Journal of Student Research on Puget Sound

The collected reports of the student scientific explorations aboard the *SV Carlyn*

Salish Sea Expeditions is a catalyst for students in their inquiry of Puget Sound through boat based-scientific exploration.

Comparison between plankton abundance at the surface (1 meter) and depth (10 meters) to the amount of sunlight at each depth at sites in Central Puget Sound.

REACH 6th - 8th Grade
Stanwood and Camano Island, Washington

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Salish Sea Expeditions
647 Horizon View Pl. N.W.
Bainbridge Island, WA 98110

phone: 206.780.7848
www.salish.org

School: REACH (Stanwood and Camano Island**)**
Dates: September 30- October 2nd, 2006
Grade: 6-8th
Teacher: Kim Lambaugh (group leader and district teacher)

I. Title

Comparison between plankton abundance at the surface (1 meter) and depth (10 meters) to the amount of sunlight at each depth at sites in Central Puget Sound.

II. Abstract

We are a group of students who are in the REACH program from Stanwood/Camano Island school district, and we went out on Carlyn for 3 days in the fall of 2006 to research our Hypothesis and Prediction. Our prediction: If we study plankton at different depths 1 meter and 10 meters), then we will find more at the surface because there is more sunlight. Why: Because plankton are easy to study. We have right tools and equipment to collect and measure them. How: We collected our samples by using the Zoo and Phytoplankton nets. We put them in the water at 1 meter and 10 meters. We settled our samples and put them in graduated cylinders. We found that our prediction was not entirely true because there was almost the same amount of plankton at the surface and down deep.

III. Introduction

We are a group of students who are in the REACH program from Stanwood/Camano Island school district, and we went out on Carlyn for 3 days in the fall of 2006 to research our Hypothesis and Prediction.

Our subject was researching plankton at different depths. We chose this subject over others because during the first meeting we had to plan out trip we divided into groups and brainstormed subjects that we wanted to study. After that we narrowed our choices down to plankton because we really wanted to study them.

Our subject relates to Puget Sound because the plankton in the ocean control a lot of what is in the air in our world. The also help control gases and pollution. They are also essential for marine life because they are at the bottom of the food chain.

Our Prediction was: if we collect plankton at different depths then we will find more at the surface because there is more sunlight closer to the surface. We decided on our hypothesis to base our prediction by combining our knowledge of three elements of plankton, water and sunlight, and figuring out how they might be connected.

We found that on average the secchi depth was 9 meters, the average where light penetrated.

We predicted that if we collect plankton at different depths (1 meter and 10 meters), then we will find more at the surface (1 meter) because there is more sunlight at the surface. The

plankton that we found was measured in mL, and we found that we collected about the same amount of plankton at the surface tow and the deep tow. We think we got these results because sunlight penetrates deeper than we thought (10m). We sampled at 10 meters and 1 meter. Maybe if we sample at the surface at 0 meters then we would have gotten our predicted results.

The results mean that there are a lot of plankton in Puget Sound. If there were no plankton , there would be no crabs, jellyfish, barnacles etc. because these animals as well as many others are plankton when they are babies, and without plankton there would be no young to grow up into these adults.

If we came out again on Carlyn we would collect more data at different times of the day. We could sample at 0 meters in the morning and at night and maybe sample in more polluted areas.

We would also like to measure at different depths, like 0 meters, and deeper in the water, like 20-30 meters (60-90 feet). We would change the depths to collect plankton because we might get more or less plankton at 0 meters, than where we sampled at 1 meter, and less at 20-30 meters because sunlight does not go down that far, because our secchi disk went down 9 meters before we could not see it any more.

IV. Experimental Design

Equipment used:

Zooplankton net
Phytoplankton net
Secchi Disk
Refractometer
Niskin Bottle
DO Probe
SONDE
Microscopes
Plankton Settler/Graduated Cylinders

We decided to test each sample site for plankton and sun light available at both one meter and ten meters. We used the zooplankton and phytoplankton nets to collect the plankton and then settled the plankton sample in graduated cylinders to find the approximate volume of plankton. We also used the secchi disk, and recorded the secchi depth at each site to see where sunlight penetrated and how deep.

