UNIVERSITY OF CALIFORNIA, SAN DIEGO SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

CalCOFI Cruise 1402
28 January –5 February 2014

CC Reference 14 - 09
4 Nov 2014

UNIVERSITY OF CALIFORNIA, SAN DIEGO

SCRIPPS INSTITUTION OF OCEANOGRAPHY

LA JOLLA, CALIFORNIA 92093-0227

PHYSICAL, CHEMICAL AND BIOLOGICAL DATA

CalCOFI Cruise 1402
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INTRODUCTION

The data presented in this report were collected during cruise 1402* of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) program aboard the NOAA vessel FSV Bell M. Shimada. Due to mechanical issues with the vessel this cruise completed 36 of 104 planned CalCOFI stations. The CalCOFI program was organized in the late 1940's to study the causes of variations in population size of fishes of importance to the State of California. It is carried out by NOAA's National Marine Fisheries Service Southwest Fisheries Science Center, the California Department of Fish and Wildlife, and the Integrative Oceanography Division (IOD) at Scripps Institution of Oceanography (SIO). IOD contributes to this program by investigations of the physical, chemical and biological structure of the California Current. Data from the cruise were collected and processed by personnel of the Integrative Oceanography Division and the Southwest Fisheries Science Center. CalCOFI data presented in this report and collected on previous cruises can be accessed at http://www.calcofi.org.

STANDARD PROCEDURES

CTD/Rosette Cast Data

A Sea-Bird Electronics, Inc., Conductivity-Temperature-Depth (CTD) instrument (Seabird 911+, Serial number 3161-936) with a rosette was deployed at each station on this cruise. The rosette was equipped with 24 ten-liter plastic (PVC) bottles equipped with epoxy-coated springs and Viton O-rings. Each CTD/rosette cast usually sampled 20 depths to a maximum sampling depth of 515 meters, bottom depth permitting. Occasional stations have multiple bottles tripped at the same depth to provide more water for ancillary programs. Additional bottle depths also appear in combined hydrographic and primary productivity casts. The sample spacing was designed to sample depth intervals as close as 10 meters around the sharp upper thermocline features such as the chlorophyll, oxygen, nitrite maxima and the shallow salinity minimum. Salinity, oxygen and nutrients were determined at sea for all depths sampled. Chlorophyll-*a* and phaeopigments were determined at sea on samples from the top 200 meters, bottom depth permitting.

Pressures and temperatures assigned to the water sample data were derived from the CTD signals recorded just prior to the bottle trip. Pressures were converted to depths by the Saunders (1981) pressure-to-depth conversion technique. CTD temperatures reported with the bottle data have been rounded to the nearest hundredth of a degree Celsius.

Salinity samples were collected from all rosette bottles and analyzed at sea using a Guildline model 8410 Portasal salinometer. Salinity samples were drawn into 200 ml Kimax high-alumina borosilicate bottles that were rinsed three times with sample prior to filling. The results were compared with the CTD salinity to verify that the rosette bottle did not mis-trip or leak. The salinometer was standardized before and after each group of samples with standardized seawater. Periodic checks on the conductivity of the standardized seawater were made by comparison with IAPSO Standard Seawater batch P152. Salinity values were calculated using the algorithms for the Practical Salinity Scale, 1978 (UNESCO, 1981a) and are reported to three decimal places, provided that accepted standards were met.

Dissolved oxygen analyses were performed with an Ocean Data Facility of Scripps Institution of Oceanography designed automated oxygen titrator using photometric end-point detection based on the absorption of 365nm wavelength ultra-violet light. A computer using PC software controlled the titration of the samples and the data logging. The method used a modified Winkler titration following the technique of Carpenter (1965) with modifications by Culberson (1991), but with higher concentrations of thiosulfate solution (50 g/l). Standard KIO3 solutions prepared ashore were run at the beginning of each run. Reagent and sea water blanks were determined to account for presence of oxidizing or reducing materials.

* The first two digits represent the year and the last digits the month of the cruise.

Nutrient samples were analyzed at sea using a QuAAtro continuous flow analyzer (SEAL Analytical). Dissolved silicate, nitrate, and nitrite were analyzed using a modification of the method described by Armstrong (1967) and Gordon et al. (1992). Phosphate was measured with a modification of the Murphy and Riley (1962) protocol and ammonium is analyzed using a modified fluorometric method described by Kerouel and Aminot (1997). Samples were collected in 45ml high-density polypropylene screw top tubes which were acid washed and rinsed with sample three times prior to filling. Standardizations and cadmium-reduction coil efficiency determinations were performed at the beginning of every run. Drift corrections were performed in each run using a high standard inserted before and after sample sets. A sample of reference material for nutrients in seawater (RMNS), produced by KANSO technos (www.kanso.co.jp) was included in every run and those data were used to adjust values for nitrate, nitrite, phosphate, and silicate if appropriate. Samples not analyzed immediately after collection were refrigerated and run the following day.

Samples for chlorophyll-*a* and phaeopigments were collected in calibrated 138 ml polyethylene bottles and filtered onto Whatman GF/F filters. The pigments were extracted in cold 90% acetone (Venrick and Hayward, 1984) for a minimum of 24 hours. Chlorophyll-*a* and phaeopigment concentrations were determined from fluorescence readings before and after acidification with a Turner Designs Fluorometer Model 10-AU-005-CE (Yentsch and Menzel, 1963; Holm-Hansen *et al*., 1965).

Evaluation of the water sample data involved comparisons with the CTD data, adjacent stations and consideration of the variation of a property as a function of density or depth and the relationships with other properties (Klein, 1973). Precision estimates for routine analyses were made on CalCOFI cruise 9003 and are reported in SIO Ref. 91-4.

Primary Productivity Sampling

Primary productivity samples were taken each day shortly before local apparent noon (LAN). Primary production was estimated from ^{14}C uptake using a simulated *in situ* technique. Light penetration was estimated from the Secchi depth (assuming that the 1% light level is three times the Secchi depth). The depths with ambient light intensities corresponding to light levels simulated by the on-deck incubators were identified and sampled on the rosette up-cast. Occasionally an extra bottle or two were tripped in addition to the usual 20 levels sampled in the combined rosette-productivity cast in order to maintain the normal sampling depth resolution. Triplicate samples (two light and one dark control) were drawn from each productivity sample depth into 250 ml polycarbonate incubation bottles. Samples were inoculated with 9.47 µCi of ^{14}C as $NaHCO_3$ (50µl of stock solution) prepared in a 0.3 g/liter solution of sodium carbonate (Fitzwater *et al.*, 1982). Samples were incubated from LAN to civil twilight in seawater-cooled incubators with neutral-density screens which simulate *in situ* light levels. At the end of the incubation, the samples were filtered onto Millipore HA filters and placed in scintillation vials. One half ml of 10% HCl was added to each sample. The sample was then allowed to sit, without a cap, at room temperature for 12 hours (after Lean and Burnison, 1979). Following this, 10 ml of scintillation cocktail were added to each sample and the samples were returned to SIO where the radioactivity was determined with a scintillation counter. Salinity, oxygen, nutrients, chlorophyll-*a* and phaeopigments were determined from all rosette productivity bottles.

Macrozooplankton Net Tows

Macrozooplankton was sampled with a 71 cm mouth diameter paired net (bongo net) equipped with 0.505mm plankton mesh. Bottom depth permitting, the nets were towed obliquely from 210 meters to the surface. The tow time for a standard tow was 21.5 minutes. Volumes filtered were determined from flowmeter readings and the mouth area of the net. Only one sample of each pair was retained and preserved. The biomass, as wet displacement volume, after removal of large (>5 ml) organisms, was determined in the laboratory ashore. These procedures are summarized in greater detail in Kramer *et al*. (1972).

Avifauna Observations (Farallon Institute of Advanced Ecosystem Research)

Sea birds were counted within a 300-meter wide strip off to one side of the ship. Counts were made while underway between stations during periods of daylight. These counts were summed over 20 nautical mile (nm) intervals, or the distance between consecutive stations, whichever was less.

Ancillary Programs

Several ancillary programs produced data on these cruises that are not presented in this report. These programs include:

1) Underway Data: Continuous near surface measurements of temperature, salinity and *in vivo* chlorophyll fluorescence were recorded from seawater pumped through the ship's uncontaminated seawater system. Water was drawn from a depth of approximately 3 meters. The data were logged in one-minute averages using a Sea-Bird Electronics, Inc., SBE-21 TSG Thermosalinographs and a Turner Designs Fluorometer Model 10-AU-005-CE.

2) California Current Ecosystem Long Term Ecological Research Program: The CCE-LTER program augments standard CalCOFI measurements to further characterize the lower trophic levels as well as the carbon system. Measurements of particulate organic carbon and nitrogen, dissolved organic carbon and nitrogen, taxon-specific phytoplankton pigments, flow-cytometric counts of bacteria and picoautotrophs and the determination of mesozooplankton size structure using a Laser Optical Plankton Counter are sampled for all CalCOFI stations. On CalCOFI lines 90 and 80 measurements also include microscopic counts of heterotrophic and autotrophic phytoplankton for biomass and abundance and mesozooplankton community structure sampled with the Planktonic Rate Processes in Oligotrophic Ocean Systems (PRPOOS) tow net. (M. Ohman, SIO)

3) Advanced Laser Fluorometer Analyzer (ALFA): Continuous underway analysis of phytoplankton pigment groups and variable fluorescence (F_v/F_m). ALFA, developed by A. Chekalyuk at Lamont-Doherty Earth Observatory, uses laser stimulated emission at 405 and 532 nm together with spectral deconvolution analysis to distinguish fluorescence from three types of phycoerythrin, chlorophyll-*a*, and chromophoric dissolved organic matter (CDOM). The ALFA is useful for differentiating the contribution of cyanobacteria and cryptophytes from other phytoplankton taxa present in natural phytoplankton assemblages, as well as for assessing phytoplankton photophysiological status. (R. Goericke, SIO)

4) Southern California Coastal Ocean Observing System (SCCOOS) Nearshore Observations: The objective of these observations is to extend CalCOFI time series to the nearshore. Nearshore observations consist of 5 stations at the ends and interspersed with current CalCOFI lines on the 20 m isobath with a standard set of CalCOFI hydrographic observations as well as a CalBOBL net tow, particulate organic carbon and nitrogen, dissolved organic carbon and nitrogen and taxon-specific phytoplankton pigments data. (R. Goericke, SIO)

5) Inorganic Carbon System: The CalCOFI group collected samples for the characterization of the inorganic carbon system at selected locations along the cruise track with 5 profile and 6 surface water stations. Total inorganic carbon and alkalinity will be measured which will allow the calculation of pH and pCO_2. The objectives of these measurements are first the long-term characterization of the inorganic carbon system and its response to changing ocean climate and second measurements of pH in the coastal zone in order to monitor the impact of 'corrosive' waters on benthic ecosystems in the Southern California Bight. (R. Goericke, SIO)

6) Marine Mammal Observations: During daylight transits, visual line-transect surveys were conducted by marine mammal observers focusing on cetaceans. Acoustic line-transect surveys were performed using a towed hydrophone array which consists of multiple hydrophone elements that sample sounds up to 100 kHz allowing for localization of calling animals. Acoustic monitoring also takes place on individual stations using sonobuoys. (J. Hildebrand, SIO)

7) *Microbial Diversity and Gene Expression*: Samples suitable for purification of DNA and RNA from bacterial and microbial eukaryotic biomass are collected for molecular diversity assays targeted to various genetic marker loci (16S and 18S rRNA). DNA samples are collected at every station, in parallel with particulate organic matter (POM) samples, on Whatman GF/F filters. RNA samples are collected in parallel with primary productivity samples on 0.2 µM sterivex filters with a maximum filtration time of 30 min. Additional samples from the mixed layer and chlorophyll max are collected along lines 80 and 90. (A. Allen, SIO and JCVI)

TABULATED DATA

CTD/Rosette Cast Data

The time reported is the Coordinated Universal Time (UTC) of the first rosette bottle trip on the up cast. The rosette bottles tripped on the up cast are reported as cast 2, where cast 1 is considered to be the down CTD profile. The sample number reported is the cast number followed by a two-digit rosette bottle number. Bottom depths, determined acoustically, have been corrected using British Admiralty Tables (Carter, 1980) and are reported in meters. Weather conditions have been coded using WMO code 4501. Secchi depths are reported for most daylight stations.

Data values from discreet sampled CTD rosette were interpolated and are reported for standard depths. Interpolated or extrapolated standard level data are noted by the footnote "ISL" printed after the depth. Multiple bottles tripped at the same depth to provide water for ancillary programs are not used in the calculation of standard depth data. Density-related parameters have been calculated from the International Equation of State of Seawater 1980 (UNESCO, 1981b). Computed values of potential temperature, sigma-theta, specific volume anomaly (SVA), and dynamic height or geopotential anomaly are included with both observed and interpolated standard depth levels.

On stations where primary productivity samples were drawn a footnote appears after each productivity depth sampled. The corresponding primary productivity data are reported in a separate section following the tabulated rosette cast data.

Primary Productivity Data

In addition to the normal hydrographic data that are reported in the rosette cast data section, the tabulated data include: the *in situ* light levels at which the samples were collected, the uptake from each of the replicate light bottles, uptake 1 and uptake 2 (which have been corrected for dark uptake by subtracting the dark value), the mean of the two uptake values and the dark uptake. The uptake values are totals for the incubation period. Also shown are the times of LAN, civil twilight, and the value of the mean uptake integrated from the surface to the deepest sample, assuming the shallowest value continues to the surface and that negative values (when dark uptake exceeds light uptake) are zero. The uptake data are reported to two significant digits (values <1.00) or one decimal (values >1.00). Incubation time, LAN, and civil twilight are given in local Pacific Standard Time (PST); to convert to UTC, add eight hours to the PST time. Incubation light intensities are listed in a footnote at the bottom of each page.

Macrozooplankton Data

Macrozooplankton biomass volumes are tabulated as total biomass volume ($cm^3/1000m^3$ strained) and as the total volume minus the volume of larger organisms under the heading "Small." Tow times are given in local PST (+8) time.

FOOTNOTES

In addition to footnotes, special notations are used without footnotes because the meaning is always the same:

D: CTD salinity value listed in place of normal shipboard salinity analysis.

ISL: After a depth value indicates that this is an interpolated or extrapolated standard level.

U: Uncertain value. Values which are not used in interpolation because they seem to be in error without apparent reason.

LITERATURE CITED

Anderson, G. C., compiler, 1971. "Oxygen Analysis," Marine Technician's Handbook, SIO Ref. No. 71-8, Sea Grant Pub. No. 9.

Carpenter, J. H., 1965. The Chesapeake Bay Institute technique for the Winkler dissolved oxygen method. *Limnol. Oceanogr., 10*: 141-143.

Carter, D. J. T., 1980. Echo-sounding correction tables. Third Edition. Hydrographic Department, Ministry of Defence, Taunton, U.K., NP 139: 150 pp.

Culberson, C. H. 1991. Dissolved oxygen. WHP Operations and Methods -- July 1991.

Fitzwater, S. E., G. A. Knauer and J. H. Martin, 1982. Metal contamination and its effect on primary production measurements. *Limnol. Oceanogr., 27*: 544-551.

Gordon, L. I., J. C. Jennings, Jr., A. A. Ross, and J. M. Krest, 1993. A suggested protocol for continuous flow automated analysis of seawater nutrients (phosphate, nitrate, nitrite and silicic acid) in the WOCE Hydrographic Program and the Joint Global Ocean Fluxes Study. WOCE Operations Manual, Part 3.1.3 "WHP Operations and Methods," *WHP Office Report WHPO 91-1*.

Holm-Hansen, O., C. J. Lorenzen, R. W. Holmes and J. D. H. Strickland, 1965. Fluorometric determination of chlorophyll. *J. Cons. perm. int. Explor. Mer, 30*: 3-15.

Klein, H. T., 1973. A new technique for processing physical oceanographic data. SIO Ref. No. 73-14.

Koroleff, F. 1969. Direct determination of ammonia in natural waters as Indophenol Blue. Int. Con. Explor. Sea, C.M. C: 9.

Koroleff, F. 1970. The above paper revised, Int. Con. Explor. Sea, Information on techniques and methods for sea water analysis. Interlab Report No. 3, 19-22.

Kramer, D., M. J. Kalin, E. G. Stevens, J. R. Thrailkill and J. R. Zweifel, 1972. Collecting and processing data on fish eggs and larvae in the California Current region. *NOAA Technical Report NMFS CIRC-370:* 38 pp.

Lean, D. R. S. and B. K. Burnison, 1979. An evaluation of errors in the ^{14}C method of primary production measurement. *Limnol. Oceanogr., 24*: 917-928.

Reid, J. L. and A. W. Mantyla, 1976. The effect of the geostrophic flow upon coastal sea elevations in the northern North Pacific Ocean. *J. Geophys. Res., 81:* 3100-3110.

Parsons, T. R., Y. Maita, C. M. Lalli, 1984. *A Manual of Chemical and Biological Methods for Seawater Analysis*. Pergamon Press Ltd., 3-28.

Saunders, P. M., 1981. Practical conversion of pressure to depth. *J. Phys. Oceanogr., 11*: 573-574.

Scripps Institution of Oceanography, University of California, 1991. Physical, Chemical and Biological Data, CalCOFI Cruises 9003 and 9004. SIO Ref. 91-4, 96 pp.

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

UNESCO, 1981, b. Background papers and supporting data on the International Equation of State 1980. *UNESCO Tech. Pap. in Mar. Sci., No. 38.*

Venrick, E. L. and T. L. Hayward, 1984. Determining chlorophyll on the 1984 CalCOFI surveys. *CalCOFI Rep., Vol. XXV*: 74-79.

Weiss, R. F., 1970. The solubility of nitrogen, oxygen and argon in water and seawater. *Deep-Sea Res., 17:* 721-735.

Yentsch, C. S. and D. W. Menzel, 1963. A method for the determination of phytoplankton, chlorophyll and phaeophytin by fluorescence. *Deep-Sea Res., 10:* 221-231.

FIGURES

Cruise 1402

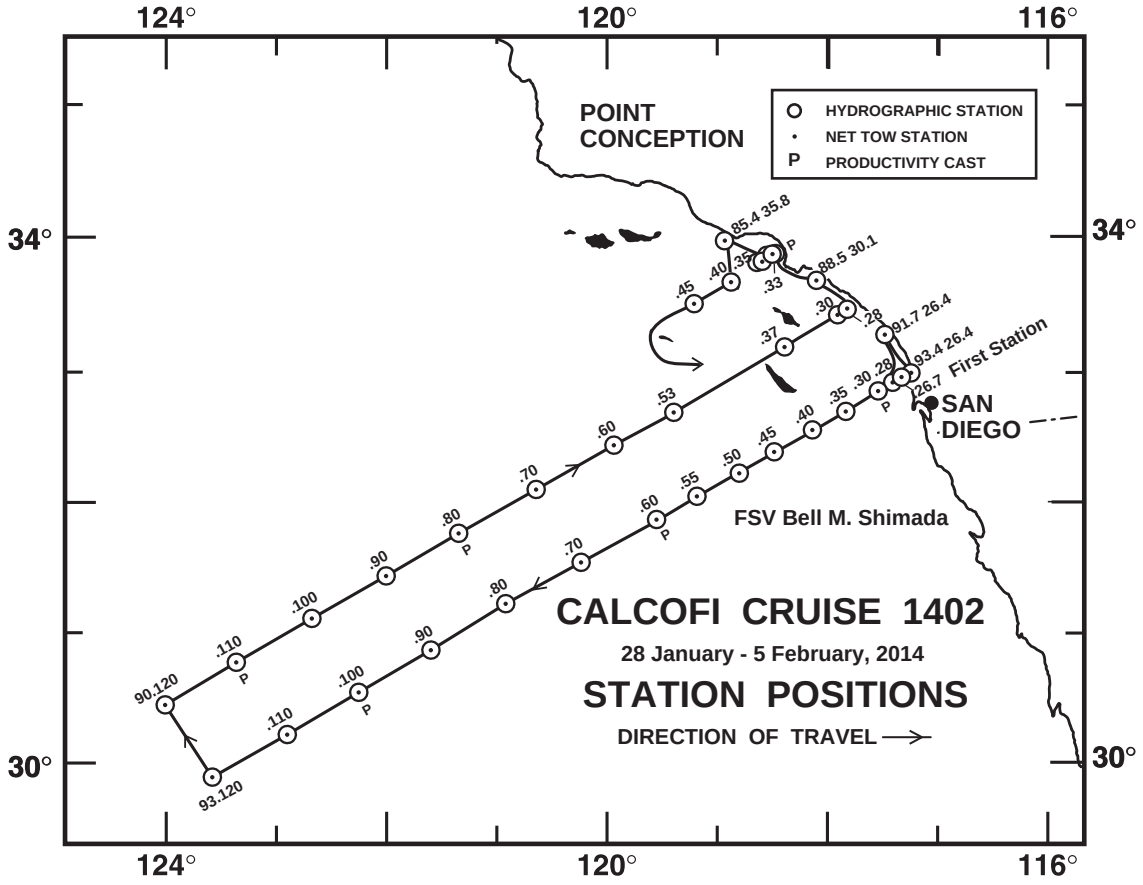
1. CalCOFI Cruise 1402 track and station positions.

2. Horizontal distribution of dynamic height anomaly (0 over 500m). In areas shallower than 500 m, the dynamic heights were extrapolated on the basis of the offshore deeper steric height as described in Reid and Mantyla (1976).

3. Horizontal distributions at 10 meters: A) chlorophyll-*a*; B) potential density; C) temperature; and D) salinity.

4. Horizontal distributions at 200 meters: A) dynamic height anomaly (200 over 500 m); B) potential density; C) temperature; and D) salinity.

5. Sections along CalCOFI line 90 (vertical exaggeration, 1000): A) potential density; B) temperature; C) salinity; D) silicate; E) nitrate; F) phosphate; G) chlorophyll-*a*; H) oxygen saturation; I) oxygen; J) nitrite; and K) phaeopigments.


124°
120°
116°
34°
30°
POINT CONCEPTION
HYDROGRAPHIC STATION
NET TOW STATION
PRODUCTIVITY CAST
SAN DIEGO
First Station
FSV Bell M. Shimada
CALCOFI CRUISE 1402
28 January - 5 February, 2014
STATION POSITIONS
DIRECTION OF TRAVEL

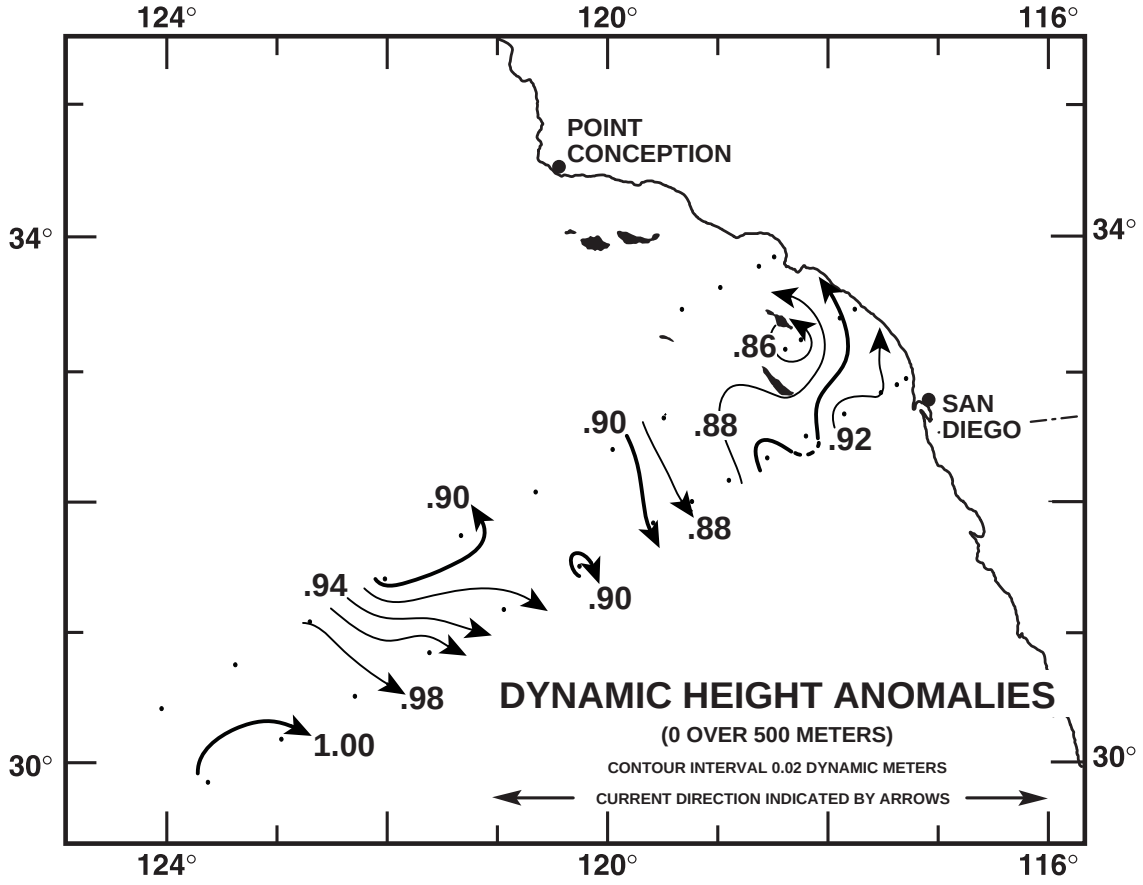

124°
120°
116°
34°
30°
POINT CONCEPTION
SAN DIEGO
.86
.90
.88
.92
.90
.88
.94
.90
.98
1.00
DYNAMIC HEIGHT ANOMALIES
(0 OVER 500 METERS)
CONTOUR INTERVAL 0.02 DYNAMIC METERS
CURRENT DIRECTION INDICATED BY ARROWS

