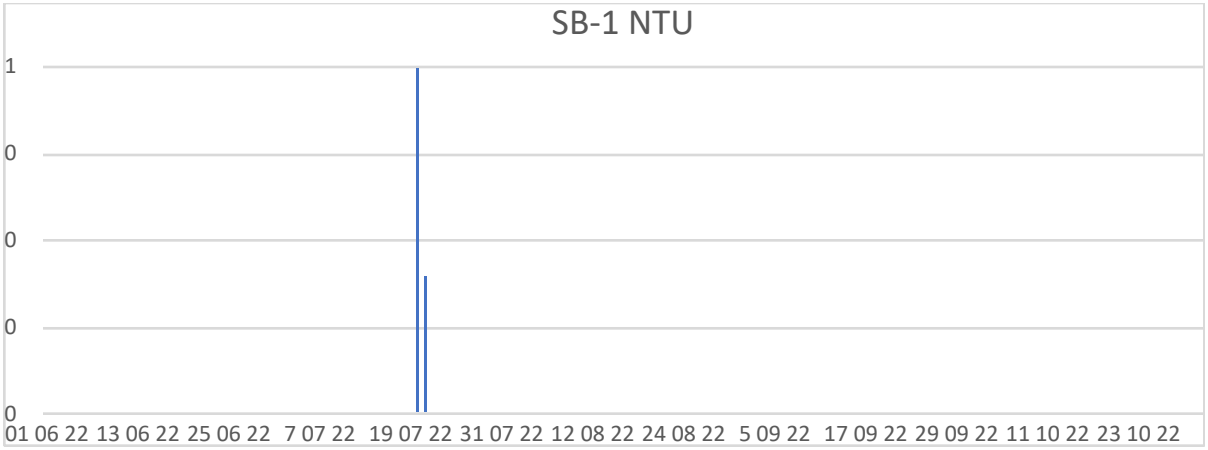
Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	11 30	SB1	13.89	6.44	291	1.54	0	96.18	9.94	0.987	0.8		Data Logger # 12407669
03-Jun	11:20	SB1	14.94	6.5	183	1.83	0	87.91	8.88	1.17	0.9		
08-Jun	11.35	SB1	16	6.73	158	1.8	0	91.44	9.03	1.15	0.9		
22-Jun	2:55	SB1	18.6	6.54	209	1.46	0	91.07	8.52	0.935	0.7		706 TDS
24-Jun	10:50	SB1	16.6	6.54	154	1.79	0	91.17	8.89	1.15	0.9		
30-Jun	11:00	SB1	18.02	6.66	147	2.33	0	86.62	8.2	1.49	1.2		
04-Jul	2:36	SB1	21.42	6.61	141	2.66	0	85.93	7.6	1.7	1.4		
06-Jul	11:15	SB1	17.81	6.67	130	2.39	0	82.88	7.88	1.53	1.2		
13-Jul	2:25	SB1	23.23	6.51	122	2.83	0	85.35	7.29	1.81	1.5		
18-Jul	11:02	SB1	21.59	6.45	125	3.02	0	88.337	7.79	1.93	1.6		
19-Jul	11:40	SB1	21.03	6.44	79	2.66	0	82.92	7.39	1.7	1.4		sulfur smell / rain
20-Jul	11:10	SB1	19.64	6.72	80	2.54	0.5	82.52	7.56	1.63	1.3		1000 TDS
21-Jul	11:00	SB1	20.22	6.74	107	2.68	0.2	82.93	7.51	1.72	1.4		1085 TDS
25-Jul	11:55	SB1	23.4	6.41	115	2.87	0	81.63	6.95	1.84	1.5		1243 TDS
26-Jul	11:25	SB1	21.54	6.66	100	2.82	0	76.77	6.8	1.8	1.5		
27-Jul	11:01	SB1	20.55	6.56	111	2.9	0	80.7	7.26	1.86	1.5		
02-Aug	11:20	SB1	21.99	6.5	93	3.01	0	82.77	7.24	1.93	1.6		
03-Aug	3:00	SB1	24.63	6.55	93	2.85	0	88.47	7.36	1.83	1.5		
09-Aug	2:45	SB1	18.66	6.75	88	2.7	0	82.83	7.74	1.73	1.4		
12-Aug	11:20	SB1	20.25	6.45	212	3.3	0	84.42	7.64	2.11	1.3		
15-Aug	11:15	SB1	19.24	6.34	212	3.17	0	82.84	7.65	2.03	1.7		
22-Aug	2:55	SB1	23.45	6.4	213	3.29	0	80.77	6.87	2.1	1.7		
23-Aug	11:21	SB1	20.18	6.35	161	2.83	0	82.65	7.49	1.81	1.5		Low level and flow
29-Aug	2:45	SB1	21.28	6.7	155	0.854	0	86.15	7.64	0.546	0.4		
30-Aug	2:45	SB1	22.79	6.51	164	0.928	0	89.05	7.67	0.594	0.5		
01-Sep	11:45	SB1	18.74	6.45	190	0.876	0	82.97	7.74	0.591	0.4		340 TDS
07-Sep	11:14	SB1	13.42	6.26	199	0.903	0	91.64	9.57	0.574	0.4		361 TDS
09-Sep	2:25	SB1	20.57	6.06	217	0.896	0	84.29	7.58	0.573	0.4		
14-Sep	11:10	SB1	18.38	6	262	0.851	0	83.96	7.89	0.544	0.4		
15-Sep	11:32	SB1	14.51	6.67	216	0.785	0	89.05	9.08	0.503	0.4		
16-Sep	11:24	SB1	11.81	6.45	268	0.769	0	89.87	9.73	0.492	0.4		
20-Sep	3:00	SB1	11.97	6.5	236	0.871	0	95.29	10.28	0.577	0.4		
21-Sep	2:40	SB1	13.61	6.21	239	0.828	0	92.03	9.57	0.53	0.4		
22-Sep	2:40	SB1	13.67	6.3	252	2.36	0	87.14	9.05	1.51	1.2		
27-Sep	11:45	SB1	14.41	6.5	229	3.57	0	84.75	8.66	2.28	1.9		
28-Sep	11:42	SB1	13.43	6.9	273	3.57	0	82.95	8.66	2.29	1.9		
04-Oct	11:56	SB1	8.81	6.01	254	3.51	0	84.9	9.86	2.25	1.8		
06-Oct	11:20	SB1	9.11	5.58	262	3.56	0	84.39	9.73	2.28	1.8		
13-Oct	11:05	SB1	9	5.62	193	3.03	0	89.01	10.29	1.94	1.6		