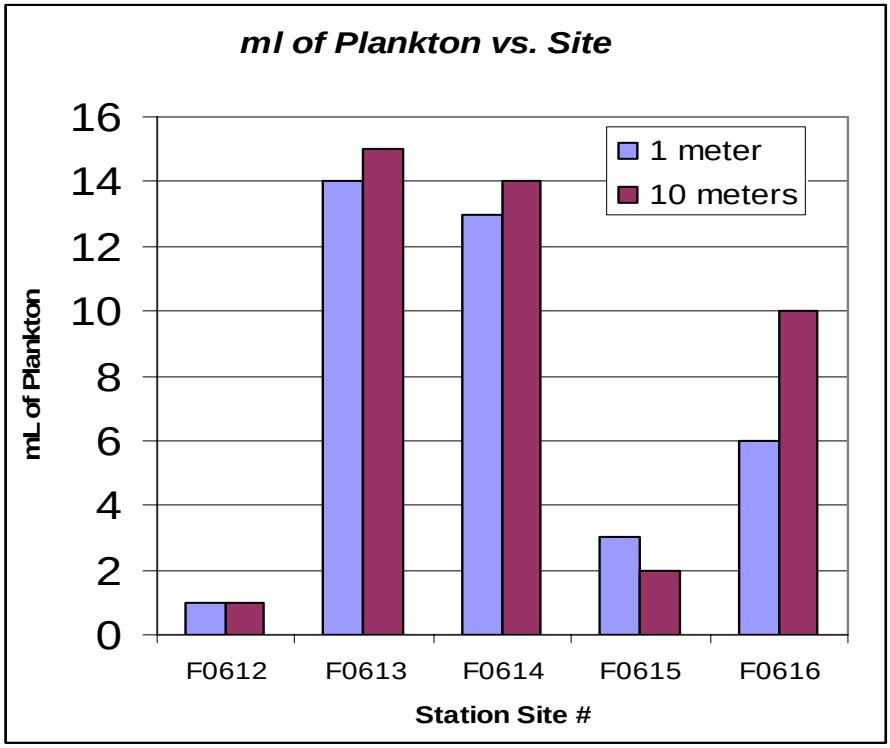
We towed the plankton nets for 5 minutes at each site, and took the Secchi disk reading three times at each site, and averaged the three secchi depths together.

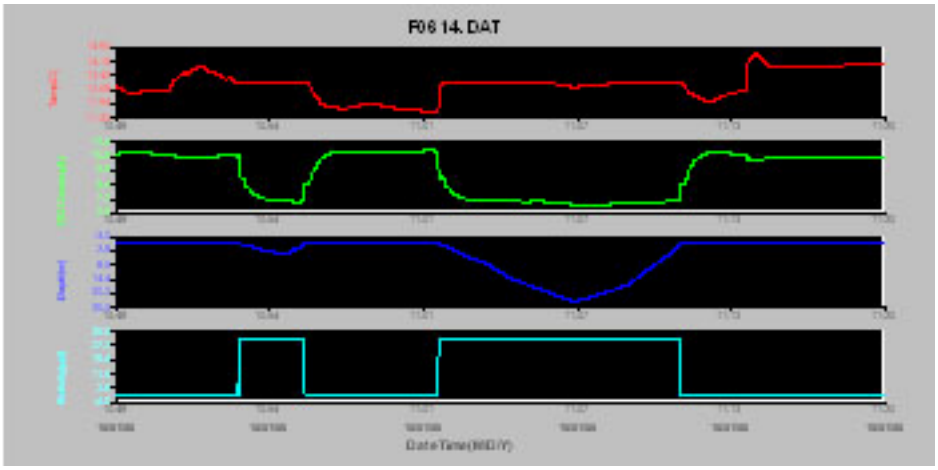
V. Results

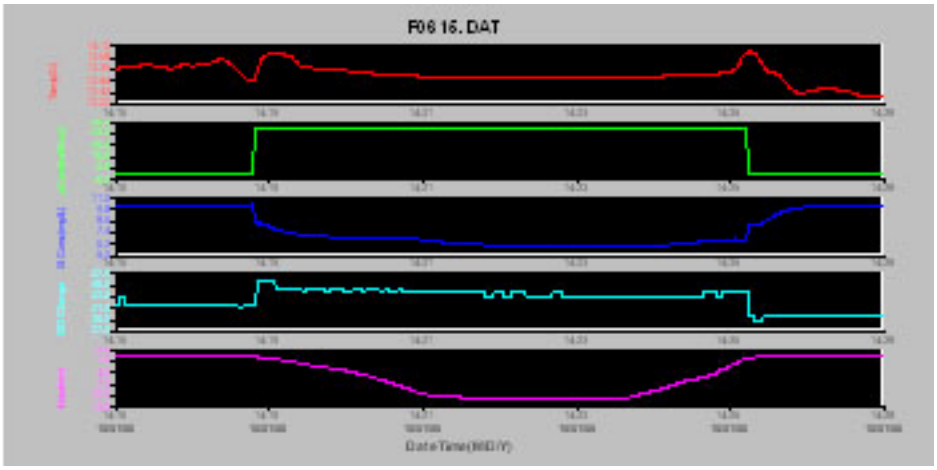
On our first deployment for the water watch, we collected 14 ml of surface plankton and 15 ml of plankton at 10 meters. On the second day we found 13 ml of surface plankton and 14 ml of plankton at 10 meters. Finally, on the third day, water watch did not capture any plankton due to our arrival at our final destination at Bell Harbor.

