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Physical, Nutrient, and Biological Measurements of
Coastal Waters off Central California in November 2007

by

Thomas A. Rago, Reiko Michisaki, Baldo Marinovic, Marguerite Blum, and
Katherine Whitaker

July 2008

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13. ABSTRACT (maximum 200 words) The results of analyses of hydrographic, nutrient, and biological data collected in coastal ocean waters off Central California in November 2007 aboard the <i>NOAA Ship David Starr Jordan</i> are presented in both tabular and graphical form. The cruise departed from and returned to San Francisco, California. After steaming to Monterey Bay, the ship proceeding from Moss Landing, California, along CalCOFI line 67 to station 90, thence to CalCOFI line 60/station 90, and finally along CalCOFI line 60 to Drake's Bay, before returning to San Francisco. Marine mammal observations taken during the cruise are also included.				
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Introduction

Following in a long tradition of hydrographic studies of the California Current system-- see, for example, Steger *et al.* (2000) and Collins *et al.* (2003)-- the data in this report were collected during the 6-10 November 2007 cruise of the Pacific Coast Ocean Observing System (PaCOOS) program aboard the *NOAA Ship David Starr Jordan*. The PaCOOS program was organized in 2003/2004 as the NOAA west coast contribution to the national Integrated Ocean Observing System (IOOS), and is charged with “providing the ocean information needed for the sustained use of fishery resources and protection of marine species and their ecosystem under a changing climate.”¹ PaCOOS cruises generally subsample the standard California Cooperative Oceanic Fisheries Investigations (CalCOFI) grid of hydrographic stations (Figure 1). With a slight exception, this cruise did exactly that, sampling along CalCOFI line 67 from Moss Landing, California, to station 90 (CTD casts 1-19), northwest to CalCOFI line 60/station 90 (CTD cast 23), then shoreward to Drake’s Bay, California, along CalCOFI line 60 (Figure 2). The exception was that, to increase the resolution of the hydrographic data and to maintain the convention of similar recent PaCOOS cruises (Rago *et al.*, 2006, 2007a, 2007b, 2007c), eight CTD casts were inserted between the standard CalCOFI sites along line 67. Primary productivity and zooplankton analyses were not performed at these added sites. Participants on the cruise came from the Naval Postgraduate School (Physical Oceanography and Marine Mammal Observations), the Monterey Bay Aquarium Research Institute (Nutrient Analysis and Primary Productivity), the University of California at Santa Cruz (Zooplankton Analysis), the University of California at San Diego (Physical Oceanography), and the Marine Advanced Technology Education (MATE) Internship Program².

Standard Procedures

CTD/Rosette Data:

At each site a Seabird Electronics, Inc., Conductivity-Temperature-Depth (CTD) instrument fitted with a 12-place rosette was deployed. The rosette was equipped with 12 10-liter PVC Niskin bottles for collection of water samples. The CTD was generally lowered to 1000 meters or the bottom (whichever came first), except that casts were extended to the full length of cable available for the CTD at stations 18 (2021 dbar) and 23 (2022 dbar). Where primary productivity sampling was performed, water samples were taken at depths designed to maximize resolution of the variables sampled throughout the thermocline. Where only nutrient sampling was performed³, water samples were more or less evenly spaced throughout the water column. A water sample was always obtained at or near the bottom of each CTD cast for later conductivity/salinity calibration of the CTD conductivity sensors.

Besides temperature (dual sensors), conductivity (dual sensors), and pressure, the CTD also measured fluorescence, transmissivity, dissolved oxygen content, and photosynthetically available radiation (PAR) in the water column. Except for PAR and the secondary of the dual sensors, all these parameters are reported here.

¹ <http://www.pacoos.org>

² <http://www.marinetech.org>

³ CTD stations 3, 5, 7, 9, 11, 13, 15, 17, and 18.

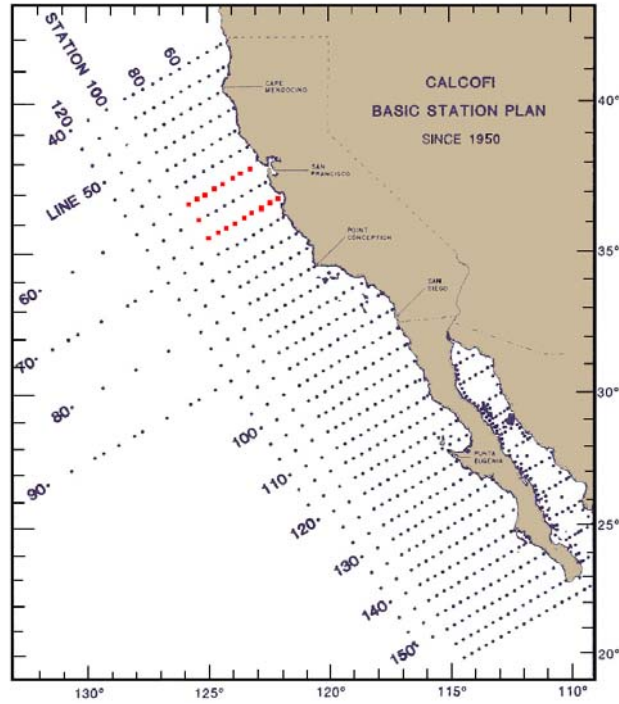


Figure 1: *Full CalCOFI hydrographic station grid. Stations occupied during the PaCOOS cruise of November 2007 are highlighted in red.*

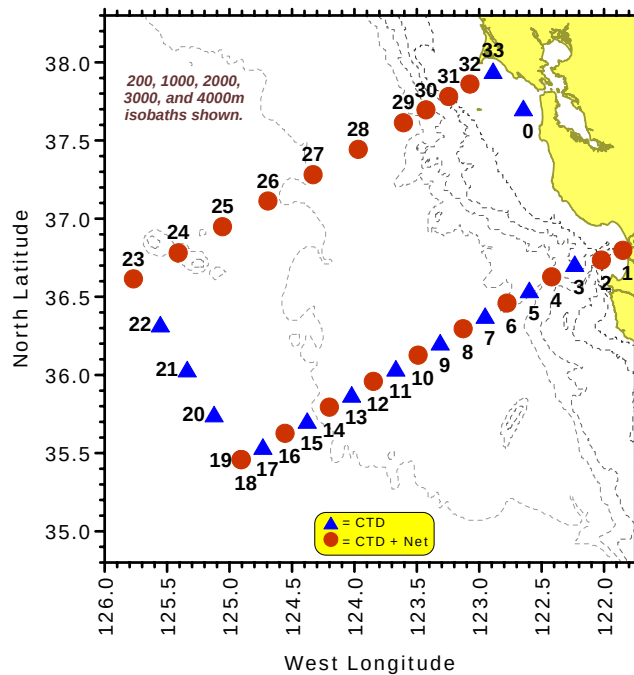


Figure 2: *Hydrographic stations occupied during the PaCOOS cruise of November 2007. 200, 1000, 2000, 3000, and 4000 m isobaths are shown. Net tows were completed at the CTD sites marked by red circles.*

Generally, a minimum of two salinity samples (including the bottom-of-cast sample) were collected from each CTD cast. These samples were analyzed after the cruise at the Naval Postgraduate School (NPS) using a Guildline model 8400B Autosol salinometer. A regression between the salinometer results and the conductivities measured by the CTD at the times the Niskin bottles were tripped was made, from which a correction to the CTD salinities was determined and then applied. The salinometer was standardized using IAPSO Standard Seawater (batch P147) before and after each set of water samples was analyzed. Salinity values were calculated using the algorithms for the Practical Salinity Scale, 1978 (UNESCO, 1981).

Dissolved oxygen (Winkler) samples were collected at CTD stations 3, 5, 7, 13, 15, 18, 23, and 28. These were analyzed after the cruise at the Monterey Bay Aquarium Research Institute (MBARI). The CTD for this cruise was outfitted with a Sea-Bird Electronics, Inc., SBE 43 oxygen sensor. This sensor is a polarographic membrane that outputs a voltage proportional to the temperature-compensated current flow occurring when oxygen is reacted inside the membrane. Dissolved oxygen concentration is then calculated from a modified version of the algorithm by Owens and Millard (1985). The results of the analysis of the Winkler oxygen samples were compared to the corresponding oxygen values recorded by the CTD. Using the method described in SBE Application Note #64-2⁴, we calculated new SBE 43 sensor coefficients. Corrected CTD oxygen values were then recalculated with the modified version of the Owens and Millard (1985) algorithm using the new sensor coefficients.

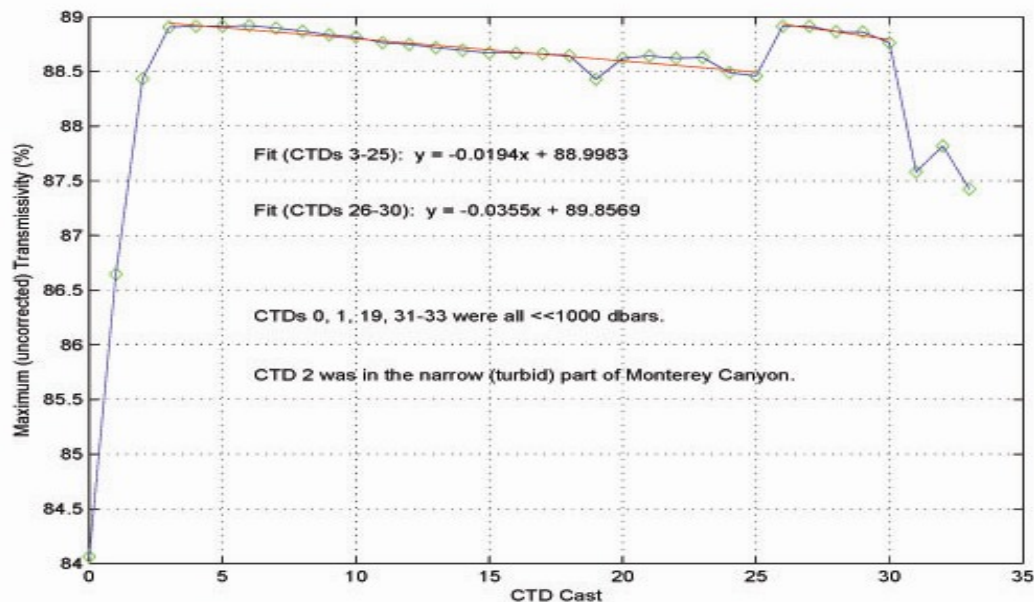


Figure 3: *Transmissivity maxima by CTD cast measured by the SeaTech 25-cm transmissometer. Least squares linear fits were applied to casts 3-25 and 26-30. The marked shift between casts 25 and 26 was most likely because of cleaning of the instrument's windows.*

For this cruise, the CTD was fitted with a Seatech 25-cm. transmissometer, whose measurements clearly drifted over time. Unfortunately, good deck values from which to correct for this drift were not obtained. Accordingly, an alternate method was devised to adjust the transmissivities

⁴See **Application notes** under the **Support** tab at <http://www.seabird.com>.

appropriately. For CTD casts to at least 1000 dbars (except CTD 2⁵), it was assumed that the CTD always reached effectively “clear” water. According to its operating manual, the transmissometer should measure “clear” water as 91.3% transmissivity. The maximum measured transmissivity for each cast was plotted versus cast number (representing the chronological order of the casts), and

Table 1: *Transmissivity offsets applied to each CTD cast during the PaCOOS cruise of November 2007.*

CTD Cast	Offset (%) Applied	CTD Cast	Offset (%) Applied	CTD Cast	Offset (%) Applied
0	+2.3	12	+2.5	23	+2.7
1	+2.3	13	+2.6	24	+2.8
2	+2.3	14	+2.6	25	+2.8
3	+2.4	15	+2.6	26	+2.4
4	+2.4	16	+2.6	27	+2.4
5	+2.4	17	+2.6	28	+2.4
6	+2.4	18	+2.7	29	+2.5
7	+2.4	19	+2.7	30	+2.5
8	+2.5	20	+2.7	31	+2.5
9	+2.5	21	+2.7	32	+2.6
10	+2.5	22	+2.7	33	+2.6
11	+2.5				

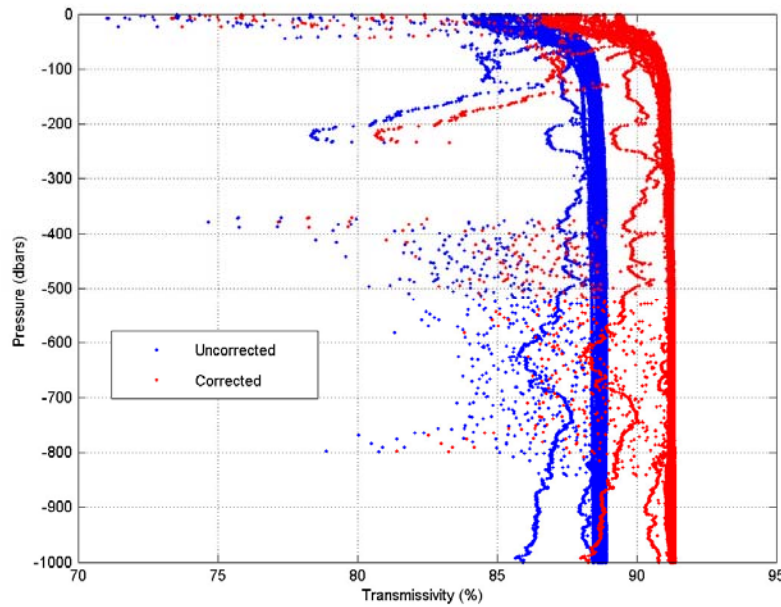


Figure 4: *Corrected (red) and uncorrected (blue) transmissivities.* This shows all the transmissivity measurements made for all CTD casts during the PaCOOS cruise of November 2007.

⁵ This cast was taken in the axis of the Monterey Canyon, where turbidity due to sediments and biology could have been significant.

least-squares linear fits were made for the appropriate (≥ 1000 dbars) casts (Figure 3). From those fits, nominal measured transmissivity maxima were calculated for each cast, from which offsets from the nominal transmissivity of “clear” water (91.3%) were calculated for each cast (Table 1). Finally, the offsets were applied to the CTD casts, giving the results shown in Figure 4.

Nutrient samples were collected in 45-ml polypropylene screw-capped containers which were rinsed three times prior to filling. Samples were frozen and returned to MBARI for later analysis on an AlpChem autoanalyzer, as in Sakamoto *et al.* (1990).

Chlorophyll-*a* and phaeopigments were collected in 280-ml polyethylene bottles and filtered onto 25-mm Whatmann GF/F filters. Chlorophyll-*a* was assayed with the standard fluorometric procedure of Holm-Hansen *et al.* (1965), modified such that phaeopigments are extracted in acetone in a freezer over at least 24 hours (Venrick and Hayward, 1984; Chavez *et al.*, 1991). Analysis was performed as possible during the cruise or at MBARI immediately following the cruise.

Primary productivity was estimated for the 100, 50, 15, 5, 1, and 0.1% light penetration depths as determined by secchi, and followed the general method of Parsons *et al.* (1984). Water samples from the appropriate depths were collected in 280-ml polycarbonate bottles, spiked with ^{14}C , and incubated on deck for 24 hours under running seawater in plexiglass tubes wrapped with nickel-cadmium screens of differing pore size. (See Pennington and Chavez, 2000, for methodology details.)

Zooplankton Net Tows:

Twenty stations⁶ (Figure 2 and Table2) were sampled for zooplankton during the cruise. All sampling was conducted with 0.7-m diameter paired bongo nets fitted with 505-mm mesh, which were towed obliquely to a depth of 210 m (or within 10 m of the bottom, whichever came first). Samples were preserved at sea according to standard protocols (Kramer *et al.*, 1972). Upon return to the University of California at Santa Cruz (UCSC), all samples were initially measured for total biovolume and subsequently processed for krill species composition and abundance.

Zooplankton distribution and abundance showed a generally similar pattern for CalCOFI lines 60 and 67. As inferred from volume displacement, zooplankton abundance was roughly equally distributed between inshore and offshore regions (Figure 5). Krill distribution, on the other hand, differed between the two CalCOFI lines. Ten species of krill were collected during the cruise, although only three (*Euphausia pacifica*, *Thysanoessa spinifera*, and *Nematoscelis difficilis*) dominated the total population (96%). *E. pacifica* was the most abundant species on both CalCOFI lines. However, it was more abundant inshore along line 67, offshore along line 60. By contrast, *N. difficilis* displayed similar patterns of distribution and abundance for both CalCOFI lines, with higher abundances at the offshore stations. *T. spinifera* was largely restricted to a single nearshore station along line 60 (60-55), where it dominated the krill species (Figure 6).

⁶ CTD stations 1, 2, 4, 6, 8, 10, 12, 14, 16, 19, and 23-32.

Table 2: *Zooplankton data.* This table lists the total biovolume abundance, as well as the mean abundance of the three dominant euphausiid species (*Euphasia pacifica*, *Thysanoessa spinifera*, and *Nematoscelis difficilis*), measured at the twenty hydrographic stations—10 each on CalCOFI lines 67 and 60—where bongo net tows were completed during the PaCOOS cruise of November 2007. The data are listed by CalCOFI line, onshore to offshore and south to north, with the line 60 data having background gray shading.

Station (CalCOFI) Number	Zooplankton Biovolume (ml/1000m ³)	<i>E. pacifica</i> Abundance (no./1000m ³)	<i>T. spinifera</i> Abundance (no./1000m ³)	<i>N. difficilis</i> Abundance (no./1000m ³)
1 (67-C1)	301.29	566.88	0.00	4.46
2 (67-M1/H3)	271.88	2345.26	0.00	18.91
4 (67-55)	121.81	10.83	0.00	32.48
6 (67-60)	128.44	918.77	0.00	197.25
8 (67-65)	161.07	177.77	0.00	129.52
10 (67-70)	322.57	696.30	54.83	137.07
12 (67-75)	101.64	0.00	0.00	2.58
14 (67-80)	177.08	23.38	0.00	10.39
16 (67-85)	323.93	1664.51	0.00	300.82
18/19 (67-90)	174.93	529.43	4.49	399.32
32 (60-52.5)	226.34	0.00	0.00	0.00
31 (60-55)	382.38	209.62	2763.19	285.85
30 (60-57.5)	274.44	870.79	0.00	104.91
29 (60-60)	98.86	2.47	2.47	0.00
28 (60-65)	150.38	143.07	0.00	7.53
27 (60-70)	135.10	132.30	0.00	32.45
26 (60-75)	275.78	3108.83	0.00	220.63
25 (60-80)	248.94	431.26	20.06	351.02
24 (60-85)	240.73	512.54	9.67	280.45
23 (60-90)	287.40	263.06	0.00	35.08

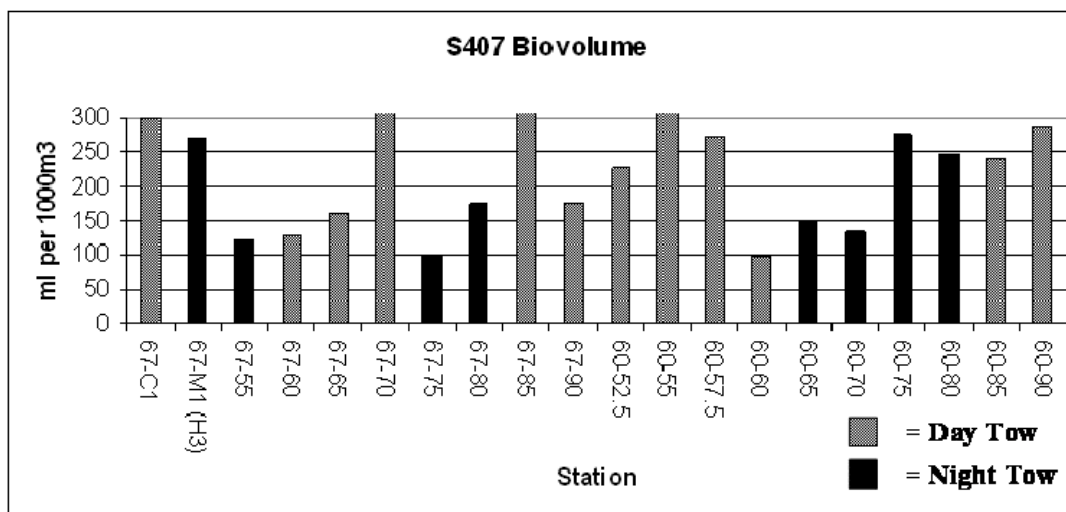


Figure 5: *Biovolume displacement values for stations sampled along CalCOFI lines 67 and 60 during the PaCOOS cruise of November 2007. Samples are arranged onshore to offshore, with stations 67-90 and 60-90 being farthest offshore for each line.*

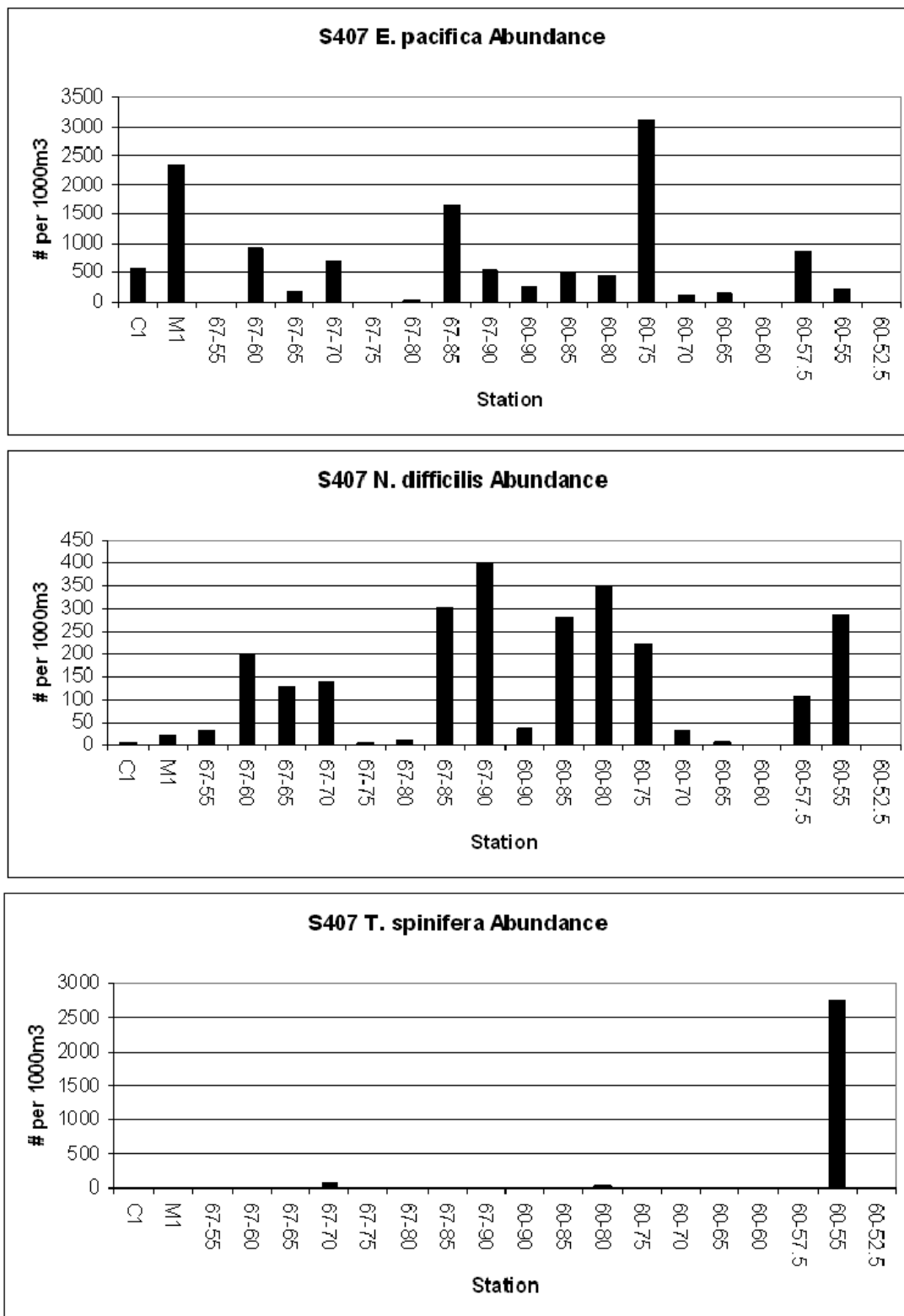


Figure 6: Krill abundance for the three most common species collected at stations sampled along CalCOFI lines 67 and 60 during the PaCOOS cruise of November 2007. Top = *Euphausia pacifica*, middle = *Nematoscelis difficilis*, and bottom = *Thysanoessa spinifera*. Note that the y-axis scale differs for each graph.

