

# 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**

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## 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 KIO<sub>3</sub> 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.

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\* 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](http://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  $\text{NO}_2 + \text{NO}_3$ ,  $\text{PO}_4$ , 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.

<b>1802SH</b>	<b><math>\text{NO}_2 + \text{NO}_3</math> (<math>\mu\text{mol/L}</math>)</b>	<b><math>\text{PO}_4</math> (<math>\mu\text{mol/L}</math>)</b>	<b>SIL (<math>\mu\text{mol/L}</math>)</b>
Mean $\pm$ SD (n=34)	$36.82 \pm 0.13$	$2.59 \pm 0.02$	$111.09 \pm 0.99$
Certified Value* (Lot CB)	36.65	2.58	111.82

\*Converted from  $\mu\text{mol/kg}$  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 pCO<sub>2</sub> and pH measurements*: Automated shipboard analysis of the partial pressure of CO<sub>2</sub> and pH were made from the ship's underway flow-through system. pCO<sub>2</sub> measurements were taken with the Shipboard Underway pCO<sub>2</sub> Environmental Recorder (SUPER-CO<sub>2</sub>) sold by Sunburst Sensors designed with a showered equilibrator and a LI-COR 840A CO<sub>2</sub>/H<sub>2</sub>O 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. pCO<sub>2</sub> 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<sub>2</sub>. 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 ( $\text{cm}^3/1000\text{m}^3$  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.

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## 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