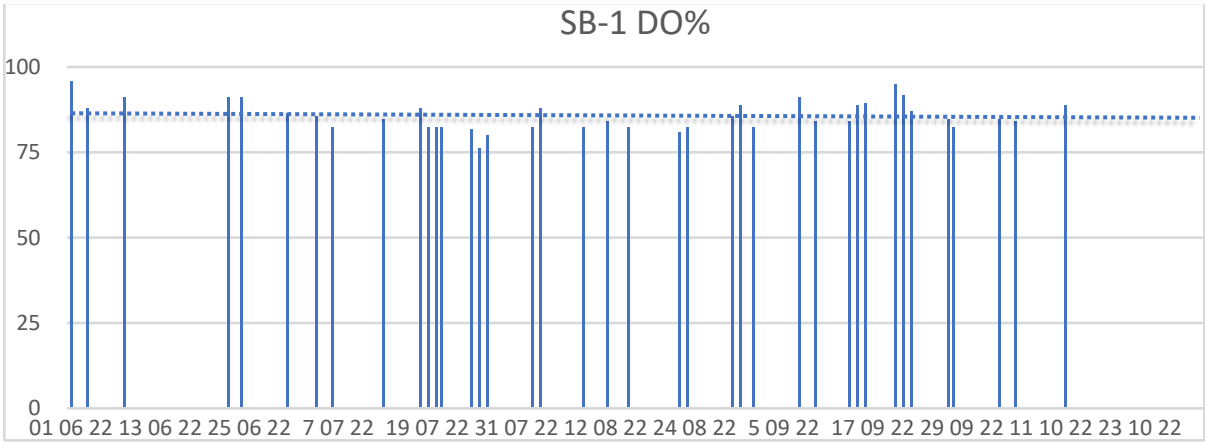

SB-1 Temp.
26
19.5
13
6.5
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

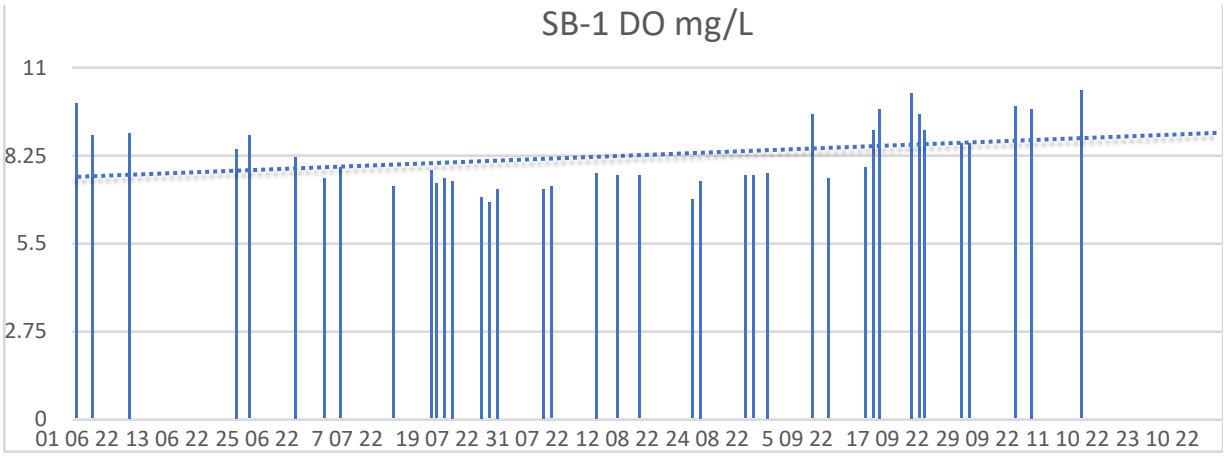

SB-1 pH
7
5.25
3.5
1.75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

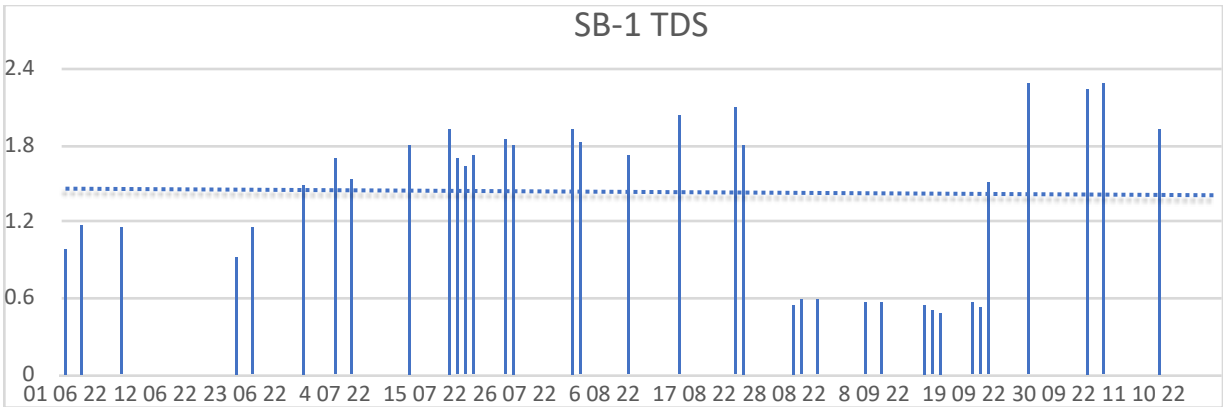

SB-1 ORP
300
225
150
75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

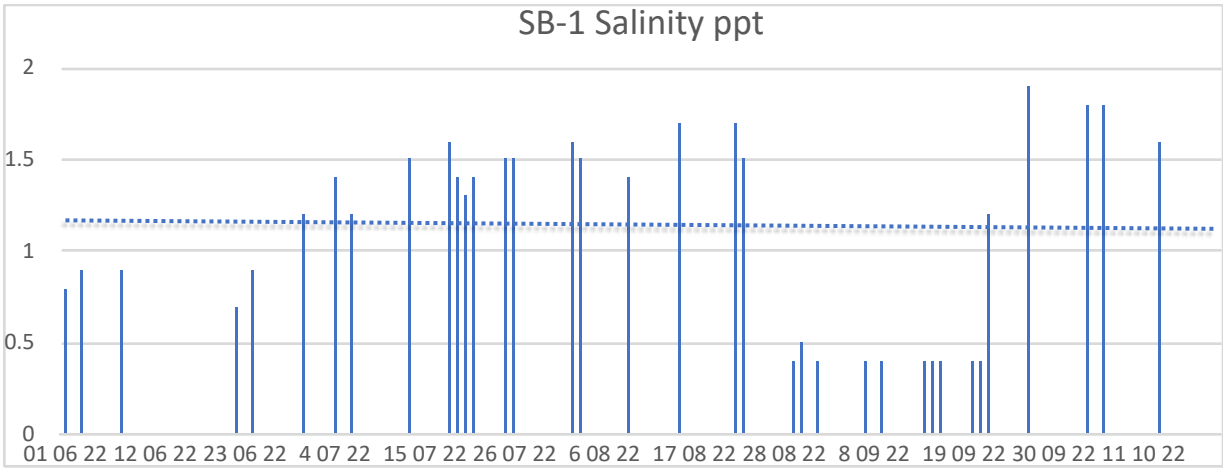

SB-1 Conductivity
4
3
2
1
0
01 06 22 12 06 22 23 06 22 4 07 22 15 07 22 26 07 22 6 08 22 17 08 22 28 08 22 8 09 22 19 09 22 30 09 22 11 10 22


SB-1 NTU
1
0
0
0
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


SB-1 DO%
100
75
50
25
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22


SB-1 DO mg/L
11
8.25
5.5
2.75
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22

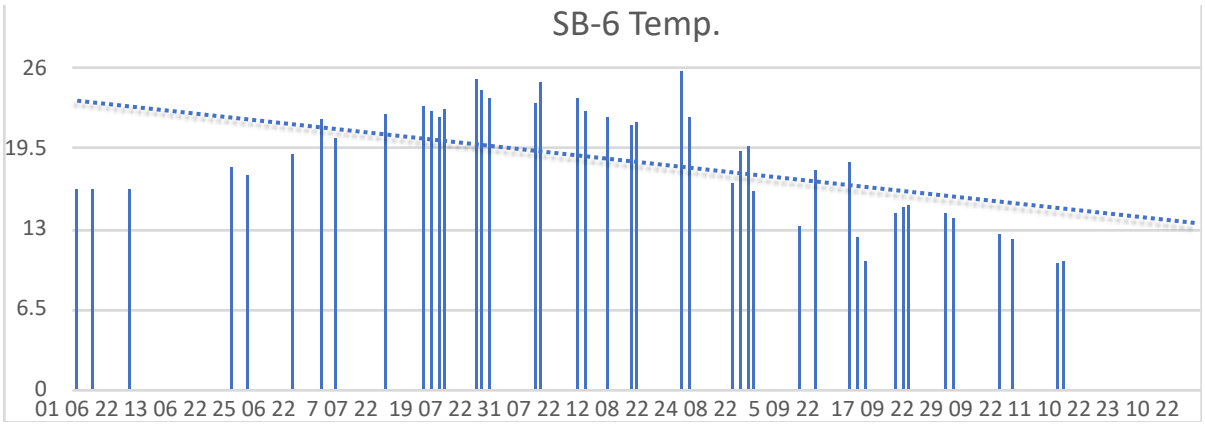

SB-1 TDS
2.4
1.8
1.2
0.6
0
01 06 22 12 06 22 23 06 22 4 07 22 15 07 22 26 07 22 6 08 22 17 08 22 28 08 22 8 09 22 19 09 22 30 09 22 11 10 22


SB-1 Salinity ppt
2
1.5
1
0.5
0
01 06 22 12 06 22 23 06 22 4 07 22 15 07 22 26 07 22 6 08 22 17 08 22 28 08 22 8 09 22 19 09 22 30 09 22 11 10 22

- Water quality data readings for location SB-6

2022 Water Quality Data SB-6

Date	Time	Location	Temp.	pH	ORP	ms/cm	NTU	D.O. %	D.O. mg./L	TDS	ppt	ot	Comments
01-Jun	10:30	SB6	16.19	7.66	193	2.09	0	101.47	9.98	1.34	1.1		
03-Jun	10:30	SB6	16.32	8.15	176	1.01	0	112.46	11.03	0.606	0.5		
08-Jun	10:35	SB6	16.34	7.7	144	2.42	0	94.55	9.27	1.55	1.2		
22-Jun	1 50	SB-6	18.02	7.66	107	2.55	0	112.28	10.63	1.63	1.3		1080 TDS
24-Jun	10:16	SB6	17.24	7.61	182	2.59	0	101.24	9.74	1.65	1.3		
30-Jun	9:55	SB6	19.15	8.04	176	2.75	0	92.63	8.57	1.76	1.4		
04-Jul	1:31	S6	21.79	7.5	144	2.95	0	97.26	8.54	1.89	1.5		
06-Jul	10:25	SB6	20.41	7.45	138	2.4	0	92.56	8.35	1.55	1.3		
13-Jul	1:34	SB6	22.27	7.4	181	3.25	0	98.39	8.68	2.08	1.7		
18-Jul	11:20	SB6	22.98	7.45	160	3.37	0	94.73	8.13	2.16	1.8		
19-Jul	10:37	SB6	22.51	7.45	146	3.32	0	93.42	8.09	2.13	1.7		Rain
20-Jul	10:05	SB6	22.1	7.37	169	3.41	0	90.17	7.87	2.18	1.8		1690 TDS
21-Jul	10:12	SB6	22.84	7.4	139	3.42	0	93.67	8.06	2.19	1.8		1650 TDS
25-Jul	10:35	SB6	25.1	7.35	161	3.49	0	89.61	7.39	2.24	1.8		1738 TDS
26-Jul	10:20	SB6	24.15	7.27	115	3.59	5.3	79.7	6.69	2.3	1.9		
27-Jul	10:01	SB6	23.66	7.24	105	3.61	13.8	86.52	7.33	2.31	1.9		
02-Aug	10:10	SB6	23.24	7.11	106	3.69	0	91.92	7.85	2.36	1.9		
03-Aug	1:51	SB6	24.96	7.17	35	3.76	0	84.18	6.96	2.41	2		
08-Aug	10.46	SB6	23.7	7.13	116	3.8	0	92.37	7.82	2.43	2		
09-Aug	1:58	SB6	22.62	7.45	164	3.81	0	92.69	8.01	2.44	2		
12-Aug	10:37	SB6	22.04	7.17	224	3.93	0	88.58	7.74	2.52	2.1		
15-Aug	10:16	SB6	21.5	7.45	202	3.78	0	89.46	7.9	2.42	1.8		
16-Aug	2:00	SB6	21.55	6.15	208	3.38	0	113.81	10.04	2.16	1.8		
22-Aug	1:40	SB6	25.8	7.07	214	3.84	0	88.8	7.23	2.46	2		
23-Aug	10:31	SB6	22.07	6.25	187	3.55	0	82.9	7.24	2.27	1.9		Low level and flow
29-Aug	1:52	SB6	16.62	4.43	256	2.62	0	77.67	7.57	1.68	1.3		
30-Aug	1:50	SB6	19.23	4.06	273	2.6	0	65.93	6.09	1.66	1.3		
31-Aug	2:00	SB6	19.77	3.57	299	2.64	0	70.37	6.43	1.69	1.4		
31-Aug	2:46	SB6	20.95	6.16	218	0.962	0	85.03	7.59	0.615	0.5		
01-Sep	10:49	SB6	15.93	4.46	314	2.69	0	89.28	8.83	1.72	1.4		990 TDS
07-Sep	10:28	SB6	13.16	3.98	287	2.78	0	84.45	8.87	1.78	1.4		1000 TDS
07-Sep	3:10	SB6	16.6	3.25	282	2.73	0	81.12	7.91	1.75	1.4		1090 TDS
09-Sep	2:00	SB6	17.85	3.26	323	2.77	0	83.89	7.97	1.77	1.4		
14-Sep	10:22	SB6	18.44	3.17	336	2.84	0	75.75	7.11	1.82	1.5		
15-Sep	10:38	SB6	12.35	4.07	306	2.9	0	88.92	9.51	1.82	1.5		
16-Sep	10:37	SB6	10.43	3.77	378	2.94	0	93.23	10.42	1.88	1.5		
20-Sep	2:02	SB6	14.23	3.95	298	3.12	0	93.58	9.6	2	1.6		
21-Sep	2:10	SB6	14.66	6.91	267	3.85	0	92.59	9.41	2.46	2		Water Output Began Again
22-Sep	2:30	SB6	15.02	6.7	264	4.08	0	95.99	9.68	2.61	2.2		
27-Sep	10:59	SB6	14.3	6.71	207	4.1	0	107.78	11.04	2.63	2.2		
28-Sep	10:50	SB6	13.8	6.32	173	4.01	0	86.81	8.99	2.44	2		
04-Oct	11:11	SB6	12.51	6.5	274	4.05	0	91.11	9.71	2.51	2.3		
06-Oct	10:20	SB6	12.25	6.27	254	4.24	0	89.46	9.59	2.72	2.2		
12-Oct	2:50	SB6	10.24	5.44	246	3.44	0	91.92	10.32	2.2	1.8		
13-Oct	10:36	SB6	10.36	5.12	267	3.2	0	74.76	8.37	2.05	1.6		