Marine Mammal Observations:

Observations of marine mammals (Figure 7, Tables A4 and A5) were made by a single observer during daylight hours (approximately 1400 to 0100 Coordinated Universal Time [UT]) throughout the cruise, conditions permitting (e.g., clear or high clouds, Beaufort state less than 4, etc.). Observations were made from the 03-deck (above the Bridge), where eye height was approximately 20 meters above the sea surface, using handheld Fujinon 7 x 50 binoculars with compass for bearing and reticle for distance. Observations were recorded on a laptop computer using the marine mammal and bird mapping program *Seebird* (developed at the Southwest Fisheries Science Center). This program interfaces with handheld global positioning system (GPS) devices, and allows the generation of observation logs containing the observations of the mammals themselves with matching ship's velocities and positions, observational conditions, etc. Generally, intensive "on effort" observations were made during the last half of each half-hour period, with the other half of the half-hour period devoted to less intensive "off effort" observations. Depending on the situation, the observer would take short breaks from the observations approximately every two hours.

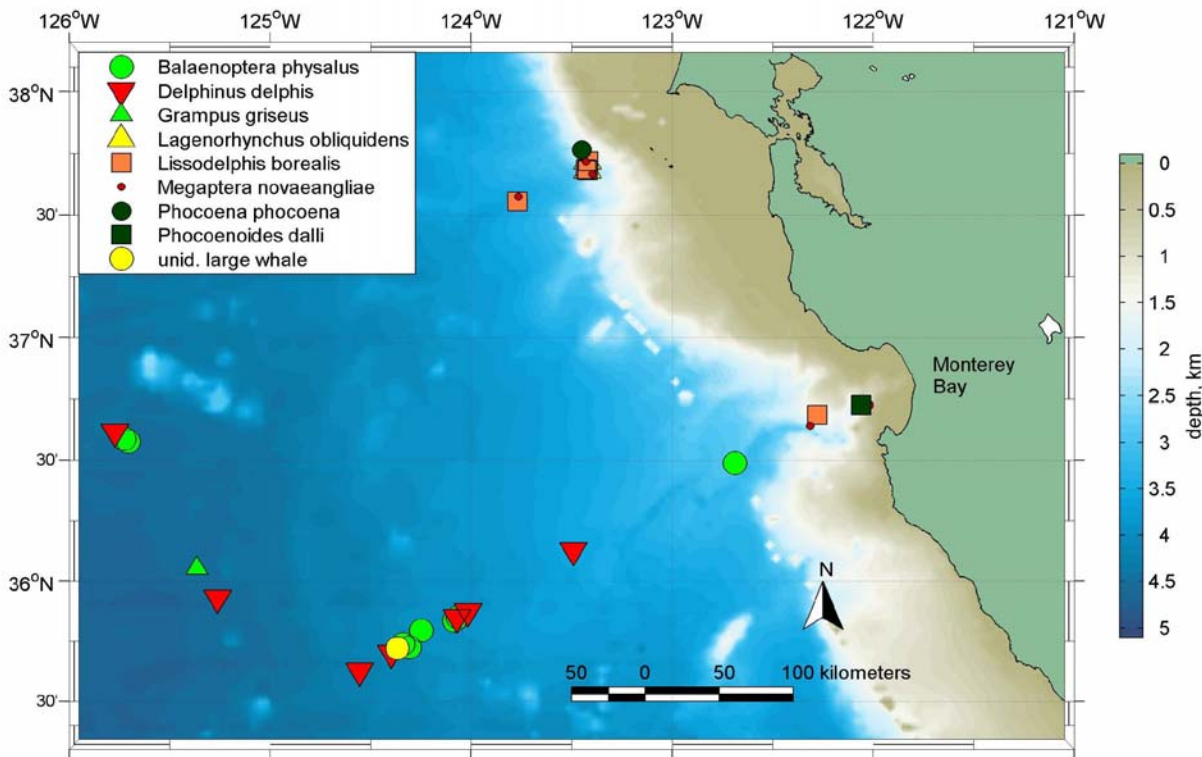


Figure 7. Marine mammal sightings during the PaCOOS cruise of November 2007.

Ancillary Observations:

Underway Data: Near surface measurements of temperature and salinity were recorded throughout the cruise from water pumped through the ship's uncontaminated seawater system. These data, along with meteorological data (barometric pressure, wind, etc.) collected from

various sensors mounted primarily on the ship's mast, were recorded at approximately 30-second intervals throughout the cruise. Table A1 lists these data at the start of each hydrographic station.

Satellite Imagery: Advanced Very High Resolution Radiometer (AVHRR) satellite imagery of sea surface temperature of the area of operation soon after the conclusion of the PaCOOS cruise is included as Figure 8. Conditions were never sufficiently clear to obtain a good satellite image during the time of the PaCOOS cruise.

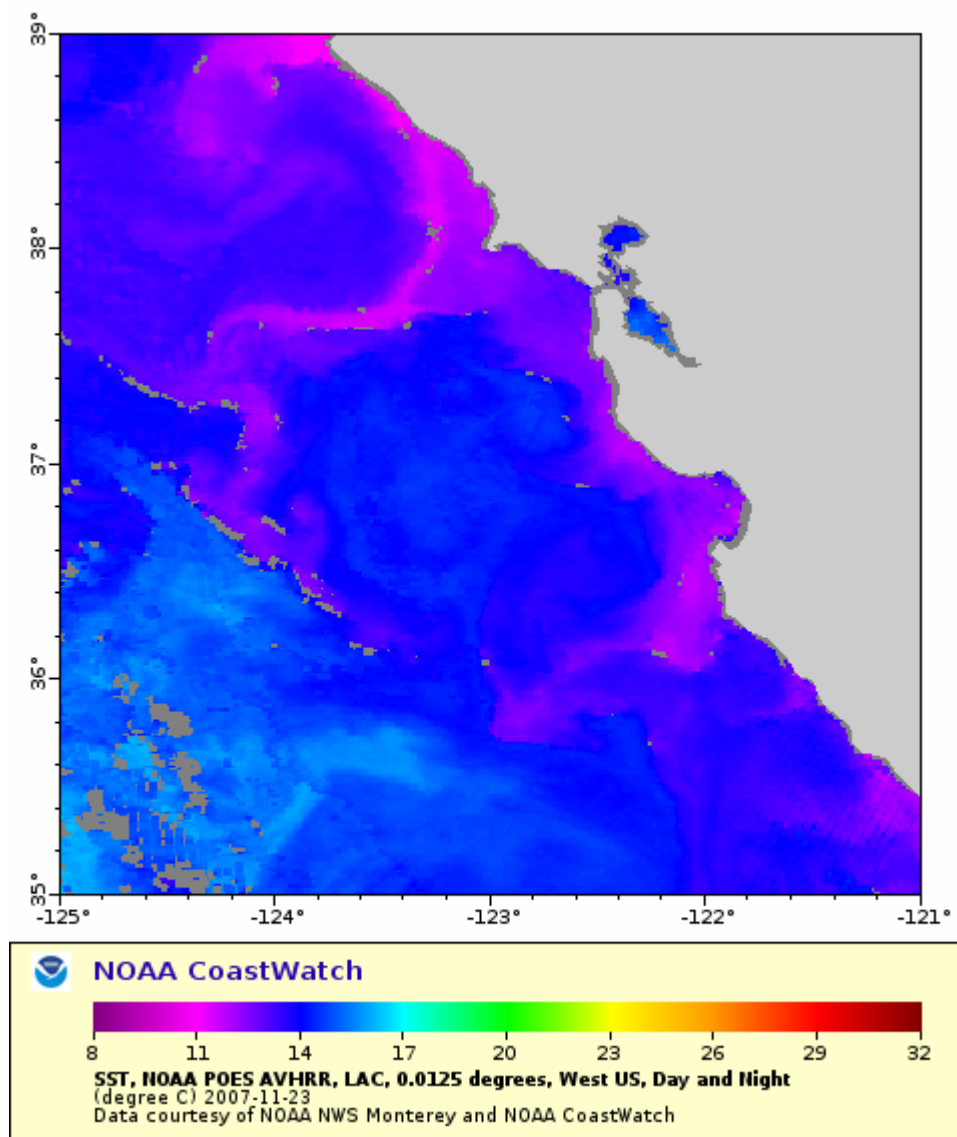


Figure 8. Advanced Very High Resolution Radiometer (AVHRR) satellite image of sea surface temperature ($^{\circ}\text{C}$) of the area of operation during the PaCOOS cruise of November 2007. The image was taken on 23 November 2007.

ADCP: Continuous ocean current measurements were made throughout the cruise using a vessel-mounted RD Instruments 150 kHz broadband Acoustic Doppler Current Profiler (ADCP), model VM-150-18HP. Some results from the ADCP are shown in Figure 9.

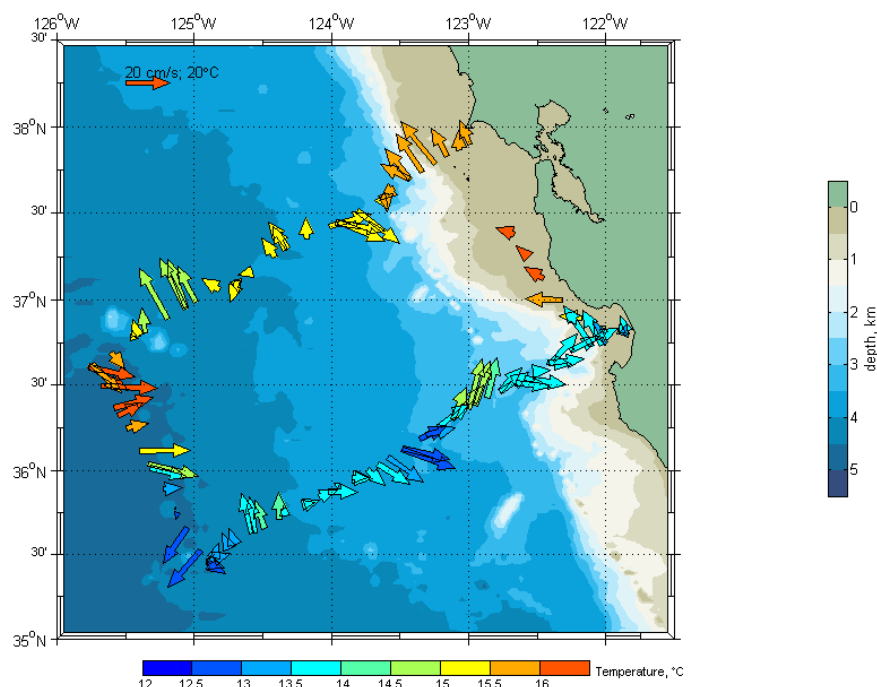


Figure 9. ADCP results from the PaCOOS cruise of November 2007. The arrows are current vectors for currents averaged between 48 and 102 m. The colors of the current vectors reflect the sea surface temperature as measured by the ship's underway data acquisition system.

Tabulated Data (in Appendix A)

The following tables of data can be found in Appendix A:

1) **Table A1: Meteorological and Sea Surface Data**

This lists the meteorological and surface oceanographic conditions at the start of each hydrographic station as measured by the underway data acquisition system of the NOAA Ship David Starr Jordan.

2) **Table A2: Hydrographic Data**

This is a chronological listing of the hydrographic data collected at each CTD station during the cruise. Data are given for standard pressures, except that the last line of data for each site is the deepest pressure for that CTD cast. The surface pressure, listed as 0 dbar, is actually 1 dbar. Salinities (oxygen) have been adjusted according to the conductivity/salinity (oxygen) calibration correction determined from the collected salinity (oxygen/Winkler) water samples, while transmissivities have been adjusted as described previously in this report. The time listed for each station is the beginning (UT) of the CTD cast. Units of geopotential anomaly ($\Delta\Phi$), potential density (σ_θ), and potential spiciness (π_θ) are m^2s^{-2} , kg m^{-3} , and kg m^{-3} , respectively.

3) **Table A3: Nutrient and Primary Productivity Data**

This is a chronological listing of the results of the nutrient and primary productivity analyses of the water samples collected from the 12 Niskin bottles

tripped at each hydrographic station. The time given is the start (UT) for each hydrographic station. Except where primary productivity analyses were not performed (see Introduction), the data for each hydrographic station are separated into two sections (“Physical and Chemical” and “Biological”).

The physical oceanographic properties listed in the first seven columns of the “Physical and Chemical” section of each station’s data are the uncorrected values measured by the CTD at the times each Niskin bottle was tripped. Because they are uncorrected, these values may differ slightly from those listed in Table A2. The last four columns of this section of each station’s data give the nitrate (NO₃), nitrite (NO₂), phosphate (PO₄), and dissolved silicate (SiO₄) concentrations (determined as described previously).

The “Biological” section of each station’s data gives the results of the primary productivity analyses. As stated above, primary productivity sampling was not undertaken at every hydrographic station.

4) *Table A4: Marine Mammal Data*

This table lists the results of the marine mammal observations made during the cruise. The data are listed alphabetically by species, then chronologically within each species.

5) *Table A5: Marine Mammal Data Summary*

This table summarizes the (more specific) results from Table A4 of the marine mammal observations made during the cruise. The data are listed alphabetically by species.

Figures of Results (in Appendix B)

Graphical representations of the data collected during this cruise follow the tabulated data in Appendix A. Figure 10 is a series of four diagrams contouring (a) the temperature (°C), (b) the salinity, (c) the density anomaly (kg m⁻³), and (d) the oxygen (μmol kg⁻¹) fields along the line of hydrographic stations from Moss Landing to Drake’s Bay, California. The two blue lines in each diagram indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23).

Figure 11 contours the fluorescence and transmissivity in the upper 100 meters of the water column along the line of hydrographic stations from Moss Landing to Drake’s Bay, California. Again, the blue lines indicate the locations of the corner hydrographic stations.

Figure 12 is a series of four diagrams contouring (a) the nitrate (μM), (b) nitrite (μM), (c) phosphate (μM), and (d) silicate (μM) fields along the line of hydrographic stations from Moss Landing to Drake’s Bay, California. The white lines indicate the locations of the corner hydrographic stations.

Cruise Participants

Personnel	Duties	Affiliation
Tim Pennington	Nutrients, Primary Productivity	Monterey Bay Aquarium Research Institute
<i>Marguerite Blum</i>	<i>Nutrients, Primary Productivity, Oxygens</i>	
Erich Rienecker	Nutrients	
Curt Collins	Physical Oceanography	Naval Postgraduate School
<i>Tarry Rago</i>	<i>Physical Oceanography</i>	
Katherine Whitaker	Marine Mammal Observer	
Baldo Marinovic (Chief Sci.)	Phytoplankton Net Tows	University of California, Santa Cruz
<i>Eric Ettner</i>	<i>Phytoplankton Net Tows</i>	
Laura Minnis	Nutrients	MATE Program
<i>Lauren (Ku'u lei) Vickery</i>	<i>Nutrients</i>	
Rachel Stern	Nutrients	
Scott Hiller	Physical Oceanography	University of California, San Diego

Literature Cited

- Chavez, F. P., R. T. Barber, A. Huyer, P. M. Kosro, S. R. Ramp, T. Stanton, and B. Rojas de Mendiola, Horizontal advection and the distribution of nutrients in the coastal transition zone off northern California: effects on primary production, phytoplankton biomass and species composition, *J. Geophys. Res.*, **96**, 14833-14848, 1991.
- Collins, C. A., J. T. Pennington, C. G. Castro, T. A. Rago, and F. P. Chavez, The California Current system off Monterey, California: physical and biological coupling, *Deep-Sea Res. II*, **50**, 2389-2404, 2003.
- Holm-Hansen, O., C. J. Lorenzen, R. W. Holmes, and J. D. H. Strickland, Fluorometric determination of chlorophyll, *J. Cons. Perm. Int. Explor. Mer*, **30**, 3-15, 1965.
- Kramer, D., M. J. Kalin, E. G. Stevens, J. R. Thrailkill, and J. R. Zweifel, Collecting and processing data on fish eggs and larvae in the California Current region, *NOAA Tech. Rep. NMFS CIRC-370*, 38 pp., Seattle, WA, 1972.
- Owens, W. B., and R. C. Millard Jr., A new algorithm for CTD oxygen calibration, *J. Phys. Oceanogr.*, **15**, 621-631, 1985.
- Parsons, T. R., Y. Maita, and C. M. Lalli, A manual of chemical and biological methods for seawater analysis, 173 pp., Pergamon Press, New York, 1984.
- Pennington, J. T., and F. P. Chavez, Seasonal fluctuations of temperature, salinity, nitrate, chlorophyll and primary production at station H3/M1 over 1989-1996 in Monterey Bay, California, *Deep-Sea Res. II*, **47**, 947-973, 2000.
- Rago, T. A., R. Michisaki, B. Marinovic, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in October 2005, *NPS Tech. Rep. No. NPS-OC-06-001*, 75 pp., 2006.
- Rago, T. A., R. Michisaki, B. Marinovic, M. Blum, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in June/July 2006, *NPS Tech. Rep. No. NPS-OC-07-001*, 79 pp., 2007a.
- Rago, T. A., R. Michisaki, B. Marinovic, M. Blum, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in October 2006, *NPS Tech. Rep. No. NPS-OC-07-002*, 93 pp., 2007b.
- Rago, T. A., R. Michisaki, B. Marinovic, M. Blum, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in June 2007, *NPS Tech. Rep. No. NPS-OC-07-008*, 87 pp., 2007c.
- Sakamoto, C. M., G. E. Friederich, and L. A. Codispoti, MBARI procedures for automated nutrient analyses using a modified Alpkem Series 300 Rapid Flow Analyzer, *MBARI Tech. Rep. No. 90-2*, 84 pp., 1990.
- Steger, J. M., F. B. Schwing, C. A. Collins, L. K. Rosenfeld, N. Garfield, and E. Gezgin, The circulation and water masses in the Gulf of the Farallones, *Deep-Sea Res. II*, **47**, 907-946, 2000.

UNESCO, Background papers and supporting data on the Practical Salinity Scale, 1978, *UNESCO Tech. Pap. In Mar. Sci.*, No. 37, 1981.

Venrick, E. L., and T. L. Hayward, Determining chlorophyll on the 1984 CalCOFI surveys, *CalCOFI Rep.* 25, 74-78, 1984.

Appendix A

Table A1: *Meteorological and sea surface data collected during the PaCOOS cruise of November 2007.* Listed here are the meteorological and surface oceanographic conditions as measured by the underway data acquisition system (UDAS) of the *NOAA Ship David Starr Jordan* at the beginning of each hydrographic station. Continuous measurements of the water being pumped through the ship's uncontaminated seawater system ("sea chest") from approximately 3 meters below the surface supplied the oceanographic data, while instrumentation atop the ship's mast supplied the meteorological data. The sea surface salinity (SSS) was adjusted higher (by 0.211) to bring the UDAS values in line with the 3-meter CTD salinity values.

