

UNIVERSITY OF CALIFORNIA   SCRIPPS INSTITUTION OF OCEANOGRAPHY

# data report

## PHYSICAL OCEANOGRAPHIC DATA

CalCOFI Cruise 8012  
26 November - 20 December 1980

CalCOFI Cruise 8101  
8 - 31 January 1981

CalCOFI Cruise 8102  
13 February - 10 March 1981

CalCOFI Cruise 8104  
1 - 27 April 1981

SIO Reference 85-9  
17 June 1985

UNIVERSITY OF CALIFORNIA  
SCRIPPS INSTITUTION OF OCEANOGRAPHY

PHYSICAL OCEANOGRAPHIC DATA

CalCOFI Cruise 8012  
26 November - 20 December 1980

CalCOFI Cruise 8101  
8 - 31 January 1981

CalCOFI Cruise 8102  
13 February - 10 March 1981

and

CalCOFI Cruise 8104  
1 - 27 April 1981

SIO Reference 85-9  
17 June 1985

Approved for distribution:

  
W. A. Nierenberg, Director

## CONTENTS

Introduction .....	3
Literature Cited .....	4
Cruise 8012	
List of Figures .....	6
Personnel .....	16
Tabulated Data .....	17
10 Meter Data .....	33
Cruise 8101	
List of Figures .....	40
Personnel .....	50
Tabulated Data .....	51
10 Meter Data .....	58
Cruise 8102	
List of Figures .....	63
Personnel .....	73
Tabulated Data .....	74
10 Meter Data .....	84
Cruise 8104	
List of Figures .....	94
Personnel .....	104
Tabulated Data .....	105
10 Meter Data .....	120
Distribution List .....	132

## INTRODUCTION

The data in this report were collected during Cruises 8012\*, 8101, 8102, and 8104 of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) program aboard the RV *David Starr Jordan* of the National Marine Fisheries Service and the RV *New Horizon* of the Scripps Institution of Oceanography.

These data were collected and processed by personnel of the Marine Life Research Group (MLRG), the Physical and Chemical Oceanographic Data Facility (PACODF), and the Southwest Fisheries Center, National Marine Fisheries Service (NMFS).

## STANDARD PROCEDURES

### *In-situ Conductivity/Temperature/Depth Recorder (CTD) Data*

CTD lowerings were made on cardinal CalCOFI line stations on all cruises except 8012 *New Horizon*. Temperature and salinity corrections were applied to the CTD data, based upon comparisons with shallow and deep Nansen cast data or rosette cast data (8102 *New Horizon*).

### *Hydrographic Cast Data*

The hydrographic casts were lowered on cardinal CalCOFI line stations on cruise 8012 *New Horizon*. The casts consisted of 18 or fewer Nansen bottles lowered to a maximum sampling depth of 500 meters, bottom depth permitting. Temperature and salinity were determined for all depths sampled.

Paired protected reversing thermometers were used to determine temperatures which are recorded to hundredths of a degree Celsius. Sampling bottles used below a depth of 100 meters were equipped with unprotected thermometers for determination of the depth of sampling.

Salinity samples were analyzed at sea on inductive-type salinometers standardized with Wormley Standard Seawater. The salinity values are reported to three decimal places.

The observed data have been evaluated using the method described by Klein (1973). This involves consideration of their variation as functions of density or depth and their relationships to each other, and comparisons with adjacent observations.

## TABULATED DATA

The time reported is Greenwich Mean Time. For CTD lowerings it is the "start down" time and for Nansen casts it is the time of messenger release.

Bottom depths, determined acoustically, have been corrected using Matthews (1939) tables and are reported in meters. Weather conditions have been coded using WMO code 4051.

Data in this report were obtained by CTD lowerings, rosette samples, or Nansen casts and appear in three forms:

1. Observed and interpolated standard depth data from Nansen casts have been interspersed and are presented together in depth sequence. Interpolated or extrapolated standard level data are noted by the footnote "ISL" printed after the depth. Density related parameters have been calculated from the International Equation of State of Seawater 1980 (EOS80, UNESCO, 1981). Some of the differences between EOS80 and the older equations of state are discussed in the introduction to SIO Ref. 84-18. Computed values of potential temperature, sigma-theta, specific volume anomaly (SVA), dynamic height or geopotential anomaly, and pressure are included with both observed and interpolated standard depth levels.

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

2. Data from CTD lowerings are presented with two stations printed side by side. Temperature and salinity are tabulated at closer standard intervals than the interpolated standard depth bottle data. The computed values are the same as for the bottle data.
3. Ten-meter temperature and salinity data from net tow station 10-meter bottles and CTD 10-meter check bottles appear as separate sections.

#### LITERATURE CITED

- Klein, Hans T., 1973. A new technique for processing physical oceanographic data. SIO Ref. No. 73-14, 17 pp.
- Matthews, D. J., 1939. Tables of the velocity of sound in pure water and seawater for use in echo-sounding and sound-ranging. Second Edition. Hydrographic Department, Admiralty, H. D. 282, 52 pp.
- Scripps Institution of Oceanography, University of California, 1984. Physical, Chemical and Biological Data, CalCOFI Cruise 8401, 4-27 January 1984. SIO Ref. No. 84-18, 120 pp.
- UNESCO, 1981. Background papers and supporting data on the International Equation of State 1980. UNESCO Tech. Pap. in Mar. Sci., No. 38, 192 pp.



## FIGURES

### Cruise 8104

1. CalCOFI Cruise 8104, station positions.
2. Horizontal distribution of dynamic height anomaly (0 over 500 m).
3. Horizontal distribution of dynamic height anomaly (200 over 500 m).
4. Horizontal distribution of temperature at 10 meters.
5. Horizontal distribution of salinity at 10 meters.
6. Horizontal distribution of sigma-theta at 10 meters.
7. Horizontal distribution of temperature at 200 meters.
8. Horizontal distribution of salinity at 200 meters.
9. Horizontal distribution of sigma-theta at 200 meters.

