

UNIVERSITY OF CALIFORNIA, SAN DIEGO SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

**CalCOFI Cruise 1110
16 October – 1 November 2011**

**CC Reference 12-05
5 November 2012**

UNIVERSITY OF CALIFORNIA, SAN DIEGO
SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92093-0227

PHYSICAL, CHEMICAL AND BIOLOGICAL DATA

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INTRODUCTION

The data presented in this report were collected during cruise 1110* of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) program aboard the RV *New Horizon* of Scripps Institution of Oceanography, University of California, San Diego. 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 Game, 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 cruises were collected and processed by personnel of the Integrative Oceanography Division and the Southwest Fisheries Science Center. SIO staff members from the Ocean Data Facility participate in the chemical analysis of nutrient samples at sea. 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 1049) with a rosette was deployed at each station on these cruises. 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 525 meters, bottom depth permitting. Occasional stations have multiple bottles tripped at the same depth to provide more water for ancillary programs. 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 have been 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 P149. Salinity values were calculated using the algorithms for the Practical Salinity Scale, 1978 (UNESCO, 1981a) and are reported to three decimal places, provided that accepted standards were met.

Dissolved oxygen analyses were performed with an Ocean Data Facility of Scripps Institution of Oceanography designed automated oxygen titrator using photometric end-point detection based on the absorption of 365nm wavelength ultra-violet light. A computer using PC software controlled the titration of the samples and the data logging. The method used a modified-Winkler titration following the technique of Carpenter (1965) with modifications by Culberson (1991), but with higher concentrations of thiosulfate solution (50 g/l). Standard KIO3

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

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.

Nutrient samples were analyzed at sea by the Scripps Ocean Data Facility for dissolved silicate, phosphate, nitrate, nitrite, and ammonium using procedures similar to those described in Gordon et al. (1993) and Koroleff (1969, 1970). Samples were collected in 45 ml high-density polypropylene screw-capped tubes which were acid washed and rinsed with sample three times prior to filling. Daily standardizations and drift corrections were accomplished by running freshly prepared mid-range standards at the beginning and end of each group of samples. Samples not analyzed immediately after collection were refrigerated and run the following day. In addition to daily standardizations, periodic full calibrations were performed with sets of six different concentration standards.

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

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

Primary Productivity Sampling

Primary productivity samples were taken each day shortly before local apparent noon (LAN). Primary production was estimated from ^{14}C uptake using a simulated *in situ* technique. Light penetration was estimated from the Secchi depth (assuming that the 1% light level is three times the Secchi depth). The depths with ambient light intensities corresponding to light levels simulated by the on-deck incubators were identified and sampled on the rosette upcast. Occasionally an extra bottle or two were tripped in addition to the usual 20 levels sampled in the combined rosette-productivity cast in order to maintain the normal sampling depth resolution. Triplicate samples (two light and one dark control) were drawn from each productivity sample depth into 250 ml polycarbonate incubation bottles. Samples were inoculated with 11.16 μCi of ^{14}C as NaHCO_3 (40 μl of stock solution) prepared in a 0.3 g/liter solution of sodium carbonate (Fitzwater *et al.*, 1982). Samples were incubated from LAN to civil twilight in seawater-cooled incubators with neutral-density screens which simulate *in situ* light levels. At the end of the incubation, the samples were filtered onto Millipore HA filters and placed in scintillation vials. One half ml of 10% HCl was added to each sample. The sample was then allowed to sit, without a cap, at room temperature for 12 hours (after Lean and Burnison, 1979). Following this, 10 ml of scintillation cocktail were added to each sample and the samples were returned to SIO where the radioactivity was determined with a scintillation counter. Salinity, oxygen, nutrients, chlorophyll-*a* and phaeopigments were determined from all rosette productivity bottles.

Macrozooplankton Net Tows

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

Avifauna Observations (Farallon Institute of Advanced Ecosystem Research)

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

Ancillary Programs

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

- 1) *Underway Data*: Continuous near surface measurements of temperature, salinity and *in vivo* chlorophyll fluorescence were recorded from seawater pumped through the ship's uncontaminated seawater system. Water was drawn from a depth of approximately 3 meters. The data were logged in one-minute averages using a Sea-Bird Electronics, Inc., SBE 45 MicroTSG Thermosalinograph and a Wetlabs Wetstar fluorometer.
- 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) *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. These additional samples, taken at all CalCOFI stations, are for measurements of particulate organic carbon and nitrogen, dissolved organic carbon and nitrogen, taxon-specific phytoplankton pigments, flow-cytometric counts of bacteria and picoautotrophs, microscopic counts of nano- microplankton, determination of mesozooplankton size structure using a Laser Optical Plankton Counter, and mesozooplankton community structure. (M. Ohman, SIO)
- 4) *SCCOOS Nearshore Observations*: The objective of these observations is to extend CalCOFI time series to the nearshore. Nearshore observations consist of 9 stations at the ends and interspersed with current CalCOFI lines on the 20 m isobath with a standard set of CalCOFI observations. (R. Goericke, SIO)
- 5) *Inorganic Carbon System*: The CalCOFI group collected samples for the characterization of the inorganic carbon system at selected locations along the cruise track. Total inorganic carbon and alkalinity will be measured which will allow the calculation of pH and pCO₂. The objectives of these measurements are first the long-term characterization of the inorganic carbon system and its response to changing ocean climate and second measurements of pH in the coastal zone in order to monitor the impact of 'corrosive' waters on benthic ecosystems in the Southern California Bight. (R. Goericke, SIO)
- 6) *Marine mammal observations*. During daylight transits, visual line-transect surveys were conducted by marine mammal observers focusing on cetaceans. Acoustic line-transect surveys were performed using a towed hydrophone array which consists of multiple hydrophone elements that sample sounds up to 100 kHz allowing for localization of calling animals. Acoustic monitoring also takes place on individual stations using sonobuoys. (J. Hildebrand, SIO)
- 7) *Nitrate isotope*: Seawater samples are acquired using the CTD-rosette and shipped frozen to Princeton University. The nitrogen and oxygen isotopic composition of nitrate is measured using strains of denitrifying bacteria that reduce nitrate to N₂O. (P. Rafter, Princeton University).
- 8) *Micronekton trawling*: A Matsuda-Oozeki-Hu trawl (MOHT) with 5 m² mouth opening and 1.77 mm mesh is used to sample the micronekton (krill, small pelagic fishes, squids, etc) within the epipelagic (upper 200 m) and mesopelagic (200 - 500 m) depth horizons. The samples provide size- and species composition data on the pelagic community, which is combined with Ek-60 multi-frequency acoustic data to estimate the distribution and abundance of the micronekton. (T. Koslow, SIO)
- 9) *ALF (Advanced Laser Fluorometer)*. Continuous underway analysis of phytoplankton pigment groups and variable fluorescence (F_v/F_m). ALF, 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 ALF 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.

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

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

Primary Productivity Data

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

Macrozooplankton Data

Macrozooplankton biomass volumes are tabulated as total biomass volume ($\text{cm}^3/1000\text{m}^3$ 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 1110

1. CalCOFI Cruise 1110 track and station positions.
2. Horizontal distribution of dynamic height anomaly (0 over 500m). In areas shallower than 500 m, the dynamic heights were extrapolated on the basis of the offshore deeper steric height as described in Reid and Mantyla (1976).
3. Horizontal distributions at 10 meters: A) chlorophyll-*a*; B) potential density; C) temperature; and D) salinity.
4. Horizontal distributions at 200 meters: A) dynamic height anomaly (200 over 500 m); B) potential density; C) temperature; and D) salinity.
5. Sections along CalCOFI line 90 (vertical exaggeration, 1000): A) potential density; B) temperature; C) salinity; D) silicate; E) nitrate; F) phosphate; G) chlorophyll-*a*; H) oxygen saturation; I) oxygen; J) nitrite; and K) phaeopigments.