SB-6 Temp.
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13
6.5
0
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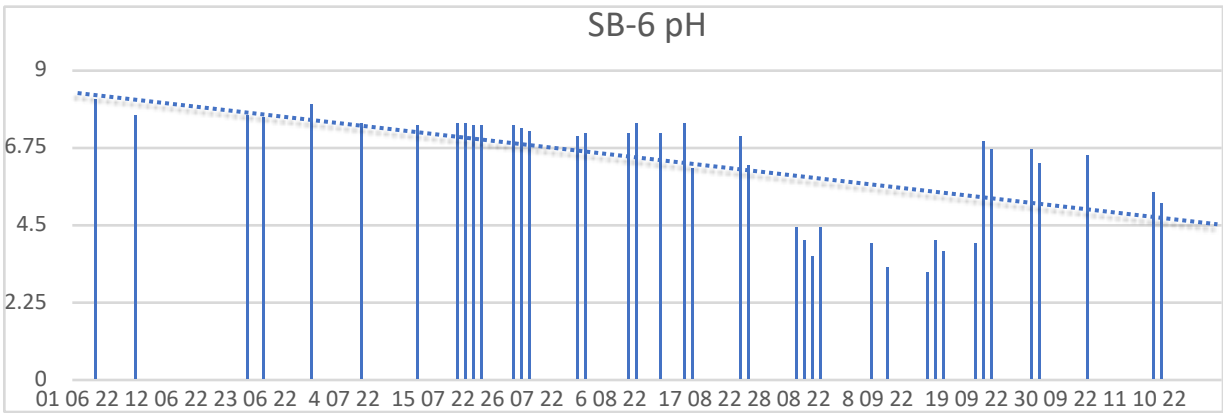
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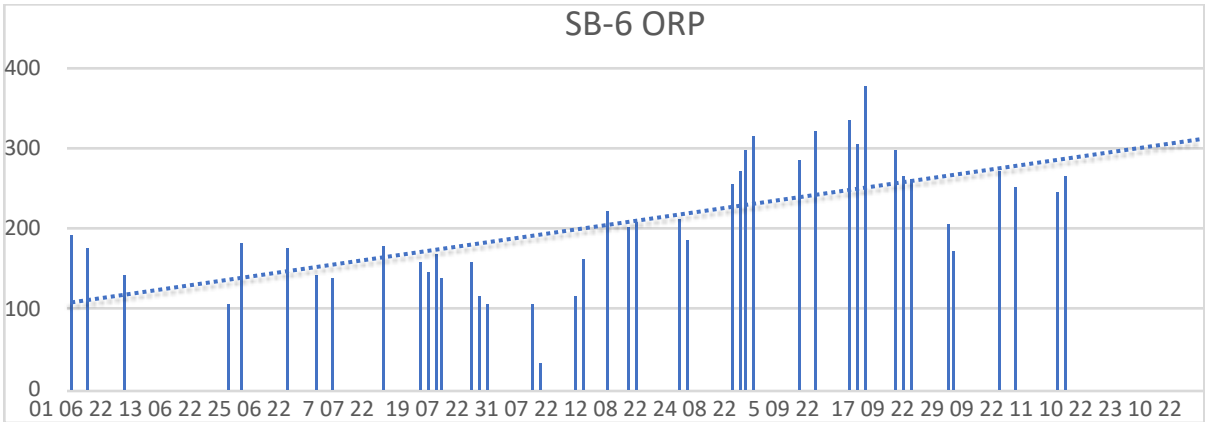
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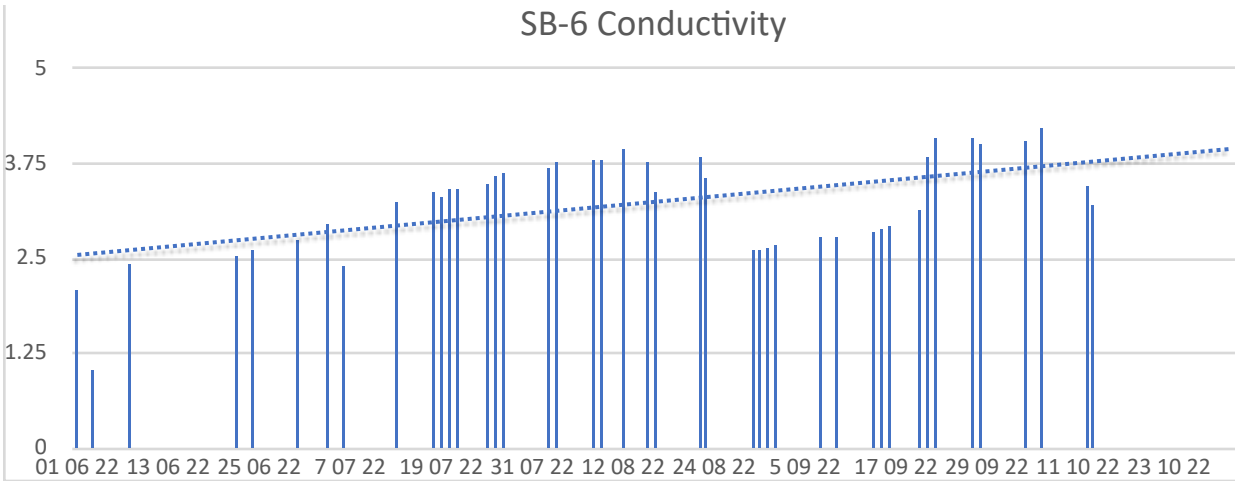
SB-6 Conductivity
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3.75
2.5
1.25
0
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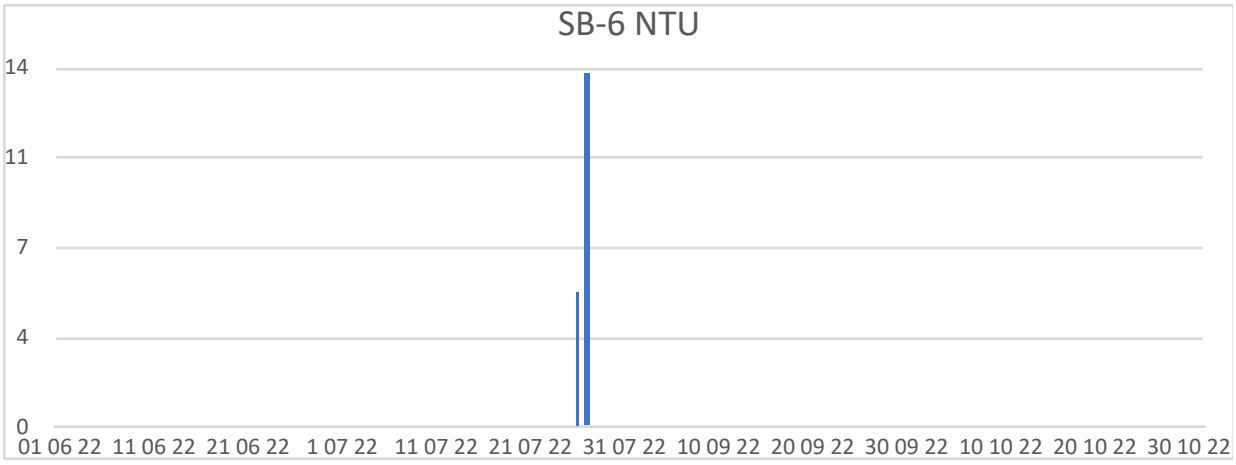
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7
4
0
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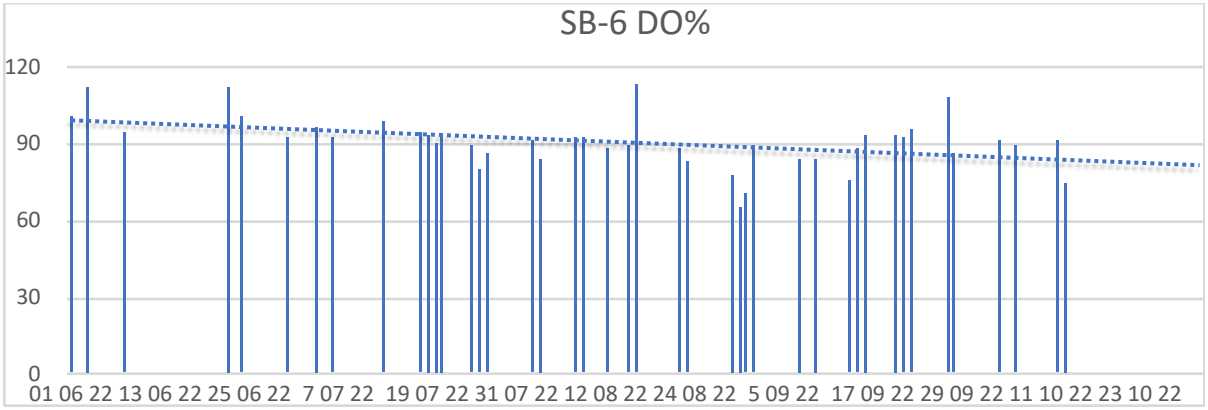
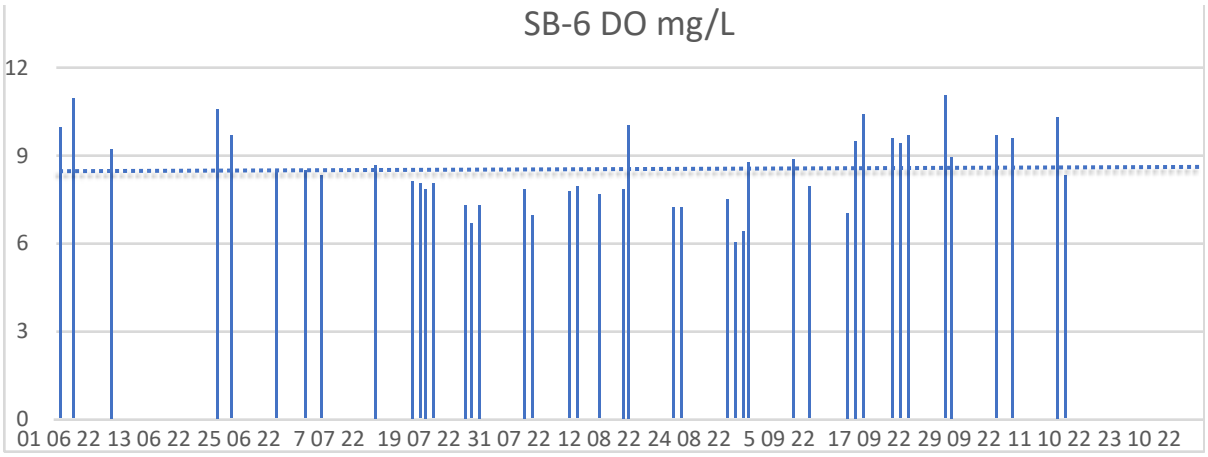
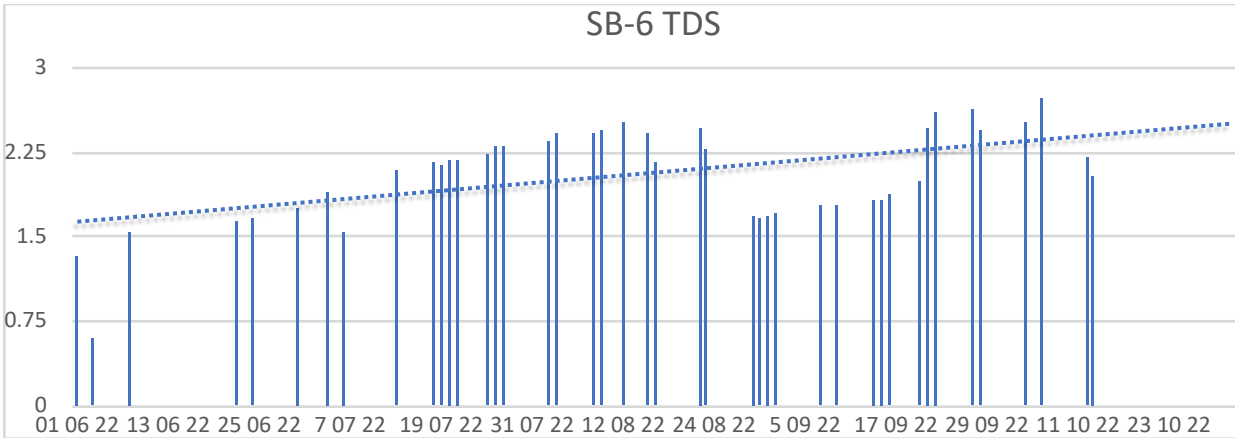
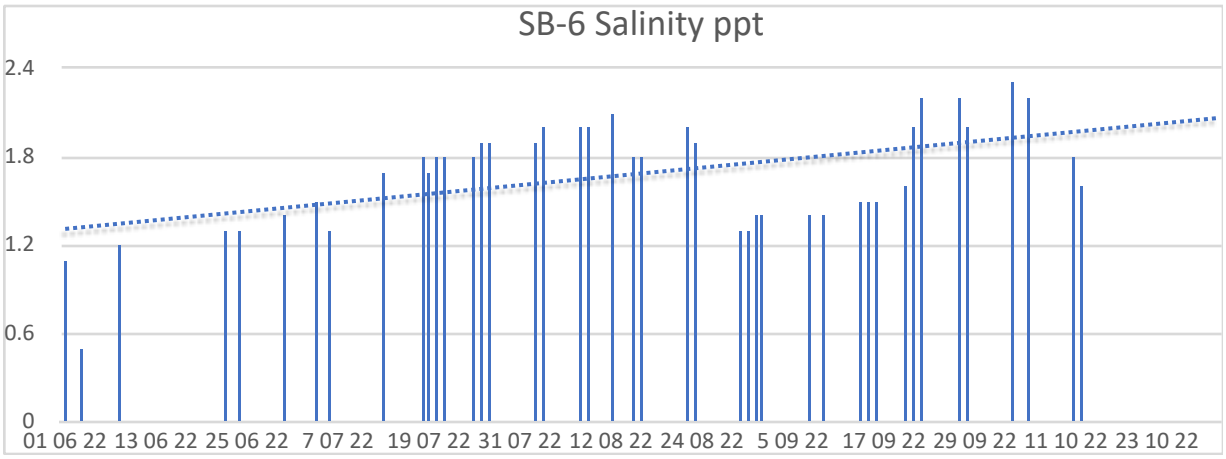

