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Water Quality Lab Memo

Introduction

The objective of this lab was to measure the water quality parameters upstream, in, and downstream of Humboldt State University's campus. Our group collected data from the Fish Hatchery, Fern Lake, and Jolly Giant Creek. We recorded the Dissolved Oxygen, Temperature, pH, and Turbidity in each location to obtain a better understanding of the water's quality.

Materials and Methods

In this analysis, different tools were utilized in measuring the different parameters, which were DO, temperature, pH, and turbidity. For the measurement of each parameter (with exception of turbidity) we dipped the parameter-stick about half-way into the water while swirling it slowly. We continued doing so until the monitor displayed a stable measurement for us to record. Turbidity was slightly different due to the fact that we had to insert the “control” turbidity sample in order to calibrate the tool. We then needed to collect water samples with a small vial-like container in order to obtain results to read/record. These steps were repeated two additional times in different locations.

Results

After utilizing the tools given to us in order to measure DO, temperature, pH, and turbidity, we recorded our results in a table. In the fish hatchery we recorded a DO of 10.4 mg/L, temperature of 13.2°C, pH of 8.63, and turbidity 3-4 NTU. In an area upstream of Fern Lake we recorded a DO of 0.7 mg/L, a temperature of 11.1°C, a pH of 9.93, and turbidity 19-21 NTU. In an outlet of Fern Lake we recorded a DO of 8.1 mg/L, a temperature of 11.3°C, a pH of 8.63, and turbidity 7-9 NTU. In Jolly Giant Creek we recorded a DO of 10.4 mg/L, a temperature of 11°C, a pH of 6.9, and turbidity 8-10 NTU.

(Refer to Table-1 for our group's complete results)

Discussion

Initially our group determined typical values of dissolved oxygen, temperature, pH and turbidity. We concluded that the typical values are; DO (5-7), temp (10°C-15°C), pH (6-7), and turbidity (10-20 NTU). Before we obtained data from the Fish Hatchery, an area upstream of Fern Lake, an outlet from Fern Lake, and Jolly Giant Creek, we developed a hypothesis regarding the parameter values of each location utilizing terms such as, “low”, “high”, and “typical”. After measuring and obtaining our data, we discovered that our hypotheses for DO, pH, and turbidity were quite inaccurate. Almost all of the locations (with exception of the area upstream from Fern

Lake) had high DO measurements, as opposed to what we had previously assumed. In addition, we first thought the pH would be low due to it being an uncontrolled environment (with exception of the Fish Hatchery); however, the pH was very consistent with the typical data. In fact, we found that the pH measurements were between 6.8 and 7.6 at each location. Dissolved oxygen was also quite consistent with typical values, with measurements between 8.10 and 10.4 mg/L. This differed greatly from our initial hypothesis (which was less than 5 mg/L). We noticed yet another inconsistency between our turbidity findings and our original estimations. We assumed that all locations aside from Jolly Giant Creek would have high turbidity, but in actuality, the fish hatchery, Fern Lake's outlet, and Jolly Giant Creek all had low turbidity. To test the accuracy of our results we searched online and came across an organization, Clean Lakes Inc., which had tested Redwood Shores Lagoon's water quality. We then compared our data to theirs and discovered that our data was very similar to theirs (refer to Table's 1 and 2). Although our measurements were accurate to Clean Lake Inc.'s findings, there were still many ramifications that possibly affected our results. For example, when testing the DO of the water, one of us could have dipped the rod in a bit too deep, thus causing the rod to touch the bottom of the location we were testing. We could have also measured the temperature of the water in question with the pH measuring device. Another factor that could have manipulated our results was the constant rainfall that was occurring while we were conducting our measurements.

Conclusion

Quite a few of our initial hypotheses ended up being incorrect. We came to find that our estimations of DO (in fish hatchery, fern lake, and upstream of the dorms), Temperature, pH (in college creek and upstream of fern lake), and Turbidity (upstream of fern lake and in fern lake) were quite different from our final results. The majority of our initial estimations were labelled as "typical", when in fact they ended up being higher than, and in few cases, lower than the measurements our group took.

TABLE 1: Our Group's Data**Water Quality Lab Data**

Location	DO (mg/L)	Temperture (°C)	pH	Turbidity Reading with 10 NTU Sample	Turbidity Reading from site (NTU)
Fish Hatchery	10.4	13.2	8.63	8.63	4.17
					3.46
					3.54
Upstream of Fern Lake	0.7	11.1	9.93	9.93	20.52
					19.72
					20.65
In Fern Lake near outlet	8.1	11.3	8.63	8.63	8.83
					7.54
					7.71
In Jolly Giant Creek	10.4	11	6.9	9.5	9.69
					9.78
					8.92

TABLE 2: Redwood Lagoon Reference Data**Site 1**

	Dissolved						
Water	Oxygen	DO		pH	pH		
Temp	(DO)	mg/l		Lower	Upper	Salinity	Turbidity
C°	mg/l	Limit	pH	Limit	Limit	ppt	NTU
12.1	15.5	5	8.4	6.5	8.5	28.39	6.81

Site 2

	Dissolved						
Water	Oxygen	DO		pH	pH		
Temp	(DO)	mg/l		Lower	Upper	Salinity	Turbidity
C°	mg/l	Limit	pH	Limit	Limit	ppt	NTU
13.0	7.76	5	2.8	6.5	8.5	35.12	21.7

Site 3

	Dissolved						
Water	Oxygen	DO		pH	pH		
Temp	(DO)	mg/l		Lower	Upper	Salinity	Turbidity
C°	mg/l	Limit	pH	Limit	Limit	ppt	NTU
12.3	6.38	5	3.3	6.5	8.5	33.39	49.2

Site 4

	Dissolved						
Water	Oxygen	DO		pH	pH		
Temp	(DO)	mg/l		Lower	Upper	Salinity	Turbidity
C°	mg/l	Limit	pH	Limit	Limit	ppt	NTU
12.6	8.41	5	1.2	6.5	8.5	37.44	17.1

