



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.

Abundance of plankton according to depth

Lake Chelan Middle/High School 7th-10th Grades
Lake Chelan, Washington



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I. Title

Abundance of plankton according to depth.

II. Abstract

III. Introduction

Knowing the abundance of plankton at different depths in Puget Sound can be helpful to other scientists who want to study the most plankton possible. This information can also be helpful in fishing. More variety of fish may be in areas with more plankton if it is their food source and is used for camouflage. Our prediction was "If the depth of the water is greater than 60 meters, then there will be more plankton because we will be drawing data from a greater volume of water."

IV. Experimental Design

We deployed the phyto and zooplankton nets at the surface of deep (>60 meters deep) and shallow (<60 meters deep) areas. Each draw was kept in the water for 20 minutes and when we pulled the nets in, we sifted the plankton through sieves to concentrate the plankton into 100ml graduated cylinders (one graduated cylinder per sample). Over time, the plankton in each of the cylinders settled to the bottom and we recorded the data of the volume of plankton to quantify the abundance.

Equipment Used

Zooplankton Net

Phytoplankton Net

Chart (to determine approximate depth)

Plankton settling graduated cylinders

In order to prove our prediction, we took surface samples of zoo and phyto plankton at deep (more than 60 meters) and shallow (less than 60 meters). First, we deployed the zoo and phytoplankton nets. We towed for 20 minutes and took nine samples. To choose our deployment sites, we used charts and looked at the depths. We tried to deploy an equal amount of shallow and deep depths.

Each time we deployed the nets, we also deployed the Secchi disk. For each station, we deployed the Secchi disk three times and averaged the three readings. The Secchi disk showed us that the water clarity did not correspond with the abundance or depth of plankton.

When we were finished with deployment, we settled the plankton in graduated cylinders (120ml). To do this, we concentrated the plankton through sieves. Additionally, we studied samples under microscopes and recorded the data after one night of settling.

V. Results

Station #	Depth	Deep/Shallow	Phytoplankton	Zooplankton	Secchi Disk Avg
22	59m		5ml	1ml	n/a
23	80m		2ml	3ml	8.5m
24	17m		5ml	4ml	8m
25	42m		21ml	2ml	8.25m
26	39m		3ml	1ml	7.25m
27	17.8m		113ml	17ml	6.25m
28	106m		89ml	16ml	8.75m
29	35m		n/a	n/a	7m

We typically found more phytoplankton in the shallow water and more zooplankton in the deeper samples. Clarity of the water was not found to correspond with the abundance of plankton.

VI. Discussion

It was concluded that the prediction stating that if the depth of the water is greater than 60 meters, then there will be more plankton because we will be drawing data from a greater volume of water is rejected. Based on our discoveries, the plankton apparently like the surface so they can photosynthesize. Our results have shown that there are more plankton at the surface of the shallow water of the Puget Sound compared to the surface of the water in the deep areas of the Puget Sound. We could have improved our experiment by doing more tows and towing at the same speed. How much plankton is on the bottom of the ocean? Does the different animals in the area make a difference in the abundance of plankton? The Secchi disk showed us that the water clarity did not correspond to the abundance of plankton or depth.

If we were to do the research over again, we might regulate the speed of the boat when we deployed the nets. By going slightly different speeds with each draw, we had different amounts of water going through the nets.

VII. Cruise Summary

Our research project involved many deployments in deep and shallow water. With these deployments we brought back plankton to measure the abundance. Throughout the experiment we wondered if the clarity of water was directly related to the amount of plankton in the water. While doing the experiment, we discovered several techniques for gathering our results. For example, to gather all plankton, we used 2 jars because there was too much water and the sample was overflowing. In Our research project was successful and helped us learn a lot about plankton, why they are different colors, and the differences between phytoplankton and zooplankton. If we had the chance to go on this trip again, I would because it is a great learning experience and a lot of fun.