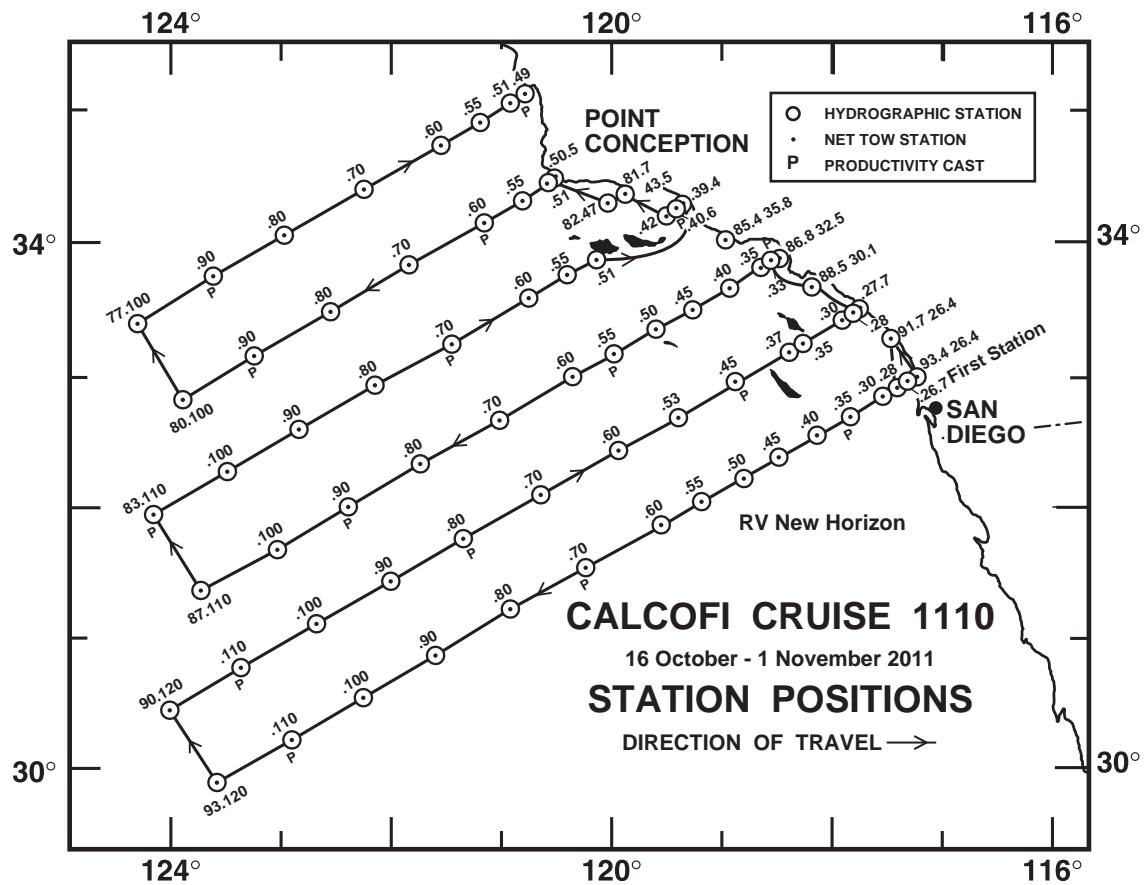


FIGURE 1

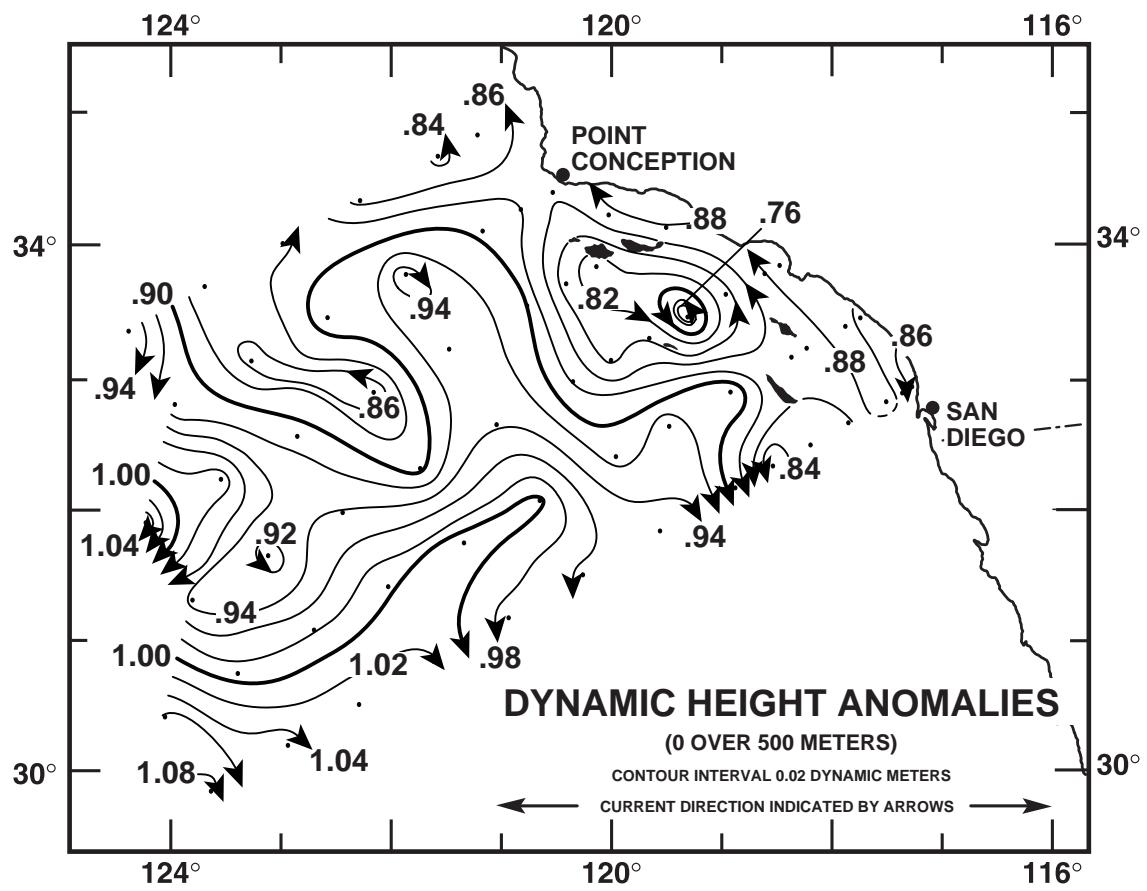


FIGURE 2

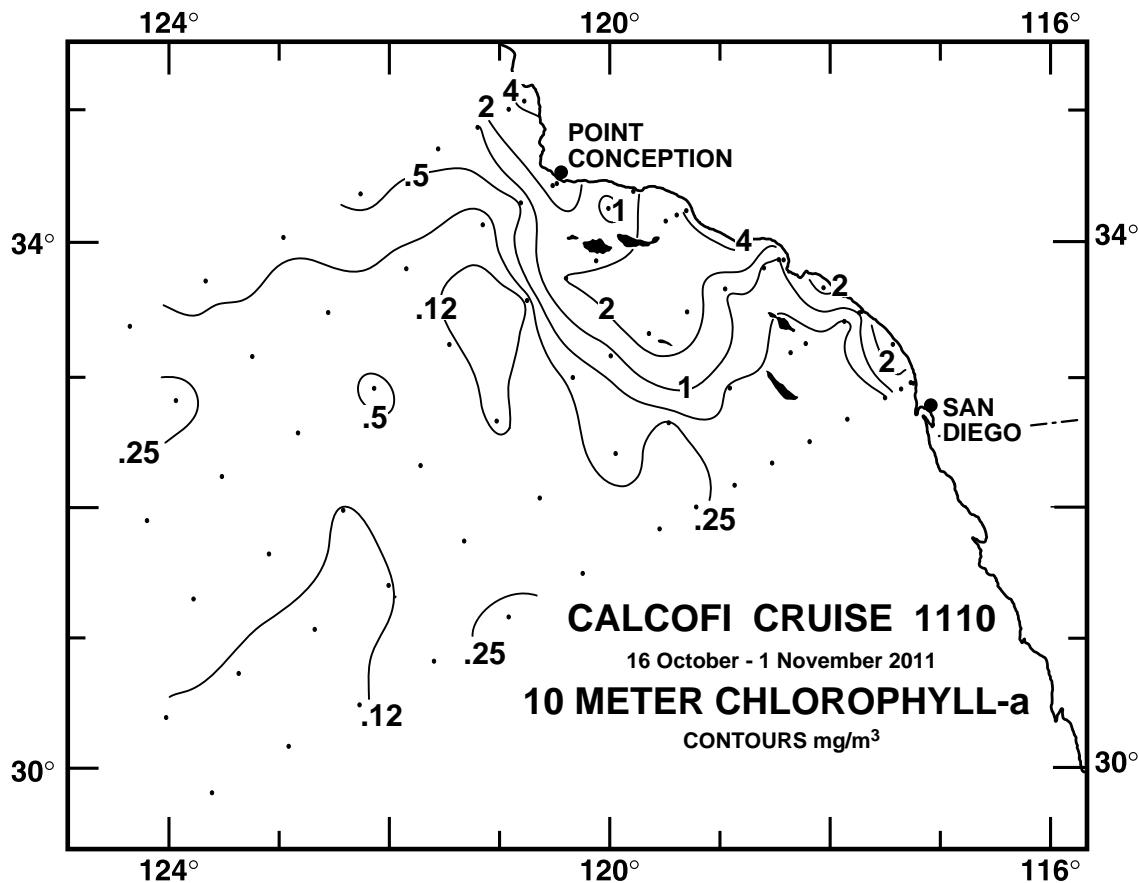


FIGURE 3A

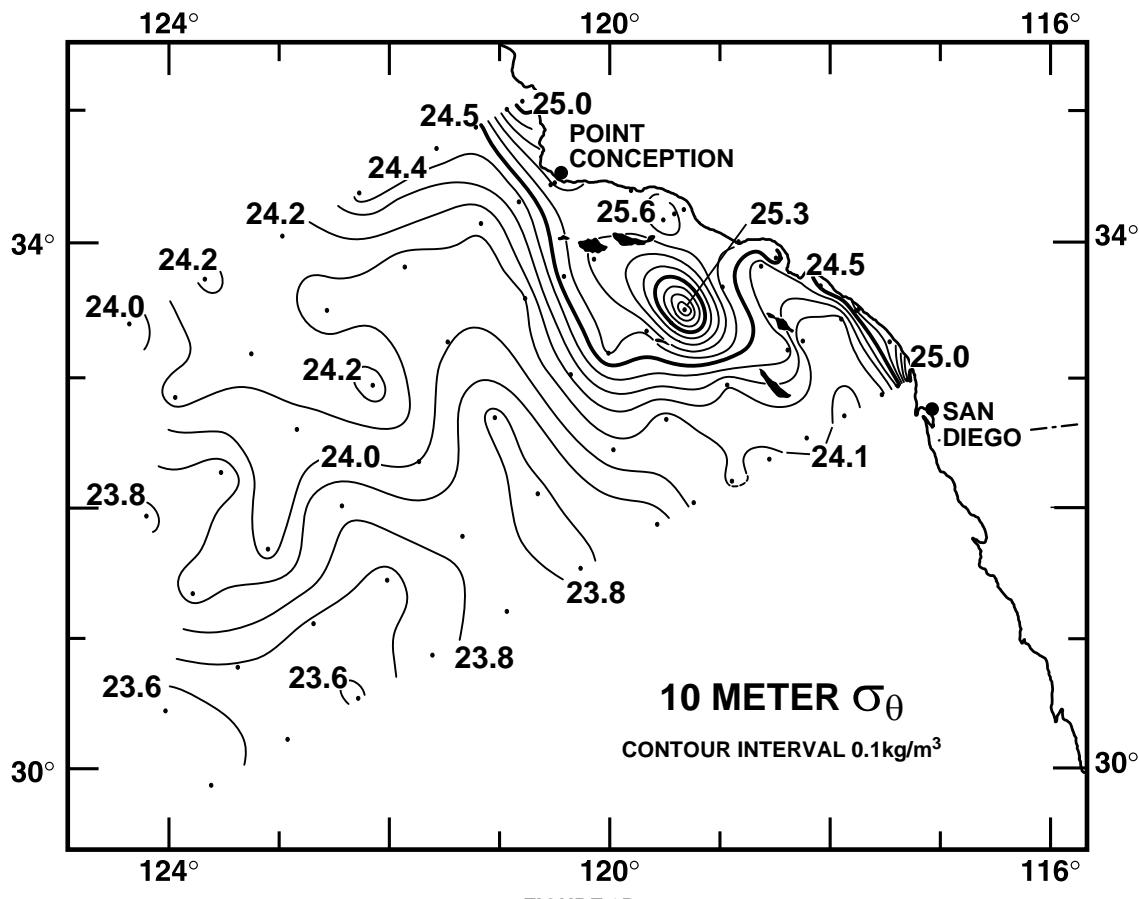


FIGURE 3B

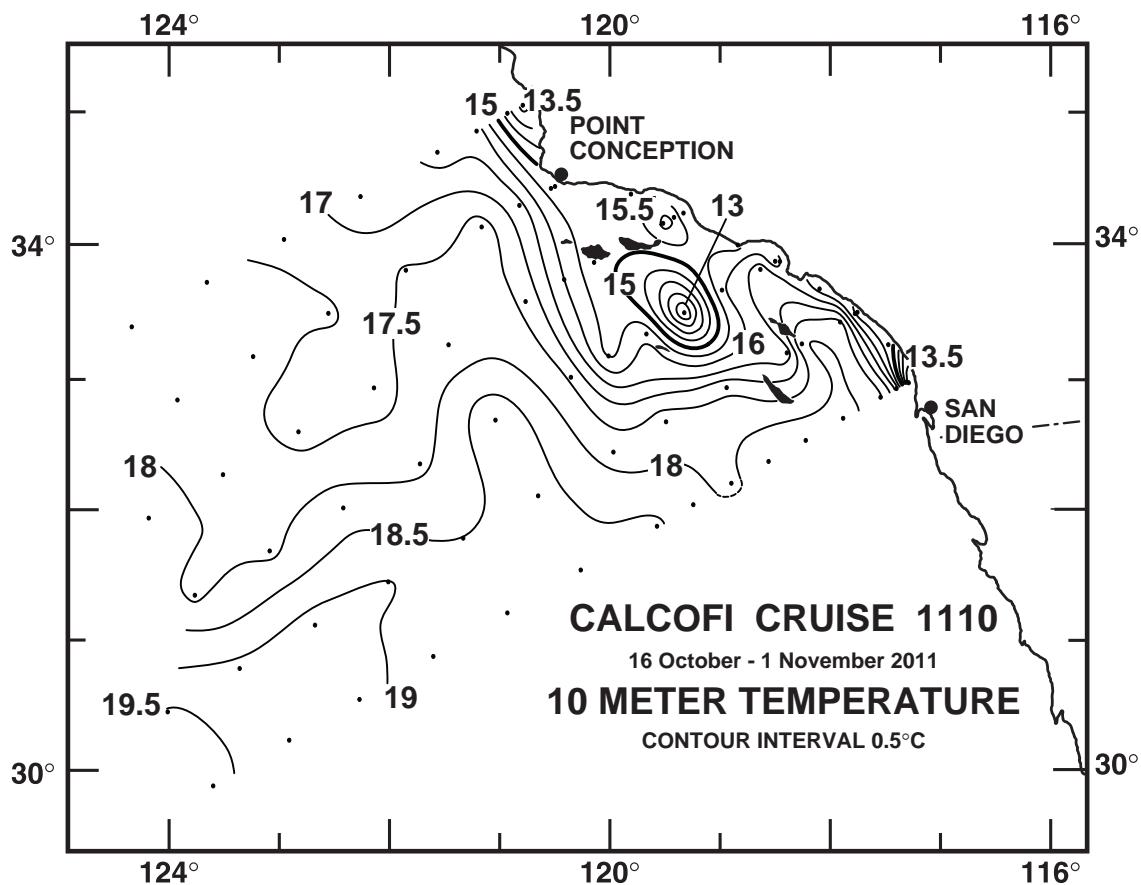


FIGURE 3C

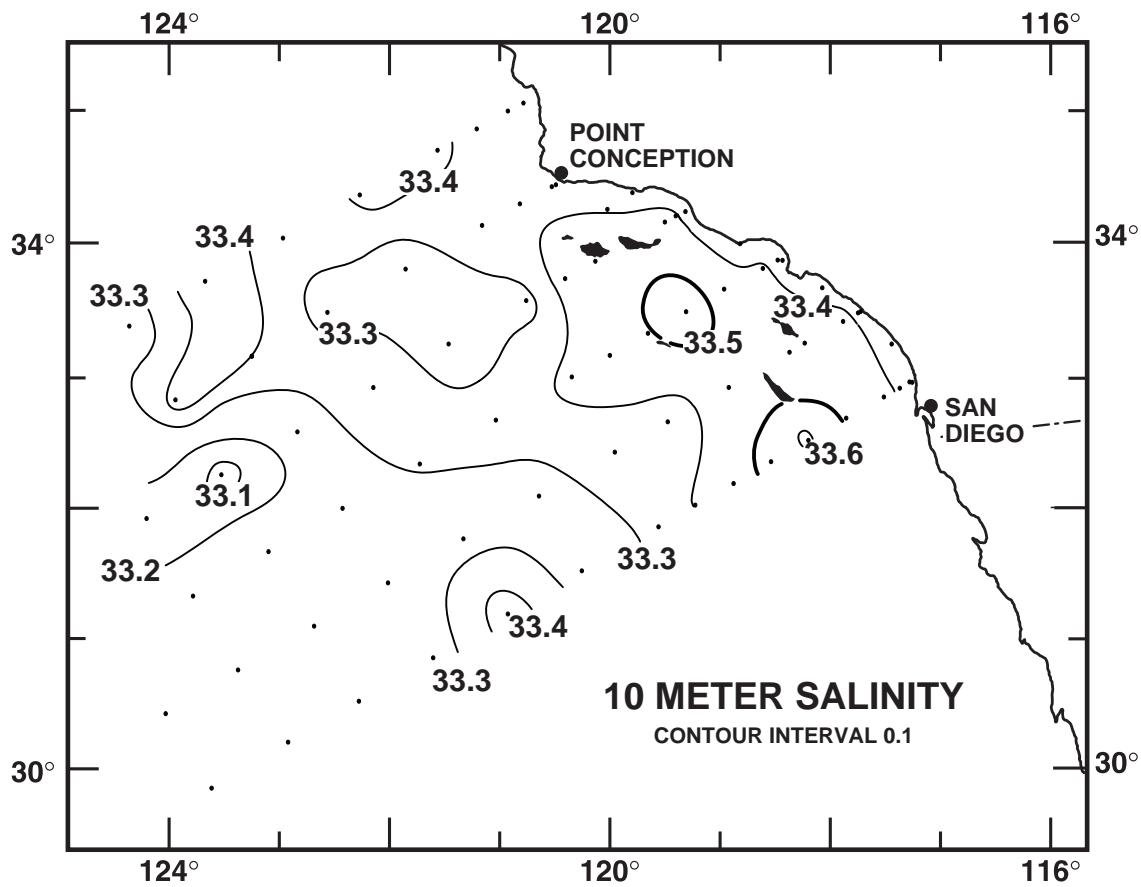


FIGURE 3D

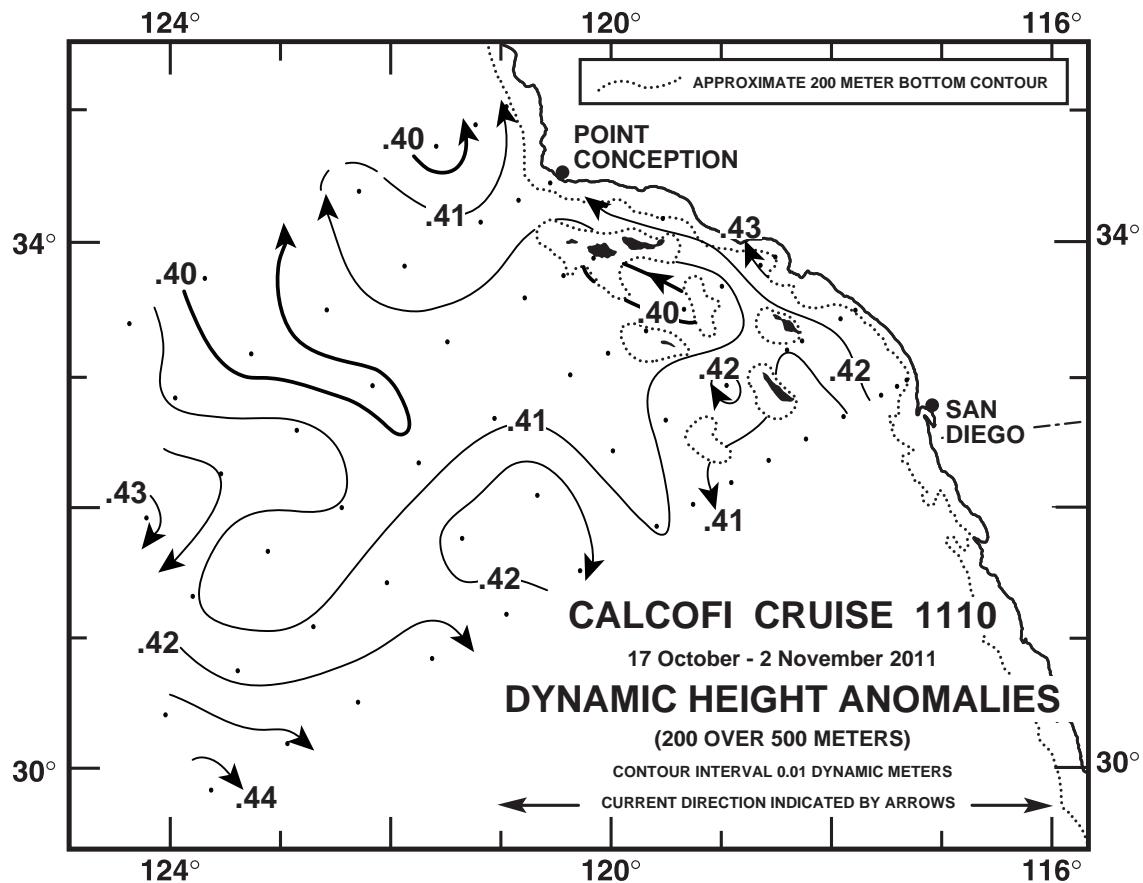


FIGURE 4A

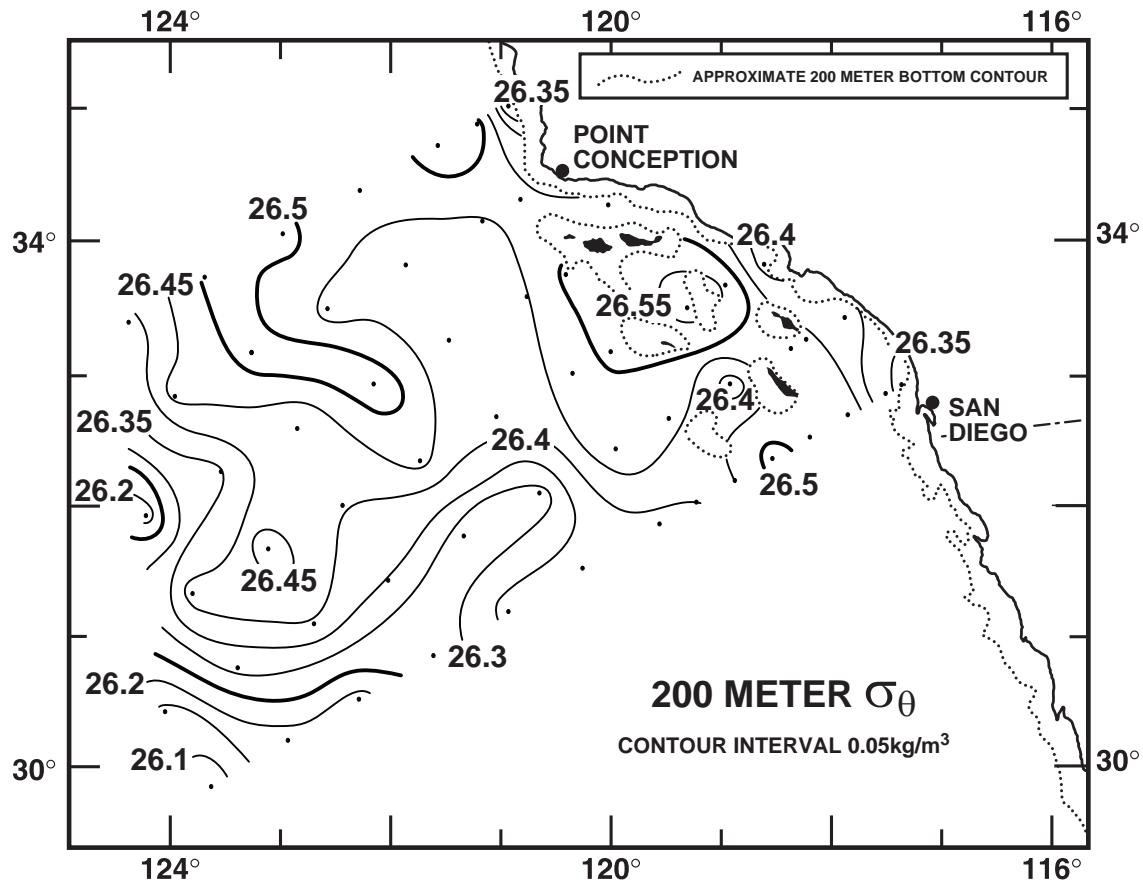


FIGURE 4B

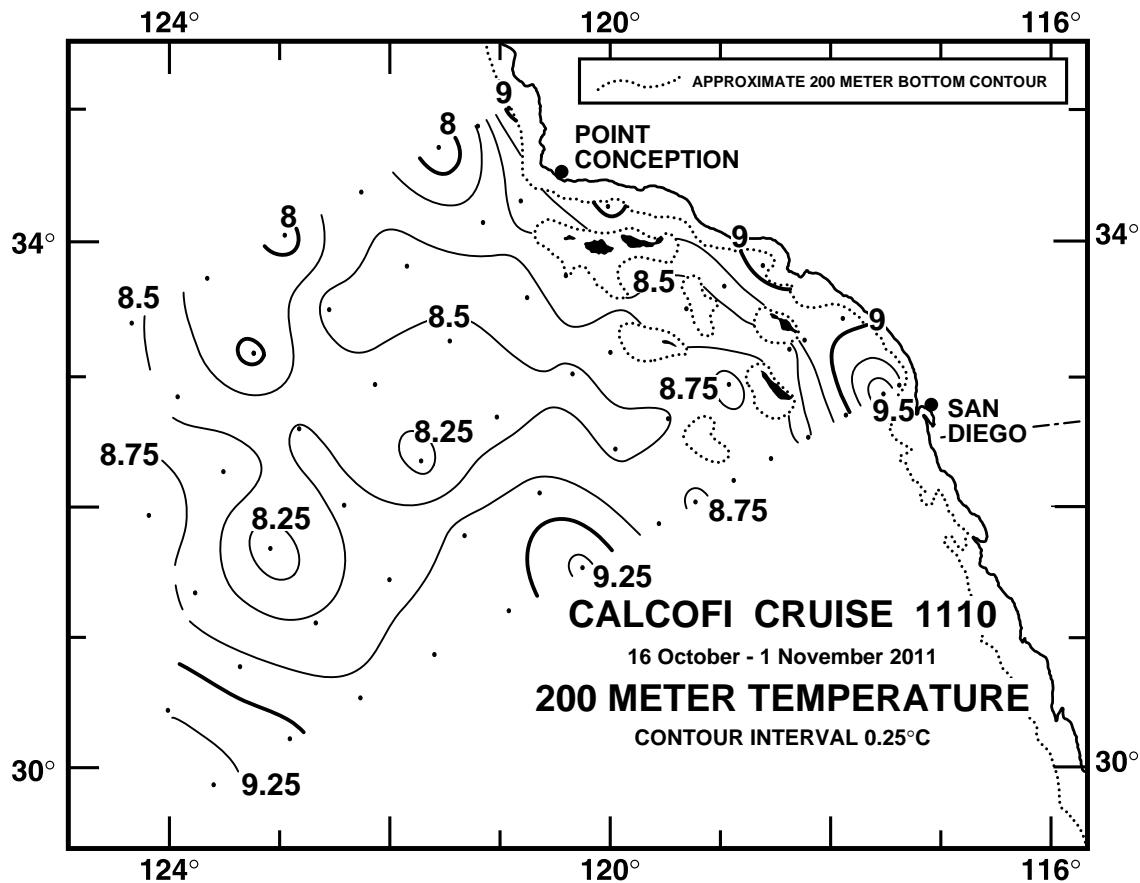


FIGURE 4C

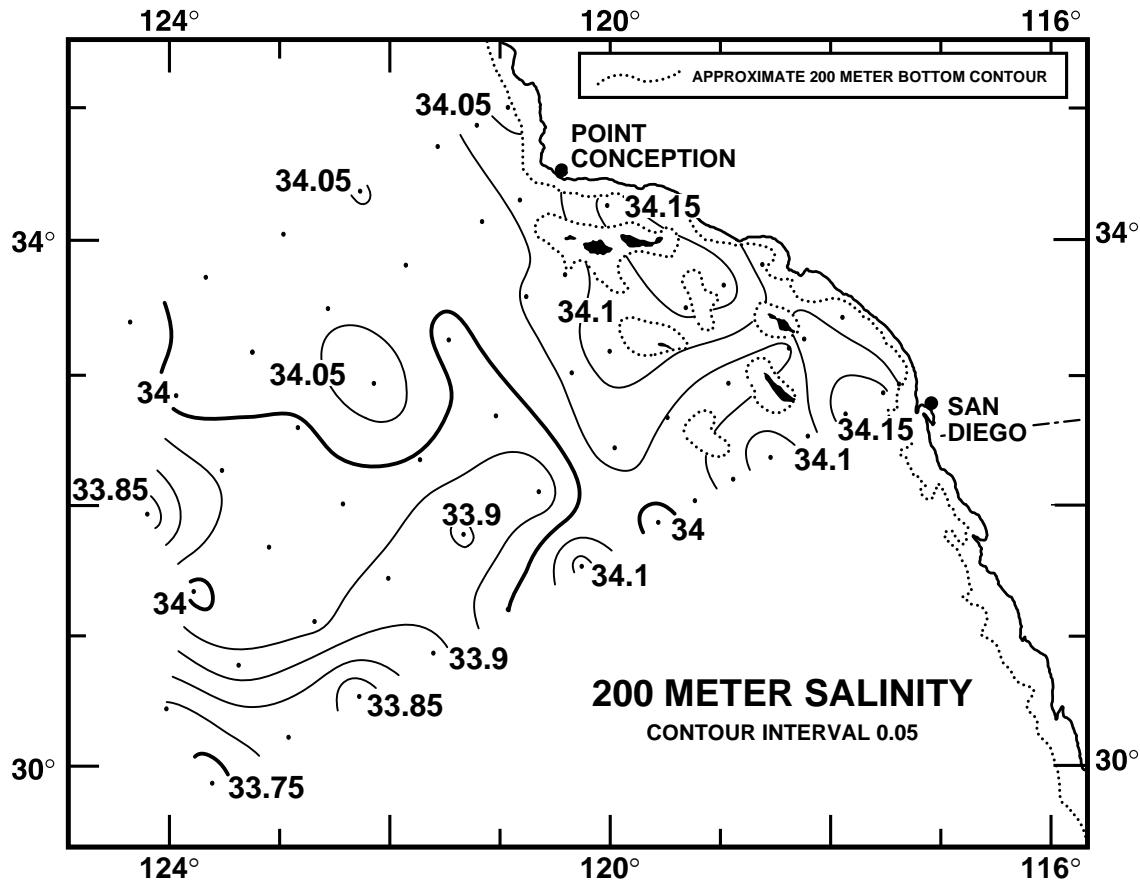
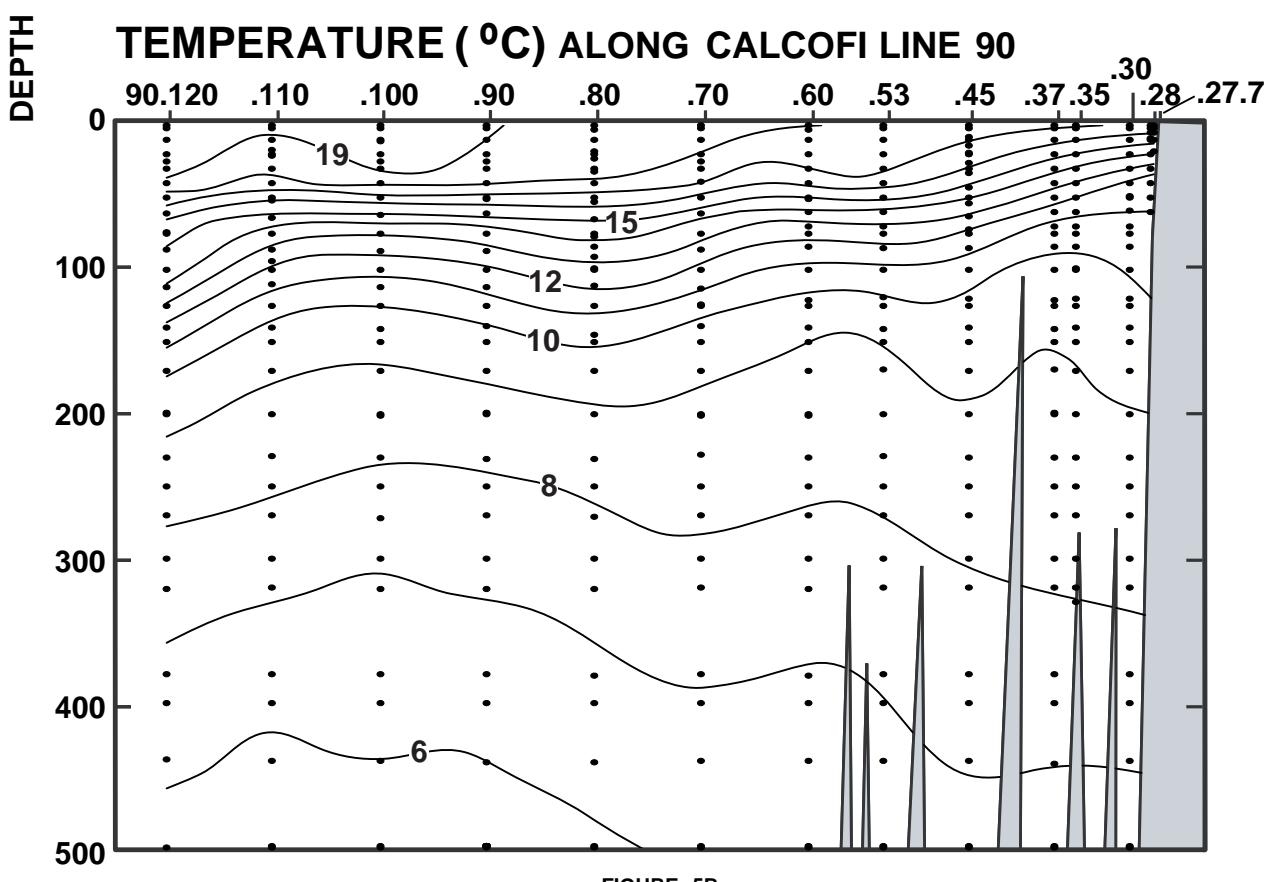
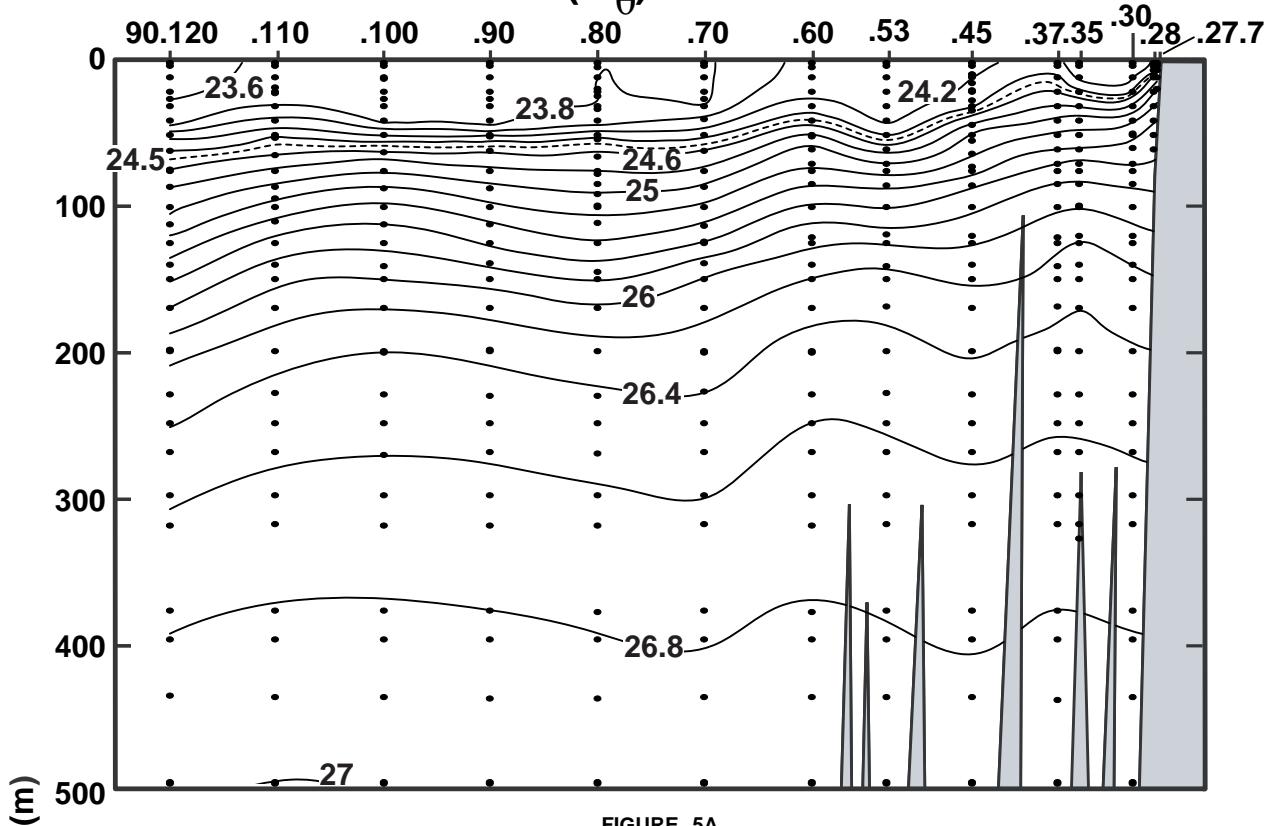


