UNIVERSITY OF CALIFORNIA, SAN DIEGO SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

CalCOFI Cruise 1802
1 - 11 February, 2018

CC Reference 19 - 01
18 Mar., 2019

UNIVERSITY OF CALIFORNIA, SAN DIEGO

SCRIPPS INSTITUTION OF OCEANOGRAPHY

LA JOLLA, CALIFORNIA 92093

PHYSICAL, CHEMICAL AND BIOLOGICAL DATA

CalCOFI Cruise 1802
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CONTENTS

INTRODUCTION

The data presented in this report were collected during cruise 1802* of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) program aboard the FSV Bell M. Shimada. 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. Many 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 P157. 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 and baseline corrections were performed in each run using a high standard and blank respectively 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 monitored throughout the cruise and available to adjust values for nitrate, nitrite, phosphate, and silicate if appropriate. The mean values for NO_2 + NO_3, PO_4, and dissolved reactive silicate species (SIL) for the cruise were calculated and compared to certified manufacturer values (see table below). A separate reference sample was used to monitor ammonium stability throughout the cruise. Samples not analyzed immediately after collection were refrigerated and run the following day.

1802SH	**NO_2+NO_3 (µmol/L)**	**PO_4 (µmol/L)**	**SIL (µmol/L)**
Mean ± SD (n=34)	36.82 ± 0.13	2.59 ± 0.02	111.09 ± 0.99
Certified Value* (Lot CB)	36.65	2.58	111.82

*Converted from µmol/kg using assumed lab temperature of 20°C and salinity 34.374 provided by manufacturer.

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

The primary productivity assay was not performed on 1802SH.

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).

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) *ADCP*: Continuous profiles of ocean currents and acoustic backscatter between 20 and 500 meters deep were measured along the shiptrack from a hull-mounted 150 kHz Acoustic Doppler Current Profiler (ADCP). The ADCP data were averaged over 3-minute intervals. Sixty 8-meter depth bins were recorded. (T. Chereskin, SIO)

3) *Underway Sea Surface pCO2 and pH measurements:* Automated shipboard analysis of the partial pressure of CO2 and pH were made from the ship's underway flow-through system. pCO2 measurements were taken with the Shipboard Underway pCO2 Environmental Recorder (SUPER-CO2) sold by Sunburst Sensors designed with a showered equilibrator and a LI-COR 840A CO2/H2O non-dispersive infrared gas analyzer. pH measurements were taken with a Honeywell Durafet based on Ion Selective Field Effect Transistor (ISFET) technology. The Durafet pH sensor was calibrated before and after the cruise. pCO2 was calibrated with standard gases traceable to NIST every 4 hours, along with an atmospheric sample. Temperature and salinity were also sampled using a SeaBird Thermosalinograph (SBE45). Measurements were recorded every 4 seconds. (T. Martz, SIO)

4) *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)

5) *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)

6) *Inorganic Carbon System*: The CalCOFI group collected samples for the characterization of the inorganic carbon system at selected locations along the cruise track with 12 profile and 11 additional 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)

7) *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)

8) *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, chlorophyll max, and two depths below the euphotic zone are collected along lines 80 and 90. (A. Allen, SIO and JCVI)

9) *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.

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.

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.

REFERENCES

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

Bernhardt, H., and Wilhelms, A., (1967). "The continuous determination of low level iron, soluble phosphate and total phosphate with the AutoAnalyzer," Technicon Symposia, I,pp.385-389 .

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.

Kerouel, R., Aminot, A., 1997. Fluorometric determination of ammonia in sea and estuarine waters by direct segmented flow analysis. *Mar. Chem.* Vol. 57, no. 3-4, pp. 265-275.