Station	Yearday, 2007 (UTC)	Barometric Pressure (mb)	Wind Speed (kts)	Wind Direction (°T)	Air Temp. (°C)	SST (°C)	SSS
0	310.1188	1017.15	4.42	239.64	11.2	13.110	33.084
1	310.5125	1016.82	2.85	049.71	10.7	12.099	33.532
2	310.6104	1016.14	3.87	052.46	10.8	13.048	33.285
3	310.7278	1017.49	3.40	322.16	12.1	15.529	33.085
4	310.8243	1016.82	3.57	328.39	12.0	15.694	32.942
5	310.9583	1015.46	7.79	355.27	12.0	15.880	32.942
6	311.0556	1015.46	7.39	344.67	11.8	15.638	32.963
7	311.1750	1016.48	6.52	341.64	12.0	14.210	32.957
8	311.2708	1017.49	7.92	004.68	12.2	14.579	33.131
9	311.3847	1017.15	8.47	354.90	12.5	14.920	33.116
10	311.4750	1016.82	7.05	347.59	12.6	14.702	32.809
11	311.5854	1017.15	3.85	355.69	12.5	14.937	32.716
12	311.6799	1018.17	2.05	000.23	12.7	15.022	32.673
13	311.7938	1018.85	0.54	154.70	13.1	15.217	32.692
14	311.8833	1017.49	3.02	177.84	13.5	14.844	32.826
15	311.9917	1017.49	1.60	142.69	13.7	15.665	33.005
16	312.0833	1017.49	0.13	256.15	13.7	15.413	32.847
17	312.1965	1018.17	5.15	136.15	14.6	15.186	32.885
18	312.2917	1017.83	8.32	131.14	14.5	15.644	33.031
19	312.3931	1017.15	7.55	146.85	15.0	15.647	33.034
20	312.5139	1016.82	9.34	188.83	14.9	15.265	32.685
21	312.6569	1016.82	6.45	162.66	14.9	14.969	32.702
22	312.8028	1016.48	7.42	150.14	15.1	15.026	32.743
23	312.9361	1014.45	6.71	101.48	14.4	14.107	32.709
24	313.1097	1014.45	7.05	092.85	14.5	14.833	32.873
25	313.2694	1015.12	8.29	122.63	14.8	14.927	32.917
26	313.4292	1014.78	7.00	119.33	13.9	13.295	32.769
27	313.5847	1014.78	5.18	093.48	14.1	13.598	33.184
28	313.7451	1016.14	4.77	078.42	14.3	13.873	33.194
29	313.9063	1015.80	5.28	091.69	13.7	13.703	33.029
30	314.0132	1016.14	3.28	176.63	13.7	13.464	33.151
31	314.1299	1016.82	2.46	111.40	12.8	12.835	33.354
32	314.2125	1017.15	2.79	122.91	12.6	12.737	33.300
33	314.2972	1017.15	5.62	113.89	13.0	13.278	33.208

Table A2: *List at standard pressures of hydrographic data collected during the PaCOOS cruise of November 2007. Stations are in chronological order, starting with station 0 that was collected outside of San Francisco Bay. For each cast, the surface pressure (listed as 0 dbar) is actually 1 dbar, while the last pressure is the deepest pressure of the cast. Salinities and oxygens have been adjusted according to the calibration corrections determined from the collected salinity and oxygen water samples, while transmissivities have been adjusted as described earlier in this report. The time listed for each station is the beginning (<mm/dd/yyyy, hhmm> UT) of the CTD cast. Units of geopotential anomaly ($\Delta\Phi$), potential density (σ_θ), and potential spiciness (π_θ) are m^2s^{-2} , kg m^{-3} , and kg m^{-3} , respectively.*

Station: 0 **Date:** 11/06/2007, 0251 **Lat.:** 37° 42.50 N **Long.:** 122° 38.72 W

P(dbar)	T(°C)	S	O ₂ ($\mu\text{mol/kg}$)	Xmiss(%)	$\Delta\Phi$	σ_θ	π_θ
0	13.102	33.091	327.2	76.7	0.030	24.894	0.211
10	12.684	33.108	260.8	77.0	0.304	24.990	0.140
20	10.497	33.690	134.6	79.5	0.551	25.844	0.189
23	10.380	33.725	107.6	73.7	0.615	25.892	0.196

Station: 1 **Date:** 11/06/2007, 1218 **Lat.:** 36° 47.85 N **Long.:** 121° 50.96 W

P(dbar)	T(°C)	S	O ₂ ($\mu\text{mol/kg}$)	Xmiss(%)	$\Delta\Phi$	σ_θ	π_θ
0	12.071	33.557	278.1	75.9	0.025	25.455	0.376
10	12.079	33.557	280.4	75.0	0.252	25.454	0.377
20	12.045	33.559	274.1	78.6	0.503	25.462	0.372
30	11.848	33.539	259.8	85.3	0.754	25.484	0.318
50	10.858	33.658	175.9	87.3	1.219	25.757	0.228
75	10.692	33.714	164.6	86.6	1.766	25.830	0.242
100	10.526	33.726	161.6	87.2	2.306	25.869	0.221
125	10.366	33.728	158.5	87.7	2.837	25.899	0.194
150	10.334	33.784	143.0	86.1	3.364	25.948	0.232
200	9.865	33.859	117.4	82.9	4.380	26.088	0.210
234	9.268	33.940	95.8	83.3	5.012	26.249	0.174

Station: 2 Date: 11/06/2007, 1439 Lat.: 36° 44.10 N Long.: 122° 01.31 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.260	33.251	275.9	87.8	0.030	24.986	0.370
10	12.664	33.274	267.6	88.1	0.291	25.122	0.267
20	12.131	33.308	260.6	87.0	0.568	25.251	0.189
30	10.733	33.218	234.9	90.3	0.831	25.435	-0.145
50	10.698	33.584	188.8	90.2	1.311	25.728	0.140
75	10.226	33.712	160.3	89.8	1.849	25.910	0.158
100	9.959	33.763	146.3	89.8	2.364	25.995	0.152
125	9.761	33.803	135.2	89.7	2.863	26.060	0.150
150	9.499	33.850	127.2	89.6	3.349	26.140	0.143
200	8.894	34.036	84.6	90.2	4.234	26.384	0.191
250	8.547	34.094	67.8	89.9	5.048	26.484	0.182
300	7.879	34.144	58.1	90.5	5.810	26.624	0.119
400	6.796	34.195	39.3	90.6	7.178	26.817	0.006
500	5.993	34.236	27.5	89.9	8.416	26.955	-0.068
600	5.321	34.288	23.2	88.6	9.516	27.079	-0.109
700	4.765	34.347	17.4	89.7	10.511	27.191	-0.126
800	4.392	34.394	18.9	89.3	11.412	27.269	-0.130
900	4.091	34.427	23.2	88.8	12.263	27.328	-0.136
1000	3.730	34.465	28.4	88.3	13.066	27.395	-0.144
1020	3.683	34.469	29.4	88.5	13.218	27.403	-0.145

Station: 3 Date: 11/06/2007, 1728 Lat.: 36° 42.73 N Long.: 122° 14.10 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.534	33.102	263.9	87.1	0.035	24.392	0.747
10	15.534	33.101	265.0	87.1	0.353	24.392	0.746
20	15.490	33.103	263.7	87.4	0.706	24.403	0.737
30	13.881	33.191	272.9	88.7	1.034	24.815	0.452
50	13.296	33.232	273.1	89.2	1.641	24.966	0.362
75	10.126	33.413	204.2	90.7	2.321	25.693	-0.097
100	9.268	33.615	176.5	90.9	2.862	25.993	-0.081
125	9.133	33.853	131.7	91.0	3.343	26.201	0.086
150	8.848	33.950	115.8	91.0	3.788	26.323	0.116
200	8.443	34.049	100.5	91.1	4.611	26.463	0.130
250	7.892	34.068	88.9	91.2	5.384	26.561	0.062
300	7.622	34.146	61.8	91.2	6.113	26.663	0.084
400	6.593	34.184	38.4	91.2	7.441	26.836	-0.030
500	6.125	34.239	24.5	91.3	8.663	26.941	-0.048
600	5.232	34.247	18.3	91.2	9.782	27.057	-0.151
700	4.795	34.335	12.7	91.1	10.787	27.177	-0.133
800	4.479	34.384	13.7	91.1	11.713	27.252	-0.129
900	4.156	34.423	17.9	90.3	12.575	27.318	-0.133
1000	3.795	34.463	22.8	90.8	13.376	27.388	-0.138
1006	3.787	34.465	22.9	90.8	13.422	27.390	-0.138

Station: 4 Date: 11/06/2007, 1947 Lat.: 36° 37.69 N Long.: 122° 25.19 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.700	32.955	262.4	87.7	0.037	24.242	0.669
10	15.691	32.955	263.8	87.6	0.367	24.244	0.666
20	14.375	32.918	272.8	87.6	0.727	24.501	0.342
30	13.483	33.078	273.9	88.5	1.053	24.809	0.279
50	11.632	33.054	256.8	90.0	1.652	25.147	-0.110
75	11.032	33.555	196.3	90.7	2.279	25.646	0.177
100	9.638	33.623	174.3	91.0	2.830	25.939	-0.013
125	9.113	33.825	147.8	91.0	3.317	26.183	0.060
150	8.558	33.899	137.8	91.1	3.757	26.327	0.030
200	8.056	34.002	112.9	91.1	4.572	26.485	0.035
250	7.649	34.067	83.6	91.2	5.333	26.596	0.026
300	7.186	34.102	63.5	91.2	6.049	26.690	-0.013
400	6.543	34.188	38.4	91.2	7.369	26.846	-0.033
500	5.741	34.206	27.4	91.2	8.572	26.963	-0.122
600	5.345	34.292	16.4	91.3	9.669	27.079	-0.103
700	4.895	34.338	13.0	91.3	10.677	27.168	-0.119
800	4.502	34.375	13.2	91.3	11.614	27.242	-0.134
900	4.165	34.422	15.9	91.3	12.483	27.316	-0.133
1000	3.863	34.452	20.1	91.3	13.295	27.372	-0.141
1007	3.845	34.454	20.6	91.3	13.350	27.375	-0.141

Station: 5 Date: 11/06/2007, 2300 Lat.: 36° 32.66 N Long.: 122° 35.91 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.878	32.944	164.8	88.0	0.037	24.194	0.701
10	15.880	32.950	203.6	88.0	0.372	24.198	0.706
20	14.731	32.869	269.3	87.0	0.740	24.388	0.381
30	14.346	32.883	273.3	87.9	1.090	24.480	0.307
50	12.759	33.039	272.6	89.1	1.726	24.922	0.098
75	10.704	33.132	238.0	90.6	2.431	25.375	-0.219
100	9.945	33.602	184.2	90.9	3.022	25.871	0.021
125	9.355	33.759	151.6	91.0	3.531	26.092	0.047
150	8.694	33.890	135.7	91.1	3.983	26.299	0.045
200	8.147	33.999	118.6	91.1	4.811	26.469	0.046
250	7.450	34.034	102.6	91.1	5.577	26.599	-0.029
300	7.090	34.092	65.9	91.2	6.287	26.695	-0.034
400	6.252	34.119	41.9	91.3	7.592	26.829	-0.126
500	5.557	34.192	28.2	91.3	8.770	26.974	-0.155
600	4.954	34.249	17.2	91.3	9.848	27.090	-0.182
700	4.911	34.364	13.0	91.2	10.837	27.187	-0.097
800	4.551	34.401	14.5	91.2	11.761	27.258	-0.108
900	4.239	34.433	17.5	91.3	12.623	27.317	-0.117
1000	3.915	34.456	21.4	91.3	13.435	27.370	-0.132
1006	3.904	34.456	21.5	91.3	13.482	27.371	-0.133

Station: 6 Date: 11/07/2007, 0120 Lat.: 36° 27.61 N Long.: 122° 46.65 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.616	32.968	262.6	87.9	0.036	24.271	0.660
10	15.634	32.970	263.6	87.9	0.365	24.268	0.665
20	14.430	33.009	271.6	88.5	0.713	24.560	0.426
30	13.636	32.997	273.6	89.2	1.042	24.715	0.246
50	13.349	33.106	269.9	89.9	1.667	24.858	0.272
75	10.635	33.109	240.4	90.8	2.381	25.369	-0.251
100	9.967	33.422	201.6	91.0	2.988	25.728	-0.117
125	9.088	33.717	155.8	91.0	3.505	26.102	-0.030
150	8.733	33.875	137.2	91.1	3.967	26.281	0.038
200	8.360	34.026	116.7	91.2	4.799	26.458	0.099
250	7.608	34.029	111.0	91.2	5.568	26.572	-0.011
300	6.879	34.053	76.9	91.2	6.285	26.693	-0.094
400	6.016	34.128	43.1	91.3	7.583	26.866	-0.148
500	5.512	34.202	25.7	91.3	8.756	26.987	-0.153
600	4.848	34.239	17.5	91.3	9.831	27.094	-0.201
700	4.665	34.334	12.9	91.3	10.816	27.191	-0.148
800	4.468	34.399	14.5	91.3	11.726	27.265	-0.118
900	4.170	34.440	18.5	91.2	12.582	27.330	-0.118
1000	3.892	34.462	22.4	91.3	13.388	27.377	-0.129
1011	3.874	34.466	23.0	91.3	13.474	27.382	-0.128

Station: 7 Date: 11/07/2007, 0412 Lat.: 36° 22.81 N Long.: 122° 57.13 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.210	32.965	271.5	87.6	0.034	24.571	0.344
10	14.451	33.082	271.0	88.5	0.335	24.611	0.489
20	14.395	33.148	268.1	89.2	0.664	24.674	0.528
30	13.289	33.015	266.8	89.6	0.985	24.799	0.188
50	10.086	32.815	261.1	90.4	1.564	25.233	-0.582
75	9.659	33.260	219.5	90.9	2.197	25.652	-0.299
100	9.619	33.679	160.3	91.0	2.736	25.986	0.028
125	8.866	33.840	143.0	91.0	3.219	26.233	0.033
150	8.611	33.956	129.1	91.1	3.652	26.364	0.083
200	7.879	34.012	120.4	91.2	4.454	26.519	0.016
250	7.379	34.040	100.0	91.2	5.201	26.613	-0.034
300	7.037	34.090	66.8	91.3	5.907	26.700	-0.044
400	6.095	34.131	43.2	91.3	7.207	26.858	-0.136
500	5.591	34.235	22.2	91.3	8.375	27.004	-0.117
600	4.989	34.286	15.1	91.3	9.435	27.116	-0.148
700	4.535	34.323	12.6	91.3	10.407	27.197	-0.170
800	4.407	34.411	15.5	91.3	11.305	27.281	-0.116
900	4.103	34.435	18.5	91.3	12.146	27.333	-0.129
1000	3.894	34.459	22.0	91.3	12.950	27.374	-0.132
1025	3.855	34.467	23.5	91.3	13.146	27.385	-0.130

Station: 8 Date: 11/07/2007, 0630 Lat.: 36° 17.76 N Long.: 123° 07.72 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.582	33.139	270.5	86.9	0.033	24.627	0.563
10	14.588	33.139	271.8	86.9	0.330	24.626	0.564
20	14.591	33.139	272.1	86.9	0.661	24.626	0.564
30	14.573	33.160	269.8	88.6	0.992	24.646	0.577
50	11.617	33.331	228.8	90.0	1.595	25.366	0.109
75	10.228	33.519	187.6	90.6	2.192	25.759	0.005
100	9.335	33.769	141.4	90.8	2.708	26.102	0.052
125	8.650	33.887	139.0	91.0	3.163	26.303	0.035
150	8.357	33.965	126.7	91.0	3.586	26.410	0.052
200	7.873	34.020	98.1	91.2	4.378	26.526	0.022
250	7.329	34.038	92.8	91.2	5.125	26.619	-0.043
300	6.683	34.041	84.2	91.2	5.830	26.709	-0.130
400	6.053	34.140	40.8	91.3	7.125	26.871	-0.134
500	5.219	34.165	29.4	91.3	8.292	26.993	-0.217
600	5.206	34.310	14.4	91.3	9.357	27.110	-0.105
700	4.665	34.341	12.8	91.3	10.334	27.197	-0.142
800	4.416	34.406	14.9	91.3	11.235	27.276	-0.119
900	4.170	34.449	19.5	91.3	12.078	27.337	-0.111
1000	3.858	34.470	23.9	91.3	12.871	27.387	-0.127
1019	3.792	34.475	25.0	91.3	13.017	27.397	-0.130

Station: 9 Date: 11/07/2007, 0914 Lat.: 36° 12.57 N Long.: 123° 18.76 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.914	32.995	267.8	86.6	0.035	24.445	0.522
10	14.918	33.126	268.4	86.8	0.341	24.546	0.627
20	14.925	33.130	268.8	86.9	0.680	24.547	0.631
30	14.855	33.166	263.8	89.0	1.017	24.590	0.643
50	10.969	32.824	269.0	89.7	1.634	25.087	-0.418
75	9.688	33.197	223.2	90.8	2.307	25.598	-0.344
100	9.989	33.736	154.0	90.9	2.851	25.969	0.136
125	9.190	33.828	128.0	90.9	3.340	26.172	0.075
150	8.781	33.932	111.8	90.8	3.786	26.319	0.092
200	8.147	34.046	91.2	91.1	4.599	26.506	0.083
250	7.245	34.030	83.4	91.1	5.346	26.624	-0.061
300	6.623	34.030	78.3	91.2	6.050	26.709	-0.146
400	5.819	34.096	50.9	91.2	7.353	26.865	-0.198
500	5.350	34.208	23.4	91.3	8.517	27.011	-0.168
600	4.834	34.276	15.0	91.3	9.568	27.125	-0.174
700	4.733	34.371	13.1	91.3	10.524	27.213	-0.111
800	4.405	34.415	15.7	91.3	11.420	27.284	-0.113
900	4.127	34.447	19.5	91.2	12.255	27.340	-0.117
1000	3.819	34.481	26.0	91.3	13.042	27.399	-0.122
1007	3.785	34.482	26.5	91.3	13.095	27.404	-0.124

Station: 10 Date: 11/07/2007, 1124 Lat.: 36° 07.62 N Long.: 123° 29.38 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.699	32.814	268.5	87.5	0.036	24.352	0.331
10	14.698	32.814	269.2	88.1	0.357	24.352	0.330
20	14.581	32.836	270.4	88.4	0.712	24.394	0.321
30	14.041	32.796	273.2	88.7	1.062	24.477	0.172
50	12.336	32.797	270.9	89.5	1.724	24.816	-0.179
75	10.051	32.874	256.0	90.7	2.437	25.285	-0.541
100	9.768	33.365	206.6	90.8	3.062	25.716	-0.197
125	8.919	33.668	183.4	91.0	3.584	26.090	-0.096
150	8.797	33.877	142.0	91.0	4.042	26.273	0.050
200	8.131	34.002	102.5	91.0	4.874	26.474	0.046
250	7.838	34.079	79.5	91.2	5.641	26.578	0.062
300	7.051	34.095	62.3	91.2	6.359	26.703	-0.037
400	6.111	34.136	41.9	91.2	7.668	26.860	-0.130
500	5.584	34.208	24.5	91.3	8.847	26.983	-0.139
600	4.917	34.254	16.5	91.3	9.924	27.099	-0.182
700	4.645	34.336	12.7	91.3	10.904	27.195	-0.148
800	4.430	34.410	15.3	91.2	11.806	27.278	-0.113
900	4.119	34.447	19.6	91.3	12.648	27.341	-0.118
1000	3.813	34.471	23.9	91.2	13.437	27.392	-0.131
1008	3.797	34.473	24.4	91.2	13.498	27.395	-0.131

Station: 11 Date: 11/07/2007, 1403 Lat.: 36° 02.58 N Long.: 123° 40.07 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.936	32.716	266.2	88.8	0.037	24.226	0.306
10	14.863	32.757	268.9	88.3	0.367	24.273	0.321
20	14.843	32.769	269.4	88.5	0.731	24.287	0.326
30	14.823	32.779	269.5	88.7	1.094	24.299	0.329
50	11.314	32.664	285.5	89.9	1.777	24.902	-0.482
75	10.191	32.739	269.4	90.7	2.507	25.156	-0.626
100	9.620	32.995	240.9	90.9	3.178	25.451	-0.518
125	9.045	33.413	213.4	91.0	3.755	25.870	-0.279
150	8.710	33.779	184.5	91.0	4.245	26.210	-0.041
200	8.066	33.986	116.6	91.1	5.088	26.471	0.024
250	7.604	34.060	80.2	91.2	5.852	26.597	0.014
300	7.298	34.105	64.4	91.2	6.570	26.677	0.005
400	6.279	34.127	45.8	91.2	7.900	26.831	-0.116
500	5.538	34.183	28.1	91.3	9.107	26.969	-0.165
600	4.957	34.240	17.8	91.3	10.196	27.083	-0.188
700	4.670	34.322	12.6	91.3	11.191	27.181	-0.156
800	4.454	34.410	15.2	91.2	12.101	27.275	-0.111
900	4.135	34.439	18.2	91.2	12.946	27.333	-0.123
1000	3.813	34.471	23.9	91.2	13.741	27.392	-0.130
1016	3.775	34.476	25.1	91.2	13.864	27.400	-0.131

Station: 12 Date: 11/07/2007, 1619 Lat.: 35° 57.55 N Long.: 123° 50.89 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.020	32.677	265.5	89.3	0.037	24.177	0.293
10	15.026	32.678	266.8	89.3	0.373	24.177	0.295
20	15.027	32.678	267.2	89.3	0.747	24.177	0.295
30	15.032	32.681	267.6	89.4	1.121	24.178	0.298
50	12.169	32.661	286.3	89.5	1.844	24.742	-0.321
75	10.882	32.819	272.3	90.7	2.593	25.100	-0.438
100	9.903	32.914	255.4	90.9	3.290	25.341	-0.535
125	9.339	33.366	215.1	91.0	3.898	25.787	-0.268
150	8.916	33.684	185.3	91.0	4.416	26.103	-0.084
200	8.466	33.998	105.5	91.1	5.288	26.420	0.094
250	7.849	34.060	87.2	91.1	6.071	26.561	0.049
300	6.935	34.029	85.1	91.1	6.803	26.666	-0.106
400	6.220	34.124	47.5	91.2	8.135	26.837	-0.126
500	5.575	34.186	28.6	91.2	9.335	26.967	-0.158
600	5.039	34.242	17.8	91.2	10.433	27.076	-0.177
700	4.590	34.305	12.7	91.2	11.432	27.176	-0.179
800	4.270	34.374	12.6	91.2	12.347	27.266	-0.159
900	4.024	34.422	16.4	91.3	13.196	27.331	-0.147
1000	3.741	34.450	20.0	91.3	13.995	27.382	-0.154
1030	3.679	34.462	22.7	91.3	14.225	27.398	-0.151

Station: 13 Date: 11/07/2007, 1903 Lat.: 35° 52.58 N Long.: 124° 01.33 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.211	32.696	264.5	88.6	0.038	24.151	0.351
10	15.209	32.696	265.8	88.7	0.376	24.151	0.350
20	15.202	32.696	266.0	88.7	0.752	24.153	0.348
30	15.052	32.706	267.3	89.5	1.125	24.194	0.322
50	14.152	33.026	267.7	89.6	1.840	24.632	0.189
75	11.212	32.800	270.0	90.4	2.611	25.027	-0.392
100	10.303	32.960	253.0	90.8	3.308	25.310	-0.429
125	9.488	33.249	224.5	90.9	3.940	25.672	-0.337
150	9.345	33.636	185.5	90.9	4.493	25.997	-0.053
200	8.647	33.941	125.7	91.0	5.401	26.347	0.076
250	7.926	34.033	101.7	91.1	6.208	26.529	0.039
300	7.257	34.058	82.9	91.1	6.949	26.645	-0.038
400	6.312	34.107	51.7	91.2	8.307	26.812	-0.128
500	5.599	34.182	29.9	91.2	9.522	26.961	-0.159
600	4.948	34.235	17.6	91.2	10.615	27.080	-0.193
700	4.655	34.323	12.3	91.2	11.604	27.184	-0.157
800	4.367	34.374	12.8	91.2	12.521	27.256	-0.149
900	4.038	34.416	16.1	91.3	13.379	27.324	-0.151
1000	3.836	34.461	22.6	91.3	14.180	27.382	-0.136
1028	3.762	34.470	24.5	91.3	14.396	27.397	-0.136

Station: 14 Date: 11/07/2007, 2112 Lat.: 35° 47.65 N Long.: 124° 12.03 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.963	32.898	268.5	86.7	0.036	24.360	0.456
10	15.205	33.044	268.5	87.0	0.355	24.420	0.626
20	15.141	33.122	268.9	87.7	0.702	24.494	0.673
30	14.949	33.115	267.5	88.3	1.044	24.531	0.624
50	11.806	32.808	275.5	89.9	1.690	24.924	-0.274
75	10.885	32.830	260.4	90.5	2.425	25.108	-0.429
100	10.712	33.101	240.0	90.8	3.112	25.350	-0.243
125	9.651	33.437	206.0	91.0	3.721	25.792	-0.160
150	9.613	33.838	129.4	90.9	4.235	26.112	0.152
200	8.759	34.023	94.8	91.0	5.119	26.394	0.159
250	8.171	34.089	78.1	91.1	5.911	26.537	0.120
300	7.661	34.133	64.2	91.2	6.654	26.647	0.078
400	6.803	34.191	39.8	91.2	8.015	26.813	0.003
500	5.944	34.233	24.4	91.2	9.235	26.959	-0.076
600	5.574	34.306	15.4	91.2	10.345	27.063	-0.064
700	4.865	34.319	13.2	91.2	11.366	27.157	-0.137
800	4.626	34.391	14.0	91.2	12.305	27.242	-0.108
900	4.196	34.416	16.5	91.2	13.178	27.309	-0.134
1000	3.899	34.453	21.5	91.3	13.993	27.369	-0.136
1018	3.830	34.458	22.6	91.3	14.134	27.380	-0.139