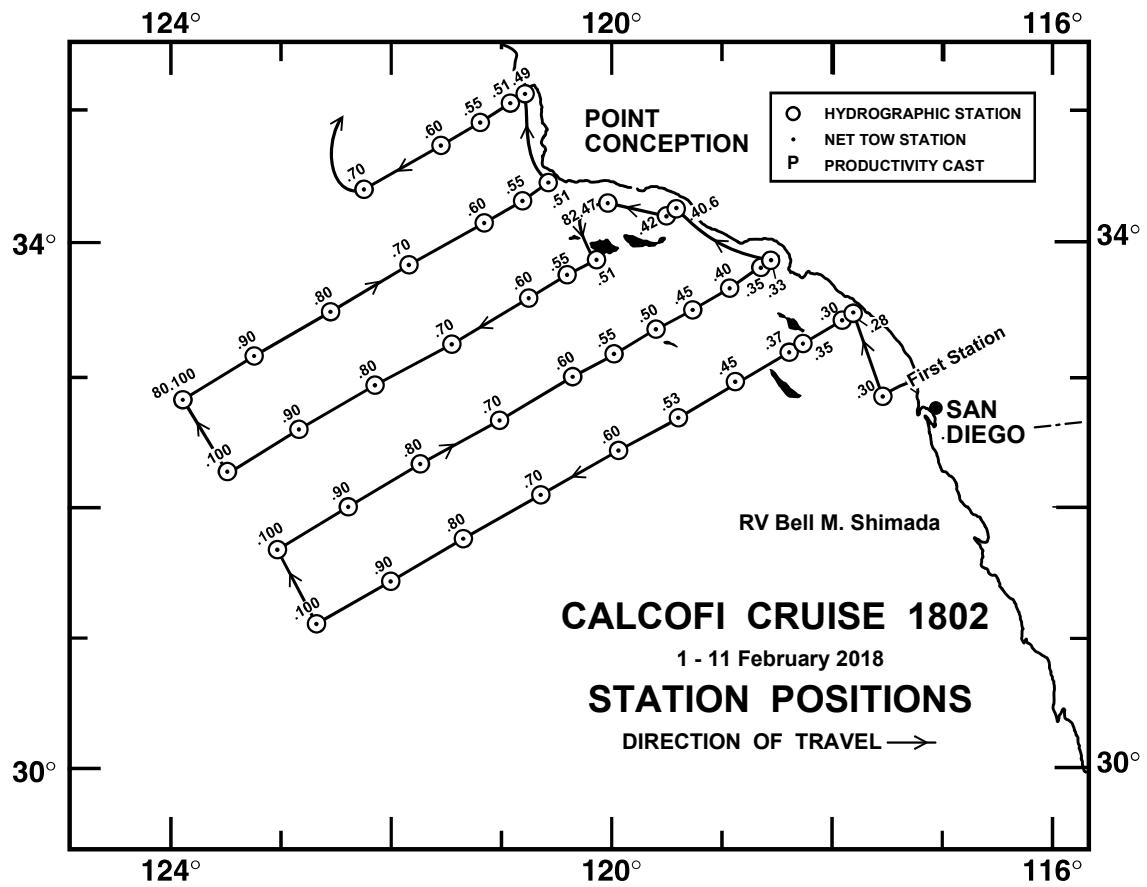


FIGURE 1

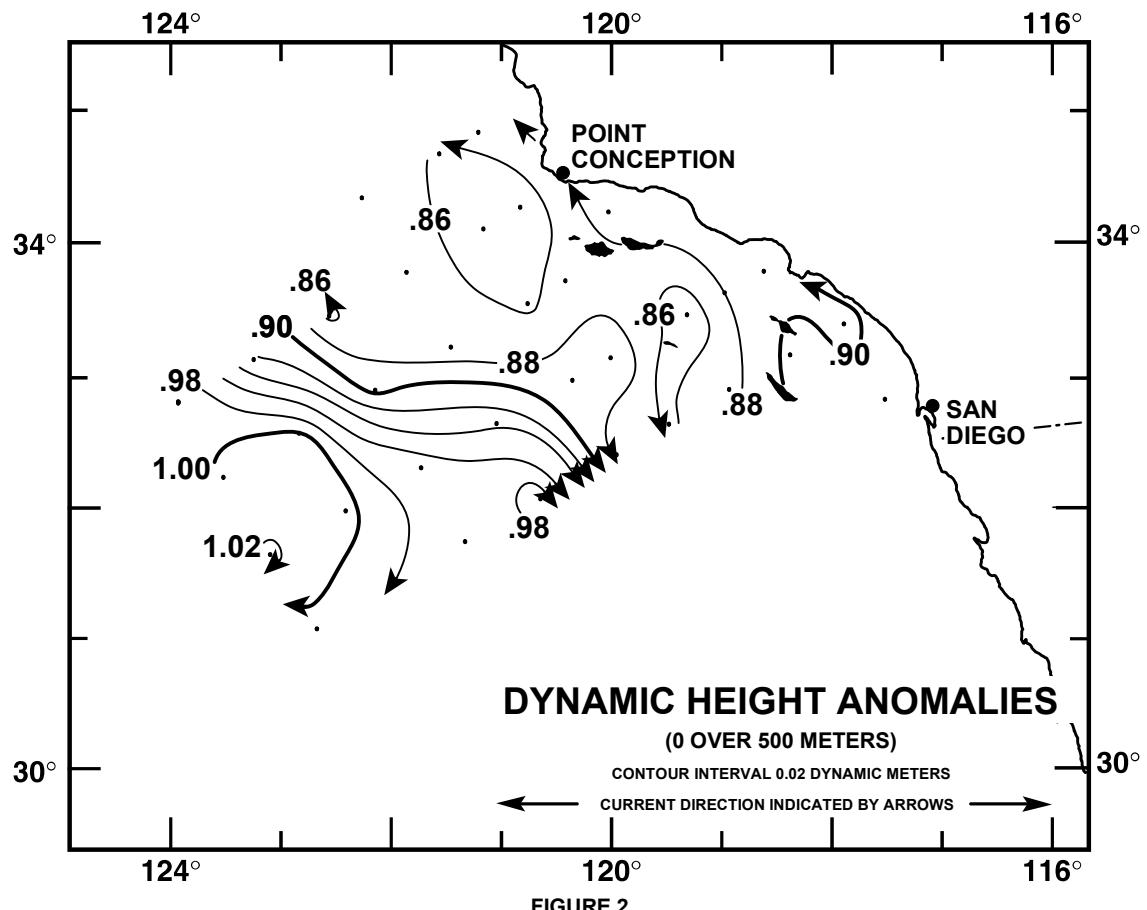


FIGURE 2

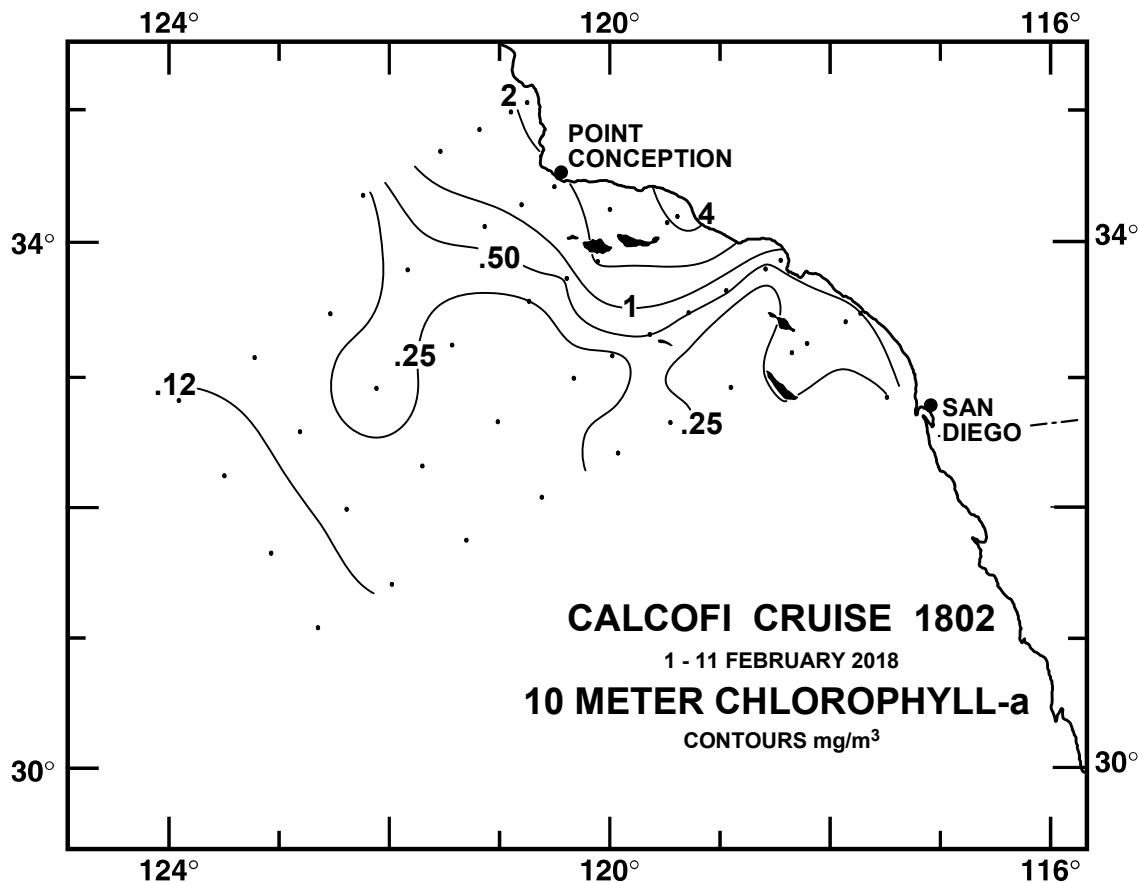


FIGURE 3A

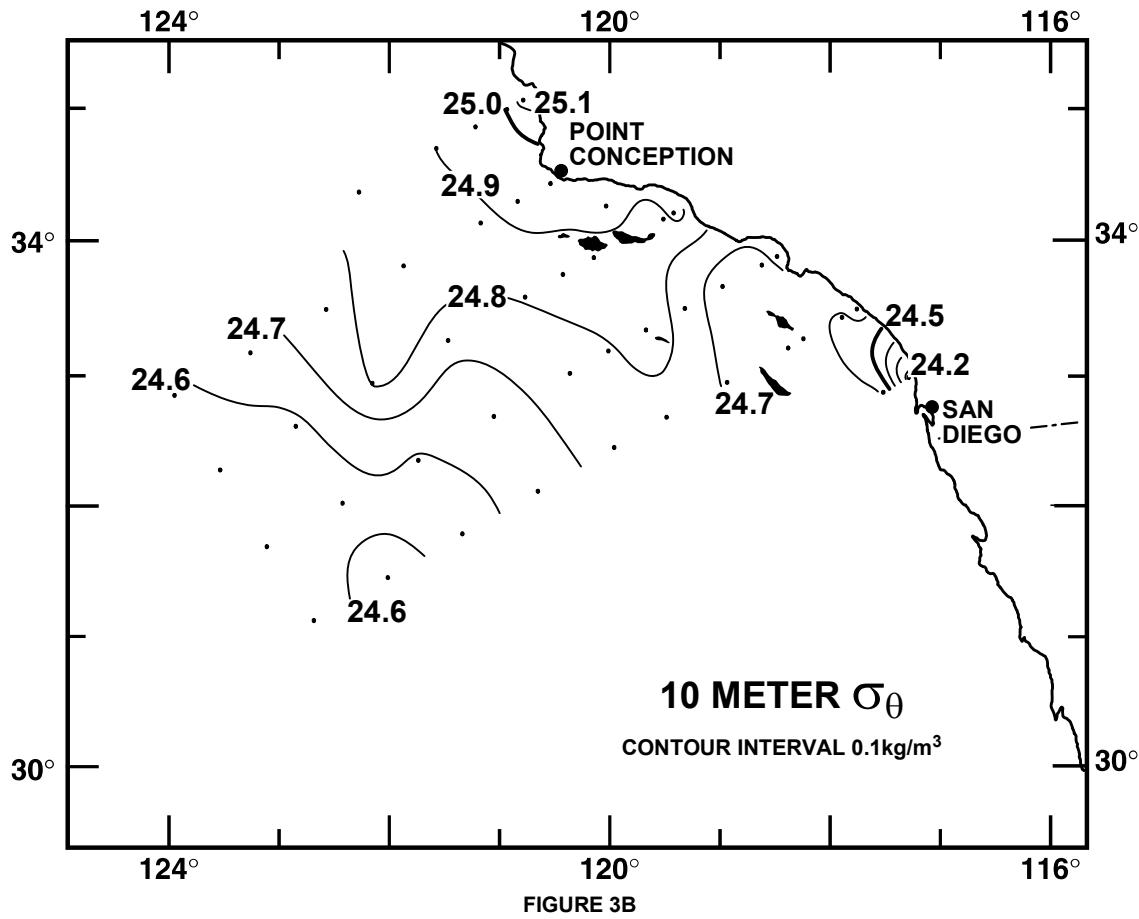


FIGURE 3B

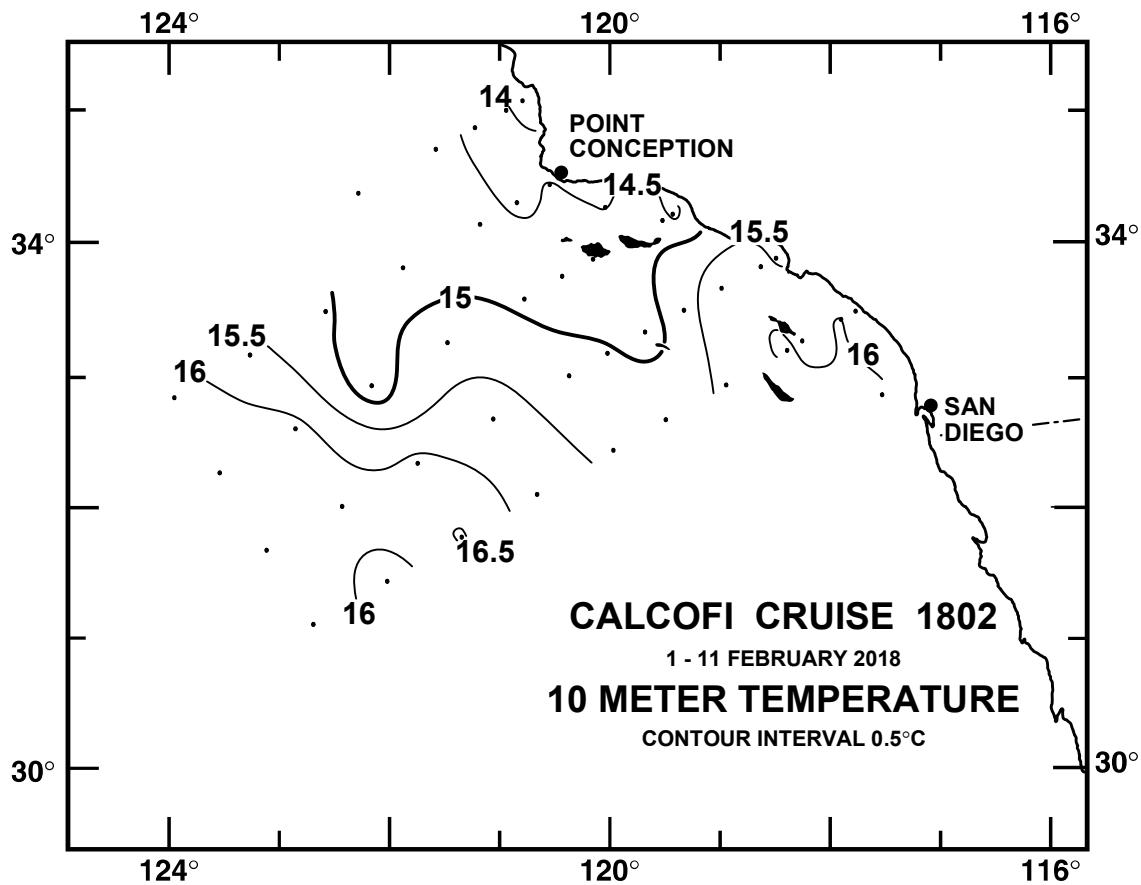


FIGURE 3C