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 1802

1. CalCOFI Cruise 1802 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

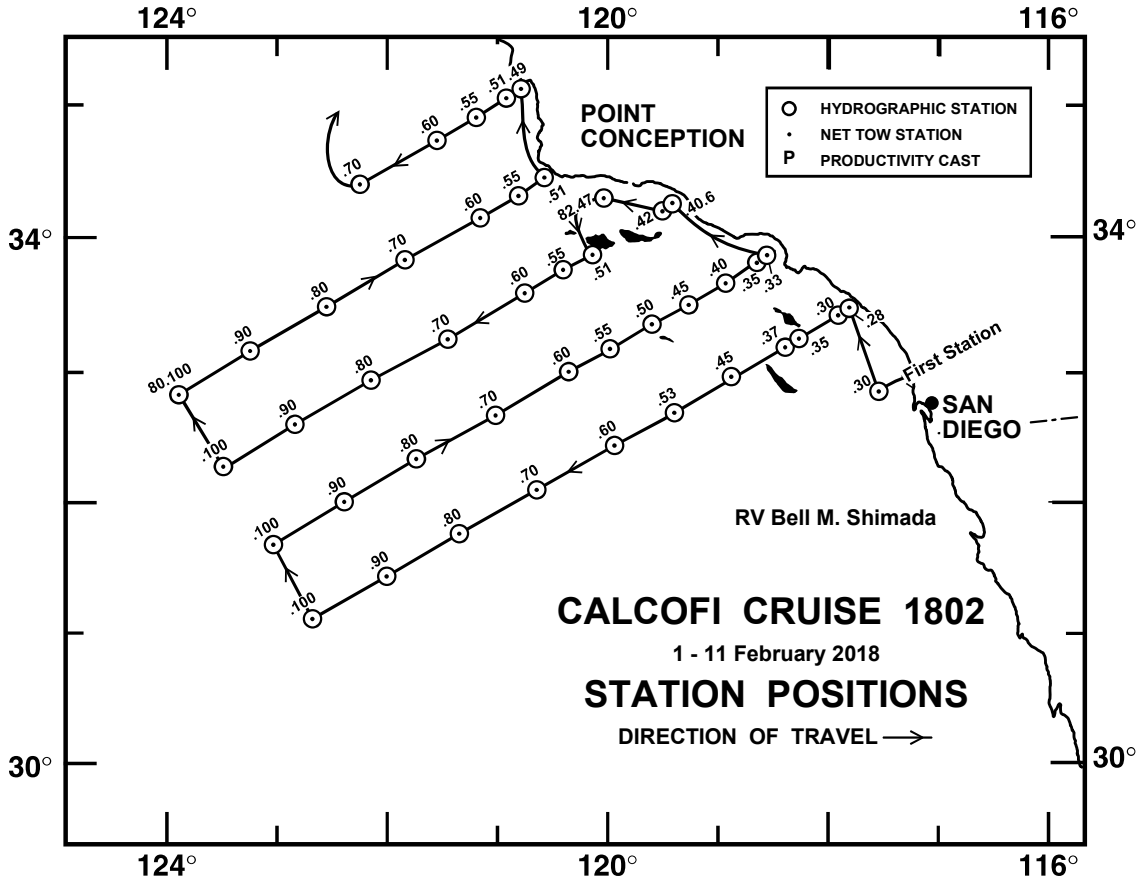

FIGURE 1

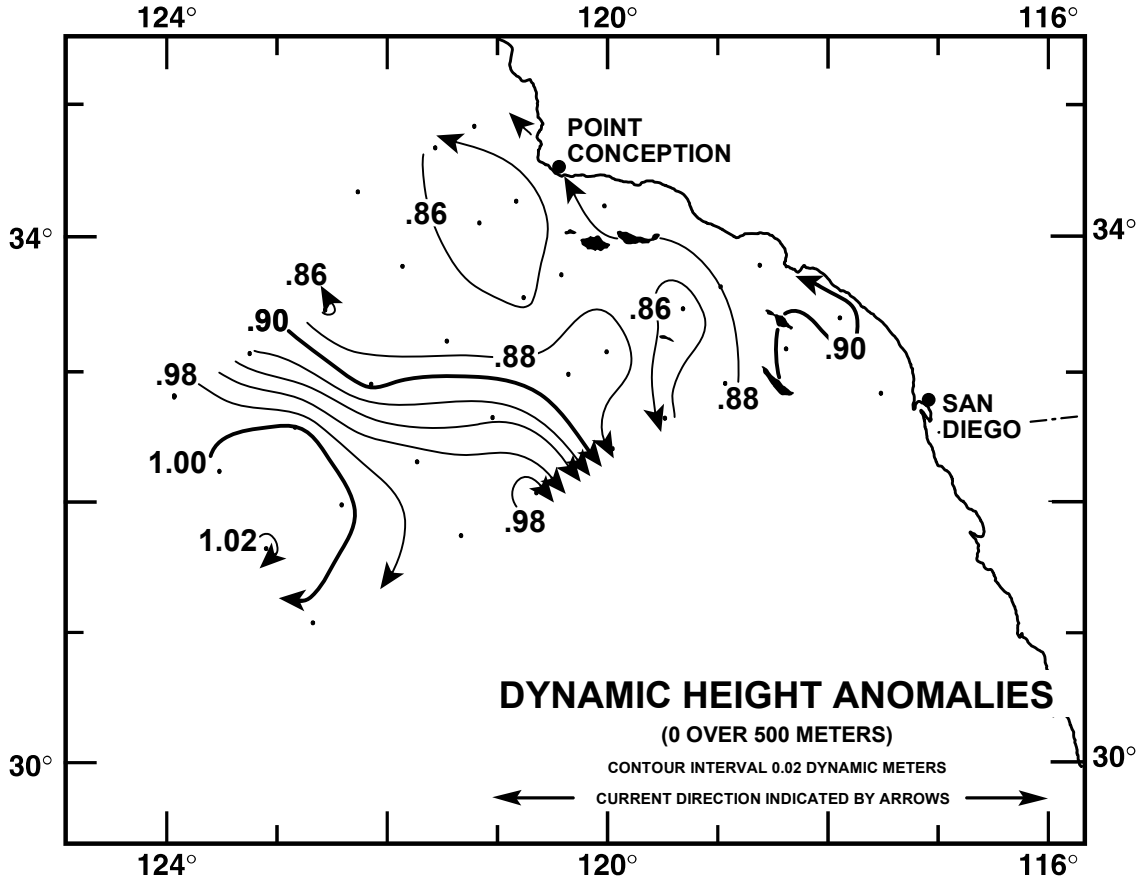

FIGURE 2

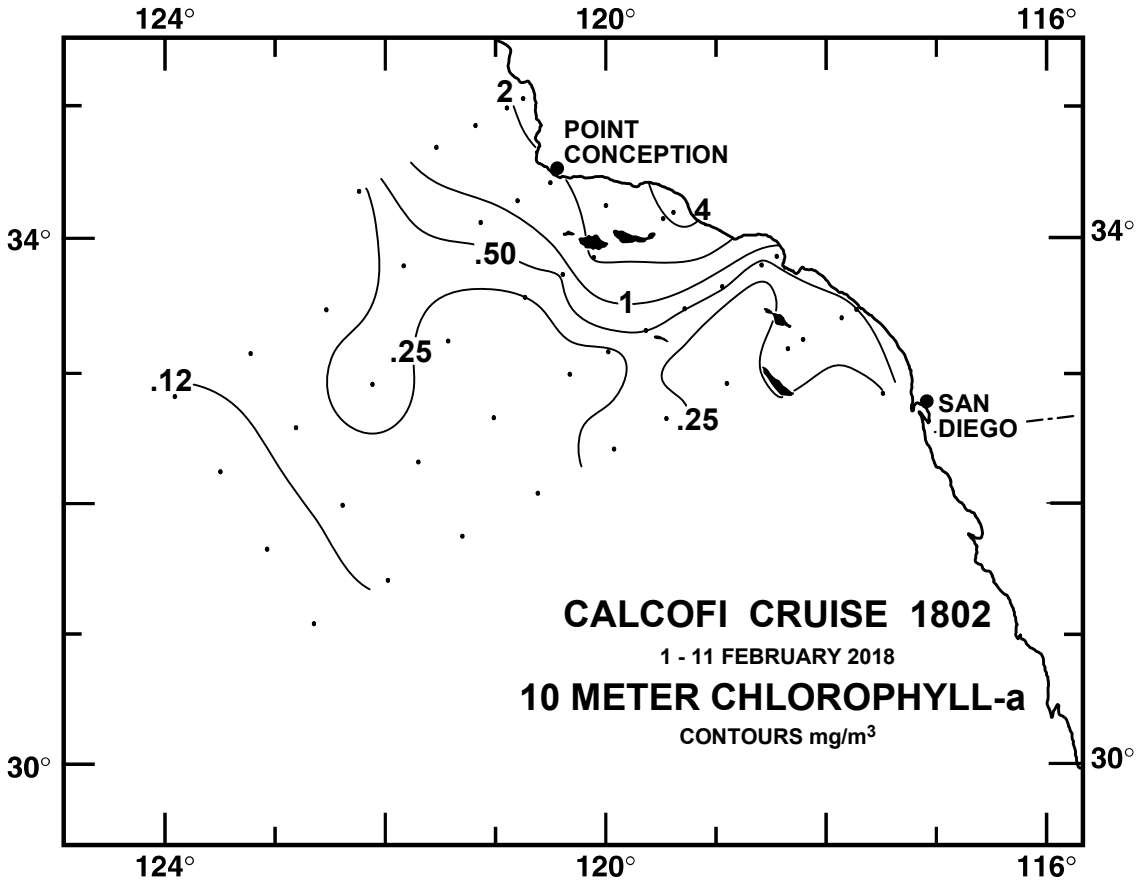

FIGURE 3A

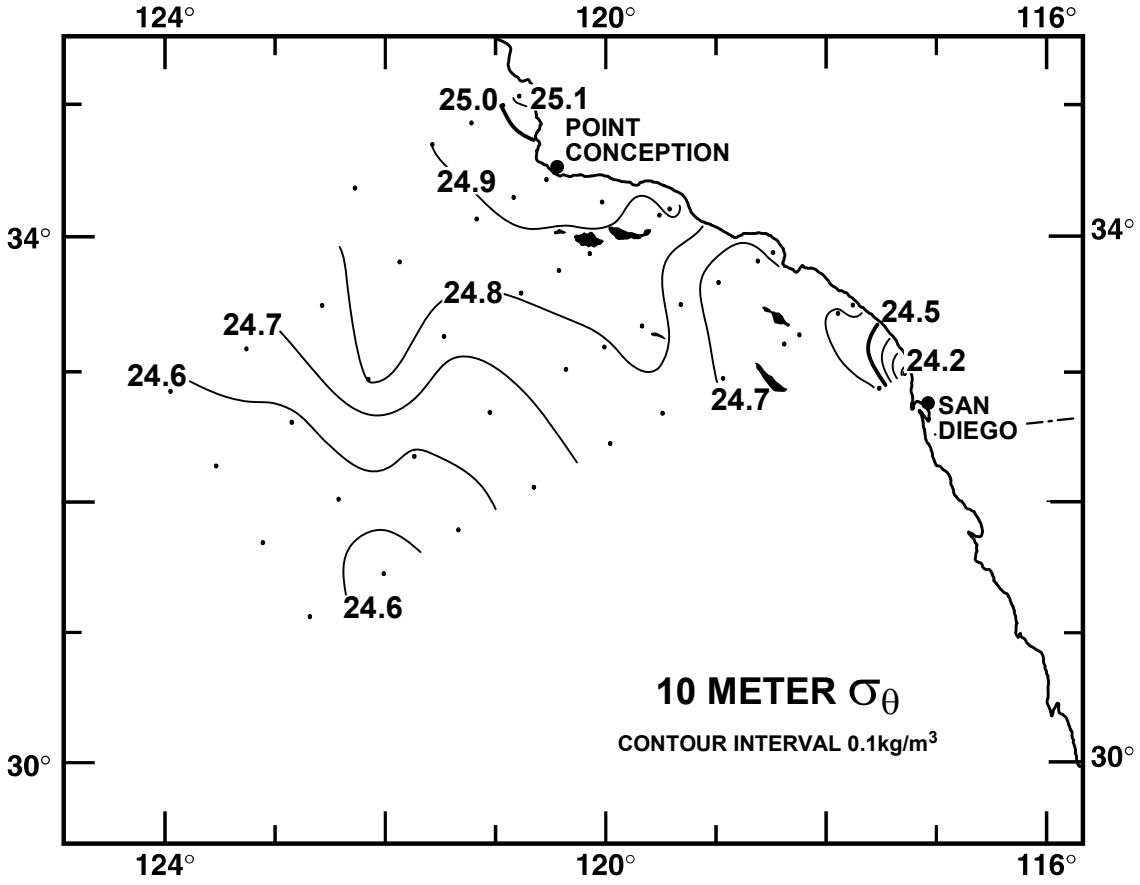

FIGURE 3B

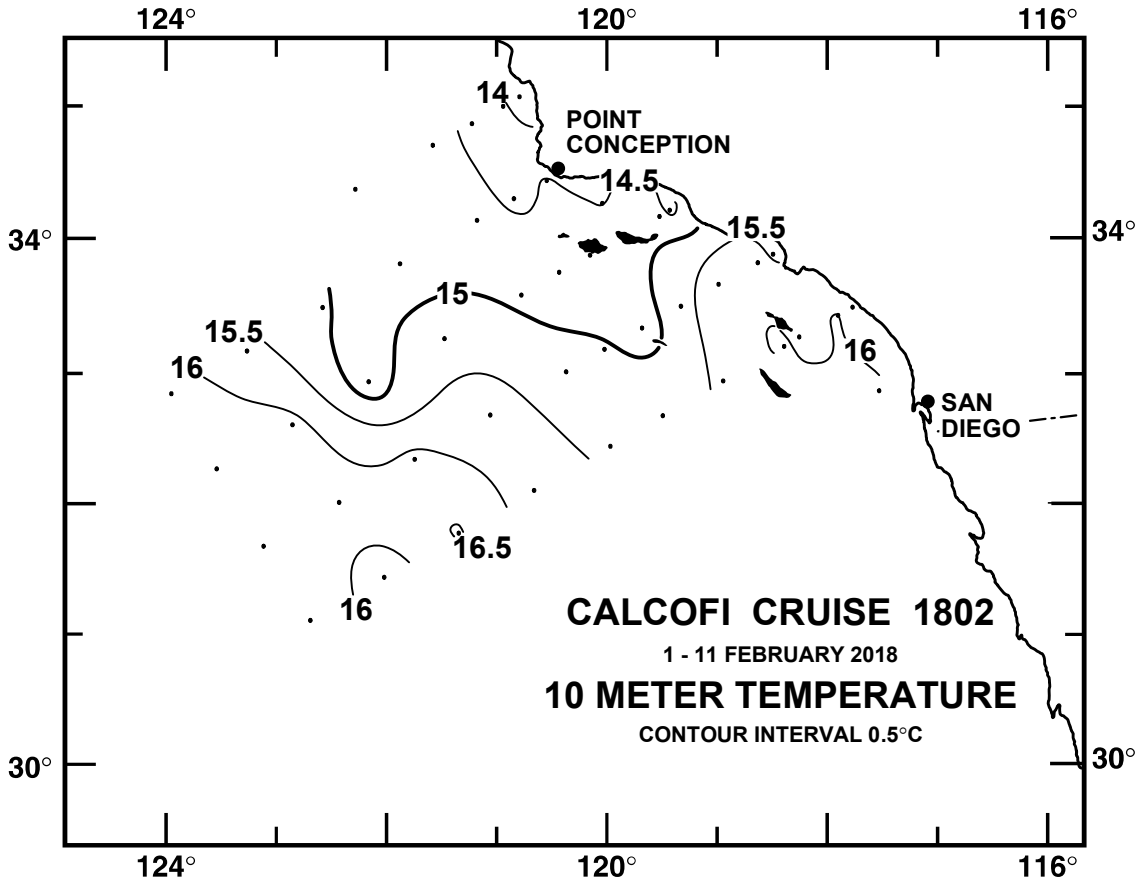

FIGURE 3C

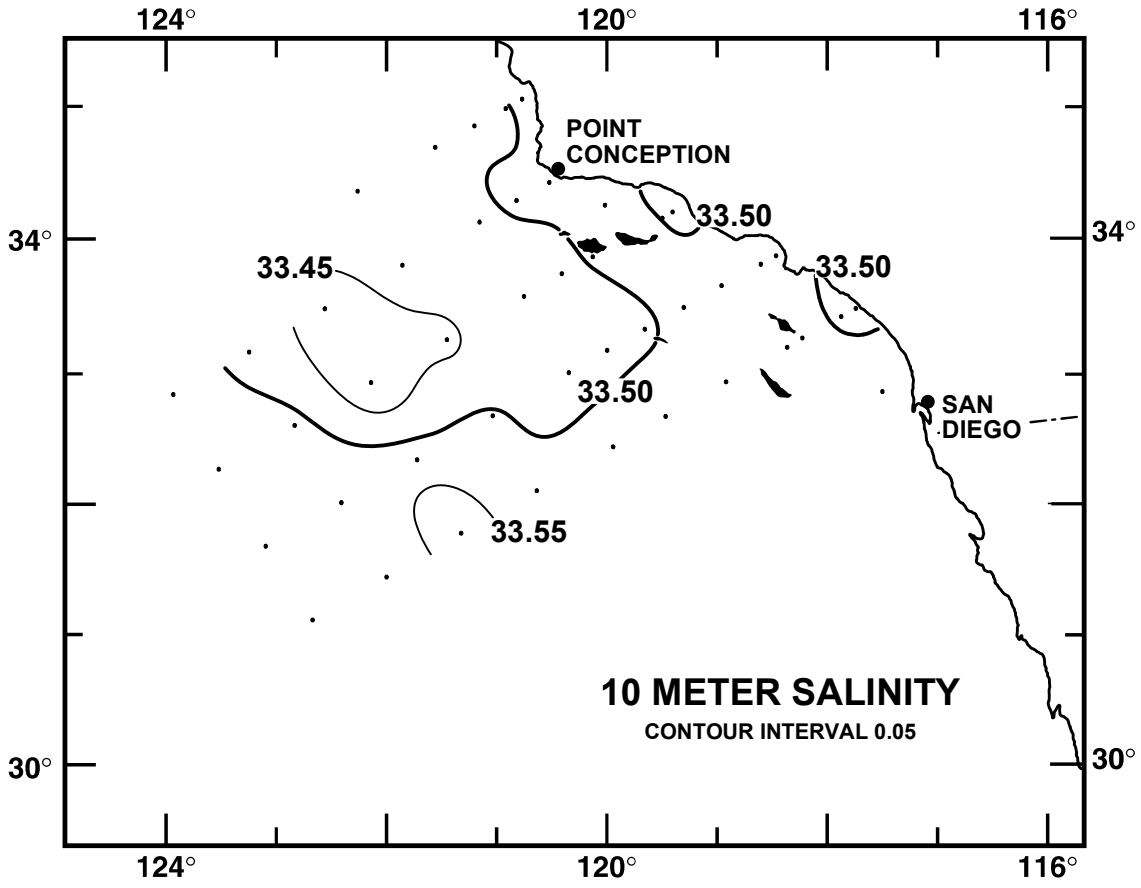

FIGURE 3D

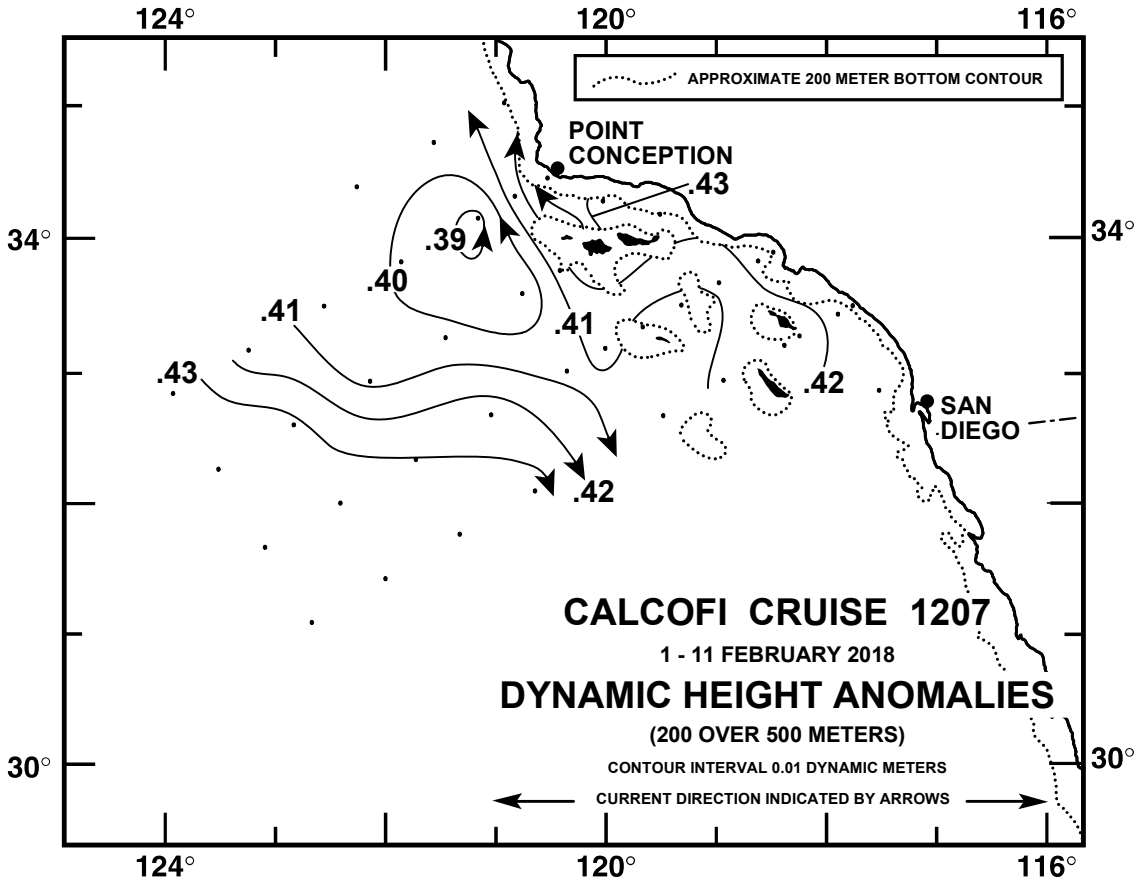

FIGURE 4A

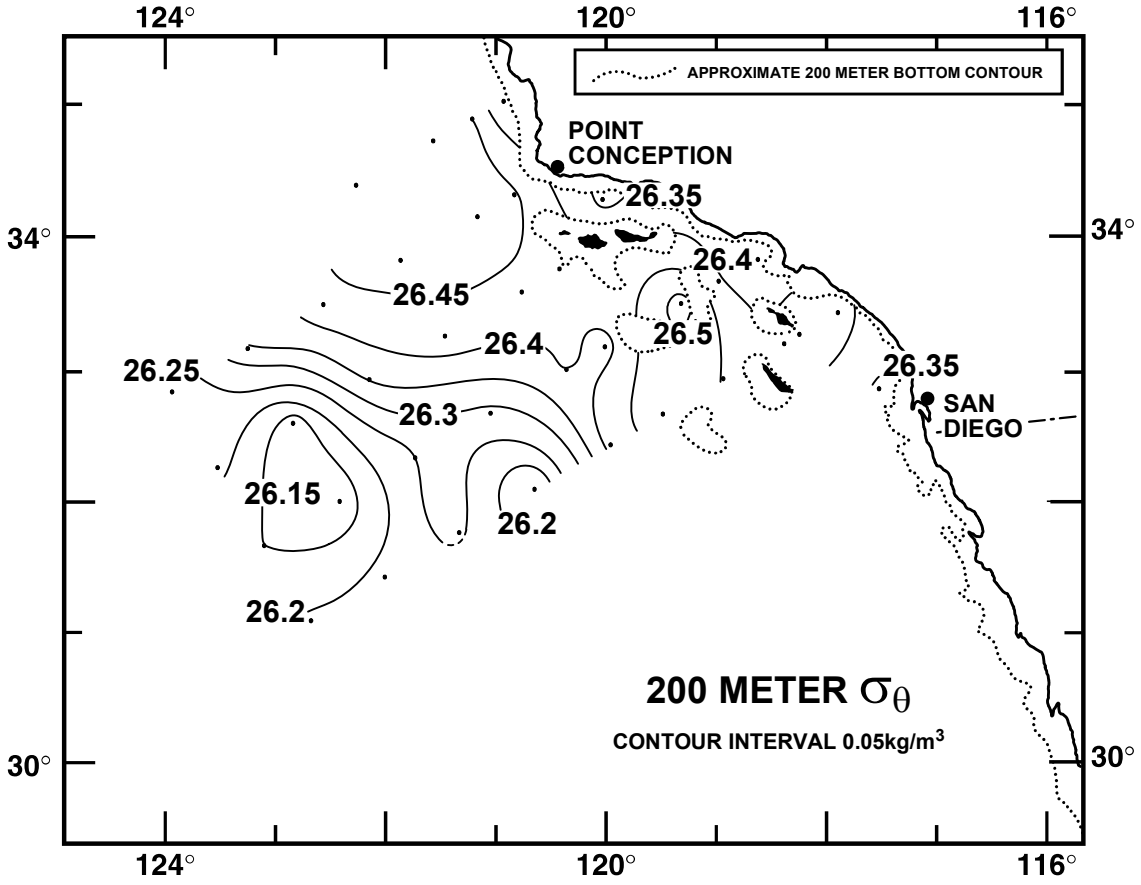

FIGURE 4B

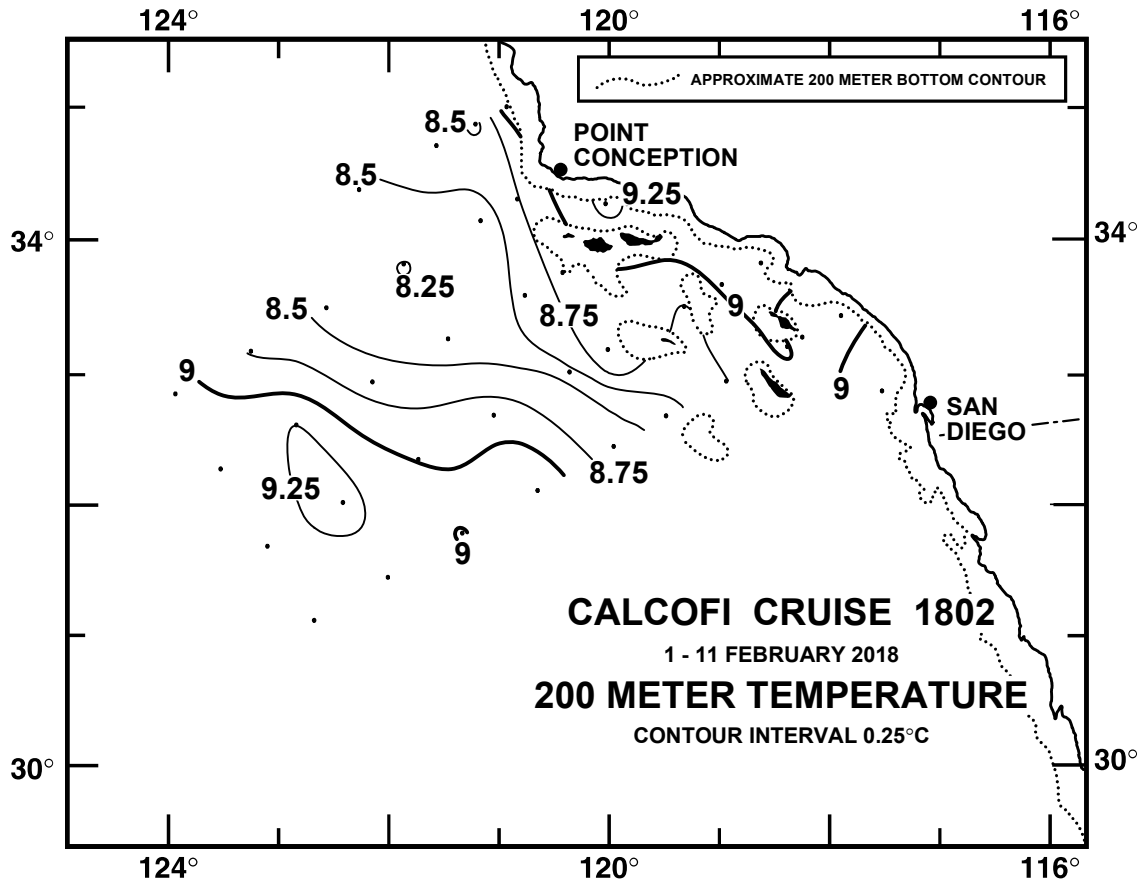

FIGURE 4C

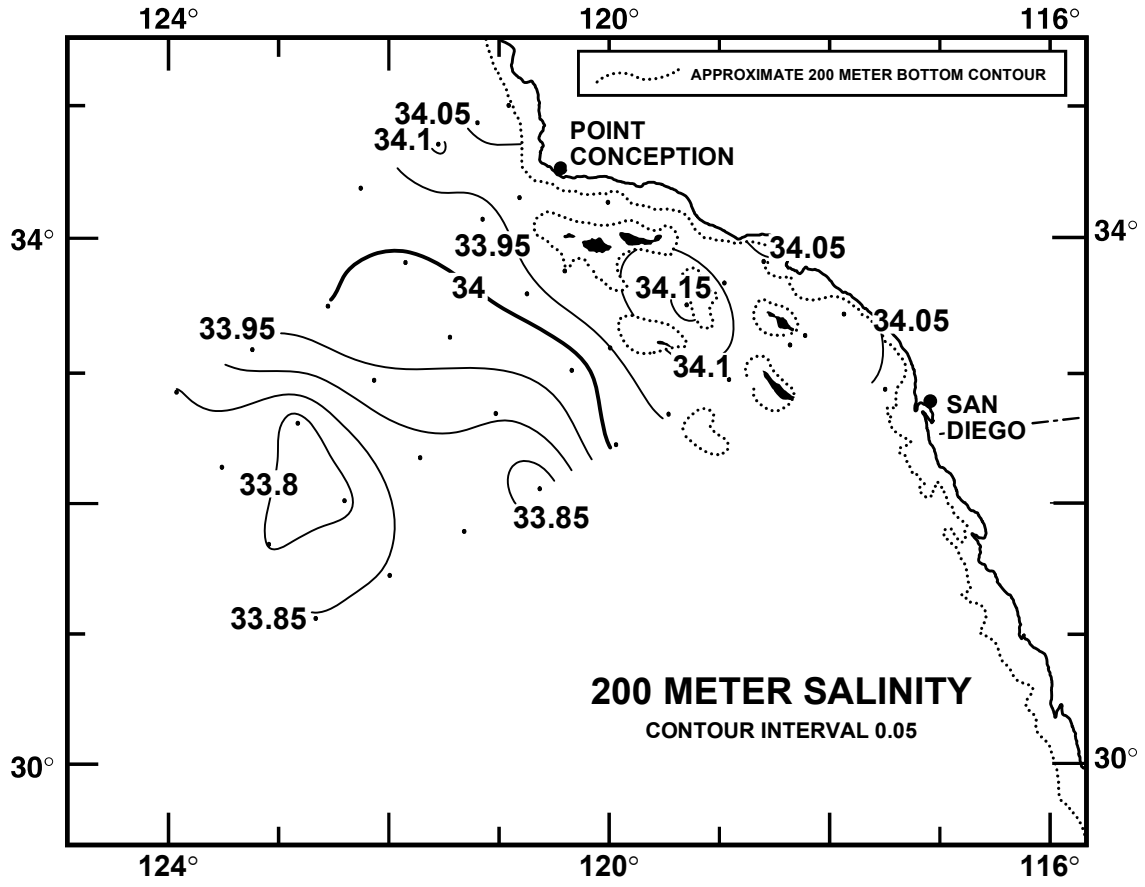

FIGURE 4D

CALCOFI CRUISE 1802

1 - 4 February 2018

POTENTIAL DENSITY (σ_θ) ALONG CALCOFI LINE 90

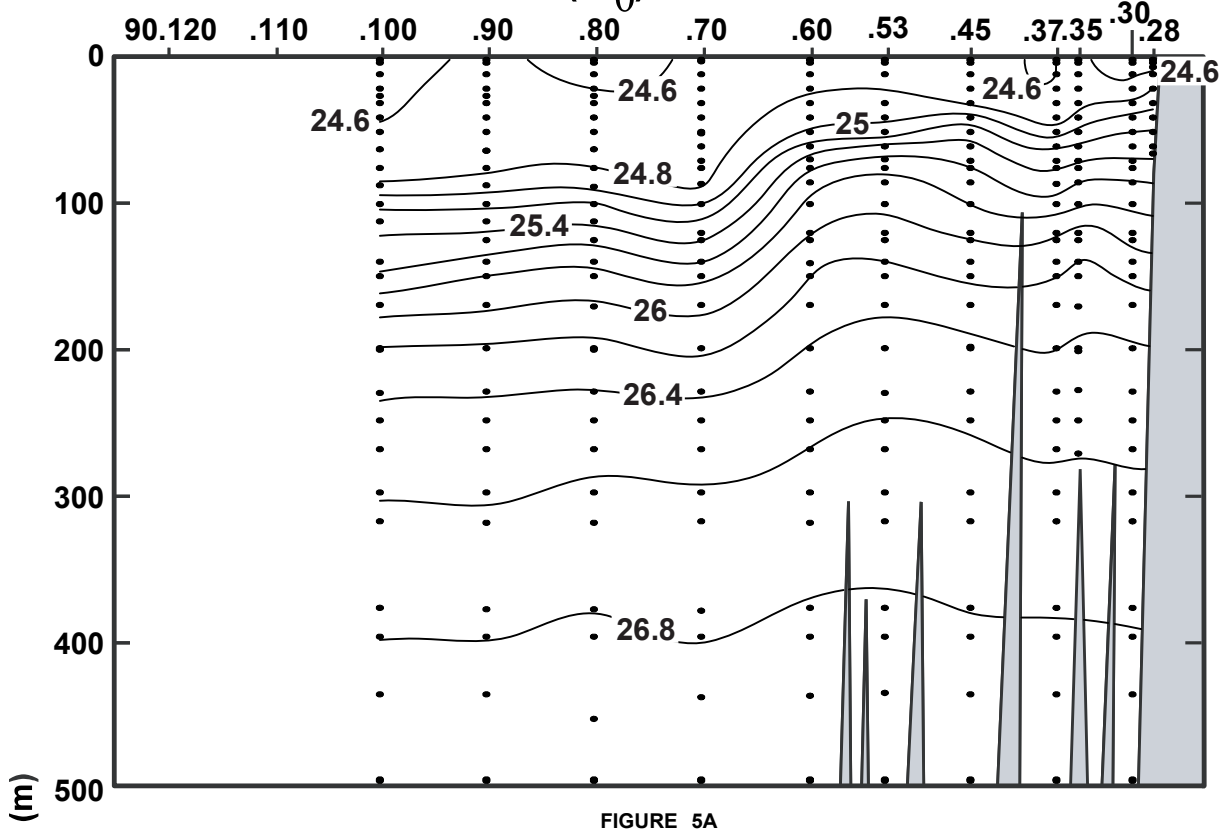

FIGURE 5A

TEMPERATURE (°C) ALONG CALCOFI LINE 90

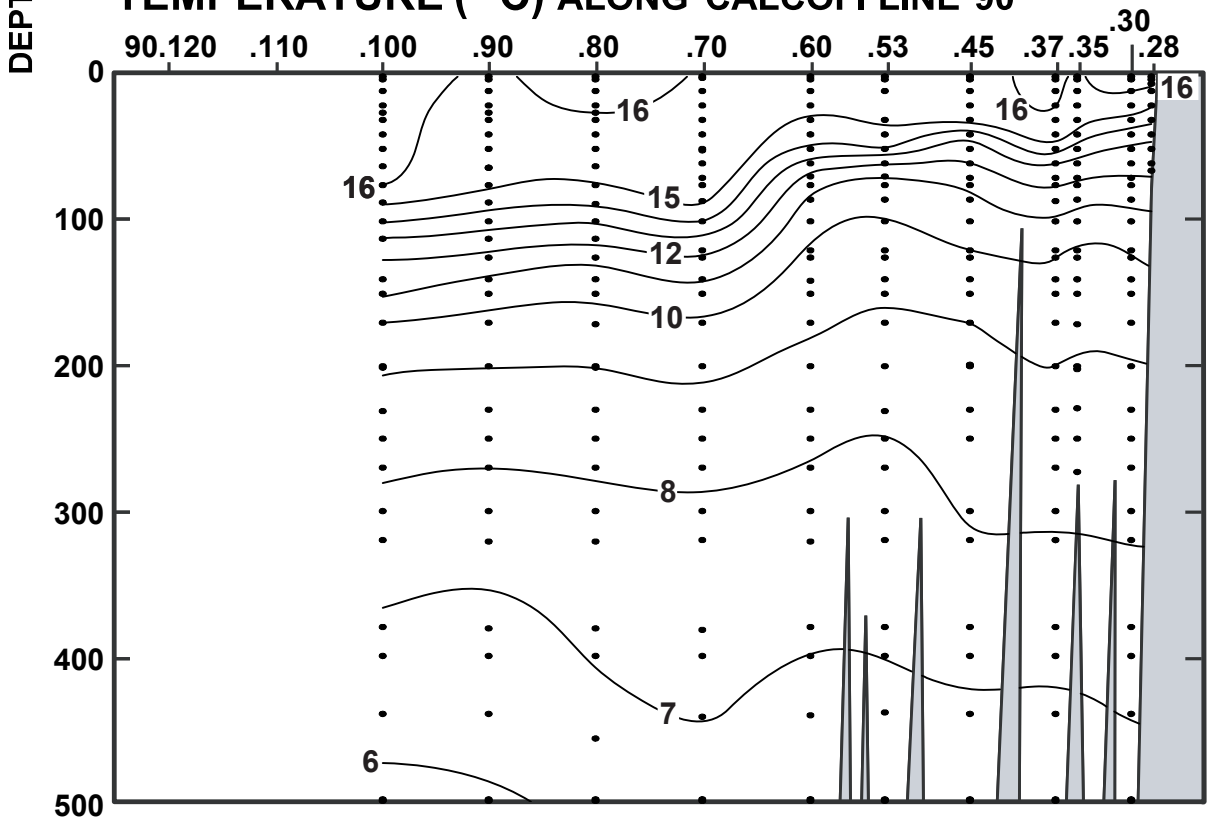

FIGURE 5B

CALCOFI CRUISE 1802

1- 4 February 2018

SALINITY ALONG CALCOFI LINE 90

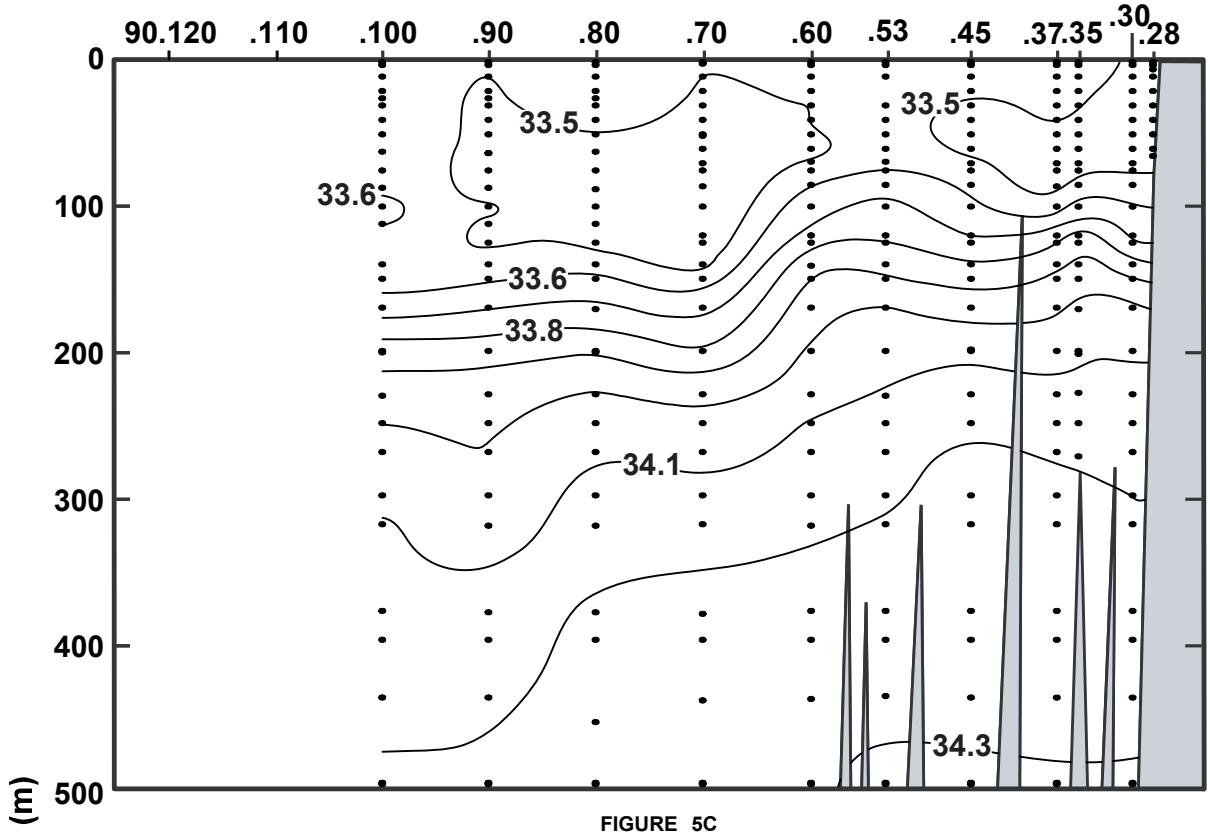

FIGURE 5C

SILICATE (μM/L) ALONG CALCOFI LINE 90

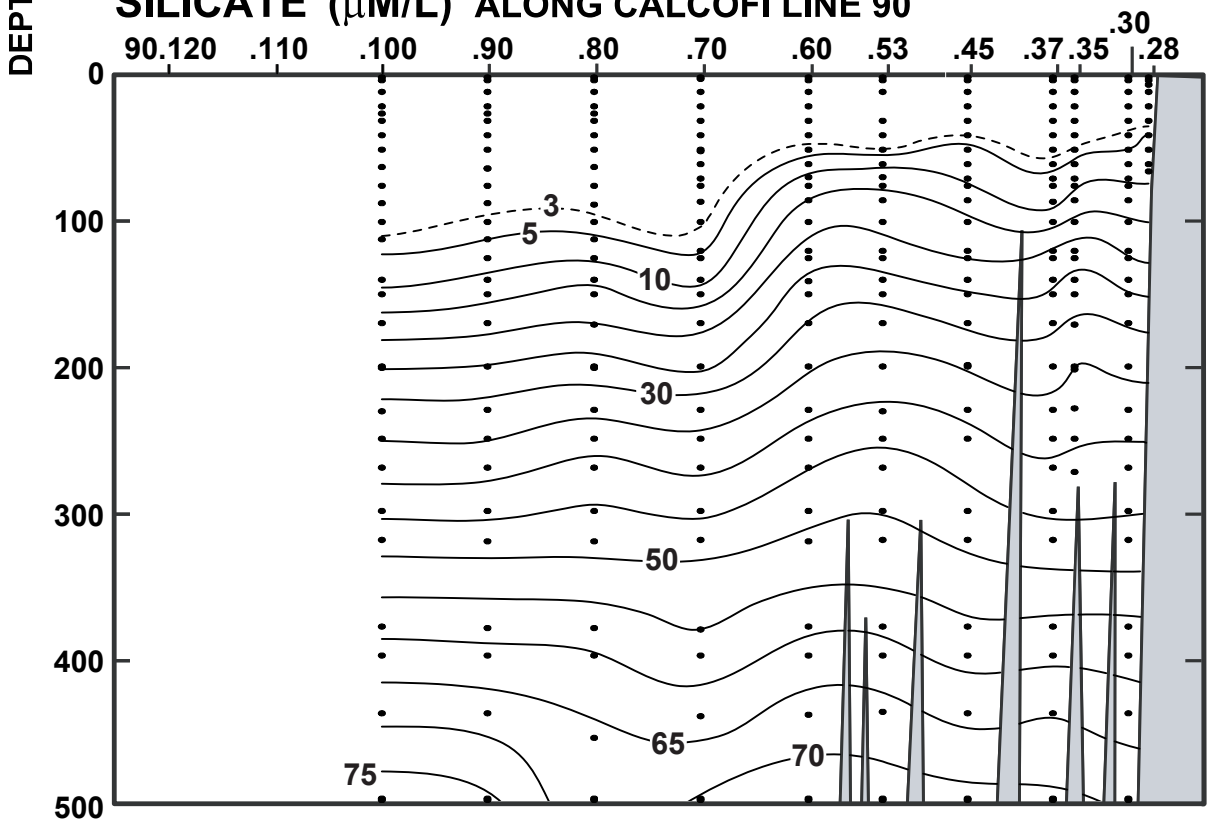

FIGURE 5D

CALCOFI CRUISE 1802

1 - 4 February 2018

NITRATE (μM/L) ALONG CALCOFI LINE 90

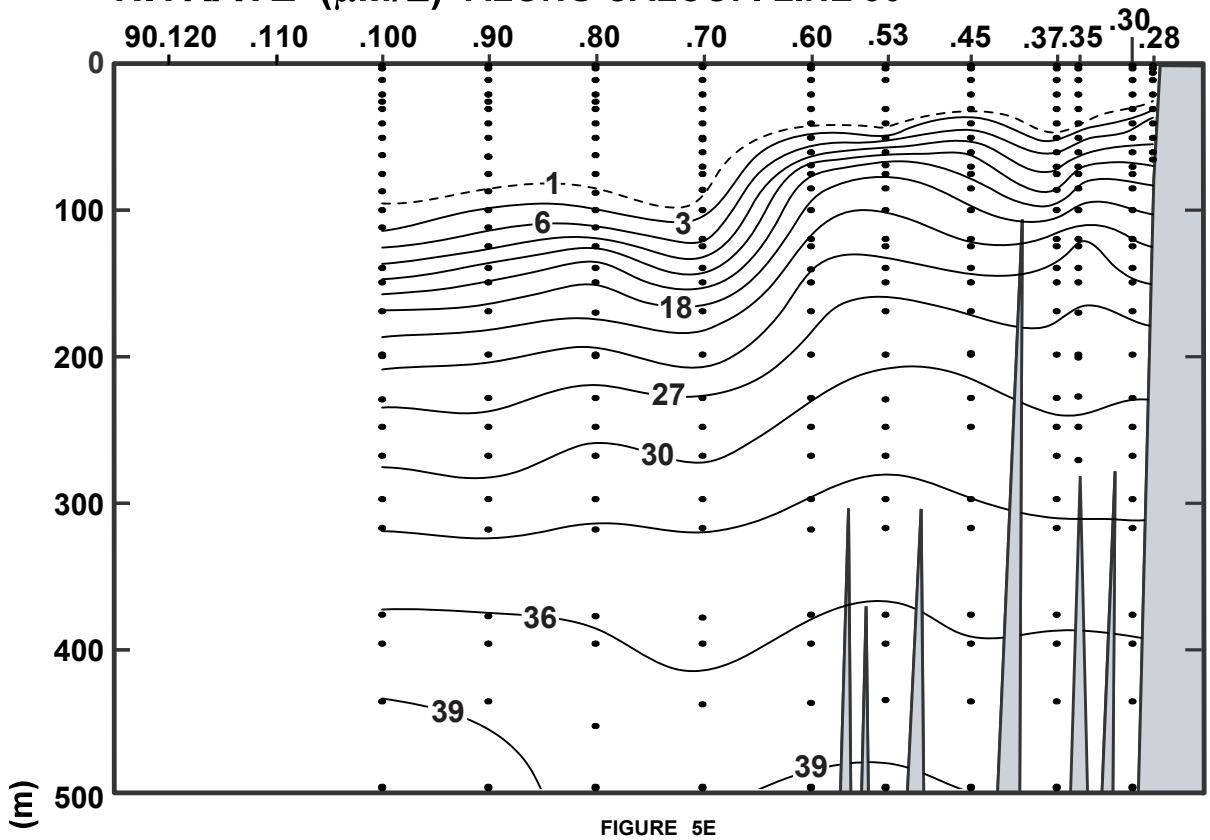

FIGURE 5E

PHOSPHATE (μM/L) ALONG CALCOFI LINE 90

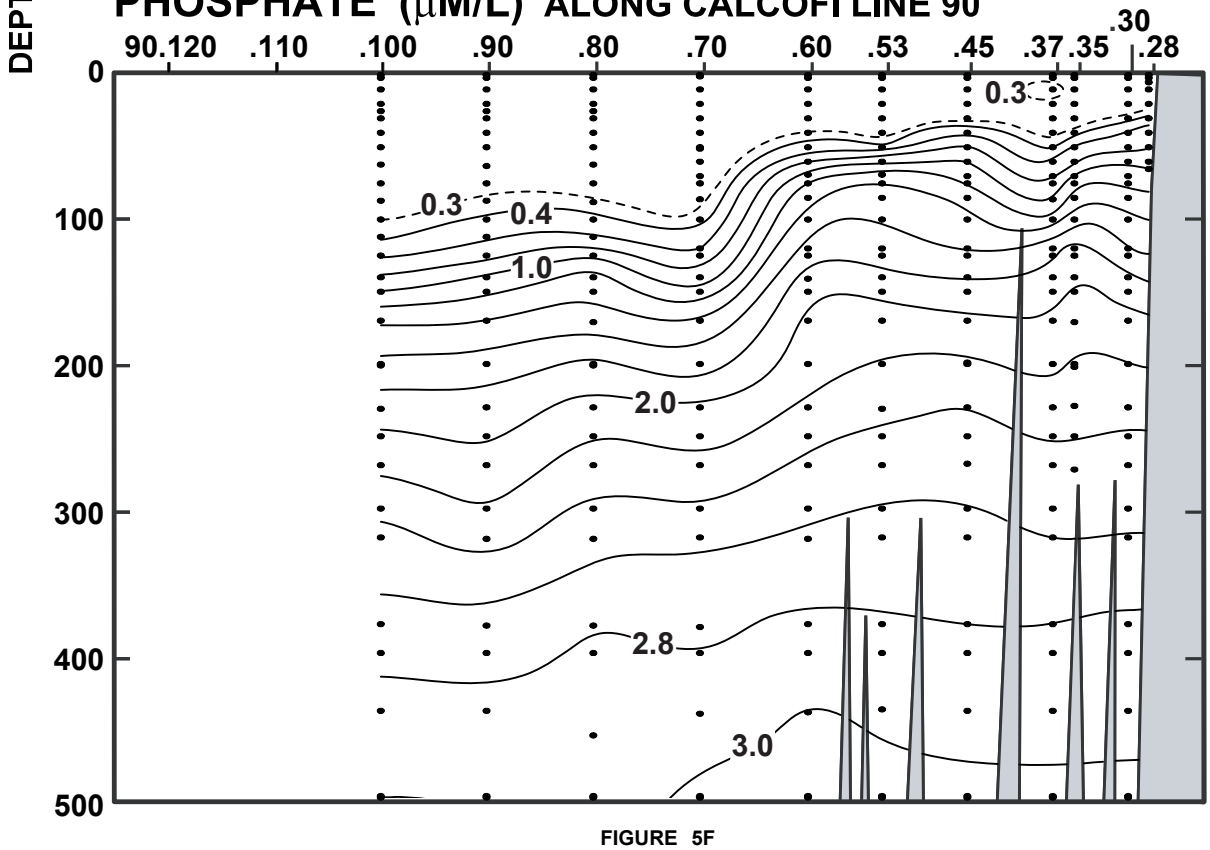

FIGURE 5F

CALCOFI CRUISE 1802

1 - 4 February 2018

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

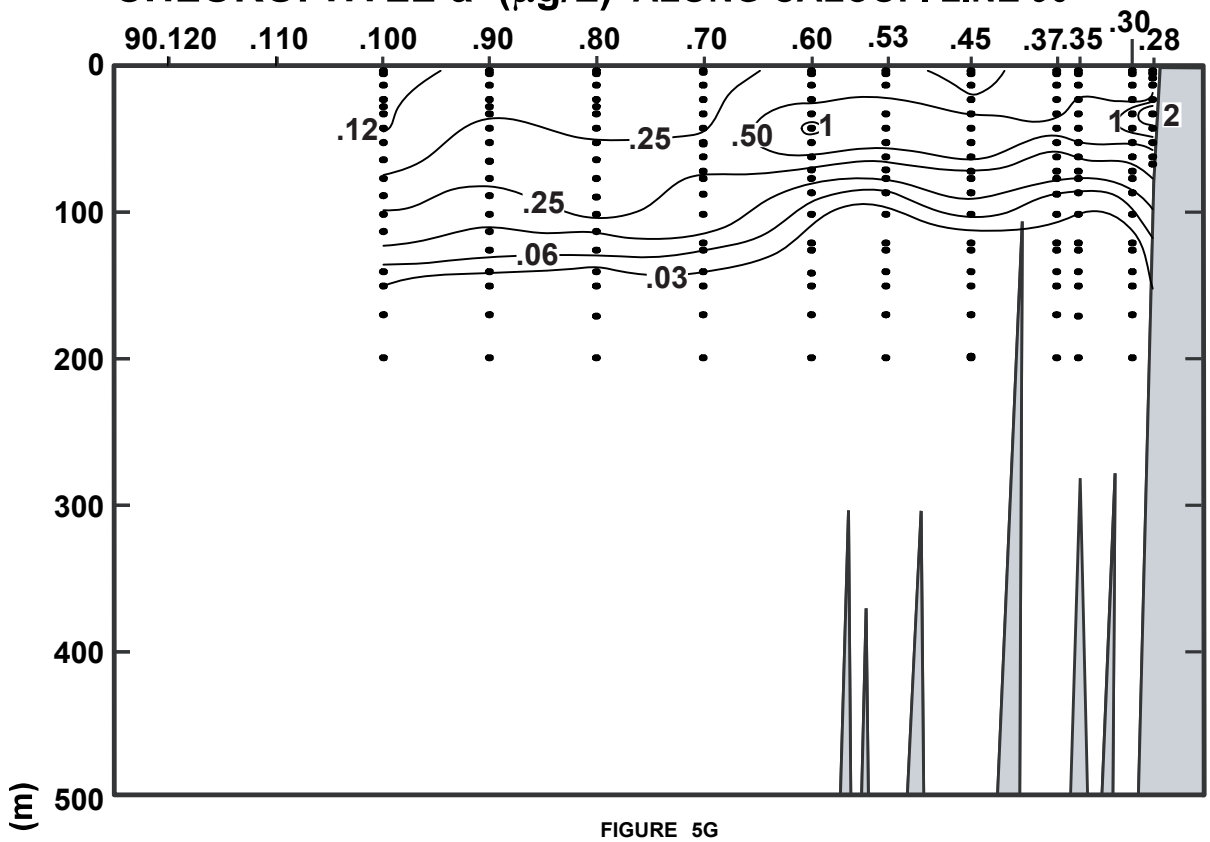

FIGURE 5G

OXYGEN SATURATION (%) ALONG CALCOFI LINE 90

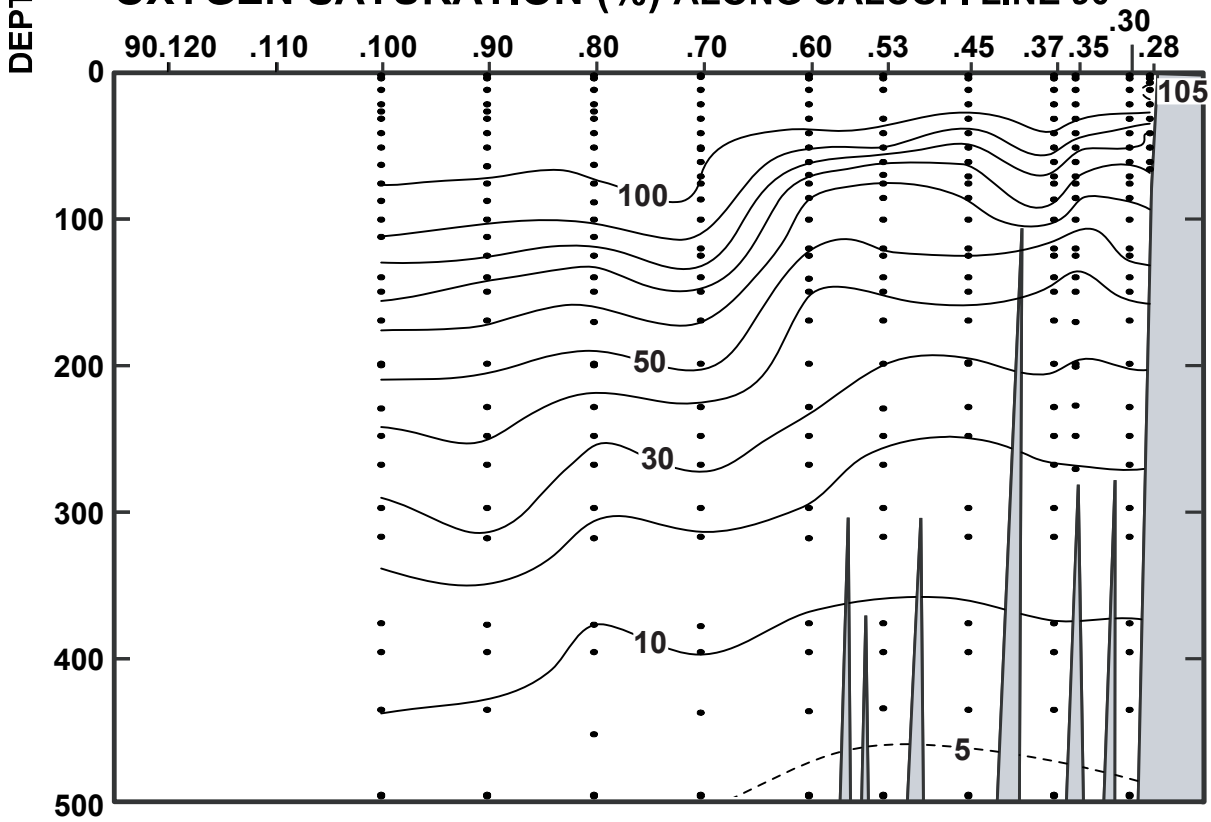

FIGURE 5H

CALCOFI CRUISE 1802

1 - 4 February 2018

OXYGEN (mL/L) ALONG CALCOFI LINE 90

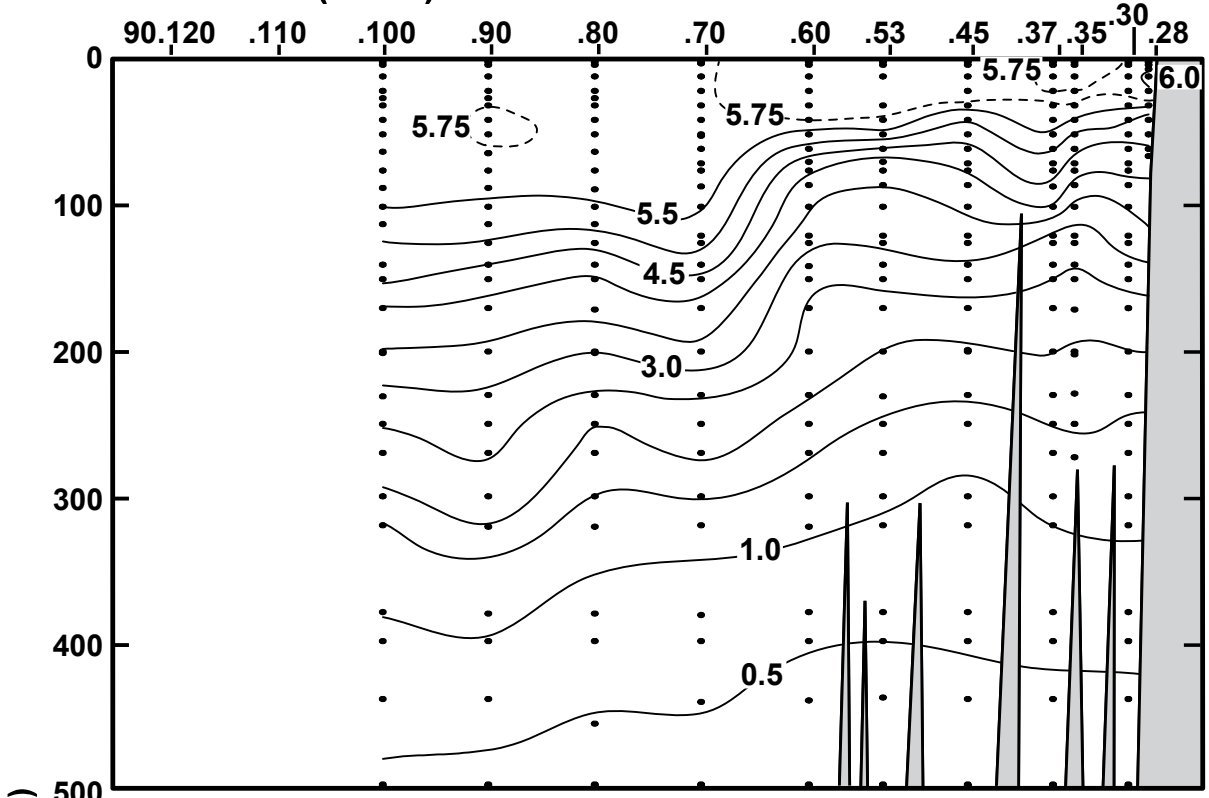

FIGURE 5I

NITRITE (μM/L) ALONG CALCOFI LINE 90

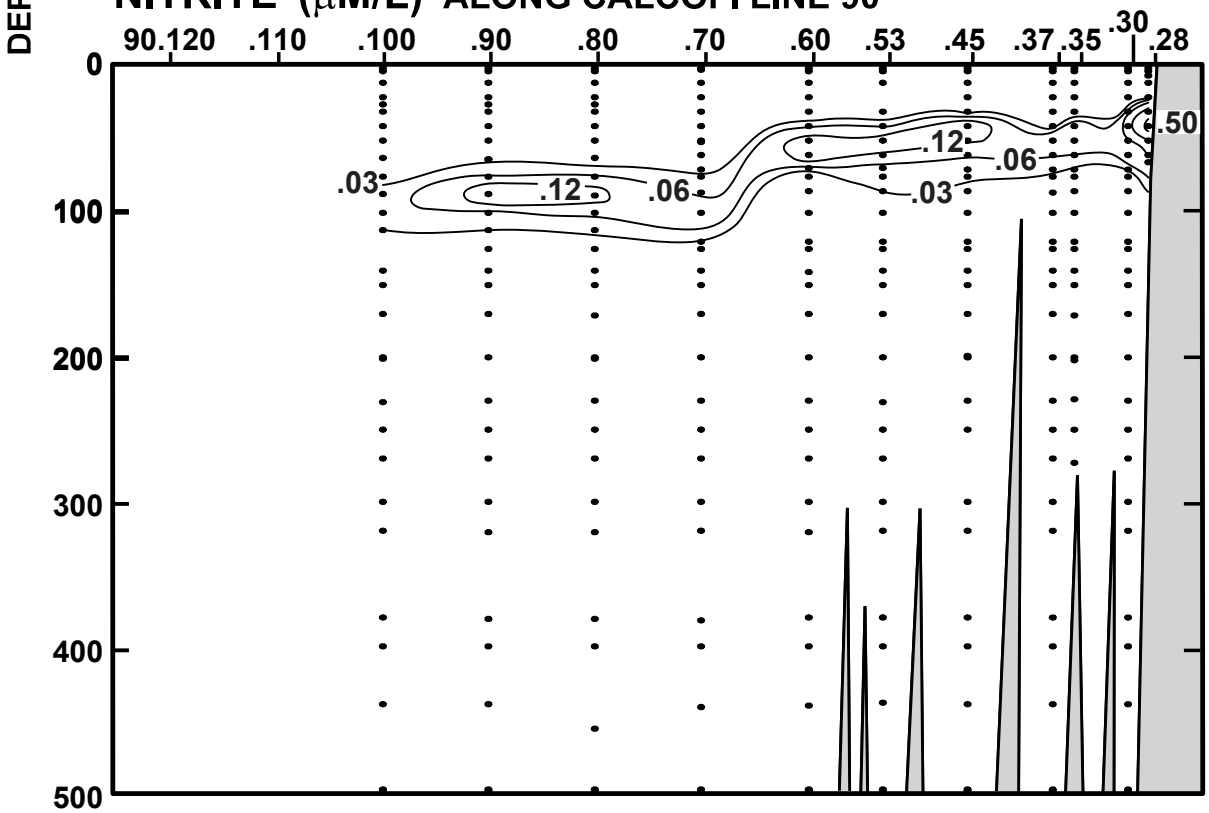

FIGURE 5J

PERSONNEL

CalCOFI Cruise 1802

SHIP'S COMMANDER

CDR. Paul Kunicki, NOAA ship *Bell M. Shimada*

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

		Participating (Legs)
Overcash, Bryan (Chief Scientist)	Fishery Biologist, NMFS	1
Dovel, Shonna	Staff Research Associate, SIO	1
Eggers, Hillary	Volunteer, SIO	1
Faber, David	Staff Research Associate, SIO	1
Force, Michael	Bird Observer, FAIER	1
Gardner, Emily	Fishery Biologist, NMFS	1
Griffiths, Emily	Fishery Biologist, NMFS	1
Hays, Amy	Fishery Biologist, NMFS	1
Poon, Tiffany	Volunteer, SIO	1
Schulberg, Anne	Scientist, JCVI	1
Schuller, Daniel	Staff Research Associate, SIO	1
Whitaker, Katherine	Marine Mammal Observer, SIO	1
Rodgers-Wolgast, Jennifer	Staff Research Associate, SIO	1
Wolgast, David	Staff Research Associate, SIO	1
Vasquez Del Mercado, Lenora	Fishery Biologist, NMFS	1

Leg 1: San Diego to San Francisco, California, 1 – 11 February, 2018

RV BELL M SHIMADA CALCOFI CRUISE 1802 STATION 76.7 49.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
35 5.6 N	120 46.2 W	09/02/2018	1701	UTC	66 m	330 02 kn	300 01 05	1	1016.5 mb	19.0 C	10.8 C	10 m	2/8	CS	041