Station: 15 Date: 11/07/2007, 2348 Lat.: 35° 42.53 N Long.: 124° 22.70 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.649	33.008	263.1	87.6	0.036	24.295	0.699
10	15.618	33.008	264.0	87.5	0.362	24.302	0.691
20	15.429	33.164	265.8	86.7	0.716	24.464	0.771
30	15.392	33.163	264.8	87.4	1.062	24.471	0.762
50	14.989	33.115	264.0	89.2	1.752	24.523	0.632
75	13.234	33.252	263.8	90.2	2.530	24.994	0.364
100	11.211	33.335	221.7	90.4	3.223	25.444	0.035
125	10.486	33.645	168.8	90.6	3.805	25.814	0.150
150	9.383	33.715	158.0	91.0	4.323	26.053	0.016
200	8.492	33.961	129.6	91.0	5.216	26.387	0.069
250	7.866	34.026	103.9	91.1	6.014	26.532	0.025
300	7.549	34.116	69.7	91.2	6.756	26.649	0.049
400	6.646	34.157	43.6	91.2	8.111	26.807	-0.045
500	6.045	34.238	24.1	91.2	9.337	26.951	-0.059
600	5.543	34.309	15.2	91.2	10.440	27.069	-0.066
700	5.029	34.334	13.3	91.2	11.461	27.151	-0.107
800	4.694	34.371	13.4	91.3	12.414	27.218	-0.116
900	4.136	34.455	20.5	91.2	13.287	27.346	-0.110
1000	3.881	34.468	23.3	91.2	14.079	27.383	-0.126
1019	3.844	34.473	24.6	91.2	14.226	27.391	-0.126

Station: 16 Date: 11/08/2007, 0200 Lat.: 35° 37.60 N Long.: 124° 33.33 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.372	32.064	166.7	87.1	0.043	23.629	-0.119
10	15.376	32.855	263.8	87.4	0.391	24.237	0.515
20	15.118	32.874	269.1	86.8	0.756	24.308	0.471
30	14.858	32.870	271.2	87.8	1.114	24.361	0.409
50	11.858	32.696	287.3	89.5	1.789	24.828	-0.354
75	10.706	32.850	265.7	90.7	2.523	25.155	-0.445
100	11.133	33.466	206.9	90.9	3.185	25.560	0.124
125	9.426	33.593	177.5	91.0	3.740	25.951	-0.073
150	8.729	33.799	156.2	91.0	4.220	26.223	-0.022
200	8.277	33.972	138.7	91.1	5.067	26.428	0.045
250	7.661	34.023	101.9	91.2	5.850	26.559	-0.008
300	7.221	34.066	76.8	91.2	6.583	26.657	-0.036
400	6.294	34.113	50.0	91.2	7.931	26.819	-0.125
500	5.355	34.151	34.0	91.3	9.138	26.965	-0.212
600	5.040	34.255	17.1	91.3	10.229	27.085	-0.167
700	4.685	34.319	12.7	91.3	11.225	27.177	-0.157
800	4.355	34.373	12.8	91.2	12.145	27.257	-0.151
900	4.226	34.443	18.9	91.1	13.004	27.327	-0.110
1000	3.824	34.460	22.1	91.2	13.806	27.382	-0.138
1028	3.749	34.467	23.6	91.3	14.023	27.395	-0.140

Station: 17 Date: 11/08/2007, 0443 Lat.: 35° 32.55 N Long.: 124° 43.99 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.172	32.885	268.3	87.2	0.036	24.304	0.492
10	15.182	32.886	269.7	87.1	0.361	24.304	0.496
20	15.143	32.885	269.4	87.3	0.722	24.311	0.485
30	14.233	32.812	275.7	88.2	1.080	24.449	0.226
50	12.561	33.012	260.2	90.2	1.726	24.940	0.038
75	10.910	33.099	243.2	90.8	2.427	25.313	-0.208
100	10.247	33.459	198.7	90.9	3.034	25.709	-0.040
125	9.328	33.676	161.7	91.0	3.569	26.031	-0.024
150	9.011	33.791	147.5	91.0	4.048	26.172	0.016
200	8.175	33.976	137.1	91.1	4.897	26.447	0.032
250	7.586	34.027	102.7	91.1	5.670	26.574	-0.015
300	7.099	34.058	79.1	91.1	6.396	26.667	-0.060
400	6.245	34.124	46.7	91.2	7.725	26.834	-0.123
500	5.581	34.172	30.5	91.3	8.935	26.955	-0.169
600	4.856	34.211	21.6	91.3	10.033	27.071	-0.223
700	4.688	34.314	12.7	91.2	11.033	27.173	-0.161
800	4.336	34.365	12.4	91.3	11.958	27.252	-0.160
900	4.084	34.416	15.5	91.3	12.818	27.320	-0.146
1000	3.776	34.454	20.9	91.3	13.621	27.382	-0.148
1027	3.694	34.460	22.3	91.3	13.828	27.395	-0.151

Station: 18 Date: 11/08/2007, 0700 Lat.: 35° 27.53 N Long.: 124° 54.40 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.656	33.039	263.7	87.7	0.036	24.317	0.725
10	15.662	33.037	264.3	87.7	0.360	24.314	0.724
20	15.669	33.037	263.6	87.7	0.721	24.313	0.726
30	15.648	33.148	264.5	87.6	1.080	24.403	0.808
50	14.260	33.169	260.5	89.8	1.761	24.720	0.515
75	10.464	32.960	254.1	90.8	2.489	25.282	-0.400
100	10.863	33.358	219.4	90.8	3.139	25.523	-0.011
125	9.795	33.546	192.5	91.0	3.718	25.853	-0.049
150	9.127	33.775	149.5	91.0	4.226	26.141	0.022
200	8.518	33.954	145.9	91.1	5.109	26.378	0.067
250	7.856	34.029	109.2	91.1	5.908	26.536	0.026
300	7.236	34.069	78.4	91.2	6.642	26.656	-0.033
400	6.111	34.070	61.8	91.2	7.994	26.808	-0.182
500	5.372	34.116	42.6	91.3	9.220	26.936	-0.238
600	4.877	34.211	21.4	91.3	10.330	27.069	-0.220
700	4.602	34.316	12.7	91.3	11.329	27.184	-0.168
800	4.283	34.366	12.4	91.3	12.243	27.259	-0.164
900	4.039	34.416	15.7	91.3	13.098	27.324	-0.151
1000	3.786	34.454	20.8	91.3	13.900	27.381	-0.147
1100	3.527	34.483	27.2	91.3	14.655	27.431	-0.149
1200	3.341	34.506	33.4	91.3	15.372	27.467	-0.149
1300	3.162	34.527	39.4	91.3	16.056	27.501	-0.150
1400	2.989	34.546	45.2	91.3	16.714	27.533	-0.151
1500	2.793	34.560	50.5	91.3	17.344	27.562	-0.158
1750	2.412	34.583	61.6	91.4	18.819	27.614	-0.173
2000	2.121	34.612	76.6	91.4	20.177	27.662	-0.175
2021	2.103	34.613	77.8	91.4	20.287	27.665	-0.175

Station: 19 Date: 11/08/2007, 0926 Lat.: 35° 27.07 N Long.: 124° 53.90 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.657	33.038	262.0	87.5	0.036	24.316	0.724
10	15.657	33.039	262.8	87.9	0.360	24.317	0.725
20	15.637	33.037	263.9	87.9	0.720	24.320	0.718
30	15.477	33.107	266.0	88.0	1.076	24.409	0.736
50	13.868	33.151	260.7	90.0	1.755	24.787	0.417
75	10.557	32.941	255.9	90.8	2.479	25.251	-0.399
100	10.692	33.346	216.7	90.8	3.127	25.544	-0.051
125	9.850	33.551	190.3	91.0	3.702	25.848	-0.036
150	9.147	33.787	150.2	91.0	4.210	26.147	0.035
200	8.518	33.954	146.1	91.1	5.097	26.378	0.067
204	8.433	33.962	146.1	91.1	5.163	26.397	0.060

Station: 20 Date: 11/08/2007, 1220 Lat.: 35° 45.00 N Long.: 125° 07.39 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.277	32.689	264.5	89.4	0.038	24.131	0.360
10	15.276	32.688	265.2	89.5	0.378	24.131	0.359
20	15.263	32.688	265.1	89.5	0.756	24.133	0.356
30	15.171	32.682	266.1	89.4	1.133	24.149	0.330
50	14.826	32.716	268.6	89.7	1.879	24.250	0.279
75	11.707	32.881	277.9	90.5	2.683	25.000	-0.235
100	10.468	32.814	270.2	90.9	3.404	25.168	-0.517
125	10.117	33.166	232.7	91.0	4.067	25.503	-0.297
150	9.278	33.589	183.8	91.0	4.640	25.972	-0.101
200	8.396	33.902	180.2	91.1	5.568	26.356	0.007
250	7.465	33.945	151.1	91.1	6.373	26.526	-0.097
300	7.025	34.018	98.7	91.2	7.114	26.646	-0.102
400	6.102	34.058	62.5	91.2	8.479	26.799	-0.193
500	5.330	34.121	38.3	91.3	9.708	26.945	-0.239
600	4.974	34.225	19.2	91.3	10.816	27.069	-0.198
700	4.466	34.275	13.3	91.3	11.819	27.166	-0.216
800	4.384	34.364	12.2	91.3	12.747	27.246	-0.155
900	4.041	34.419	15.9	91.3	13.607	27.327	-0.148
1000	3.795	34.456	20.9	91.3	14.409	27.382	-0.144
1028	3.712	34.464	22.5	91.3	14.624	27.397	-0.146

Station: 21 Date: 11/08/2007, 1546 Lat.: 36° 02.27 N Long.: 125° 20.36 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.977	32.703	265.6	89.4	0.037	24.207	0.304
10	14.983	32.704	266.5	89.5	0.370	24.206	0.306
20	14.837	32.686	268.7	89.4	0.741	24.224	0.259
30	14.800	32.682	269.4	89.4	1.110	24.229	0.247
50	14.309	32.709	271.8	89.4	1.840	24.355	0.160
75	12.424	32.866	286.3	90.0	2.673	24.854	-0.108
100	11.585	32.924	271.2	90.8	3.422	25.056	-0.224
125	11.050	33.052	264.8	91.1	4.132	25.253	-0.222
150	10.022	33.402	235.4	91.1	4.765	25.704	-0.125
200	8.479	33.871	163.1	91.1	5.759	26.318	-0.005
250	7.647	33.949	163.3	91.1	6.577	26.503	-0.068
300	7.036	33.994	113.2	91.1	7.331	26.625	-0.119
400	5.835	34.023	69.1	91.2	8.693	26.805	-0.255
500	5.205	34.113	39.4	91.3	9.909	26.953	-0.259
600	4.744	34.185	22.9	91.3	11.010	27.063	-0.256
700	4.465	34.276	13.4	91.3	12.018	27.167	-0.214
800	4.220	34.347	11.5	91.3	12.943	27.250	-0.185
900	3.890	34.393	13.1	91.3	13.798	27.322	-0.183
1000	3.586	34.434	16.6	91.3	14.595	27.385	-0.182
1020	3.503	34.438	17.2	91.3	14.748	27.396	-0.187

Station: 22 Date: 11/08/2007, 1916 Lat.: 36° 19.50 N Long.: 125° 33.26 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	15.001	32.737	265.6	89.3	0.037	24.228	0.337
10	15.011	32.738	266.5	89.4	0.369	24.227	0.340
20	14.217	32.703	273.1	89.4	0.729	24.368	0.136
30	13.630	32.734	277.8	89.8	1.080	24.513	0.035
50	11.201	32.663	283.9	90.1	1.720	24.922	-0.504
75	10.053	32.707	271.5	90.8	2.446	25.154	-0.675
100	9.682	32.901	253.7	91.0	3.126	25.368	-0.583
125	9.406	33.272	217.4	91.1	3.745	25.703	-0.332
150	8.923	33.583	200.2	91.1	4.280	26.023	-0.163
200	8.332	33.901	134.0	91.0	5.183	26.364	-0.003
250	7.569	34.014	89.8	91.1	5.975	26.565	-0.028
300	6.622	34.003	98.6	91.1	6.694	26.688	-0.168
400	5.820	34.068	54.8	91.2	8.013	26.843	-0.220
500	5.142	34.141	32.6	91.3	9.195	26.983	-0.244
600	4.685	34.208	19.2	91.3	10.272	27.088	-0.243
700	4.449	34.288	12.6	91.3	11.261	27.178	-0.207
800	4.123	34.361	11.7	91.3	12.170	27.271	-0.184
900	3.869	34.415	14.6	91.3	13.005	27.341	-0.168
1000	3.557	34.456	19.8	91.3	13.783	27.405	-0.167
1030	3.418	34.455	19.6	91.3	14.006	27.418	-0.181

Station: 23 Date: 11/08/2007, 2228 Lat.: 36° 36.89 N Long.: 125° 46.21 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.075	32.722	274.7	87.6	0.035	24.412	0.121
10	13.957	32.720	276.0	87.4	0.350	24.434	0.094
20	13.888	32.809	275.5	87.5	0.695	24.518	0.150
30	13.988	32.887	273.6	87.8	1.034	24.558	0.233
50	12.130	32.719	277.7	89.7	1.699	24.795	-0.282
75	9.816	33.156	229.6	90.8	2.378	25.544	-0.355
100	9.190	33.519	192.1	91.0	2.937	25.930	-0.171
125	8.796	33.785	156.7	90.9	3.423	26.201	-0.022
150	8.328	33.876	146.2	91.0	3.860	26.345	-0.023
200	7.711	33.971	127.5	91.1	4.667	26.511	-0.041
250	7.170	33.997	110.7	91.1	5.416	26.609	-0.098
300	6.701	34.037	75.6	91.2	6.124	26.704	-0.131
400	5.447	34.031	63.3	91.2	7.424	26.858	-0.295
500	5.116	34.145	31.8	91.3	8.597	26.989	-0.244
600	4.713	34.216	18.9	91.3	9.669	27.091	-0.235
700	4.415	34.286	13.0	91.3	10.655	27.180	-0.212
800	4.104	34.346	11.4	91.3	11.565	27.261	-0.198
900	3.827	34.397	13.2	91.4	12.410	27.331	-0.186
1000	3.586	34.449	18.6	91.4	13.195	27.397	-0.170
1100	3.345	34.475	23.3	91.4	13.932	27.441	-0.173
1200	3.094	34.503	29.9	91.4	14.628	27.488	-0.174
1300	2.939	34.524	36.4	91.4	15.290	27.518	-0.172
1400	2.764	34.537	40.4	91.4	15.927	27.545	-0.178
1500	2.592	34.551	45.1	91.4	16.540	27.571	-0.182
1750	2.206	34.587	61.3	91.5	17.962	27.634	-0.186
2000	1.976	34.615	77.5	91.5	19.262	27.676	-0.183
2022	1.958	34.617	78.9	91.5	19.373	27.678	-0.183

Station: 24 Date: 11/09/2007, 0238 Lat.: 36° 46.87 N Long.: 125° 24.69 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.828	32.873	267.7	87.2	0.035	24.370	0.406
10	14.833	32.873	270.0	87.4	0.355	24.369	0.407
20	14.664	32.873	271.1	87.3	0.708	24.405	0.369
30	14.139	32.851	272.3	88.7	1.055	24.499	0.237
50	10.523	33.048	246.0	89.9	1.669	25.341	-0.318
75	9.927	33.377	206.4	90.4	2.284	25.699	-0.160
100	8.964	33.723	166.1	90.8	2.800	26.126	-0.044
125	8.461	33.858	131.6	90.8	3.251	26.310	-0.017
150	8.172	33.939	114.3	90.8	3.669	26.417	0.003
200	7.343	33.965	123.5	90.9	4.447	26.558	-0.098
250	6.885	34.007	90.4	91.0	5.173	26.656	-0.129
300	6.513	34.030	75.5	91.1	5.868	26.723	-0.161
400	5.758	34.092	46.8	91.1	7.149	26.869	-0.209
500	5.032	34.146	30.2	91.2	8.311	26.999	-0.253
600	4.657	34.232	16.9	91.2	9.371	27.110	-0.228
700	4.274	34.313	11.9	91.2	10.329	27.217	-0.205
800	3.971	34.370	11.9	91.2	11.204	27.294	-0.193
900	3.766	34.425	15.4	91.2	12.022	27.359	-0.170
1000	3.515	34.462	20.7	91.2	12.787	27.414	-0.167
1024	3.461	34.473	23.9	91.3	12.962	27.428	-0.163

Station: 25 Date: 11/09/2007, 0628 Lat.: 36° 56.91 N Long.: 125° 03.38 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	14.927	32.915	266.3	87.3	0.035	24.381	0.462
10	14.931	32.916	267.7	87.8	0.354	24.381	0.463
20	14.871	32.911	268.0	87.9	0.708	24.390	0.445
30	14.455	32.889	269.3	89.0	1.058	24.462	0.335
50	10.416	33.131	236.5	90.2	1.642	25.423	-0.271
75	9.574	33.569	183.2	90.7	2.221	25.907	-0.067
100	8.902	33.754	164.2	90.8	2.714	26.159	-0.030
125	8.557	33.868	138.2	90.8	3.165	26.303	0.006
150	8.201	33.911	156.4	90.9	3.588	26.391	-0.014
200	7.570	33.975	131.1	90.9	4.381	26.534	-0.058
250	6.872	33.985	107.1	90.9	5.120	26.640	-0.148
300	6.596	34.056	63.4	91.1	5.812	26.733	-0.130
400	5.660	34.096	44.9	91.1	7.089	26.885	-0.218
500	4.982	34.166	26.6	91.2	8.231	27.021	-0.243
600	4.555	34.236	16.0	91.2	9.264	27.125	-0.236
700	4.394	34.330	11.6	91.2	10.213	27.217	-0.180
800	4.019	34.373	11.9	91.2	11.093	27.292	-0.185
900	3.835	34.417	14.9	91.2	11.918	27.346	-0.170
1000	3.590	34.450	18.9	91.2	12.697	27.397	-0.169
1025	3.545	34.456	19.9	91.3	12.885	27.406	-0.168

Station: 26 Date: 11/09/2007, 1018 Lat.: 37° 06.79 N Long.: 124° 41.55 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.260	32.774	280.5	86.2	0.033	24.618	-0.009
10	13.040	32.813	282.0	86.6	0.329	24.691	-0.024
20	13.231	32.965	279.6	87.3	0.651	24.772	0.137
30	11.841	32.822	275.8	88.6	0.960	24.928	-0.255
50	9.733	32.840	254.4	90.3	1.512	25.311	-0.623
75	9.148	33.429	213.4	90.8	2.104	25.866	-0.248
100	8.997	33.752	165.1	90.9	2.601	26.143	-0.016
125	8.835	33.916	115.1	90.9	3.050	26.298	0.088
150	8.583	33.999	99.3	90.9	3.471	26.402	0.114
200	8.012	34.068	78.7	90.9	4.262	26.543	0.080
250	7.506	34.091	67.4	91.1	4.997	26.635	0.024
300	6.703	34.072	63.5	91.2	5.691	26.731	-0.103
400	5.880	34.107	45.2	91.2	6.977	26.866	-0.182
500	5.619	34.224	23.9	91.3	8.146	26.992	-0.122
600	5.257	34.315	14.2	91.2	9.216	27.108	-0.095
700	4.875	34.364	13.0	91.2	10.199	27.192	-0.100
800	4.431	34.400	14.6	91.3	11.109	27.270	-0.121
900	4.109	34.433	17.9	91.3	11.958	27.331	-0.130
1000	3.839	34.468	23.6	91.3	12.756	27.387	-0.131
1016	3.797	34.472	24.6	91.3	12.879	27.394	-0.132

Station: 27 Date: 11/09/2007, 1402 Lat.: 37° 16.89 N Long.: 124° 19.85 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.589	33.186	273.9	88.8	0.031	24.870	0.387
10	13.588	33.185	274.5	88.8	0.307	24.870	0.386
20	13.526	33.180	275.3	89.0	0.615	24.879	0.369
30	12.635	33.322	250.5	90.0	0.911	25.166	0.300
50	10.914	33.575	181.6	90.3	1.414	25.682	0.172
75	10.148	33.757	135.7	90.1	1.955	25.958	0.180
100	9.653	33.835	125.1	90.4	2.452	26.102	0.157
125	9.002	33.876	124.8	90.9	2.915	26.240	0.083
150	8.758	33.962	108.3	90.9	3.351	26.346	0.112
200	8.156	34.042	94.5	91.1	4.165	26.501	0.081
250	7.668	34.081	75.9	91.2	4.918	26.604	0.040
300	7.115	34.095	68.5	91.2	5.630	26.694	-0.028
400	6.476	34.174	38.6	91.2	6.944	26.843	-0.053
500	5.566	34.196	26.7	91.2	8.137	26.976	-0.151
600	5.141	34.273	16.1	91.2	9.224	27.088	-0.142
700	4.696	34.332	12.2	91.2	10.214	27.187	-0.145
800	4.415	34.380	12.9	91.3	11.133	27.256	-0.139
900	4.055	34.410	15.0	91.3	11.992	27.318	-0.154
1000	3.770	34.447	18.9	91.3	12.799	27.377	-0.154
1028	3.687	34.457	20.7	91.3	13.015	27.393	-0.154

Station: 28 Date: 11/09/2007, 1753 Lat.: 37° 26.62 N Long.: 123° 58.15 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.850	33.195	273.8	88.5	0.031	24.823	0.450
10	13.757	33.196	274.2	88.6	0.311	24.844	0.431
20	13.523	33.261	275.8	89.5	0.614	24.942	0.432
30	12.215	33.307	238.6	90.0	0.904	25.235	0.205
50	10.565	33.475	197.0	90.2	1.395	25.665	0.030
75	9.954	33.776	135.3	90.5	1.924	26.005	0.162
100	9.420	33.886	112.5	90.6	2.403	26.180	0.159
125	9.160	33.969	93.8	90.6	2.852	26.287	0.181
150	8.867	34.027	85.5	90.8	3.279	26.380	0.180
200	8.447	34.090	72.1	90.8	4.087	26.495	0.163
250	8.028	34.144	61.2	91.0	4.847	26.601	0.142
300	7.503	34.163	53.2	91.1	5.562	26.693	0.080
400	6.323	34.154	40.9	91.2	6.883	26.847	-0.089
500	5.700	34.203	26.5	91.2	8.082	26.966	-0.129
600	5.165	34.255	16.6	91.3	9.179	27.071	-0.153
700	4.766	34.322	12.3	91.3	10.187	27.170	-0.146
800	4.480	34.378	13.2	91.1	11.117	27.247	-0.134
900	4.219	34.412	15.1	91.2	11.993	27.303	-0.135
1000	3.861	34.456	20.5	91.3	12.808	27.375	-0.138
1026	3.780	34.463	21.9	91.3	13.010	27.389	-0.140

