CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Christopher Alford; Krisette Mosqueda; Jose Tapia

Project Number
J0901

Project Title
Marsh Contamination

Abstract

Objectives/Goals
Our project was to determine if the amount of contaminants in Madrona Marsh soil increased as we sampled away from Madrona Avenue. Using soil samples; we tested to see if the contaminants altered the amount of nitrogen, potassium and phosphorous levels.

Methods/Materials
Twenty soil samples were collected along four transects for a total of ten dry samples and ten wet samples. Each sample was color metrically tested for pH, nitrogen, potassium and phosphorous levels.

Results
After conducting the laboratory experiments on our soil samples, we noted that the data reflected insufficient levels of nutrients to be explained by pollution coming off of Madrona Avenue.

Conclusions/Discussion
We still have not disproved the possibility of contaminants existing in the soil. Broad-spectrum chemical testing would be necessary to do this; even though no significant nutrient levels were found.

Summary Statement
We expected, but our hypothesis was proven incorrect, that because a very busy street is adjacent to a sensitive vernal marsh habitat, road contamination would have a detectable effect on soil nutrients.

Help Received
Mr. Robert Carr; Madrona Marsh Biologist; helped with soil sampling. Ms. Tracy Drake; Madrona Marsh Manager; Naturalist; assisted with research design an methods and editing.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Bryce N. Altona

Project Number
J0902

Project Title
Storm Drain Dangers?

Abstract

Objectives/Goals
My objective was to find out if different concentrations of stormwater runoff pollutants affect brine shrimp and algae differently.

Methods/Materials
The brine shrimp and algae were exposed to 2%, 5%, and 10% of antifreeze and .25%, .5% and 1% of ammonium nitrate. To measure the growth of the algae I counted the cells using a hemacytometer and digital microscope. The brine shrimp were measured by the number still living. Observations were taken daily for brine shrimp and every other day for algae.

Results
Low concentrations of Ammonium Nitrate don#t hurt algae as much as it hurts brine shrimp. Low concentrations of antifreeze help algae and brine shrimp in the long run.

Conclusions/Discussion
Different concentrations of antifreeze and fertilizer did have different effects but not as much as I had expected. There was a very small difference in the reactions of algae and brine shrimp to the different concentrations of fertilizer. I think that this was because the Ammonium Nitrate is very toxic, even at much lower concentrations. There was a bigger difference for the antifreeze. Most interestingly, the lowest concentration of antifreeze actually helped both the algae and the brine shrimp over the long run, after increasing the death rate for the brine shrimp for the first nine days. These experiments show how difficult it is to predict or measure the effect that any pollutant has on the ecosystem.

Summary Statement
Exposing brine shrimp and algae to stormwater runoff pollutants to see their different reactions.

Help Received
Father helped type report, take pictures and set up expirement; Mother suplied art for back board; Godfather helped set up expirement.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Victor B. Blanc

Project Number
J0903

Project Title
Trees Are a Gas

Abstract

Objectives/Goals
My project was to determine if car exhaust would have a detrimental effect on seedling Douglas Fir trees. I believe that trees exposed to high concentrations of exhaust will show ill effects.

Methods/Materials
I constructed fifteen mini-greenhouses, which I called enviro-tents. The enviro-tents were designed to house one Douglas Fir seedling and contain test gases around each tree. I tested three gases. 1. Air - to test if the tents themselves affected the trees. 2. Nitrogen - to test if the tents were capable of keeping the gases contained around the trees. 3. Car exhaust - to test the effects of automobile pollution on the trees. The fifteen trees were divided into three groups and each group was exposed to one gas. The gas in each tent was replaced every 48 hours for 28 days. During each changing of the gas, the trees were watered and observations were made. At the end of the experiment a close examiniation of each tree was made.

Results
The group of trees tested in the air atmosphere showed no ill effects from being in the enviro-tents. This showed that any changes in the trees tested in the other gases would not be caused by the enviro-tents but by the gases in the tents. The group of trees tested in the nitrogen atmosphere, with no CO(2) to use for photosynthesis, showed deterioration. This demonstrated that the enviro-tents successfuly contained each test gas around the trees. The group of trees exposed to very high concentrations of car exhaust showed no ill effects.

Conclusions/Discussion
I wanted to see the effects of car exhaust on trees and thought that its presence in high concentration would interrupt the photosynthesis process or otherwise damage the seedlings. However, in my experiment there was no significant effect to the trees placed in the car exhaust atmospheres. My results raise several questions. Is there enough available CO(2) in car exhaust for plants to sustain photosynthesis? Can plants process CO in place of CO(2)? Would car exhaust damage the trees over a longer period of time?

Summary Statement
My project was to investigate the effect of car exhaust on the health of seedling Douglas Fir trees.

Help Received
My father helped me build the enviro-tents. My mother helped me with some typing and editing. I used the Dragon Speaking typing program for my notebook as writing by hand is very difficult for me. This program is an accommodation I am allowed to use at my school.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Kevin C. Case

Project Number
J0904

Project Title
Determining the Effects of Air Pollutants on the Water Cycle, and Subsequent Seed Germination

Abstract

Objectives/Goals
The objective of my project is to find out if airborne pollutants effect our water cycle. I'll then test these affected water samples on seed germination.

Methods/Materials
I'll be obtaining four different airborne pollutants; wood burning smoke, car exhaust (carbon monoxide), paint fumes, and glue fumes. I'll capture these pollutants in a 20 gallon aquarium. I'll collect the pollutants on a sterilized piece of paper. I'll then burn the paper, and collect the remaining ashes. I'll then percolate 100 mL of purified water through the ashes in a coffee filter. I'll test the change in the water's pH, and use the water to check it's effect on seed germination.

Results
Each of the pollutants adversely affected the water's pH. The glue fumes had the greatest effect on the pH, and seed germination. The car exhaust had the least effect on both the pH, and seed germination.

Conclusions/Discussion
Glue fumes should be altered so that they don't adversely effect our water supply, which in turn adversely effects us. Each of the airborne pollutants should be monitored by some type of agency to determine their total effect on us, and our environment.

Summary Statement
Finding out if airborne pollutants hurt the water cycle, and us.

Help Received
Dad helped me with my experimental procedures

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Rosalind N. Cox

Project Number
J0905

Project Title
A Baseline Study of the Water Quality of the Teichert Ponds

Abstract

Objectives/Goals
I wanted to set up a multi year environmental engineering project by first establishing a baseline for the water quality of the Teichert Ponds in Chico. I assumed that pollution including heavy metals may be leaching from the old Chico dump upstream and making their way down to the ponds along with storm drain runoff.