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	13.59	13.59	33.521	25.129	282.5	0.000	6.46	282.1	109.3	3.6	0.30	0.7	0.07	0.32	4.73	0.65	0	
2	13.59	13.59	33.521	25.130	282.5	0.006	6.46	282.1	109.3	3.6	0.30	0.7	0.07	0.32	4.73	0.65	2	08
5	13.57	13.57	33.520	25.132	282.3	0.014	6.47	282.4	109.4	3.5	0.31	0.6	0.07	0.30	5.08	0.69	5	07
10	13.53	13.53	33.525	25.146	281.2	0.028	6.44	281.1	108.8	3.5	0.30	0.7	0.07	0.34	2.83	0.58	10	05
10	13.53	13.53	33.524	25.145	281.3	0.029											10	06
20	13.52	13.52	33.523	25.146	281.5	0.056	6.43 D	280.1 D	108.7	3.9	0.33	1.1	0.08	0.40	2.69	0.69	20	04
30 ISL	13.28 D	13.27	33.534 D	25.205	276.2	0.082	5.99 D	260.9 D	100.7	5.4	0.48	2.9	0.14	0.59	1.73	0.72	30	
31	13.18	13.17	33.536	25.226	274.2	0.087	5.90	257.6	99.0	5.6	0.50	3.1	0.15	0.61	1.63	0.72	31	03
40	13.07	13.07	33.544	25.253	271.9	0.112	5.74	250.5	96.1	6.4	0.57	3.8	0.17	0.69	1.66	0.66	40	02
50 ISL	12.46 D	12.45	33.563 D	25.389	259.2	0.137	4.88 D	212.5 D	80.7	9.6	0.86	7.2	0.27	0.82	1.21	0.93	50	
54	12.43	12.43	33.562	25.393	258.9	0.149	4.80	209.7	79.4	10.9	0.97	8.5	0.30	0.87	1.03	1.03	54	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 1802 STATION 76.7 51.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
35 1.2 N	120 55.0 W	09/02/2018	1912	UTC	235 m	330 13 kn	300 01 06	1	1016.4 mb	17.3 C	12.4 C	11 m	3/8	CS	042

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	14.28	14.28	33.487	24.959	298.6	0.000	6.06	264.4	104.0	3.3	0.33	0.9	0.12	0.38	1.25	0.40	0	
2	14.28	14.28	33.487	24.960	298.7	0.006	6.06	264.4	104.0	3.3	0.33	0.9	0.12	0.38	1.25	0.40	2	17
10	14.13	14.12	33.493	24.998	295.3	0.030	6.10	266.2	104.3	2.5	0.28	0.6	0.11	0.15	1.53	0.55	10	14
10	14.13	14.12	33.490	24.996	295.5	0.030											10	16
10	14.13	14.12	33.486	24.993	295.8	0.029											10	15
20	14.08	14.07	33.485	25.003	295.1	0.059	6.05	264.1	103.4	2.6	0.29	0.6	0.11	0.23	1.62	0.37	20	13
30	13.62	13.62	33.490	25.101	286.1	0.088	5.66 D	246.4 D	95.8	4.2	0.45	2.8	0.25	0.25	1.65	0.61	30	12
40	12.91	12.90	33.508	25.258	271.4	0.116	5.12 D	223.2 D	85.5	7.9	0.76	7.1	0.44	0.00	0.73	0.40	40	11
50	12.77	12.77	33.516	25.292	268.5	0.143	4.94	215.6	82.2	8.8	0.83	8.3	0.37	0.00	0.58	0.40	50	10
60	11.21	11.21	33.542	25.605	238.8	0.169	4.00 D	174.0 D	64.3	13.7	1.25	14.9	0.05	0.00	0.47	0.42	60	09
70	10.67	10.66	33.608	25.754	224.8	0.192	3.76	164.1	59.8	16.4	1.41	17.5	0.04	0.00	0.10	0.23	71	08
75 ISL	10.56 D	10.55	33.641 D	25.799	220.6	0.201	3.67 D	159.8 D	58.3	17.5	1.47	18.2	0.04	0.00	0.07	0.21	76	
85	10.35	10.34	33.683	25.867	214.4	0.225	3.35 D	145.8 D	53.0	19.6	1.59	19.8	0.04	0.00	0.02	0.17	86	07
100 ISL	10.35 D	10.34	33.695 D	25.877	213.8	0.256	3.30 D	143.7 D	52.2	20.2	1.63	20.1	0.03	0.00	0.04	0.14	101	
101	10.35	10.34	33.691	25.875	214.0	0.259	3.28	143.1	51.9	20.3	1.63	20.1	0.03	0.05	0.04	0.14	102	06
121	10.03	10.02	33.834	26.042	198.6	0.300	2.52	110.0	39.6	26.9	1.94	23.5	0.08	0.00	0.05	0.22	122	05
125 ISL	9.98 D	9.97	33.847 D	26.059	197.0	0.307	2.50 D	108.9 D	39.3	27.1	1.95	23.6	0.07	0.00	0.05	0.21	126	
141	9.89	9.87	33.865	26.091	194.4	0.340	2.42	105.5	37.9	27.9	1.99	24.3	0.04	0.00	0.04	0.18	142	04
150 ISL	9.78 D	9.76	33.915 D	26.148	189.1	0.356	2.29 D	99.6 D	35.8	29.0	2.04	25.0	0.04	0.00	0.03	0.15	151	
170	9.49	9.47	33.973	26.242	180.6	0.394	2.07 D	90.2 D	32.2	31.3	2.15	26.5	0.03	0.00	0.02	0.11	171	03
200	9.13	9.11	34.031	26.345	171.3	0.447	1.95	85.1	30.1	34.3	2.24	27.7	0.04	0.00	0.02	0.09	202	02
228	8.69	8.66	34.120	26.486	158.3	0.493	1.50	65.2	22.8	41.8	2.47	30.1	0.05	0.06			230	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 1802 STATION 76.7 55.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 53.2 N	121 11.9 W	09/02/2018	2223	UTC	562 m	310 17 kn	260 01 05	0	1014.4 mb	14.7 C	13.6 C	10 m	0/8		043

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	14.57	14.57	33.489	24.901	304.2	0.000	6.36	277.7	109.8	2.3	0.20	0.0	0.03	0.03	1.56	0.40	0	
3	14.57	14.57	33.489	24.901	304.3	0.009	6.36	277.7	109.8	2.3	0.20	0.0	0.03	0.00	1.56	0.40	3	23
10	14.41	14.41	33.489	24.935	301.2	0.030	6.42	280.1	110.4	1.9	0.19	0.0	0.00	0.00	1.94	0.51	10	20
10	14.41	14.41	33.488	24.935	301.3	0.030											10	22
10	14.41	14.41	33.487	24.934	301.4	0.030											10	21
20	14.32	14.31	33.490	24.956	299.6	0.060	6.24	272.2	107.1	1.8	0.20	0.0	0.03	0.00	1.64	0.58	20	18
20	14.32	14.31	33.491	24.957	299.5	0.061											20	19
30	14.16	14.15	33.486	24.987	297.0	0.090	5.99 D	260.9 D	102.5	2.4	0.31	0.7	0.10	0.29	1.03	0.52	30	17
40	13.80	13.79	33.492	25.067	289.7	0.120	5.77 D	251.4 D	98.1	3.7	0.43	1.9	0.26	0.44	0.71	0.56	40	16
50	13.29	13.29	33.494	25.171	280.0	0.148	5.38	235.0	90.5	5.7	0.62	4.8	0.45	0.25	0.40	0.36	50	15
60	12.31	12.30	33.514	25.380	260.3	0.175	4.62 D	201.1 D	76.1	10.0	0.94	10.1	0.24	0.00	0.24	0.35	60	14
70	12.00	11.99	33.543	25.462	252.7	0.201	4.40	192.0	72.0	12.3	1.09	12.3	0.13	0.00	0.25	0.31	71	13
75 ISL	11.87 D	11.86	33.566 D	25.503	248.9	0.210	4.30 D	187.4 D	70.3	13.2	1.16	13.4	0.11	0.00	0.21	0.28	76	
85	11.20	11.19	33.585	25.642	235.9	0.238	3.92 D	170.7 D	63.1	15.1	1.30	15.5	0.06	0.00	0.13	0.22	86	12
100	10.41	10.39	33.621	25.811	220.1	0.272	3.76	164.2	59.5	17.1	1.43	18.2	0.03	0.00	0.03	0.13	101	11
120	9.98	9.96	33.704	25.949	207.4	0.315	3.55	154.8	55.6	19.9	1.56	20.4	0.00	0.00	0.02	0.13	121	10
125 ISL	9.86 D	9.85	33.721 D	25.982	204.4	0.322	3.54 D	154.1 D	55.4	21.2	1.62	21.1	0.00	0.00	0.02	0.12	126	
140	9.52	9.50	33.828	26.122	191.3	0.355	3.05	133.0	47.3	25.1	1.79	23.4	0.00	0.00	0.02	0.08	141	09
150 ISL	9.36 D	9.35	33.895 D	26.201	184.0	0.371	2.76 D	120.3 D	42.8	27.4	1.89	24.6	0.00	0.00	0.02	0.08	151	
171	8.96	8.94	33.992	26.342	170.9	0.411	2.42 D	105.1 D	37.1	32.2	2.10	27.2	0.00	0.00	0.03	0.06	172	08
200	8.42	8.40	34.028	26.455	160.6	0.459	2.19	95.7	33.3	37.4	2.20	29.1	0.00	0.00	0.01	0.06	202	07
230	8.16	8.14	34.068	26.525	154.4	0.506	1.92 D	83.5 D	29.0	40.8	2.31	30.6	0.00	0.00			232	06
250 ISL	7.99 D	7.96	34.107 D	26.582	149.4	0.535	1.66 D	72.2 D	24.9	43.5	2.44	31.5	0.00	0.00			252	
270	8.15	8.12	34.180	26.616	146.7	0.566	1.21	52.7	18.2	46.2	2.57	32.4	0.00	0.00			272	05
300 ISL	8.04 D	8.01	34.212 D	26.658	143.2	0.609	1.01 D	43.9 D	15.2	49.2	2.64	33.2	0.00	0.00			302	
320	7.86	7.82	34.216	26.689	140.6	0.638	0.93 D	40.4 D	13.9	51.1	2.69	33.8	0.00	0.00			323	04
380	6.94	6.90	34.193	26.802	130.2	0.719	0.76	33.3	11.2	61.0	2.84	36.6	0.00	0.00			383	03
400 ISL	6.82 D	6.78	34.207 D	26.829	127.8	0.745	0.67 D	29.2 D	9.8	63.2	2.89	37.0	0.00	0.00			403	
440	6.64	6.60	34.238	26.879	123.6	0.795	0.53 D	22.9 D	7.7	67.6	2.99	37.7	0.00	0.13			444	02
500 ISL	5.96 D	5.92	34.231 D	26.961	116.0	0.869	0.44 D	19.2 D	6.3	76.9	3.09	39.8	0.00	0.00			504	
515	5.87	5.82	34.249	26.988	113.6	0.884	0.38	16.6	5.4	79.2	3.11	40.3	0.00	0.00			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 1802 STATION 76.7 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 43.3 N	121 33.0 W	10/02/2018	0207	UTC	947 m	330 16 kn	300 01 05	1	1013.5 mb	15.7 C	13.1 C		3/8	ST	044

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		14.60		14.60	33.503	24.904	304.0	0.000	6.24	272.6	107.9	1.5	0.22	0.0	0.03	0.01	1.36	0.43	0	
2		14.60		14.60	33.503	24.904	304.0	0.006	6.24	272.6	107.9	1.5	0.22	0.0	0.03	0.00	1.36	0.43	2	22
10		14.60		14.60	33.501	24.904	304.2	0.030	6.29	D274.1	D108.7	1.0	0.20	0.0	0.00	0.00	1.48	0.45	10	20
10		14.60		14.60	33.502	24.905	304.2	0.030											10	21
20		14.27		14.27	33.503	24.976	297.7	0.061	6.07	265.2	104.3	1.5	0.27	0.3	0.06	0.30	1.27	0.53	20	18
20		14.27		14.27	33.501	24.974	297.9	0.061											20	19
30		13.84		13.83	33.497	25.062	289.9	0.090	5.76	D250.9	D 98.0	3.3	0.44	2.2	0.21	0.53	0.81	0.58	30	17
40		13.52		13.51	33.501	25.130	283.6	0.119	5.49	D239.2	D 92.8	4.3	0.53	3.4	0.31	0.50	0.67	0.65	40	16
50		12.79		12.78	33.488	25.267	270.8	0.146	4.89	213.6	81.4	7.4	0.79	8.0	0.33	0.00	0.24	0.28	50	15
60		11.62		11.61	33.520	25.514	247.5	0.172	4.22	D183.8	D 68.5	11.8	1.14	13.4	0.08	0.00	0.12	0.19	60	14
70		11.20		11.19	33.591	25.645	235.2	0.196	3.79	165.5	61.0	15.2	1.33	15.9	0.05	0.00	0.10	0.22	71	13
75	ISL	11.03	D	11.02	33.621	D 25.701	230.0	0.207	3.71	D161.6	D 59.5	16.1	1.38	16.6	0.05	0.00	0.08	0.19	76	
85		10.70		10.69	33.648	25.780	222.7	0.231	3.57	D155.3	D 56.8	17.8	1.48	18.2	0.05	0.00	0.05	0.14	86	12
100		10.41		10.40	33.686	25.861	215.3	0.264	3.34	145.8	52.9	19.7	1.58	19.6	0.03	0.00	0.03	0.11	101	11
120		9.80		9.79	33.771	26.031	199.6	0.305	3.19	139.2	49.8	22.9	1.70	21.9	0.03	0.00	0.02	0.09	121	10
125	ISL	9.72	D	9.71	33.798	D 26.065	196.4	0.314	3.09	D134.5	D 48.2	23.8	1.75	22.5	0.00	0.00	0.02	0.09	126	
140		9.49		9.47	33.871	26.161	187.6	0.344	2.81	122.5	43.6	26.5	1.89	24.3	0.00	0.00	0.02	0.08	141	09
150	ISL	9.42	D	9.40	33.881	D 26.180	186.0	0.362	2.81	D122.1	D 43.5	28.0	1.96	25.0	0.00	0.00	0.02	0.09	151	
170		9.38		9.36	33.973	26.259	178.9	0.399	2.25	D 98.1	D 34.9	31.0	2.10	26.4	0.00	0.00	0.02	0.11	171	08
200		8.78		8.76	34.114	26.467	159.7	0.450	1.54	67.3	23.6	39.2	2.38	29.8	0.00	0.00	0.01	0.07	202	07
230		8.38		8.35	34.152	26.559	151.3	0.496	1.35	D 58.9	D 20.5	44.1	2.50	31.3	0.00	0.00			232	06
250	ISL	8.18	D	8.16	34.146	D 26.584	149.3	0.528	1.37	D 59.8	D 20.8	46.0	2.55	31.8	0.00	0.00			252	
270		8.08		8.05	34.169	26.618	146.4	0.556	1.16	50.7	17.5	47.8	2.59	32.4	0.00	0.00			272	05
300	ISL	7.73	D	7.70	34.190	D 26.686	140.3	0.601	0.88	D 38.4	D 13.2	52.5	2.69	33.5	0.00	0.00			302	
320		7.55		7.52	34.202	26.722	137.1	0.627	0.84	D 36.5	D 12.5	55.6	2.75	34.3	0.00	0.00			323	04
380		6.88		6.84	34.201	26.816	128.8	0.706	0.72	31.6	10.6	62.4	2.87	36.9	0.00	0.00			383	03
400	ISL	6.74	D	6.70	34.209	D 26.841	126.6	0.736	0.65	D 28.1	D 9.4	64.9	2.91	37.4	0.00	0.00			403	
440		6.49		6.45	34.254	26.910	120.5	0.781	0.46	D 20.2	D 6.7	70.0	3.00	38.4	0.00	0.00			444	02
500	ISL	6.06	D	6.01	34.292	D 26.997	112.7	0.856	0.32	D 13.8	D 4.6	77.9	3.11	39.8	0.00	0.00			504	
515		5.96		5.92	34.294	27.011	111.5	0.868	0.29	12.5	4.1	79.9	3.14	40.1	0.00	0.00			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED 02;

RV BELL M SHIMADA CALCOFI CRUISE 1802 STATION 76.7 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 23.1 N	122 14.8 W	10/02/2018	0712	UTC	4015 m	340 19 kn			1015.3 mb	15.4 C	13.0 C				045

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		14.71		14.71	33.461	24.850	309.1	0.000	5.94	D258.7	D102.8	2.5	0.26	0.0	0.00	0.02	0.22	0.09	0	
2		14.71		14.71	33.461	24.850	309.1	0.006	5.96	260.0	103.1	2.5	0.26	0.0	0.00	0.00	0.22	0.09	2	20
10		14.71		14.71	33.461	24.849	309.4	0.031	5.96	260.2	103.2	2.5	0.26	0.0	0.00	0.00	0.14	0.06	10	19
20		14.71		14.71	33.459	24.848	309.9	0.062	5.95	260.0	103.1	2.5	0.25	0.0	0.00	0.00	0.32	0.11	20	18
30		14.67		14.67	33.454	24.853	309.7	0.093	5.93	D258.6	D102.7	2.5	0.25	0.0	0.00	0.00	0.26	0.11	30	17
40		14.17		14.16	33.419	24.933	302.4	0.124	5.93	D258.4	D101.5	2.7	0.27	0.1	0.05	0.12	0.55	0.23	40	16
50	ISL	13.92	D	13.91	33.412	D 24.980	298.2	0.152	5.86	D255.4	D 99.8	3.1	0.32	0.5	0.12	0.35	0.50	0.24	50	
51		13.91		13.91	33.416	24.985	297.8	0.157	5.89	257.0	100.2	3.2	0.32	0.6	0.13	0.37	0.50	0.24	51	15
60		13.42		13.42	33.435	25.100	287.1	0.183	5.42	D236.0	D 91.4	3.8	0.44	2.5	0.33	0.11	0.33	0.17	60	14
70		11.70		11.69	33.428	25.428	255.9	0.210	4.70	205.0	76.3	8.1	0.91	10.1	0.04	0.00	0.11	0.09	71	13
75	ISL	11.39	D	11.38	33.451	D 25.503	248.9	0.221	4.51	D196.5	D 72.9	9.1	0.97	11.2	0.00	0.00	0.10	0.09	76	
85		10.97		10.96	33.480	25.601	239.7	0.247	4.38	D190.7	D 70.1	11.0	1.10	13.4	0.00	0.00	0.06	0.09	86	12
100		10.43		10.42	33.573	25.768	224.1	0.282	3.91	170.8	62.0	15.5	1.39	17.9	0.00	0.00	0.03	0.06	101	11
120		9.70		9.69	33.713	26.002	202.3	0.324	3.43	149.7	53.5	21.2	1.65	21.8	0.00	0.00	0.01	0.05	121	10
125	ISL	9.55	D	9.53	33.772	D 26.074	195.5	0.334	3.37	D146.6	D 52.3	22.1	1.68	22.2	0.00	0.00	0.01	0.05	126	
140		9.25		9.24	33.840	26.175	186.2	0.363	3.25	141.9	50.2	24.8	1.75	23.5	0.00	0.00	0.01	0.04	141	09
150	ISL	9.07	D	9.05	33.873	D 26.230	181.1	0.381	3.15	D136.9	D 48.4	26.9	1.85	24.7	0.00	0.00	0.01	0.04	151	
171		8.86		8.84	33.974	26.343	170.8	0.418	2.46	D106.9	D 37.6	31.4	2.05	27.0	0.00	0.00	0.00	0.05	172	08
200	ISL	8.44	D	8.42	34.032	D 26.455	160.6	0.467	2.35	D102.3	D 35.7	36.4	2.20	28.9	0.00	0.00	0.00	0.04	202	
201		8.31		8.29	34.009	D 26.455	160.5	0.469	2.34	D101.7	D 35.4								203	07
231		7.92		7.90	34.023	26.525	154.3	0.515	2.31	D100.6	D 34.7	40.3	2.20	29.8	0.00	0.00			233	06
250	ISL	7.73	D	7.71	34.049	D 26.573	150.0	0.545	1.98	D 86.2	D 29.6	43.0	2.32	31.0	0.00	0.00			252	
269		7.68		7.65	34.076	26.603	147.5	0.572	1.77	77.4	26.5	45.6	2.43	32.2	0.00	0.00			271	05
300	ISL	7.39	D	7.36	34.098	D 26.662	142.3	0.619	1.50	D 65.2	D 22.2	50.3	2.55	33.8	0.00	0.00			302	
321		7.12		7.09	34.108	26.708	138.1	0.647	1.27	D 55.2	D 18.7	53.4	2.63	34.9	0.00	0.00			324	04
380		6.78		6.74	34.174	26.808	129.4	0.726	0.78	34.0	11.4	61.8	2.85	37.0	0.00	0.00			383	03
400	ISL	6.68	D	6.64	34.195	D 26.839	126.8	0.754	0.64	D 27.7	D 9.3	64.7	2.90	37.6	0.00	0.00			403	
440		6.34		6.30	34.224	26.907	120.6	0.801	0.49	D 21.5	D 7.2	70.4	3.01	38.7	0.00	0.00			444	02
500	ISL	5.75	D	5.71	34.234	D 26.989	113.1	0.875	0.38	D 16.4	D 5.4	78.7	3.12	40.2	0.00	0.00			504	
514		5.71		5.66	34.253	27.010	111.3	0.886	0.34	14.7	4.8	80.6	3.14	40.6	0.00	0.00			518	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; SECONDARY CRUISE-CORRECTED 02;

RV BELL M SHIMADA CALCOFI CRUISE 1802 STATION 80.0 51.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 27.1 N	120 31.5 W	09/02/2018	1141	UTC	76 m	330 05 kn			1015.2 mb	16.0 C	12.4 C				040

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		14.52		14.52	33.511	24.928	301.6	0.000	6.19	270.1	106.7	1.4	0.26	0.2	0.05	0.09	1.59	0.54	0	
1		14.52		14.52	33.511	24.928	301.6	0.003	6.19	270.1	106.7	1.4	0.26	0.2	0.05	0.09	1.59	0.54	1	09
5		14.52		14.52	33.503	24.922	302.4	0.015	6.18	269.7	106.5	0.7	0.23	0.0	0.04	0.00	1.47	0.52	5	08
10		14.53		14.53	33.502	24.920	302.7	0.030	6.19	270.4	106.8	0.6	0.23	0.0	0.04	0.06	1.60	0.62	10	06
11		14.51		14.51	33.502	24.923	302.5	0.032											11	07
20		13.92		13.91	33.517	25.060	289.7	0.060	6.18	D269.4	D105.4	0.9	0.26	0.3	0.04	0.11	1.29	0.66	20	05
30		13.01		13.00	33.518	25.245	272.3	0.088	4.96	D215.9	D 82.9	5.7	0.70	5.3	0.25	0.65	0.88	0.95	30	04
41		12.63		12.62	33.525	25.327	264.9	0.117	4.69	204.8	77.8	9.4	0.91	8.8	0.40	0.31	0.73	0.89	41	03
50		12.46		12.46	33.522	25.356	262.3	0.141	4.58	199.9	75.7	10.5	0.98	10.0	0.45	0.14	0.69	0.93	50	02
66		12.17		12.16	33.551	25.435	255.2	0.183	4.28	186.7	70.3	12.3	1.10	11.7	0.34	0.24	0.65	1.02	67	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED 02;

RV BELL M SHIMADA CALCOFI CRUISE 1802 STATION 80.0 55.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 18.8 N	120 49.2 W	09/02/2018	0740	UTC	777 m	350 20 kn			1016.8 mb	14.5 C	13.1 C				039

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	33.510	24.953	299.3	0.000	6.32	275.8	108.7	0.7	0.16	0.1	0.03	0.17	1.16	0.27	0	
1	14.40	14.40	33.510	24.953	299.3	0.003	6.32	275.8	108.7	0.7	0.16	0.1	0.03	0.17	1.16	0.27	1	23
10	14.39	14.38	33.512	24.958	299.1	0.030	6.30	275.0	108.3	0.6	0.14	0.0	0.00	0.08	1.23	0.26	10	20
10	14.39	14.38	33.516	24.961	298.8	0.031											10	22
10	14.39	14.38	33.511	24.957	299.2	0.030											10	21
20	14.34	14.33	33.514	24.970	298.3	0.060	6.25	272.8	107.3	0.8	0.16	0.0	0.03	0.12	1.25	0.30	20	19
30 ISL	13.08 D	13.08	33.513 D	25.227	274.1	0.088	5.07 D	221.0 D	85.0	6.0	0.70	6.0	0.21	0.41	1.46	0.60	30	
31	13.08	13.08	33.521	25.232	273.6	0.090											30	18
31	12.82	12.82	33.516	25.281	268.9	0.091	4.91 D	213.7 D	81.7	6.5	0.75	6.7	0.22	0.44	1.48	0.63	31	17
40	12.07	12.06	33.532	25.438	254.2	0.115	4.20 D	182.9 D	68.9	11.8	1.12	12.3	0.27	0.09	0.55	0.39	40	16
50	11.32	11.31	33.573	25.610	238.1	0.139	3.70	161.6	59.7	15.5	1.35	16.0	0.10	0.00	0.22	0.20	50	15
60	10.92	10.91	33.622	25.720	227.8	0.163	3.37 D	146.9 D	54.0	17.9	1.52	18.2	0.05	0.00	0.13	0.18	60	14
70	10.71	10.70	33.660	25.787	221.7	0.185	3.20	139.6	50.9	19.4	1.61	19.4	0.05	0.00	0.09	0.14	71	13
75 ISL	10.51 D	10.50	33.699 D	25.853	215.5	0.196	3.11 D	135.2 D	49.3	20.7	1.67	20.3	0.04	0.00	0.07	0.13	76	
85	10.21	10.20	33.766	25.957	205.8	0.217	2.85 D	124.2 D	45.0	23.4	1.80	22.1	0.03	0.00	0.02	0.10	86	12
100	10.09	10.08	33.786	25.992	202.8	0.248	2.78	121.2	43.7	24.2	1.84	22.6	0.03	0.00	0.03	0.11	101	11
121	9.55	9.53	33.864	26.145	188.7	0.289	2.76	120.4	42.9	26.7	1.91	24.4	0.00	0.00	0.02	0.10	122	10
125 ISL	9.39 D	9.37	33.926 D	26.220	181.6	0.297	2.52 D	109.7 D	39.1	27.5	1.94	24.7	0.00	0.00	0.02	0.09	126	
140	9.25	9.24	33.943	26.256	178.5	0.324	2.46	107.4	38.0	30.6	2.04	26.1	0.00	0.00	0.03	0.08	141	09
150 ISL	8.97 D	8.95	33.959 D	26.314	173.1	0.342	2.56 D	111.4 D	39.3	31.5	2.06	26.5	0.00	0.00	0.04	0.08	151	
170	8.86	8.84	33.987	26.353	169.8	0.376	2.41 D	105.0 D	37.0	33.3	2.10	27.3	0.00	0.00	0.04	0.08	171	08
200	8.76	8.74	34.098	26.457	160.6	0.425	1.79	78.1	27.4	38.0	2.32	29.2	0.00	0.00	0.02	0.08	202	07
230	8.35	8.33	34.156	26.565	150.8	0.472	1.55 D	67.4 D	23.5	42.2	2.44	31.0	0.00	0.00			232	06
250 ISL	8.18 D	8.15	34.123 D	26.566	151.0	0.504	1.59 D	69.2 D	24.0	44.0	2.46	31.5	0.00	0.00			252	
271	8.02	7.99	34.130	26.597	148.4	0.533	1.48	64.8	22.3	45.9	2.49	32.0	0.00	0.00			273	05
300 ISL	7.99 D	7.96	34.218 D	26.670	142.0	0.578	0.96 D	41.8 D	14.4	49.6	2.62	33.1	0.00	0.00			302	
321	7.76	7.73	34.207	26.696	139.8	0.606	0.91 D	39.5 D	13.6	52.3	2.72	34.0	0.00	0.00			324	04
381	7.41	7.37	34.229	26.765	134.1	0.688	0.73	31.7	10.8	57.5	2.81	35.4	0.00	0.00			384	03
400 ISL	7.19 D	7.15	34.233 D	26.799	131.0	0.716	0.68 D	29.7 D	10.1	60.3	2.86	36.1	0.00	0.00			403	
438	6.77	6.73	34.238	26.861	125.4	0.762	0.56 D	24.1 D	8.1	66.1	2.95	37.5	0.00	0.00			442	02
500 ISL	6.17 D	6.12	34.259 D	26.957	116.7	0.841	0.40 D	17.3 D	5.7	73.3	3.05	39.1	0.00	0.00			504	
518	6.14	6.10	34.266	26.966	116.0	0.858	0.38	16.4	5.4	75.4	3.08	39.5	0.00	0.00			522	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 1802 STATION 80.0 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 8.8 N	121 9.1 W	09/02/2018	0347	UTC	2165 m	310 16 kn			1017.9 mb	14.4 C	13.3 C				038

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	14.73	14.73	33.495	24.871	307.0	0.000	6.22	271.5	107.7	1.1	0.23	0.0	0.01	0.02	0.71	0.18	0	
2	14.73	14.73	33.495	24.871	307.1	0.006	6.22	271.5	107.7	1.1	0.23	0.0	0.00	0.00	0.71	0.18	2	23
10	14.73	14.73	33.486	24.865	308.0	0.031	6.21	271.2	107.6	1.0	0.22	0.0	0.00	0.00	0.67	0.22	10	20
10	14.73	14.73	33.493	24.870	307.4	0.031											10	22
10	14.73	14.73	33.492	24.869	307.5	0.031											10	21
20	14.69	14.69	33.492 D	24.878	307.0	0.059	6.22	271.7	107.7	1.1	0.22	0.0	0.00	0.00	0.73	0.25	20	19
30	14.14	14.14	33.510	25.009	294.9	0.092	5.98 D	260.7 D	102.4	2.2	0.33	0.6	0.09	0.16	1.99	1.06	30	17
30	14.14	14.14	33.510	25.009	294.9	0.091											30	18
40	13.97	13.96	33.508	25.044	291.8	0.121	5.74 D	250.2 D	97.9	4.0	0.44	2.3	0.25	0.36	1.10	0.58	40	16
50	13.68	13.67	33.510	25.106	286.3	0.150	5.46	238.6	92.6	5.4	0.57	4.1	0.37	0.33	0.47	0.32	50	15
60	12.62	12.61	33.508	25.316	266.5	0.177	4.66 D	202.9 D	77.2	9.1	0.91	9.6	0.19	0.00	0.19	0.25	60	14
70	11.84	11.83	33.517 D	25.471	251.9	0.203	4.10	179.0	66.9	11.9	1.13	13.0	0.05	0.00	0.12	0.16	71	13
75 ISL	11.48 D	11.47	33.552 D	25.566	242.9	0.215	3.81 D	165.8 D	61.7	13.8	1.26	14.7	0.04	0.00	0.10	0.14	76	
85	10.98	10.97	33.616 D	25.706	229.8	0.239	3.34 D	145.6 D	53.6	17.5	1.52	18.2	0.03	0.00	0.04	0.12	86	12
100	10.28	10.27	33.670 D	25.870	214.5	0.272	3.44	150.2	54.3	19.5	1.58	19.9	0.00	0.00	0.02	0.09	101	11
120	9.77	9.76	33.748 D	26.018	200.8	0.314	3.39	148.2	53.0	21.9	1.64	21.4	0.00	0.00	0.02	0.08	121	10
125 ISL	9.55 D	9.53	33.793 D	26.090	194.0	0.324	3.36 D	146.2 D	52.2	23.2	1.69	22.1	0.00	0.00	0.02	0.08	126	
140	9.22	9.20	33.860 D	26.196	184.2	0.353	3.07	134.0	47.4	26.9	1.83	24.2	0.00	0.00	0.02	0.10	141	09
150 ISL	9.16 D	9.14	33.888 D	26.228	181.3	0.371	2.96 D	128.6 D	45.6	28.5	1.89	25.0	0.00	0.00	0.02	0.09	151	
170	8.75	8.73	33.955	26.345	170.5	0.405	2.75 D	119.7 D	42.0	31.7	2.00	26.7	0.00	0.00	0.01	0.08	171	08
200	8.32	8.30	34.017	26.460	160.0	0.455	2.37	103.6	35.9	37.2	2.15	28.8	0.00	0.00	0.00	0.05	202	07
230	8.05	8.02	34.085	26.555	151.5	0.501	1.80 D	78.4 D	27.1								232	06
250 ISL	7.86 D	7.84	34.122 D	26.613	146.4	0.534	1.53 D	66.4 D	22.9	47.2	2.44	32.4	0.00	0.00			252	
271	7.35	7.33	34.110	26.676	140.4	0.562	1.38	60.3	20.5	51.4	2.56	34.0	0.00	0.09			273	05
300 ISL	7.07 D	7.04	34.168 D	26.762	132.7	0.604	0.97 D	42.4 D	14.3	58.7	2.77	35.8	0.00	0.00			302	
321	6.81	6.78	34.213	26.834	126.0	0.628	0.65 D	28.2 D	9.5	64.0	2.92	37.1	0.00	0.00			324	04
380	6.34	6.31	34.244	26.920	118.4	0.701	0.45	19.6	6.5	71.7	3.00	38.8	0.00	0.00			383	03
400 ISL	6.31 D	6.27	34.255 D	26.934	117.4	0.728	0.42 D	18.4 D	6.1	73.3	3.03	39.1	0.00	0.00			403	
440	6.17	6.13	34.297	26.986	113.0	0.770	0.30 D	13.0 D	4.3	76.4	3.09	39.7	0.00	0.00			444	02
500 ISL	6.01 D	5.96	34.321 D	27.027	109.9	0.842	0.24 D	10.4 D	3.5	80.0	3.14	39.9	0.00	0.00			504	
516	6.00	5.95	34.320	27.027	110.1	0.855	0.24	10.3	3.4	80.9	3.15	40.0	0.00	0.00			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 1802 STATION 80.0 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 48.9 N	121 50.7 W	08/02/2018	2203	UTC	3627 m	300 15 kn	340 04 07	1	1019.7 mb	14.4 C	12.8 C	16 m	4/8	ST	037

