Sebastian Moraga

Mr. Dickson

AP Biology

5/9/2012

Introduction

The purpose of this to see the effect of temperature and canopy cover on the amount of the dissolved oxygen within the water. Cove River is the site where the data was collected, the river is by West Haven High School CT here the site is divided and helps with the collection of data. Cove River site's supports research in archeology, water quality, plants life, and small animals. The canopy cover in Cove River was calculated with an instrument referred to as canopy biomass tool. This tool was used to measure the amount of leafs on top of the canopy. Dissolved Oxygen in water can be generated by the plants in the water going through photosynthesis and by the diffusion of oxygen in the atmosphere that

Hypothesis

If the temperature is high then the water in Cove River will have low Dissolved oxygen because the temperature of the sun excites the water molecules making them unable to hold a substantial amount of oxygen. Although the canopy cover around the site block the sunlight from directly reaching the bodies of water surrounding the river, this prevents plants in the water from getting sunlight which lowers the rate of photosynthesis so the rate of oxygen from photosynthesis will also decrease.

Materials

- Thermometer
- Samples of the water from Cove River
- Vernier Probeware
- Canopy cover biomass tool (densiometer)

Procedures

1. Go to Cove River
2. Check the temperature with thermometer
3. Observe at major trees cover the water site (canopy cover)
4. Use densiometer to calculate the canopy cover
5. Walk on a straight line across the canopy cover every 3 steps use the densiometer to look up and check up for canopy.
6. Use beaker to obtain water sample
7. Use Vernier Probeware to obtain the dissolved oxygen from the water sample
8. Dispose water
9. Repeat step 1-9 for 5 random days

Data

Table 1

Days	Dissolved Oxygen (mg/L)	Temperature (° C)
10/21/2011	2.5 mg/L	15.25 ° C
04/18/2011	12.8 mg/L	11 ° C
01/20/2012	8 mg/L	-1 ° C
02/17/2012	7.6 mg/L	6.7 ° C
03/30/2012	6.5 mg/L	6 ° C

*The average Dissolved oxygen of tab water is 5-7 mg/L

Table 2

Days	Canopy Cover
9/30/2011	63%
10/21/2011	68.6%
11/18/2011	39%
1/20/2012	43.2%
3/30/2012	68%

Conclusion

At first the data in table 1 supports the hypothesis but as the days pass by the data becomes misleading. If the temperature is high then the water in Cove River will have low Dissolved oxygen because the temperature of the sun excites the water molecules making them unable to hold a substantial amount of oxygen. One factor that affects the dissolved oxygen in the water is the canopy cover of the trees surrounding the water which blocks sunlight in the water. The data from table 2 supports the hypothesis as well because in earlier month there was a lower (63%) canopy cover and the dissolved oxygen was lower. Months later the canopy cover increased (68%) and the dissolved oxygen increased as well this proves that canopy cover does affect the amount of dissolved oxygen in water. A way to improve this experiment would be to do the water quality right in Cove River so the water doesn't get affected by the change of environment. The gas station next to cove river contaminates the water the gas station had a leakage and it's been dumped into the river. This experiment relates in many ways to biology and the life of water animals since certain fish can live in a certain dissolved oxygen amount. In water from Cove river there is little to non-fish life because the D.O. is not enough to sustain life.

