**Lab 4: Observations and Simple Forecasts**

**Intro:**

For the entire lab, note that psychrometer is the same thing as hygrometer.

We will do #1 and then go outside to do #5, and then come back in to finish the lab.

**Question 1:**

**DO NOT PULL THE CLOTH OFF THE PSYCHROMETER!**

When we whirl the psychrometer around, the wet-bulb thermometer (cloth dipped in water) has water on it that evaporates, cooling the bulb. After a few minutes of whirling, we take the temperature readings for both wet-bulb and dry-bulb. If the surrounding air is dry (low relative humidity), then more of the water evaporates, so the wet-bulb gets decently cooler than the dry-bulb (Evaporation is a cooling process!). If the surrounding air is moist (high relative humidity), then less water evaporates, so the wet-bulb will be closer in temperature to the dry-bulb. If the relative humidity is 100% then there will be no difference between the two temperatures.

Once you have the two temperatures, the sling psychrometer has a reference sheet we will look at to determine relative humidity. On the chart the Air temp is the dry bulb temperature. The depression of wet-bulb is dry bulb minus wet bulb temperature. You locate where the depression column intersects with the air temp row, and this is your relative humidity percentage.

**Question 2:**

Thermometers will be passed around. Give me Celsius.

**Question 3:**

Website: <http://www.denysschen.com/denysschen/catalogue/density.aspx>

First you must determine the density by using the website given. Click metric and enter the values you calculated. We are 22 meters above sea level. After you get density, use the ideal gas law (equation given to you in question 3) to calculate pressure. It is left up to you to google/figure out what units these should be in! Remember that temperature is in Kelvin.

**Question 4:**

I will pass around a barometer for this question. Hint: 1 mbar = 1 hPa

**Question 5:**

Don’t do wind direction, or air pressure for the “campus” column. When it comes to cloud types and cloud cover, just look up in the sky and observe. A very general 1-3 word description is fine.

Then fill out the “College Park Airport” column when we come back inside. Use this website: <http://www.wunderground.com/q/zmw:20740.1.99999>

**Question 6.**

Calculate the wind chill

**Question 7:**

This is just a simple forecast based on the idea that the weather tomorrow might be similar to today. You must complete this question before you complete #13.

**For Questions 8-10, you will be using data I have provided for you in elms. Do not go to the website listed in the manual**

**Question 8:**

Look at Dec. 2014 for College Park.

I will do an example on the projector once people begin getting to this point. You must choose two criteria (any ones you want!) but you MUST tell me what those criteria are. This includes the type of weather you are looking at (precipitation, temperature, etc.) and what range you find acceptable to deem the weather as “similar” (i.e., within 10 degrees of the previous day or within 5 degrees). Use the same criteria for questions 9 and 10.

**Question 9:**

Now look at July 2014 for College Park and do the same thing.

**Question 10:**

Look at Dec. 2014 and July 2014 for Hilo and come up with a percentage for each month.

**Question 12:**

You are comparing your answer for #5 (College Park airport) to the climatological means for today, found by scrolling down on the wunderground website to the “Almanac” section.

**Question 13**

This is in reference to your answer for number 7.