SB-6 DO%
120
90
60
30
0
01 06 22 13 06 22 25 06 22 7 07 22 19 07 22 31 07 22 12 08 22 24 08 22 5 09 22 17 09 22 29 09 22 11 10 22 23 10 22







In addition to water temperature readings, 3 - HOBO™ thermal data loggers have been installed on June 1st to late October in 3 strategic locations on NB-13 (**Figure 2**), SB-1 (**Figure 3**) and LR-9 (**Figure 4**). Note that the data logger on NB-13 was missing during the period of June 1st. until replaced on July 25th.

Figure 2 – NB-13 location

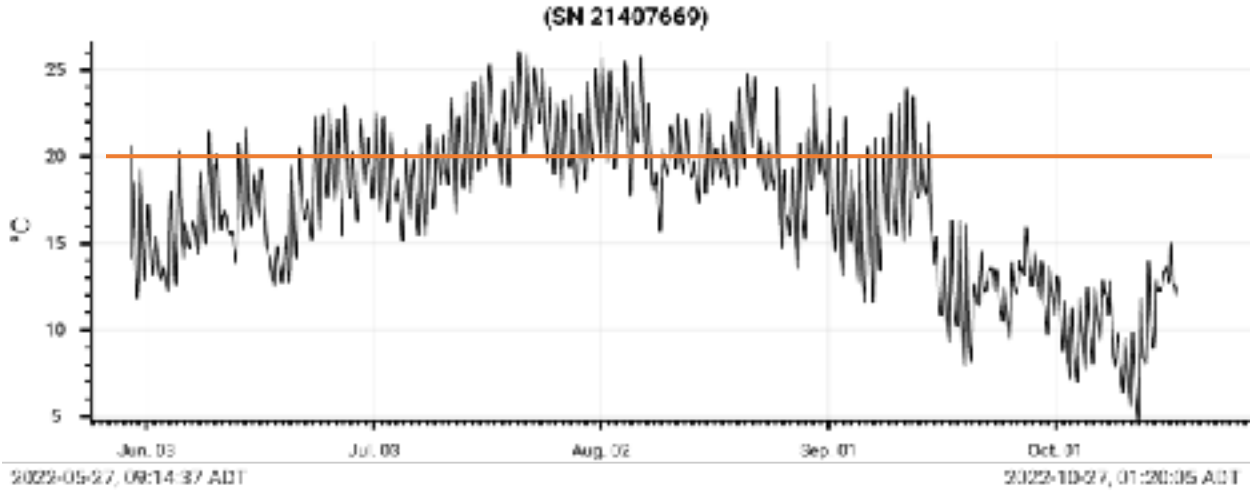


Figure 3 – SB-1 location

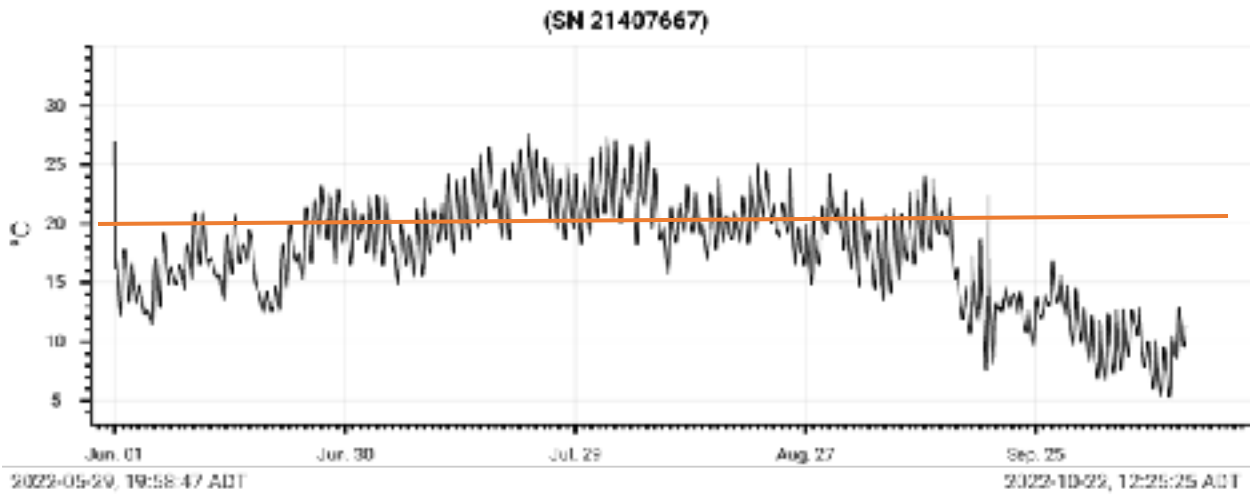


Figure 4 – NB-9 Location

-TDS and Conductivity variations on the South branch of the Little River

The following charts **Figure 5** July 20th and **Figure 6** September 7th indicate the fluxuation of TDS (total dissolved solid) observed over the season, this reflect the variation of data recorded.

It has been observed during the maintenance activities from the former Brunswick Mine #12 area water treatment plant that flows into the South branch of the Little River.

On July 20th the TDS readings on station SB-6 is 1690 ppm, SB-1 is 1000 ppm downstream. On September 7th, the SB-6 location has reduced to 1000 ppm and SB-1 has reduced to 361 ppm. These high numbers influenced the TDS readings on the main stem, I.e.; Station LR-1 indicated on July 20th to be 464 ppm, and on September 7th 136 ppm.

On the North Branch of the Little River, the TDS readings

Knowing that the South branch of the Little River has been constructed by Brunswick mining operation, to drain the treated was from the water treatment plant. This impacted water quality on the main stem of the Little River, including aquatic life.

Heavy sedimentation is observed in the South Branch of the Little River, during electrofishing activities. Shown on **Photo – 3** is the accumulation of sedimentation on the net for fish capture of electrofishing session on site SB-1, of only 30 minutes of installation.

On **Figure 7**, very high conductivity readings are recorded and impact electrofishing challenges in these areas from SB-6 to LR-1 on July 20th.

For example, we operated at 500 volts on the North Branch of the Little River, and reduced the voltage to 150 volts for the South Branch of the Little River, due to very high conductivity. This has reduced possible catch of fish in these areas.