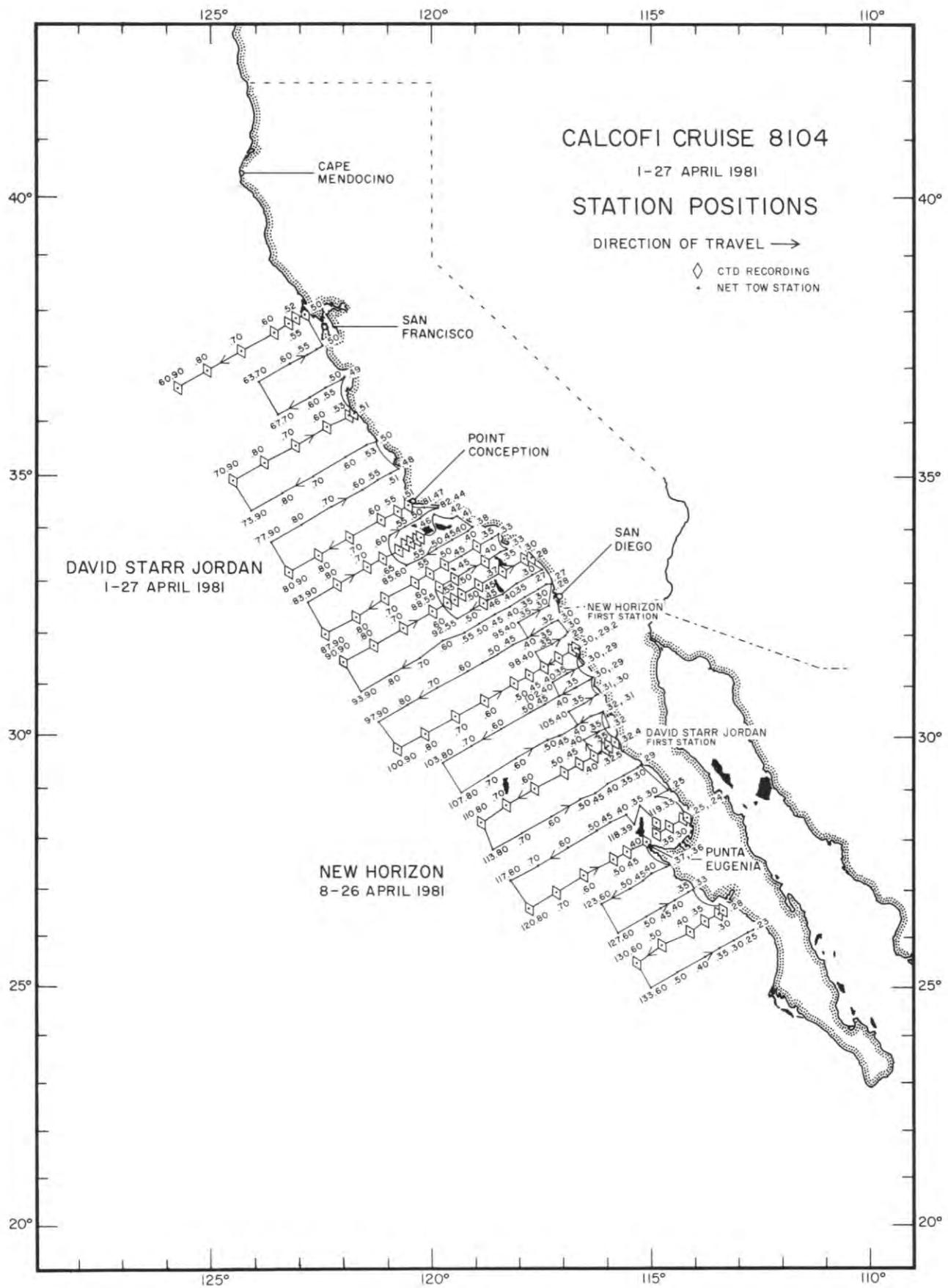


FIGURE 1

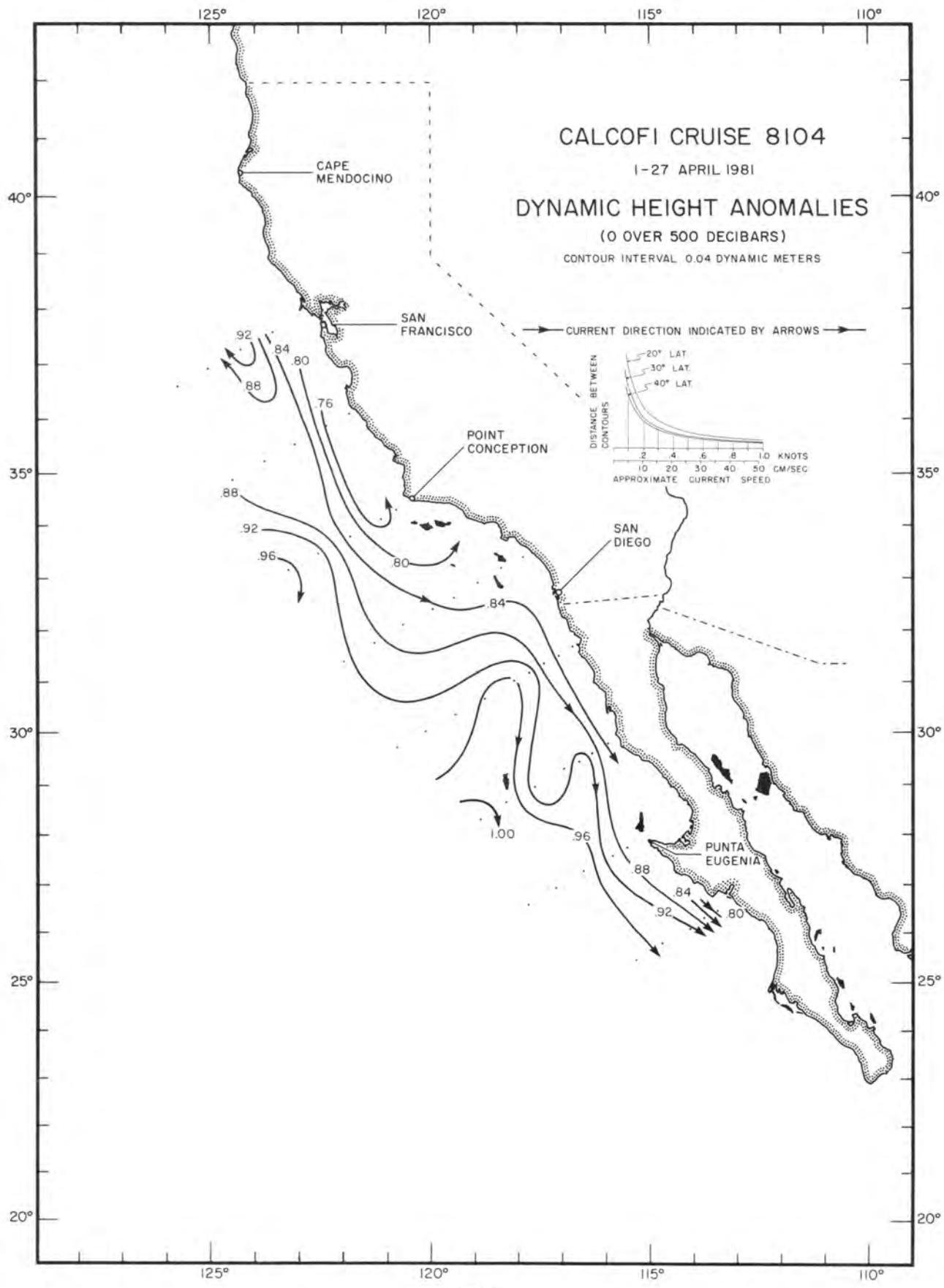


FIGURE 2

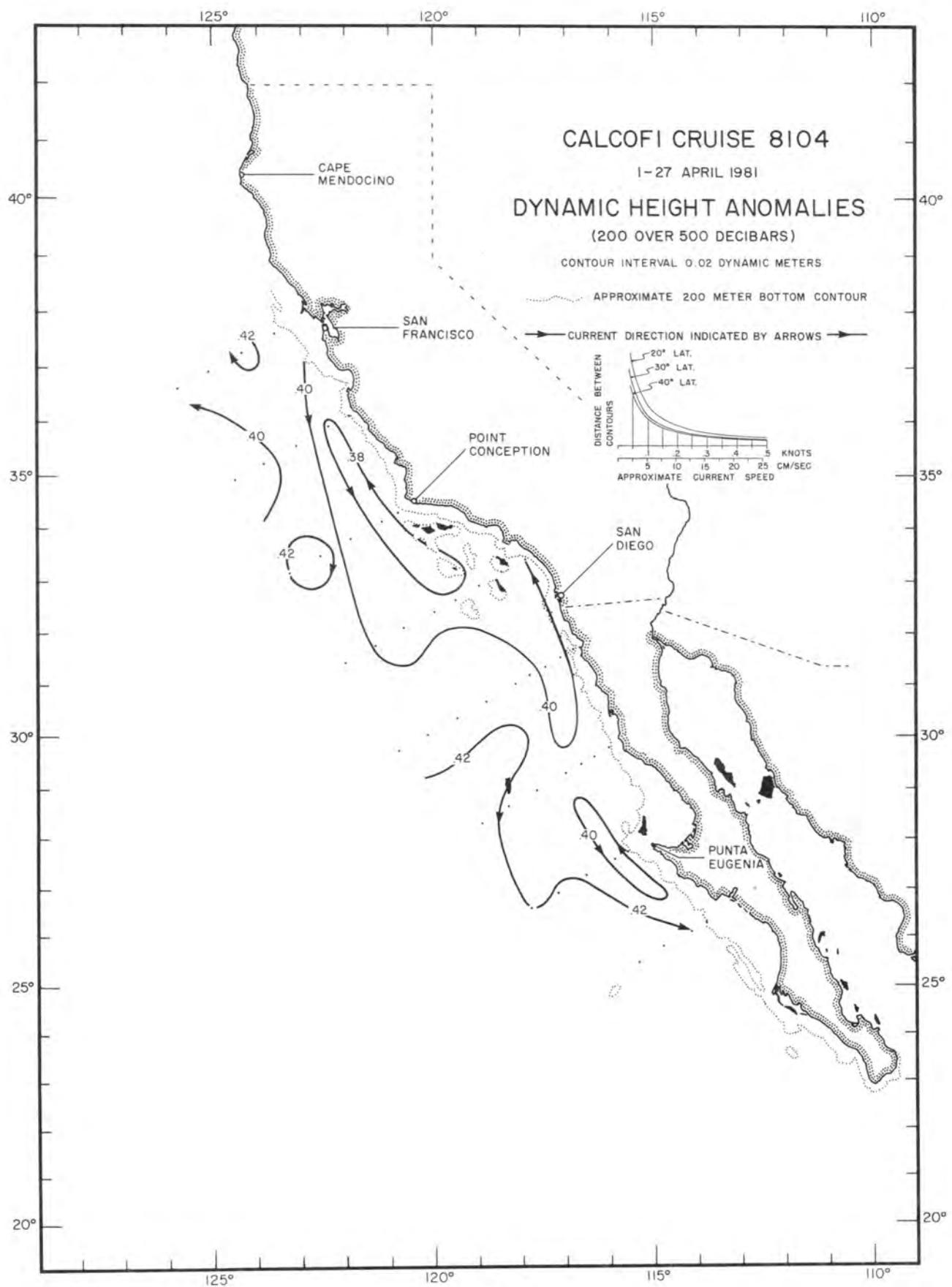


FIGURE 3

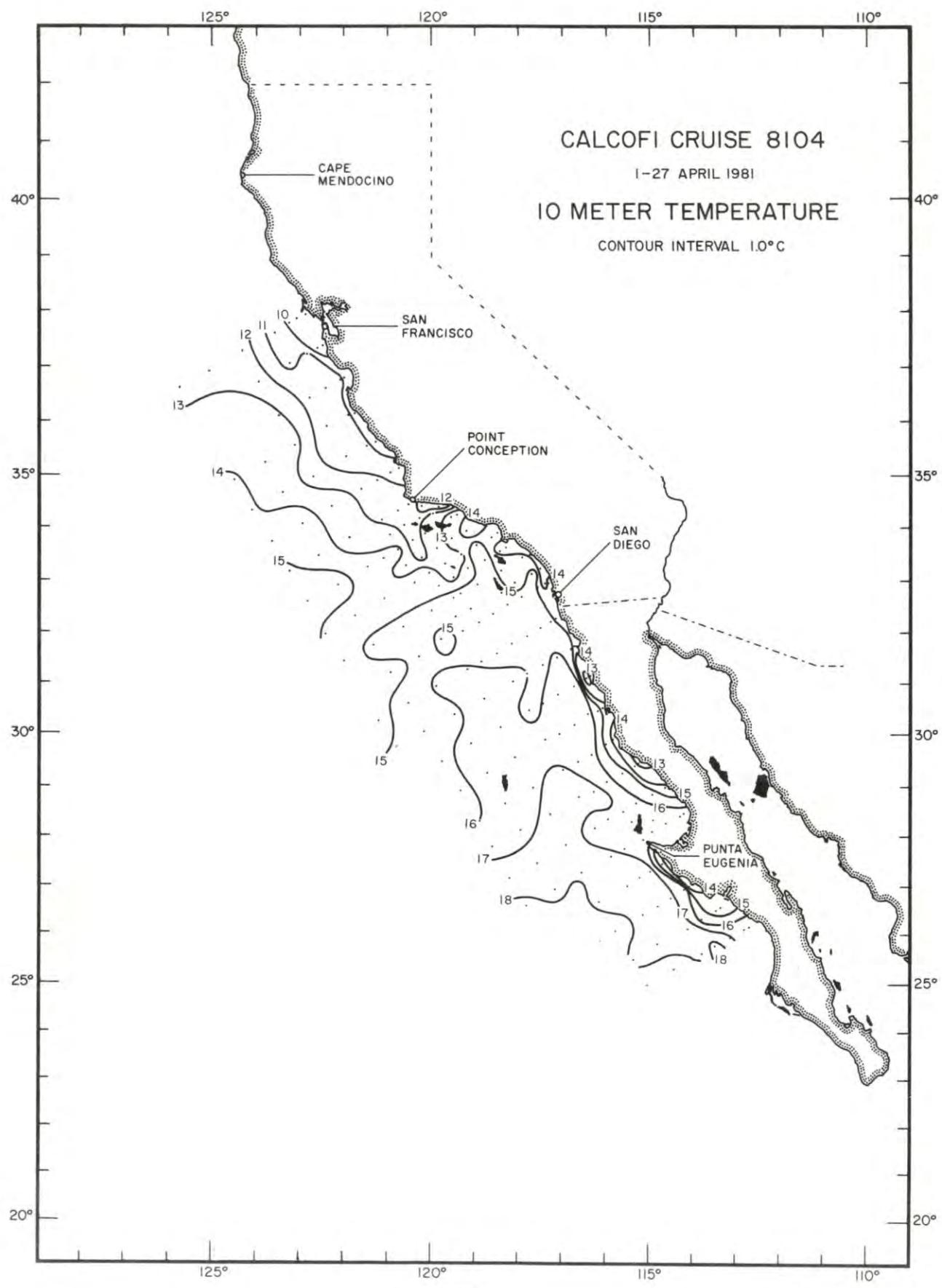


FIGURE 4

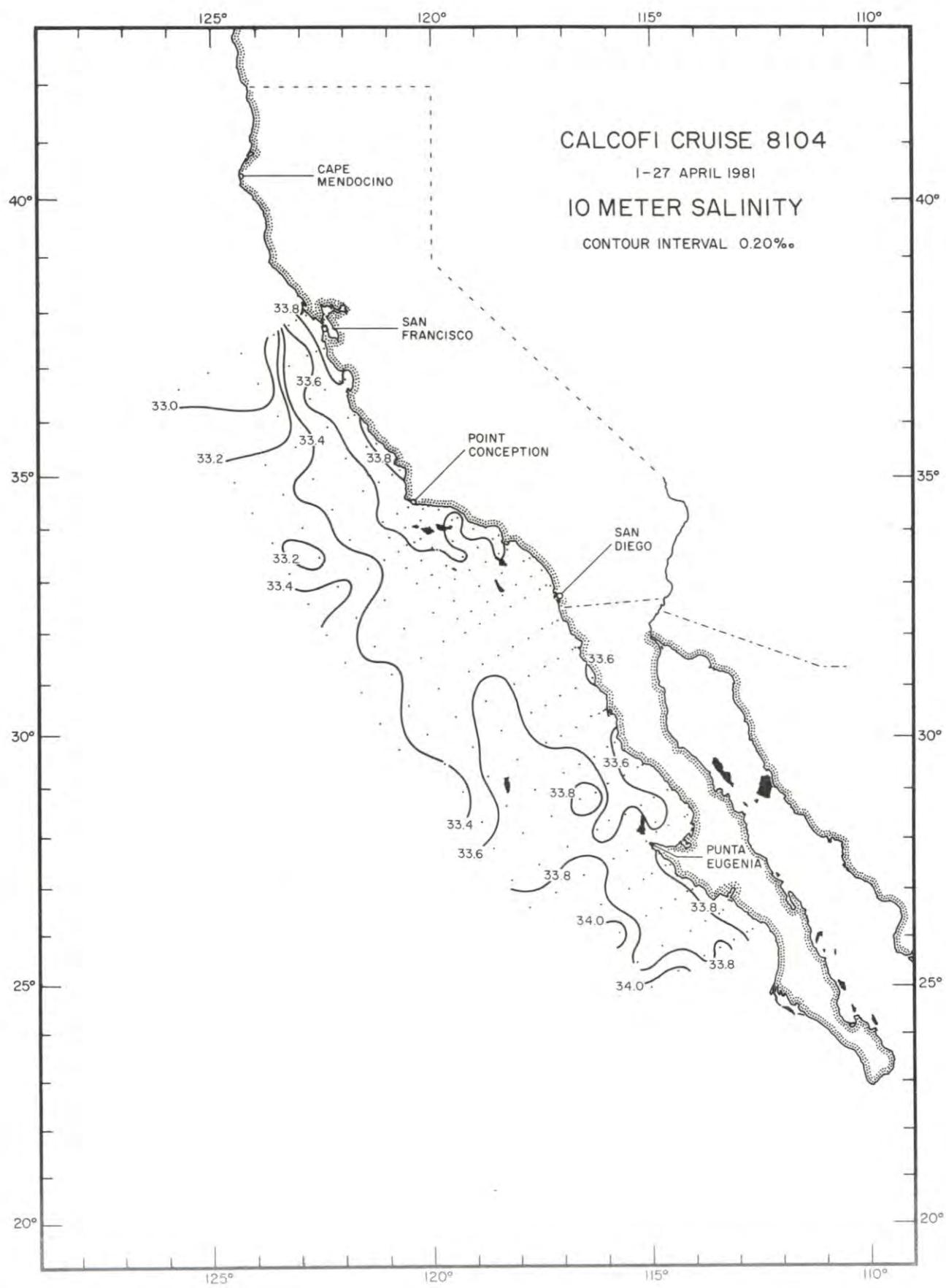


FIGURE 5

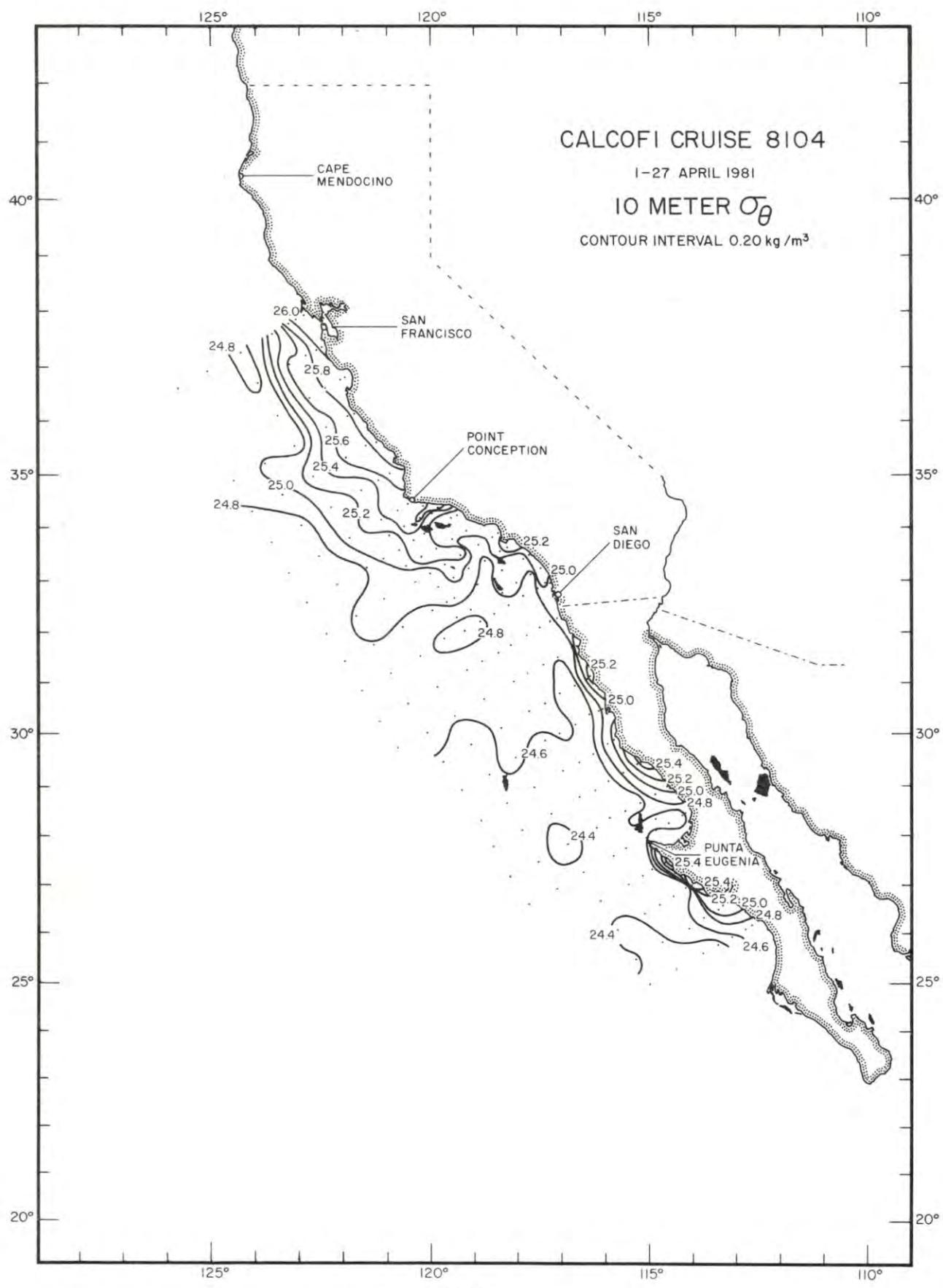


FIGURE 6

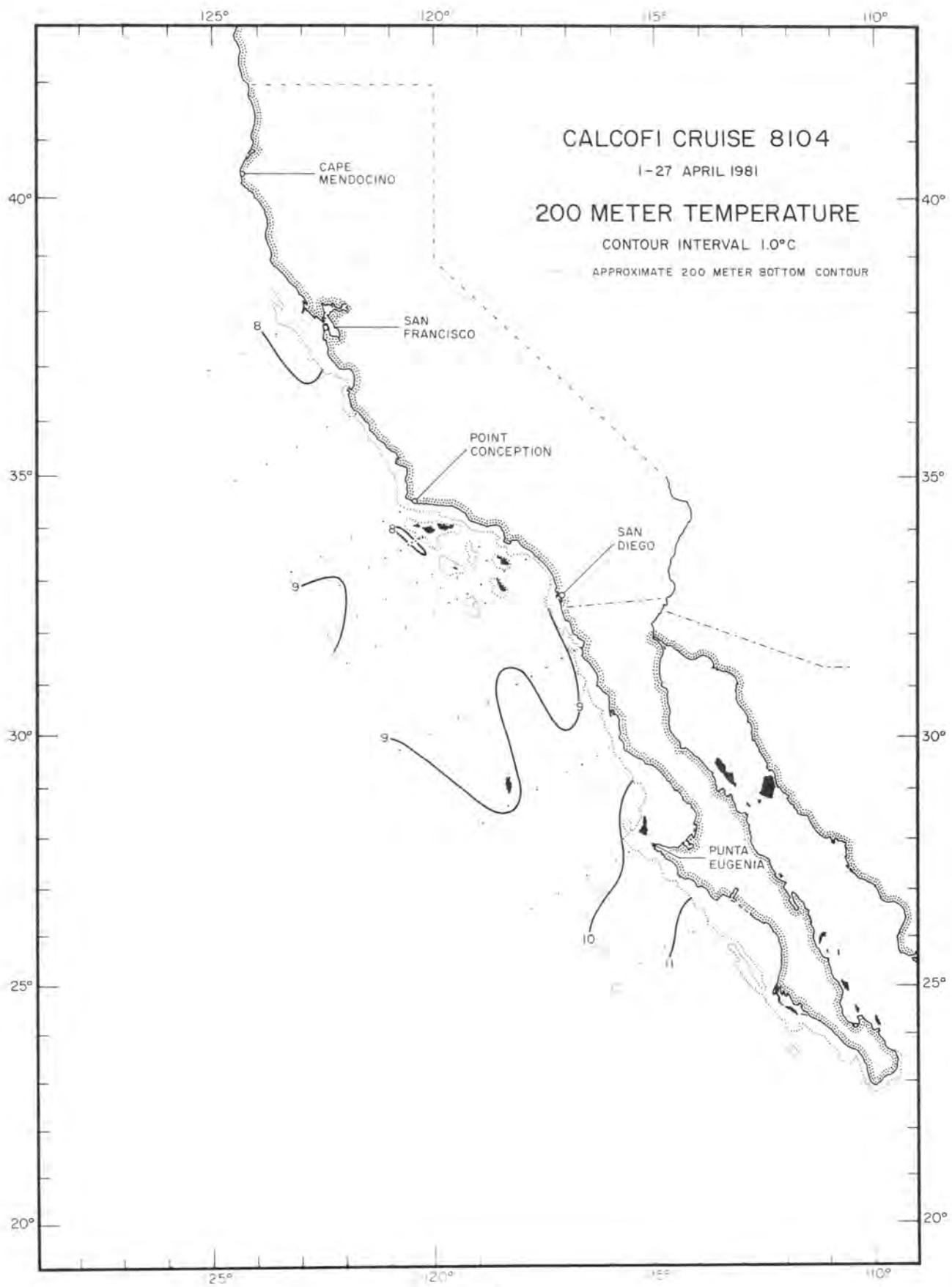


FIGURE 7

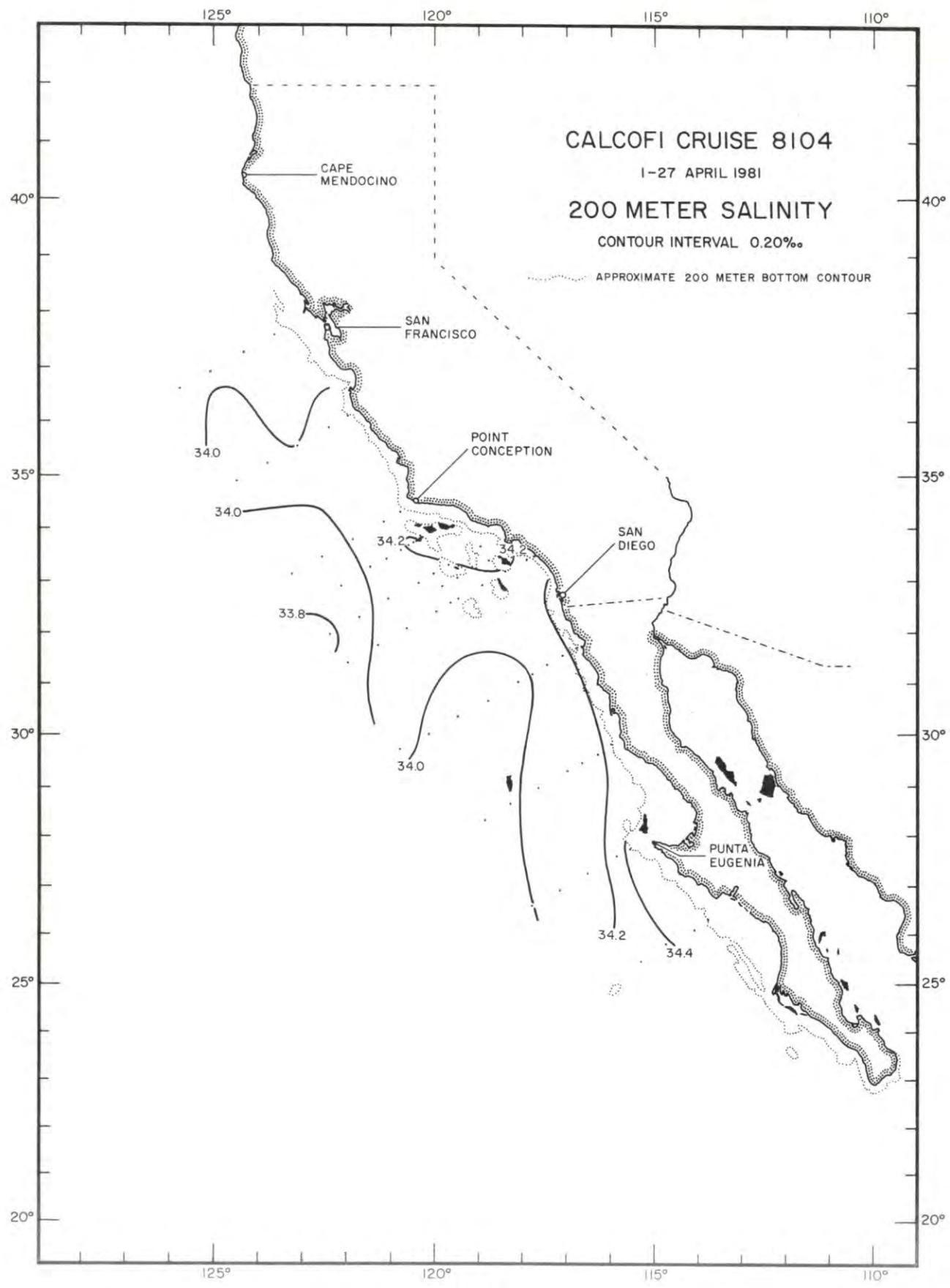


FIGURE 8