FIGURE 2

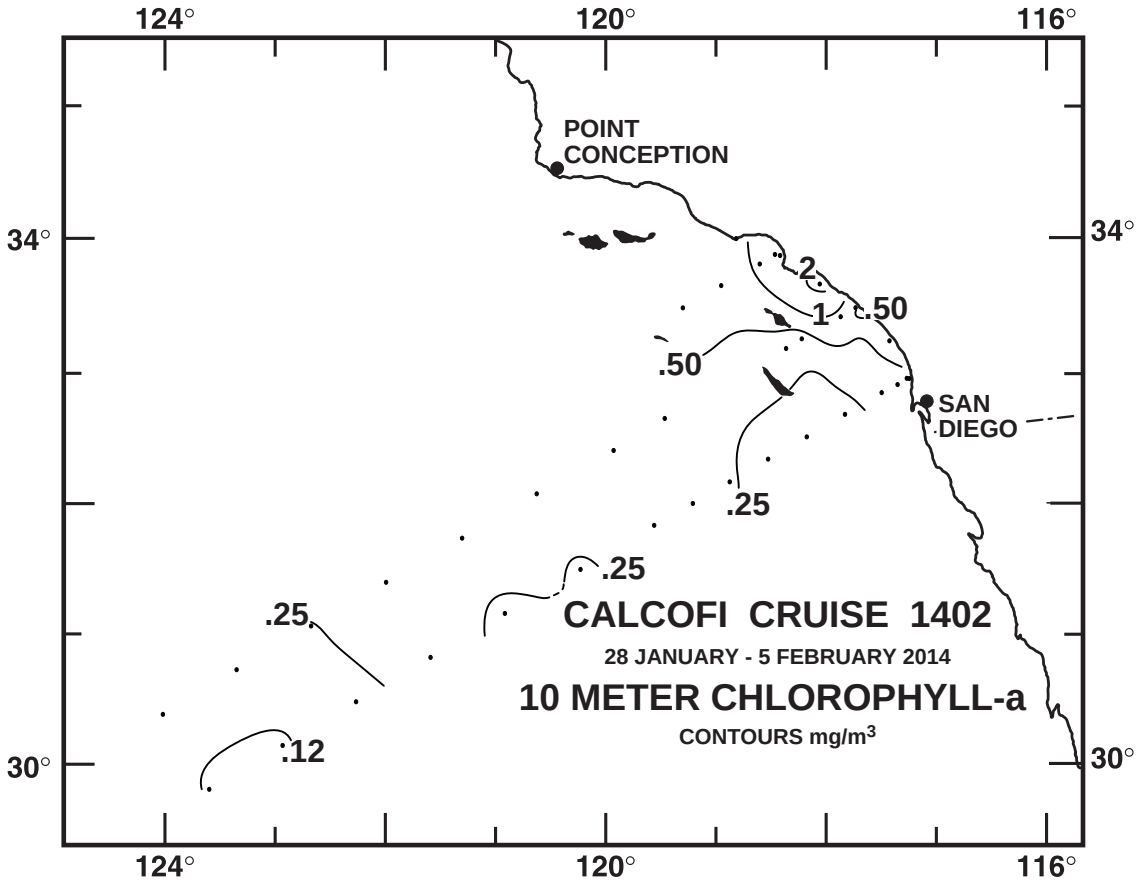


FIGURE 3A

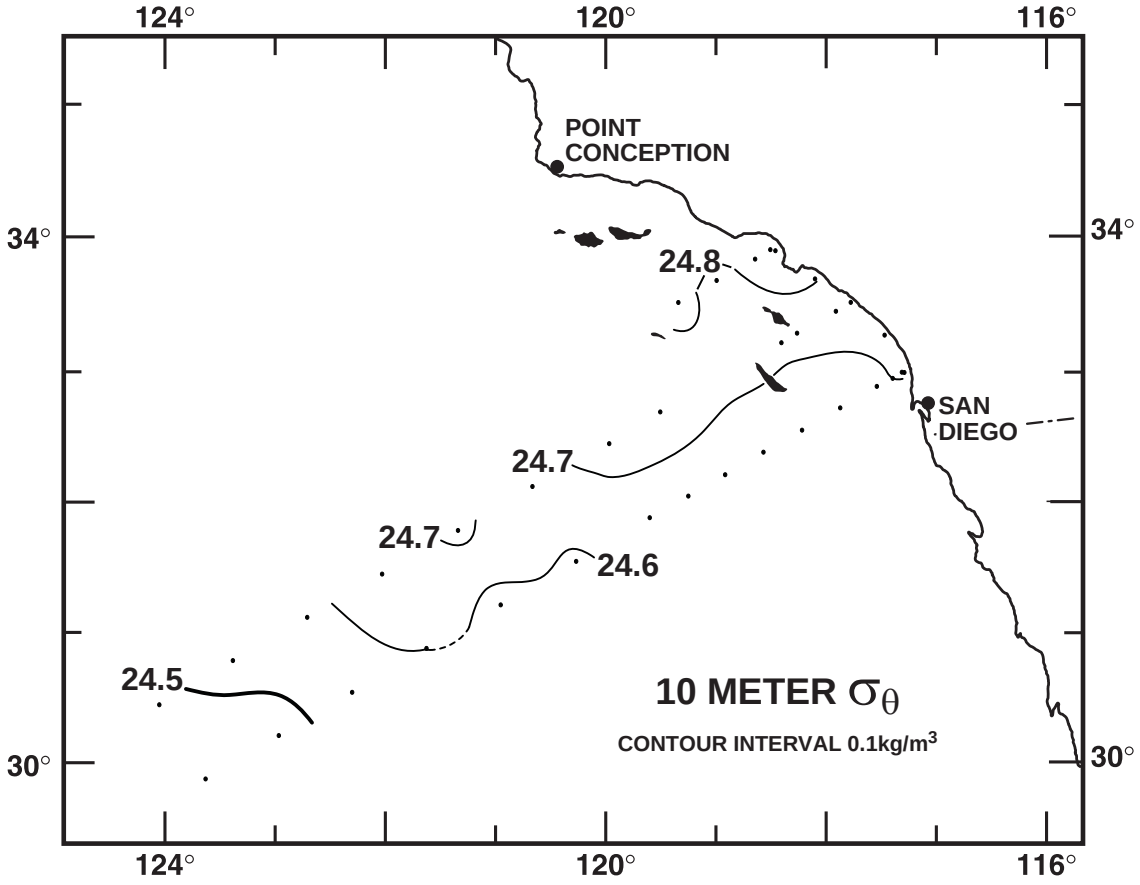


FIGURE 3B

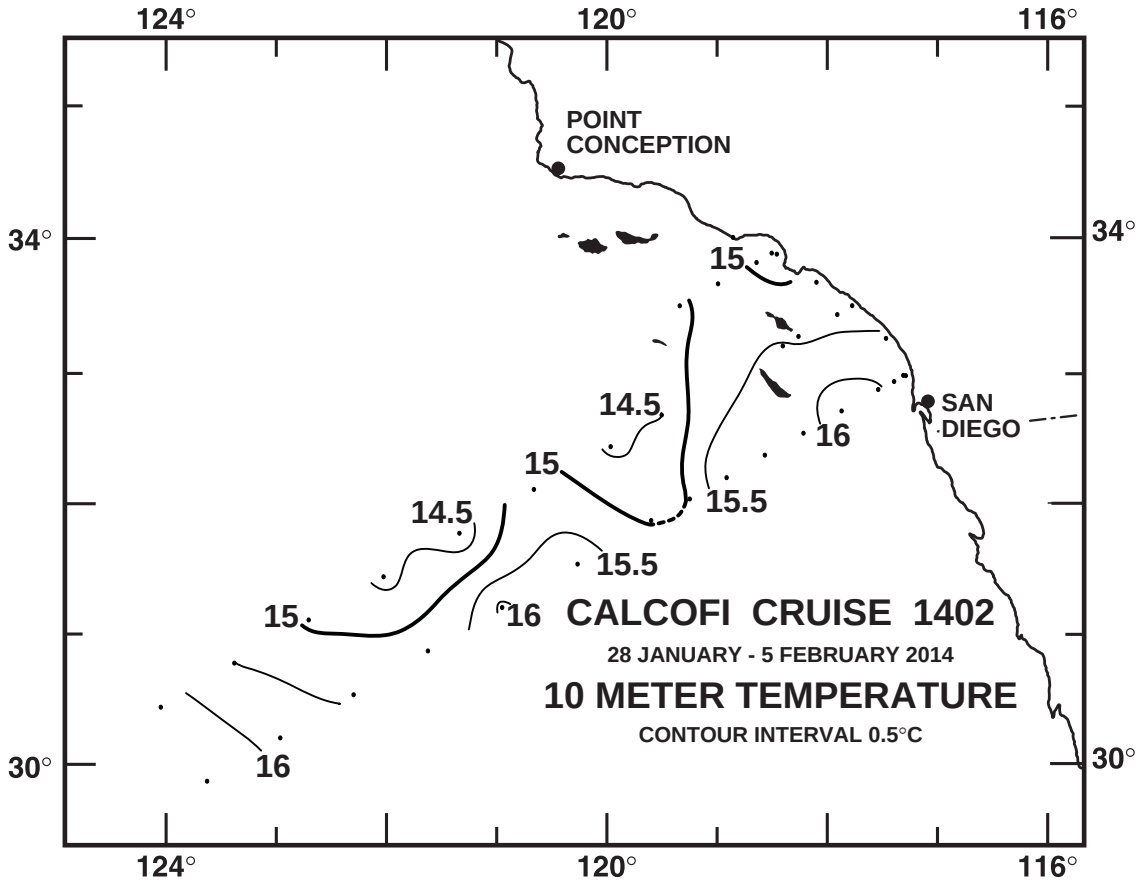


FIGURE 3C

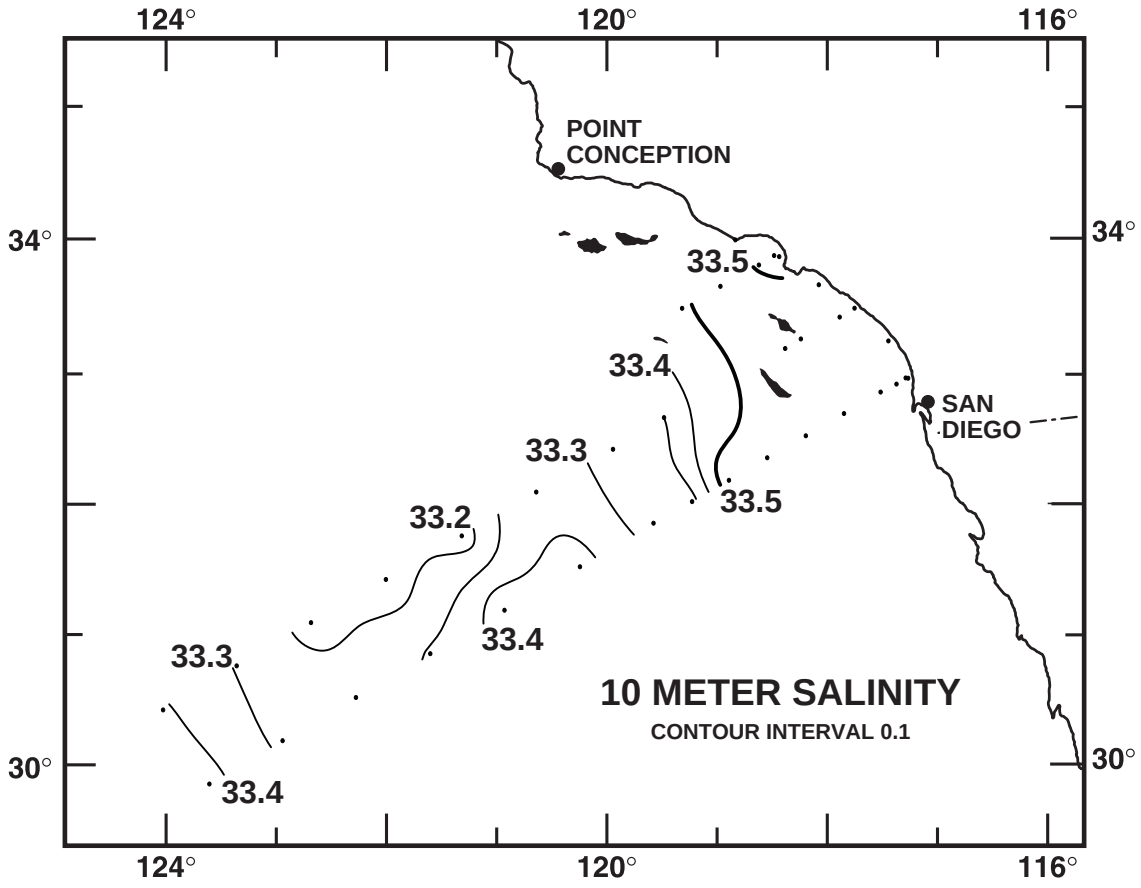


FIGURE 3D

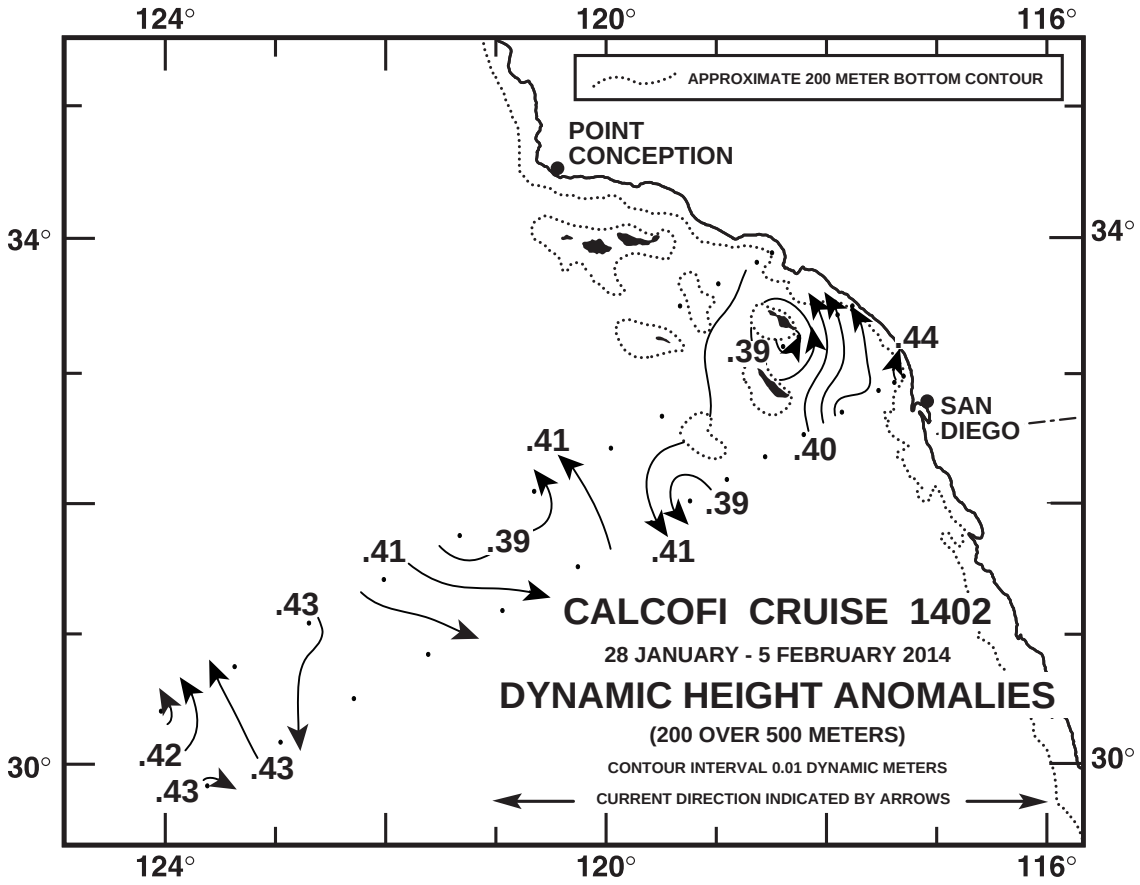


FIGURE 4A

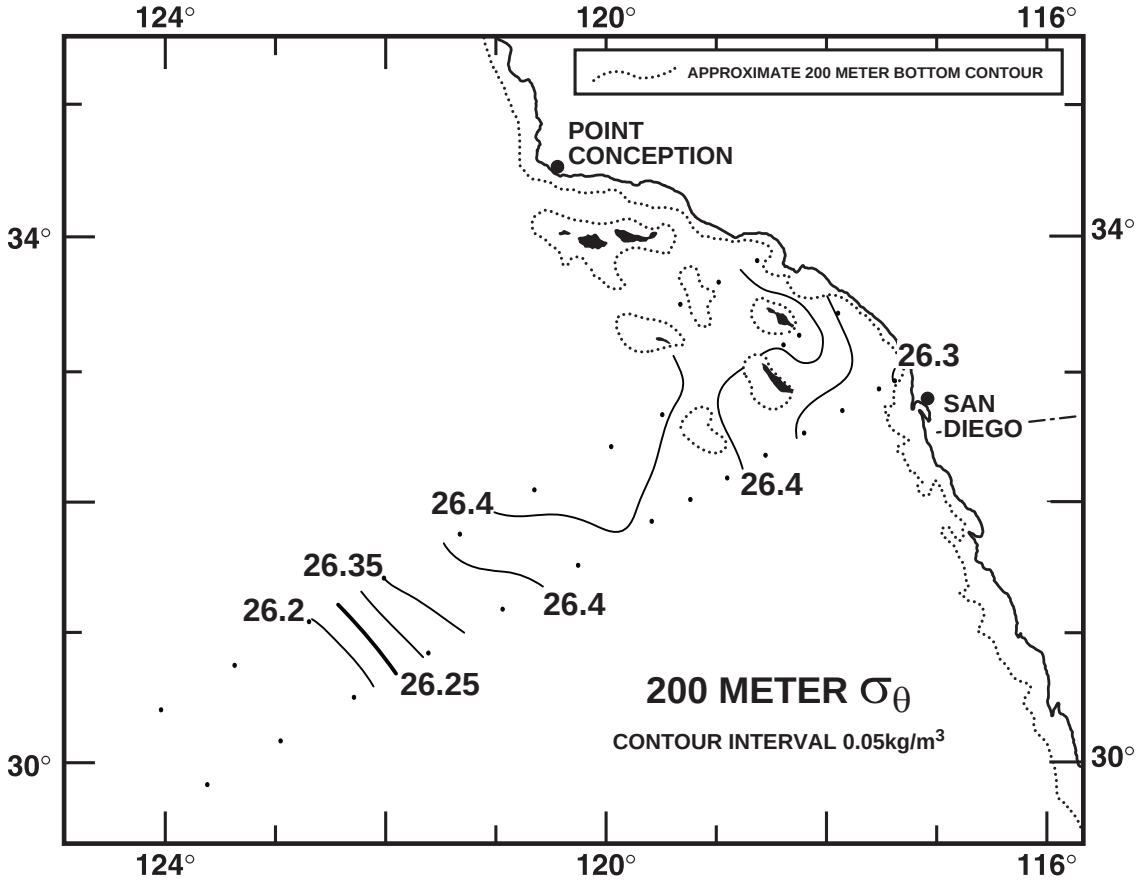


FIGURE 4B

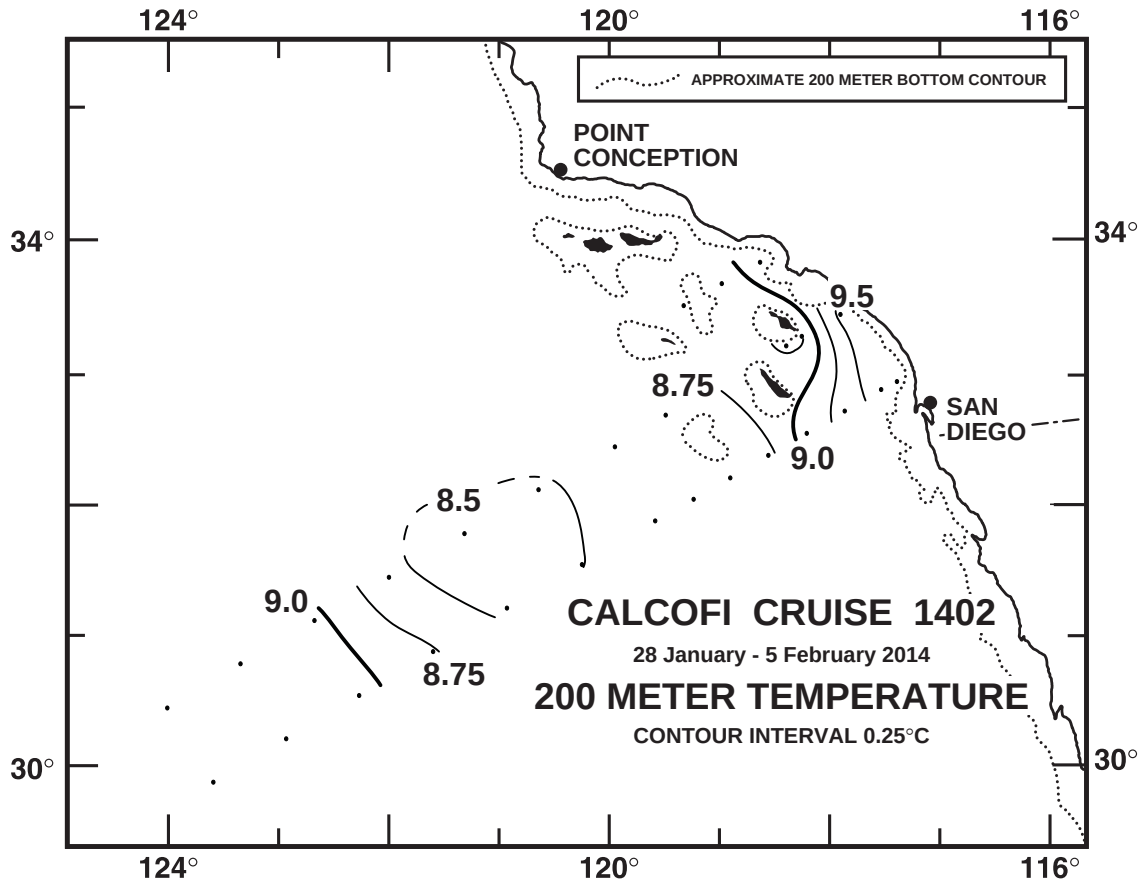


FIGURE 4C

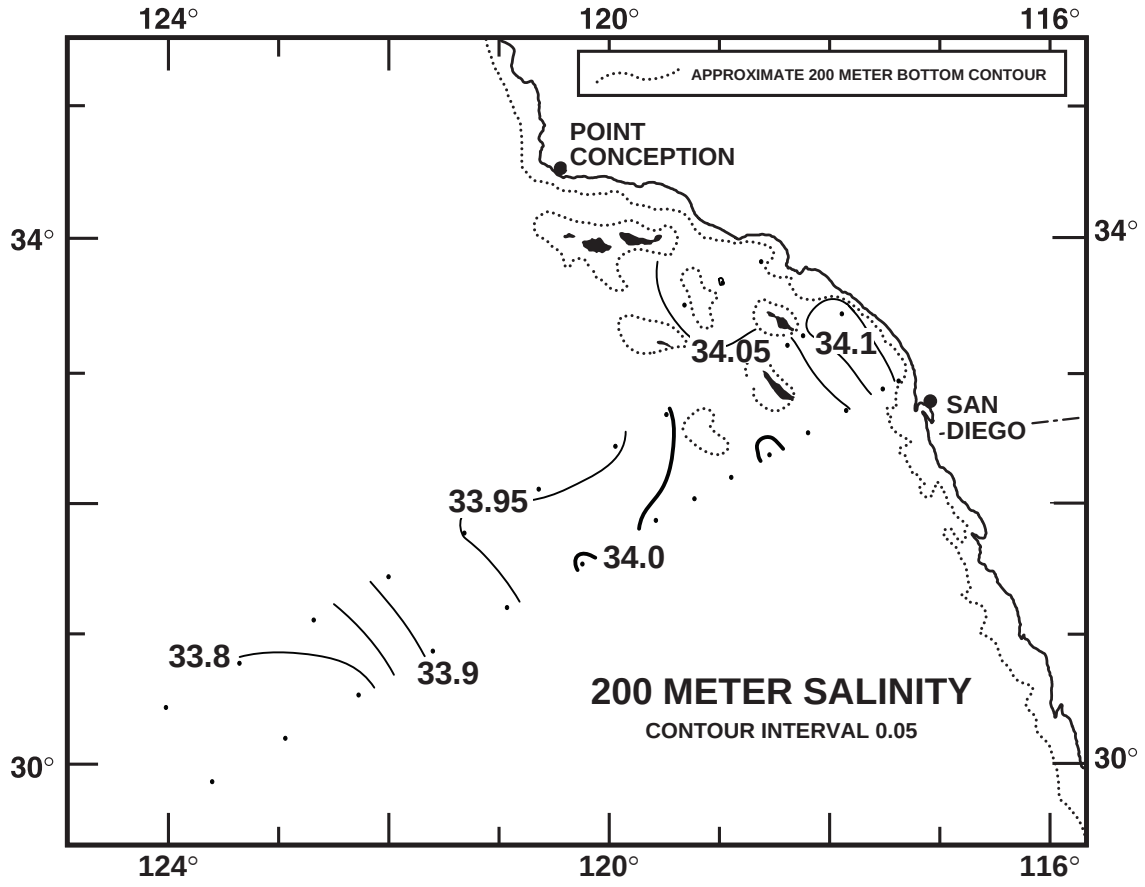


FIGURE 4D

CALCOFI CRUISE 1402

1 - 4 February 2014

POTENTIAL DENSITY (σ_θ) ALONG CALCOFI LINE 90

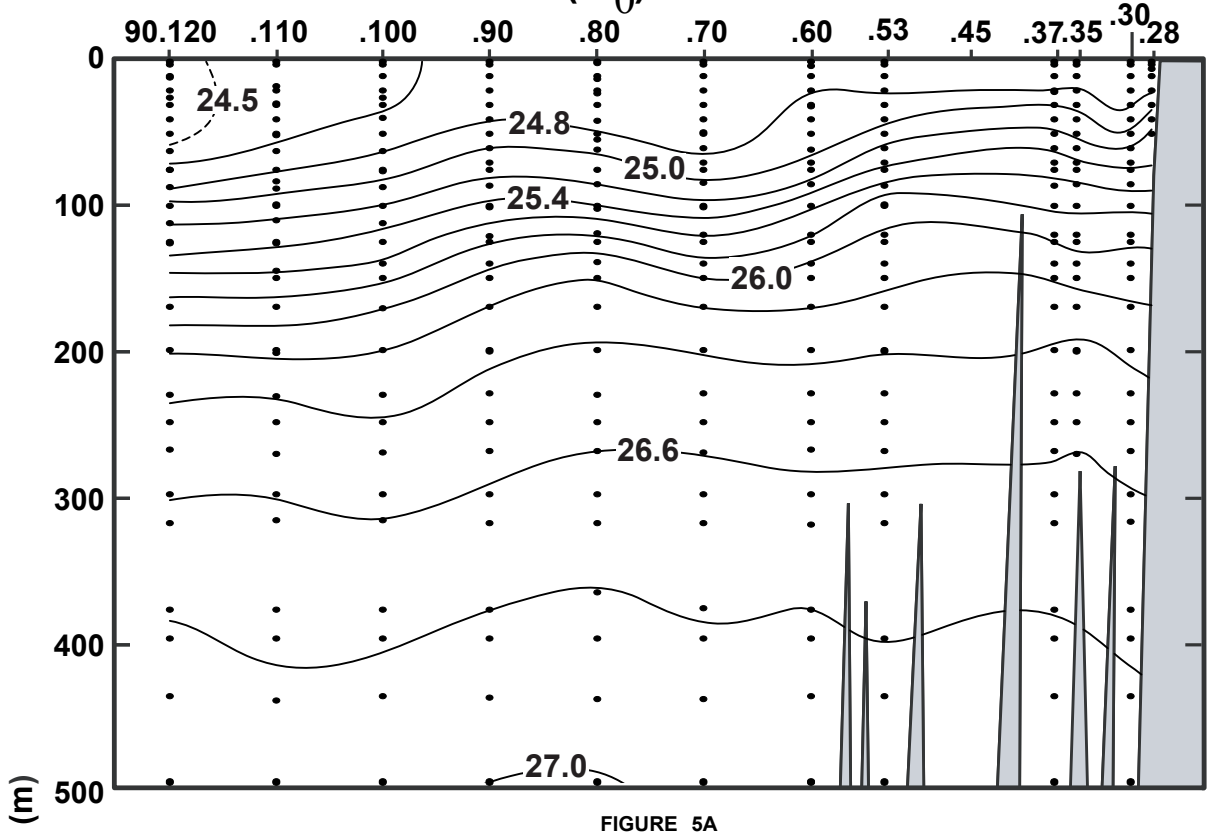


FIGURE 5A

TEMPERATURE (^{o}C) ALONG CALCOFI LINE 90

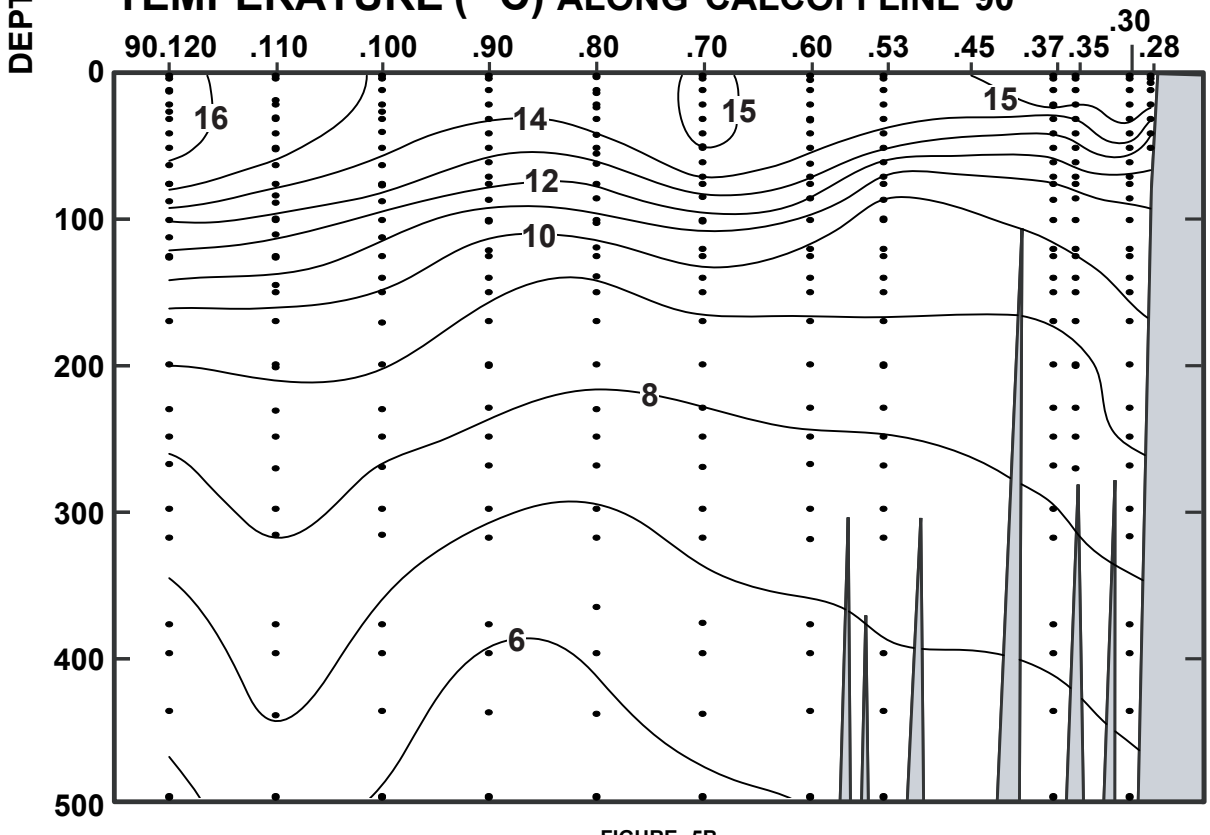


FIGURE 5B

CALCOFI CRUISE 1402

1 - 4 February 2014

SALINITY ALONG CALCOFI LINE 90

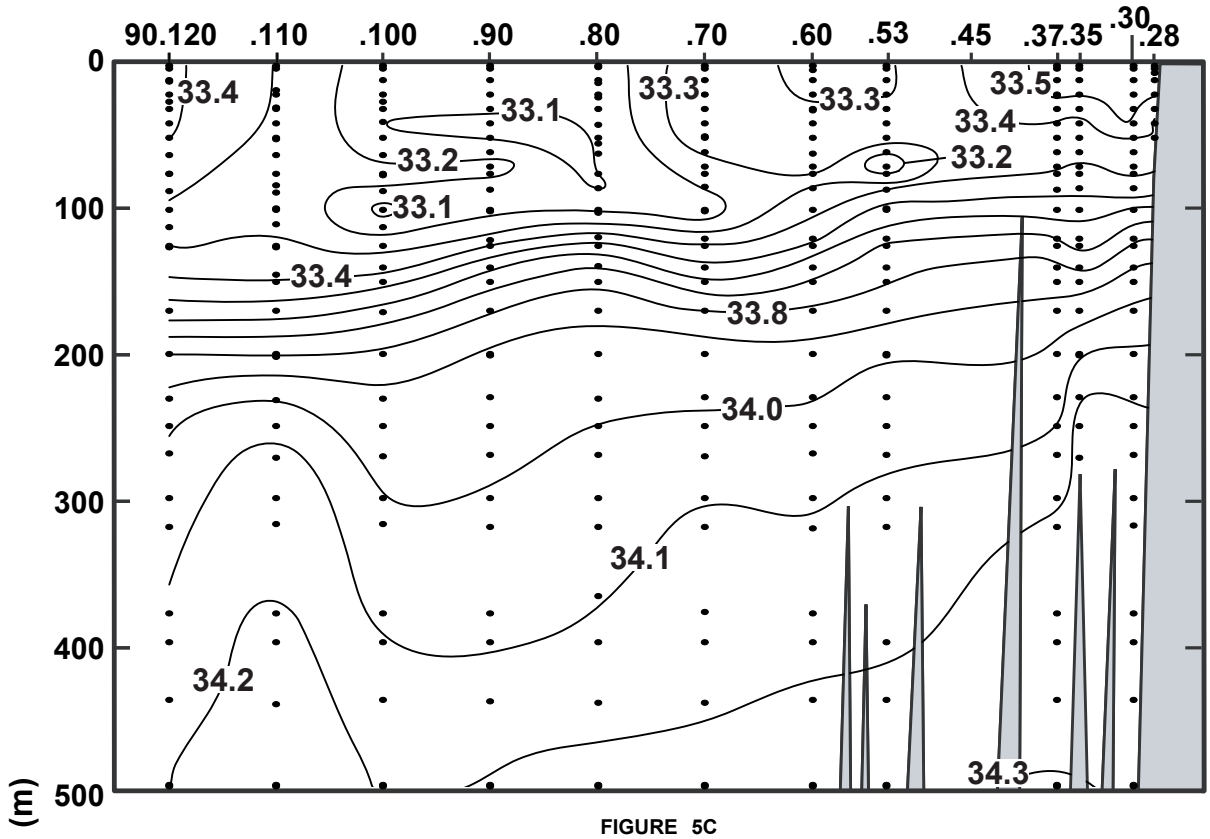


FIGURE 5C

SILICATE (μM/L) ALONG CALCOFI LINE 90

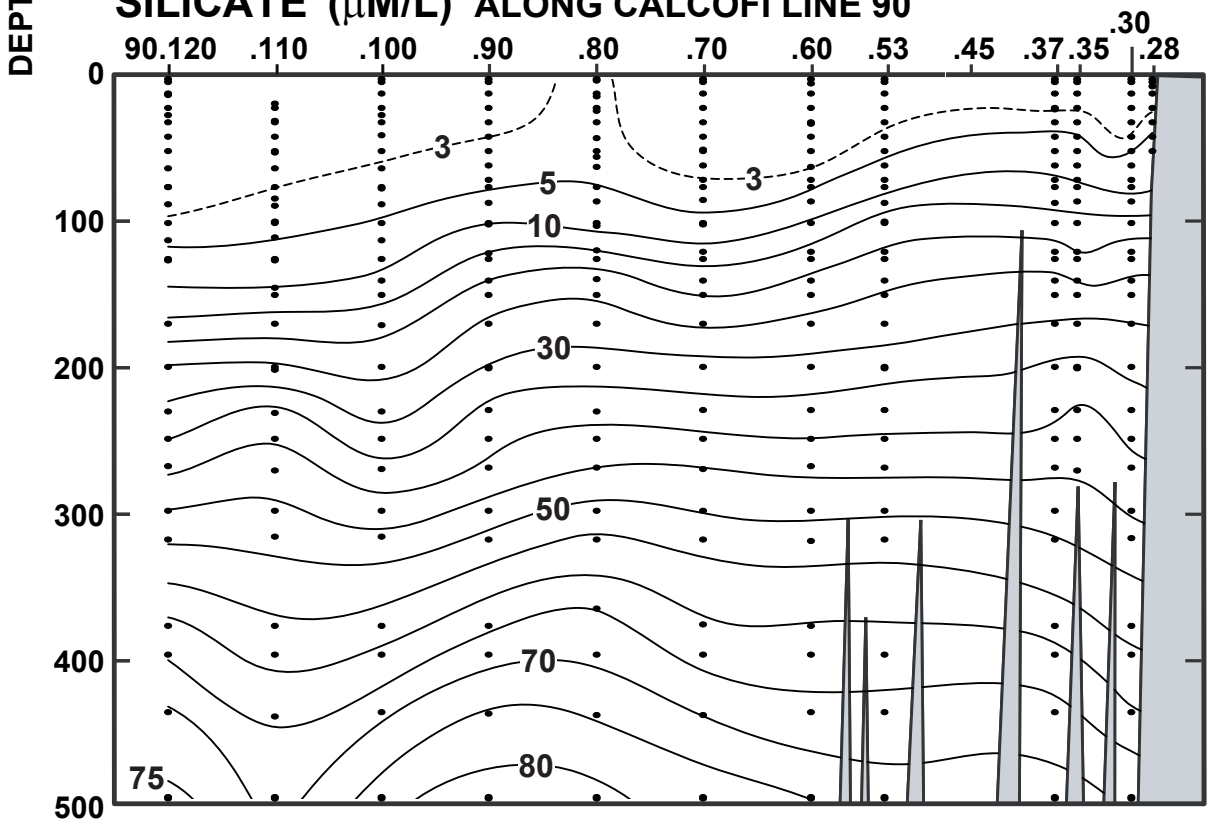


FIGURE 5D

CALCOFI CRUISE 1402

1 - 4 February 2014

NITRATE (μM/L) ALONG CALCOFI LINE 90

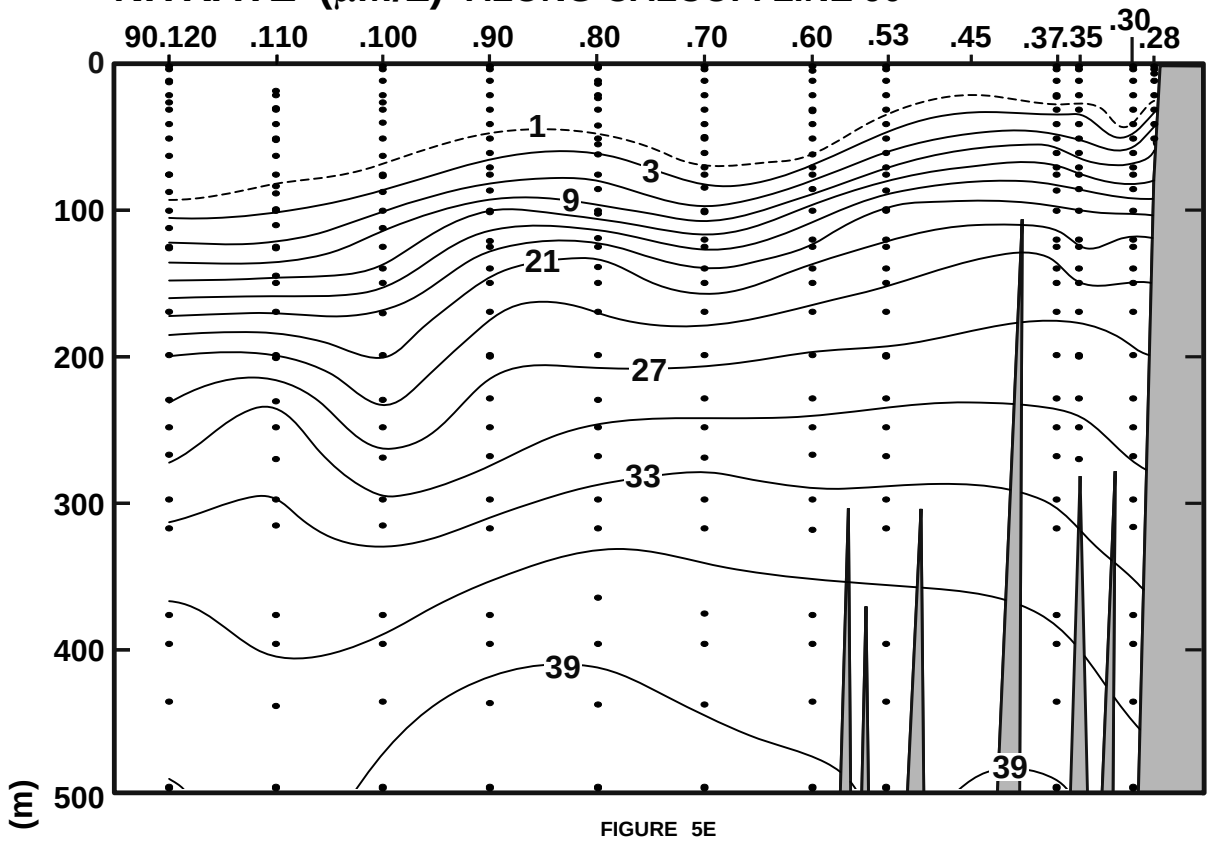


FIGURE 5E

PHOSPHATE (μM/L) ALONG CALCOFI LINE 90

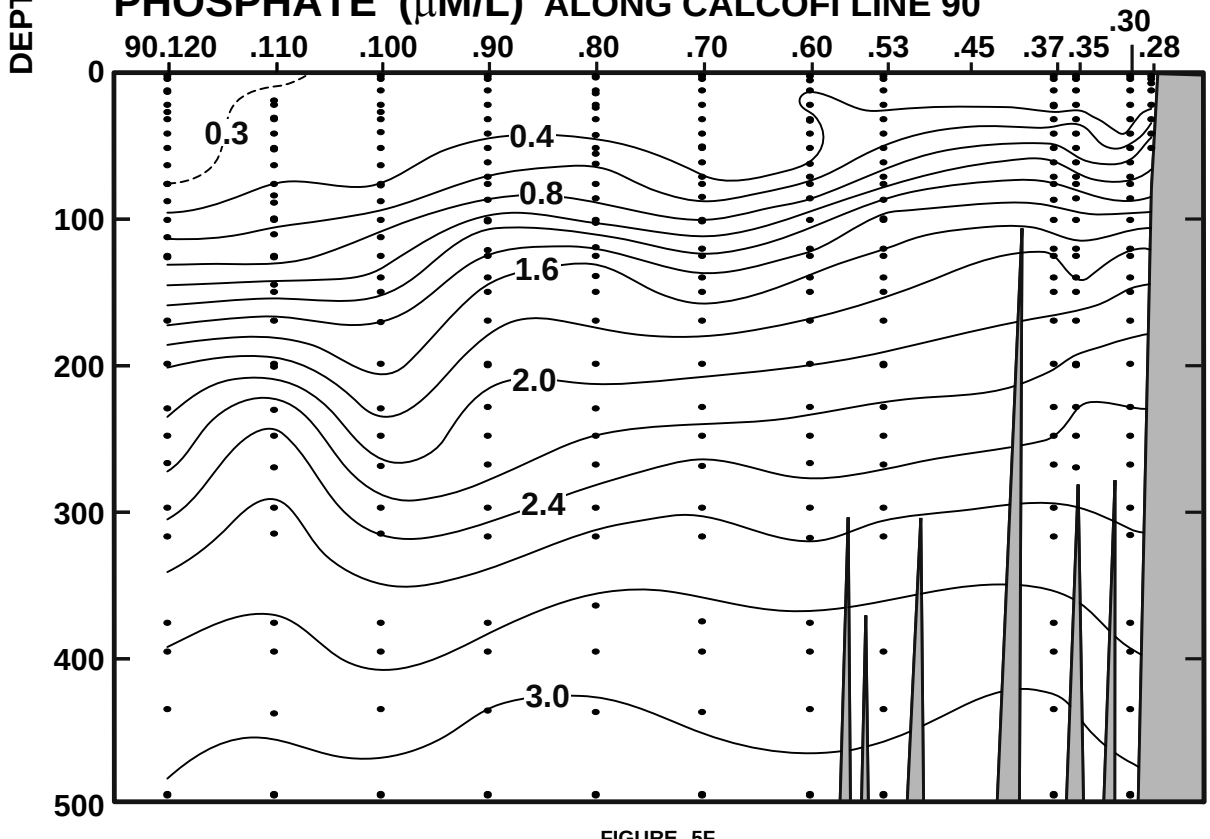


FIGURE 5F

CALCOFI CRUISE 1402

1 - 4 February 2014

CHLOROPHYLL-a (μg/L) ALONG CALCOFI LINE 90

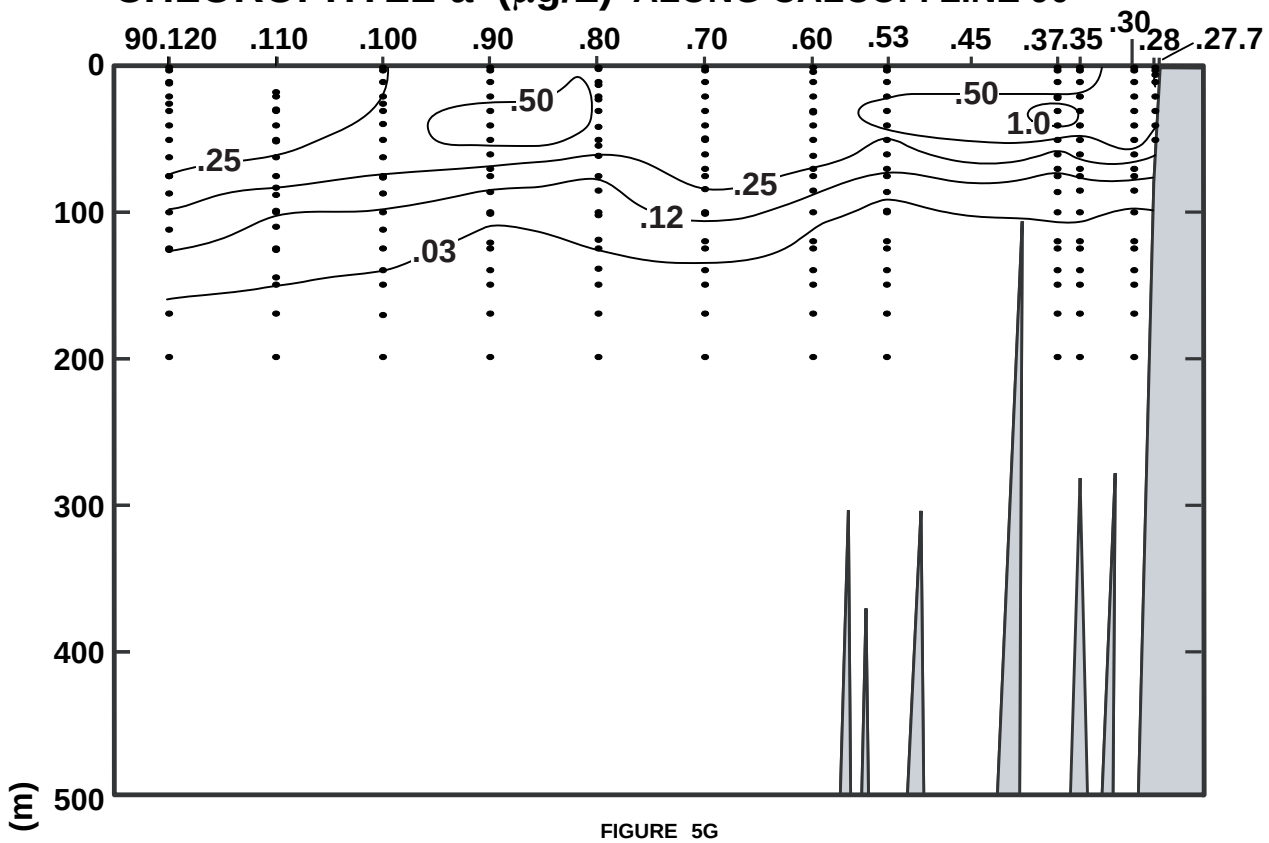


FIGURE 5G

OXYGEN SATURATION (%) ALONG CALCOFI LINE 90

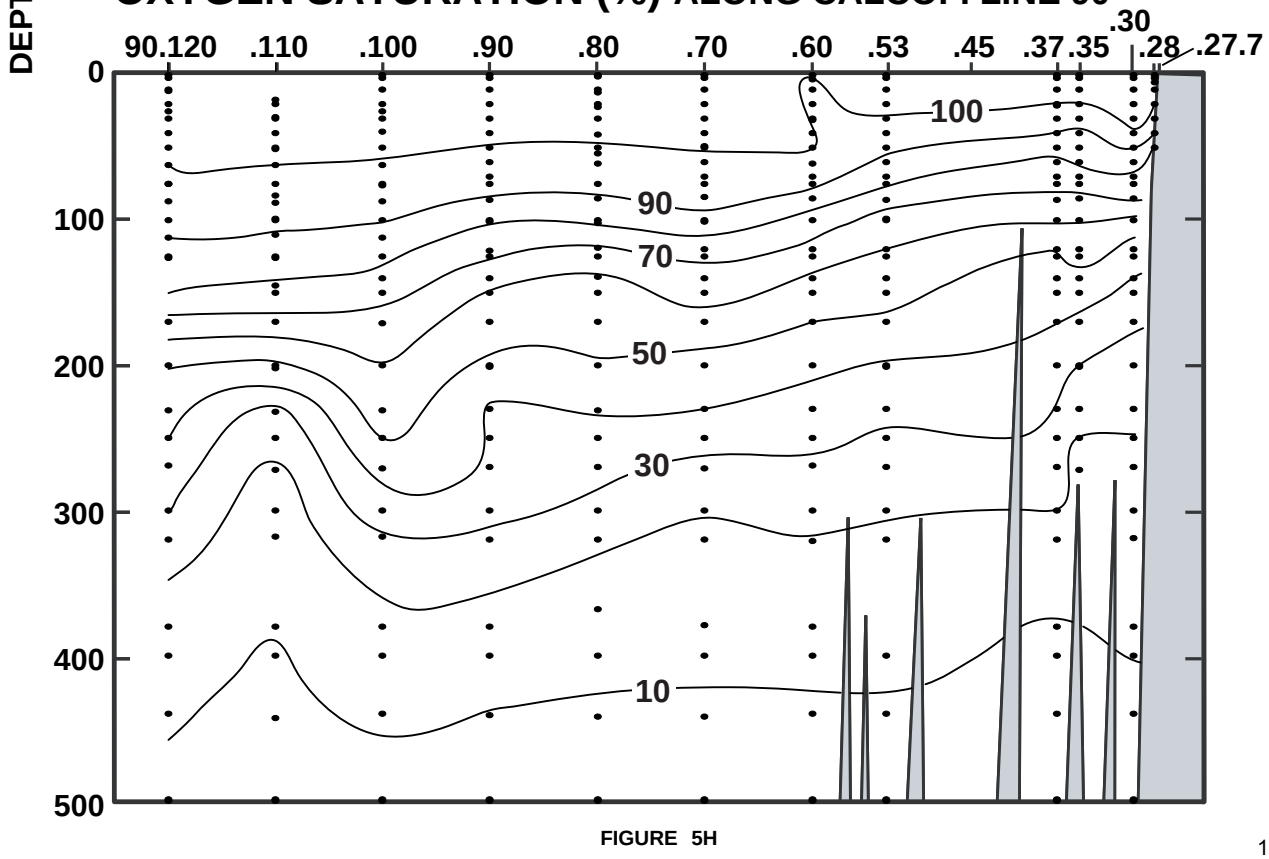


FIGURE 5H

CALCOFI CRUISE 1402

1 - 4 February 2014

OXYGEN (mL/L) ALONG CALCOFI LINE 90

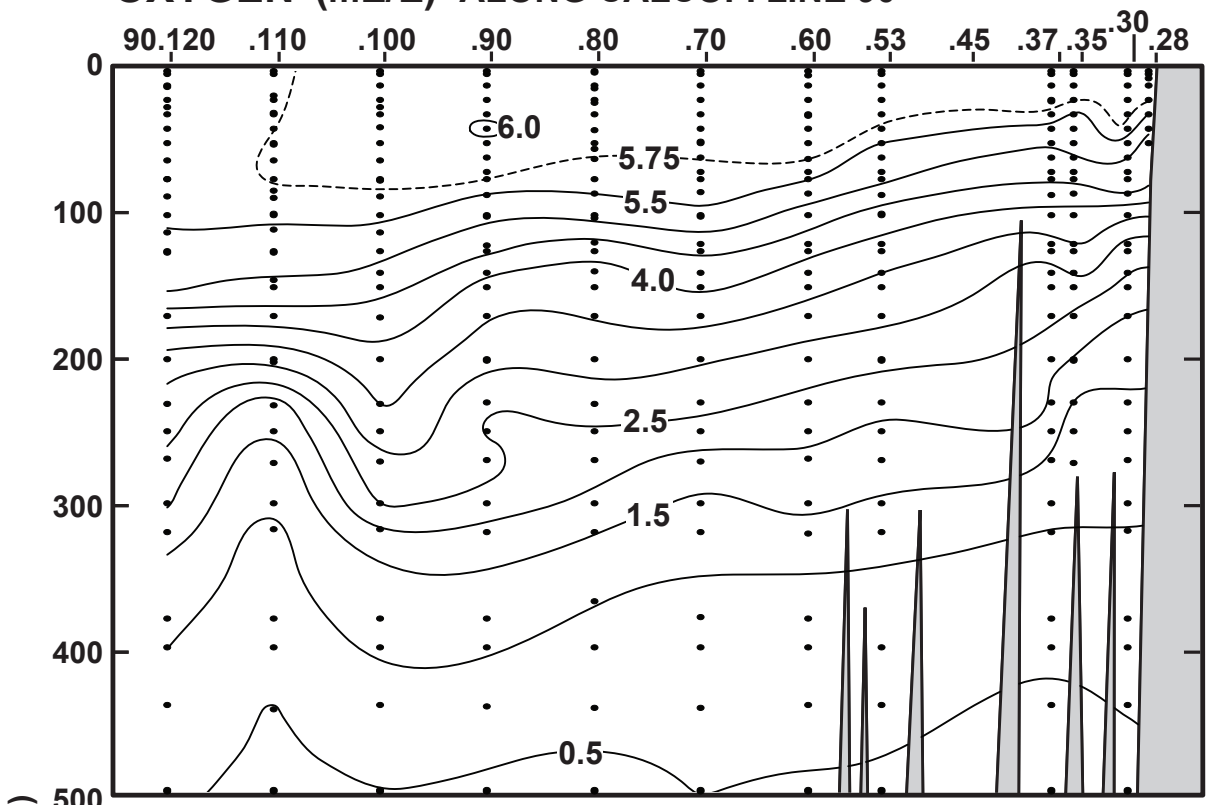


FIGURE 5I

NITRITE (μM/L) ALONG CALCOFI LINE 90

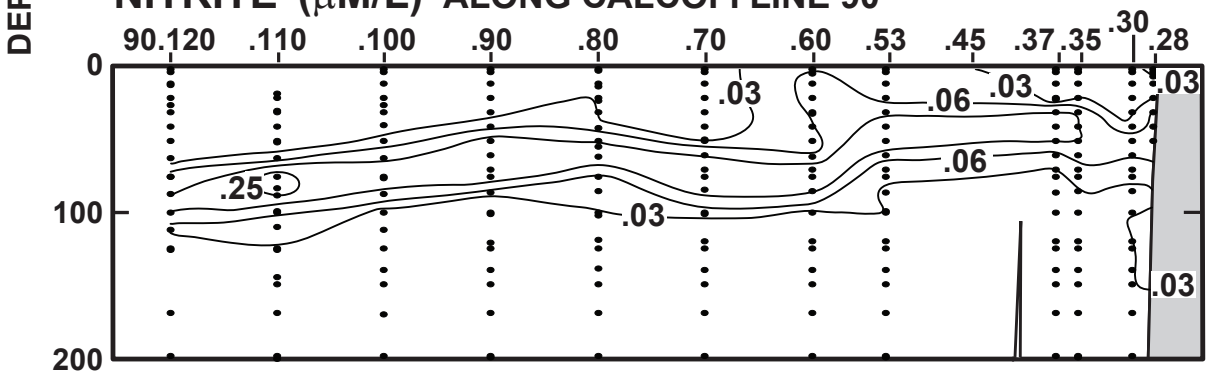


FIGURE 5J

PHAEOPIGMENTS (μg/L) ALONG CALCOFI LINE 90

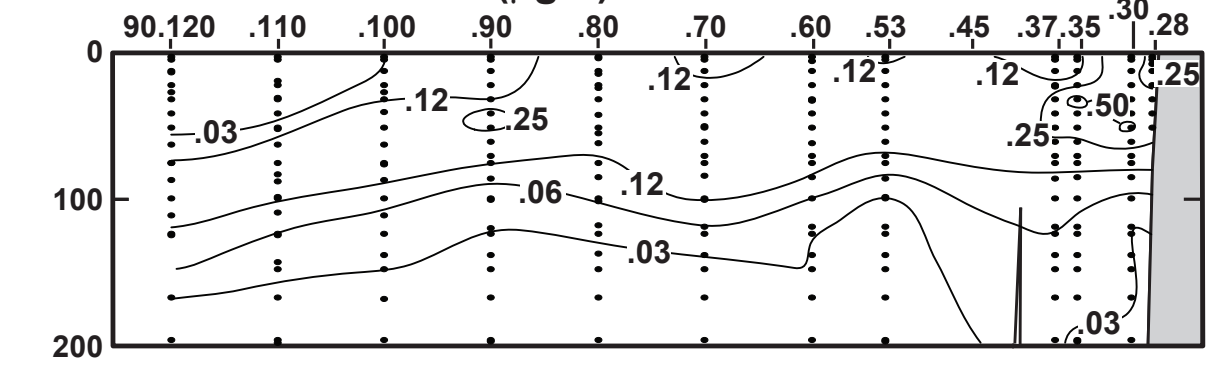


FIGURE 5K

PERSONNEL

CalCOFI Cruise 1402

SHIP'S CAPTAIN

Sirois, Scott, FSV Bell M. Shimada

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

Griffith, David (Chief Scientist)	Fishery Biologist, NMFS
Breese, Dawn	Bird Observer, FIAER
Debich, Amanda	Marine Mammal Acoustician, MPL
Dovel, Shonna	Staff Research Associate, SIO
Ekern, Lindsey	Staff Research Associate, SIO
Faber, David	Staff Research Associate, SIO
Hays, Amy	Fishery Biologist, NMFS
Jiorle, Ralph	Staff Research Associate, SIO
Klemmedson, Angela	Volunteer
Manion, Sue	Fishery Biologist, NMFS
Overcash, Bryan	Fishery Biologist, NMFS
Rodgers-Wolgast, Jennifer	Staff Research Associate, SIO
Whitaker, Katherine	Marine Mammal Observer, MPL
Wolgast, David	Staff Research Associate, SIO
Worland, Jared	Volunteer

San Diego to San Diego, California, 28 January - 6 February, 2014

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 85.4 35.8

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 0.6 N	118 50.5 W	05/02/2014	0246	UTC	40 m	350 06 kn			1017.0 mb	12.4 C	8.8 C				034

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0	14.92	14.92	33.501	24.835	310.5	0.000	5.89	257.2	102.4	2.9	0.38	0.4	0.08	0.08	0.77	0.31	0	
2	14.92	14.92	33.501	24.835	310.6	0.006	5.89	257.2	102.4	2.9	0.38	0.4	0.08	0.08	0.77	0.31	2	07
10	14.89	14.89	33.499	24.839	310.4	0.031	5.82	254.1	101.1	3.0	0.37	0.4	0.10	0.04	0.80	0.36	10	05
10	14.89	14.89	33.498	24.839	310.5	0.031											10	06
20	14.52	14.52	33.499	24.919	303.1	0.062	5.60	244.3	96.5	4.2	0.48	2.0	0.31	0.27	1.03	0.41	20	04
30	14.40	14.39	33.493	24.942	301.3	0.092	5.52	240.8	94.9	4.7	0.53	2.5	0.41	0.43	1.00	0.53	30	03
39	13.75	13.74	33.451	25.045	291.7	0.119	5.08	221.9	86.3	6.6	0.74	5.7	0.42	0.30	0.44	0.34	39	02

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 86.7 33.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 53.4 N	118 29.6 W	04/02/2014	1921	UTC	52 m	350 01 kn	250 02 06	1	1018.5 mb	15.5 C	12.3 C	13 m	5/8	SC	031

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0	14.69	14.69	33.495	24.880	306.2	0.000	5.67	247.4	98.1	4.5	0.49	1.9	0.38	0.62	1.45	0.42	0	
2 A	14.69	14.69	33.495	24.880	306.2	0.006	5.67	247.4	98.1	4.5	0.49	1.9	0.38	0.62	1.45	0.42	2	11
5	14.66	14.66	33.495	24.885	305.9	0.015	5.66	247.1	97.9	4.5	0.49	1.8	0.35	0.56	1.46	0.40	5	10
10 A	14.65	14.65	33.496	24.889	305.7	0.031	5.66	247.2	97.9	4.5	0.48	1.8	0.37	0.51	1.46	0.43	10	07
10	14.65	14.65	33.496	24.889	305.6	0.030											10	09
10	14.65	14.65	33.496	24.889	305.7	0.030											10	08
11 A	14.65	14.64	33.509	24.900	304.7	0.034	5.66	247.2	97.9	4.5	0.47	1.7	0.36	0.49	1.37	0.43	11	06
20 ISL	14.63 D	14.63	33.496 D	24.893	305.6	0.060	5.66 D	246.6 D	97.8	4.6	0.49	1.8	0.37	0.60	1.34	0.42	20	
22 A	14.62	14.62	33.495	24.896	305.4	0.067	5.62	245.6	97.2	4.6	0.50	1.8	0.37	0.62	1.33	0.42	22	04
22	14.62	14.62	33.496	24.897	305.3	0.067											22	05
30 ISL	14.28 D	14.28	33.465 D	24.945	301.0	0.078	5.52 D	240.4 D	94.7	5.7	0.62	3.7	0.56	1.12	0.84	0.34	30	
32	14.19	14.19	33.455	24.955	300.0	0.098	5.26	229.8	90.1	6.0	0.65	4.2	0.61	1.25	0.71	0.32	32	03
41 A	13.64	13.63	33.430	25.052	291.1	0.124	4.97	216.9	84.1	7.0	0.76	6.1	0.74	1.03	0.51	0.31	41	02
49 A	13.25	13.24	33.411	25.116	285.2	0.147	4.78	208.6	80.2	8.0	0.88	7.7	0.66	0.65	0.33	0.28	49	01

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.
D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 86.7 35.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 49.1 N	118 37.8 W	04/02/2014	2253	UTC	655 m	300 05 kn	260 02 06	1	1016.1 mb	13.4 C	10.0 C	13 m	7/8	SC	033

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0	15.14	15.14	33.495	24.783	315.5	0.000	5.88	256.8	102.8	3.0	0.38	0.3	0.06	0.10	1.07	0.38	0	
2	15.14	15.14	33.495	24.783	315.5	0.006	5.88	256.8	102.8	3.0	0.38	0.3	0.06	0.10	1.07	0.38	2	21
10	14.89	14.88	33.495	24.838	310.5	0.031	5.89	257.2	102.4	3.0	0.37	0.2	0.04	0.01	1.18	0.43	10	19
10	14.89	14.88	33.495	24.838	310.6	0.031											10	20
20	14.85	14.85	33.494	24.846	310.1	0.062	5.93	258.6	102.9	3.2	0.37	0.3	0.05	0.03	1.21	0.49	20	18
30	14.79	14.79	33.489	24.854	309.6	0.093	5.84	255.1	101.4	3.1	0.37	0.3	0.06	0.01	1.38	0.53	30	17
