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**MEMORANDUM**

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**TO:** KRISTEN RADECKY & MARGARET LANG  
**FROM:** CHRISTOPHER ALSTON, JOSHUA LUDERS, & ROBERT DUNCAN  
**SUBJECT:** WATER QUALITY AROUND HSU  
**DATE:** 11/9/2012

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**INTRODUCTION:**

The purpose of this memo is to discuss the test results from a few bodies of water for their quality. The testing locations included College Creek, Fern Lake and Jolly Giant Creek, located on or near campus. The main objective to test the levels of these four main measurements (pH, DO, °C, Turbidity) is to get a good idea about the quality of the water. Then compare the results with the hypotheses that were made involving those readings.

**MATERIALS AND METHODS:**

At each site, three electronic devices were used to gather the data for DO levels, pH, temperature, and turbidity. DO levels were gathered utilizing the YSI, model 55 dissolved oxygen meter. Once calibrated, the DO probe was inserted in the water and swirled around slowly to get a distributed reading of the test site. The pH and temperature was gathered using a Hanna, model HI8315 membrane pH meter, it has a function that allows the reading of both pH and degrees Celsius. The pH probe was also inserted in the test water site and swirled around gently for data collection. Our last data collection device was the Hanna, model HI93703 turbidity meter. After calibration at each site, three samples were taken and averaged out for the data provided.

**RESULTS AND DATA:**

The table below, Table 1, contains the raw data collected at each water location. The pH, temperature, DO, and turbidity were quantitatively measured and collected, using the electronic devices and instruments.

**Table 1: Water quality data from each water location**

<b>Location</b>	<b>pH</b>	<b>Temperature (C°)</b>	<b>DO (mg/L)</b>	<b>Turbidity (NTU)</b>
<i>College Creek</i>	7.28	16.0	9.84	3.59
<i>Upstream Fern Lake</i>	7.67	12.2	10.71	8.41
<i>In Fern Lake</i>	7.79	12.9	6.88	3.59
<i>Jolly Giant Creek</i>	7.38	11.1	11.25	5.51

## **DISCUSSION:**

From the results and data collected, the initial hypotheses were confirmed with a few exceptions that could have altered the results.

As speculated the initial hypotheses were determined to be correct. College Creek had low turbidity, normal pH, and average DO compared to the other sites which makes sense because of the turbulence of the water. The College Creek site had somewhat of a low DO compared to the other two good sites and this could be due to the fish hatchery upstream which could possibly deplete the amount of dissolved oxygen in the water. In Fern Lake, the water quality in the lake was observed to be poor and from the results, the DO was low due to the static current, and the turbidity on the outlet end of the lake was very low. The turbidity level might have been low because the sediments coming into the lake could have settled to the bottom due to low turbulence, thus creating a clean out flow. Upstream of Fern Lake, DO measurements were very high, likely due to the turbulence of the creek, and the turbidity was very high. Jolly Giant Creek had the best quality of water due to low human activity, high volume of water and a high current flow. This explains the high DO and relatively low turbidity (drinking water  $\leq 5$  NTU).

Water quality measurements in 1996 on the Klamath River, where it crosses state lines, measured a DO level of 3, pH level of 9 and a temperature of 15 degrees Celsius. Although a different year, these measurements compared to the data gathered at HSU provide insight that water in a similar geographic region can differ in water quality. The observed rain condition at HSU may have been the reason.

Some sources of error or obscured values are the local weather conditions and level of human activity. For example, during and two days prior to the samples collected, rain fell in the area which could affect the pH of the each site as well as the DO. Also, there was human activity in the area being tested; causing a disturbance to the water thus the measured turbidity could be inflated. Due to these factors, the altering of DO, pH, temperature and turbidity might differ from the typical levels recorded throughout the year.

## **CONCLUSION:**

The experimental data proved that each site was relatively close to each other, and the variance between each site had independent variables that contributed to the variations of the experimental results. In conclusion the variance in water quality around HSU is not significantly drastic; as water flows through HSU the average water quality is maintained.