

Introduction

The locations at which the water quality samples were taken were the Fish Hatchery, upstream of Fern Lake, in Fern Lake near the outlet, and in Jolly Giant Creek. These samples were taken to analyze the pH, turbidity, dissolved oxygen, and temperature of the bodies of water. They were taken in order to understand the local drainage patterns and water bodies at these locations as well as how to operate basic instruments involved in measuring water quality.

Materials and Methods

The materials used were the USI Model 55 for the dissolved oxygen and temperature, the HI93703 for turbidity, and a pH probe. The instruments were calibrated before the samples were taken, and were left on while the water was collected. The group then travelled to all three locations, and used each instrument to record the data. In order to get a more accurate read for pH, the wand used to record the number was swirled around in the water, just in case different areas had a slightly higher pH than others. For a more accurate turbidity reading, three samples were taken, as different areas of the water had a slightly different turbidity, especially it was raining and the water had different levels.

Results

The data shows the analyzed water samples that were taken in the sampling location. The data, shown in Table A-1, is read horizontally, and has the final numbers for DO, pH, temperature, and turbidity with their units. The individual turbidities appeared too high, especially in Jolly Giant Creek. The rest of the data seems congruent with averages of healthy water quality ranges.

Discussion

The group's hypotheses are shown in Table A-2. The hypotheses concerning the turbidity of both sites in Fern Lake as well as Jolly Giant Creek were incorrect. It was previously assumed that Fern Lake would have a low turbidity level, and that Jolly Giant Creek's would be typical, however after testing, they all proved to be high. For example, one of the highest turbidity readings in Jolly Giant Creek was 68 NTUs, which is much higher than the hypothesized low value. Another reading near the outlet of Fern Lake was 45.87 NTUs: again much higher than was expected. These raised values of turbidity were most likely due to the fact that it was raining and the water was running, which was not accounted for when creating these hypotheses. Had it been nicer weather, perhaps the turbidity would have been typical or even low.

Similarly, the hypothesis concerning the pH of the Fish Hatchery was presumed to be typical, as to keep the fish healthy. Yet, the pH was 7.6, a relatively high number.

However, after researching, it was discovered that the desirable pH for fish is about 6.5 to 9, so in reality this pH is in desirable range. We had assumed that the pH would match those of freshwater rivers and lakes, which have different pH needs.

When comparing our measurements of the fish hatchery with that of a normal sample, the results are accurate. The temperature of the fish hatchery was 13.2 degrees Celsius with a high DO while transitioning into springtime, which is expected. Also a pH of 7.6 is normal. When comparing the results of the Jolly Giant Creek with a normal creek the pH was low being at 5.15. The pH should always be between 7 and 8.5. The dissolved oxygen is accurate being 9.8 where the average or February value being around 10. The temperature is also accurate. When looking at the results of the Fern Lake with that of a normal lake, the pH is low around 5.24-5.7. A healthy pH should be between 6 and 9. The dissolved oxygen of the lake is healthy as long as it does not drop below 6 mg/L.

One possible error that might have complicated the interpretation of the data would be rainfall that may have caused the water's turbidity to be higher than normal. In addition, another error would be that the samples were not gathered from different locations. For example, in Fern Lake, the samples for turbidity were all gathered around the same spot. Therefore, the data may not represent the true turbidity of the entire lake. Overall, the sampling location and the weather at the time of the sampling might slightly complicate the interpretation of the data.

Conclusion

After taking several water samples in the Fish Hatchery, upstream of Fern Lake, near the outlet of Fern Lake, and in Jolly Giant Creek, the DO, temperature, pH, and turbidity were analyzed. This information allowed our group to analyze the water quality of these bodies of water, and determine if the information matched our hypotheses. Again, refer to Tables A-1 and A-2 to view the results and hypotheses.

Most noticeably, the turbidity of all outside bodies of water were rather high, due to the prevailing rainfall. All other factors were typical and signs of good water quality.

Appendices

Table A-1

Location	DO (mg/L)	Temperature (C)	pH	Turbidity Reading with 10 NTU Sample	Turbidity Reading from site (NTU)
Fish Hatchery	10.4 mg/L	13.2 C	7.6	8.63	4.17 3.46 3.54
Upstream of Fern Lake	7.5 mg/L	11.6 C	5.7	11.03	14.96 12.55 11.03
In Fern Lake near the outlet	9.41 mg/L	11.5 C	5.24	7.66	27.71 45.87 22.28
In Jolly Giant Creek	9.80 mg/L	11.2 C	5.15	8.15	68 51 38.85

Table A-2

Location	Dissolved Oxygen	Temperature	pH	Turbidity
In Fish Hatchery	Low, because all of the fish would have consumed the oxygen.	Low, because fish need low temperatures.	Typical, because a non-typical pH would kill the fish.	High, because all of the fish may create dirty water.
Upstream of Fern Lake	High, because it had previously been in a forest which means photosynthesis.	Typical, because a stream feeds directly into it.	Typical, because a natural stream feeds directly into it.	Low, because a clear forest stream feeds directly into it.
In Fern Lake near the outlet	Low, because organisms in the lake may use up the oxygen.	Low, because the lake is deeper than the creek.	Typical, because it's just a lake.	Low, because lakes cause settling.
In Jolly Giant Creek	Typical, because it has left the lake.	Typical, because it is now running water.	High, because it might have urban runoff.	Typical, because it is now running water.

Edits as of 4-18-46:

This was originally written as a group assignment, and authors included Elizabeth Pineda, and Veronica Lynch, and myself. Further edits were made by me.

Feedback I received from my lab instructor was as follows:

Really great writing clarity, your group did not have the correct heading (refer to the ERE website for an example), your group started to discuss results before the discussion, I found 2 spelling or grammar errors, references should include more than the url.

Taking this feedback into consideration, I fixed the heading, all spelling errors, and added more detail on the references section.

References:

Penn State's interpretations of different water quality samples and values: <http://extension.psu.edu/natural-resources/water/drinking-water/water-testing/testing/interpreting-water-tests-for-ponds-and-lakes>

EPA's watershed priorities of the Klamath River Basin:
<https://www3.epa.gov/region9/water/watershed/klamath.html#settlement>