Station: 29 Date: 11/09/2007, 2145 Lat.: 37° 36.81 N Long.: 123° 36.44 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.780	33.007	275.7	87.5	0.032	24.693	0.286
10	13.684	33.008	277.4	87.3	0.323	24.713	0.266
20	13.302	33.058	276.9	87.6	0.642	24.829	0.225
30	12.382	33.082	276.0	88.1	0.945	25.028	0.058
50	9.927	33.127	233.4	90.5	1.483	25.503	-0.359
75	9.726	33.703	157.8	90.8	2.047	25.986	0.065
100	9.087	33.849	128.8	90.9	2.526	26.205	0.075
125	8.796	33.935	119.6	91.1	2.969	26.319	0.097
150	8.492	33.987	110.7	91.2	3.390	26.407	0.090
200	8.106	34.074	80.8	91.1	4.179	26.534	0.099
250	7.241	34.039	82.1	91.2	4.920	26.632	-0.054
300	6.980	34.101	59.4	91.3	5.619	26.717	-0.042
400	6.215	34.150	40.8	91.3	6.921	26.858	-0.106
500	5.559	34.180	28.3	91.3	8.111	26.964	-0.165
600	5.206	34.267	16.2	91.3	9.205	27.076	-0.139
700	4.848	34.329	13.0	91.2	10.216	27.167	-0.131
800	4.390	34.378	12.8	91.3	11.140	27.257	-0.143
900	4.130	34.420	15.6	91.2	12.003	27.318	-0.138
1000	3.813	34.451	19.4	91.3	12.808	27.376	-0.146
1020	3.783	34.459	20.8	91.3	12.964	27.385	-0.143

Station: 30 Date: 11/10/2007, 0019 Lat.: 37° 41.77 N Long.: 123° 25.60 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.523	32.794	156.8	87.8	0.033	24.580	0.061
10	13.241	33.154	275.6	87.3	0.317	24.916	0.290
20	12.154	33.219	272.1	89.3	0.607	25.178	0.123
30	11.141	33.490	204.2	90.2	0.866	25.575	0.147
50	10.608	33.569	180.0	90.6	1.332	25.731	0.112
75	9.938	33.666	163.1	90.9	1.874	25.922	0.072
100	9.300	33.789	140.3	91.0	2.371	26.123	0.062
125	9.110	33.907	118.3	91.0	2.831	26.247	0.125
150	8.861	33.993	103.8	91.1	3.265	26.354	0.152
200	8.479	34.053	88.1	91.1	4.085	26.461	0.139
250	8.032	34.127	62.5	90.7	4.854	26.588	0.130
300	7.416	34.165	51.4	91.1	5.566	26.707	0.069
400	6.506	34.165	40.2	91.0	6.886	26.833	-0.056
500	5.519	34.159	31.8	91.3	8.104	26.953	-0.186
600	5.099	34.282	15.8	91.2	9.202	27.100	-0.139
700	4.787	34.337	13.1	91.2	10.190	27.180	-0.132
800	4.408	34.389	14.0	91.1	11.110	27.263	-0.133
900	4.040	34.429	16.9	91.1	11.955	27.335	-0.140
1000	3.737	34.462	21.3	91.2	12.748	27.392	-0.145
1016	3.665	34.469	23.1	91.1	12.869	27.405	-0.146

Station: 31 Date: 11/10/2007, 0307 Lat.: 37° 46.90 N Long.: 123° 14.67 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	12.880	33.323	355.3	80.9	0.028	25.118	0.350
10	12.499	33.337	295.3	85.8	0.281	25.202	0.284
20	11.530	33.461	213.7	89.5	0.545	25.482	0.196
30	10.873	33.588	176.1	90.0	0.782	25.700	0.175
50	10.441	33.694	147.8	90.1	1.222	25.858	0.182
75	9.643	33.882	91.9	87.4	1.716	26.140	0.193
100	9.615	33.887	88.0	87.2	2.186	26.149	0.192
118	9.607	33.887	88.2	87.4	2.524	26.151	0.190

Station: 32 Date: 11/10/2007, 0506 Lat.: 37° 51.66 N Long.: 123° 04.45 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	12.719	33.312	323.5	87.9	0.028	25.141	0.309
10	12.602	33.315	297.5	87.8	0.281	25.166	0.288
20	12.214	33.357	260.7	89.6	0.556	25.273	0.244
30	11.522	33.434	222.9	90.0	0.814	25.462	0.172
50	10.234	33.670	151.9	90.3	1.276	25.875	0.127
75	9.817	33.809	110.3	89.2	1.783	26.054	0.164
84	9.732	33.824	109.2	89.0	1.958	26.080	0.162

Station: 33 Date: 11/10/2007, 0708 Lat.: 37° 56.80 N Long.: 122° 53.33 W

P(dbar)	T(°C)	S	O ₂ (μmol/kg)	Xmiss(%)	ΔΦ	σ _θ	π _θ
0	13.136	33.222	406.1	82.4	0.030	24.989	0.322
10	12.878	33.211	361.4	80.5	0.295	25.032	0.261
20	11.947	33.348	243.5	87.9	0.579	25.317	0.186
30	10.572	33.658	145.8	89.9	0.812	25.807	0.177
44	10.233	33.751	103.4	80.0	1.104	25.938	0.191

Table A3: Results of nutrient and primary productivity analyses of water samples collected at each hydrographic station during the PaCOOS cruise of November 2007. Stations are in chronological (and numerical) order. The time listed (<Mon. dd, yyyy hh:mm> UT) for each station is the beginning of the CTD cast. 12 Niskin bottles were tripped at each station, although some bottles sampled duplicate pressures. Except where primary productivity analyses were not performed (see Introduction), the data for each station are separated into two sections (“Physical and Chemical” and “Biological”).

The physical oceanographic properties listed in the first seven columns of the “Physical and Chemical” section of each station’s data are the uncorrected values measured by the CTD at the times each Niskin bottle was tripped. Because they are uncorrected, these values may differ slightly from those listed in Table A2. The last four columns of this section give the nitrate (NO₃), nitrite (NO₂), phosphate (PO₄), and dissolved silicate (SiO₄) concentrations.

The “Biological” section of each station’s data gives the results of the primary productivity analyses. As stated above, primary productivity sampling was not undertaken at every hydrographic station.

Date	Nov 06, 2007 12:13	Cruise: S407	Latitude:	36.797	Year:	2007
Project:	PACOOS	Station: C1	Longitude:	-121.850	Work week:	45
Platform:	D.S. JORDAN	Cast: 1	Secchi Depth:	3	Day of Year:	310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)	O2 (ml l-1)
0	2.4	12	12.081	33.553	25.450	71	4.986	0.263	1.088	17.432	6.059
5	5.2	11	12.081	33.553	25.450	71	5.437	0.250	0.813	17.239	6.056
10	10.6	10	12.060	33.555	25.456	74	5.671	0.250	0.742	17.433	5.951
20	20.2	9	12.034	33.554	25.460	76	6.445	0.244	0.753	17.309	5.829
30	30.5	8	11.254	33.592	25.634	85	16.739	0.392	1.426	19.102	4.474
40	40.4	7	10.976	33.631	25.714	86	19.423	0.414	1.453	20.735	3.934
60	60.5	6	10.755	33.699	25.806	84	---	---	---	---	3.567
80	80.3	5	10.679	33.708	25.826	85	22.027	0.415	1.638	24.221	3.531
100	100.2	4	10.525	33.722	25.864	85	22.793	0.412	1.862	24.734	3.449
150	150.1	3	10.353	33.770	25.931	85	24.565	0.359	1.788	27.577	3.107
200	201.5	2	9.719	33.874	26.120	80	27.476	0.303	2.140	35.991	2.406
230	233.2	1	9.265	33.937	26.243	80	29.143	0.254	2.143	40.059	2.055

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	13.896	1.197	0	100	576.601	41.495	0
5	11	9.355	1.668	0	50	246.035	17.706	2
10	10	5.349	0.934	0	30	220.792	15.889	3
20	9	3.787	0.690	5	15	52.245	5.585	5
30	8	0.536	0.329	5	5	17.702	1.892	9
40	7	0.391	0.339	10	1	3.569	0.667	15
80	5	0.277	0.300	10	0.1	2.150	0.402	26
100	4	0.214	0.273					
150	3	0.153	0.227					
200	2	0.099	0.238					
230	1	0.077	0.205					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll a:	148.15	mg m-2 day -1	Carbon Fixation:	1571.0	mg m-2 day-1
Phaeophytin:	20.86	mg m-2 day -1	Productivity Index:	10.60	mg C mg Chl day-1
Mixed Layer	205	meters	PBOpt:	41.49	mg C mg Chl day-1

Date: Nov 06, 2007 14:32 Cruise: **S407** Latitude: 36.735 Year: 2007
 Project: PACOOS Station: **H3** Longitude: -122.021 Work week: 45
 Platform: D.S. JORDAN Cast: **2** Secchi Depth: 15 Day of Year: 310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.4	12	13.243	33.248	24.988	86	5.754	0.236	0.477	5.553	5.931
5	6.9	11	12.877	33.267	25.075	86	7.215	0.337	1.020	6.710	5.780
10	10.8	10	12.723	33.271	25.108	86	7.825	0.278	0.703	7.067	5.737
20	20.4	9	12.239	33.285	25.212	85	10.344	0.280	0.762	9.652	5.571
30	30.7	8	11.602	33.272	25.321	87	11.782	0.258	0.721	10.380	5.206
40	40.7	7	10.390	33.258	25.526	88	15.832	0.177	1.018	12.990	4.803
60	60.8	6	10.467	33.645	25.814	88	22.543	0.265	1.709	21.798	3.697
80	81.9	5	10.267	33.699	25.891	88	23.021	0.169	1.442	23.558	3.444
100	101.3	4	9.853	33.782	26.025	88	25.277	0.133	2.164	26.564	2.968
150	151.0	3	9.455	33.862	26.154	87	26.435	0.058	1.774	29.224	2.607
200	200.8	2	8.883	34.022	26.370	88	29.979	0.086	2.047	36.413	1.931
1000	1019.1	1	3.677	34.467	27.395	86	43.678	0.120	3.513	129.26	0.614

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.736	0.282	0	100	54.441	74.003	0
5	11	0.602	0.184	5	50	27.980	46.467	6
10	10	0.636	0.238	10	30	28.131	44.249	11
20	9	0.908	0.338	20	15	18.142	19.976	16
30	8	0.426	0.270	30	5	2.909	6.829	25
40	7	0.184	0.107	40	1	0.245	1.329	42
60	6	0.220	0.169	60	0.1	0.099	0.451	71
80	5	0.193	0.172					
100	4	0.105	0.148					
150	3	0.044	0.097					
200	2	0.018	0.065					
1000	1	0.014	0.079					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	22.25	mg m-2 day -1	Carbon Fixation:	625.59	mg m-2 day-1
Phaeophytin:	9.85	mg m-2 day -1	Productivity Index:	28.12	mg C mg Chl day-1
Mixed Layer	923	meters	PBOpt:	74.	mg C mg Chl day-1

Date	Nov 06, 2007 17:20	Cruise: S407	Latitude:	36.712	Year:	2007
Project:	PACOOS	Station: NPS1	Longitude:	-122.236	Work week:	45
Platform:	D.S. JORDAN	Cast: 3	Secchi Depth:	---	Day of Year:	310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.2	12	15.531	33.094	24.387	85	0.270	0.058	0.084	0.264	5.692
50	52.4	11	12.409	33.229	25.136	87	9.425	0.333	0.630	6.707	5.461
100	102.1	10	9.461	33.602	25.950	89	22.623	0.085	1.494	22.010	3.743
200	202.0	9	7.896	34.019	26.519	89	---	---	---	---	0.874
300	302.7	8	7.614	34.114	26.635	89	37.940	0.205	3.111	53.269	1.127
395	400.7	7	6.612	34.182	26.827	89	38.050	0.075	2.781	66.847	0.760
500	503.9	6	6.082	34.236	26.938	89	39.824	0.048	2.772	77.155	0.481
600	604.4	5	5.247	34.256	27.057	89	42.166	0.048	3.185	89.409	0.355
700	704.3	4	4.810	34.332	27.167	89	43.333	0.041	3.000	101.71	0.254
800	803.3	3	4.477	34.382	27.244	88	43.676	0.036	3.170	110.51	0.290
900	901.7	2	4.157	34.419	27.308	88	43.845	0.039	3.146	117.28	0.366
1000	1000.8	1	3.790	34.461	27.378	88	44.182	0.041	3.015	125.51	0.471

Date: Nov 06, 2007 19:43 Cruise: **S407** Latitude: 36.627 Year: 2007
 Project: PACOOS Station: **67-55** Longitude: -122.419 Work week: 45
 Platform: D.S. JORDAN Cast: **4** Secchi Depth: 18 Day of Year: 310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.4	12	15.701	32.950	24.238	85	0.079	0.036	0.050	0.685	5.675
5	6.2	11	15.702	32.950	24.238	85	0.053	0.037	0.142	0.292	5.670
10	11.1	10	15.693	32.949	24.239	85	0.047	0.046	0.233	0.047	5.676
20	22.1	9	14.151	33.001	24.612	86	2.337	0.154	0.241	1.274	5.882
30	30.7	8	13.127	33.107	24.902	87	10.351	0.585	0.709	11.311	5.844
40	40.9	7	11.987	32.927	24.982	87	9.326	1.382	0.786	13.499	5.833
60	60.1	6	10.944	33.247	25.420	88	---	---	---	---	4.851
80	80.2	5	10.754	33.554	25.693	88	---	---	---	---	4.116
100	100.8	4	9.590	33.628	25.949	89	---	---	---	---	3.655
150	150.8	3	8.594	33.870	26.297	89	---	---	---	---	2.966
200	201.1	2	8.041	33.997	26.480	89	---	---	---	---	2.312
1000	1005.7	1	3.853	34.450	27.364	89	42.623	1.729	2.752	109.59	0.420

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.380	0.122	0	100	18.346	48.325	0
5	11	0.381	0.119	5	50	16.290	42.705	8
10	10	0.416	0.145	10	30	14.750	35.461	13
20	9	0.582	0.180	20	15	12.202	20.959	20
30	8	0.550	0.242	30	5	3.960	7.194	30
40	7	0.462	0.217	40	1	0.735	1.590	46
60	6	0.164	0.113	80	0.1	0.003	0.057	78
80	5	0.047	0.054					
100	4	0.012	0.019					
150	3	0.004	0.016					
200	2	0.004	0.017					
1000	1	0.005	0.012					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	22.34	mg m-2 day -1	Carbon Fixation:	422.41	mg m-2 day-1
Phaeophytin:	8.57	mg m-2 day -1	Productivity Index:	18.91	mg C mg Chl day-1
Mixed Layer	18	meters	PBOpt:	48.33	mg C mg Chl day-1

Date: Nov 06, 2007 22:56 Cruise: **S407** Latitude: 36.544 Year: 2007
 Project: PACOOS Station: **NPS2** Longitude: -122.598 Work week: 45
 Platform: D.S. JORDAN Cast: **5** Secchi Depth: --- Day of Year: 310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.3	12	14.056	32.685	24.387	86	---	---	---	---	0.688
50	50.5	11	11.543	32.886	25.032	87	---	---	---	---	1.212
100	105.6	10	9.297	33.392	25.812	89	---	---	---	---	0.816
200	202.1	9	8.094	33.729	26.261	89	---	---	---	---	0.907
300	305.0	8	7.000	34.063	26.681	89	34.982	0.080	3.065	54.510	0.993
400	395.3	7	6.134	34.101	26.825	89	33.962	0.256	2.164	55.353	0.762
500	493.2	6	5.590	34.181	26.956	89	---	---	---	---	0.585
600	603.7	5	4.977	34.260	27.091	89	---	---	---	---	0.313
700	698.0	4	4.908	34.364	27.182	89	42.549	0.045	2.770	100.59	0.254
800	794.9	3	4.565	34.392	27.242	89	44.232	0.101	3.172	107.60	0.288
900	899.2	2	4.238	34.429	27.307	89	---	---	---	---	0.358
1000	1000.9	1	3.915	34.454	27.360	89	38.849	0.112	3.317	111.45	0.444

Date: Nov 07, 2007 01:15 Cruise: **S407** Latitude: 36.460 Year: 2007
 Project: PACOOS Station: **67-60** Longitude: -122.778 Work week: 45
 Platform: D.S. JORDAN Cast: **6** Secchi Depth: 18 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.3	12	15.637	32.964	24.263	86	0.194	0.033	0.294	0.825	5.653
5	5.9	11	15.634	32.962	24.262	86	0.184	0.038	0.158	0.723	5.653
10	10.1	10	14.661	32.918	24.440	86	0.889	0.089	0.313	1.111	5.839
20	20.5	9	13.923	32.956	24.624	87	2.398	0.164	0.383	1.584	5.863
30	30.8	8	13.598	33.038	24.754	87	3.946	0.234	0.472	2.133	5.855
40	41.4	7	13.511	33.125	24.839	87	4.774	0.277	0.683	2.291	5.800
60	60.5	6	10.636	32.893	25.199	88	7.628	0.127	0.934	6.045	5.600
80	80.4	5	10.362	33.239	25.516	89	13.919	0.061	1.063	11.781	4.866
100	100.0	4	9.820	33.538	25.841	89	20.744	0.058	1.632	20.036	3.911
150	149.6	3	8.739	33.882	26.284	89	26.545	0.031	1.743	30.288	2.889
200	200.2	2	8.367	34.019	26.448	89	28.776	0.041	1.996	37.197	2.480
1000	1010.1	1	3.875	34.463	27.372	89	44.266	0.045	3.000	122.62	0.472

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.346	0.099	0	100	19.557	56.519	0
5	11	0.373	0.101	5	50	20.876	55.926	8
10	10	0.502	0.174	10	30	21.838	43.482	13
20	9	0.438	0.213	20	15	10.172	23.237	20
30	8	0.430	0.185	30	5	3.373	7.836	31
40	7	0.360	0.161	40	1	0.589	1.638	49
60	6	0.203	0.165	60	0.1	0.083	0.408	80
80	5	0.054	0.056					
100	4	0.008	0.023					
150	3	0.005	0.015					
200	2	0.003	0.017					
1000	1	0.002	0.013					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	20.08	mg m-2 day -1	Carbon Fixation:	485.90	mg m-2 day-1
Phaeophytin:	8.09	mg m-2 day -1	Productivity Index:	24.19	mg C mg Chl day-1
Mixed Layer	53	meters	PBOpt:	56.52	mg C mg Chl day-1

Date	Nov 07, 2007 04:04	Cruise: S407	Latitude:	36.380	Year:	2007
Project:	PACOOS	Station: NPS3	Longitude:	-122.952	Work week:	45
Platform:	D.S. JORDAN	Cast: 7	Secchi Depth:	18	Day of Year:	311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.3	12	14.159	32.934	24.558	86	2.008	0.112	0.140	1.904	5.854
50	52.6	11	10.060	32.817	25.238	88	10.407	0.087	0.677	8.616	5.538
100	102.9	10	9.530	33.702	26.016	89	24.660	0.116	2.063	25.161	3.337
200	203.5	9	7.876	34.006	26.511	89	21.501	0.108	2.005	30.157	2.535
300	303.7	8	6.839	34.091	26.725	89	36.078	0.055	2.523	58.468	1.278
400	403.9	7	6.074	34.127	26.853	89	39.171	0.148	2.937	71.894	0.873
500	502.8	6	5.588	34.233	26.997	89	41.452	0.032	2.953	85.239	0.430
600	605.3	5	4.913	34.279	27.114	89	42.959	0.090	3.115	99.733	0.286
700	705.0	4	4.503	34.320	27.192	89	43.835	0.020	3.126	108.08	0.244
800	805.8	3	4.390	34.410	27.276	89	43.859	0.034	3.333	111.70	0.317
900	902.6	2	4.098	34.431	27.323	89	43.583	0.014	3.171	118.14	0.382
1000	1024.1	1	3.856	34.463	27.374	89	44.283	0.105	3.413	124.05	0.483

Date: Nov 07, 2007 06:29 Cruise: **S407** Latitude: 36.296 Year: 2007
 Project: PACOOS Station: **67-65** Longitude: -123.129 Work week: 45
 Platform: D.S. JORDAN Cast: **8** Secchi Depth: 18 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.1	12	14.567	33.134	24.626	85	2.199	0.106	0.101	1.261	5.829
10	8.9	11	14.569	33.134	24.626	85	2.219	0.138	0.230	1.180	5.834
15	13.1	10	14.566	33.133	24.626	85	2.066	0.105	0.034	1.082	5.824
25	23.4	9	14.572	33.132	24.624	85	2.346	0.141	0.322	1.244	5.828
35	33.5	8	14.087	33.140	24.732	86	2.810	0.144	0.261	1.344	5.702
40	42.5	7	12.427	33.300	25.188	87	11.549	0.668	0.739	8.654	5.085
60	62.8	6	10.071	33.292	25.607	88	17.614	0.049	1.237	16.599	4.570
80	82.3	5	10.139	33.568	25.810	88	22.478	0.010	1.477	22.620	3.719
100	101.7	4	9.257	33.751	26.099	88	25.740	0.016	2.107	28.363	2.989
150	150.1	3	8.290	33.915	26.378	89	23.155	0.031	1.571	28.542	3.045
200	199.2	2	7.800	33.997	26.515	89	31.303	0.080	2.495	43.007	2.190
1000	1018.5	1	3.792	34.472	27.387	89	44.041	0.025	3.307	125.80	0.513

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.559	0.165	0	100	36.881	65.922	0
10	11	0.571	0.159	10	50	32.822	57.454	7
15	10	0.589	0.142	15	30	26.056	44.274	11
25	9	0.549	0.175	25	15	15.286	27.819	18
35	8	0.485	0.181	35	5	4.759	9.812	29
40	7	0.418	0.201	40	1	0.671	1.605	45
60	6	0.142	0.100	60	0.1	0.004	0.028	77
80	5	0.088	0.104					
100	4	0.012	0.076					
150	3	0.002	0.032					
200	2	0.001	0.019					
1000	1	0.002	0.013					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	23.33	mg m-2 day -1	Carbon Fixation:	658.28	mg m-2 day-1
Phaeophytin:	7.95	mg m-2 day -1	Productivity Index:	28.22	mg C mg Chl day-1
Mixed Layer	311	meters	PBOpt:	65.92	mg C mg Chl day-1

