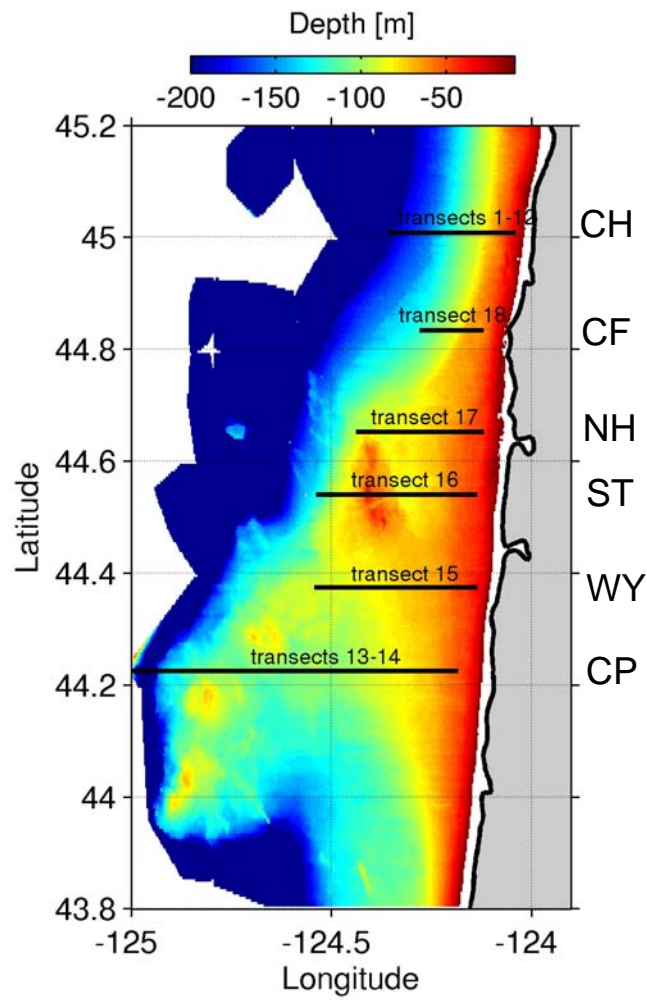


College of  
Oceanic and Atmospheric Sciences



**Oregon State University**



**Pump Station Data Report for the May  
2001, August 2001 and January 2003  
COAST cruises**

Jennifer J. Wetz and P. A. Wheeler

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Data Report 202  
COAS Reference 2005-5  
April 2005



**Pump Station Data Report for the May 2001, August 2001 and January  
2003 COAST Cruises**

**Nutrients, Extracted Chlorophyll, and Dissolved and Particulate  
Organic Carbon and Nitrogen**

Jennifer J. Wetz and Patricia Wheeler

College of Oceanic and Atmospheric Sciences  
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**Cover Legend:** The map shows transect locations and bathymetry for the COAST cruise in May 2001. See page 3 for further descriptions of stations for all cruises.

The data set presented here includes the discrete depth profile data and time series data from the vertical profiling cruises carried out as a portion of the “Coastal Ocean Advances in Shelf Transport” (COAST) project. The primary purpose for collection of this data set was to calibrate the optical parameters that were measured during the high resolution vertical profiling. The following data sets were collected onboard the R/V Thomas G. Thompson (May and August 2001) and the R/V Revelle (January 2003). For further information about this data set, contact Patricia Wheeler ([pwheeler@coas.oregonstate.edu](mailto:pwheeler@coas.oregonstate.edu)) at the College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, OR.

Additional projects with complementary data include the following: high resolution surveys (3-D thermohaline, velocity, bio-optical and zooplankton fields), high resolution vertical profiles (temperature, salinity, turbulence, nutrients, photosynthesis parameters, trace metals), aircraft measurements (lower atmosphere and upper ocean), mooring deployments, land-based coastal radar, circulation and ecosystem modeling and mesoscale atmospheric modeling. For additional information and data from the COAST project, please see the webpage at <http://damp.oce.orst.edu/coast/> or contact Jack Barth, project leader, at [barth@coas.oregonstate.edu](mailto:barth@coas.oregonstate.edu).

### Station Sites

The following table lists transect locations and sample designations for all three COAST cruises for discrete sampling only. There are additional data sets for high resolution vertical profiling transects, but those data sets are not included here and may be obtained from other COAST PIs. In May 2001, all transects and stations were sampled as pump stations only (discrete samples from surface to depth in roughly 5 to 10 m increments). In August 2001, all transects were again sampled as pump stations, with Cape Perpetua, Heceta Bank, and Stonewall Bank also having surface-to-depth transects (surface and deep samples taken alternatively as ship moved inshore to offshore over time). In January 2003, only the Cascade Head transect was sampled and included pump stations, a surface-to-depth transect, and surface salinity transects (samples taken from the surface only as ship moved inshore to offshore along the transect line).

Table 1. Transect locations, sample designations, and type of sample for all COAST cruises.

<i>Date of cruise</i>	<i>Transect</i>	<i>Sample ID</i>	<i>Station #</i>	<i>Latitude</i>	<i>Longitude</i>	<i>Type of station</i>
May01	Cascade Head	CH	1	45°0.5'N	124°2.5'W	Pump
			3		124°7.8'W	Pump
			6		124°20.0'W	Pump
	Cape Foulweather Newport Stonewall Bank	CF NH ST	1	44°50.0'N	124°7.0'W	Pump
			1	44°39.1'N	124°6.1'W	Pump
			1	44°32.4'N	124°7.6'W	Pump
			2		124°32.9'W	Pump

Aug01	Waldport/Yachats	WY	1	44°22.5'N	124°8.0'W	Pump		
			2		124°32.8'W	Pump		
	Cape Perpetua	CP	2	44°13.5'N	124°10.7'W	Pump		
			3		124°18.5'W	Pump		
			5		124°30.0'W	Pump		
			11		125°0.9'W	Pump		
	Cascade Head	CH	1	45°0.5'N	124°2.5'W	Pump		
			3		124°7.3'W	Pump		
			6		124°21.4'W	Pump		
	Cape Perpetua	CP	1	44°13.5'N	124°8.8'W	Pump		
			4		124°28.1'W	Pump		
			4/5-TS		From CP4 to CP5	Transect (3 times)		
			5		124°36.4'W	Pump		
			11		124°60.0'W	Pump		
			Heceta Bank	MC	1	44°11.5'N	124°39.2'W	Pump
					HB	4	44°6.5'N	124°39.0'W
	6	44°1.5'N		124°41.0'W		Pump		
	8	43°57.0'N		124°47.1'W		Pump		
	10	43°51.5'N		124°44.6'W		Pump		
	12	43°51.5'N		124°16.9'W		Pump		
NS-TS	44°14.6'N- 43°55.1'N	124°47.0'W 124°55.3'W		Transect				
Stonewall Bank	ST	1-12-TS	~44°30.0'N	124°13.9'W 124°29.9'W	Transect			
Jan03	Cascade Head	CH	1	45°0.00'N	124°02.5'W	Pump		
			3		124°07.3'W	Pump		
			5		124°13.5'W	Pump		
			6		124°19.8'W	Pump		
			6.5		124°23.4'W	Pump		
			Transect		124°02.7'W	Transect		
			1		124°20.4'W			
			Sal Surv		124°02.5'W	SalTrans		
1-3		124°23.5'W	(3 times)					

### Sample Collection

At each station or along each transect, water samples were collected from various depths with Burke Hale's (OSU- Chemical Oceanography) towed sled with attached pump or through the ship's surface seawater flowthrough system (Jan 2003 surface transects). These sampling events included pump stations (all cruises), surface-to-depth time series (Aug 2001 and Jan 2003), and surface-only-transects (Jan 2003). At each station and depth of interest, water was pumped on board into a 20 L acid-washed and rinsed carboy.

Total Organic Carbon (TOC) samples were subsampled from carboys into precombusted borosilicate vials capped with Teflon coated liners (these are the first samples drawn from the carboys). Fifty  $\mu\text{l}$  of 90%  $\text{H}_3\text{PO}_4$  was added to each vial immediately and the vials were stored at room temperature until analysis.

Replicate nutrient samples (analyzed for Orthophosphate, Ammonium, Silicate, Nitrate+Nitrite, and Nitrite) were then subsampled from the carboys into acid-washed Nalgene™ 30- or 60-ml HDPE bottles and stored at  $-20^\circ\text{C}$  until analysis.

Total Nitrogen (TN) samples were sampled into 125-ml Nalgene HDPE bottles and triplicate 10 ml volumes were subsampled by pipette into 60 ml HDPE or Teflon bottles. Samples were stored at  $-20^\circ\text{C}$  until analysis.

Chlorophyll samples were also taken in duplicate from the carboys at each depth. The samples were drawn into 125-ml Nalgene™ amber polyethylene bottles. Samples were then immediately vacuum filtered ( $<200$  mm Hg) through precombusted (at  $400^\circ\text{C}$  for 4 h) 25 mm Whatman™ GF/F filters. The filters were then stored in glass Vacutainer™ tubes at  $-20^\circ\text{C}$  until processing.

Particulate Organic Carbon and Nitrogen (POC/PON) samples were subsampled from the carboys into 1 or 0.5 L acid-washed bottles after filtration through 200  $\mu\text{m}$  mesh (to exclude large zooplankton). One or 0.5 L samples were then vacuum filtered ( $<200$  mm Hg) through precombusted (at  $400^\circ\text{C}$  for 4 h) 25 mm Whatman™ GF/F filters. The filters were then stored in glass Vacutainer™ tubes at  $-20^\circ\text{C}$  until further processing.

## Sample Analyses

### *Nutrient Analysis*

After thawing quickly in warm water and storing for 24 h in the dark, nutrients were analyzed using standard colorimetric methods as adapted for autoanalyzers (Atlas et al. 1971, Gordon et al. 1995). A Technicon AA was used for samples from August 2001 and January 2003. For May 2001, samples were run on a hybrid Technicon AA/Alpkem RFA system. Nutrient concentrations were determined from the mean peak heights and calculated from a linear regression thru a five point standard curve prepared in an artificial seawater or low nutrient seawater matrix.

Screening of the data was done initially by calculating standard deviations (SD) and coefficients of variation (CV) for replicates when available (August 2001 and January 2003). Screening criteria for phosphate, silicate, and nitrate were  $\text{CV} \leq 10\%$  or  $\text{SD} \leq 0.5$ , 2.0, and 1.0, respectively. Criteria for ammonium and nitrite were  $\text{CV} \leq 20\%$ . Any data falling above these criteria were subject to further review and deletion of fliers or erroneous data as necessary. Mean values and standard deviations of CV for two cruises (August 2001 and January 2003) are shown in Table 2. In addition, all data was

screened by reviewing coherence within salinity vs. nutrient plots, depth profiles, and by examination of nitrate:silicate and nitrate:phosphate ratios.

Table 2. Mean coefficient of variation (%)  $\pm$  SD for replicate nutrient samples.

<i>Nutrient</i>	<i>August 2001</i>	<i>January 2003</i>	<i>2001-03 mean</i>
Phosphate	4.82 $\pm$ 7.17	2.69 $\pm$ 2.85	3.58 $\pm$ 5.21
Silicate	5.40 $\pm$ 9.19	4.16 $\pm$ 5.90	4.73 $\pm$ 7.61
Nitrate+Nitrite	5.25 $\pm$ 10.17	3.21 $\pm$ 4.05	4.03 $\pm$ 7.23
Ammonium	27.32 $\pm$ 27.77	21.41 $\pm$ 24.60	24.27 $\pm$ 26.30
Nitrite	9.08 $\pm$ 14.73	4.61 $\pm$ 6.35	6.44 $\pm$ 10.82

*Note: the calculation of the above mean values did not include CVs < 0 or > 100.*

For all three cruises, an analytical error (AE) was also calculated for each standard curve at the beginning and end of the sample runs. The AE was calculated by fitting a linear regression through standard concentrations and adjusted peak heights, including zero points. The resulting slope was then used to determine the error associated with each original standard curve. A mean and standard deviation for the |AE| of each nutrient for each cruise were determined. The mean AE + 1 SD was then subtracted from each sample value. Resulting values that were less than the AE were assumed to be below detection limits and were reported as 0.00. The mean value  $\pm$  SD of AE for 2001-2003 are listed in Table 3.

Table 3. Mean analytical error  $\pm$  SD for 2001-2003.

<i>Nutrient</i>	<i>Mean AE <math>\pm</math> 1SD</i>
Phosphate	0.02 $\pm$ 0.02
Silicate	0.90 $\pm$ 0.65
Nitrate+Nitrite	0.31 $\pm$ 0.38
Ammonium	0.06 $\pm$ 0.04
Nitrite	0.02 $\pm$ 0.02

**Please note that due to noise in the August 2001 Ammonium data set, there may be additional deletions after comparing with other data sets (Burke Hale's nutrient data). In that instance, there will be a revised version of the data available at a later date.**

#### *Total Nitrogen Analysis*

For TN analysis, samples were thawed at room temperature. Organic nitrogen was converted to nitrate using a persulfate wet oxidation method (Libby and Wheeler 1997). Samples were then analyzed using a Technicon AA-II. Instrument calibration was performed daily using a standard curve prepared from triplicate digested leucine



standards at three concentrations. Fresh standards were made prior to each run by diluting a primary standard with artificial seawater. Digested artificial seawater was used as a blank. The standard curve was corrected for nitrogen content of the blank by determining the concentration of nitrogen in the persulfate solution and then calculating the amount of nitrogen in the artificial seawater. Artificial seawater nitrogen content was estimated as the difference between blank signal and persulfate signal. Data was screened by checking triplicate data for CV > 10%. Fliers greater than 1 SD from the mean replicate value were deleted from the data set. In addition, data was screened for coherence within depth profiles. See Table 4 for the average coefficient of variation for all TN replicates after editing.

Table 4. TN average CV (%)  $\pm$  SD for each cruise, and highest observed CV for edited data set.

<i>Cruise</i>	<i>CV (%) <math>\pm</math> SD</i>	<i>High observed CV</i>
May 2001	2.14 $\pm$ 2.11	12.62
August 2001	1.96 $\pm$ 1.64	8.09
January 2003	4.33 $\pm$ 2.52	9.84

### *Chlorophyll Analysis*

Prior to analysis, samples were transferred to plastic centrifuge tubes and extracted with methanol for  $\geq 12$  h in the dark at  $-20^{\circ}\text{C}$ . Samples were analyzed on a Turner Designs™ 10-AU Fluorometer. Instrument calibrations were done biannually. A ten point dilution series was made using purified *chl a* extracted from *Anacystis nidulans* algae (Sigma Aldrich Chemicals, Product Number C 6144) in concentrations ranging from 0.1 to 100  $\mu\text{g/l}$ . A secondary solid standard (Turner Designs 10-AU-904) was also used with the Turner 10-AU fluorometer to account for instrument drift. The use of MeOH as a solvent requires allowing the *A. nidulans* to dissolve for at least 24 h before calibration. After 24 h of dissolution, the slopes of the standard curves for acetone vs. methanol vary by less than 10%. See Table 5.

Table 5. Comparison of calibrations done simultaneously with acetone and methanol.

<i>Solvent</i>	<i>Slope</i>	<i>Intercept</i>	<i>r-squared</i>
Acetone	10.84	-0.49	1.00
Methanol	10.09	-4.27	0.99

Coefficients of variation were also calculated for each chlorophyll replicate sample and generally fall below 10%. Any values greater than 10% CV and greater than 1 SD from the mean value were deleted as necessary. Data was also screened for coherence within depth profiles. Table 6 below lists CV (%) for all edited chlorophyll data by cruise.

Table 6. Chlorophyll CV (%)± SD for each cruise.

<i>Cruise</i>	<i>CV ± SD</i>	<i>High CV observed</i>
May 2001	5.38 ± 4.56	32.65
August 2001	4.19 ± 3.67	22.74
January 2003	3.47 ± 2.06	9.57

*POC/PON Analysis*

Filters were fumed with concentrated hydrochloric acid (for 12 h) to remove inorganic carbon and then dried at 60°C overnight. Analysis followed using a Control Equipment Corp. 440HA CHN elemental analyzer calibrated with acetanilide. During analysis, filter blanks were run after every nine to ten samples and were checked for fliers within each batch run. The average, SD, and CV of all blanks run within one batch were calculated. The avg±2SD was used to screen the blanks. Any values outside of this range were not included in the blank mean used to correct sample values. Filter blank averages for each cruise are listed in Table 7.

Table 7. Filter blank averages by cruise and mean of all cruises.

<i>Cruise</i>	<i>μg C</i>	<i>μg N</i>
May 2001	26.67	0.33
August 2001	21.87	0.16
January 2003	27.73	0.69
<b>All cruises</b>	25.95 ± 10.59	0.49 ± 0.75

These average blank values were subtracted from each measured sample value as a filter blank correction. Resulting sample values were then screened for the number of standard deviations away from filter blank values. Any samples values that were very low or a negative number of sd from the blank average were deleted from the data set as below detection limit. Triplicate values were screened using a coefficient of variation and the standard deviation. When the CV of the triplicates was > 10%, a sample value was removed if it was greater than one standard deviation away from the mean of the triplicates. Table 8 lists the average coefficient of variation for all POC and PON replicates by cruise and the number of values excluded by screening.

Table 8. Average CV  $\pm$  SD for POC and PON for each cruise (after screening) and # values excluded for all sample values (n).

<i>Cruise</i>	<i>Avg CV <math>\pm</math> SD (POC)</i>	<i># values excluded (n)</i>	<i>Avg CV <math>\pm</math> SD (PON)</i>	<i># values excluded (n)</i>
May 2001	5.18 $\pm$ 2.71	35 (321)	4.14 $\pm$ 2.41	28 (321)
August 2001	3.88 $\pm$ 2.34	43 (1038)	3.54 $\pm$ 2.32	24 (1038)
January 2003	4.48 $\pm$ 2.35	76 (771)	4.66 $\pm$ 2.69	64 (771)

### *TOC Analysis*

Triplicate samples were analyzed using the High Temperature Catalytic Combustion method on a Shimadzu TOC-5000A analyzer. Standard curves were run twice daily using a DIW blank and four concentrations of an acid potassium phthalate solution. Beginning and ending standard curves were used to interpolate the data and account for drift during each run. Five subsamples were taken from each water sample and injected in sequence. Subsamples were screened for a coefficient of variance  $> 5\%$ . If the CV was  $>5\%$ , values greater than 1 SD from the mean were excluded. Table 9 lists the subsample variance for each cruise after editing.

Table 9. Subsample variance for TOC by cruise.

<i>Cruise</i>	<i>Avg CV <math>\pm</math> SD for subsamples</i>
May 2001	2.12 $\pm$ 1.23
August 2001	1.53 $\pm$ 1.08
January 2003	1.67 $\pm$ 1.64

Deep-water standards (DSW) of known TOC concentration were injected after every three to four samples (fifteen to twenty subsamples) to check for baseline shifts. Table 10 lists the average DSW values for each cruise.

Table 10. Average DSW TOC value for each cruise and number of runs to complete data processing for each cruise

<i>Cruise</i>	<i>Avg DSW value <math>\pm</math> SD</i>	<i># instrument runs</i>
May 2001	40.1 $\pm$ 2.6	25
August 2001	41.8 $\pm$ 2.0	25
January 2003	39.5 $\pm$ 2.1, 47.2 $\pm$ 7.3	28

The DSW values listed in Table 10 were used to normalize data from all runs for each cruise in May and August 2001. Because the CV of January DSW values was higher than normal, the Sargasso Deep Sea Water Standard (SDSW) (obtained from Drs.

Dennis Hansell and W. Chen, Certified Reference Materials Program, University of Miami) was used to normalize January data. This reference material was injected several times (in triplicate) during each run. Average values for the SDSW for each cruise are listed in Table 11.

Table 11. Average values of SDSW TOC for each cruise.

<i>Cruise</i>	<i>Avg SDSW (prior to normalizing) ± SD</i>
May 2001	46.72 ± 3.22
August 2001	47.28 ± 2.75
January 2003	46.23 ± 5.14

After interpolating and normalizing the data, values were screened by calculating the coefficient of variation between triplicates. If the CV of the triplicates was > 10%, a sample value was removed if it was greater than one standard deviation away from the mean of the triplicates. Table 12 lists the average CV for triplicate values, number of values excluded after screening, and total number of samples processed for each cruise.