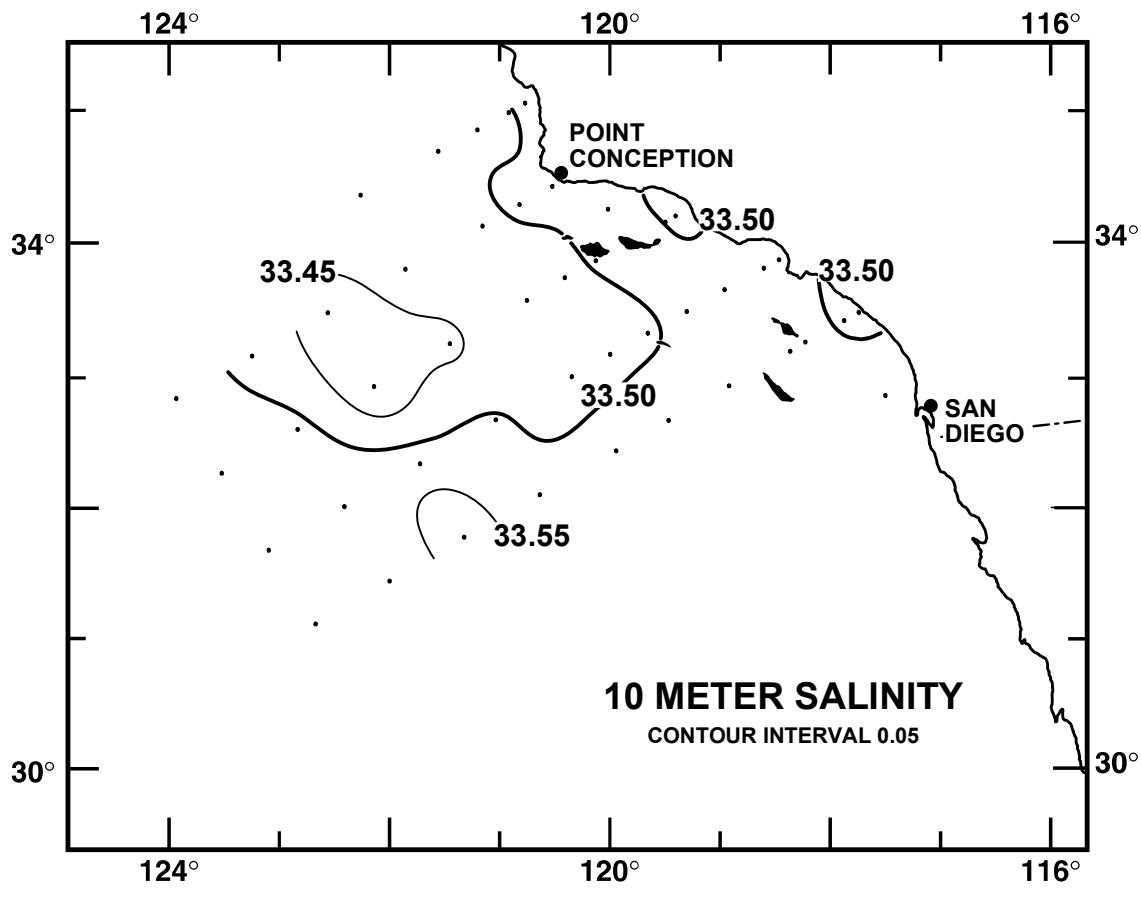


FIGURE 3D

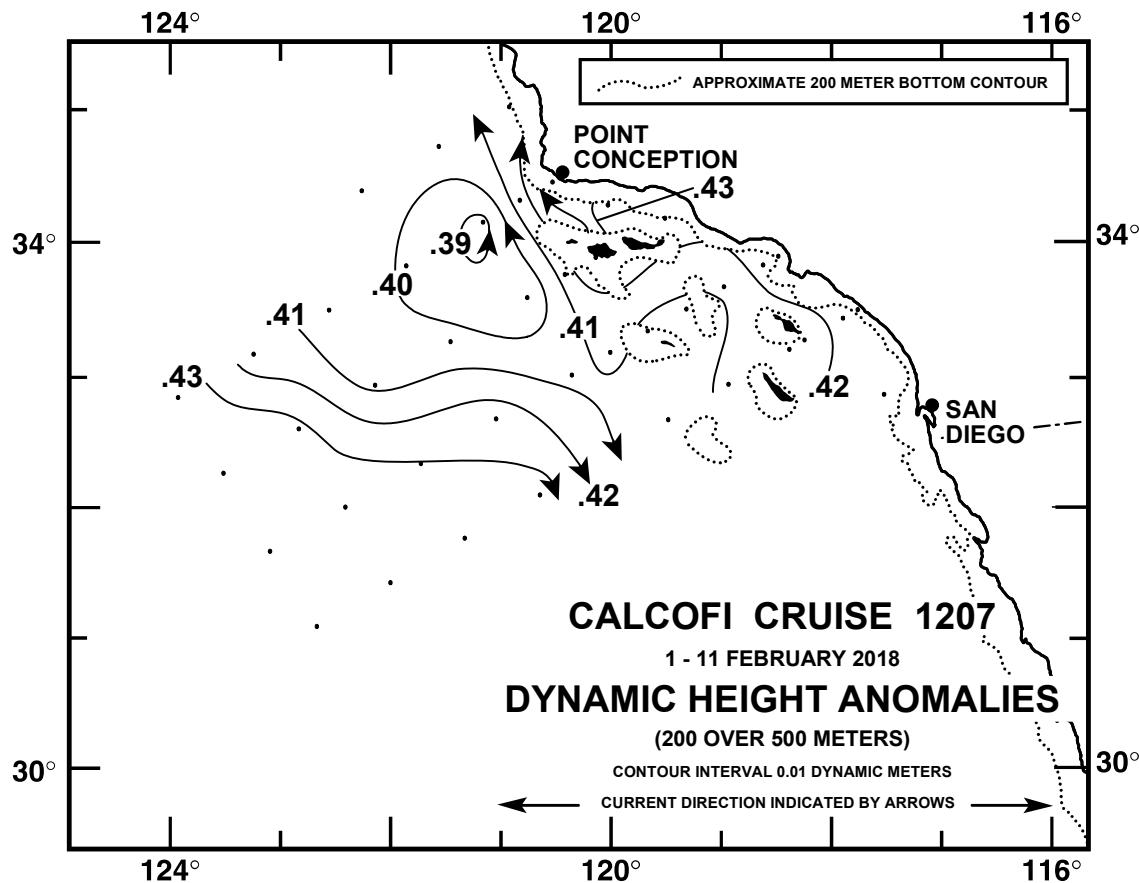


FIGURE 4A

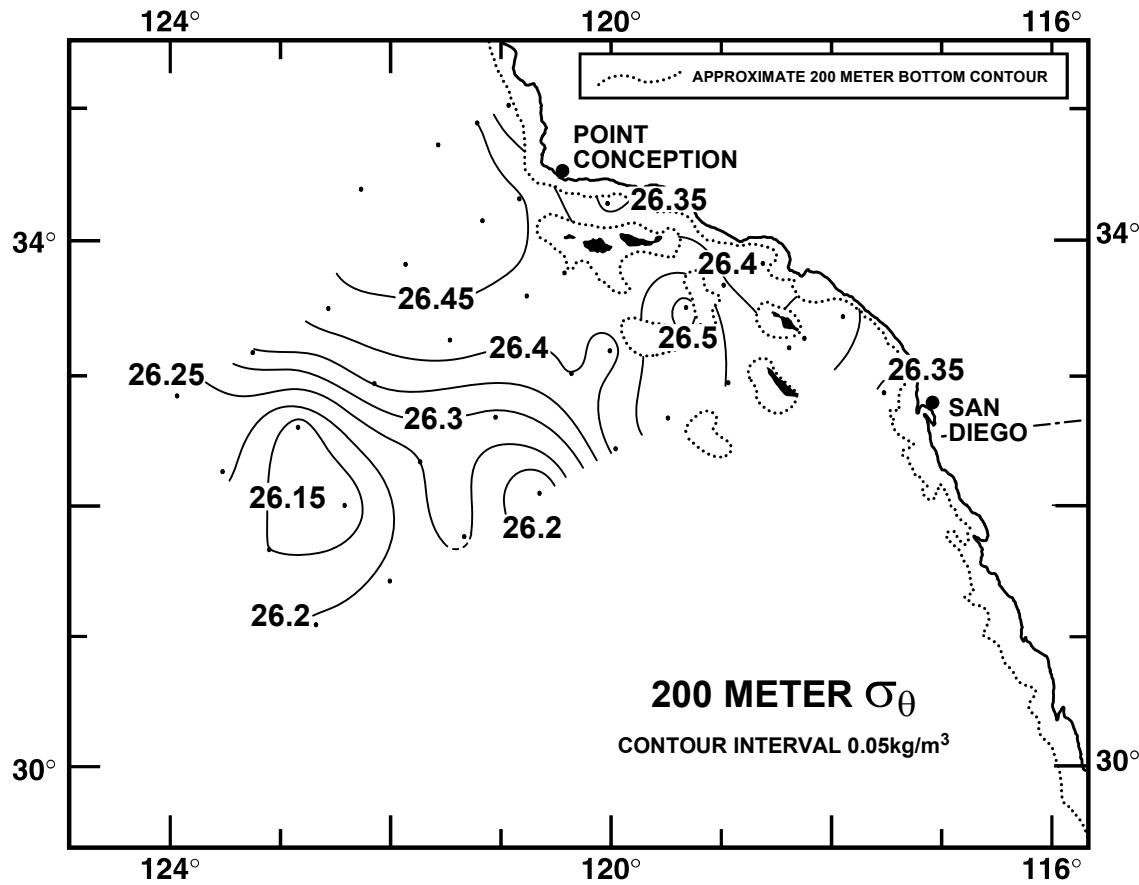


FIGURE 4B

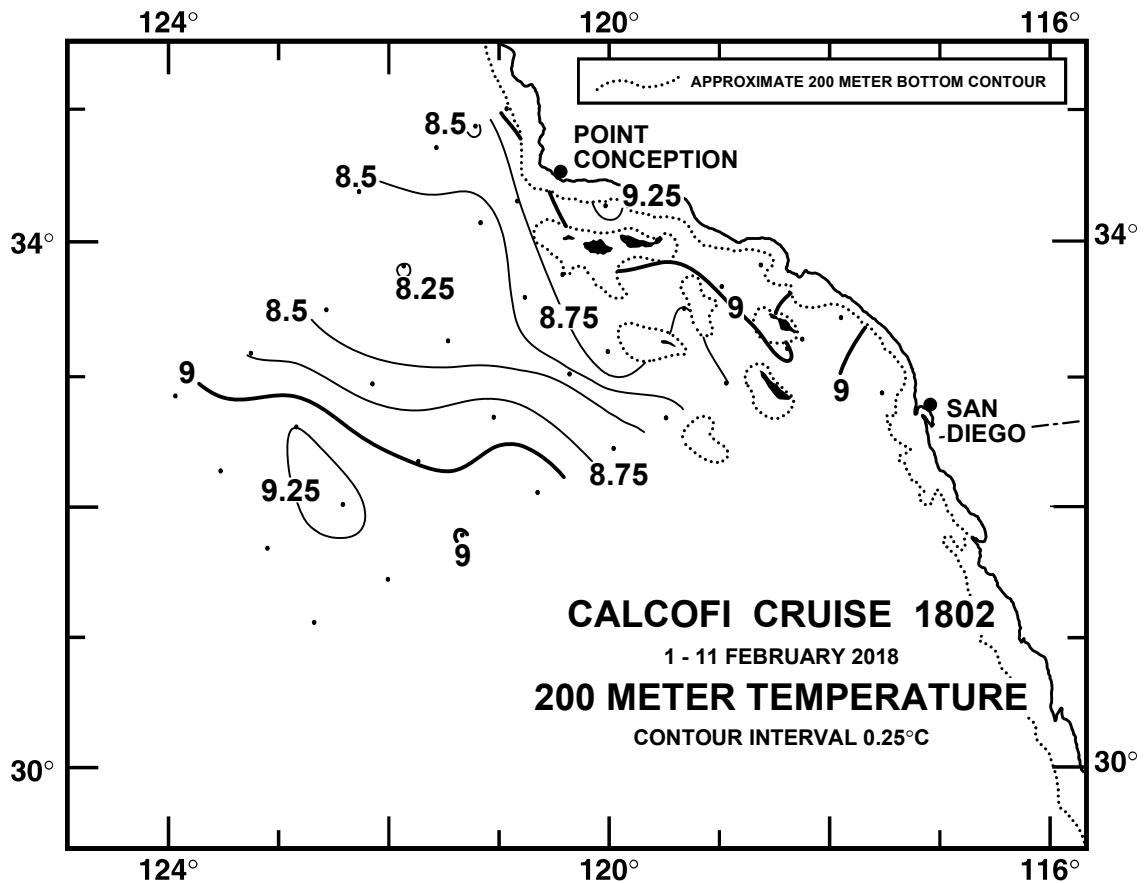


FIGURE 4C

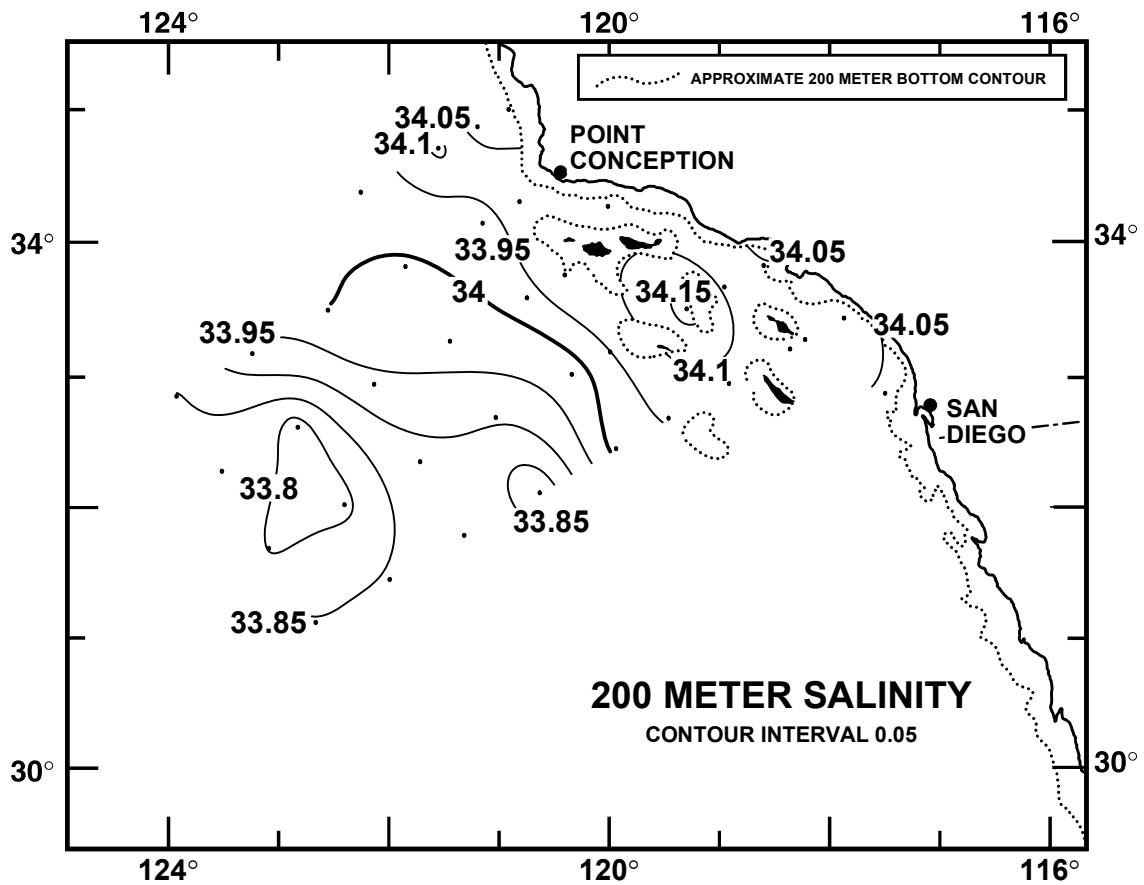
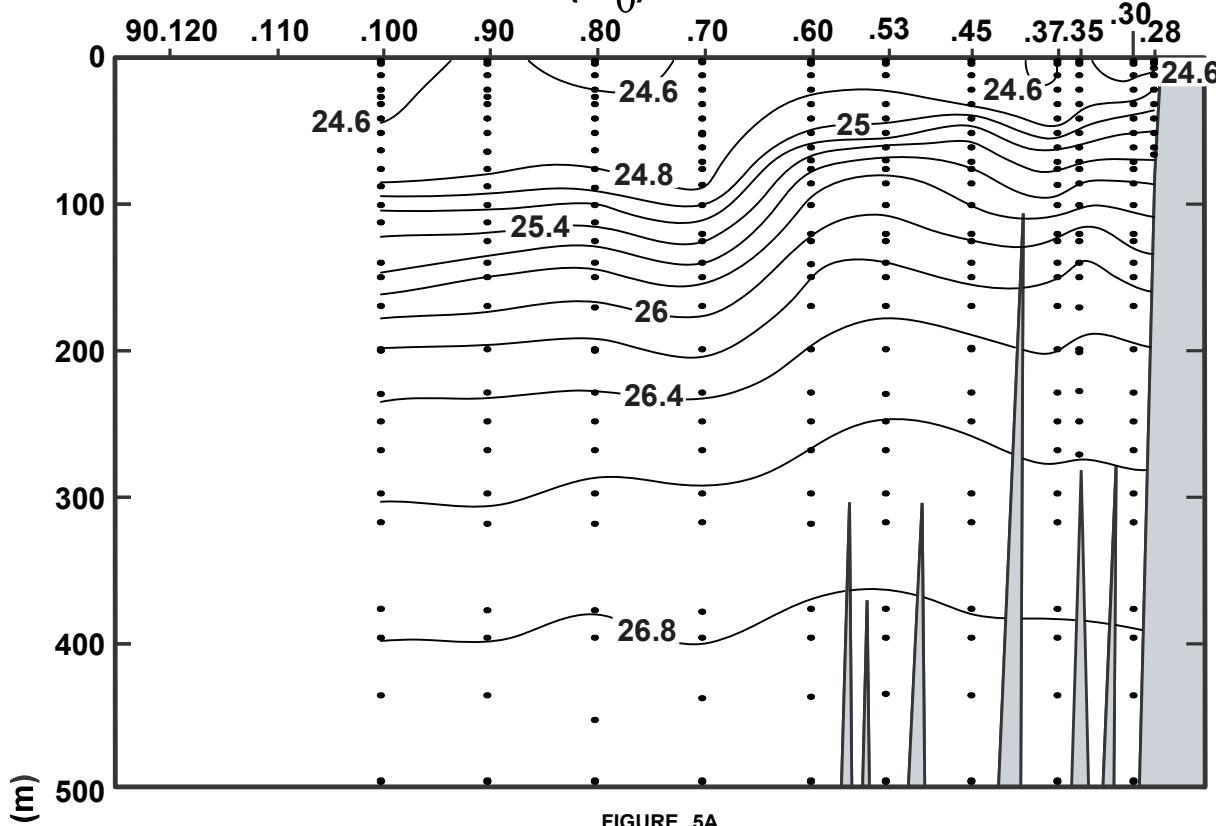