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		14.80		14.80	33.476	24.840	310.0	0.000	6.02	262.7		104.3		2.8	0.26	0.0	0.01	0.04	0.34	0.10	0	
2		14.80		14.80	33.476	24.841	310.0	0.006	6.02	262.7		104.3		2.8	0.26	0.0	0.00	0.00	0.34	0.10	2	22
10		14.77		14.77	33.478	24.849	309.4	0.031	6.02	262.7		104.3		2.4	0.24	0.0	0.00	0.00	0.34	0.09	10	20
10		14.77		14.77	33.478	24.849	309.4	0.031													10	21
20		14.62		14.62	33.477	24.881	306.8	0.062	6.06	264.5		104.7		2.4	0.25	0.0	0.00	0.00	0.41	0.14	20	19
30		14.43		14.42	33.478	24.924	303.0	0.092	5.90	D256.9	D	101.5		2.4	0.25	0.0	0.00	0.00	0.35	0.15	30	17
30		14.43		14.42	33.468	24.916	303.8	0.093													30	18
40		14.38		14.37	33.464	24.924	303.3	0.123	5.81	D253.3	D	100.0		2.5	0.30	0.3	0.10	0.32	0.54	0.20	40	16
50		14.21		14.20	33.462	24.958	300.4	0.153	5.74	250.6		98.3		2.6	0.33	0.5	0.15	0.43	0.34	0.16	50	15
60		12.33		12.32	33.385	25.276	270.2	0.181	5.15	D224.3	D	84.8		5.6	0.66	6.4	0.07	0.00	0.15	0.14	60	14
70		11.88		11.87	33.389	25.365	261.9	0.208	5.00	218.5		81.6		6.5	0.74	7.7	0.05	0.00	0.12	0.12	71	13
75	ISL	11.67	D	11.66	33.410	D 25.419	256.9	0.219	4.96	D216.2	D	80.6		7.0	0.78	8.4	0.04	0.00	0.11	0.10	76	
85		11.46		11.45	33.416	25.464	252.9	0.246	4.83	D210.2	D	78.1		7.9	0.87	9.7	0.04	0.00	0.08	0.08	86	12
100		10.83		10.82	33.487	25.632	237.1	0.283	4.26	186.2		68.0		12.5	1.19	14.7	0.03	0.00	0.04	0.08	101	11
120		10.10		10.08	33.626	25.868	215.1	0.328	3.65	159.4		57.4		18.5	1.52	19.8	0.00	0.00	0.01	0.05	121	10
125	ISL	9.90	D	9.89	33.689	D 25.950	207.4	0.338	3.72	D162.1	D	58.3		19.5	1.56	20.4	0.00	0.00	0.01	0.05	126	
141		9.55		9.54	33.760	26.064	196.8	0.372	3.38	147.4		52.5		22.6	1.68	22.2	0.00	0.00	0.01	0.05	142	09
150	ISL	9.37	D	9.35	33.822	D 26.142	189.5	0.388	3.34	D145.4	D	51.7		24.4	1.73	23.0	0.00	0.00	0.01	0.04	151	
170		8.91		8.90	33.912	26.286	176.2	0.426	3.13	D136.3	D	48.0		28.3	1.83	24.8	0.00	0.00	0.00	0.04	171	08
200		8.24		8.22	33.991	26.452	160.8	0.476	2.68	116.9		40.5		35.7	2.06	28.0	0.00	0.00	0.01	0.03	202	07
231		7.77		7.74	34.018	26.544	152.4	0.525	2.24	D 97.5	D	33.5		41.8	2.24	30.5	0.00	0.00			233	06
250	ISL	7.44	D	7.42	34.039	D 26.607	146.6	0.553	2.00	D 86.9	D	29.7		45.1	2.34	31.7	0.00	0.00			252	
270		7.24		7.21	34.050	26.645	143.3	0.582	1.82	79.4		26.9		48.5	2.44	32.9	0.00	0.00			272	05
300	ISL	6.97	D	6.94	34.066	D 26.695	138.9	0.625	1.53	D 66.4	D	22.4		53.8	2.58	34.6	0.00	0.00			302	
320		6.77		6.74	34.075	26.730	135.8	0.652	1.31	D 56.9	D	19.1		57.4	2.68	35.7	0.00	0.00			323	04
380		6.23		6.20	34.124	26.840	125.9	0.731	0.85	37.2		12.3		67.6	2.89	38.4	0.00	0.00			383	03
400	ISL	6.11	D	6.08	34.139	D 26.867	123.5	0.757	0.75	D 32.7	D	10.8		70.0	2.93	39.0	0.00	0.00			403	
439		5.76		5.72	34.149	26.920	118.7	0.803	0.62	D 27.0	D	8.9		74.6	3.01	40.1	0.00	0.00			443	02
500	ISL	5.38	D	5.34	34.175	D 26.987	112.8	0.875	0.50	D 21.7	D	7.1									504	
515		5.44		5.40	34.204	D 27.003	111.6	0.892	0.42	D 18.3	D	6.0									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 1802 STATION 80.0 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 28.8 N	122 32.5 W	08/02/2018	1624	UTC	4000 m	340 10 kn	300 03 06	2	1022.8 mb	11.6 C	10.7 C	20 m	8/8	ST	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		15.05		15.05	33.427	24.748	318.8	0.000	5.87	256.2		102.3		2.2	0.23	0.0	0.01	0.00	0.21	0.07	0	
2		15.05		15.05	33.427	24.748	318.8	0.006	5.87	256.2		102.3		2.2	0.23	0.0	0.00	0.00	0.21	0.07	2	22
10		15.05		15.05	33.433	24.754	318.5	0.032	5.87	256.5		102.4		2.2	0.23	0.0	0.00	0.00	0.17	0.08	10	20
10		15.05		15.05	33.427	24.749	319.0	0.032													10	21
20		15.03		15.03	33.426	24.755	318.8	0.064	5.90	257.5		102.7		2.2	0.24	0.0	0.00	0.00	0.21	0.09	20	19
30		14.03		14.03	33.406	24.951	300.4	0.095	6.13	D267.1	D	104.6		3.2	0.28	0.3	0.08	0.05	0.65	0.35	30	17
31		14.03		14.03	33.406	24.951	300.4	0.096													30	18
41		13.76		13.75	33.408	25.009	295.1	0.128	5.72	D249.1	D	97.1		3.8	0.40	1.5	0.27	0.20	0.61	0.33	41	16
50		12.92		12.91	33.363	25.144	282.6	0.154	5.53	241.6		92.2		4.4	0.54	4.2	0.15	0.00	0.35	0.25	50	15
61		12.02		12.01	33.373	25.326	265.4	0.184	4.92	D214.1	D	80.4		6.7	0.77	7.9	0.08	0.00	0.25	0.20	61	14
70		10.99		10.99	33.463	25.583	241.1	0.207	4.33	188.9		69.3		11.5	1.16	14.1	0.03	0.00	0.09	0.11	71	13
75	ISL	10.68	D	10.67	33.532	D 25.693	230.7	0.216	4.12	D179.3	D	65.5		13.1	1.25	15.4	0.00	0.00	0.07	0.10	76	
86		10.25		10.24	33.578	25.803	220.5	0.243	3.82	D166.2	D	60.2		16.6	1.44	18.4	0.00	0.00	0.02	0.08	87	12
100		9.79		9.78	33.711	25.985	203.5	0.273	3.39	147.9		52.9		21.6	1.66	21.9	0.00	0.00	0.01	0.07	101	11
120		9.38		9.37	33.813	26.132	189.9	0.312	3.08	134.4		47.7		25.4	1.81	24.0	0.00	0.00	0.00	0.07	121	10
125	ISL	9.28	D	9.26	33.849	D 26.177	185.6	0.320	3.07	D133.8	D	47.5		26.1	1.84	24.3	0.00	0.00	0.00	0.06	126	
140		9.15		9.14	33.882	26.224	181.5	0.349	2.87	125.1		44.2		28.4	1.92	25.3	0.00	0.00	0.01	0.06	141	09
150	ISL	9.01	D	8.99	33.922	D 26.278	176.5	0.366	2.73	D118.6	D	41.9		29.4	1.95	25.9	0.00	0.00	0.01	0.06	151	
170		8.82		8.80	33.962	26.340	171.0	0.402	2.58	D112.1	D	39.5		31.6	2.02	27.0	0.00	0.00	0.01	0.06	171	08
200	ISL	8.38	D	8.35	34.001	D 26.440	162.0	0.451	2.53	D110.1	D	38.4		35.3	2.10	28.3	0.00	0.00	0.01	0.05	202	
201		8.35		8.33	34.005	26.447	161.4	0.454	2.50	109.1		37.8		35.4	2.10	28.4	0.00	0.00	0.01	0.05	203	07
231		8.17		8.14	34.077	26.531	153.9	0.501	1.77	D 76.8	D	26.7		41.7	2.37	31.1	0.00	0.00			233	06
250	ISL	7.71	D	7.68	34.057	D 26.584	149.0	0.530	1.87	D 81.3	D	27.9		44.9	2.37	31.7	0.00	0.00			252	
272		7.27		7.25	34.022	26.618	145.9	0.562	2.03	88.8		30.1		48.6	2.38	32.4	0.00	0.00			274	05
300	ISL	6.99	D	6.96	34.070	D 26.695	138.9	0.602	1.54	D 66.8	D	22.6		53.2	2.55	34.4	0.00	0.00			302	
321		6.86		6.83	34.088	26.728	136.1	0.631	1.27	D 55.1	D	18.6		56.7	2.67	35.8	0.00	0.00			324	04
381		6.31		6.27	34.123	26.829	127.0	0.710	0.90	39.1		13.0		65.9	2.86	38.2	0.00	0.00			384	03
400	ISL	6.17	D	6.14	34.130	D 26.852	125.0	0.735	0.83	D 36.1	D	12.0		67.7	2.90	38.5	0.00	0.00			403	
440		6.08		6.05	34.179	26.904	120.6	0.783	0.58	D 25.1	D	8.3		71.6	2.98	39.2	0.00	0.00			444	02
500	ISL	5.90	D	5.85	34.238	D 26.974	114.7	0.856	0.38	D 16.7	D	5.5		77.6	3.07	40.3	0.00	0.00			504	
516		5.82		5.77	34.247	26.992	113.2	0.872	0.35	15.1		5.0		79.2	3.10	40.6	0.00	0.00			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 1802 STATION 80.0 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 8.8 N	123 13.3 W	08/02/2018	1039	UTC	4232 m	070 04 kn			1022.8 mb	12.4 C	11.1 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		15.60		15.60		33.467		24.658	327.3	0.000	5.78		252.5		101.9		2.1	0.21	0.0	0.01	0.00	0.15	0.05	0	
2		15.60		15.60		33.467		24.659	327.3	0.007	5.78		252.5		101.9		2.1	0.21	0.0	0.00	0.00	0.15	0.05	2	22
10		15.61		15.60		33.468		24.660	327.5	0.033	5.78		252.6		102.0		1.9	0.19	0.0	0.00	0.00	0.15	0.07	10	20
10		15.61		15.60		33.465		24.658	327.7	0.031														10	21
20		15.61		15.60		33.465		24.658	328.0	0.066	5.75		251.2		101.4		1.9	0.19	0.0	0.00	0.00	0.15	0.06	20	19
30		15.52		15.52		33.452		24.667	327.5	0.098	5.77	D	251.6	D	101.6		1.9	0.20	0.0	0.00	0.00	0.23	0.10	30	18
40		14.74		14.73		33.389	D	24.790	316.1	0.128	5.89	D	256.8	D	102.0									40	17
50		14.52		14.51		33.392		24.840	311.6	0.162	5.91		258.1		101.9		2.4	0.24	0.0	0.00	0.00	0.58	0.26	50	15
50		14.52		14.51		33.392		24.841	311.6	0.161														50	16
60		14.34		14.33		33.395		24.881	308.0	0.193	5.80	D	252.6	D	99.5		2.7	0.33	0.2	0.20	0.00	0.49	0.26	60	14
70		13.95		13.94		33.410		24.973	299.5	0.223	5.66	D	246.8	D	96.5		3.1	0.35	1.5	0.18	0.00	0.33	0.22	71	13
75	ISL	13.34	D	13.33		33.412	D	25.099	287.6	0.236	5.48	D	238.9	D	92.3		4.0	0.45	3.2	0.14	0.00	0.27	0.19	76	
86		12.12		12.11		33.386		25.318	266.9	0.269	5.24	D	228.3	D	85.9		6.0	0.68	6.8	0.05	0.00	0.14	0.13	87	12
100		11.22		11.21		33.434		25.521	247.8	0.305	5.21		227.3		83.8		6.2	0.68	7.0	0.03	0.00	0.09	0.09	101	11
120		10.37		10.36		33.577		25.783	223.2	0.352	4.08		178.0		64.4		15.4	1.33	16.9	0.00	0.00	0.02	0.04	121	10
125	ISL	10.28	D	10.26		33.603	D	25.819	219.9	0.362	3.98	D	173.1	D	62.7		16.8	1.40	17.9	0.00	0.00	0.02	0.04	126	
140		9.71		9.70		33.690		25.982	204.6	0.395	3.56		155.6		55.6		20.9	1.61	21.0	0.00	0.00	0.01	0.04	141	09
150	ISL	9.48	D	9.46		33.777	D	26.090	194.5	0.414	3.63	D	157.8	D	56.3		22.3	1.63	21.6	0.00	0.00	0.01	0.03	151	
170		9.22		9.20		33.857		26.194	185.0	0.453	3.51	D	152.9	D	54.3		24.9	1.68	22.7	0.00	0.00	0.00	0.02	171	08
200		8.70		8.68		33.949		26.349	170.8	0.506	3.03		132.3		46.3		31.2	1.89	25.6	0.00	0.00	0.00	0.03	202	07
230		8.12		8.09		33.986		26.467	159.9	0.556	2.83	D	123.3	D	42.7		36.9	2.04	27.7	0.00	0.00			232	06
250	ISL	7.78	D	7.75		33.995	D	26.525	154.6	0.588	2.77	D	120.3	D	41.3		40.4	2.13	29.1	0.00	0.00			252	
270		7.49		7.46		33.996		26.568	150.7	0.618	2.46		107.5		36.6		43.9	2.22	30.5	0.00	0.00			272	05
300	ISL	7.06	D	7.03		34.006	D	26.635	144.6	0.663	2.29	D	99.4	D	33.6		50.2	2.39	32.7	0.00	0.00			302	
320		6.79		6.76		34.023		26.687	139.8	0.691	1.84	D	80.1	D	26.9		54.4	2.51	34.1	0.00	0.00			323	04
381		6.53		6.49		34.133		26.809	129.1	0.773	0.94		40.9		13.6		63.7	2.85	37.2	0.00	0.00			384	03
400	ISL	6.29	D	6.25		34.132	D	26.839	126.3	0.799	0.85	D	37.0	D	12.3		66.9	2.89	37.9	0.00	0.00			403	
441		5.98		5.94		34.156		26.899	121.0	0.847	0.65	D	28.4	D	9.4		73.8	2.99	39.3	0.00	0.00			445	02
500	ISL	5.76	D	5.72		34.223	D	26.979	114.1	0.920	0.41	D	17.9	D	5.9		79.5	3.09	40.4	0.00	0.00			504	
516		5.64		5.59		34.217		26.989	113.1	0.935	0.41		17.7		5.8		81.1	3.12	40.6	0.00	0.00			520	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED 02;

RV BELL M SHIMADA CALCOFI CRUISE 1802 STATION 80.0 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 49.2 N	123 54.2 W	08/02/2018	0534	UTC	4384 m	080 04 kn			1023.4 mb	13.7 C	11.9 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		16.24		16.24		33.556		24.584	334.4	0.000	5.66		247.1		101.1		1.8	0.23	0.0	0.00	0.00	0.11	0.03	0	
2		16.24		16.23		33.556		24.584	334.4	0.007	5.66		247.1		101.1		1.8	0.23	0.0	0.00	0.00	0.11	0.03	2	22
10		16.21		16.21		33.546		24.584	334.7	0.034	5.68		248.0		101.4		1.8	0.23	0.0	0.00	0.00	0.11	0.05	10	20
10		16.21		16.21		33.549		24.586	334.5	0.034														10	21
20	ISL	16.19	D	16.19		33.546	D	24.588	334.7	0.064	5.68	D	247.4	D	101.3		1.8	0.24	0.0	0.00	0.00	0.11	0.04	20	
25		16.19		16.19		33.549		24.591	334.6	0.084	5.67		247.7		101.2		1.8	0.24	0.0	0.00	0.00	0.11	0.03	25	19
30	ISL	16.19	D	16.18		33.546	D	24.590	334.9	0.098	5.67	D	247.2	D	101.2		1.8	0.23	0.0	0.00	0.00	0.12	0.03	30	
40		16.19		16.18		33.562		24.604	333.9	0.134	5.68	D	247.5	D	101.3		1.8	0.22	0.0	0.00	0.00	0.13	0.04	40	18
50		16.18		16.17		33.546		24.593	335.3	0.167	5.67	D	247.1	D	101.1		1.8	0.22	0.0	0.00	0.00	0.15	0.04	50	17
63		16.17		16.16		33.548		24.598	335.3	0.211	5.67		247.5		101.1		1.8	0.22	0.0	0.00	0.00	0.16	0.06	64	16
75		16.06		16.05		33.536		24.613	334.3	0.251	5.66	D	246.8	D	100.8		1.8	0.23	0.0	0.00	0.00	0.24	0.09	76	15
87		15.41		15.40		33.499		24.731	323.4	0.291	5.67		247.5		99.6		2.2	0.27	0.2	0.10	0.00	0.33	0.20	88	13
87		15.41		15.40		33.500		24.732	323.3	0.290														88	14
100		13.38		13.36		33.457		25.129	285.6	0.330	5.52		241.2		93.0		3.8	0.43	2.6	0.07	0.00	0.19	0.15	101	12
112		12.73		12.72		33.456		25.255	273.7	0.364	5.23	D	228.0	D	87.0		5.1	0.57	5.0	0.03	0.00	0.15	0.12	113	11
125		11.92		11.91		33.477		25.427	257.6	0.398	5.01		218.8		81.8		6.9	0.71	7.5	0.00	0.00	0.10	0.11	126	10
140		11.46		11.44		33.512		25.541	247.0	0.436	4.75		207.3		76.8		9.4	0.89	10.5	0.00	0.00	0.05	0.07	141	09
150	ISL	11.04	D	11.02		33.554	D	25.650	236.8	0.460	4.55	D	198.1	D	73.0		12.7	1.08	13.4	0.00	0.00	0.04	0.06	151	
171		9.82		9.80		33.682		25.960	207.4	0.507	3.88	D	168.7	D	60.6		19.7	1.47	19.4	0.00	0.00	0.01	0.03	172	08
200		9.09		9.06		33.846		26.208	184.3	0.563	3.35		146.1		51.5		26.5	1.73	23.3	0.00	0.00	0.00	0.02	202	07
231		8.66		8.64		33.940		26.349	171.4	0.619	2.92	D	127.0	D	44.5		31.9	1.93	26.0	0.00	0.00			233	06
250	ISL	8.55	D	8.53		33.961	D	26.383	168.6	0.653	2.82	D	122.7	D	42.9		34.4	2.03	27.3	0.00	0.00			252	
271		8.38		8.35		34.040		26.472	160.4	0.685	2.30		100.2		34.8		37.1	2.14	28.7	0.00	0.00			273	05
300	ISL	7.79	D	7.76		34.061	D	26.577	150.7	0.733	1.86	D	81.1	D	27.9		43.7	2.35	31.3	0.00	0.00			302	
321		7.60		7.57		34.098		26.632	145.7	0.761	1.49	D	64.7	D	22.2		48.5	2.51	33.2	0.00	0.00			324	04
380		7.00		6.97		34.141		26.752	134.9	0.844	1.00		43.6		14.7		58.4	2.75	36.0	0.00	0.00			383	03
400	ISL	6.81	D	6.78		34.151	D	26.786	131.9	0.875	0.86	D	37.5	D	12.6		61.2	2.81	36.6	0.00	0.00			403	
440		6.56		6.52		34.182		26.845	126.7	0.922	0.65	D	28.4	D	9.5		66.7	2.92	37.9	0.00	0.00			444	02
500	ISL	6.11	D	6.07		34.234	D	26.944	117.8	1.001	0.42	D	18.1	D	6.0		74.7	3.06	39.6	0.00	0.00			504	
515		6.01		5.96		34.240		26.963	116.1	1.013	0.39		16.9		5.6		76.7	3.09	40.0	0.00	0.00			519	01

D) CTD DATA USED ON STANDARD LEVELS AND MISSING FIELDS; PRIMARY T; PRIMARY CORRECTED SALINITY; PRIMARY CRUISE-CORRECTED 02;

RV BELL M SHIMADA CALCOFI CRUISE 1802 STATION 81.8 46.9

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 16.6 N	120 1.5 W	06/02/2018	1448	UTC	578 m	110 10 kn			1014.9 mb	12.8 C	11.8 C	10 m			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	14.61	14.61	33.503	24.903	304.0	0.000	6.51	284.2	112.5	0.5	0.18	0.0	0.02	0.04	2.05	0.45	0	
1	14.61	14.61	33.503	24.903	304.0	0.003	6.51	284.2	112.5	0.5	0.18	0.0	0.00	0.00	2.05	0.45	1	24
10	14.48	14.48	33.509	24.936	301.2	0.030	6.53	285.1	112.6	0.2	0.17	0.0	0.00	0.00	2.51	0.69	10	22
10	14.48	14.48	33.507	24.935	301.3	0.030											10	23
20	14.14	14.14	33.507	25.006	294.8	0.060	6.28	274.2	107.5	0.4	0.23	0.0	0.03	0.00	4.83	1.43	20	21
30	13.82	13.82	33.516	25.079	288.2	0.089	5.46	238.6	92.9	4.2	0.50	3.1	0.13	0.34	2.53	1.46	30	20
40	13.40	13.39	33.520	25.169	279.9	0.118	5.33	232.7	89.8	5.1	0.59	4.3	0.14	0.39	0.99	2.44	40	19
50	13.13	13.12	33.524	25.227	274.6	0.145	5.04	220.0	84.5	6.9	0.70	6.2	0.19	0.33	1.68	1.00	50	18
60	13.05	13.04	33.521	25.241	273.6	0.173	5.00	218.3	83.7	7.3	0.73	6.7	0.22	0.33	1.13	0.70	60	17
70	12.60	12.59	33.521	25.329	265.5	0.200	4.56	199.0	75.6	10.0	0.91	9.6	0.34	0.12	0.86	0.71	71	16
75 ISL	12.05 D	12.04	33.532 D	25.443	254.7	0.213	4.12 D	179.5 D	67.5	11.5	1.02	11.3	0.25	0.00	0.68	0.60	76	
85	11.45	11.44	33.546	25.566	243.2	0.238	3.54 D	154.2 D	57.3	14.5	1.25	14.5	0.07	0.00	0.34	0.36	86	15
100	10.65	10.63	33.667	25.805	220.7	0.272	3.13	136.6	49.8	20.0	1.58	19.7	0.05	0.00	0.08	0.16	101	14
120	10.13	10.12	33.783	25.984	204.1	0.315	2.73	119.4	43.1	23.9	1.78	22.7	0.04	0.00	0.04	0.12	121	13
125 ISL	10.03 D	10.02	33.824 D	26.034	199.5	0.325	2.58 D	112.3 D	40.6	24.8	1.82	23.1	0.00	0.00	0.04	0.12	126	
140	9.85	9.83	33.879	26.108	192.7	0.354	2.39	104.1	37.4	27.3	1.92	24.6	0.00	0.00	0.05	0.10	141	12
150 ISL	9.76 D	9.74	33.930 D	26.163	187.7	0.374	2.23 D	97.1 D	34.9	28.7	1.97	25.3	0.00	0.00	0.04	0.10	151	
170	9.45	9.43	33.998	26.268	178.1	0.410	2.08	90.5	32.2	31.6	2.08	26.7	0.00	0.00	0.02	0.10	171	11
200	9.33	9.31	34.061	26.338	172.2	0.463	1.80	78.4	27.8	33.0	2.19	27.7	0.00	0.00	0.02	0.09	202	10
230	9.00	8.97	34.127	26.443	162.7	0.513	1.39	60.8	21.4	41.1	2.35	29.3	0.03	0.00			232	09
250 ISL	8.78 D	8.75	34.168 D	26.510	156.7	0.547	1.02 D	44.3 D	15.6	44.0	2.46	30.4	0.00	0.00			252	
270	8.59	8.56	34.174	26.545	153.6	0.576	0.89	38.9	13.6	46.9	2.56	31.6	0.00	0.00			272	08
300 ISL	8.25 D	8.22	34.199 D	26.617	147.3	0.623	0.71 D	31.0 D	10.8	52.8	2.68	32.6	0.00	0.00			302	
320	7.97	7.94	34.208	26.666	142.8	0.650	0.55	24.1	8.3	56.8	2.76	33.4	0.00	0.00			323	07
380	7.32	7.28	34.223	26.773	133.2	0.733	0.36	15.9	5.4	67.6	2.90	33.7	0.00	0.00			383	06
400 ISL	7.15 D	7.11	34.234 D	26.805	130.4	0.763	0.30 D	12.9 D	4.4	72.2	2.96	33.0	0.00	0.00			403	
440	6.88	6.84	34.242	26.850	126.6	0.811	0.16	6.8	2.3	81.5	3.07	31.5	0.00	0.00			444	05
480	6.69	6.65	34.249	26.881	124.1	0.861	0.20	8.5	2.9	85.4	3.14	30.2	0.00	0.00			484	04
500 ISL	6.67 D	6.62	34.253 D	26.888	123.8	0.890	0.04 D	1.8 D	0.6	93.3	3.29	26.3	0.00	0.00			504	
517	6.62	6.57	34.252	26.895	123.4	0.907	0.04	1.6	0.5	99.9	3.42	22.9	0.00	0.00			521	03
565	6.53	6.48	34.254	26.908	122.7	0.966	0.03	1.5	0.5	95.8	3.24	28.1	0.00	0.00			570	02
570	6.53	6.48	34.255	26.909	122.7	0.972	0.04	1.6	0.5	94.8	3.25	28.2	0.03	0.00			575	01

A) SANTA BARBARA BASIN STATION.
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 1802 STATION 83.3 40.6

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 13.5 N	119 25.1 W	06/02/2018	0902	UTC	40 m	130 10 kn			1013.7 mb	12.0 C	11.6 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	14.67	14.67	33.488	24.878	306.4	0.000	6.48	282.8	112.1	0.5	0.20	0.0	0.01	0.04	3.59	0.72	0	
2	14.67	14.67	33.488	24.878	306.5	0.006	6.48	282.8	112.1	0.5	0.20	0.0	0.00	0.00	3.59	0.72	2	06
5	14.55	14.55	33.486	24.903	304.2	0.015	6.39 D	278.5 D	110.3	0.5	0.20	0.0	0.00	0.00	4.01	0.08	5	05
10	14.33	14.33	33.482	24.946	300.2	0.030	6.08	265.4	104.5	1.2	0.28	0.2	0.03	0.00	5.61	1.03	10	03
10	14.33	14.33	33.479	24.944	300.5	0.030											10	04
20	14.02	14.01	33.478	25.009	294.5	0.060	5.40	235.7	92.2	3.4	0.53	2.4	0.11	0.51	3.89	0.57	20	02
30	14.02	14.01	33.483	25.014	294.4	0.090	5.34	233.3	91.2	3.1	0.54	2.2	0.12	0.57	4.09	0.26	30	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 1802 STATION 83.3 42.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
34 10.6 N	119 30.6 W	06/02/2018	1049	UTC	161 m	120 08 kn			1013.7 mb	12.4 C	11.9 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	15.03	15.03	33.505	24.815	312.4	0.000	6.32	275.9	110.1	0.5	0.18	0.0	0.01	0.01	1.46	0.48	0	
2	15.03	15.02	33.505	24.815	312.4	0.006	6.32	275.9	110.1	0.5	0.18	0.0	0.00	0.00	1.46	0.48	2	12
10	14.85	14.84	33.501	24.852	309.2	0.031	6.37	278.2	110.6	0.5	0.18	0.0	0.00	0.00	3.10	0.70	10	10
10	14.85	14.84	33.502	24.852	309.2	0.031											10	11
20	14.35	14.35	33.505	24.961	299.1	0.062	6.18	269.7	106.2	0.9	0.29	0.0	0.00	0.12	7.79	0.51	20	09
30	14.06	14.05	33.507	25.024	293.4	0.091	5.80	253.1	99.1	2.5	0.38	1.6	0.06	0.17	6.68	0.28	30	07
30	14.06	14.05	33.508	25.025	293.3	0.092											30	08
50 ISL	12.18 D	12.17	33.467 D	25.368	261.1	0.145	4.17 D	181.7 D	68.5	10.5	1.03	11.2	0.05	0.00	0.67	0.21	50	
51	12.10	12.09	33.475	25.389	259.1	0.149	4.15	181.0	68.0	10.9	1.06	11.7	0.05	0.00	0.37	0.20	51	06
75	11.02	11.01	33.595	25.682	231.9	0.208	3.45	150.6	55.3	17.0	1.43	17.7	0.03	0.00	0.06	0.09	76	05
100 ISL	10.54 D	10.52	33.690 D	25.842	217.2	0.263	3.07 D	133.6 D	48.7	20.5	1.63	20.5	0.00	0.00	0.05	0.08	101	
101	10.53	10.52	33.694	25.846	216.8	0.266	3.06	133.4	48.5	20.6	1.64	20.6	0.00	0.00	0.05	0.08	102	04
120	10.13	10.12	33.795	25.994	203.1	0.306	2.74	119.8	43.2	24.0	1.80	22.8	0.03	0.00	0.03	0.09	121	03
125 ISL	10.07 D	10.05	33.807 D	26.014	201.3	0.316	2.71 D	118.1 D	42.7	24.1	1.81	22.9	0.03	0.00	0.03	0.08	126	
139	10.08	10.07	33.807	26.012	201.9	0.345	2.72	118.8	42.8	24.3	1.83	23.1	0.03	0.00	0.04	0.07	140	02
150	10.10	10.08	33.808	26.012	202.2	0.367	2.77	120.7	43.5	25.0	1.84	23.2	0.03	0.00	0.03	0.07	151	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 1802 STATION 83.3 51.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 52.8 N	120 8.1 W	06/02/2018	2008	UTC	101 m	100 07 kn	290 01 05	0	1017.1 mb	14.4 C	12.4 C	14 m	0/8		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		15.21		15.21		33.513		24.781		315.6	0.000	6.23		271.9		108.9		0.3	0.17	0.0	0.01	0.00	1.26	0.30	0	
1		15.21		15.21		33.513		24.782		315.6	0.003	6.23		271.9		108.9		0.3	0.17	0.0	0.00	0.00	1.26	0.30	1	11
5		15.14		15.14		33.511		24.795		314.5	0.016	6.21		271.0		108.4		0.3	0.17	0.0	0.00	0.00	1.20	0.44	5	10
10		14.75		14.75		33.511		24.879		306.6	0.031	6.22		271.6		107.8		0.5	0.21	0.0	0.00	0.00	2.17	0.58	10	08
10		14.75		14.75		33.510		24.878		306.7	0.032														10	09
20		13.85		13.84		33.500		25.062		289.5	0.061	5.89		257.0		100.1		2.2	0.41	1.9	0.07	0.17	3.08	1.24	20	07
30		13.19		13.19		33.499		25.194		277.2	0.089	5.01		218.6		84.0		6.7	0.71	6.4	0.11	0.13	2.38	0.93	30	06
41		12.52		12.52		33.517		25.340		263.6	0.119	4.53		197.6		74.9		9.9	0.92	9.7	0.11	0.13	1.20	0.70	41	05
50		11.94		11.94		33.550		25.477		250.8	0.142	4.11		179.4		67.2							0.64	0.47	50	04
61		11.23		11.23		33.595		25.643		235.2	0.169	3.71		162.1		59.8		16.1	1.36	15.9	0.08	0.00	0.30	0.26	61	03
70		10.78		10.77		33.683		25.792		221.2	0.189	3.29		143.7		52.5		20.0	1.57	18.8	0.07	0.00	0.18	0.25	71	02
75	ISL	10.49	D	10.48		33.722	D	25.874		213.5	0.200	3.16	D	137.6	D	50.2		20.8	1.62	19.4	0.07	0.00	0.16	0.24	76	
90		10.35		10.34		33.766		25.933		208.3	0.232	2.94		128.4		46.6		23.2	1.75	21.3	0.06	0.00	0.10	0.23	91	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 1802 STATION 83.3 55.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 45.0 N	120 24.8 W	06/02/2018	2259	UTC	986 m	110 06 kn	350 06 14	0	1015.9 mb	15.0 C	12.7 C	21 m	0/8		028

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		14.89		14.89		33.474		24.819		312.0	0.000	5.96		260.5		103.7		3.0	0.27	0.1	0.03	0.04	0.39	0.17	0	
2		14.89		14.89		33.474		24.819		312.0	0.006	5.96		260.5		103.7		3.0	0.27	0.1	0.03	0.00	0.39	0.17	2	23
10		14.75		14.75		33.471		24.848		309.6	0.031	5.99		261.6		103.8		2.5	0.26	0.0	0.00	0.07	0.51	0.19	10	20
10		14.75		14.75		33.479		24.854		309.0	0.031														10	22
10		14.75		14.75		33.469		24.846		309.7	0.031														10	21
20		14.67		14.67		33.472		24.867		308.1	0.062	5.97		260.8		103.3		2.5	0.26	0.0	0.00	0.00	0.58	0.20	20	19
30		14.58		14.58		33.466		24.882		307.0	0.093	5.93	D	258.4	D	102.4		2.5	0.26	0.0	0.04	0.07	0.71	0.26	30	17
30		14.58		14.58		33.464		24.881		307.1	0.092														30	18
40		14.38		14.38		33.470		24.928		302.9	0.123	5.82	D	253.8	D	100.2		2.7	0.30	0.5	0.08	0.14	0.37	0.46	40	16
50		13.89		13.88		33.501		25.055		291.1	0.153	5.69		248.6		97.0		3.4	0.41	2.0	0.15	0.25	0.57	0.33	50	15
60		11.97		11.96		33.445		25.391		259.2	0.181	4.91	D	214.0	D	80.4		7.5	0.80	8.4	0.16	0.00	0.22	0.28	60	14
70		11.03		11.02		33.515		25.618		237.8	0.205	4.19		183.1		67.2		12.9	1.20	14.7	0.04	0.00	0.09	0.13	71	13
75	ISL	10.99	D	10.98		33.525	D	25.633		236.5	0.215	4.17	D	181.7	D	66.8		13.2	1.22	14.9	0.04	0.00	0.08	0.12	76	
86		10.83		10.82		33.532		25.667		233.5	0.243	4.06	D	176.8	D	64.8		14.0	1.25	15.5	0.04	0.00	0.05	0.12	87	12
100	ISL	10.24	D	10.23		33.631	D	25.847		216.7	0.273	3.87	D	168.4	D	61.0		17.3	1.41	18.2	0.03	0.00	0.02	0.12	101	
101		10.08		10.07		33.633		25.874		214.0	0.277	3.83		167.4		60.3		17.6	1.42	18.4	0.03	0.00	0.02	0.12	102	11
121		9.42		9.41		33.823	D	26.134		189.7	0.315	3.26	D	141.8	D	50.5									122	10
125	ISL	9.30	D	9.28		33.851	D	26.175		185.8	0.323	3.17	D	137.9	D	49.0		23.2	1.66	22.0	0.00	0.00	0.02	0.08	126	
140		9.20		9.19		33.863		26.201		183.7	0.353	3.06	D	133.1	D	47.2		26.7	1.81	24.2	0.00	0.00	0.01	0.05	141	09
150	ISL	9.13	D	9.11		33.889	D	26.234		180.8	0.369	2.97	D	129.3	D	45.8		28.9	1.92	25.3	0.00	0.00	0.01	0.05	151	
170		8.99		8.98		34.011		26.351		170.1	0.406	2.20	D	95.7	D	33.8		33.4	2.13	27.4	0.00	0.00	0.02	0.05	171	08
200		8.85		8.83		34.098		26.442		162.1	0.456	1.91		83.3		29.3		36.4	2.24	28.6	0.00	0.00	0.02	0.06	202	07
230		8.59		8.56		34.136		26.514		155.7	0.503	1.51	D	65.5	D	22.9		40.8	2.41	30.3	0.00	0.00			232	06
250	ISL	8.50	D	8.48		34.172	D	26.556		152.2	0.534	1.34	D	58.2	D	20.4		43.1	2.50	31.0	0.00	0.00			252	
270		8.36		8.33		34.208		26.608		147.6	0.564	1.12		48.9		17.0		45.3	2.58	31.8	0.00	0.00			272	05
300	ISL	8.02	D	7.98		34.218	D	26.667		142.3	0.608	0.96	D	41.8	D	14.5		48.6	2.64	32.7	0.00	0.00			302	
321		7.97		7.94		34.246	D	26.696		140.0	0.638	0.83	D	36.3	D	12.5		50.9	2.69	33.3	0.00	0.00			324	04
380		7.26		7.23		34.236		26.791		131.5	0.717	0.64		28.1		9.5		60.3	2.85	35.9	0.00	0.00			383	03
400	ISL	7.20	D	7.16		34.249	D	26.811		129.9	0.745	0.62	D	27.1	D	9.2		62.3	2.88	36.5	0.00	0.00			403	
441		6.74		6.70		34.243		26.869		124.7	0.796	0.52	D	22.8	D	7.7		66.4	2.94	37.5	0.00	0.00			445	02
500	ISL	6.25	D	6.20		34.269	D	26.956		116.9	0.870	0.40	D	17.3	D	5.8									504	
517		6.13		6.09		34.281	D	26.980		114.7	0.889	0.37	D	16.0	D	5.3									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 1802 STATION 83.3 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 34.5 N	120 45.2 W	07/02/2018	0311	UTC	1381 m	090 01 kn			1017.7 mb	13.7 C	12.5 C				029

