



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.

The Study of Plankton Abundance in Water Depth

Adna High School - 7th through 10th Grades
Adna, 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: **Adna High School**
Adna, Washington
Dates: March 21-22, 2006
Grades: 7-10
Teacher: **Asia Freeman**

I. **TITLE: The Study of Plankton Abundance in Water Depth**
(The key to finding plankton you see is in deeper colder waters.)

II. **Abstract**

Our hypothesis was; we will find more plankton in deeper waters. We chose this because more people wanted to learn about plankton. Our hypothesis was correct. We used a zooplankton net at the surface above 36ft, 72ft, 360 ft, and 750 ft to catch plankton. If we were to do this again we would have taken a longer trip and do more experiments.

III. **Introduction**

We choose our subject because more people wanted to learn about plankton than anything else. We thought about it for a while. The finally we decided to study if we will find more plankton in deeper waters than in shallow waters. Everyone thought we would find less in shallow. We decided on this hypothesis because in deep water there is more room for them to float. Only the phytoplankton has to stay in shallow water in order to get sunlight, which is their food they need to live.

Plankton are important to Puget Sound because they are the basics. They are the starting point and the beginning of the food channel. If there weren't any plankton in the Sound, the fish and animals would eventually die. Then we would not be able to go fishing. But not all the fish and other creatures would die, just the ones that depend on plankton directly or indirectly. So we need plankton.

IV. **Experimental Design**

At each station we deployed several pieces of equipment. We used a large zooplankton net, a phytoplankton net, the dissolved oxygen probe, the Secchi dick, and the refractometer. We did this over two days and did four stations. Two of the stations were over deep water and two were over shallower water. Station Locations are found in the table below.

	General location	Latitude	Longitude
S0206 (known as station 2)	East of the shipping lanes	47 27.138	122 23.921
S0306 (known as station 3)	Off Blake Island	47 32.335	122 26.876
S0406 (known as station 4)	North end of Vashon	47 30.3	122 28.28
S0506 (known as station 5)	Tramp Harbor	47 24.843	122 24.194

At each station the plankton nets were left in the water for 5-6 minutes. We wrote down our results on the data sheets. We used the bowline knots to tie the equipment to the boat. When we had the plankton samples on board we needed to strain the zooplankton so we could transfer it to the cylinders to measure it. We poured the zooplankton through a funnel onto a strainer that was over a bucket. This collected the plankton into the center of the strainer. Then we scooped the plankton into the cylinder and added 100ml of fresh water. We let the plankton settle to the bottom before we measured it.

V. Results

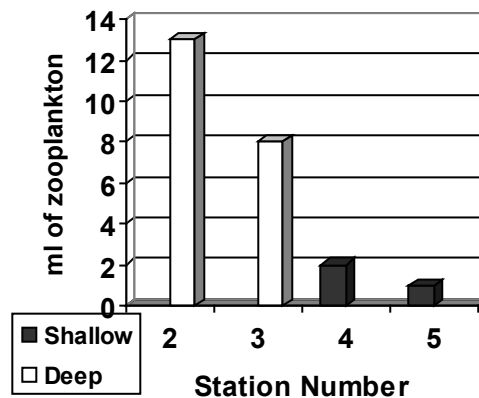
While on board the Carlyn, we were looking for plankton. We were looking at shallow and deep water depths. We found that we can find more zooplankton in deep water. A table of our results is shown below (Table 1).

Table 1

Station #	General Location	Water Depth FT	Salinity PPT	ml of Zooplankton	DO Mg/L	Temperature C	Clarity Depth Ft	% Cloud Cover
2	East of Shipping Lanes	750	30	13	9.8	47.3	10.5	99.9
3	Blake Island	360	30	8	9.8	47.5	9	100
4	North end of Vashon	36	30	2	9.1	48.1	7.88	96
5	Tramp Harbor	72	30	1	9.2	48.4	9.5	95

We found 13ml of zooplankton over a water depth of 750 feet and 8 ml of zooplankton over a depth of 360 feet. While over shallow water at depths of 72 and 35 ft, we found 1ml and 2 ml of zooplankton. These results are shown in Figure 1

Figure 1



When comparing the dissolved oxygen we were in for a surprise. The dissolved oxygen (DO) of our deep measurement was 9.8. The shallow stations show the same results as 9.1 and 9.2. Also in the deep area the temperature was lower than the temperatures in the shallow areas. So with the data it shows that with a colder water temperature and a high DO measurement there is more zooplankton in the water.

VI. Discussion

Our hypothesis was that we made was that we would find more plankton in deep water than in shallow. Our data very much supported our hypothesis. Our results tell us that there is a lot of plankton in the Puget Sound and it is mostly found in the deep water. If you ask us, we think that other people who do a plankton study should do both deep and shallow water and see if they get the same results.

I think we got these results because depending on whether the plankton like warm or cold water, that's where you will find plankton. Cold water holds more dissolved oxygen and can support more life. We found more life in waters over colder, deeper waters.

The quality of the water means there's lots of sea life in the water and lots of plankton. It matters to us because the Puget Sound supplies us with water and seafood.

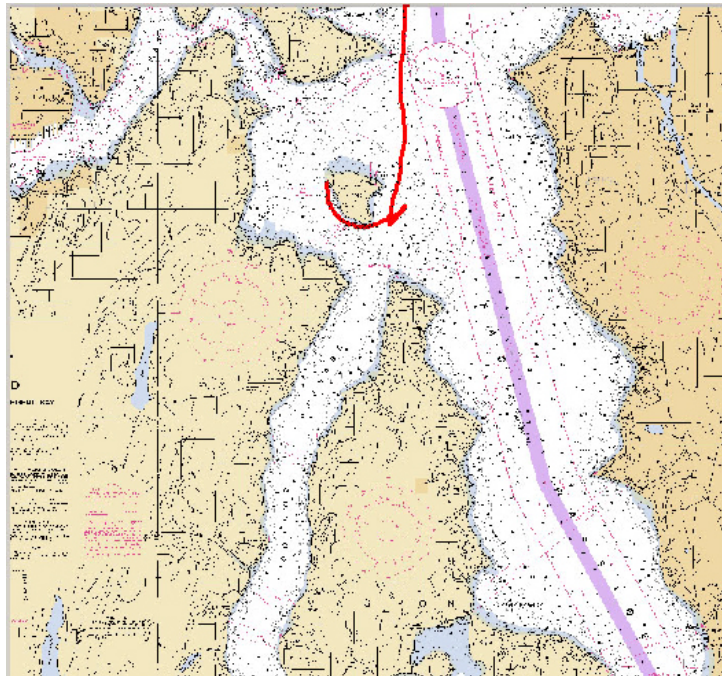
Future Study

If we were to run another experiment in the future, we really wouldn't change all that much. One thing we would change is how many sample sites we were able to go to. You can never have too many samples, so we think 8 would have been a better number. The places we would have like to also visit would be smaller passages, and places farther away from the main passage.

For our experimental deign, we would have wanted to at least 4 days, and pick up samples at the same times. This is because our experiments would be even more accurate than it was. We also would have switched off sleeping arrangements, because we would have been going for 4 days instead of 2. Other than that not much needed a critical change.

Some new questions came across after completing our experiment, about if the weather might have played a role in our results. When we went there was almost 100% cloud cover on both days. Did water temperature have something to do with it? What about the season? Maybe on some other trip later, some kids can continue our research.

In conclusion, our experiments went fairly well. Amongst the lost buckets, windblown faces, and crazy weather, we found the answer to a scientific question.



Sampling Site Cruise Track