Jacob Yisehak

Globe Research Project

The effect that the pH of water has on the height and formation of clouds

Introduction

Background

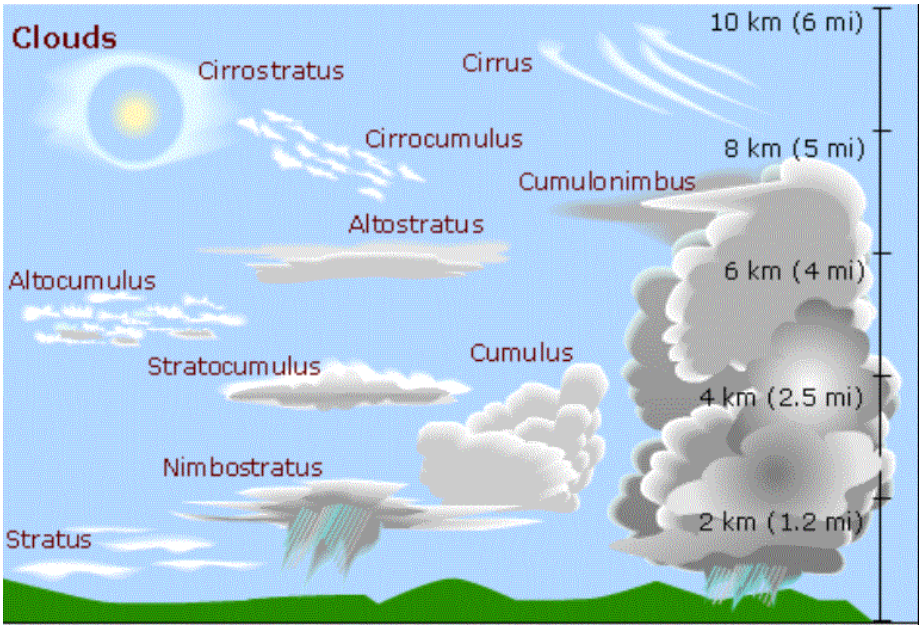
Stratus clouds are uniform gray clouds that usually cover the entire sky. They can form when very weak, upward vertical air currents lift a thin layer of air high enough to initiate condensation. Stratus clouds look like a layer of fog that never reaches the ground. Precipitation rarely falls from stratus clouds since the upward vertical motion needed for precipitation is very weak, but light mist and drizzle can sometimes accompany stratus clouds.

Cumulus clouds form as water vapor condenses in strong, upward air currents above the earth's surface. These clouds usually have flat bases and lumpy tops. Cumulus clouds are usually very isolated with large areas of blue sky in between the clouds. Most cumulus clouds form below 6,000 feet and are relatively thin and associated with fair weather. If the atmosphere is unstable enough, cumulonimbus clouds, better known as thunderstorms, form. Cumulonimbus clouds can tower from below 6,000 feet to greater than 50,000 feet.

Cirrus clouds are thin, wispy clouds that usually form above 18,000 feet. Cirrus clouds generally move from west to east across the sky and usually indicate fair weather. Cirrus clouds form when water vapor undergoes deposition and forms ice crystals. Cirrus clouds are thin because they form in the higher levels of the atmosphere where little water vapor is present.

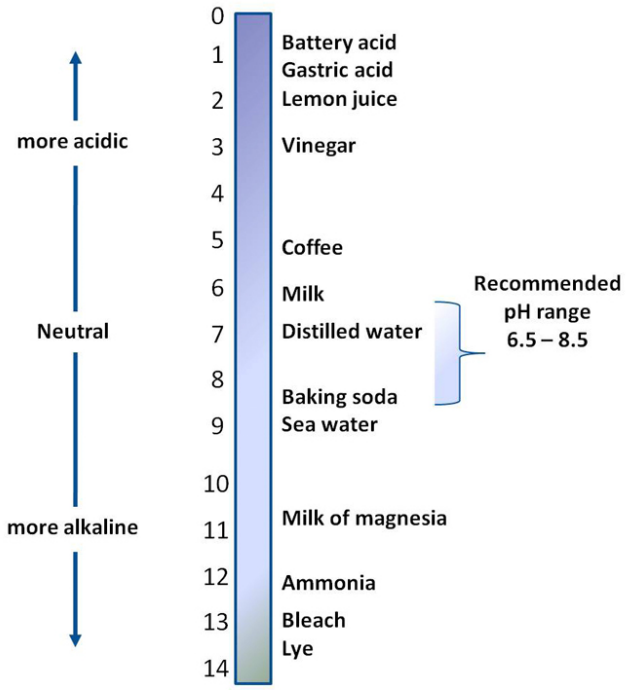
Absorbed water vapor that is too acidic will cause acid rain in clouds that produce rain, which are usually nimbostratus and cumulonimbus clouds.

Cloud Types



http://airlineworld.files.wordpress.com/2008/07/cloud_types.gif

pH Scale



http://pubs.ext.vt.edu/442/442-665/L_IMG_Ph_scale.jpg

Hypothesis Statement: If the pH of water is too high, the evaporation of that water will cause low-altitude clouds, because the high acidity of the water will dissolve more substances. The added weight of the solution will cause clouds to build-up and form at a lower altitude.

Independent Variable: Uncontrolled change in pH of water

Dependent Variable: Height and type of cloud formation

Materials

1. Vernier probe ware
2. Bucket
3. Cloud Chart

Procedure

1. Observe the clouds and figure out what type they are.
2. Obtain water 1 liter of water from Cove River.
3. Use Vernier probe ware to test the pH of the water electronically.
4. Repeat procedure once a month.