Methods/Materials
I collected water samples and conducted 13 different water analysis tests using LaMotte Water Pollution Detection Outfit-Model Am-12 Code 5905-01 at three different sites. Site 1 was at the north end of the ponds just east of what appeared to be the outlet area. Site 2 was on the west side of the ponds near the freeway. Site 3 was also on the west side, but toward the south where an inlet ditch carrying street runoff ran into the ponds. I took the temperature and ran the Dissolved Oxygen and Carbon Dioxide tests at the ponds for all three sites. I ran all of the other tests for Site 1 at the ponds as well. I ran the remaining tests for Site 2 and Site 3 at home after collecting water in a clean plastic bottle. It was easier to run the tests on the counter in my kitchen. I followed the instructions for each test and recorded the results.

Results
I did not find any heavy metals that might be coming from the dump. The oxygen levels seem right for a pond environment in cold weather and the pH is neutral; however, there are some pollutants in the ponds. There are definite levels of nitrates and phosphates. There was also coliform at the testing sites.

Conclusions/Discussion
According to my water analysis tests, the pond overall seems to be healthy in some regards like heavy metals, but it does have quite a bit of nitrates and phosphates in it, as well as coliform, which comes from animal and human waste. These pollutants are most likely coming from the storm drains from the street and caused by animal waste, fertilizers, and detergents.

Summary Statement
The purpose of my project was to develop a baseline for various pollutants within the Teichert Ponds in order to form a basis for a future environmental engineering project.

Help Received
I used books and water test kits provided by Anne Stephens, March Jr. High. My father drove my to the test sites and helped be construct my backboard. My sister helped me with my tables and graphs on the computer and my mother helped type my final draft.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Madeleine Disner; Jordan Liu; Sarah Stegman-Wise

Project Number
J0906

Project Title
Are There Dangerous Levels of Lead in Local Soil?

Abstract

Objectives/Goals
The purpose of this experiment is to determine whether local soil contains dangerous levels of lead. This is significant because the results will indicate where the soil is hazardous to the health of humans, especially young children.

Methods/Materials
Soil samples were procured from several sites. Samples were tested for dangerous levels of lead using a Sensafe Soil Check Testing Kit, which produced a color scale dependent upon the amount of lead present in the sample. After testing it was determined which sites contained dangerous levels of lead.

Results
The soil by the old building and the beach sand both had the highest of all the least possible amounts of lead, 400 ppm. The colors of the samples taken from six inches below the surface were a brighter red than those taken from the surface, especially at the old building.

Conclusions/Discussion
The potting soil had little or no lead. The soil by the old building had the highest concentration of lead. While other sites had 400 ppm, the old building soil had a brighter red than the other sites, which implies that it had a higher concentration of lead than could be tested for. The soil near the gasoline station did not have the highest level, or even the second highest, because it only had approximately 200 ppm. The two sites with the highest amounts of lead were the soil by the old buildings and the sand by the beach. Although the landfill had among the lowest least possible amounts of lead, with 200 ppm, it is quite probable that there was more. Thus, it is apparent that there are high levels of lead in local soil. Dangerous levels of lead were found at the beach and the landfill, which are both places where children commonly play. These sites are public health risks, and should be cleansed of lead immediately. Also, although it is not known how dangerous the amounts of lead found at the landfill are, there should be further inspection of this because students frequently hike there. If at least 400 ppm of lead is found there, the soil should be removed and replaced with pure soil at once.

Summary Statement
Local soil was tested for dangerous levels of lead.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Daniel Eagle; Andrew Nitschke

Project Number
J0907

Project Title
Don't Hold Your Breath: Air Quality and Carbon Pollutants

Abstract

Objectives/Goals
The objective is to determine what material, when commonly burned, gives off the most black carbon particulate and contributes to the San Joaquin Valley's poor air quality.

Methods/Materials
Four materials, each tested for a period of 40 minutes, were burned and then the black carbon particulate was collected through an apparatus simultaneously. The materials included were agricultural clippings, charcoal briquettes, firewood, and a DuraFlame log. The black carbon particulate collected on the filter paper was then compared to a photographic scale according to the intensity of the carbon. After determining the air volume, the black carbon can now be measured as uug/cm2.

Results
Out of the four materials burned, the Duraflame log produced the most black carbon particulate with 5 uug/cm² over a period of forty minutes whereas the agricultural clippings produced the least amount of black carbon particulate with 1 uug/cm² over a period of forty minutes. The firewood produced 5 uug/cm² and the charcoal briquettes produced 1.5 uug/cm² after forty minutes.

Conclusions/Discussion
Black carbon particulate is one of the major contributors to poor air; the exhaust from automobiles, homes, industries, and fireplaces all are the major suppliers of the pollution. Furthermore, it could possibly be a key contributor to cardiopulmonary diseases, such as asthma. Although our hypothesis was not supported, we determined that the DuraFlame log produced the most black carbon particulate over the time tested. We speculated that if cutting back on the materials that produce a large amount of the particulate, it would be possible to reduce the amount of cardiopulmonary cases.

Summary Statement
With an apparatus built with household products, we measured the black carbon particulate given off of commonly burned materials.

Help Received
Father helped in testing and putting board together; Tony Hansen helped in testing.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Scott M. Elder

Project Number
J0908

Project Title
Hickory Creek Watershed Toxic Risk

Abstract

Objectives/Goals
How can I detect, analyze and locate toxic pollution levels in the Hickory Creek watershed? I will determine which type of Bioassay is the best for detecting pollution. Then I will survey Hickory Creek and conduct Bioassays at various points throughout Hickory Creek watershed to determine relative toxic pollution levels. Once the toxic characteristics are charted for the watershed, analysis will be performed on the results to determine locations and sources of toxic pollution.

Methods/Materials
This project incorporated four separate procedures to complete. I first experimented with Bioassay techniques to determine if this technique would work for my experiment and which seed would be the best to use. I then conducted Bioassay at 16 different locations along Hickory Creek watershed to measure, analyze and detect toxic risk levels. I found the locations by surveying the watershed and identified the points using GPS positioning technology. A laboratory was set up in my room to conduct the Bioassay's.

Results
Between 6/01/2003 and 2/16/2004, I conducted a total of 26 Bioassay's consisting of 260 individual measurements. Calibration data showed that the Grand Rapids lettuce seed was the best indicator of toxic pollution. The creek was then divided into four sections with 29 points of interest identified using GPS waypoints. Four Bioassay's were conducted for each section.

Conclusions/Discussion
Through analysis of the Bioassay data, six unique areas of toxic pollution were identified. From the survey data, the origin of the pollution for each area was located. In one case, I was able to clean up the source of pollution, however, time did not allow for further analysis of the result of this clean up activity.

Summary Statement
I conducted Bioassay's to detect, analyze and measure toxic pollution levels throughout the Hickory Creek watershed and then determined the sources of the toxic pollution.

Help Received
Dad helped with transportation and construction of the display board.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Dana A. Feeny

Project Number
J0909

Project Title
Blinded by the Light: Is the Migration of Zooplankton Altered in Light Polluted Lakes? What Is the Effect When the Ligh

Abstract

Objectives/Goals
In previous experiments, I proved that Daphnia, a common zooplankton, are attracted to artificial light (opposite of the data reported by M. Moore in the April, 2002 issue of Science News) and repelled by ultraviolet light, altering the zooplankton#s natural migration in shallow ponds. This project was designed to investigate a possible reason for the disparity in M. Moore's data with my findings from last year by looking at the migration of zooplankton in lakes that have been exposed to very different levels of light pollution. Therefore, the purpose of this project was to determine the effect of long-term light pollution on the migration pattern of zooplankton in lakes with differing levels of light pollution.