40	14.64	14.64	33.473	24.875	308.0	0.124	5.73	250.0	99.0	3.4	0.42	1.0	0.08	0.02	1.15	0.43	40	16
50	14.16	14.16	33.449	24.958	300.4	0.155	5.57	243.0	95.3	3.9	0.50	2.1	0.12	0.01	0.85	0.35	50	15
61	12.99	12.99	33.374	25.139	283.4	0.187	5.01	218.6	83.6	6.4	0.79	6.6	0.12	0.04	0.58	0.41	61	14
70	12.71	12.70	33.388	25.205	277.2	0.212	4.84	211.4	80.4	7.4	0.90	8.2	0.04	0.01	0.32	0.25	71	13
75 ISL	12.38 D	12.37	33.409 D	25.285	269.8	0.212	4.80 D	208.9 D	79.1	8.8	0.99	9.7	0.05	0.01	0.24	0.22	76	
85	11.87	11.86	33.434	25.401	258.9	0.252	4.22	184.1	68.8	11.7	1.18	12.6	0.06	0.00	0.08	0.18	86	12
100	11.18	11.17	33.549	25.618	238.6	0.289	3.68	160.7	59.2	15.9	1.45	16.4	0.03	0.01	0.03	0.11	101	11
120	10.65	10.63	33.654	25.795	222.2	0.335	3.26	142.4	51.9	19.5	1.64	19.4	0.03	0.01	0.01	0.07	121	10
125 ISL	10.54 D	10.53	33.706 D	25.854	216.6	0.334	3.10 D	134.8 D	49.2	20.8	1.70	20.2	0.03	0.02	0.01	0.07	126	
140	10.20	10.19	33.801	25.987	204.3	0.378	2.71	118.2	42.7	24.7	1.88	22.7	0.03	0.06	0.01	0.06	141	09
150 ISL	10.09 D	10.07	33.841 D	26.037	199.7	0.386	2.56 D	111.2 D	40.2	25.7	1.92	23.4	0.02	0.04	0.01	0.05	151	
170	9.67	9.65	33.906	26.159	188.5	0.437	2.61	114.1	40.8	27.7	1.99	24.9	0.02	0.00	0.00	0.04	171	08
200	9.22	9.20	34.066	26.358	170.2	0.491	2.03	88.7	31.4	33.9	2.22	27.6	0.03	0.01	0.00	0.03	202	07
230	9.06	9.04	34.167	26.464	160.7	0.540	1.52	66.3	23.4	38.4	2.40	29.3	0.02	0.00			232	06
250 ISL	8.90 D	8.87	34.189 D	26.508	157.0	0.561	1.43 D	62.3 D	22.0	41.4	2.48	30.3	0.02	0.00			252	
271	8.50	8.48	34.204	26.582	150.2	0.604	1.20	52.3	18.3	44.6	2.57	31.4	0.02	0.01			273	05
300 ISL	8.17 D	8.14	34.214 D	26.640	145.0	0.637	1.13 D	49.0 D	17.0	48.3	2.65	32.6	0.02	0.01			302	
320	7.98	7.94	34.225	26.679	141.6	0.676	0.91	39.8	13.7	50.9	2.71	33.4	0.01	0.01			323	04
380	7.41	7.37	34.270	26.797	131.0	0.758	0.54	23.6	8.0	59.7	2.91	35.5	0.01	0.00			383	03
400 ISL	7.30 D	7.26	34.275 D	26.817	129.5	0.775	0.55 D	23.9 D	8.1	61.8	2.94	35.9	0.01	0.00			403	
442	6.96	6.92	34.285	26.873	124.6	0.837	0.40	17.4	5.9	66.1	3.01	36.6	0.02	0.00			446	02
500 ISL	6.60 D	6.55	34.307 D	26.939	118.9	0.900	0.33 D	14.2 D	4.8	74.5	3.11	38.0	0.02	0.02			504	
515	6.42	6.38	34.316	26.970	116.0	0.925	0.29 D	12.5 D	4.2	76.7	3.13	38.3	0.02	0.02			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 86.7 40.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 39.3 N	118 58.6 W	05/02/2014	0601	UTC	698 m	330 08 kn			1018.4 mb	13.6 C	9.9 C				035

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0	15.32	15.32	33.529	24.769	316.7	0.000	5.80	253.3	101.7	2.4	0.34	0.0	0.02	0.06	0.62	0.23	0	
2	15.32	15.32	33.529	24.770	316.8	0.006	5.80	253.3	101.7	2.4	0.34	0.0	0.02	0.06	0.62	0.23	2	24
10	15.32	15.32	33.528	24.768	317.2	0.032	5.80	253.1	101.7	2.4	0.33	0.0	0.03	0.04	0.59	0.19	10	23
20	15.31	15.30	33.526	24.771	317.3	0.063	5.78	252.3	101.3	2.4	0.33	0.0	0.02	0.05	0.72	0.17	20	22
30	15.26	15.26	33.522	24.778	316.9	0.095	5.74	250.7	100.5	2.4	0.36	0.1	0.03	0.04	0.75	0.23	30	21
40	14.20	14.19	33.444	24.946	301.2	0.126	5.55	242.3	95.1	3.9	0.52	2.2	0.14	0.03	0.87	0.41	40	20
50	13.75	13.74	33.413	25.016	294.8	0.156	5.32	232.5	90.3	4.7	0.63	3.9	0.17	0.05	0.60	0.33	50	19
60	12.92	12.91	33.369	25.149	282.4	0.185	5.09	222.2	84.8	6.1	0.78	6.4	0.08	0.02	0.48	0.27	60	18
70	11.91	11.90	33.404	25.371	261.4	0.212	4.59	200.2	74.9	9.1	1.01	10.7	0.04	0.05	0.17	0.19	71	17
75 ISL	11.78 D	11.77	33.437 D	25.420	256.8	0.227	4.60 D	200.1 D	74.8	10.4	1.09	12.0	0.04	0.04	0.14	0.17	76	
85	11.41	11.39	33.496	25.536	246.0	0.250	4.05	176.6	65.4	13.0	1.26	14.6	0.04	0.02	0.07	0.13	86	16
100	10.91	10.90	33.590	25.698	230.9	0.286	3.56	155.5	57.0	16.9	1.48	17.8	0.02	0.02	0.02	0.06	101	15
120	10.48	10.47	33.755	25.902	211.9	0.330	2.93	127.8	46.5	21.9	1.74	21.5	0.02	0.04	0.01	0.05	121	14
125 ISL	10.35 D	10.34	33.785 D	25.948	207.6	0.343	2.88 D	125.3 D	45.6	23.0	1.77	22.2	0.02	0.03	0.01	0.05	126	
140	9.65	9.63	33.838	26.108	192.6	0.371	2.78	121.3	43.3	26.2	1.86	24.3	0.03	0.01	0.01	0.06	141	13
150 ISL	9.40 D	9.39	33.926 D	26.218	182.4	0.392	2.52 D	109.7 D	39.1	28.5	1.96	25.6	0.02	0.01	0.01	0.05	151	
170	9.12	9.10	34.019	26.338	171.4	0.425	2.09	91.2	32.2	33.3	2.15	28.1	0.01	0.01	0.00	0.05	171	12
200	8.82	8.79	34.105	26.454	160.9	0.475	1.69	73.9	25.9	37.9	2.31	29.9	0.02	0.02	0.00	0.05	202	11
230	8.62	8.60	34.149	26.519	155.3	0.522	1.47	64.0	22.4	40.9	2.42	31.4	0.03	0.01			232	10
250 ISL	8.43 D	8.40	34.179 D	26.573	150.5	0.556	1.26 D	55.0 D	19.2	43.3	2.50	32.0	0.03	0.02			252	
270	8.30	8.27	34.197	26.607	147.6	0.582	1.12	48.7	16.9	45.7	2.57	32.6	0.03	0.03			272	09
300 ISL	8.06 D	8.03	34.222 D	26.664	142.7	0.630	0.97 D	42.0 D	14.6	48.5	2.68	33.5	0.02	0.04			302	
320	8.00	7.96	34.227	26.678	141.7	0.654	0.88	38.4	13.3	50.4	2.75	34.1	0.02	0.04			323	08
381	7.54	7.50	34.265	26.775	133.3	0.738	0.58	25.5	8.7	56.9	2.87	36.1	0.02	0.02			384	07
400 ISL	7.30 D	7.26	34.277 D	26.819	129.3	0.769	0.52 D	22.6 D	7.7	59.8	2.92	36.7	0.02	0.02			403	
440	6.94	6.90	34.288	26.878	124.0	0.814	0.40 D	17.4 D	5.9	65.8	3.02	37.9	0.02	0.03			444	06
480	6.73	6.68	34.298	26.915	121.0	0.863	0.33	14.3	4.8	69.6	3.07	38.5	0.02	0.03			484	05
500 ISL	6.61 D	6.56	34.307 D	26.938	119.0	0.893	0.31 D	13.5 D	4.5	71.5	3.10	38.7	0.02	0.03			504	
514	6.54	6.49	34.308	26.949	118.2	0.903	0.28	12.3	4.1	72.9	3.12	38.9	0.02	0.03			518	04
600 ISL	6.06 D	6.01	34.339 D	27.037	110.5	1.009	0.21 D	9.0 D	3.0	82.3	3.23	39.6	0.01	0.08			605	
605	6.04	5.99	34.339	27.039	110.4	1.007	0.18	8.0	2.6	82.9	3.24	39.6	0.01	0.08			610	03
694	5.59	5.53	34.370	27.121	103.2	1.102	0.12	5.0	1.6	93.9	3.32	39.8	0.01	0.03			700	02
699	5.57	5.51	34.371	27.124	103.0	1.108	0.12 D	5.1 D	1.7	94.3	3.32	39.4	0.01	0.04			705	01
700 ISL	5.56 D	5.50	34.374 D	27.128	102.6	1.117	0.12 D	5.2 D	1.7								706	