Date: Nov 07, 2007 09:10 Cruise: **S407** Latitude: 36.209 Year: 2007
 Project: PACOOS Station: **NPS4** Longitude: -123.312 Work week: 45
 Platform: D.S. JORDAN Cast: **9** Secchi Depth: --- Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.2	12	14.896	33.123	24.548	85	1.103	0.103	0.084	1.615	5.765
50	53.2	11	10.241	32.768	25.169	88	---	---	---	---	5.686
100	102.9	10	9.982	33.716	25.952	89	23.439	0.076	1.759	31.212	3.315
200	202.9	9	7.970	34.027	26.514	89	---	---	---	---	1.935
300	302.6	8	6.553	34.027	26.713	89	36.047	0.108	2.504	59.809	1.579
400	404.1	7	5.711	34.091	26.870	89	39.180	---	2.800	74.613	1.049
500	502.7	6	5.322	34.212	27.013	89	41.554	0.050	2.935	88.534	0.434
600	604.4	5	4.776	34.279	27.129	89	---	0.046	---	92.369	0.275
700	704.6	4	4.722	34.370	27.207	89	---	0.074	---	93.017	0.258
800	802.5	3	4.386	34.414	27.279	89	---	0.047	---	106.92	0.322
900	895.9	2	4.137	34.442	27.328	89	---	0.152	---	107.52	0.395
1000	1005.9	1	3.793	34.479	27.393	89	---	0.146	---	113.15	0.548

Date: Nov 07, 2007 11:20 Cruise: **S407** Latitude: 36.127 Year: 2007
 Project: PACOOS Station: **67-70** Longitude: -123.490 Work week: 45
 Platform: D.S. JORDAN Cast: **10** Secchi Depth: 18 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.9	12	14.667	32.804	24.351	86	0.871	0.087	0.156	0.696	5.777
5	5.5	11	14.668	32.804	24.351	86	0.902	0.088	0.276	0.495	5.784
10	10.2	10	14.676	32.805	24.350	86	0.784	0.066	0.298	0.408	5.782
20	20.5	9	14.635	32.889	24.423	86	1.100	0.124	0.505	0.723	5.788
30	30.3	8	14.298	32.971	24.557	86	1.927	0.169	0.440	1.380	5.792
40	41.0	7	13.802	32.938	24.635	87	2.618	0.196	0.270	1.889	5.800
60	60.9	6	10.423	32.762	25.134	88	8.272	0.052	0.723	6.476	5.654
80	81.0	5	9.861	33.055	25.457	88	15.525	0.028	1.177	13.897	4.976
100	101.0	4	9.607	33.429	25.790	88	21.835	0.010	1.470	22.241	4.218
150	150.8	3	8.782	33.890	26.284	89	26.891	0.010	1.736	31.023	2.795
200	203.8	2	8.126	34.003	26.472	89	30.973	0.010	2.071	40.354	2.105
1000	1007.1	1	3.798	34.469	27.385	89	44.024	0.018	3.320	124.86	0.503

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.404	0.168	0	100	21.770	53.866	0
5	11	0.386	0.161	5	50	18.741	48.552	7
10	10	0.404	0.160	10	30	14.805	36.633	13
20	9	0.358	0.156	20	15	10.196	28.494	20
30	8	0.440	0.225	30	5	4.193	9.518	32
40	7	0.412	0.229	40	1	0.778	1.886	48
60	6	0.219	0.158	60	0.1	0.064	0.294	77
80	5	0.130	0.094					
100	4	0.056	0.073					
150	3	0.004	0.027					
200	2	0.002	0.023					
1000	1	0.002	0.016					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	19.59	mg m-2 day -1	Carbon Fixation:	456.93	mg m-2 day-1
Phaeophytin:	9.23	mg m-2 day -1	Productivity Index:	23.33	mg C mg Chl day-1
Mixed Layer	39	meters	PBOpt:	53.87	mg C mg Chl day-1

Date	Nov 07, 2007 13:59	Cruise: S407	Latitude:	36.043	Year:	2007
Project:	PACOOS	Station: NPS5	Longitude:	-123.668	Work week:	45
Platform:	D.S. JORDAN	Cast: 11	Secchi Depth:	---	Day of Year:	311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.4	12	14.854	32.752	24.271	86	0.608	0.083	0.281	0.650	5.773
50	50.4	11	11.224	32.663	24.916	88	3.593	0.368	0.643	3.686	6.099
100	100.7	10	9.562	33.081	25.526	88	15.529	0.064	1.200	14.624	4.951
200	203.9	9	8.072	33.978	26.461	89	29.843	0.063	1.864	37.727	2.483
300	301.7	8	7.337	34.099	26.662	89	35.114	0.055	2.318	54.080	1.364
400	400.6	7	6.277	34.122	26.823	89	38.493	0.064	2.737	70.124	0.927
500	503.5	6	5.472	34.182	26.971	89	41.575	0.070	2.961	87.595	0.536
600	601.5	5	4.878	34.248	27.093	89	43.324	0.063	3.130	100.43	0.318
700	702.9	4	4.641	34.341	27.193	89	43.940	0.050	3.003	108.26	0.246
800	796.3	3	4.450	34.407	27.266	89	44.189	0.055	3.077	114.29	0.307
900	895.7	2	4.151	34.433	27.319	89	44.547	0.112	3.212	120.73	0.368
1000	1015.3	1	3.778	34.472	27.389	89	44.641	0.066	3.193	126.96	0.516

Date: Nov 07, 2007 16:14 Cruise: **S407** Latitude: 35.959 Year: 2007
 Project: PACOOS Station: **67-75** Longitude: -123.848 Work week: 45
 Platform: D.S. JORDAN Cast: **12** Secchi Depth: 22 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.1	12	15.024	32.674	24.174	87	0.130	0.054	0.032	0.676	5.729
5	7.4	11	15.022	32.673	24.174	87	0.104	0.053	0.198	0.477	5.726
10	13.1	10	15.024	32.673	24.174	87	0.146	0.056	0.333	0.429	5.722
20	22.8	9	15.023	32.673	24.174	87	0.122	0.058	0.127	0.359	5.729
30	32.6	8	15.013	32.675	24.177	87	0.226	0.069	0.461	0.163	5.720
40	42.8	7	13.819	32.690	24.440	87	1.717	0.258	0.512	1.781	6.025
60	62.6	6	10.882	32.682	24.992	88	4.552	0.087	0.551	3.624	5.952
80	82.5	5	10.546	32.796	25.139	88	5.494	0.053	0.587	3.243	5.800
100	102.8	4	9.798	32.939	25.377	88	11.389	0.046	0.914	9.753	5.378
150	152.9	3	8.949	33.658	26.075	89	22.863	0.022	1.315	24.908	3.951
200	202.2	2	8.593	34.000	26.398	89	29.800	0.036	1.819	36.670	2.213
1000	1028.4	1	3.683	34.458	27.387	89	44.630	0.029	2.859	130.21	0.459

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.275	0.141	0	100	14.499	52.686	0
5	11	0.270	0.142	10	50	12.843	48.427	8
10	10	0.265	0.136	20	30	10.254	39.754	15
20	9	0.258	0.132	20	15	6.595	25.570	23
30	8	0.259	0.167	40	5	3.078	9.233	36
40	7	0.333	0.237	60	1	0.450	2.358	54
60	6	0.191	0.152	80	0.1	-0.015	-0.172	89
80	5	0.085	0.091					
100	4	0.026	0.030					
150	3	0.006	0.023					
200	2	0.003	0.026					
1000	1	0.004	0.013					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	14.71	mg m-2 day -1	Carbon Fixation:	352.73	mg m-2 day-1
Phaeophytin:	9.07	mg m-2 day -1	Productivity Index:	23.98	mg C mg Chl day-1
Mixed Layer	341	meters	PBOpt:	52.69	mg C mg Chl day-1

Date: Nov 07, 2007 18:59 Cruise: **S407** Latitude: 35.877 Year: 2007
 Project: PACOOS Station: **NPS6** Longitude: -124.022 Work week: 45
 Platform: D.S. JORDAN Cast: **13** Secchi Depth: 21 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.8	12	15.216	32.691	24.145	86	0.003	0.026	0.072	0.545	5.711
0	2.9	11	15.214	32.690	24.145	86	0.020	0.031	0.184	0.342	5.714
50	52.9	10	12.552	32.893	24.848	88	3.479	0.308	0.454	2.640	5.901
100	102.2	9	10.175	32.960	25.330	88	9.966	0.071	0.774	7.743	5.398
200	202.1	8	8.639	33.957	26.358	89	26.485	0.066	1.605	32.291	2.894
300	303.7	7	7.288	34.040	26.623	89	29.809	0.068	2.081	44.551	1.908
400	403.8	6	6.367	34.101	26.795	89	37.917	0.066	2.652	66.673	1.085
500	504.3	5	5.600	34.171	26.947	89	40.579	0.045	2.821	83.136	0.604
600	605.0	4	4.964	34.230	27.069	89	42.421	0.034	2.923	97.852	0.351
700	705.3	3	4.625	34.317	27.176	89	43.131	0.032	3.052	107.12	0.237
900	905.8	2	4.024	34.415	27.318	89	44.452	0.023	3.114	121.99	0.332
1000	1027.5	1	3.763	34.467	27.386	89	43.352	0.043	3.024	127.56	0.507

Date: Nov 07, 2007 21:08 Cruise: **S407** Latitude: 35.793 Year: 2007
 Project: PACOOS Station: **67-80** Longitude: -124.200 Work week: 45
 Platform: D.S. JORDAN Cast: **14** Secchi Depth: 14 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.6	12	14.936	32.864	24.339	84	0.393	0.067	0.153	0.427	5.822
5	7.7	11	15.142	33.002	24.401	84	0.224	0.051	0.213	0.235	5.785
10	12.7	10	15.170	33.094	24.466	85	0.268	0.049	0.231	0.372	5.771
20	22.9	9	15.070	33.120	24.508	86	0.559	0.061	0.088	0.557	5.745
30	32.6	8	14.771	33.101	24.558	86	0.758	0.069	0.053	0.662	5.753
40	42.9	7	13.981	33.060	24.692	87	1.639	0.189	0.305	1.476	5.727
60	62.6	6	11.188	32.795	25.026	88	5.479	0.203	0.374	4.050	5.688
80	82.3	5	10.699	32.915	25.205	88	9.263	0.058	0.647	7.320	5.403
100	102.8	4	10.666	33.239	25.463	88	14.358	0.066	0.935	12.164	4.856
150	152.8	3	9.523	33.889	26.164	88	27.008	0.028	1.638	30.101	2.393
200	203.0	2	8.561	34.021	26.420	89	29.864	0.055	1.952	37.723	2.039
1000	1016.7	1	3.836	34.455	27.369	89	43.659	0.085	2.970	124.56	0.464

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.505	0.168	0	100	27.359	54.180	0
5	11	0.490	0.196	5	50	29.760	60.682	7
10	10	0.520	0.249	10	30	28.129	54.051	12
20	9	0.445	0.267	20	15	13.326	29.944	18
30	8	0.354	0.231	20	5	5.705	12.820	29
40	7	0.265	0.194	30	1	1.197	3.379	47
60	6	0.200	0.189	60	0.1	0.107	0.536	77
80	5	0.114	0.109					
100	4	0.038	0.046					
150	3	0.005	0.028					
200	2	0.003	0.026					
1000	1	0.001	0.009					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	20.94	mg m-2 day -1	Carbon Fixation:	631.35	mg m-2 day-1
Phaeophytin:	11.36	mg m-2 day -1	Productivity Index:	30.15	mg C mg Chl day-1
Mixed Layer	10	meters	PBOpt:	60.68	mg C mg Chl day-1

Date: Nov 07, 2007 23:41 Cruise: **S407** Latitude: 35.710 Year: 2007
 Project: PACOOS Station: **NPS7** Longitude: -124.375 Work week: 45
 Platform: D.S. JORDAN Cast: **15** Secchi Depth: --- Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.3	12	15.641	33.010	24.298	85	0.526	0.073	0.207	0.846	5.690
50	50.4	11	15.170	33.135	24.498	86	0.178	0.061	0.298	0.752	5.651
100	99.2	10	11.105	33.473	25.568	88	17.776	0.071	1.261	15.685	4.265
200	199.5	9	8.423	33.958	26.392	89	27.156	0.034	1.746	33.777	2.825
300	298.8	8	7.597	34.112	26.635	89	33.808	0.084	2.278	52.094	1.419
400	399.8	7	6.648	34.154	26.800	89	37.432	0.066	2.588	67.272	0.902
500	499.3	6	5.939	34.231	26.953	89	40.031	0.049	2.828	81.561	0.476
600	599.9	5	5.494	34.304	27.065	89	41.364	0.055	2.968	91.003	0.288
700	700.5	4	5.009	34.329	27.142	89	42.530	0.036	3.008	99.968	0.259
800	798.6	3	4.696	34.370	27.210	89	43.294	0.045	3.063	106.63	0.268
900	899.1	2	4.140	34.451	27.335	89	43.490	0.037	3.116	120.89	0.423
1000	1018.2	1	3.845	34.470	27.380	89	42.705	0.031	2.958	126.41	0.507

Date: Nov 08, 2007 01:55 Cruise: **S407** Latitude: 35.626 Year: 2007
 Project: PACOOS Station: **67-85** Longitude: -124.555 Work week: 45
 Platform: D.S. JORDAN Cast: **16** Secchi Depth: 14 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.5	12	15.392	32.870	24.245	85	0.347	0.064	0.087	0.892	5.737
5	5.7	11	15.399	32.869	24.243	85	0.027	0.048	0.084	0.615	5.738
10	10.8	10	15.376	32.868	24.247	85	0.170	0.077	0.224	0.436	5.741
20	20.7	9	15.207	32.880	24.293	85	0.178	0.071	0.255	0.687	5.783
30	30.6	8	14.825	32.862	24.362	85	0.408	0.063	0.122	0.679	5.808
40	40.4	7	13.170	32.751	24.618	86	1.536	0.205	0.287	2.009	6.062
60	60.3	6	10.784	32.699	25.022	88	5.137	0.160	0.488	3.974	5.924
80	80.6	5	10.593	32.876	25.193	88	8.360	0.072	0.627	6.659	5.561
100	99.8	4	11.215	33.437	25.520	88	16.474	0.128	1.233	14.142	4.450
150	151.3	3	8.726	33.795	26.217	88	24.849	0.072	1.672	28.895	3.266
200	200.8	2	8.280	33.964	26.419	89	26.933	0.032	1.609	34.469	2.955
1000	1028.0	1	3.748	34.464	27.385	89	44.243	0.051	2.823	126.03	0.486

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.361	0.098	0	100	12.108	33.496	0
5	11	0.341	0.097	5	50	14.289	41.953	8
10	10	0.380	0.111	10	30	14.532	38.279	14
20	9	0.546	0.149	20	15	15.622	28.620	21
30	8	0.495	0.154	20	5	6.818	12.490	31
40	7	0.470	0.220	30	1	1.415	2.859	48
60	6	0.250	0.157	60	0.1	0.123	0.493	76
80	5	0.123	0.089					
100	4	0.054	0.047					
150	3	0.004	0.007					
200	2	0.003	0.003					
1000	1	0.002	0.002					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	22.52	mg m-2 day -1	Carbon Fixation:	480.89	mg m-2 day-1
Phaeophytin:	6.36	mg m-2 day -1	Productivity Index:	21.35	mg C mg Chl day-1
Mixed Layer	725	meters	PBOpt:	41.95	mg C mg Chl day-1

Date: Nov 08, 2007 04:41 Cruise: **S407** Latitude: 35.542 Year: 2007
 Project: PACOOS Station: **NPS8** Longitude: -124.733 Work week: 45
 Platform: D.S. JORDAN Cast: **17** Secchi Depth: --- Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.6	12	15.145	32.872	24.300	85	0.089	0.040	0.299	1.452	5.794
50	52.2	11	12.795	33.037	24.913	88	5.053	0.496	0.575	4.170	5.584
100	102.1	10	9.972	33.465	25.758	88	19.721	0.044	1.261	18.655	4.154
200	201.9	9	8.251	33.964	26.423	88	25.347	0.041	1.709	32.848	2.987
300	299.0	8	7.163	34.047	26.646	89	34.296	0.047	2.207	53.245	1.699
400	398.2	7	6.280	34.117	26.819	89	38.121	0.005	2.378	67.937	0.962
500	499.1	6	5.548	34.165	26.949	89	40.084	0.006	2.684	79.933	0.615
600	598.4	5	4.854	34.208	27.064	89	42.861	0.007	2.968	96.858	0.414
700	700.2	4	4.667	34.311	27.167	89	43.527	0.038	3.227	105.70	0.243
800	801.7	3	4.315	34.363	27.246	89	44.133	0.061	3.098	115.32	0.246
900	903.9	2	4.056	34.417	27.316	89	43.916	0.067	3.314	121.09	0.334
1000	1026.8	1	3.695	34.457	27.385	89	44.505	0.044	3.081	128.85	0.459

Date: Nov 08, 2007 06:59 Cruise: **S407** Latitude: 35.459 Year: 2007
 Project: PACOOS Station: **67-90** Longitude: -124.907 Work week: 45
 Platform: D.S. JORDAN Cast: **18** Secchi Depth: --- Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
300	305.1	12	7.255	34.064	26.646	89	34.265	0.059	2.011	53.726	1.638
400	405.3	11	6.070	34.064	26.804	89	37.402	0.039	2.347	68.166	1.275
500	505.3	10	5.297	34.131	26.952	89	40.974	0.051	2.718	85.430	0.750
600	606.9	9	4.881	34.222	27.072	89	39.999	0.151	2.937	95.270	0.380
700	705.8	8	4.583	34.309	27.174	89	42.842	0.060	2.947	107.46	0.242
800	807.1	7	4.265	34.355	27.245	89	44.106	0.056	3.068	116.18	0.235
900	907.8	6	4.015	34.411	27.316	89	44.581	0.017	3.165	123.03	0.311
1000	1008.5	5	3.791	34.449	27.369	89	44.340	0.082	3.076	127.31	0.422
1250	1261.7	4	3.248	34.518	27.477	89	44.150	0.131	3.180	139.73	0.786
1500	1514.6	3	2.782	34.557	27.551	89	43.540	0.010	2.914	150.16	1.073
1750	1768.9	2	2.396	34.582	27.604	89	42.969	0.034	2.930	162.83	1.315
2000	2019.2	1	2.104	34.610	27.651	89	43.434	0.060	2.984	169.00	1.653

Date: Nov 08, 2007 09:22 Cruise: **S407** Latitude: 35.452 Year: 2007
 Project: PACOOS Station: **67-90** Longitude: -124.898 Work week: 45
 Platform: D.S. JORDAN Cast: **19** Secchi Depth: 14 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.4	12	15.700	33.035	24.304	85	0.085	0.073	0.040	0.866	5.655
5	7.7	11	15.656	33.035	24.313	85	0.074	0.061	0.288	0.472	5.658
10	12.1	10	15.658	33.035	24.313	85	0.098	0.037	0.323	0.025	5.661
20	22.7	9	15.521	33.031	24.340	85	0.055	0.058	0.223	0.383	5.689
30	32.6	8	15.596	33.166	24.428	86	0.309	0.075	0.263	0.443	5.659
40	42.6	7	14.702	33.123	24.589	87	1.418	0.145	0.215	1.587	5.684
60	62.6	6	11.233	32.894	25.095	88	6.954	0.395	0.520	4.887	5.613
80	82.7	5	10.135	32.943	25.324	88	9.800	0.105	0.822	7.920	5.420
100	103.1	4	10.472	33.323	25.563	88	16.613	0.093	1.400	14.830	4.623
150	153.2	3	9.143	33.797	26.153	88	24.853	0.093	1.893	27.313	3.135
200	203.1	2	8.466	33.955	26.383	88	26.115	0.110	1.851	33.288	3.126
200	203.2	1	8.474	33.955	26.382	88	26.106	0.090	1.694	33.115	3.113

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.326	0.122	0	100	13.093	40.157	0
5	11	0.311	0.082	5	50	14.891	47.941	8
10	10	0.339	0.109	10	30	15.109	44.601	14
20	9	0.446	0.087	20	15	13.315	29.859	22
30	8	0.404	0.202	20	5	5.668	12.710	33
40	7	0.286	0.163	40	1	1.201	4.197	53
60	6	0.103	0.099	60	0.1	0.120	1.174	95
80	5	0.071	0.053					
100	4	0.050	0.033					
150	3	0.004	0.008					
200	2	0.003	0.003					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	20.06	mg m-2 day -1	Carbon Fixation:	491.82	mg m-2 day-1
Phaeophytin:	5.68	mg m-2 day -1	Productivity Index:	24.52	mg C mg Chl day-1
Mixed Layer	58	meters	PBOpt:	47.94	mg C mg Chl day-1

Date: Nov 08, 2007 12:19 Cruise: **S407** Latitude: 35.750 Year: 2007
 Project: PACOOS Station: **62.25-90** Longitude: -125.123 Work week: 45
 Platform: D.S. JORDAN Cast: **20** Secchi Depth: 14 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.6	12	15.264	32.685	24.131	87	0.094	0.048	0.056	1.535	5.685
10	9.4	11	15.253	32.685	24.133	87	0.091	0.061	0.353	1.681	5.682
25	25.7	10	15.142	32.675	24.149	87	0.008	0.051	0.181	1.182	5.711
50	50.5	9	14.196	32.783	24.434	87	0.706	0.127	0.575	0.973	5.897
100	101.9	8	10.080	32.846	25.257	88	6.313	0.097	0.740	5.092	5.708
200	200.8	7	8.325	33.913	26.371	88	23.854	0.090	1.396	30.666	3.804
500	500.6	6	5.304	34.124	26.945	89	40.917	0.126	2.999	85.765	0.729
600	599.3	5	4.983	34.218	27.058	89	42.680	0.053	2.907	97.586	0.371
700	697.9	4	4.469	34.270	27.156	89	43.812	0.206	3.348	110.22	0.254
800	798.5	3	4.395	34.359	27.235	89	44.028	0.044	3.348	114.78	0.239
900	900.7	2	4.042	34.417	27.318	89	44.437	0.020	3.332	122.90	0.326
1000	1026.6	1	3.713	34.460	27.386	89	44.534	0.053	3.444	131.42	0.463

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.236	0.077	0	100	7.739	32.772	0
10	11	0.224	0.078	10	50	9.235	41.168	9
25	10	0.251	0.097	10	30	7.990	35.619	16
50	9	0.303	0.173	10	15	5.693	25.379	26
100	8	0.045	0.050	25	5	2.825	11.268	39
200	7	0.003	0.005	50	1	0.842	2.776	60
500	6	0.002	0.000	50	0.1	0.127	0.419	92
600	5	0.001	0.000					
700	4	0.001	0.000					
800	3	0.001	0.001					
900	2	0.000	0.002					
1000	1	0.001	0.003					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	14.71	mg m-2 day -1	Carbon Fixation:	297.23	mg m-2 day-1
Phaeophytin:	5.95	mg m-2 day -1	Productivity Index:	20.20	mg C mg Chl day-1
Mixed Layer	653	meters	PBOpt:	41.17	mg C mg Chl day-1