Methods/Materials
Four lakes, at least 25 feet deep, with various amounts of light pollution were identified. Tubes, 1.5 feet by 12 feet, were constructed that would isolate light pollution from the zooplankton during the night, yet allow them to vertically migrate. Using a 3.2 liter Kemmerer sampler, numerous samples at three different depths were taken in and outside of the tubes during the day and at night. The samples were concentrated and zooplankton identified and counted.

Conclusions/Discussion
After analyzing the data, two conclusions were apparent. First, light pollution has effected the migration of zooplankton in differing ways, depending on the amount of light pollution; the more light polluted the lake, the more eccentric the migration pattern of the zooplankton. One of the three light polluted lakes exhibited a suppressed migration as reported by M. Moore (Science News, April 2002). Second, when the light pollution was removed from the lakes, the zooplankton did not change their pattern and migrate like zooplankton in unpolluted lakes. This indicates that when exposed to light pollution, over time the zooplankton have changed their inherent response to light. It would be fascinating to determine if the zooplankton in light polluted lakes are genetically different from those in unpolluted lakes.

Summary Statement
This project determined the effect of long-term light pollution on the migration pattern of zooplankton in lakes with differing levels of light pollution.

Help Received
Getting permission to sample on lakes that allowed no public access was difficult. I tried, but my mother ended up spending hours calling and emailing to get permission to sample. She drove me day and night, even at 4am, to get samples. She rowed the boat while I sampled. I also had to have a ranger observe my

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Michael A. Gushansky

Project Number
J0910

Project Title
Recovery of Vegetative Cover after a Fire in the Coastal Chaparral

Abstract

Objectives/Goals
The objective of this project was to examine the recovery of flora after the fire in the coastal chaparral of Southern California. The first species to recover after a fire were hypothesized to be those which are not present in the densely populated chaparral.

Methods/Materials
The density of vegetative ground cover was compared between burnt and un-burnt areas of Chatsworth and Simi Valley. Two and a half square foot plots were randomly selected and percent ground coverage by species was determined.

Results
The results showed that the total ground coverage was higher in un-burnt areas. However, in burnt areas a small number of species, which were not present in un-burnt areas, appeared to dominate. Of these new species, the six species of the genus Hydrophyllaceae appeared to be most prevalent.

Conclusions/Discussion
From this data it is possible to conclude that in coastal chaparral the growth of minority plant species is inhibited by the dense vegetation. After a fire, the once inhibited flora is then able to dominate. The abundance of the Hydrophyllaceae following the fires may indicate an adaptive strategy developed within the genus, which permits it to strive after a fire.

Summary Statement
This project is about the recovery of flora after fires in the Southern California coastal chaparral

Help Received
My uncle, Gene Gushansky, drove me to data collection areas.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
C. Quinn Hilberg

Project Number
J0911

Project Title
Fire Frenzy

Abstract

Objectives/Goals

From my experiment I am trying to prove which object (styrofoam, vinyl material, cotton material, newspaper, or cardboard), has more harmful elements, (ash and smoke) to the atmosphere when it is burnt. I chose to do this experiment because I am worried about the hole in the ozone. I have read that smoke is not good for the atmosphere. I wondered why our town lets people burn their trash, tree limbs, and other stuff if it is so bad. That made me wonder of all the stuff we burn what is the worst? I hoped to find out that one object is worst than another and I thought that it might be the vinyl material because it has plastic in it.

Methods/Materials

Foil, burn can, cardboard box, vinyl material, styrofoam, 2 by 4, matches, newspaper, trash bag, cotton fabric, glass cover, plastic cups (5), rubber bands, saran wrap, stop watch.

Results

Cotton material took 12 minutes to burn, it smelled really bad, produced white smoke and I collected 1/4 cup of ashes.

Vinyl material took 25 minutes to burn, smelled worse than the cotton, grey to black smoke was produced, and I collected 1/32 cup of ashes.

Newspaper took 7 minutes to burn, no smell, white smoke, and 1/2 cup of ashes was collected.

Styrofoam took 32 minutes to burn, black soot covered the can and the glass, high amounts of black smoke poured out of the can, smelled the worst, 1/16 cup of ashes was collected.

Cardboard took 10 minutes to burn, it did not smell, white smoke, and ½ cup of ashes was collected.

Conclusions/Discussion

Before I conducted the experiment I thought that vinyl material would be the winner because it has plastic in it, and it was heavy. Once I started the actual burning I realized that styrofoam must also have some type of plastic in it. When I spoke to the fire chief, I found out that styrofoam is a type of plastic and it is dangerous to breathe. He said styrofoam is very toxic and can kill people if they breathe in a lot of the smoke. Luckily for me I did not breathe in any smoke. That also explains why there was hardly any ash from the vinyl material or the styrofoam. Since it was plastic it almost completely burnt up and went into the atmosphere.

The Styrofoam had the most smoke the blackest smoke, and second to last for the least amount of ash. That tells me that almost all of the Styrofoam went into the atmosphere.

Summary Statement

Burning different objects to determine which object has the most harmful effects to the atmosphere.

Help Received

My Mom helped me type the report and was there when I burnt all of of the objects.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Shaheen Jeeawoody

Project Number
J0912

Project Title
Water Quality along Saratoga Creek

Abstract

Objectives/Goals
My objective was to determine the impact of stormwater pollution on the water quality in Saratoga Creek as it flows from the mountain, through urban and industrial areas, down to the Bay. I believe that the creek will become more polluted downstream.

Methods/Materials
I collected water samples using a home-made launching device at 6 different sampling sites along the creek and on 3 different days: clear day, light rainy day and after a heavy downpour. I also collected rain water for my control. I tested all samples using the GREEN Standard Water Monitoring kit for levels of Coliform Bacteria, phosphate, nitrate, dissolved oxygen, pH, and turbidity.

Results
The Coliform Bacteria tests were positive at all locations and on all three days; each sample contained more than 20 coliform colonies per 100 mL of water. The phosphate levels varied between 2 and 4 ppm at all sites on all the three days while the nitrate levels increased from 0 in the mountain to 10 ppm at the Bay. The dissolved oxygen levels varied between 6 and 8 ppm but decreased to 4-6 ppm after the downpour. The pH of the water samples was in the range 8-9 and lightly decreased to 7-8.5 after the downpour. The turbidity levels were low (0-20 JTU) but increased to a maximum of 60 JTU on the heavy downpour day.