FIGURE 4D

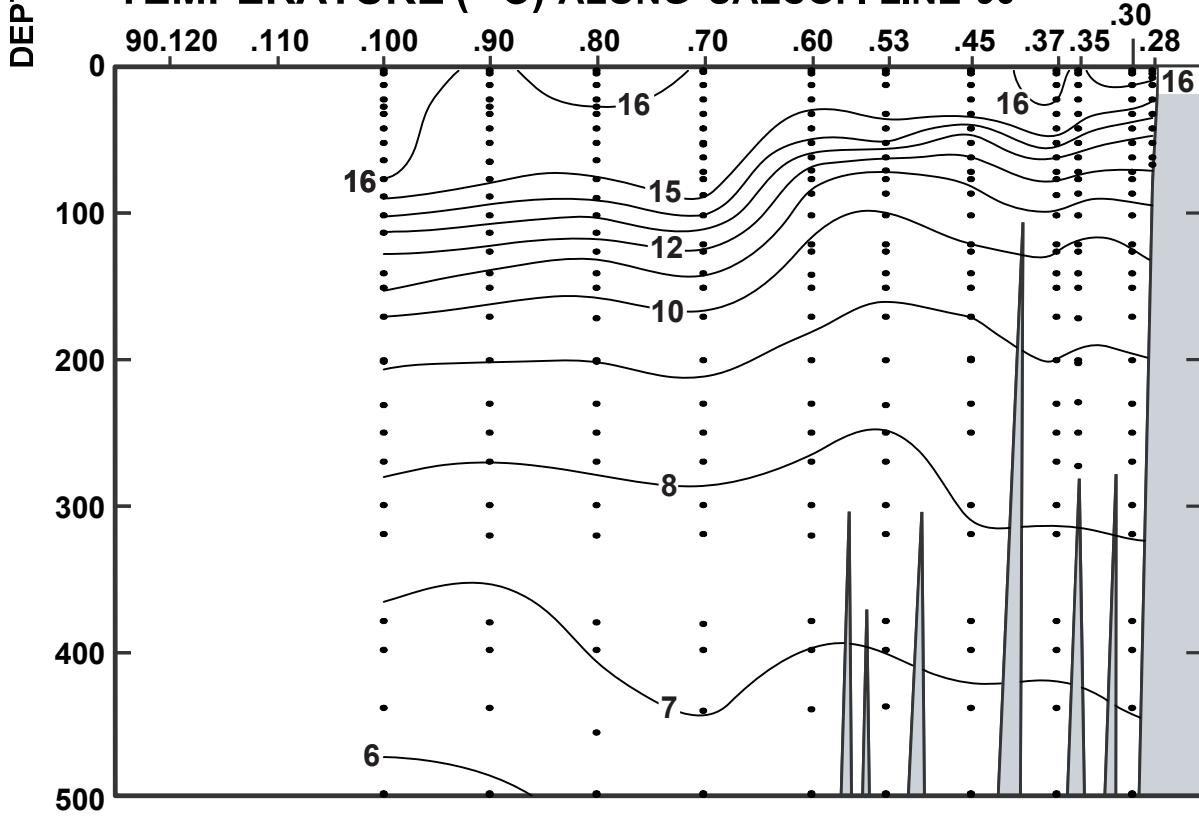
# CALCOFI CRUISE 1802

1 - 4 February 2018

## POTENTIAL DENSITY ( $\sigma_0$ ) ALONG CALCOFI LINE 90



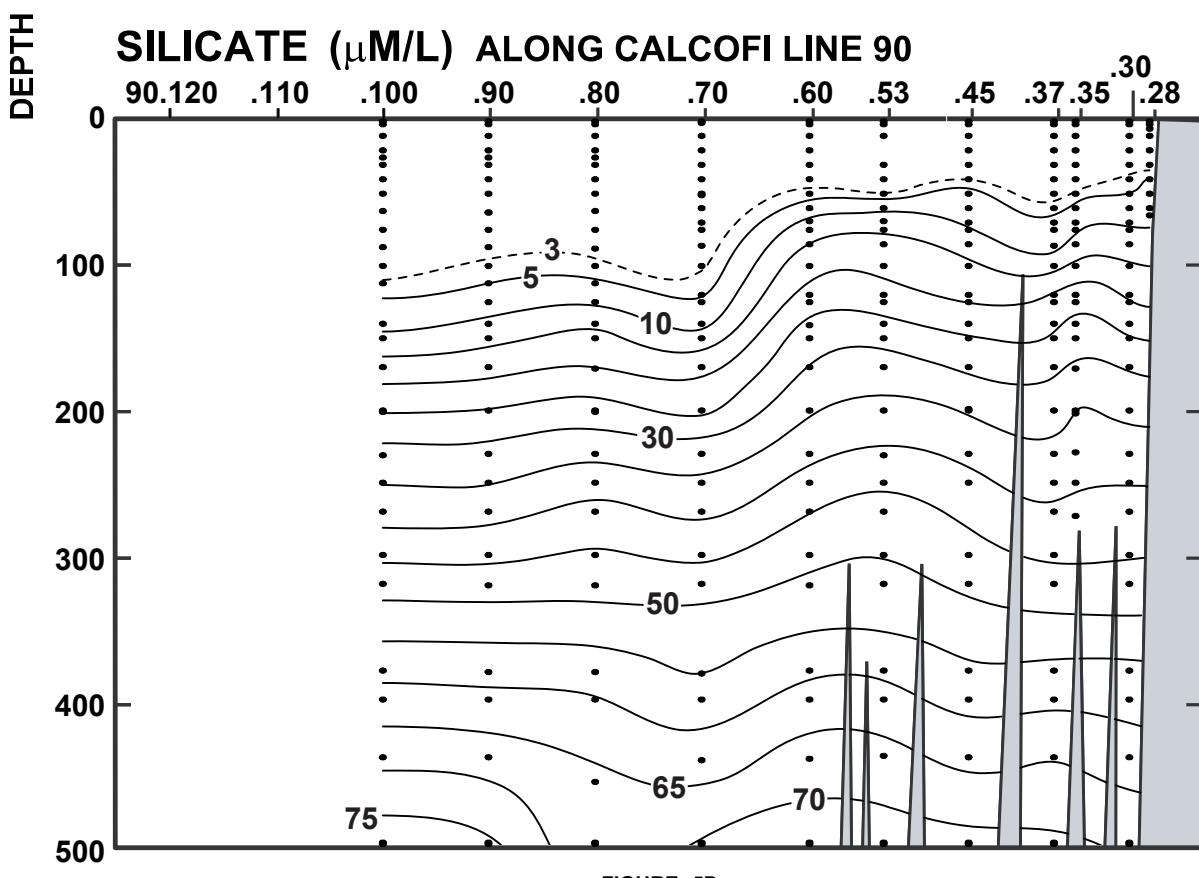
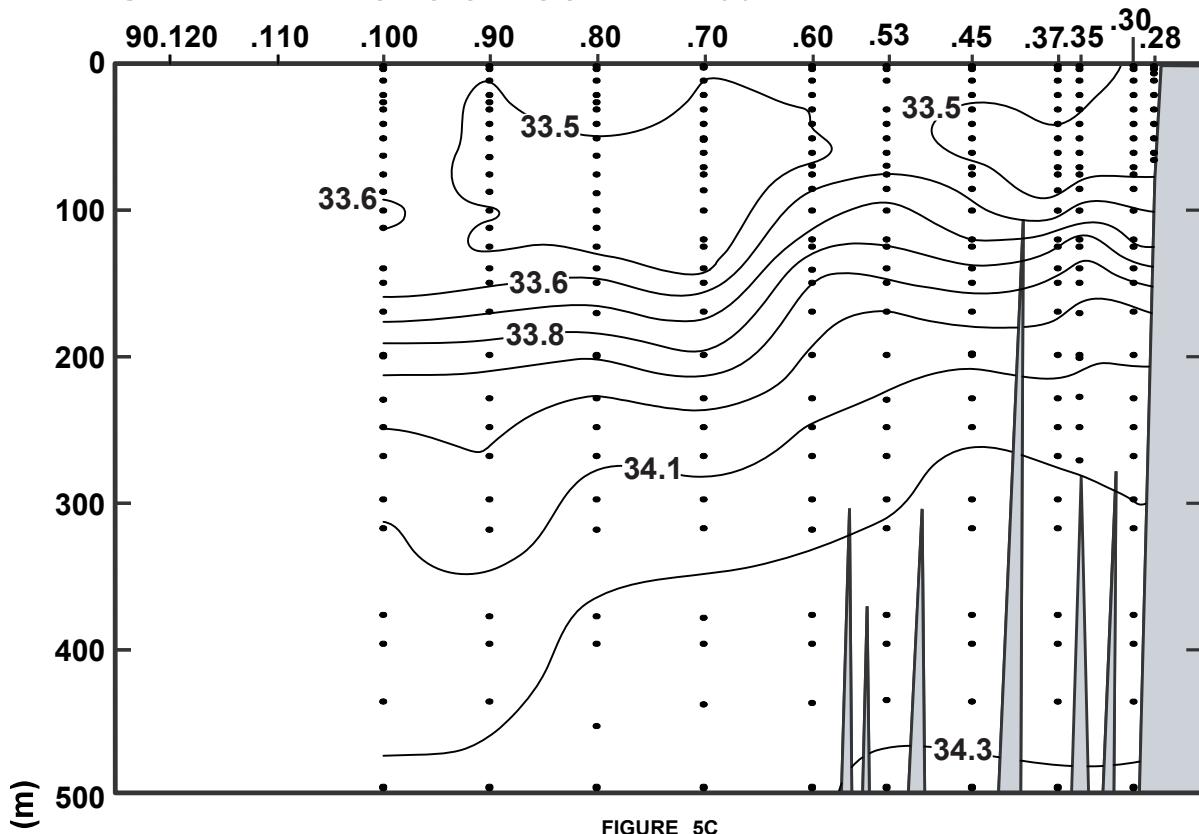
## TEMPERATURE (°C) ALONG CALCOFI LINE 90