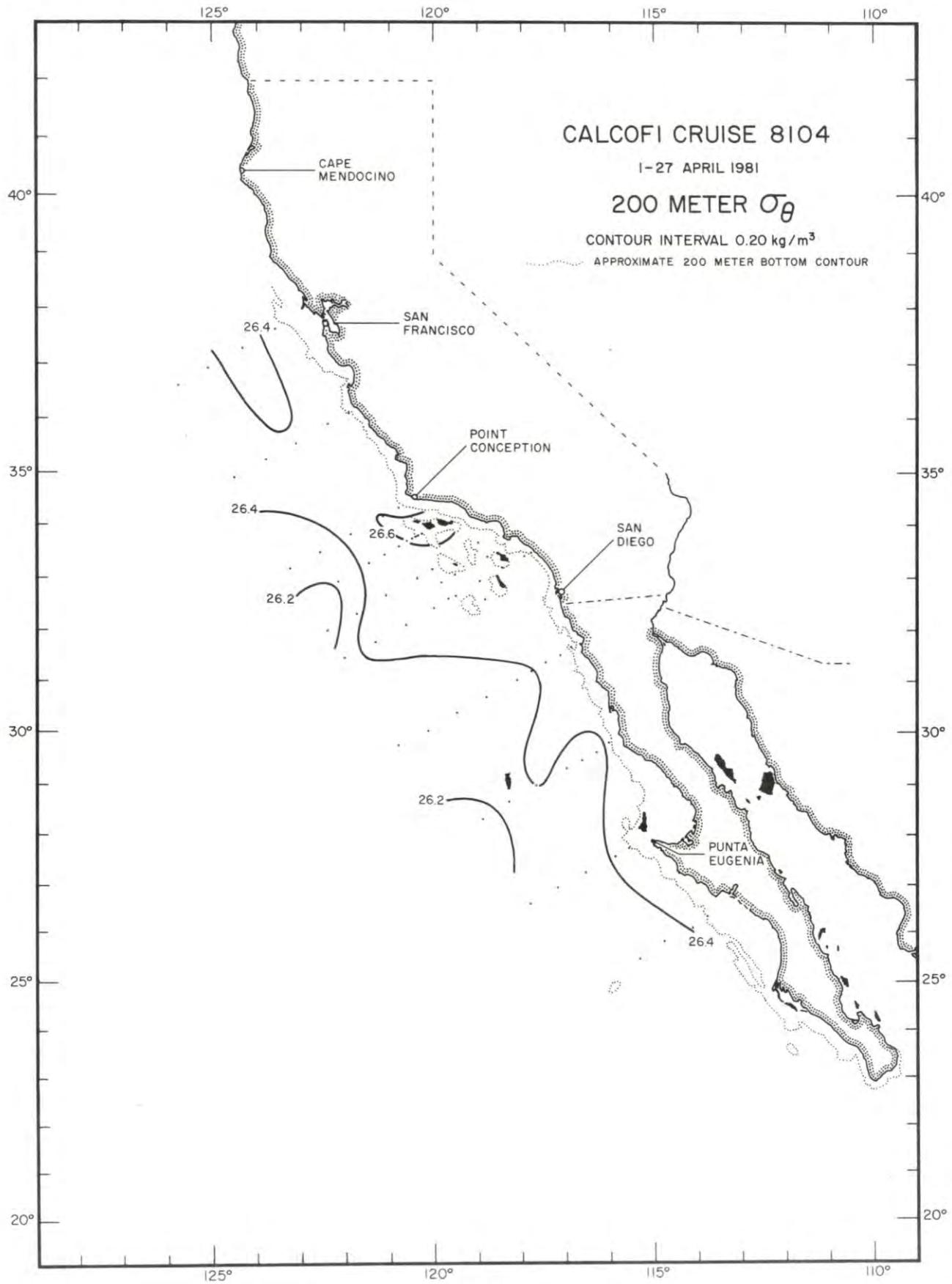


FIGURE 9

## PERSONNEL

Cruise 8104

### SHIPS' CAPTAINS

Roll, Milton, *RV David Starr Jordan*  
Davis, Laurence E., *RV New Horizon*

### PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

#### *RV David Starr Jordan*

Flerx, William C. (in charge)	Fishery Biologist, NMFS
Alheit, Jurgen	Fishery Biologist, Mar. Inst. Peru
Bergstad, Odd	Graduate Student, SIO
Conway, Carol B.	Staff Research Associate, SIO