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		15.03		15.03		33.469		24.786		315.1	0.000	5.91		257.9		102.9		2.5	0.26	0.1	0.02	0.07	0.24	0.05	0	
2		15.03		15.03		33.469		24.787		315.2	0.006	5.91		257.9		102.9		2.5	0.26	0.1	0.00	0.07	0.24	0.05	2	21
10		14.90		14.90		33.457		24.805		313.7	0.032	5.93		258.8		103.0		2.1	0.24	0.0	0.00	0.00	0.23	0.07	10	19
10		14.90		14.90		33.459		24.807		313.5	0.030														10	20
20		14.78		14.78		33.478		24.847		310.0	0.063	5.95		259.9		103.2		2.2	0.24	0.0	0.00	0.00	0.35	0.12	20	18
30		14.40		14.40		33.468		24.921		303.2	0.093	6.00	D	261.6	D	103.3		2.6	0.25	0.0	0.00	0.00	0.66	0.24	30	17
40		14.31		14.30		33.471		24.945		301.3	0.124	5.79	D	252.1	D	99.4		2.6	0.30	0.4	0.09	0.15	0.78	0.25	40	16
50		14.27		14.27		33.481		24.960		300.1	0.154	5.81		253.9		99.8		2.7	0.30	0.5	0.08	0.20	0.67	0.27	50	15
60		13.40		13.39		33.445		25.113		285.9	0.183	5.28	D	229.9	D	88.9		4.1	0.48	3.2	0.26	0.12	0.23	0.12	60	14
70		11.94		11.93		33.433		25.388		259.8	0.210	4.72		206.0		77.1		8.3	0.88	9.9	0.07	0.00	0.22	0.13	71	13
75	ISL	11.22	D	11.21		33.458	D	25.539		245.5	0.222	4.54	D	197.6	D	73.0		9.7	0.99	11.5	0.06	0.00	0.19	0.12	76	
85		10.87		10.86		33.480		25.619		238.0	0.247	4.17	D	181.6	D	66.6		12.5	1.20	14.9	0.05	0.00	0.12	0.10	86	12
100		10.02		10.01		33.629		25.882		213.2	0.281	3.64		159.1		57.2		18.9	1.52	19.9	0.03	0.00	0.06	0.07	101	11
120		9.55		9.54		33.771	D	26.072		195.6	0.321	3.35	D	145.9	D	52.1									121	10
125	ISL	9.51	D	9.50		33.785	D	26.089		194.0	0.330	3.30	D	143.8	D	51.3		23.9	1.70	22.6	0.04	0.00	0.03	0.05	126	
140		9.23		9.21		33.868		26.201		183.7	0.362	3.05		133.1		47.1		27.0	1.81	24.3	0.04	0.00	0.01	0.04	141	09
150	ISL	8.96	D	8.95		33.931	D	26.292		175.2	0.377	2.88	D	125.3	D	44.2		28.3	1.85	24.8	0.02	0.00	0.01	0.04	151	
170		8.79		8.77		33.950		26.334		171.6	0.415	2.67	D	116.2	D	40.9		31.1	1.94	26.0	0.00	0.00	0.00	0.04	171	08
200		8.56		8.54		34.034		26.437		162.3	0.465	2.24		97.8		34.1		35.9	2.15	28.4	0.00	0.00	0.00	0.03	202	07
229		8.10		8.08		34.096		26.555		151.5	0.510	1.77	D	76.8	D	26.6		42.5	2.36	30.8	0.00	0.11			231	06
250	ISL	7.92	D	7.90		34.122	D	26.604		147.2	0.539	1.51	D	65.7	D	22.7		45.5	2.43	31.8	0.00	0.00			252	
270		7.69		7.66		34.128		26.642		143.9	0.571	1.42		62.0		21.2		48.5	2.50	32.7	0.00	0.00			272	05
300	ISL	7.26	D	7.23		34.134	D	26.709		137.7	0.611	1.20	D	52.0	D	17.7		54.3	2.66	34.7	0.00	0.00			302	
320		6.99		6.96		34.168		26.773		131.9	0.640	0.87	D	37.6	D	12.7		58.2	2.76	36.0	0.00	0.00			323	04
380		6.51		6.48		34.222		26.882		122.2	0.716	0.57		25.1		8.3		67.8	2.93	38.1	0.00	0.00			383	03
400	ISL	6.43	D	6.40		34.242	D	26.908		120.0	0.740	0.50	D	21.8	D	7.3		70.2	2.97	38.4	0.00	0.00			403	
440		6.21		6.17		34.272		26.961		115.4	0.787	0.37	D	16.1	D	5.3		75.0	3.04	39.2	0.00	0.00			444	02
500	ISL	5.86	D	5.82		34.307	D	27.033		109.1	0.855	0.28	D	12.1	D	4.0		79.7	3.13	40.2	0.00	0.00			504	
515		5.84		5.79		34.307		27.036		109.0	0.871	0.28		12.0		4.0		80.8	3.15	40.5	0.00	0.00			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 1802 STATION 83.3 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 14.5 N	121 26.7 W	07/02/2018	0832	UTC	3803 m	050 03 kn			1019.8 mb	13.8 C	12.8 C				030

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		15.30		15.30		33.439	24.704	323.0	0.000	5.81		253.8		101.8		2.0	0.27	0.0	0.00	0.05	0.14	0.04	0	
2		15.30		15.30		33.439	24.704	323.0	0.007	5.81		253.8		101.8		2.0	0.27	0.0	0.00	0.05	0.14	0.04	2	21
10		15.24		15.23		33.438	24.718	321.9	0.032	5.82		254.3		101.9		2.0	0.24	0.0	0.00	0.00	0.14	0.04	10	19
10		15.24		15.23		33.435	24.716	322.2	0.032														10	20
19		14.72		14.72		33.415	24.812	313.3	0.061	5.94		259.5		102.9		2.4	0.30	0.0	0.00	0.08	0.28	0.10	19	18
20	ISL	14.58	D	14.58		33.417	D 24.843	310.4	0.061	5.92	D	257.8	D	102.1		2.4	0.31	0.2	0.00	0.08	0.29	0.11	20	
30	ISL	13.92	D	13.91		33.377	D 24.953	300.2	0.092	5.68	D	247.5	D	96.7		3.0	0.39	1.7	0.00	0.05	0.39	0.15	30	
31		13.89		13.89		33.380	24.960	299.6	0.098	5.67	D	247.1	D	96.5		3.1	0.40	1.9	0.16	0.05	0.40	0.16	31	17
40		13.25		13.25		33.365	25.079	288.5	0.124	5.55	D	241.8	D	93.2		3.8	0.50	3.3	0.07	0.00	0.40	0.21	40	16
49		12.71		12.70		33.358	25.182	278.9	0.150	5.46		238.4		90.6		4.5	0.58	4.6	0.06	0.16	0.36	0.18	49	15
50	ISL	12.65	D	12.64		33.359	D 25.193	277.8	0.150	5.47	D	238.1	D	90.6		4.6	0.59	4.8	0.06	0.00	0.35	0.18	50	
60		12.23		12.22		33.378	25.290	268.9	0.180	5.26	D	229.2	D	86.5		5.6	0.68	6.3	0.04	0.00	0.26	0.16	60	14
70		11.65		11.65		33.437	25.444	254.5	0.206	4.98		217.5		80.9		7.3	0.80	8.6	0.03	0.00	0.17	0.13	71	13
75	ISL	11.42	D	11.41		33.440	D 25.489	250.2	0.216	4.84	D	210.6	D	78.1		8.8	0.91	10.2	0.00	0.00	0.14	0.11	76	
85		10.80		10.79		33.488	25.637	236.3	0.243	4.35	D	189.5	D	69.4		11.6	1.12	13.6	0.00	0.00	0.06	0.08	86	12
100		10.13		10.12		33.621	25.858	215.6	0.277	3.79		165.5		59.6		17.9	1.49	18.9	0.00	0.00	0.02	0.04	101	11
120		9.64		9.62		33.743	D 26.035	199.1	0.317	3.35	D	146.0	D	52.2									121	10
125	ISL	9.52	D	9.50		33.763	D 26.071	195.7	0.327	3.30	D	143.8	D	51.3		22.7	1.70	22.4	0.00	0.00	0.02	0.04	126	
141		9.24		9.22		33.829	26.169	186.7	0.359	3.05		132.9		47.0		25.8	1.84	24.6	0.00	0.00	0.02	0.04	142	09
150	ISL	9.09	D	9.07		33.870	D 26.225	181.6	0.374	3.00	D	130.5	D	46.2		27.2	1.88	25.3	0.00	0.00	0.01	0.04	151	
170		8.83		8.81		33.915	26.301	174.7	0.411	2.70		118.0		41.4		30.4	1.98	26.9	0.00	0.00	0.01	0.04	171	08
200	ISL	8.29	D	8.27		33.978	D 26.435	162.5	0.461	2.81	D	122.3	D	42.5		34.7	2.01	27.4	0.00	0.00	0.01	0.03	202	
201		8.29		8.27		33.983	26.438	162.2	0.463	2.80		122.3		42.4		34.9	2.01	27.4	0.00	0.00	0.01	0.03	203	07
231		7.90		7.87		34.027	26.532	153.7	0.511	2.15	D	93.6	D	32.3		40.5	2.26	30.5	0.00	0.00			233	06
250	ISL	7.63	D	7.61		34.038	D 26.580	149.3	0.539	2.03	D	88.4	D	30.3		44.1	2.34	31.6	0.00	0.00			252	
271		7.38		7.35		34.046	26.622	145.6	0.570	1.84		80.2		27.2		48.1	2.42	32.8	0.00	0.00			273	05
300	ISL	7.12	D	7.09		34.069	D 26.676	140.7	0.613	1.58	D	68.6	D	23.2		50.7	2.55	34.2	0.00	0.00			302	
320		6.98		6.95		34.090	26.713	137.5	0.640	1.34	D	58.2	D	19.7		52.4	2.64	35.2	0.00	0.00			323	04
380		6.41		6.38		34.131	26.822	127.8	0.719	0.86		37.3		12.4		64.0	2.84	37.8	0.00	0.00			383	03
400	ISL	6.12	D	6.08		34.136	D 26.864	123.8	0.746	0.79	D	34.5	D	11.4		68.5	2.89	38.7	0.00	0.00			403	
441		5.55		5.51		34.127	26.928	117.8	0.794	0.72	D	31.3	D	10.2		77.7	2.98	40.5	0.00	0.00			445	02
500	ISL	5.37	D	5.33		34.190	D 26.999	111.6	0.865	0.46	D	19.9	D	6.5		83.6	3.10	41.4	0.00	0.00			504	
516		5.42		5.38		34.226	27.022	109.7	0.879	0.36		15.7		5.1		85.2	3.13	41.6	0.00	0.00			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 1802 STATION 83.3 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 54.7 N	122 7.6 W	07/02/2018	1405	UTC	4183 m	110 06 kn			1020.6 mb	13.1 C	11.9 C				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		14.64		14.64		33.398	24.816	312.3	0.000	6.01		262.5		103.9		2.7	0.26	0.0	0.03	0.09	0.39	0.13	0	
2		14.64		14.64		33.398	24.816	312.3	0.006	6.01		262.5		103.9		2.7	0.26	0.0	0.03	0.09	0.39	0.13	2	21
10		14.64		14.64		33.394	24.813	312.9	0.031	6.03		263.4		104.3		2.4	0.25	0.0	0.00	0.05	0.42	0.15	10	19
10		14.64		14.64		33.395	D 24.811	312.9	0.032														10	20
20		14.41		14.41		33.413	24.877	307.1	0.062	6.08		265.3		104.5		2.6	0.25	0.0	0.03	0.00	0.43	0.19	20	18
30		14.04		14.04		33.416	24.956	299.9	0.093	6.09	D	265.1	D	103.9		2.8	0.27	0.1	0.07	0.00	0.60	0.29	30	17
39		13.93		13.93		33.417	24.980	297.9	0.120	5.95	D	259.1	D	101.3		3.0	0.33	0.7	0.15	0.26	0.50	0.28	39	16
50		13.83		13.82		33.426	25.010	295.4	0.152	5.85		255.7		99.5		3.2	0.37	1.3	0.23	0.32	0.38	0.22	50	15
60		13.62		13.61		33.417	25.046	292.2	0.182	5.72	D	249.1	D	96.8		3.5	0.43	2.1	0.26	0.26	0.30	0.25	60	14
70		12.89		12.88		33.377	25.162	281.4	0.210	5.34		233.2		89.0		4.8	0.60	5.2	0.07	0.00	0.16	0.14	71	13
75	ISL	12.39	D	12.38		33.389	D 25.269	271.3	0.222	5.35	D	233.1	D	88.2		4.7	0.58	5.0	0.06	0.00	0.15	0.14	76	
85		11.99		11.98		33.414	25.365	262.4	0.251	5.49	D	239.1	D	89.8		4.3	0.53	4.4	0.05	0.00	0.13	0.13	86	12
100		10.92		10.91		33.444	25.582	241.9	0.289	5.08		221.7		81.2		7.6	0.82	9.3	0.03	0.00	0.06	0.06	101	11
120		10.32		10.31		33.557	25.776	223.9	0.335	4.20		183.5		66.3		14.6	1.30	16.5	0.00	0.06	0.03	0.05	121	10
125	ISL	10.17	D	10.16		33.622	D 25.852	216.8	0.345	3.98	D	173.4	D	62.7		16.4	1.39	17.9	0.00	0.00	0.03	0.04	126	
140		9.66		9.64		33.726	26.020	201.0	0.378	3.44	D	149.7	D	53.6		21.8	1.66	22.1	0.00	0.00	0.02	0.04	141	09
150	ISL	9.38	D	9.36		33.797	D 26.121	191.6	0.397	3.33	D	144.8	D	51.5		23.2	1.70	22.7	0.00	0.00	0.02	0.03	151	
170		9.20		9.18		33.836	26.181	186.2	0.436	3.22	D	140.2	D	49.7		25.9	1.79	23.9	0.00	0.00	0.02	0.03	171	08
200	ISL	8.59	D	8.57		33.939	D 26.359	169.8	0.488	3.10	D	134.7	D	47.1		30.9	1.88	25.8	0.00	0.00	0.00	0.02	202	
201		8.54		8.52		33.940	26.366	169.1	0.491	3.08		134.6		46.9		31.1	1.88	25.8	0.00	0.00	0.00	0.02	203	07
229		8.00		7.97		33.995	26.493	157.4	0.536	2.63	D	114.5	D	39.6		37.7	2.10	28.8	0.00	0.00			231	06
250	ISL	7.74	D	7.71		34.009	D 26.542	153.0	0.569	2.47	D	107.4	D	36.9		41.6	2.20	30.1	0.00	0.00			252	
270		7.41		7.38		34.019	26.597	147.9	0.599	2.24		97.7		33.2		45.4	2.30	31.5	0.00	0.00			272	05
300	ISL	7.00	D	6.97		34.052	D 26.680	140.3	0.643	1.72	D	74.7	D	25.2		52.3	2.52	34.0	0.00	0.00			302	
320		6.77		6.74		34.070	26.726	136.1	0.670	1.39	D	60.5	D	20.3		56.9	2.66	35.6	0.00	0.00			323	04
381		6.10		6.06		34.110	26.846	125.2	0.750	0.99		43.1		14.2		66.6	2.84	38.0	0.00	0.00			384	03
400	ISL	6.04	D	6.00		34.136	D 26.874	122.8	0.775	0.78	D	34.1	D	11.3		69.7	2.89	38.7	0.00	0.00			403	
440		5.56		5.52		34.126	26.925	118.0	0.822	0.76	D	33.2	D	10.8		76.2	2.98	40.1	0.00	0.00			444	02
500	ISL	5.41	D	5.37		34.188	D 26.994	112.2	0.894	0.47	D	20.4	D	6.6		83.3	3.09	41.2	0.00	0.00			504	
516		5.31		5.27		34.196	27.012	110.5	0.909	0.44		19.2		6.2		85.1	3.12	41.5	0.00	0.00			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 1802 STATION 83.3 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 34.9 N	122 48.8 W	07/02/2018	1939	UTC	4262 m	090 05 kn	320 04 07	2	1023.2 mb	14.3 C	12.4 C	33 m	8/8	SC	032

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		16.21	16.21	33.524	24.566	336.1	0.000	5.68	247.9	101.3	1.8	0.22	0.0	0.01	0.01	0.14	0.03	0	
2		16.21	16.21	33.524	24.567	336.1	0.007	5.68	247.9	101.3	1.8	0.22	0.0	0.00	0.00	0.14	0.03	2	23
10		16.16	16.16	33.519	24.574	335.7	0.034	5.68	248.0	101.3	1.8	0.21	0.0	0.00	0.00	0.14	0.04	10	20
10		16.16	16.16	33.520	24.575	335.6	0.034											10	22
10		16.16	16.16	33.520	24.575	335.6	0.033											10	21
20	ISL	16.13 D	16.13	33.523 D	24.585	335.0	0.064	5.65 D	246.1 D	100.6	1.8	0.21	0.0	0.00	0.00	0.14	0.04	20	
25		16.12	16.12	33.519	24.583	335.4	0.084	5.68	248.1	101.2	1.8	0.21	0.0	0.00	0.00	0.14	0.04	25	19
30	ISL	16.12 D	16.11	33.524 D	24.589	335.0	0.098	5.65 D	246.4 D	100.7	1.7	0.21	0.0	0.00	0.00	0.15	0.04	30	
40		16.09	16.09	33.524	24.595	334.8	0.134	5.65 D	246.2 D	100.6	1.7	0.21	0.0	0.00	0.00	0.17	0.05	40	18
50		15.80	15.79	33.484	24.632	331.6	0.168	5.67 D	247.1 D	100.3	1.8	0.24	0.0	0.00	0.16	0.27	0.10	50	17
62		15.53	15.52	33.472	24.682	327.2	0.207	5.71	249.4	100.5	1.9	0.24	0.0	0.00	0.00	0.28	0.11	62	16
75		15.45	15.44	33.478	24.706	325.4	0.250	5.72 D	249.2 D	100.5	1.9	0.22	0.0	0.00	0.00	0.28	0.12	76	14
75		15.45	15.44	33.469	24.699	326.0	0.249											76	15
87		15.34	15.33	33.464	24.719	324.5	0.289	5.73	250.4	100.5	1.9	0.22	0.0	0.00	0.05	0.24	0.10	88	13
100		14.64	14.63	33.415	24.835	313.8	0.330	5.75	251.3	99.4	2.3	0.28	0.4	0.07	0.13	0.16	0.09	101	12
112		13.44	13.43	33.454	25.114	287.4	0.366	5.41 D	235.8 D	91.3	3.7	0.45	2.9	0.07	0.00	0.16	0.16	113	11
125		12.36	12.34	33.442 D	25.317	268.1	0.401	5.15 D	224.2 D	84.9								126	10
141		11.38	11.36	33.490 D	25.538	247.3	0.443	4.67 D	203.4 D	75.4								142	09
150	ISL	10.97 D	10.96	33.532 D	25.644	237.4	0.465	4.55 D	198.0 D	72.8	12.9	1.06	12.9	0.00	0.00	0.07	0.08	151	
171		9.94	9.92	33.639	25.906	212.7	0.512	3.90 D	169.6 D	61.0	17.9	1.40	18.5	0.00	0.00	0.01	0.03	172	08
200		9.28	9.26	33.774	26.121	192.6	0.571	3.56	155.4	55.0	23.2	1.63	22.1	0.00	0.00	0.00	0.02	202	07
230		8.62	8.60	33.918	26.337	172.4	0.626	2.92 D	127.1 D	44.5	30.7	1.91	26.1	0.00	0.00			232	06
250	ISL	8.23 D	8.21	33.984 D	26.449	162.1	0.660	2.56 D	111.6 D	38.7	34.9	2.04	27.9	0.00	0.00			252	
270		7.99	7.96	34.018	26.512	156.3	0.691	2.34	102.0	35.1	39.2	2.17	29.7	0.00	0.00			272	05
300	ISL	7.82 D	7.79	34.082 D	26.588	149.6	0.738	1.66 D	72.2 D	24.9	43.2	2.33	31.4	0.00	0.00			302	
320		7.75	7.71	34.080	26.598	149.0	0.768	1.58 D	68.9 D	23.7	45.9	2.44	32.6	0.00	0.00			323	04
380		7.02	6.98	34.138	26.747	135.4	0.853	0.97	42.4	14.3	56.9	2.72	36.0	0.00	0.00			383	03
400	ISL	6.88 D	6.84	34.168 D	26.790	131.6	0.881	0.81 D	35.1 D	11.8	60.2	2.79	36.7	0.00	0.00			403	
441		6.52	6.48	34.202	26.866	124.7	0.932	0.55 D	24.0 D	8.0	66.9	2.93	38.3	0.00	0.00			445	02
500	ISL	6.20 D	6.15	34.247 D	26.944	117.9	1.006	0.39 D	17.0 D	5.6	72.9	3.03	39.4	0.00	0.00			504	
518		6.08	6.03	34.246	26.958	116.7	1.025	0.37	16.1	5.3	74.8	3.06	39.8	0.00	0.00			522	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 1802 STATION 83.3 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 14.7 N	123 29.7 W	08/02/2018	0046	UTC	4158 m	110 02 kn	350 03 08	2	1021.5 mb	14.5 C	12.5 C		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		16.37	16.37	33.548	24.547	337.9	0.000	5.72	249.6	102.4	1.9	0.21	0.0	0.02	0.02	0.11	0.04	0	
2		16.37	16.37	33.548	24.548	337.9	0.007	5.72	249.6	102.4	1.9	0.21	0.0	0.00	0.00	0.11	0.04	2	23
10		16.27	16.26	33.543	24.568	336.2	0.034	5.68	247.8	101.4	1.6	0.21	0.0	0.00	0.00	0.10	0.04	10	20
10		16.27	16.26	33.545	24.570	336.1	0.034											10	22
10		16.27	16.26	33.543	24.568	336.2	0.034											10	21
20	ISL	16.25 D	16.25	33.543 D	24.573	336.2	0.064	5.67 D	247.0 D	101.2	1.6	0.20	0.0	0.00	0.00	0.09	0.04	20	
25		16.25	16.24	33.544	24.574	336.2	0.084	5.66	247.0	101.0	1.6	0.20	0.0	0.00	0.00	0.09	0.04	25	19
30	ISL	16.24 D	16.24	33.543 D	24.574	336.4	0.098	5.66 D	246.8 D	101.1	1.6	0.20	0.0	0.00	0.00	0.11	0.04	30	
40		16.23	16.23	33.546	24.580	336.2	0.135	5.66 D	246.9 D	101.1	1.6	0.20	0.0	0.00	0.00	0.13	0.04	40	18
50		16.20	16.19	33.538 D	24.583	336.2	0.166	5.66 D	246.8 D	101.0								50	17
62		16.17	16.16	33.537	24.590	336.0	0.208	5.64	246.1	100.5	1.6	0.20	0.0	0.00	0.00	0.17	0.07	62	16
75		16.04	16.02	33.529	24.614	334.1	0.252	5.65 D	246.1 D	100.4	1.6	0.21	0.0	0.00	0.00	0.31	0.14	76	15
87		15.67	15.66	33.515	24.687	327.6	0.292	5.66	247.3	100.0	1.8	0.23	0.0	0.05	0.00	0.41	0.20	88	13
87		15.67	15.66	33.520	24.691	327.2	0.291											88	14
100		14.67	14.65	33.653	25.013	296.9	0.332	5.60	244.6	97.0	2.6	0.26	0.7	0.05	0.00	0.32	0.23	101	12
112		13.76	13.74	33.637	25.190	280.2	0.367	5.48	239.3	93.1	3.2	0.33	1.9	0.04	0.00	0.19	0.15	113	11
125		12.79	12.77	33.584 D	25.346	265.5	0.402	5.28 D	230.0 D	87.9								126	10
140		11.72	11.71	33.562	25.531	248.0	0.441	4.95	216.3	80.6	7.6	0.75	8.4	0.03	0.06	0.04	0.05	141	09
150	ISL	10.97 D	10.95	33.579 D	25.682	233.8	0.465	4.63 D	201.7 D	74.2	10.8	0.96	11.7	0.00	0.00	0.03	0.05	151	
170		9.91	9.89	33.620	25.895	213.6	0.510	3.82 D	166.4 D	59.8	17.1	1.39	18.1	0.00	0.00	0.01	0.04	171	08
200		8.99	8.97	33.840	26.218	183.3	0.569	3.29	143.6	50.5	26.3	1.76	23.8	0.00	0.00	0.00	0.03	202	07
230		8.64	8.62	33.944	26.356	170.7	0.622	2.82 D	122.8 D	43.0	31.7	1.95	26.3	0.00	0.00			232	06
250	ISL	8.19 D	8.16	33.983 D	26.456	161.4	0.656	2.75 D	119.7 D	41.5	35.4	2.05	27.9	0.00	0.00			252	
270		7.97	7.95	34.009	26.507	156.8	0.688	2.43	105.9	36.4	39.2	2.15	29.5	0.00	0.00			272	05
300	ISL	7.67 D	7.64	34.037 D	26.574	150.8	0.734	2.09 D	91.1 D	31.2	43.7	2.29	31.3	0.00	0.00			302	
320		7.36	7.33	34.037	26.618	146.8	0.764	1.93 D	83.9 D	28.6	46.8	2.38	32.5	0.00	0.00			323	04
380		6.68	6.65	34.078	26.745	135.2	0.848	1.27	55.3	18.5	58.8	2.68	36.1	0.00	0.00			383	03
400	ISL	6.54 D	6.51	34.099 D	26.780	132.1	0.877	1.08 D	47.2 D	15.8	61.6	2.75	36.8	0.00	0.00			403	
440		6.29	6.25	34.148	26.852	125.7	0.926	0.77 D	33.7 D	11.2	67.1	2.89	38.3	0.00	0.00			444	02
500	ISL	6.05 D	6.01	34.217 D	26.938	118.2	1.003	0.46 D	20.0 D	6.6	73.6	3.03	39.6	0.00	0.00			504	
516		5.94	5.90	34.222	26.956	116.6	1.019	0.44	19.0	6.3	75.3	3.07	40.0	0.00	0.00			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 1802 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 53.3 N	118 29.3 W	06/02/2018	0320	UTC	58 m	180 02 kn			1013.8 mb	12.6 C	11.9 C				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		15.52	15.52	33.499	24.702	323.2	0.000	6.11	266.8	107.6	1.0	0.22	0.0	0.01	0.00	0.62	0.13	0	
2		15.52	15.52	33.499	24.702	323.2	0.007	6.11	266.8	107.6	1.0	0.22	0.0	0.00	0.00	0.62	0.13	2	10
5		15.49	15.49	33.495	24.705	323.1	0.016	6.13	267.5	107.8	1.0	0.22	0.0	0.00	0.05	0.61	0.14	5	09
10		15.35	15.35	33.511	24.750	318.9	0.032	6.25	273.1	109.7	0.6	0.18	0.0	0.00	0.00	0.72	0.22	10	06
10		15.35	15.35	33.491	24.734	320.4	0.032											10	08
10		15.35	15.35	33.493	24.736	320.3	0.032											10	07
20		14.71	14.71	33.480	24.865	308.3	0.064	6.09 D	265.5 D	105.5	1.5	0.28	0.4	0.03	0.05	2.49	0.49	20	05
30		13.80	13.80	33.440	25.025	293.4	0.094	5.14 D	223.9 D	87.3	6.0	0.70	5.7	0.26	0.33	2.42	0.80	30	03
30		13.80	13.80	33.439	25.024	293.4	0.094											30	04
40		12.37	12.37	33.441	25.311	266.4	0.122	4.11	179.6	67.8	10.7	1.09	11.8	0.65	0.66	0.72	0.33	40	02
50		12.02	12.01	33.493	25.418	256.4	0.148	3.77	164.6	61.7	13.5	1.25	14.2	0.65	0.52	0.35	0.32	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 1802 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 49.4 N	118 37.5 W	06/02/2018	0035	UTC	672 m	220 08 kn	130 01 07	4	1012.6 mb	13.2 C	12.4 C		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		16.14		16.14		33.545	24.599	333.0	0.000	5.86		255.8		104.4		2.0	0.21	0.0	0.02	0.02	0.31	0.07	0	
2		16.14		16.13		33.545	24.599	333.1	0.007	5.86		255.8		104.4		2.0	0.21	0.0	0.00	0.00	0.31	0.07	2	23
10		15.95		15.95		33.532	24.632	330.2	0.033	5.83		254.5		103.5		1.5	0.20	0.0	0.00	0.00	0.33	0.10	10	20
10		15.95		15.95		33.514	24.618	331.5	0.032														10	22
10		15.95		15.95		33.514	24.618	331.5	0.032														10	21
20		15.60		15.60		33.503	24.688	325.2	0.066	5.84		254.8		102.9		1.7	0.21	0.0	0.00	0.00	0.34	0.13	20	19
30		14.39		14.39		33.446	24.907	304.6	0.098	5.29	D	230.5	D	91.0		3.9	0.44	2.3	0.17	0.00	1.00	0.38	30	17
30		14.39		14.39		33.459	24.917	303.6	0.097														30	18
40		13.48		13.47		33.418	25.075	288.9	0.127	4.83	D	210.5	D	81.5		6.1	0.67	5.7	0.18	0.00	0.67	0.37	40	16
50		12.98		12.98		33.428	D 25.182	279.0	0.154	4.66		203.5		77.8		6.8	0.77	7.1	0.18	0.00	0.73	0.33	50	15
60		12.33		12.32		33.453	25.329	265.1	0.183	4.26	D	185.5	D	70.2		9.9	1.01	10.9	0.33	0.00	0.49	0.27	60	14
71		11.53		11.52		33.534	25.542	245.1	0.208	3.67		160.4		59.5		14.2	1.29	15.1	0.00	0.00	0.08	0.12	71	13
75	ISL	11.50	D	11.49		33.541	D 25.552	244.2	0.219	3.68	D	160.3	D	59.6		14.5	1.31	15.4	0.00	0.00	0.07	0.12	76	
85		11.28		11.26		33.555	25.605	239.4	0.245	3.52	D	153.4	D	56.8		15.2	1.35	16.0	0.03	0.00	0.07	0.12	86	12
100		10.62		10.61		33.636	25.785	222.6	0.279	3.35		146.4		53.3		18.4	1.53	18.9	0.00	0.00	0.05	0.10	101	11
120		10.16		10.14		33.787	25.983	204.2	0.322	2.76		120.4		43.4		23.6	1.81	22.5	0.00	0.00	0.02	0.06	121	10
125	ISL	10.05	D	10.04		33.815	D 26.023	200.5	0.331	2.75	D	119.8	D	43.3		24.2	1.83	22.8	0.00	0.00	0.02	0.06	126	
140		9.88		9.87		33.851	26.080	195.4	0.362	2.60		113.6		40.8		25.9	1.89	23.9	0.00	0.00	0.01	0.07	141	09
150	ISL	9.74	D	9.73		33.899	D 26.141	189.8	0.380	2.55	D	110.8	D	39.8		26.8	1.93	24.3	0.00	0.00	0.01	0.07	151	
170		9.61		9.59		33.956	26.208	183.9	0.419	2.42	D	105.3	D	37.7		28.8	2.00	25.3	0.00	0.00	0.01	0.06	171	08
200		9.19		9.16		34.051	26.353	170.7	0.472	2.15		93.9		33.2		33.2	2.12	27.1	0.00	0.00	0.01	0.04	202	07
231		8.84		8.81		34.117	26.460	161.0	0.523	1.71	D	74.5	D	26.2		38.4	2.30	29.3	0.00	0.00			233	06
250	ISL	8.59	D	8.57		34.149	D 26.525	155.2	0.553	1.57	D	68.2	D	23.9		41.3	2.39	30.3	0.00	0.00			252	
270		8.43		8.40		34.179	26.573	150.8	0.584	1.31		57.0		19.8		44.3	2.48	31.3	0.00	0.00			272	05
300	ISL	8.14	D	8.11		34.218	D 26.648	144.2	0.629	1.05	D	45.7	D	15.9		48.1	2.58	32.5	0.00	0.00			302	
320		7.97		7.93		34.220	26.676	141.8	0.657	0.93	D	40.3	D	13.9		50.7	2.65	33.3	0.00	0.00			323	04
380		7.60		7.57		34.238	26.745	136.2	0.740	0.76		33.0		11.3		55.4	2.77	34.7	0.00	0.00			383	03
400	ISL	7.42	D	7.38		34.261	D 26.789	132.2	0.768	0.62	D	27.0	D	9.2		58.2	2.82	35.3	0.00	0.00			403	
440		7.11		7.07		34.271	26.841	127.7	0.820	0.50	D	21.5	D	7.3		63.7	2.91	36.5	0.00	0.00			444	02
500	ISL	6.81	D	6.76		34.298	D 26.905	122.4	0.896	0.37	D	16.3	D	5.5		68.9	3.01	37.7	0.00	0.00			504	
516		6.64		6.59		34.307	26.934	119.6	0.914	0.34		14.8		4.9		70.3	3.04	38.0	0.00	0.00			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 1802 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 39.5 N	118 58.7 W	05/02/2018	2032	UTC	744 m	120 02 kn	310 02 06	4	1015.0 mb	13.3 C	12.2 C	21 m	8/8	ST	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		16.03		16.03		33.520	24.604	332.5	0.000	5.81		253.7		103.3		2.2	0.20	0.1	0.02	0.03	0.33	0.08	0	
2		16.03		16.03		33.520	24.604	332.5	0.007	5.81		253.7		103.3		2.2	0.20	0.1	0.00	0.00	0.33	0.08	2	23
10		15.88		15.88		33.522	24.639	329.5	0.033	5.82		254.3		103.3		1.6	0.19	0.0	0.00	0.00	0.43A	0.10A	10	20
10		15.88		15.88		33.527	24.643	329.1	0.033														10	22
10		15.88		15.88		33.519	24.636	329.7	0.033														10	21
20		15.76		15.76		33.517	24.663	327.5	0.066	5.84		255.1		103.3		1.6	0.19	0.0	0.00	0.00	0.69	0.25	20	19
30		15.34		15.34		33.504	24.747	319.9	0.098	5.76	D	250.9	D	101.0		1.9	0.23	0.0	0.00	0.00	1.60	0.36	30	17
30		15.34		15.34		33.502	24.746	320.0	0.098														30	18
40		13.78		13.78		33.435	25.026	293.6	0.129	5.25	D	228.9	D	89.2		4.5	0.49	3.4	0.11	0.00	0.86	0.59	40	16
50		12.37		12.37		33.445	25.314	266.3	0.157	4.45		194.3		73.4		9.1	0.91	9.7	0.04	0.00	0.28	0.26	50	15
60		11.80		11.79		33.498	25.464	252.2	0.183	4.01	D	174.6	D	65.3		12.1	1.15	13.2	0.03	0.00	0.14	0.11	60	14
70		11.46		11.45		33.540	25.559	243.4	0.208	3.72		162.5		60.2		14.6	1.30	15.5	0.00	0.00	0.07	0.08	71	13
75	ISL	11.23	D	11.22		33.561	D 25.617	238.0	0.218	3.71	D	161.7	D	59.8		15.2	1.34	16.1	0.00	0.00	0.06	0.08	76	
85		10.99		10.98		33.591	25.685	231.8	0.243	3.57	D	155.4	D	57.2		16.4	1.42	17.3	0.00	0.00	0.04	0.08	86	12
100		10.73		10.72		33.641	25.771	224.0	0.278	3.30		144.1		52.6		18.6	1.54	19.1	0.00	0.00	0.02	0.06	101	11
120		10.30		10.28		33.724	25.911	211.1	0.321	3.03		132.1		47.8		21.5	1.69	21.1	0.00	0.00	0.02	0.06	121	10
125	ISL	10.20	D	10.19		33.761	D 25.955	207.0	0.330	2.92	D	127.2	D	46.1		22.7	1.74	21.8	0.00	0.00	0.02	0.06	126	
140		9.84		9.83		33.853	26.088	194.6	0.362	2.66		115.9		41.6		26.4	1.89	23.8	0.00	0.00	0.01	0.06	141	09
150	ISL	9.75	D	9.73		33.885	D 26.130	190.9	0.380	2.53	D	110.3	D	39.6		28.0	1.95	24.6	0.00	0.00	0.01	0.05	151	
170		9.47		9.45		33.964	26.238	180.9	0.418	2.27	D	98.8	D	35.3		31.2	2.06	26.1	0.00	0.00	0.00	0.04	171	08
200		9.06		9.04		34.092	26.404	165.7	0.470	1.79		78.3		27.6		36.9	2.25	28.5	0.00	0.00	0.00	0.06	202	07
230		8.71		8.68		34.178	26.529	154.4	0.518	1.31	D	56.8	D	20.0		42.4	2.45	30.5	0.00	0.00			232	06
250	ISL	8.63	D	8.60		34.199	D 26.558	152.0	0.549	1.22	D	53.2	D	18.7		44.2	2.51	31.1	0.00	0.00			252	
270		8.42		8.39		34.221	26.608	147.6	0.579	1.07		46.8		16.3		46.1	2.56	31.8	0.00	0.00			272	05
300	ISL	8.14	D	8.11		34.257	D 26.679	141.3	0.623	0.85	D	36.9	D	12.8		49.9	2.65	32.9	0.00	0.00			302	
320		7.96		7.92		34.259	26.708	138.8	0.650	0.75	D	32.5	D	11.2		52.4	2.71	33.7	0.00	0.00			323	04
379		7.35		7.31		34.271	26.807	130.1	0.730	0.56		24.6		8.4		59.9	2.84	35.6	0.00	0.00			382	03
400	ISL	7.22	D	7.18		34.284	D 26.835	127.7	0.759	0.48	D	20.7	D	7.0		62.5	2.90	36.2	0.00	0.00			403	
440		6.79		6.74		34.295	26.904	121.4	0.807	0.35	D	15.2	D	5.1		67.4	3.01	37.4	0.00	0.00			444	02
500	ISL	6.50	D	6.45		34.315	D 26.959	116.9	0.881	0.29	D	12.5	D	4.2		74.8	3.07	38.6	0.00	0.00			504	
514		6.39		6.34		34.318	26.976	115.4	0.894	0.28	D	12.3	D	4.1		76.5	3.08	38.9	0.00	0.00			518	01
600	ISL	5.67	D	5.62		34.364	D 27.104	103.6	0.992	0.14	D	6.0	D	2.0									605	
700	ISL	5.39	D	5.33		34.385	D 27.156	99.6	1.095	0.11	D	4.6	D	1.5									706	