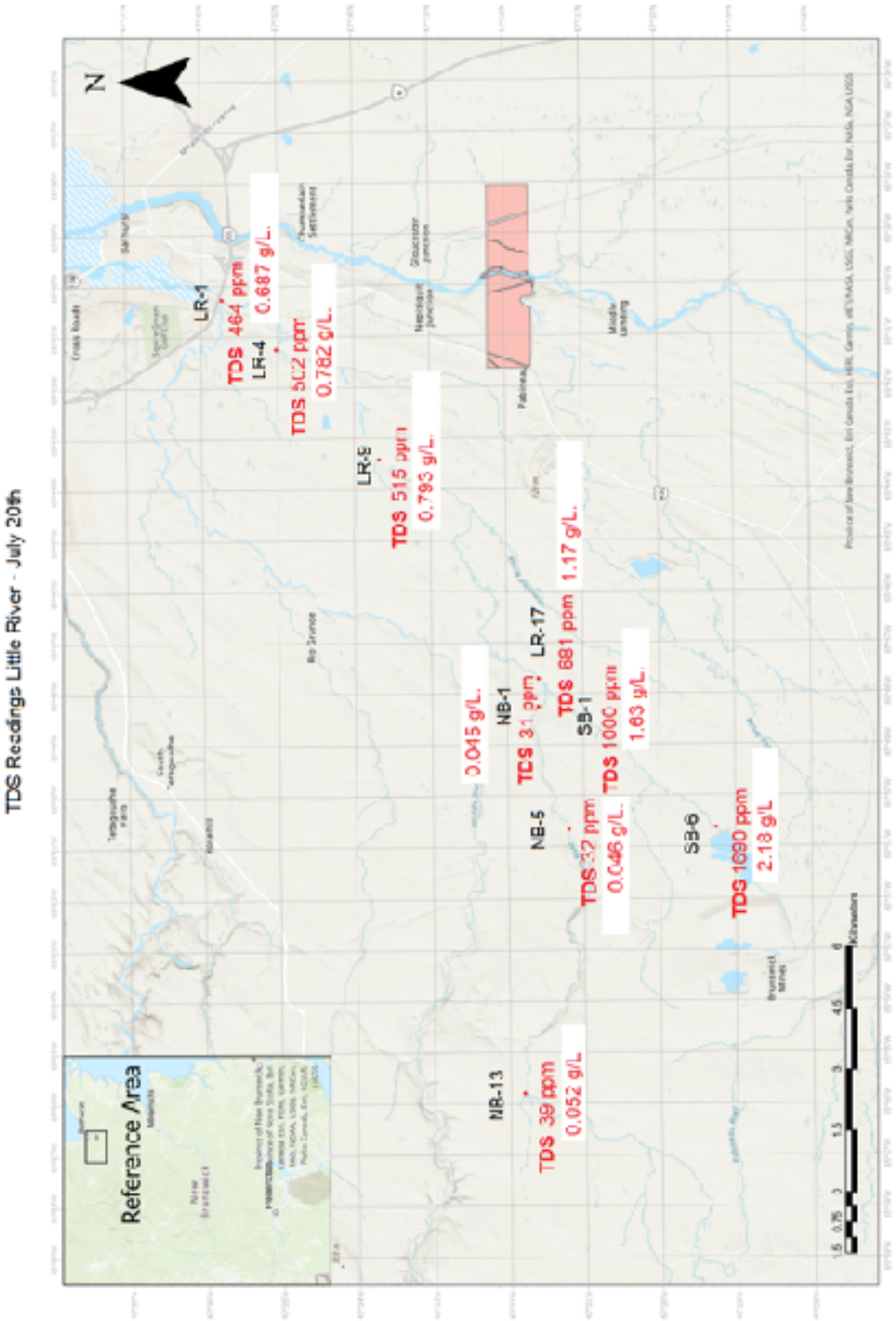


Figure 5 – July 2th TDS Readings

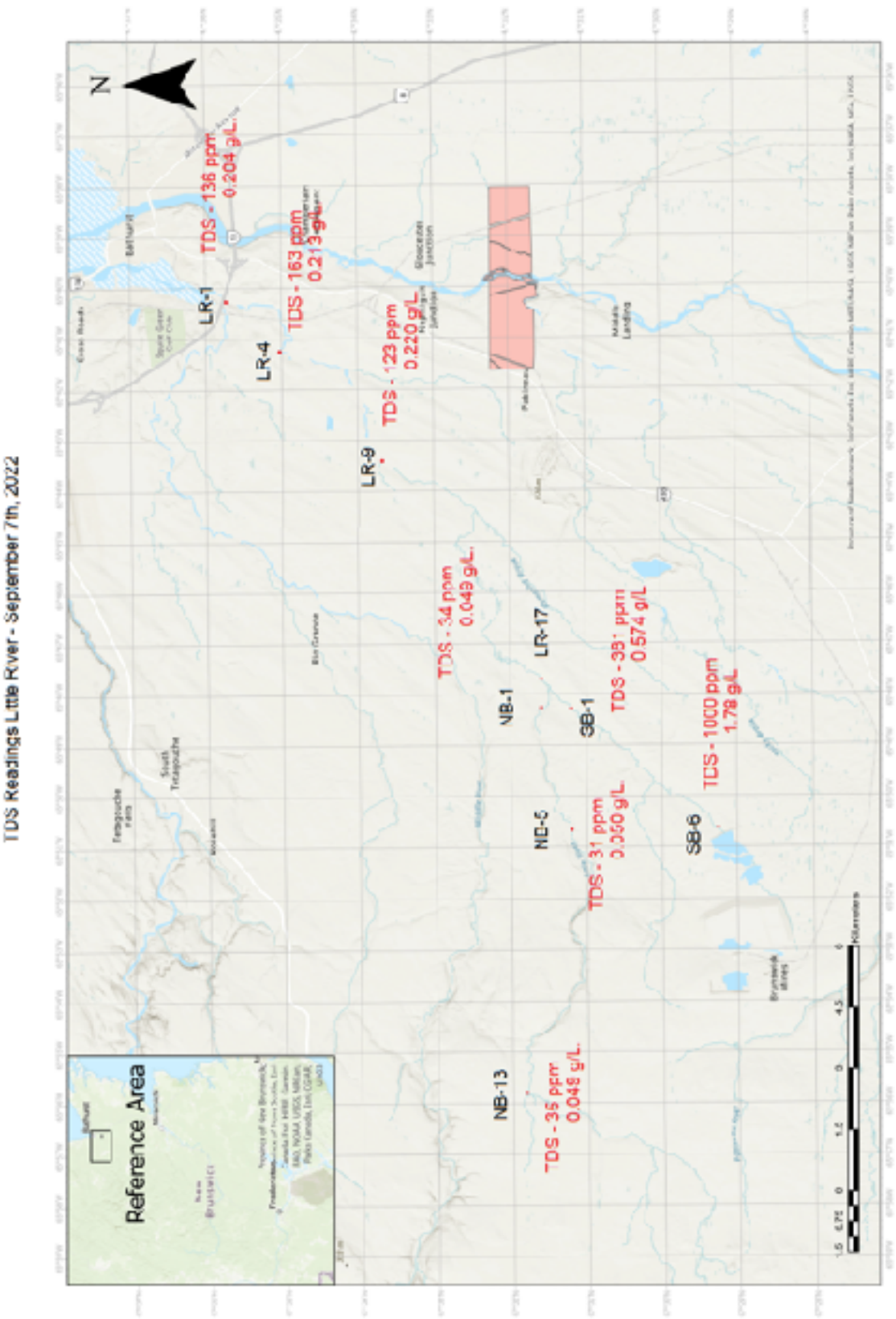


Figure 6 – September 7th TDS Readings

Indicated below in **Photo 1** and **Photo 2** is the variance of water flow and water depth at the SB-6 station.

Photo 1 - SB-6 Location

Photo 2 - SB-6 Location

On July 27th, a water sample have been taken to compare other physio-chemical water testing with magnesium and Iron readings from LR-1 station, SB-1 and SB-6 station. It is apparent that these readings are of concern where data shows consistent increase of iron and magnesium deposits downstream to LR-1 station. NB- 1 Station parameters are shown for base reference.

LR-1	Fe - 0.40	Mn - 0.462
SB-1	Fe – 0.53	Mn - 0.800 (over limit)
SB-6	Fe – 0.10	Mn - 0.352
NB-1	**Fe – 0.03**	**Mn – 0.050**

Photo 3- SB-1 Location, note the high water upstream due to sedimentation blocking the catch net.

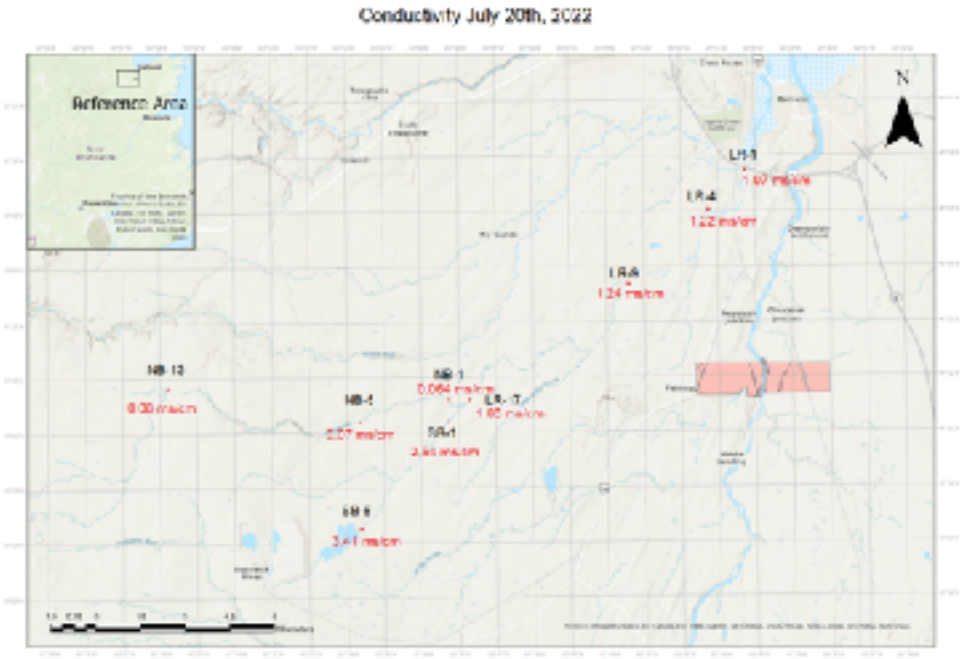


Figure 7 – Conductivity July 20th, 2022

Little River Electrofishing Report 2022

Electrofishing procedures

The electrofishing procedures are as follows. A suitable habitat is first chosen. It is recommended to choose a habitat that has small riffles, which may contain fry and somewhat deeper water (up to 24”) and faster flowing as it may contain parr. Once a site is established, the lower or downstream barrier is placed first. The edge of the net is usually tied to the shore on a branch or sometimes held in place with large rocks.

A section of net is unrolled to give ample working space but not too much as the current can pull the net downstream. Large rocks are placed on the burlap fringe on the upstream side ensuring that the rocks cover the burlap edge.

When the small section of netting is installed, unroll the barrier net in a small length and repeat the procedure (**Figure 1**). When enough netting is installed, a person can begin installing the crutch sticks, one stick upstream and one stick downstream, holding up the net. Rope hoops are built into the nets which are dedicated for the crutch sticks.

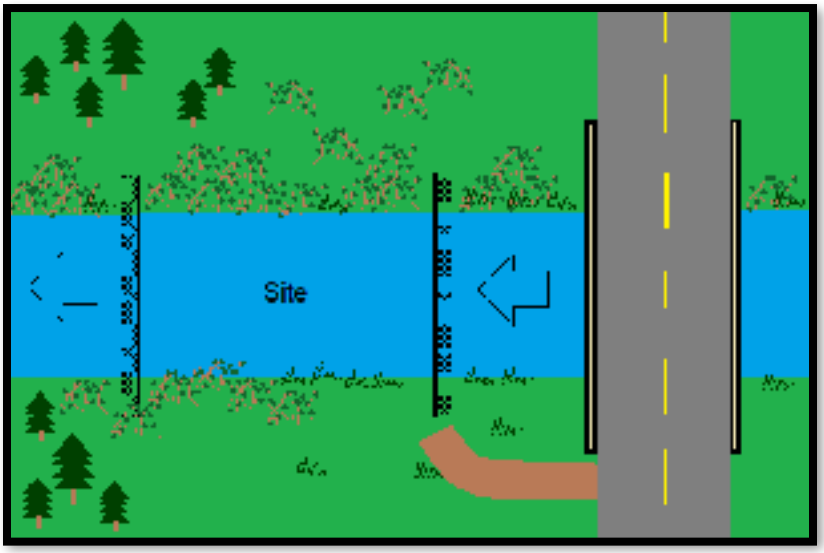
Ensure that there is no place the burlap is not touching the bottom of the river as this can become an entry or escape point for the fish. It becomes easier if one person holds the large net, another stays on the inside of the study site to place the rocks and the rest of the team collects the rocks for the burlap. Repeat this procedure until the entire net is installed and the burlap is covered in rocks and that the net is standing upright.