# CALCOFI CRUISE 1802

1- 4 February 2018

## SALINITY ALONG CALCOFI LINE 90



# CALCOFI CRUISE 1802

1 - 4 February 2018

## NITRATE ( $\mu\text{M/L}$ ) ALONG CALCOFI LINE 90

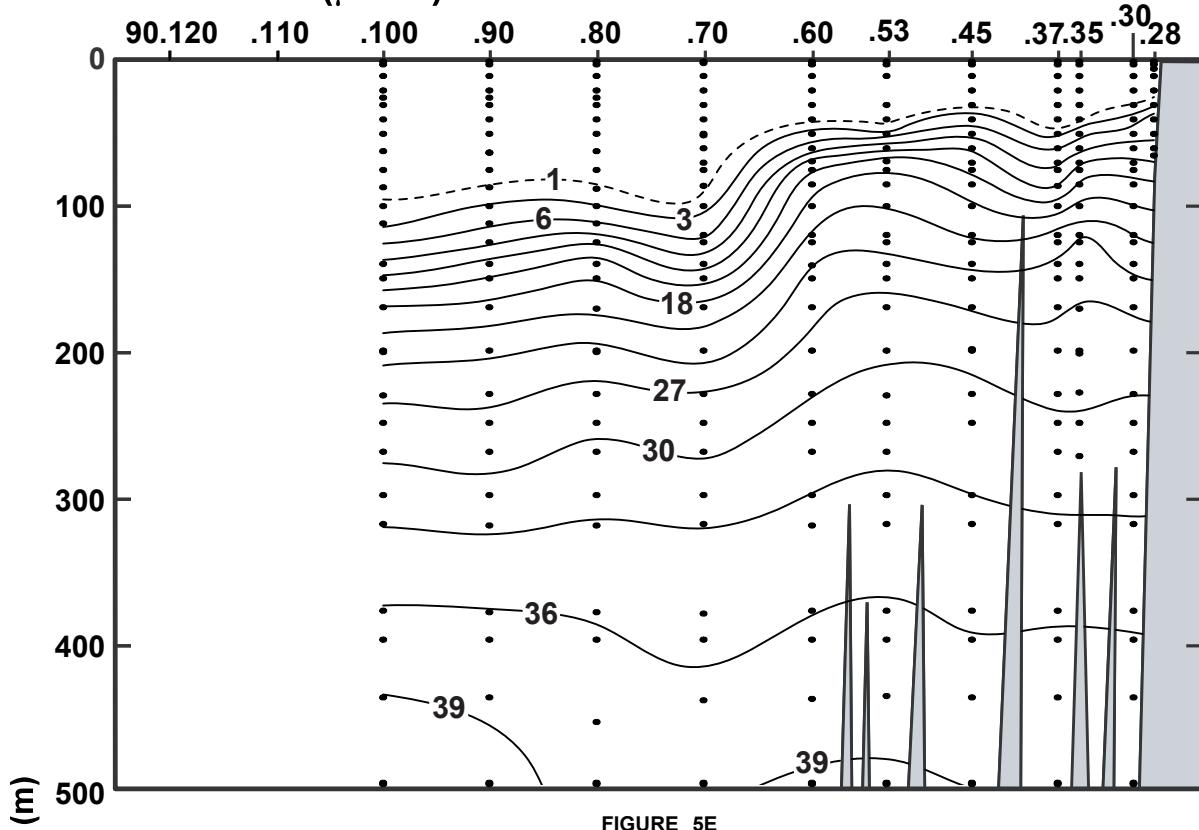


FIGURE 5E

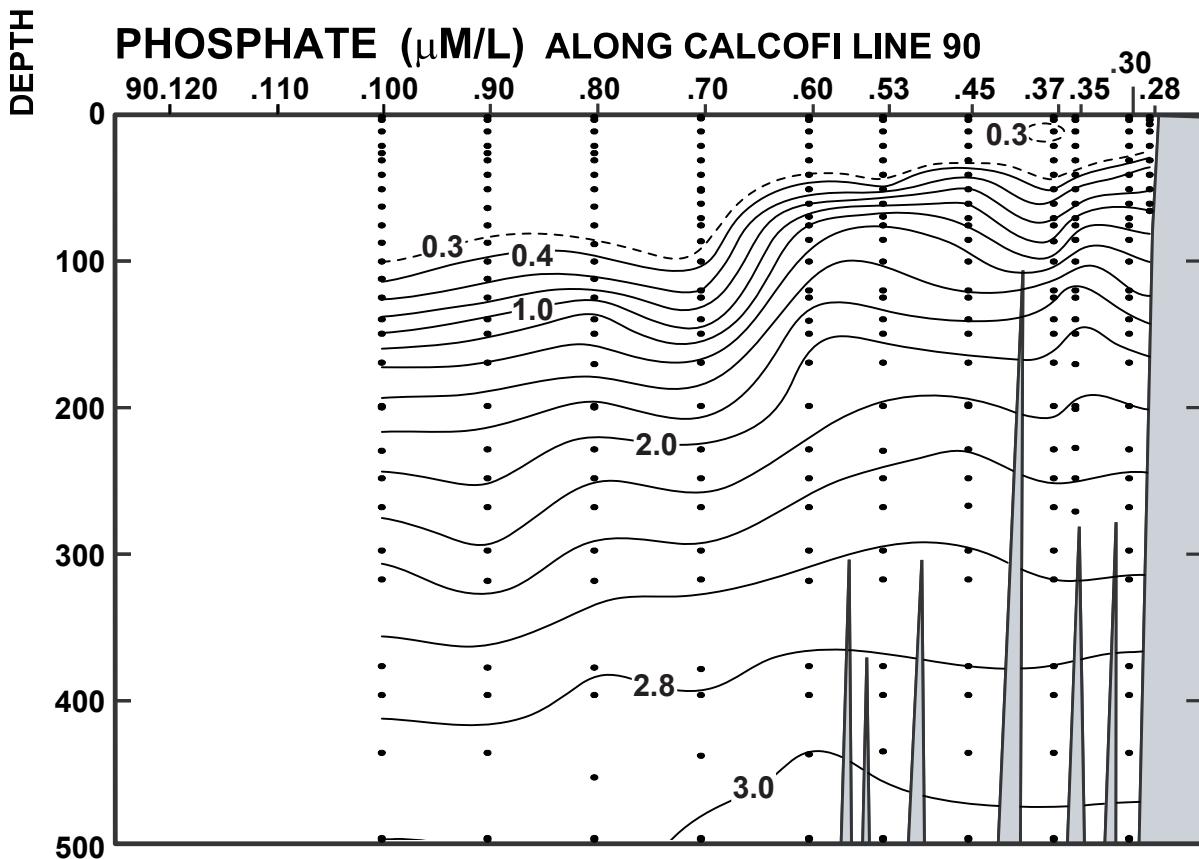


FIGURE 5F

# CALCOFI CRUISE 1802

1 - 4 February 2018

## CHLOROPHYLL-a ( $\mu\text{g/L}$ ) ALONG CALCOFI LINE 90

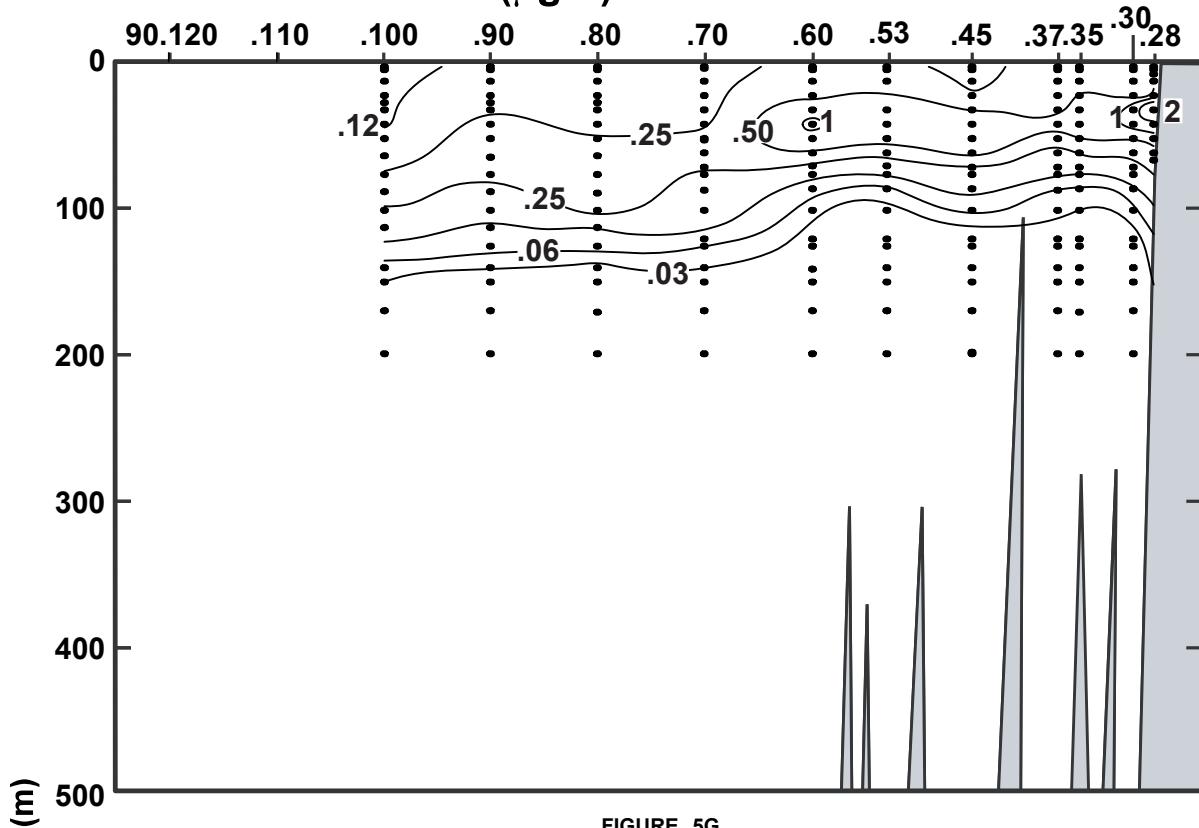


FIGURE 5G

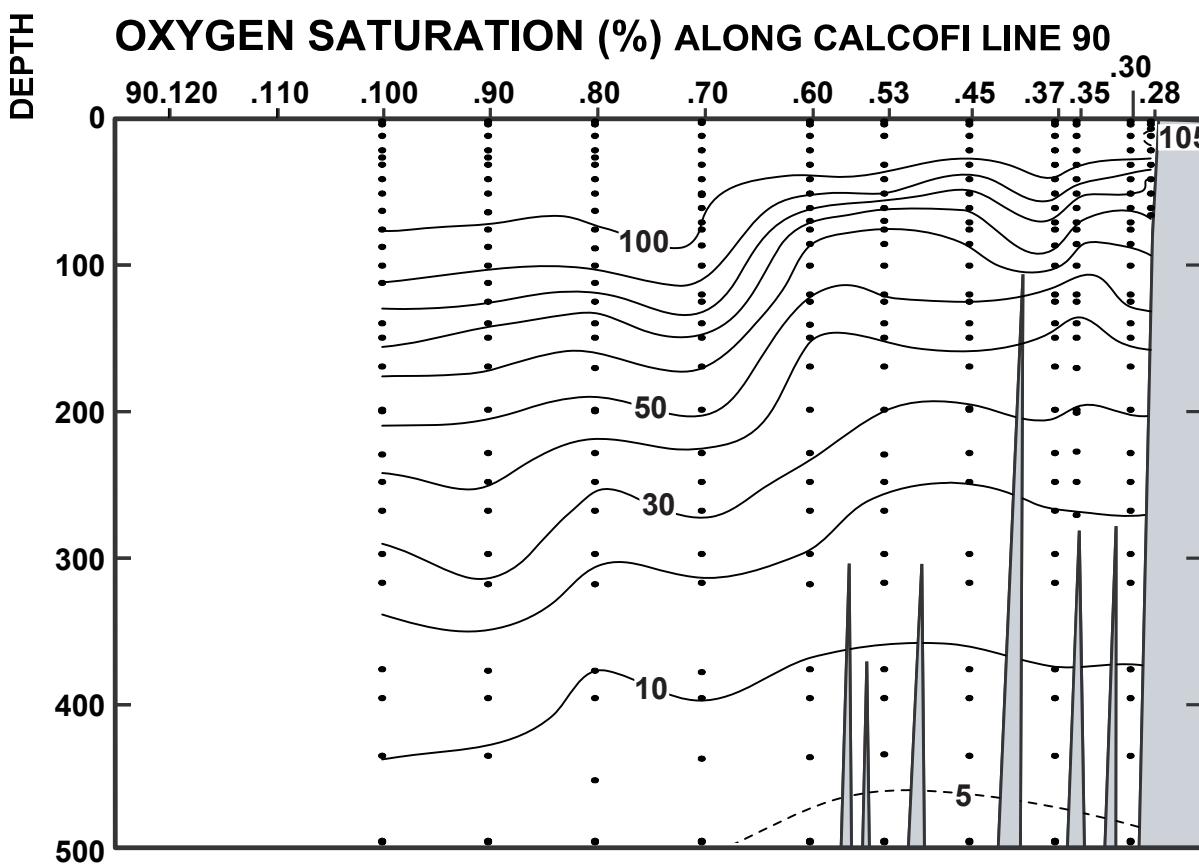


FIGURE 5H

# CALCOFI CRUISE 1802

1 - 4 February 2018

## OXYGEN (mL/L) ALONG CALCOFI LINE 90

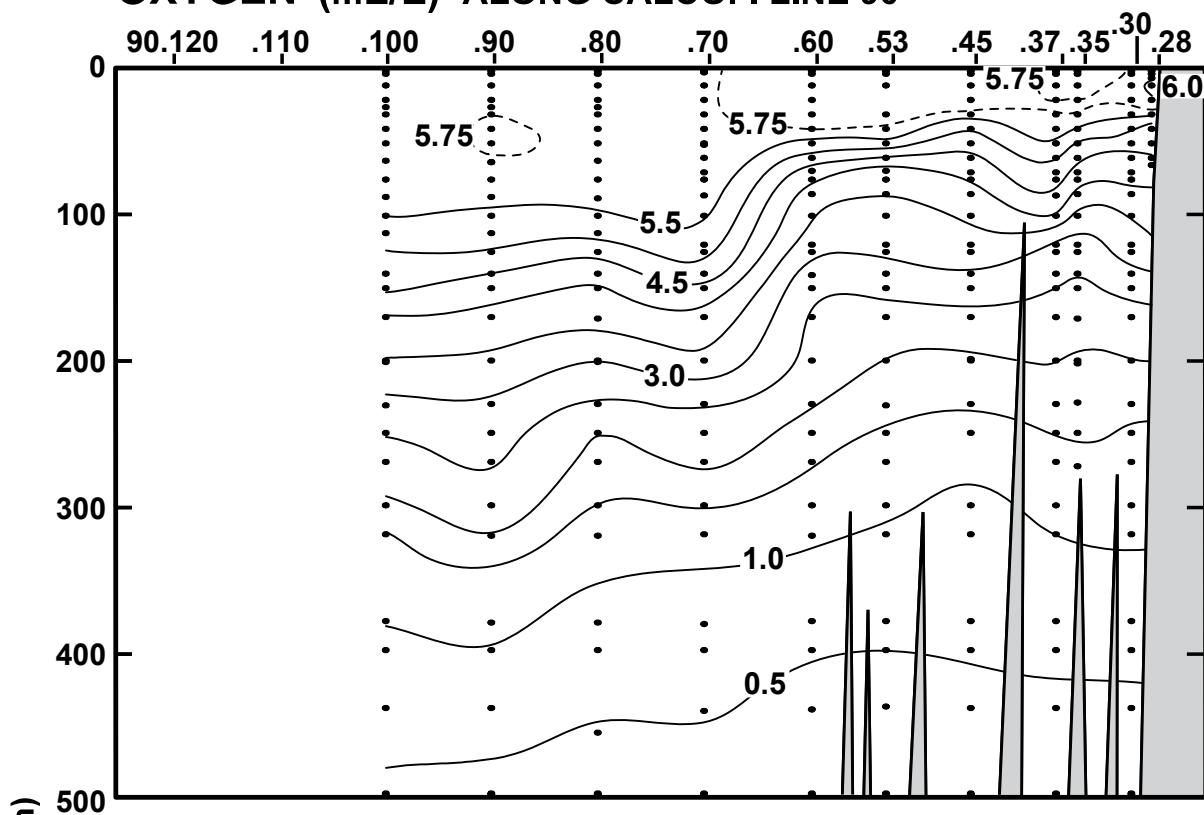


FIGURE 5I

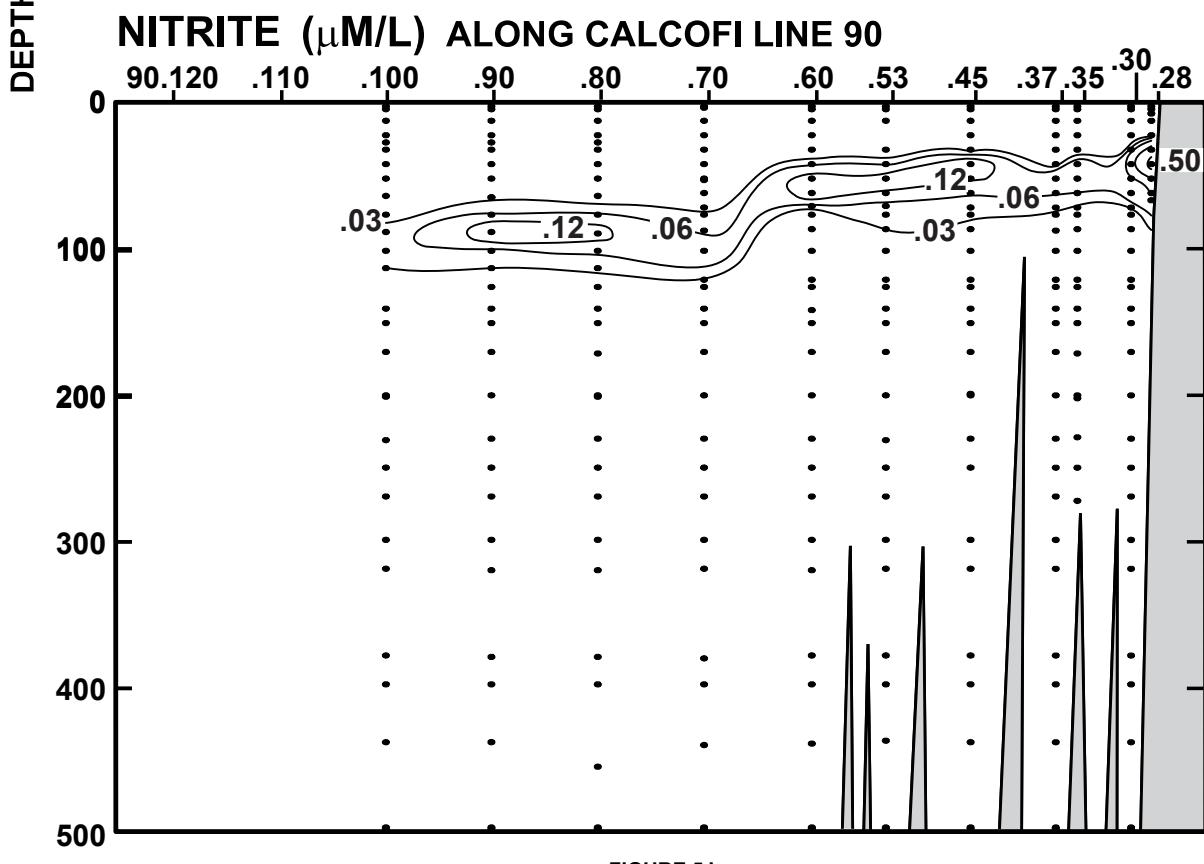


FIGURE 5J

## 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	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	D280.1	D108.7	3.9	0.33	1.1	0.08	0.40	2.69	0.69	20 04	
30	13.28	D 13.27	33.534	D 25.205	276.2	0.082	5.99	D260.9	D100.7	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	12.46	D 12.45	33.563	D 25.389	259.2	0.137	4.88	D212.5	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 02;

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	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	D246.4	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	D223.2	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	D174.0	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	10.56	D 10.55	33.641	D 25.799	220.6	0.201	3.67	D159.8	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	D145.8	D 53.0	19.6	1.59	19.8	0.04	0.00	0.02	0.17	86 07	
100	10.35	D 10.34	33.695	D 25.877	213.8	0.256	3.30	D143.7	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	D108.9	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 02;

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	CS	043		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA			ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	
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	D260.9	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	D251.4	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	D201.1	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												

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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SV	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	D98.0	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	D92.8	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	D68.5	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	11.03	D 11.02	33.621	D 25.701	230.0	0.207	3.71	D161.6	D59.5	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	D56.8	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	9.72	D 9.71	33.798	D 26.065	196.4	0.314	3.09	D134.5	D48.2	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	9.42	D 9.40	33.881	D 26.180	186.0	0.362	2.81	D122.1	D43.5	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	D98.1	D34.9	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	D58.9	D20.5	44.1	2.50	31.3	0.00	0.00			232 06	
250	8.18	D 8.16	34.146	D 26.584	149.3	0.528	1.37	D59.8	D20.8	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				272 05	
300	7.73	D 7.70	34.190	D 26.686	140.3	0.601	0.88	D38.4	D13.2	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	D36.5	D12.5	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	6.74	D 6.70	34.209	D 26.841	126.6	0.736	0.65	D28.1	D9.4	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	D20.2	D6.7	70.0	3.00	38.4	0.00	0.00			444 02	
500	6.06	D 6.01	34.292	D 26.997	112.7	0.856	0.32	D13.8	D4.6	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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SV	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	D99.8	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	D91.4	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	D72.9	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	D70.1	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	D52.3	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	D48.4	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	D37.6	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	D35.7	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	D35.4	40.3	2.20	29.8	0.00	0.00			233 06	
231	7.92	7.90	34.023	26.525	154.3	0.515	2.31	D100.6	D34.7	40.3	2.20	29.8	0.00	0.00			252	
250	ISL 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	D65.2	D22.2	50.3	2.55	33.8	0.00				302	
321	7.12	7.09	34.108	26.708	138.1	0.647	1.27	D55.2	D18.7	53.4	2.63	34.9	0.00	0.00			324 04</td	

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 80.0 55.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND SPEED ml/L	WEA	BAROMETER 1016.8 mb	DRY 14.5 C	WET 13.1 C	SECCHI	CLD	AMT	TYPE	ORD 039	STATION	80.0	55.0