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY STA-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 86.7 45.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 29.2 N	119 19.3 W	05/02/2014	1030	UTC	1601 m	320 09 kn			1018.3 mb	14.0 C	11.0 C				036

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0	14.87	14.87	33.503	24.847	309.4	0.000	5.75	250.9	99.9	2.9	0.38	0.3	0.03	0.15	0.70	0.14	0	
2	14.87	14.87	33.503	24.847	309.4	0.006	5.75	250.9	99.9	2.9	0.38	0.3	0.03	0.15	0.70	0.14	2	21
9	14.87	14.87	33.495	24.841	310.2	0.028											9	20
10	14.87	14.87	33.494	24.841	310.2	0.031	5.76	251.4	100.0	2.9	0.38	0.3	0.02	0.10	0.67	0.15	10	19
20	14.87	14.86	33.494	24.842	310.5	0.062	5.76	251.6	100.1	2.8	0.39	0.3	0.03	0.13	0.66	0.20	20	18
30	14.86	14.85	33.492	24.843	310.7	0.093	5.76	251.3	100.0	2.8	0.38	0.3	0.03	0.04	0.66	0.17	30	17
40	14.84	14.84	33.490	24.845	310.8	0.124	5.75	251.1	99.9	2.9	0.39	0.4	0.03	0.07	0.66	0.16	40	16
50 ISL	12.78 D	12.77	33.360 D	25.170	280.0	0.142	5.16 D	224.9 D	85.8	6.0	0.77	6.2	0.10	0.03	0.47	0.27	50	
51	12.74	12.73	33.356	25.175	279.6	0.157	5.11	223.1	84.8	6.3	0.81	6.8	0.10	0.03	0.45	0.28	51	15
60	11.95	11.95	33.361	25.328	265.2	0.181	4.87	212.7	79.6	7.7	0.95	8.9	0.05	0.13	0.32	0.30	60	14
70	11.57	11.56	33.433	25.456	253.3	0.207	4.43	193.3	71.8	10.4	1.13	12.1	0.04	0.06	0.20	0.18	71	13
75 ISL	11.34 D	11.33	33.443 D	25.505	248.7	0.208	4.39 D	191.0 D	70.8	10.9	1.17	12.7	0.03	0.05	0.17	0.16	76	
85	11.16	11.15	33.448	25.543	245.3	0.244	4.33	189.0	69.5	12.1	1.24	13.8	0.03	0.03	0.12	0.13	86	12
100	10.33	10.32	33.628	25.829	218.3	0.279	3.55	155.0	56.1	18.6	1.61	19.6	0.01	0.09	0.02	0.05	101	11
120	10.08	10.07	33.667	25.902	211.8	0.322	3.42	149.2	53.7	20.2	1.67	20.6	0.00	0.03	0.01	0.04	121	10
125 ISL	9.88 D	9.86	33.738 D	25.992	203.4	0.322	3.23 D	140.6 D	50.5	21.2	1.71	21.3	0.00	0.03	0.01	0.04	126	
140	9.80	9.79	33.788	26.044	198.8	0.363	2.97	129.5	46.4	24.1	1.84	23.3	0.00	0.02	0.00	0.04	141	09
150 ISL	9.64 D	9.62	33.821 D	26.097	193.9	0.372	2.91 D	126.7 D	45.4	26.5	1.93	24.5	0.00	0.03	0.00	0.04	151	
170	9.23	9.21	33.979	26.288	176.2	0.419	2.33	101.8	36.0	31.1	2.12	26.9	0.00	0.04	0.00	0.04	171	08
200	8.90	8.88	34.081	26.422	164.0	0.470	1.86	81.0	28.5	36.3	2.31	29.2	0.00	0.05	0.00	0.04	202	07
230	8.71	8.68	34.127	26.488	158.3	0.518	1.63	71.1	24.9	39.3	2.40	30.3	0.01	0.03			232	06
250 ISL	8.53 D	8.50	34.161 D	26.543	153.3	0.541	1.46 D	63.4 D	22.2	41.8	2.48	31.0	0.01	0.03			252	
271	8.41	8.38	34.184	26.580	150.3	0.582	1.19	52.1	18.1	44.5	2.57	31.7	0.01	0.03			273	05
300 ISL	8.14 D	8.11	34.215 D	26.646	144.4	0.616	1.04 D	45.0 D	15.6	47.7	2.67	32.9	0.01	0.04			302	
321	8.06	8.03	34.231	26.671	142.4	0.654	0.87	37.9	13.1	50.0	2.74	33.8	0.01	0.05			324	04
380	7.50	7.46	34.264	26.779	132.8	0.736	0.60	26.1	8.9	57.8	2.89	35.8	0.02	0.08			383	03
400 ISL	7.46 D	7.42	34.267 D	26.789	132.3	0.755	0.61 D	26.3 D	9.0	59.5	2.91	36.0	0.02	0.06			403	
441	7.18	7.13	34.280	26.839	128.0	0.815	0.47	20.5	7.0	62.9	2.96	36.5	0.01	0.01			445	02
500 ISL	6.70 D	6.66	34.301 D	26.921	120.7	0.883	0.37 D	15.9 D	5.4	69.6	3.06	38.0	0.01	0.01			504	
515	6.65	6.61	34.303	26.930	120.1	0.907	0.38	16.4	5.5	71.3	3.09	38.4	0.01	0.01			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 86.8 32.5

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 52.9 N	118 26.8 W	04/02/2014	2101	UTC	34 m	240 07 kn	260 01 06	1	1017.0 mb	14.3 C	11.4 C		7/8	SC	032

DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SIO3	PO4	NO3	NO2	NH4	CHL-A	PHAEO	PRES	SAMP
m	DEG C	DEG C		THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
0	14.84	14.84	33.479	24.834	310.6	0.000	5.71	249.1	99.1	3.9	0.48	1.4	0.29	1.77	1.24	0.42	0	
2	14.84	14.84	33.479	24.834	310.6	0.006	5.71	249.1	99.1	3.9	0.48	1.4	0.29	1.77	1.24	0.42	2	05
4	14.78	14.78	33.482	24.851	309.1	0.012	5.74	250.6	99.5	3.9	0.47	1.4	0.29	1.78	1.20	0.38	4	04
10	14.75	14.74	33.478	24.855	308.9	0.031	5.70	249.0	98.8	4.0	0.47	1.4	0.31	1.74	1.47	0.50	10	03
15	14.73	14.73	33.481	24.861	308.5	0.046	5.71	249.3	98.9	4.0	0.48	1.5	0.31	1.71	1.50	0.47	15	02
20	14.68	14.68	33.480	24.871	307.7	0.062	5.72	249.5	98.9	4.2	0.49	1.7	0.36	1.58	1.62	0.48	20	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 88.5 30.1

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 40.0 N	118 5.4 W	04/02/2014	1550	UTC	21 m	060 07 kn	250 03 05	1	1017.3 mb	12.9 C	10.9 C		4/8	SC	030

DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SIO3	PO4	NO3	NO2	NH4	CHL-A	PHAEO	PRES	SAMP
m	DEG C	DEG C		THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
0	15.12	15.12	33.523	24.809	313.0	0.000	5.77	251.9	100.7	4.5	0.39	0.2	0.04	0.16	2.63	0.45	0	
2	15.12	15.12	33.523	24.809	313.0	0.006	5.77	251.9	100.7	4.5	0.39	0.2	0.04	0.16	2.63	0.45	2	04
5	15.13	15.13	33.524	24.807	313.3	0.016	5.76	251.7	100.7	4.5	0.40	0.2	0.04	0.12	2.89	0.39	5	03
10	15.13	15.13	33.519	24.803	313.9	0.031	5.76	251.4	100.5	4.5	0.39	0.2	0.04	0.12	2.48	0.43	10	02
13	15.13	15.13	33.516	24.801	314.1	0.041	5.75	251.0	100.4	4.5	0.39	0.2	0.04	0.12	2.62	0.43	13	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 28.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 29.3 N	117 46.1 W	04/02/2014	1235	UTC	55 m	100 11 kn			1015.6 mb	13.3 C	10.4 C				029

DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SIO3	PO4	NO3	NO2	NH4	CHL-A	PHAEO	PRES	SAMP
m	DEG C	DEG C		THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
0	15.28	15.28	33.524	24.775	316.2	0.000	5.78	252.4	101.2	2.5	0.36	0.0	0.04	0.10	0.49	0.15	0	
2	15.28	15.27	33.524	24.775	316.2	0.006	5.78	252.4	101.2	2.5	0.36	0.0	0.04	0.10	0.49	0.15	2	07
5	15.27	15.27	33.526	24.778	316.1	0.016	5.79	252.6	101.3	2.5	0.36	0.0	0.03	0.09	0.48	0.16	5	06
10	15.27	15.27	33.517	24.770	317.0	0.032	5.79	252.6	101.3	2.5	0.34	0.0	0.02	0.04	0.47	0.15	10	05
20	15.26	15.26	33.511	24.770	317.4	0.063	5.78	252.4	101.2	2.6	0.34	0.1	0.03	0.07	0.51	0.17	20	04
30	14.05	14.04	33.408	24.950	300.5	0.094	5.47	238.6	93.3	4.1	0.57	2.6	0.07	0.07	0.91	0.48	30	03
40	12.94	12.94	33.375	25.148	281.9	0.123	5.16	225.4	86.1	5.6	0.75	5.7	0.08	0.13	0.52	0.46	40	02
50	12.48	12.47	33.399	25.258	271.6	0.151	4.63	202.0	76.4	8.8	1.02	9.4	0.10	0.23	0.28	0.26	50	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 30.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 25.2 N	117 54.1 W	04/02/2014	0945	UTC	609 m	130 11 kn			1015.6 mb	15.0 C	12.5 C				028

DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SIO3	PO4	NO3	NO2	NH4	CHL-A	PHAEO	PRES	SAMP
m	DEG C	DEG C		THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
0	15.32	15.32	33.531	24.769	316.7	0.000	5.85	255.5	102.6	2.7	0.34	0.0	0.02	0.08	0.82	0.43	0	
2	15.32	15.32	33.531	24.769	316.8	0.006	5.85	255.5	102.6	2.7	0.34	0.0	0.02	0.08	0.82	0.43	2	21
10	15.34	15.34	33.532	24.767	317.3	0.032	5.84	255.1	102.5	2.6	0.34	0.0	0.01	0.03	0.78	0.31	10	19
10	15.34	15.34	33.533	24.768	317.2	0.031											10	20
20	15.35	15.34	33.531	24.766	317.7	0.064	5.83	254.7	102.3	2.6	0.34	0.0	0.01	0.05	0.74	0.35	20	18
30	15.35	15.34	33.529	24.765	318.1	0.095	5.83	254.8	102.3	2.5	0.33	0.0	0.02	0.02	0.72	0.31	30	17
40	15.15	15.14	33.523	24.804	314.8	0.127	5.83	254.7	101.9	2.6	0.35	0.0	0.02	0.02	0.77	0.32	40	16
50	13.63	13.63	33.391	25.023	294.1	0.157	5.42	236.5	91.7	4.1	0.60	3.1	0.11	0.12	0.77	0.58	50	15
60	12.63	12.62	33.353	25.194	278.0	0.186	5.04	220.3	83.6	6.0	0.81	7.0	0.06	0.05	0.34	0.31	60	14
70	11.83	11.82	33.359	25.351	263.3	0.213	4.82	210.7	78.6	7.9	0.97	9.6	0.04	0.02	0.18	0.18	71	13
75 ISL	11.67 D	11.66	33.406 D	25.417	257.1	0.212	4.81	D209.3 D	78.1	8.8	1.03	10.6	0.04	0.03	0.14	0.15	76	
85	11.11	11.10	33.408	25.520	247.5	0.251	4.54	198.4	72.9	10.6	1.14	12.6	0.02	0.06	0.07	0.09	86	12
100	10.72	10.71	33.625	25.759	225.1	0.287	3.51	153.3	56.0	17.3	1.52	17.7	0.03	0.03	0.02	0.05	101	11
120	10.31	10.29	33.788	25.958	206.6	0.330	2.87	125.3	45.4	22.5	1.80	21.5	0.03	0.03	0.01	0.03	121	10
125 ISL	10.29 D	10.28	33.814 D	25.981	204.6	0.326	2.85	D123.9 D	45.0	23.3	1.84	22.0	0.03	0.02	0.01	0.03	126	
140	10.19	10.17	33.903	26.070	196.5	0.370	2.47	107.9	39.0	25.6	1.95	23.3	0.03	0.00	0.01	0.03	141	09
150 ISL	10.20 D	10.18	33.949 D	26.103	193.5	0.376	2.34	D101.9 D	36.9	27.1	2.02	24.1	0.03	0.00	0.01	0.03	151	
170	9.83	9.81	34.024	26.225	182.4	0.427	1.97	86.0	30.9	30.1	2.16	25.7	0.02	0.01	0.00	0.03	171	08
200	9.57	9.55	34.115	26.341	172.0	0.480	1.71	74.5	26.6	33.3	2.27	27.2	0.03	0.01	0.00	0.03	202	07
230	9.29	9.26	34.188	26.445	162.7	0.531	1.44	62.8	22.3	36.9	2.40	28.4	0.02	0.00			232	06
250 ISL	9.11 D	9.09	34.217 D	26.496	158.2	0.550	1.32 D	57.5 D	20.4	39.0	2.45	29.2	0.02	0.01			252	
270	8.81	8.78	34.214	26.543	154.0	0.594	1.27	55.3	19.4	41.0	2.49	29.9	0.02	0.01			272	05
300 ISL	8.59 D	8.55	34.253 D	26.608	148.3	0.628	1.06 D	46.0 D	16.1	44.4	2.56	30.8	0.01	0.02			302	
319	8.29	8.25	34.239	26.644	145.1	0.667	0.99	43.2	15.0	46.5	2.61	31.4	0.01	0.03			322	04
380	7.68	7.64	34.237	26.733	137.3	0.753	0.77	33.4	11.4	53.4	2.75	33.6	0.02	0.02			383	03
400 ISL	7.55 D	7.51	34.253 D	26.764	134.7	0.770	0.69 D	30.0 D	10.3	55.7	2.80	34.2	0.02	0.03			403	
440	7.24	7.19	34.266	26.820	129.8	0.834	0.53	23.0	7.8	60.2	2.89	35.4	0.02	0.05			444	02
500 ISL	6.79 D	6.74	34.287 D	26.899	122.9	0.900	0.44 D	18.9 D	6.4	68.5	3.04	36.7	0.02	0.03			504	
516	6.63	6.58	34.301	26.931	119.9	0.929	0.40	17.5	5.9	70.7	3.08	37.0	0.02	0.03			520	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 35.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 15.2 N	118 15.1 W	04/02/2014	0525	UTC	299 m	300 11 kn			1015.0 mb	13.5 C	11.1 C				027

DEPTH m		TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.40	15.40	33.527	24.749	318.7	0.000	5.79	252.8	101.7	2.3	0.32	0.0	0.02	0.04	0.27	0.09	0	
2		15.40	15.40	33.527	24.749	318.7	0.006	5.79	252.8	101.7	2.3	0.32	0.0	0.02	0.04	0.27	0.09	2	17
10		15.40	15.40	33.525	24.748	319.1	0.032	5.80	253.5	101.9	2.3	0.32	0.0	0.02	0.04	0.30	0.09	10	15
10		15.40	15.40	33.526	24.749	319.0	0.031											10	16
20		14.99	14.99	33.504	24.823	312.3	0.063	5.78	252.5	100.7	2.5	0.35	0.1	0.03	0.06	0.55	0.19	20	14
30		13.94	13.94	33.420	24.980	297.6	0.094	5.39	235.5	91.9	4.5	0.58	2.4	0.12	0.01	0.99	0.55	30	13
40		13.12	13.11	33.375	25.114	285.1	0.123	5.20	227.3	87.1	5.4	0.73	5.3	0.10	0.03	0.56	0.41	40	12
50		12.83	12.82	33.373	25.171	280.0	0.151	5.21	227.5	86.7	5.8	0.75	5.8	0.13	0.02	0.41	0.33	50	11
60		12.30	12.30	33.376	25.274	270.4	0.179	5.01	218.8	82.5	7.1	0.84	7.8	0.08	0.02	0.31	0.21	60	10
70		11.75	11.74	33.418	25.411	257.5	0.205	4.65	203.0	75.6	9.7	1.03	10.8	0.05	0.00	0.16	0.17	71	09
75	ISL	11.25 D	11.24	33.442 D	25.521	247.2	0.204	4.57	D198.8 D	73.5	11.0	1.11	12.2	0.04	0.01	0.13	0.14	76	
85		10.88	10.87	33.487	25.623	237.7	0.242	4.21	183.6	67.2	13.6	1.28	15.0	0.03	0.02	0.07	0.10	86	08
100		10.45	10.44	33.545	25.743	226.5	0.277	3.90	170.4	61.8	16.5	1.45	17.8	0.03	0.00	0.04	0.08	101	07
120		10.12	10.11	33.631	25.868	215.1	0.321	3.54	154.6	55.7	19.5	1.61	20.1	0.02	0.00	0.02	0.05	121	06
125	ISL	10.12 D	10.11	33.650 D	25.882	213.8	0.318	3.48	D151.3 D	54.7	20.6	1.65	20.8	0.02	0.00	0.01	0.05	126	
140		9.64	9.62	33.761	26.050	198.2	0.363	3.08	134.4	48.0	23.8	1.77	22.7	0.00	0.00	0.01	0.05	141	05
150	ISL	9.44 D	9.43	33.827 D	26.134	190.4	0.369	2.97	D129.4 D	46.1	26.3	1.86	23.9	0.01	0.00	0.01	0.04	151	
170		9.11	9.09	33.956	26.289	176.0	0.419	2.37	103.6	36.6	31.1	2.05	26.4	0.02	0.00	0.00	0.04	171	04
200	ISL	8.70 D	8.68	34.099 D	26.467	159.6	0.457	1.95	D 84.8 D	29.8	37.1	2.25	28.6	0.01	0.01	0.00	0.02	202	
201		8.60	8.57	34.108	26.490	157.4	0.471	1.89	82.5	28.8	37.3	2.26	28.7	0.01	0.01	0.00	0.02	203	03
230		8.69	8.66	34.201	26.550	152.4	0.515	1.37	59.8	21.0	41.3	2.42	29.8	0.01	0.02			232	02
250	ISL	8.67 D	8.65	34.265 D	26.603	147.8	0.534	1.08	D 47.2 D	16.6	43.1	2.48	30.3	0.02	0.02			252	
272		8.49	8.46	34.240	26.612	147.3	0.578	1.12	49.0	17.1	45.1	2.55	30.9	0.02	0.01			274	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 37.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 10.8 N	118 23.6 W	04/02/2014	0202	UTC	1177 m	280 16 kn			1013.6 mb	13.6 C	9.7 C				026

DEPTH m		TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.53	15.53	33.531	24.724	321.1	0.000	5.82	254.1	102.5	2.5	0.34	0.0	0.00	0.05	0.36	0.10	0	
2		15.53	15.53	33.531	24.724	321.1	0.006	5.82	254.1	102.5	2.5	0.34	0.0	0.00	0.05	0.36	0.10	2	22
10		15.54	15.54	33.531	24.721	321.6	0.032	5.82	254.2	102.6	2.5	0.34	0.0	0.01	0.01	0.36	0.10	10	20
10		15.54	15.54	33.530	24.721	321.7	0.033											10	21
20	ISL	15.22 D	15.22	33.515 D	24.781	316.3	0.048	5.85	D254.8 D	102.3	2.4	0.33	0.0	0.00	0.01	0.48	0.14	20	
21		15.19	15.19	33.517	24.789	315.6	0.067	5.85	255.3	102.3	2.4	0.33	0.0	0.00	0.01	0.50	0.15	21	19
30		14.02	14.02	33.443	24.982	297.4	0.095	5.75	251.0	98.1	3.3	0.48	1.4	0.11	0.02	1.49	0.43	30	17
30		14.02	14.02	33.443	24.983	297.4	0.095											30	18
40		13.14	13.14	33.396	25.125	284.1	0.124	5.40	235.9	90.5	4.9	0.67	4.5	0.26	0.01	1.02	0.46	40	16
50		12.47	12.46	33.371	25.239	273.5	0.152	5.09	222.3	84.1	6.8	0.85	7.5	0.11	0.01	0.44	0.32	50	15
60		11.80	11.79	33.395	25.384	259.9	0.179	4.74	207.0	77.2	9.3	1.04	10.7	0.04	0.02	0.19	0.23	60	14
70		11.28	11.27	33.375	25.464	252.4	0.204	4.67	203.8	75.2	10.5	1.14	12.5	0.03	0.03	0.13	0.15	71	13
75	ISL	10.92 D	10.91	33.419 D	25.562	243.2	0.187	4.61	D200.5 D	73.6	11.6	1.21	13.6	0.02	0.02	0.11	0.14	76	
86		10.67	10.66	33.472	25.647	235.3	0.243	4.21	183.7	66.9	14.0	1.35	16.0	0.02	0.01	0.06	0.11	87	12
100		10.50	10.49	33.559	25.746	226.2	0.275	3.82	166.6	60.5	16.8	1.51	18.4	0.01	0.02	0.04	0.09	101	11
120		9.86	9.84	33.717	25.979	204.5	0.318	3.21	140.0	50.2	22.4	1.77	22.5	0.01	0.02	0.01	0.06	121	10
125	ISL	9.76 D	9.74	33.750 D	26.022	200.5	0.299	3.18	D138.2 D	49.6	23.5	1.81	23.1	0.01	0.02	0.01	0.06	126	
140		9.49	9.47	33.836	26.133	190.2	0.358	2.80	122.1	43.4	26.6	1.93	24.8	0.02	0.02	0.01	0.05	141	09
150	ISL	9.29 D	9.28	33.878 D	26.198	184.2	0.348	2.76	D120.3 D	42.7	27.7	1.96	25.4	0.02	0.02	0.01	0.05	151	
170		9.05	9.03	33.922	26.272	177.6	0.413	2.67	116.6	41.1	29.9	2.01	26.5	0.02	0.02	0.01	0.04	171	08
200		8.71	8.69	34.016	26.400	166.0	0.464	2.26	98.8	34.6	34.6	2.17	28.4	0.01	0.02	0.00	0.04	202	07
230		8.50	8.47	34.064	26.471	159.7	0.513	2.02	88.1	30.7	37.8	2.28	29.5	0.02	0.01			232	06
250	ISL	8.30 D	8.28	34.089 D	26.521	155.3	0.517	1.88	D 81.7 D	28.4	40.8	2.39	30.6	0.01	0.02			252	
270		8.26	8.23	34.150	26.576	150.5	0.575	1.46	63.7	22.1	43.7	2.50	31.7	0.01	0.02			272	05
300	ISL	7.95 D	7.92	34.183 D	26.649	144.0	0.592	1.35	D 58.7 D	20.3	47.7	2.61	32.8	0.01	0.03			302	
320		7.86	7.83	34.216	26.688	140.6	0.648	0.96	42.1	14.5	50.3	2.69	33.6	0.01	0.04			323	04
380		7.31	7.27	34.253	26.798	130.9	0.729	0.62	27.1	9.2	58.5	2.89	35.9	0.01	0.03			383	03
400	ISL	7.09 D	7.05	34.265 D	26.839	127.2	0.729	0.57	D 25.0 D	8.5	61.5	2.94	36.5	0.01	0.02			403	
440		6.74	6.70	34.287	26.904	121.3	0.805	0.40	17.4	5.8	67.4	3.04	37.8	0.01	0.01			444	02
500	ISL	6.33 D	6.29	34.310 D	26.976	115.0	0.851	0.34	D 14.9 D	5.0	73.7	3.11	39.3	0.01	0.03			504	
514		6.25	6.20	34.316	26.992	113.6	0.891	0.32	D 13.9 D	4.6	75.2	3.13	39.6	0.01	0.03			518	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 53.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 39.1 N	119 29.1 W	03/02/2014	1000	UTC	1318 m	310 15 kn			1012.9 mb	14.5 C	12.1 C				025

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		14.45		14.45		33.288		24.771	316.6	0.000	5.86		255.8		100.8		2.4	0.36	0.1	0.04	0.06	0.45	0.12	0	
2		14.45		14.45		33.288		24.771	316.7	0.006	5.86		255.8		100.8		2.4	0.36	0.1	0.04	0.06	0.45	0.12	2	22
10		14.46		14.46		33.290		24.771	316.9	0.032	5.90		257.5		101.5		2.4	0.37	0.1	0.04	0.05	0.47	0.12	10	20
10		14.46		14.46		33.288		24.769	317.1	0.030														10	21
20		14.46		14.45		33.291		24.773	317.0	0.063	5.86		255.8		100.8		2.4	0.36	0.1	0.04	0.03	0.46	0.13	20	19
30		14.22		14.21		33.355		24.873	307.8	0.095	5.81		253.9		99.6		2.8	0.43	0.9	0.10	0.11	0.62	0.19	30	17
30		14.22		14.21		33.358		24.876	307.6	0.094														30	18
40		13.96		13.95		33.395		24.958	300.0	0.125	5.73		250.2		97.7		3.2	0.48	1.7	0.18	0.19	0.54	0.19	40	16
50		13.18		13.18		33.382		25.107	286.1	0.154	5.48		239.1		91.8		4.7	0.64	4.3	0.23	0.03	0.20	0.14	50	15
60		11.80		11.79		33.199		25.232	274.3	0.182	5.40		235.6		87.8		5.5	0.74	6.1	0.07	0.02	0.19	0.17	60	14
70		10.86		10.85		33.127		25.345	263.7	0.209	5.26		229.5		83.8		7.8	0.92	9.2	0.04	0.02	0.13	0.10	71	13
75	ISL	10.79	D	10.78		33.188	D	25.382	260.3	0.222	5.10		222.0		81.1		9.3	1.01	10.9	0.04	0.02	0.10	0.08	76	
86		9.88		9.87		33.406	D	25.731	227.2	0.220	4.75		207.4		74.2		12.8	1.22	14.5	0.02	0.01	0.04	0.04	87	12
99		9.55		9.54		33.529		25.882	213.1	0.278	4.23		184.7		65.6		17.7	1.46	18.7	0.03	0.02	0.01	0.03	100	11
100	ISL	9.53	D	9.52		33.544	D	25.897	211.7	0.251	4.23	D	183.9	D	65.6		17.8	1.47	18.8	0.03	0.02	0.01	0.03	101	
120		9.30		9.29		33.650		26.018	200.7	0.322	3.91		170.5		60.3		20.6	1.58	20.8	0.02	0.03	0.01	0.02	121	10
125	ISL	9.24	D	9.23		33.731	D	26.091	193.8	0.302	3.84	D	167.2	D	59.3		21.6	1.62	21.4	0.02	0.03	0.01	0.02	126	
140		9.09		9.08		33.771		26.146	188.8	0.360	3.47		151.4		53.4		24.4	1.73	23.2	0.03	0.02	0.01	0.02	141	09
150	ISL	9.08	D	9.06		33.794	D	26.167	187.1	0.350	3.44	D	149.9	D	53.0		25.2	1.77	23.7	0.02	0.02	0.01	0.02	151	
170		9.01		8.99		33.864		26.233	181.2	0.416	3.16		137.9		48.6		26.9	1.84	24.6	0.02	0.02	0.00	0.02	171	08
200	ISL	8.62	D	8.60		33.996	D	26.399	166.0	0.440	2.56	D	111.3	D	39.0		33.1	2.06	27.5	0.02	0.03	0.00	0.02	202	
201		8.61		8.59		33.990		26.394	166.4	0.470	2.56		111.6		39.0		33.3	2.07	27.6	0.02	0.03	0.00	0.02	203	07
230		8.25		8.23		34.059		26.504	156.5	0.517	2.18		95.2		33.0		38.4	2.22	29.7	0.01	0.08			232	06
250	ISL	7.97	D	7.94		34.077	D	26.561	151.3	0.520	1.87	D	81.4	D	28.1		40.9	2.30	30.7	0.01	0.06			252	
270		7.90		7.88		34.074		26.569	150.9	0.578	1.80		78.5		27.0		43.4	2.38	31.7	0.01	0.03			272	05
300	ISL	7.72	D	7.69		34.143	D	26.651	143.6	0.595	1.40	D	60.7	D	20.9		49.2	2.55	33.6	0.01	0.04			302	
320		7.36		7.33		34.150		26.708	138.3	0.650	1.13		49.1		16.7		53.1	2.67	34.8	0.01	0.04			323	04
380		7.05		7.02		34.167		26.765	133.7	0.732	0.95		41.4		14.0									383	03
400	ISL	6.97	D	6.94		34.184	D	26.790	131.6	0.733	0.88	D	38.3	D	12.9		62.1	2.86	36.9	0.01	0.05			403	
440		6.56		6.52		34.218		26.873	124.1	0.809	0.60		26.1		8.7		66.5	2.95	38.0	0.01	0.05			444	02
500	ISL	6.37	D	6.32		34.264	D	26.935	118.9	0.858	0.47	D	20.4	D	6.8		70.9	3.06	38.6	0.01	0.11			504	
514		6.39		6.34		34.300		26.962	116.7	0.899	0.33		14.3		4.8		71.9	3.09	38.7	0.01	0.12			518	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 24.6 N	119 56.7 W	03/02/2014	0440	UTC	933 m	230 16 kn			1014.4 mb	12.3 C	11.3 C				024