On the first deployment for Wind watch we collected 1 ml at the surface and 1 ml at 10 meters. On the second day we collected 3 ml of plankton at the surface and 2 ml at 10 meters. On the third day we collected 6 ml of plankton at the surface at 10 meters we caught 10 ml.

We found the most plankton at Bainbridge Island with the water watch there we found 15 ml (10 m) and 14 ml (1 m). Through out the whole trip we found 37 ml of plankton in total at the surface (1 m) and 42 ml at 10 meters so we found only slightly more at 10 meters.



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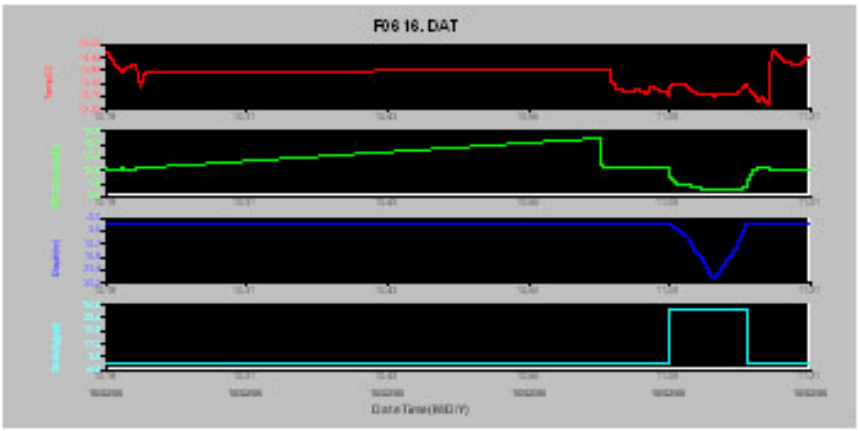
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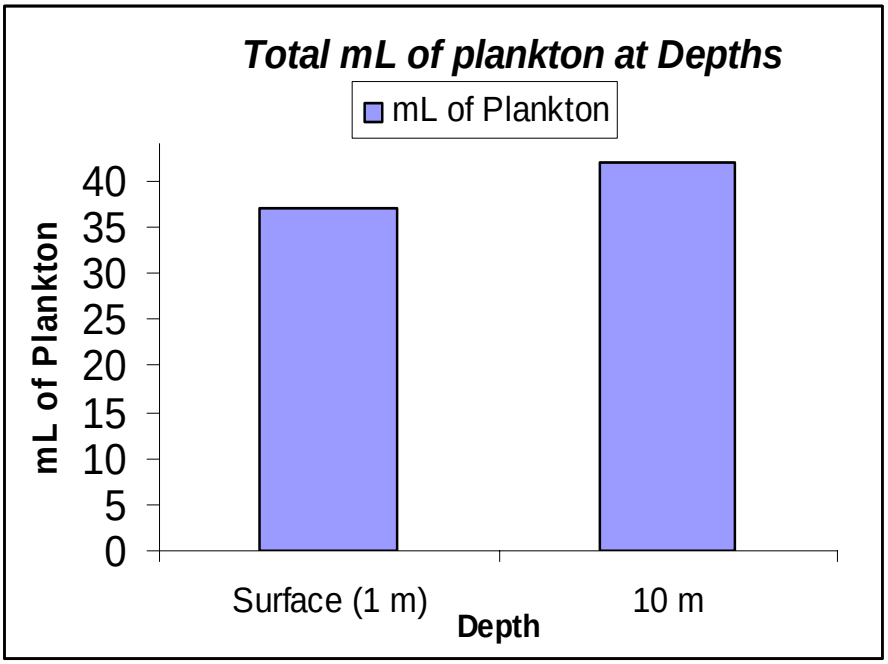
Total mL of plankton at Depths
mL of Plankton
mL of Plankton
40
35
30
25
20
15
10
5
0
Surface (1 m)
10 m
Depth

Station #	ml Plankton 1 meter	ml Plankton 10 meters
F0612	1	1
F0613	14	15
F0614	13	14
F0615	3	2
F0616	6	10

Station data from each sample site and depth.

VI. Discussion

We would also like to ask these questions: How different would our results be if we tested at o meters and 20-30 meters? What different ways could we test or collect for plankton? We could also student at deeper depths to see if the amount of plankton is deeper down, and if there is a point where they decrease. We could also see if plankton dissolves in different temperatures of water, putting them in warmer water etc.

VII. Cruise Summary

Camping:
Blake Island, one remote spot with a pit toilet, one with running water. We moored on the southern tip of Blake Island our first night, and went to shore through the kelp. We hiked to the other side of the Island and read a scary story about the Dutchman. We toasted tortillas over an open gas fire and made omlettes for breakfast.
Shore Activities: Hiking, challenge games, cooking, setting up tents and looking at the tidal zone.
On the Boat activities: Mafia, cooking and looking for creatures.
Sailing Activities: Sailing and Driving and Tacking