																	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	0.08	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	D221.0	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	D213.7	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	D182.9	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	D146.9	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	D135.2	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	D124.2	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	D109.7	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	D111.4	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	D105.0	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	D67.4	D 23.5	42.2	2.44	31.0	0.00			232	06		
250	ISL 8.18	D 8.15	34.123	D 26.566	151.0	0.504	1.59	D69.2	D 24.0	44.0	2.46	31.5	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			273	05		
300	ISL 7.99	D 7.96	34.218	D 26.670	142.0	0.578	0.96	D41.8	D 14.4	49.6	2.62	35.1	0.00			302			
321	7.76	7.73	34.207	26.696	139.8	0.606	0.91	D39.5	D 13.6	52.3	2.72	34.0	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			384	03		
400	ISL 7.19	D 7.15	34.233	D 26.799	131.0	0.716	0.68	D29.7	D 10.1	60.3	2.86	36.1	0.00			403			
438	6.77	6.73	34.238	26.861	125.4	0.762	0.56	D24.1	D 8.1	66.1	2.95	37.5	0.00			442	02		
500	ISL 6.17	D 6.12	34.259	D 26.957	116.7	0.841	0.40	D17.3	D 5.7	73.3	3.05	39.1	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			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

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND SPEED 310	WEA	BAROMETER 1017.9 mb	DRY 14.4 C	WET 13.3 C	SECCHI	CLD	AMT	TYPE	ORD 038	STATION	80.0	60.0
																	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	
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	D260.7	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	D250.2	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	D202.9	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	D165.8	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	D145.6	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	D146.2	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	D128.6	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	D119.7	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		

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAEAO μg/L	PRES db	SAMP
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			
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	D101.5	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	D100.0	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	D84.8	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				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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAEAO μg/L	PRES db	SAMP
33 28.8 N	122 32.5 W	08/02/2018	1624	UTC	4000 m	340 10 kn	300 03 03	2	1022.8 mb	11.6 C	10.7 C	20 m	8/8	ST	036			
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	D104.6	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	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										

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 80.0 90.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND SPEED m/L $\mu$ mol/Kg	WAVES PCT	WEA	BAROMETER 1022.8 mb	DRY 12.4 C	WET 11.1 C	SECCHI	CLD	AMT	TYPE	ORD 035		
																		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	D251.6	D101.6	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	D256.8	D102.0								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	D252.6	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	D246.8	D 96.5	3.1	0.35	1.5	0.18	0.00	0.33	0.22	71	13	
75	13.34	D 13.33	33.412	D 25.099	287.6	0.236	5.48	D238.9	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	D228.3	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	D173.1	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	D157.8	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	D152.9	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	D123.3	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	D120.3	D 41.3	40.4	2.13	29.1	0.00			252		
270	7.49	7.46	33.996	26.568	150.7	0.618	2.46	107.5	36.1	43.9	2.22	30.5	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			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			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			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			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			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			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			520	01	