Table 12. Average CV between triplicate samples of TOC for each cruise, # values excluded and total # samples processed (n)

<i>Cruise</i>	<i>Avg CV ± SD</i>	<i># values excluded</i>	<i>n</i>
May 2001	2.71 ± 1.70	18	891
August 2001	3.77 ± 2.57	21	1065
January 2003	3.86 ± 2.41	48	768

#### DON and DOC calculations

Dissolved organic nitrogen (DON) was determined by subtracting PON and DIN (NH<sub>4</sub><sup>+</sup>, NO<sub>3</sub><sup>-</sup>, and NO<sub>2</sub><sup>-</sup>) values from TN values, as shown in Eq. (1).

$$(1) \quad \text{DON} = \text{TN} - \text{PON} - \text{DIN}$$

The standard deviation for DON was calculated by propagation of error using standard deviations for TN, PON, and DIN.

Dissolved organic carbon (DOC) was determined by subtracting POC values from TOC values, as shown in Eq. (2).

$$(2) \quad \text{DOC} = \text{TOC} - \text{POC}$$

The standard deviation for DOC was calculated by propagation of error using standard deviations for TOC and POC.

### Missing Data

Individual data points within data sets of nutrients, POM, TOC or Chl were deleted if the coefficient of variation remained greater than 10% after removing data points greater than one SD from the mean. Also for POM data, various points were deleted if the sample value was determined to be below the detection limit. For TOC data, samples run on 3/18/03 (CH1 and CH3 samples on 1/25/03) were deleted due to higher than normal slopes for standard curves and poor coherence within the depth profile. TOC data from runs on 3/28/03, 4/9/03, and 4/14/03 are also not included as values were low and suspect. DON data is missing for August 01 HB8, HB10, HB12, NS-1 due to contamination issues with TN data. If other miscellaneous POM, TN or TOC data are missing, the corresponding DOM data could not be calculated and is not included.

### Data Presentation

Data is presented in chronological order of cruises. Pump station data is presented as depth profiles for each station according to the date and time of sampling. Time series (TS) and transect data are also presented within the data report according to the date and time of sampling. Station names indicate the transect, station number, and carboy number. The GMT date and GMT time indicate the date/time at the start of carboy filling from the towed pump system. Depth (pressure in dbar), temperature (°C), and salinity are also included as measured by CTD. Units for phosphate, ammonium, silicate, nitrite, nitrate, particulate carbon and nitrogen, and dissolved organic carbon and nitrogen are  $\mu\text{M}$ . Chlorophyll units are  $\mu\text{g/L}$ .

### Acknowledgements

We are especially grateful to the following analysts for running and/or initially screening various portions of the data:

Julie Arrington	(TOC analysis/initial screening; Jan 2003)
Jennifer Harman	(TN analysis, Chl analysis; May, Aug 2001 and Jan 2003)
Lee Karp-Boss	(POC/PON screening, May 2001)
Chi Meredith	(TOC analysis/initial screening, POC/PON and nutrient data screening; May/Aug 2001)
Mike Wetz	(Nutrient analysis, May 2001; TOC, Chl, POC/PON initial data screening, Jan 2003)

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The following data set includes discrete depth profile data and time series data from vertical profiling cruises carried out during the COAST project. Zero values indicate data that was below detection limit. For details on sample collection, data screening, or missing data please see the text in Data Report 202: "Pump Station Data Report for the May 2001, August 2001, and January 2003 COAST cruises."

Data is presented in chronological order of cruises. Pump station data is presented as depth profiles for each station according to the date and time of sampling. Time series (TS) and transect data are also presented within the data report according to the date and time of sampling. Station names indicate the transect, station number, and carboy number. GMT date and GMT time indicate the date/time at the start of carboy filling from the towed pump system. Depth (pressure in dbar), temperature (°C), and salinity are also included as measured by CTD.

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH1_5	45°0.5'N	124°2.5'W	5/20/2001	19:00:00	5	10.55	31.95	0.88	0.19	17.01	0.23	7.21	3.81	30.16	5.34	70.17	10.47
CH1_4	45°0.5'N	124°2.5'W	5/20/2001	18:46:17	10	9.40	32.80	1.68	0.77	28.74	0.30	17.31	2.07	16.20	2.89	62.04	8.34
CH1_3	45°0.5'N	124°2.5'W	5/20/2001	18:07:00	15	8.55	33.46	2.28	1.05	42.76	0.26	25.38	1.66	12.31	2.25	63.47	7.08
CH1_2	45°0.5'N	124°2.5'W	5/20/2001	17:54:33	20	7.76	33.80	2.82	0.24	55.21	0.18	33.31	1.84	12.12	2.16	56.06	4.41
CH1_1	45°0.5'N	124°2.5'W	5/20/2001	17:39:36	25	7.72	33.81	2.71	0.27	52.73	0.18	32.31	2.10	16.19	2.34	53.41	4.81
CH6_12	45°0.5'N	124°20.0'W	5/21/2001	8:17:00	5	11.62	30.44	0.21	0.00	4.92	0.00	0.00	0.31	9.68	1.42	79.04	8.41
CH6_11	45°0.5'N	124°20.0'W	5/21/2001	8:07:00	10	11.62	30.40	0.17	0.00	4.92	0.00	0.00	0.31	9.61	1.48	83.05	8.12
CH6_10	45°0.5'N	124°20.0'W	5/21/2001	7:53:00	20	10.82	31.20	0.28	0.00	4.62	0.07	0.00	0.26	7.01	1.20	76.44	7.98
CH6_9	45°0.5'N	124°20.0'W	5/21/2001	7:39:00	30	9.95	32.43	0.55	0.32	3.68	0.11	1.33	0.71	6.03	1.04	67.06	7.74
CH6_8	45°0.5'N	124°20.0'W	5/21/2001	7:28:00	41	8.97	32.52	0.83	0.45	8.53	0.39	4.94	0.45	4.17	0.71	64.06	7.58
CH6_7	45°0.5'N	124°20.0'W	5/21/2001	7:14:00	50	8.71	32.67	0.76	0.00	12.65	0.36	9.20	0.23	2.76	0.45	59.92	8.21
CH6_6	45°0.5'N	124°20.0'W	5/21/2001	6:58:00	60	8.71	33.08	1.57	0.00	19.23	0.06	17.57	0.11	1.60	0.30	58.64	7.10
CH6_5	45°0.5'N	124°20.0'W	5/21/2001	6:47:00	70	8.65	33.22	1.80	0.00	24.20	0.11	21.26	0.08				
CH6_4	45°0.5'N	124°20.0'W	5/21/2001	6:34:00	80	8.30	33.59	2.13	0.00	31.21	0.11	26.26	0.03				
CH6_3	45°0.5'N	124°20.0'W	5/21/2001	6:21:00	90	8.08	33.73	2.33	0.00	37.50	0.09	29.21	0.02				
CH6_2	45°0.5'N	124°20.0'W	5/21/2001	6:09:00	100	7.72	33.83	2.63	0.00	49.80	0.09	33.01	0.04	2.20	0.44	55.08	3.49
CH6_1	45°0.5'N	124°20.0'W	5/21/2001	5:57:00	110	7.68	33.91	2.62	0.00	47.91	0.12	33.93	0.03				
CH1_5	45°0.5'N	124°2.5'W	5/21/2001	18:55:38	5	9.89	32.50	1.42	0.33	26.50	0.19	14.28	2.73	20.75	3.69	57.70	8.55
CH1_4	45°0.5'N	124°2.5'W	5/21/2001	18:44:35	10	9.81	32.80	1.43	0.52	27.32	0.20	15.49	3.46	24.04	4.48	51.87	8.06
CH1_3	45°0.5'N	124°2.5'W	5/21/2001	18:36:15	15	8.17	33.50	2.14	0.46	38.50	0.18	24.10	2.11	17.33	3.12	49.26	6.25
CH1_2	45°0.5'N	124°2.5'W	5/21/2001	18:25:30	20	7.83	33.70	2.69	0.17	50.84	0.15	32.08	0.75	7.54	1.39	51.97	4.96
CH1_1	45°0.5'N	124°2.5'W	5/21/2001	18:14:57	25	7.67	33.80	2.74	0.00	53.80	0.14	32.96	0.97	8.15	1.36	55.64	5.00
CH3_12	45°0.4'N	124°7.8'W	5/22/2001	9:17:51	5	10.15	32.04	0.86	0.30	12.01	0.24	6.53	0.64	8.78	1.59	76.90	9.70
CH3_11	45°0.4'N	124°7.8'W	5/22/2001	9:09:37	12		32.03	1.13	0.44	15.35	0.31	9.77	0.55	7.93	1.28	70.79	9.56
CH3_10	45°0.4'N	124°7.8'W	5/22/2001	8:58:59	20	8.40	33.18	1.91	0.00	30.15	0.18	21.78	0.28	3.71	0.75	63.97	8.13
CH3_9	45°0.4'N	124°7.8'W	5/22/2001	8:48:12	27	8.37	33.44	2.39	0.00	38.27	0.26	25.17	0.38	5.01	0.90	61.24	6.38
CH3_8	45°0.4'N	124°7.8'W	5/22/2001	8:37:39	35	8.28	33.52	2.39	0.00	45.68	0.32	28.43	0.42	5.11	0.88	60.63	5.89
CH3_7	45°0.4'N	124°7.8'W	5/22/2001	8:27:32	42	7.93	33.68	2.67	0.00	48.31	0.13	31.07	0.27	4.39	0.74	53.80	5.43
CH3_6	45°0.4'N	124°7.8'W	5/22/2001	8:16:53	50	7.73	33.81	2.39	0.00	47.90	0.04	32.27	0.22	3.36	0.62	52.14	4.93

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH3_5	45°0.4'N	124°7.8'W	5/22/2001	8:06:31	57	7.44	33.87	2.67	0.00	53.50	0.02	34.07	0.19	3.29	0.60	58.70	4.59
CH3_4	45°0.4'N	124°7.8'W	5/22/2001	7:55:21	65	7.21	33.95	2.73	0.00	56.13	0.15	34.99	0.17	3.65	0.63	54.28	4.78
CH3_3	45°0.4'N	124°7.8'W	5/22/2001	7:43:15	73	7.07	33.97	2.97	0.00	58.58	0.39	36.15	0.13	4.63	0.65	51.50	2.58
CH3_2	45°0.4'N	124°7.8'W	5/22/2001	7:31:50	80	6.95	33.93	3.16	0.31	62.88	0.48	36.32	0.08	4.50	0.63	50.84	2.83
CH3_1	45°0.4'N	124°7.8'W	5/22/2001	7:19:42	85	6.95	33.93	2.92	0.27	58.92	0.38	35.92	0.10	5.07	0.81	50.43	4.58
CH1_5	45°0.5'N	124°2.5'W	5/22/2001	16:27:11	5	8.66	33.37	2.16	0.62	42.45	0.23	24.78	1.02	21.23	3.93	58.36	7.03
CH1_4	45°0.5'N	124°2.5'W	5/22/2001	16:16:35	11	7.95	33.67	2.60	0.24	52.98	0.18	31.32	3.06	8.35	1.50	68.37	5.10
CH1_3	45°0.5'N	124°2.5'W	5/22/2001	16:06:05	16	7.66	33.81	2.74	0.00	57.33	0.14	33.70	0.65	6.48	1.08	61.87	4.29
CH1_2	45°0.5'N	124°2.5'W	5/22/2001	15:56:13	21	7.62	33.82	2.77	0.00	57.87	0.13	34.06	0.90	7.47	1.24	68.46	4.82
CH1_1	45°0.5'N	124°2.5'W	5/22/2001	15:47:16	25	7.61	33.80	2.70	0.00	58.95	0.13	33.89	0.99	8.91	1.40	90.69	6.95
CH1_5	45°0.5'N	124°2.5'W	5/24/2001	1:13:15	5	10.92	32.81	0.87	0.25	12.35	0.16	4.35	11.66	63.22	10.07	81.65	11.76
CH1_4	45°0.5'N	124°2.5'W	5/24/2001	1:01:36	10	9.80	33.42	1.89	2.04	27.03	0.23	17.26	5.64	28.02	5.24	66.96	11.95
CH1_3	45°0.5'N	124°2.5'W	5/24/2001	0:50:38	15	8.75	33.54	2.16	2.04	37.16	0.21	23.76	2.58	15.37	2.97	60.86	8.66
CH1_2	45°0.5'N	124°2.5'W	5/24/2001	0:38:32	20	8.53	33.55	2.33	1.93	40.61	0.22	25.66	2.50	17.98	3.21	56.82	6.56
CH1_1	45°0.5'N	124°2.5'W	5/24/2001	0:30:07	25	8.32	33.64	2.44	1.71	44.01	0.22	27.63	3.74	22.03	3.83	57.11	5.05
CH6_12	45°0.5'N	124°20.0'W	5/24/2001	16:28:03	5	11.97	31.25						0.27	7.07	1.25	83.13	
CH6_11	45°0.5'N	124°20.0'W	5/24/2001	16:18:55	10	11.89	31.27	0.28	0.00	3.68	0.00	0.00	0.30	7.26	1.37	80.59	8.46
CH6_10	45°0.5'N	124°20.0'W	5/24/2001	16:07:17	20	10.52	31.78	0.30	0.00	3.40	0.00	0.00	0.89	8.95	1.72		9.20
CH6_9	45°0.5'N	124°20.0'W	5/24/2001	15:57:57	30	9.31	32.33	0.41	0.26	4.50	0.00	0.00	0.80	5.75	1.08	68.52	13.90
CH6_8	45°0.5'N	124°20.0'W	5/24/2001	15:47:45	40	8.73	32.49	0.73	0.70	6.59	0.21	3.49	0.48	3.54	0.69	66.09	12.74
CH6_7	45°0.5'N	124°20.0'W	5/24/2001	15:37:21	50	8.49	32.57	0.96	0.92	9.98	0.30	6.30	0.23	2.81	0.53	62.38	14.35
CH6_6	45°0.5'N	124°20.0'W	5/24/2001	15:28:33	60	8.27	32.97	1.26	0.00	15.43	0.23	12.26	0.14				
CH6_5	45°0.5'N	124°20.0'W	5/24/2001	15:18:33	70	8.20	33.19	1.58	0.00	21.64	0.05	17.65	0.09				
CH6_4	45°0.5'N	124°20.0'W	5/24/2001	15:08:13	81	8.12	33.41	1.95	0.00	30.30	0.03	23.09	0.06				
CH6_3	45°0.5'N	124°20.0'W	5/24/2001	14:58:07	90	7.88	33.49	2.00	0.00	31.91	0.00	24.59	0.03	1.37	0.29	55.24	7.57
CH6_2	45°0.5'N	124°20.0'W	5/24/2001	14:47:33	100	7.87	33.62	1.92	0.00	28.71	0.00	24.33	0.03	2.03	0.37	54.62	10.90
CH6_1	45°0.5'N	124°20.0'W	5/24/2001	14:36:50	110	7.82	33.74	2.27	0.00	37.06	0.00	29.34	0.03				
CH1_5	45°0.5'N	124°2.5'W	5/25/2001	1:23:55	5	9.92	33.09	1.61	1.21	25.87	0.23	15.25	4.61	31.16	5.30	62.39	9.18
CH1_4	45°0.5'N	124°2.5'W	5/25/2001	1:12:57	10	9.54	33.17	1.67	1.31	26.11	0.23	15.77	5.26	32.69	5.91	61.55	10.12
CH1_3	45°0.5'N	124°2.5'W	5/25/2001	1:02:33	15	8.96	33.39	2.04	2.00	34.10	0.22	21.58	2.99	17.18	3.15	60.91	7.95
CH1_2	45°0.5'N	124°2.5'W	5/25/2001	0:51:24	20	8.90	33.67	2.20	2.03	39.15	0.23	24.33	2.70	17.64	3.27	55.78	6.36
CH1_1	45°0.5'N	124°2.5'W	5/25/2001	0:41:24	25	8.10	33.66	2.54	1.48	48.22	0.23	29.53	2.71	17.51	2.97	65.93	6.21
CH3_12	45°0.5'N	124°7.8'W	5/25/2001	16:34:52	5	10.07	32.04	0.79	0.58	9.79	0.13	4.52	1.54	13.36	2.51	56.89	8.67
CH3_11	45°0.5'N	124°7.8'W	5/25/2001	16:23:54	12	9.99	32.08	0.87	0.62	9.13	0.15	4.57	1.68	17.75	3.05	47.78	8.86
CH3_10	45°0.5'N	124°7.8'W	5/25/2001	16:13:08	20	8.65	32.63	1.73	0.30	26.57	0.19	18.70	0.52	4.80	0.82	53.08	7.38
CH3_9	45°0.5'N	124°7.8'W	5/25/2001	16:01:43	27	8.21	33.04	1.93	0.00	32.14	0.14	23.29	0.28	3.49	0.57	51.92	6.13



Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH3_8	45°0.5'N	124°7.8'W	5/25/2001	15:50:31	33	8.20	33.27	2.07	0.00	37.47	0.12	25.35	0.22	3.93	0.61	58.41	6.30
CH3_7	45°0.5'N	124°7.8'W	5/25/2001	15:39:44	42	8.06	33.54	2.38	0.12	44.48	0.10	29.05	0.39	4.65	0.88	52.06	5.59
CH3_6	45°0.5'N	124°7.8'W	5/25/2001	15:28:40	50	7.74	33.76	2.63	0.35	50.50	0.17	32.09	0.57	5.96	1.01	52.11	5.56
CH3_5	45°0.5'N	124°7.8'W	5/25/2001	15:17:07	57	7.34	33.86	2.66	0.00	55.86	0.09	34.59	0.28	4.42	0.84	50.27	
CH3_4	45°0.5'N	124°7.8'W	5/25/2001	15:05:18	66	7.24	33.89	2.86	0.00	58.00	0.16	35.39	0.44	4.96	0.91	49.79	4.38
CH3_3	45°0.5'N	124°7.8'W	5/25/2001	14:53:27	72	7.23	33.89	2.77	0.00	58.00	0.18	35.38	0.61	6.86	1.18	49.74	4.32
CH3_2	45°0.5'N	124°7.8'W	5/25/2001	14:39:39	80	7.23	33.89	2.84	0.00	58.21	0.19	35.28	0.69	6.78	1.24	48.32	4.95
CH3_1	45°0.5'N	124°7.8'W	5/25/2001	14:26:50	84	7.22	33.89	2.82	0.00	57.08	0.19	35.29	0.65	6.91	1.23	47.56	4.03
CH1_5	45°0.5'N	124°2.5'W	5/25/2001	21:19:15	5	10.00	32.70	1.13	0.11	20.65	0.25	9.35	13.50	51.93	9.04	37.72	9.47
CH1_4	45°0.5'N	124°2.5'W	5/25/2001	21:07:32	10	8.50	33.40	1.86	0.13	31.52	0.21	21.12	2.50	12.06	2.32	46.57	9.93
CH1_3	45°0.5'N	124°2.5'W	5/25/2001	20:55:30	15	8.20	33.41	2.27	0.27	42.66	0.22	26.76	1.79	11.86	2.27	44.35	6.28
CH1_2	45°0.5'N	124°2.5'W	5/25/2001	20:43:50	20	8.02	33.59	2.43	0.40	46.46	0.24	28.57	2.61	17.55	3.07	40.78	6.52
CH1_1	45°0.5'N	124°2.5'W	5/25/2001	20:32:43	25	7.78	33.74	2.69	0.50	53.26	0.25	32.03	3.09	17.79	3.07	40.09	4.27
CH1_5	45°0.5'N	124°2.5'W	5/26/2001	15:57:52	5	8.71	33.34	2.14	0.31	39.85	0.32	23.80	6.53	30.78	5.45	44.14	8.07
CH1_4	45°0.5'N	124°2.5'W	5/26/2001	15:46:08	10	8.31	33.49	2.25	0.26	42.29	0.31	25.55	6.65	29.16	5.18	44.63	6.05
CH1_3	45°0.5'N	124°2.5'W	5/26/2001	15:34:53	15	7.71	33.80	2.84	0.00	57.48	0.23	34.07	0.72	7.62		48.97	
CH1_2	45°0.5'N	124°2.5'W	5/26/2001	15:24:01	20	7.48	33.84	2.94	0.00	61.12	0.30	35.47	0.57	7.25	1.13	48.45	3.34
CH1_1	45°0.5'N	124°2.5'W	5/26/2001	15:12:59	27	7.41	33.85	2.90	0.00	60.18	0.31	35.20	0.84	8.31	1.35	43.92	3.84
CH6_12	45°0.5'N	124°20.0'W	5/27/2001	5:53:41	5	11.54	31.42	0.22	1.88	3.42	0.07	0.00	0.38	9.10	1.43	74.36	5.82
CH6_11	45°0.5'N	124°20.0'W	5/27/2001	5:42:44	10	11.55	31.39	0.23	0.13	3.20	0.07	0.00	0.40	10.11	1.61	75.53	6.88
CH6_10	45°0.5'N	124°20.0'W	5/27/2001	5:31:40	20	10.59	32.07	0.36	0.00	2.51	0.07	0.00	0.37				
CH6_9	45°0.5'N	124°20.0'W	5/27/2001	5:21:52	30	9.58	32.37	0.55	0.00	4.46	0.09	1.01	0.89				
CH6_8	45°0.5'N	124°20.0'W	5/27/2001	5:11:12	40	8.68	32.49	0.83	0.46	9.78	0.39	5.28	0.68	5.38	1.08	64.58	8.81
CH6_7	45°0.5'N	124°20.0'W	5/27/2001	5:00:26	50	8.31	32.76	1.32	0.00	17.03	0.14	13.81	0.21				
CH6_6	45°0.5'N	124°20.0'W	5/27/2001	4:50:01	60	8.12	33.08	1.83	0.00	27.17	0.10	21.53	0.10				
CH6_5	45°0.5'N	124°20.0'W	5/27/2001	4:38:13	70	8.01	33.39	2.13	0.00	34.90	0.09	26.36	0.06				
CH6_4	45°0.5'N	124°20.0'W	5/27/2001	4:25:58	80	7.95	33.51	2.25		37.34	0.09	28.18	0.04	1.82	0.33	56.92	6.97
CH6_3	45°0.5'N	124°20.0'W	5/27/2001	4:14:53	90	7.95	33.70	2.30		37.61	0.09	29.47	0.02				
CH6_2	45°0.5'N	124°20.0'W	5/27/2001	4:04:12	100	7.93	33.77	2.40	0.00	41.97	0.09	31.37	0.02				
CH6_1	45°0.5'N	124°20.0'W	5/27/2001	3:50:31	178	6.63	33.95	2.97	0.35	62.22	0.18	37.49	0.03	3.21	0.55	48.29	3.12
CH3_12	45°0.5'N	124°7.8'W	5/27/2001	22:40:59	5	10.97	31.62	0.50	0.71	4.83	0.10	1.73	0.87	13.16	2.25	75.58	10.81
CH3_11	45°0.5'N	124°7.8'W	5/27/2001	22:29:22	12	9.58	32.30	1.23	0.44	18.38	0.27	10.84	1.57	15.61	2.77	62.29	10.32
CH3_10	45°0.5'N	124°7.8'W	5/27/2001	22:18:17	20	8.99	32.61	1.53	0.55	23.95	0.25	15.37	0.79	8.36	1.64	61.43	10.71
CH3_9	45°0.5'N	124°7.8'W	5/27/2001	22:06:19	27	8.46	32.95	1.94	0.16	33.39	0.25	21.93	0.47	5.16	1.03	57.30	10.44
CH3_8	45°0.5'N	124°7.8'W	5/27/2001	21:54:07	35	7.98	33.52	2.37	0.00	44.04	0.13	29.21	0.36	4.12	0.82	56.79	8.64
CH3_7	45°0.5'N	124°7.8'W	5/27/2001	21:43:54	42	7.75	33.68	2.48	0.00	46.34	0.05	30.76	0.35	4.29	0.86	51.57	8.13
CH3_6	45°0.5'N	124°7.8'W	5/27/2001	21:34:09	50	7.49	33.81	2.64	0.00	48.41	0.03	33.41	0.11	3.08	0.63	50.37	7.58

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH3_5	45°0.5'N	124°7.8'W	5/27/2001	21:24:42	57	7.33	33.86	2.76	0.00	53.87	0.05	34.98	0.11	3.11	0.61	52.03	6.68
CH3_4	45°0.5'N	124°7.8'W	5/27/2001	21:12:57	65	6.91	33.92	2.86	0.00	57.63	0.38	36.12	0.07				
CH3_3	45°0.5'N	124°7.8'W	5/27/2001	21:01:35	72	6.87	33.93	2.88		58.57	0.41	36.10	0.09				
CH3_2	45°0.5'N	124°7.8'W	5/27/2001	20:51:37	80	6.86	33.93	2.88	0.17	58.56	0.41	35.95	0.13	3.93	0.53	50.43	6.66
CH3_1	45°0.5'N	124°7.8'W	5/27/2001	20:42:18	85	6.88	33.93	2.87	0.22	55.92	0.41	35.96	0.15	4.30	0.62	49.69	6.99
CP2-5	44°13.5'N	124°10.7'W	5/28/2001	5:11:35	5	10.89	33.04	0.37	0.00	2.91	0.09	1.17	8.46	89.73	9.06	56.87	11.73
CP2-4	44°13.5'N	124°10.7'W	5/28/2001	5:00:10	10	9.40	33.33	0.54	0.00	5.78	0.11	2.68	8.10	88.39	9.44	52.96	11.55
CP2-3	44°13.5'N	124°10.7'W	5/28/2001	4:49:24	20	8.09	33.52	2.40	0.00	41.82	0.24	28.93	0.67	5.10	0.95	58.02	8.56
CP2-2	44°13.5'N	124°10.7'W	5/28/2001	4:37:59	35	7.71	33.80	2.69	0.00	49.70	0.15	33.17	0.25				
CP2-1	44°13.5'N	124°10.7'W	5/28/2001	4:26:36	47	7.36	33.86	3.01	0.63	60.68	0.42	34.26	0.96	7.66	1.42	54.72	5.50
CP11-12	44°13.5'N	125°0.9'W	5/29/2001	22:10:47	5	12.83	30.89	0.14	0.00	3.79	0.04	0.00	0.17	6.64	1.08	74.09	7.85
CP11-11	44°13.5'N	125°0.9'W	5/29/2001	22:00:13	10	12.69	30.96	0.14	0.00	3.80	0.04	0.00	0.17	6.83	1.11	73.02	8.67
CP11-10	44°13.5'N	125°0.9'W	5/29/2001	21:50:17	20	12.28	31.07	0.16	0.00	3.57	0.04	0.00	0.27	7.29	1.30	70.39	9.07
CP11-9	44°13.5'N	125°0.9'W	5/29/2001	21:33:24	30	11.55	32.56	0.37	0.00	2.14	0.05	0.00	0.22	5.84	1.02	71.52	7.54
CP11-8	44°13.5'N	125°0.9'W	5/29/2001	21:23:05	40	10.95	32.58	0.41	0.11	2.38	0.06	0.00	0.28	7.41	1.06	65.13	8.18
CP11-7	44°13.5'N	125°0.9'W	5/29/2001	21:11:24	50	9.77	32.63	0.69	0.80	7.64	0.45	3.70	0.33	5.24	0.74	65.42	8.91
CP11-6	44°13.5'N	125°0.9'W	5/29/2001	21:01:26	60	9.43	32.74	0.91	0.12	10.27	0.58	7.54	0.22				
CP11-5	44°13.5'N	125°0.9'W	5/29/2001	20:51:33	70	9.35	32.89	1.14	0.00	12.90	0.14	11.47	0.14	2.76	0.29	61.95	9.16
CP11-4	44°13.5'N	125°0.9'W	5/29/2001	20:42:08	80	8.95	33.11	1.54	0.00	20.07	0.08	17.80	0.08				
CP11_3	44°13.5'N	125°0.9'W	5/29/2001	20:31:36	90	8.61	33.30	1.72	0.00	22.70	0.08	20.51	0.04				
CP11-2	44°13.5'N	125°0.9'W	5/29/2001	20:20:47	100	8.39	33.46	1.94	0.00	27.71	0.06	26.05	0.02				
CP11-1	44°13.5'N	125°0.9'W	5/29/2001	20:11:03	110	8.25	33.61	2.07	0.00	31.54	0.07	26.55	0.02				
CP3-12	44°13.5'N	124°18.5'W	5/30/2001	5:51:02	5	7.29	33.87	0.48	0.11	3.50	0.06	0.94	9.52	96.90	12.19	58.07	10.42
CP3-11	44°13.5'N	124°18.5'W	5/30/2001	5:40:55	10	7.30	33.87	0.65	0.13	5.94	0.09	2.74	10.83	94.69	12.42	72.84	11.41
CP3-10	44°13.5'N	124°18.5'W	5/30/2001	5:30:36	15	7.41	33.85	1.00	0.21	12.74	0.15	7.54	10.91	85.25	12.44	64.57	10.49
CP3-9	44°13.5'N	124°18.5'W	5/30/2001	5:20:19	20	7.62	33.80	1.14	0.20	14.64	0.16	9.27	10.09	82.65	11.90	57.29	10.99
CP3-8	44°13.5'N	124°18.5'W	5/30/2001	5:10:24	25	7.91	33.66	1.64	2.39	17.90	0.08	13.70	2.57	11.98	1.90	53.34	16.19
CP3-7	44°13.5'N	124°18.5'W	5/30/2001	5:01:18	30	8.00	33.59	2.27	0.00	38.01	0.16	27.78	2.50	11.08	1.70	52.72	6.95
CP3-6	44°13.5'N	124°18.5'W	5/30/2001	4:50:18	39	8.07	33.54	2.32	0.00	39.64	0.12	28.51	1.73	8.72	1.45	56.03	7.13
CP3-5	44°13.5'N	124°18.5'W	5/30/2001	4:40:16	50	8.20	33.47	2.51	0.00	45.62	0.07	31.52	0.59	4.18	0.78	56.69	7.69
CP3-4	44°13.5'N	124°18.5'W	5/30/2001	4:29:50	60	10.46	33.17	2.65	0.00	49.96	0.11	32.96	0.54	4.52	0.81	51.79	6.60
CP3-3	44°13.5'N	124°18.5'W	5/30/2001	4:19:44	70	8.39	33.40	2.70	0.00	54.31	0.21	34.60	0.53				
CP3-2	44°13.5'N	124°18.5'W	5/30/2001	4:10:08	74	10.75	33.08	2.89	0.30	57.30	0.31	34.84	0.72	6.57	1.15	50.74	6.35
CP3-1	44°13.5'N	124°18.5'W	5/30/2001	3:59:43	76	10.74	33.07	2.86	0.35	58.65	0.31	34.49	0.86	6.98	1.15	50.62	6.14
CP4-12	44°13.5'N	124°30.0'W	5/31/2001	6:33:22	5	11.43	31.67	0.25	0.00	2.38	0.07	0.00	5.44	66.11	7.51	36.70	9.66
CP4-11	44°13.5'N	124°30.0'W	5/31/2001	6:21:41	10	10.00	32.01	0.78	0.32	7.71	0.23	4.48	5.00	43.86	6.89	57.37	10.27
CP4-10	44°13.5'N	124°30.0'W	5/31/2001	6:10:24	20	8.42	32.83	1.77	0.14	27.80	0.23	20.05	0.55	4.61	0.86	53.77	7.82

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CP4-9	44°13.5'N	124°30.0'W	5/31/2001	5:59:30	30	8.12	33.10	2.19	0.00	36.99	0.21	26.97	0.23				
CP4-8	44°13.5'N	124°30.0'W	5/31/2001	5:47:57	40	8.01	33.48	2.11	0.00	34.58	0.21	25.61	0.24				
CP4-7	44°13.5'N	124°30.0'W	5/31/2001	5:37:06	50	7.97	33.51	2.23	0.00	37.96	0.21	27.49	0.19				
CP4-6	44°13.5'N	124°30.0'W	5/31/2001	5:25:59	60	7.77	33.75	2.67	0.00	50.55	0.13	33.44	0.32				
CP4-5	44°13.5'N	124°30.0'W	5/31/2001	5:15:46	70	7.49	33.55	2.73	0.00	52.25	0.07	34.61	0.30				
CP4-4	44°13.5'N	124°30.0'W	5/31/2001	5:06:00	80	7.47	33.85	2.73	0.00	52.73	0.08	34.60	0.26				
CP4-3	44°13.5'N	124°30.0'W	5/31/2001	4:55:41	90	7.43	33.86	2.79	0.00	54.19	0.17	34.77	0.40				
CP4-2	44°13.5'N	124°30.0'W	5/31/2001	4:45:59	94	7.14	33.88	3.05	0.34	63.63	0.32	35.22	0.89	7.40	1.36	38.58	5.39
CP4-1	44°13.5'N	124°30.0'W	5/31/2001	4:35:56	100	7.10	33.88	3.00	0.37	65.80	0.33	35.04	0.95	8.64	1.44	38.69	6.39
WY1-5	44°22.5'N	124°8.0'W	5/31/2001	14:23:13	5	10.20	33.30	1.08	0.19	15.68	0.17	7.58	11.13	64.14	11.71	61.11	11.89
WY1-4	44°22.5'N	124°8.0'W	5/31/2001	14:13:04	10	8.20	33.61	1.69	0.30	26.61	0.19	17.33	10.20	55.97	9.43	57.08	11.40
WY1-3	44°22.5'N	124°8.0'W	5/31/2001	14:02:51	20	8.00	33.70	2.50	0.39	43.16	0.19	30.38	6.35	31.78	4.63	51.68	7.82
WY1-2	44°22.5'N	124°8.0'W	5/31/2001	13:51:49	30	7.79	33.78	2.80	1.10	50.35	0.33	31.98	10.95	62.53	8.98	38.31	7.01
WY1-1	44°22.5'N	124°8.0'W	5/31/2001	13:42:25	35	7.74	33.79	2.85	1.19	51.31	0.35	32.07	11.88	62.04	8.94	43.22	6.99
WY2-12	44°22.5'N	124°32.8'W	6/1/2001	3:34:00	5	13.34	36.05	0.16	0.00	9.76	0.00	0.00	0.74	19.47	2.80	65.72	9.42
WY2-11	44°22.5'N	124°32.8'W	6/1/2001	3:23:27	10	13.16	30.19	0.18	0.00	9.14	0.00	0.00	0.78	23.39	3.61	61.88	9.75
WY2-10	44°22.5'N	124°32.8'W	6/1/2001	3:13:03	15	12.18	30.83	0.18	0.00	7.62	0.00	0.00	1.09	19.53	2.87	75.91	10.18
WY2-9	44°22.5'N	124°32.8'W	6/1/2001	3:02:17	20	10.48	31.95	0.50	0.00	4.82	0.00	0.00	2.36	27.84	4.42	52.51	11.82
WY2-8	44°22.5'N	124°32.8'W	6/1/2001	2:51:08	30	8.93	32.49	0.93	0.14	8.93	0.32	6.07	0.95	6.54	1.35	55.43	11.12
WY2-7	44°22.5'N	124°32.8'W	6/1/2001	2:40:01	40	8.34	32.78	1.56	0.00	20.94	0.11	16.78	0.36	2.98	0.70	57.02	10.38
WY2-6	44°22.5'N	124°32.8'W	6/1/2001	2:29:55	50	8.19	33.02	1.84	0.00	26.86	0.10	21.05	0.29	3.05	0.67	54.11	10.34
WY2-5	44°22.5'N	124°32.8'W	6/1/2001	2:18:50	60	8.10	33.16	1.97	0.17	29.82	0.13	22.76	0.19	1.86	0.51	56.49	11.09
WY2-4	44°22.5'N	124°32.8'W	6/1/2001	2:08:44	70	7.70	33.71	2.56	0.00	44.96	0.13	31.52	0.09	2.12		54.50	
WY2-3	44°22.5'N	124°32.8'W	6/1/2001	1:58:15	80	7.51	33.80	2.65	0.00	48.57	0.12	33.03	0.08	2.11	0.52	51.37	8.25
WY2-2	44°22.5'N	124°32.8'W	6/1/2001	1:47:38	85	7.38	33.82	2.68	0.00	49.89	0.11	33.68	0.05	2.24	0.50	55.03	9.08
WY2-1	44°22.5'N	124°32.8'W	6/1/2001	1:35:28	90	7.38	33.82	2.63	0.10	49.88	0.11	33.69	0.07	2.14	0.45	48.12	9.23
ST1-5	44°32.4'N	124°7.6'W	6/1/2001	8:55:08	5	10.30	33.53	1.43	4.25	23.82	0.26	11.45	9.01	55.76	9.34	49.18	15.87
ST1-4	44°32.4'N	124°7.6'W	6/1/2001	8:45:34	10	10.00	33.56	2.42	1.05	43.05	0.27	27.70	6.69	25.90	4.90	52.97	10.59
ST1-3	44°32.4'N	124°7.6'W	6/1/2001	8:35:01	20	8.00	33.77	2.63	1.25	49.70	0.29	30.71	5.27	18.93	3.67	49.70	11.91
ST1-2	44°32.4'N	124°7.6'W	6/1/2001	8:23:56	30	7.61	33.83	2.78	0.50	56.89	0.32	33.02	3.46	12.61	2.42	48.35	8.05
ST1-1	44°32.4'N	124°7.6'W	6/1/2001	8:14:55	34	7.52	33.85	2.83	0.34	55.94	0.27	33.66	4.81	18.00	3.32	45.55	7.24
ST2-12	44°32.4'N	124°32.9'W	6/2/2001	2:24:32	5	13.87	29.76	0.13	0.00	6.56	0.00	0.00	0.67	25.09	2.65	75.31	10.19
ST2-11	44°32.4'N	124°32.9'W	6/2/2001	2:14:29	10	13.23	30.30	0.25		6.93	0.00	0.00	0.62	19.73	2.37	69.88	9.18
ST2-10	44°32.4'N	124°32.9'W	6/2/2001	2:03:27	15	10.35	32.24	0.42	0.00	2.60	0.00	0.00	0.33	7.07	1.24	61.62	7.87
ST2-9	44°32.4'N	124°32.9'W	6/2/2001	1:53:41	23	9.84	32.33	0.46	0.00	3.53	0.00	0.00	0.46	8.25	1.50	56.47	7.80
ST2-8	44°32.4'N	124°32.9'W	6/2/2001	1:43:03	35	9.64	32.48	0.65	0.44	5.98	0.12	1.99	0.95	9.36	1.94	54.60	8.65
ST2-7	44°32.4'N	124°32.9'W	6/2/2001	1:33:04	50	8.54	32.59	1.06	0.00	12.19	0.29	8.72	0.48	3.98		52.70	