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		14.40		14.40		33.257		24.758	317.8	0.000	5.82		254.0		99.9		2.7	0.39	0.4	0.06	0.09	0.41	0.13	0	
3		14.40		14.40		33.257		24.758	317.9	0.010	5.82		254.0		99.9		2.7	0.39	0.4	0.06	0.09	0.41	0.13	3	20
10		14.39		14.39		33.257		24.760	317.9	0.032	5.82		254.4		100.1		2.7	0.40	0.4	0.07	0.11	0.39	0.13	10	19
20		14.23		14.22		33.277		24.810	313.5	0.063	5.77		252.1		98.8		2.8	0.41	0.7	0.09	0.23	0.37	0.14	20	18
30	ISL	14.27	D	14.26		33.321	D	24.837	311.3	0.095	5.83	D	254.2	D	100.0		2.8	0.39	0.4	0.06	0.26	0.39	0.15	30	
31		14.27		14.26		33.319		24.835	311.5	0.098	5.83		254.6		99.9		2.8	0.39	0.4	0.06	0.26	0.40	0.15	31	17
40		14.27		14.27		33.326		24.840	311.3	0.126	5.84		255.2		100.2		2.7	0.38	0.3	0.06	0.16	0.43	0.15	40	16
50		14.25		14.25		33.333		24.850	310.7	0.157	5.85		255.6		100.3		2.7	0.36	0.2	0.04	0.17	0.47	0.14	50	15
61		13.71		13.70		33.319		24.952	301.3	0.191	5.78		252.5		98.0		2.8	0.39	0.6	0.06	0.22	0.35	0.13	61	14
70		13.06		13.05		33.320		25.085	288.8	0.217	5.59		244.0		93.4		4.1	0.56	3.2	0.17	0.18	0.22	0.15	71	13
75	ISL	12.60	D	12.59		33.300	D	25.160	281.7	0.233	5.52	D	240.5	D	91.4		4.7	0.63	4.4	0.16	0.14	0.19	0.14	76	
85		12.45		12.44		33.304		25.191	279.0	0.259	5.27		230.2		87.0		6.1	0.77	6.8	0.13	0.05	0.15	0.13	86	12
100		10.44		10.43		33.365		25.605	239.6	0.298	4.71		205.5		74.4		12.0	1.17	13.9	0.02	0.07	0.05	0.05	101	11
120		9.88		9.87		33.476		25.787	222.7	0.345	4.34		189.7		67.9		15.6	1.36	17.2	0.02	0.02	0.02	0.04	121	10
125	ISL	9.73	D	9.72		33.526	D	25.851	216.7	0.358	4.18	D	182.1	D	65.2		17.2	1.44	18.4	0.02	0.03	0.02	0.03	126	
140		9.33		9.32		33.664		26.025	200.4	0.387	3.68		160.6		56.9		21.8	1.66	22.1	0.01	0.05	0.01	0.03	141	09
150	ISL	9.23	D	9.21		33.707	D	26.075	195.8	0.410	3.65	D	159.0	D	56.4		23.3	1.71	22.9	0.01	0.04	0.01	0.03	151	
170		8.92		8.90		33.808		26.204	183.9	0.445	3.25		142.0		49.9		26.4	1.82	24.6	0.01	0.03	0.01	0.03	171	08
200		8.60		8.58		33.935		26.353	170.3	0.498	2.76		120.6		42.1		31.6	1.98	27.2	0.02	0.04	0.01	0.03	202	07
230		8.19		8.16		33.990		26.460	160.6	0.547	2.40		104.9		36.3		36.5	2.14	29.2	0.01	0.03			232	06
250	ISL	7.94	D	7.91		34.035	D	26.533	153.9	0.583	2.18	D	94.8	D	32.7		39.8	2.24	30.4	0.01	0.04			252	
269		7.83		7.80		34.050		26.562	151.5	0.608	1.90		82.9		28.5		42.9	2.34	31.6	0.01	0.05			271	05
300	ISL	7.53	D	7.50		34.081	D	26.629	145.5	0.659	1.67	D	72.6	D	24.8		48.4	2.48	33.3	0.01	0.03			302	
321		7.25		7.22		34.109		26.692	139.8	0.684	1.32		57.7		19.5		52.2	2.57	34.5	0.00	0.02			324	04
380		6.84		6.80		34.182		26.806	129.7	0.763	0.82		35.6		11.9		60.6	2.82	36.7	0.02	0.03			383	03
400	ISL	6.76	D	6.72		34.186	D	26.821	128.5	0.796	0.80	D	34.9	D	11.7		62.5	2.85	37.1	0.01	0.02			403	
440		6.56		6.52		34.209		26.866	124.7	0.840	0.61		26.5		8.8		66.4	2.92	37.9	0.00	0.01			444	02
500	ISL	6.03	D	5.99		34.258	D	26.973	114.9	0.919	0.45	D	19.7	D	6.5		75.0	3.06	39.6	0.02	0.01			504	
515		5.95		5.91		34.267		26.991	113.4	0.929	0.36		15.8		5.2		77.1	3.09	40.0	0.02	0.01			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 5.0 N	120 38.2 W	02/02/2014	2202 UTC	3832 m	240 15 kn	310 04 09	2	1016.8 mb	14.2 C	10.8 C	19 m	4/8	AC	023

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.17		15.17		33.380		24.687	324.5	0.000	5.77	252.1		100.8		2.4	0.35	0.0	0.02	0.03	0.33	0.11	0	
2		15.17		15.17		33.380		24.687	324.6	0.007	5.77	252.1		100.8		2.4	0.35	0.0	0.02	0.03	0.33	0.11	2	22
10		15.16		15.15		33.379		24.690	324.6	0.033	5.78	252.6		101.0		2.3	0.36	0.0	0.01	0.02	0.35	0.11	10	20
11		15.14		15.14		33.377		24.692	324.4	0.036													11	21
20		15.11		15.11		33.378		24.700	324.0	0.065	5.78	252.2		100.8		2.3	0.36	0.0	0.02	0.02	0.33	0.13	20	19
30		15.11		15.10		33.379		24.701	324.2	0.097	5.77	251.9		100.6		2.3	0.36	0.0	0.01	0.01	0.37	0.14	30	18
40		15.11		15.10		33.379		24.702	324.5	0.130	5.77	251.9		100.6		2.3	0.34	0.0	0.00	0.01	0.38	0.14	40	17
49		15.11		15.10		33.381		24.704	324.6	0.159	5.76	251.7		100.5		2.3	0.33	0.0	0.01	0.03	0.38	0.15	49	16
50	ISL	15.08	D	15.07		33.378	D	24.708	324.3	0.147	5.76	251.2		100.5		2.4	0.33	0.1	0.02	0.03	0.38	0.16	50	
60		14.44		14.43		33.305		24.790	316.6	0.194	5.76	251.5		99.0		2.8	0.38	0.6	0.12	0.07	0.33	0.20	60	15
70		14.26		14.25		33.262		24.794	316.6	0.226	5.73	250.2		98.2		2.9	0.40	0.8	0.16	0.06	0.33	0.18	71	13
70		14.26		14.25		33.274		24.803	315.7	0.227													71	14
75	ISL	13.32	D	13.31		33.244	D	24.925	304.1	0.241	5.69	248.0		95.6		3.2	0.45	1.6	0.16	0.04	0.30	0.19	76	
84		13.02		13.01		33.211		25.008	296.5	0.268	5.63	245.7		93.9		3.7	0.55	3.0	0.15	0.01	0.25	0.22	85	12
100	ISL	11.50	D	11.49		33.156	D	25.255	273.2	0.292	5.41	D235.4	D	87.3		5.9	0.79	6.6	0.04	0.03	0.16	0.13	101	
101		11.36		11.34		33.136		25.266	272.1	0.317	5.39	235.2		86.7		6.0	0.80	6.8	0.03	0.03	0.15	0.12	102	11
120		10.50		10.48		33.353		25.587	241.8	0.366	4.74	207.0		75.0		11.6	1.15	13.0	0.02	0.00	0.06	0.05	121	10
125	ISL	10.33	D	10.31		33.414	D	25.664	234.6	0.356	4.58	D199.3	D	72.2		12.9	1.22	14.3	0.02	0.00	0.05	0.05	126	
140		9.75		9.74		33.517		25.841	218.0	0.411	4.23	184.7		66.0		17.0	1.44	17.9	0.01	0.01	0.02	0.03	141	09
150	ISL	9.29	D	9.27		33.602	D	25.984	204.5	0.411	4.10	D178.6	D	63.3		19.3	1.52	19.4	0.01	0.01	0.01	0.02	151	
170		8.96		8.94		33.804	D	26.194	184.9	0.451	3.73	163.0		57.3		23.8	1.69	22.4	0.01	0.02	0.00	0.02	171	08
200		8.41		8.39		33.943		26.389	166.9	0.525	3.02	132.0		45.9		31.9	1.97	26.4	0.01	0.01	0.00	0.02	202	07
230		8.00		7.98		33.985		26.484	158.2	0.574	2.69	117.3		40.4		36.7	2.10	28.7	0.01	0.00			232	06
250	ISL	7.77	D	7.75		34.017	D	26.543	152.9	0.584	2.27	D 98.8	D	34.0		41.0	2.27	30.5	0.01	0.00			252	
271		7.63		7.60		34.059		26.598	148.0	0.636	1.75	76.3		26.1		45.6	2.44	32.5	0.00	0.00			273	05
300	ISL	7.39	D	7.36		34.094	D	26.659	142.6	0.659	1.41	D 61.1	D	20.8		49.7	2.58	34.0	0.01	0.00			302	
320		7.32		7.29		34.126		26.695	139.5	0.707	1.16	50.8		17.2		52.5	2.67	35.0	0.01	0.00			323	04
379		6.96		6.93		34.167		26.777	132.5	0.787	0.82	35.6		12.0		59.4	2.84	36.8	0.02	0.00			382	03
400	ISL	6.76	D	6.72		34.180	D	26.815	129.1	0.796	0.76	D 33.1	D	11.1		62.6	2.88	37.5	0.02	0.01			403	
442		6.34		6.30		34.191		26.880	123.2	0.867	0.63	27.3		9.1		68.9	2.97	38.8	0.02	0.03			446	02
500	ISL	5.92	D	5.87		34.211	D	26.951	116.9	0.920	0.51	D 22.2	D	7.3		75.6	3.06	39.9	0.02	0.02			504	
516		5.82		5.78		34.222		26.971	115.1	0.955	0.44	19.0		6.2		77.4	3.09	40.2	0.02	0.02			520	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 44.9 N	121 18.5 W	02/02/2014	1646 UTC	3585 m	290 11 kn	320 05 10	2	1019.7 mb	13.9 C	11.1 C	17 m	8/8	ST	022

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		14.05		14.05		33.133		24.734	320.1	0.000	5.94	259.5		101.3		3.1	0.38	0.2	0.03	0.14	0.49	0.15	0	
1	A	14.05		14.05		33.133		24.734	320.1	0.003	5.94	259.5		101.3		3.1	0.38	0.2	0.03	0.14	0.49	0.15	1	23
10	ISL	14.06	D	14.05		33.130	D	24.732	320.6	0.032	5.94	D259.0	D	101.3		3.1	0.37	0.2	0.03	0.13	0.49	0.15	10	
12	A	14.06		14.05		33.133		24.734	320.4	0.038	5.93	259.1		101.1		3.1	0.37	0.2	0.03	0.13	0.48	0.15	12	21
12		14.06		14.05		33.130		24.732	320.7	0.038													12	22
15		14.06		14.05		33.130	D	24.733	320.7	0.044	5.94	D259.0	D	101.3									15	20
20	ISL	14.06	D	14.05		33.130	D	24.733	320.9	0.060	5.93	D258.4	D	101.1		3.1	0.36	0.1	0.03	0.11	0.49	0.15	20	
22		14.06		14.05		33.130		24.733	320.9	0.070	5.94	259.4		101.3		3.1	0.36	0.1	0.03	0.10	0.49	0.15	22	19
29		14.06		14.05		33.130		24.733	321.1	0.093													29	18
30	A	14.06		14.05		33.130		24.733	321.1	0.095	5.94	259.2		101.2		3.1	0.37	0.2	0.03	0.14	0.49	0.16	30	17
41		14.05		14.05		33.132		24.736	321.2	0.131	5.93	258.8		101.0		3.1	0.37	0.2	0.03	0.11	0.49	0.15	41	16
50	ISL	13.67	D	13.67		33.103	D	24.792	316.1	0.144	5.95	D259.1	D	100.5		3.4	0.43	1.0	0.11	0.15	0.39	0.16	50	
54	A	13.41		13.40		33.100		24.843	311.3	0.172	5.85	255.7		98.5		3.5	0.46	1.4	0.15	0.17	0.34	0.17	54	15
61	A	12.71		12.70		33.113		24.992	297.3	0.193	5.71	249.6		94.7		4.2	0.60	3.6	0.16	0.08	0.20	0.13	61	14
75		12.02		12.01		33.100		25.114	286.0	0.234	5.60	244.5		91.4		5.2	0.72	5.7	0.04	0.06	0.12	0.10	76	13
85		11.64		11.63		33.095		25.181	279.8	0.262	5.54	242.1		89.8		5.6	0.76	6.4	0.03	0.03	0.10	0.08	86	12
100	ISL	10.80	D	10.78		33.152	D	25.378	261.3	0.288	5.06	D220.2	D	80.4		8.0	0.95	9.7	0.03	0.08	0.07	0.07	101	
102		10.42		10.41		33.184	D	25.468	252.7	0.293	5.23	228.4		82.5		8.4	0.98	10.1	0.03	0.09	0.07	0.06	103	11
119		9.76		9.74		33.454	D	25.790	222.4	0.334	4.33	189.1		67.5		15.2	1.42	17.3	0.02	0.07	0.04	0.05	120	10
125	ISL	9.62	D	9.61		33.526	D	25.869	215.0	0.347	4.26	D185.5	D	66.2		17.7	1.51	18.9	0.02	0.07	0.03	0.04	126	
139		9.04		9.03		33.703	D	26.101	193.1	0.376	3.76	164.2		57.8		23.4	1.72	22.5	0.01	0.08	0.01	0.02	140	09
150	ISL	8.88	D	8.86		33.790	D	26.195	184.4	0.397	3.59	D156.4	D	55.0		24.7	1.73	23.0	0.01	0.07	0.01	0.02	151	
170		8.65		8.63		33.867		26.292	175.5	0.448	3.55	154.9		54.1		27.2	1.76	23.9	0.00	0.05	0.00	0.02	171	08
200		8.24		8.22		33.951		26.421	163.7	0.499	3.26	142.3		49.3		32.3	1.89	26.0	0.01	0.03	0.00	0.02	202	07
231		7.77		7.75		33.983		26.515	155.2	0.548	2.74	119.7		41.0		38.4	2.09	28.7	0.01	0.03			233	06
250	ISL	7.57	D	7.54		34.001	D	26.559	151.2	0.564	2.47	D107.5	D	36.8		41.7	2.20	30.1	0.02	0.03			252	
270		7.34		7.32		34.013		26.601	147.5	0.607	2.21	96.4		32.7		45.1	2.31	31.5	0.02	0.02			272	05
300	ISL	6.93	D	6.90		34.026	D	26.669	141.3	0.637	1.89	D 82.3	D	27.7		51.7	2.50	33.8	0.01	0.04			302	
320		6.70		6.67		34.047		26.716	137.0	0.678	1.50	65.6		21.9		56.0	2.63	35.3	0.01	0.06			323	04
368		6.27		6.24		34.094		26.811	128.5	0.742	1.00	43.5		14.4		65.0	2.85	37.8	0.02	0.05			371	03
400	ISL	6.06	D	6.03		34.118	D	26.857	124.4	0.771	0.87	D 37.7	D	12.5		69.2	2.93	38.6	0.02	0.05			403	
442		5.86		5.82		34.166		26.921	118.8	0.833	0.59	25.7		8.4		74.6	3.03	39.7	0.02	0.04			446	02
500	ISL	5.58	D	5.53		34.239	D	27.014	110.5	0.889	0.39	D 16.9	D	5.5		81.7	3.14	40.6	0.03	0.08			504	
516		5.58		5.53		34.262		27.033	108.9	0.917	0.30	12.9		4.2		83.7	3.17	40.9	0.04	0.09			520	01

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.
D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 24.9 N	121 59.5 W	02/02/2014	0857	UTC	3886 m	310 13 kn			1012.3 mb	13.7 C	10.7 C				021

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		14.30		14.30		33.129	24.681	325.2	0.000	5.95		260.0		102.0		2.8	0.34	0.0	0.01	0.14	0.47	0.10	0	
2		14.30		14.29		33.129	24.681	325.2	0.007	5.95		260.0		102.0		2.8	0.34	0.0	0.01	0.14	0.47	0.10	2	22
10		14.31		14.31		33.129	24.679	325.7	0.033	5.99		261.6		102.7		2.7	0.35	0.0	0.01	0.03	0.48	0.10	10	20
10		14.31		14.31		33.129	24.679	325.7	0.032														10	21
20		14.31		14.31		33.129	24.679	326.0	0.065	5.94		259.4		101.8		2.7	0.34	0.0	0.00	0.03	0.48	0.07	20	19
30		14.30		14.29		33.131	24.684	325.8	0.098	5.95		259.7		101.9		2.7	0.34	0.0	0.02	0.03	0.50	0.10	30	18
39		13.79		13.79		33.047	24.724	322.3	0.128														39	17
40		13.49		13.48		33.054	24.791	315.9	0.130	6.04		263.8		101.7		3.1	0.38	0.2	0.04	0.06	0.78	0.32	40	16
50		13.06		13.06		33.086	24.901	305.6	0.161	5.97		260.7		99.7		3.4	0.48	1.5	0.16	0.11	0.58	0.26	50	15
60		12.80		12.79		33.167	25.017	294.9	0.191	5.82		254.0		96.6		3.7	0.53	2.6	0.20	0.10	0.35	0.21	60	14
70		12.70		12.69		33.251	25.100	287.3	0.220	5.78		252.4		95.9		3.9	0.60	3.5	0.28	0.21	0.21	0.14	71	13
75	ISL	12.29	D	12.28	D	33.220	25.157	282.0	0.204	5.80	D	252.6	D	95.3		4.4	0.65	4.4	0.20	0.18	0.18	0.12	76	
86		11.34		11.32		33.137	25.269	271.4	0.265	5.51		240.5		88.7		5.6	0.76	6.5	0.03	0.11	0.11	0.06	87	12
100	ISL	10.37	D	10.36	D	33.172	25.467	252.7	0.272	5.10	D	222.0	D	80.4		10.1	1.11	12.4	0.02	0.04	0.05	0.05	101	
101		10.34		10.33		33.166	25.466	252.8	0.304	5.12		223.5		80.6		10.5	1.14	12.8	0.02	0.03	0.04	0.05	102	11
121		9.70		9.68		33.341	25.712	229.8	0.352	4.62		201.7		71.8		15.2	1.37	16.6	0.03	0.09	0.02	0.03	122	10
125	ISL	9.60	D	9.59	D	33.426	25.794	222.0	0.332	4.60	D	200.3	D	71.4		16.2	1.41	17.4	0.02	0.08	0.02	0.03	126	
140		9.22		9.21		33.565	25.964	206.1	0.393	4.10		179.0		63.2		20.2	1.57	20.3	0.02	0.04	0.01	0.02	141	09
150	ISL	9.05	D	9.03	D	33.681	26.084	195.0	0.384	3.82	D	166.4	D	58.7		22.1	1.64	21.5	0.02	0.05	0.01	0.02	151	
170		8.85		8.83		33.790	26.200	184.3	0.451	3.53		154.0		54.0		26.0	1.77	23.8	0.01	0.07	0.00	0.02	171	08
200	ISL	8.51	D	8.49	D	33.918	26.354	170.2	0.475	3.15	D	137.1	D	47.9		30.5	1.91	25.9	0.01	0.03	0.00	0.02	202	
201		8.51		8.49		33.916	26.352	170.4	0.506	3.12		135.9		47.3		30.6	1.91	26.0	0.01	0.03	0.00	0.02	203	07
230		8.11		8.09		33.983	26.466	160.0	0.554	2.53		110.6		38.2		36.7	2.14	28.8	0.00	0.04			232	06
250	ISL	7.87	D	7.85	D	33.994	26.510	156.1	0.557	2.44	D	105.9	D	36.5		38.8	2.14	29.2	0.01	0.05			252	
270		7.58		7.55		33.986	26.547	152.8	0.617	2.65		115.9		39.5		40.8	2.13	29.5	0.01	0.05			272	05
300	ISL	7.21	D	7.18	D	34.010	26.619	146.3	0.633	2.28	D	99.1	D	33.6		47.3	2.33	32.0	0.01	0.03			302	
320		6.85		6.82		34.019	26.675	141.0	0.690	1.85		80.9		27.1		51.6	2.47	33.6	0.02	0.01			323	04
380		6.17		6.14		34.062	26.798	129.8	0.772	1.18		51.5		17.0		64.2	2.77	37.4	0.02	0.01			383	03
400	ISL	5.93	D	5.89	D	34.089	26.851	124.8	0.770	1.05	D	45.6	D	15.0		68.0	2.85	38.2	0.02	0.02			403	
441		5.87		5.83		34.180	26.931	117.8	0.820	0.66		29.0		9.5		76.0	3.01	39.7	0.02	0.04			445	02
500	ISL	5.47	D	5.43	D	34.205	27.000	111.6	0.889	0.45	D	19.7	D	6.4		83.0	3.11	40.8	0.02	0.03			504	
515		5.37		5.32		34.216	27.021	109.8	0.932	0.39		16.8		5.5		84.8	3.14	41.1	0.02	0.03			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 5.1 N	122 40.0 W	02/02/2014	0223	UTC	3984 m	010 15 kn			1022.0 mb	12.3 C	8.8 C				020

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		14.90		14.90		33.145	24.564	336.2	0.000	5.83		254.8		101.2		2.6	0.32	0.0	0.02	0.01	0.24	0.06	0	
2		14.90		14.90		33.145	24.565	336.3	0.007	5.83		254.8		101.2		2.6	0.32	0.0	0.02	0.01	0.24	0.06	2	21
10		14.90		14.90		33.147	24.566	336.4	0.034	5.84		255.1		101.3		2.6	0.32	0.0	0.01	0.02	0.24	0.06	10	19
20	ISL	14.90	D	14.90	D	33.141	24.562	337.2	0.056	5.81	D	253.3	D	100.8		2.6	0.31	0.0	0.02	0.01	0.24	0.07	20	
25		14.87		14.87		33.140	24.568	336.8	0.084	5.84		255.0		101.2		2.6	0.31	0.0	0.02	0.01	0.25	0.07	25	18
30	ISL	14.81	D	14.81	D	33.125	24.570	336.7	0.090	5.85	D	254.8	D	101.2		2.6	0.31	0.0	0.02	0.02	0.33	0.11	30	
39		14.43		14.43		33.096	24.629	331.4	0.131	5.94		259.6		102.1		2.8	0.32	0.0	0.02	0.03	0.47	0.19	39	17
50		14.11		14.11		33.111	24.708	324.1	0.157	5.88		256.7		100.3		2.9	0.33	0.2	0.03	0.13	0.44	0.22	50	16
62		13.86		13.85		33.141	24.784	317.2	0.205	5.87		256.5		99.7		3.2	0.38	0.7	0.11	0.17	0.32	0.19	62	15
75	ISL	13.84	D	13.83	D	33.298	24.910	305.7	0.236	5.76	D	251.1	D	97.9		3.3	0.39	1.1	0.17	0.11	0.24	0.16	76	
76		13.90		13.89		33.315	24.911	305.6	0.239	5.77		251.9		98.0		3.3	0.39	1.1	0.17	0.10	0.23	0.16	77	14
87		12.69		12.68		33.148	25.024	295.0	0.283	5.74		250.7		95.1		3.6	0.49	2.3	0.09	0.02	0.18	0.14	88	13
100		11.39		11.38		33.071	25.209	277.5	0.320	5.65		246.5		90.9		5.3	0.70	5.8	0.01	0.01	0.10	0.08	101	12
112		10.89		10.88		33.140	25.352	264.1	0.352	5.31		231.7		84.6		7.8	0.87	8.9	0.02	0.03	0.06	0.05	113	11
125		10.76		10.75		33.285	25.488	251.5	0.386	5.12		223.6		81.5		9.1	0.93	10.2	0.02	0.02	0.05	0.05	126	10
140		10.31		10.29		33.355	25.621	239.0	0.423	4.93		215.2		77.7		10.9	1.03	12.0	0.02	0.05	0.03	0.04	141	09
150	ISL	9.98	D	9.96	D	33.456	25.755	226.4	0.437	4.72	D	205.6	D	73.9		13.3	1.15	14.0	0.02	0.04	0.02	0.03	151	
171		9.39		9.37		33.645	26.001	203.4	0.491	4.22		184.4		65.4		18.4	1.40	18.3	0.02	0.01	0.01	0.02	172	08
200		9.06		9.04		33.818	26.191	185.9	0.548	3.95		172.4		60.7		22.5	1.51	20.6	0.00	0.02	0.00	0.02	202	07
231		8.69		8.67		33.918	26.327	173.5	0.603	3.55		154.8		54.1		27.7	1.72	23.3	0.02	0.01			233	06
250	ISL	8.39	D	8.36	D	33.953	26.402	166.7	0.627	3.37	D	146.8	D	51.1		31.8	1.86	25.3	0.02	0.02			252	
271		7.96		7.93		33.981	26.488	158.6	0.670	2.87		125.3		43.1		36.2	2.02	27.5	0.01	0.03			273	05
300	ISL	7.64	D	7.61	D	33.998	26.549	153.2	0.707	2.58	D	112.2	D	38.4		42.0	2.24	30.1	0.01	0.02			302	
318		7.48		7.45		34.037	26.602	148.4	0.742	1.91		83.3		28.4		45.6	2.38	31.7	0.00	0.02			321	04
380		6.74		6.71		34.067	26.729	136.8	0.831	1.34		58.5		19.6		57.1	2.65	35.3	0.01	0.03			383	03
400	ISL	6.63	D	6.59	D	34.106	26.775	132.7	0.851	1.10	D	47.9	D	16.1		61.2	2.73	36.3	0.00	0.03			403	
440		6.04		6.00		34.112	26.856	125.0	0.909	0.85		37.0		12.2		69.3	2.88	38.3	0.00	0.04			444	02
500	ISL	5.92	D	5.87	D	34.191	26.959	116.1	0.981	0.50	D	21.7	D	7.2		77.5	3.03	39.5	0.01	0.06			504	
514		5.70		5.65		34.209	26.976	114.4	0.998	0.44		19.4		6.3		79.4	3.07	39.8	0.02	0.07			518	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
30 45.3 N	123 20.2 W	01/02/2014	1957	UTC	4037 m	020 15 kn	340 06 06	1	1023.2 mb	14.0 C	10.9 C	24 m	4/8	ST	019

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.49		15.49		33.296	24.551	337.5	0.000	5.73		250.3		100.7							0.16	0.04	0	
2	A	15.49		15.49		33.296	24.551	337.6	0.007	5.73		250.3		100.7							0.16	0.04	2	24
10		15.49		15.49		33.293	D 24.551	337.9	0.034	5.73	D	249.6	D	100.6									10	23
17	A	15.47		15.47		33.294	24.556	337.6	0.057	5.72		249.9		100.5		2.5	0.34	0.0	0.01	0.19	0.16	0.04	17	22
20	A	15.49		15.48		33.296	24.554	337.9	0.068	5.72		249.6		100.4		2.5	0.33	0.0	0.01	0.04	0.16	0.04	20	21
29		15.46		15.46		33.292	24.557	338.0	0.098	5.73		250.2		100.6		2.5	0.32	0.0	0.00	0.03	0.17	0.04	29	20
30	ISL	15.46	D	15.46	D	33.292	D 24.557	338.0	0.102	5.74	D	250.0	D	100.7		2.5	0.32	0.0	0.00	0.03	0.17	0.05	30	
40	A	15.36		15.36		33.281	24.571	337.0	0.135	5.74		250.5		100.5		2.5	0.32	0.0	0.00	0.04	0.18	0.05	40	19
50	ISL	15.30	D	15.29	D	33.266	D 24.574	337.0	0.170	5.74	D	250.2	D	100.5		2.6	0.32	0.0	0.01	0.05	0.23	0.07	50	
51		15.29		15.28		33.270	24.580	336.5	0.172	5.77		251.9		100.9		2.6	0.32	0.0	0.01	0.05	0.24	0.07	51	18
62		14.85		14.84		33.237	24.649	330.2	0.209	5.77		252.2		100.1		2.7	0.34	0.0	0.02	0.05	0.24	0.15	62	16
63		14.80		14.79		33.238	24.663	329.0	0.211														63	17
75	A	14.17		14.16		33.185	24.755	320.5	0.251	5.77		252.1		98.7		3.1	0.41	0.7	0.32	0.15	0.51	0.21	76	15
83		13.58		13.57		33.306	D 24.970	300.2	0.257	5.65		246.6		95.4		3.3	0.43	1.3	0.34	0.04	0.17	0.14	84	14
88	A	13.38		13.37		33.289	24.997	297.7	0.291	5.65		246.5		95.0		3.5	0.47	1.8	0.24	0.05	0.17	0.14	89	13
99		12.77		12.75		33.251	25.090	289.1	0.323	5.56		242.9		92.4		4.0	0.54	3.0	0.06	0.06	0.13	0.14	100	12
100	ISL	12.78	D	12.77		33.285	D 25.113	286.9	0.307	5.54	D	241.5	D	92.1		4.1	0.55	3.2	0.05	0.06	0.13	0.13	101	
110		12.16		12.15		33.253	25.208	278.0	0.354	5.45		237.8		89.3		5.1	0.65	4.9	0.05	0.06	0.09	0.09	111	11
125	ISL	11.72	D	11.70		33.343	D 25.361	263.8	0.376	5.32	D	231.6	D	86.4		6.3	0.71	6.2	0.03	0.07	0.06	0.05	126	
126		11.66		11.65		33.345	25.373	262.7	0.397	5.33		232.5		86.4		6.4	0.71	6.3	0.02	0.07	0.06	0.05	127	10
145		10.63		10.61		33.356	25.568	244.3	0.446	4.91		214.3		77.9		10.6	1.05	11.7	0.02	0.03	0.04	0.04	146	09
150	ISL	10.30	D	10.28		33.413	D 25.668	234.8	0.440	5.00	D	217.8	D	78.9		11.9	1.13	12.9	0.02	0.03	0.03	0.04	151	
170		9.78		9.76		33.546	25.859	216.9	0.503	4.22		184.4		65.9		17.3	1.45	17.9	0.03	0.05	0.01	0.02	171	08
200	ISL	9.18	D	9.16	D	33.800	D 26.157	189.1	0.547	3.12	D	135.8	D	48.1		25.9	1.87	24.2	0.01	0.07	0.00	0.02	202	
202		9.15		9.13		33.800	26.162	188.7	0.567	3.12		136.1		48.0		26.4	1.90	24.6	0.01	0.07	0.00	0.02	204	07
232		8.79		8.76		34.026	26.397	167.0	0.621	1.73		75.5		26.5		36.7	2.34	29.9	0.02	0.07			234	06
250	ISL	8.62	D	8.59	D	34.071	D 26.460	161.3	0.634	1.55	D	67.2	D	23.6		39.6	2.44	31.0	0.02	0.07			252	
272		8.48		8.45		34.132	26.529	155.1	0.685	1.15		50.3		17.6		43.1	2.57	32.3	0.01	0.07			274	05
300	ISL	8.25	D	8.22	D	34.170	D 26.594	149.4	0.712	1.03	D	44.6	D	15.5		46.2	2.64	33.1	0.01	0.08			302	
318		8.09		8.06		34.183	26.628	146.4	0.754	0.91		39.7		13.7		48.3	2.69	33.6	0.01	0.08			320	04
380		7.61		7.57		34.223	26.732	137.4	0.842	0.66		29.0		9.9		55.3	2.83	35.2	0.00	0.02			383	03
400	ISL	7.44	D	7.40	D	34.234	D 26.765	134.4	0.854	0.64	D	27.8	D	9.5		57.7	2.88	35.6	0.00	0.04			403	
443		7.11		7.06		34.256	26.830	128.8	0.926	0.47		20.6		6.9		62.7	2.98	36.6	0.01	0.08			447	02
500	ISL	6.74	D	6.69	D	34.280	D 26.900	122.7	0.984	0.41	D	17.6	D	5.9		68.5	3.07	37.6	0.00	0.07			504	
515		6.60		6.55		34.274	26.914	121.5	1.016	0.35		15.2		5.1		70.0	3.09	37.9	0.00	0.07			519	01

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.
D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 90.0 120.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
30 25.1 N	124 0.0 W	01/02/2014	1316	UTC	4259 m	010 17 kn			1020.3 mb	15.3 C	11.5 C				018

