

Water Quality Memo

To: Professor Radecsky
From: Devin Taylor, Jake Coniglione, Charles Diehl
Subject: Water Quality
Date: November 15, 2013

Introduction:

For this lab, we had to adventure into the forest to collect data from nearby streams. We went to four different locations that each had different readings for a variety of different reasons. With our background knowledge of water quality, we were able to hypothesize what the water quality at different locations was going to be. After collecting data, we were able to see trends and understand why we were getting the results that we were. The purpose of this lab was to teach young engineers how to use different types of basic water quality instruments. Our group measured the levels of dissolved oxygen, temperature, pH, and turbidity using a variety of different instruments.

Materials and Methods:

- YSI Model 55 Dissolved Oxygen (DO) Meter
- HI93703 Portable Turbidity Meter
- pH meter

In order to measure the turbidity, we collected a small sample in a glass container and placed it in the HI93703 Portable Turbidity Meter. At each site we took 3 different measurements and obtained an average turbidity for the particular site. After we measured the turbidity, we then used the YSI Model 55 DO Meter to measure each site's dissolved oxygen levels. The measurement was taken two inches below the surface while stirring. Temperature and pH were collected using the pH meter. This measurement too was taken from approximately 2 inches below the surface of the water.

Results:

Table 1, This table shows the values for the DO, Temperature, pH, and Turbidity samples collected at the four sample sites. Note that the samples were collected during a light rain.

Location	DO (mg/L)	Temperature (C)	pH	Turbidity (NTU)
College Creek	7.92	15.10	5.65	79.79
Upstream of Fern Lake	10.53	10.00	6.31	62.32
In Fern Lake near the Outlet	6.24	10.90	6.00	2.25
In Jolly Giant Creek Upstream of the Dorms	11.06	10.40	6.11	3.09

Discussion:

We predicted that the turbidity in College Creek, downstream from the fish hatchery, would be lower

than the turbidity in the surrounding creeks and lake upstream. It turns out that the turbidity of College creek was the highest of any location we sampled. We thought that perhaps the fish would eat some of the stuff in the water, but apparently the fish (or something between Fern Lake and College Creek) serve to raise the turbidity somewhat.

We also predicted that the water leaving the fish hatchery would be more acidic than the water going in. Turns out this hypothesis was incorrect as well. The pH measured in College Creek past the hatchery was relatively low compared to the water in Fern Lake, but not by too much. The additional acidity found in the waters upstream may have come from the conifers and their mildly acidic needles.

Another prediction we had about College Creek was that the temperature would be similar to the water found just upstream, but between 10 and 15 degrees celsius because thats the range these fish like. What we found was that the water leaving the hatchery was a whole 5 degrees warmer than the water going in. Perhaps the water is warmed up by the increased turbidity prior to leaving the hatchery.

According to "In The Dellanina Nature Area" the turbidity in the Jolly Giant creek fluctuated between 5 and 60 NTU. Our results fit this. All of our measurements from around the same area fit roughly within this range, except College Creek because it lies downstream from the hatchery. They measured the pH to be between 5.5 and 6. Our data went a little above this, but not by much. The DO values they collected also fit our values for DO. They showed that the DO was fluctuating over time from a little below 5 mg/L to a little above 20 mg/L. Lastly, the range of temperatures they measured was between 11 and 15 degrees Celsius, so our water was a little on the cold side.

Our data could have been impacted by the light rain that had begun a few hours before samples were taken. We soon ran into difficulty with this meter because of of the rain and water accumulation within the meter itself. But that was easily fixed with a quick dry of the hole and container before each measurement. However, it is likely that the moisture within the sampling chamber altered the value reported by the meter to some degree.

Another thing to note is that all of our data was collected on one day at one spot in each creek or lake. The values for DO, pH, Turbidity, and Temperature would all be different based on where along the creek we took the sample and would change as time went by. Our data is a snapshot at best.

Conclusion:

The location with the highest DO level was at the Jolly Giant Creek, upstream of the dorms. The location with the highest temperature and turbidity level is at College Creek. We also found that upstream of Fern Lake has the highest pH reading.

References:

Christopher Shutt, Merideth Powell, Richard Glover. (2004). Jolly Giant Creek | Office of Sustainability | Humboldt State University. In The Dellanina Nature Area. Retrieved 11/15/2013, from http://humboldt.edu/sustainability/sites/default/files/envs410_010004-4.pdf.