Journal *of* Student Research *on* Puget Sound

Bremerton High School
9th Grade
Bremerton, WA

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Developing curiousity and confidence through student-led scientific research on the waters of the Salish Sea

Turbidity or not turbidity, that is the question.

Bremerton High School Apr. 13-15

- What is the effect of turbidity on Zooplankton and Phytoplankton?
- We wanted to know if the clarity of the water had anything to do with the zooplankton’s ability to hunt the phytoplankton and their ability to receive light to photosynthesize.

Things you need to know

If the turbidity is too high, then the phytoplankton, an important part in the food chain, will not be able to access light, and will die due to this. That will cause all of the animals depending on these plankton die, such as zooplankton, certain whales, and nearly all life because they provide oxygen for the water.

Zooplankton: plankton consisting of small animals and premature stages of other animals

Phytoplankton: plankton consisting of microscopic plants

Turbidity: the cloudiness or haziness of a fluid due to various particles in the water.

Our background knowledge

We thought that the hazier the water was, the more difficult it would be for the different planktons to survive.

Question and Prediction

- If: The turbidity is high
- Then: the phytoplankton and zooplankton will die
- Because: Turbidity will decrease zooplankton’s ability to find food and will decrease the phytoplankton’s light source.

Variables

Manipulated: The turbidity of the water
Responding: The phytoplankton and the zooplankton in the water.
Controlled: depth of water, time equipment is in water, and location.

Materials

We used: graduated cylinders, a secchi disk, a phytoplankton and zooplankton net, and a niskin bottle.

Method

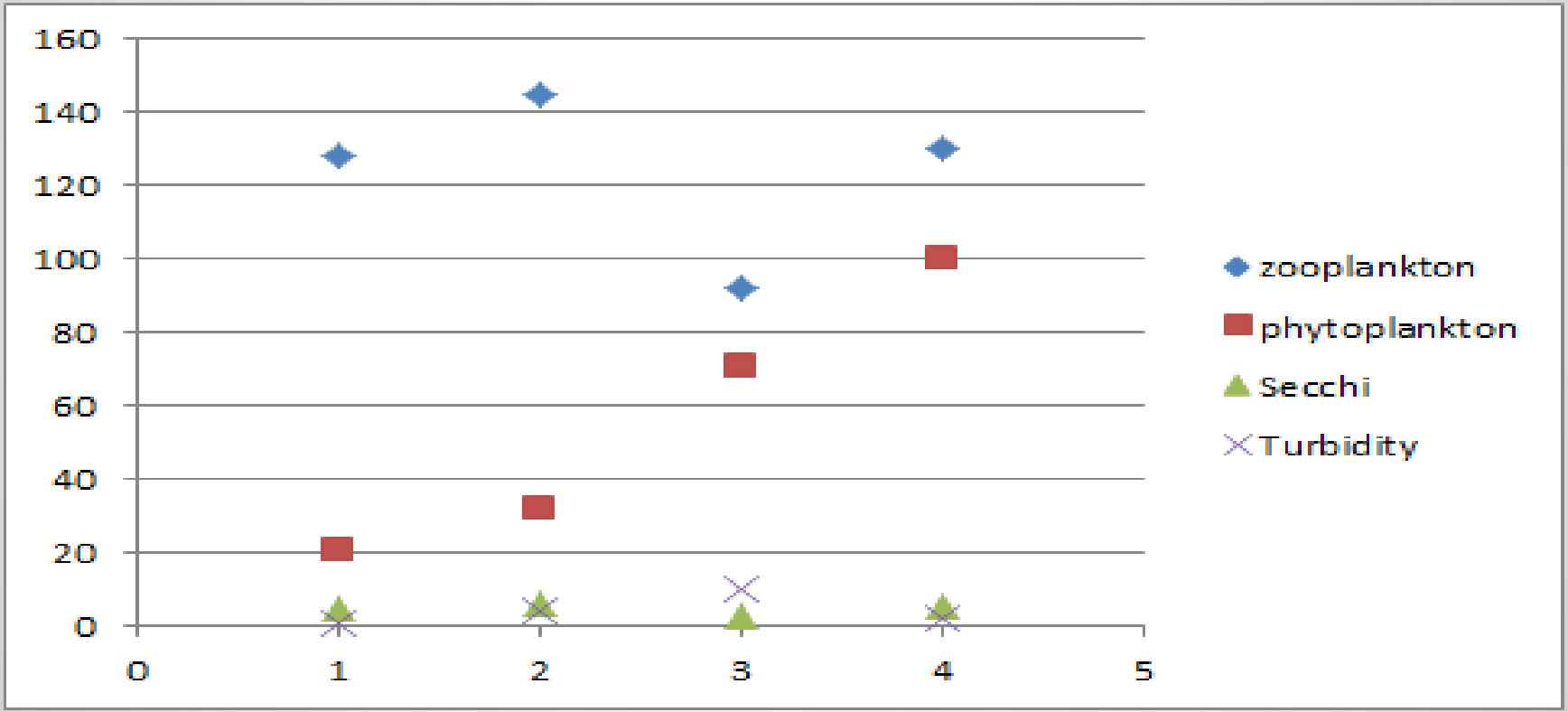
- We measured at the same depth, 6 meters. We did all of your data collection in the Puget Sound around Blake Island. It was sunny and windy the entire time.
- Our deployments were 3 minutes and 40 seconds each. We used the nets, the niskin bottle, and the secchi disk.
- After we collected our planktons, we put them in graduated cylinders, counted them, and then examined them under microscopes.