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.20		16.20		33.417	24.486	343.7	0.000	5.60		244.7		99.9		1.9	0.30	0.1	0.01	0.20	0.15	0.05	0	
2		16.20		16.20		33.417	24.486	343.8	0.007	5.60		244.7		99.9		1.9	0.30	0.1	0.01	0.20	0.15	0.05	2	22
10	ISL	16.21	D	16.21	D	33.410	D 24.478	344.8	0.035	5.59	D	243.8	D	99.8		1.9	0.29	0.0	0.01	0.13	0.16	0.05	10	
10		16.21		16.21		33.410	24.479	344.8	0.034														10	21
11		16.21		16.21		33.411	24.479	344.8	0.038	5.62		245.3		100.2		1.9	0.29	0.0	0.02	0.12	0.16	0.05	11	20
20	ISL	16.21	D	16.21	D	33.410	D 24.479	345.1	0.068	5.59	D	243.8	D	99.7		1.9	0.29	0.0	0.01	0.09	0.16	0.05	20	
25		16.21		16.20		33.408	24.479	345.3	0.086	5.62		245.3		100.1		1.9	0.29	0.0	0.01	0.07	0.15	0.05	25	19
30	ISL	16.21	D	16.21	D	33.410	D 24.480	345.4	0.102	5.58	D	243.4	D	99.6		1.9	0.29	0.0	0.01	0.06	0.16	0.05	30	
40		16.21		16.21		33.411	24.480	345.7	0.138	5.61		244.9		100.0		1.9	0.29	0.0	0.01	0.03	0.16	0.05	40	18
50		16.18		16.17		33.404	24.483	345.8	0.173	5.61		245.2		100.1		1.9	0.29	0.0	0.01	0.05	0.16	0.05	50	17
62		15.95		15.94		33.370	24.510	343.6	0.214	5.64		246.2		100.0		1.9	0.28	0.0	0.01	0.03	0.20	0.08	62	16
75		15.54		15.53		33.326	24.568	338.4	0.257														75	15
75		15.54		15.53		33.327	24.569	338.4	0.258	5.68		248.0		99.9		2.0	0.29	0.0	0.02	0.04	0.28	0.14	76	14
87		14.57		14.55		33.309	24.768	319.7	0.298	5.74		250.5		98.9		2.3	0.32	0.2	0.12	0.06	0.30	0.16	88	13
100		13.01		12.99		33.291	25.073	290.7	0.338	5.62		245.4		93.8		3.4	0.45	2.1	0.12	0.03	0.24	0.16	101	12
112		12.40		12.38		33.288	25.191	279.8	0.372	5.46		238.4		90.0		4.5	0.59	4.3	0.03	0.03	0.18	0.14	113	11
125	ISL	11.83	D	11.81		33.301	D 25.309	268.8	0.386	5.31	D	231.3	D	86.5		6.0	0.72	6.5	0.02	0.06	0.13	0.11	126	
126		11.81		11.79		33.295	25.307	268.9	0.410	5.30		231.7		86.3		6.1	0.73	6.7	0.02	0.06	0.12	0.11	127	10
140		11.14		11.12		33.333	25.460	254.6	0.447	5.06		221.0		81.2							0.07	0.07	141	09
150	ISL	10.34	D	10.33		33.435	D 25.678	233.9	0.451	5.11	D	222.4	D	80.6							0.05	0.06	151	
170		9.75		9.73		33.541	25.860	216.8	0.516	4.28		186.9		66.7		16.0	1.35	17.3	0.01	0.06	0.01	0.03	171	08
200		9.01		8.99		33.803	26.186	186.3	0.577	3.30		144.1		50.7		25.4	1.78	24.0	0.00	0.06	0.00	0.02	202	07
231		8.46		8.44		33.927	26.369	169.4	0.632	2.85		124.5		43.3		31.1	1.96	26.8	0.01	0.05			233	06
250	ISL	8.16	D	8.13	D	33.991	D 26.466	160.4	0.643	2.67	D	116.1	D	40.3		34.9	2.06	28.2	0.01	0.04			252	
269		7.89		7.86		34.008	26.520	155.5	0.693	2.42		105.8		36.3		38.6	2.15	29.5	0.01	0.03			271	05
300	ISL	7.58	D	7.55	D	34.035	D 26.586	149.6	0.721	2.06	D	89.5	D	30.6		45.1	2.34	31.8	0.01	0.04			302	
320		7.21		7.18		34.056	26.655	143.2	0.770	1.74		75.8		25.6		49.4	2.47	33.3	0.02	0.05			323	04
380		6.49		6.45		34.101	26.789	130.9	0.852	1.11		48.6		16.2		61.4	2.74	36.6	0.01	0.05			383	03
400	ISL	6.37	D	6.34	D	34.122	D 26.820	128.2	0.859	1.01	D	44.0	D	14.6		64.6	2.81	37.2	0.01	0.04			403	
440		6.08		6.04		34.143	26.876	123.2	0.928	0.79		34.3		11.3		70.8	2.94	38.4	0.02	0.01			444	02
500	ISL	5.63	D	5.59	D	34.199	D 26.976	114.1	0.982	0.58	D	25.0	D	8.2		77.2	3.01	39.2	0.02	0.05			504	
515		5.60		5.55		34.200	26.981	113.8	1.017	0.55		24.1		7.9		78.8	3.03	39.4	0.02	0.06			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 91.7 26.4

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 14.3 N	117 27.8 W	29/01/2014	1242	UTC	20 m	080 03 kn			1017.8 mb	11.2 C	10.8 C				003

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.56		15.56		33.548	24.731	320.4	0.000	5.76	251.6	101.5	3.1	0.41	0.1	0.05	0.24	0.78	0.34	0	
1		15.56		15.56		33.548	24.731	320.4	0.003	5.76	251.6	101.5	3.1	0.41	0.1	0.05	0.24	0.78	0.34	1	04
5		15.55		15.55		33.548	24.732	320.4	0.016	5.76	251.7	101.6	3.1	0.37	0.1	0.07	0.19	0.77	0.37	5	03
9		15.55		15.55		33.548	24.733	320.5	0.029	5.76	251.7	101.6	3.1	0.36	0.1	0.06	0.19	0.76	0.33	9	02
10	ISL	15.55	D	15.55	D	33.547	D 24.734	320.5	0.032	5.78	D251.8	D101.8	3.1	0.36	0.1	0.06	0.22	0.80	0.33	10	
16		15.46		15.46		33.542	24.749	319.2	0.051	5.72	249.9	100.6	3.2	0.37	0.1	0.08	0.37	1.05	0.38	16	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; SECONDARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 26.7

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 57.3 N	117 18.4 W	29/01/2014	0511	UTC	63 m	250 03 kn			1019.2 mb	12.5 C	11.8 C				001

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.04		16.04		33.572	24.641	329.0	0.000	5.82	254.3	103.6	2.5	0.33	0.0	0.02	0.07	0.36	0.11	0	
2		16.04		16.04		33.572	24.641	329.0	0.007	5.82	254.3	103.6	2.5	0.33	0.0	0.02	0.07	0.36	0.11	2	07
6		16.02		16.01		33.576	24.650	328.3	0.020	5.82	254.3	103.6	2.5	0.32	0.0	0.01	0.10	0.34	0.10	6	06
10		15.79		15.79		33.560	24.690	324.6	0.033	5.82	254.0	103.0	2.5	0.32	0.0	0.01	0.09	0.29	0.10	10	05
20	ISL	15.16	D	15.16		33.513	D 24.792	315.2	0.065	5.89	D256.5	D102.8	3.0	0.36	0.0	0.02	0.14	0.34	0.37	20	
21		15.16		15.16		33.507	24.788	315.7	0.068	5.88	256.7	102.7	3.0	0.36	0.0	0.02	0.15	0.35	0.40	21	04
30		14.58		14.58		33.484	24.896	305.7	0.096	5.74	250.7	99.2	3.6	0.40	0.2	0.11	0.08	0.97	0.40	30	03
39		14.07		14.06		33.448	24.976	298.3	0.123	5.30	231.5	90.6	4.8	0.59	2.8	0.48	0.11	0.87	0.42	39	02
50	ISL	13.36	D	13.35	D	33.421	D 25.102	286.6	0.157	4.92	D214.3	D 82.8	7.0	0.79	6.5	0.15	0.05	0.45	0.32	50	
51		13.36		13.35		33.420	25.101	286.7	0.158	4.83	211.0	81.3	7.2	0.81	6.8	0.12	0.04	0.42	0.31	51	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; SECONDARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 28.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 54.5 N	117 23.4 W	29/01/2014	1528	UTC	595 m	010 03 kn	300 04 08	4	1018.0 mb	12.8 C	12.1 C	22 m	8/8	ST	004

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.91		15.91		33.566	24.665	326.6	0.000	5.82	254.1	103.2	2.1	0.31	0.0	0.02	0.07	0.32	0.08	0	
2		15.91		15.91		33.566	24.666	326.7	0.007	5.82	254.1	103.2	2.1	0.31	0.0	0.02	0.07	0.32	0.08	2	20
10		15.70		15.70		33.561	24.710	322.7	0.033	5.83	254.8	103.1	2.1	0.33	0.0	0.02	0.07	0.31	0.07	10	19
20		15.14		15.14		33.516	24.800	314.5	0.064	5.91	258.3	103.3	2.8	0.34	0.0	0.01	0.05	0.35	0.13	20	18
30		14.66		14.65		33.497	24.890	306.2	0.095	5.61	245.2	97.1	3.8	0.44	0.5	0.19	0.07	1.44	0.57	30	17
40		13.83		13.82		33.406	24.994	296.6	0.126	5.24	229.0	89.1	4.7	0.63	3.6	0.20	0.08	0.79	0.42	40	16
50		13.31		13.31		33.432	25.119	285.0	0.155	4.69	204.8	78.9	7.7	0.87	7.4	0.03	0.05	0.29	0.26	50	15
60		12.66		12.65		33.392	25.219	275.7	0.183	4.71	205.8	78.1	7.7	0.91	8.6	0.04	0.07	0.26	0.27	60	14
70		12.19		12.18		33.452	25.355	263.0	0.210	4.40	192.2	72.3	9.8	1.07	10.9	0.04	0.04	0.14	0.16	71	13
75	ISL	12.00	D	11.99	D	33.466	D 25.402	258.6	0.224	4.31	D187.6	D 70.5	11.1	1.15	12.3	0.03	0.04	0.11	0.14	76	
85		11.61		11.60		33.512	25.511	248.5	0.248	3.90	D170.0	D 63.4	13.6	1.31	15.2	0.03	0.04	0.04	0.10	86	12
100		11.27		11.25		33.558	25.610	239.4	0.285	3.71	161.9	59.8	15.1	1.40	16.0	0.02	0.10	0.04	0.09	101	11
119		11.02		11.00		33.682	25.751	226.4	0.329	3.13	136.8	50.3	19.3	1.64	19.0	0.01	0.27	0.02	0.06	120	10
125	ISL	10.92	D	10.90		33.698	D 25.782	223.6	0.345	3.12	D136.0	D 50.0	20.1	1.68	19.7	0.01	0.24	0.02	0.05	126	
140		10.42		10.40		33.765	25.923	210.4	0.375	2.97	129.7	47.1	22.1	1.77	21.4	0.01	0.18	0.01	0.05	141	09
150	ISL	10.45	D	10.43		33.897	D 26.021	201.4	0.398	2.66	D115.8	D 42.2	23.8	1.84	22.5	0.01	0.14	0.01	0.04	151	
170		9.88		9.86		33.957	D 26.164	188.1	0.437	2.54	111.0	39.8	27.0	1.98	24.6	0.01	0.06	0.00	0.04	171	08
200		9.75		9.73		34.093	26.294	176.5	0.490	1.81	79.0	28.3	32.4	2.25	27.1	0.02	0.11	0.01	0.04	202	07
230		9.44		9.41		34.156	26.395	167.5	0.541	1.68	73.4	26.1	35.0	2.34	28.1	0.02	0.20			232	06
250	ISL	9.11	D	9.08	D	34.205	D 26.487	159.0	0.577	1.39	D 60.4	D 21.4	38.5	2.43	29.4	0.01	0.14			252	
270		8.82		8.79		34.216	26.541	154.1	0.605	1.24	54.2	19.0	41.9	2.52	30.6	0.00	0.07			272	05
300	ISL	8.61	D	8.58	D	34.239	D 26.594	149.7	0.655	1.18	D 51.1	D 17.9	45.5	2.59	31.7	0.00	0.08			302	
320		8.26		8.23		34.223	26.635	146.0	0.680	1.02	44.4	15.4	47.8	2.64	32.4	0.00	0.09			323	04
381		7.71		7.67		34.232	26.725	138.2	0.767	0.83	36.1	12.4	53.7	2.76	34.4	0.00	0.08			384	03
400	ISL	7.61	D	7.57	D	34.240	D 26.746	136.4	0.798	0.78	D 34.0	D 11.7	56.1	2.80	34.9	0.00	0.08			403	
440		7.25		7.21		34.262	D 26.814	130.4	0.852	0.61	D 26.4	D 9.0								444	02
500	ISL	6.73	D	6.68	D	34.291	D 26.910	121.8	0.929	0.42	D 18.4	D 6.2	68.6	3.03	37.4	0.01	0.08			504	
515		6.66		6.61		34.295	26.923	120.7	0.944	0.44	19.1	6.4	70.5	3.06	37.8	0.01	0.08			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 30.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 50.8 N	117 32.0 W	29/01/2014	1830 UTC	837 m	300 05 kn	280 05 12	4	1018.7 mb	14.7 C	13.6 C	23 m	7/8	ST	005

DEPTH m		TEMP DEG C		POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.14		16.14	33.583	24.626	330.4	0.000	5.78	252.5	103.1	2.1	0.33	0.1	0.01	0.59	0.26	0.07	0	
2	A	16.14		16.14	33.583	24.626	330.4	0.007	5.78	252.5	103.1	2.1	0.33	0.1	0.01	0.59	0.26	0.07	2	22
9		16.11		16.11	33.584	24.635	329.8	0.031											9	21
10		16.11		16.11	33.583	24.634	330.0	0.033	5.81	253.8	103.6	2.1	0.34	0.2	0.01		0.29	0.06	10	20
17	A	15.97		15.96	33.576	24.662	327.5	0.056	5.81	253.7	103.2	2.1	0.32	0.0	0.02	0.28	0.29	0.08	17	19
20	A	15.92		15.92	33.571	24.669	327.0	0.066	5.81	253.6	103.1	2.1	0.33	0.0	0.00	0.25	0.30	0.09	20	18
30		15.57		15.56	33.540	D 24.725	322.0	0.086	5.86	D255.4	D103.3								30	17
40	A	14.91		14.90	33.491	24.832	312.1	0.130	5.84	255.0	101.5	3.0	0.38	0.0	0.02	0.18	0.64	0.22	40	16
50		13.87		13.87	33.414	24.991	297.2	0.161	5.39	235.2	91.7	4.6	0.58	2.3	0.23	0.16	0.57	0.36	50	15
72	A	12.48		12.47	33.397	25.257	272.4	0.223	4.77	208.3	78.8	7.7	0.91	8.5	0.05	0.08	0.26	0.29	73	14
75	ISL	12.27	D	12.26	33.417	D 25.313	267.1	0.220	4.71	D205.1	D 77.5	8.6	0.97	9.5	0.04	0.07	0.22	0.26	76	
83	A	11.86		11.85	33.464	25.427	256.4	0.252	4.30	187.5	70.1	11.0	1.14	12.3	0.03	0.03	0.12	0.16	84	13
92		11.55		11.54	33.528	25.535	246.3	0.275	3.87	169.1	62.8	13.9	1.32	15.0	0.02	0.05	0.05	0.11	93	12
99		11.39		11.38	33.539	25.572	242.9	0.292	3.84	167.6	62.1	14.3	1.34	15.5	0.01	0.10	0.05	0.08	100	11
100	ISL	11.33	D	11.32	33.550	D 25.592	241.1	0.283	3.86	D168.1	D 62.3	14.6	1.36	15.7	0.01	0.11	0.05	0.08	101	
120		10.94		10.93	33.687	25.769	224.8	0.341	3.14	137.0	50.3	19.6	1.66	19.5	0.02	0.30	0.02	0.06	121	10
125	ISL	10.77	D	10.76	33.720	D 25.825	219.5	0.341	3.11	D135.3	D 49.6	20.7	1.71	20.3	0.02	0.27	0.02	0.06	126	
140		10.37		10.35	33.812	25.968	206.2	0.384	2.69	117.5	42.6	23.9	1.87	22.6	0.01	0.16	0.01	0.05	141	09
150	ISL	10.36	D	10.34	33.898	D 26.036	200.0	0.394	2.55	D111.0	D 40.4	25.5	1.95	23.5	0.01	0.13	0.01	0.05	151	
170		10.15		10.13	34.050	26.192	185.7	0.443	2.12	92.5	33.5	28.5	2.12	25.4	0.01	0.06	0.01	0.04	171	08
199		9.68		9.66	34.118	26.325	173.5	0.495	1.97	85.9	30.7	32.0	2.21	27.1	0.01	0.06	0.00	0.02	201	07
200	ISL	9.66	D	9.63	34.124	D 26.334	172.7	0.487	1.97	D 85.8	D 30.8	32.1	2.21	27.1	0.01	0.06			202	
229		8.97		8.94	34.115	26.439	163.1	0.545	2.03	88.5	31.2	35.6	2.24	28.4	0.00	0.04			231	06
250	ISL	8.88	D	8.85	34.182	D 26.505	157.2	0.570	1.70	D 74.0	D 26.1	38.8	2.39	29.6	0.00	0.04			252	
270		8.83		8.80	34.235	26.556	152.8	0.610	1.24	54.1	19.0	41.8	2.53	30.8	0.00	0.04			272	05
300	ISL	8.58	D	8.55	34.255	D 26.611	148.0	0.647	1.03	D 44.7	D 15.7	44.5	2.61	31.7	0.01	0.04			302	
320		8.50		8.47	34.264	26.630	146.6	0.684	0.95	D 41.4	D 14.5	46.4	2.66	32.3	0.01	0.04			323	04
379		7.81		7.77	34.265	26.737	137.1	0.768	0.75	32.6	11.2	53.3	2.78	34.6	0.00	0.05			382	03
400	ISL	7.48	D	7.44	34.248	D 26.770	134.0	0.790	0.74	D 32.0	D 10.9	56.6	2.83	35.4	0.00	0.06			403	
438		7.10		7.06	34.270	26.842	127.6	0.846	0.53	23.2	7.8	62.6	2.93	36.9	0.01	0.07			442	02
500	ISL	6.71	D	6.67	34.290	D 26.911	121.6	0.918	0.49	21.3	7.2	68.4	3.04	38.2	0.01	0.05			504	
514		6.64		6.59	34.295	26.925	120.5	0.941	0.48	21.0	7.0	69.7	3.06	38.5	0.01	0.05			518	01

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.
D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 35.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 41.0 N	117 51.8 W	29/01/2014	2241 UTC	634 m	330 04 kn	300 02 08	1	1015.6 mb	14.4 C	13.0 C	25 m	5/8	ST	006

DEPTH m		TEMP DEG C		POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.59		16.59	33.587	24.527	339.8	0.000	5.79	252.7	104.1	2.2	0.31	0.1	0.02	0.11	0.20	0.04	0	
2		16.59		16.59	33.587	24.527	339.9	0.007	5.79	252.7	104.1	2.2	0.31	0.1	0.02	0.11	0.20	0.04	2	20
10		16.29		16.28	33.591	24.600	333.2	0.034	5.73	250.3	102.5	2.1	0.30	0.0	0.02	0.02	0.22	0.05	10	19
20		16.24		16.24	33.592	24.612	332.4	0.067	5.74	250.7	102.6	2.1	0.30	0.0	0.01	0.03	0.24	0.06	20	18
30		16.17		16.16	33.575	24.617	332.3	0.100	5.75	251.0	102.6	2.1	0.31	0.1	0.02	0.07	0.25	0.06	30	17
40		15.49		15.48	33.517	24.725	322.3	0.133	5.76	251.6	101.4	2.8	0.35	0.0	0.01	0.06	0.58	0.29	40	16
50	ISL	14.59	D	14.58	33.439	D 24.861	309.7	0.166	5.64	D246.0	D 97.5	4.1	0.49	1.1	0.14	0.02	0.83	0.57	50	
51		14.45		14.44	33.441	24.892	306.7	0.168	5.45	237.7	93.8	4.2	0.50	1.2	0.16	0.02	0.85	0.60	51	15
60		13.35		13.34	33.415	25.100	287.0	0.194	4.93	215.3	83.0	6.5	0.77	5.7	0.05	0.07	0.30	0.32	60	14
70		12.61		12.60	33.459	25.280	270.1	0.222	4.47	195.0	74.0	9.3	0.99	9.5	0.04	0.03	0.17	0.19	71	13
75	ISL	12.49	D	12.48	33.486	D 25.325	266.0	0.237	4.38	D190.8	D 72.4	10.4	1.06	10.6	0.03	0.04	0.15	0.17	76	
84		12.06		12.05	33.521	D 25.434	255.8	0.261	4.02	D175.2	D 65.9								85	12
99		11.53		11.52	33.578	25.577	242.6	0.296	3.59	156.7	58.2	15.8	1.41	16.0	0.03	0.06	0.04	0.08	100	11
100	ISL	11.52	D	11.51	33.583	D 25.583	242.0	0.301	3.55	D154.6	D 57.6	16.1	1.43	16.2	0.03	0.07	0.03	0.08	101	
121		11.06		11.04	33.798	25.836	218.5	0.347	2.66	116.0	42.7	22.3	1.80	20.9	0.02	0.17	0.01	0.04	122	10
125	ISL	10.93	D	10.92	33.795	D 25.855	216.7	0.359	2.70	D117.7	D 43.3	22.9	1.83	21.3	0.02	0.15	0.01	0.04	126	
140		10.78		10.76	33.893	25.960	207.1	0.388	2.36	103.0	37.7	24.9	1.95	23.0	0.02	0.08	0.01	0.04	141	09
150	ISL	10.66	D	10.64	33.943	D 26.020	201.5	0.411	2.26	D 98.2	D 36.0	25.8	1.97	23.6	0.02	0.07	0.01	0.04	151	
170		10.01		9.99	33.978	26.160	188.5	0.447	2.36	103.1	37.1	27.4	2.01	24.8	0.02	0.04	0.00	0.03	171	08
200		9.38		9.35	34.043	26.316	174.2	0.501	2.35	102.4	36.4	31.1	2.07	26.6	0.02	0.04	0.00	0.03	202	07
230		8.95		8.92	34.105	26.434	163.5	0.552	2.07	90.3	31.8	35.8	2.20	28.5	0.02	0.04			232	06
250	ISL	8.73	D	8.70	34.132	D 26.489	158.6	0.589	1.89	D 82.0	D 28.8	38.2	2.29	29.5	0.02	0.04			252	
270		8.55		8.52	34.144	26.528	155.2	0.616	1.65	71.8	25.1	40.5	2.37	30.5	0.02	0.03			272	05
300	ISL	8.50	D	8.46	34.213	D 26.591	149.9	0.667	1.33	D 58.0	D 20.3	44.5	2.52	31.8	0.01	0.02			302	
320		8.24		8.20	34.245	26.656	144.0	0.691	0.99	43.0	14.9	47.2	2.62	32.6	0.01	0.02			323	04
380		7.65		7.61	34.237	26.737	136.9	0.775	0.80	35.0	12.0	54.6	2.76	34.9	0.02	0.04			383	03
400	ISL	7.49	D	7.45	34.245	D 26.766	134.4	0.809	0.74	D 32.2	D 11.0	56.7	2.80	35.5	0.02	0.04			403	
440		7.23		7.19	34.261	26.816	130.2	0.855	0.61	26.6	9.0	60.8	2.88	36.6	0.02	0.05			444	02
500	ISL	6.65	D	6.60	34.288	D 26.918	120.9	0.938	0.43	D 18.7	D 6.3	70.6	3.04	38.8	0.02	0.04			504	
514		6.42		6.37	34.298	26.957	117.2	0.947	0.38	D 16.4	D 5.5	72.9	3.08	39.3	0.02	0.04			518	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 40.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 30.8 N	118 12.4 W	30/01/2014	0227	UTC	1627 m	250 07 kn			1014.8 mb	15.3 C	14.3 C				007

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.33		16.33		33.569		24.572	335.5	0.000	5.80	253.4		103.8		2.9	0.30	0.1	0.00	0.02	0.20	0.04	0	
2		16.33		16.33		33.569		24.572	335.6	0.007	5.80	253.4		103.8		2.9	0.30	0.1	0.00	0.02	0.20	0.04	2	21
10		15.84		15.84		33.559		24.677	325.9	0.033	5.84	255.2		103.5		3.0	0.31	0.0	0.00	0.07	0.19	0.05	10	19
10		15.84		15.84		33.558		24.677	325.9	0.034													10	20
20		15.54		15.54		33.551		24.738	320.4	0.066	5.90	257.4		103.8		3.0	0.30	0.0	0.01	0.04	0.25	0.09	20	18
30	ISL	14.31	D	14.31		33.441	D	24.920	303.3	0.081	5.54	241.3		95.1		4.3	0.45	1.0	0.06	0.07	1.15	0.82	30	
31		14.20		14.20		33.445		24.946	300.9	0.100	5.50	240.3		94.3		4.5	0.47	1.1	0.07	0.07	1.24	0.89	31	17
41		13.48		13.48		33.408		25.066	289.7	0.129	5.05	220.3		85.1		6.0	0.68	5.0	0.05	0.02	0.48	0.37	41	16
50		12.92		12.91		33.435		25.200	277.2	0.155	4.60	200.9		76.8		8.6	0.88	8.1	0.05	0.02	0.38	0.32	50	15
60		12.63		12.62		33.443		25.264	271.4	0.182	4.48	195.6		74.3		9.1	0.97	9.6	0.04	0.00	0.21	0.20	60	14
70		12.43		12.42		33.511	D	25.355	263.0	0.194	4.25	185.5		70.2		10.6	1.08	11.1	0.05	0.02	0.15	0.15	71	13
75	ISL	12.32	D	12.31		33.533	D	25.393	259.5	0.207	3.99	D173.8	D	65.8		11.7	1.15	12.2	0.04	0.02	0.12	0.13	76	
85		11.86		11.85		33.563		25.504	249.2	0.248	3.74	163.5		61.1		14.1	1.30	14.5	0.03	0.02	0.06	0.08	86	12
100		11.25		11.23		33.681		25.709	229.9	0.283	3.12	136.1		50.2		19.0	1.59	18.6	0.03	0.02	0.02	0.06	101	11
120		10.95		10.93		33.818		25.870	215.1	0.328	2.60	113.6		41.7		22.7	1.81	21.4	0.03	0.08	0.01	0.05	121	10
125	ISL	10.88	D	10.86		33.860	D	25.916	210.9	0.325	2.45	D106.6	D	39.2		23.1	1.83	21.8	0.02	0.07	0.01	0.04	126	
141		10.43		10.42		33.899		26.024	200.9	0.372	2.61	113.9		41.4		24.5	1.88	23.1	0.02	0.03	0.01	0.04	142	09
150	ISL	10.24	D	10.22		33.911	D	26.068	196.9	0.376	2.56	D111.6	D	40.5		25.4	1.91	23.7	0.02	0.02	0.01	0.03	151	
170		9.88		9.86		33.982		26.185	186.2	0.428	2.48	108.1		38.8		27.6	1.97	25.0	0.03	0.01	0.00	0.03	171	08
200		9.14		9.12		34.026		26.341	171.8	0.481	2.29	100.1		35.4		32.1	2.09	27.6	0.03	0.02	0.00	0.03	202	07
231		8.49		8.46		34.052		26.464	160.4	0.533	2.11	92.1		32.1		37.4	2.22	29.6	0.02	0.05			233	06
250	ISL	8.32	D	8.29		34.086	D	26.517	155.7	0.552	1.99	D 86.5	D	30.1		40.1	2.32	30.6	0.02	0.04			252	
270		8.25		8.22		34.133		26.564	151.6	0.594	1.60	69.8		24.2		43.0	2.43	31.6	0.03	0.03			272	05
300	ISL	7.97	D	7.94		34.172	D	26.637	145.1	0.628	1.39	D 60.6	D	20.9		47.6	2.55	33.1	0.02	0.02			302	
321		7.70		7.67		34.183		26.686	140.7	0.668	1.12	48.8		16.7		50.9	2.64	34.2	0.01	0.02			324	04
380		7.45		7.41		34.273		26.794	131.4	0.748	0.61	26.8		9.1		58.1	2.86	35.8	0.01	0.02			383	03
400	ISL	7.19	D	7.16		34.273	D	26.830	128.1	0.765	0.55	D 23.8	D	8.1		61.0	2.90	36.5	0.01	0.02			403	
441		6.80		6.76		34.287		26.896	122.2	0.826	0.44	19.0		6.4		67.0	2.99	38.0	0.02	0.01			445	02
500	ISL	6.36	D	6.32		34.303	D	26.967	116.0	0.888	0.36	D 15.8	D	5.3		72.9	3.08	39.3	0.01	0.01			504	
516		6.25		6.20		34.305		26.984	114.4	0.914	0.34	D 14.8	D	4.9		74.5	3.11	39.6	0.01	0.01			520	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 45.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 20.7 N	118 33.3 W	30/01/2014	0631	UTC	1343 m	290 07 kn			1015.0 mb	14.6 C	13.6 C				008

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.96		15.96		33.509		24.612	331.8	0.000	5.69	248.3		101.0		2.3	0.33	0.1	0.03	0.07	0.14	0.01	0	
2		15.96		15.96		33.509		24.612	331.8	0.007	5.69	248.3		101.0		2.3	0.33	0.1	0.03	0.07	0.14	0.01	2	21
9		15.93		15.92		33.509		24.619	331.4	0.031													9	20
10		15.92		15.92		33.508		24.619	331.4	0.033	5.72	249.6		101.5		2.3	0.33	0.0	0.01	0.01	0.13	0.02	10	19
20	ISL	15.91	D	15.91		33.508	D	24.623	331.4	0.053	5.72	D249.3	D	101.5		2.2	0.33	0.0	0.01	0.10	0.13	0.02	20	
25		15.85		15.85		33.510		24.637	330.2	0.083	5.72	250.0		101.4		2.1	0.33	0.0	0.01	0.15	0.14	0.02	25	18
30	ISL	15.77	D	15.77		33.508	D	24.655	328.7	0.087	5.75	D250.7	D	101.8		2.1	0.33	0.0	0.02	0.15	0.17	0.04	30	
40		15.59		15.58		33.510		24.698	324.9	0.132	5.74	250.8		101.2		2.1	0.33	0.0	0.02	0.14	0.23	0.06	40	17
50		15.25		15.24		33.479		24.750	320.2	0.164	5.76	251.5		100.8		2.3	0.35	0.0	0.02	0.09	0.42	0.14	50	16
62		14.09		14.08		33.415		24.949	301.6	0.202	5.64	246.2		96.3		3.1	0.46	1.2	0.15	0.01	0.84	0.42	62	15
74		12.49		12.48		33.358		25.225	275.5	0.236	5.04	220.0		83.3		6.7	0.83	7.7	0.04	0.01	0.21	0.20	75	14
75	ISL	12.49	D	12.48		33.360	D	25.228	275.2	0.228	5.04	D219.5	D	83.2		6.9	0.84	7.9	0.04	0.01	0.21	0.19	76	
88		11.72		11.71		33.376		25.384	260.6	0.274	4.85	212.0		78.9		8.5	0.97	10.0	0.04	0.04	0.13	0.14	89	13
100		11.01		10.99		33.482		25.597	240.5	0.304	4.37	190.8		70.0		13.5	1.27	15.1	0.03	0.07	0.06	0.06	101	12
112		10.81		10.79		33.511		25.656	235.2	0.332	4.07	177.8		65.0		14.7	1.34	16.2	0.03	0.04	0.04	0.06	113	11
125	ISL	10.44	D	10.43		33.594	D	25.784	223.2	0.351	3.78	D164.7	D	59.9		17.0	1.47	18.2	0.03	0.06	0.02	0.04	126	
126		10.41		10.40		33.582		25.780	223.7	0.364	3.75	163.5		59.3		17.1	1.48	18.4	0.03	0.06	0.02	0.04	127	10
139		9.99		9.98		33.682		25.930	209.6	0.393	3.43	149.6		53.7		20.7	1.64	21.0	0.03	0.06	0.01	0.04	140	09
150	ISL	9.57	D	9.55		33.774	D	26.072	196.3	0.404	3.30	D143.7	D	51.3		23.4	1.75	22.7	0.03	0.08	0.01	0.03	151	
170		9.26		9.24		33.896		26.219	182.7	0.453	2.76	120.6		42.7		28.3	1.95	25.7	0.03	0.11	0.00	0.03	171	08
200		8.68		8.66		33.989		26.384	167.5	0.505	2.43	105.8		37.0		34.0	2.09	28.1	0.03	0.01	0.00	0.02	202	07
230		8.37		8.35		34.060		26.487	158.1	0.554	2.04	89.2		31.0		38.3	2.24	29.9	0.03	0.05			232	06
250	ISL	8.28	D	8.25		34.101	D	26.534	154.0	0.576	1.84	D 80.2	D	27.9		40.5	2.32	30.7	0.02	0.04			252	
270		8.25		8.22		34.127		26.560	152.0	0.616	1.62	70.9		24.6		42.7	2.40	31.4	0.02	0.03			272	05
300	ISL	7.92	D	7.89		34.150	D	26.627	146.0	0.652	1.40	D 60.9	D	21.0		47.7	2.55	33.0	0.02	0.03			302	
321		7.68		7.65		34.177		26.684	140.9	0.691	1.12	49.1		16.8		51.2	2.65	34.2	0.01	0.03			324	04
380		7.22		7.19		34.245		26.804	130.3	0.771	0.67	29.1		9.9		59.5	2.86	36.3	0.02	0.02			383	03
400	ISL	7.12	D	7.08		34.265	D	26.834	127.6	0.789	0.58	D 25.1	D	8.5		62.3	2.91	37.0	0.02	0.02			403	
440		6.68		6.64		34.276		26.903	121.4	0.846	0.45	19.6		6.5		67.7	3.00	38.3	0.01	0.01			444	02
500	ISL	6.32	D	6.27		34.305	D	26.975	115.2	0.911	0.36	D 15.5	D	5.2		74.7	3.10	39.5	0.01	0.03			504	
515		6.18		6.13		34.308		26.995	113.3	0.934	0.34	D 14.6	D	4.8		76.5	3.12	39.8	0.02	0.04			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 50.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 10.4 N	118 54.0 W	30/01/2014	1034	UTC	1473 m	320	19 kn			1014.3 mb	15.2 C	14.0 C				009