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
ST2-6	44°32.4'N	124°32.9'W	6/2/2001	1:22:24	60	8.34	32.77	1.34	0.00	17.08	0.04	13.71	0.23				
ST2-5	44°32.4'N	124°32.9'W	6/2/2001	1:12:18	70	8.27	32.86	1.49	0.00	19.90	0.00	16.27	0.17	2.05	0.44	50.56	8.89
ST2-4	44°32.4'N	124°32.9'W	6/2/2001	1:02:21	81	8.00	33.30	1.86	0.52	27.42	0.00	22.58	0.08				
ST2-3	44°32.4'N	124°32.9'W	6/2/2001	0:51:55	90	7.70	33.70	2.49	0.00	44.93	0.12	31.14	0.05	2.18	0.42	45.17	6.80
ST2-2	44°32.4'N	124°32.9'W	6/2/2001	0:40:45	115	7.10	33.90	2.70	0.00	52.83	0.12	35.09	0.03	2.19	0.36	45.60	5.87
ST2-1	44°32.4'N	124°32.9'W	6/2/2001	0:30:54	120	7.10	33.90	2.70	0.00	53.39	0.13	35.09	0.03	2.51	0.48	44.86	6.00
NHT1-5	44°39.1'N	124°6.1'W	6/2/2001	7:39:08	5	10.47	33.47	1.19	1.01	19.60	0.30	11.50	15.30	70.96	11.88	56.55	9.82
NHT1-4	44°39.1'N	124°6.1'W	6/2/2001	7:29:33	10	9.00	33.55	1.64	0.91	26.86	0.30	16.96	14.56	58.11	10.02	51.04	8.90
NHT1-3	44°39.1'N	124°6.1'W	6/2/2001	7:20:27	15	9.30	33.54	2.72	2.47	43.73	0.35	26.65	7.58	28.60	5.19	24.41	6.77
NHT1-2	44°39.1'N	124°6.1'W	6/2/2001	7:10:11	20	8.33	33.74	2.64	2.81	46.91	0.35	28.39	7.08	24.79	4.48	33.79	6.42
NHT1-1	44°39.1'N	124°6.1'W	6/2/2001	6:55:50	26	8.27	33.74	2.69	2.48	46.88	0.37	28.46	8.01	28.23	5.13	44.84	6.26
CF1-6	44°50.0'N	124°7.0'W	6/2/2001	23:57:30	5	11.45	31.62	0.37	0.09	9.20	0.12	0.71	8.30		9.20		11.81
CF1-5	44°50.0'N	124°7.0'W	6/2/2001	23:46:38	10	9.98	32.28	1.23	0.31	21.78	0.21	12.70	6.50	31.84	5.86	94.73	9.36
CF1-4	44°50.0'N	124°7.0'W	6/2/2001	23:35:57	15	8.73	33.07	2.06	0.57	36.30	0.29	23.17	3.38	13.65	2.58	76.44	8.21
CF1-3	44°50.0'N	124°7.0'W	6/2/2001	23:25:54	25	7.52	33.83	2.69	0.87	51.79	0.27	31.98	1.26	7.65	1.51	62.98	6.43
CF1-2	44°50.0'N	124°7.0'W	6/2/2001	23:15:21	45	7.39	33.85	2.85	0.00	56.87	0.24	34.56	1.76	10.09	1.76	49.99	6.22
CF1-1	44°50.0'N	124°7.0'W	6/2/2001	23:04:54	51	7.40	33.90	2.86	0.14	56.87	0.24	34.65	2.14	11.96	2.12	47.20	5.72
CH1_05	45°00.5'N	124°02.5'W	8/8/2001	0:36:29	5	12.64	32.70	0.68	0.83	0.00	0.00	3.18	8.31	48.50	7.44	126.62	19.69
CH1_04	45°00.5'N	124°02.5'W	8/8/2001	0:25:00	10	12.50	32.92	0.59	0.88	0.00	0.00	3.11	8.11	47.59	7.32	150.05	23.43
CH1_03	45°00.5'N	124°02.5'W	8/8/2001	0:13:45	15	11.20	33.26	1.07	2.69	4.80	0.12	5.73	6.35	41.18	6.73	141.01	20.11
CH1_02	45°00.5'N	124°02.5'W	8/8/2001	0:00:18	20	10.65	33.45	1.26	1.85	4.98	0.11	8.38	7.02	43.11	6.82	165.38	19.34
CH1_01	45°00.5'N	124°02.5'W	8/7/2001	23:48:38	28	9.92	33.56	1.87	3.28	9.80	0.18	14.19	8.85	43.11	6.74	252.28	22.02
CH6_12	45°00.5'N	124°20.0'W	8/8/2001	10:33:17	5	14.17	32.30	0.51	0.00	9.89	0.12	1.95	1.22	15.12	2.88	107.64	14.18
CH6_11	45°00.5'N	124°21.4'W	8/8/2001	10:20:40	10	14.13	32.30	0.54	0.21	10.16	0.13	2.21	1.22	15.02	2.84	98.98	11.97
CH6_10	45°00.5'N	124°21.4'W	8/8/2001	10:10:06	20	9.06	32.39	1.47	0.00	15.52	0.36	12.46	1.16	10.15	1.74	75.49	8.27
CH6_09	45°00.5'N	124°21.4'W	8/8/2001	10:59:13	30	7.96	32.65	1.66	0.00	17.40	0.00	15.98	0.30	3.17	0.58	73.95	8.30
CH6_08	45°00.5'N	124°21.4'W	8/8/2001	10:47:56	40	7.89	32.82	1.74	0.00	18.87	0.00	17.61	0.13	2.10	0.40	70.60	6.66
CH6_07	45°00.5'N	124°21.4'W	8/8/2001	10:35:00	50	7.90	33.19	2.10	0.00	26.24	0.00	23.83	0.04	1.86	0.36	71.27	6.74
CH6_06	45°00.5'N	124°21.4'W	8/8/2001	10:24:09	60	7.81	33.46	2.32	0.00	30.40	0.00	27.20	0.03	1.88	0.42	77.67	7.03
CH6_05	45°00.5'N	124°21.4'W	8/8/2001	10:13:28	70	7.91	33.64	2.47	0.57	33.75	0.00	29.32	0.03	1.39	0.38	69.13	6.00
CH6_04	45°00.5'N	124°21.4'W	8/8/2001	10:02:48	80	7.91	33.70	2.58	0.00	36.56	0.00	31.32	0.03		0.40		6.12
CH6_03	45°00.5'N	124°21.4'W	8/8/2001	9:51:29	90	7.86	33.75	2.49	0.56	37.50	0.00	31.20	0.06	2.12	0.47	64.85	7.33
CH6_02	45°00.5'N	124°21.4'W	8/8/2001	9:40:33	100	7.60	33.84	2.52	2.50	38.57	0.09	30.37	0.04	1.74		66.97	
CH6_01	45°00.5'N	124°21.4'W	8/8/2001	8:25:44	176	6.99	33.94	3.06	0.00	54.65	0.13	39.82	0.11	3.44	0.62	69.38	2.46
CH3_12	45°00.5'N	124°07.3'W	8/9/2001	21:26:49	5	10.14	33.06	2.45	2.12		0.16	24.12	1.48	14.81	2.25	68.96	5.74
CH3_11	45°00.5'N	124°07.3'W	8/9/2001	21:17:28	12	8.50	33.04	2.72	1.95		0.20	28.07	1.04	10.41	1.57	71.45	2.10

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH3_10	45°00.5'N	124°07.3'W	8/9/2001	21:06:32	19	8.29	33.07	2.82	1.32	33.91	0.24	30.60	0.50	7.53	1.06	64.42	1.64
CH3_09	45°00.5'N	124°07.3'W	8/9/2001	20:56:29	25	8.07	33.30	2.96	0.85	36.33	0.22	32.27	0.43	5.80	0.84	67.39	0.90
CH3_08	45°00.5'N	124°07.3'W	8/9/2001	20:46:23	32	7.95	33.52	2.91	1.11	36.22	0.20	31.93	0.66	6.25	0.96	64.18	3.36
CH3_07	45°00.5'N	124°07.3'W	8/9/2001	20:36:56	39	7.81	33.68	2.89	0.73	43.03	0.21	33.33	1.17	6.10	1.04	59.29	4.91
CH3_06	45°00.5'N	124°07.3'W	8/9/2001	20:27:27	46	7.57	33.82	2.87	0.55	43.18	0.23	33.33	0.98	5.17	0.87	59.00	5.15
CH3_05	45°00.5'N	124°07.3'W	8/9/2001	20:17:23	53	7.52	33.87	2.91	0.47	46.13	0.31	34.13	0.52	3.85	0.82	57.25	4.61
CH3_04	45°00.5'N	124°07.3'W	8/9/2001	20:07:41	60	7.40	33.87	3.12	1.08	52.15	0.45	35.15	0.68	5.44	1.05	58.00	3.69
CH3_03	45°00.5'N	124°07.3'W	8/9/2001	19:58:17	66	7.35	33.88	3.20	1.03	54.16	0.48	35.50	0.60	5.00	1.00	64.74	3.61
CH3_02	45°00.5'N	124°07.3'W	8/9/2001	19:47:17	73	7.33	33.88	3.20	1.01	52.72	0.50	35.30	0.52	5.24	1.06	61.50	3.58
CH3_01	45°00.5'N	124°07.3'W	8/9/2001	19:37:32	80	7.25	33.90	3.21	2.76	55.27	0.51	34.19	1.90	5.86	1.12	58.31	4.53
CH1_05	45°00.5'N	124°02.5'W	8/11/2001	3:22:28	5	11.33	32.98	1.85	1.05	19.11	0.19	17.03	3.23	31.73	4.65	63.51	15.63
CH1_04	45°00.5'N	124°02.5'W	8/11/2001	3:13:01	10	10.92	33.15	1.99	1.39	20.20	0.18	18.77	3.05	27.87	3.96	63.64	8.07
CH1_03	45°00.5'N	124°02.5'W	8/11/2001	3:02:26	15	10.17	33.42	2.68	1.95	29.94	0.28	26.50		27.20	3.74	54.89	3.25
CH1_02	45°00.5'N	124°02.5'W	8/11/2001	2:49:54	20	8.75	33.62	2.91	2.29	37.42	0.29	29.09	4.05	23.23	3.59	59.76	1.43
CH1_01	45°00.5'N	124°02.5'W	8/11/2001	2:39:29	29	7.83	33.76	3.14	2.87	47.29	0.36	32.20	3.83	18.05	3.01	54.64	
CH6_12	45°00.5'N	124°20.0'W	8/11/2001	17:52:46	5	14.00	32.10	0.33	0.64	5.54	0.00	0.00	1.05	17.87	2.99	88.91	9.90
CH6_11	45°00.5'N	124°20.0'W	8/11/2001	17:43:25	10	14.01	32.34	0.94	0.65	6.50	0.11	0.00	1.79	16.67	2.94	80.86	11.22
CH6_10	45°00.5'N	124°20.0'W	8/11/2001	17:32:08	20	9.16	32.48	1.71	0.52	17.83	0.41	16.38	0.81	8.39	1.59	67.82	6.70
CH6_09	45°00.5'N	124°20.0'W	8/11/2001	17:20:44	25	8.62	32.55	1.81	0.00	18.79	0.24	18.21	0.63	6.76	1.27	65.66	7.85
CH6_08	45°00.5'N	124°20.0'W	8/11/2001	17:10:38	30	8.49	32.58	1.89	0.00	20.67	0.12	20.03	0.48	5.47	0.91	59.87	6.27
CH6_07	45°00.5'N	124°20.0'W	8/11/2001	17:00:26	40	8.07	32.72	2.00	0.93	24.43	0.00	21.81	0.14	2.91	0.49	61.51	6.02
CH6_06	45°00.5'N	124°20.0'W	8/11/2001	16:50:04	60	7.83	33.38	1.99	1.62	21.91	0.00	21.53	0.03	2.68	0.41	59.61	7.00
CH6_05	45°00.5'N	124°20.0'W	8/11/2001	16:39:55	80	7.91	33.64	2.36	0.00	30.59	0.00	29.19	0.02		0.39		2.78
CH6_04	45°00.5'N	124°20.0'W	8/11/2001	16:28:59	100	7.88	33.73	2.45	0.11	35.14	0.00	31.75	0.02	2.00	0.45	57.38	2.39
CH6_03	45°00.5'N	124°20.0'W	8/11/2001	16:16:45	150	7.26	33.91	2.64	0.74	42.75	0.16	29.88	0.05	2.73	0.50	55.92	5.35
CH6_02	45°00.5'N	124°20.0'W	8/11/2001	16:05:52	170	7.21	33.92	3.09	0.80	51.56	0.28	35.81	0.10	6.22	0.84	52.01	
CH6_01	45°00.5'N	124°20.0'W	8/11/2001	15:56:11	176	7.19	33.92	3.11	1.12	50.25	0.31	35.71	0.09				
CP1-05	44°13.5'N	124°08.8'W	8/12/2001	9:50:43	5	11.20	33.44	1.08	1.47	0.00	0.10	2.20	8.13	46.51	7.37	64.13	18.79
CP1-04	44°13.5'N	124°08.8'W	8/12/2001	9:37:37	10	10.80	33.47	1.49	1.35	4.78	0.13	10.11	11.11	62.67	8.89	53.00	12.91
CP1-03	44°13.5'N	124°08.8'W	8/12/2001	9:28:26	20	9.34	33.60	2.92	5.06	25.39	0.18	24.64	8.22	37.93	8.13		
CP1-02	44°13.5'N	124°08.8'W	8/12/2001	9:17:36	26	8.31	33.65	3.18	6.13	31.33	0.21	27.87	7.20	31.59	5.57	66.52	3.99
CP1-01	44°13.5'N	124°08.8'W	8/12/2001	9:07:15	32	8.24	33.62	3.90	6.55	24.10	0.20	22.42	9.74	42.15	7.20	54.15	11.58
CP11_12	44°13.5'N	124°60.0'W	8/13/2001	22:34:11	5	15.58	32.30	0.21	2.05	0.00	0.00	0.00	0.27	7.25	1.34	90.45	9.52
CP11_11	44°13.5'N	124°60.0'W	8/13/2001	22:24:21	10	15.41	32.31	0.29	0.00	0.00	0.00	0.00	0.25	7.12	1.38	88.82	10.08
CP11_10	44°13.5'N	124°60.0'W	8/13/2001	22:15:23	17	12.04	32.36	0.61	1.30	0.00	0.00	0.00	0.47	7.94	1.53	76.58	9.44
CP11-09	44°13.5'N	124°60.0'W	8/13/2001	22:05:44	25	9.61	32.43	0.87	1.33	3.62	0.26	2.41	0.48	4.90	0.99	65.27	8.76
CP11-08	44°13.5'N	124°60.0'W	8/13/2001	21:54:33	40	8.54	32.51	1.20	0.00	8.49	0.22	9.09	0.23	2.53	0.53	62.47	8.59

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 ( $\mu$ M)	NH4 ( $\mu$ M)	SiO <sub>2</sub> ( $\mu$ M)	NO <sub>2</sub> ( $\mu$ M)	NO <sub>3</sub> ( $\mu$ M)	Chl ( $\mu$ g/l)	POC ( $\mu$ M)	PON ( $\mu$ M)	DOC ( $\mu$ M)	DON ( $\mu$ M)
CP11-07	44°13.5'N	124°60.0'W	8/13/2001	21:44:37	50	8.12	32.70	1.58	0.00	15.22	0.11	15.39	0.09		0.39		8.60
CP11-06	44°13.5'N	124°60.0'W	8/13/2001	21:34:27	60	8.16	33.00	1.92	0.00	20.49	0.00	21.04	0.07	1.73	0.28	59.23	7.95
CP11-05	44°13.5'N	124°60.0'W	8/13/2001	21:24:10	70	8.44	33.24	2.04	0.00	23.24	0.00	23.23	0.06		0.29		8.67
CP11-04	44°13.5'N	124°60.0'W	8/13/2001	21:13:27	80	8.35	33.51	2.21	0.00	28.52	0.00	27.38	0.03		0.30		8.04
CP11-03	44°13.5'N	124°60.0'W	8/13/2001	21:03:43	90	8.14	33.68	2.34	0.00	30.87	0.00	29.05	0.01		0.27		6.90
CP11-02	44°13.5'N	124°60.0'W	8/13/2001	20:54:22	100	8.10	33.75	2.46	0.00	33.23	0.00	30.47	0.03		0.31		6.96
CP11-01	44°13.5'N	124°60.0'W	8/13/2001	20:40:59	200	7.50	33.95	2.95	0.00	43.53	0.15	35.17	1.30	2.86	0.61	52.05	5.90
CP5_12	44°13.5'N	124°36.4'W	8/14/2001	10:18:05	5	12.20	32.57	0.79	0.34	9.03	0.15	3.81	4.59	30.48	5.68	55.86	13.65
CP5_11	44°13.5'N	124°36.4'W	8/14/2001	10:08:18	10	12.25	32.78	0.68	0.37	15.41	0.14	3.26	6.74	38.76	7.03	52.62	12.25
CP5_10	44°13.5'N	124°36.4'W	8/14/2001	9:58:53	20	8.40	33.09	2.55	1.49	30.17	0.14	27.28	0.92	6.33	1.13	52.62	7.02
CP5_09	44°13.5'N	124°36.4'W	8/14/2001	9:48:44	30	7.86	33.29	2.60	0.63	35.42	0.14	29.28	0.71	5.20	0.97	53.24	6.65
CP5_08	44°13.5'N	124°36.4'W	8/14/2001	9:38:51	40	7.76	33.49	2.52	0.54	32.81	0.16	30.62	0.37	4.21	0.74	54.85	6.15
CP5_07	44°13.5'N	124°36.4'W	8/14/2001	9:28:30	50	7.71	33.70	2.93	0.89	40.17	0.15	33.49	0.55	4.85	0.98	53.52	4.71
CP5_06	44°13.5'N	124°36.4'W	8/14/2001	9:18:26	60	7.41	33.89	3.10	0.27	40.53	0.16	36.10	0.43	4.86	0.97	51.09	5.12
CP5_05	44°13.5'N	124°36.4'W	8/14/2001	9:08:44	70	7.41	33.89	2.86	0.36	46.40	0.20	32.96	0.30	4.05	0.80	50.17	7.78
CP5_04	44°13.5'N	124°36.4'W	8/14/2001	8:59:22	80	7.27	33.93	3.12	0.00	52.64	0.13	38.02	0.30	5.21	0.81	49.29	3.11
CP5_03	44°13.5'N	124°36.4'W	8/14/2001	8:51:46	90	7.22	33.93	2.96	0.00	48.91	0.16	28.77	0.57	7.83	1.19	48.95	
CP5_02	44°13.5'N	124°36.4'W	8/14/2001	8:44:03	95	7.22	33.94	3.30	0.00	62.85	0.32	37.41	0.77	10.78	1.41	47.89	3.38
CP5_01	44°13.5'N	124°36.4'W	8/14/2001	8:35:36	101	7.20	33.93	3.50	0.22	66.82	0.33	36.54	1.09	11.96	1.54	46.48	3.79
CP 4/5 TS	44°13.5'N	124°33.8'W	8/14/2001	19:22:13	3	13.20	33.07	0.28	0.00	0.00	0.00	0.00	1.99	26.86	4.19	68.89	12.71
CP 4/5 TS	44°13.5'N	124°33.2'W	8/14/2001	19:38:15	95	7.08	33.93	3.41	1.04	59.79	0.30	31.85	1.01	10.41	1.62	57.80	9.11
CP 4/5 TS	44°13.5'N	124°30.3'W	8/14/2001	21:15:10	3	13.47	33.12	0.33	0.00	0.00	0.00	0.00	2.66	36.70	4.58	54.18	12.92
CP 4/5 TS	44°13.5'N	124°29.6'W	8/14/2001	21:34:16	95	7.15	33.92	3.48	1.52	64.17	0.57	31.77	0.80	9.22	1.44	43.63	8.93
CP 4/5 TS	44°13.5'N	124°29.8'W	8/14/2001	23:10:20	3	13.42	33.09	0.43	0.57	0.00	0.10	0.00	3.28	45.88	6.02	42.59	12.48
CP 4/5 TS	44°13.5'N	124°30.0'W	8/14/2001	23:29:50	97	7.14	33.92	3.21	1.60	32.83	0.32	27.49	0.81	9.69	1.47	48.99	11.16
CP 4/5 TS	44°13.5'N	124°33.5'W	8/15/2001	1:29:13	98	7.10	33.92	3.63	0.35	34.86	0.31	34.81	1.55	10.18	1.59	80.64	5.53
CP 4/5 TS	44°13.5'N	124°33.1'W	8/15/2001	1:13:58	5	13.63	33.11	0.33	0.00	0.00	0.00	0.00	1.72	29.59	3.93	28.61	9.81
CP 4/5 TS	44°13.5'N	124°36.6'W	8/15/2001	3:12:30	4	12.80	32.60	0.78	0.00	5.59	0.10	3.42	9.22	43.00	6.53	48.61	11.32
CP 4/5 TS	44°13.5'N	124°36.6'W	8/15/2001	3:42:45	101	7.20	33.90	3.50	0.00	56.14	0.26	34.64	0.69	8.81	1.21	46.64	6.23
CP 4/5 TS	44°13.5'N	124°33.6'W	8/15/2001	5:03:28	6	12.28	32.70	0.84	0.00	3.99	0.12	4.72	6.21	39.11	6.38	51.80	11.84
CP 4/5 TS	44°13.5'N	124°33.5'W	8/15/2001	5:19:10	97	7.08	33.93	3.67	0.00	31.15	0.32	33.81	1.31	10.55	1.54	46.17	7.92
CP 4/5 TS	44°13.5'N	124°30.6'W	8/15/2001	7:16:28	5	13.54	33.12	0.28	0.00	0.00	0.00	0.00	1.54	25.78	3.51	67.03	10.70
CP 4/5 TS	44°13.5'N	124°30.1'W	8/15/2001	7:30:56	98	7.14	33.92	3.69	0.61	74.78	0.34	34.62	1.05	9.25	1.48	46.54	5.93
CP4_12	44°13.5'N	124°28.1'W	8/15/2001	11:01:20	5	13.48	33.12	0.25	0.64	0.00	0.00	3.84	2.74	33.64	4.62	62.20	7.26
CP4_11	44°13.5'N	124°28.1'W	8/15/2001	10:50:40	10	13.47	33.12	0.27	0.62	0.00	0.00	3.96	2.80	35.59	4.73	64.82	7.71
CP4_10	44°13.5'N	124°28.1'W	8/15/2001	10:39:22	20	9.37	33.27	1.53	2.43	7.54	0.10	13.19	1.72	17.86	2.68	59.43	8.11
CP4_09	44°13.5'N	124°28.1'W	8/15/2001	10:28:53	25	8.09	33.37	2.95	5.61	24.88	0.10	28.38	0.55	7.96	1.21	61.18	3.51
CP4_08	44°13.5'N	124°28.1'W	8/15/2001	10:18:07	30	8.02	33.58	3.05	5.78	30.41	0.10	30.41	0.46	7.04	1.09	53.46	1.96