Date: Nov 08, 2007 15:44 Cruise: **S407** Latitude: 36.038 Year: 2007
 Project: PACOOS Station: **63.5-90** Longitude: -125.339 Work week: 45
 Platform: D.S. JORDAN Cast: **21** Secchi Depth: 17 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.8	12	14.996	32.699	24.200	87	0.114	0.065	0.276	2.421	5.726
5	7.9	11	14.999	32.698	24.198	87	0.142	0.054	0.265	2.161	5.724
10	13.1	10	14.872	32.684	24.215	87	0.327	0.133	0.209	2.043	5.757
20	23.2	9	14.794	32.676	24.225	87	0.233	0.057	0.259	1.807	5.762
40	43.2	8	14.310	32.710	24.354	87	0.933	0.114	0.238	1.776	5.818
60	62.3	7	13.195	32.848	24.688	87	0.337	0.088	0.234	1.534	6.186
80	82.7	6	11.729	32.880	24.993	88	1.558	0.263	0.326	2.177	5.906
100	103.1	5	11.327	32.946	25.118	88	3.960	0.059	0.445	2.837	5.732
200	203.1	4	8.381	33.888	26.343	88	24.970	0.037	1.544	28.501	3.474
500	500.5	3	5.251	34.109	26.939	89	40.906	0.038	2.733	80.114	0.810
750	749.5	2	4.324	34.306	27.200	89	44.024	0.058	3.157	108.53	0.225
1000	1019.6	1	3.507	34.434	27.386	89	44.675	0.040	3.051	128.70	0.349

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.272	0.104	0	100	10.801	39.776	0
5	11	0.274	0.116	5	50	9.886	36.043	9
10	10	0.296	0.128	10	30	9.476	32.006	15
20	9	0.303	0.133	20	15	6.701	22.091	23
40	8	0.321	0.156	20	5	2.981	9.828	35
60	7	0.318	0.226	40	1	0.768	2.397	53
80	6	0.186	0.168	60	0.1	0.142	0.446	80
100	5	0.072	0.089					
200	4	0.005	0.019					
500	3	0.001	0.007					
750	2	0.001	0.004					
1000	1	0.002	0.013					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	15.96	mg m-2 day -1	Carbon Fixation:	308.38	mg m-2 day-1
Phaeophytin:	7.03	mg m-2 day -1	Productivity Index:	19.32	mg C mg Chl day-1
Mixed Layer	995	meters	PBOpt:	39.78	mg C mg Chl day-1

Date: Nov 08, 2007 19:15 Cruise: **S407** Latitude: 36.325 Year: 2007
 Project: PACOOS Station: **61.75-90** Longitude: -125.554 Work week: 45
 Platform: D.S. JORDAN Cast: **22** Secchi Depth: 20 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.2	12	14.779	32.704	24.250	86	0.423	0.105	0.293	1.774	5.779
5	8.2	11	14.438	32.667	24.294	86	0.749	0.078	0.308	1.805	5.839
10	13.7	10	14.203	32.689	24.360	86	1.135	0.119	0.286	1.692	5.886
20	23.6	9	14.088	32.712	24.401	86	1.175	0.137	0.387	1.603	5.893
40	43.7	8	11.757	32.687	24.838	87	2.877	0.330	0.721	3.656	6.122
60	62.9	7	10.472	32.669	25.053	88	5.549	0.141	0.855	4.879	5.933
80	81.4	6	9.937	32.714	25.178	88	7.345	0.098	0.736	5.670	5.774
100	103.0	5	9.691	32.907	25.369	88	10.409	0.081	0.798	8.597	5.390
200	203.7	4	8.237	33.917	26.388	88	29.854	0.055	1.945	36.519	2.362
500	504.9	3	5.110	34.141	26.981	89	41.620	0.090	2.997	82.319	0.631
750	756.7	2	4.224	34.322	27.224	89	43.676	0.089	3.307	110.07	0.218
1000	1028.9	1	3.431	34.452	27.407	89	43.771	0.047	3.380	132.17	0.399

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.287	0.101	0	100	15.928	55.500	0
5	11	0.395	0.177	10	50	12.267	30.979	8
10	10	0.396	0.176	10	30	14.944	37.740	13
20	9	0.312	0.163	20	15	8.463	27.166	21
40	8	0.338	0.229	40	5	3.551	10.512	33
60	7	0.207	0.143	60	1	0.618	2.987	51
80	6	0.115	0.074	80	0.1	0.064	0.557	83
100	5	0.038	0.032					
200	4	0.004	0.021					
500	3	0.003	0.009					
750	2	0.002	0.007					
1000	1	0.002	0.007					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.30	mg m-2 day -1	Carbon Fixation:	380.67	mg m-2 day-1
Phaeophytin:	9.03	mg m-2 day -1	Productivity Index:	23.36	mg C mg Chl day-1
Mixed Layer	947	meters	PBOpt:	55.5	mg C mg Chl day-1

Date: Nov 08, 2007 22:23 Cruise: **S407** Latitude: 36.614 Year: 2007
 Project: PACOOS Station: **60-90** Longitude: -125.771 Work week: 45
 Platform: D.S. JORDAN Cast: **23** Secchi Depth: 17 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.5	12	13.961	32.717	24.431	85	1.554	0.197	0.499	2.605	5.943
5	8.4	11	13.964	32.716	24.430	85	1.501	0.163	0.640	2.385	5.943
10	13.6	10	13.876	32.717	24.449	85	1.453	0.144	0.537	2.080	5.945
20	23.8	9	13.665	32.748	24.516	85	2.168	0.201	0.425	2.138	5.939
30	33.4	8	13.840	32.848	24.558	86	2.550	0.187	0.271	2.227	5.859
40	43.4	7	12.095	32.738	24.815	87	3.951	0.351	0.449	3.704	5.908
60	63.4	6	9.741	33.067	25.486	88	15.678	0.093	1.159	13.893	4.987
80	83.4	5	9.394	33.435	25.830	88	21.061	0.184	1.700	20.888	4.260
100	103.9	4	9.015	33.628	26.041	88	24.296	0.115	1.707	25.443	3.745
150	153.5	3	8.171	33.903	26.387	88	27.493	0.115	1.841	32.572	3.144
200	204.6	2	7.603	33.963	26.518	88	29.423	0.195	1.960	39.108	2.723
2000	2020.7	1	1.961	34.614	27.665	89	---	---	---	---	1.675

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.425	0.145	0	100	25.965	61.089	0
5	11	0.427	0.141	5	50	28.857	67.602	7
10	10	0.461	0.176	10	30	23.771	51.523	12
20	9	0.488	0.193	20	15	15.674	32.138	19
30	8	0.440	0.193	30	5	6.231	14.176	30
40	7	0.350	0.206	40	1	1.327	3.794	48
60	6	0.069	0.070	60	0.1	0.088	1.280	93
80	5	0.030	0.049					
100	4	0.010	0.031					
150	3	0.004	0.023					
200	2	0.003	0.018					
2000	1	0.001	0.005					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	20.91	mg m-2 day -1	Carbon Fixation:	657.38	mg m-2 day-1
Phaeophytin:	8.88	mg m-2 day -1	Productivity Index:	31.45	mg C mg Chl day-1
Mixed Layer	983	meters	PBOpt:	67.6	mg C mg Chl day-1

Date: Nov 09, 2007 02:34 Cruise: **S407** Latitude: 36.781 Year: 2007
 Project: PACOOS Station: **60-85** Longitude: -125.412 Work week: 45
 Platform: D.S. JORDAN Cast: **24** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.4	12	14.838	32.868	24.364	85	1.027	0.128	0.147	1.535	5.793
5	4.9	11	14.841	32.867	24.362	85	1.213	0.161	0.384	1.351	5.794
10	10.0	10	14.746	32.866	24.382	84	1.170	0.145	0.404	1.373	5.813
20	20.6	9	14.708	32.866	24.390	84	1.285	0.147	0.428	1.262	5.813
40	40.3	8	11.585	32.942	25.068	87	9.026	0.423	0.601	6.491	5.476
60	59.9	7	10.375	33.301	25.562	88	17.786	0.093	1.101	15.592	4.601
80	80.4	6	9.477	33.569	25.921	88	24.699	0.102	1.621	24.667	3.883
100	99.8	5	8.852	33.762	26.172	88	26.720	0.085	1.683	28.744	3.320
200	199.8	4	7.434	33.976	26.552	88	31.789	0.077	2.179	41.991	2.307
500	499.5	3	5.060	34.141	26.987	88	39.124	0.064	3.032	83.563	0.616
750	751.5	2	4.098	34.337	27.248	88	40.819	0.075	---	111.77	0.222
1000	1022.8	1	3.463	34.470	27.418	88	44.719	0.078	3.286	132.02	0.485

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.375	0.140	0	100	21.539	57.422	0
5	11	0.388	0.123	5	50	27.748	71.552	8
10	10	0.460	0.146	10	30	24.809	53.984	13
20	9	0.511	0.181	20	15	18.983	37.125	20
40	8	0.361	0.236	20	5	7.732	15.121	31
60	7	0.226	0.167	40	1	1.300	3.605	47
80	6	0.064	0.060	60	0.1	0.095	0.420	77
100	5	0.012	0.039					
200	4	0.001	0.024					
500	3	0.001	0.010					
750	2	0.000	0.009					
1000	1	0.000	0.007					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	21.38	mg m-2 day -1	Carbon Fixation:	696.46	mg m-2 day-1
Phaeophytin:	8.32	mg m-2 day -1	Productivity Index:	32.57	mg C mg Chl day-1
Mixed Layer	15	meters	PBOpt:	71.55	mg C mg Chl day-1

Date: Nov 09, 2007 06:21 Cruise: **S407** Latitude: 36.947 Year: 2007
 Project: PACOOS Station: **60-80** Longitude: -125.055 Work week: 45
 Platform: D.S. JORDAN Cast: **25** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.5	12	14.920	32.910	24.379	85	1.301	0.129	0.200	1.854	5.743
10	12.6	11	14.916	32.910	24.379	85	1.230	0.117	0.423	1.462	5.740
20	22.4	10	14.604	32.880	24.423	86	1.486	0.137	0.312	1.364	5.752
40	42.2	9	10.643	33.110	25.367	87	14.012	0.215	1.307	11.196	5.108
60	62.5	8	9.871	33.488	25.793	88	20.633	0.125	1.749	19.363	4.180
80	82.5	7	9.164	33.645	26.031	88	25.181	0.103	1.653	26.309	3.651
100	102.3	6	8.856	33.768	26.176	88	24.988	0.088	1.735	27.329	3.354
200	202.9	5	7.418	33.961	26.542	88	---	---	---	---	2.889
400	403.6	4	5.538	34.098	26.897	88	40.353	0.074	2.810	74.364	0.870
600	604.9	3	4.509	34.245	27.132	88	43.648	0.072	3.071	102.59	0.289
800	805.4	2	4.038	34.380	27.289	88	44.329	0.069	2.977	116.17	0.248
1000	1023.7	1	3.546	34.453	27.397	88	40.124	0.066	3.083	126.59	0.407

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.426	0.126	0	100	19.122	44.893	0
10	11	0.427	0.116	10	50	17.608	41.251	7
20	10	0.408	0.119	20	30	17.100	41.933	13
40	9	0.320	0.170	40	15	5.980	18.704	20
60	8	0.074	0.060	40	5	3.831	11.984	33
80	7	0.032	0.047	60	1	0.185	2.511	53
100	6	0.024	0.031	80	0.1	0.029	0.932	103
200	5	0.009	0.024					
400	4	0.004	0.012					
600	3	0.001	0.003					
800	2	0.000	0.002					
1000	1	0.001	0.001					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	16.03	mg m-2 day -1	Carbon Fixation:	418.05	mg m-2 day-1
Phaeophytin:	7.00	mg m-2 day -1	Productivity Index:	26.08	mg C mg Chl day-1
Mixed Layer	980	meters	PBOpt:	44.89	mg C mg Chl day-1

Date: Nov 09, 2007 10:15 Cruise: **S407** Latitude: 37.114 Year: 2007
 Project: PACOOS Station: **60-75** Longitude: -124.693 Work week: 45
 Platform: D.S. JORDAN Cast: **26** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)	O2 (ml l-1)
0	2.6	12	13.271	32.754	24.600	84	2.106	0.149	0.468	3.205	6.061
10	12.5	11	12.922	32.818	24.718	85	3.234	0.168	0.420	3.586	6.069
20	22.2	10	12.285	32.822	24.844	85	5.837	0.260	0.137	5.713	6.029
40	42.9	9	9.799	32.813	25.278	88	10.880	0.078	0.820	8.917	5.482
60	62.6	8	9.438	33.281	25.702	88	17.338	0.087	1.091	16.220	4.686
80	82.7	7	8.997	33.598	26.021	89	21.068	0.080	1.277	21.074	3.992
100	102.7	6	9.045	33.856	26.216	89	27.001	0.074	1.909	28.864	2.637
200	201.5	5	7.968	34.071	26.549	89	33.002	0.055	2.205	42.999	1.540
400	402.1	4	5.903	34.109	26.861	89	38.958	0.066	2.686	70.405	0.928
600	604.9	3	5.211	34.310	27.104	89	41.977	0.103	3.171	91.471	0.273
800	805.4	2	4.403	34.399	27.266	89	43.669	0.079	3.093	108.86	0.298
1000	1014.5	1	3.796	34.468	27.384	89	43.570	0.061	3.279	120.70	0.507

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.863	0.316	0	100	49.030	56.826	0
10	11	0.845	0.275	10	50	46.047	54.517	5
20	10	0.836	0.326	20	30	32.175	38.508	9
40	9	0.262	0.136	40	15	4.677	17.820	15
60	8	0.047	0.098	40	5	3.061	11.664	24
80	7	0.013	0.046	60	1	0.099	2.097	39
100	6	0.012	0.215	80	0.1	0.000	0.000	77
200	5	0.001	0.052					
400	4	0.001	0.012					
600	3	0.001	0.011					
800	2	0.001	0.010					
1000	1	0.001	0.008					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	15.62	mg m-2 day -1	Carbon Fixation:	570.84	mg m-2 day-1
Phaeophytin:	7.02	mg m-2 day -1	Productivity Index:	36.54	mg C mg Chl day-1
Mixed Layer	907	meters	PBOpt:	56.83	mg C mg Chl day-1

Date: Nov 09, 2007 13:58 Cruise: **S407** Latitude: 37.281 Year: 2007
 Project: PACOOS Station: **60-70** Longitude: -124.331 Work week: 45
 Platform: D.S. JORDAN Cast: **27** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.0	12	13.561	33.181	24.872	87	4.772	0.242	0.211	4.368	5.900
10	10.0	11	13.564	33.181	24.871	87	4.819	0.258	0.284	4.058	5.903
20	19.8	10	13.362	33.217	24.939	87	5.759	0.305	0.466	4.661	5.897
40	40.3	9	11.447	33.441	25.481	88	16.347	0.139	1.072	14.049	4.456
60	60.1	8	10.743	33.602	25.733	88	21.393	0.062	1.264	20.039	3.682
80	79.8	7	10.124	33.754	25.958	88	25.095	0.036	1.595	26.444	2.870
100	99.5	6	9.785	33.826	26.071	88	26.462	0.035	1.692	28.426	2.588
200	200.2	5	8.126	34.050	26.509	89	31.330	0.050	2.119	39.457	1.866
400	399.2	4	6.281	34.151	26.846	89	38.340	0.048	2.665	67.272	0.819
600	602.1	3	5.102	34.278	27.091	89	42.117	0.060	3.038	92.800	0.293
800	799.1	2	4.414	34.376	27.246	89	42.921	0.098	3.296	105.74	0.255
1000	1027.2	1	3.688	34.453	27.383	89	44.055	0.074	3.435	123.02	0.422

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.387	0.108	0	100	21.330	55.130	0
10	11	0.381	0.138	10	50	19.837	52.129	8
20	10	0.549	0.186	10	30	13.898	36.521	13
40	9	0.261	0.181	20	15	15.460	28.182	20
60	8	0.131	0.143	20	5	7.370	13.436	31
80	7	0.039	0.144	40	1	0.818	3.138	50
100	6	0.022	0.118	60	0.1	0.108	0.829	84
200	5	0.003	0.043					
400	4	0.002	0.018					
600	3	0.001	0.011					
800	2	0.001	0.010					
1000	1	0.000	0.007					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	22.02	mg m-2 day -1	Carbon Fixation:	557.23	mg m-2 day-1
Phaeophytin:	8.34	mg m-2 day -1	Productivity Index:	25.31	mg C mg Chl day-1
Mixed Layer	21	meters	PBOpt:	55.13	mg C mg Chl day-1

Date: Nov 09, 2007 17:51 Cruise: **S407** Latitude: 37.444 Year: 2007
 Project: PACOOS Station: **60-65** Longitude: -123.969 Work week: 45
 Platform: D.S. JORDAN Cast: **28** Secchi Depth: 21 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.1	12	13.831	33.189	24.822	86	4.012	0.193	0.182	3.607	5.883
10	13.5	11	13.522	33.249	24.932	87	5.449	0.233	0.320	4.615	5.908
20	23.5	10	12.372	33.287	25.188	87	12.841	0.553	0.987	10.250	5.046
40	42.8	9	10.390	33.467	25.689	88	20.225	0.109	1.661	18.746	4.050
60	63.6	8	10.024	33.744	25.967	88	24.907	0.072	2.038	25.234	2.986
80	83.7	7	9.705	33.839	26.095	88	26.475	0.059	2.144	27.922	2.555
100	103.2	6	9.375	33.893	26.191	88	27.367	0.069	2.075	29.620	2.265
200	203.4	5	8.480	34.093	26.489	88	31.977	0.074	2.449	40.246	1.459
400	403.5	4	6.244	34.157	26.855	89	38.550	0.106	2.999	68.546	0.789
600	605.6	3	5.096	34.269	27.085	89	42.301	0.050	3.318	90.234	0.288
800	806.5	2	4.460	34.376	27.241	89	43.517	0.076	3.309	105.29	0.266
1000	1025.6	1	3.781	34.460	27.379	89	43.869	0.094	3.326	122.38	0.450

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)	DEP (m)	% S. I.	CARBON (mg m-3 d-1)	PROD INDEX carbon/chl (mg m-3 d-1)	LIGHT DEPTH (m)
0	12	0.518	0.118	0	100	13.717	26.497	0
10	11	0.512	0.163	10	50	13.603	26.557	7
20	10	0.417	0.271	10	30	13.675	26.698	12
40	9	0.224	0.166	20	15	6.425	15.413	19
60	8	0.040	0.091	40	5	1.479	6.594	30
80	7	0.020	0.086	60	1	0.195	4.891	50
100	6	0.012	0.081	80	0.1	0.375	18.759	95
200	5	0.004	0.059					
400	4	0.002	0.027					
600	3	0.002	0.013					
800	2	0.001	0.020					
1000	1	0.002	0.012					

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	15.65	mg m-2 day -1	Carbon Fixation:	293.22	mg m-2 day-1
Phaeophytin:	8.38	mg m-2 day -1	Productivity Index:	18.73	mg C mg Chl day-1
Mixed Layer	202	meters	PBOpt:	26.7	mg C mg Chl day-1

Date: Nov 09, 2007 21:40 Cruise: **S407** Latitude: 37.614 Year: 2007
 Project: PACOOS Station: **60-60** Longitude: -123.608 Work week: 45
 Platform: D.S. JORDAN Cast: **29** Secchi Depth: 14 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.0	12	13.777	33.009	24.695	85	2.500	0.129	0.048	3.073	5.956
10	12.8	11	13.551	32.993	24.728	84	2.895	0.138	0.206	3.393	5.973
20	22.8	10	13.299	33.079	24.846	85	4.289	0.282	0.910	4.277	5.961
40	42.8	9	11.000	32.960	25.187	87	11.297	0.380	0.662	9.593	5.422
60	62.4	8	9.786	33.194	25.577	88	13.868	0.078	1.048	12.397	4.733
80	82.8	7	9.632	33.723	26.016	88	---	---	---	---	3.143
100	102.9	6	9.101	33.838	26.192	89	26.702	0.092	1.745	28.497	2.736
200	202.6	5	8.112	34.067	26.525	89	30.860	0.116	2.095	38.943	1.683
400	403.4	4	6.182	34.141	26.851	89	---	---	---	---	0.819
600	605.5	3	5.197	34.273	27.076	89	39.855	0.039	2.791	87.276	0.299
800	807.1	2	4.356	34.374	27.250	89	41.221	0.074	2.934	107.76	0.251
1000	1019.5	1	3.783	34.456	27.375	89	---	---	---	---	0.425

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)
0	12	0.643	0.139
10	11	0.745	0.205
20	10	0.681	0.226
40	9	0.526	0.289
60	8	0.119	0.084
80	7	0.023	0.082
100	6	0.006	0.053
200	5	0.002	0.029
400	4	0.002	0.022
600	3	0.002	0.015
800	2	0.002	0.013
1000	1	0.001	0.016

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	---	mg m-2 day -1	Carbon Fixation:	---	mg m-2 day-1
Phaeophytin:	---	mg m-2 day -1	Productivity Index:	---	mg C mg Chl day-1
Mixed Layer	788	meters	PBOpt:	---	mg C mg Chl day-1

Date: Nov 10, 2007 00:15 Cruise: **S407** Latitude: 37.697 Year: 2007
 Project: PACOOS Station: **60-57.5** Longitude: -123.427 Work week: 45
 Platform: D.S. JORDAN Cast: **30** Secchi Depth: 16 Day of Year: 314

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	2.4	12	13.585	33.169	24.858	85	5.280	0.259	0.264	4.372	5.982
10	10.0	11	13.058	33.153	24.951	85	5.168	0.269	0.412	5.205	6.070
20	20.1	10	12.471	33.260	25.148	86	3.879	0.239	0.161	5.272	6.361
40	39.5	9	10.939	33.533	25.644	88	19.662	0.054	1.236	17.656	3.992
60	60.0	8	10.311	33.650	25.845	88	23.410	0.057	1.400	22.605	3.400
80	79.7	7	9.705	33.706	25.991	89	24.793	0.042	1.410	24.078	3.299
100	100.1	6	9.231	33.824	26.161	89	27.545	0.147	1.925	27.842	2.788
200	201.3	5	8.422	34.058	26.471	89	33.441	0.074	1.883	38.227	1.738
400	402.0	4	6.577	34.162	26.816	89	37.371	0.059	2.499	62.508	0.844
600	597.9	3	5.105	34.276	27.089	89	41.977	0.047	2.787	88.558	0.301
800	802.2	2	4.393	34.387	27.257	89	43.219	0.052	2.849	105.48	0.279
1000	1013.0	1	3.669	34.466	27.395	89	44.682	0.065	2.985	120.18	0.474

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)
0	12	0.836	0.173
10	11	0.826	0.267
20	10	1.117	0.494
40	9	0.177	0.159
60	8	0.099	0.132
80	7	0.074	0.132
100	6	0.023	0.099
200	5	0.009	0.067
400	4	0.006	0.050
600	3	0.003	0.040
800	2	0.004	0.025
1000	1	0.002	0.023

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	---	mg m-2 day -1	Carbon Fixation:	---	mg m-2 day-1
Phaeophytin:	---	mg m-2 day -1	Productivity Index:	---	mg C mg Chl day-1
Mixed Layer	682	meters	PBOpt:	---	mg C mg Chl day-1

Date	Nov 10, 2007 03:02	Cruise: S407	Latitude:	37.781	Year:	2007
Project:	PACOOS	Station: 60-55	Longitude:	-123.245	Work week:	45
Platform:	D.S. JORDAN	Cast: 31	Secchi Depth:	---	Day of Year:	314