Eber, Laurence E.	Oceanographer, NMFS
Favuzzi, John A.	Student, UCSB
Iacometti, Susan	Computer Specialist, NMFS
Inness-Brown, Lee	Physical Science Aide, NMFS
Kimbrell, Carol A.	Fishery Biologist, NMFS
Mead, Richard V.	Marine Technician, SIO
Piquelle, Susan J.	Biological Statistician, NMFS
Santander, Haydee	Fishery Biologist, Mar. Inst. Peru
Smith, Paul	Fishery Biologist, NMFS
Willason, Stewart W.	Student, UCSB

#### *RV New Horizon*

Costello, James P. (in charge)	Staff Research Associate, SIO
Abramenkoff, Dimitry N.	Biological Technician, NMFS
Eber, Laurence E.	Oceanographer, NMFS
Escudero-Diaz, Maritza A.	Investigador Titular, INP
Metoyer, Jack D.	Biological Technician, NMFS
Schmitt, James A.	Electronics Technician, SIO





































RV DAVID STARR JORDAN

CALCOFI CRUISE ATD4

10 METER DATA

LINE	STA	TIME	WEEK	WEAHT	TEMP	PCT	SIG TH	SVA	
88	50	13/04/81 0900GMT	33 02.7N	119 26.6W	WEAHT 0 BOTTOM 792M WIND 310 16 KT WAVES BAR 1016.4MB DRY 13.0C WET 11.5C CLOUDS	10	13.43	33.574	25.203 275.7
88	55	13/04/81 0500GMT	32 52.6N	119 49.0W	WEAHT 0 BOTTOM 1202M WIND 310 18 KT WAVES BAR 1016.8MB DRY 13.8C WET 12.0C CLOUDS	10	14.26	33.490	24.967 298.2
90	28	12/04/81 0230GMT	33 29.1N	117 46.7W	WEAHT 2 BOTTOM 65M WIND 310 12 KT WAVES 310 02 DE BAR 1016.5MB DRY 15.4C WET 13.8C CLOUDS 8/R SC	10	13.96	33.548	25.074 288.0