Conclusions/Discussion
According to the GREEN Standard, Saratoga Creek is doing poorly on the bacteria test. This level of contamination is due to wastes and fecal droppings of birds and animals living in the mountains or in the creek neighborhood. The high level of phosphate (accepted level: 0.3 ppm) must be coming from phosphorus occurring naturally in rocks and fertilizers washed by rain and excess watering. The nitrate levels were above the accepted level of 4 ppm. Nitrates might be coming from fertilizers, animal wastes and decomposition of organic matter. Saratoga Creek is doing well on the dissolved oxygen levels (optimal range above 5 ppm), pH (optimal range 6.5-8.5) and turbidity levels. A turbidity level of less than 40 JTU is considered good for aquatic life. As expected, the turbidity increased after a downpour due to soil erosion and heavy run-off. These findings lead me to conclude that stormwater pollution affects the water quality of Saratoga Creek. This will severely impact the delicate ecological balance of the Bay unless more drastic measures are taken to prevent and limit water pollution.

Summary Statement
As Saratoga Creek flows downstream, its water quality decreases as a result of stormwater pollution caused by residential, commercial and industrial activities.

Help Received
My mother drove me to all the site locations to collect water samples and took pictures. My father helped me with the tables and charts.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Alan M. Joyce

Project Number
J0913

Project Title
The Effect of Runoff on Bacteria Levels in Escondido Creek

Abstract

Objectives/Goals
This study sought to compare bacteria levels before and after rain along the Escondido Creek to determine whether runoff from a horse farm would affect bacteria levels in the Creek.

Methods/Materials
Water samples were collected several times at each of four locations along the Escondido Creek: two immediately upstream and two immediately downstream from a horse farm. Samples were taken both before and twelve hours after a rain. In the first tests, samples were run through a 0.22 micron filter to collect bacterial impurities. The filters were swabbed, and then bacteria were cultured in soy trypticase agar, which was incubated for 24 hours at 24 ºC. After the incubation period, a digital picture was taken of each dish against a light box. The pictures were uploaded to a computer. They were analyzed using Adobe Photoshop to desaturate the images, and Kodak 1D, to determine the total number of pixels representing bacteria on each dish. For each sample the pixel counts representing bacteria were compared. In the second phase of this study, I used the multiple tube fermentation technique to confirm the results of the first experiment by testing samples collected from locations upstream and downstream from a horse farm, again before and after rainfall.

Results
After the rain, the downstream samples had much higher bacteria counts than the upstream samples. In the first tests, the average number of pixels representing bacteria in samples taken after the rain was 11 million, and only 4.8 million for #before rain# samples. In the second set of experiments on average there were much higher bacteria levels after the rain. The downstream samples averaged 20 times as much total coliform bacteria (MPN 1,400,000) and almost twice as much fecal coliform bacteria (MPN 30,000) as the upstream samples.

Conclusions/Discussion
From the results, runoff from a horse farm appeared to significantly impact bacterial levels in the creek.

Summary Statement
This study compared bacteria levels before and after rain along the Escondido Creek to determine whether runoff from a horse farm affected bacteria levels in the Creek.

Help Received
Dr. Gerald Joyce allowed me to use his lab equipment; Suzanne Mandel Mosko allowed me to use her lab and equipment; Mother helped with display creation; Science teacher provided advice throughout project

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Megan Kalsman; Lucy Mayone

Project Number
J0914

Project Title
What's In Your Water?

Abstract

Objectives/Goals
Our goal was to test different chemicals and find out which ones were in different kinds of water. Our objective was to find out which water was the most contaminated.

Methods/Materials
Our methods included obtaining the materials, setting up our testing space, putting on our gloves and goggles to be safe, testing samples of water, recording our results onto tables and graphs, and putting it all together on the science board. Our materials included a Freshwater Master Test Kit, labels, paper, gloves, goggles, a science board, and the water samples.

Results
Our results showed that none of the water samples (including the Carmel River, Lake El Estero, Colton Middle School drinking fountain, and tap water) had nitrates in them. Carmel River has the highest pH. Lake El Estero had the most high range pH. Lake El Estero also contained the most ammonia, because of all the wildlife waste products.

Conclusions/Discussion
We predicted that Lake El Estero would have the most ammonia and we were correct. We predicted that the school drinking fountain would have the highest pH, but we were incorrect because the Carmel River had the highest pH. We predicted that tap water would have the most high range pH, but we were incorrect because Lake El Estero had the most high range pH. Lastly, we predicted that Carmel River would have the most nitrates, but were were incorrect because none of our water samples had nitrates in them. Therefore, we concluded that tap water was the least contaminated and Lake El Estero was the most contaminated.

Summary Statement
Our project is about testing for contaminated water by obtaining water samples in Monterey and Carmel.

Help Received
Father helped with graphs; mother drove us to get water samples.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Stephanie Kurniawan

Project Number
J0915

Project Title
How Do Plants Affect the Temperature?

Abstract

Objectives/Goals
The objective of my project was to find out if plants affect the temperature in a sealed box. I think plants will lower the temperature in the box compared to the box without any plants.

Methods/Materials
Thermometers were placed into six acrylic boxes. Sand was poured inside the boxes to represent the soil on Earth and to level the plants. The box represents the atmosphere. A Ming Aralia plant was placed in three of the boxes and the other three were left only with sand. A thermometer was put outside as the control; this will measure the room temperature. The boxes were positioned in a sunny place and were rotated every week. Temperatures were recorded three times everyday for two weeks. These temperature recordings were then averaged at the end of each week.

Results
After three days of experimentation, the containers started to fog up. Some days, not all of the containers got sunlight, so I rotated Box 1 and Plant 1 with Box 3 And Plant 3 on the second week. I discovered a change in temperature appeared when there was direct sunlight. But the difference was around one to two degrees. The box without the plant was the hottest out of the three variables with an average of 20.2°. The box with plants had an average of 19.3°. The control had an average of 18.9°, which is the lowest and it#s the room temperature.

Conclusions/Discussion
My hypothesis is correct. If there are plants in the sealed box, the temperature is lower than if there aren#t any plants. But the change of temperature stands out when there is direct sunlight. When it#s cloudy, the temperature stays the same in all the variables and the control. The reason why the boxes with plants had a lower temperature because plants absorb the carbon dioxide when there is sun to make its food in a process called photosynthesis. The boxes with no plants are warmer because carbon dioxide molecules absorb heat energy, which gets trapped in the box and causes it to be warmer. Plants also create shade and give off water vapor through the process of respiration which also lower the temperature.

My experiment also proves that deforestation can affect the earth#s temperature negatively. The trees will no longer be able to absorb the carbon dioxide from the atmosphere causing the earth to become hotter.The greenhouse effect is part of Earth#s natural balance, and we must try not disrupting it.

Summary Statement
My project shows that plants lower the temperature by absorbing carbon dioxide, a greenhouse gas, and sunlight in the process of photosynthesis.