Try walking on the edge of the river or grass while moving to the installation to the upper barrier. This is important as to not walk into the study area during the procedure disturbing any fish. The same procedure is followed for the upper barrier only the burlap is folded towards the downstream side of the site so both burlaps become folded in towards the study area.

The above procedure can be applied to streams or brooks of considerable smaller stature but for larger or wider river or streams barriers should be placed in a rectangular fashion. All of the burlap should end up folded into the study site. Usually, two nets are used and overlapped at some point to have a continuation of the barrier nets. Approximately 100 m^2 is targeted for an electrofishing study in any way the nets are setup or how narrow the stream maybe.

Observation and recording of water velocity have been recorded through the season, this is a best practice method. This will indicate if water velocity is greater than 5 feet per second, electrofishing cannot be efficiently effective for comparative data with other sites.

Figure 1



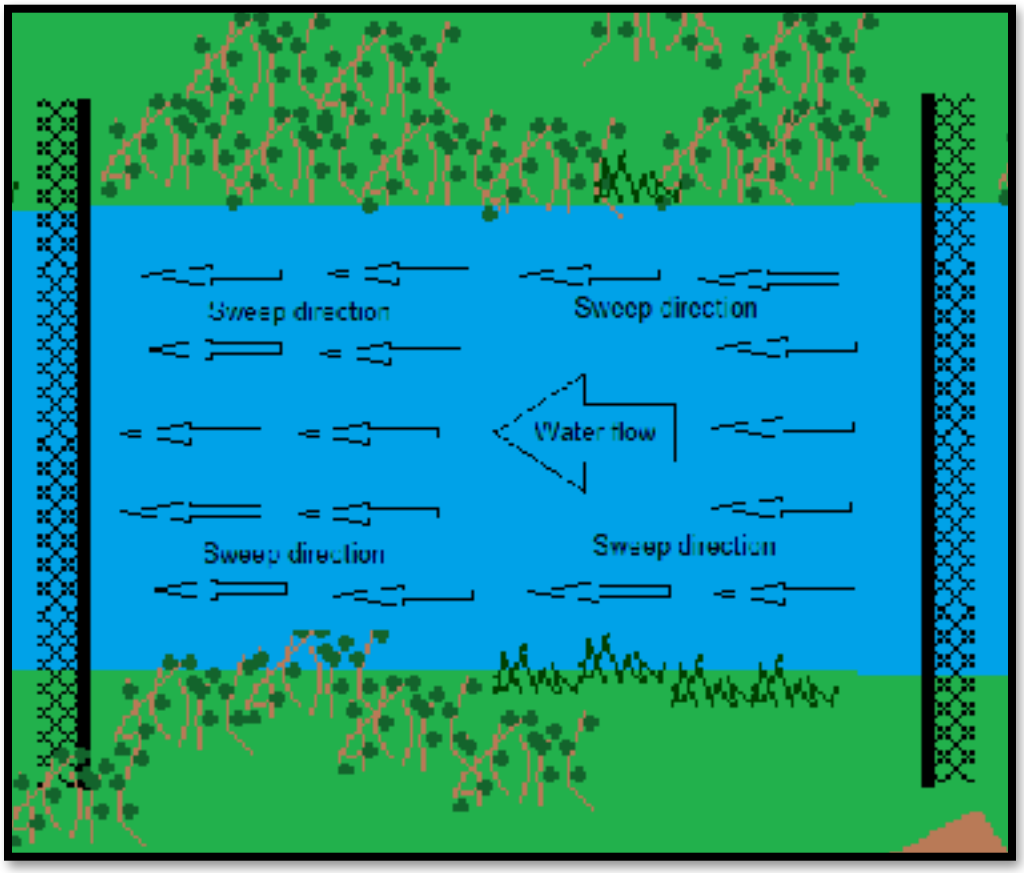
Typical site layout

Once the nets are installed begin setting up the electrofishing unit. The ground cable is attached to the “cathode” plug and the probe (long fiberglass wand with a ring on the end) is attached to the “anode”. Ensure that the power switch is on the off position during the installation of the battery.

The electrofishing unit is usually set in specific settings which are found on the side of the unit depending on the site. The settings are usually PULSE RATE and DUTY CYCLE. The voltage switch is the one that changes the most during the season. To determine what voltage the unit needs to be set, first start at a lower voltage for example 250 volts. Start a shocking test outside the enclosure to observe fish reaction. Do not touch the wand to the ground wire. ALWAYS read the manual before use, and have a formal training certificate. Also basic first aid & CPR is mandatory.

Electrofishing begins at the bottom barrier working from one side of the river to the other side following the downstream net (**Figure 2**). First the person with the back pack always sweeps with the water direction starting upstream towards the bottom barrier net. One person should be walking with the dip net downstream of the wearer of the back pack to collect the stunned fish that either floats in the water or have been held against the bottom barrier net. The two person team with the apron net should follow behind until the entire bottom barrier net has been cleared.

Figure 2



Typical sweep direction into net

The collected fish go into a 5-gallon pail with holes perforated at the upper half of the pail. This is done so that the perforations can allow water exchange at times maintaining good oxygen conditions. Once the bottom barrier has been fished, the two-person team with the apron net, setup the net in an angle to the water as to create a pocket. The person with the dip net should be placed between the back pack wearer and the apron net as to collect the stunned fish. The shocking array is most effective within 2ft radius around the probe which means three passes should be done before moving the apron net laterally. Once the entire width of the study area has been cleared move upstream to approximately where the wand started shocking the previous pass. This is done to ensure that the entire study surface has been shocked.

Once the first sweep has been completed two people can measure and record the length of the fish captured. The salmon parr, salmon fry and all trout are usually measured and the other species only counted. The measurements must be accurate and taken at the inside of the forked tail and not the total length of the fish.

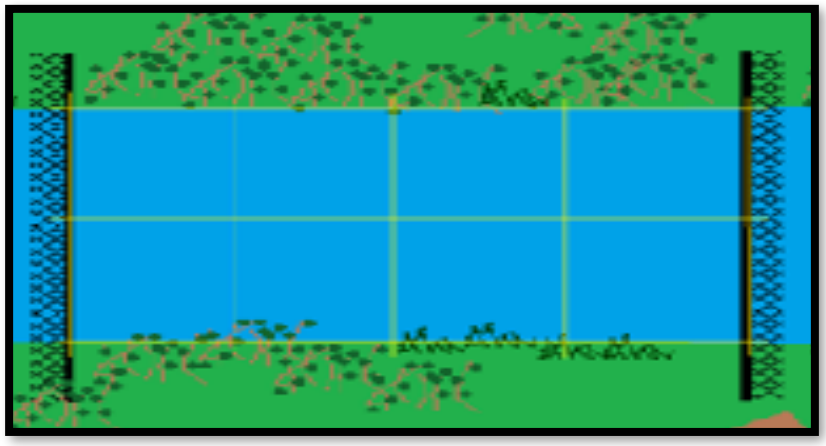
The barrier nets should always be standing up during the sweeps to hold back the fish inside the study area. If at any time the barrier nets fall down into the study area, possibly due to high water or fallen crutch sticks, the entire site shall be taken down. The location can be studied again at 2 to 4 weeks later to let fish reclaim its habitat.

The total number of fish captured per sweep should reduce at every sweep for a total of three sweeps. If the total number of fry and parr diminish three times ex; (sweep 1 = 32 parr, sweep 2 = 17 parr, sweep 3 = 5 parr) this means the study has been successful. If the total number of parr and fry do not diminish three times additional sweeps are required until the total number is in reduction three times. It is important to not take down the site until the total number parr and fry have been measured and counted. If the total number of fish does not decrease, check the bottom of the barrier nets to ensure they have been secured with rocks and have no loose area.

There are two types of nets used during the electrofishing study. There are two rolls of 100ft long nets and two rolls of 50ft long nets. Combinations of these nets are used to accomplish the approximate 100 square meter area required for the electrofishing study area.

There are other parameters observed during electrofishing studies. Such parameters are water depth measurements. 20 measurements are recorded within the electrofishing site after the three sweeps have been completed and the fish are all measured. Total lengths are taken three times, one on each side and one in the center (**Figure 3**). Total widths are also measured five times dividing the site in equal parts. These lengths and widths are added to the field sheets which are later used to determine the total dimension of the electrofishing site in square meters.

Figure 3



Typical measuring grid

Open site procedure: if used

This mythology is used when areas in the river are wider than the nets applied, in some cases this method assures less habitat disturbance for verification when electrofishing.

Electrofishing conversion in an open site using one sweep is as follows;

- Number of fish caught greater than 10 add 65%
- Number of fish caught less than 10 add 30%

Ex. 9 fry % used 30% = 30 30 X 533.8 sq./m. X 100 = 5.62 fry per sq./m.

- **Little River Electrofishing Results for 2022**

This year Pabineau First Nation has included in the water quality assessment of the Little River with electrofishing study for the Atlantic salmon, our aquaculture technician has undertaken a comprehensive electrofishing certification course at the University of New-Brunswick (UNB) in conjunction with the Canadian River Institute. This ensured a safe operational method for all employees while ensuring fish health during the process.

Application for a Section 52 permit for electrofishing to the Department of Fisheries and Oceans was submitted in April of 2022, and was accepted in mid-July for work to begin.

The electrofishing study was carried out on the Little River (4 sites), water temperature was very high during the summer and with air temperature of over 30°C there was an impact on the work for crew due to high heat.

We have implemented water velocity parameters to ensure proper operation and consistent data recording without compromising fish capture.

Table 1 shows the captured fry and parr density for all sites which are found on each individual electrofishing sheet.

Electrofishing results were tabulated and are shown in **Table 2,** shown as total factored density per 100m². On the North Branch of the Little River.

Graph 1 shows the overall factored result for every electrofishing site for every year the studies were completed, it also indicates the stocking impact of Atlantic salmon fry stocked in 2020 and 2021.

The water depth in each electrofishing site was measured, recorded and averaged directly on the field sheets.

Salmon age is categorized by its length (fry being 3.1cm to 5.5cm), (parr 1+ being 5.6cm to 10.5cm) and (parr 2+ being bigger than 10.5cm). The parr densities for the 1+ and 2+ were added together, as a whole due to the insignificant number of 2+ found. The electrofishing study enumerated the Atlantic salmon but also other species within each site. These other species include black nose dace, lamprey eels, American eels, shiners, trout, sticklebacks and suckers. The percentage of captured Atlantic salmon vs other species were tabulated for each site and then combined for an overall result. Summaries for other species caught at each site are included in **Table 3**.