FIGURE 4D

CALCOFI CRUISE 1110

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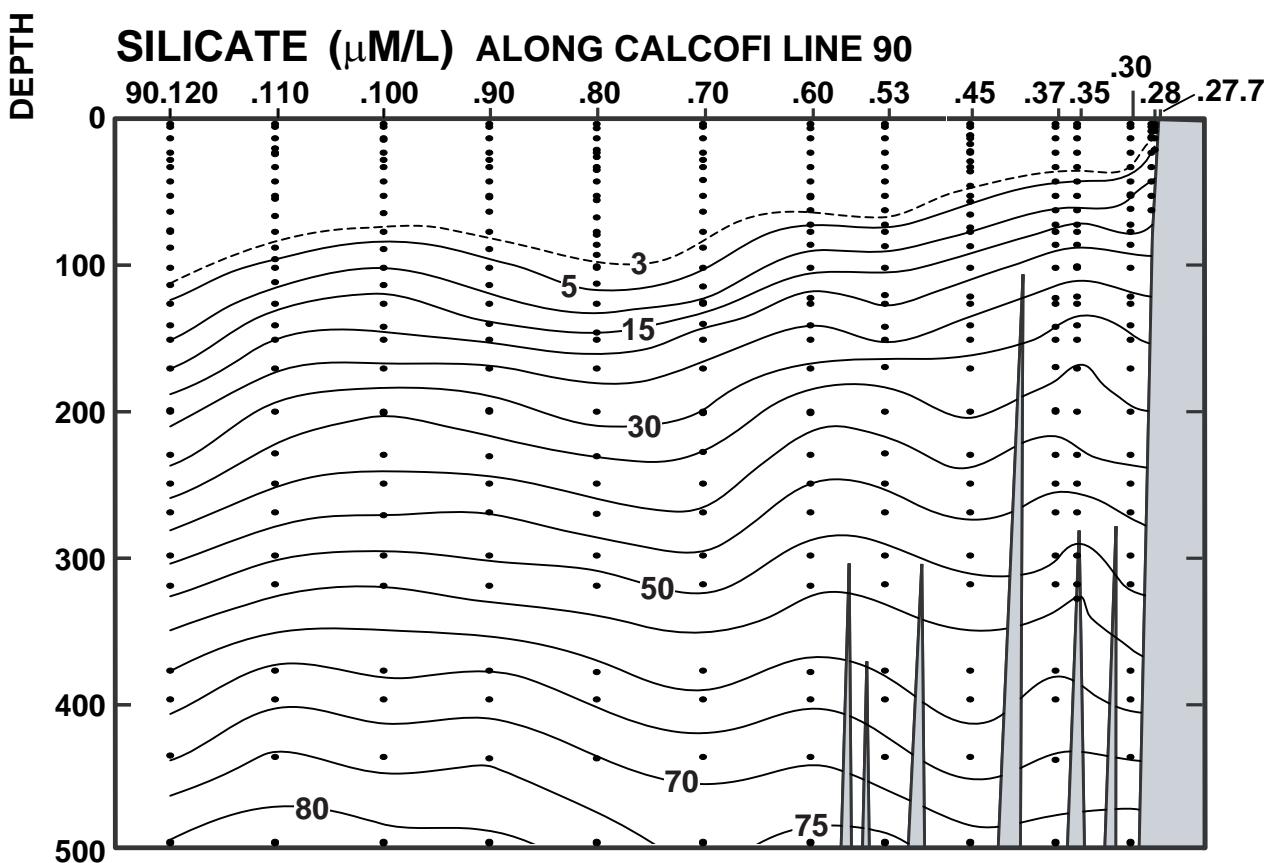
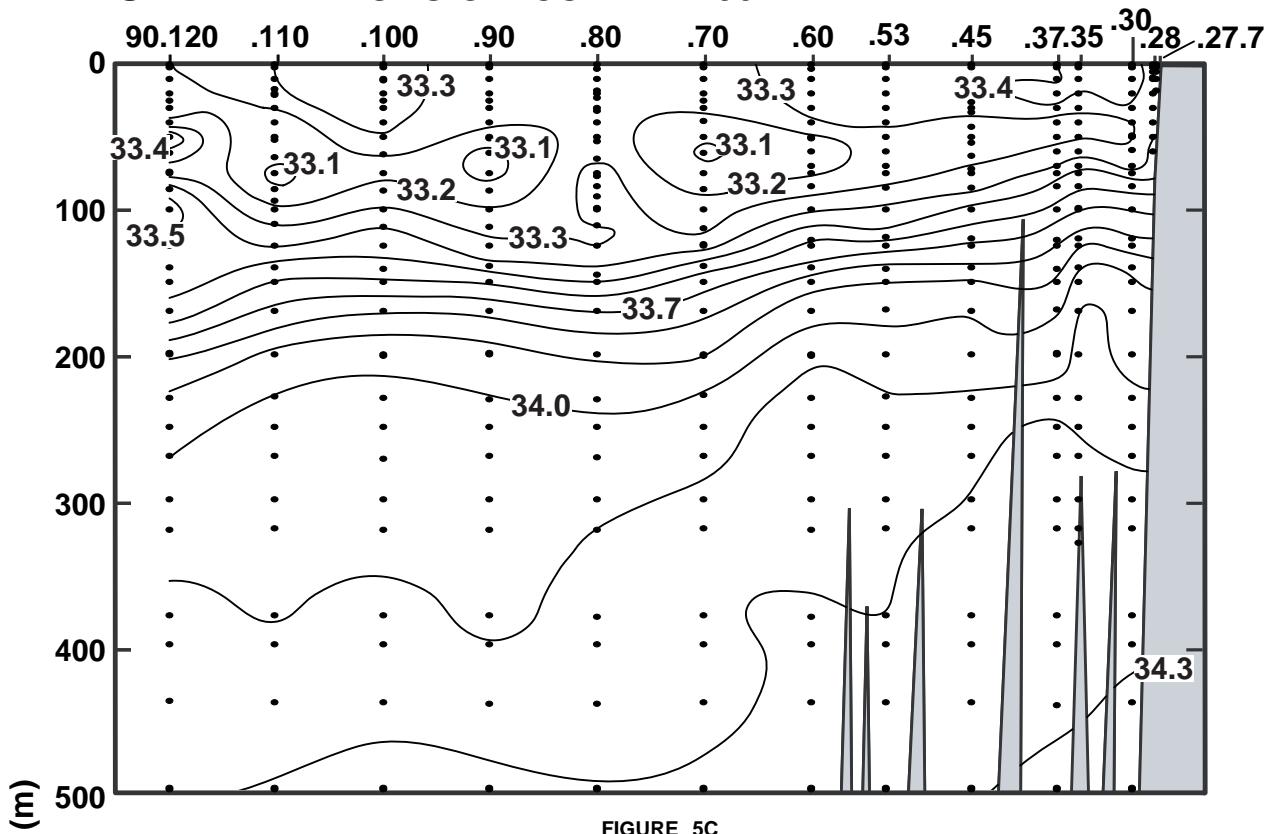
POTENTIAL DENSITY (σ_0) ALONG CALCOFI LINE 90



CALCOFI CRUISE 1110

20 - 23 October 2011

SALINITY ALONG CALCOFI LINE 90



CALCOFI CRUISE 1110

20 - 23 October 2011

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

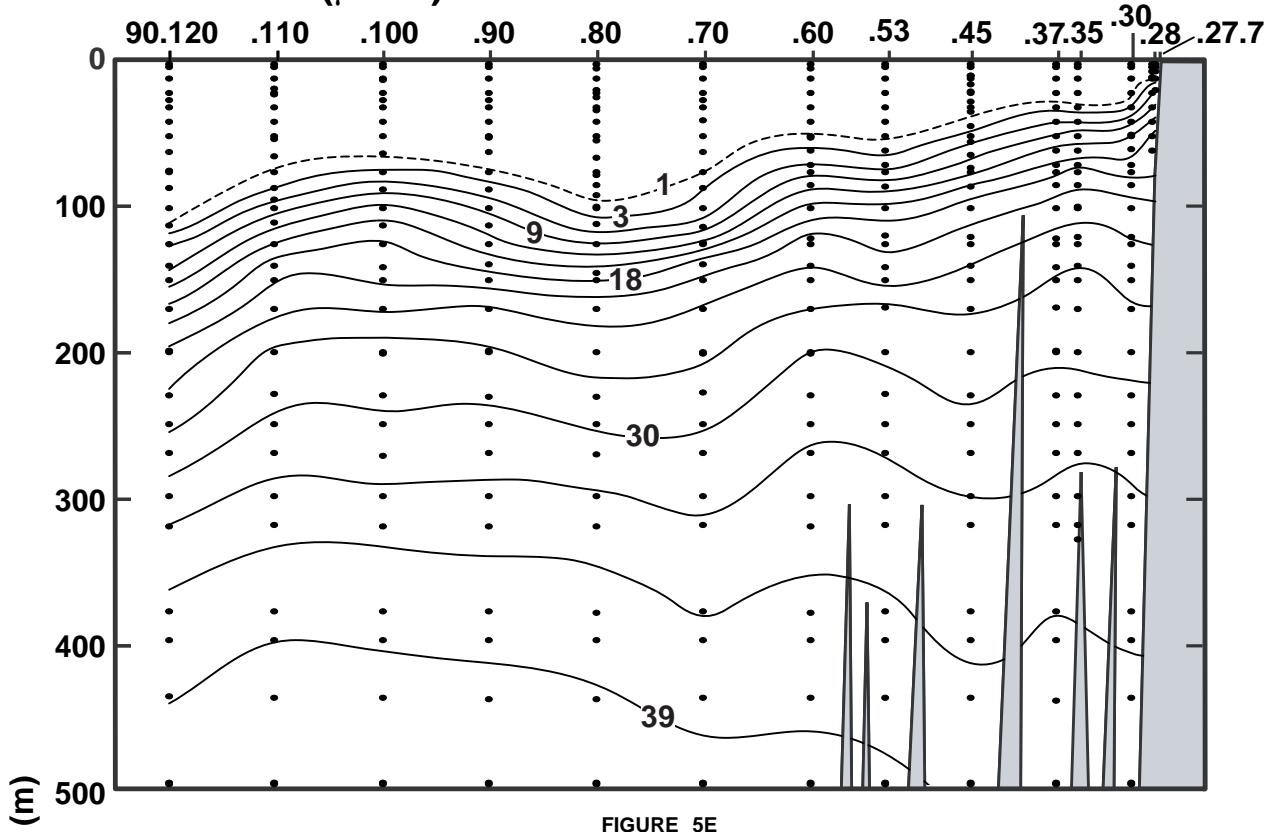


FIGURE 5E

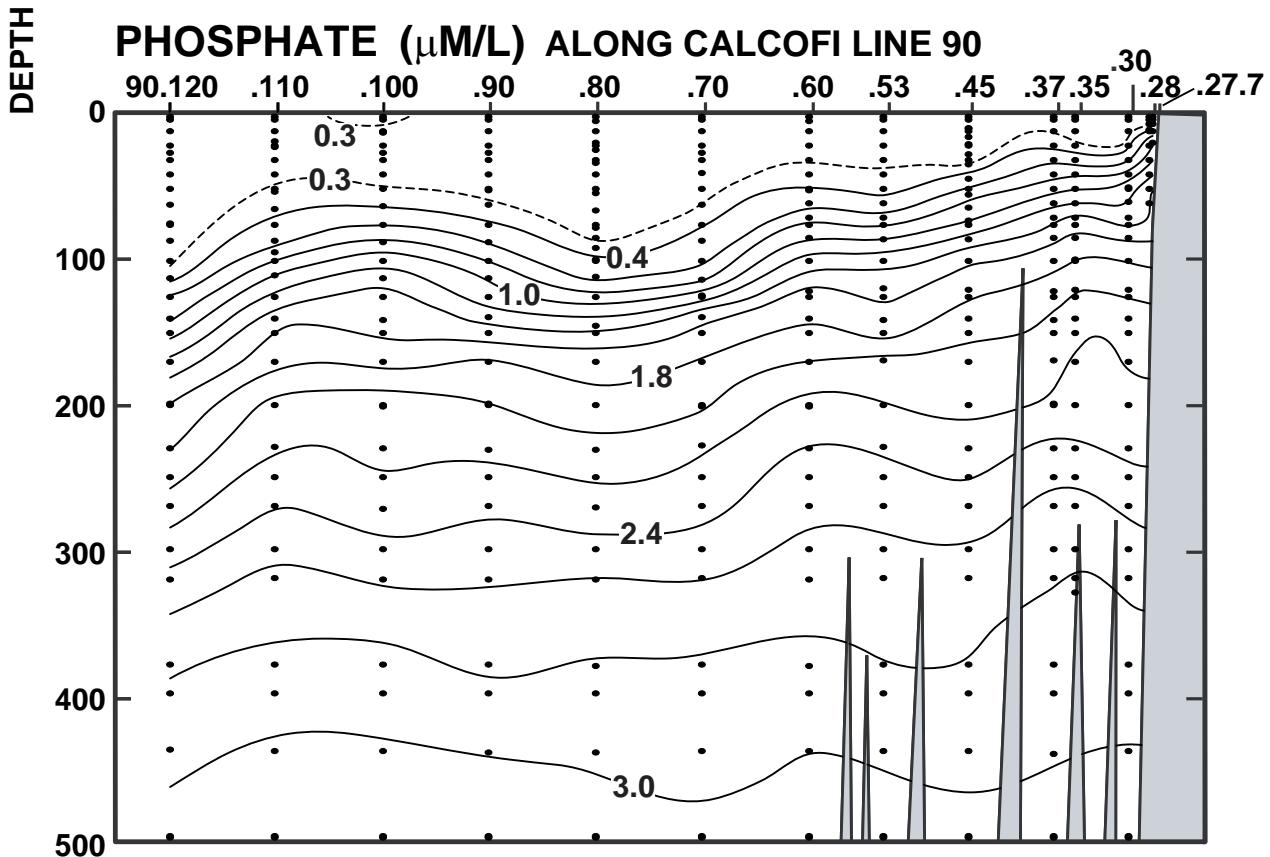


FIGURE 5F

CALCOFI CRUISE 1110

20 - 23 October 2011

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

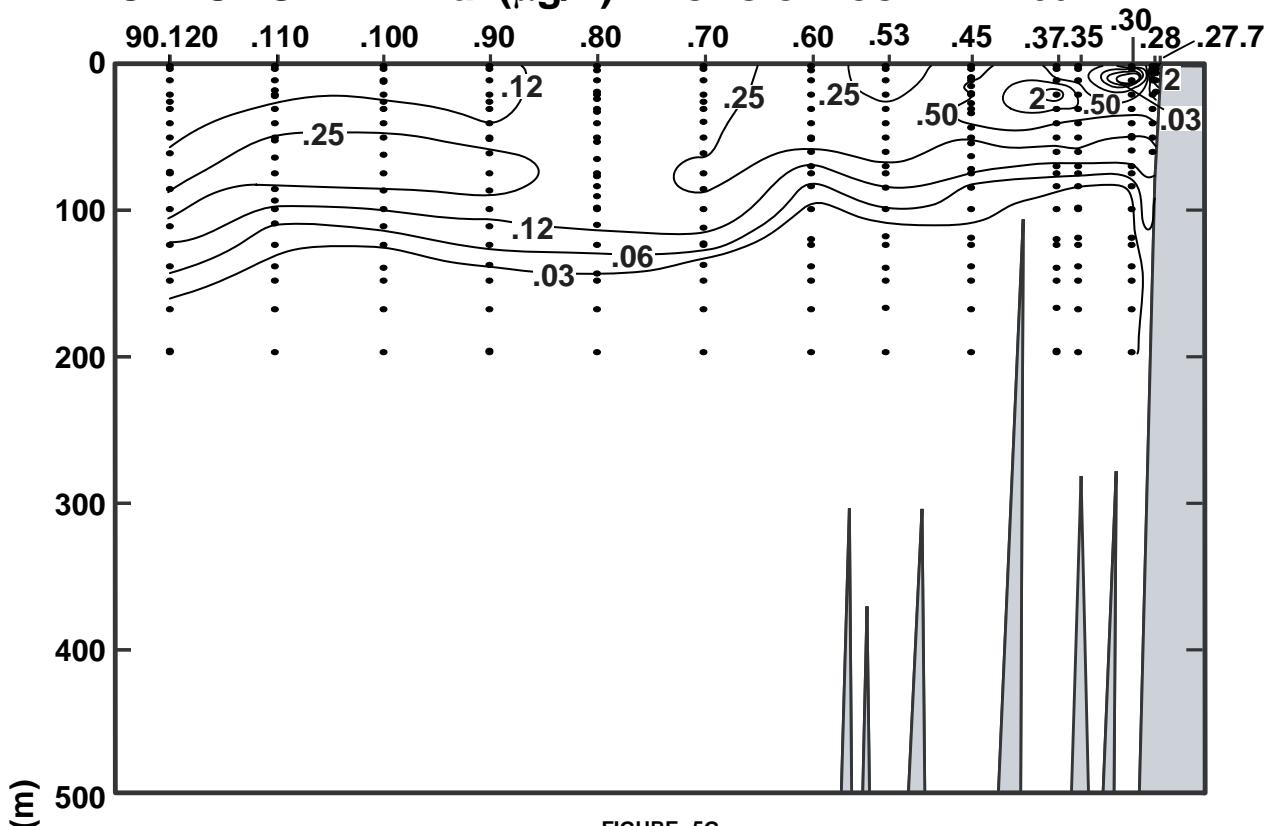


FIGURE 5G

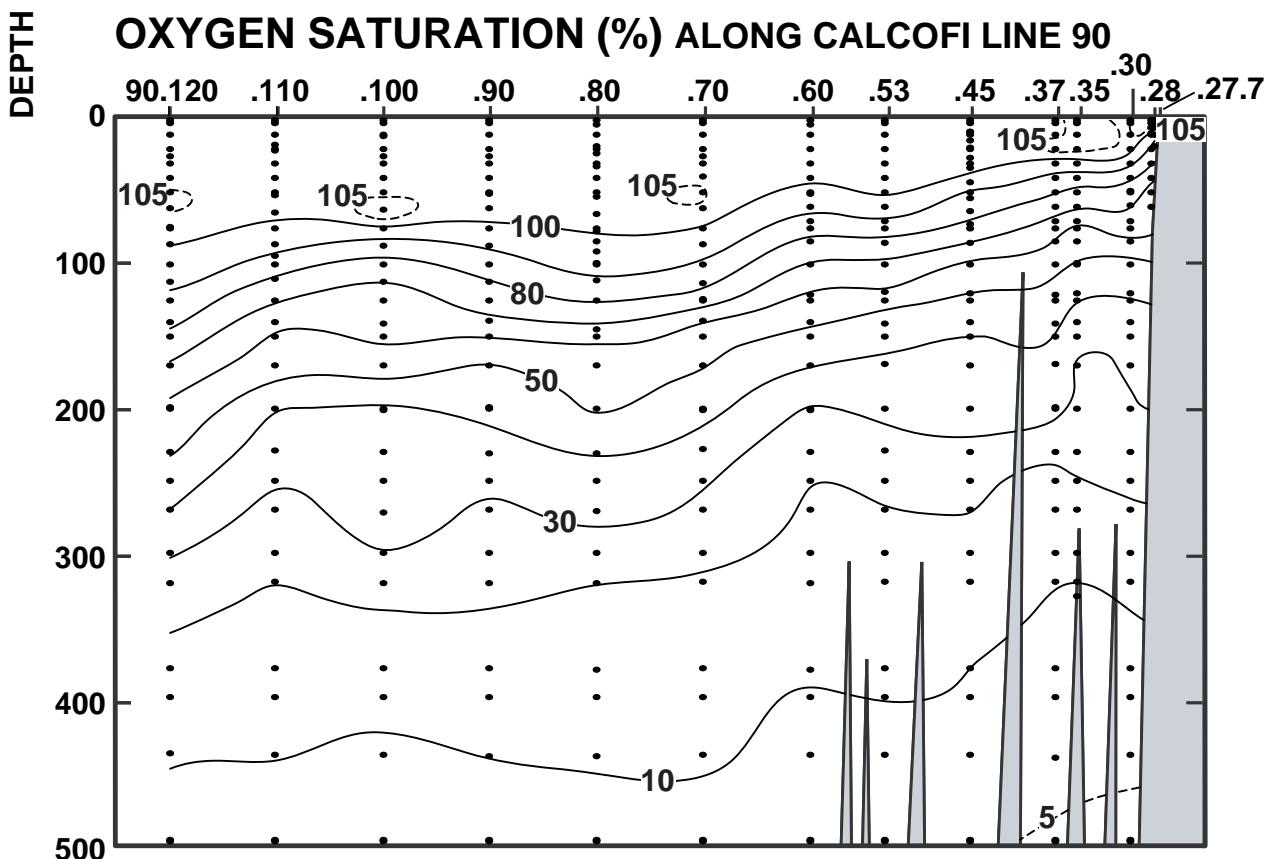


FIGURE 5H

CALCOFI CRUISE 1110

20 - 23 October 2011

OXYGEN (mL/L) ALONG CALCOFI LINE 90

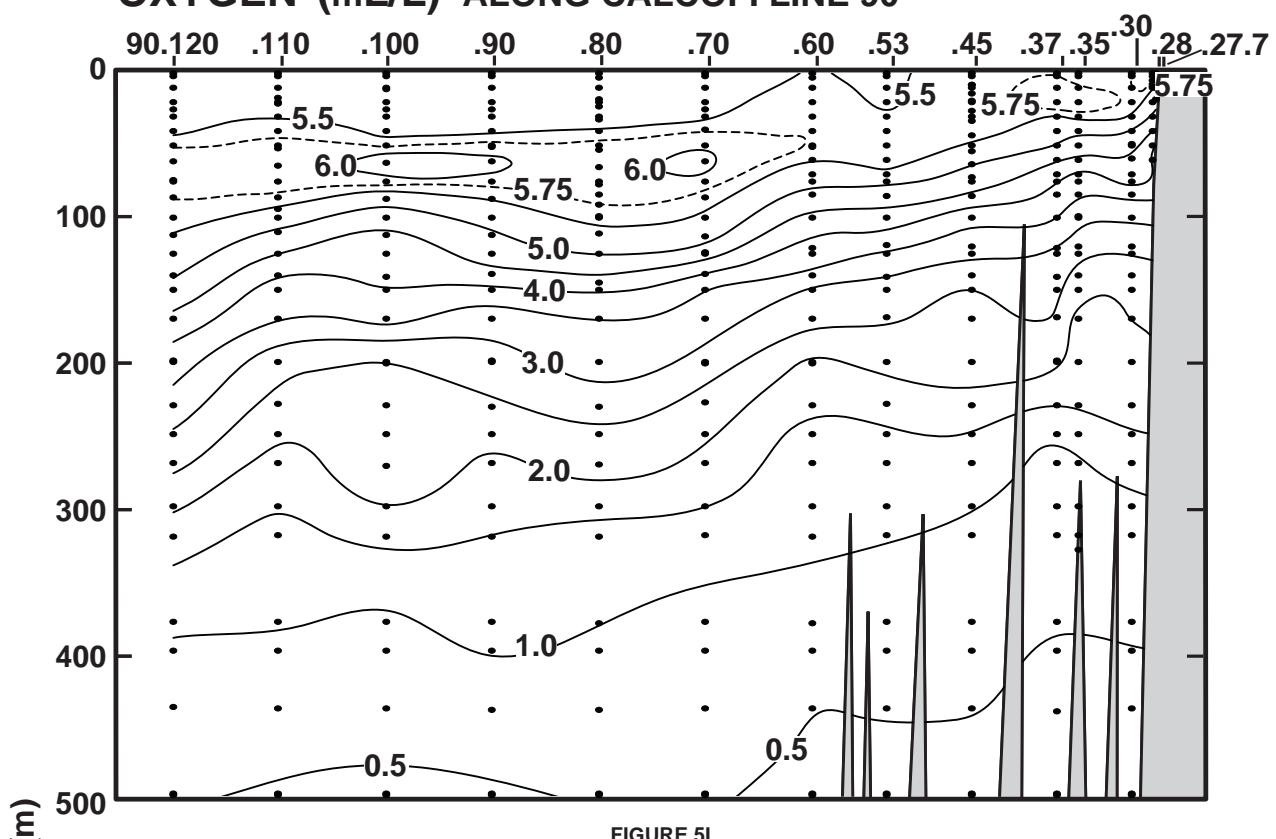


FIGURE 5I

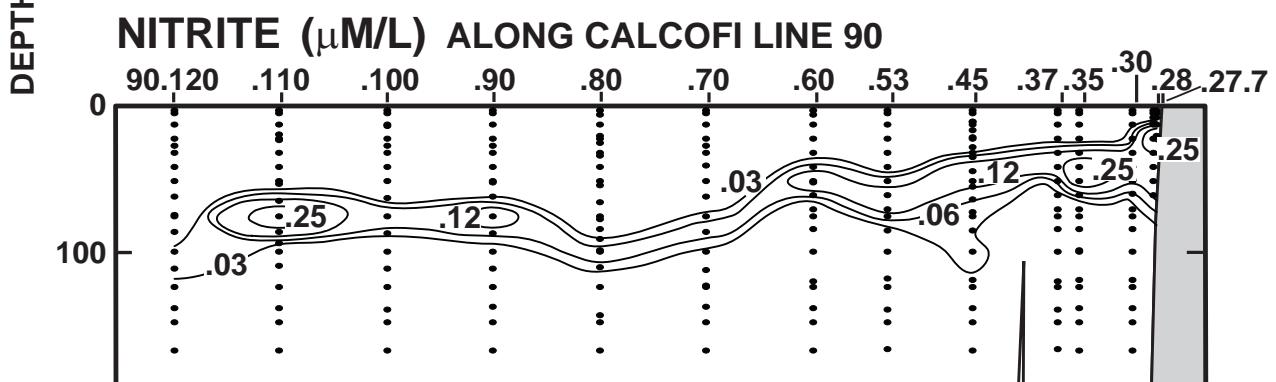


FIGURE 5J

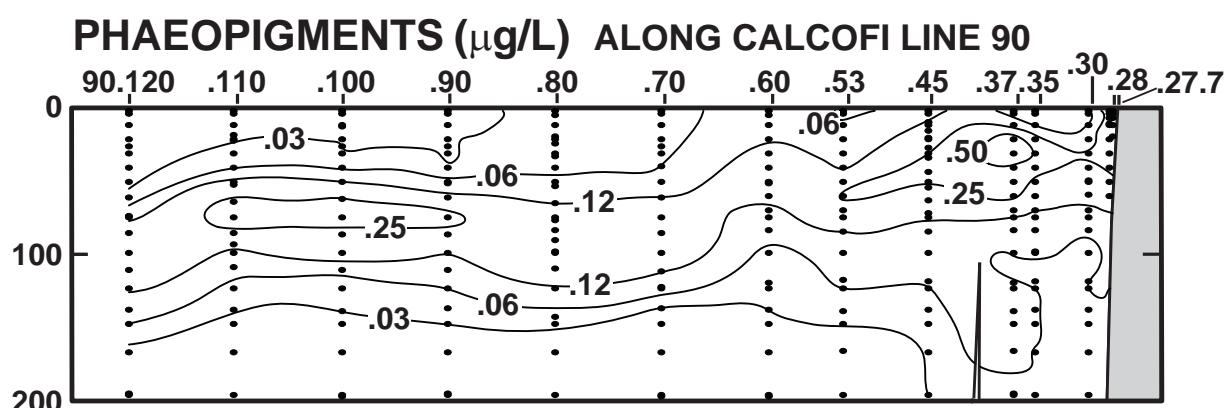


FIGURE 5K

PERSONNEL

CalCOFI Cruise 1110

SHIP'S CAPTAIN

Ian Lawrence, R/V *New Horizon*

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

		Participating (Leg)
Wilkinson, James (Chief Scientist)	Programmer Analyst, SIO	1
Abramenkoff, Dimitry	Fishery Biologist, NMFS	1
Dovel, Shonna	Staff Research Associate, SIO	1
Faber, David	Staff Research Associate, SIO	1
Hays, Amy	Fishery Biologist, NMFS	1
Kieckhefer, Thomas	Marine Mammal Observer, MPL	1
Liu, Jian	Staff Research Associate, SIO	1
Nalley, Eileen	Volunteer,SIO	1
Roadman, Megan	Staff Research Associate, SIO	1
Roche, Lauren	Marine Mammal Acoustician, MPL	1
Schuller, Danial	Staff Research Associate, SIO	1
Shiosaka, Lauren	Volunteer, SIO	1
Susner, Michael	Staff Research Associate, SIO	1
Whitaker, Katherine	Marine Mammal Observer, MPL	1
Wolgast, David	Staff Research Associate, SIO	1
Zolkos, Scott	Volunteer, SIO	1