Help Received
Parents bought materials

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Megan Lynn Lopez

Project Number
J0916

Project Title
Minimizing Nitrogen Pollution and Conserving Water

Abstract

Objectives/Goals

Nitrogen pollution in the environment results mainly from the over-use of nitrogen-based fertilizers in agriculture. Crops often cannot absorb all the nitrogen added. During irrigation, this excess nitrogen, which exists in the soil as nitrate, leaches down through the soil and contaminates ground water supplies, lakes, and rivers.

Farmers can reduce nitrate leaching by limiting the amount of water they use. By monitoring the moisture content of the soil and only applying enough water to reach adequate levels of moisture, they can both minimize nitrate leaching and conserve water.

Nitrate serves as plant food and its availability determines soil fertility. Nitrates are created in the soil through nitrification. Nitrification occurs when nitrifying bacteria converts ammonia fertilizer (or other naturally occurring ammonia) into nitrites and then nitrates.

This experiment tries to determine if and how limiting the amount of water applied (or the soil moisture) will affect the nitrification process. The experimenter hypothesizes that the amount of moisture in the soil will affect the nitrification process.

Methods/Materials

The experimenter set up 6 potted plants. Measurements showed that all pots contained the same initial levels of nitrate. The experimenter then fertilized each of the plants with 10 grams of ammonia sulfate and proceeded to carefully monitor and control the soil moisture in each pot. The experimenter kept two pots dry, two pots moist, and two pots very moist. After a ten-week period, the experimenter measured the final nitrate levels in each pot.

Results

Initial nitrate measurements showed that the soil nitrate levels in all the pots were about the same at the start of the experiment.

After 10 weeks of controlling the soil moisture in each of the pots, the experimenter measured the final nitrate content of the soil in each pot and found that the pots with the higher moisture content contained greater levels of nitrates.

Conclusions/Discussion

The results of the experiment support the hypothesis. The moisture content of the soil does appear to have an affect on the nitrification process. The experiment shows that soils containing the higher moisture levels also showed the greatest increase in nitrate concentration. Therefore, keeping the soil moist will result in additional plant nutrients (more nitrate).

Summary Statement

My experiment tries to determine if and how soil moisture affects nitrification.

Help Received

My dad helped me research the project and helped me to understand the material.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
David I. Marash-Whitman

Project Number
J0917

Project Title
Ecotoxicology of Stormwater Pollution in Our Aquatic Communities

Abstract

Objectives/Goals
Chemical pollutants that flow into the storm drain go directly into creeks and the Bay without treatment, making stormwater pollution a threat to aquatic communities. Residential activities (yard, pool, auto, and home maintenance) contribute to stormwater pollution. I wanted to (a)determine the impact of residential stormwater pollutants on organism growth; and (b)compare growth in environmental stormwater runoff samples with growth in 'clean water'

Methods/Materials
I designed dose/response experiments using a lettuce seed bioassay protocol to look at the effect of pollutant dose on growth. For each of 9 residential pollutants, I exposed 3 replicates with 6 seeds each to 11 serial dilutions of the pollutant(100%>>>0.01%) and a control(0%),incubating them for 5 days. I measured # seeds sprouted and root lengths. I also ran bioassays on environmental stormwater samples to compare growth with controls over a 5 day period.

Results
Growth (# seeds sprouted/18, average root length) responded to pollutant dose inversely -no growth at high doses and 'normal' growth at very low doses. The dose that caused a 50% drop in growth (TC50) varied greatly - Copper Algaecide(7.4% Cu) had the most impact, with TC50 < 0.01%; Clorox, the herbicide, pesticides, and brake fluid had less impact, with 0.1% < TC50< 1%; and paint and coolant had the least impact, with TC50>1%. Exposure to the pollutants had greater effect on root length than on germination. For environmental samples, stormwater from near a gas station had 3/8 the growth, from near a remodel had 7/8 the growth, and other samples had slightly better growth than the control with 'clean' water over the 5 day period.

Conclusions/Discussion
All the pollutants proved toxic enough that we should take precautions to avoid contaminating stormwater with them. The fact that Copper Algaecide(7.4% Cu) had significant impact at even very low concentration of copper(7.4 ppm), and similarly that one pesticide (0.24% pyrethins) had significant impact at very low concentration of pyrethins (9.6 ppm), is consistent with community concern and effort to specifically reduce stormwater pollution by these 2 chemicals. Greater impact on root elongation than germination, emphasizes that we should consider multiple effects when studying the ecotoxicology of aquatic systems. Less impact than expected for environmental samples, was probably due to dilution of pollutants with heavy rains.

Summary Statement
This project determined the potential impact of stormwater pollution due to residential activities on aquatic organism growth and identified which of 9 representative pollutants had the greatest toxic impact.

Help Received
My mother helped glue the board, helped get materials for the experiments, drove me to get environmental samples, and helped me wash petri dishes. My little brother Adam helped me label the >350 petri dishes that I used!

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Alyx D.Munden

Project Number
J0918

Project Title
Acid Rain Go Away

Abstract

Objectives/Goals
If I germinate radish seeds in an acid rain environment, then I believe there will be reduced germination; because, it is my opinion, that acid rain is detrimental to the growth and health of plants.

Methods/Materials
Methods:
Germination and observation of radish seeds in an acid rain environment.

Materials:
1. Four 1 gallon jugs 5. One role of paper towels
2. Four germination trays 6. Measuring cup
3. One jar of vinegar 7. Plastic rap
4. pH testing strips 8. Teaspoon (1 tsp.=5mls.)
9. Radish seeds.

Results
Results:
The successful germination of radish plants was dramatically reduced by the gradual addition of acid rain in this experiment.

Conclusions/Discussion
Conclusion:
Ecosystems are delicate and vulnerable to pollution. My experiment showed how acid rain reduced the growth and health of radish plants and it exemplifies the effects of auto mobile and industrial pollution. We must take responsibility to reduce these pollutants to minimize the environmental hazards they present in forming acid rain.

Summary Statement
My experiment illustrates how the effects of acid rain can harm the environment.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Keri A. Neal

Project Number
J0919

Project Title
Will the Effect of Decreasing Photosynthesis in an Aqueous Solution Raise or Lower the pH?

Abstract

Objectives/Goals
The purpose of this experiment is to see how the process of photosynthesis affects the pH in an aqueous solution.

Methods/Materials
(1) Purify distilled water in an autoclave. (2) Place 5 beakers in each of four wooden boxes. (3) Pour 350ml of distilled water into 10 beakers. (4) Pour 350ml of pond water into the other 10 beakers. (5) Calibrate the pH meter with a buffer of seven before starting any recordings. (6) Record the pH of each beaker. (7) Place 8g of Elodea plants in each beaker. (8) Cover one box containing distilled water with the black plastic and one box containing pond water with black plastic. (9) Cover the other box containing distilled water with the clear plastic and the other box containing pond water with the clear plastic. (10) Turn on the fluorescent light. (11) Calibrate the pH meter using a buffer of seven before starting each recording and record the pH in each beaker every 30 minutes for 8 hours.