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.5	12	12.835	33.317	25.122	79	1.003	0.206	0.071	9.325	7.794
5	4.9	11	12.752	33.316	25.137	78	0.956	0.048	0.094	7.984	7.317
10	10.0	10	12.432	33.334	25.214	85	4.696	0.044	0.412	7.733	6.035
20	20.3	9	11.537	33.463	25.481	87	14.365	0.031	0.881	14.925	4.550
30	29.9	8	10.871	33.599	25.708	87	20.533	0.048	1.448	21.571	3.682
40	40.4	7	10.614	33.651	25.793	88	23.452	0.063	1.489	22.186	3.358
60	59.7	6	10.001	33.797	26.012	86	26.099	0.039	1.732	30.246	2.412
80	80.4	5	9.648	33.876	26.133	85	---	---	---	---	1.890
100	100.7	4	9.622	33.881	26.141	85	28.513	0.055	2.003	36.323	1.846
100	100.5	3	9.621	33.881	26.142	85	---	---	---	---	1.848
115	116.1	2	9.592	33.886	26.150	85	---	---	---	---	1.891
115	116.5	1	9.572	33.889	26.156	85	---	---	---	---	1.901

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)
0	12	13.169	0.821
5	11	17.892	1.186
10	10	4.768	0.531
20	9	0.500	0.433
30	8	0.377	0.458
40	7	0.152	0.271
60	6	0.120	0.247
80	5	0.081	0.342
100	4	0.088	0.374
100	3	0.074	0.388
115	2	0.064	0.338

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	---	mg m-2 day -1	Carbon Fixation:	---	mg m-2 day-1
Phaeophytin:	---	mg m-2 day -1	Productivity Index:	---	mg C mg Chl day-1
Mixed Layer	9	meters	PBOpt:	---	mg C mg Chl day-1

Date	Nov 10, 2007 05:04	Cruise: S407	Latitude:	37.861	Year:	2007
Project:	PACOOS	Station: 60-52.5	Longitude:	-123.074	Work week:	45
Platform:	D.S. JORDAN	Cast: 32	Secchi Depth:	---	Day of Year:	314

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (μM)	NO2 (μM)	PO4 (μM)	SIO4 (μM)	O2 (ml l-1)
0	3.5	12	12.747	33.306	25.131	85	5.302	0.073	0.337	9.225	7.233
5	8.3	11	12.637	33.311	25.156	86	6.335	0.056	0.401	9.391	6.395
10	13.4	10	12.599	33.311	25.163	86	5.704	0.060	0.368	8.281	6.245
20	23.8	9	12.056	33.370	25.313	87	12.128	0.027	0.907	13.839	5.306
30	33.6	8	11.358	33.445	25.500	88	16.000	0.032	0.864	16.965	4.542
40	43.8	7	10.684	33.601	25.742	88	22.420	0.028	1.542	25.241	3.397
60	63.2	6	9.888	33.773	26.012	88	26.585	0.037	1.694	30.328	2.642
80	83.3	5	9.740	33.819	26.073	86	26.735	0.037	1.790	32.837	2.323
80	82.7	4	9.745	33.818	26.072	86	---	---	---	---	2.324
80	83.1	3	9.742	33.819	26.073	86	---	---	---	---	2.324
80	83.1	2	9.743	33.819	26.073	86	---	---	---	---	2.326
80	83.2	1	9.741	33.819	26.073	86	---	---	---	---	2.323

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)
0	12	2.116	0.258
5	11	2.125	0.317
10	10	2.043	0.763
20	9	0.781	0.491
30	8	0.490	0.451
40	7	0.222	0.329
60	6	0.106	0.286
80	5	0.103	0.407

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	---	mg m-2 day -1	Carbon Fixation:	---	mg m-2 day-1
Phaeophytin:	---	mg m-2 day -1	Productivity Index:	---	mg C mg Chl day-1
Mixed Layer	---	meters	PBOpt:	---	mg C mg Chl day-1

Date	Nov 10, 2007 07:06	Cruise: S407	Latitude:	37.947	Year:	2007
Project:	PACOOS	Station: 60-50	Longitude:	-122.889	Work week:	45
Platform:	D.S. JORDAN	Cast: 33	Secchi Depth:	---	Day of Year:	314

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

DEP (m)	PRESS (db)	BTL #	TEMP (°C)	SAL (psu)	SIGMA T	TRANSMISS (%)	NO3 (µM)	NO2 (µM)	PO4 (µM)	SIO4 (µM)	O2 (ml l-1)
0	3.1	12	13.036	33.209	24.998	79	0.811	0.087	0.017	9.781	8.510
5	8.6	11	12.824	33.203	25.036	79	2.717	0.076	0.307	10.800	7.146
10	13.8	10	12.649	33.201	25.068	81	6.487	0.069	0.588	14.009	6.295
20	23.5	9	11.174	33.517	25.590	86	21.774	0.062	1.707	25.755	3.499
30	33.7	8	10.446	33.725	25.880	87	26.533	0.108	2.208	34.745	2.400
40	44.0	7	10.234	33.746	25.933	78	27.088	0.120	2.139	38.958	2.199
45	44.0	6	10.234	33.746	25.933	78	---	---	---	---	2.199
45	43.9	5	10.233	33.746	25.934	77	---	---	---	---	2.194
45	43.8	4	10.235	33.747	25.933	78	---	---	---	---	2.201
45	43.9	3	10.233	33.747	25.934	77	---	---	---	---	2.201
45	43.7	2	10.234	33.747	25.934	77	---	---	---	---	2.198
45	43.9	1	10.232	33.747	25.934	77	---	---	---	---	2.201

Biological

DEP (m)	BTL #	CHL (mg m-3 d-1)	PHAEO (mg m-3 d-1)
0	12	8.083	0.735
5	11	8.810	0.856
10	10	7.538	1.110
20	9	1.371	0.647
30	8	0.318	0.615
40	7	0.381	0.924

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

Chlorophyll <i>a</i> :	---	mg m-2 day -1	Carbon Fixation:	---	mg m-2 day-1
Phaeophytin:	---	mg m-2 day -1	Productivity Index:	---	mg C mg Chl day-1
Mixed Layer	---	meters	PBOpt:	---	mg C mg Chl day-1

Table A4: *Marine mammal observations.* This table lists the results of the marine mammal observations made during the PaCOOS cruise of November 2007. The data are listed alphabetically by species' scientific name, then chronologically within each species. Background shading alternates between gray and yellow by species. The darkness of the background shading within each colored background changes with date of sighting.

Species Code	Scientific Name	Group Size	Date	Latitude (°N)	Longitude (°E)
74	<i>Balaenoptera physalus</i>	4	11/06/2007	36.488	-122.688
74	<i>Balaenoptera physalus</i>	2	11/07/2007	35.849	-124.066
74	<i>Balaenoptera physalus</i>	5	11/07/2007	35.835	-124.084
74	<i>Balaenoptera physalus</i>	3	11/07/2007	35.795	-124.247
74	<i>Balaenoptera physalus</i>	2	11/07/2007	35.725	-124.308
74	<i>Balaenoptera physalus</i>	2	11/07/2007	35.739	-124.338
74	<i>Balaenoptera physalus</i>	2	11/08/2007	36.576	-125.705
74	<i>Balaenoptera physalus</i>	1	11/08/2007	36.587	-125.725
17	<i>Delphinus delphis</i>	75	11/06/2007	36.126	-123.490
17	<i>Delphinus delphis</i>	860	11/07/2007	35.873	-124.016
17	<i>Delphinus delphis</i>	230	11/07/2007	35.847	-124.071
17	<i>Delphinus delphis</i>	650	11/07/2007	35.700	-124.396
17	<i>Delphinus delphis</i>	250+	11/07/2007	35.626	-124.554
17	<i>Delphinus delphis</i>	140	11/08/2007	35.933	-125.259
17	<i>Delphinus delphis</i>	100+	11/08/2007	36.614	-125.771
21	<i>Grampus griseus</i>	120	11/08/2007	36.053	-125.365
22	<i>Lagenorhynchus obliquidens</i>	400	11/09/2007	37.719	-123.496
22	<i>Lagenorhynchus obliquidens</i>	300	11/09/2007	37.682	-123.421
27	<i>Lissodelphis borealis</i>	75	11/06/2007	36.686	-122.277
27	<i>Lissodelphis borealis</i>	30	11/09/2007	37.556	-123.769
27	<i>Lissodelphis borealis</i>	60	11/09/2007	37.719	-123.418
27	<i>Lissodelphis borealis</i>	120	11/09/2007	37.686	-123.428
27	<i>Lissodelphis borealis</i>	200	11/09/2007	37.682	-123.420
76	<i>Megaptera novaeangliae</i>	1	11/06/2007	36.727	-122.017
76	<i>Megaptera novaeangliae</i>	1	11/06/2007	36.718	-122.081
76	<i>Megaptera novaeangliae</i>	2	11/06/2007	36.642	-122.314
76	<i>Megaptera novaeangliae</i>	1	11/09/2007	37.576	-123.765
76	<i>Megaptera novaeangliae</i>	2	11/09/2007	37.718	-123.428
76	<i>Megaptera novaeangliae</i>	2	11/09/2007	37.668	-123.397
40	<i>Phocoena phocoena</i>	2	11/09/2007	37.766	-123.449
44	<i>Phocoenoides dalli</i>	6	11/06/2007	36.724	-122.061
79	unidentified whale	1	11/07/2007	35.723	-124.352
-	PINNIPEDS	-	-	-	-
CU	<i>Callorhinus ursinus</i>	1	11/07/2007	35.743	-124.300
MA	<i>Mirounga angustirostris</i>	1	11/09/2007	37.534	-123.774
PU	unidentified pinniped	1	11/09/2007	37.444	-123.967

Table A5: *Summary of marine mammal observations.* This table summarizes the results of the marine mammal observations made during the PaCOOS cruise of November 2007. The data are listed alphabetically by species' scientific name.

Species Code	Scientific Name	Total sightings	Total animals
74	<i>Balaenoptera physalus</i>	8	21
17	<i>Delphinus delphis</i>	7	1955
21	<i>Grampus griseus</i>	1	120
22	<i>Lagenorhynchus obliquidens</i>	2	700
27	<i>Lissodelphis borealis</i>	5	485
76	<i>Megaptera novaeangliae</i>	6	9
40	<i>Phocoena phocoena</i>	1	2
44	<i>Phocoenoides dalli</i>	1	6
79	unidentified whale	1	1
-	PINNIPEDS	-	-
CU	<i>Callorhinus ursinus</i>	1	1
MA	<i>Mirounga angustirostris</i>	1	1
PU	unidentified pinniped	1	1
		<u>35</u>	<u>3,302</u>

Appendix B

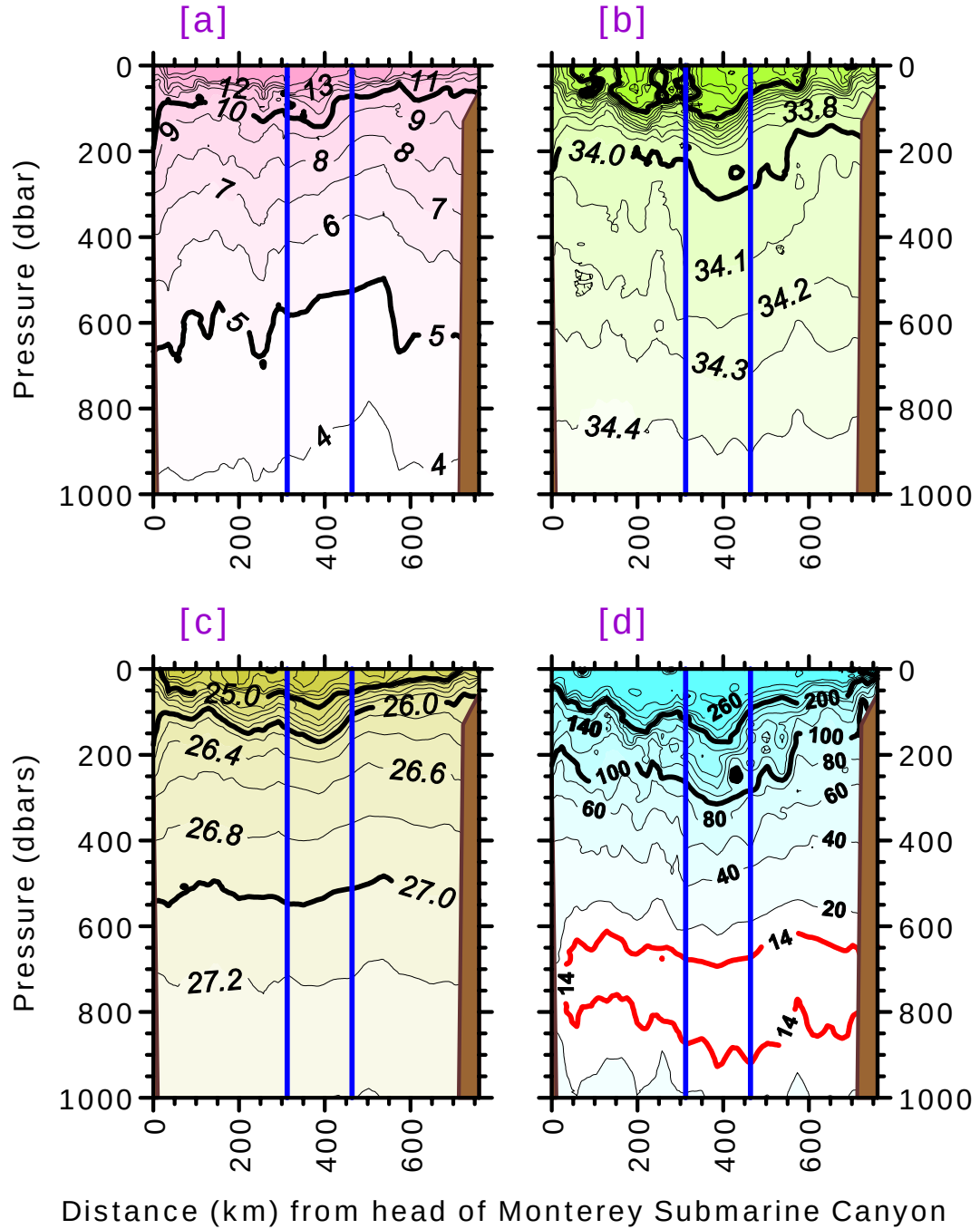


Figure 10: Contours of (a) temperature ($^{\circ}\text{C}$), (b) salinity, (c) density anomaly (kg m^{-3}), and (d) oxygen ($\mu\text{mol kg}^{-1}$) fields along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. The blue lines indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23). Contour intervals for panels a-d are 1°C , 0.1, 0.2 kg m^{-3} , and 20 $\mu\text{mol kg}^{-1}$, respectively, except that the (nearly) oxygen minimum contour of 14 $\mu\text{mol kg}^{-1}$ is highlighted in red in panel d.

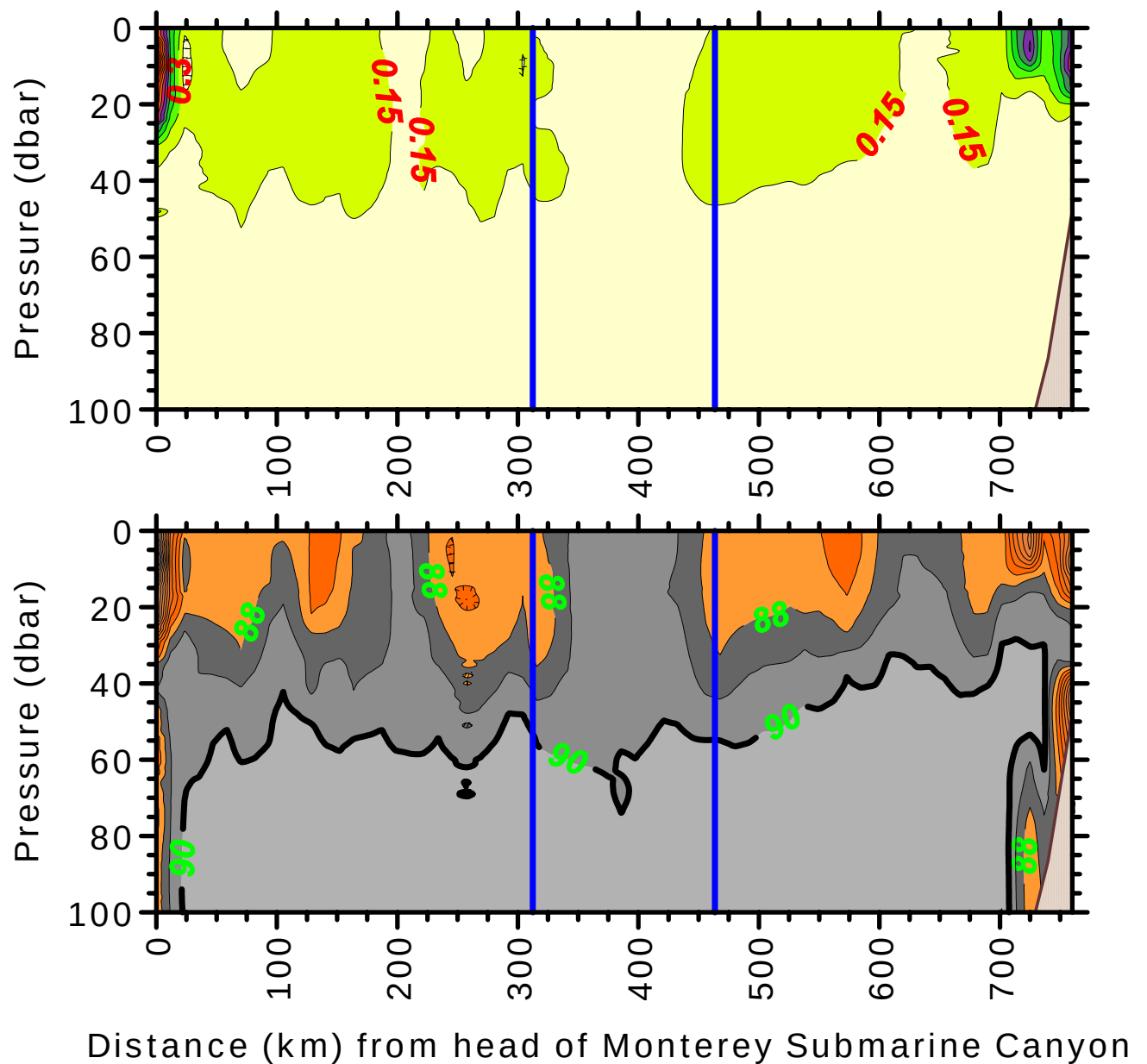


Figure 11: Contours of fluorescence (volts) [upper panel] and transmissivity (percentage) [lower panel] in the upper 100 dbars of the water column along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. The blue lines indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23). The contour intervals are 0.15 volts and 1 percent, respectively, for the upper and lower panels. Closed contours are hatched if values are decreasing within the contour.

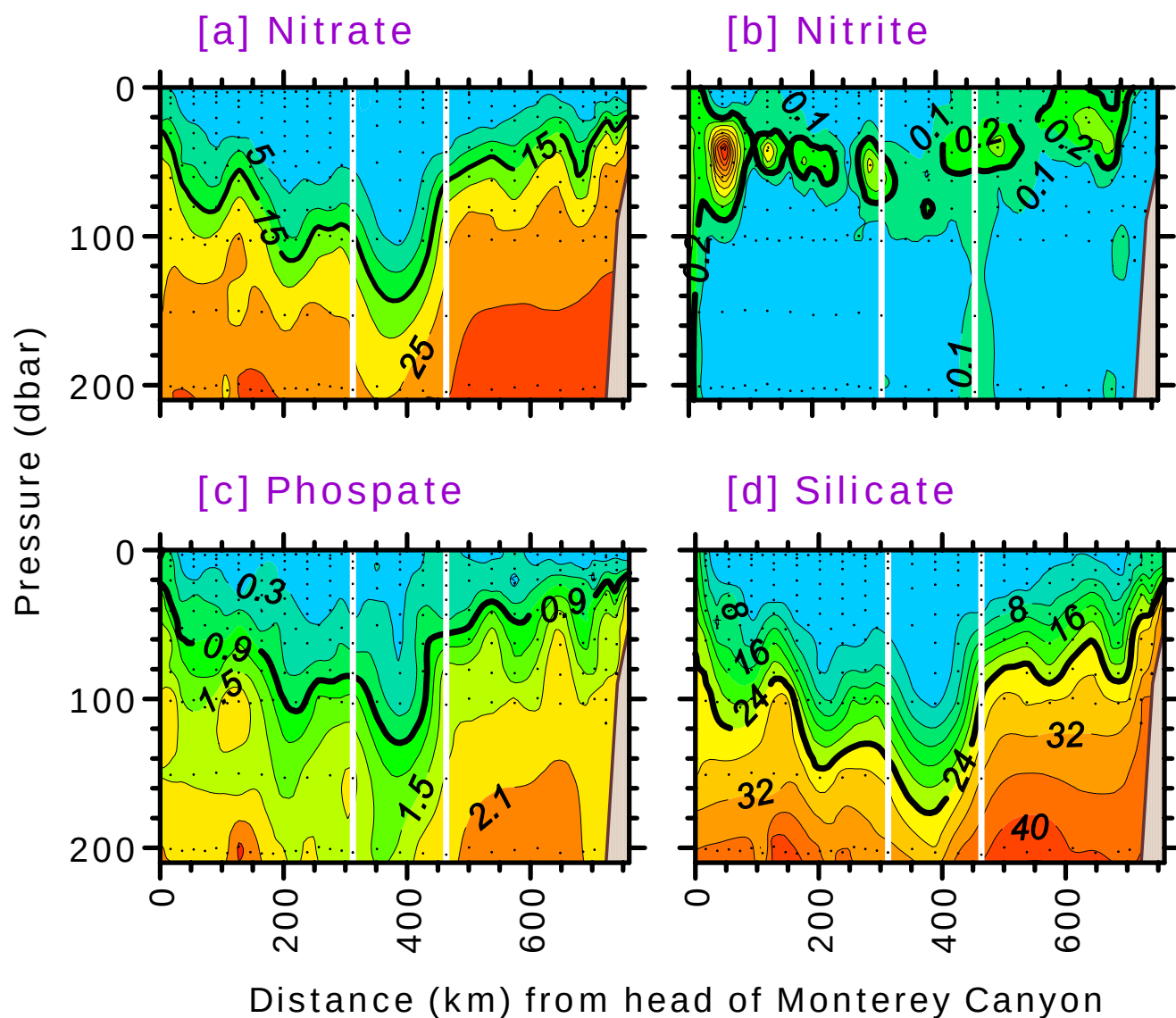


Figure 12: Contours of (a) nitrate (μM), (b) nitrite (μM), (c) phosphate (μM), and (d) silicate (μM) fields along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. The white lines indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23). The dots indicate the water sample locations. Contour intervals for panels a-d are $5\mu\text{M}$, $0.1\mu\text{M}$, $0.3\mu\text{M}$, and $4\mu\text{M}$, respectively.

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