Observations

Date	pH	Cloud Type
10/21/2011	6.3	cirrostratus
11/18/2011	7.1	stratus
12/9/2011	7.2	altocumulus
1/20/2012	7.1	stratus
2/17/2012	7.4	stratocumulus

Conclusion

I did not notice a trend that established between the pH of water and the height and type of cloud. Therefore, the hypothesis, “If the pH of water is too high, the evaporation of that water will cause low-altitude clouds, because it the high acidity of the water will dissolve more substances. The added weight of the solution will cause clouds to build-up and form at a lower altitude,” was not supported by my data.

Sources of Error

A possible error could have been made in picking the types of clouds. An uncontrollable error, such as rain prior to the taking of data, could have changed the pH of Cove River. Another error that conflicted with our data was caused by a lack of not know the actual height of the clouds. The height of the clouds were assumed by their type.

The experiment can be improved by checking future cloud type results with a professional meteorologist. More data can be taken to gain a greater understanding of the effect that the pH of water has on cloud type and height.

Future Research

Research can be continued at a regular rate, at more occurrences throughout the year to gain a further understanding of the topic.

There are other variables that could have affected results that were not taken into account in this experiment, such as temperature, nitrate, and salinity levels. To increase reliability in future results, it would be important to include these variables.

References

Palmer, Chad. "Cirrus Clouds." *USA Today*. Gannett, 16 Oct. 2005. Web. 11 Apr. 2012. <http://www.usatoday.com/weather/wcirrus.htm >.

Palmer, Chad. "Cumulus Clouds." *USA Today*. Gannett, 16 Oct. 2005. Web. 11 Apr. 2012. <http://www.usatoday.com/weather/wcumulus.htm>.

Palmer, Chad. "Stratus Clouds." *USA Today*. Gannett, 16 Oct. 2005. Web. 11 Apr. 2012. <http://www.usatoday.com/weather/wstratus.htm>.

Michelle Diaz
Mr. Dickson
AP Biology
9 May 2012

I. Introduction

Since Earth was created, the ozone layer has been protecting all living forms on the planet from the sun's harmful ultraviolet rays. The Ozone protects us from the sun's ultraviolet rays by absorbing the radiation. It is made up of three oxygen atoms; this comes about when the ultraviolet ray hits an oxygen molecule causing it to break apart into atoms, which can then combine with another oxygen molecule. Unfortunately, chemicals released by the products used are weakening the ozone layer. To help the Ozone recover, the Montreal Protocol was put together to get rid of the ozone-depleting chemicals. While the ozone is recovering from the damages caused by the CFCs, it is being affected by climate change.

The group will investigate the effects of temperature on the Ozone layer. Ozone loss causes the lowered ground temperature. This brings no surprise the fact that the deepest Ozone holes are over the Arctic and Antarctic. By recording the temperatures of Cove River every month, the ozone condition above West Haven can be determined.

II. Hypothesis

If the ground temperature is higher, then the ozone layer will continue to deteriorate. This is because the Ozone is taking in so much heat. The more ozone in a given parcel of air, the more heat it retains.

III. Materials

Digital Thermometer

Cloud Chart

IV. Procedures

1. Walk to Cover River
2. Take the temperature

V. Error Analysis

During the lab a couple errors that occurred could have impacted the results. One of the errors was the interval between each visit to Cove River. Although the class went on a Friday of each month, the space in between each trip was not consistent. Another error could also be a mechanical error on the part of the thermometer.

VII. Conclusion

The ozone layer keeps Earth's living inhabitants from ultraviolet rays that can gravely harm them. The hypoth/esis that higher temperatures results an increase in Ozone hole deterioration was proven false. This was not a valid experiment because the ozone hole right above West Haven cannot be seen. Also, an error that could have impacted the results was that there was no data for the month of December. A way to improve the lab would be by recording the temperature every week. Additional research about the length that it takes for temperatures to affect the ozone could also be done to improve the lab. During the Fridays that we went to Cove