Data Analysis

Our Data Table

Station #	Zooplankton	Phytoplankton	Secchi	Turbidity
1	128 mL	21 mL	5 meters	1.0 formazin turbidity unit
2	145 mL	32 mL	5.75 meters	4 ftu
3	92 mL	71 mL	3 meters	10 ftu
4	130 mL	100 mL	5.5 meters	2 ftu

Data Cont.


160
140
120
100
80
60
40
20
0
0
1
2
3
4
5
zooplankton
phytoplankton
Secchi
Turbidity

Analysis

1. Our data always shows more zooplankton that phytoplankton
2. There doesn't seem to be a connection between the secchi disk measurements and the niskin bottle measurements.
3. There is either a big gap or a small gap between the different plankton populations.

Conclusion

After reviewing our data, we decided that we were undecided. However, on most occasions, the clearer the water was, the more zooplankton that we found.

Evaluation

If we could do this again, we would like to also study the dissolved oxygen in the water. Also, we wouldn’t use the secchi disk again, because that can be influenced by human error.

Ideas for the future

New Questions

What effect do the seasons have on the phytoplankton and zooplankton population?

Are there variations due to the depth of the water?

New Methodologies

Use less water to get the plankton out of the nets

More control over dependent (manipulated) variables

Comparing Zooplankton and Phytoplankton at Different Depths in the Puget Sound

Introduction

I am Mary, And this is Jordan. We go to Bremerton High School and went on the Salish Sea trip last year. We Had a lovely time and this is our presentation we hope you enjoy.

Background knowledge

- The Puget Sound is in Washington State.
- Zooplankton- They are a community of floating, often microscopic, animals that inhabit aquatic environments.
- Phytoplankton- Are Drifting microscopic plants that trap the energy from the sunlight and are primary organisms in a marine food chain.
- The Puget Sound is an estuary, where saltwater from the ocean mixes with fresh water that falls as precipitation or drains from surrounding land.

Background knowledge

Based on prior knowledge we expected to see a difference in Phytoplankton and Zooplankton at different depths.

- We measured the Zoo and Phytoplankton at 5 and 15 meters.
- We Also found out what the difference between the plankton by kind of using a cheat sheet .

Hypothesis

IF: we collect plankton at different depths.Then: we will find more plankton in shallower water.Because: the plankton cannot withstand the mass pressure at deeper depths and cannot find adequate sustenance .

Variables

Manipulated Variables:

- water depth
- deployment location
- speed

Responding Variables:

- The amount of zooplankton and phytoplankton in the water

How are the manipulated and responding variables related?

- When we manipulate the water depth, deployment location, and speed we get different amounts of plankton.
- The faster you move through the water the more water passes through the net which means you get more plankton in your net.
- You will have different amounts of plankton in different locations and water depths around the Puget Sound.

Materials

- rope
- funnel
- clip
- flow meter
- graduated cylinder
- nets
- bottles
- microscope
- protective gear (i.e. goggles, raingear)

Methods

- We measured at two different depths, 15 meters, and 5 meters. We did our data collections in the Puget Sound. And the weather was typically windy, and partially rainy.
- Our deployments were two minutes each. We used the zoo, and phytoplankton nets.
- After we collected our plankton, we poured them into graduated cylinders, and took them to the labs to inspect them underneath microscopes.

Data Analysis

- Zooplankton at 5 Meters We caught 13 ml.
- Zooplankton we caught 16 ml.
- Phytoplankton We caught 7 ml.
- Phytoplankton we caught 13 ml.

Conclusion

- Our experiments and research gathering ended in being undecided.
- The data we collected told us that more zooplankton was at deeper depths, and more phytoplankton was at shallower depths.

Evaluation

If we were to re-do this experiment, some of the things that we would change would be that at one point we accidentally stopped the timer, and ended up having the nets in the water for perhaps longer than what we would've liked. Not to mention that some plankton samples spilled. We should've paid more attention, and kept better track of how we were doing the gathering our plankton. Other factors we would like to have control over are wind, movement of the the water, and the location for the experiment.

Ideas for the Future

New Questions

How can we catch more plankton?
Does the location really matter in how much plankton we caught?
Would our results be different if we caught plankton on a sunnier day?

New Methodologies

1.Make sure to throw plankton nets at the same time
2. Make sure not to spill water samples
3. Pull in nets at the same time.

Questions?