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CP4_07	44°13.5'N	124°28.1'W	8/15/2001	10:06:59	40	7.77	33.67	4.08	2.72	37.04	0.12	32.36	0.36	6.12	0.95	52.82	2.27
CP4_06	44°13.5'N	124°28.1'W	8/15/2001	9:55:41	50	7.43	33.78	3.13	0.00	49.73	0.24	36.79	0.25	5.14	0.79	50.48	1.15
CP4_05	44°13.5'N	124°28.1'W	8/15/2001	9:45:45	60	7.43	33.83	3.15	0.00	51.29	0.16	37.15	0.31	5.20	0.77	50.30	0.68
CP4_04	44°13.5'N	124°28.1'W	8/15/2001	9:35:21	70	7.40	33.88	3.13	0.00	51.66	0.15	37.39	0.19	4.35	0.68	48.97	5.66
CP4_03	44°13.5'N	124°28.1'W	8/15/2001	9:25:27	80	7.27	33.91	3.45	0.11	62.63	0.32	37.14	0.46	7.32	1.22	48.80	5.68
CP4_02	44°13.5'N	124°28.1'W	8/15/2001	9:17:34	85	7.13	33.92	3.69	0.25	64.59	0.36	35.95	0.74	8.84	1.38	47.89	5.55
CP4_01	44°13.5'N	124°28.1'W	8/15/2001	9:08:36	90	7.13	33.92	3.68	0.26	60.45	0.37	34.92	0.78	8.98	1.51	50.39	6.16
CP 4/5 TS	44°13.5'N	124°30.0'W	8/15/2001	13:33:54	3	13.32	33.11	0.33	0.36	0.00	0.00	4.46	2.42	28.38	4.11	60.22	7.13
CP 4/5 TS	44°13.5'N	124°30.8'W	8/15/2001	13:58:19	95	7.12	33.92	3.66	0.67	52.19	0.36	35.31	0.85	9.77	1.63	45.41	1.02
CP 4/5 TS	44°13.5'N	124°33.0'W	8/15/2001	15:08:52	4	12.62	32.99	0.57	0.00	0.00	0.00	0.95	4.43	30.23	5.39	55.55	10.36
CP 4/5 TS	44°13.5'N	124°33.3'W	8/15/2001	15:19:49	95	7.09	33.92	3.70	0.62	53.17	0.35	35.49	0.91	9.34	1.51	44.58	1.46
CP 4/5 TS	44°13.5'N	124°36.0'W	8/15/2001	16:58:05	3	11.83	32.63	0.91	0.19	8.94	0.16	5.74	5.00	32.22	5.91	44.26	8.12
CP 4/5 TS	44°13.5'N	124°36.4'W	8/15/2001	17:15:32	100	7.19	33.93	3.51	0.62	55.22	0.26	36.69	0.76	7.69	1.20	43.39	0.79
CP 4/5 TS	44°13.5'N	124°36.2'W	8/15/2001	19:20:39	3	13.44	33.08	0.35	0.23	0.00	0.00	0.00	2.91	31.58	4.87	54.15	10.30
CP 4/5 TS	44°13.5'N	124°36.2'W	8/15/2001	19:51:18	95	7.11	33.92	3.69	0.95	61.11	0.36	34.04	0.87	9.03	1.50	45.49	2.85
CP 4/5 TS	44°13.5'N	124°36.2'W	8/15/2001	21:19:58	3	13.60	33.08	0.39	0.00	0.00	0.00	0.00	2.79	52.41	6.64	39.02	12.40
CP 4/5 TS	44°13.5'N	124°36.2'W	8/15/2001	21:38:17	95	7.13	33.92	3.68	1.08	73.48	0.36	34.99	0.81	9.28	1.44	50.39	2.72
CP4_12	44°13.5'N	124°28.1'W	8/16/2001	3:28:44	5	12.93	33.09	0.24	1.04	0.00	0.00	0.00	2.83	43.16	5.06	42.48	10.08
CP4_11	44°13.5'N	124°28.1'W	8/16/2001	3:19:04	10	11.99	33.13	0.59	1.02	0.00	0.00	4.75	1.75	19.65	3.04	50.79	10.42
CP4_10	44°13.5'N	124°28.1'W	8/16/2001	3:08:57	20	8.83	33.29	2.88	5.90	14.88	0.00	24.70	0.43	8.41	1.45	45.69	5.87
CP4_09	44°13.5'N	124°28.1'W	8/16/2001	2:57:44	25	8.11	33.53	3.19	5.60	25.16	0.00	28.79	0.39	7.76	1.23	56.16	6.01
CP4_08	44°13.5'N	124°28.1'W	8/16/2001	2:47:15	30	7.85	33.62	3.00	2.92	34.34	0.15	31.58	0.38	8.21	1.17	51.74	4.05
CP4_07	44°13.5'N	124°28.1'W	8/16/2001	2:36:45	40	7.67	33.69	2.99	2.53	37.37	0.15	33.64	0.28	5.70	0.89	55.64	5.03
CP4_06	44°13.5'N	124°28.1'W	8/16/2001	2:26:33	50	7.52	33.74	3.12	0.39	74.83	0.18	36.22	0.25	4.30	0.81	54.51	2.95
CP4_05	44°13.5'N	124°28.1'W	8/16/2001	2:16:18	60	7.44	33.80	3.09	0.00	76.77	0.00	36.57	0.22	3.65	0.77	51.76	3.62
CP4_04	44°13.5'N	124°28.1'W	8/16/2001	1:47:00	70	7.39	33.83	3.15	0.00	78.30	0.12	37.29	0.21	4.26	0.84	50.57	0.90
CP4_03	44°13.5'N	124°28.1'W	8/16/2001	1:37:39	80	7.30	33.87	3.23	0.70		0.27	37.86	0.22	4.76	0.95	49.80	0.17
CP4_02	44°13.5'N	124°28.1'W	8/16/2001	1:28:05	90	7.18	33.90	3.80	0.78	73.57	0.45	35.49	1.28	10.50	1.83	53.85	2.50
CP4_01	44°13.5'N	124°28.1'W	8/16/2001	1:18:37	95	7.18	33.90	3.81	0.91	74.00	0.46	34.97	1.41	12.36	1.93	47.56	3.33
CP 4/5 TS	44°13.5'N	124°31.9'W	8/16/2001	7:09:31	3	12.47	33.19	0.29	0.47	0.00	0.00	0.00	4.07	43.35	5.09	73.75	9.10
CP 4/5 TS	44°13.5'N	124°32.3'W	8/16/2001	7:23:09	91	7.12	33.92	3.59	0.59	75.25	0.39	34.72	1.03	12.09	1.53	43.19	5.45
CP 4/5 TS	44°13.5'N	124°36.3'W	8/16/2001	9:14:00	5	12.57	32.80	0.68	0.28	0.00	0.00	2.02	10.94	62.40	10.37	35.48	11.55
CP 4/5 TS	44°13.5'N	124°36.1'W	8/16/2001	9:33:00	98	7.18	33.92	3.57	0.29	70.05	0.31	36.96	0.78	9.84	1.20	44.05	4.82
CP 4/5 TS	44°13.5'N	124°33.0'W	8/16/2001	11:15:00	5	12.80	33.15	0.59	0.27	0.00	0.00	1.07	4.21	29.31	5.21	51.12	11.15
CP 4/5 TS	44°13.5'N	124°32.5'W	8/16/2001	11:29:00	95	7.10	33.90	3.73	0.35	74.95	0.40	36.32	0.89	11.37	1.42	40.83	4.81
CP 4/5 TS	44°13.5'N	124°29.1'W	8/16/2001	13:13:00	3	12.22	32.94	0.53	0.26	3.26	0.07	3.72	5.11	32.63	6.01	48.57	10.22
CP 4/5 TS	44°13.5'N	124°28.4'W	8/16/2001	13:34:00	95	7.12	33.92	3.71	0.46	70.35	0.42	36.90	1.02	10.94	1.62	62.32	3.91
CP 4/5 TS	44°13.5'N	124°29.8'W	8/16/2001	14:58:00	3	12.93	33.09	0.53	0.00	0.00	0.00	2.57	3.51	32.21	6.23	65.43	9.89

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CP 4/5 TS	44°13.5'N	124°30.4'W	8/16/2001	15:16:30	95	7.11	33.92	3.57	0.40	63.91	0.46	36.24	0.72	9.86	1.54	68.44	3.42
CP 4/5 TS	44°13.5'N	124°33.5'W	8/16/2001	17:10:05	3	13.15	33.15	0.40	0.93	0.00	0.00	1.08	5.24	31.52	4.86	74.76	8.93
CP 4/5 TS	44°13.5'N	124°33.9'W	8/16/2001	17:24:33	95	7.11	33.92	3.22	0.31	61.36	0.40	35.83	1.02	11.12	1.36	65.60	5.33
CP 4/5 TS	44°13.5'N	124°36.2'W	8/16/2001	19:09:43	3	12.60	32.74	0.72	0.51	9.00	0.00	3.43	13.40	61.62	11.29	53.42	10.15
CP 4/5 TS	44°13.5'N	124°37.7'W	8/16/2001	19:50:05	103	7.21	33.97	3.30	0.43	58.95	0.38	37.13	1.13	12.33	1.51	57.57	4.49
CP 4/5 TS	44°13.5'N	124°43.0'W	8/17/2001	1:52:00	3	12.69	32.72	0.54	0.83	18.33	0.00	0.00	11.56	89.61	12.83	47.30	11.45
CP 4/5 TS	44°13.5'N	124°42.4'W	8/17/2001	2:07:37	100	7.18	33.90	2.72	1.01	53.32	0.14	24.82	0.28	7.13	0.96	57.78	17.01
MC1_09	44°11.5'N	124°39.2'W	8/17/2001	23:44:23	5	12.27	32.65	0.78	0.73		0.12	3.84	10.66	58.66	9.91	47.77	12.56
MC1_08	44°11.5'N	124°39.2'W	8/17/2001	23:34:51	10	10.32	32.74	1.67	1.45	18.67	0.22	15.34	4.88	21.25	4.14	64.38	10.92
MC1_07	44°11.5'N	124°39.2'W	8/17/2001	23:25:07	20	8.73	33.00	2.26	0.82	30.27	0.21	24.79	0.52	4.97	0.99	62.38	9.35
MC1_06	44°11.5'N	124°39.2'W	8/17/2001	23:15:04	30	7.84	33.25	2.35	0.00	31.48		27.28	0.11	2.67	0.52	61.17	7.93
MC1_05	44°11.5'N	124°39.2'W	8/17/2001	23:04:47	50	7.69	33.66	2.79	1.06	42.82	0.25	32.12	0.21	3.75	0.75	65.88	6.19
MC1_04	44°11.5'N	124°39.2'W	8/17/2001	22:53:46	70	7.34	33.84	3.02	1.99	43.50	0.23	30.72	0.20	4.13	0.83	56.42	11.75
MC1_03	44°11.5'N	124°39.2'W	8/17/2001	22:44:02	80	7.31	33.90	3.10	1.86	36.94	0.21	34.36	0.21	4.01	0.76	53.71	7.38
MC1_02	44°11.5'N	124°39.2'W	8/17/2001	22:34:52	95	7.22	33.92	2.97	1.27	38.80	0.25	28.37	0.27	5.50	0.97	51.27	13.49
MC1_01	44°11.5'N	124°39.2'W	8/17/2001	22:23:31	105	7.14	33.92	3.11	0.42	40.54	0.28	30.50	0.90	9.26	1.39	61.06	11.77
HB4_09	44°06.5'N	124°39.0'W	8/18/2001	14:53:24	5	13.14	32.95	0.49	0.00	0.00	0.00	0.00	11.08	74.09	10.92	47.00	12.78
HB4_08	44°06.5'N	124°39.0'W	8/18/2001	14:44:48	10	9.96	33.01	0.73	0.00	0.00	0.00	2.33	11.15	55.60	10.45	47.43	11.45
HB4_07	44°06.5'N	124°39.0'W	8/18/2001	14:35:37	20	9.51	33.05	2.11	1.62	17.58	0.17	20.69	2.44	12.90	2.53	64.16	10.03
HB4_06	44°06.5'N	124°39.0'W	8/18/2001	14:24:04	30	8.01	33.15	2.33	1.55	23.13	0.15	24.08	1.17	7.87	1.53	66.22	9.49
HB4_05	44°06.5'N	124°39.0'W	8/18/2001	14:15:02	50	7.79	33.46	2.70	0.00	39.07	0.16	31.64	0.19	3.27		55.37	
HB4_04	44°06.5'N	124°39.0'W	8/18/2001	14:05:27	70	7.48	33.83	2.98	0.13	46.46	0.18	36.63	0.15	3.52	0.64	56.76	6.78
HB4_03	44°06.5'N	124°39.0'W	8/18/2001	13:56:04	80	7.36	33.86	3.14	0.15	51.62	0.15	37.56	0.13	3.69	0.66	54.24	5.97
HB4_02	44°06.5'N	124°39.0'W	8/18/2001	13:46:06	110	7.18	33.92	3.59	0.70	56.12	0.41	34.93	0.53	8.24	1.22	50.87	7.09
HB4_01	44°06.5'N	124°39.0'W	8/18/2001	13:37:11	115	7.19	33.92	3.24	1.95	54.69	0.46	32.20	0.55	10.19	1.27	51.22	8.76
HB6_09	44°01.5'N	124°41.0'W	8/19/2001	15:15:30	5	12.88	32.70	0.49	0.42	6.27	0.00	0.00	12.12	34.91	7.21	71.33	
HB6_08	44°01.5'N	124°41.0'W	8/19/2001	15:03:33	5	11.68	32.65	1.23	0.74	15.99	0.16	9.78	8.38	68.62	11.71	14.42	5.81
HB6_07	44°01.5'N	124°41.0'W	8/19/2001	14:51:36	20	8.65	33.02	2.62	0.93	30.37	0.23	28.40	0.54	4.82	0.95	58.54	8.56
HB6_06	44°01.5'N	124°41.0'W	8/19/2001	14:39:46	30	8.41	33.11	2.60	1.08	30.12	0.23	27.93	0.54	4.77	0.92	55.60	7.96
HB6_05	44°01.5'N	124°41.0'W	8/19/2001	14:27:47	50	7.82	33.38	2.59	0.87	34.80	0.00	29.97	0.15	2.74	0.48	56.84	7.04
HB6_04	44°01.5'N	124°41.0'W	8/19/2001	14:16:19	70	7.58	33.78	3.05	0.00	46.17	0.15	36.00	0.15	3.47	0.57	48.59	6.38
HB6_03	44°01.5'N	124°41.0'W	8/19/2001	14:05:12	100	7.26	33.91	3.47	0.41	63.27	0.30	37.92	0.17	5.88	0.96	59.57	5.93
HB6_02	44°01.5'N	124°41.0'W	8/19/2001	13:55:37	110	7.19	33.92	3.65	0.53	71.91	0.40	36.21	0.36	6.80	1.19	52.60	8.15
HB6_01	44°01.5'N	124°41.0'W	8/19/2001	13:45:20	120	7.19	33.92	3.61	0.38	73.16	0.38	35.43	0.49	7.95	1.28	52.49	6.73
HB8_09	43°57.0'N	124°47.1'W	8/20/2001	8:17:54	5	12.66	32.60	0.61	0.00	10.01	0.00	0.00	11.06	69.17	11.40	43.36	
HB8_08	43°57.0'N	124°47.1'W	8/20/2001	8:08:24	10	11.57	32.54	0.85	0.00	12.22	0.10	4.46	8.10	50.53	8.66	49.46	
HB8_07	43°57.0'N	124°47.1'W	8/20/2001	7:57:51	20	8.44	32.64	2.04	0.00	23.31	0.11	21.19	0.53	4.80	1.10	63.21	



Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 ( $\mu$ M)	NH4 ( $\mu$ M)	SiO <sub>2</sub> ( $\mu$ M)	NO <sub>2</sub> ( $\mu$ M)	NO <sub>3</sub> ( $\mu$ M)	Chl ( $\mu$ g/l)	POC ( $\mu$ M)	PON ( $\mu$ M)	DOC ( $\mu$ M)	DON ( $\mu$ M)
HB8_06	43°57.0'N	124°47.1'W	8/20/2001	7:46:44	30	8.02	32.88	2.07	0.00	24.02	0.00	21.43	0.27	3.06	0.80	61.34	
HB8_05	43°57.0'N	124°47.1'W	8/20/2001	7:35:25	50	8.16	33.38	2.23	0.00	27.46	0.00	25.85	0.05	1.97	0.56	57.64	
HB8_04	43°57.0'N	124°47.1'W	8/20/2001	7:24:25	70	7.93	33.57	2.83	0.44	39.10	0.20	32.55	0.12	2.48	0.61	51.39	
HB8_03	43°57.0'N	124°47.1'W	8/20/2001	7:12:53	100	7.56	33.87	3.06	0.00	48.15	0.22	36.57	0.11	3.16	0.74	43.20	
HB8_02	43°57.0'N	124°47.1'W	8/20/2001	7:02:06	112	7.30	33.91	3.36	0.50	60.61	0.32	37.74	0.16	3.87	0.82	43.07	
HB8_01	43°57.0'N	124°47.1'W	8/20/2001	6:52:12	122	7.29	33.91	3.40	0.47	60.77	0.32	37.69	0.17	4.18	0.87	46.19	
HB10_09	43°51.5'N	124°44.6'W	8/21/2001	4:52:53	5	12.61	32.59	0.52	0.34	9.62	0.00	0.00	15.47	93.06	12.52	33.67	
HB10_08	43°51.5'N	124°44.6'W	8/21/2001	4:40:54	10	12.26	32.37	0.74	0.30	10.51	0.00	0.00	15.18	73.78	12.22	32.77	
HB10_07	43°51.5'N	124°44.6'W	8/21/2001	4:30:40	20	9.87	32.65	1.83	0.37		0.16	17.15	3.15	16.50	3.06	47.03	
HB10_06	43°51.5'N	124°44.6'W	8/21/2001	4:19:13	30	8.41	32.81	2.37	0.00	30.04	0.00	26.35	0.54	5.23	0.96	50.45	
HB10_05	43°51.5'N	124°44.6'W	8/21/2001	4:08:42	50	8.04	33.22	2.53	0.27	32.17	0.12	28.75	0.21	3.39	0.71	55.15	
HB10_04	43°51.5'N	124°44.6'W	8/21/2001	3:57:45	70	7.74	33.67	2.98	1.83	38.77	0.17	33.22	0.12	3.16	0.70	58.51	
HB10_03	43°51.5'N	124°44.6'W	8/21/2001	3:46:29	90	7.76	33.75	2.91	0.87	40.90	0.18	34.31	0.09	2.70	0.69	53.90	
HB10_02	43°51.5'N	124°44.6'W	8/21/2001	3:35:24	110	7.78	33.91	2.96	0.00	43.95	0.00	36.24	0.04	2.65	0.64	52.44	
HB10_01	43°51.5'N	124°44.6'W	8/21/2001	3:25:39	130	7.60	33.94	2.97	0.00	47.26	0.11	36.08	0.06	4.38	0.59	52.72	
HB12	43°51.5'N	124°16.9'W	8/21/2001	10:05:15	5	10.30	33.10	1.57	0.00	16.31	0.00	11.65	7.49	42.98	7.40	38.65	
NS-1 TS	44°14.6'N	124°47.0'W	8/23/2001	15:09:30	25	10.76	32.35	1.15	0.00	12.34	0.24	9.54	0.60	7.28	1.37	62.80	
NS-2 TS	44°11.5'N	124°47.0'W	8/23/2001	17:11:25	19	12.40	32.29	0.89	0.00	10.09	0.23	6.78	0.61	7.70	1.57	60.32	
NS-3 TS	44°08.4'N	124°47.6'W	8/23/2001	19:03:44	20	8.90	32.45	1.43	0.00	15.06	0.14	12.93	0.70	6.35	1.22	51.90	
NS-3 TS	44°08.0'N	124°47.7'W	8/23/2001	19:16:15	78	7.81	33.72	2.78	0.00	43.61	0.00	32.70	0.10	3.33	0.51	45.95	
NS-4 TS	44°05.0'N	124°48.9'W	8/23/2001	21:09:04	25	9.66	32.45	1.58	0.00	17.52	0.00	15.36	0.62	6.53	1.23	51.28	7.89
NS-5 TS	44°02.6'N	124°50.3'W	8/23/2001	23:10:02	26	10.55	32.34	1.03	0.00	12.63	0.21	10.10	0.70	8.62	1.63	59.92	11.29
NS-6 TS	44°00.2'N	124°50.9'W	8/24/2001	1:07:15	20	9.42	32.47	1.18	0.00	12.61	0.17	9.73	0.81	9.47	1.71	65.42	11.40
NS-7 TS	43°57.3'N	124°51.0'W	8/24/2001	3:12:49	21	12.11	32.44	0.82	0.00	11.01	0.00	6.93	2.20	17.75	3.02	60.85	12.00
NS-8 TS	43°55.1'N	124°55.3'W	8/24/2001	4:44:45	20	12.68	32.37	1.46	0.00	15.52	0.11	12.33	1.82	13.38	2.41	59.88	10.45
ST-1 TS	44°27.0'N	124°15.0'W	8/24/2001	13:28:40	6	11.35	32.80	1.11	0.12	6.57	0.00	5.30	16.74	59.69	12.23	50.23	12.38
ST-1 TS	44°33.0'N	124°15.0'W	8/24/2001	13:48:03	70	7.43	33.81	3.68	4.47	62.73	0.30	33.02	4.26	20.27	3.45	50.21	3.75
ST-2 TS	44°33.0'N	124°18.6'W	8/24/2001	15:36:38	4	11.52	32.60	1.08	0.00	9.58	0.11	4.05	13.14	55.56	11.06	47.28	11.60
ST-2 TS	44°33.0'N	124°18.6'W	8/24/2001	15:36:38	4	11.52	32.60						8.99	55.56	11.06	47.28	
ST-2 TS	44°33.0'N	124°19.0'W	8/24/2001	15:47:32	77	7.38	33.83	3.73	2.78	57.22	0.27	34.13	2.77	17.19	2.69	48.53	4.05
ST-3 TS	44°33.0'N	124°22.6'W	8/24/2001	17:39:00	4	11.90	32.43	0.84	0.00	10.45	0.10	2.98	10.52	52.68	9.77	48.66	13.38
ST-3 TS	44°33.0'N	124°23.0'W	8/24/2001	17:49:12	55	7.68	33.67	2.85	0.30	43.85	0.21	33.90	0.49	4.84	0.78	49.78	4.28