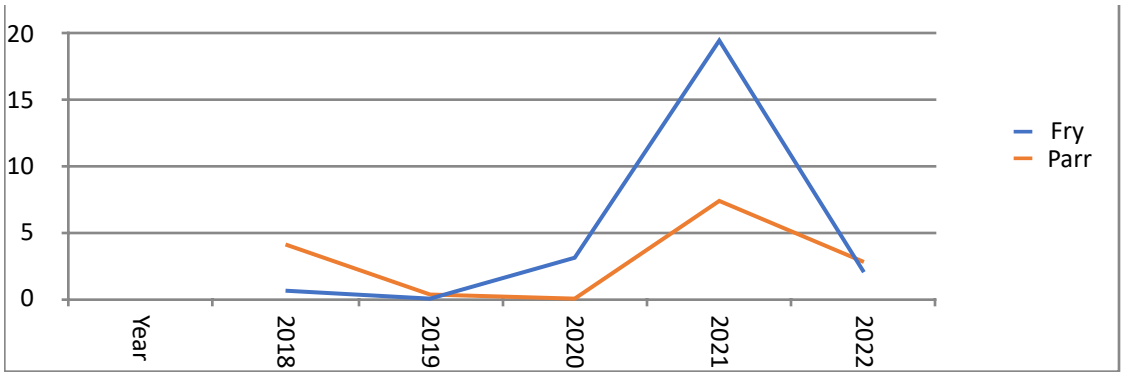
STREAM	SITE	MONTH	Total m²	FRY 100m²	PARR 100m²
Little River - NB	NB-1 Station	August.	199.64	0	2.72
	NB-5 Station	July	226.98	6.19	4.77
	NB-13 Station	August	275.37	0	1.17
Little River - SB	SB-6 Station	August	177.03	0	0

Table 1 – Tabulated fry and parr densities

Table 2: North Branch of Little River total factored fry and parr density / 100m²

Site #	total (m²)	Fry/100m²		Parr/100m²		Fry Factored	Parr Factored
NB-1	199.64	0	0	2.72	543.02		
NB-5	226.98	6.19	1405.01	4.77	1082.69		
NB-13	275.37	0	0	1.17	322.18		
	701.99		1405.01		1947.89	**2.00**	**2.77**

1405.01 ÷ 701.99 = **2.00** 1947.89 ÷ 701.99 = **2.77**



Total Factored Density 100m² Fry and Parr Little River / Year

Graph 1 - Total Factored Density 100m² Fry and Parr Little River / Year

STREAM	SITE	Dace (*Leucisus leucus cus*)	Shiner (*Notropis macalatus*)	Lamprey Eel (*Petromyzon marinus*)	American Eel (*Anguilla rostrata*)	Creek Chub (*Semotilus atromaculatus*)	Trout (*Salvinus frontalatis*)	Sucker (*Catostomus catostomus*)	Stickel Back	Salamander
Little River	NB-1	88	17	1	1	0	1	2	0	0
	NB-5	126	7	1	1	0	6	2	0	0
	NB-13	23	2	0	9	0	1	2	0	0
	SB-1	0	0	0	5	0	0	0	0	0
	Total	**237**	**26**	**2**	**16**	**0**	**8**	**6**	**0**	**0**

Table 3 - Summaries for other species caught at each site.

Electrofishing NB-1.xlsx

ELECTROFISHING DATA LITTLE RIVER NB-1

System:	Station:	Recorder:	Date:
Little River	NB-1	Eric Guignard	10-Aug-22

# Sweep / Time		1 Min. 14	2 Min. 14	3 Min. 18	4 Min. 11
Species: *Salmo salar* **Salmon Fry** **3.1 - 5.5 cm**					
Total =	0	0	0	0	0
Species: *Salmo salar*					

Salmon Parr **5.6 - 10.5 cm** Total =	9	4	2	3	0
Species: *Leuciscus leucuscus* **Dace** Total =	88	32	30	17	9
Species: *Petromyzon marinus* **Lamprey Eels** Total =	1	0	1	0	0
Species: *Notropis maculatus* **Shiners** Total =	17	9	3	4	1
Species: *Salvinus fontinalis* **Trout** Total =	1	0	1	0	0
Species: **Sucker**					

Total =	2	0	1	0	1
Species: **American Eel**					
Total =	1	1	0	0	0

Lenghts	Widths	Flow Rate
Left Bank	Lr. Barrier	sec./meter
32	6.8	3.76
	7.3	3.76
33	6.7	3.76
	5.6	Average
Right Bank	Up. Barrier	3.76
28	5.8	sec./meter
Average		Sq. Meters
31	6.44	199.64

Depths (cm)					
Up Stream Barrier					
25	18	18	9	Total	70
11	12	20	15	Total	58
15	21	29	28	Total	93
10	17	23	31	Total	81
27	45	48	30	Total	150
Down Stream Barrier					
Max. Depth		Average depths			Total
48		22.6			452

Little River		NB-1		Eric Guignard	10-Aug-22	
	cm	Sweep 1	Sweep 2	Sweep 3	Sweep 4	Total
0+	2.6-3.0					0
	3.1-3.5					0
	3.6-4.0					0
	4.1-4.5					0
	4.6-5.0					0
0	5.1-5.5					0
	5.6-6.0		1			1
	6.1-6.5					0
	6.6-7.0					0

1+	7.1-7.5					0
	7.6-8.0					0
	8.1-8.5					0
	8.6-9.0					0
	9.6-10.0	2		1		3
5	10.1-10.5	1				1
2+	10.6-11.0		1			1
	11.1-11.5			2		2
	11.6-12.0					0
	12.1-12.5	1				1
	12.6-13.0					0
	13.1-13.5					0
	13.6-14.0					0
	14.1-14.5					0
	14.6-15.0					0
	15.1-15.5					0
	15.6-16.0					0
	16.1-16.5					0
	16.6-17.0					0
	17.1-17.5					0
4	17.6-18.0					0

Electrofishing NB-5.xlsx

ELECTROFISHING DATA LITTLE RIVER NB-5

System:	Station:	Recorder:	Date:
Little River	NB-5	Eric Guignard	16-Aug-22

# Sweep / Time	1	Min. 23	2	Min. 19	3	Min. 18	4	Min.
Species: *Salmo salar*								

Salmon Fry **3.1 - 5.5 cm** Total =	0	0	0	0	
Species: *Salmo salar* **Salmon Parr** **5.6 - 10.5 cm** Total =	3	2	1	0	
Species: *Leuciscus leucuscus* **Dace** Total =	126	69	37	20	
Species: *Petromyzon marinus* **Lamprey Eels** Total =	1	0	1	0	
Species: *Notropis maculatus* **Shiners** Total =	7	5	2	0	
Species: *Salvinus fontinalis* **Trout**					

Total =	6	6	0	0	
Species: **Sucker**					
Total =	2	1	1	0	
Species: **American Eel**					
Total =	1	0	1	0	

Lenghts	Widths	Flow Rate
Left Bank	Lr. Barrier	sec./meter
41.1	4.1	3.88
	12.6	3.47
41.1	5.5	5.04
	5.8	Average
Right Bank	Up. Barrier	4.13
41.1	5.5	sec./meter
Average		Sq. Meters
41.1	6.7	275.37

Depths (cm)					
Up Stream Barrier					
13	10	11	11	Total	45
41	32	16	8	Total	97
44	17	6	9	Total	76
13	14	12	15	Total	54
11	17	16	12	Total	56
Down Stream Barrier					
Max. Depth		Average depths			Total
44		16.4			328

System:	Station:	Recorder:	Date:
Little River	NB-5	Eric Guignard	16-Aug-22

	cm	Sweep 1	Sweep 2	Sweep 3	Sweep 4	Total
0+	2.6-3.0					0
	3.1-3.5					0
	3.6-4.0					0
	4.1-4.5					0
	4.6-5.0					0
0	5.1-5.5					0
1+	5.6-6.0					0
	6.1-6.5					0
	6.6-7.0					0
	7.1-7.5					0
	7.6-8.0					0
	8.1-8.5					0
	8.6-9.0					0
	9.6-10.0					0
0	10.1-10.5					0
2+	10.6-11.0	1				1
	11.1-11.5	1				1
	11.6-12.0		1			1
	12.1-12.5					0
	12.6-13.0					0
	13.1-13.5					0
	13.6-14.0					0
	14.1-14.5					0
	14.6-15.0					0
	15.1-15.5					0
	15.6-16.0					0
	16.1-16.5					0
	16.6-17.0					0
	17.1-17.5					0
3	17.6-18.0					0

ELECTROFISHING DATA LITTLE RIVER NB-13

# Sweep / Time		1	Min. 31	2	Min. 30	3	Min. 26	4	Min.
Species: *Salmo salar* **Salmon Fry** **3.1 - 5.5 cm**									
Total =	13		8		3		2		
Species: *Salmo salar* **Salmon Parr** **5.6 - 10.5 cm**									
Total =	9		5		2		2		
Species: *Leuciscus leucuscus* **Dace**									
Total =	23		9		4		10		
Species: *Petromyzon marinus* **Lamprey Eels**									
Total =	0		0		0		0		
Species: *Notropis maculatus*									

Shiners						
Total =	2	1	0	1		
Species: *Salvinus fontinalis* **Trout**						
Total =	1	0	0	1		
Species: Sucker						
Total =	2	1	0	1		
Species: American Eel						
Total =	9	5	3	1		

Lenghts	Widths	Flow Rate
Left Bank	Lr. Barrier	sec./meter
34.6	6.8	3.88
	6.3	3.47
34.6	5	5.04
	8.9	Average
Right Bank	Up. Barrier	4.13
34.6	5.8	sec./meter
Average		Sq. Meters

Depths (cm)					
Up Stream Barrier					
13	21	39	41	Total	114
11	12	20	15	Total	58
15	21	29	28	Total	93
10	17	23	31	Total	81
27	45	48	30	Total	150
Down Stream Barrier					
Max. Depth		Average depths			Total

34.6	6.56	226.98		48	24.8	496

System:	Station:	Recorder:	Date:
Little River	NB-13	Eric Guignard	14-Jul-22

	cm	Sweep 1	Sweep 2	Sweep 3	Sweep 4	Total
0+	2.6-3.0					0
	3.1-3.5					0
	3.6-4.0					0
	4.1-4.5					0
	4.6-5.0	1	2	2		5
13	5.1-5.5	7	1			8
1+	5.6-6.0					0
	6.1-6.5					0
	6.6-7.0					0
	7.1-7.5					0
	7.6-8.0					0
	8.1-8.5					0
	8.6-9.0	1				1
	9.6-10.0	2		1		3
5	10.1-10.5		1			1
2+	10.6-11.0	1	1	1		3
	11.1-11.5					0
	11.6-12.0	1				1
	12.1-12.5					0
	12.6-13.0					0
	13.1-13.5					0
	13.6-14.0					0
	14.1-14.5					0
	14.6-15.0					0
	15.1-15.5					0
	15.6-16.0					0

	16.1-16.5					0
	16.6-17.0					0
	17.1-17.5					0
4	**17.6-18.0**					0

Electrofishing SB-1.xlsx

ELECTROFISHING DATA LITTLE RIVER SB-1

System:	Station:	Recorder:	Date:
Little River	SB-6	Eric Guignard	11-Aug-22

# Sweep / Time		1 Min. 16	2 Min.	3 Min.	4 Min.
Species: *Salmo salar* **Salmon Fry** **3.1 - 5.5 cm**					
Total =	0	0	0	0	
Species: *Salmo salar* **Salmon Parr** **5.6 - 10.5 cm**					
Total =	0	0	0	0	
Species: *Leuciscus leucuscus* **Dace**					
Total =	0	0	0	0	
Species:					

Petromyzon marinus **Lamprey Eels** Total =						
Species: *Notropis maculatus* **Shiners** Total =	0	0	0	0		
Species: *Salvinus fontinalis* **Trout** Total =	0	0	0	0		
Species: **Sucker** Total =	0	0	0	0		
Species: **American Eel** Total =	5	5	0	0		