San Diego to San Diego, California, 16 Oct. – 1 Nov., 2011

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 80.0 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
33	9.2 N	123 13.4 W	30/10/2011	2317	UTC	4472 m	350	21 kn	340 07 07	2	1019.0 mb	17.6 C	15.7 C	8/8	ST	066	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SIO3	PO4	N03	N02	NH4	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA			ml/l	PCT	um/l	um/l	um/l	um/l	um/l	um/l	ug/l	ug/l	db	
0	17.68	17.68	33.412	24.135	377.3	0.000	5.53	101.5	0.6	0.27	0.1	0.00	0.03	0.22	0.05	0	
2	17.68	17.68	33.412	24.135	377.3	0.008	5.53	101.5	0.6	0.27	0.1	0.00	0.03	0.22	0.05	2	
10	17.69	17.68	33.415	24.137	377.4	0.038	5.55	101.9	0.5	0.27	0.1	0.00	0.03	0.22	0.05	10	
20	17.69	17.68	33.411	24.134	378.0	0.076	5.52	101.3	0.6	0.26	0.1	0.00	0.06	0.22	0.05	20	
30	17.69	17.69	33.429	24.148	377.1	0.113	5.51	101.2	0.4	0.26	0.0	0.00	0.05	0.21	0.05	30	
40	15.00	15.00	33.315	24.476	327.0	0.149	5.68	98.8	1.1	0.31	0.5	0.04	0.06	0.59	0.15	40	
50	12.99	12.98	33.412	25.169	280.2	0.179	5.04	84.2	4.9	0.91	9.4	0.26	0.00	0.64	0.40	50	
60	12.02	12.02	33.370	25.322	265.7	0.206	4.73	77.4	7.8	1.14	13.0	0.04	0.00	0.41	0.43	60	
70	10.91	10.90	33.478	25.609	238.6	0.231	3.99	63.8	14.0	1.51	18.6	0.00	0.00	0.16	0.22	71	
75	ISL	10.10 D	10.08	33.519 D	25.783	222.0	0.244	3.75 D	58.9	16.3	1.58	20.0	0.00	0.00	0.11	0.16	76
85	9.64	9.63	33.596	25.919	209.3	0.265	3.51	54.6	21.0	1.73	22.8	0.00	0.00	0.02	0.05	86	
100	9.22	9.18	33.770 D	26.130	189.6	0.295	2.88 D	44.4								101	
120	8.88	8.87	33.889	26.271	176.5	0.331	2.61	40.0	30.6	2.05	27.6	0.00	0.00	0.01	0.04	121	
125	ISL	8.88 D	8.86	33.902 D	26.283	175.5	0.341	2.52 D	38.6	31.1	2.07	27.8	0.00	0.00	0.00	0.04	126
139	8.75	8.73	33.933	26.327	171.6	0.364	2.41	36.8	32.4	2.11	28.5	0.00	0.00	0.04	0.04	140	
150	ISL	8.62 D	8.61	33.955 D	26.364	168.3	0.385	2.37 D	36.1	33.7	2.14	29.0	0.00	0.00	0.03	0.03	151
170	8.30	8.29	34.001	26.449	160.5	0.416	2.21	33.5	36.1	2.20	30.0	0.00	0.00	0.03	0.03	171	
200	7.97	7.95	34.018	26.514	154.8	0.463	1.94	29.1	40.4	2.31	31.7	0.00	0.00	0.02	0.02	202	
230	7.62	7.60	34.031	26.575	149.4	0.509	1.97	29.4	44.1	2.33	32.0	0.00	0.00			232	
250	ISL	7.36 D	7.34	34.044 D	26.622	145.2	0.541	1.50 D	22.2	48.0	2.50	33.3	0.00	0.00			252
271	7.59	7.57	34.179	26.696	138.7	0.568	1.03	15.4	52.1	2.67	34.7	0.00	0.00			273	
300	ISL	7.22 D	7.19	34.160 D	26.735	135.3	0.611	1.03 D	15.2	57.5	2.73	36.2	0.00	0.00			302
320	6.63	6.60	34.097	26.765	132.3	0.635	1.05	15.3	61.2	2.77	37.3	0.00	0.00			323	
381	6.62	6.59	34.231	26.873	123.1	0.713	0.52	7.6	67.4	2.97	38.0	0.00	0.00			384	
400	ISL	6.49 D	6.45	34.251 D	26.908	120.1	0.740	0.46 D	6.7	70.0	3.00	38.5	0.00	0.00			403
440	6.15	6.11	34.261	26.960	115.4	0.783	0.37	5.3	75.6	3.07	39.6	0.00	0.00			444	
500	ISL	5.54 D	5.49	34.245 D	27.024	109.6	0.855	0.35 D	5.0	83.4	3.13	40.9	0.00	0.00			504
514	5.55	5.50	34.264	27.038	108.4	0.866	0.32	4.6	85.2	3.15	41.2	0.00	0.00			518	
600	ISL	5.13 D	5.08	34.317 D	27.130	100.3	0.961	0.25 D	3.5	95.2	3.21	42.6	0.00	0.00			605
650	4.75	4.70	34.319	27.175	96.1	1.004	0.20	2.8	101.0	3.25	43.4	0.00	0.00			656	
700	ISL	4.61 D	4.55	34.340 D	27.209	93.3	1.059	0.24 D	3.3								706
800	ISL	4.25 D	4.18	34.394 D	27.291	86.0	1.150	0.28 D	3.9								807
900	ISL	3.98 D	3.91	34.444 D	27.360	80.0	1.233	0.41 D	5.6								908
1000	ISL	3.73 D	3.65	34.467 D	27.405	76.1	1.312	0.52 D	7.1								1010
1100	ISL	3.53 D	3.45	34.494 D	27.447	72.5	1.388	0.65 D	8.8								1111
1200	ISL	3.37 D	3.28	34.512 D	27.479	70.0	1.460	0.75 D	10.1								1212
1300	ISL	3.12 D	3.02	34.531 D	27.518	66.4	1.529	0.87 D	11.7								1313
1400	ISL	2.93 D	2.83	34.547 D	27.548	63.7	1.595	0.99 D	13.2								1415
1500	ISL	2.73 D	2.63	34.561 D	27.577	60.9	1.658	1.12 D	14.9								1516
1600	ISL	2.57 D	2.45	34.573 D	27.602	58.7	1.719	1.23 D	16.3								1618
1800	ISL	2.28 D	2.15	34.600 D	27.649	54.3	1.833	1.52 D	19.9								1821
2000	ISL	2.09 D	1.95	34.617 D	27.680	51.6	1.941	1.78 D	23.2								2024
2200	ISL	1.96 D	1.80	34.631 D	27.703	49.8	2.044	2.01 D	26.1								2227
2400	ISL	1.85 D	1.67	34.642 D	27.723	48.3	2.144	2.20 D	28.5								2431
2600	ISL	1.76 D	1.57	34.650 D	27.737	47.3	2.242	2.33 D	30.1								2635
2800	ISL	1.68 D	1.47	34.657 D	27.751	46.5	2.337	2.48 D	32.0								2839
3000	ISL	1.61 D	1.39	34.663 D	27.763	45.7	2.431	2.62 D	33.7								3043
3200	ISL	1.56 D	1.32	34.668 D	27.773	45.3	2.524	2.76 D	35.4								3248
3400	ISL	1.54 D	1.28	34.672 D	27.780	45.2	2.617	2.85 D	36.6								3452
3500		1.53	1.25	34.674	27.784	45.1	3.016	2.89	37.0	174.0	2.69	38.6	0.00	0.00	0.02	0.02	01

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

RV NEW HORIZON

CALCOFI CRUISE 1110

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	5.2 N	122 39.8 W	21/10/2011	0752 UTC	4018 m	330	20 kn	330	05 06 2	1017.0 mb	18.3 c	16.0 c	27 m	8/8	SC	020	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C			ml/l	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	ug/l	db	
0	19.34	19.34	33.347	23.674	421.3	0.000	5.33	100.9	1.4	0.31	0.1	0.00	0.01	0.12	0.02	0	
2	19.34	19.34	33.347	23.674	421.3	0.008	5.33	100.9	1.4	0.31	0.1	0.00	0.01	0.12	0.02	2	20
10 ISL	19.34 D	19.34	33.343 D	23.670	421.9	0.043	5.34	D101.1	1.4	0.29	0.1	0.00	0.00	0.11	0.02	10	
11	19.35	19.34	33.344	23.671	421.9	0.046	5.34	101.1	1.4	0.29	0.1	0.00	0.00	0.11	0.02	11	19
20 ISL	19.35 D	19.35	33.343 D	23.670	422.4	0.085	5.33	D100.9	1.3	0.29	0.1	0.00	0.00	0.11	0.03	20	
25	19.35	19.34	33.344	23.671	422.5	0.105	5.39	102.0	1.2	0.29	0.1	0.00	0.00	0.12	0.03	25	18
30 ISL	19.34 D	19.34	33.343 D	23.672	422.6	0.127	5.34	D101.1	1.2	0.29	0.1	0.00	0.00	0.13	0.03	30	
40	19.11	19.10	33.307	23.706	419.8	0.169	5.37	101.2	1.3	0.29	0.1	0.00	0.00	0.16	0.05	40	17
50	17.13	17.12	33.306	24.189	373.9	0.208	5.64	102.4	1.3	0.30	0.1	0.00	0.00	0.28	0.10	50	16
62	14.49	14.48	33.197	24.696	325.7	0.250	6.46	111.1	2.1	0.37	0.1	0.00	0.00	0.41	0.26	62	15
75	13.17	13.16	33.202	24.971	299.7	0.291	5.91	99.0	3.3	0.59	3.1	0.11	0.02	0.39	0.32	76	14
87	11.81	11.80	33.218	25.245	273.8	0.325	5.17	84.1	6.3	0.86	8.4	0.01	0.00	0.23	0.20	88	13
100	11.13	11.11	33.314	25.445	255.0	0.360	4.76	76.4	10.1	1.13	12.9	0.00	0.00	0.11	0.17	101	12
112	10.47	10.46	33.398	25.626	238.0	0.389	4.40	69.6	13.8	1.33	16.2	0.00	0.00	0.07	0.07	113	11
125	10.04	10.03	33.472	25.757	225.8	0.420	4.11	64.4	16.6	1.47	18.4	0.00	0.00	0.03	0.04	126	10
141	9.43	9.41	33.538	25.911	211.3	0.455	4.13	63.9	18.8	1.49	19.3	0.00	0.00	0.02	0.03	142	09
150 ISL	9.29 D	9.26	33.609 D	25.990	203.9	0.477	3.99	D 61.6	20.9	1.56	20.5	0.00	0.00	0.01	0.03	151	
170	8.87	8.85	33.786	26.195	184.8	0.512	3.69	56.5	25.7	1.72	23.3	0.00	0.00	0.00	0.02	171	08
200 ISL	8.54 D	8.52	33.987 D	26.403	165.6	0.568	2.48	D 37.7	34.6	2.12	28.5	0.00	0.00	0.00	0.02	202	
201	8.52	8.50	33.987	26.406	165.3	0.566	2.42	36.8	34.9	2.13	28.7	0.00	0.00	0.00	0.02	203	07
230	8.11	8.08	34.002	26.481	158.5	0.613	2.51	37.8	38.0	2.15	29.4	0.00	0.00			232	06
250 ISL	7.75 D	7.73	34.016 D	26.545	152.7	0.648	2.29	D 34.2	41.3	2.21	30.3	0.00	0.00			252	
272	7.40	7.37	34.015	26.596	148.1	0.678	2.39	35.4	44.9	2.27	31.3	0.00	0.00			274	05
300 ISL	7.00 D	6.97	34.024 D	26.659	142.3	0.723	2.05	D 30.1	50.6	2.44	33.5	0.00	0.00			302	
321	6.87	6.84	34.061	26.705	138.2	0.748	1.63	23.9	54.9	2.57	35.1	0.00	0.00			324	04
380	6.53	6.50	34.141	26.815	128.6	0.827	0.89	12.9	64.0	2.87	38.1	0.00	0.00			383	03
400 ISL	6.39 D	6.36	34.148 D	26.839	126.5	0.858	0.79	D 11.5	66.9	2.92	38.7	0.00	0.00			403	
440	6.09	6.05	34.194	26.914	119.6	0.901	0.60	8.7	72.7	3.02	39.8	0.00	0.00			444	02
500 ISL	5.75 D	5.70	34.231 D	26.988	113.2	0.978	0.42 D	6.0	81.0	3.13	41.1	0.00	0.00			504	
516	5.66	5.62	34.248	27.012	111.1	0.989	0.36	5.1	83.2	3.16	41.4	0.00	0.00			520	01

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 90.0 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
30	45.1 N	123 20.8 W	21/10/2011	0122 UTC	4271 m	350	14 kn	300	05 06 2	1019.1 mb	18.9 c	15.9 c	25 m	8/8	SC	019	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C			ml/l	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	ug/l	db	
0	19.19	19.19	33.301	23.676	421.0	0.000	5.37	101.4	1.1	0.30	0.1	0.00	0.00	0.10	0.03	0	
2 A	19.19	19.19	33.301	23.676	421.0	0.008	5.37	101.4	1.1	0.30	0.1	0.00	0.00	0.10	0.03	2	23
10 A	19.19	19.19	33.301	23.676	421.4	0.042	5.35	101.0	1.3	0.29	0.1	0.00	0.00	0.10	0.03	10	22
17 A	19.20	19.19	33.300	23.675	421.7	0.072	5.47	103.3	1.2	0.30	0.1	0.00	0.00	0.10	0.02	17	21
20 ISL	19.20 D	19.19	33.298 D	23.675	421.9	0.085	5.35	D101.0	1.2	0.29	0.1	0.00	0.02	0.10	0.03	20	
21 A	19.18	19.18	33.300	23.679	421.5	0.089	5.36	101.2	1.1	0.29	0.1	0.00	0.03	0.10	0.03	21	19
30	18.36	18.35	33.192	23.804	409.9	0.126	5.48	101.8	1.3	0.28	0.1	0.00	0.00	0.14	0.04	30	18
40 A	17.25	17.24	33.163	24.051	386.7	0.166	5.61	101.9	1.1	0.29	0.1	0.00	0.00	0.18	0.05	40	17
50 ISL	15.86 D	15.89	33.123 D	24.332	360.2	0.205	5.89	D104.2	1.3	0.31	0.1	0.00	0.00	0.24	0.13	50	
52	15.33	15.33	33.129	24.461	347.8	0.210	5.92	103.6	1.4	0.31	0.1	0.00	0.00	0.26	0.15	52	16
64	14.73	14.72	33.119	24.585	336.4	0.251	5.91	102.1	1.4	0.36	0.5	0.09	0.09	0.38	0.28	65	15
75 A	13.23	13.21	33.076	24.863	310.1	0.287	5.80	97.2	2.2	0.44	1.2	0.53	0.00	0.36	0.35	76	14
86 A	12.53	12.51	33.103	25.021	295.2	0.320	5.73	94.6	2.9	0.49	2.3	0.15	0.00	0.21	0.21	87	13
94	11.86	11.85	33.185	25.210	277.3	0.343	5.43	88.4	4.8	0.67	5.5	0.01	0.00	0.14	0.13	95	12
100 ISL	11.78 D	11.76	33.211 D	25.247	274.0	0.362	5.29	D 86.0	6.4	0.80	7.6	0.01	0.00	0.11	0.11	101	
110	11.02	11.01	33.295	25.449	254.8	0.386	4.91	78.6	9.0	1.01	11.2	0.00	0.00	0.06	0.07	111	11
125	10.16	10.15	33.387	25.671	233.9	0.423	4.52	71.0	13.3	1.25	15.1	0.00	0.00	0.04	0.05	126	10
140	9.67	9.66	33.539	25.872	215.1	0.456	3.99	62.1	18.5	1.54	19.7	0.00	0.00	0.02	0.03	141	09
150 ISL	9.52 D	9.50	33.609 D	25.951	207.7	0.481	3.79	D 58.8	20.5	1.61	20.9	0.00	0.00	0.01	0.02	151	
170	9.07	9.05	33.729	26.118	192.2	0.517	3.56	54.7	24.5	1.74	23.2	0.00	0.00	0.00	0.02	171	08
200	8.83	8.80	33.934	26.318	173.8	0.572	2.61	40.0	31.7	2.07	27.6	0.00	0.00	0.00	0.01	202	07
229	8.39	8.36	34.006	26.443	162.3	0.621	2.36	35.8	36.1	2.18	29.2	0.00	0.00			231	06
250 ISL	8.10 D	8.08	34.039 D	26.512	156.1	0.659	2.02 D	30.4	39.8	2.29	30.6	0.00	0.00			252	
270	7.86	7.84	34.073	26.574	150.4	0.685	1.85	27.7	43.3	2.40	32.0	0.00					

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 90.0 120.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN	HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT		uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
30	25.1 N	123 59.9 W	20/10/2011	1653 UTC	4233 m	340	11 kn			1017.7 mb	19.9 C	18.0 C					018	
0	19.60	19.60	33.198	23.493	438.5	0.000	5.34	101.5	1.7	0.28	0.0	0.00	0.00	0.08	0.02	0		
2	19.60	19.60	33.198	23.493	438.5	0.009	5.34	101.5	1.7	0.28	0.0	0.00	0.00	0.08	0.02	2	20	
10	19.58	19.58	33.197 D	23.496	438.5	0.044	5.34	101.5	1.6	0.30	0.1	0.00	0.05	0.08	0.01	10	21	
20	ISL	19.14 D	19.14	33.167 D	23.588	430.2	0.088	5.39	D101.6	1.6	0.29	0.0	0.00	0.02	0.08	0.01	20	
25	19.12	19.12	33.176	23.600	429.2	0.109	5.39	101.5	1.6	0.28	0.0	0.00	0.00	0.08	0.02	25	18	
30	ISL	19.11 D	19.11	33.180 D	23.606	428.8	0.131	5.39	D101.5	1.6	0.28	0.0	0.00	0.08	0.02	30		
40	19.09	19.08	33.204	23.632	426.8	0.173	5.40	101.7	1.6	0.27	0.0	0.00	0.00	0.09	0.02	40	17	
50	18.05	18.04	33.508	24.124	380.2	0.214	5.73	106.0	1.9	0.20	0.1	0.00	0.13	0.10	0.02	50	16	
61	16.36	16.35	33.362	24.411	353.0	0.254	5.90	105.5	1.8	0.23	0.0	0.00	0.02	0.13	0.04	61	15	
74	15.13	15.12	33.250	24.600	335.4	0.299	5.92	103.2	2.0	0.27	0.0	0.00	0.00	0.18	0.08	75	14	
75	ISL	15.14 D	15.13	33.245 D	24.593	336.0	0.304	5.94	D103.6	2.0	0.27	0.0	0.00	0.00	0.19	0.09	76	
86	14.94	14.93	33.455	24.800	316.7	0.338	5.76	100.2	2.2	0.24	0.0	0.00	0.00	0.25	0.21	87	13	
100	14.51	14.50	33.560	24.973	300.6	0.381	5.60	96.6	2.6	0.28	0.4	0.04	0.02	0.26	0.23	101	12	
112	14.06	14.04	33.514	25.034	295.1	0.417	5.50	94.0	2.9	0.34	0.9	0.07	0.00	0.24	0.21	113	11	
125	12.37	12.36	33.432	25.308	269.0	0.454	5.18	85.4	5.5	0.63	5.7	0.00	0.03	0.10	0.13	126	10	
140	11.73	11.72	33.441	25.435	257.1	0.493	5.04	82.0	7.4	0.77	8.2	0.00	0.08	0.07	0.08	141	09	
150	ISL	11.05 D	11.02	33.462 D	25.579	243.5	0.522	4.85	D 77.7	9.9	0.93	10.7	0.00	0.05	0.05	0.06	151	
170	10.05	10.03	33.525	25.799	222.8	0.565	4.39	68.9	14.8	1.25	15.8	0.00	0.00	0.02	0.02	171	08	
199	9.28	9.26	33.766	26.114	193.3	0.625	3.76	58.1	22.7	1.60	21.5	0.00	0.00	0.00	0.01	201	07	
200	ISL	9.25 D	9.22	33.782 D	26.133	191.4	0.631	3.78	D 58.4	22.9	1.61	21.6	0.00	0.00	0.00	0.01	202	
230	8.74	8.72	33.916	26.318	174.3	0.682	3.34	51.0	28.2	1.79	24.3	0.00	0.00		232	06		
250	ISL	8.54 D	8.52	33.964 D	26.386	168.2	0.721	2.94	D 44.7	32.7	1.94	26.4	0.00	0.00		252		
270	8.08	8.05	33.998	26.483	159.1	0.749	2.66	40.1	37.1	2.08	28.4	0.00		272	05			
300	ISL	7.65 D	7.62	34.034 D	26.575	150.7	0.800	2.08	D 31.0	43.7	2.30	31.2	0.00		302			
321	7.44	7.41	34.063	26.628	145.9	0.827	1.72	25.5	48.3	2.46	33.1	0.00		324	04			
380	6.81	6.78	34.131	26.770	133.1	0.909	1.12	16.4	59.9	2.77	36.8	0.00		383	03			
400	ISL	6.60 D	6.57	34.143 D	26.807	129.7	0.941	0.90	D 13.1	63.1	2.83	37.5	0.00		403			
439	6.25	6.21	34.166	26.872	123.8	0.985	0.72	10.4	69.2	2.94	38.8	0.00		443	02			
500	ISL	5.61 D	5.56	34.187 D	26.969	114.7	1.065	0.55	D 7.8	80.3	3.06	40.7	0.00		504			
514	5.54	5.49	34.204	26.991	112.8	1.073	0.48	6.8	82.9	3.09	41.1	0.00		518	01			

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 91.7 26.4

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN	HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT		uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
33	14.7 N	117 28.1 W	17/10/2011	1220 UTC	25 m	330	08 kn			1015.3 mb	18.0 C	16.8 C					003	
0	17.62	17.62	33.322	24.106	380.0	0.000	6.52	119.5	3.8	0.15	0.0	0.00	0.03	1.85	0.20	0		
2	17.62	17.62	33.355 D	24.106	380.0	0.008	6.52	119.5	3.8	0.15	0.0	0.00	0.03	1.85	0.20	2	05	
5	17.52	17.53	33.353 D	24.126	378.2	0.019	6.42	117.4	3.8	0.16	0.0	0.00	0.01	1.71	0.17	5	04	
10	15.24	15.24	33.342	24.642	329.2	0.037	5.26	91.9	4.3	0.39	0.0	0.00	0.09	3.19	0.25	10	03	
15	13.31	13.29	33.317 D	25.032	292.2	0.052	4.65	78.1	7.7	0.72	0.7	0.10	0.07	2.17	0.33	15	02	
17	12.94	12.94	33.317 D	25.103	285.4	0.058	4.39	73.3	8.6	0.78	0.6	0.08	0.06	2.83	0.32	17	01	