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (μM)	NH4 (μM)	SiO <sub>2</sub> (μM)	NO <sub>2</sub> (μM)	NO <sub>3</sub> (μM)	Chl (μg/l)	POC (μM)	PON (μM)	DOC (μM)	DON (μM)
ST-4 TS	44°33.1N	124°26.5'W	8/24/2001	19:39:35	4	11.92	32.42	1.13	0.11	11.46	0.10	5.35	9.57	40.19	7.30	59.55	9.31
ST-4 TS	44°33.0N	124°26.6'W	8/24/2001	19:50:13	70	7.47	33.81	3.29	0.37	53.38	0.25	36.79	0.62	5.56	0.89	56.16	2.52
ST-5 TS	44°33.0N	124°29.9'W	8/24/2001	21:13:05	4	12.40	32.33	0.80	0.00	9.54	0.00	0.00	8.64	59.24	9.61	53.68	11.10
ST-6 TS	44°18.4N	124°23.8'W	8/25/2001	1:28:22	4	13.53	32.55	0.67	0.00	8.85	0.22	0.00	6.13	56.99	8.52	63.95	10.47
ST-6 TS	44°18.9N	124°23.5'W	8/25/2001	1:53:28	81	7.37	33.87	3.26	1.79	55.01	0.31	35.70	0.51	6.05	0.97	50.89	3.27
ST-7 TS	44°20.7N	124°22.4'W	8/25/2001	3:31:03	6	12.99	32.42	0.58	0.00	8.95	0.00	0.00	8.71	68.47	9.49	53.19	10.79
ST-7 TS	44°20.9N	124°22.3'W	8/25/2001	3:42:52	76	7.33	33.86	3.60	2.05	72.17	0.28	33.87	0.65	7.12	1.17	50.09	4.41
ST-8 TS	44°23.1N	124°20.9'W	8/25/2001	5:35:56	5	12.99	32.43	0.62	0.00	8.63	0.00	0.00	5.99	63.73	7.79	50.08	11.19
ST-8 TS	44°23.4N	124°20.8'W	8/25/2001	5:47:55	70	7.33	33.86	3.74	2.72	72.51	0.34	34.97	1.86	10.93	1.89	50.28	2.93
ST-9 TS	44°25.9N	124°13.9'W	8/25/2001	7:39:40	5	12.50	32.49	0.60	0.00	8.57	0.00	0.00	5.74	61.16	7.61	50.30	11.51
ST-9 TS	44°26.2N	124°19.1'W	8/25/2001	7:49:55	66	7.32	33.85	3.80	3.30	73.23	0.28	34.60	4.15	19.28	3.22	47.40	4.77
ST-10 TS	44°28.9N	124°17.5'W	8/25/2001	9:41:12	4	12.11	32.62	0.75	0.00	7.29	0.00	0.00	10.55	76.34	11.37	44.33	12.96
ST-10 TS	44°29.0N	124°17.3'W	8/25/2001	9:52:49	74	7.35	33.84	3.69	3.51	68.65	0.32	34.25	4.04	19.99	3.28	44.83	5.05
ST-11 TS	44°33.4N	124°15.4'W	8/25/2001	13:02:14	5	12.28	32.79	0.86	0.93	5.77	0.00	0.00	15.39	81.34	13.98	34.93	13.38
ST-11 TS	44°33.5N	124°15.7'W	8/25/2001	13:14:27	70	7.45	33.80	3.54	4.63	54.87	0.27	32.78	3.73	16.12	2.80	51.40	5.95
ST-12 TS	44°34.0N	124°18.9'W	8/25/2001	15:07:00	4	11.45	32.81	0.96	0.68	3.85	0.00	2.96	10.40	60.75	10.45	45.93	15.13
CH6_12	45°0.00'N	124°19.8'W	1/19/2003	14:55:00	5	10.89	31.96	0.82	0.00	8.02	0.13	5.64	1.38	9.93	1.82	118.38	12.39
CH6_11	45°0.00'N	124°19.8'W	1/19/2003	14:45:00	9	10.88	31.96	0.82	0.00	8.01	0.13	5.74	1.27	9.66	1.95	123.27	11.34
CH6_10	45°0.00'N	124°19.8'W	1/19/2003	14:35:00	20	11.10	32.15	0.80	0.00	6.30	0.14	5.42	0.81	6.44	1.13	129.21	12.77
CH6_9	45°0.00'N	124°19.8'W	1/19/2003	14:25:00	30	11.23	32.33	0.86	0.00	6.04	0.10	6.17	0.32	4.95	0.74	127.96	12.51
CH6_8	45°0.00'N	124°19.8'W	1/19/2003	14:15:00	40	11.30	32.45	0.91	0.00	5.78	0.07	6.87	0.15	5.81	0.59	138.65	12.91
CH6_7	45°0.00'N	124°19.8'W	1/19/2003	14:07:00	50	11.23	32.46	0.92	0.00	9.64	0.07	6.91	0.13	4.25	0.46	129.39	14.16
CH6_6	45°0.00'N	124°19.8'W	1/19/2003	13:57:00	60	11.27	32.51	0.88	0.00	4.31	0.07	6.71	0.16	3.76	0.49	133.98	14.31
CH6_5	45°0.00'N	124°19.8'W	1/19/2003	13:47:00	71	11.38	32.58	0.87	0.00	4.54	0.03	6.86	0.10	3.52	0.48	144.01	15.14
CH6_4	45°0.00'N	124°19.8'W	1/19/2003	13:37:00	80	11.27	32.57	0.96	0.00	6.46	0.02	8.13	0.08	4.56	0.49	149.04	14.75
CH6_3	45°0.00'N	124°19.8'W	1/19/2003	13:27:00	90	11.20	32.64	1.06	0.00	8.37	0.00	9.31	0.05	4.35	0.50	153.95	16.64
CH6_2	45°0.00'N	124°19.8'W	1/19/2003	13:17:00	101	11.17	32.82	1.17	0.00	10.05	0.00	11.49	0.04	6.73	0.55	155.10	15.24
CH6_1	45°0.00'N	124°19.8'W	1/19/2003	13:05:00	149	8.35	33.63	2.16	0.00	33.84	0.04	27.40	0.01		0.44		13.25
CH6.5_12	44°59.4'N	124°25.0'W	1/21/2003	11:19:00	5	10.83	31.95	0.83	0.00	7.23	0.11	5.15	1.66	11.99	2.09	74.09	7.36
CH6.5_11	44°59.4'N	124°25.0'W	1/21/2003	11:09:00	10	10.83	32.01	0.85	0.00	6.98	0.13	5.54	1.38	8.44	1.53	73.70	7.77
CH6.5_10	44°59.4'N	124°25.0'W	1/21/2003	10:58:00	20	11.23	32.32	0.90	0.00	6.96	0.15	6.53	0.62	5.41	0.93	75.18	7.49

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH6.5_9	44°59.4'N	124°25.0'W	1/21/2003	10:48:00	30	11.26	32.35	0.93	0.00	6.46	0.15	6.74	0.48	4.35	0.74	76.84	6.55
CH6.5_8	44°59.4'N	124°25.0'W	1/21/2003	10:38:00	40	11.33	32.46	0.97	0.00	6.93	0.06	7.23	0.17	3.05	0.51	78.18	8.52
CH6.5_7	44°59.4'N	124°25.0'W	1/21/2003	10:27:00	50	11.26	32.48	0.96	0.00	6.68	0.05	7.24	0.12	3.02	0.42	74.62	7.80
CH6.5_6	44°59.4'N	124°25.0'W	1/21/2003	10:15:00	60	11.30	32.51	0.91	0.00	5.09	0.06	6.82	0.12	2.46	0.46	78.52	8.46
CH6.5_5	44°59.4'N	124°25.0'W	1/21/2003	10:04:00	70	11.36	32.57	0.91	0.00	5.08	0.05	6.94	0.12	2.27	0.44	75.65	7.69
CH6.5_4	44°59.4'N	124°25.0'W	1/21/2003	9:53:00	80	11.38	32.58	0.91	0.00	5.42	0.02	6.96	0.10	2.59	0.41	82.41	8.39
CH6.5_3	44°59.4'N	124°25.0'W	1/21/2003	9:43:00	89	11.41	32.67	0.98	0.00	6.38	0.02	8.38	0.07	2.36	0.34	83.50	6.58
CH6.5_2	44°59.4'N	124°25.0'W	1/21/2003	9:33:00	100	10.99	32.79	1.16	0.00	9.38	0.04	10.95	0.04		0.39		5.96
CH6.5_1	44°59.4'N	124°25.0'W	1/21/2003	9:20:00	150	8.44	33.41	1.88	0.00	26.17	0.00	23.29	0.01	2.50		70.66	
CH3_11	44°59.4'N	124°07.3'W	1/22/2003	4:28:00	10	11.07	31.31	0.84	0.00	12.11	0.22	7.16	0.88	7.68	1.33	82.83	6.98
CH3_10	44°59.4'N	124°07.3'W	1/22/2003	4:18:00	16	11.07	31.32	0.90	0.00	12.70	0.25	7.04	0.91	7.83	1.36	84.06	6.61
CH3_9	44°59.4'N	124°07.3'W	1/22/2003	4:08:00	21	11.07	31.33	0.80	0.00	11.47	0.21	6.77	0.90	7.68	1.37	92.46	
CH3_8	44°59.4'N	124°07.3'W	1/22/2003	3:58:00	25	11.08	31.35	0.86	0.14	11.71	0.23	6.75	0.64	8.47	1.38	93.90	6.38
CH3_7	44°59.4'N	124°07.3'W	1/22/2003	3:48:00	29	11.08	31.36	0.89	0.00	11.69	0.24	6.94	0.90	8.33	1.36	98.68	6.22
CH3_6	44°59.4'N	124°07.3'W	1/22/2003	3:38:00	40	11.21	32.01	0.92	0.00	8.77	0.19	6.89	0.48	4.13	0.72	99.97	6.85
CH3_5	44°59.4'N	124°07.3'W	1/22/2003	3:27:00	51	11.06	32.07	0.87	0.00	6.83	0.27	5.91	0.33	4.64	0.71	98.96	6.86
CH3_4	44°59.4'N	124°07.3'W	1/22/2003	3:17:00	60	11.11	32.32	0.96	0.00	7.29	0.28	6.56	0.30	6.23	0.84	93.95	7.74
CH3_3	44°59.4'N	124°07.3'W	1/22/2003	3:07:00	65	11.08	32.33	0.93	0.00	7.28	0.25	6.03	0.31	7.50	0.93	97.53	7.37
CH3_2	44°59.4'N	124°07.3'W	1/22/2003	2:57:00	70	11.09	32.33	0.97	0.00	7.51	0.26	6.68	0.28	8.42	1.04	90.75	7.20
CH3_1	44°59.4'N	124°07.3'W	1/22/2003	2:38:00	74	11.14	32.35	0.98	0.00	7.73	0.24	6.74	0.36	9.13	1.09	97.27	8.92
CH6.5_12	45°0.00'N	124°23.4'W	1/23/2003	16:20:00	8	11.13	31.94	0.89	0.00	7.61	0.19	6.50	0.74	5.47	1.02	78.64	3.21
CH6.5_11	45°0.00'N	124°23.4'W	1/23/2003	16:09:00	10	11.13	31.94	0.86	0.00	8.20	0.18	6.36	0.70	5.43	0.97	77.96	4.01
CH6.5_10	45°0.00'N	124°23.4'W	1/23/2003	15:59:00	20	11.13	31.94	0.89	0.00	8.17	0.19	6.35	0.74	5.36	1.03	74.41	4.26
CH6.5_9	45°0.00'N	124°23.4'W	1/23/2003	15:48:00	29	11.12	32.03	0.87	0.00	6.81	0.18	6.11	0.77	5.46	1.06	73.56	4.49
CH6.5_8	45°0.00'N	124°23.4'W	1/23/2003	15:38:00	40	11.10	32.07	0.86	0.00	8.85	0.18	6.06	0.80	5.69	1.16	76.23	4.77
CH6.5_7	45°0.00'N	124°23.4'W	1/23/2003	15:27:00	49	10.98	32.29	0.86	0.00	4.95	0.27	5.77	0.54	4.74	0.99	74.79	4.57
CH6.5_6	45°0.00'N	124°23.4'W	1/23/2003	15:16:00	59	10.99	32.39	0.89	0.00	4.80	0.35	6.04	0.41	3.75	0.76	73.51	4.74
CH6.5_5	45°0.00'N	124°23.4'W	1/23/2003	15:07:00	69	11.11	32.49	0.86	0.00	4.42	0.28	5.96	0.27	3.22	0.60	75.46	4.90
CH6.5_4	45°0.00'N	124°23.4'W	1/23/2003	14:56:00	79	11.12	32.50	0.90	0.00	4.64	0.38	6.32	0.28	3.59	0.70	76.19	4.96
CH6.5_3	45°0.00'N	124°23.4'W	1/23/2003	14:47:00	90	11.09	32.49	0.90	0.00	5.10	0.43	6.28	0.28	3.70	0.72	75.26	4.64
CH6.5_2	45°0.00'N	124°23.4'W	1/23/2003	14:36:00	101	11.06	32.49	0.91	0.00	5.81	0.42	6.70	0.23	3.44	0.66	70.88	4.74

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (μM)	NH4 (μM)	SiO <sub>2</sub> (μM)	NO <sub>2</sub> (μM)	NO <sub>3</sub> (μM)	Chl (μg/l)	POC (μM)	PON (μM)	DOC (μM)	DON (μM)
CH6.5_1	45°0.00'N	124°23.4'W	1/23/2003	14:25:00	151	8.46	33.32	1.97	0.00	28.73	0.05	23.39	0.03	3.01	0.35	56.98	3.90
CH1_5	45°0.00'N	124°02.5'W	1/23/2003	22:43:00	5	11.24	30.95	0.93	0.45	13.91	0.24	7.05	1.20	15.64	1.98	63.87	8.91
CH1_4	45°0.00'N	124°02.5'W	1/23/2003	22:33:00	10	11.17	31.32	0.89	0.43	12.19	0.21	6.79	1.18	13.56	1.68	65.24	7.36
CH1_3	45°0.00'N	124°02.5'W	1/23/2003	22:24:00	15	11.17	31.36	0.96	0.36	12.16	0.23	7.12	1.16	12.41	1.59	69.06	7.45
CH1_2	45°0.00'N	124°02.5'W	1/23/2003	22:14:00	20	11.18	31.40	0.91	0.15	10.93	0.22	6.63	1.01	10.52	1.42	61.32	7.47
CH1_1	45°0.00'N	124°02.5'W	1/23/2003	21:58:00	25	11.18	31.46	0.95	0.13	11.63	0.23	7.08	0.95	12.18	1.61	64.15	7.17
CH3_12	45°0.00'N	124°07.3'W	1/24/2003	3:17:00	5	11.13	32.33	0.93	0.00	5.31	0.21	6.36	0.41	5.17	0.68	64.37	6.70
CH3_11	45°0.00'N	124°07.3'W	1/24/2003	3:08:00	10	11.12	32.34	0.90	0.00	5.41	0.19	6.07	0.42	4.81	0.73	67.53	
CH3_10	45°0.00'N	124°07.3'W	1/24/2003	2:58:00	15	11.12	32.35	0.69	0.00	4.89	0.13	4.40	0.43	5.05	0.73	64.92	9.16
CH3_9	45°0.00'N	124°07.3'W	1/24/2003	2:48:00	20	11.12	32.36	0.93	0.00	6.09	0.21	6.46	0.43	4.87	0.81	70.05	6.59
CH3_8	45°0.00'N	124°07.3'W	1/24/2003	2:38:00	25	11.12	32.37	0.93	0.00	6.07	0.22	6.46	0.44	4.56	0.68	78.61	5.92
CH3_7	45°0.00'N	124°07.3'W	1/24/2003	2:28:00	30	11.12	32.36	0.93	0.00	6.05	0.21	6.46	0.39	4.69	0.65	79.47	7.52
CH3_6	45°0.00'N	124°07.3'W	1/24/2003	2:18:00	40	11.12	32.38	0.92	0.00	5.66	0.21	6.22	0.38	4.66	0.61	71.11	6.79
CH3_5	45°0.00'N	124°07.3'W	1/24/2003	2:08:00	50	11.13	32.38	0.90	0.00	5.27	0.19	6.44	0.39	4.74	0.64	72.77	7.83
CH3_4	45°0.00'N	124°07.3'W	1/24/2003	1:59:00	60	11.13	32.39	0.87	0.00	5.01	0.20	5.97	0.39	5.65	0.76	70.08	7.61
CH3_3	45°0.00'N	124°07.3'W	1/24/2003	1:48:00	65	11.13	32.30	0.94	0.00	5.96	0.21	6.47	0.41	5.44	0.71	72.84	8.08
CH3_2	45°0.00'N	124°07.3'W	1/24/2003	1:38:00	70	11.13	32.39	0.95	0.00	5.69	0.21	6.62	0.38	5.58	0.74	72.90	7.89
CH3_1	45°0.00'N	124°07.3'W	1/24/2003	1:28:00	75	11.13	32.39	0.95	0.00	5.92	0.22	6.77	0.40	5.72	0.77	73.13	6.07
CH1_5	45°0.00'N	124°02.4'W	1/25/2003	2:07:00	5	11.16	31.07	0.97	0.56	14.52	0.22	6.90	1.16	14.27	1.83	72.15	7.66
CH1_4	45°0.00'N	124°02.4'W	1/25/2003	1:57:00	10	11.15	31.08	0.99	0.54	12.80	0.21	6.56	1.18	13.30	1.63	74.04	
CH1_3	45°0.00'N	124°02.4'W	1/25/2003	1:46:00	15	11.14	31.17	0.98	0.56	12.90	0.22	6.90	1.08	13.62	1.68		6.52
CH1_2	45°0.00'N	124°02.4'W	1/25/2003	1:35:00	20	11.13	31.20	0.91	0.49	11.78	0.22	6.35	1.09	14.25	1.59		7.27
CH1_1	45°0.00'N	124°02.4'W	1/25/2003	1:25:00	25	11.13	31.21	0.94	0.47	12.49	0.22	6.85	1.13	17.73	1.86		6.66
CH3_12	44°59.4'N	124°07.3'W	1/25/2003	6:12:00	5	11.15	32.26	0.94	0.00	7.26	0.24	6.64	0.43	5.70	0.84		6.85
CH3_11	44°59.4'N	124°07.3'W	1/25/2003	6:02:00	10	11.15	32.27	0.94	0.00	7.12	0.24	6.62	0.45	4.87	0.80		6.37
CH3_10	44°59.4'N	124°07.3'W	1/25/2003	5:53:00	15	11.13	32.29	0.99	0.00	6.47	0.23	6.21	0.42	4.88	0.74		7.03
CH3_9	44°59.4'N	124°07.3'W	1/25/2003	5:42:00	20	11.13	32.32	0.93	0.00	6.29	0.24	6.39	0.40	4.54	0.75		6.58
CH3_8	44°59.4'N	124°07.3'W	1/25/2003	5:32:00	25	11.15	32.39	0.93	0.00	5.41	0.24	6.13	0.42	4.79	0.74		7.28
CH3_7	44°59.4'N	124°07.3'W	1/25/2003	5:23:00	30	11.17	32.41	0.89	0.00	5.25	0.24	6.01	0.43	5.07	0.80		6.94