A) SECOND FLUOROMETER READING RECALCULATED BECAUSE ACID RATIO > TAU OF PURE CHL-A
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 1802 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 29.4 N	119 19.0 W	05/02/2018	1615	UTC	1641 m	240 10 kn	160 22 07	4	1015.4 mb	12.0 C	11.8 C	16 m	8/8	ST	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	15.34	15.34	33.520	24.757	317.9	0.000	5.92	258.4	103.8	1.5	0.20	0.0	0.00	0.00	0.85	0.29	0	
1	15.34	15.34	33.520	24.757	317.9	0.003	5.92	258.4	103.8	1.5	0.20	0.0	0.00	0.00	0.85	0.29	1	21
10	15.34	15.33	33.521	24.760	317.9	0.032	5.93	258.7	103.9	1.5	0.19	0.0	0.00	0.00	0.47	0.12	10	19
10	15.34	15.33	33.520	24.759	318.0	0.031											10	20
20	14.66	14.66	33.505	24.894	305.5	0.063	6.15	268.6	106.4	0.4	0.21	0.0	0.00	0.00	1.64	0.55	20	18
30	14.45	14.45	33.501	24.936	301.8	0.093	5.97 D	260.1 D	102.8	1.0	0.29	0.3	0.03	0.14	2.59	0.93	30	17
40	12.77	12.77	33.472	25.257	271.5	0.122	4.70 D	204.8 D	78.2	8.1	0.81	8.2	0.19	0.00	0.56	0.42	40	16
50	12.52	12.51	33.487	25.318	265.9	0.149	4.56 D	198.5 D	75.4	8.8	0.85	9.0	0.12	0.00	0.37	0.22	50	15
60	11.28	11.27	33.531	25.584	240.8	0.174	3.97 D	172.7 D	64.0	13.2	1.17	13.9	0.04	0.00	0.17	0.15	60	14
70	10.61	10.60	33.642	25.791	221.2	0.197	3.47	151.4	55.1	18.7	1.50	18.8	0.00	0.00	0.04	0.10	71	13
75 ISL	10.48 D	10.47	33.663 D	25.829	217.8	0.208	3.41 D	148.6 D	54.1	19.5	1.54	19.5	0.00	0.00	0.03	0.10	76	
86	10.18	10.17	33.707	25.916	209.7	0.232	3.21 D	139.8 D	50.6	21.3	1.64	20.9	0.00	0.00	0.02	0.09	87	12
100	9.81	9.80	33.794	26.046	197.6	0.260	2.93	127.9	45.8	25.1	1.79	23.1	0.00	0.00	0.01	0.07	101	11
121	9.51	9.49	33.878	26.163	187.0	0.301	2.63	114.8	40.9	28.4	1.93	24.9	0.00	0.00	0.01	0.06	122	10
125 ISL	9.44 D	9.42	33.921 D	26.208	182.8	0.308	2.50 D	108.8 D	38.8	29.0	1.95	25.2	0.00	0.00	0.01	0.06	126	
141	9.34	9.32	33.966	26.259	178.2	0.337	2.33	101.8	36.1	31.3	2.05	26.4	0.00	0.00	0.01	0.04	142	09
150 ISL	9.22 D	9.20	34.020 D	26.322	172.4	0.354	2.19 D	95.3 D	33.9	33.4	2.13	27.2	0.00	0.00	0.01	0.04	151	
171	8.93	8.91	34.115	26.442	161.4	0.388	1.71 D	74.3 D	26.2	38.2	2.33	29.2	0.00	0.00	0.00	0.04	172	08
200 ISL	8.73 D	8.71	34.175 D	26.522	154.4	0.435	1.39 D	60.3 D	21.2	41.7	2.44	30.4	0.00	0.00	0.00	0.03	202	
201	8.72	8.69	34.178	26.526	154.0	0.435	1.38	60.2	21.1	41.8	2.44	30.5	0.00	0.00	0.00	0.03	203	07
230	8.57	8.54	34.206	26.572	150.2	0.479	1.18 D	51.3 D	18.0	44.7	2.51	31.3	0.00	0.00			232	06
250 ISL	8.43 D	8.41	34.231 D	26.613	146.8	0.511	1.03 D	44.9 D	15.7	46.5	2.57	31.8	0.00	0.00			252	
270	8.35	8.32	34.244	26.636	144.9	0.538	0.96	41.9	14.6	48.3	2.62	32.4	0.00	0.00			272	05
300 ISL	8.15 D	8.12	34.261 D	26.681	141.1	0.584	0.81 D	35.4 D	12.3	51.5	2.68	33.2	0.00	0.00			302	
321	7.96	7.93	34.270	26.716	138.1	0.611	0.70 D	30.6 D	10.6	53.7	2.73	33.8	0.00	0.00			324	04
381	7.45	7.41	34.287	26.805	130.3	0.691	0.52	22.5	7.7	60.5	2.90	35.7	0.00	0.05			384	03
400 ISL	7.34 D	7.30	34.291 D	26.824	128.8	0.720	0.48 D	20.9 D	7.1	63.2	2.94	36.2	0.00	0.05			403	
440	6.89	6.85	34.300	26.894	122.4	0.766	0.37 D	16.2 D	5.5	69.0	3.01	37.5	0.00	0.05			444	02
500 ISL	6.46 D	6.42	34.317 D	26.965	116.2	0.842	0.28 D	12.2 D	4.1	75.4	3.09	38.4	0.00	0.05			504	
516	6.36	6.32	34.324	26.984	114.6	0.856	0.26	11.5	3.8	77.1	3.11	38.7	0.00	0.05			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 1802 STATION 86.7 50.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 19.4 N	119 40.0 W	05/02/2018	1257	UTC	82 m	290 10 kn			1014.6 mb	12.1 C	11.9 C				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	14.75	14.75	33.487	24.860	308.1	0.000	6.02	262.9	104.4	2.0	0.26	0.1	0.03	0.08	0.59	0.18	0	
2	14.75	14.75	33.487	24.860	308.2	0.006	6.02	262.9	104.4	2.0	0.26	0.1	0.03	0.08	0.59	0.18	2	10
5	14.76	14.75	33.491	24.862	308.0	0.015	6.00	262.1	104.1	1.8	0.25	0.0	0.00	0.05			5	09
10	14.72	14.72	33.491	24.871	307.4	0.031	6.00	262.0	103.9	1.7	0.25	0.0	0.00	0.00	0.51	0.24	10	07
10	14.72	14.72	33.484	24.866	307.9	0.031											10	08
20	14.45	14.44	33.491	24.930	302.1	0.061	5.94	259.3	102.3	1.8	0.27	0.1	0.04	0.13	0.80	0.39	20	06
30	14.34	14.34	33.495	24.955	300.0	0.091	5.87	256.3	100.9	2.0	0.30	0.6	0.06	0.17	1.37	0.23	30	05
40	13.48	13.47	33.503	25.141	282.6	0.121	5.23	228.1	88.2	5.5	0.58	5.0	0.19	0.12	0.86	0.35	40	04
50	12.90	12.89	33.509	25.262	271.3	0.148	4.85	211.9	81.0	7.8	0.76	7.7	0.21	0.05	0.54	0.24	50	03
61	11.29	11.28	33.608 D	25.643	235.2	0.174	3.94 D	171.4 D	63.5								61	02
69	11.21	11.20	33.616	25.665	233.3	0.195	3.84	167.8	61.9	15.6	1.29	15.7	0.12	0.07	0.13	0.14	70	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 1802 STATION 86.7 55.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
33 9.6 N	120 0.3 W	05/02/2018	0852	UTC	1188 m	310 17 kn			1016.0 mb	13.0 C	12.5 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	15.07	15.07	33.476	24.784	315.4	0.000	5.89	257.1	102.7	2.2	0.23	0.1	0.02	0.05	0.18	0.07	0	
2	15.07	15.07	33.476	24.784	315.4	0.006	5.89	257.1	102.7	2.2	0.23	0.1	0.00	0.05	0.18	0.07	2	21
10	15.07	15.07	33.476	24.783	315.7	0.032	5.88	256.5	102.5	2.0	0.20	0.0	0.00	0.00	0.19	0.07	10	19
10	15.07	15.07	33.476	24.783	315.8	0.031											10	20
20	15.06	15.05	33.479	24.789	315.6	0.063	5.88	256.5	102.4	1.9	0.20	0.0	0.00	0.00	0.18	0.06	20	18
30	15.03	15.02	33.470	24.790	315.8	0.095	5.87 D	255.8 D	102.3	1.9	0.20	0.0	0.00	0.00	0.27	0.10	30	17
40	14.80	14.80	33.468	24.837	311.6	0.126	5.89 D	256.6 D	102.1	1.9	0.22	0.0	0.00	0.00	0.41	0.16	40	16
50	14.74	14.73	33.473	24.855	310.2	0.157	5.82	254.2	100.9	1.8	0.23	0.0	0.03	0.00	0.57	0.23	50	15
59	14.66	14.66	33.466	24.867	309.4	0.185	5.74 D	250.0 D	99.2	1.9	0.25	0.1	0.08	0.18	0.43	0.19	59	14
70	13.25	13.24	33.396	25.105	286.9	0.218	5.40	235.9	90.7	3.8	0.47	3.6	0.11	0.00	0.22	0.13	71	13
75 ISL	12.54 D	12.53	33.398 D	25.246	273.5	0.230	5.21 D	227.1 D	86.3	5.4	0.61	5.9	0.09	0.00	0.18	0.11	76	
85	11.57	11.56	33.430	25.454	253.8	0.258	4.74 D	206.2 D	76.8	8.6	0.90	10.5	0.05	0.00	0.09	0.08	86	12
100	10.57	10.56	33.591	25.759	225.1	0.294	4.09	178.5	64.9	14.8	1.27	16.4	0.03	0.00	0.02	0.04	101	11
120	9.77	9.76	33.714	25.991	203.4	0.337	3.67	160.2	57.3	19.9	1.50	20.0	0.00	0.00	0.01	0.04	121	10
125 ISL	9.67 D	9.66	33.777 D	26.057	197.2	0.346	3.45 D	150.3 D	53.8	21.4	1.59	21.0	0.00	0.00	0.01	0.04	126	
140	9.53	9.51	33.851	26.139	189.7	0.376	2.81	122.7	43.7	26.1	1.85	24.1	0.00	0.00	0.01	0.04	141	09
150 ISL	9.44 D	9.43	33.909 D	26.198	184.2	0.394	2.61 D	113.8 D	40.6	27.0	1.89	24.6	0.00	0.00	0.01	0.04	151	
170	9.38	9.36	33.932	26.228	181.9	0.432	2.43 D	105.9 D	37.7	28.8	1.97	25.5	0.00	0.00	0.01	0.03	171	08
200	8.99	8.97	34.049	26.382	167.8	0.484	1.99	86.7	30.6	34.2	2.19	28.0	0.00	0.00	0.00	0.04	202	07
230	8.68	8.65	34.147	26.509	156.2	0.533	1.50 D	65.4 D	23.0	39.8	2.39	30.0	0.00	0.00			232	06
250 ISL	8.54 D	8.51	34.177 D	26.554	152.3	0.563	1.34 D	58.3 D	20.4	42.1	2.44	30.7	0.00	0.00			252	
271	8.42	8.39	34.192	26.585	149.7	0.596	1.21	52.6	18.3	44.4	2.50	31.4	0.00	0.00			273	05
300 ISL	8.14 D	8.10	34.224 D	26.654	143.7	0.638	0.98 D	42.7 D	14.8	48.2	2.59	32.7	0.00	0.00			302	
321	7.73	7.70	34.217	26.708	138.6	0.668	0.92 D	40.2 D	13.8	51.0	2.66	33.7	0.00	0.00			324	04
384	7.15	7.11	34.201	26.779	132.6	0.754	0.79	34.5	11.6	58.2	2.76	35.8	0.00	0.00			387	03
400 ISL	7.10 D	7.06	34.232 D	26.811	129.8	0.775	0.65 D	28.3 D	9.6	60.8	2.81	36.4	0.00	0.00			403	
440	6.70	6.66	34.281	26.904	121.3	0.825	0.41 D	17.9 D	6.0	67.4	2.95	37.8	0.00	0.00			444	02
500 ISL	6.22 D	6.18	34.296 D	26.980	114.6	0.897	0.33 D	14.4 D	4.8	73.5	3.03	39.3	0.00	0.00			504	
513	6.15	6.10	34.300	26.993	113.4	0.910	0.31	13.4	4.4	74.8	3.05	39.6	0.00	0.00			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 1802 STATION 86.7 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 59.3 N	120 21.0 W	05/02/2018	0450	UTC	717 m	290 16 kn			1017.4 mb	14.6 C	13.7 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		15.16		15.16		33.480	24.767	317.0	0.000	5.90		257.4		103.0		1.9	0.24	0.0	0.00	0.00	0.25	0.06	0	
2		15.16		15.16		33.480	24.767	317.0	0.006	5.90		257.4		103.0		1.9	0.24	0.0	0.00	0.00	0.25	0.06	2	24
10		15.14		15.14		33.475	24.766	317.4	0.032	5.89		257.1		102.9		2.2	0.24	0.0	0.00	0.00	0.25	0.07	10	21
10		15.14		15.14		33.477	24.768	317.2	0.030														10	22
20	ISL	14.64	D	14.64		33.456	D 24.861	308.7	0.060	5.98	D	260.4	D	103.3		2.4	0.24	0.0	0.00	0.00	0.34	0.12	20	
21		14.57		14.57		33.452	24.872	307.6	0.066	5.98		260.9		103.2		2.4	0.24	0.0	0.00	0.00	0.35	0.12	21	20
30		14.54		14.54		33.449	24.877	307.4	0.094	5.93	D	258.4	D	102.3		2.5	0.25	0.0	0.00	0.00	0.62	0.20	30	17
40		14.38		14.37		33.445	24.910	304.6	0.124	5.77	D	251.3	D	99.2		2.6	0.31	0.5	0.10	0.11	0.58	0.26	40	16
50		13.93		13.93		33.423	24.986	297.7	0.155	5.65		246.5		96.2		3.1	0.38	1.8	0.16	0.00	0.31	0.16	50	15
60		13.21		13.20		33.423	25.134	283.9	0.184	5.29	D	230.6	D	88.8		4.5	0.52	4.2	0.17	0.00	0.19	0.11	60	14
70		12.01		12.00		33.424	25.367	261.8	0.211	4.87		212.5		79.6		7.4	0.79	8.7	0.03	0.00	0.11	0.10	71	13
75	ISL	11.80	D	11.79		33.435	D 25.415	257.4	0.222	4.86	D	211.6	D	79.2		8.1	0.84	9.5	0.00	0.00	0.09	0.09	76	
85		11.26		11.25		33.472	25.543	245.4	0.249	4.67	D	203.4	D	75.2		9.4	0.93	11.2	0.00	0.00	0.07	0.07	86	12
100		10.60		10.59		33.563	25.731	227.7	0.285	4.11		179.2		65.2		14.4	1.27	16.3	0.00	0.00	0.03	0.05	101	11
120		10.07		10.06		33.652	25.893	212.7	0.329	3.72		162.6		58.5		18.2	1.47	19.4	0.00	0.00	0.02	0.04	121	10
125	ISL	9.71	D	9.69		33.737	D 26.020	200.7	0.338	3.56	D	155.0	D	55.5		19.6	1.53	20.3	0.00	0.00	0.01	0.04	126	
140		9.46		9.44		33.783	26.096	193.7	0.369	3.27		142.5		50.7		23.6	1.70	22.9	0.05	0.08	0.01	0.03	141	09
150	ISL	9.37	D	9.36		33.816	D 26.137	190.0	0.387	3.26	D	141.9	D	50.5		24.7	1.73	23.3	0.04	0.08	0.01	0.03	151	
170		9.05		9.03		33.889	26.247	179.9	0.425	3.13	D	136.0	D	48.1		27.1	1.79	24.2	0.03	0.08	0.01	0.03	171	08
200		8.45		8.43		33.967	26.402	165.7	0.477	2.98		129.8		45.2		32.2	1.91	26.4	0.00	0.00	0.00	0.03	202	07
230		8.11		8.09		33.997	26.476	159.0	0.526	2.55	D	111.0	D	38.4		37.0	2.06	28.7	0.00	0.00			232	06
250	ISL	7.81	D	7.78		34.024	D 26.543	152.9	0.557	2.32	D	100.8	D	34.7		40.9	2.20	30.3	0.00	0.00			252	
270		7.69		7.67		34.059	26.588	149.0	0.587	1.83		80.0		27.4		44.8	2.33	31.9	0.00	0.00			272	05
300	ISL	7.41	D	7.38		34.103	D 26.664	142.2	0.632	1.44	D	62.7	D	21.4		51.2	2.52	34.2	0.00	0.00			302	
320		7.02		6.99		34.128	26.738	135.3	0.658	1.06	D	46.2	D	15.6		55.5	2.65	35.7	0.00	0.00			323	04
380		6.46		6.43		34.157	26.836	126.5	0.737	0.74		32.4		10.8		64.5	2.84	38.0	0.00	0.00			383	03
400	ISL	6.35	D	6.31		34.167	D 26.860	124.4	0.764	0.69	D	29.8	D	9.9		67.1	2.87	38.4	0.00	0.00			403	
440		6.11		6.07		34.183	26.903	120.7	0.811	0.56	D	24.4	D	8.1		72.2	2.93	39.2	0.00	0.00			444	02
500	ISL	5.79	D	5.75		34.238	D 26.988	113.3	0.884	0.37	D	16.1	D	5.3		78.5	3.06	40.4	0.00	0.00			504	
515		5.75		5.71		34.290	27.034	109.1	0.897	0.28		12.3		4.0		80.0	3.09	40.7	0.00	0.00			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 1802 STATION 86.7 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 39.4 N	121 2.0 W	04/02/2018	2320	UTC	3792 m	290 13 kn	300 04 07	1	1017.4 mb	14.4 C	13.0 C	29 m	2/8	CU	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		15.90		15.90		33.508	24.624	330.5	0.000	5.76		251.5		102.2		1.4	0.21	0.0	0.01	0.01	0.16	0.01	0	
2		15.90		15.90		33.508	24.625	330.6	0.007	5.76		251.5		102.2		1.4	0.21	0.0	0.00	0.00	0.16	0.01	2	23
10		15.87		15.87		33.507	24.630	330.4	0.033	5.75		251.2		102.0		1.5	0.21	0.0	0.00	0.00	0.15	0.03	10	20
10		15.87		15.87		33.506	24.629	330.5	0.033														10	22
10		15.87		15.87		33.508	24.630	330.3	0.033														10	21
20		15.83		15.83		33.506	24.639	329.9	0.066	5.74		250.4		101.6		1.4	0.20	0.0	0.00	0.00	0.14	0.03	20	19
30	ISL	15.51	D	15.50		33.474	D 24.687	325.6	0.096	5.77	D	251.6	D	101.6		1.5	0.22	0.0	0.00	0.00	0.17	0.05	30	
31		15.47		15.46		33.481	24.701	324.3	0.102	5.77	D	251.4	D	101.4		1.5	0.22	0.0	0.00	0.00	0.18	0.05	31	18
40		14.95		14.94		33.433	24.779	317.1	0.131	5.85	D	254.7	D	101.7		1.7	0.23	0.0	0.00	0.09	0.33	0.09	40	17
50	ISL	14.82	D	14.81		33.425	D 24.800	315.4	0.161	5.87	D	255.8	D	101.8		1.7	0.23	0.0	0.00	0.06	0.35	0.10	50	
50		14.82		14.81		33.430	24.804	315.1	0.164														50	16
51		14.81		14.80		33.433	24.809	314.6	0.166	5.88	D	256.0	D	101.9		1.7	0.23	0.0	0.00	0.06	0.35	0.10	51	15
60		14.61		14.60		33.422	24.844	311.6	0.194	5.76	D	251.1	D	99.5		1.8	0.27	0.0	0.07	0.07	0.41	0.13	60	14
70		13.53		13.52		33.420	25.068	290.4	0.224	5.57		243.0		94.0		2.9	0.40	2.2	0.11	0.00	0.34	0.20	71	13
75	ISL	12.92	D	12.91		33.437	D 25.203	277.7	0.237	5.37	D	233.8	D	89.5		3.7	0.48	3.5	0.09	0.00	0.28	0.18	76	
85		12.26		12.24		33.440	25.334	265.4	0.265	5.14	D	223.7	D	84.5		5.3	0.63	6.1	0.04	0.00	0.16	0.15	86	12
100		11.12		11.10		33.438	25.543	245.7	0.304	4.75		207.5		76.3		8.8	0.92	10.6	0.00	0.00	0.05	0.06	101	11
120		10.42		10.41		33.568	25.767	224.8	0.351	3.98		173.7		63.0		15.3	1.36	17.4	0.00	0.00	0.02	0.04	121	10
125	ISL	10.41	D	10.39		33.571	D 25.772	224.4	0.362	3.97	D	173.0	D	62.9		16.4	1.39	18.0	0.00	0.00	0.02	0.04	126	
140		9.80		9.78		33.710	25.985	204.4	0.394	3.80		165.7		59.3		19.5	1.49	19.8	0.00	0.00	0.01	0.04	141	09
150	ISL	9.70	D	9.69		33.726	D 26.013	201.9	0.414	3.74	D	163.0	D	58.4		20.8	1.53	20.6	0.00	0.00	0.01	0.03	151	
170		9.35		9.33		33.799	26.129	191.2	0.453	3.61	D	157.1	D	55.9		23.5	1.62	22.0	0.00	0.00	0.01	0.02	171	08
200	ISL	8.90	D	8.88		33.906	D 26.285	176.9	0.510	3.38	D	146.9	D	51.7		27.6	1.74	24.0	0.00	0.00	0.01	0.02	202	
201		8.94		8.92		33.915	26.284	177.0	0.510	3.39		147.9		52.0		27.7	1.74	24.1	0.00	0.00	0.01	0.02	203	07
230		8.42		8.40		33.960	26.401	166.3	0.560	3.11	D	135.3	D	47.2		31.5	1.87	26.0	0.00	0.00			232	06
250	ISL	8.19	D	8.17		33.979	D 26.451	161.8	0.595	2.81	D	122.3	D	42.4		35.2	1.98	27.5	0.00	0.00			252	
269		7.91		7.88		33.996	26.507	156.7	0.623	2.70		117.8		40.5		38.6	2.08	28.9	0.00	0.00			271	05
300	ISL	7.53	D	7.50		34.016	D 26.577	150.4	0.674	2.39	D	104.0	D	35.6		43.9	2.26	31.1	0.00	0.00			302	
320		7.37		7.34		34.047	26.626	146.1	0.700	1.93	D	84.0	D	28.6		47.3	2.38	32.6	0.00	0.00			323	04
380		6.47		6.43		34.092	26.784	131.3	0.783	1.20		52.3		17.4		61.5	2.73	37.1	0.00	0.00			383	03
400	ISL	6.37	D	6.33		34.113	D 26.815	128.7	0.814	1.00	D	43.3	D	14.4		64.7	2.80	37.9	0.00	0.00			403	
440		5.97		5.94		34.144	26.889	121.9	0.860	0.71	D	30.7	D	10.1		71.3	2.95	39.6	0.00	0.00			444	02
500	ISL	5.65	D	5.60		34.186	D 26.964	115.3	0.937	0.48	D	20.9	D	6.8		78.9	3.07	40.9	0.00	0.00			504	
516		5.59		5.54		34.204	26.985	113.4	0.949	0.43		18.9		6.2		81.0	3.10	41.3	0.00	0.00			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 1802 STATION 86.7 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 19.1 N	121 42.8 W	04/02/2018	1750 UTC	4040 m	320 07 kn	290 03 06	1	1019.6 mb	14.3 C	13.0 C	37 m	6/8	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		16.20		16.20		33.533		24.575	335.3	0.000	5.68		247.9		101.3		1.6	0.22	0.0	0.00	0.00	0.17	0.01	0	
2		16.20		16.20		33.533		24.575	335.3	0.007	5.68		247.9		101.3		1.6	0.22	0.0	0.00	0.00	0.17	0.01	2	23
9		16.18		16.17		33.533		24.581	335.0	0.032														9	21
10		16.17		16.16		33.534		24.584	334.8	0.034	5.66		247.2		101.0		1.6	0.21	0.0	0.00	0.00	0.14	0.02	10	20
10		16.17		16.16		33.534		24.584	334.8	0.033														10	22
20	ISL	16.04	D	16.03		33.510	D	24.596	334.0	0.064	5.67	D	247.1	D	100.8		1.5	0.21	0.0	0.00	0.00	0.14	0.02	20	
25		16.02		16.02		33.516		24.604	333.4	0.084	5.67		247.7		100.9		1.5	0.21	0.0	0.00	0.00	0.14	0.03	25	19
30	ISL	16.01	D	16.01		33.509	D	24.601	333.8	0.098	5.67	D	246.9	D	100.7		1.5	0.21	0.0	0.00	0.00	0.16	0.04	30	
40		15.92		15.91		33.504		24.619	332.4	0.134	5.68	D	247.4	D	100.7		1.5	0.21	0.0	0.00	0.00	0.19	0.06	40	18
50	ISL	15.65	D	15.65		33.473	D	24.655	329.3	0.165	5.73	D	249.5	D	101.0		1.6	0.21	0.0	0.00	0.00	0.20	0.08	50	
51		15.63		15.62		33.482		24.669	328.1	0.170	5.73	D	249.7	D	101.0		1.6	0.21	0.0	0.00	0.00	0.20	0.08	51	17
62		15.27		15.26		33.427		24.705	325.0	0.206	5.78		252.2		101.1		1.6	0.24	0.0	0.00	0.00	0.35	0.07	62	15
63		15.27		15.26		33.426		24.704	325.0	0.207														62	16
75		14.83		14.82		33.424		24.799	316.3	0.248	5.68	D	247.6	D	98.6		2.0	0.29	0.4	0.18	0.00	0.27	0.11	76	14
87		14.08		14.07		33.394		24.935	303.7	0.285	5.66		247.0		96.7		2.6	0.37	1.6	0.09	0.00	0.26	0.08	88	13
100		12.99		12.97		33.364		25.134	285.0	0.323	5.57		243.3		93.0		3.5	0.47	3.3	0.00	0.00	0.17	0.12	101	12
112		12.45		12.44		33.477		25.326	266.9	0.356	5.07	D	220.7	D	83.7		5.8	0.66	6.6	0.00	0.00	0.13	0.10	113	11
125		11.63		11.61		33.514		25.512	249.5	0.390	4.83		210.7		78.3		8.2	0.83	9.5	0.00	0.00	0.05	0.06	126	10
140		10.80		10.78		33.574		25.707	231.1	0.426	4.45		194.2		71.0		12.3	1.09	13.6	0.00	0.00	0.04	0.03	141	09
150	ISL	10.37	D	10.35		33.604	D	25.806	221.8	0.449	4.09	D	178.0	D	64.6		14.9	1.24	15.9	0.00	0.00	0.03	0.03	151	
171		9.67		9.65		33.704		26.002	203.4	0.493	3.68	D	160.3	D	57.4		20.4	1.55	20.8	0.00	0.00	0.01	0.02	172	08
200	ISL	9.01	D	8.99		33.885	D	26.250	180.2	0.550	3.35	D	145.7	D	51.5		26.5	1.73	23.8	0.00	0.00	0.00	0.02	202	
201		9.01		8.99		33.887		26.252	180.1	0.550	3.34		146.0		51.4		26.7	1.74	23.9	0.00	0.00	0.00	0.02	203	07
230		8.66		8.63		33.947		26.355	170.8	0.601	2.97	D	129.2	D	45.3		30.6	1.89	25.8	0.00	0.00			232	06
250	ISL	8.29	D	8.26		33.992	D	26.447	162.3	0.636	2.62	D	114.0	D	39.6		34.9	2.01	27.6	0.00	0.00			252	
270		7.94		7.91		34.008		26.512	156.3	0.667	2.52		110.1		37.9		39.2	2.13	29.4	0.00	0.00			272	05
300	ISL	7.54	D	7.51		34.017	D	26.577	150.4	0.715	2.30	D	100.2	D	34.3		44.7	2.27	31.3	0.00	0.00			302	
320		7.26		7.23		34.030		26.628	145.8	0.742	2.05	D	89.1	D	30.3		48.4	2.36	32.6	0.00	0.00			323	04
381		6.80		6.77		34.125		26.766	133.4	0.828	1.02		44.6		15.0		58.6	2.76	36.7	0.00	0.00			384	03
400	ISL	6.57	D	6.53		34.125	D	26.797	130.6	0.856	0.92	D	40.1	D	13.4		61.9	2.82	37.5	0.00	0.00			403	
441		6.23		6.19		34.165		26.873	123.7	0.904	0.66	D	28.6	D	9.5		69.0	2.94	39.1	0.00	0.00			445	02
500	ISL	5.87	D	5.83		34.221	D	26.964	115.5	0.980	0.40	D	17.5	D	5.8		77.0	3.08	40.6	0.00	0.00			504	
516		5.80		5.75		34.242		26.990	113.3	0.993	0.37		15.9		5.2		79.1	3.12	41.0	0.00	0.00			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 1802 STATION 86.7 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 59.3 N	122 23.6 W	04/02/2018	1222 UTC	4091 m	320 07 kn			1018.9 mb	14.2 C	13.4 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		16.32		16.32		33.539		24.551	337.5	0.000	5.65		246.5		101.2		1.3	0.22	0.0	0.01	0.26	0.11	0.02	0	
2		16.32		16.32		33.539		24.552	337.5	0.007	5.65		246.5		101.2		1.3	0.22	0.0	0.00	0.26	0.11	0.02	2	21
10		16.27		16.27		33.533		24.560	337.0	0.034	5.66		246.9		101.2		1.3	0.21	0.0	0.00	0.00	0.13	0.01	10	22
10		16.27		16.27		33.535		24.562	336.9	0.035														10	20
20	ISL	16.24	D	16.24		33.539	D	24.572	336.2	0.064	5.65	D	246.2	D	100.9		1.4	0.20	0.0	0.00	0.00	0.13	0.01	20	
25		16.20		16.20		33.534		24.577	335.9	0.084	5.65	D	246.2	D	100.8		1.4	0.19	0.0	0.00	0.00	0.13	0.02	25	18
30	ISL	16.20	D	16.20		33.540	D	24.582	335.7	0.098	5.65	D	246.4	D	100.9		1.4	0.20	0.0	0.00	0.00	0.14	0.03	30	
40		16.17		16.16		33.542		24.592	335.1	0.135	5.64	D	246.0	D	100.6		1.3	0.21	0.0	0.00	0.00	0.17	0.05	40	17
50		16.12		16.11		33.529		24.594	335.3	0.168	5.65	D	246.1	D	100.6		1.2	0.21	0.0	0.00	0.00	0.23	0.06	50	16
63		16.04		16.03		33.522		24.608	334.4	0.212	5.61		244.4		99.7		1.2	0.20	0.0	0.00	0.00	0.26	0.08	64	15
75		16.03		16.02		33.519		24.608	334.8	0.252	5.64	D	245.6	D	100.2		1.2	0.20	0.0	0.00	0.00	0.31	0.09	76	14
87		16.00		15.98		33.524		24.620	334.0	0.292	5.62		245.1		99.9		1.2	0.20	0.0	0.00	0.00	0.28	0.07	88	13
100		13.95		13.93		33.462		25.016	296.4	0.333	5.54		241.3		94.4		2.6	0.36	1.8	0.05	0.00	0.20	0.14	101	12
112		12.99		12.97		33.428		25.184	280.5	0.368	5.38	D	234.2	D	89.8		3.7	0.48	3.7	0.03	0.00	0.13	0.10	113	11
125		12.35		12.33		33.504	D	25.368	263.3	0.402	5.23		227.8		86.2		5.0	0.61	5.8	0.03	0.00	0.07	0.07	126	10
140		11.49		11.47		33.536		25.554	245.8	0.442	4.81		209.4		77.9		8.3	0.83	9.7	0.00	0.00	0.06	0.04	141	09
150	ISL	11.21	D	11.19		33.546	D	25.612	240.4	0.465	4.65	D	202.3	D	74.8		10.5	0.96	11.8	0.00	0.00	0.04	0.04	151	
170		10.32		10.30		33.634		25.839	219.1	0.512	4.23	D	183.9	D	66.7		14.9	1.23	16.1	0.00	0.00	0.02	0.02	171	08
200		9.38		9.36		33.787		26.115	193.2	0.574	3.69		160.5		57.1		21.9	1.57	21.3	0.00	0.00	0.00	0.02	202	07
230		8.64		8.61		33.913		26.331	173.0	0.629	3.19	D	138.8	D	48.6		29.6	1.80	25.0	0.00	0.00			232	06
250	ISL	8.37	D	8.34		33.958	D	26.409	166.0	0.662	2.99	D	130.1	D	45.3		33.1	1.92	26.6	0.00	0.00			252	
270		8.09		8.06		33.979		26.468	160.6	0.695	2.71		118.1		40.9		36.5	2.04	28.2	0.00	0.00			272	05
300	ISL	7.69	D	7.66		34.031	D	26.567	151.6	0.742	2.16	D	93.8	D	32.2		42.3	2.23	30.6	0.00	0.00			302	
320		7.45		7.42		34.035		26.605	148.2	0.772	1.95	D	84.6	D	28.9		46.2	2.35	32.2	0.00	0.00			323	04
380		6.68		6.64		34.102		26.764	133.5	0.857	1.07		46.6		15.6		59.9	2.72	36.8	0.00	0.00			383	03
400	ISL	6.67	D	6.63		34.156	D	26.808	129.6	0.884	0.79	D	34.2	D	11.5		62.8	2.79	37.4	0.00	0.00			403	
440		6.35		6.31		34.180		26.870	124.1	0.935	0.58	D	25.1	D	8.3		68.6	2.94	38.8	0.00	0.00			444	02
500	ISL	5.95	D	5.90		34.231	D	26.963	115.8	1.008	0.39	D	16.8	D	5.5		75.8	3.07	40.1	0.00	0.00			504	
515		5.91		5.87		34.249		26.981	114.2	1.024	0.37		16.0		5.3		77.6	3.10	40.4	0.00	0.00			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 1802 STATION 86.7 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
31 39.2 N	123 4.4 W	04/02/2018	0702	UTC	4124 m	300 04 kn			1019.9 mb	14.5 C	13.1 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	16.24	16.24	33.521	24.556	337.1	0.000	5.67	247.5	101.2	1.6	0.23	0.0	0.00	0.06	0.10	0.03	0	
2	16.24	16.24	33.521	24.556	337.1	0.007	5.67	247.5	101.2	1.6	0.23	0.0	0.00	0.06	0.10	0.03	2	23
10	16.21	16.20	33.520	24.565	336.6	0.034	5.69	248.4	101.5	1.5	0.22	0.0	0.00	0.00	0.10	0.02	10	20
10	16.21	16.20	33.519	24.563	336.7	0.032											10	22
10	16.21	16.20	33.519	24.564	336.7	0.032											10	21
20 ISL	16.15 D	16.15	33.523 D	24.580	335.5	0.064	5.67 D	247.2 D	101.1	1.5	0.21	0.0	0.00	0.00	0.10	0.03	20	
25	16.14	16.14	33.518	24.578	335.9	0.084	5.71	249.4	101.8	1.5	0.21	0.0	0.00	0.00	0.10	0.03	25	19
30 ISL	16.14 D	16.14	33.523 D	24.583	335.6	0.098	5.67 D	247.2 D	101.1	1.4	0.21	0.0	0.00	0.00	0.11	0.03	30	
40	16.12	16.11	33.517	24.584	335.8	0.135	5.67 D	247.2 D	101.0	1.4	0.21	0.0	0.00	0.00	0.12	0.03	40	18
50	16.09	16.08	33.518	24.592	335.4	0.168	5.67 D	247.1 D	100.9	1.4	0.23	0.0	0.00	0.00	0.15	0.06	50	17
62	16.03	16.02	33.517	24.606	334.5	0.208	5.68	248.1	101.0	1.4	0.21	0.0	0.00	0.00	0.21	0.06	62	16
75	16.01	16.00	33.517	24.611	334.4	0.252	5.66 D	246.6 D	100.5	1.4	0.23	0.0	0.00	0.12	0.26	0.09	76	15
87	16.00	15.99	33.518	24.614	334.6	0.292	5.66	247.0	100.5	1.4	0.21	0.0	0.00	0.00	0.28	0.10	88	13
87	16.00	15.99	33.520	24.616	334.4	0.292											88	14
100	15.94	15.92	33.511	24.624	334.1	0.335	5.65	246.9	100.3	1.4	0.22	0.0	0.00	0.00	0.23	0.09	101	12
112	14.57	14.55	33.473 D	24.895	308.4	0.373	5.58 D	243.1 D	96.3								113	11
125	13.60	13.58	33.508 D	25.125	286.7	0.412	5.44 D	237.0 D	92.0								126	10
140	12.53	12.51	33.469	25.307	269.6	0.455	5.36	234.1	88.7	4.2	0.49	4.1	0.00	0.00	0.09	0.07	141	09
150 ISL	11.81 D	11.79	33.477 D	25.449	256.2	0.481	5.11 D	222.4 D	83.2	7.9	0.75	8.3	0.00	0.00	0.06	0.06	151	
170	10.13	10.11	33.599	25.843	218.6	0.528	4.06 D	176.6 D	63.8	15.4	1.27	16.6	0.00	0.00	0.01	0.03	171	08
200	9.21	9.19	33.798	26.150	189.8	0.589	3.52	153.5	54.2	23.5	1.64	22.3	0.00	0.00	0.00	0.02	202	07
230	8.69	8.66	33.916	26.326	173.5	0.644	3.04 D	132.3 D	46.4	29.2	1.85	25.3	0.00	0.00			232	06
250 ISL	8.49 D	8.46	33.969 D	26.399	166.9	0.678	2.81 D	122.3 D	42.7	33.2	1.99	27.2	0.00	0.00			252	
270	8.20	8.18	34.016	26.479	159.6	0.711	2.38	103.7	35.9	37.2	2.13	29.0	0.00	0.00			272	05
300 ISL	7.86 D	7.83	34.070 D	26.573	151.1	0.758	1.84 D	80.1 D	27.6	43.6	2.34	31.5	0.00	0.00			302	
321	7.54	7.51	34.099	26.643	144.6	0.788	1.52 D	65.9 D	22.5	48.0	2.48	33.2	0.00	0.00			324	04
381	7.03	7.00	34.147	26.752	135.0	0.872	0.98	42.7	14.4	56.8	2.72	36.0	0.00	0.00			384	03
400 ISL	6.89 D	6.85	34.166 D	26.788	131.8	0.900	0.84 D	36.5 D	12.3	59.4	2.78	36.7	0.00	0.00			403	
441	6.47	6.43	34.184	26.857	125.4	0.951	0.64 D	28.0 D	9.4	65.1	2.90	38.2	0.00	0.00			445	02
500 ISL	6.13 D	6.08	34.225 D	26.935	118.6	1.025	0.46 D	19.9 D	6.6	71.9	3.00	39.4	0.00	0.00			504	
516	6.07	6.02	34.226	26.944	117.9	1.042	0.46	19.9	6.6	73.8	3.03	39.7	0.00	0.00			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 1802 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 29.0 N	117 46.3 W	02/02/2018	0339	UTC	73 m	170 06 kn			1016.6 mb	14.7 C	14.4 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	16.31	16.31	33.487	24.515	341.0	0.000	5.84	255.0	104.4	0.2	0.23	0.0	0.01	0.07	0.47	0.11	0	
2	16.31	16.31	33.487	24.515	341.1	0.007	5.84	255.0	104.4	0.2	0.23	0.0	0.00	0.07	0.47	0.11	2	11
5	16.18	16.18	33.482	24.540	338.7	0.017	5.87	256.3	104.6	0.0	0.21	0.0	0.00	0.00	0.41	0.08	5	10
10	15.67	15.66	33.489	24.662	327.3	0.034	6.04	263.9	106.7	0.0	0.22	0.0	0.00	0.12	0.49	0.10	10	08
10	15.67	15.66	33.486	24.660	327.5	0.034											10	09
20	15.06	15.05	33.508	24.812	313.4	0.066	5.98	261.3	104.4	0.0	0.24	0.0	0.00	0.00	0.58	0.20	20	07
30	14.27	14.27	33.438	24.926	302.8	0.097	5.60	244.7	96.1	1.4	0.44	2.6	0.35	0.08	3.95	0.80	30	05
30	14.27	14.27	33.461	24.944	301.1	0.096											30	06
40	13.25	13.24	33.401	25.108	285.7	0.126	4.60	201.1	77.3	5.7	0.79	8.6	0.70	0.14	1.60	0.62	40	04
50	12.77	12.76	33.408	25.209	276.3	0.154	4.77	208.2	79.3	5.6	0.77	7.9	0.20	0.05	0.64	0.56	50	03
60	12.30	12.29	33.444	25.328	265.3	0.181	4.43	193.4	72.9	7.9	0.96	10.4	0.11	0.00	0.40	0.38	60	02
65	12.22	12.21	33.455	25.352	263.1	0.194	4.32	188.7	71.1	8.4	0.99	10.9	0.12	0.00	0.36	0.32	66	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 1802 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 54.2 W	02/02/2018	0616	UTC	615 m	130 05 kn			1018.0 mb	15.1 C	15.0 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	16.29	16.29	33.493	24.524	340.1	0.000	5.75	251.2	102.8	0.8	0.22	0.2	0.02	0.05	0.27	0.07	0	
2	16.29	16.29	33.493	24.524	340.2	0.007	5.75	251.2	102.8	0.8	0.22	0.2	0.00	0.05	0.27	0.07	2	23
10	16.03	16.03	33.491	24.581	335.0	0.034	5.77	251.9	102.6	0.6	0.21	0.0	0.00	0.08	0.30	0.09	10	20
10	16.03	16.03	33.495	24.584	334.7	0.034											10	22
10	16.03	16.03	33.491	24.581	335.0	0.034											10	21
20	15.83	15.82	33.486	24.625	331.2	0.067	5.82	253.9	103.0	0.4	0.21	0.0	0.00	0.05	0.45	0.12	20	19
30	14.65	14.65	33.419	24.830	311.9	0.099	5.63 D	245.3 D	97.3	1.8	0.34	0.1	0.03	0.05	1.25	0.57	30	18
40	13.53	13.52	33.400	25.052	291.1	0.129	5.04 D	219.7 D	85.2	3.6	0.60	4.5	0.12	0.00	1.25	0.62	40	16
40	13.53	13.52	33.402	25.053	291.0	0.129											40	17
50	12.85	12.85	33.417	25.199	277.3	0.158	4.90	213.9	81.6	4.9	0.73	7.1	0.08	0.00	0.53	0.38	50	15
60	12.41	12.40	33.445	25.307	267.2	0.185	4.25 D	185.1 D	70.1	7.9	0.98	10.8	0.08	0.08	0.29	0.26	60	14
70	11.94	11.93	33.467	25.414	257.3	0.211	4.14	180.9	67.7	9.1	1.07	12.5	0.04	0.00	0.19	0.19	71	13
75 ISL	11.63 D	11.62	33.489 D	25.488	250.3	0.222	4.19 D	182.6 D	68.1	10.3	1.14	13.6	0.00	0.00	0.15	0.16	76	
85	11.17	11.16	33.548	25.619	238.1	0.248	3.77 D	164.3 D	60.7	12.8	1.29	15.9	0.00	0.09	0.09	0.11	86	12
100	10.76	10.75	33.606	25.738	227.1	0.283	3.55	155.2	56.7	15.3	1.43	17.9	0.00	0.00	0.05	0.08	101	11
120	10.00	9.98	33.683	25.929	209.2	0.327	3.41	148.8	53.5	18.9	1.59	20.9	0.00	0.00	0.01	0.06	121	10
125 ISL	9.97 D	9.95	33.701 D	25.948	207.6	0.337	3.36 D	146.2 D	52.7	19.9	1.65	21.5	0.00	0.00	0.01	0.06	126	
140	9.85	9.83	33.833	26.072	196.2	0.367	2.83	123.6	44.3	23.1	1.82	23.1	0.00	0.00	0.01	0.04	141	09
150 ISL	9.64 D	9.63	33.900 D	26.159	188.1	0.386	2.72 D	118.2 D	42.3	25.2	1.90	24.2	0.00	0.00	0.01	0.04	151	
170	9.45	9.43	34.015	26.281	176.9	0.423	2.24 D	97.5 D	34.8	29.4	2.07	26.5	0.00	0.00	0.00	0.04	171	08
200	8.93	8.91	34.081	26.417	164.4	0.474	2.01	87.9	30.9	33.6	2.20	28.5	0.00	0.00	0.00	0.04	202	07
230	8.71	8.69	34.159	26.513	155.9	0.522	1.58 D	68.9 D	24.2	37.6	2.36	30.0	0.00	0.00			232	06
250 ISL	8.59 D	8.56	34.176 D	26.547	153.1	0.554	1.43 D	62.1 D	21.8	39.8	2.42	30.8	0.00	0.00			252	
270	8.41	8.38	34.184	26.580	150.2	0.584	1.34	58.3	20.3	41.9	2.48	31.6	0.00	0.00			272	05
300 ISL	8.20 D	8.17	34.200 D	26.625	146.5	0.630	1.15 D	50.1 D	17.4	44.8	2.56	32.5	0.00	0.00			302	
320	8.04	8.01	34.203	26.652	144.2	0.657	1.07 D	46.7 D	16.2	46.8	2.61	33.2	0.00	0.00			323	04
380	7.49	7.45	34.265	26.782	132.5	0.740	0.64	28.0	9.6	56.2	2.84	35.7	0.00	0.00			383	03
400 ISL	7.33 D	7.30	34.270 D	26.808	130.3	0.770	0.57 D	24.6 D	8.4	58.2	2.87	36.1	0.00	0.00			403	
440	7.05	7.00	34.291	26.865	125.3	0.818	0.44 D	19.0 D	6.4	62.0	2.94	37.1	0.00	0.00			444	02
500 ISL	6.63 D	6.59	34.306 D	26.935	119.3	0.896	0.32 D	14.1 D	4.7	68.9	3.05	38.3	0.00	0.00			504	
516	6.56	6.52	34.316	26.952	117.9	0.910	0.30	13.0	4.3	70.8	3.08	38.6	0.00	0.00			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 1802 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 15.3 N	118 15.1 W	02/02/2018	1011	UTC	295 m	340 03 kn			1017.6 mb	14.4 C	14.3 C				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		15.94		15.94		33.522	24.626	330.4	0.000	5.76		251.7		102.3		0.2	0.21	0.0	0.02	0.08	0.32	0.08	0	
2		15.94		15.94		33.522	24.626	330.4	0.007	5.76		251.7		102.3		0.2	0.21	0.0	0.00	0.08	0.32	0.08	2	19
10		15.91		15.91		33.517	24.629	330.5	0.033	5.73		250.2		101.6		0.0	0.20	0.0	0.00	0.00	0.36	0.12	10	16
10		15.91		15.91		33.519	24.631	330.3	0.033														10	18
10		15.91		15.91		33.518	24.630	330.4	0.033														10	17
20		15.67		15.67		33.512	24.680	325.9	0.066	5.75	D	250.4	D	101.4		0.0	0.22	0.0	0.00	0.00	0.54	0.26	20	15
30		15.30		15.29		33.509	24.761	318.6	0.098	5.77		251.8		101.0		0.2	0.22	0.0	0.00	0.00	0.61	0.28	30	14
40		14.60		14.60		33.469	24.880	307.5	0.129	5.47	D	238.1	D	94.4		1.1	0.34	1.0	0.11	0.10	0.80	0.54	40	12
40		14.60		14.60		33.476	24.886	306.9	0.130														40	13
50		13.30		13.30		33.400	25.097	287.1	0.159	4.82	D	209.9	D	81.0		4.3	0.68	5.7	0.14	0.00	0.49	0.39	50	11
60		12.73		12.73		33.418	25.223	275.3	0.187	4.57		199.5		75.9		5.7	0.83	8.2	0.05	0.00	0.29	0.31	60	10
70		12.03		12.02		33.471	25.400	258.6	0.214	4.26	D	185.5	D	69.8		9.0	1.04	11.8	0.03	0.00	0.15	0.18	71	09
75	ISL	11.83	D	11.82		33.478	D 25.443	254.7	0.225	4.20	D	182.8	D	68.5		10.3	1.13	13.2	0.00	0.00	0.12	0.15	76	
85		11.11		11.10		33.549	25.630	237.0	0.251	3.74		163.3		60.1		12.9	1.32	15.9	0.00	0.00	0.06	0.10	86	08
100		10.65		10.64		33.650	25.791	222.1	0.286	3.26		142.2		51.8		17.2	1.57	19.3	0.00	0.00	0.03	0.07	101	07