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

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND SPEED m/L $\mu$ mol/Kg	WAVES PCT	WEA	BAROMETER 1023.4 mb	DRY 13.7 C	WET 11.9 C	SECCHI	CLD	AMT	TYPE	ORD 034		
																		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	334.5	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	D247.4	D101.3	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	16.18	33.546	D 24.590	334.9	0.098	5.67	D247.2	D101.2	1.8	0.23	0.0	0.00	0.00	0.12	0.03	30	
40	16.19	16.18	33.542	24.604	333.9	0.134	5.68	D247.5	D101.3	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	D247.1	D101.1	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	D246.8	D100.8	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	287.7	0.364	5.23	D228.0	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	11.44	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	11.02	D 11.02	33.554	D 25.650	236.8	0.460	4.55	D198.1	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	D168.7	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	0.02	0.02	202	07	
231	8.66	8.64	33.940	26.349	171.4	0.619	2.92	D127.0	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	D122.7	D 42.9	34.4</td								

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 81.8 46.9

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN mL/L	OXYGEN μmol/Kg	OXY PCT	WEA		BAROMETER		DRY	WET	SECCHI	CLD	AMT	TYPE	ORD	
										SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP		026	
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	D179.5	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	D154.2	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	D112.3	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	D97.1	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	D44.3	D	15.6	44.0	2.46	30.4	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				272	08			
300	ISL	8.25	D	8.22	34.199	D	26.617	147.3	0.623	0.71	D31.0	D	10.8	52.8	2.68	32.6	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				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				383	06			
400	ISL	7.15	D	7.11	34.234	D	26.805	130.4	0.763	4.30	D12.9	D	4.4	72.2	2.96	35.0	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				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				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			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				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				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

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN mL/L	OXYGEN μmol/Kg	OXY PCT	WEA		BAROMETER		DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
										SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP		024
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	D278.5	D110.3	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

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN mL/L	OXYGEN μmol/Kg	OXY PCT	WEA		BAROMETER		DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
										SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP		025
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	33.508	25.025	293.3	0.092	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	D181.7	D								

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAEAO μg/L	PRES db	SAMP
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	
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	D137.6 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 02;

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAEAO μg/L	PRES db	SAMP
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	
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	D258.4	D102.4	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	D253.8	D100.2	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	D214.0	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	D181.7 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	235.5	0.243	4.06	D176.8 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	25.847	216.7	0.273	3.87	D168.4 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	26.134	189.7	0.315	3.26	D141.8 D	50.5								122 10	
125 ISL	9.30 D	9.28	33.851	26.175	185.8	0.323	3.17	D137.9 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	D133.1 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	26.234	180.8	0.369	2.97	D129.3 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 02;

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAEAO μg/L	PRES db	SAMP
33 34.5 N	120 45.2 W	07/02/2018	0311	UTC	1381 m	090 01 kn	290 01 05	0	1017.7 mb	13.7 C	12.5 C	13.7 m	0/8				029	
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		

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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN	HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA				ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
0	15.30	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	14.58	14.58	33.417	D 24.843	310.4	0.061		5.92	D257.8	D102.1	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	D247.5	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	D247.1	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	D241.8	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	D238.1	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	D229.2	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	D210.6	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	D189.5	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	D146.0	D 52.2								121 10	
125	ISL	9.52	D 9.50	33.763	D 26.071	195.7	0.327	3.30	D143.8	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	D130.5	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	D122.3	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				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				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				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 02;

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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN	HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA				ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
0	14.64	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	ISL	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		

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SI03* µM	P04* µM	N03* µM	N02* µM	NH4* µM	CHL-A µg/L	PHAE0 µg/L	PRES db	SAMP
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			
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	16.13	33.523 D	24.585	335.0	0.064	5.65	D246.1	D100.6	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	D246.4	D100.7	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	D246.2	D100.6	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	D247.1	D100.3	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	D249.2	D100.5	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	D235.8 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	D224.2 D	84.9								126 10	
141	11.38	11.36	33.490 D	25.538	247.3	0.443	4.67	D203.4 D	75.4								142 09	
150 ISL	10.97 D	10.96	33.532 D	25.644	237.4	0.465	4.55	D198.0 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	D169.6 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	D127.1 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	D111.6 D	38.7	34.9	2.04	27.9	0.00				252	
270	7.99	7.96	34.018 D	26.512	156.3	0.691	2.34	102.0	35.1	39.2	2.17	29.7	0.00				272 05	
300 ISL	7.82 D	7.79	34.082 D	26.588	149.6	0.738	1.66	D72.2 D	24.9	43.2	2.33	31.4	0.00				302	
320	7.75	7.71	34.080 D	26.598	149.0	0.768	1.58	D68.9 D	23.7	45.9	2.44	32.6	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				383 03	
400 ISL	6.88 D	6.84	34.168 D	26.790	131.6	0.881	0.81	D35.1 D	11.8	60.2	2.79	36.7	0.00				403	
441	6.52	6.48	34.202	26.866	124.7	0.932	0.55	D24.0 D	8.0	66.9	2.93	38.3	0.00				445 02	
500 ISL	6.20 D	6.15	34.247 D	26.944	117.9	1.006	0.39	D17.0 D	5.6	72.9	3.03	39.4	0.00				504	
518	6.08	6.03	34.246 D	26.958	116.7	1.025	0.37	16.1	5.3	74.8	3.06	39.8	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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SI03* µM	P04* µM	N03* µM	N02* µM	NH4* µM	CHL-A µg/L	PHAE0 µg/L	PRES db	SAMP
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	7/8	SC	033			
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	D247.0	D101.2	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	D246.8	D101.1	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	D246.9	D101.1	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	D246.8	D101.0								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	D246.1	D100.4	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	14.63	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	D230.0 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	D201.7 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	D166.4 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	D122.8 D	43.0	31.7	1.95	26.3	0.00				232 06	
250 ISL	8.19 D	8.16	33.983 D	26.456	161.4	0.656	2.75	D119.7 D	41.5	35.4	2.05	27.9	0.00				252	
270	7.97	7.95	34.009 D	26.507	156.8	0.688	2.43	105.9	36.4	39.2	2.15	29.5	0.00				272 05	
300 ISL	7.67 D	7.64	34.037 D	26.574	150.8	0.734	2.09	D91.1 D	31.2	43.7	2.29	31.3	0.00				302	
320	7.36	7.33	34.037 D	26.618	146.8	0.764	1.93	D83.9 D	28.6									

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	
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SI03* µM	P04* µM	N03* µM	N02* µM	NH4* µM	CHL-A µg/L	PHAE0 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
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
10	15.95	15.95	33.514	24.618	331.5	0.032											20
10	15.95	15.95	33.514	24.618	331.5	0.032											22
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
30	14.39	14.39	33.446	24.907	304.6	0.098	5.29	D230.5	D 91.0	3.9	0.44	2.3	0.17	0.00	1.00	0.38	30
30	14.39	14.39	33.459	24.917	303.6	0.097											18
40	13.48	13.47	33.418	25.075	288.9	0.127	4.83	D210.5	D 81.5	6.1	0.67	5.7	0.18	0.00	0.67	0.37	40
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
60	12.33	12.32	33.453	25.329	265.1	0.183	4.26	D185.5	D 70.2	9.9	1.01	10.9	0.33	0.00	0.49	0.27	60
70	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
75 ISL	11.50	D 11.49	33.541	D 25.552	244.2	0.219	3.68	D160.3	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	4.52	D153.4	D 56.8	15.2	1.35	16.0	0.03	0.00	0.07	0.12	86
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
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
125 ISL	10.05	D 10.04	33.815	D 26.023	200.5	0.331	2.75	D119.8	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
150 ISL	9.74	D 9.73	33.899	D 26.141	189.8	0.380	2.55	D110.8	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	D105.3	D 37.7	28.8	2.00	25.3	0.00	0.00	0.01	0.06	171
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
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
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
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
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
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
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 02;

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD	
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SI03* µM	P04* µM	N03* µM	N02* µM	NH4* µM	CHL-A µg/L	PHAE0 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
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
10	15.88	15.88	33.527	24.643	329.1	0.033											22
10	15.88	15.88	33.519	24.636	329.7	0.033											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
30	15.34	15.34	33.504	24.747	319.9	0.098	5.76	D250.9	D 101.0	1.9	0.23	0.0	0.00	0.00	1.60	0.36	30
30	15.34	15.34	33.502	24.746	320.0	0.098											18
40	13.78	13.78	33.435	25.026	293.6	0.129	5.25	D228.9	D 89.2	4.5	0.49	3.4	0.11	0.00	0.86	0.59	40
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
60	11.80	11.79	33.498	25.464	252.2	0.183	4.01	D174.6	D 65.3	12.1	1.15	13.2	0.03	0.00	0.14	0.11	60
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
75 ISL	11.23	D 11.22	33.561	D 25.617	238.0	0.218	3.71	D161.7	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	5.57	D155.4	D 57.2	16.4	1.42	17.3	0.00	0.00	0.04	0.08	86
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
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
125 ISL	10.20	D 10.19	33.761	D 25.955	207.0	0.330	2.92	D127.2	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
150 ISL	9.75	D 9.73	33.885	D 26.130	190.9	0.380	2.53	D110.3	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
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
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
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
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
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			38

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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	D260.1	D102.8	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	D204.8	D78.2	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	D198.5	D75.4	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	D172.7	D64.0	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	D148.6	D54.1	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	D139.8	D50.6	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	D108.8	D38.8	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	D95.3	D33.9	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	D74.3	D26.2	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	D60.3	D21.2	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	D51.3	D18.0	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	D44.9	D15.7	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				272 05	
300 ISL	8.15 D	8.12	34.261 D	26.681	141.1	0.584	0.81	D35.4	D12.3	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	D30.6	D10.6	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	D20.9	D7.1	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	D16.2	D5.5	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	D12.2	D4.1	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 02;

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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	0.51	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	D171.4	D63.5								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 02;

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		
DEPTH	TEMP	POTTEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	0.19	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	D255.8	D102.3	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	D256.6										

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 86.7 60.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND ml/L	SPEED μmol/Kg	WEA	BAROMETER 1017.4 mb	DRY 14.6 C	WET 13.7 C	SECCHI	CLD	AMT	TYPE	ORD 017						
μM	μM	μM	μM	μM	μM	μg/L	μg/L	db															
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	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	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;

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND ml/L	SPEED μmol/Kg	WEA	BAROMETER 1017.4 mb	DRY 14.4 C	WET 13.0 C	SECCHI	CLD	AMT	TYPE	ORD 016						
μM	μM	μM	μM	μM	μM	μg/L	μg/L	db															
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					
51	14.82	14.81	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	99.5	1.8	0.27	0.0	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.							