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 26.7

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN	HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT		uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
32	57.3 N	117 18.4 W	17/10/2011	0745 UTC	73 m	310	08 kn	330	01 06 1	1013.8 mb	18.0 C	17.0 C	14 m	2/8	SC	001		
0	18.05	18.05	33.391	24.029	387.3	0.000	6.63	122.5	1.6	0.24	0.1	0.00	0.18	1.66	0.11	0		
2	18.05	18.05	33.391	24.029	387.3	0.008	6.63	122.5	1.6	0.24	0.1	0.00	0.18	1.66	0.11	2	08	
5	16.95	16.95	33.389	24.290	362.6	0.019	6.57	118.9	2.0	0.24	0.1	0.00	0.10	1.50	0.10	5	07	
10	13.98	13.97	33.287	24.870	307.5	0.036	5.37	91.5	4.9	0.57	1.6	0.15	0.12	1.67	0.28	10	06	
20	12.52	12.51	33.248	25.132	282.8	0.065	4.73	78.2	7.0	0.68	1.7	0.08	0.30	1.13	0.29	20	05	
30	11.24	11.23	33.392	25.483	249.6	0.092	3.72	59.9	14.7	1.29	9.6	0.10	0.10	0.09	0.17	30	04	
40	10.88	10.87	33.441	25.586	240.1	0.116	3.89	62.2	15.2	1.41	16.5	0.02	0.07	0.12	0.17	40	03	
50	10.68	10.68	33.496	25.663	233.0	0.140	3.66	58.2	17.5	1.51	18.6	0.05	0.36	0.07	0.15	50	02	
60	10.66	10.65	33.546	25.707	229.0	0.163	3.37	53.6	19.7	1.62	19.7	0.15	0.05	0.18	60	01		

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 28.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
					606 m	280	04 kn			1015.0 mb	18.3 c	17.1 c					004
32 54.4 N	117 23.7 W	17/10/2011	1629	UTC													
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		m/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	ug/l	db	
0	18.00	18.00	33.365	24.022	388.1	0.000	6.67	123.1	3.3	0.07	0.0	0.00	0.10	4.92	0.29	0	
2	18.00	18.00	33.365	24.022	388.1	0.008	6.67	123.1	3.3	0.07	0.0	0.00	0.10	4.92	0.29	2	20
10	16.50	16.50	33.383	24.391	353.2	0.037	5.96	106.8	1.5	0.30	0.0	0.00	0.02	1.96	0.19	10	19
20	13.71	13.71	33.259	24.904	304.5	0.070	5.41	91.7	4.2	0.63	4.2	0.32	0.18	1.04	0.40	20	18
30	12.50	12.50	33.257	25.142	282.1	0.100	5.04	83.2	6.6	0.87	8.0	0.40	0.01	0.60	0.28	30	17
40	11.27	11.26	33.236	25.356	261.9	0.127	4.87	78.3	9.3	1.01	10.5	0.07	0.01	0.34	0.31	40	16
50	11.18	11.17	33.337	25.451	253.1	0.153	4.52	72.5	11.7	1.18	13.2	0.04	0.01	0.28	0.20	50	15
60	10.74	10.74	33.570	25.710	228.7	0.177	3.26	52.0	20.6	1.66	19.5	0.16	0.00	0.05	0.12	60	14
70	10.62	10.61	33.687	25.824	218.1	0.199	2.72	43.3	25.1	1.88	21.4	0.17	0.00	0.03	0.18	71	13
75 ISL	10.57 D	10.56	33.695 D	25.840	216.8	0.211	2.75	D 43.7	25.0	1.88	21.8	0.15	0.00	0.02	0.15	76	
85	10.41	10.40	33.714	25.881	213.1	0.231	2.74	43.3	24.8	1.89	22.6	0.10	0.01	0.02	0.10	86	12
100	10.30	10.29	33.769	25.944	207.4	0.263	2.57	40.6	26.2	1.95	23.1	0.01	0.00	0.01	0.08	101	11
120	10.06	10.04	33.935	26.116	191.5	0.303	2.25	35.4	29.7	2.09	25.1	0.00	0.05	0.01	0.05	121	10
125 ISL	10.08 D	10.06	33.972 D	26.142	189.3	0.314	2.15	D 33.9	30.3	2.12	25.3	0.00	0.04	0.01	0.05	126	
140	10.03	10.01	34.037	26.201	184.0	0.340	1.92	30.2	32.1	2.21	26.0	0.00	0.01	0.01	0.06	141	09
150 ISL	10.02 D	10.00	34.054 D	26.217	182.7	0.361	1.84	D 28.9	32.6	2.23	26.4	0.00	0.05	0.01	0.06	151	
170	9.72	9.70	34.081	26.288	176.4	0.395	1.83	28.5	33.6	2.26	27.1	0.00	0.13	0.01	0.06	171	08
200 ISL	9.28 D	9.26	34.097 D	26.374	168.7	0.449	1.88	D 29.1	34.3	2.26	28.3	0.00	0.02	0.00	0.05	202	
201	9.29	9.26	34.095	26.371	169.0	0.448	1.86	28.8	34.3	2.26	28.3	0.00	0.02	0.00	0.05	203	07
232	8.99	8.97	34.138	26.453	161.8	0.499	1.68	25.8	36.8	2.34	29.4	0.00	0.01		234	06	
250 ISL	8.78 D	8.74	34.177 D	26.519	155.8	0.531	1.44	D 22.0	40.2	2.44	30.5	0.00	0.01		252		
271	8.48	8.45	34.206	26.587	149.7	0.560	1.19	18.0	44.1	2.56	31.7	0.00	0.01		273	05	
300 ISL	8.31 D	8.28	34.235 D	26.636	145.4	0.606	0.99	D 15.0	47.1	2.64	32.6	0.00	0.04		302		
321	8.06	8.02	34.231	26.672	142.3	0.633	0.94	14.1	49.2	2.69	33.3	0.00	0.06		324	04	
381	7.69	7.66	34.278	26.763	134.6	0.716	0.59	8.9	55.6	2.86	34.9	0.00	0.02		384	03	
400 ISL	7.56 D	7.52	34.288 D	26.791	132.2	0.746	0.54	D 8.1	58.3	2.90	35.5	0.00	0.02		403		
441	7.11	7.07	34.305	26.868	125.2	0.794	0.40	5.9	64.0	2.99	36.8	0.00	0.02		445	02	
500 ISL	6.65 D	6.61	34.314 D	26.938	119.1	0.872	0.32	D 4.7	71.2	3.09	38.2	0.00	0.00		504		
515	6.52	6.47	34.317	26.958	117.2	0.884	0.28	4.1	73.0	3.11	38.5	0.00	0.00		519	01	

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

RV NEW HORIZON

CALCOFI CRUISE 1110

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
					868 m	350	06 kn			1014.8 mb	18.0 c	16.7 c					005
32 50.4 N	117 32.3 W	17/10/2011	1957	UTC													
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAEAO	PRES	SAMP
m	DEG C	DEG C		THETA		m/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	ug/l	db	
0	17.99	17.98	33.423	24.069	383.5	0.000	5.69	105.1	1.3	0.30	0.1	0.00	0.18	0.31	0.06	0	
2	17.99	17.98	33.423	24.069	383.5	0.008	5.69	105.1	1.3	0.30	0.1	0.00	0.18	0.31	0.06	2	20
10	17.61	17.61	33.431	24.166	374.6	0.038	5.73	105.1	1.2	0.31	0.0	0.00	0.05	0.28	0.05	10	19
20	16.20	16.20	33.395	24.470	346.0	0.074	5.81	103.6	2.0	0.32	0.0	0.00	0.03	0.28	0.12	20	18
30	14.32	14.32	33.315	24.820	312.8	0.107	5.71	98.0	2.8	0.47	1.9	0.32	0.35	0.59	0.16	30	17
40	13.03	13.02	33.276	25.055	290.7	0.137	5.23	87.3	4.8	0.75	6.0	0.26	0.06	0.71	0.23	40	16
50	11.86	11.86	33.297	25.296	268.0	0.165	4.77	77.7	9.1	1.03	10.7	0.03	0.03	0.38	0.21	50	15
60	10.83	10.82	33.283	25.473	251.3	0.191	4.66	74.2	11.6	1.15	13.0	0.02	0.27	0.13	0.12	60	14
70	10.63	10.62	33.401	25.600	239.4	0.216	4.23	67.1	14.7	1.33	15.9	0.01	0.03	0.08	0.09	71	13
75 ISL	10.67 D	10.66	33.514 D	25.681	231.9	0.229	3.72	D 59.2	16.3	1.42	16.9	0.01	0.04	0.06	0.08	76	
85	10.69	10.68	33.658 D	25.789	221.9	0.252	2.88	D 45.9								86	12
100	10.45	10.43	33.782 D	25.929	208.9	0.285	2.65	D 42.0	24.2	1.87	21.8	0.00	0.09	0.03	0.08	101	11
120	10.27	10.25	33.906	26.058	197.1	0.323	2.25	35.5	28.8	2.07	24.2	0.00	0.12	0.01	0.05	121	10
125 ISL	10.22 D	10.16	33.933 D	26.094	193.8	0.335	2.20	D 34.7	29.2	2.09	24.5	0.00	0.18	0.01	0.05	126	
139	10.05	10.03	34.009	26.175	186.4	0.359	2.07	32.5	30.6	2.14	25.4	0.00	0.33	0.01	0.04	140	09
150 ISL	10.02 D	10.00	34.078 D	26.235	181.0	0.383	1.85	D 29.1	31.3	2.17	25.8	0.00	0.23	0.01	0.04	151	
170	9.93	9.91	34.101	26.269	178.3	0.416	1.82	28.6	32.6	2.23	26.4	0.00	0.06	0.00	0.04	171	08
200 ISL	9.80 D	9.78	34.166 D	26.343	171.9	0.472	1.65	D 25.9	34.6	2.30	27.4	0.00	0.05	0.00	0.04	202	
201	9.75	9.73	34.167	26.351	171.1	0.470	1.63	25.4	34.6	2.30	27.4	0.00	0.05	0.00	0.04	203	07
230	8.85	8.83	34.114	26.455	161.4	0.518	1.91	29.4	37.3	2.27	28.8	0.00	0.18		232	06	
250 ISL	8.69 D	8.66	34.153 D	26.512	156.4	0.554	1.66	D 25.4	40.4	2.38	29.9	0.00	0.13		252		
270	8.54	8.51	34.179	26.556	152.5	0.581	1.38	21.0	43.5	2.48	31.0	0.00	0.07		272	05	
300 ISL	8.37 D	8.34	34.212 D	26.610	148.0	0.631	1.15	D 17.5	46.9	2.58	32.1	0.00	0.09		302		
320	8.10	8.06	34.223	26.659	143.5	0.655	1.02	15.3	49.2	2.65	32.9	0.00	0.10		323	04	
370	7.65	7.62	34.278	26.769	133.8	0.724	0.61	9.1	56.7	2.85	34.8	0.00	0.14		373	03	
400 ISL	7.49 D	7.45	34.293 D	26.804	130.9	0.770	0.51	D 7.6	59.6	2.89							

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 35.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
0	18.24	18.24	33.494	24.062	384.2	0.000	6.06	112.4	0.8	0.24	0.0	0.00	0.03	0.88	0.11	0	
2	A 18.24	18.24	33.494	24.062	384.2	0.008	6.06	112.4	0.8	0.24	0.0	0.00	0.03	0.88	0.11	2	22
10 ISL	18.18 D	18.17	33.490 D	24.075	383.3	0.039	5.99	111.1	0.7	0.26	0.0	0.00	0.20	0.47	0.10	10	
12 A	17.98	17.98	33.493	24.124	378.7	0.046	5.99	110.6	0.6	0.26	0.0	0.00	0.24	0.36	0.10	12	21
16 A	16.91	16.91	33.507	24.392	353.3	0.061	5.94	107.5	0.9	0.29	0.0	0.00	0.03	0.33	0.10	16	20
20 ISL	16.24 D	16.24	33.496 D	24.539	339.4	0.075	5.96	106.4	1.5	0.35	0.1	0.01	0.02	0.54	0.17	20	
22	16.10	16.10	33.488	24.565	337.0	0.081	5.92	105.3	1.7	0.38	0.2	0.01	0.02	0.64	0.21	22	19
29 A	13.94	13.94	33.400	24.965	299.0	0.104	5.30	90.2	2.8	0.65	4.1	0.40	0.32	0.78	0.32	29	18
30 ISL	13.87 D	13.83	33.375 D	24.969	298.7	0.107	5.16	87.7	3.1	0.67	4.5	0.38	0.28	0.76	0.32	30	
36	13.36	13.35	33.346	25.043	291.7	0.124	5.06	85.1	4.6	0.82	7.1	0.24	0.05	0.65	0.29	36	17
45	11.84	11.83	33.292	25.296	267.9	0.150	4.89	79.6	7.7	0.99	10.0	0.06	0.00	0.36	0.22	45	16
50 ISL	11.33 D	11.31	33.264 D	25.369	261.0	0.164	4.69	75.5	9.5	1.09	11.8	0.04	0.00	0.27	0.22	50	
54 A	11.04	11.03	33.294	25.443	254.0	0.173	4.56	73.0	11.0	1.17	13.2	0.03	0.00	0.19	0.22	54	15
62 A	10.72	10.71	33.348	25.541	244.8	0.193	4.34	69.1	13.0	1.29	15.0	0.02	0.01	0.14	0.13	62	14
70	10.48	10.47	33.418	25.639	235.7	0.212	4.08	64.6	15.1	1.42	17.1	0.02	0.00	0.10	0.14	71	13
75 ISL	10.32 D	10.28	33.526 D	25.755	224.8	0.225	3.71	58.5	17.3	1.52	18.7	0.01	0.01	0.08	0.12	76	
85	9.93	9.92	33.625	25.895	211.7	0.246	3.40	53.2	21.5	1.72	22.0	0.00	0.02	0.03	0.07	86	12
100	9.69	9.68	33.725	26.011	200.9	0.276	3.10	48.3	24.0	1.84	23.5	0.00	0.04	0.02	0.07	101	11
120	9.36	9.34	33.866	26.177	185.5	0.315	2.83	43.8	28.0	1.95	25.3	0.00	0.04	0.02	0.07	121	10
125 ISL	9.31 D	9.29	33.920 D	26.228	180.8	0.326	2.66	41.2	28.8	1.98	25.7	0.00	0.03	0.01	0.06	126	
140	9.07	9.05	33.963	26.301	174.2	0.351	2.52	38.8	31.3	2.06	27.0	0.00	0.00	0.01	0.04	141	09
150 ISL	8.92 D	8.90	33.976 D	26.335	171.1	0.370	2.43	37.3	32.8	2.12	27.6	0.00	0.01	0.01	0.04	151	
170	8.83	8.81	34.056	26.413	164.1	0.402	2.10	32.1	35.7	2.23	28.9	0.00	0.02	0.00	0.04	171	08
200	8.92	8.90	34.187	26.501	156.5	0.450	1.49	22.9	39.7	2.43	29.8	0.00	0.01	0.00	0.05	202	07
230	8.55	8.52	34.197	26.568	150.6	0.496	1.29	19.7	43.2	2.52	31.3	0.00	0.02		232	06	
250 ISL	8.27 D	8.24	34.194 D	26.609	147.0	0.529	1.25	18.9	45.7	2.58	32.1	0.00	0.02		252		
271	8.16	8.13	34.221	26.647	143.7	0.556	1.05	15.8	48.3	2.65	32.9	0.00	0.03		273	05	
300 ISL	7.90 D	7.87	34.245 D	26.704	138.7	0.601	0.83	12.5	51.5	2.73	33.9	0.00	0.01		302		
320	7.76	7.73	34.256	26.734	136.2	0.625	0.75	11.2	53.8	2.78	34.6	0.00	0.00		323	04	
381	7.28	7.25	34.269	26.814	129.3	0.706	0.57	8.5	60.1	2.92	36.3	0.00	0.00		384	03	
400 ISL	7.19 D	7.15	34.299 D	26.852	126.1	0.735	0.44	6.5	62.0	2.95	36.7	0.00	0.00		403		
440	6.94	6.90	34.302	26.889	123.0	0.780	0.40	5.8	66.0	3.02	37.4	0.00	0.00		444	02	
500 ISL	6.56 D	6.51	34.310 D	26.948	118.0	0.858	0.33	4.8	71.6	3.09	38.6	0.00	0.00		504		
516	6.44	6.39	34.315	26.967	116.3	0.871	0.32	4.7	73.1	3.11	38.9	0.00	0.00		520	01	

A) PRIMARY PRODUCTIVITY SAMPLES WERE TAKEN FROM THESE LEVELS.

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 40.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
0	18.47	18.47	33.619	24.099	380.7	0.000	5.58	104.0	0.9	0.29	0.0	0.00	0.00	0.34	0.06	0	
2	18.47	18.47	33.619	24.099	380.7	0.008	5.58	104.0	0.9	0.29	0.0	0.00	0.00	0.34	0.06	2	21
10 ISL	18.44	18.43	33.623	24.113	379.7	0.037										10	20
10	18.44	18.43	33.624	24.114	379.6	0.038	5.59	104.3	1.0	0.29	0.0	0.00	0.00	0.28	0.06	10	19
20	16.59	16.59	33.471	24.439	349.0	0.074	5.85	105.1	1.5	0.35	0.0	0.00	0.10	0.41	0.23	20	18
30	13.39	13.38	33.418	25.093	286.9	0.106	5.38	90.6	4.7	0.69	4.9	0.14	0.10	0.66	0.30	30	17
39	12.11	12.11	33.437	25.356	262.0	0.131	4.47	73.3	10.5	1.19	12.6	0.20	0.15	0.65	0.30	39	16
49	11.09	11.09	33.541	25.625	236.6	0.156	3.76	60.4	16.5	1.49	18.0	0.05	0.00	0.27	0.24	49	15
50 ISL	11.06 D	11.04	33.547 D	25.637	235.4	0.159	3.74	60.0	16.8	1.51	18.2	0.05	0.00	0.26	0.24	50	
60	10.63	10.63	33.604	25.756	224.3	0.181	3.40	54.1	19.5	1.66	20.6	0.03	0.01	0.17	0.19	60	14
71	10.05	10.04	33.645	25.888	212.0	0.205	3.27	51.4	21.8	1.75	22.2	0.02	0.00	0.07	0.13	72	13
75 ISL	9.93 D	9.89	33.665 D	25.930	208.1	0.215	3.21	50.3	22.7	1.79	22.7	0.02	0.00	0.06	0.13	76	
85	9.71	9.70	33.740	26.020	199.7	0.234	2.97	46.4	25.0	1.88	24.1	0.01	0.01	0.03	0.14	86	12
100	9.53	9.52	33.835	26.124	190.2	0.263	2.71	42.2	27.6	1.98	25.4	0.00	0.01	0.03	0.17	101	11
119	9.37	9.36	33.879	26.185	184.8	0.299	2.48	38.4	29.6	2.07	26.7	0.00	0.02	0.08	0.12	10	10
125 ISL	9.26 D	9.25	33.920 D	26.236	180.1	0.312	2.47	38.2	30.3	2.08	26.9	0.00	0.01	0.07	0.12	126	
141	9.13	9.12	33.966	26.292	175.1	0.338	2.37	36.5	32.2	2.12	27.3	0.00	0.01	0.07	0.12	142	09
150 ISL	9.03 D	9.01	33.998 D	26.335	171.1	0.356	2.17	33.4	33.6	2.16	27.9	0.00	0.01	0.06	0.15		
171	8.64	8.62	34.043	26.431	162.3	0.389	2.06	31.5	36.9	2.25	29.3	0.00	0.01	0.05	0.17	08	
200	8.46	8.44	34.082	26.490	157.3	0.435	1.87	28.4	40.0	2.34	30.5	0.00	0.01	0.05	0.05	202	07
230	8.30	8.28	34.155	26.573	150.0	0.481	1.47	22.2	44.2	2.50	31.7	0.00	0.00		232	06	
250 ISL	8.34 D	8.31	34.210 D	26.													

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 45.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN	OXY PCT	SI03 uM/L	P04 uM/L	N03 uM/L	N02 uM/L	NH4 uM/L	CHL-A ug/l	PHAE0 ug/l	PRES db	SAMP	
m	DEG C	DEG C			m/	/	ml/l											
0	18.38	18.38	33.547	24.068	383.6	0.000	5.82	108.3	0.9	0.23	0.0	0.00	0.00	0.49	0.09	0		
2	18.38	18.38	33.547	24.068	383.6	0.008	5.82	108.3	0.9	0.23	0.0	0.00	0.00	0.49	0.09	2	21	
9	18.18	18.18	33.527 D	24.101	380.7	0.035											9	20
10	18.29	18.29	33.544	24.087	382.1	0.038	5.83	108.3	0.9	0.24	0.0	0.00	0.00	0.44	0.12	10	19	
20	14.72	14.72	35.402	24.803	314.2	0.073	5.69	98.4	2.1	0.48	1.6	0.19	0.03	1.08	0.33	20	18	
30	12.71	12.71	33.327	25.156	280.8	0.103	4.95	82.1	6.8	0.90	8.9	0.16	0.03	0.62	0.31	30	17	
40	11.05	11.04	33.443	25.557	242.8	0.129	4.04	64.7	14.0	1.36	16.5	0.03	0.00	0.20	0.16	40	16	
50	10.63	10.62	33.520	25.691	230.3	0.153	3.72	59.1	16.9	1.52	19.2	0.02	0.00	0.09	0.15	50	15	
59	10.28	10.27	33.562	25.784	221.6	0.173	3.56	56.1	18.9	1.60	20.5	0.03	0.03	0.07	0.12	59	14	
70	10.04	10.04	33.634	25.881	212.6	0.197	3.32	52.2	21.0	1.70	21.7	0.01	0.00	0.04	0.07	71	13	
75 ISL	9.97 D	9.96	33.655 D	25.910	210.0	0.209	3.29	D 51.6	21.5	1.72	22.0	0.01	0.00	0.03	0.06	76		
85	9.89	9.88	33.675	25.940	207.4	0.229	3.20	50.2	22.5	1.76	22.6	0.02	0.00	0.03	0.05	86	12	
100	9.65	9.64	33.764	26.050	197.3	0.259	2.95	45.9	24.7	1.86	24.3	0.01	0.00	0.02	0.06	101	11	
120	9.37	9.35	33.858	26.169	186.3	0.297	2.58	39.9	28.7	2.00	26.4	0.00	0.00	0.02	0.09	121	10	
125 ISL	9.31 D	9.29	33.915 D	26.225	181.1	0.308	2.42	D 37.4	29.7	2.03	26.8	0.00	0.00	0.02	0.08	126		
139	9.08	9.06	33.998	26.326	171.8	0.331	2.29	35.3	32.4	2.11	27.8	0.00	0.00	0.01	0.05	140	09	
150 ISL	8.81 D	8.79	33.993 D	26.365	168.2	0.352	2.34	D 35.8	33.7	2.15	28.2	0.00	0.00	0.01	0.04	151		
170	8.80	8.78	34.076	26.433	162.3	0.383	2.04	31.2	35.9	2.21	29.0	0.00	0.00	0.00	0.03	171	08	
200	8.57	8.55	34.151	26.527	153.8	0.430	1.73	26.3	40.7	2.37	30.5	0.00	0.00	0.00	0.05	202	07	
230	8.30	8.28	34.177	26.590	148.4	0.476	1.32	20.0	44.5	2.51	31.9	0.00	0.00		0.05	232	06	
250 ISL	8.29 D	8.26	34.213 D	26.620	145.9	0.508	1.14	D 17.3	46.5	2.57	32.6	0.00	0.00	0.04	0.08	252		
270	8.04	8.02	34.212	26.656	142.8	0.534	1.02	15.3	48.4	2.63	33.2	0.00	0.00	0.08	0.05	272	05	
300 ISL	7.81 D	7.78	34.224 D	26.702	138.9	0.580	0.87	D 15.0	52.5	2.73	34.3	0.00	0.00	0.04	0.04	302		
320	7.59	7.56	34.246	26.751	134.5	0.604	0.71	10.6	55.1	2.79	35.0	0.00	0.02		0.02	323	04	
381	7.13	7.09	34.281	26.845	126.3	0.683	0.62	9.1	62.0	2.92	37.0	0.00	0.04		0.04	384	03	
400 ISL	6.95 D	6.91	34.280 D	26.869	124.2	0.712	0.48	D 7.1	64.1	2.96	37.5	0.00	0.03		0.03	403		
440	6.69	6.64	34.301	26.922	119.6	0.756	0.36	5.2	68.6	3.03	38.4	0.00	0.00		0.00	444	02	
500 ISL	6.22 D	6.18	34.310 D	26.991	113.5	0.831	0.31	D 4.5	75.0	3.10	39.6	0.00	0.00		0.00	504		
515	6.17	6.12	34.318 D	27.004	112.5	0.843	0.29	D 4.2	76.6	3.12	39.9	0.00	0.00		0.00	518	01	