120		9.79		9.78		33.857	26.099	193.1	0.327	2.64		115.4		41.3		24.3	1.90	24.2	0.00	0.00	0.01	0.06	121	06
125	ISL	9.64	D	9.63		33.885	D 26.146	188.7	0.336	2.60	D	113.3	D	40.6		24.9	1.92	24.5	0.00	0.00	0.01	0.06	126	
140		9.44		9.42		33.935	26.219	182.1	0.365	2.48		108.1		38.4		26.8	1.98	25.4	0.00	0.00	0.00	0.06	141	05
150	ISL	9.39	D	9.37		33.954	D 26.242	180.1	0.383	2.43	D	105.9	D	37.7		28.5	2.03	26.1	0.00	0.00	0.00	0.06	151	
171		9.08		9.06		34.043	26.363	169.0	0.419	2.13	D	92.9	D	32.9		32.2	2.15	27.6	0.00	0.00	0.01	0.06	172	04
200	ISL	8.78	D	8.75		34.091	D 26.449	161.4	0.468	1.90	D	82.8	D	29.1		35.4	2.24	28.8	0.00	0.00	0.00	0.08	202	
202		8.77		8.75		34.095	26.452	161.1	0.470	1.88		82.0		28.8		35.7	2.25	28.9	0.00	0.00	0.00	0.08	204	03
229		8.76		8.73		34.106	26.464	160.5	0.514	1.81	D	78.8	D	27.7		36.1	2.27	29.2	0.00	0.00			231	02
250	ISL	8.61	D	8.58		34.132	D 26.508	156.7	0.548	1.66	D	72.1	D	25.3		39.6	2.39	30.4	0.00	0.00			252	
273		8.34		8.31		34.191	26.597	148.6	0.582	1.24	D	54.1	D	18.9		43.3	2.53	31.6	0.00	0.00			275	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 1802 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 11.0 N	118 23.3 W	02/02/2018	1301	UTC	1177 m	310 02 kn			1017.3 mb	13.7 C	13.4 C				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		16.07		16.07		33.525	24.599	333.0	0.000	5.72		249.8		101.8		0.0	0.22	0.0	0.02	0.10	0.35	0.07	0	
2		16.07		16.07		33.525	24.599	333.1	0.007	5.72		249.8		101.8		0.0	0.22	0.0	0.00	0.10	0.35	0.07	2	22
10		16.06		16.06		33.522	24.598	333.4	0.033	5.73		250.0		101.9		0.3		0.0	0.00	0.91	0.42	0.07	10	20
10		16.06		16.06		33.525	24.601	333.1	0.033														10	21
20		16.03		16.03		33.523	24.607	332.9	0.067	5.75		250.9		102.2		0.0	0.23	0.0	0.00	0.00	0.34	0.06	20	19
30		15.89		15.89		33.510	24.629	331.2	0.100	5.73	D	249.9	D	101.7		0.0	0.23	0.0	0.00	0.00	0.45	0.14	30	18
40		15.77		15.76		33.511	D 24.659	328.6	0.130	5.71	D	248.7	D	100.9		0.4	0.26	0.1	0.00	0.05	0.59	0.21	40	17
50		14.53		14.52		33.458	D 24.888	307.1	0.163	5.51		240.4		95.0		1.3	0.36	1.3	0.11	0.08	0.32	0.23	50	15
50		14.53		14.52		33.467	24.895	306.4	0.164														50	16
60		13.11		13.10		33.432	25.161	281.2	0.194	5.06	D	220.2	D	84.6		3.9	0.63	5.8	0.06	0.00	0.19	0.19	60	14
70		12.32		12.31		33.431	D 25.315	266.8	0.220	4.80		209.6		79.1		5.7	0.79	8.5	0.04	0.00	0.15	0.10	71	13
75	ISL	12.10	D	12.09		33.440	D 25.364	262.2	0.233	4.67	D	203.5	D	76.6		6.5	0.85	9.4	0.03	0.00	0.12	0.09	76	
86		11.64		11.63		33.473	D 25.475	251.9	0.261	4.48	D	195.1	D	72.8		8.3	0.98	11.6	0.00	0.00	0.05	0.08	87	12
100		10.87		10.86		33.532	25.661	234.5	0.297	4.01		174.9		64.0		12.3	1.23	15.7	0.00	0.00	0.04	0.06	101	11
120		10.13		10.12		33.743	25.953	207.0	0.341	2.94		128.4		46.3		20.3	1.72	21.7	0.00	0.00	0.02	0.05	121	10
125	ISL	10.04	D	10.02		33.796	D 26.011	201.6	0.350	2.80	D	121.7	D	43.9		21.2	1.76	22.4	0.00	0.00	0.01	0.05	126	
140		9.74		9.73		33.859	26.109	192.5	0.381	2.65		115.7		41.4		24.0	1.88	24.3	0.00	0.00	0.01	0.05	141	09
150	ISL	9.54	D	9.53		33.927	D 26.196	184.6	0.399	2.49	D	108.2	D	38.7		25.3	1.92	24.9	0.00	0.00	0.00	0.04	151	
170		9.39		9.37		33.970	26.256	179.2	0.437	2.35	D	102.4	D	36.5		27.7	2.01	26.2	0.00	0.00	0.00	0.03	171	08
200		9.04		9.01		34.054	26.379	168.1	0.489	2.06		90.1		31.8		31.7	2.13	27.2	0.00	0.00	0.00	0.03	202	07
230		8.78		8.76		34.124	26.475	159.5	0.538	1.72	D	74.8	D	26.3		35.9	2.29	29.5	0.00	0.00			232	06
250	ISL	8.63	D	8.60		34.163	D 26.529	154.7	0.569	1.50	D	65.4	D	22.9		38.2	2.38	30.3	0.00	0.00			252	
270		8.52		8.49		34.189	26.567	151.5	0.600	1.32		57.6		20.1		40.4	2.46	31.0	0.00	0.00			272	05
300	ISL	8.23	D	8.20		34.212	D 26.631	145.9	0.645	1.10	D	47.7	D	16.6		44.2	2.54	32.4	0.00	0.00			302	
320		7.89		7.85		34.205	26.676	141.8	0.674	1.01	D	44.1	D	15.2		46.7	2.59	33.3	0.00	0.00			323	04
380		7.29		7.25		34.237	26.788	131.8	0.756	0.67		29.2		9.9		56.3	2.80	35.7	0.00	0.00			383	03
400	ISL	7.13	D	7.09		34.252	D 26.822	128.8	0.783	0.59	D	25.6	D	8.7		59.2	2.84	36.3	0.00	0.00			403	
440		6.80		6.76		34.281	D 26.891	122.7	0.834	0.43	D	18.7	D	6.3		65.0	2.93	37.6	0.00	0.00			444	02
500	ISL	6.37	D	6.33		34.308	D 26.970	115.7	0.906	0.31	D	13.4	D	4.5		71.3	3.02	38.8	0.00	0.00			504	
515		6.28		6.24		34.313	26.986	114.3	0.922	0.30		12.9		4.3		72.8	3.04	39.1	0.00	0.00			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 1802 STATION 90.0 45.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD AMT	TYPE	ORD
32 55.1 N	118 56.2 W	02/02/2018	1816 UTC	1690 m	310 03 kn	290 01 07	4	1020.1 mb	11.5 C	11.3 C	24 m	8/8	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	15.74	15.74	33.507	24.658	327.3	0.000	5.78	252.3	102.2	0.6	0.24	0.0	0.03	0.11	0.21	0.07	0	
2	15.74	15.74	33.507	24.658	327.4	0.007	5.78	252.3	102.2	0.6	0.24	0.0	0.03	0.11	0.21	0.07	2	24
10	15.62	15.62	33.506	24.685	325.1	0.033	5.78	252.6	102.0	0.0	0.22	0.0	0.00	0.00	0.23	0.07	10	20
10	15.62	15.62	33.509	24.688	324.8	0.033											10	22
10	15.62	15.62	33.507	24.686	325.0	0.032											10	21
20	15.59	15.59	33.505	24.691	324.9	0.065	5.78	252.4	101.9	0.0	0.22	0.0	0.00	0.00	0.26	0.06	20	19
30	15.55	15.54	33.504	24.702	324.2	0.098	5.75 D	250.4 D	101.2	0.0	0.22	0.0	0.00	0.00	0.47	0.16	30	17
30	15.55	15.54	33.506	24.703	324.1	0.098											30	18
40	13.34	13.33	33.448	25.126	284.0	0.128	4.97 D	216.3 D	83.6	3.6	0.62	5.3	0.22	0.00	0.86	0.34	40	16
50	12.41	12.40	33.454	25.314	266.3	0.156	4.76	207.9	78.6	6.0	0.82	8.7	0.12	0.00	1.03	0.34	50	15
60	11.77	11.76	33.484	25.459	252.8	0.182	4.35 D	189.5 D	70.8	8.4	1.01	11.8	0.06	0.06	0.51	0.26	60	14
70	11.39	11.38	33.520	25.557	243.6	0.206	4.16	181.7	67.2	9.9	1.12	13.5	0.04	0.00	0.23	0.25	71	13
75 ISL	11.16 D	11.15	33.548 D	25.620	237.7	0.216	4.02 D	175.1 D	64.6	11.1	1.19	14.6	0.03	0.00	0.20	0.21	76	
85	10.84	10.83	33.578	25.701	230.2	0.242	3.78 D	164.4 D	60.3	13.5	1.34	16.7	0.03	0.00	0.15	0.14	86	12
100	10.49	10.48	33.621	25.796	221.6	0.276	3.55	155.0	56.3	15.6	1.44	18.5	0.00	0.00	0.07	0.10	101	11
120	10.02	10.01	33.692	25.932	209.0	0.319	3.39	147.8	53.2	18.7	1.57	20.7	0.00	0.00	0.01	0.06	121	10
125 ISL	9.81 D	9.80	33.752 D	26.014	201.3	0.327	3.26 D	141.8 D	50.9	19.8	1.63	21.4	0.00	0.00	0.01	0.06	126	
140	9.55	9.53	33.805	26.099	193.5	0.359	2.96	129.1	46.0	23.4	1.79	23.6	0.00	0.00	0.01	0.06	141	09
150 ISL	9.48 D	9.47	33.864 D	26.157	188.2	0.376	2.75 D	119.6 D	42.7	25.4	1.88	24.7	0.00	0.00	0.01	0.06	151	
170	8.99	8.97	33.953	26.306	174.3	0.414	2.38 D	103.7 D	36.6	29.3	2.05	26.8	0.00	0.10	0.01	0.05	171	08
199	8.75	8.73	34.071	26.436	162.5	0.463	1.91	83.4	29.2	34.5	2.23	29.1	0.00	0.00	0.01	0.04	201	07
200 ISL	8.74 D	8.72	34.082 D	26.447	161.5	0.463	1.90 D	82.7 D	29.1	34.6	2.24	29.2	0.00	0.00			202	
230	8.48	8.46	34.140	26.533	153.8	0.512	1.52 D	66.3 D	23.2	39.1	2.40	30.7	0.01	0.09			232	06
250 ISL	8.41 D	8.38	34.177 D	26.574	150.4	0.542	1.34 D	58.1 D	20.3	41.2	2.46	31.4	0.00	0.00			252	
269	8.27	8.24	34.209	26.621	146.2	0.571	1.10	47.9	16.6								271	05
300 ISL	8.05 D	8.02	34.236 D	26.677	141.4	0.615	0.89 D	38.9 D	13.5	46.6	2.61	33.0	0.00	0.00			302	
320	7.97	7.94	34.236	26.689	140.7	0.644	0.86 D	37.3 D	12.9	48.7	2.67	33.6	0.00	0.00			323	04
380	7.46	7.42	34.275	26.794	131.4	0.725	0.59	25.6	8.7	55.5	2.80	35.5	0.00	0.00			383	03
400 ISL	7.27 D	7.23	34.274 D	26.820	129.1	0.752	0.53 D	22.8 D	7.8	57.9	2.85	36.1	0.00	0.00			403	
440	6.90	6.86	34.279	26.876	124.1	0.802	0.42 D	18.4 D	6.2	62.7	2.95	37.1	0.00	0.00			444	02
500 ISL	6.35 D	6.31	34.314 D	26.977	115.0	0.876	0.29 D	12.7 D	4.2	71.1	3.04	38.9	0.00	0.00			504	
516	6.31	6.26	34.315	26.984	114.6	0.892	0.30	12.9	4.3	73.4	3.06	39.4	0.00	0.00			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 1802 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 28.8 W	02/02/2018	2323 UTC	1315 m	030 04 kn	290 02 11	1	1017.7 mb	15.1 C	13.5 C	21 m	1/8	ST	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	15.57	15.57	33.553	24.732	320.3	0.000	5.89	256.6	103.8	0.3	0.21	0.0	0.02	0.07	0.30	0.06	0	
2	15.57	15.57	33.553	24.732	320.3	0.006	5.89	256.6	103.8	0.3	0.21	0.0	0.00	0.07	0.30	0.06	2	22
10	15.33	15.33	33.549	24.782	315.9	0.032	5.91	257.6	103.7	0.2	0.19	0.0	0.00	0.00	0.31	0.09	10	20
10	15.33	15.33	33.553	24.785	315.6	0.032											10	21
20	15.21	15.20	33.541 D	24.804	314.1	0.061	5.85 D	254.8 D	102.3								20	19
30	15.13	15.13	33.548	24.827	312.3	0.095	5.82 D	253.7 D	101.7	0.0	0.22	0.0	0.00	0.00	0.75	0.24	30	17
30	15.13	15.13	33.549	24.827	312.2	0.096											30	18
40	14.83	14.82	33.542	24.889	306.6	0.126	5.72 D	249.2 D	99.3	0.4	0.26	0.4	0.05	0.07	0.73	0.27	40	16
50	14.05	14.04	33.530	25.044	292.1	0.155	5.43	236.5	92.7	1.9	0.41	2.6	0.15	0.10	0.57	0.20	50	15
60	11.87	11.86	33.521	25.468	251.9	0.183	4.26 D	185.4 D	69.5	9.2	1.03	12.4	0.11	0.00	0.30	0.17	60	14
69	11.03	11.02	33.566	25.657	234.0	0.205	3.83	166.8	61.4	12.7	1.30	16.4	0.04	0.00	0.17	0.12	70	13
75 ISL	10.73 D	10.72	33.603 D	25.739	226.3	0.217	3.76 D	163.7 D	59.9	14.3	1.38	17.6	0.04	0.00	0.12	0.10	76	
85	10.28	10.27	33.666	25.867	214.4	0.240	3.50 D	152.2 D	55.2	17.0	1.51	19.6	0.03	0.00	0.05	0.05	86	12
100	9.98	9.97	33.723	25.962	205.6	0.272	3.38	147.2	53.1	19.2	1.57	20.8	0.03	0.00	0.02	0.05	101	11
120	9.62	9.61	33.780	26.067	196.1	0.312	3.25	141.5	50.6	21.1	1.66	22.3	0.03	0.00	0.01	0.05	121	10
125 ISL	9.57 D	9.55	33.803 D	26.094	193.6	0.321	3.08 D	134.1 D	47.9	22.4	1.71	22.9	0.00	0.00	0.01	0.05	126	
140	9.25	9.24	33.876	26.203	183.5	0.350	2.81	122.4	43.5	26.2	1.85	24.9	0.00	0.00	0.01	0.04	141	09
150 ISL	9.12 D	9.10	33.903 D	26.246	179.7	0.368	2.73 D	118.8 D	42.1	28.2	1.93	25.9	0.00	0.00	0.01	0.04	151	
170	8.86	8.84	34.005	26.367	168.5	0.403	2.19 D	95.3 D	33.6	32.1	2.10	27.9	0.00	0.00	0.01	0.04	171	08
200	8.35	8.33	34.059	26.488	157.4	0.452	1.98	86.3	30.1	36.7	2.21	29.4	0.00	0.00	0.00	0.03	202	07
231	8.10	8.08	34.109	26.567	150.5	0.499	1.66 D	72.2 D	25.0	41.1	2.34	31.4	0.00	0.00			233	06
250 ISL	7.98 D	7.96	34.132 D	26.602	147.4	0.529	1.45 D	63.0 D	21.8	44.3	2.44	32.0	0.00	0.00			252	
270	7.76	7.73	34.173	26.668	141.4	0.556	1.19	51.6	17.7	47.6	2.54	32.7	0.00	0.00			272	05
300 ISL	7.69 D	7.66	34.181 D	26.685	140.4	0.601	1.12 D	48.6 D	16.7	50.1	2.61	33.5	0.00	0.00			302	
320	7.53	7.50	34.209	26.730	136.4	0.626	0.90 D	39.2 D	13.4	51.8	2.66	34.0	0.03	0.00			323	04
380	7.06	7.02	34.249	26.830	127.7	0.705	0.61	26.4	9.0	59.4	2.82	36.5	0.00	0.00			383	03
400 ISL	7.02 D	6.98	34.267 D	26.850	126.1	0.735	0.50 D	21.9 D	7.4	62.0	2.87	37.1	0.00	0.00			403	
439	6.64	6.60	34.291	26.920	119.7	0.779	0.39 D	16.9 D	5.7	67.1	2.96	38.2	0.00	0.00			443	02
500 ISL	6.24 D	6.20	34.311 D	26.989	113.7	0.855	0.28 D	12.2 D	4.1	72.3	3.02	39.5	0.00	0.00			504	
516	6.19	6.15	34.319	27.001	112.7	0.868	0.27	11.9	3.9	73.6	3.03	39.8	0.00	0.00			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 1802 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 25.1 N	119 57.1 W	03/02/2018	0352	UTC	947 m	320 04 kn			1018.5 mb	14.2 C	12.7 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		15.52		15.52		33.531		24.726	320.9	0.000	5.87		256.4		103.4		1.6	0.23	0.0	0.01	0.00	0.34	0.12	0	
2		15.52		15.52		33.531		24.726	320.9	0.006	5.87		256.4		103.4		1.6	0.23	0.0	0.00	0.00	0.34	0.12	2	22
10		15.42		15.42		33.524		24.742	319.6	0.032	5.89		257.0		103.4		1.7	0.22	0.0	0.00	0.00	0.36	0.14	10	20
10		15.42		15.42		33.521		24.740	319.8	0.032														10	21
20		15.28		15.27		33.522		24.774	316.9	0.064	5.87		256.1		102.8		1.7	0.22	0.0	0.00	0.00	0.37	0.20	20	19
30		14.77		14.76		33.498		24.867	308.4	0.095	6.00	D	261.4	D	104.0		1.4	0.22	0.0	0.00	0.00	0.76	0.38	30	18
39		14.53		14.52		33.499		24.919	303.7	0.123														39	17
40		14.53		14.52		33.501		24.921	303.6	0.126	5.78	D	251.9	D	99.7		1.8	0.29	0.5	0.04	0.11	1.09	0.51	40	16
50		13.78		13.77		33.498		25.075	289.2	0.155	5.38		234.8		91.4		3.9	0.47	3.4	0.16	0.11	0.80	0.45	50	15
60		12.64		12.64		33.472		25.282	269.6	0.183	4.80	D	209.3	D	79.7		6.8	0.75	7.5	0.19	0.00	0.40	0.29	60	14
69		11.63		11.62		33.512		25.506	248.5	0.207	4.26		185.9		69.1		11.5	1.11	13.1	0.04	0.00	0.20	0.19	70	13
75	ISL	11.19	D	11.18		33.543	D	25.610	238.7	0.220	4.09	D	178.0	D	65.8		13.2	1.22	14.6	0.00	0.00	0.15	0.16	76	
85		10.84		10.83		33.596		25.715	228.9	0.245	3.74	D	162.7	D	59.7		16.1	1.39	17.2	0.00	0.00	0.08	0.11	86	12
100		10.31		10.30		33.659		25.857	215.7	0.278	3.50		152.7		55.2		18.7	1.54	19.4	0.00	0.00	0.04	0.08	101	11
120		9.87		9.86		33.730		25.987	203.8	0.320	3.27		142.9		51.2		21.7	1.66	21.4	0.00	0.00	0.02	0.07	121	10
125	ISL	9.73	D	9.71		33.781	D	26.051	197.8	0.329	3.09	D	134.6	D	48.3		22.9	1.72	22.1	0.00	0.00	0.02	0.07	126	
141		9.43		9.41		33.874		26.173	186.5	0.361	2.72		118.7		42.2		27.0	1.92	24.4	0.00	0.00	0.01	0.06	142	09
150	ISL	9.37	D	9.35		33.903	D	26.206	183.5	0.377	2.62	D	113.9	D	40.5		28.0	1.96	25.0	0.00	0.00	0.01	0.06	151	
170		9.21		9.19		33.963		26.279	176.9	0.413	2.41	D	104.7	D	37.2		30.4	2.06	26.4	0.00	0.00	0.01	0.05	171	08
200		8.59		8.57		34.016		26.418	164.2	0.465	2.34		102.2		35.7		34.6	2.11	28.1	0.00	0.00	0.00	0.03	202	07
230		8.23		8.21		34.055		26.504	156.4	0.513	2.08	D	90.7	D	31.5		38.9	2.24	29.8	0.00	0.00			232	06
250	ISL	8.16	D	8.14		34.107	D	26.557	151.9	0.545	1.74	D	75.5	D	26.2		41.8	2.35	30.9	0.00	0.00			252	
270		7.95		7.92		34.126		26.603	147.7	0.574	1.55		67.4		23.2		44.7	2.45	32.0	0.00	0.00			272	05
300	ISL	7.85	D	7.82		34.155	D	26.642	144.6	0.619	1.32	D	57.2	D	19.7		48.5	2.56	33.1	0.00	0.00			302	
321		7.63		7.60		34.183		26.696	139.7	0.647	1.07	D	46.4	D	15.9		51.2	2.63	33.8	0.00	0.00			324	04
380		7.18		7.14		34.251		26.815	129.2	0.727	0.61		26.7		9.0		59.3	2.85	35.9	0.00	0.00			383	03
400	ISL	6.97	D	6.93		34.260	D	26.851	125.9	0.755	0.52	D	22.6	D	7.6		62.2	2.90	36.6	0.00	0.00			403	
441		6.58		6.54		34.287		26.924	119.3	0.802	0.38	D	16.7	D	5.6		68.0	3.01	38.1	0.00	0.00			445	02
500	ISL	6.22	D	6.18		34.293	D	26.977	114.8	0.875	0.32	D	13.9	D	4.6		74.3	3.08	39.3	0.00	0.00			504	
516		6.11		6.07		34.291		26.990	113.7	0.890	0.30		13.3		4.4		76.0	3.10	39.6	0.00	0.00			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 1802 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 4.8 N	120 38.3 W	03/02/2018	0912	UTC	3815 m	350 07 kn			1018.6 mb	12.9 C	12.8 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		15.90		15.90		33.515		24.630	330.0	0.000	5.71		249.2		101.2		1.7	0.22	0.0	0.02	0.06	0.14	0.04	0	
1		15.90		15.90		33.515		24.630	330.0	0.003	5.71		249.2		101.2		1.7	0.22	0.0	0.00	0.06	0.14	0.04	1	22
10		15.75		15.75		33.498		24.650	328.5	0.033	5.74		250.5		101.5		1.2	0.23	0.0	0.00	0.00	0.15	0.04	10	20
10		15.75		15.75		33.496		24.648	328.6	0.033														10	21
20		15.74		15.73		33.496		24.652	328.6	0.066	5.72		249.8		101.1		1.1	0.21	0.0	0.00	0.00	0.20	0.06	20	19
30		15.66		15.65		33.488		24.664	327.8	0.099	5.73	D	249.8	D	101.2		1.1	0.21	0.0	0.00	0.00	0.21	0.12	30	18
40		15.56		15.56		33.487		24.685	326.1	0.131	5.74	D	250.0	D	101.0		1.1	0.22	0.0	0.00	0.00	0.22	0.08	40	17
50	ISL	15.50	D	15.49		33.489	D	24.703	324.8	0.164	5.72	D	249.4	D	100.7		1.1	0.22	0.0	0.00	0.00	0.33	0.12	50	
50		15.50		15.49		33.485		24.699	325.1	0.164														50	16
51		15.50		15.50		33.492		24.703	324.8	0.167	5.71		249.3		100.4		1.1	0.22	0.0	0.00	0.00	0.34	0.12	51	15
60		15.48		15.47		33.495		24.712	324.2	0.196	5.71	D	248.9	D	100.4		1.1	0.22	0.0	0.00	0.00	0.35	0.12	60	14
70		15.42		15.41		33.479		24.714	324.4	0.229	5.70		248.9		100.1		1.2	0.23	0.0	0.03	0.10	0.27	0.12	71	13
75	ISL	15.40	D	15.39		33.479	D	24.718	324.2	0.245	5.70	D	248.5	D	100.1		1.2	0.23	0.0	0.03	0.10	0.23	0.12	76	
86		15.27		15.26		33.471		24.741	322.4	0.280	5.68	D	247.4	D	99.4		1.3	0.24	0.0	0.05	0.09	0.15	0.12	87	12
100		14.00		13.98		33.459		25.004	297.6	0.324	5.57		243.4		95.1		2.3	0.35	1.6	0.10	0.00	0.21	0.07	101	11
120		12.16		12.14		33.410		25.330	266.7	0.380	5.29		230.9		86.8		4.7	0.59	5.5	0.03	0.00	0.07	0.08	121	10
125	ISL	11.95	D	11.93		33.430	D	25.386	261.4	0.395	5.18	D	225.5	D	84.6		5.7	0.67	6.8	0.00	0.00	0.06	0.07	126	
140		11.08		11.06		33.474		25.580	243.2	0.431	4.80		209.6		77.0		8.7	0.89	10.6	0.00	0.00	0.03	0.04	141	09
150	ISL	10.52	D	10.50		33.556	D	25.742	227.9	0.456	4.32	D	187.9	D	68.4		11.8	1.07	13.4	0.00	0.00	0.02	0.04	151	
170		9.91		9.89		33.663		25.929	210.4	0.499	3.89	D	169.1	D	60.8		18.2	1.43	18.9	0.00	0.00	0.01	0.03	171	08
200		9.28		9.26		33.804		26.145	190.4	0.559	3.45	D	150.2	D	53.3		23.6	1.67	22.3	0.00	0.00	0.00	0.02	202	07
230		8.66		8.63		33.972		26.375	168.9	0.613	2.54	D	110.6	D	38.8		32.6	2.03	27.2	0.00	0.00			232	06
250	ISL	8.32	D	8.30		34.035	D	26.476	159.5	0.648	2.28	D	99.2	D	34.5		35.7	2.13	28.4	0.00	0.00			252	
270		8.15		8.12		34.067		26.528	155.0	0.678	2.12		92.7		32.0		38.8	2.23	29.6	0.00	0.10			272	05
300	ISL	7.91	D	7.88		34.125	D	26.609	147.8	0.726	1.55	D	67.3	D	23.2		44.0	2.42	31.5	0.00	0.07			302	
320		7.80		7.77		34.151		26.646	144.6	0.752	1.30	D	56.6	D	19.5		47.5	2.54	32.8	0.00	0.05			323	04
382		7.44		7.40		34.224		26.757	135.0	0.839	0.82		35.7		12.2		54.8	2.76	34.9	0.00	0.00			385	03
400	ISL	7.30	D	7.26		34.241	D	26.790	132.0	0.867	0.69	D	29.8	D	10.2		56.8	2.80	35.3	0.00	0.00			403	
442		7.08		7.04		34.260		26.836	128.2	0.918	0.54	D	23.5	D	8.0		61.6	2.90	36.3	0.00	0.00			446	02
500	ISL	6.39	D	6.35		34.282	D	26.947	117.8	0.994	0.36	D	15.6	D	5.2		70.4	3.03	38.5	0.00	0.00			504	
516		6.31		6.27		34.285		26.959	116.9	1.008	0.34	D	14.7	D	4.9		72.9	3.07	39.2	0.00	0.00			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 1802 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 45.2 N	121 19.0 W	03/02/2018	1441	UTC	3679 m	340 02 kn			1019.5 mb	13.1 C	12.1 C	31 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		16.59		16.59		33.594	24.533	339.2	0.000	5.62	245.3		101.0		1.4	0.21	0.0	0.01	0.00	0.13	0.01	0	
2		16.59		16.58		33.594	24.533	339.3	0.007	5.62	245.3		101.0		1.4	0.21	0.0	0.00	0.00	0.13	0.01	2	22
10		16.57		16.57		33.594	24.538	339.1	0.034	5.61	244.8		100.8		1.4	0.21	0.0	0.00	0.00	0.13	0.01	10	20
10		16.57		16.57		33.594	24.538	339.2	0.035													10	21
20	ISL	16.14	D	16.13		33.550	D 24.604	333.2	0.064	5.67	D247.3	D	101.1		1.4	0.22	0.0	0.00	0.00	0.16	0.02	20	
25		15.96		15.96		33.523	24.622	331.6	0.084	5.70	D248.6	D	101.3		1.4	0.23	0.0	0.00	0.00	0.17	0.02	25	19
30	ISL	15.95	D	15.95		33.526	D 24.628	331.2	0.098	5.70	D248.4	D	101.2		1.4	0.23	0.0	0.00	0.00	0.16	0.04	30	
40		15.85		15.85		33.515	24.642	330.2	0.134	5.71	D249.1	D	101.3		1.4	0.22	0.0	0.00	0.00	0.15	0.07	40	18
50		15.58		15.58		33.499	24.691	325.9	0.167	5.74	250.5		101.1		1.5	0.23	0.0	0.00	0.00	0.28	0.07	50	17
62		15.36		15.35		33.482	24.728	322.8	0.206	5.73	250.3		100.5		1.6	0.23	0.0	0.00	0.00	0.38	0.10	62	15
62		15.36		15.35		33.483	24.728	322.8	0.205													62	16
75		15.00		14.99		33.464	24.794	316.9	0.247	5.72	D249.4	D	99.7		1.8	0.26	0.1	0.06	0.11	0.39	0.10	76	14
88		14.10		14.09		33.439	24.966	300.8	0.287	5.62	245.6		96.1		2.5	0.35	1.4	0.16	0.00	0.35	0.16	89	13
100		12.97		12.96		33.476	25.224	276.4	0.322	5.43	237.0		90.7		3.6	0.45	3.4	0.06	0.00	0.29	0.10	101	12
112		12.36		12.34		33.494	25.358	263.9	0.354	5.16	225.5		85.2		5.4	0.61	6.1	0.04	0.00	0.12	0.09	113	11
125		11.18		11.17		33.474	25.560	244.7	0.387	4.63	D201.8	D	74.5		9.6	0.97	11.7	0.00	0.00	0.07	0.05	126	10
140		10.45		10.43		33.557	25.755	226.4	0.423	4.14	180.7		65.5		14.7	1.28	16.5	0.00	0.00	0.02	0.04	141	09
150	ISL	10.15	D	10.13		33.625	D 25.860	216.6	0.444	3.95	D171.9	D	62.1		16.5	1.35	17.8	0.00	0.00	0.02	0.03	151	
171		9.61		9.59		33.730	26.032	200.6	0.489	3.66	D159.4	D	57.0		20.3	1.51	20.4	0.00	0.00	0.01	0.02	172	08
200	ISL	8.99	D	8.97		33.898	D 26.263	179.0	0.544	2.98	D129.9	D	45.8		27.8	1.84	25.0	0.00	0.00	0.00	0.02	202	
201		8.98		8.95		33.894	26.263	179.1	0.546	2.97	129.7		45.6		28.0	1.85	25.1	0.00	0.00	0.00	0.02	203	07
230		8.63		8.60		34.007	26.407	165.9	0.596	2.38	D103.5	D	36.3		33.9	2.08	28.0	0.00	0.00			232	06
250	ISL	8.37	D	8.35		34.064	D 26.491	158.2	0.628	1.99	D 86.8	D	30.2		37.9	2.19	29.3	0.00	0.00			252	
270		8.10		8.07		34.090	26.553	152.5	0.659	1.87	81.8		28.2		41.8	2.30	30.7	0.00	0.00			272	05
300	ISL	7.79	D	7.76		34.140	D 26.638	144.9	0.704	1.42	D 61.7	D	21.2		45.7	2.45	32.3	0.00	0.00			302	
321		7.73		7.70		34.164	26.666	142.6	0.734	1.16	D 50.3	D	17.3		48.3	2.56	33.3	0.00	0.00			324	04
381		7.16		7.12		34.228	26.799	130.7	0.816	0.68	29.6		10.0		58.2	2.79	35.8	0.00	0.00			384	03
400	ISL	7.08	D	7.04		34.247	D 26.825	128.4	0.842	0.59	D 25.6	D	8.7		60.3	2.83	36.3	0.00	0.00			403	
457		6.58		6.54		34.250	26.896	122.2	0.913	0.47	D 20.5	D	6.9		66.6	2.93	38.0	0.00	0.00			461	02
500	ISL	6.21	D	6.16		34.247	D 26.943	118.0	0.966	0.43	D 18.5	D	6.2		66.5	2.92	38.0	0.00	0.00			504	
516		6.12		6.07		34.252	26.958	116.7	0.983	0.37	D 16.0	D	5.3		66.4	2.92	38.1	0.00	0.00			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 1802 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 59.2 W	03/02/2018	2022	UTC	3882 m	250 02 kn	320 05 07	1	1020.1 mb	14.6 C	12.4 C	43 m	1/8	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		15.82		15.82		33.501	24.636	329.4	0.000	5.73	250.2		101.4		1.4	0.22	0.0	0.01	0.02	0.14	0.03	0	
2		15.82		15.82		33.501	24.636	329.5	0.007	5.73	250.2		101.4		1.4	0.22	0.0	0.00	0.00	0.14	0.03	2	22
10		15.76		15.76		33.500	24.650	328.5	0.033	5.74	250.5		101.4		1.4	0.21	0.0	0.00	0.00	0.13	0.04	10	20
10		15.76		15.76		33.500	24.650	328.4	0.033													10	21
20	ISL	15.72	D	15.72		33.495	D 24.655	328.3	0.063	5.73	D249.9	D	101.3		1.4	0.22	0.0	0.00	0.00	0.18	0.04	20	
25		15.69		15.68		33.497	24.665	327.6	0.082	5.74	250.4		101.3		1.4	0.22	0.0	0.00	0.14	0.20	0.04	25	19
30	ISL	15.64	D	15.63		33.491	D 24.672	327.1	0.096	5.75	D250.5	D	101.4		1.4	0.22	0.0	0.00	0.00	0.23	0.03	30	
40		15.54		15.53		33.490	24.694	325.3	0.131	5.76	D251.1	D	101.4		1.4	0.22	0.0	0.00	0.00	0.30	0.02	40	18
50		15.46		15.45		33.492	24.713	323.8	0.164	5.76	D251.2	D	101.3		1.4	0.22	0.0	0.00	0.00	0.31	0.02	50	17
63		15.37		15.36		33.483	24.726	322.9	0.204													62	16
63		15.37		15.36		33.482	24.727	323.0	0.206	5.75	D250.6	D	100.9		1.4	0.23	0.0	0.00	0.00	0.46	0.01	63	15
75		15.21		15.20		33.471	24.753	320.9	0.244	5.70	D248.6	D	99.8		1.6	0.25	0.0	0.05	0.11	0.33	0.09	76	14
87		14.47		14.46		33.442	24.891	308.0	0.282	5.61	245.1		96.7		2.3	0.33	1.1	0.21	0.00	0.15	0.10	88	13
100		13.43		13.42		33.517	25.165	282.2	0.320	5.40	235.6		91.0		3.5	0.42	3.2	0.04	0.00	0.16	0.11	101	12
112		12.50		12.49		33.485	25.324	267.2	0.353	5.18	D225.5	D	85.6		5.1	0.59	5.7	0.03	0.00	0.10	0.08	113	11
125		11.82		11.81		33.490	25.456	254.8	0.387	4.99	218.0		81.4		6.6	0.71	7.9	0.00	0.00	0.07	0.05	126	10
140		10.86		10.85		33.533	25.664	235.1	0.424	4.49	196.0		71.7		11.5	1.06	13.3	0.00	0.00	0.03	0.03	141	09
150	ISL	10.28	D	10.26		33.594	D 25.814	221.0	0.447	4.11	D178.9	D	64.8		13.7	1.17	15.2	0.00	0.00	0.02	0.03	151	
170		9.85		9.83		33.688	25.959	207.5	0.490	3.90	D169.9	D	61.0		18.0	1.40	18.8	0.00	0.00	0.01	0.02	171	08
200		9.05		9.03		33.856	26.221	183.0	0.548	3.40	148.4		52.3		25.2	1.67	23.3	0.00	0.00	0.00	0.03	202	07
230		8.51		8.49		33.953	26.382	168.1	0.601	2.95	D128.1	D	44.8		31.5	1.89	26.3	0.00	0.00			232	06
250	ISL	8.20	D	8.18		33.986	D 26.455	161.5	0.636	2.68	D116.7	D	40.5		34.6	1.98	27.5	0.00	0.00			252	
270		8.02		8.00		34.001	26.494	158.1	0.666	2.56	111.5		38.4		37.7	2.06	28.7	0.00	0.00			272	05
300	ISL	7.61	D	7.58		34.011	D 26.564	151.8	0.715	2.40	D104.2	D	35.7		43.7	2.21	30.9	0.00	0.00			302	
321		7.18		7.15		34.035	26.642	144.4	0.743	1.99	D 86.7	D	29.4		47.8	2.32	32.5	0.00	0.00			324	04
381		6.68		6.65		34.104	26.766	133.3	0.827	1.16	50.8		17.0		58.3	2.64	36.1	0.00	0.00			384	03
400	ISL	6.60	D	6.57		34.122	D 26.791	131.2	0.856	0.98	D 42.6	D	14.3		61.3	2.71	36.9	0.00	0.00			403	
440		6.36		6.32		34.180	26.869	124.3	0.903	0.64	D 28.0	D	9.3		67.7	2.86	38.5	0.00	0.00			444	02
500	ISL	5.88	D	5.83		34.208	D 26.953	116.6	0.980	0.45	D 19.7	D	6.5		76.0	2.98	40.0	0.00	0.00			504	
517		5.75		5.71		34.228	26.985	113.7	0.994	0.40	17.3		5.7		78.4	3.01	40.4	0.00	0.00			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 1802 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 39.1 W	04/02/2018	0140	UTC	4042 m	300 03 kn	340 05 10	1	1018.2 mb	15.5 C	13.4 C		2/8	ST	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		16.51		16.51		33.560		24.524	340.1	0.000	5.70	249.0		102.4		0.2	0.13	0.0	0.00	0.00	0.10	0.02	0	
2		16.51		16.51		33.560		24.525	340.1	0.007	5.70	249.0		102.4		0.2	0.13	0.0	0.00	0.00	0.10	0.02	2	22
10		16.37		16.36		33.549		24.550	338.0	0.034	5.66	247.0		101.3		1.3	0.20	0.0	0.00	0.00	0.10	0.02	10	20
10		16.37		16.36		33.549		24.550	338.0	0.034													10	21
20	ISL	16.20	D	16.20		33.543	D	24.583	335.2	0.065	5.66	D246.5	D	100.9		1.3	0.20	0.0	0.00	0.00	0.10	0.02	20	
25		16.19		16.18		33.547		24.590	334.7	0.084	5.65	246.5		100.7		1.3	0.20	0.0	0.00	0.00	0.11	0.03	25	19
30	ISL	16.18	D	16.18		33.544	D	24.589	335.0	0.098	5.65	D246.4	D	100.9		1.3	0.20	0.0	0.00	0.00	0.11	0.03	30	
40		16.18		16.17		33.552		24.596	334.6	0.135	5.66	D246.7	D	101.0		1.3	0.19	0.0	0.00	0.00	0.11	0.04	40	18
50		16.14		16.13		33.554		24.609	333.8	0.168	5.65	D246.1	D	100.6		1.2	0.19	0.0	0.00	0.00	0.15	0.04	50	17
62		16.12		16.11		33.553		24.614	333.7	0.208	5.64	246.1		100.4		1.2	0.20	0.0	0.00	0.00	0.20	0.07	62	16
75		16.07		16.06		33.548		24.622	333.4	0.251	5.64	D245.6	D	100.3		1.2	0.20	0.0	0.00	0.00	0.26	0.11	76	15
87		15.10		15.09		33.565		24.850	312.0	0.290	5.61	245.2		98.0		1.6	0.23	0.1	0.06	0.00	0.36	0.21	88	13
87		15.10		15.09		33.568		24.852	311.8	0.290													88	14
100		14.09		14.08		33.652		25.133	285.3	0.329	5.50	240.2		94.2		2.6	0.30	1.5	0.04	0.00	0.22	0.18	101	12
112		12.92		12.90		33.517	D	25.267	272.6	0.362	5.40	D235.4	D	90.2		3.1	0.36	2.3	0.03	0.00	0.17	0.14	113	11
125		12.05		12.04		33.494	D	25.417	258.6	0.396	4.96	D215.9	D	81.2									126	10
140		11.63		11.61		33.529		25.522	248.8	0.434	4.78	208.5		77.5		8.4	0.83	9.7	0.00	0.00	0.04	0.06	141	09
150	ISL	11.12	D	11.10		33.553	D	25.634	238.3	0.459	4.60	D200.3	D	73.9		11.3	1.01	12.6	0.00	0.00	0.03	0.05	151	
170		9.97		9.95		33.651		25.911	212.1	0.503	3.95	D172.1	D	62.0		17.1	1.37	18.3	0.00	0.00	0.01	0.03	171	08
200	ISL	9.11	D	9.08		33.853	D	26.210	184.1	0.565	3.47	D150.8	D	53.4		24.5	1.65	22.7	0.00	0.00	0.00	0.02	202	
201		9.11		9.08		33.851		26.209	184.2	0.565	3.46	151.1		53.3		24.8	1.66	22.8	0.00	0.00	0.00	0.02	203	07
231		8.52		8.50		33.958		26.384	168.0	0.617	2.84	D123.8	D	43.2		32.0	1.91	26.6	0.00	0.00			233	06
250	ISL	8.38	D	8.35		33.998	D	26.439	163.1	0.651	2.54	D110.3	D	38.4		34.8	2.03	28.0	0.00	0.00			252	
270		8.16		8.14		34.040		26.504	157.2	0.681	2.23	97.3		33.6		37.8	2.16	29.5	0.00	0.00			272	05
300	ISL	7.71	D	7.68		34.054	D	26.583	150.1	0.730	1.91	D 82.9	D	28.4		43.9	2.35	31.6	0.00	0.00			302	
320		7.60		7.57		34.115		26.646	144.4	0.756	1.46	D 63.7	D	21.8		48.0	2.47	32.9	0.00	0.00			323	04
380		6.88		6.84		34.141		26.768	133.3	0.839	1.02	44.3		14.9		58.6	2.69	36.2	0.00	0.00			383	03
400	ISL	6.72	D	6.68		34.148	D	26.796	130.8	0.870	0.89	D 38.8	D	13.0		61.9	2.75	37.1	0.00	0.00			403	
440		6.15		6.11		34.153		26.875	123.4	0.917	0.71	D 30.8	D	10.2		68.5	2.88	39.1	0.00	0.00			444	02
500	ISL	5.88	D	5.84		34.230	D	26.970	115.0	0.994	0.41	D 17.9	D	5.9		78.1	3.00	40.5	0.00	0.00			504	
515		5.64		5.60		34.216		26.989	113.2	1.006	0.44	19.0		6.2		80.5	3.03	40.9	0.00	0.00			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 1802 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 50.6 N	117 32.0 W	01/02/2018	2206	UTC	846 m	250 09 kn	300 01 07	1	1015.4 mb	14.2 C	13.4 C	23 m	2/8	ST	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		16.45		16.45		33.529		24.514	341.0	0.000	5.73	250.0		102.7		0.1	0.22	0.0	0.00	0.06	0.20	0.02	0	
2		16.45		16.45		33.529		24.514	341.1	0.007	5.73	250.0		102.7		0.0	0.22	0.0	0.00	0.06	0.20	0.02	2	23
9		16.08		16.08		33.536		24.605	332.7	0.032													9	21
10		16.07		16.07		33.531		24.602	333.0	0.034	5.75	251.2		102.4		0.0	0.21	0.0	0.00	0.09	0.20	0.04	10	20
10		16.07		16.07		33.524		24.598	333.4	0.033													10	22
20		16.01		16.01		33.523		24.611	332.6	0.067	5.75	251.0		102.2		0.0	0.23	0.0	0.00	0.00	0.23	0.07	20	19
30		15.93		15.93		33.520		24.628	331.3	0.100	5.75	D250.6	D	102.1		0.0	0.23	0.0	0.00	0.10	0.91	0.55	30	18
40		13.86		13.86		33.405		24.986	297.4	0.132	5.44	D236.8	D	92.4		2.4	0.46	2.7	0.08	0.00	0.94	0.53	40	16
40		13.86		13.86		33.406		24.987	297.3	0.131													40	17
50		12.64		12.63		33.415		25.240	273.4	0.160	4.88	213.3		81.0		5.4	0.76	7.9	0.00	0.08	0.29	0.33	50	15
60		12.30		12.29		33.426		25.314	266.6	0.187	4.59	D200.1	D	75.6		6.6	0.85	9.4	0.00	0.45	0.21	0.30	60	14
70		11.25		11.24		33.526		25.586	240.8	0.213	4.00	174.9		64.5		11.2	1.17	14.4	0.00	0.00	0.09	0.11	71	13
75	ISL	11.19	D	11.18		33.534	D	25.603	239.3	0.223	4.01	D174.4	D	64.5		11.9	1.21	15.1	0.00	0.00	0.07	0.11	76	
85		10.86		10.85		33.559		25.682	232.0	0.248	3.91	D170.4	D	62.5		13.3	1.28	16.5	0.00	0.00	0.04	0.09	86	12
100		10.56		10.54		33.634		25.795	221.6	0.282	3.68	160.5		58.4		15.5	1.40	18.0	0.00	0.14	0.02	0.07	101	11
120		10.22		10.20		33.787		25.973	205.1	0.325	2.81	122.8		44.4		21.1	1.75	22.4	0.00	0.00	0.02	0.08	121	10
125	ISL	10.15	D	10.13		33.823	D	26.013	201.4	0.334	2.73	D118.7	D	43.0		21.9	1.79	22.8	0.00	0.00	0.02	0.07	126	
140		9.81		9.79		33.883		26.117	191.8	0.365	2.54	111.0		39.8		24.5	1.90	24.2	0.00	0.08	0.01	0.04	141	09
150	ISL	9.71	D	9.69		33.921	D	26.165	187.5	0.383	2.51	D109.2	D	39.2		25.6	1.94	24.8	0.00	0.17	0.01	0.04	151	
169		9.61		9.60		34.001		26.243	180.6	0.419	2.25	D 97.8	D	35.0		27.7	2.03	25.9	0.00	0.33	0.00	0.04	170	08
200		9.23		9.21		34.045		26.341	171.8	0.473	2.08	90.7		32.1		30.6	2.11	27.5	0.00	0.14	0.00	0.05	202	07
230		8.95		8.92		34.133		26.456	161.4	0.523	1.71	D 74.4	D	26.3		35.3	2.28	29.2	0.00	0.13			232	06
250	ISL	8.83	D	8.81		34.160	D	26.496	158.0	0.555	1.52	D 66.2	D	23.3		37.2	2.34	29.9	0.00	0.00			252	
271		8.69		8.66		34.181		26.535	154.7	0.588	1.40	61.1		21.4		39.3	2.40	30.7	0.00	0.00			273	05
300	ISL	8.26	D	8.23		34.194	D	26.611	147.8	0.633	1.24	D 54.1	D	18.8		43.5	2.51	32.0	0.00	0.00			302	
320		8.13		8.10		34.235		26.663	143.2	0.661	1.00	D 43.4	D	15.1		46.4	2.58	32.9	0.00	0.00			323	04
380		7.58		7.55		34.239		26.748	135.8	0.745	0.77	33.7		11.5		53.3	2.73	35.1	0.00	0.13			383	03
400	ISL	7.44	D	7.40		34.247	D	26.776	133.5	0.774	0.69	D 30.1	D	10.3		55.7	2.78	35.7	0.00	0.13			403	
440		7.09		7.04		34.261		26.837	128.1	0.824	0.54	D 23.4	D	7.9		60.4	2.87	36.9	0.00	0.12			444	02
500	ISL	6.60	D	6.55		34.296	D	26.931	119.7	0.902	0.36	D 15.5	D	5.2		68.3	2.99	38.5	0.00	0.14			504	
518		6.46		6.41		34.312		26.963	116.7	0.919	0.33	14.5		4.8		70.7	3.02	39.0	0.00	0.14			522	01