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (μM)	NH4 (μM)	SiO <sub>2</sub> (μM)	NO <sub>2</sub> (μM)	NO <sub>3</sub> (μM)	Chl (μg/l)	POC (μM)	PON (μM)	DOC (μM)	DON (μM)
CH3_6	44°59.4'N	124°07.3'W	1/25/2003	5:12:00	40	11.16	32.41	0.96	0.00	6.17	0.26	6.38	0.42	5.29	0.83	77.52	6.48
CH3_5	44°59.4'N	124°07.3'W	1/25/2003	5:02:00	50	11.13	32.41	0.95	0.00	6.36	0.25	6.73	0.39	5.44		72.54	
CH3_4	44°59.4'N	124°07.3'W	1/25/2003	4:52:00	60	11.14	32.42	0.94	0.00	6.22	0.27	6.60	0.40	5.97	0.86	71.11	6.79
CH3_3	44°59.4'N	124°07.3'W	1/25/2003	4:43:00	65	11.16	32.43	0.93	0.00	6.30	0.27	6.68	0.42	5.41	0.86	70.19	6.62
CH3_2	44°59.4'N	124°07.3'W	1/25/2003	4:32:00	70	11.17	32.43	0.94	0.00	6.07	0.27	6.59	0.43	6.21	0.96	70.03	7.05
CH3_1	44°59.4'N	124°07.3'W	1/25/2003	4:23:00	75	11.16	32.43	0.94	0.00	5.44	0.27	6.74	0.46	6.01	0.95	74.59	7.64
CH6.5_12	45°0.00'N	124°23.4'W	1/25/2003	11:43:00	5	11.30	32.48	0.91	0.00	6.28	0.24	6.44	0.48	4.06	0.85	72.96	6.89
CH6.5_11	45°0.00'N	124°23.4'W	1/25/2003	11:34:00	11	11.30	32.47	0.89	0.00	5.64	0.24	6.38	0.48	4.03	0.94	83.26	6.77
CH6.5_10	45°0.00'N	124°23.4'W	1/25/2003	11:25:00	20	11.29	32.48	0.89	0.00	5.46	0.25	6.36	0.49	4.42	0.95	73.05	7.44
CH6.5_9	45°0.00'N	124°23.4'W	1/25/2003	11:16:00	30	11.25	32.52	0.90	0.00	5.44	0.29	6.50	0.44	3.85	0.84	68.13	7.16
CH6.5_8	45°0.00'N	124°23.4'W	1/25/2003	11:06:00	41	11.23	32.56	0.97	0.00	5.28	0.33	6.75	0.36	3.50	0.82	64.13	7.91
CH6.5_7	45°0.00'N	124°23.4'W	1/25/2003	10:56:00	51	11.23	32.56	0.93	0.00	6.42	0.34	6.73	0.35	3.74	0.79	67.02	9.44
CH6.5_6	45°0.00'N	124°23.4'W	1/25/2003	10:46:00	59	11.23	32.56	0.93	0.00	5.10	0.32	6.74	0.30	3.51	0.73	68.02	6.63
CH6.5_5	45°0.00'N	124°23.4'W	1/25/2003	10:36:00	69	11.19	32.67	0.95	0.00	5.88	0.17	7.69	0.15	2.68	0.54	66.85	7.62
CH6.5_4	45°0.00'N	124°23.4'W	1/25/2003	10:26:00	81	11.07	32.74	0.83	0.00	8.64	0.00	10.68	0.05	2.19	0.36	64.99	7.02
CH6.5_3	45°0.00'N	124°23.4'W	1/25/2003	10:18:00	91	9.99	32.67	1.20	0.00	10.28	0.00	11.38	0.04	2.21	0.33	63.32	6.60
CH6.5_2	45°0.00'N	124°23.4'W	1/25/2003	10:08:00	101	9.96	32.98	1.33	0.00	13.01	0.00	13.55	0.03	1.65	0.41	61.77	6.33
CH6.5_1	45°0.00'N	124°23.4'W	1/25/2003	9:56:00	151	8.11	33.49	2.11	0.00	32.43	0.17	26.17	0.02	2.18	0.34	58.57	6.41
CH1_5	45°0.00'N	124°02.5'W	1/26/2003	0:19:00	5	11.22	31.00	0.87	0.78	15.42	0.19	6.66	0.94	13.24	1.66	66.81	7.08
CH1_4	45°0.00'N	124°02.5'W	1/26/2003	0:09:00	10	11.20	31.15	0.90	0.71	14.65	0.20	6.79	0.91	11.51	1.50	71.23	
CH1_3	45°0.00'N	124°02.5'W	1/25/2003	23:59:00	15	11.20	31.19	0.90	0.72	15.46	0.20	6.98	0.85	10.79	1.37	68.27	6.27
CH1_2	45°0.00'N	124°02.5'W	1/25/2003	23:49:00	20	11.19	31.21	0.91	0.62	15.06	0.20	6.97	0.93	10.86	1.35	76.84	6.58
CH1_1	45°0.00'N	124°02.5'W	1/25/2003	23:40:00	25	11.19	31.21	0.92	0.62	14.66	0.20	7.36	0.93	10.71	1.40	69.46	6.66
CH3_12	45°0.00'N	124°07.3'W	1/26/2003	4:35:00	5	11.26	32.40	0.87	0.00	4.80	0.22	5.33	0.47	4.97	0.89	74.07	8.52
CH3_11	45°0.00'N	124°07.3'W	1/26/2003	4:25:00	10	11.26	32.40	0.89	0.17	4.80	0.22	5.33	0.42	4.88	0.80	67.37	8.04
CH3_10	45°0.00'N	124°07.3'W	1/26/2003	4:15:00	15	11.25	32.40	0.90	0.00	5.37	0.23	5.43	0.41	4.62	0.84	64.63	8.27
CH3_9	45°0.00'N	124°07.3'W	1/26/2003	4:04:00	20	11.26	32.40	0.89	0.00	6.33	0.20	6.62	0.40	4.57	0.86	64.56	6.30
CH3_8	45°0.00'N	124°07.3'W	1/26/2003	3:55:00	25	11.25	32.42	0.88	0.00	6.43	0.20	6.20	0.41	4.62	0.80	62.95	7.56
CH3_7	45°0.00'N	124°07.3'W	1/26/2003	3:44:00	30	11.25	32.44	0.90	0.00	4.84	0.22	6.37	0.40	5.25	0.78	61.03	7.66
CH3_6	45°0.00'N	124°07.3'W	1/26/2003	3:34:00	40	11.25	32.44	0.86	0.00	5.65	0.21	5.61	0.41	4.92	0.83	61.49	7.87

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH3_5	45°0.00'N	124°07.3'W	1/26/2003	3:24:00	50	11.25	32.45	0.91	0.00	5.24	0.24	6.53	0.42	4.62	0.86	62.81	6.86
CH3_4	45°0.00'N	124°07.3'W	1/26/2003	3:13:00	60	11.25	32.45	0.86	0.00	5.77	0.24	6.21	0.40	5.33	0.83	62.05	6.83
CH3_3	45°0.00'N	124°07.3'W	1/26/2003	3:03:00	65	11.25	32.45	0.92	0.00	5.14	0.25	6.70	0.43	4.87	0.93	64.08	6.08
CH3_2	45°0.00'N	124°07.3'W	1/26/2003	2:53:00	70	11.25	32.46	0.91	0.00	5.71	0.25	6.58	0.48	5.85	0.92	60.53	6.61
CH3_1	45°0.00'N	124°07.3'W	1/26/2003	2:43:00	75	11.25	32.46	0.88	0.00	6.05	0.22	6.19	0.42	6.35	0.91	63.20	7.04
CH1_5	45°0.00'N	124°02.5'W	1/27/2003	0:05:00	5	11.38	30.80	0.95	0.78	14.37	0.25	7.35	0.79	11.91	1.50	58.83	7.58
CH1_4	45°0.00'N	124°02.5'W	1/26/2003	23:55:00	10	11.34	31.24	0.91	0.72	11.86	0.23	6.39	0.74	10.09	1.30	58.63	7.75
CH1_3	45°0.00'N	124°02.5'W	1/26/2003	23:45:00	15	11.34	31.25	0.94	0.74	11.98	0.25	6.58	0.71	10.39	1.33	55.98	7.53
CH1_2	45°0.00'N	124°02.5'W	1/26/2003	23:36:00	20	11.33	31.39	0.91	0.98	11.64	0.27	6.51	0.74	11.54	1.37	53.58	6.69
CH1_1	45°0.00'N	124°02.5'W	1/26/2003	23:26:00	25	11.32	31.51	0.91	0.57	10.16	0.24	6.18	0.80	13.08	1.52	57.33	7.33
CH5_12	45°0.00'N	124°13.5'W	1/27/2003	7:21:00	5	11.26	32.34	0.84	0.00	4.35	0.31	6.30	0.61	5.93	0.68	69.00	6.64
CH5_11	45°0.00'N	124°13.5'W	1/27/2003	7:11:00	10	11.27	32.34	0.82	0.00	4.35	0.31	6.19	0.60	6.20	0.75	54.59	9.17
CH5_10	45°0.00'N	124°13.5'W	1/27/2003	7:01:00	20	11.27	32.34	0.71	0.00	3.43	0.25	4.91	0.60	6.08	0.73		7.80
CH5_9	45°0.00'N	124°13.5'W	1/27/2003	6:51:00	35	11.28	32.36	0.87	0.00	4.80	0.32	6.71	0.50	4.47	0.50	62.04	6.38
CH5_8	45°0.00'N	124°13.5'W	1/27/2003	6:41:00	50	11.34	32.47	0.88	0.16	5.26	0.19	7.06	0.36	4.31		56.36	
CH5_7	45°0.00'N	124°13.5'W	1/27/2003	6:30:00	65	11.36	32.49	0.94	0.00	5.26	0.18	7.90	0.33	3.90	0.61	57.50	5.51
CH5_6	45°0.00'N	124°13.5'W	1/27/2003	6:20:00	80	11.29	32.53	0.97	0.00	5.71	0.19	8.15	0.22	3.58	0.55	69.61	7.38
CH5_5	45°0.00'N	124°13.5'W	1/27/2003	6:10:00	90	11.26	32.54	0.97	0.00	5.71	0.21	8.09	0.21	3.75	0.68	69.28	5.40
CH5_4	45°0.00'N	124°13.5'W	1/27/2003	6:00:00	100	11.26	32.54	0.94	0.00	5.94	0.20	7.48	0.20		0.59		6.46
CH5_3	45°0.00'N	124°13.5'W	1/27/2003	5:49:00	110	11.25	32.58	0.99	0.00	7.31	0.10	8.16	0.14	3.86	0.45	67.62	7.07
CH5_2	45°0.00'N	124°13.5'W	1/27/2003	5:38:00	120	11.09	32.77	1.19	0.00	8.45	0.05	10.80	0.06		0.43		6.32
CH5_1	45°0.00'N	124°13.5'W	1/27/2003	5:28:00	130	10.75	32.74	1.42	0.00	8.45	0.07	9.60	0.07	3.41	0.54	68.54	8.62
CH6.5_12	45°0.00'N	124°23.4'W	1/27/2003	16:03:00	6	11.13	32.32	0.83	0.00	7.76	0.34	6.10	0.63	4.62	1.14	68.41	6.36
CH6.5_11	45°0.00'N	124°23.4'W	1/27/2003	15:54:00	10	11.13	32.32	0.83	0.00	3.89	0.34	6.21	0.60	4.78	1.16	65.32	5.39
CH6.5_10	45°0.00'N	124°23.4'W	1/27/2003	15:46:00	20	11.23	32.43	0.83	0.14	7.31	0.24	6.89	0.28	2.99	0.63		6.23
CH6.5_9	45°0.00'N	124°23.4'W	1/27/2003	15:36:00	30	11.32	32.55	0.95	0.00	5.71	0.15	8.49	0.22	2.08	0.52	61.37	5.95
CH6.5_8	45°0.00'N	124°23.4'W	1/27/2003	15:27:00	40	11.32	32.57	0.95	0.00	5.60	0.11	8.48	0.21	2.33	0.52		6.10
CH6.5_7	45°0.00'N	124°23.4'W	1/27/2003	15:20:00	50	11.32	32.60	1.02	0.00	6.17	0.08	9.14	0.14	2.40	0.50		4.90
CH6.5_6	45°0.00'N	124°23.4'W	1/27/2003	15:11:00	61	11.30	32.61	1.00	0.00	5.94	0.08	9.20	0.12	2.39	0.48		5.78
CH6.5_5	45°0.00'N	124°23.4'W	1/27/2003	15:01:00	71	11.31	32.62	1.02	0.00	6.17	0.08	9.51	0.16	2.44	0.48		4.88

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
CH6.5_4	45°0.00'N	124°23.4'W	1/27/2003	14:52:00	81	11.31	32.66	1.01	0.00	6.51	0.05	9.64	0.13	2.88	0.35		7.59
CH6.5_3	45°0.00'N	124°23.4'W	1/27/2003	14:42:00	88	11.16	32.66	1.14	0.00	8.67	0.06	11.15	0.14	2.92	0.44		5.96
CH6.5_2	45°0.00'N	124°23.4'W	1/27/2003	14:32:00	103	9.80	32.79	1.43	0.00	13.46	0.07	15.77	0.03	3.49	0.42		5.40
CH6.5_1	45°0.00'N	124°23.4'W	1/27/2003	14:19:00	150	8.11	33.32	2.01	0.00	25.87	0.16	25.44	0.02	2.43	0.39		5.68
CH1_5	45°0.00'N	124°02.5'W	1/28/2003	1:05:00	5	11.47	30.50	0.95	0.70	16.35	0.25	2.52	0.66	11.90	1.51		12.14
CH1_4	45°0.00'N	124°02.5'W	1/28/2003	0:55:00	10	11.48	31.29	0.94	0.71	28.49	0.27	8.44	0.64	11.06	1.33		5.93
CH1_3	45°0.00'N	124°02.5'W	1/28/2003	0:45:00	15	11.45	31.34	0.92	0.66	28.49	0.27	7.67	0.52	7.85	1.15		6.08
CH1_2	45°0.00'N	124°02.5'W	1/28/2003	0:35:00	20	11.45	31.35	0.92	0.68	28.49	0.27	7.62	0.54	8.12	1.17		6.00
CH1_1	45°0.00'N	124°02.5'W	1/28/2003	0:25:00	25	11.43	31.48	0.99	0.81	29.63	0.30	7.70	0.70	17.42	1.76		6.14
CH5_12	45°0.00'N	124°13.5'W	1/28/2003	7:13:00	5	11.27	32.38	0.88	0.00	3.94	0.32	6.29	0.51	4.74	0.94		5.69
CH5_11	45°0.00'N	124°13.5'W	1/28/2003	7:03:00	10	11.27	32.38	0.88	0.00	3.81	0.31	6.45	0.50	4.73	1.01		5.69
CH5_10	45°0.00'N	124°13.5'W	1/28/2003	6:52:00	20	11.27	32.38	0.89	0.00	4.29	0.30	6.23	0.50	5.13	0.98		6.80
CH5_9	45°0.00'N	124°13.5'W	1/28/2003	6:42:00	35	11.28	32.40	0.87	0.00	4.15	0.32	6.36	0.41	3.90	0.90		6.17
CH5_8	45°0.00'N	124°13.5'W	1/28/2003	6:33:00	50	11.31	32.48	0.87	0.00	5.78	0.22	6.13	0.22	3.22	0.56		7.20
CH5_7	45°0.00'N	124°13.5'W	1/28/2003	4:52:00	65	11.31	32.54	0.99	0.00	5.73	0.15	8.48	0.16	2.95	0.56		5.55
CH5_6	45°0.00'N	124°13.5'W	1/28/2003	4:42:00	80	11.33	32.58	1.03	0.00	6.91	0.09	8.97	0.14		0.47		5.23
CH5_5	45°0.00'N	124°13.5'W	1/28/2003	4:32:00	90	11.32	32.57	1.03	0.00	7.31	0.08	9.02	0.12	1.94	0.48		5.14
CH5_4	45°0.00'N	124°13.5'W	1/28/2003	4:21:00	100	11.20	32.58	1.03	0.00	8.03	0.09	9.00	0.12	2.90	0.60		6.07
CH5_3	45°0.00'N	124°13.5'W	1/28/2003	4:11:00	110	10.92	32.68	1.26	0.00	12.08	0.14	12.32	0.12	4.36	0.79		4.26
CH5_2	45°0.00'N	124°13.5'W	1/28/2003	4:01:00	120	8.52	33.44	2.21	0.00	32.12	0.15	27.37	0.03	5.12	0.89		2.25
CH5_1	45°0.00'N	124°13.5'W	1/28/2003	3:51:00	130	8.03	33.69	2.42	0.00	39.25	0.20	31.30	0.03	4.77	0.61		1.24
CH6.5_12	45°0.00'N	124°23.4'W	1/28/2003	15:07:00	6	11.17	32.25	0.85	0.00	3.66	0.31	5.88	0.74	5.82	1.28	72.14	8.15
CH6.5_11	45°0.00'N	124°23.4'W	1/28/2003	14:57:00	10	11.19	32.36	0.86	0.00	3.77	0.32	5.92	0.69	5.23	1.24	74.10	8.01
CH6.5_10	45°0.00'N	124°23.4'W	1/28/2003	14:49:00	20	11.16	32.32	0.88	0.00	3.51	0.39	6.60	0.40	3.68	0.83	69.97	5.03
CH6.5_9	45°0.00'N	124°23.4'W	1/28/2003	14:40:00	29	11.14	32.47	0.92	0.00	4.12	0.44	7.25	0.29	2.73	0.68	70.75	6.17
CH6.5_8	45°0.00'N	124°23.4'W	1/28/2003	14:32:00	40	11.09	32.47	0.91	0.00	4.35	0.44	7.18	0.25	2.43	0.60	72.88	5.17
CH6.5_7	45°0.00'N	124°23.4'W	1/28/2003	14:23:00	51	11.15	32.50	0.85	0.00	4.55	0.36	5.78	0.21	2.44	0.65	74.37	7.59
CH6.5_6	45°0.00'N	124°23.4'W	1/28/2003	14:14:00	61	11.14	32.54	1.00	0.00	10.48	0.23	6.01	0.15	2.15	0.58	71.61	8.13
CH6.5_5	45°0.00'N	124°23.4'W	1/28/2003	14:05:00	69	11.04	32.70	1.07	0.00	6.46	0.18	10.30	0.09	1.83		70.22	
CH6.5_4	45°0.00'N	124°23.4'W	1/28/2003	13:55:00	79	11.00	32.75	1.08	0.00	7.31	0.09	11.80	0.05	1.66	0.40	74.20	6.10