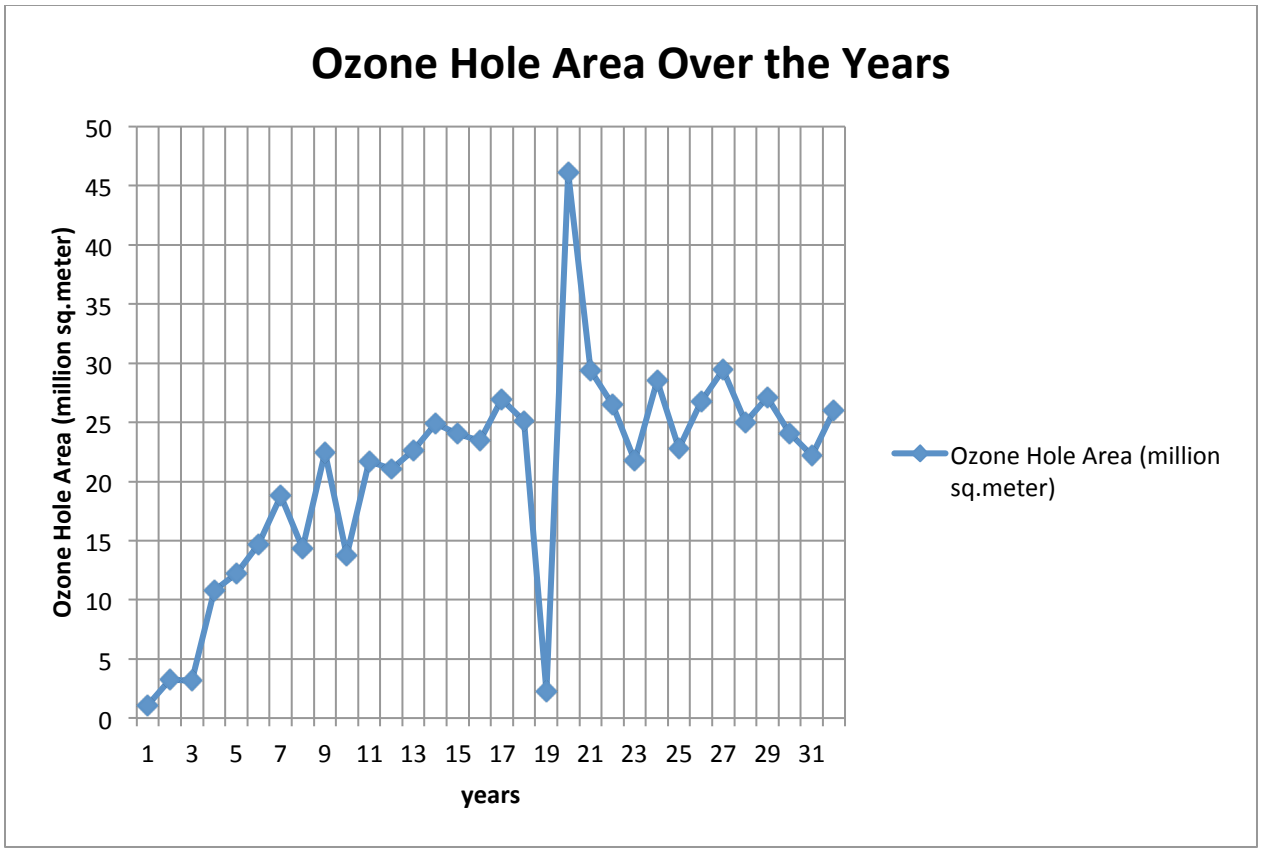
River, the group recorded the temperature. It was important to have the temperature because of its impact on the different levels of Cove River's ecosystem.

VI. Data

Date	Temperature (Celsius)
9/30/12	22.2
10/21/12	15
11/18/12	11.5
1/20/12	-1
3/30/12	6

Year	Ozone Hole Area (million sq.meter)
1. 1979	1.09
2. 1980	3.27
3. 1981	3.15
4. 1982	10.8
5. 1983	12.24
6. 1984	14.65
7. 1985	18.79
8. 1986	14.37
9. 1987	22.45
10. 1988	13.76
11. 1989	21.73
12. 1990	21.05
13. 1991	22.60
14. 1992	24.90

15. 1993	24.01
16. 1994	23.42
17. 1996	26.96
18. 1997	25.13
19. 1998	2.21
20. 1999	46.09
21. 2000	29.4
22. 2001	26.52
23. 2002	21.74
24. 2003	28.51
25. 2004	22.76
26. 2005	26.77
27. 2006	29.46
28. 2007	25.02
29. 2008	27.1
30. 2009	24.1
31. 2010	22.2
32. 2011	26.0



References.

http://www.theozonehole.com/climate.htm

http://www.theozonehole.com/ozoneholehistory.htm