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 50.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA THETA	SVA	DYN HT	OXYGEN	OXY PCT	SI03 uM/L	P04 uM/L	N03 uM/L	N02 uM/L	NH4 uM/L	CHL-A ug/l	PHAE0 ug/l	PRES db	SAMP
m	DEG C	DEG C			m/	/	ml/l										
0	17.94	17.94	33.469	24.115	379.2	0.000	5.67	104.6	0.9	0.29	0.1	0.00	0.03	0.30	0.08	0	
2	17.94	17.94	33.469	24.115	379.2	0.008	5.67	104.6	0.9	0.29	0.1	0.00	0.03	0.30	0.08	2	20
10	17.93	17.93	33.459	24.112	379.8	0.038	5.66	104.5	0.9	0.28	0.1	0.00	0.00	0.30	0.08	10	19
20	16.61	16.61	33.363	24.352	357.2	0.075	5.76	103.5	1.0	0.31	0.3	0.00	0.01	0.44	0.17	20	18
30	16.19	16.18	33.350	24.440	349.2	0.110	5.80	103.3	0.9	0.34	0.3	0.01	0.03	1.07	0.39	30	17
40	15.35	15.34	33.314	24.600	334.2	0.144	5.68	99.6	1.4	0.43	1.2	0.14	0.09	1.06	0.44	40	16
50	12.95	12.95	33.256	25.054	291.1	0.176	5.36	89.4	4.2	0.70	5.5	0.15	0.02	0.44	0.33	50	15
59	12.03	12.02	33.220	25.205	276.9	0.201	5.15	84.2	6.4	0.90	8.2	0.03	0.05	0.23	0.22	59	14
70	11.25	11.24	33.229	25.355	262.8	0.231	4.93	79.2	9.0	1.03	11.0	0.01	0.01	0.12	0.12	71	13
75 ISL	10.89 D	10.82	33.267 D	25.460	252.9	0.246	4.80	D 76.5	10.0	1.08	12.0	0.01	0.01	0.10	0.10	76	
85	10.28	10.27	33.294	25.577	241.9	0.269	4.66	73.3	12.0	1.19	14.0	0.00	0.01	0.06	0.07	86	12
100	9.88	9.87	33.540	25.837	217.5	0.303	3.73	58.3	19.6	1.64	20.6	0.00	0.03	0.02	0.06	101	11
120	9.47	9.45	33.774	26.088	194.0	0.344	2.94	45.7	26.2	1.96	24.9	0.00	0.05	0.02	0.09	121	10
125 ISL	9.37 D	9.35	33.806 D	26.130	190.1	0.356	2.92	D 45.2	27.3	1.98	25.4	0.00	0.04	0.02	0.09	126	
140	9.11	9.10	33.915	26.256	178.5	0.382	2.56	39.4	30.8	2.05	26.9	0.00	0.00	0.01	0.07	141	09
150 ISL	9.03 D	9.01	33.964 D	26.308	173.7	0.401	2.36	D 36.3	32.1	2.11	27.5	0.00	0.00	0.01	0.06	151	
170	8.95	8.93	34.018	26.363	168.9	0.434	2.10	32.3	34.7	2.22	28.8	0.00	0.00	0.01	0.05	171	08
200	8.66	8.64	34.072	26.451	161.1	0.483	1.92	29.4	37.9	2.30	29.7	0.00	0.00	0.01	0.05	202	07
230	8.43	8.40	34.130	26.534	153.8	0.530	1.60	24.4	41.4	2.44	31.0	0.00	0.00		0.00	232	06
250 ISL	8.40 D	8.37	34.205 D	26.598	148.1	0.564	1.09	D 16.6	45.0	2.55	32.1	0.00	0.00		0.00	252	
270	8.09	8.06	34.205	26.648	143.6	0.590	1.05	15.8	48.6	2.65	33.1	0.00	0.00		0.00	272	05
300 ISL	7.69 D	7.66	34.188 D	26.690	139.9	0.636	1.07	D 16.0	52.3	2.71	34.1	0.00	0.00		0.00	302	
320	7.52	7.49	34.205	26.728	136.6	0.660	0.93	13.8	54.8	2.75	34.8	0.00	0.00		0.00	323	04
380	7.05	7.01	34.250	26.832	127.5	0.739	0.62	9.1	62.6	2.93	36.9	0.00	0.00		0.00	383	03
400 ISL	6.85 D	6.81	34.261 D	26.868	124.2	0.769	0.52	D 7.6	65.1	2.97	37.4	0.00	0.00		0.00	403	
440	6.59	6.55	34.292	26.927	119.0	0.813	0.39	5.7	70.3	3.06	38.3	0.00	0.00		0.00	444	02
500 ISL	6.19 D	6.14	34														

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
31 50.8 N	119 33.9 W	18/10/2011	2031	UTC	1855 m	310	12 kn			1016.2 mb	17.5 C	16.0 C				011	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C		THETA	m/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	ug/l	db	
0	18.62	18.62	33.315	23.830	406.4	0.000	5.42	101.2	1.2	0.29	0.0	0.00	0.01	0.18	0.04	0	
2	18.62	18.62	33.315	23.830	406.4	0.008	5.42	101.2	1.2	0.29	0.0	0.00	0.01	0.18	0.04	2	
10	18.63	18.62	33.314	23.829	406.8	0.041	5.42	101.3	1.2	0.29	0.1	0.00	0.00	0.18	0.04	10	
20	18.62	18.61	33.322	23.838	406.3	0.081	5.43	101.4	1.2	0.28	0.1	0.00	0.00	0.19	0.05	20	
30	18.15	18.14	33.309	23.945	396.4	0.121	5.46	101.0	1.1	0.29	0.0	0.00	0.00	0.21	0.06	30	
40	14.88	14.88	33.104	24.539	340.0	0.158	6.07	105.1	1.7	0.32	0.1	0.00	0.00	0.36	0.21	40	
50	13.65	13.64	33.085	24.783	316.9	0.191	6.02	101.8	2.1	0.39	0.3	0.01	0.03	0.36	0.28	50	
60	12.86	12.85	33.120	24.969	299.5	0.222	5.75	95.6	2.9	0.50	2.1	0.21	0.00	0.31	0.31	60	
70	12.59	12.58	33.164	25.055	291.5	0.251	5.63	93.1	3.3	0.52	2.7	0.06	0.00	0.25	0.24	71	
75 ISL	12.46 D	12.43	33.157 D	25.079	289.4	0.268	5.57	91.8	3.8	0.57	3.6	0.04	0.00	0.21	0.21	76	
84	12.14	12.13	33.191	25.163	281.6	0.292	5.40	88.5	4.5	0.67	5.3	0.00	0.00	0.14	0.15	85	
100	11.17	11.16	33.282	25.412	258.1	0.335	4.97	79.8	8.2	0.94	9.9	0.00	0.00	0.08	0.11	101	
120	10.01	10.00	33.433	25.732	228.0	0.383	4.18	65.5	16.2	1.42	17.6	0.00	0.00	0.02	0.04	121	
125 ISL	9.85 D	9.83	33.491 D	25.805	221.1	0.397	3.94	61.5	17.6	1.49	18.7	0.00	0.00	0.01	0.04	126	
140	9.53	9.52	33.612	25.951	207.5	0.427	3.56	55.3	21.7	1.71	22.1	0.00	0.00	0.01	0.03	141	
150 ISL	9.32 D	9.29	33.709 D	26.063	197.0	0.450	3.34	51.6	24.6	1.81	23.7	0.00	0.00	0.01	0.03	151	
170	8.89	8.87	33.875	26.261	178.5	0.484	2.81	43.0	30.3	2.01	26.8	0.00	0.00	0.00	0.02	171	
200 ISL	8.61 D	8.59	33.972 D	26.381	167.7	0.540	2.29	34.9	34.6	2.19	29.3	0.00	0.00	0.01	0.04	202	
201	8.60	8.58	33.973	26.384	167.5	0.538	2.24	34.1	34.7	2.20	29.4	0.00	0.00	0.01	0.04	203	
230	8.10	8.07	34.032	26.506	156.2	0.585	2.08	31.3	40.0	2.30	30.9	0.00	0.00		232	06	
250 ISL	7.86 D	7.84	34.040 D	26.548	152.5	0.620	2.04	30.6	42.7	2.36	31.7	0.00	0.00		252		
270	7.69	7.66	34.058	26.588	148.9	0.646	1.85	27.7	45.3	2.41	32.5	0.00	0.00		272	05	
300 ISL	7.34 D	7.31	34.086 D	26.661	142.4	0.695	1.49	22.1	51.1	2.56	34.3	0.00	0.00		302		
320	7.13	7.10	34.110	26.708	138.1	0.718	1.28	18.9	54.9	2.66	35.5	0.00	0.00		323	04	
381	6.62	6.58	34.171	26.827	127.5	0.799	0.81	11.8	64.5	2.90	37.8	0.00	0.00		384	03	
400 ISL	6.32 D	6.28	34.150 D	26.850	125.3	0.829	0.82	11.9	67.5	2.94	38.4	0.00	0.00		403		
440	6.02	5.98	34.179	26.912	119.8	0.872	0.62	8.9	73.8	3.02	39.7	0.00	0.00		446	02	
500 ISL	5.66 D	5.62	34.227 D	26.995	112.4	0.949	0.43	6.1	80.5	3.12	40.8	0.00	0.00		504		
515	5.66	5.61	34.241	27.007	111.5	0.958	0.40	5.6	82.2	3.14	41.1	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 NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
31 30.6 N	120 15.3 W	19/10/2011	0249	UTC	3942 m	330	18 kn	300	03 04 2	1017.7 mb	18.5 C	16.5 C	27 m	8/8	SC	012	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C		THETA	m/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	ug/l	db	
0	18.67	18.66	33.245	23.766	412.5	0.000	5.45	101.8	1.4	0.30	0.0	0.00	0.18	0.13	0.03	0	
2 A	18.67	18.66	33.245	23.766	412.5	0.008	5.45	101.8	1.4	0.30	0.0	0.00	0.18	0.13	0.03	2	
10 A	18.67	18.66	33.245	23.766	412.8	0.041	5.42	101.3	1.5	0.30	0.1	0.00	0.27	0.13	0.03	10	
18 A	18.65	18.65	33.244	23.770	412.7	0.074	5.45	101.8	1.3	0.29	0.1	0.00	0.07	0.14	0.03	18	
20 ISL	18.56 D	18.56	33.241 D	23.789	410.9	0.083	5.46	101.8	1.3	0.29	0.1	0.00	0.05	0.16	0.04	20	
24 A	18.20	18.20	33.247	23.884	402.1	0.099	5.51	102.1	1.2	0.29	0.0	0.00	0.22	0.06	0.06	24	
30 ISL	17.96 D	17.95	33.233 D	23.933	397.6	0.124	5.58	102.9	1.2	0.29	0.0	0.00	0.07	0.25	0.07	30	
34	17.36	17.36	33.253	24.092	382.5	0.138	5.59	101.9	1.3	0.29	0.0	0.00	0.12	0.27	0.08	34	
43 A	15.38	15.37	33.201	24.507	343.2	0.171	5.95	104.2	1.3	0.32	0.0	0.00	0.11	0.50	0.30	43	
50 ISL	14.49 D	14.48	33.279 D	24.758	319.4	0.196	6.09	104.8	1.9	0.40	0.5	0.02	0.14	0.57	0.33	50	
56	14.13	14.12	33.279	24.835	312.3	0.213	6.02	102.9	2.4	0.46	1.0	0.03	0.16	0.63	0.36	56	
69	13.08	13.07	33.294	25.061	291.0	0.252	5.33	89.1	4.7	0.74	5.9	0.25	0.05	0.40	0.42	70	
75 ISL	12.65 D	12.63	33.326 D	25.171	280.6	0.271	4.98	82.5	6.6	0.88	8.4	0.13	0.05	0.28	0.31	76	
81 A	12.01	12.00	33.356	25.315	267.0	0.286	4.72	77.2	8.4	1.02	10.9	0.01	0.04	0.16	0.20	82	
93 A	11.33	11.32	33.418	25.489	250.7	0.317	4.32	69.7	12.1	1.25	14.5	0.00	0.00	0.08	0.11	94	
100 ISL	10.83 D	10.78	33.492 D	25.643	236.1	0.336	3.91	62.3	14.5	1.37	16.4	0.00	0.03	0.06	0.08	101	
106	10.58	10.57	33.523	25.704	230.4	0.348	3.83	60.8	16.5	1.48	18.1	0.00	0.06	0.03	0.06	107	
120	10.19	10.17	33.678 D	25.893	212.7	0.381	3.23	50.9								121	
125 ISL	10.13 D	10.11	33.720 D	25.936	208.8	0.392	3.07	48.3	21.5	1.73	21.1	0.00	0.05	0.00	0.03	126	
140	10.01	9.99	33.814	26.030	200.2	0.420	2.80	44.0	25.4	1.92	23.5	0.00	0.04	0.00	0.03	141	
150 ISL	9.94 D	9.91	33.884 D	26.099	193.9	0.443	2.42	38.0	26.8	1.90	24.5	0.00	0.23	0.00	0.03	151	
170	9.72	9.70	34.041	26.258	179.2	0.477	2.10	32.8	29.5	1.86	26.4	0.00	0.60	0.00	0.03	171	
200 ISL	9.36 D	9.33	34.131 D	26.388	167.4	0.533	1.88	29.2	34.4	2.25	28.0	0.00	0.02	0.00	0.03	202	
201	9.33	9.31	34.132	26.393	166.9	0.531	1.88	29.1	34.6	2.26	28.1	0.00	0.00	0.00	0.03	203	
230	9.25	9.22	34.236	26.489	158.5	0.578	1.40	21.7	38.3	2.43	29.3	0.00	0.00		232	06	
250 ISL	8.86 D	8.84	34.202 D	26.523	155.5	0.614	1.42	21.8	40.3	2.45	30.2	0.00	0.00		252		
269	8.50	8.48	34.179	26.562	152.0	0.639	1.52	23.1	42.1	2.46	31.0	0.00	0.00		271	05	
300 ISL	8.16 D	8.13	34.187 D	26.620	146.8	0.690	1.14</										

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
31 10.8 N	120 55.2 W	19/10/2011	1036	UTC	3856 m	340	18 kn			1016.0 mb	19.0 C	17.0 C				013	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C		THETA		m/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db	
0	19.11	19.11	33.487	23.838	405.5	0.000	5.39	101.6	0.9	0.30	0.1	0.00	0.00	0.34	0.20	0	
2	19.11	19.11	33.487	23.838	405.5	0.008	5.39	101.6	0.9	0.30	0.1	0.00	0.00	0.34	0.20	2	20
10	19.12	19.11	33.479	23.831	406.5	0.041	5.40	101.8	0.8	0.29	0.1	0.00	0.00	0.26	0.07	10	19
20 ISL	19.12 D	19.11	33.478 D	23.832	406.9	0.082	5.38	D101.5	0.8	0.30	0.1	0.00	0.00	0.18	0.05	20	
25	19.12	19.11	33.478	23.832	407.1	0.102	5.40	101.8	0.8	0.30	0.1	0.00	0.00	0.15	0.04	25	18
30 ISL	19.12 D	19.11	33.477 D	23.831	407.4	0.123	5.38	D101.5	0.8	0.30	0.1	0.00	0.00	0.15	0.04	30	
40	18.05	18.05	33.409	24.045	387.3	0.162	5.54	102.4	0.9	0.30	0.1	0.00	0.00	0.15	0.03	40	17
50	15.26	15.25	33.176	24.513	342.8	0.198	5.96	104.1	1.1	0.33	0.0	0.00	0.01	0.15	0.04	50	16
62	14.09	14.09	33.086	24.693	325.9	0.238	5.92	101.0	1.6	0.40	0.2	0.10	0.22	0.05	0.06	62	15
74	12.97	12.96	33.051	24.893	307.1	0.276	5.81	96.8	2.3	0.47	1.2	0.39	0.00	0.09	0.08	75	14
75 ISL	12.91 D	12.89	33.054 D	24.909	305.6	0.281	5.70	D 94.8	2.5	0.49	1.5	0.36	0.00	0.09	0.08	76	
87	11.89	11.87	33.140	25.171	280.8	0.315	5.37	87.5	4.8	0.72	5.6	0.00	0.00	0.14	0.12	88	13
100	11.37	11.36	33.187	25.302	268.6	0.350	5.17	83.3	6.7	0.86	8.1	0.00	0.00	0.34	0.27	101	12
112	10.53	10.52	33.268	25.514	248.6	0.381	4.82	76.4	10.3	1.09	11.9	0.00	0.00	0.48	0.41	113	11
124	10.10	10.09	33.505	25.773	224.2	0.410	3.98	62.5	17.1	1.51	18.4	0.00	0.00	0.02	0.04	125	10
125 ISL	10.09 D	10.07	33.524 D	25.790	222.6	0.414	3.87	D 60.8	17.4	1.53	18.6	0.00	0.00	0.02	0.04	126	
139	10.02	10.01	33.695	25.935	209.1	0.442	3.30	51.8	21.6	1.78	21.8	0.00	0.00	0.02	0.03	140	09
150 ISL	9.72 D	9.70	33.814 D	26.079	195.7	0.467	2.92	D 45.6	23.9	1.85	23.1	0.00	0.00	0.01	0.03	151	
169	9.29	9.27	33.907	26.222	182.4	0.500	2.80	43.3	27.9	1.97	25.3	0.00	0.00	0.00	0.03	170	08
200 ISL	8.85 D	8.82	34.005 D	26.370	168.8	0.558	2.55	D 39.1	32.1	2.09	27.0	0.00	0.00	0.00	0.02	202	
201	8.84	8.82	34.003	26.370	168.9	0.557	2.55	39.1	32.2	2.09	27.1	0.00	0.00	0.00	0.02	203	07
231	8.75	8.72	34.129	26.485	158.6	0.606	1.83	38.0	2.35	29.5	0.00	0.00			233	06	
250 ISL	8.63 D	8.60	34.180 D	26.544	153.4	0.639	1.50	D 22.9	41.0	2.44	30.5	0.00			252		
272	8.36	8.33	34.193	26.595	148.8	0.669	1.33	20.2	44.5	2.55	31.6	0.00			274	05	
300 ISL	7.98 D	7.94	34.215 D	26.671	141.9	0.714	1.07	D 16.1	48.5	2.66	32.8	0.00			302		
320	7.80	7.77	34.222	26.701	139.3	0.737	0.98	14.6	51.4	2.73	33.7	0.00			323	04	
382	7.20	7.16	34.246	26.808	129.8	0.821	0.68	10.0	60.2	2.91	36.3	0.00			385	03	
400 ISL	6.98 D	6.94	34.242 D	26.835	127.4	0.850	0.64	D 9.4	62.2	2.94	36.7	0.00			403		
441	6.64	6.60	34.277	26.909	120.8	0.895	0.46	6.7	66.8	3.01	37.6	0.00			445	02	
500 ISL	6.40 D	6.35	34.330 D	26.984	114.4	0.971	0.28	D 4.1	73.6	3.11	39.0	0.00			504		
515	6.29	6.24	34.326	26.995	113.4	0.981	0.26	3.8	75.3	3.14	39.3	0.00			519	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
30 50.7 N	121 35.5 W	19/10/2011	1626	UTC	4102 m	340	20 kn			1016.3 mb	18.8 C	16.6 C				014	
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C		THETA		m/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db	
0	18.71	18.71	33.248	23.757	413.4	0.000	5.43	101.6	1.1	0.29	0.1	0.00	0.00	0.13	0.02	0	
3	18.71	18.71	33.248	23.757	413.4	0.012	5.43	101.6	1.1	0.29	0.1	0.00	0.00	0.13	0.02	3	20
10	18.71	18.71	33.248	23.758	413.5	0.041	5.44	101.7	0.9	0.29	0.1	0.00	0.00	0.13	0.03	10	19
20 ISL	18.70 D	18.70	33.245 D	23.758	413.9	0.083	5.44	D101.7	1.1	0.29	0.1	0.00	0.00	0.13	0.03	20	
25	18.70	18.69	33.249	23.763	413.7	0.103	5.44	101.6	1.2	0.29	0.1	0.00	0.00	0.13	0.03	25	18
30 ISL	18.70 D	18.69	33.244 D	23.759	414.2	0.125	5.43	D101.5	1.2	0.29	0.1	0.00	0.01	0.14	0.03	30	
39	18.38	18.37	33.238	23.835	407.3	0.161	5.47	101.6	1.2	0.29	0.1	0.00	0.03	0.14	0.03	39	17
50	16.82	16.81	33.153	24.145	378.1	0.204	5.86	105.5	1.5	0.27	0.1	0.00	0.00	0.15	0.04	50	16
62	15.74	15.66	33.245 D	24.477	346.7	0.250	5.98	105.5	1.8	0.27	0.0	0.00	0.01	0.16	0.05	62	15
75 ISL	14.56 D	14.55	33.250 D	24.722	323.7	0.294	5.97	D102.9	1.9	0.28	0.0	0.00	0.00	0.18	0.11	76	
76	14.53	14.52	33.261	24.737	322.2	0.295	5.95	102.5	1.9	0.28	0.0	0.00	0.00	0.18	0.11	77	14
86	14.02	14.01	33.299 D	24.874	309.5	0.326	5.85	99.8	2.0	0.29	0.0	0.00	0.00	0.19	0.17	87	13
100	13.41	13.40	33.398	25.076	290.6	0.368	5.67	95.5	2.4	0.33	0.3	0.10	0.01	0.22	0.20	101	12
112	12.27	12.25	33.336	25.252	273.9	0.402	5.43	89.3	4.0	0.53	3.7	0.01	0.00	0.14	0.18	113	11
124	11.29	11.28	33.281	25.391	260.8	0.434	5.16	83.0	6.8	0.80	8.0	0.00	0.02	0.10	0.15	125	10
125 ISL	11.19 D	11.17	33.291 D	25.418	258.2	0.440	5.15	D 82.7	7.1	0.82	8.3	0.00	0.02	0.09	0.14	126	
141	10.30	10.29	33.368	25.632	238.0	0.477	4.76	75.0	11.6	1.10	13.1	0.00	0.00	0.05	0.07	142	09
150 ISL	10.05 D	10.02	33.415 D	25.714	230.4	0.501	4.45	D 69.8	14.5	1.26	15.6	0.00	0.00	0.03	0.05	151	
168	9.36	9.34	33.597	25.968	206.4	0.537	3.93	60.7	20.5	1.59	20.7	0.00	0.00	0.01	0.02	169	08
200	9.00	8.98	33.875	26.244	180.9	0.599	3.40	52.3	26.2	1.77	23.9	0.00	0.00	0.01	0.01	202	07
231	8.42	8.39	33.963	26.405	166.0	0.653	3.07	46.6	31.6	1.93	26.5	0.00			233	06	
250 ISL	8.09 D	8.06	33.995 D	26.479	159.1	0.689	2.68	D 40.4	35.4	2.06	28.2	0.00			252		
267	7.91	7.88	34.008	26.516	155.8	0.711	2.51	37.6	38.8	2.17	29.8	0.00			269	05	
300 ISL	7.49 D	7.46	34.056 D	26.616	146.8	0.766	1.83	D 27.2	46.5	2.41	32.8	0.00			302		
321	7.20	7.17	34.073	26.670	141.8	0.791	1.54	22.7	51.4	2.56	34.7	0.00			324	04	
380	6.53</																