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (μM)	NH4 (μM)	SiO <sub>2</sub> (μM)	NO <sub>2</sub> (μM)	NO <sub>3</sub> (μM)	Chl (μg/l)	POC (μM)	PON (μM)	DOC (μM)	DON (μM)
CH6.5_3	45°0.00'N	124°23.4'W	1/28/2003	13:45:00	91	10.46	32.85	1.39	0.00	13.21	0.06	14.98	0.04	2.19	0.46	69.73	4.05
CH6.5_2	45°0.00'N	124°23.4'W	1/28/2003	13:36:00	102	8.83	32.75	1.74	0.00	19.72	0.09	20.08	0.03	2.25	0.43	62.92	3.63
CH6.5_1	45°0.00'N	124°23.4'W	1/28/2003	13:26:00	150	8.19	33.48	2.13	0.00	28.81	0.15	27.64	0.01	1.57	0.32	59.58	2.41
Transect 1	45°0.00'N	124°20.4'W	1/28/2003	18:52:00	176	8.00	33.71	2.40	0.00	36.03	0.14	31.72	0.03	3.28	0.40	64.03	0.74
Transect 1	45°0.00'N	124°19.3'W	1/28/2003	19:11:00	5	11.18	32.23	0.83	0.00	3.44	0.14	5.15	0.81	7.50	1.54	74.58	8.79
Transect 1	45°0.00'N	124°18.4'W	1/28/2003	19:30:00	161	7.96	33.72	2.43	0.00	37.04	0.14	31.96	0.02	3.48	0.52	62.65	0.48
Transect 1	45°0.00'N		1/28/2003	19:50:00	5	11.21	32.20	0.83	0.00	5.55	0.21	5.86	0.80	7.54	1.46	72.93	5.70
Transect 1	45°0.00'N	124°16.5'W	1/28/2003	20:08:00	152	7.90	33.74	2.47	0.17	38.05	0.16	32.28	0.04	4.78	0.60	60.19	0.94
Transect 1	45°0.00'N	124°15.9'W	1/28/2003	20:27:00	5	11.25	32.30	0.88	0.00	4.59	0.20	6.39	0.61	7.00	1.27	74.19	5.50
Transect 1	45°0.00'N	124°14.9'W	1/28/2003	20:45:00	142	7.97	33.72	2.36	0.00	35.86	0.24	30.04	0.04	6.52	0.80	60.01	3.93
Transect 1	45°0.00'N	124°13.7'W	1/28/2003	21:03:00	5	11.24	32.29	0.87	0.00	4.12	0.28	6.27	0.59	8.00	1.39	71.94	5.65
Transect 1	45°0.00'N	124°13.3'W	1/28/2003	21:20:00	128	8.20	33.50	1.96	0.00	32.43	0.29	22.43	0.05	5.68	0.81	59.98	7.97
Transect 1	45°0.00'N	124°12.5'W	1/28/2003	21:36:00	5	11.27	32.28	0.91	0.00	3.29	0.30	6.44	0.58	7.02	1.27	71.46	5.17
Transect 1	45°0.00'N	124°11.5'W	1/28/2003	21:52:00	113	9.00	33.00	1.94	0.39	24.71	0.26	21.93	0.11	9.67	1.33	60.98	2.43
Transect 1	45°0.00'N	124°10.6'W	1/28/2003	22:07:00	5	11.29	32.29	0.79	0.39	5.31	0.21	5.06	0.57	6.76	1.38	68.63	7.07
Transect 1	45°0.00'N	124°10.0'W	1/28/2003	22:22:00	100	11.00	32.60	1.04	0.00	12.91	0.26	7.54	0.20	3.72	0.81	72.28	
Transect 1	45°0.00'N	124°09.5'W	1/28/2003	22:37:00	5	11.30	32.31	0.83	0.00	5.06	0.29	4.54	0.53	7.65	1.42	68.24	8.03
Transect 1	45°0.00'N	124°08.8'W	1/28/2003	22:51:00	87	11.31	32.48	0.97	0.00	6.26	0.31	6.34	0.21	3.28	0.73	70.34	7.27
Transect 1	45°0.00'N	124°08.1'W	1/28/2003	23:05:00	5	11.30	32.28	0.84	0.00	6.25	0.34	4.80	0.51	7.39	1.31	72.44	6.42
Transect 1	45°0.00'N	124°07.5'W	1/28/2003	23:20:00	79	11.32	32.45	0.90	0.00	6.49	0.30	5.64	0.21	3.56	0.78	81.35	6.44
Transect 1	45°0.00'N	124°06.4'W	1/28/2003	23:42:00	5	11.44	31.73	0.91	0.00	8.65	0.29	6.23	0.35	6.45	0.92	84.68	6.33
Transect 1	45°0.00'N	124°05.8'W	1/28/2003	23:55:00	62	11.36	32.42	0.90	0.00	6.71	0.32	5.98	0.29	5.25	0.93	83.51	
Transect 1	45°0.00'N	124°05.0'W	1/29/2003	0:12:00	5	11.42	31.18	0.91	0.00	11.29	0.29	7.08	0.37	6.35	0.88	80.35	6.29
Transect 1	45°0.00'N	124°04.4'W	1/29/2003	0:24:00	47	11.34	32.27	0.92	0.31	7.42	0.25	5.93	0.43	8.45	1.22	80.46	
Transect 1	45°0.00'N	124°03.4'W	1/29/2003	0:44:00	5	11.48	30.62	0.91	0.38	24.06	0.27	7.58	0.71	11.78	1.56	87.05	3.08
Transect 1	45°0.00'N	124°02.7'W	1/29/2003	0:56:00	31	11.38	31.82	0.83	0.72	8.13	0.26	6.07	0.41	6.64	0.91	84.12	6.59
CH1_5	45°0.00'N	124°02.5'W	1/29/2003	3:02:00	5	11.40	30.83	0.91	0.56	14.25	0.27	6.19	0.59	8.50	1.16	83.97	7.88
CH1_4	45°0.00'N	124°02.5'W	1/29/2003	2:52:00	10	11.39	31.42	0.95	0.35	10.76	0.28	5.81	0.51	6.33	0.98	83.46	7.57
CH1_3	45°0.00'N	124°02.5'W	1/29/2003	2:42:00	15	11.40	31.64	0.81	0.32	8.35	0.22	6.31	0.49	4.81	0.83	78.43	7.61
CH1_2	45°0.00'N	124°02.5'W	1/29/2003	2:32:00	20	11.40	31.68	0.93	0.37	9.44	0.26	7.52	0.49	4.34	0.83	78.60	5.84
CH1_1	45°0.00'N	124°02.5'W	1/29/2003	2:22:00	25	11.39	31.77	0.96	0.51	9.81	0.27	7.51	0.41	7.18	0.74	76.96	8.89



Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (µM)	NH4 (µM)	SiO <sub>2</sub> (µM)	NO <sub>2</sub> (µM)	NO <sub>3</sub> (µM)	Chl (µg/l)	POC (µM)	PON (µM)	DOC (µM)	DON (µM)
Sal survey 1	45°0.00'N	124°02.8'W	2/1/2003	21:24:00	surface	11.94	26.50	1.07	1.40	35.22	0.41	12.79	0.65	20.56	2.10	68.72	3.17
Sal survey 1	45°0.00'N	124°03.3'W	2/1/2003	21:36:00	surface	11.86	27.26	1.06	1.31	31.47	0.44	11.88	0.62	13.56	1.68	74.64	2.22
Sal survey 1	45°0.00'N	124°03.9'W	2/1/2003	21:49:00	surface	11.99	27.81	0.95	1.20	26.88	0.39	9.98	0.62	10.48	1.34	71.52	3.08
Sal survey 1	45°0.00'N	124°04.5'W	2/1/2003	22:02:00	surface	12.03	29.44	0.97	0.98	21.81	0.44	7.13	0.54	7.02	1.04	72.14	5.44
Sal survey 1	45°0.00'N	124°05.1'W	2/1/2003	22:14:00	surface	12.16	29.96	1.06	0.69	14.57	0.36	5.90	0.49	7.68	0.99	69.79	5.96
Sal survey 1	45°0.00'N	124°05.7'W	2/1/2003	22:25:00	surface	12.07	29.99	0.94	0.79	19.14	0.38	5.99	0.56	7.74	1.13	72.64	7.11
Sal survey 1	45°0.00'N	124°06.3'W	2/1/2003	22:38:00	surface	12.04	30.42	0.95	0.62	15.52	0.41	6.06	0.48	5.70	0.84	77.26	8.94
Sal survey 1	45°0.00'N	124°06.9'W	2/1/2003	22:51:00	surface	12.03	31.74	0.91	0.28	7.67	0.35	5.36	0.27	4.94	0.62	62.69	5.59
Sal survey 1	45°0.00'N	124°07.5'W	2/1/2003	23:04:00	surface	12.01	32.11	0.90	0.19	6.58	0.30	5.02	0.27	3.17	0.61	63.76	7.71
Sal survey 1	45°0.00'N	124°08.1'W	2/1/2003	23:17:00	surface	11.99	32.14	0.91	0.00	5.97	0.30	5.39	0.24	2.93	0.60	66.92	6.86
Sal survey 1	45°0.00'N	124°08.7'W	2/1/2003	23:29:00	surface	11.99	32.22	0.92	0.00	5.12	0.27	5.69	0.26	2.53	0.51	65.69	5.42
Sal survey 1	45°0.00'N	124°09.3'W	2/1/2003	23:43:00	surface	11.99	32.23	0.84	0.15	4.99	0.26	5.36	0.27	2.43	0.60	62.78	8.73
Sal survey 1	45°0.00'N	124°10.8'W	2/2/2003	0:14:00	surface	11.97	32.22	0.91	0.00	4.14	0.31	6.17	0.35	3.20	0.63	62.35	4.14
Sal survey 1	45°0.00'N	124°12.2'W	2/2/2003	0:43:00	surface	11.96	32.23	0.88	0.00	5.10	0.31	6.44	0.40	3.73	0.76	78.39	3.78
Sal survey 1	45°0.00'N	124°13.5'W	2/2/2003	1:11:00	surface	11.96	32.24	0.91	0.00	4.85	0.27	5.44	0.45	3.72	0.66	77.65	6.66
Sal survey 1	45°0.00'N	124°14.9'W	2/2/2003	1:43:00	surface	11.95	32.26	0.87	0.00	4.60	0.37	5.88	0.58	5.04	0.87	68.63	4.74
Sal survey 1	45°0.00'N	124°16.5'W	2/2/2003	2:14:00	surface	11.81	32.23	0.87	0.00	4.11	0.38	5.37	0.63	4.75	0.83	68.51	4.66
Sal survey 1	45°0.00'N	124°17.9'W	2/2/2003	2:43:00	surface	11.78	32.23	0.85	0.00	4.11	0.39	5.47	0.60	4.89	0.93	62.55	5.17
Sal survey 1	45°0.00'N	124°20.6'W	2/2/2003	3:42:00	surface	11.84	32.24	0.86	0.00	4.10	0.41	5.55	0.57	4.50	0.83	61.21	3.65
Sal survey 1	45°0.00'N	124°23.5'W	2/2/2003	4:44:00	surface	11.86	32.26	0.85	0.00	3.62	0.38	5.30	0.53	3.95	0.83	59.43	4.33
Sal survey 2	45°0.00'N	124°02.5'W	2/2/2003	16:03:00	surface	11.80	29.18	1.04	0.84	22.61	0.42	10.17	0.42	11.38	1.43	60.25	4.04
Sal survey 2	45°0.00'N	124°02.8'W	2/2/2003	16:13:00	surface	11.93	29.66	1.08	0.91	20.73	0.40	9.22	0.48	11.64	1.25	64.05	4.23
Sal survey 2	45°0.00'N	124°03.6'W	2/2/2003	16:29:00	surface	11.83	29.17	1.09	1.02	23.87	0.43	10.96	0.54	14.68	1.46	56.99	4.10
Sal survey 2	45°0.00'N	124°04.3'W	2/2/2003	16:45:00	surface	11.76	28.84	1.09	1.04	24.14	0.41	10.99	0.48	13.95	1.45	58.69	4.90
Sal survey 2	45°0.00'N	124°05.0'W	2/2/2003	17:00:00	surface	11.78	28.87	1.10	1.05	25.60	0.43	11.55	0.48	12.80	1.52	57.90	3.31
Sal survey 2	45°0.00'N	124°05.7'W	2/2/2003	17:15:00	surface	11.78	28.93	1.07	1.08	26.23	0.41	11.26	0.46	11.51	1.34	57.77	4.58
Sal survey 2	45°0.00'N	124°06.4'W	2/2/2003	17:29:00	surface	11.72	28.55	1.07	1.06	25.20	0.42	11.37	0.48	11.20	1.36	62.00	3.33
Sal survey 2	45°0.00'N	124°07.1'W	2/2/2003	17:45:00	surface	11.71	28.72	1.09	1.01	25.83	0.42	11.64	0.50	10.70	1.31	60.17	3.60
Sal survey 2	45°0.00'N	124°07.8'W	2/2/2003	18:00:00	surface	11.72	28.74	1.02	0.98	24.32	0.39	11.46	0.54	9.25		62.78	
Sal survey 2	45°0.00'N	124°08.5'W	2/2/2003	18:15:00	surface	11.66	28.64	0.97	0.93	23.89	0.40	10.39	0.54	8.74	1.12	63.81	4.39
Sal survey 2	45°0.00'N	124°09.2'W	2/2/2003	18:30:00	surface	11.75	28.61	0.97	0.97	26.41	0.42	10.69	0.54	8.07	1.15	67.82	3.88

Station	Latitude	Longitude	GMT Date	GMT Time	Depth (m)	Temp (C)	Salinity	PO4 (μM)	NH4 (μM)	SiO <sub>2</sub> (μM)	NO <sub>2</sub> (μM)	NO <sub>3</sub> (μM)	Chl (μg/l)	POC (μM)	PON (μM)	DOC (μM)	DON (μM)
Sal survey 2	45°0.00'N	124°09.9'W	2/2/2003	18:44:00	surface	11.70	28.37	0.93	1.00	25.38	0.40	11.08	0.53	8.64	1.13	70.65	3.55
Sal survey 2	45°0.00'N	124°11.3'W	2/2/2003	19:15:00	surface	11.63	28.08	0.99	0.89	24.82	0.41	10.36	0.53	8.63	1.21	67.96	3.53
Sal survey 2	45°0.00'N	124°12.8'W	2/2/2003	19:45:00	surface	11.70	29.44	0.97	0.80	22.37	0.40	9.65	0.52	7.39	1.03	72.40	3.42
Sal survey 2	45°0.00'N	124°14.1'W	2/2/2003	20:14:00	surface	11.80	31.72	0.91	0.00	7.37	0.37	6.50	0.55	3.84	0.85	62.95	3.93
Sal survey 2	45°0.00'N	124°15.5'W	2/2/2003	20:44:00	surface	11.68	32.24	0.87	0.00	3.73	0.39	5.51	0.65	4.65	0.89	64.49	3.32
Sal survey 2	45°0.00'N	124°16.9'W	2/2/2003	21:13:00	surface	11.70	32.25	0.82	0.00	3.88	0.38	5.28	0.64	4.35	0.88	64.08	4.28
Sal survey 2	45°0.00'N	124°18.3'W	2/2/2003	21:44:00	surface	11.73	32.25	0.86	0.00	3.57	0.40	5.52	0.63		0.93		3.51
Sal survey 2	45°0.00'N	124°21.1'W	2/2/2003	22:43:00	surface	11.78	32.26	0.82	0.00	3.84	0.39	5.38	0.54	4.44	0.82	60.02	4.09
Sal survey 2	45°0.00'N	124°23.3'W	2/2/2003	23:30:00	surface	11.81	32.26	0.85	0.00	3.28	0.41	5.43	0.54	3.88	0.80	55.23	4.61
Sal survey 3	45°0.00'N	124°02.5'W	2/5/2003	16:22:00	surface	11.65	31.52	0.95	0.49	11.21	0.40	7.10	0.45	9.18	1.22	53.09	8.99
Sal survey 3	45°0.00'N	124°03.1'W	2/5/2003	16:37:00	surface	11.50	31.33	0.98	0.43	10.78	0.40	7.47	0.56	6.44	1.08	57.85	7.40
Sal survey 3	45°0.00'N	124°03.8'W	2/5/2003	16:52:00	surface	11.83	31.71	0.94	0.32	8.09	0.40	7.07	0.32	2.97	0.73	58.55	5.92
Sal survey 3	45°0.00'N	124°04.5'W	2/5/2003	17:06:00	surface	11.28	30.75	0.94	0.42	14.40	0.36	8.57	0.58	5.59	0.97	55.65	
Sal survey 3	45°0.00'N	124°05.3'W	2/5/2003	17:22:00	surface	11.28	30.26	0.93	0.45	16.34	0.35	9.10	0.71	7.05	1.16	56.92	5.38
Sal survey 3	45°0.00'N	124°05.9'W	2/5/2003	17:38:00	surface	11.22	30.15	0.94	0.48	17.08	0.36	9.52	0.70	6.19	1.09	52.78	5.74
Sal survey 3	45°0.00'N	124°06.5'W	2/5/2003	17:52:00	surface	11.17	30.07	0.94	0.50	17.24	0.35	9.48	0.70	6.75	1.21	50.52	5.93
Sal survey 3	45°0.00'N	124°07.2'W	2/5/2003	18:06:00	surface	11.07	30.02	0.93	0.57	17.63	0.35	9.54	0.66	6.21	1.11	58.92	6.24
Sal survey 3	45°0.00'N	124°07.9'W	2/5/2003	18:22:00	surface	11.07	30.16	0.93	0.57	16.95	0.36	9.44	0.55	5.48	0.96	57.02	5.41
Sal survey 3	45°0.00'N	124°08.6'W	2/5/2003	18:37:00	surface	11.12	30.41	0.90	0.56	13.79	0.36	8.06	0.53	5.71	0.97	56.94	5.77
Sal survey 3	45°0.00'N	124°09.3'W	2/5/2003	18:51:00	surface	11.40	30.77	0.92	0.54	13.59	0.36	8.13	0.62	6.75	1.05	56.47	6.35
Sal survey 3	45°0.00'N	124°10.1'W	2/5/2003	19:08:00	surface	11.38	30.79	0.92	0.48	13.75	0.35	7.93	0.63	6.88	1.09	56.71	6.23
Sal survey 3	45°0.00'N	124°11.5'W	2/5/2003	19:37:00	surface	11.33	30.91	0.88	0.39	12.01	0.34	7.75	0.72	7.32	1.16	56.77	6.07
Sal survey 3	45°0.00'N	124°12.9'W	2/5/2003	20:07:00	surface	11.39	31.02	0.91	0.48	12.16	0.34	7.66	0.76	7.87	1.16		6.66
Sal survey 3	45°0.00'N	124°14.3'W	2/5/2003	20:36:00	surface	11.52	31.16	0.86	0.00	11.82	0.32	7.12	0.72	7.91	1.15	57.16	6.61
Sal survey 3	45°0.00'N	124°15.6'W	2/5/2003	21:05:00	surface	11.48	31.10	0.92	0.30	11.31	0.35	7.30	0.67	6.70	1.15	57.32	5.78
Sal survey 3	45°0.00'N	124°17.1'W	2/5/2003	21:38:00	surface	11.43	31.07	0.88	0.00	10.26	0.34	7.28	0.66	6.00	1.04	57.11	5.85
Sal survey 3	45°0.00'N	124°18.5'W	2/5/2003	22:07:00	surface	11.45	31.25	0.91	0.25	10.88	0.35	7.38	0.49	5.11	0.81	51.03	7.71
Sal survey 3	45°0.00'N	124°21.4'W	2/5/2003	23:07:00	surface	11.52	31.34	0.89	0.31	10.35	0.35	7.29	0.39	3.78	0.74	51.27	6.33
Sal survey 3	45°0.00'N	124°23.5'W	2/6/2003	0:06:00	surface	11.51	31.44	0.86	0.00	9.32	0.35	7.09	0.47	4.56	0.86	55.70	7.41