Results
The results show that in the clear-pond water the pH changed at an average of .43 on the pH scale. The clear-pond water changed because the light energy could reach the Elodea and the pond water may have had nutrients in it that reacted to the light. In the clear-distilled water the pH changed at an average of .228 on the pH scale. In the blocked-distilled water the pH changed at an average of .178 on the pH scale. In the blocked-pond water the pH changed at an average of .124 on the pH scale. The blocked-pond water didn#t change very much because it was mostly restricted from the light leaving very little light energy to reach the Elodea.

Conclusions/Discussion
The hypothesis is incorrect. In the containers restricted from the light, the pH level increased slightly. In the containers not restricted from the light, the pH level increased several more pH points than the other containers. This is because with the containers being restricted from the light, the light energy is not able to reach the Elodea.

Summary Statement
The purpose of this experiment is to see how the process of photosynthesis affects the pH in an aqueous solution.

Help Received
Mrs. Williams helped me with the experimantal design.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Omar E. Njie

Project Number
J0920

Project Title
What Type of Reclaimed Water Helps Marathon Light Grass Grow the Best?

Abstract

Objectives/Goals
The goal of my experiment is to discover the effect of different types of reclaimed water on the growth of grass. My hypothesis is I think that the reclaimed water from LMU which has not been treated is most likely to help the grass grow the tallest

Methods/Materials
I bought 1 gallon pots , I purchased 4 bags of Washed Play Sand, I filled each pot 3/4 with the sand. I assigned each pot to their own specific plant number (1,2,3,4,5) as well as specific test group, which are as follows: BD (water with biodegradable soap), NBD (water with non biodegradable soap), WM (water from washing machine), LMUC (water from Loyola Marymount University that has been chlorinated), LMUNC (water from Loyola Marymount University that has not been chlorinated, TAP (tap water)
Part 2: Planting the Grass. I bought marathon light, grass sod .The grass was 4 cm tall. I planted the grass in the pots.
Part 3: Watering the Grass/ Measuring Growth. I watered the grass every other day with 240 mL of water. I measured the height of the grass every 2 days as well. Part 4: Testing the Water. I performed water tests. I tested the PH, hardness, and chlorine of my water, using a LaMotte water testing kit. I filled up the test bag with the amount of water needed, put in the tablets, and recording my data according to the amount of the tested substance in the water. My materials were tap water, recycled water from LMU that has been chlorinated, recycled water from LMU that has not been chlorinated, Washed Sand, 30 1 gallon pots, Shade Cloth, 1 LaMotte water testing kit

Results
Tap water helped Marathon Light grass grow the best over an 18 day time period. Non biodegradable soap water helped Marathon Light grass grow the least over 18 days.

Conclusions/Discussion
The reason that TAP group grew the tallest out of my 6 groups was because when I collected the PH, Hardness and chlorine samples, the grass growing in group TAP fell within the expectable measurement range for those three categories, where as group NBD did not. This project showed that using non-biodegradable substances is harmful to the environment. Recycling water around the house while using biodegradable substances is cost effective, environmentally safe, and a good way of conserving water. Before a drought were to occur people should be more aware of the way they use water, and in addition I would hope that they would continue to look for ways to recycle water themselves.

Summary Statement
I tested what type of reclaimed water helps Marathon Light Grass grow the best.

Help Received
I obtained the 2 types of reclaimed water from LMU from Dr. Pippa Drennan..

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Alyssa C. Paulson

Project Number
J0921

Project Title
The Effects of Runoff Pollutants on Various Aquatic Plants

Abstract

Objectives/Goals
The goal of this project was to observe the reaction of various aquatic plant species to the pollutants: motor oil, car wash detergent, fertilizer, and water-based paint.

Methods/Materials
In this project, two gallon sized aquarium tanks were used, along with Anubias Nana plants, Amazon Sword plants, Pennywort plants, and Dwarf Sagittaria plants. In every tank, there was one of each plant species. Approximately every five days, 237 mL of water was collected and mixed with 1.6 mL of a pollutant, then poured back evenly, across the surface of the water in the tank. Each tank was subjected to a different pollutant, with the exception of a control tank. Besides recording the plants' reactions to the pollutants, the water was tested for its pH, ammonia, nitrite, and hardness level as indicators of environmental health.

Results
In the first week, there were no significant changes. By the end of the second week, in all tanks, some leaves of the Anubias Nanas were turning brown. The Pennywort exposed to "fertilizer runoff" was also browning. In the third week, the Anubias Nanas subjected to the detergent and "oil runoff" began to die, along with the Amazon Sword plant exposed to the "fertilizer runoff". After four weeks, the Amazon Sword, Pennywort, and Anubias Nana plants exposed to the "fertilizer runoff" had decomposed, as had the Anubias Nana subjected to the "detergent runoff". By five weeks, the Anubias Nana subjected to the "oil runoff" had decayed.

Conclusions/Discussion
After 5 weeks of introducing the pollutants, the "fertilizer runoff" appeared to have the most negative impact on the four species of plants. The "detergent runoff" had slightly less impact and was similar to the "oil runoff" results. Surprisingly, the water-based "paint runoff" did not produce any visible damage to the health of the plants.

Summary Statement
In a runoff simulation, this project tested the effects of motor oil, car wash detergent, fertilizer, and water-based paint on various aquatic plants.

Help Received
Thanks to my mother who took me to the stores to purchase my materials. Thanks to my science teacher who helped edit my report.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Pamela Phonxaylinkham

Project Number
J0922

Project Title
Investigating the Growth of Radish Seeds in Various Ash and Soil Combinations

Abstract

Objectives/Goals
The purpose of my science fair project is to investigate the growth of radish seeds in various ash and soil combinations. I am trying to find out if slash and burn techniques have any affects on the soil when growing rasdish seeds in the soil that contains ash.

Methods/Materials
In my science project, I used soil, radish seeds, 25 potting bowls, water, mesuring cups, matches, 5 different type of woods (orange, lemon, apricot, pistachio, and walnut), and a mallet. The woods were burnt into ash so it can mix with the soil. The mixture of soil is put into the potting bowls so that I can start my experiment.

Results
The results of my experiment showed that slash and burn techniques are beneficial and that they help the plants grow faster than just regular soil. The Orange wood ash came in the best in all three requirements in my project (health, # of growth, and length of plants). The lemon wood ash came in least best because it had less affect on the radish seeds. Apricot wood ash came in second best, the control came in 3rd, the pistachio wood ash came in 4th, and the walnut wood ash came in 5th. I aslo discovered that it depends on what type of wood ash that is added to the soil to make the plant grow faster or slower. Some wood ash makes the plant slower and some makes it grow faster, but slash and burn techniques is still pretty beneficial.

Conclusions/Discussion
After completing my investigation, I found out that my hypotheses was all wrong. My hypotheses was that the lemon wood would work better than the others, and help the radishes grow healthier. I think that because the citric acid would probably feed the radish seeds and help it grow. I also think that the walnut wood ash will not help the radish seeds grow.