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 100.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
0	19.30	19.30	33.199	23.571	431.1	0.000	5.35	101.1	1.7	0.29	0.1	0.00	0.03	0.09	0.02	0	
2	19.30	19.30	33.199	23.571	431.1	0.009	5.35	101.1	1.7	0.29	0.1	0.00	0.03	0.09	0.02	2	
10	19.30	19.30	33.197	23.570	431.5	0.043	5.35	101.2	1.6	0.28	0.2	0.00	0.00	0.09	0.01	10	
20	ISL	19.29	19.29	33.193 D	23.569	431.9	0.087	5.35 D	101.1	1.6	0.28	0.2	0.00	0.09	0.01	20	
25	19.28	19.27	33.194	23.574	431.7	0.108	5.37	101.4	1.6	0.28	0.2	0.00	0.09	0.01	25		
30	ISL	19.12	19.12	33.176 D	23.601	429.4	0.130	5.39	101.5	1.7	0.27	0.2	0.00	0.11	0.02	30	
39	18.56	18.55	33.238	23.791	411.5	0.167	5.63	105.0	1.8	0.25	0.1	0.00	0.00	0.14	0.03	39	
49	17.20	17.19	33.306	24.173	375.4	0.206	5.84	106.0	1.9	0.23	0.2	0.00	0.00	0.14	0.03	49	
50	ISL	17.05	17.05	33.300 D	24.202	372.7	0.212	5.87	106.4	1.9	0.23	0.2	0.00	0.00	0.14	0.03	50
62	15.60	15.59	33.303	24.537	341.0	0.253	5.95	104.8	2.0	0.24	0.1	0.00	0.00	0.17	0.05	62	
75	14.54	14.53	33.304	24.769	319.2	0.296	5.92	102.0	2.0	0.26	0.1	0.00	0.01	0.21	0.12	76	
86	14.54	14.53	33.409	24.850	311.8	0.331	5.74	99.0	2.3	0.27	0.0	0.00	0.02	0.22	0.22	87	
100	14.01	14.00	33.500	25.032	294.9	0.373	5.57	95.0	2.8	0.32	0.6	0.06	0.00	0.21	0.25	101	
112	13.14	13.12	33.441	25.164	282.5	0.408	5.36	89.8	3.9	0.51	3.5	0.01	0.00	0.13	0.21	113	
125	12.03	12.02	33.439	25.377	262.4	0.443	5.23	85.7	5.4	0.62	5.7	0.00	0.00	0.08	0.15	126	
139	11.15	11.15	33.434 D	25.533	247.6	0.483	5.01 D	80.5								140	
150	ISL	10.62	10.60	33.454 D	25.646	237.0	0.509	4.78	75.9	11.3	0.99	11.8	0.00	0.00	0.04	0.07	151
170	9.71	9.69	33.560	25.883	214.7	0.550	4.46	69.5	15.9	1.28	16.7	0.00	0.00	0.01	0.02	171	
199	8.84	8.82	33.724	26.152	189.5	0.609	3.75	57.3	24.6	1.69	23.2	0.00	0.00	0.01	0.01	201	
200	ISL	8.81	8.78	33.742 D	26.170	187.7	0.616	3.74 D	57.2	24.7	1.70	23.3	0.00	0.00		202	
231	8.31	8.28	33.894	26.367	169.5	0.666	3.31	50.1	30.7	1.87	26.0	0.00	0.00		233		
250	ISL	8.14	8.11	33.977 D	26.458	161.2	0.703	2.86 D	43.1	34.5	2.00	27.7	0.00	0.00		252	
271	7.93	7.90	34.000	26.508	156.7	0.731	2.58	38.7	38.7	2.14	29.6	0.00	0.00		273		
300	ISL	7.64	7.62	34.051 D	26.588	149.5	0.782	1.89 D	28.2	44.8	2.34	32.0	0.00	0.00		302	
321	7.37	7.34	34.065	26.639	144.8	0.806	1.70	25.2	49.2	2.48	33.7	0.00	0.00		324		
380	6.70	6.66	34.110	26.768	133.1	0.888	1.14	16.6	59.3	2.74	37.0	0.00	0.00		383		
400	ISL	6.54	6.50	34.130 D	26.805	129.7	0.922	0.94 D	13.7	63.2	2.80	37.8	0.00	0.00		403	
440	6.04	6.00	34.146	26.882	122.6	0.965	0.79	11.3	71.0	2.93	39.5	0.00	0.00		444		
500	ISL	5.72	5.67	34.212 D	26.976	114.2	1.044	0.48 D	6.9	79.0	3.06	41.0	0.00	0.00		504	
516		5.65	5.61	34.228	26.997	112.4	1.054	0.43	6.2	81.2	3.10	41.4	0.00	0.00		520	

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C	THETA		ml/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	db		
0	19.46	19.46	33.261	23.577	430.5	0.000	5.36	101.6	1.5	0.29	0.1	0.00	0.00	0.11	0.03	0	
2	A	19.46	19.46	33.261	23.577	430.5	0.009	5.36	101.6	1.5	0.29	0.1	0.00	0.11	0.03	2	
10	ISL	19.36	19.36	33.256 D	23.600	428.6	0.043	5.36	D 101.5	1.4	0.29	0.1	0.00	0.02	0.10	0.02	10
11	19.34	19.34	33.258	23.607	428.0	0.047	5.41	102.3	1.4	0.29	0.1	0.00	0.02	0.09	0.02	11	
20	A	19.30	19.29	33.256	23.617	427.4	0.086	5.38	101.6	1.3	0.29	0.0	0.00	0.10	0.02	20	
26	A	19.11	19.10	33.244	23.657	423.9	0.111	5.42	102.2	1.3	0.28	0.0	0.00	0.09	0.02	26	
30	ISL	19.09	19.09	33.241 D	23.657	424.0	0.129	5.38	D 101.3	1.3	0.28	0.0	0.00	0.09	0.02	30	
37	19.06	19.05	33.245	23.670	423.1	0.158	5.44	102.4	1.4	0.28	0.0	0.00	0.00	0.10	0.02	37	
46	A	18.09	18.08	33.240	23.907	400.7	0.195	5.42	100.2	1.2	0.29	0.0	0.00	0.00	0.14	0.04	46
50	ISL	17.73	17.71	33.364 D	24.092	383.2	0.213	5.78	D 106.1	1.4	0.27	0.0	0.00	0.06	0.16	0.04	50
61	17.00	16.99	33.468	24.345	359.5	0.252	5.82	105.5	1.8	0.21	0.0	0.00	0.00	0.19	0.05	61	
74	15.63	15.62	33.417	24.619	333.6	0.297	5.92	104.4	1.8	0.22	0.0	0.00	0.00	0.22	0.10	75	
75	ISL	15.50	15.48	33.437 D	24.665	329.2	0.302	5.92	D 104.1	1.9	0.22	0.0	0.00	0.00	0.22	0.11	76
87	A	15.02	15.01	33.462	24.788	317.9	0.339	5.90	102.7	2.1	0.22	0.0	0.00	0.00	0.22	0.16	88
94	14.48	14.47	33.462	24.904	307.0	0.361	5.82	100.2	2.3	0.25	0.0	0.00	0.00	0.19	0.21	95	
100	A	14.26	14.24	33.511	24.990	299.0	0.379	5.70	97.7	2.5	0.30	0.1	0.03	0.06	0.22	0.18	101
112	13.16	13.14	33.440	25.159	282.9	0.414	5.54	92.8	3.2	0.39	1.8	0.04	0.00	0.17	0.20	113	
125	12.14	12.12	33.399	25.326	267.2	0.450	5.34	87.6	5.0	0.58	5.0	0.00	0.00	0.10	0.10	126	
140	11.56	11.55	33.450	25.473	253.5	0.489	5.11	82.9						0.07	0.09	141	
150	ISL	11.00	10.98	33.435 D	25.565	244.9	0.517	4.85	D 77.6	11.2	1.04	12.2	0.00	0.00	0.05	0.06	151
171	9.76	9.74	33.575	25.887	214.4	0.562	4.26	66.4	17.1	1.39	17.7	0.00	0.00	0.01	0.02	172	
200	9.09	9.07	33.803	26.173	187.6	0.620	3.87	59.6	23.6	1.62	21.8	0.00	0.00	0.00	0.01	202	
231	8.63	8.60	33.934	26.349	171.4	0.676	3.37	51.3	29.6	1.83	25.0	0.00	0.00		233		
250	ISL	8.11	8.08	33.968 D	26.455	161.4	0.712	2.90 D	43.7	34.6	1.99	27.2	0.00	0.00		252	
271	7.79	7.76	33.991	26.521	155.4	0.741	2.62	39.1	40.1	2.17	29.7	0.00	0.00		273		
300	ISL	7.48	7.45	34.025 D	26.592	149.0	0.790	2.12 D	31.5	46.7	2.38	32.4	0.00	0.00		302	
320	7.14	7.11	34.054	26.663	142.4	0.814	1.72	25.3	51.3	2.53	34.2	0.00	0.00		322		
381	6.54	6.51	34.086	26.770	132.8	0.898	1.32	19.2	60.7	2.72	36.9	0.00	0.00				

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 120.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
					4130 m	360	15 kn	360	03 08	1016.9 mb	19.9 c	17.9 c		7/8	SC	017	
29 50.9 N	123 35.1 W	20/10/2011	0953	UTC	4130 m	360	15 kn	360	03 08	1	1016.9 mb	19.9 c	17.9 c				
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C		THETA		ml/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	ug/l	db	
0	19.76	19.76	33.308	23.536	434.4	0.000	5.32	101.5	1.6	0.26	0.1	0.00	0.00	0.07	0.02	0	
2	19.76	19.76	33.308	23.536	434.4	0.009	5.32	101.5	1.6	0.26	0.1	0.00	0.00	0.07	0.02	2	20
10	19.76	19.75	33.291	23.524	435.9	0.044	5.32	101.5	1.7	0.26	0.1	0.00	0.06	0.07	0.02	10	21
20 ISL	19.61 D	19.58	33.286 D	23.567	432.2	0.087	5.37	D102.1	1.6	0.25	0.1	0.00	0.02	0.08	0.02	20	
25	19.34	19.33	33.274	23.621	427.2	0.108	5.37	101.6	1.6	0.25	0.1	0.00	0.00	0.08	0.02	25	18
30 ISL	19.31 D	19.31	33.274 D	23.628	426.8	0.131	5.38	D101.8	1.6	0.25	0.1	0.00	0.00	0.08	0.02	30	
40	19.28	19.27	33.283	23.642	425.8	0.172	5.38	101.6	1.6	0.25	0.1	0.00	0.00	0.09	0.02	40	17
50	18.51	18.50	33.282	23.836	407.7	0.214	5.56	103.5	1.6	0.24	0.1	0.00	0.00	0.11	0.03	50	16
62	16.56	16.55	33.256	24.284	365.2	0.260	5.90	105.8	1.9	0.25	0.1	0.00	0.01	0.13	0.03	62	15
75	15.58	15.57	33.216	24.475	347.3	0.307	5.95	104.6	1.8	0.27	0.1	0.00	0.02	0.21	0.04	76	14
87	14.68	14.66	33.259	24.706	325.6	0.347	5.80	100.1	2.1	0.30	0.1	0.00	0.00	0.23	0.18	88	13
100	14.05	14.03	33.381	24.933	304.3	0.388	5.57	95.1	2.7	0.36	0.5	0.07	0.01	0.25	0.23	101	12
113	13.42	13.41	33.362	25.047	293.7	0.427	5.40	90.9	3.3	0.48	2.6	0.02	0.00	0.17	0.18	114	11
125	12.79	12.77	33.372	25.181	281.2	0.461	5.28	87.7	4.3	0.58	4.5	0.00	0.00	0.11	0.13	126	10
140	11.89	11.87	33.373	25.354	264.9	0.502	5.09	83.0	6.3	0.75	7.5	0.00	0.00	0.09	0.08	141	09
150 ISL	11.21 D	11.19	33.377 D	25.482	252.8	0.532	4.85	D 78.0	9.0	0.93	10.4	0.00	0.00	0.06	0.06	151	
170	10.13	10.11	33.472	25.744	228.0	0.576	4.37	68.6	14.4	1.30	16.1	0.00	0.00	0.01	0.02	171	08
200	9.40	9.37	33.710	26.052	199.2	0.641	4.14	64.1	19.3	1.47	19.4	0.00	0.00	0.00	0.01	202	07
229	8.80	8.78	33.910	26.304	175.7	0.695	3.60	55.0	26.8	1.73	23.7	0.00	0.00			231	06
250 ISL	8.45 D	8.43	33.955 D	26.393	167.5	0.736	3.31	D 50.2	30.7	1.86	25.6	0.00	0.00			252	
270	8.05	8.02	33.984	26.477	159.7	0.764	3.02	45.4	34.5	1.99	27.4	0.00	0.00			272	05
300 ISL	7.67 D	7.64	33.995 D	26.541	153.9	0.816	2.57	D 38.3	40.1	2.16	29.8	0.00	0.00			302	
320	7.43	7.39	34.007	26.587	149.8	0.841	2.35	34.8	43.8	2.28	31.4	0.00	0.00			322	04
381	6.62	6.58	34.051	26.732	136.4	0.928	1.54	22.4	56.9	2.64	36.1	0.00	0.00			384	03
400 ISL	6.48 D	6.44	34.075 D	26.770	133.1	0.961	1.24	D 18.0	60.2	2.72	37.0	0.00	0.00			403	
440	6.20	6.16	34.119	26.842	126.6	1.006	0.95	13.7	67.2	2.88	38.8	0.00	0.00			444	02
500 ISL	5.74 D	5.70	34.158 D	26.930	118.6	1.088	0.66	D 9.4	76.0	3.01	40.4	0.00	0.00			504	
516	5.62	5.58	34.167	26.952	116.6	1.098	0.60	8.5	78.4	3.05	40.8	0.00	0.00			520	01

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

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.4 26.4

LATITUDE	LONGITUDE	DAY/MO/YR	CAST	TIME	BOTTOM	WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	SECCHI	CLD	AMT	TYPE	ORD
					24 m	310	08 kn	290	01 06	1014.1 mb	18.3 c	17.0 c		4/8	SC	002	
32 57.1 N	117 17.0 W	17/10/2011	0925	UTC	24 m	310	08 kn	290	01 06	1	1014.1 mb	18.3 c	17.0 c				
DEPTH	TEMP	POT TEMP	SALINITY	SIGMA	SVA	DYN HT	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	PRES	SAMP
m	DEG C	DEG C		THETA		ml/l	PCT	uM/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	ug/l	db	
0	16.23	16.23	33.330	24.412	350.8	0.000	5.79	103.3	4.0	0.20	0.1	0.00	0.10	14.35	0.88	0	
2	16.23	16.23	33.330	24.412	350.8	0.007	5.79	103.3	4.0	0.20	0.1	0.00	0.10	14.35	0.88	2	05
5	15.28	15.28	33.334	24.628	330.3	0.017	5.47	D 95.8	4.0	0.18	0.1	0.00	0.04	10.23	0.41	5	04
10	12.76	12.76	33.250	25.087	286.8	0.033	4.38	72.7	7.8	0.64	0.3	0.02	0.24	0.87	0.18	10	03
14	11.98	11.98	33.286	25.263	270.2	0.044	4.08	66.7	10.1	0.85	0.8	0.03	0.08	0.38	0.15	14	02
18	11.94	11.94	33.278	25.264	270.2	0.055	4.10	66.9	10.1	0.86	1.3	0.03	0.10	0.38	0.12	18	01

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

PRIMARY PRODUCTIVITY CASTS

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 76.7 49.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
35 5.3 N	120 46.8 W	02/11/2011	0319 UTC	13 m	1158 - 1738 PST	1147 PST	1733 PST	139.9 mg C/m ²	075

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1 2 MEAN DARK
2	14.01	33.369	24.926	5.75	98.1	3.9	0.57	3.7	0.17	0.05	2.06	0.42	79. A	5.6 5.8 5.7 0.19
5	13.71	33.369	24.988	5.54	94.0	4.4	0.65	4.6	0.21	0.12	2.41	0.34		
8	13.43	33.371	25.047	5.31	89.5	5.2	0.73	5.9	0.25	0.28	1.66	0.40	39.	2.4 6.2 4.3 0.16
12	13.10	33.359	25.102	5.15	86.2	5.8	0.80	6.7	0.28	0.38	1.13	0.36	24.	5.2 4.9 5.0 0.14
22	12.66	33.392	25.216	4.82	79.9	8.3	0.96	8.7	0.29	0.59	0.72	0.40	7.4	3.2 2.8 3.0 0.76
30	12.39	33.376	25.256	4.68	77.2	8.7	1.03	9.8	0.34	0.52	0.40	0.23		
39	11.94	33.389	25.351	4.49	73.3	10.1	1.12	11.4	0.31	0.42	0.26	0.18	1.00	1.1 0.98 1.1 0.20
45	11.41	33.431	25.483	4.17	67.3	12.8	1.29	14.2	0.27	0.18	0.18	0.17	0.49	0.44 0.46 0.45 0.14

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 76.7 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
33 43.5 N	123 38.6 W	31/10/2011	2314 UTC	17 m	1158 - 1743 PST	1158 PST	1743 PST	831.7 mg C/m ²	069

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1 2 MEAN DARK
2	17.54	33.485	24.225	5.51	100.9	1.0	0.29	0.2	0.00	0.05	0.28	0.08	83. A	53.5 49.3 51.4 0.40
11	17.54	33.485	24.224	5.52	101.0	0.9	0.29	0.1	0.00	0.04	0.25	0.07	37.	34.5 13.5 24.0 0.25
15	17.55	33.486	24.224	5.51	100.9	0.9	0.28	0.1	0.00	0.04	0.26	0.07	26.	21.7 24.1 22.9 0.21
26	17.55	33.486	24.225	5.51	100.9	0.8	0.28	0.1	0.00	0.07	0.26	0.07	9.6	9.2 9.1 9.1 0.21
39	15.19	33.297	24.621	5.81	101.4	2.3	0.38	0.8	0.10	0.10	1.17	0.47		
50	11.89	33.283	25.279	5.04	82.1	7.0	1.00	10.4	0.06	0.00	0.56	0.50	1.1	0.61 0.55 0.58 0.15
59	11.36	33.327	25.411	4.64	74.8	10.3	1.22	13.9	0.02	0.00	0.31	0.40	0.49	0.12 0.09 0.10 0.15

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 80.0 60.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
34 9.1 N	121 9.2 W	30/10/2011	0139 UTC	20 m	1148 - 1743 PST	1148 PST	1743 PST	206.6 mg C/m ²	063

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1 2 MEAN DARK
3	17.74	33.387	24.103	5.52	101.5	1.1	0.27	0.1	0.00	0.00	0.16	0.04	79. A	4.6 4.9 4.7 0.14
10	17.72	33.383	24.104	5.51	101.2	1.0	0.27	0.1	0.00	0.00	0.17	0.05		
13	17.72	33.384	24.104	5.51	101.2	1.0	0.27	0.1	0.00	0.00	0.17	0.04	37.	2.3 4.5 3.4 0.16
17	17.71	33.387	24.110	5.53	101.5	1.1	0.27	0.1	0.00	0.00	0.18	0.04	27.	4.5 4.0 4.3 0.13
31	17.65	33.393	24.131	5.53	101.3	0.9	0.27	0.1	0.00	0.00	0.20	0.05	9.3	3.4 3.4 0.16
41	15.88	33.347	24.508	5.74	101.6	1.3	0.32	0.5	0.07	0.01	0.55	0.21		
50	14.17	33.354	24.883	5.53	94.6	2.4	0.60	4.3	0.50	0.01	0.56	0.35		
60	12.13	33.215	25.182	5.37	88.0	4.5	0.76	6.9	0.06	0.00	0.37	0.39	1.00 1.8 1.6 1.7 0.07	
69	11.44	33.338	25.406	4.70	76.0	9.1	1.13	12.9	0.00	0.00	0.19	0.22	0.50 0.55 0.47 0.51 0.10	

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 80.0 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
33 9.0 N	123 13.4 W	31/10/2011	0249 UTC	16 m	1157 - 1752 PST	1157 PST	1752 PST	162.0 mg C/m ²	666

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1 2 MEAN DARK
2	17.62	33.379	24.124	5.54	101.6	0.9	0.29	0.1	0.00	0.00	0.25	0.05	83. A	5.8 5.7 5.7 0.13
12	17.63	33.375	24.121	5.55	101.7	1.0	0.28	0.1	0.00	0.00	0.26	0.05	32.	2.6 5.2 3.9 0.13
14	17.63	33.375	24.121	5.53	101.3	0.3	0.27	0.1	0.00	0.00	0.24	0.06	26.	4.6 5.1 4.9 0.14
25	17.62	33.383	24.128	5.54	101.6	0.5	0.27	0.1	0.00	0.01	0.25	0.06	9.1	2.8 3.0 2.9 0.16
49	13.29	33.399	25.099	5.26	88.3	3.5	0.80	7.4	0.32	0.00	0.71	0.35	0.91	1.1 0.98 1.0 0.15
55	12.72	33.410	25.220	4.90	81.5	5.9	1.02	10.9	0.15	0.00	0.64	0.40	0.51	0.37 0.34 0.35 0.15

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 83.3 40.6

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
34 13.5 N	119 24.6 W	29/10/2011	0228 UTC	16 m	1141 - 1736 PST	1141 PST	1736 PST	644.3 mg C/m ²	056

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1 2 MEAN DARK
2	16.49	33.454	24.447	5.92	106.2	1.0	0.31	0.1	0.00	0.03	0.75	0.14	83. A	22.0 20.4 21.2 0.26
5	16.39	33.444	24.464	5.96	106.7	1.0	0.30	0.2	0.00	0.04	0.77	0.15		
10	15.97	33.423	24.543	5.84	103.7	2.0	0.38	0.9	0.04	0.07	1.04	0.25	38.	32.1 31.4 31.7 0.27
14	15.94	33.423	24.550	5.82	103.2	2.0	0.39	1.0	0.04	0.05	0.98	0.24	26.	34.6 30.6 32.6 0.26
25	14.01	33.367	24.925	5.22	89.1	4.7	0.70	5.1	0.27	0.42	0.74	0.26	9.1	12.9 11.9 12.4 0.21
30	13.72	33.354	24.975	5.04	85.5	5.9	0.78	6.2	0.30	0.53	0.61	0.33	5.6	2.0 1.3 1.7 0.18

A) INCUBATION LIGHT INTENSITIES WERE 55, 35, 25, 8.7, 1.0 AND 0.5 PERCENT RESPECTIVELY.