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.05		16.05		33.603		24.663	326.9	0.000	5.76	251.5		102.5		2.0	0.27	0.1	0.01	0.10	0.30	0.07	0	
1		16.05		16.05		33.603		24.663	326.9	0.003	5.76	251.5		102.5		2.0	0.27	0.1	0.01	0.10	0.30	0.07	1	20
10		16.06		16.06		33.584		24.646	328.8	0.033	5.71	249.4		101.7		2.0	0.29	0.1	0.02	0.18	0.27	0.09	10	19
20	ISL	15.87	D	15.87		33.567	D	24.677	326.2	0.066	5.76	D251.0		D102.1		2.1	0.34	0.2	0.02	0.26	0.29	0.08	20	
21		15.87		15.87		33.587		24.693	324.7	0.069	5.73	250.1		101.6		2.1	0.34	0.2	0.02	0.27	0.29	0.08	21	18
30		15.05		15.05		33.504		24.810	313.8	0.098	5.82	253.9		101.4		2.4	0.27	0.1	0.02	0.03	0.47	0.17	30	17
41		13.22		13.21		33.353		25.077	288.6	0.131	5.48	239.1		91.9		4.4	0.55	3.6	0.14	0.04	0.59	0.33	41	16
50		12.32		12.31		33.388		25.280	269.5	0.156	4.96	216.5		81.6		6.7	0.79	7.4	0.06	0.00	0.42	0.43	50	15
60		11.48		11.47		33.331		25.393	259.0	0.182	4.89	213.5		79.1		8.7	0.94	10.5	0.04	0.05	0.18	0.16	60	14
71		11.00		10.99		33.366		25.507	248.4	0.210	4.67	203.9		74.7		10.9	1.09	12.9	0.05	0.04	0.11	0.10	72	13
75	ISL	10.63	D	10.62		33.482	D	25.663	233.6	0.222	4.73	D206.0	D	75.2		12.3	1.17	14.2	0.05	0.04	0.09	0.08	76	
85		10.38		10.37		33.496		25.717	228.7	0.243	4.14	180.8		65.4		15.6	1.36	17.4	0.04	0.03	0.04	0.05	86	12
100		9.95		9.94		33.652		25.912	210.4	0.276	3.57	155.8		55.9		20.4	1.60	21.0	0.04	0.03	0.02	0.04	101	11
119		9.74		9.73		33.752		26.026	200.0	0.315	3.25	142.1		50.8		23.7	1.76	23.3	0.02	0.21	0.01	0.03	120	10
125	ISL	9.55	D	9.53	D	33.754	D	26.059	196.9	0.330	3.29	D143.3	D	51.2		24.6	1.80	23.8	0.02	0.15	0.01	0.03	126	
140		9.41		9.39		33.856		26.163	187.4	0.355	2.79	121.9		43.3		26.9	1.90	25.0	0.03	0.01	0.00	0.03	141	09
150	ISL	9.35	D	9.34	D	33.879	D	26.189	185.1	0.378	2.74	D119.3	D	42.4		28.5	1.96	25.9	0.03	0.02	0.00	0.03	151	
170		9.07		9.05		33.969		26.306	174.4	0.410	2.38	103.9		36.7		31.8	2.08	27.7	0.04	0.03	0.00	0.03	171	08
200		8.73		8.71		34.038		26.414	164.6	0.461	2.15	93.8		32.9		35.7	2.19	29.1	0.03	0.02	0.00	0.02	202	07
230		8.35		8.33		34.086		26.511	155.9	0.509	1.85	80.5		28.0		40.6	2.33	31.0	0.03	0.08			232	06
250	ISL	8.01	D	7.99	D	34.117	D	26.587	148.9	0.544	1.63	D 70.9	D	24.5		44.7	2.44	32.4	0.03	0.04			252	
270		7.69		7.66		34.124		26.640	144.1	0.569	1.40	61.0		20.9		48.8	2.54	33.8	0.03	0.00			272	05
300	ISL	7.45	D	7.42	D	34.168	D	26.710	137.9	0.616	1.10	D 47.8	D	16.3		52.8	2.68	34.7	0.03	0.00			302	
321		7.51		7.48		34.223		26.744	135.1	0.640	0.84	36.8		12.5		55.5	2.77	35.4	0.03	0.00			324	04
380		7.08		7.05		34.262		26.836	127.1	0.717	0.57	24.9		8.4		62.0	2.92	37.0	0.03	0.06			383	03
400	ISL	6.87	D	6.84	D	34.275	D	26.875	123.5	0.748	0.49	D 21.3	D	7.2		64.7	2.96	37.5	0.03	0.04			403	
440		6.64		6.60		34.294		26.922	119.5	0.791	0.38	16.5		5.5		70.2	3.05	38.6	0.02	0.00			444	02
500	ISL	6.33	D	6.28	D	34.313	D	26.979	114.7	0.868	0.32	D 14.0	D	4.7		74.8	3.10	39.6	0.03	0.04			504	
515		6.27		6.23		34.314		26.988	114.1	0.878	0.30	13.1		4.3		75.9	3.11	39.8	0.03	0.05			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 55.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 0.6 N	119 13.9 W	30/01/2014	1437	UTC	1592 m	320	19 kn			1014.2 mb	14.9 C	13.7 C	18 m			010

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.02		15.02		33.264		24.631	329.9	0.000	5.81	253.8		101.1		2.9	0.31	0.0	0.00	0.05	0.24	0.06	0	
2		15.02		15.02		33.264		24.631	329.9	0.007	5.81	253.8		101.1		2.9	0.31	0.0	0.00	0.05	0.24	0.06	2	21
10		15.02		15.01		33.264		24.632	330.2	0.033	5.82	254.3		101.3		2.8	0.32	0.0	0.00	0.09	0.25	0.07	10	19
10		15.02		15.01		33.264		24.632	330.1	0.033													10	20
20		15.00		15.00		33.244		24.619	331.7	0.066	5.83	254.7		101.5		2.7	0.33	0.0	0.00	0.05	0.25	0.07	20	18
30		14.75		14.75		33.240		24.671	327.1	0.099	5.85	255.6		101.3		2.6	0.33	0.0	0.02	0.04	0.33	0.14	30	17
40		13.17		13.16		33.236		24.996	296.3	0.130	5.64	246.3		94.5		3.4	0.51	2.1	0.24	0.06	0.41	0.27	40	16
50		12.48		12.47		33.177		25.086	288.0	0.159	5.58	243.6		92.0		4.7	0.65	4.6	0.13	0.05	0.31	0.23	50	15
60		12.30		12.29		33.175		25.119	285.1	0.188	5.53	241.6		90.9		4.9	0.65	5.0	0.13	0.09	0.29	0.21	60	14
70		11.35		11.34		33.129		25.261	271.8	0.216	5.41	236.1		87.1		6.1	0.77	7.0	0.06	0.01	0.19	0.15	71	13
75	ISL	11.19	D	11.18		33.163	D	25.316	266.6	0.214	5.33	D232.3	D	85.6		7.0	0.83	8.1	0.05	0.03	0.16	0.13	76	
85		10.89		10.88		33.226		25.417	257.2	0.256	5.11	223.1		81.5		8.7	0.96	10.4	0.03	0.08	0.10	0.09	86	12
100		10.65		10.64		33.322		25.535	246.3	0.293	4.81	209.9		76.3		11.2	1.13	13.2	0.03	0.10	0.07	0.07	101	11
121		9.70		9.69		33.562		25.884	213.4	0.342	3.94	171.9		61.3		19.0	1.56	20.5	0.02	0.12	0.01	0.03	122	10
125	ISL	9.65	D	9.63	D	33.610	D	25.930	209.2	0.335	3.89	D169.5	D	60.6									126	
140		9.28		9.27		33.728	D	26.083	194.9	0.366	3.56	D154.8	D	54.9									141	09
150	ISL	9.16	D	9.15	D	33.809	D	26.165	187.3	0.385	3.24	D140.8	D	49.9									151	
170		8.88		8.87		33.882		26.267	178.0	0.436	2.89	126.0		44.2		29.2	1.94	26.4	0.02	0.14	0.00	0.02	171	08
200		8.50		8.48		34.023		26.438	162.2	0.487	2.17	94.8		33.0		36.4	2.20	29.6	0.02	0.04	0.00	0.02	202	07
230		8.71		8.68		34.184		26.533	154.0	0.535	1.45	63.1		22.1		40.4	2.42	30.9	0.01	0.07			232	06
250	ISL	8.62	D	8.59	D	34.205	D	26.565	151.4	0.551	1.29	D 56.1	D	19.7		43.1	2.49	31.9	0.01	0.05			252	
270		8.18		8.15		34.201		26.628	145.5	0.595	1.19	52.0		18.0		45.9	2.56	32.8	0.02	0.03			272	05
300	ISL	7.83	D	7.80	D	34.220	D	26.695	139.6	0.624	0.94	D 40.9	D	14.1		50.5	2.68	34.2	0.01	0.08			302	
321		7.63		7.60		34.219		26.724	137.0	0.667	0.81	35.4		12.1		53.7	2.76	35.2	0.01	0.12			324	04
380		7.02		6.98		34.259		26.843	126.4	0.745	0.49	21.4		7.2		63.1	2.95	37.4	0.01	0.05			383	03
400	ISL	6.75	D	6.71	D	34.283	D	26.898	121.2	0.756	0.45	D 19.4	D	6.5		65.6	2.99	37.9	0.01	0.04			403	
440		6.52		6.48		34.287		26.933	118.4	0.817	0.36	15.7		5.2		70.6	3.06	39.0	0.01	0.03			444	02
500	ISL	6.38	D	6.33	D	34.309	D	26.970	115.7	0.875	0.35	D 15.1	D	5.0		72.7	3.08	39.4	0.01	0.07			504	
515		6.37		6.32		34.296		26.961	116.8	0.905	0.32	14.1		4.7		73.3	3.08	39.5	0.01	0.08			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 50.7 N	119 34.8 W	30/01/2014	1839	UTC	1905 m	320 20 kn	280 08 10	2	1016.4 mb	14.9 C	14.2 C	15 m	8/8	ST	011

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		14.96		14.96		33.247		24.629	330.1	0.000	5.83		254.6		101.3		2.5	0.35	0.1	0.01	0.51	0.27	0.07	0	
2	A	14.96		14.96		33.247		24.629	330.1	0.007	5.83		254.6		101.3		2.5	0.35	0.1	0.01	0.51	0.27	0.07	2	24
10	ISL	14.96	D	14.96		33.246	D	24.629	330.4	0.033	5.84	D	254.6	D	101.5		2.6	0.34	0.0	0.01	0.21	0.25	0.07	10	
11	A	14.97		14.96		33.247		24.629	330.4	0.036	5.83		254.6		101.3		2.6	0.34	0.0	0.01	0.17	0.25	0.08	11	22
11		14.97		14.96		33.246		24.629	330.5	0.037														11	23
13	A	14.97		14.97		33.256		24.637	329.8	0.043	5.83		254.4		101.3		2.6	0.32	0.0	0.02	0.05	0.26	0.08	13	21
20		14.97		14.97		33.264		24.643	329.4	0.066	5.83		254.6		101.3		2.5	0.32	0.0	0.01	0.06	0.27	0.08	20	20
25	A	14.97		14.97		33.260		24.639	330.0	0.083	5.84		254.9		101.5		2.5	0.33	0.0	0.00	0.13	0.27	0.08	25	19
30	ISL	14.94	D	14.94		33.297	D	24.674	326.8	0.096	5.83	D	254.0	D	101.3		2.5	0.34	0.1	0.04	0.11	0.43	0.21	30	
36		14.67		14.67		33.311		24.744	320.4	0.118	5.78		252.4		99.9		2.5	0.36	0.2	0.09	0.09	0.63	0.36	36	17
36		14.67		14.67		33.310		24.743	320.4	0.119														36	18
48	A	14.17		14.16		33.272		24.821	313.4	0.156	5.73		250.2		98.0		2.8	0.43	0.9	0.23	0.05	0.73	0.15	48	16
50	ISL	14.02	D	14.02		33.263	D	24.844	311.2	0.142	5.72	D	249.2	D	97.5		2.9	0.45	1.2	0.26	0.05	0.63	0.21	50	
55	A	13.41		13.41		33.232		24.945	301.7	0.178	5.70		248.7		95.9		3.2	0.50	2.0	0.33	0.06	0.38	0.35	55	15
62		12.70		12.69		33.153	D	25.025	294.1	0.178	5.61	D	244.5	D	93.0									62	14
71		11.79		11.78		33.132		25.181	279.4	0.224	5.47		239.1		89.0		5.2	0.73	5.7	0.04	0.19	0.20	0.18	72	13
75	ISL	11.70	D	11.69		33.118	D	25.187	278.9	0.215	5.51	D	240.0	D	89.4		5.9	0.78	6.6	0.08	0.14	0.17	0.16	76	
84		11.86		11.85		33.314		25.310	267.5	0.260	5.11		223.1		83.3		7.6	0.88	8.7	0.18	0.03	0.11	0.11	85	12
100	ISL	11.29	D	11.28		33.368	D	25.457	253.9	0.282	4.66	D	203.0	D	75.1		10.1	1.09	12.0	0.02	0.07	0.11	0.11	101	
101		11.29		11.28		33.384		25.470	252.7	0.304	4.64		202.7		74.7		10.3	1.10	12.2	0.01	0.07	0.11	0.11	102	11
119		10.77		10.76		33.538		25.683	232.7	0.348	3.96		173.1		63.2		15.0	1.38	16.5	0.02	0.26	0.05	0.06	120	10
125	ISL	10.67	D	10.65		33.567	D	25.724	229.0	0.343	3.83	D	166.9	D	61.0		16.9	1.47	17.8	0.02	0.19	0.03	0.05	126	
140		9.94		9.93		33.704		25.956	207.2	0.394	3.28		143.3		51.5		21.4	1.69	21.2	0.01	0.02	0.01	0.03	141	09
150	ISL	9.41	D	9.39		33.755	D	26.084	195.1	0.396	3.29	D	143.3	D	51.0		24.1	1.79	22.8	0.01	0.05	0.01	0.03	151	
171		9.04		9.02		33.926		26.277	177.2	0.454	2.68		116.9		41.2		29.7	2.00	26.1	0.01	0.12	0.00	0.02	172	08
200	ISL	8.63	D	8.61		34.014	D	26.411	164.9	0.485	2.32	D	101.0	D	35.4		35.1	2.15	28.3	0.01	0.01	0.00	0.02	202	
201		8.62		8.60		34.015		26.413	164.7	0.505	2.30		100.4		35.1		35.3	2.16	28.4	0.01	0.01	0.00	0.02	203	07
228		8.76		8.73		34.134		26.486	158.5	0.548	1.69		74.0		25.9		38.8	2.37	29.7	0.01	0.04			230	06
250	ISL	8.68	D	8.65		34.179	D	26.535	154.3	0.565	1.48	D	64.3	D	22.6		41.8	2.48	30.6	0.01	0.04			252	
271		8.55		8.52		34.235		26.599	148.6	0.615	1.10		47.9		16.7		44.7	2.59	31.5	0.01	0.04			273	05
300	ISL	8.22	D	8.19		34.240	D	26.653	143.8	0.640	1.03	D	44.9	D	15.6		48.1	2.67	32.5	0.00	0.06			302	
319		8.10		8.06		34.262		26.690	140.6	0.684	0.83		36.0		12.4		50.4	2.73	33.1	0.00	0.07			322	04
381		7.25		7.21		34.273		26.822	128.6	0.768	0.56		24.6		8.3		60.3	2.92	36.0	0.00	0.04			384	03
400	ISL	7.04	D	7.00		34.266	D	26.846	126.5	0.776	0.58	D	25.0	D	8.5		62.3	2.95	36.5	0.01	0.06			403	
444		6.80		6.76		34.294		26.901	121.8	0.846	0.40		17.5		5.9		66.9	3.03	37.5	0.01	0.09			448	02
500	ISL	6.38	D	6.33		34.308	D	26.970	115.7	0.898	0.34	D	14.8	D	4.9		73.3	3.11	38.7	0.00	0.08			504	
522		6.25		6.21		34.315		26.991	113.9	0.938	0.30		13.1		4.4		75.8	3.14	39.2	0.00	0.07			526	01

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.
D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 30.7 N	120 14.6 W	31/01/2014	0044	UTC	3945 m	300 12 kn	340 05 07	2	1014.3 mb	14.7 C	13.3 C		8/8	CU	012

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.90		15.90		33.447		24.577	335.1	0.000	5.69		248.7		101.0		2.2	0.32	0.0	0.02	0.04	0.28	0.02	0	
3		15.90		15.90		33.447		24.577	335.2	0.010	5.69		248.7		101.0		2.2	0.32	0.0	0.02	0.04	0.28	0.02	3	20
10		15.85		15.85		33.438		24.581	335.0	0.034	5.70		248.7		100.9		2.2	0.34	0.0	0.03	0.08	0.23	0.06	10	19
20	ISL	15.40	D	15.39		33.367	D	24.629	330.8	0.067	5.78	D	251.7	D	101.3		2.2	0.33	0.0	0.03	0.03	0.28	0.08	20	
25		15.39		15.39		33.371		24.633	330.6	0.083	5.77		252.1		101.3		2.3	0.33	0.0	0.03	0.01	0.30	0.09	25	18
30	ISL	15.38	D	15.37		33.365	D	24.632	330.8	0.101	5.78	D	252.1	D	101.4		2.3	0.33	0.0	0.03	0.02	0.34	0.11	30	
41		15.05		15.04		33.339		24.685	326.2	0.136	5.81		253.9		101.2		2.4	0.33	0.0	0.02	0.04	0.43	0.15	41	17
50		14.29		14.28		33.289	D	24.809	314.5	0.166	5.79		252.8		99.3		2.4	0.34	0.1	0.05	0.02	0.48	0.10	50	16
61		13.01		13.00		33.266		25.051	291.7	0.198	5.58		243.6		93.1		3.9	0.55	3.2	0.12	0.01	0.31	0.29	61	15
74		11.57		11.56		33.382		25.417	257.1	0.233	4.73		206.7		76.7		8.9	1.01	10.5	0.05	0.03	0.13	0.10	75	14
75	ISL	11.47	D	11.46		33.412	D	25.457	253.2	0.238	4.68	D	203.9	D	75.7		9.2	1.03	10.9	0.05	0.03	0.13	0.10	76	
86		11.02		11.01		33.473		25.586	241.2	0.263	4.27		186.3		68.4		12.9	1.27	14.8	0.03	0.04	0.07	0.06	87	13
100		10.43		10.41		33.478		25.696	231.0	0.296	4.30		187.6		68.0		14.2	1.32	16.1	0.03	0.00	0.03	0.04	101	12
113		10.25		10.23		33.580		25.806	220.8	0.326	3.84		167.7		60.5		17.2	1.48	18.5	0.03	0.03	0.03	0.04	114	11
125		9.54		9.52		33.681		26.004	202.1	0.351	3.63		158.6		56.4		21.0	1.61	21.1	0.02	0.04	0.01	0.02	126	10
139		9.35		9.34		33.798	D	26.126	190.9	0.381	3.43	D	149.1	D	53.0									140	09
150	ISL	9.22	D	9.20		33.854	D	26.192	184.8	0.402	3.32	D	144.6	D	51.3		25.5	1.77	23.6	0.02	0.02	0.00	0.02	151	
170		8.82		8.80		33.904		26.295	175.3	0.438	3.04		132.5		46.4		29.2	1.90	25.6	0.02	0.01	0.00	0.02	171	08
200	ISL	8.49	D	8.47		34.008	D	26.428	163.2	0.489	2.59	D	112.5	D	39.3		34.1	2.05	27.7	0.02	0.01	0.00	0.02	202	
201		8.49		8.47		33.996		26.418	164.1	0.491	2.59		112.9		39.3		34.2	2.05	27.8	0.03	0.01	0.00	0.02	203	07
229		8.13		8.11		34.033		26.502	156.5	0.536	2.27		99.2		34.3		39.3	2.20	29.8	0.02	0.00			231	06
250	ISL	8.15	D	8.12		34.110	D	26.561	151.4	0.568	1.74	D	75.9	D	26.3		42.6	2.34	31.2	0.02	0.01			252	
269		7.88		7.85		34.121		26.610	147.0	0.596	1.54		67.3		23.1		45.6	2.47	32.4	0.01	0.01			271	05
300	ISL	7.31	D	7.28		34.086	D	26.664	142.1	0.642	1.61	D	69.9	D	23.8		51.0	2.56	34.0	0.01	0.01			302	
320		7.04		7.01		34.093		26.707	138.2	0.669	1.36		59.2		19.9		54.4	2.61	35.1	0.02	0.01			323	04
381		6.56		6.53		34.151		26.818	128.2	0.750	0.86		37.7		12.6		63.7	2.83	37.5	0.02	0.02			384	03
400	ISL	6.37	D	6.34		34.168	D	26.856	124.8	0.776	0.77	D	33.4	D	11.1		66.8	2.88	38.1	0.02	0.02			403	
440		6.10		6.06		34.191		26.911	119.9	0.823	0.59		25.8		8.5		73.3	3.00	39.4	0.01	0.01			444	02
500	ISL	6.00	D	5.96		34.280	D	26.994	112.9	0.896	0.38	D	16.3	D	5.4		77.5	3.12	39.9	0.01	0.01			504	
515		6.02		5.97		34.316		27.021	110.7	0.910	0.34		14.9		4.9		78.6	3.15	40.0	0.01	0.01			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 10.8 N	120 55.4 W	31/01/2014	0650	UTC	3841 m	290 14 kn			1015.5 mb	14.5 C	13.3 C				013

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.14		16.14		33.490	24.557	337.0	0.000	5.67	247.7		101.1		2.0	0.30	0.0	0.01	0.07	0.19	0.03	0	
2		16.14		16.14		33.490	24.557	337.0	0.007	5.67	247.7		101.1		2.0	0.30	0.0	0.01	0.07	0.19	0.03	2	20
10		16.14		16.14		33.491	24.557	337.3	0.034	5.63	245.9		100.4		2.0	0.29	0.0	0.01	0.03	0.18	0.04	10	19
20	ISL	16.12	D	16.11		33.486	D 24.560	337.4	0.068	5.65	D246.3		D100.6		2.0	0.29	0.0	0.01	0.02	0.19	0.05	20	
25		16.05		16.04		33.444	24.543	339.2	0.084	5.69	248.3		101.1		2.0	0.29	0.0	0.01	0.02	0.19	0.06	25	18
30	ISL	15.95	D	15.94		33.449	D 24.570	336.7	0.102	5.67	D247.2		D100.6		2.0	0.29	0.0	0.01	0.01	0.20	0.06	30	
39		15.91		15.90		33.441	24.573	336.8	0.132	5.69	248.4		100.9		2.1	0.30	0.0	0.02	0.00	0.22	0.06	39	17
50	ISL	14.75	D	14.74		33.253	D 24.684	326.5	0.169	5.87	D256.0		D101.6		2.3	0.31	0.0	0.02	0.05	0.43	0.14	50	
51		14.34		14.33		33.187	D 24.719	323.1	0.172	5.77	251.9		98.9		2.3	0.31	0.0	0.02	0.05	0.45	0.14	51	16
62		13.35		13.34		33.139	24.885	307.5	0.206	5.85	255.7		98.4		3.4	0.46	1.7	0.24	0.12	0.27	0.38	62	15
75	ISL	12.59	D	12.58		33.183	D 25.071	290.2	0.246	5.63	D245.3	D	93.1		3.8	0.54	3.3	0.17	0.03	0.23	0.18	76	
76		12.48		12.47		33.166	D 25.079	289.4	0.249	5.63	245.9		92.9		3.8	0.55	3.4	0.16	0.02	0.22	0.16	77	14
85		11.31		11.29		33.183	25.310	267.4	0.273	5.35	233.6		86.1		6.6	0.78	7.5	0.03	0.04	0.10	0.09	86	13
100		10.64		10.63		33.215	25.454	254.0	0.312	5.09	222.3		80.7		9.4	0.98	10.9	0.03	0.01	0.07	0.06	101	12
112		10.22		10.21		33.305	25.597	240.7	0.342	4.84	211.4		76.1		11.9	1.13	13.5	0.03	0.04	0.05	0.04	113	11
125		9.88		9.86		33.406	25.733	227.9	0.372	4.54	198.3		70.9		15.1	1.31	16.5	0.02	0.05	0.03	0.03	126	10
140		9.48		9.47		33.663	D 25.999	202.9	0.407	3.53	D153.5	D	54.7									141	09
150	ISL	9.31	D	9.29		33.752	D 26.098	193.7	0.427	3.83	D166.5	D	59.1		20.8	1.52	20.4	0.02	0.08	0.02	0.02	151	
170		8.89		8.87		33.833	26.228	181.7	0.462	3.56	155.3		54.5		25.3	1.69	23.5	0.01	0.10	0.00	0.02	171	08
200		8.45		8.43		33.941	26.381	167.6	0.514	3.22	140.6		48.9		30.5	1.84	25.8	0.02	0.05	0.00	0.01	202	07
230		8.50		8.48		34.076	26.479	158.9	0.563	2.20	96.0		33.4		37.0	2.19	28.9	0.01	0.05			232	06
250	ISL	8.23	D	8.20		34.098	D 26.539	153.6	0.598	1.99	D 86.5	D	30.1		40.3	2.31	30.2	0.01	0.04			252	
270		8.04		8.01		34.138	26.600	148.1	0.625	1.61	70.4		24.3		43.6	2.42	31.4	0.02	0.02			272	05
300	ISL	7.24	D	7.21		34.048	D 26.643	144.0	0.673	1.84	D 79.8	D	27.1		48.7	2.49	33.3	0.01	0.03			302	
320		7.11		7.08		34.074	26.682	140.6	0.697	1.52	66.3		22.4		52.2	2.54	34.5	0.01	0.03			323	04
380		6.66		6.62		34.132	26.791	130.9	0.778	0.97	42.3		14.1		61.2	2.78	37.2	0.01	0.01			383	03
400	ISL	6.46	D	6.43		34.147	D 26.829	127.5	0.810	0.88	D 38.3	D	12.8		64.3	2.83	37.9	0.01	0.01			403	
441		6.15		6.11		34.176	26.892	121.8	0.855	0.65	28.2		9.3		70.8	2.93	39.2	0.01	0.01			445	02
500	ISL	5.92	D	5.88		34.252	D 26.982	113.9	0.932	0.45	D 19.7	D	6.5		79.1	3.05	40.6	0.00	0.01			504	
513		5.67		5.62		34.234	27.000	112.1	0.939	0.42	18.3		6.0		81.0	3.08	40.9	0.00	0.01			517	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
30 50.9 N	121 35.5 W	31/01/2014	1253	UTC	4099 m	350 15 kn			1016.0 mb	13.0 C	12.3 C				014

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.32		15.32		33.312	24.601	332.7	0.000	5.75	251.1		100.7		2.4	0.31	0.0	0.03	0.11	0.26	0.09	0	
1		15.32		15.32		33.312	24.601	332.8	0.003	5.75	251.1		100.7		2.4	0.31	0.0	0.03	0.11	0.26	0.09	1	20
10		15.33		15.33		33.311	24.599	333.3	0.033	5.75	251.3		100.8		2.3	0.32	0.0	0.02	0.18	0.25	0.07	10	19
20	ISL	15.34	D	15.34		33.312	D 24.599	333.6	0.067	5.75	D250.5		D100.7		2.3	0.30	0.0	0.02	0.07	0.25	0.07	20	
26		15.33		15.33		33.311	24.600	333.7	0.087	5.74	250.8		100.6		2.3	0.28	0.0	0.01	0.00	0.25	0.07	26	18
30	ISL	15.33	D	15.33		33.308	D 24.598	334.0	0.101	5.75	D250.6		D100.7		2.3	0.28	0.0	0.02	0.02	0.28	0.09	30	
40		15.38		15.37		33.334	24.609	333.4	0.133	5.71	249.5		100.2		2.2	0.29	0.0	0.03	0.08	0.34	0.12	40	17
50		15.40		15.39		33.395	24.651	329.7	0.167	5.66	247.3		99.4		2.3	0.29	0.1	0.02	0.07	0.38	0.17	50	16
63		15.03		15.02		33.326	24.681	327.3	0.209	5.70	248.8		99.2		2.4	0.32	0.2	0.07	0.09	0.28	0.15	63	15
75	ISL	13.49	D	13.48		33.134	D 24.854	310.9	0.249	5.89	D256.7	D	99.2		3.2	0.44	1.3	0.10	0.32	0.32	0.19	76	
76		13.15		13.14		33.080	24.880	308.4	0.251	5.95	260.1		99.6		3.3	0.45	1.4	0.10	0.34	0.32	0.19	77	14
87		13.02		13.01		33.115	24.934	303.6	0.284	5.99	261.5		99.8		3.5	0.48	1.7	0.10	0.41	0.27	0.16	88	13
100		12.88		12.86		33.223	25.047	293.2	0.323	5.86	256.1		97.6		3.7	0.53	2.7	0.15	0.45	0.15	0.11	101	12
112		12.07		12.06		33.213	25.194	279.4	0.358	5.54	241.9		90.6		4.6	0.59	4.6	0.03	0.00	0.08	0.08	113	11
125		10.66		10.64		33.167	25.414	258.5	0.393	5.31	231.9		84.2		7.8	0.89	9.3	0.03	0.02	0.06	0.05	126	10
140		10.14		10.12		33.403	25.687	232.7	0.429	4.76	207.7		74.7		12.7	1.15	14.1	0.03	0.04	0.02	0.03	141	09
150	ISL	9.79	D	9.78		33.457	D 25.788	223.3	0.455	4.66	D202.9	D	72.7		15.4	1.28	16.3	0.03	0.04	0.02	0.02	151	
170		9.22		9.20		33.657	26.038	199.8	0.495	4.00	174.5		61.6		20.8	1.53	20.7	0.02	0.03	0.01	0.01	171	08
200		8.77		8.75		33.911	26.309	174.6	0.551	3.78	164.9		57.7		25.6	1.61	22.6	0.02	0.03	0.00	0.01	202	07
231		8.37		8.34		33.954	26.405	165.9	0.604	3.49	152.3		52.8		30.4	1.75	24.8	0.03	0.02			233	06
250	ISL	8.00	D	7.98		33.970	D 26.472	159.7	0.639	3.44	D149.8	D	51.8		34.5	1.89	26.7	0.02	0.01			252	
270		7.67		7.65		33.985	26.532	154.3	0.666	2.84	124.1		42.4		38.9	2.04	28.8	0.02	0.00			272	05
300	ISL	7.26	D	7.23		33.999	D 26.603	147.8	0.716	2.42	D105.2	D	35.7		45.0	2.23	31.2	0.01	0.00			302	
320		7.00		6.97		34.010	26.647	143.7	0.740	2.10	91.5		30.8		49.1	2.35	32.8	0.01	0.00			323	04
380		6.50		6.46		34.059	26.754	134.2	0.824	1.37	59.7		19.8		59.5	2.66	36.4	0.02	0.02			383	03
400	ISL	6.27	D	6.24		34.078	D 26.799	130.1	0.856	1.20	D 52.2	D	17.3		63.4	2.74	37.4	0.02	0.02			403	
441		5.93		5.89		34.120	26.876	123.0	0.902	0.82	35.8		11.8		71.5	2.90	39.4	0.02	0.01			445	02
500	ISL	5.48	D	5.44		34.164	D 26.966	114.9	0.980	0.62	D 27.0	D	8.8		80.5	3.02	40.8	0.02	0.02			504	
517		5.38		5.33		34.178	26.990	112.7	0.992	0.52	22.6		7.3		83.1	3.06	41.2	0.02	0.02			521	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA | CALCOFI CRUISE 1402 | STATION 93.3 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
30 30.8 N	122 15.7 W	31/01/2014	1851 UTC	4175 m	030 09 kn	340 04 06	1	1019.6 mb	15.3 C	13.3 C	24 m	5/8	SC	015