The orange wood did the best out of all of them and the lemon did the worst.

I learned that slash and burn techniques are beneficial and that it can help the seed grow faster depending on what type of wood ash it is. In conclusion, people who farm or garden should consider into taking the slash and burn technique.

Summary Statement
My project is to see if slash and burn techniques have any affects on plants.

Help Received
Teacher revised science papers; Sister helped glue papers to board.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
William C. Piper

Project Number
J0923

Project Title
The Effect of Electromagnetic Fields on Eremosphaera Algae Cells

Abstract

Objectives/Goals
Environmental exposure to man-made electromagnetic fields has been steadily increasing with growing electricity demand and ever-advancing technology. There are conflicting studies regarding health issues and electromagnetic fields. The purpose of this experiment was to find out how man-made electromagnetic fields affect eremosphaera algae cells. I predicted that exposing algae cells to an increasingly stronger electromagnectic field would damage them in an increasingly negative way.

Methods/Materials
My procedures involved building a testing apparatus that would hold six test tubes each wrapped with an increasing number of copper wire coils. The control test tubes were kept in a separate room away from the testing apparatus. Slides were made of the algae culture solution before and after exposure to the electromagnetic field. Approximately 100 cells were counted for each sample and normal cells verses abnormal cells were recorded. The experiment was repeated three times.

Results
The results, after averaging all three trials, showed that the number of abnormal cells increased as the exposure to the electromagnetic field increased. There was a 32% increase in abnormal cells between the control group (no exposure) and Test tube #6 (greatest exposure).

Conclusions/Discussion
In conclusion, my hypothesis was correct. The algae cells were affected negatively by an increasingly stronger electromagnetic field. There was an increasing percent of abnormal cells at higher levels of electromagnetic exposure. This experiment supports research that shows biological changes from exposure from man-made electromagnetic fields. Most studies confirm that more research is needed on electromagnetic fields and health risks.

Summary Statement
My project tested the effect of man-made electromagnetic fields on eremosphaera algae cells.

Help Received
My father helped me build my testing apparatus; Dr. Schmalhorst taught me how to make microscope slides; Mr. Price showed me how to measure an electromagnetic field.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Megan M. Sexton

Project Number
J0924

Project Title
Burn Today, Grow Tomorrow

Abstract

Objectives/Goals
My objective was to test the effects of fire on the mineral content of soil. I believed that the minerals in the soil would be depleted from the fire.

Methods/Materials
My materials to conduct this experiment included various samples of burnt and unburnt soil. I also ordered a Rapitest Soil Test Kit, which I used to test the PH level and the amounts of nitrogen, phosphorus, and potassium in the soil. I collected both burnt and unburnt soil samples from various areas in Southern California and then tested them using the Rapitest Soil Test Kit.

Results
My results showed that the amounts of nitrogen, phosphorus and potassium in the soil were higher in the burnt soil samples as compared to the unburnt samples. They also showed that the soil was more alkaline in the burnt soil samples.

Conclusions/Discussion
My results proved that my hypothesis was incorrect. Instead of depleting the minerals in the soil, as I had predicted, the effects of the fire actually increased the mineral content, enriching the soil for the native plants. Contrary to what many people think, my results suggest that seeding or tampering with burnt soil may interfere with the natural healing process.

Summary Statement
My project is designed to test the effects of fire on the mineral content of soil.

Help Received
Father helped order the soil test kit and drove me to various locations to collect my soil samples.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Rainer J. Sexton

Project Number
J0925

Project Title
To Drink or Not To Drink Cayucos Creek Water

Abstract

Objectives/Goals
The objective is to determine which of six Cayucos creeks contain the highest nitrate levels and to determine if they are safe for human consumption. I believe Toro Creek will be the most contaminated because it runs through more agricultural and ranching operations than the other creeks.

Methods/Materials
Two water samples were collected from each site plus a control creek during a 4 week period after the rainy season. Each test was taken ¼ - ½ mile inland from the creek mouth. A Nitrate-Nitrogen test (using sulfamic acid and zinc) procedure was used to obtain ppm (parts per million) nitrogen-nitrate readings which were then converted to get nitrate levels.

Results
According to the California State Water Board, nitrate levels of 6ppm are not unusual, but levels of 10ppm can be fatal to infants and dangerous to others. Average ppm readings for Cayucos were 0, 4.4, 5.5, 6.6, 7.7, and 8.8, with Toro Creek as the highest, as I predicted. All the creeks are considered safe for humans, although 50% of the readings were above normal. Cayucos Creek and Toro Creek are close to the danger level and people should avoid getting water from these creeks into their bodies.

Conclusions/Discussion
The findings of this project lead to questions concerning what affected the contamination, such as rain or lack of rain, amounts and types of pesticides used, number of animals along creeks, and other existing contaminants. Another important aspect to study would be the affects of eutrophication (when high nutrient supplements cause abnormal growth of plants and algae and robs the oxygen supply system needed for the natural environment). This was a challenging project, but the bigger challenge would be for Cayucos to have a monitoring program in order to successfully protect our creeks.

Summary Statement
My project is to determine the safety of water in Cayucos creeks by testing for nitrates.

Help Received
My mother drove me to the National Estuary Program, the creek sites, and proofread my writing. Ann Kitajima from the National Estuary Program taught me how to do the nitrate testing.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Mitzi Torres

Project Number
J0926

Project Title
Determining if Oral Bacteria Can Be Transported by Culex pipen

Abstract

Objectives/Goals
The goal of my project is to determine if culex pipen (mosquito specie), is able to transport oral bacteria (bacillus).

Methods/Materials
Bacillus was obtained from my mouth to apply on ten petri dishes with three Q-tips. The agar was used as the jelly base of the petri dishes. A large tank with a lid was used to pu the petri dishes and mosquitoes in; the sugar water was the "food" that would keep around 100 culex pipen alive.

Results
The least amount of cultures grown was 12 and the most amounts were 35 cultures. The average amount of the cultures was 22.75. The bacillus used in my experiment was obtained from my mouth. The results obtained proved that the mosquitoes transported the bacillus.

Conclusions/Discussion
Culex pipen, the common house mosquito, was able to transport the bacillus. With my experiment, I can conclude that mosquitoes can transport bacteria. This brings one more reason to continue the efforts to abate mosquitoes worldwide. You don't have to be a rocket scientist to do it, but you can help by not keeping containers of stagnant water which is a nesting place for mosquitoes.

Summary Statement
My project is about finding out if mosquitoes are able to transport bacillus which could lead to illnesses.

Help Received
My mom gave suggestions on my project and my dad cut my board. I received the mosquitoes from mr. Charlie Smith consolidated mosquito Abatement District. Mr. Edward Case gave suggestions and corrected some of my papers; my uncle helped me do my flowchart .