PRIMARY PRODUCTIVITY CASTS

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 83.3 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
33 14.7 N	121 27.2 W	28/10/2011	0230 UTC	28 m	1149 - 1746 PST	1150 PST	1741 PST	278.2 mg C/m ²	051

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)			
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1	2	MEAN	DARK
2	17.65	33.220	23.995	5.60	102.6	1.5	0.28	0.0	0.00	0.00	0.12	0.04	90. A	2.6	2.6	2.6	0.14
10	17.60	33.225	24.013	5.54	101.4	1.5	0.27	0.0	0.00	0.00	0.13	0.04	35.	2.9	3.0	3.0	0.17
19	17.59	33.222	24.014	5.54	101.4	1.3	0.27	0.0	0.00	0.00	0.14	0.04	25.	3.0	2.8	2.9	0.16
25	17.53	33.226	24.030	5.55	101.4	1.3	0.27	0.0	0.00	0.01	0.15	0.04					
35	16.64	33.203	24.224	5.75	103.2	1.4	0.28	0.0	0.00	0.00	0.23	0.10					
45	13.89	33.121	24.761	6.10	103.6	1.9	0.30	0.0	0.00	0.00	0.38	0.26	8.5	4.8	5.2	5.0	0.13
58	13.31	33.166	24.915	5.89	98.9	2.3	0.34	0.4	0.07	0.00	0.44	0.35					
71	13.21	33.189	24.954	5.82	97.5	2.5	0.38	0.9	0.16	0.00	0.36	0.30					
84	12.44	33.228	25.134	5.57	91.9	3.5	0.49	2.9	0.14	0.00	0.24	0.26	1.00	1.2	0.96	1.1	0.10
90	12.24	33.217	25.165	5.55	91.1	3.9	0.54	3.6	0.08	0.00	0.22	0.22					
98	10.82	33.243	25.444	5.36	85.4	5.4	0.68	5.9	0.03	0.00	0.16	0.17	0.46	0.35	0.30	0.33	0.07

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 83.3 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
31 54.6 N	124 10.2 W	27/10/2011	0114 UTC	24 m	1200 - 1754 PST	1200 PST	1753 PST	130.6 mg C/m ²	047

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)			
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1	2	MEAN	DARK
3	18.47	33.171	23.759	5.44	101.2	1.4	0.29	0.0	0.00	0.00	0.13	0.04	83. A	1.7	1.9	1.8	0.10
10	18.47	33.169	23.757	5.47	101.8	1.3	0.28	0.0	0.00	0.00	0.13	0.04					
16	18.47	33.169	23.757	5.44	101.3	1.3	0.28	0.0	0.00	0.00	0.14	0.04	36.	2.3	2.4	2.4	0.12
22	18.47	33.171	23.759	5.44	101.2	1.3	0.28	0.0	0.00	0.00	0.13	0.03	24.	2.3	2.4	2.3	0.12
38	18.47	33.177	23.765	5.45	101.4	1.3	0.28	0.0	0.00	0.00	0.14	0.04	8.8	1.8	1.7	1.7	0.11
49	18.08	33.169	23.855	5.44	100.5	1.2	0.28	0.0	0.00	0.00	0.14	0.04					
60	15.97	33.083	24.285	5.96	105.5	1.1	0.30	0.0	0.00	0.00	0.24	0.12					
72	14.23	33.035	24.626	6.06	103.5	1.5	0.32	0.0	0.00	0.00	0.28	0.19	1.00	0.87	0.81	0.84	0.05
84	13.64	33.037	24.749	5.96	100.6	1.6	0.36	0.2	0.04	0.03	0.30	0.28	0.46	0.41	0.37	0.39	0.07

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 86.7 33.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
33 53.2 N	118 29.6 W	24/10/2011	0151 UTC	11 m	1138 - 1738 PST	1138 PST	1737 PST	525.1 mg C/m ²	033

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)			
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1	2	MEAN	DARK
2	16.78	33.369	24.316	6.61	119.2	1.0	0.22	0.1	0.00	0.00	2.88	0.15	76. A	35.0	43.2	39.1	0.39
5	16.64	33.365	24.345	6.58	118.2	0.9	0.19	0.1	0.00	0.00	1.42	0.16					
8	16.14	33.358	24.454	6.31	112.4	1.2	0.25	0.1	0.00	0.00	0.86	0.21	33.	16.3	15.8	16.0	0.30
10	15.51	33.350	24.590	6.09	107.1	1.5	0.29	0.1	0.00	0.00	0.94	0.26	25.	15.7	18.3	17.0	0.21
18	12.87	33.286	25.093	5.28	87.9	3.9	0.56	0.8	0.10	0.00	1.81	0.51	8.1	15.9	15.1	15.5	0.27
26	11.93	33.304	25.288	4.58	74.7	8.7	1.07	11.7	0.38	0.08	0.65	0.46					
33	11.50	33.354	25.406	4.33	70.0	10.9	1.21	14.1	0.14	0.20	0.38	0.31	1.00	0.22	0.15	0.19	0.44
38	11.34	33.377	25.453	4.21	67.9	11.6	1.27	14.9	0.02	0.00	0.26	0.25	0.50	0.17	0.19	0.18	0.07

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 86.7 55.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
33 9.5 N	120 0.2 W	25/10/2011	0318 UTC	16 m	1206 - 1745 PST	1144 PST	1743 PST	491.0 mg C/m ²	040

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)			
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1	2	MEAN	DARK
2	15.61	33.354	24.571	5.96	105.0	0.3	0.26	0.1	0.00	0.22	0.52	0.17	83. A	13.6	13.9	13.7	0.21
11	15.24	33.335	24.638	6.00	104.8	0.1	0.28	0.1	0.00	0.00	0.75	0.23	35.	17.8	17.1	17.4	0.22
14	15.12	33.329	24.660	6.00	104.6	0.1	0.27	0.1	0.00	0.00	0.93	0.34	26.	18.2	19.0	18.6	0.22
24	13.90	33.284	24.885	5.72	97.3	1.6	0.45	1.7	0.12	0.51	0.85	0.52	10.0	9.9	10.0	10.0	0.13
36	12.53	33.251	25.133	5.26	86.9	5.2	0.76	6.1	0.21	0.59	0.38	0.41					
48	10.98	33.208	25.386	5.04	80.6	8.9	1.01	11.0	0.04	0.00	0.15	0.27	1.00	0.47	0.38	0.43	0.08
54	10.95	33.355	25.507	4.47	71.5	12.4	1.25	14.6	0.06	0.00	0.10	0.22	0.56	0.13	0.14	0.14	0.07

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 86.7 90.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
31 59.3 N	122 24.4 W	26/10/2011	0304 UTC	28 m	1205 - 1755 PST	1154 PST	1754 PST	180.4 mg C/m ²	044

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)			
m	DEG C	THETA	ml/L	PCT	uM/L	uM/L	uM/L	uM/L	uM/L	uM/L	ug/l	ug/l	PCT	1	2	MEAN	DARK
2	18.50	33.200	23.773	5.45	101.5	1.4	0.28	0.1	0.00	0.34	0.14	0.03	90. A	2.4	2.5	2.5	0.15
10	18.31	33.198	23.819	5.47	101.5	1.2	0.28	0.0	0.00	0.00	0.11	0.02					
19	18.04	33.195	23.882	5.51	101.7	1.2	0.28	0.0	0.00	0.00	0.12	0.04	35.	2.9	2.9	2.9	0.08
25	17.71	33.219	23.983	5.59	102.5	1.2	0.27	0.0	0.00	0.00	0.13	0.03	25.	2.7	2.9	2.8	0.14
35	17.39	33.234	24.071	5.61	102.3	1.0	0.28	0.0	0.00	0.00	0.16	0.05					
45	14.42	33.082	24.622	6.10	104.7	1.5	0.32	0.0	0.00	0.00	0.21	0.14	8.5	2.4	2.4	2.4	0.12
58	13.55	33.086	24.805	5.94	100.1	2.1	0.39	0.4	0.05	0.00	0.35	0.33					
71	12.35	33.181	25.114	5.41	89.0	4.2	0.66	5.1	0.05	0.00	0.22	0.28					
84	11.75	33.196	25.240	5.26	85.5	5.5	0.76	6.9	0.00	0.00	0.16	0.22	1.00	0.56	0.56	0.56	0.07
90	11.38	33.285	25.376	4.95	79.8	8.0	0.98	10.5	0.00	0.00	0.10	0.18					
98	10.83	33.308	25.492	4.89	77.9	9.5	1.04	11.6	0.00	0.00	0.07	0.11	0.46	0.13	0.13	0.13	0.08

A) INCUBATION LIGHT INTENSITIES WERE 55, 35, 25, 8.7, 1.0 AND 0.5 PERCENT RESPECTIVELY.

PRIMARY PRODUCTIVITY CASTS

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 90.0 45.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
32 54.8 N	118 56.0 W	23/10/2011	0221 UTC	21 m	1140 - 1738 PST	1140 PST	1737 PST	396.6 mg C/m ²	026

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/l	PCT	uM/l	um/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	PCT	1 2 MEAN DARK
2	17.60	33.383	24.132	5.56	101.8	0.8	0.28	0.1	0.00	0.03	0.29	0.08	86. A	5.6 5.3 5.5 0.16
8	17.52	33.387	24.156	5.61	102.6	0.9	0.27	0.1	0.00	0.01	0.63	0.21	36.	7.6 8.2 7.9 0.21
14	17.19	33.377	24.226	5.62	102.2	0.9	0.29	0.1	0.00	0.04	0.44	0.17	25.	7.8 8.3 8.1 0.16
19	17.16	33.390	24.244	5.65	102.6	0.9	0.27	0.1	0.00	0.00	0.55	0.19		
26	16.86	33.389	24.315	5.68	102.5	0.9	0.28	0.1	0.00	0.02	0.73	0.26	9.0	9.4 8.6 9.0 0.14
33	16.11	33.340	24.450	5.80	103.2	0.7	0.28	0.1	0.03	0.00	0.20	0.03		
43	13.78	33.185	24.832	5.67	96.2	2.5	0.46	1.9	0.34	0.00	0.42	0.33		
54	12.69	33.225	25.082	5.27	87.4	5.2	0.74	6.2	0.10	0.00	0.20	0.23		
63	12.30	33.268	25.192	5.01	82.4	6.9	0.87	8.5	0.06	0.00	0.17	0.16	1.00 0.50 0.47 0.48 0.00	
72	12.01	33.312	25.280	4.86	79.5	8.3	0.98	10.2	0.06	0.00	0.15	0.16	0.52 0.16 0.14 0.15 0.06	

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 90.0 80.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
31 45.3 N	121 19.2 W	22/10/2011	0010 UTC	26 m	1147 - 1747 PST	1148 PST	1747 PST	102.4 mg C/m ²	022

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/l	PCT	uM/l	um/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	PCT	1 2 MEAN DARK
3	18.51	33.244	23.803	5.42	101.0	1.7	0.29	0.0	0.00	0.00	0.15	0.04	84. A	2.7 2.8 2.7 0.10
10	18.51	33.244	23.804	5.41	100.8	1.5	0.28	0.0	0.00	0.00	0.15	0.04		
18	18.51	33.247	23.807	5.42	100.9	1.4	0.29	0.0	0.00	0.00	0.15	0.04	35.	2.2 2.2 2.2 0.13
23	18.51	33.243	23.804	5.42	100.9	1.4	0.29	0.0	0.00	0.00	0.16	0.04	26.	1.8 1.9 1.9 0.16
32	18.50	33.248	23.811	5.43	101.1	1.4	0.28	0.1	0.00	0.00	0.16	0.04		
40	18.48	33.242	23.813	5.43	101.0	1.3	0.28	0.0	0.00	0.00	0.16	0.05	9.4	0.95 0.90 0.93 0.09
53	15.66	33.206	24.448	5.94	104.6	1.6	0.26	0.0	0.00	0.00	0.24	0.08		
65	14.90	33.283	24.675	5.96	103.5	2.1	0.25	0.0	0.00	0.00	0.24	0.11		
77	14.33	33.348	24.848	5.86	100.5	2.1	0.27	0.1	0.00	0.00	0.20	0.20	1.1 0.27 0.19 0.23 0.08	
84	13.66	33.287	24.938	5.82	98.5	2.2	0.29	0.0	0.00	0.02	0.20	0.22		
91	13.44	33.305	24.998	5.77	97.3	2.3	0.32	0.2	0.03	0.02	0.20	0.22	0.46 0.06 0.10 0.08 0.11	

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 90.0 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
30 45.1 N	123 20.8 W	21/10/2011	0122 UTC	25 m	1156 - 1800 PST	1158 PST	1758 PST	98.7 mg C/m ²	019

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/l	PCT	uM/l	um/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	PCT	1 2 MEAN DARK
2	19.19	33.301	23.676	5.37	101.4	1.1	0.30	0.1	0.00	0.00	0.10	0.03	88. A	2.5 2.3 2.4 0.05
10	19.19	33.301	23.676	5.35	101.0	1.3	0.29	0.1	0.00	0.00	0.10	0.03		
17	19.20	33.300	23.675	5.47	103.3	1.2	0.30	0.1	0.00	0.00	0.10	0.02	35.	0.68 0.68 0.68 0.12
21	19.18	33.300	23.679	5.36	101.2	1.1	0.29	0.1	0.00	0.03	0.10	0.03	28.	1.6 1.5 1.6 0.18
30	18.36	33.192	23.804	5.48	101.8	1.3	0.28	0.1	0.00	0.00	0.14	0.04		
40	17.25	33.163	24.051	5.61	101.9	1.1	0.29	0.1	0.00	0.00	0.18	0.05	8.6	1.4 1.5 1.4 0.08
52	15.33	33.129	24.461	5.92	103.6	1.4	0.31	0.1	0.00	0.00	0.26	0.15		
64	14.73	33.119	24.585	5.91	102.1	1.4	0.36	0.5	0.09	0.09	0.38	0.28		
75	13.23	33.076	24.863	5.80	97.2	2.2	0.44	1.2	0.53	0.00	0.36	0.35	1.00 0.49 0.57 0.53 0.04	
86	12.53	33.103	25.021	5.73	94.6	2.9	0.49	2.3	0.15	0.00	0.21	0.21	0.51 0.15 0.18 0.17 0.03	

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 35.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
32 40.7 N	117 52.6 W	18/10/2011	0123 UTC	18 m	1139 - 1747 PST	1137 PST	1744 PST	518.9 mg C/m ²	006

DEPTH	TEMP	SALINITY	SIGMA	OXYGEN	OXY	SI03	P04	N03	N02	NH4	CHL-A	PHAE0	LIGHT	UPTAKE (mg C/m ³)
m	DEG C	THETA	ml/l	PCT	uM/l	um/l	uM/l	uM/l	uM/l	uM/l	ug/l	ug/l	PCT	1 2 MEAN DARK
2	18.24	33.494	24.062	6.06	112.4	0.8	0.24	0.0	0.00	0.03	0.88	0.11	88. A	14.8 15.2 15.0 0.37
12	17.98	33.493	24.124	5.99	110.6	0.6	0.26	0.0	0.00	0.24	0.36	0.10	36.	10.8 11.7 11.2 0.30
16	16.91	33.507	24.392	5.94	107.5	0.9	0.29	0.0	0.00	0.03	0.33	0.10	26.	11.8 10.2 11.0 0.29
22	16.10	33.488	24.565	5.92	105.3	1.7	0.38	0.2	0.01	0.02	0.64	0.21		
29	13.94	33.400	24.965	5.30	90.2	2.8	0.65	4.1	0.40	0.32	0.78	0.32	8.4	11.5 13.0 12.3 0.22
36	13.36	33.346	25.043	5.06	85.1	4.6	0.82	7.1	0.24	0.05	0.65	0.29		
45	11.84	33.292	25.296	4.89	79.6	7.7	0.99	10.0	0.06	0.00	0.36	0.22		
54	11.04	33.294	25.443	4.56	73.0	11.0	1.17	13.2	0.03	0.00	0.19	0.22	1.00 0.42 0.55 0.49 0.11	
62	10.72	33.348	25.541	4.34	69.1	13.0	1.29	15.0	0.02	0.01	0.14	0.13	0.51 0.23 0.29 0.26 0.05	

A) INCUBATION LIGHT INTENSITIES WERE 55, 35, 25, 8.7, 1.0 AND 0.5 PERCENT RESPECTIVELY.

PRIMARY PRODUCTIVITY CASTS

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 70.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
31 30.6 N	120 15.3 W	19/10/2011	0249 UTC	27 m	1148 - 1150 PST	1146 PST	1753 PST	773.9 mg C/m ²	012

DEPTH m	TEMP DEG C	SALINITY	SIGMA THETA	OXYGEN mL/L	OXY PCT	SI03 uM/L	P04 uM/L	N03 uM/L	N02 uM/L	NH4 uM/L	CHL-A ug/l	PHAE0 ug/l	LIGHT PCT	1	2	MEAN	DARK	UPTAKE (mg C/m ³)
2	18.67	33.245	23.766	5.45	101.8	1.4	0.30	0.0	0.00	0.18	0.13	0.03	89. A	14.7	15.2	15.0	0.30	
10	18.67	33.245	23.766	5.42	101.3	1.5	0.30	0.1	0.00	0.27	0.13	0.03						
18	18.65	33.244	23.770	5.45	101.8	1.3	0.29	0.1	0.00	0.07	0.14	0.03	36.	10.7	11.6	11.2	0.30	
24	18.20	33.247	23.884	5.51	102.1	1.2	0.29	0.0	0.00	0.00	0.22	0.06	26.	11.7	10.1	11.0	0.20	
34	17.36	33.253	24.092	5.59	101.9	1.3	0.29	0.0	0.00	0.12	0.27	0.08						
43	15.38	33.201	24.507	5.95	104.2	1.3	0.32	0.0	0.00	0.11	0.50	0.30	8.7	11.5	12.9	12.3	0.20	
56	14.13	33.279	24.835	6.02	102.9	2.4	0.46	1.0	0.03	0.16	0.63	0.36						
69	13.08	33.294	25.061	5.33	89.1	4.7	0.74	5.9	0.25	0.05	0.40	0.42						
81	12.01	33.356	25.315	4.72	77.2	8.4	1.02	10.9	0.01	0.04	0.16	0.20	1.00	0.40	0.50	0.49	0.10	
93	11.33	33.418	25.489	4.32	69.7	12.1	1.25	14.5	0.00	0.00	0.08	0.11	0.51	0.20	0.20	0.26		

RV NEW HORIZON

CALCOFI CRUISE 1110

STATION 93.3 110.0

LATITUDE	LONGITUDE	DAY/MO/YR	CAST TIME	SECCHI	INCUBATION TIME	LAN	CIVIL TWILIGHT	INTEGRATED VALUE	ORD
30 12.0 N	122 53.8 W	20/10/2011	0410 UTC	29 m	1253 - 1804 PST	1157 PST	1804 PST	108.4 mg C/m ²	016

DEPTH m	TEMP DEG C	SALINITY	SIGMA THETA	OXYGEN mL/L	OXY PCT	SI03 uM/L	P04 uM/L	N03 uM/L	N02 uM/L	NH4 uM/L	CHL-A ug/l	PHAE0 ug/l	LIGHT PCT	1	2	MEAN	DARK	UPTAKE (mg C/m ³)
2	19.46	33.261	23.577	5.36	101.6	1.5	0.29	0.1	0.00	0.00	0.11	0.03	90. A	1.8	1.6	1.7	0.06	
11	19.34	33.258	23.607	5.41	102.3	1.4	0.29	0.1	0.00	0.02	0.09	0.02						
20	19.30	33.256	23.617	5.38	101.6	1.3	0.29	0.0	0.00	0.00	0.10	0.02	35.	1.7	1.7	1.7	0.12	
26	19.11	33.244	23.657	5.42	102.2	1.3	0.28	0.0	0.00	0.00	0.09	0.02	25.	1.5	1.4	1.5	0.19	
37	19.06	33.245	23.670	5.44	102.4	1.4	0.28	0.0	0.00	0.00	0.10	0.02						
46	18.09	33.240	23.907	5.42	100.2	1.2	0.29	0.0	0.00	0.00	0.14	0.04	8.8	1.2	1.2	1.2	0.15	
61	17.00	33.468	24.345	5.82	105.5	1.8	0.21	0.0	0.00	0.00	0.19	0.05						
74	15.63	33.417	24.619	5.92	104.4	1.8	0.22	0.0	0.00	0.00	0.22	0.10						
87	15.02	33.462	24.788	5.90	102.7	2.1	0.22	0.0	0.00	0.00	0.22	0.16	1.00	0.53	0.37	0.45	0.05	
94	14.48	33.462	24.904	5.82	100.2	2.3	0.25	0.0	0.00	0.00	0.19	0.21						
100	14.26	33.511	24.990	5.70	97.7	2.5	0.30	0.1	0.03	0.06	0.22	0.18	0.50	0.28	0.28	0.28	0.02	

A) INCUBATION LIGHT INTENSITIES WERE 55, 35, 25, 8.7, 1.0 AND 0.5 PERCENT RESPECTIVELY.

MACROZOOPLANKTON BIOMASS
Net Mesh Size: 0.505mm

Line	Sta.	Latitude N	Longitude W	Mo/Day	Date	Time (PST)	Water Volume	Max. Tow Depth (m)	Volume per 1000 m ³ Strained	
					Start	End	Strained (m ³)		Total (cm ³)	Small (cm ³)
76.7	49.0	35 05.3	120 24.3	11/01	1204	1211	152	59	315	282
76.7	51.0	35 01.3	120 08.0	11/01	0933	0952	413	168	281	281
76.7	55.0	34 53.2	119 19.5	11/01	0604	0625	436	207	112	112
76.7	60.0	34 43.4	119 24.7	11/01	0141	0204	446	211	323	222
76.7	90.0	33 43.1	119 30.5	10/31	0623	0644	426	208	216	216
76.7	100.0	33 23.0	119 48.0	10/31	0034	0057	466	208	54	54
80.0	50.5	34 27.7	120 01.4	10/28	2234	2236	55	21	236	236
80.0	51.0	34 26.9	120 29.2	10/29	0014	0020	126	48	279	239
80.0	55.0	34 19.0	120 31.4	10/29	0406	0427	415	214	282	125
80.0	60.0	34 09.0	120 48.3	10/29	1102	1124	442	210	95	95
80.0	70.0	33 49.1	121 08.9	10/29	1734	1754	412	217	70	70
80.0	80.0	33 29.0	121 50.5	10/30	0137	0200	475	203	67	67
80.0	90.0	33 08.9	122 32.0	10/30	0930	0952	457	209	368	368
80.0	100.0	32 49.2	123 13.0	10/30	1650	1711	436	208	218	158
81.7	43.5	34 24.2	123 54.5	10/28	1458	1500	43	14	23	23
81.8	46.9	34 16.5	124 19.2	10/28	1811	1832	408	208	181	181
83.3	39.4	34 15.5	123 38.0	10/28	0848	0849	37	13	27	27
83.3	40.6	34 13.7	121 33.1	10/28	1004	1006	56	21	447	447
83.3	42.0	34 10.7	121 11.8	10/28	1228	1236	161	71	322	322
83.3	51.0	33 52.7	120 55.1	10/28	0327	0335	172	68	116	116
83.3	55.0	33 44.7	120 46.7	10/27	2359	0021	432	211	171	171
83.3	60.0	33 34.7	117 18.4	10/27	1829	1849	409	214	95	95
83.3	70.0	33 14.7	117 17.0	10/27	1150	1213	484	211	29	29
83.3	80.0	32 54.6	117 28.1	10/27	0514	0535	464	213	136	136
83.3	90.0	32 34.3	117 23.7	10/26	2306	2329	473	215	104	104
83.3	100.0	32 14.7	117 32.0	10/26	1531	1555	496	210	12	12
83.3	110.0	31 54.7	117 52.4	10/26	0801	0823	457	214	28	28
85.4	35.8	34 00.7	118 12.8	10/23	1443	1445	39	15	154	154
86.7	33.0	33 53.2	118 33.2	10/23	1055	1059	94	42	202	202
86.7	35.0	33 49.4	118 53.3	10/23	1754	1815	412	208	124	124
86.7	40.0	33 39.7	119 14.0	10/23	2338	0000	445	212	144	144
86.7	45.0	33 29.5	119 34.1	10/24	0412	0433	412	215	131	131
86.7	50.0	33 19.5	120 14.7	10/24	0752	0758	137	47	255	255
86.7	55.0	33 09.5	120 55.0	10/24	1231	1253	420	212	138	138
86.7	60.0	32 59.5	121 35.1	10/24	1655	1717	435	207	90	90
86.7	70.0	32 39.6	122 15.5	10/24	2318	2340	465	208	49	49
86.7	80.0	32 19.5	122 53.5	10/25	0557	0618	455	209	141	55
86.7	90.0	31 59.4	123 35.1	10/25	1205	1229	509	208	55	55
86.7	100.0	31 39.4	123 59.8	10/25	1931	1952	422	218	66	66
86.7	110.0	31 19.3	123 19.9	10/26	0231	0254	464	210	69	69
86.8	32.5	33 53.1	122 39.7	10/23	1205	1207	54	20	93	93
88.5	30.1	33 40.4	121 59.1	10/23	0637	0639	40	14	249	249
90.0	27.7	33 29.6	121 18.8	10/23	0354	0356	46	14	194	194
90.0	28.0	33 29.1	120 38.3	10/23	0258	0303	116	40	113	113
90.0	30.0	33 25.1	119 57.6	10/23	0015	0037	413	210	140	140
90.0	35.0	33 15.1	119 28.9	10/22	2005	2027	420	209	174	174
90.0	37.0	33 11.0	118 56.0	10/22	1706	1728	433	204	139	139
90.0	45.0	32 55.0	118 23.1	10/22	0925	0947	438	204	27	27
90.0	53.0	32 39.1	118 15.1	10/22	0351	0412	413	205	75	75
90.0	60.0	32 25.0	117 54.4	10/21	2111	2133	433	214	55	55
90.0	70.0	32 04.9	117 46.1	10/21	1442	1505	444	214	20	20
90.0	80.0	31 45.0	117 44.9	10/21	0700	0721	429	213	21	21
90.0	90.0	31 24.8	118 05.5	10/21	0134	0156	458	212	33	33
90.0	100.0	31 05.1	118 29.5	10/20	1719	1740	429	213	30	30
90.0	110.0	30 45.1	118 27.1	10/20	0828	0850	442	205	29	29
90.0	120.0	30 25.1	118 49.9	10/20	0224	0246	444	212	18	18
91.7	26.4	33 14.7	118 37.6	10/16	2041	2042	47	10	21	21
93.3	26.7	32 57.3	118 58.3	10/16	1645	1649	100	38	180	180
93.3	28.0	32 54.6	119 19.0	10/17	0215	0237	415	209	130	130
93.3	30.0	32 50.6	119 39.6	10/17	0522	0543	432	207	134	134
93.3	35.0	32 40.7	120 00.3	10/17	0814	0837	479	252	61	61
93.3	40.0	32 30.8	120 20.9	10/17	1341	1403	431	210	86	86
93.3	45.0	32 20.8	121 01.9	10/17	1738	1759	448	214	83	83
93.3	50.0	32 10.8	121 42.8	10/17	2133	2156	434	231	101	101
93.3	55.0	32 00.8	122 23.6	10/18	0145	0207	442	211	54	54
93.3	60.0	31 50.7	123 04.1	10/18	0549	0610	428	212	44	44
93.3	70.0	31 30.7	123 44.7	10/18	1158	1220	449	216	96	96
93.3	80.0	31 10.7	124 10.2	10/18	1944	2005	419	211	45	45
93.3	90.0	30 50.5	123 29.6	10/19	0136	0158	432	214	44	44
93.3	100.0	30 30.8	122 48.6	10/19	0723	0744	445	214	20	20
93.3	110.0	30 11.9	122 07.7	10/19	1301	1323	453	211	20	20
93.3	120.0	29 50.9	121 26.7	10/19	1903	1924	438	214	30	30
93.4	26.4	32 57.1	120 45.3	10/16	1743	1744	38	14	185	185