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

CalCOFI Cruise 1802

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)
76.7	49.0	35 05.3	120 46.6	02/09	0959	1004	112	46	72	72
76.7	51.0	35 01.4	120 54.9	02/09	1211	1232	411	218	78	78
76.7	55.0	34 53.3	121 11.7	02/09	1527	1548	443	214	23	23
76.7	60.0	34 43.4	121 32.6	02/09	1908	1929	432	213	70	70
76.7	70.0	34 23.4	122 14.8	02/10	0024	0045	444	205	104	104
80.0	51.0	34 27.0	120 31.5	02/09	0436	0442	135	59	186	186
80.0	55.0	34 18.7	120 48.9	02/09	0114	0134	420	209	112	112
80.0	60.0	34 08.8	121 08.9	02/08	2057	2117	409	209	240	78
80.0	70.0	33 48.9	121 50.6	02/08	1525	1546	444	210	205	41
80.0	80.0	33 29.0	122 32.3	02/08	0946	1007	396	211	53	53
80.0	90.0	33 09.1	123 13.2	02/08	0408	0429	409	210	44	44
80.0	100.0	32 48.9	123 54.2	02/07	2243	2303	451	205	49	49
81.8	46.9	34 16.5	120 01.6	02/06	0823	0844	443	206	102	102
83.3	40.6	34 13.4	119 25.1	02/06	0150	0153	73	24	109	109
83.3	42.0	34 10.5	119 30.5	02/06	0402	0411	185	78	49	49
83.3	51.0	33 52.7	120 07.9	02/06	1305	1311	139	63	36	36
83.3	55.0	33 44.8	120 24.5	02/06	1626	1646	469	197	75	75
83.3	60.0	33 34.5	120 45.2	02/06	2026	2047	443	213	86	86
83.3	70.0	33 14.6	121 26.6	02/07	0156	0217	439	206	130	112
83.3	80.0	32 54.6	122 07.6	02/07	0721	0742	425	210	57	57
83.3	90.0	32 34.7	122 48.6	02/07	1239	1259	429	209	23	23
83.3	100.0	32 14.6	123 29.5	02/07	1744	1805	460	207	39	39
86.7	33.0	33 53.4	118 29.4	02/05	2005	2009	100	36	100	100
86.7	35.0	33 49.3	118 37.8	02/05	1748	1808	422	211	50	50
86.7	40.0	33 39.3	118 58.5	02/05	1359	1419	431	217	93	93
86.7	45.0	33 29.5	119 19.2	02/05	0950	1011	413	208	56	56
86.7	50.0	33 19.4	119 39.8	02/05	0556	0602	123	50	357	211
86.7	55.0	33 09.7	120 00.2	02/05	0222	0243	429	209	51	51
86.7	60.0	32 59.5	120 21.1	02/04	2203	2224	468	208	58	58
86.7	70.0	32 39.4	121 02.1	02/04	1644	1705	419	211	21	21
86.7	80.0	32 19.3	121 42.7	02/04	1103	1124	454	211	22	22
86.7	90.0	31 59.4	122 23.6	02/04	0533	0554	432	212	46	46
86.7	100.0	31 39.3	123 04.1	02/04	0008	0029	461	205	41	41
90.0	28.0	33 29.1	117 46.2	02/01	2037	2049	288	113	132	62
90.0	30.0	33 25.1	117 54.3	02/01	2338	2359	426	206	33	33
90.0	35.0	33 15.1	118 15.1	02/02	0334	0355	413	212	44	44
90.0	37.0	33 11.1	118 23.2	02/02	0638	0659	436	208	57	30
90.0	45.0	32 55.1	118 56.2	02/02	1149	1209	410	214	412	20
90.0	53.0	32 39.1	119 28.6	02/02	1652	1713	464	204	229	151
90.0	60.0	32 25.2	119 57.2	02/02	2107	2127	449	188	165	80
90.0	70.0	32 05.1	120 38.2	02/03	0243	0304	435	208	48	48
90.0	80.0	31 45.1	121 18.9	02/03	0810	0831	469	207	40	40
90.0	90.0	31 25.1	121 59.1	02/03	1340	1401	459	198	22	22
90.0	100.0	31 05.1	122 39.0	02/03	1848	1908	427	209	40	40
93.3	30.0	32 50.7	117 31.8	02/01	1520	1541	442	217	14	14