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Isabella Tromba; Lara Tromba

Project Number
J0927

Project Title
Invigorating or Deadly II: The Influence of Fertilizers on Local Ponds

Abstract

Objectives/Goals
Our objective was to determine which concentration of Nitrate, Phosphate and combination of the two would lead to the greatest increase in algae growth. Our hypothesis is that the .3% nitrate and phosphate solution will lead to the greatest algae growth and dissolved oxygen.

Methods/Materials
We made a dilution series from 1% to .01% of Nitrate and Phosphate and then we made a .3% to a .03% of a combination of the two. Then we tested dissolved oxygen and compared algae with dissolved oxygen content. We used a microscope, 100 ml beaker, 2 different kinds of pippetes, an eyedropper, a dissolved oxygen test kit, pond water, cups, tap water, and fertilizer.

Results
Our results and conclusion was that the .3% solution had the most algae. Both the westlake phosphate and the combination had the highest dissolved oxygen measured in ppm. so, our hypothesis was partly correct.

Conclusions/Discussion
We think that the phosphate and some Antonellis samples moved onto the second step of euthrophication which is when the bacteria begin breaking down the algea. If this happens there will be more dissolved oxygen because the bacteria use up oxygen and less algae content.

Summary Statement
The effect of Nitrate and Phosphate Fertilizers on agal growth in Antonelli's and Westlake Pond

Help Received
Mother gave us pointers on how to design our display board.

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Liberty D. Williams

Project Number
J0928

Project Title
What Is in the Water?

Abstract

Objectives/Goals
My objective is to compare the quality of different water samples-- treated municipal water,and untreated well,river,and mountain spring water.

Methods/Materials
Using water testing kits, I tested my samples for Nitrates, Nitrites, Alkalinity, pH, Hardness, Copper, Iron, Chlorine, Arsenic, Pesticide, Lead, and E.coli bacteria.

Results
My project shows that the Piercy mountain spring water is the most desirable; Downey's municipal-treated water has the highest amount of hardness at 250ppm; Redway School water has a high pH, alkalinity, and copper traces; and most unexpected are the positive E.coli bacteria results from Phillpsville-Miranda and Redcrest Eel River samples.

Conclusions/Discussion
Eventhough Miranda and Phillpsville treat their water with chlorine the E.coli bacteria is present. Upon contacting Humboldt County Environmental Health and Regional Water Quality Control Board, both agencies state a lack of funding and staff to monitor this area.

Summary Statement
My project compares water quality from varying sources both treated municipal and untreated well, river, and spring water.

Help Received
Harry Vaughn: hatchery manager, inspired and guided; Mother gave feedback; Teacher kept me on time line

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Amy L. Wolfberg

Project Number
J0929

Project Title
Triclosan's Effect on a Marine Alga

Abstract

Objectives/Goals
This experiment was performed to determine if triclosan (antimicrobial) has an effect on a marine alga.

Methods/Materials
Five different treatments of triclosan were used starting at 0.25 mcg/l and was increased by five times for each succeeding treatment. A control with no triclosan was also set up. There were three replicates of each dilution for accuracy. Test tubes with 15 ml Isochrysis Galbana marine algae were set up, then the triclosan dilution was added. Using a cytometer, alga cells were counted three times during the experiment, on day one, four, and eight. Five cytometer squares were picked randomly and counted for each sample. The data was analyzed using the SYSTAT statistics and graphing program.

Results
All of the cell concentrations increased but the controls consistently had a higher concentration of Isochrysis than the algae with triclosan. The increasing rate of the treatments of triclosan was slower than the control. The difference between the control and the greatest treatment of triclosan was greater in the middle of the experiment, this shows that triclosan is most effective after a four day period. In general, as the triclosan treatment increased the cell concentration decreased. The analysis of covariance, produced by SYSTAT, showed that only the treatments and the days had a significant difference. These are the two variables that were graphed.

Conclusions/Discussion
Over all triclosan slowed the growth of the algae. The highest treatment of triclosan always had a slower growth rate than the control. Even though the cell concentrations of the triclosan treated Isochrysis did not decrease, they were always less than the control, revealing a possible environmental concern. The lowest treatment of triclosan used was 0.25 mcg/l, which is the lowest amount found in effluent waste water in the U.S.A according to my research. The difference between the triclosan treatments and the control was less on the eighth day. This could mean that the algae becomes less susceptible to triclosan or triclosan is degradable over an eight day period. Since algae is at the bottom of the food chain triclosan may be altering ecosystems.

Summary Statement
My experiment was performed to show triclosan#s (antimicrobial) effect on a marine alga (Isochrysis), it showed that triclosan may pose an environmental concern.

Help Received
Used Telonicher Marine Lab equipment at Humboldt State University under supervision of Dr. Dennis A. Thoney, Ph.D., and Grant Eberle, M.S.; Dr. Dennis A. Thoney, Ph.D., helped with SYSTAT statistics and graphing program; Kenny Norman, a math aide at Green Point Elementary helped with triclosan dilutions;

CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Swati Yanamadala

Project Number
J0930

Project Title
The Determination of Bacterial and Pollutant Flows in Coastal Estuaries of Southern California

Abstract

Objectives/Goals
There are two main objectives of this experiment: to create a mathematical model showing the relationship between turbidity, dissolved oxygen, pH, and the levels of indicator bacteria for fecal contamination and to assess the impact of the Ballona Wetlands on coastal water quality.

Methods/Materials
In the field samples were tested for temperature, salinity, dissolved oxygen, and pH levels using the YSI 600R Sonde Electronic Probe. Further testing was done in the laboratory using the HACH2100N Turbidimeter for turbidity levels and the IDEXX Quantitray 2000 System with the MPN method for levels of indicator bacteria for fecal contamination (total Coliform, Eschericia coli, and Enterococci).

Results
Results indicated that bacterial levels were higher with increased turbidity and dissolved oxygen in a neutral pH. 70 percent of the time total Coliform levels were higher during the flood tide than during the ebb tide. The state law maximums were breached 60 percent of the time for total Coliform levels and 70 percent of the time for Enterococci levels. A mathematical model was created for bacterial contaminant determination: [EB] = Ke^(7-pH)([dO][T])^2. The correlation constants were K (total Coliform) = 2.00x10^1, K (E. Coli) = 1.06x10^-1, and K (Enterococci) = 8.79x10^-3.

Conclusions/Discussion
Coastal pollution and beach water quality are a result of the interaction of a myriad of human and naturally occuring factors. This study clearly demonstrates that there is contamination in the Ballona Wetlands, which is carried into the ocean by tidal flows. The two possible explanations for this are primary contamination from wildlife in the Ballona Wetlands or secondary contamination from human sources from the Ballona Watershed area. This study also shows that sophisticated mathematical models can be constructed to greatly simplify the current testing procedures and be more cost effective. These types of models are critical from an economic point of view and for beach safety considerations.

Summary Statement
The purpose of this project is to understand the role of the Ballona Wetlands on coastal water quality and to costruct a mathematical model for bacterial contaminant determination.

Help Received
Used equipment at Loyola Marymount University under the supervision of Dr. John Dorsey