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.50		15.50		33.284	24.540	338.6	0.000	5.73	250.5	100.8	2.5	0.34	0.3	0.00		0.19	0.06	0	
1	A	15.50		15.50		33.284	24.540	338.6	0.003	5.73	250.5	100.8	2.5	0.34	0.3	0.00		0.19	0.06	1	24
10		15.47		15.47		33.282	24.546	338.3	0.034	5.73	250.5	100.7	2.4	0.32	0.1	0.00	0.20	0.20	0.06	10	23
18	A	15.41		15.41		33.280	24.558	337.5	0.061	5.73	250.2	100.5	2.5	0.31	0.0	0.00	0.08	0.21	0.06	18	22
20	ISL	15.42	D	15.41		33.279	D 24.557	337.6	0.068	5.75	D250.7	D100.9						0.20	0.06	20	
21	A	15.41		15.41		33.280	24.558	337.6	0.071	5.75	251.0	100.8						0.20	0.06	21	21
30	ISL	15.40	D	15.40		33.277	D 24.558	337.8	0.102	5.73	D249.7	D100.5						0.21	0.07	30	
31		15.41		15.40		33.281	24.561	337.6	0.105	5.76	251.7	101.0	2.5	0.31	0.0	0.01	0.16	0.21	0.07	31	20
41	A	15.38		15.38		33.277	24.564	337.7	0.139	5.74	250.6	100.5	2.5	0.31	0.0	0.01	0.13	0.23	0.07	41	19
50	ISL	15.22	D	15.22		33.272	D 24.595	335.0	0.170	5.75	D250.8	D100.5	2.5	0.30	0.0	0.00	0.06	0.34	0.14	50	
53		15.28		15.27		33.318	D 24.618	332.9	0.180	5.76	251.4	100.7	2.5	0.30	0.0	0.00	0.03	0.38	0.16	53	18
63		14.99		14.98		33.265	24.643	330.9	0.212	5.71	249.4	99.3	2.6	0.30	0.0	0.00	0.06	0.30	0.15	63	16
63		14.99		14.98		33.265	24.642	330.9	0.213											63	17
75	A	14.29		14.28		33.144	24.698	325.9	0.252	5.78	252.4	98.9	2.7	0.34	0.1	0.03	0.20	0.23	0.12	76	15
81		14.13		14.12		33.186	24.763	319.8	0.271	5.73	250.5	97.9	2.9	0.36	0.3	0.09	0.24	0.20	0.13	82	14
88	A	13.77		13.75		33.170	24.827	314.0	0.294	5.72	249.8	96.9	3.0	0.40	0.8	0.24	0.23	0.18	0.13	89	13
100		13.34		13.33		33.213	24.947	302.8	0.331	5.68	248.0	95.4	3.2	0.42	1.2	0.34	0.16	0.10	0.08	101	12
111		13.14		13.12		33.287	25.046	293.7	0.363	5.62	245.5	94.1	3.4	0.49	2.2	0.23	0.03	0.10	0.10	112	11
125	ISL	11.39	D	11.37		33.179	D 25.294	270.1	0.385	5.43	D236.6	D 87.6	3.7	0.47	2.4	0.11	0.08	0.07	0.06	126	
126		11.46		11.44		33.165	25.271	272.3	0.406	5.41	236.3	87.3	3.7	0.47	2.4	0.11	0.08	0.06	0.06	127	10
145		11.16		11.14		33.413	25.519	249.1	0.455	4.80	209.4	77.0	6.0	0.73	6.5	0.01	0.04	0.05	0.06	146	09
150	ISL	11.08	D	11.06		33.441	D 25.554	245.9	0.450	4.80	D209.1	D 77.0	6.7	0.78	7.3	0.01	0.04	0.05	0.05	151	
171		9.83		9.81		33.475	25.797	222.9	0.517	4.47	195.3	69.8	9.9	0.98	10.9	0.02	0.02	0.02	0.02	172	08
200		9.10		9.08		33.773	26.149	189.9	0.577	3.89	169.8	59.8	15.6	1.31	16.5	0.00	0.03	0.00	0.02	202	07
230		8.64		8.62		33.903	26.323	173.8	0.631	3.53	154.0	53.8	22.3	1.55	21.0	0.01	0.07			232	06
250	ISL	8.54	D	8.51		33.927	D 26.358	170.8	0.650	3.46	D150.5	D 52.6	24.9	1.63	22.4	0.00	0.07			252	
271		7.91		7.89		33.987	26.499	157.5	0.700	2.68	116.8	40.1	27.6	1.72	23.8	0.00	0.08			273	05
300	ISL	7.48	D	7.45		34.013	D 26.583	149.9	0.729	2.36	D102.5	D 35.0	33.5	1.93	26.7	0.00	0.06			302	
320		7.24		7.21		34.019	26.622	146.3	0.774	2.04	89.1	30.1	37.6	2.08	28.7	0.00	0.05			323	04
382		6.69		6.65		34.076	26.743	135.5	0.862	1.28	D 55.7	D 18.7	47.3	2.37	32.4	0.00	0.05			385	03
400	ISL	6.70	D	6.66		34.128	D 26.783	132.0	0.872	1.04	D 45.2	D 15.1	50.5	2.46	33.5	0.00	0.05			403	
442		6.34		6.30		34.161	26.856	125.5	0.940	0.77	33.5	11.1	58.0	2.68	36.1	0.00	0.05			446	02
500	ISL	5.87	D	5.83		34.221	D 26.964	115.6	0.997	0.49	D 21.4	D 7.1	64.6	2.86	37.5	0.00	0.06			504	
517		5.75		5.71		34.235	26.990	113.2	1.029	0.42	18.2	5.9	66.6	2.91	37.9	0.00	0.06			521	01

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.
D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA | CALCOFI CRUISE 1402 | STATION 93.3 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
30 11.0 N	122 55.4 W	01/02/2014	0049 UTC	3826 m	010 12 kn	340 03 06	1	1018.3 mb	15.1 C	12.7 C		4/8	AC	016

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		15.98		15.98		33.273	24.425	349.6	0.000	5.68	248.0	100.7	2.1	0.31	0.0	0.01	0.03	0.11	0.04	0	
2		15.98		15.98		33.273	24.425	349.6	0.007	5.68	248.0	100.7	2.1	0.31	0.0	0.01	0.03	0.11	0.04	2	20
10		15.95		15.94		33.271	24.432	349.2	0.035	5.68	248.2	100.7	2.1	0.31	0.0	0.01	0.06	0.10	0.03	10	19
20	ISL	15.86	D	15.86		33.270	D 24.451	347.7	0.070	5.69	D248.2	D100.7	2.1	0.32	0.0	0.02	0.05	0.11	0.03	20	
25		15.87		15.86		33.275	24.454	347.7	0.087	5.67	247.9	100.4	2.1	0.32	0.0	0.02	0.05	0.12	0.04	25	18
30	ISL	15.89	D	15.88		33.282	D 24.455	347.7	0.105	5.69	D247.9	D100.7	2.1	0.32	0.0	0.01	0.07	0.12	0.04	30	
40		15.89		15.89		33.289	24.460	347.6	0.139	5.68	248.0	100.5	2.1	0.31	0.1	0.01	0.10	0.13	0.04	40	17
50	ISL	15.90	D	15.89		33.293	D 24.462	347.8	0.176	5.66	D246.9	D100.3	2.1	0.31	0.0	0.01	0.05	0.13	0.04	50	
51		15.89		15.88		33.293	24.464	347.6	0.178	5.67	247.8	100.4	2.1	0.31	0.0	0.01	0.04	0.13	0.04	51	16
61		15.56		15.55		33.249	24.506	343.9	0.212	5.71	249.2	100.3	2.2	0.32	0.0	0.02	0.04	0.20	0.08	61	15
75		14.96		14.95		33.245	24.633	332.2	0.260	5.68	248.0	98.6	2.3	0.33	0.1	0.08	0.10	0.22	0.09	76	14
87		13.88		13.87		33.259	24.872	309.7	0.298	5.69	248.6	96.8	2.9	0.43	1.1	0.42	0.04	0.20	0.10	88	13
100		12.94		12.93		33.290	25.086	289.5	0.337	5.57	243.2	92.8	3.6	0.50	2.6	0.07	0.02	0.17	0.12	101	12
112		12.30		12.29		33.271	25.196	279.3	0.371	5.45	238.1	89.6	4.5	0.60	4.3	0.03	0.05	0.12	0.11	113	11
125		11.84		11.82		33.316	25.318	267.9	0.407	5.29	231.0	86.1	6.1	0.70	6.2	0.03	0.03	0.07	0.07	126	09
140		10.56		10.54		33.342	25.569	244.1	0.445	4.99	218.0	79.1	9.6	0.96	10.7	0.02	0.02	0.04	0.05	141	10
150	ISL	10.24	D	10.22		33.416	D 25.682	233.5	0.472	4.77	D207.7	D 75.1	12.7	1.14	13.7	0.02	0.02	0.03	0.04	151	
170		9.57		9.55		33.624	25.956	207.7	0.513	3.89	169.7	60.4	19.1	1.51	19.7	0.02	0.02	0.01	0.02	171	08
200	ISL	9.09	D	9.07		33.833	D 26.197	185.4	0.576	3.36	D146.1	D 51.7	25.2	1.75	23.3	0.02	0.05	0.00	0.01	202	
201		9.08		9.06		33.833	26.198	185.2	0.574	3.35	146.1	51.5	25.4	1.76	23.4	0.02	0.05	0.00	0.01	203	07
231		8.47		8.45		33.953	26.388	167.6	0.627	2.93	127.8	44.5	32.0	1.94	26.3	0.01	0.04			233	06
250	ISL	8.19	D	8.16		33.993	D 26.463	160.7	0.662	2.76	D120.1	D 41.7	35.6	2.06	27.8	0.02	0.03			252	
271		7.92		7.90		34.020	26.524	155.2	0.691	2.40	104.6	36.0	39.6	2.19	29.5	0.02	0.01			273	05
300	ISL	7.62	D	7.59		34.039	D 26.583	149.9	0.740	2.15	D 93.3	D 32.0	44.0	2.32	31.3	0.01	0.02			302	
320		7.42		7.39		34.051	26.622	146.5	0.765	1.85	80.7	27.4	47.0	2.41	32.5	0.01	0.03			322	04
380		6.73		6.69		34.092	26.750	134.8	0.850	1.30	56.6	18.9	58.2	2.67	35.7	0.01	0.04			383	03
400	ISL	6.69	D	6.66		34.121	D 26.778	132.5	0.882	1.10	D 47.8	D 16.0	61.2	2.73	36.4	0.01	0.05			403	
440		6.24		6.20		34.137	26.850	125.8	0.928	0.89	38.9	12.9	67.1	2.86	37.9	0.01	0.06			444	02
500	ISL	5.93	D	5.89		34.186	D 26.929	118.9	1.008	0.67	D 29.1	D 9.6	75.2	3.00	39.6	0.01	0.05			504	
515		5.76		5.72		34.194	26.956	116.4	1.019	0.58	25.1	8.2	77.3	3.04	40.0	0.01	0.05			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 120.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
29 51.1 N	123 35.0 W	01/02/2014	0652 UTC	4114 m	020 16 kn			1020.8 mb	13.6 C	10.7 C				017

DEPTH m		TEMP DEG C		POTTEMP DEG C		SALINITY		SIGMA THETA	SVA	DYN HT	OXYGEN ml/L		OXYGEN µmol/Kg		OXY PCT		SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0		16.43		16.43		33.430		24.444	347.7	0.000	5.66		247.0		101.3		2.1	0.29	0.1	0.00	0.28	0.11	0.03	0	
2		16.43		16.43		33.430		24.444	347.8	0.007	5.66		247.0		101.3		2.1	0.29	0.1	0.00	0.28	0.11	0.03	2	20
10		16.42		16.42		33.429		24.445	348.0	0.035	5.60		244.6		100.3		2.1	0.26	0.0	0.01	0.09	0.10	0.03	10	19
20	ISL	16.43	D	16.43		33.431	D	24.445	348.3	0.070	5.60	D	244.0	D	100.3		2.0	0.26	0.0	0.00	0.10	0.12	0.02	20	
25		16.43		16.43		33.431		24.445	348.5	0.087	5.61		244.8		100.4		2.0	0.26	0.0	0.00	0.10	0.12	0.02	25	18
30	ISL	16.43	D	16.43		33.431	D	24.446	348.6	0.105	5.58	D	243.2	D	99.9		2.0	0.25	0.0	0.00	0.08	0.12	0.02	30	
40		16.35		16.34		33.430		24.465	347.2	0.139	5.60		244.8		100.2		2.0	0.24	0.0	0.01	0.03	0.12	0.04	40	17
50		15.85		15.84		33.321		24.494	344.7	0.174	5.66		247.2		100.1		2.1	0.25	0.0	0.02	0.14	0.17	0.06	50	16
63		15.46		15.45		33.272		24.545	340.3	0.218	5.69		248.3		99.8		2.1	0.26	0.1	0.00	0.10	0.24	0.10	63	15
75		15.19		15.18		33.310		24.633	332.2	0.259	5.74		250.6		100.2		2.3	0.24	0.0	0.02	0.13	0.26	0.10	76	14
87		14.10		14.09		33.335		24.886	308.4	0.297	5.75		251.0		98.2		2.8	0.34	0.7	0.17	0.25	0.26	0.13	88	13
100	ISL	12.60	D	12.59		33.253	D	25.124	285.8	0.338	5.56	D	242.4	D	92.1		3.8	0.45	3.2	0.04	0.12	0.17	0.14	101	
101		12.56		12.54		33.252		25.131	285.1	0.339	5.56		243.0		92.0		3.9	0.46	3.4	0.03	0.11	0.17	0.14	102	12
113		11.86		11.85		33.249		25.261	273.0	0.372	5.41		236.1		88.1		5.1	0.61	5.5	0.02	0.17	0.13	0.11	114	11
125		11.30		11.28		33.308		25.411	258.9	0.404	5.12		223.6		82.4		7.6	0.81	9.3	0.01	0.10	0.08	0.08	126	10
140		10.52		10.51		33.369		25.596	241.5	0.441	4.78		208.9		75.7		11.1	1.04	13.1	0.01	0.22	0.04	0.05	141	09
150	ISL	10.33	D	10.31		33.426	D	25.674	234.2	0.469	4.66	D	202.7	D	73.5		13.2	1.15	14.8	0.01	0.21	0.03	0.04	151	
170		9.61		9.59		33.553		25.893	213.6	0.510	4.23		184.7		65.7		17.3	1.36	18.3	0.00	0.20	0.01	0.02	171	08
198		9.25		9.22		33.783		26.133	191.4	0.567	3.27		143.0		50.5		24.5	1.70	23.7	0.01	0.05	0.00	0.02	200	07
200	ISL	9.24	D	9.22		33.809	D	26.155	189.4	0.574	3.31	D	144.1	D	51.1		24.8	1.71	23.8	0.00	0.05			202	
232		8.64		8.61		33.916	D	26.334	172.8	0.633	2.99		130.4		45.5		30.0	1.85	26.1	0.00	0.08			234	06
250	ISL	8.38	D	8.35		33.971	D	26.416	165.2	0.663	2.83	D	123.3	D	42.9		33.8	1.99	27.6	0.00	0.07			252	
270		8.25		8.22		34.054		26.503	157.4	0.691	2.20		95.9		33.2		37.9	2.15	29.2	0.00	0.06			272	05
300	ISL	7.66	D	7.63		34.044	D	26.581	150.2	0.742	2.04	D	88.6	D	30.4		43.9	2.32	31.3	0.00	0.07			302	
320		7.56		7.53		34.105		26.644	144.5	0.767	1.59		69.4		23.7		48.0	2.43	32.7	0.00	0.08			322	04
379		6.99		6.95		34.149		26.759	134.2	0.849	1.03		44.9		15.1		57.5	2.68	35.6	0.00	0.13			382	03
400	ISL	6.65	D	6.61		34.157	D	26.812	129.2	0.883	0.91	D	39.6	D	13.3		61.6	2.75	36.5	0.00	0.11			403	
440		6.26		6.22		34.185		26.886	122.5	0.927	0.65		28.6		9.5		69.3	2.89	38.3	0.01	0.06			444	02
500	ISL	5.81	D	5.77		34.199	D	26.954	116.5	1.006	0.59	D	25.6	D	8.4		75.6	3.02	39.4	0.02	0.16			504	
516		5.86		5.81		34.249		26.988	113.5	1.017	0.40		17.4		5.7		77.3	3.05	39.7	0.02	0.19			520	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.4 26.4

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 57.2 N	117 17.1 W	29/01/2014	0953 UTC	20 m	180 04 kn			1018.4 mb	13.0 C	12.2 C				002

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	PRES db	SAMP
0	15.89	15.89	33.551	24.658	327.3	0.000	5.86	255.9	104.0	2.8	0.34	0.0	0.05	0.06	0.66	0.28	0	
2	15.89	15.89	33.551	24.658	327.4	0.007	5.86	255.9	104.0	2.8	0.34	0.0	0.05	0.06	0.66	0.28	2	04
5	15.84	15.84	33.552	24.672	326.2	0.016	5.85	255.6	103.7	2.8	0.34	0.0	0.03	0.09	0.32	0.74	5	03
10	15.66	15.66	33.557	24.715	322.3	0.033	5.84	255.2	103.2	2.6	0.32	0.0	0.01	0.05	0.63	0.27	10	02
20	15.35	15.35	33.534	24.768	317.6	0.065	5.83	254.5	102.3	3.2	0.37	0.0	0.05	0.11	0.71	0.33	20	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED O2;

PRIMARY PRODUCTIVITY CASTS

RV BELL M SHIMADA — CALCOFI CRUISE 1402 — STATION 86.7 33.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
33 53.4 N	118 29.6 W	04/02/2014	1921 UTC	13 m	1217 - 1731 PST	1208 PST	1728 PST	757.0 mg C/m2	031

DEPTH m	TEMP DEG C	SALINITY	SIGMA THETA	OXYGEN ml/L	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	LIGHT PCT	UPTAKE (mg C/m3) 1	2	MEAN	DARK
2	14.69	33.495	24.881	5.67	98.1	4.5	0.49	1.9	0.38	0.62	1.45	0.42	79. A	27.7	25.7	26.7	0.23
5	14.66	33.495	24.885	5.66	97.9	4.5	0.49	1.8	0.35	0.56	1.46	0.40					
10	14.65	33.496	24.889	5.66	97.9	4.5	0.48	1.8	0.37	0.51	1.46	0.43	31.	28.2	29.1	28.6	0.23
11	14.65	33.509	24.900	5.66	97.9	4.5	0.47	1.7	0.36	0.49	1.37	0.43	27.	25.6	25.8	25.7	0.28
22	14.62	33.495	24.896	5.62	97.2	4.6	0.50	1.8	0.37	0.62	1.33	0.42	7.4	18.1	20.3	19.2	0.19
32	14.19	33.455	24.956	5.26	90.1	6.0	0.65	4.2	0.61	1.25	0.71	0.32					
41	13.64	33.430	25.052	4.97	84.1	7.0	0.76	6.1	0.74	1.03	0.51	0.31	0.79	1.6	2.0	1.8	0.18
49	13.25	33.411	25.116	4.78	80.2	8.0	0.88	7.7	0.66	0.65	0.33	0.28	0.31	0.32	0.45	0.39	0.20

RV BELL M SHIMADA — CALCOFI CRUISE 1402 — STATION 90.0 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
31 44.9 N	121 18.5 W	02/02/2014	1646 UTC	17 m	1226 - 1806 PST	1219 PST	1806 PST	257.3 mg C/m2	022

DEPTH m	TEMP DEG C	SALINITY	SIGMA THETA	OXYGEN ml/L	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	LIGHT PCT	UPTAKE (mg C/m3) 1	2	MEAN	DARK
1	14.05	33.133	24.735	5.94	101.3	3.1	0.38	0.2	0.03	0.14	0.49	0.15	91.	6.3	6.1	6.2	0.01
12	14.06	33.133	24.735	5.93	101.1	3.1	0.37	0.2	0.03	0.13	0.48	0.15	34.	7.2	7.8	7.5	0.13
22	14.06	33.130	24.733	5.94	101.3	3.1	0.36	0.1	0.03	0.10	0.49	0.15					
30	14.06	33.130	24.734	5.94	101.2	3.1	0.37	0.2	0.03	0.14	0.49	0.16	6.7	5.1	4.7	4.9	0.11
41	14.05	33.132	24.736	5.93	101.0	3.1	0.37	0.2	0.03	0.11	0.49	0.15					
54	13.41	33.100	24.843	5.85	98.5	3.5	0.46	1.4	0.15	0.17	0.34	0.17	0.76	1.0	0.67	0.85	0.08
61	12.71	33.113	24.992	5.71	94.7	4.2	0.60	3.6	0.16	0.08	0.20	0.13	0.41	0.19	0.18	0.18	0.09

RV BELL M SHIMADA — CALCOFI CRUISE 1402 — STATION 90.0 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
30 45.3 N	123 20.2 W	01/02/2014	1957 UTC	24 m	1306 - 1820 PST	1227 PST	1815 PST	84.0 mg C/m2	019

DEPTH m	TEMP DEG C	SALINITY	SIGMA THETA	OXYGEN ml/L	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	LIGHT PCT	UPTAKE (mg C/m3) 1	2	MEAN	DARK
2	15.49	33.296	24.551	5.73	100.7						0.16	0.04	88. A	2.0	1.8	1.9	0.13
17	15.47	33.294	24.556	5.72	100.5	2.5	0.34	0.0	0.01	0.19	0.16	0.04	34.	1.8	1.7	1.8	0.16
20	15.49	33.296	24.554	5.72	100.4	2.5	0.33	0.0	0.01	0.04	0.16	0.04	28.	1.3	1.5	1.4	0.13
29	15.46	33.292	24.557	5.73	100.6	2.5	0.32	0.0	0.00	0.03	0.17	0.04					
40	15.36	33.281	24.571	5.74	100.5	2.5	0.32	0.0	0.00	0.04	0.18	0.05	7.7	0.88	1.0	0.95	0.17
51	15.29	33.270	24.580	5.77	100.9	2.6	0.32	0.0	0.01	0.05	0.24	0.07					
62	14.85	33.237	24.649	5.77	100.1	2.7	0.34	0.0	0.02	0.05	0.24	0.15					
75	14.17	33.185	24.755	5.77	98.7	3.1	0.41	0.7	0.32	0.15	0.51	0.21	0.83	0.35	0.24	0.29	0.16
83	13.58	33.305D	24.969	5.65	95.4	3.3	0.43	1.3	0.34	0.04	0.17	0.14					
88	13.38	33.289	24.997	5.65	95.0	3.5	0.47	1.8	0.24	0.05	0.17	0.14	0.36	0.06	0.03	0.04	0.11

RV BELL M SHIMADA — CALCOFI CRUISE 1402 — STATION 93.3 30.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
32 50.8 N	117 32.0 W	29/01/2014	1830 UTC	23 m	1208 - 1757 PST	1203 PST	1750 PST	383.6 mg C/m2	005

DEPTH m	TEMP DEG C	SALINITY	SIGMA THETA	OXYGEN ml/L	OXY PCT	SIO3 µM	PO4 µM	NO3 µM	NO2 µM	NH4 µM	CHL-A µg/L	PHAEO µg/L	LIGHT PCT	UPTAKE (mg C/m3) 1	2	MEAN	DARK
2	16.14	33.583	24.627	5.78	103.1	2.1	0.33	0.1	0.01	0.59	0.26	0.07	88. A	6.4	6.1	6.2	0.18
10	16.11	33.583	24.634	5.81	103.6	2.1	0.34	0.2	0.01		0.29	0.06					
17	15.97	33.576	24.663	5.81	103.2	2.1	0.32	0.0	0.02	0.28	0.29	0.08	32.	6.0	6.2	6.1	0.18
20	15.92	33.571	24.669	5.81	103.1	2.1	0.33	0.0	0.00	0.25	0.30	0.09	26.	5.2	5.0	5.1	0.14
40	14.91	33.491	24.833	5.84	101.5	3.0	0.38	0.0	0.02	0.18	0.64	0.22	6.9	7.4	7.2	7.3	0.14
50	13.87	33.414	24.992	5.39	91.7	4.6	0.58	2.3	0.23	0.16	0.57	0.36					
72	12.48	33.397	25.257	4.77	78.8	7.7	0.91	8.5	0.05	0.08	0.26	0.29	0.82	0.86	0.93	0.90	0.10
83	11.86	33.464	25.428	4.30	70.1	11.0	1.14	12.3	0.03	0.03	0.12	0.16	0.39	0.17	0.29	0.23	0.08

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
31 50.7 N	119 34.8 W	30/01/2014	1839 UTC	15 m	1214 - 1758 PST	1212 PST	1756 PST	120.7 mg C/m2	011

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SIO3	PO4	NO3	NO2	NH4	CHL-A	PHAEO	LIGHT	UPTAKE (mg C/m3)			
m	DEG C		THETA	ml/L	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	PCT	1	2	MEAN	DARK
2	14.96	33.247	24.630	5.83	101.3	2.5	0.35	0.1	0.01	0.51	0.27	0.07	81. A	3.2	4.8	4.0	0.12
11	14.97	33.247	24.630	5.83	101.3	2.6	0.34	0.0	0.01	0.17	0.25	0.08	32.	4.1	4.1	4.1	0.12
13	14.97	33.256	24.637	5.83	101.3	2.6	0.32	0.0	0.02	0.05	0.26	0.08	26.	3.3	3.7	3.5	0.13
20	14.97	33.264	24.643	5.83	101.3	2.5	0.32	0.0	0.01	0.06	0.27	0.08					
25	14.97	33.260	24.639	5.84	101.5	2.5	0.33	0.0	0.00	0.13	0.27	0.08	7.7	2.1	1.8	2.0	0.11
36	14.67	33.311	24.744	5.78	99.9	2.5	0.36	0.2	0.09	0.09	0.63	0.36					
48	14.17	33.272	24.821	5.73	98.0	2.8	0.43	0.9	0.23	0.05	0.73	0.15	0.74	0.83	0.81	0.82	0.06
55	13.41	33.232	24.945	5.70	95.9	3.2	0.50	2.0	0.33	0.06	0.38	0.35	0.36	0.31	0.27	0.29	0.06

RV BELL M SHIMADA CALCOFI CRUISE 1402 STATION 93.3 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
30 30.8 N	122 15.7 W	31/01/2014	1851 UTC	24 m	1233 - 1813 PST	1223 PST	1810 PST	145.9 mg C/m2	015

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SIO3	PO4	NO3	NO2	NH4	CHL-A	PHAEO	LIGHT	UPTAKE (mg C/m3)			
m	DEG C		THETA	ml/L	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	PCT	1	2	MEAN	DARK
1	15.50	33.284	24.540	5.73	100.8	2.5	0.34	0.3	0.00		0.19	0.06	94. A	2.3	2.2	2.3	0.11
10	15.47	33.282	24.547	5.73	100.7	2.4	0.32	0.1	0.00	0.20	0.20	0.06					
18	15.41	33.280	24.558	5.73	100.5	2.5	0.31	0.0	0.00	0.08	0.21	0.06	32.	2.8	2.7	2.7	0.12
21	15.41	33.280	24.558	5.75	100.8						0.20	0.06	26.	2.3	2.5	2.4	0.13
31	15.41	33.281	24.561	5.76	101.0	2.5	0.31	0.0	0.01	0.16	0.21	0.07					
41	15.38	33.277	24.564	5.74	100.5	2.5	0.31	0.0	0.01	0.13	0.23	0.07	7.3	2.3	2.0	2.2	0.16
53	15.28	33.318D	24.618	5.76	100.7	2.5	0.30	0.0	0.00	0.03	0.38	0.16					
63	14.99	33.265	24.643	5.71	99.3	2.6	0.30	0.0	0.00	0.06	0.30	0.15					
75	14.29	33.144	24.699	5.78	97.8	2.7	0.34	0.1	0.03	0.20	0.23	0.12	0.83	0.40	0.37	0.39	0.29
81	14.13	33.186	24.764	5.73	98.6	2.9	0.36	0.3	0.09	0.24	0.20	0.13					
88	13.77	33.170	24.827	5.72	97.2	3.0	0.40	0.8	0.24	0.23	0.18	0.13	0.36	0.17	0.22	0.20	0.12

A) INCUBATION LIGHT INTENSITIES WERE 55.7; 31.3; 25.8; 7.2; 0.8; 0.36 PERCENT RESPECTIVELY.

CalCOFI Cruise 1402SH

MACROZOOPLANKTON BIOMASS
Net Mesh Size: 0.505mm

Line	Sta.	Latitude N	Longitude W	Date Mo/Day	Time (PST) Start	Time (PST) End	Water Volume Strained (m^3)	Max. Tow Depth (m)	Volume per 1000 m^3 Strained Total (cm^3)	Volume per 1000 m^3 Strained Small (cm^3)
85.4	55.0	33 09.5	120 00.4	04/15	0955	1016	496	204	293	293
86.7	35.0	33 49.4	118 37.6	04/10	0257	0318	447	204	165	165
86.7	40.0	33 39.3	118 58.5	04/10	0719	0739	457	202	160	160
86.7	45.0	33 29.5	119 19.1	04/10	1129	1149	445	204	94	94
86.7	50.0	33 19.4	119 39.6	04/15	0440	0448	174	62	92	92
86.8	33.0	33 53.4	118 29.3	04/10	0014	0018	94	34	417	417
88.5	32.5	33 52.8	118 27.3	04/09	2251	2254	53	19	1966	1966
90.0	28.0	33 29.0	117 46.1	04/09	1548	1554	118	56	271	271
90.0	30.0	33 25.1	117 54.5	04/09	1322	1342	430	205	121	121
90.0	30.1	33 38.9	118 05.1	04/09	1921	1923	63	16	726	726
90.0	35.0	33 15.0	118 15.0	04/09	0846	0906	467	200	148	103
90.0	45.0	32 55.2	118 56.0	04/10	1930	1951	412	201	163	163
90.0	53.0	32 38.9	119 29.0	04/14	1946	2007	421	201	221	221
90.0	60.0	32 25.0	119 57.6	04/14	1440	1500	427	217	52	52
90.0	70.0	32 05.4	120 38.8	04/14	0650	0711	526	203	48	48
90.0	80.0	31 45.1	121 19.3	04/14	0012	0032	449	221	58	58
90.0	90.0	31 25.0	121 59.7	04/13	1755	1815	423	208	156	132
90.0	100.0	31 04.9	122 40.0	04/13	1101	1121	507	193	59	59
90.0	110.0	30 44.9	123 19.8	04/13	0350	0411	439	214	55	39
91.7	27.7	33 29.5	117 45.3	04/09	1645	1648	70	24	86	86
93.3	26.7	32 57.4	117 18.5	04/06	1838	1858	416	207	183	183
93.3	28.0	32 54.4	117 24.0	04/06	2204	2224	470	210	141	141
93.3	30.0	32 50.7	117 31.9	04/07	0040	0101	433	213	69	69
93.3	35.0	32 40.8	117 52.3	04/07	0422	0442	465	207	123	123
93.3	40.0	32 30.9	118 12.7	04/07	0814	0835	446	211	81	63
93.3	45.0	32 20.8	118 33.2	04/07	1328	1347	466	204	129	129
93.3	50.0	32 10.9	118 53.3	04/07	1751	1811	430	215	79	79
93.3	55.0	32 00.8	119 14.1	04/11	0335	0356	461	208	217	217
93.3	60.0	31 50.9	119 33.6	04/11	0614	0634	443	218	178	178
93.3	70.0	31 30.9	120 15.0	04/11	1416	1436	493	191	53	53
93.3	80.0	31 10.7	120 55.5	04/11	2151	2211	570	196	123	123
93.3	90.0	30 51.0	121 35.3	04/12	0457	0517	523	212	54	54
93.3	100.0	30 30.0	122 13.2	04/12	1255	1316	534	211	17	17
93.3	110.0	30 10.9	122 55.1	04/12	2112	2132	494	195	45	45
93.4	26.4	32 56.9	117 17.5	04/06	1946	1949	58	21	2465	2465