Lenghts	Widths	Flow Rate
Left Bank	Lr. Barrier	**sec./meter**

Depths (cm)
Up Stream Barrier

28.1	7.4	3.69
	6.3	3.69
28.1	5.8	3.69
	5.8	**Average**
Right Bank	Up. Barrier	3.96
28.1	6.2	**sec./meter**

Average		**Sq. Meters**
28.1	6.3	177.03

25	26	30	18	**Total**	99
27	31	34	35	**Total**	127
26	37	38	30	**Total**	131
34	39	43	40	**Total**	156
41	39	40	33	**Total**	153
Down Stream Barrier					

Max. Depth	**Average depths**	**Total**
43	33.3	666

System:	**Station:**	**Recorder:**	**Date:**
Little River	SB-1	Eric Guignard	August 11. 2022

	cm	**Sweep 1**	**Sweep 2**	**Sweep 3**	**Sweep 4**	**Total**
0+	**2.6-3.0**					0
	3.1-3.5					0
	3.6-4.0					0
	4.1-4.5					0
	4.6-5.0					0
0	**5.1-5.5**					0
1+	**5.6-6.0**					0
	6.1-6.5					0
	6.6-7.0					0
	7.1-7.5					0
	7.6-8.0					0
	8.1-8.5					0
	8.6-9.0					0
	9.6-10.0					0
0	**10.1-10.5**					0
	10.6-11.0					0
	11.1-11.5					0
	11.6-12.0					0
	12.1-12.5					0

2+	12.6-13.0					0
	13.1-13.5					0
	13.6-14.0					0
	14.1-14.5					0
	14.6-15.0					0
	15.1-15.5					0
	15.6-16.0					0
	16.1-16.5					0
	16.6-17.0					0
	17.1-17.5					0
0	17.6-18.0					0

MAP. Little River.2021.2022... 11

LITTLE RIVER BRAVER DAM REMOVAL PROJECT 2022

Photo of Robert Kryszko walking the Little River watershed.

The Little River beaver dam removal project commenced on May 30, 2022.
Hired were 3 Pabineau First Nation members,
1. Issac Prisk,
2. Corey Myers and
3. Gregory Peter Paul;
They are called the “Fish Obstruction Monitoring Technicians (FOMT)”

Photo of Fish Obstruction Monitoring Technicians; Issac Prisk, Corey Myers and Gregory Peter Paul walking the Little River Mainstem.

The FOMT team went to all 18 beaver dam locations identified in Little River in 2021.
In 2022, thirteen identified dams were still an obstruction to Fish passage, and 5 dams located in 2021 were washed out.

Dam site # 1
GPS location 47.53277, -65.78900 (dam is inactive and very smalls)
Length of dam: 10 feet
Height of dam (left bank): 1.5 feet
Height of dam (right bank): 1.2 feet
Water level above dam: 13 inches
Water level below dam: 3.5 inches

Dam site # 1 removed

Water level above dam: 9 inches
Water level below dam: 5.5 inches

Dam site # 2
GPS location: 47.53352, -65.78954
Length of dam: 11 feet
Height of dam (left bank): 3 feet
Height of dam (right bank): 3.3 feet
Water level above dam: 21 inches
Water level below dam: 14 inches

Dam site # 2 removed
Water level above dam: 21 inches, Water level below dam: 14 inches

Dam site # 3.
GPS location 47.53352, -65.78954

Length of dam: 25 feet
Height of dam (left bank): 3.8 feet
Height of dam (right bank): 3.6 feet
Water level above dam: 3.3 feet, Water level below dam: 1 foot

Removed 4 inches of beaver dam # 3 debris off dam.

Removed another 4 inches from dam site # 3.

Another 4 inches removed from Dam site # 3 in July
Went back after weekend and the dam was restored by beavers. This dam is “officially” an active dam.

I contacted Nuisance Control Operator, Bruno Lebouthillier.
Meeting with Bruno Lebouthillier (business name: BLB Exterminateur) on July 20, 2022.
Signed beaver removal contract with BLB Exterminateur, Bruno Lebouthillier on July 20, 2022.

See restored dam picture below:

Nuisance control operator finished Little River trapping beaver contract on August 10, 2022. AFSAR team went to dismantal dam site # 3 once we got the go-ahead from Bruno Lebouthillier.

Please click tab below for: “Nuisance Control Operator Contract.2022”

Nuisance.Control.O
perator.Contract.20

Nuisance Control Operator video footage of: "Beaver Trapping in Little River.2022" Please click tab below.

20220730_094351.mp4 20220728_125407.mp4 20220728_124722.mp4 20220728_095135.mp4 20220728_085044.mp4 20220728_082807.mp4

20220728_074302.mp4 20220728_073145.mp4 20220726_145739.mp4 20220726_140409.mp4 20220726_140256.mp4 20220724_083323.mp4

20220724_075109.mp4 20220724_072003.mp4 20220801_083859.mp4 20220730_105005.mp4 20220730_103430.mp4 20220730_102941.mp4

20220730_101701.mp4

Dam site # 3 (Took fresh debris off and went another 4 inched down)

Water level before breach above dam: 1 foot, 6 inches
Water level before breach below dam: 1 foot, 3 inch

Beaver dam site # 3 completed.

Water level above dam: 1 foot
Water level below dam: 1 foot

Debris from site # 3

<u>Dam site # 4.</u>
GPS location 47.53341, -65.78916.
Length of dam: 35 feet
Channel width: 19 feet

Height of dam (left bank): 3.5 feet
Height of dam (right bank): 4 feet

Site # 4 is located 2 km downstream from North branch (NB) 4-Wheeler bridge 47.52556, -65.80389.

Dam site # 4 (back view)

Issac Prisk, Corey Myers and Gregory Peter Paul removing debris from dam site # 4

Removing another 4 inches from dam site # 4

Photo of Fish Obstruction Monitoring Technicians Issac Prisk.

Dam site # 4 completed

<u>Dam site # 5</u>,
GPS Location: 47.52623, -65.79588

Dam site # 5 (below dam)

Dam site # 5 (above dam)

Picture of dam site # 5 completed.

Dam 5 water level above dam is 20 inches, and water below dam after breach is 14 inches.

Also, there is a washed-out beaver dam approximately 20 meters down river from Dam site # 5.
See picture below.

Dam site # 6
GPS location: 47.52616, -65.79591.
Length of dam: 25 feet
Height of dam (left bank): 3.2 feet
Height of dam (right bank) 3 feet
Water level above dam: 28 inches
Water level below dam: 3 inches

4 inches taken off dam site # 6

Dam site # 6.

Dam site # 6.

Dam site # 6

Dam site # 7
GPS location: 47.52692, -65.81662
Length of dam: 28 feet
Channel width: 20 feet
Height of dam (left bank): 3 feet
Height of dam (right bank): 2.5 feet


dam site 7


Site #7
TUESDAY
8 23 2022
32ft - Length

Dam site # 8
GPS location: 47.52686, -65.81730
Length of dam: 15 feet
Channel width: 11 feet
Height of dam (left bank): 3.1 feet
Height of dam (right bank): 2.9 feet

Photo of Fish Obstruction Monitoring Technicians Corey Myers.

Dam site # 9

GPS location: 47.52683, -65.81751

Length of dam: 28 feet
Channel width: 20 feet
Height of dam (left bank): 3 feet
Height of dam (right bank): 2.5 feet

Photo of Fish Obstruction Monitoring Technician Gregory Peter Paul.
Water level above dam: 16 inches
Water level below dam: 3 inches

Water level above dam: 9 inches
Water level below dam: 6.5 inches

Dam site # 10
GPS location: 47.52687, -65.81782
Length of dam: 14 feet
Channel width: 12 feet
Height of dam (left bank): 2 feet
Height of dam (right bank): 2.5 feet
Dam was removed in early September.

Water level above dam: 12 inches
Water level below dam: 7 inches

Dam site # 11
GPS location: 47.52635, -65.81805

Length of dam: 26 feet
Channel width: 22 feet
Height of dam (left bank): 3.3 feet
Height of dam (right bank): 3 feet
Dam was removed in mid-September.

Water level above dam: 14 inches
Water level below dam: 8 inches

Dam site # 12
GPS location: 47.52604, -65.81915
Length of dam: 14 feet
Channel width: 12 feet
Height of dam (left bank): 2 feet
Height of dam (right bank): 2.5 feet
Dam was removed in mid-September.

Water level above dam: 12.5 inches
Water level below dam: 9.5 inches

Dam site # 13
GPS location: 47.52589, -65.81873
Length of dam: 21 feet
Channel width: 16 feet
Height of dam (left bank): 2 feet
Height of dam (right bank): 2.5 feet
Dam was removed in late September.

A total of 19 beaver were removed by nuisance control operator during the project and 13 beaver dams were dismantled by the Fish Obstruction Monitoring Technicians. However, other beavers started to move in the watershed and by the end of September/early October new beaver dams are being built. Due to federal/provincial law, beaver dams cannot be removed/dismantled from October 1 to May 30; therefore, the Fish Obstruction Monitoring Technicians did not remove any dams after the end of September 2022. However, Pabineau First Nation Fish Obstruction Monitoring Technicians will continue the beaver dam removal work in the Little River watershed in 2023.

Please click PDF tab below for: MAP Little River beaver dams removed and locations.

MAP. Little River.11x17 - 1-75,0(

Training courses attended by the Pabineau First Nation Little River Fish Obstruction Monitoring Technicians (FOMT).

1. GPS/Compass/Mapping course going to be done by Maritime College of Forestry Technology.
Course started: June 2, 2022 and ended on June 3, 2022.
All FOMT team were successful in this training and received certificate.

Please click PDF tab below for the GPS/Mapping/Compass course certificates. 2022

GPS.MAPPING.COMPASS.CERTIFICATE.2

2. Firearms Safety training going to be done by Department of Natural Resources before end of June.
Course started June 27, 2022 and ended on June 28, 2022. Course Instructor: Robert Gaudet DNRE.
All FOMT team were successful in this training and received certificate.

Please click PDF tab below for the Firearm Safety Course Certificates. 2022

Firearm.safety.certificate.2022.pdf

3. Trapping Course was offered by the Department of Natural Resources and Energy (DNRE)
Course date: Friday August 26, 2022 from 6:00 pm to 9:00 pm
Saturday August 27, 2022 from 8:00 am to 5:00 pm
Sunday August 28, 2022 from 8:00 am to 5:00 pm

Course Instructor: Denis Guitard
Course location: Bathurst Youth Centre 895 St-Anne Street, Bathurst NB.
All FOMT team were successful in this training and received certificate.

Please click PDF tab below for the Trappers Course Certificates. 2022

Trapper.Coursw.Certificates.2022.pdf

4. Nuisance Control Operator Course was offered by the Department of Natural Resources and Energy (DNRE).
Course date: September 27, 2022
Course location: 2574 Route 180 South Tedagouche N. B
Course instructor: Denis Guitard
All FOMT team were successful in this training and received certificate.
Please click PDF tab below for NWCO course certificates. 2022

NWCO Course Certificates 2022.pd

Pabineau First Nation have 4 members that obtained their Nuisance Control Operator Certificate/Licence in 2022.