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SI03* µM	P04* µM	N03* µM	N02* µM	NH4* µM	CHL-A µg/L	PHAEAO µg/L	PRES db	SAMP
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		
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	16.03	33.510 D	24.596	334.0	0.064	5.67	D247.1	D100.8	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	D246.9	D100.7	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	D247.4	D100.7	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	D249.5	D101.0	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	D249.7	D101.0	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	D247.6	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	D220.7 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	D178.0 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	D160.3 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	D145.7 D	51.5	26.5	1.73	23.8	0.00	0.00	0.02	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	0.02	0.02	203 07	
230	8.66	8.63	33.947	26.355	170.8	0.601	2.97	D129.2 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	D114.0 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	D100.2 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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN µmol/Kg	OXY PCT	SI03* µM	P04* µM	N03* µM	N02* µM	NH4* µM	CHL-A µg/L	PHAEAO µg/L	PRES db	SAMP
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
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	0.13	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	D246.2	D100.9	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	D246.2	D100.8	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	D246.4	D100.9	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	D246.0	D100.6	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	D246.1	D100.6	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	D245.6	D100.2	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	D234.2 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	D202.3 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	D183.9 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		202 07	
230	8.64	8.61	33.913	26.331	173.0	0.629	3.19	D138.8 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	D130.1 D	45.3	33.1	1.92	26.6	0.00	0.00			252	
270	8.09	8.06	33.979	26.468														

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	TEMP	POTTEMP	SALINITY	SIGMA	DEG C	DEG C	THETA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m									ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	0.10	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	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	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	33.523 D	24.580	335.5	0.064	5.67	D247.2	D101.1	1.5	0.21	0.0	0.00	0.00	0.10	0.03	0.03	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	0.03	0.03	25 19	
30	ISL	16.14 D	16.14	33.523 D	24.583	335.6	0.098	5.67	D247.2	D101.1	1.4	0.21	0.0	0.00	0.00	0.11	0.03	0.03	30	
40	16.12	16.11	33.517	24.584	335.8	0.135	5.67	D247.2	D101.0	1.4	0.21	0.0	0.00	0.00	0.12	0.03	0.03	40 18		
50	16.09	16.08	33.518	24.592	335.4	0.168	5.67	D247.1	D100.9	1.4	0.23	0.0	0.00	0.00	0.15	0.06	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	0.06	62 16		
75	16.01	16.00	33.517	24.611	334.4	0.252	5.66	D246.6	D100.5	1.4	0.23	0.0	0.00	0.12	0.26	0.09	0.09	76 15		
87	16.00	15.99	33.518	24.614	334.6	0.292	5.66	D247.0	100.5	1.4	0.21	0.0	0.00	0.00	0.28	0.10	0.08	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	0.09	101 12		
112	14.57	14.55	33.473 D	24.895	308.4	0.373	5.58	D243.1	D96.3										113 11	
125	13.60	13.58	33.508 D	25.125	286.7	0.412	5.44	D237.0	D92.0										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	0.07	141 09		
150	ISL	11.81 D	11.79	33.477 D	25.449	256.2	0.481	5.11	D222.4	D83.2	7.9	0.75	8.3	0.00	0.00	0.06	0.06	0.06	151	
170	10.13	10.11	33.599	25.843	218.6	0.528	4.06	D176.6	D63.8	15.4	1.27	16.6	0.00	0.00	0.01	0.03	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	0.02	202 07		
230	8.69	8.66	33.916	26.326	173.5	0.644	3.04	D132.3 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	D122.3 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	D80.1 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	D59.9 D	22.5	48.0	2.48	35.2	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	D36.5 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	D28.0 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	D19.9 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 02;

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	TEMP	POTTEMP	SALINITY	SIGMA	DEG C	DEG C	THETA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m									ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	0.11	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	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	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	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	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	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 02;

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	TEMP	POTTEMP	SALINITY	SIGMA	DEG C	DEG C	THETA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP
m									ml/L	µmol/Kg	PCT	µM	µM	µM	µM	µM	µg/L	µg/L	db	
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	0.07	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	0.07	2 23		
10	16.03	16.03	33.491	24.581	335.0	0.034	5.77													

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 90.0 35.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	WEA		BAROMETER		DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
										1017.6 mb	14.4 C	14.3 C	μM	μM	N03*	N02*	NH4*	CHL-A μg/L	PHAE0 μg/L	PRES db
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	0.08	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	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	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	D250.4	D101.4	0.0	0.22	0.0	0.00	0.00	0.54	0.26	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	0.30	14		
40	14.60	14.60	33.469	24.880	307.5	0.129	5.47	D238.1	D 94.4	1.1	0.34	1.0	0.11	0.10	0.80	0.54	0.40	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	D209.9	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	D185.5	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	D182.8	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	D113.3	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	D105.9	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			
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 02;

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 90.0 37.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	WEA		BAROMETER		DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
										1017.3 mb	13.7 C	13.4 C	μM	μM	N03*	N02*	NH4*	CHL-A μg/L	PHAE0 μg/L	PRES db
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	323.9	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	D249.9	D101.7	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	D248.7	D100.9	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	1.1	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	D220.2	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	D203.5	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	D195.1	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	33.543	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	D121.7	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	D108.2	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	D102.4	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</														

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAE0 μg/L	PRES db	SAMP
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			
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	D250.4	D101.2	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	D216.3	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	D189.5	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	D175.1	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	D164.4	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	D141.8	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	D119.6	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	D103.7	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				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 02;

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		
DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN ml/L	OXYGEN μmol/Kg	OXY PCT	SI03* μM	P04* μM	N03* μM	N02* μM	NH4* μM	CHL-A μg/L	PHAE0 μg/L	PRES db	SAMP
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			
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	D254.8	D 102.3								20 19	
30	15.13	15.13	33.548	24.827	312.3	0.095	5.82	D253.7	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	D249.2	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	D185.4	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	D163.7	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	D152.2	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	D134.1	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	D118.8	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				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	

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 90.0 60.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND SPEED ml/L μmol/Kg	WEA	BAROMETER 1018.5 mb	DRY 14.2 C	WET 12.7 C	SECCHI	CLD	AMT	TYPE	ORD 008
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
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
10	15.42	15.42	33.521	24.740	319.8	0.032										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
30	14.77	14.76	33.498	24.867	308.4	0.095	6.00 D261.4	D104.0	1.4	0.22	0.0	0.00	0.00	0.76	0.38	30
39	14.53	14.52	33.499	24.919	303.7	0.123										17
40	14.53	14.52	33.501	24.921	303.6	0.126	5.78 D251.9	D99.7	1.8	0.29	0.5	0.04	0.11	1.09	0.51	40
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
60	12.64	12.64	33.472	25.282	269.6	0.183	4.80 D209.3	D79.7	6.8	0.75	7.5	0.19	0.00	0.40	0.29	60
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
75	ISL 11.19	D 11.18	33.543	D 25.610	238.7	0.220	4.09 D178.0	D65.8	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 D162.7	D59.7	16.1	1.39	17.2	0.00	0.00	0.08	0.11	86
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
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
125	ISL 9.73	D 9.71	33.781	D 26.051	197.8	0.329	3.09 D134.6	D48.3	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
150	ISL 9.37	D 9.35	33.903	D 26.206	183.5	0.377	2.62 D113.9	D40.5	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 D104.7	D37.2	30.4	2.06	26.4	0.00	0.00	0.01	0.05	171
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
230	8.23	8.21	34.055	26.504	156.4	0.513	2.08 D90.7	D31.5	38.9	2.24	29.8	0.00	0.00			232
250	ISL 8.16	D 8.14	34.107	D 26.557	151.9	0.545	1.74 D75.5	D26.2	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
300	ISL 7.85	D 7.82	34.155	D 26.642	144.6	0.619	1.32 D57.2	D19.7	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 D46.4	D15.9	51.2	2.63	33.8	0.00	0.00			324
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
400	ISL 6.97	D 6.93	34.260	D 26.851	125.9	0.755	0.52 D22.6	D7.6	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 D16.7	D5.6	68.0	3.01	38.1	0.00	0.00			445
500	ISL 6.22	D 6.18	34.293	D 26.977	114.8	0.875	0.32 D13.9	D4.6	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

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND SPEED ml/L μmol/Kg	WEA	BAROMETER 1018.6 mb	DRY 12.9 C	WET 12.8 C	SECCHI	CLD	AMT	TYPE	ORD 009
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
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
10	15.75	15.75	33.496	24.648	328.6	0.033										21
20	15.74	15.73	33.496	24.652	328.6	0.066	5.72 248.9	101.1	1.1	0.21	0.0	0.00	0.00	0.20	0.06	20
30	15.66	15.65	33.488	24.664	327.8	0.099	5.73 D249.8	D101.2	1.1	0.21	0.0	0.00	0.00	0.21	0.12	30
40	15.56	15.56	33.487	24.685	326.1	0.131	5.74 D250.0	D101.0	1.1	0.22	0.0	0.00	0.00	0.22	0.08	40
50	ISL 15.50	D 15.49	33.489	D 24.703	324.8	0.164	5.72 D249.4	D100.7	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										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
60	15.48	15.47	33.495	24.712	324.2	0.196	5.71 D248.9	D100.4	1.1	0.22	0.0	0.00	0.00	0.35	0.12	60
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
75	ISL 15.40	D 15.39	33.479	D 24.718	324.2	0.245	5.70 D248.5	D100.1	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 D247.4	D99.4	1.3	0.24	0.0	0.05	0.09	0.15	0.12	87
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
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
125	ISL 11.95	D 11.93	33.430	D 25.386	261.4	0.395	5.18 D225.5	D84.6	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
150	ISL 10.52	D 10.50	33.556	D 25.742	227.9	0.456	4.32 D187.9	D68.4	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 D169.1	D60.8	18.2	1.43	18.9	0.00	0.00	0.01	0.03	171
200	9.28	9.26	33.804	26.145	190.4	0.559	3.45 D150.2	D53.3	23.6	1.67	22.3	0.00	0.00	0.00	0.02	202
230	8.66	8.63	33.972	26.375	168.9	0.613	2.54 D110.6	D38.8	32.6	2.03	27.2	0.00	0.00			232
250	ISL 8.32	D 8.30	34.035	D 26.476	159.5	0.648	2.28 D99.2	D34.5	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
300	ISL 7.91	D 7.88	34.125	D 26.609	147.8	0.726	1.55 D67.3	D23.2	44.0	2.42	31.5	0.00	0.07			302
320	7.80															

RV BELL M SHIMADA

CALCOFI CRUISE 1802

STATION 90.0 80.0

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND m/L	SPEED μmol/Kg	WEA	BAROMETER mb	DRY 1019.5	WET 13.1 C	SECCHI 12.1 C	CLD	AMT	TYPE	ORD 010								
																		SI03*	P04*	N03*	N02*	NH4*	CHL-A μg/L	PHAE0 μg/L	PRES db
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	D 247.3	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	D 248.6	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	D 248.4	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	D 249.1	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	D 249.4	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	D 201.8	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	D 171.9	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	D 159.4	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	D 129.9	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	D 103.5	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	35.3	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 02;

DEPTH m	TEMP DEG C	POTTEMP DEG C	SALINITY	SIGMA THETA	SVA	DYN HT	WIND m/L	SPEED μmol/Kg	WEA	BAROMETER mb	DRY 1020.1	WET 14.6 C	SECCHI 12.4 C	CLD	AMT	TYPE	ORD 011									
																		SI03*	P04*	N03*	N02*	NH4*	CHL-A μg/L	PHAE0 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	D 249.9	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	0.00	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	D 250.5	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	D 251.1	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	D 251.2	D 101.3	1.4	0.22	0.0	0.00	0.00	0.31	0.02	50	17								
63	15.37	15.36	33.482	24.727	323.0	0.206	5.75	D 250.6	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	D 248.6	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											

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	TEMP	POTTEMP	SALINITY	SIGMA	SWA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP	
m	DEG C	DEG C		THETA		ml/L	μmol/Kg	PCT	μM	μM	μM	μM	μM	μM	μg/L	μg/L	db		
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	33.543	D 24.583	335.2	0.065	5.66	D 246.5	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	D 246.4	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	D 246.7	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	D 246.1	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	D 245.6	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	D 235.4	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	D 215.9	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	283.8	0.459	4.60	D 200.3	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	D 172.1	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	D 150.8	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	D 123.8	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	D 110.3	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	TEMP	POTTEMP	SALINITY	SIGMA	SWA	DYN HT	OXYGEN	OXYGEN	OXY	SI03*	P04*	N03*	N02*	NH4*	CHL-A	PHAEAO	PRES	SAMP	
m	DEG C	DEG C		THETA		ml/L	μmol/Kg	PCT	μM	μM	μM	μM	μM	μM	μg/L	μg/L	db		
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	D 250.6	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	D 236.8	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	D 200.1	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	D 174.4	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	4.91	D 170.4	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	D 118.7	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	D 109.2	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 3										

## CalCOFI Cruise 1802

## MACROZOOPLANKTON BIOMASS

Net Mesh Size: 0.505mm

Line	Sta.	Latitude N	Longitude W	Date Mo/Day	Time (PST)		Water Volume Strained (m <sup>3</sup> )	Max. Tow Depth (m)	Volume per 1000 m <sup>3</sup> Strained		
					Start	End			Total (cm <sup>3</sup> )	Small (cm <sup>3</sup> )	
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	