90	30	11/04/81 2358GMT	33 25.1N	117 54.3W	WEAHT 1 BOTTOM 611M WIND 280 15 KT WAVES 280 03 DE BAR 1017.3MB DRY 17.0C WET 14.2C CLOUDS 6/R AS	10	14.58	33.553	24.948 300.0
90	37	11/04/81 1843GMT	33 11.1N	118 23.1W	WEAHT 1 BOTTOM 1221M WIND 300 10 KT WAVES 280 03 DE BAR 1019.0MB DRY 15.7C WET 13.4C CLOUDS 6/R AS	10	14.86	33.535	24.874 307.1
90	45	11/04/81 1102GMT	32 55.1N	118 56.1W	WEAHT 0 BOTTOM 1803M WIND 280 06 KT WAVES BAR 1016.2MB DRY 13.0C WET 11.5C CLOUDS	10	15.38	33.567	24.785 315.5
90	53	11/04/81 0420GMT	32 39.1N	119 28.9W	WEAHT 0 BOTTOM 1387M WIND 300 17 KT WAVES BAR 1015.8MB DRY 13.8C WET 12.2C CLOUDS	10	15.28	33.563	24.804 315.7
90	60	10/04/81 2220GMT	32 25.1N	119 57.6W	WEAHT 2 BOTTOM 966M WIND 250 19 KT WAVES 240 10 DE BAR 1015.5MB DRY 15.0C WET 13.4C CLOUDS 8/R SC	10	15.38	33.543	24.767 317.3
90	70	10/04/81 1615GMT	32 05.8N	120 38.7W	WEAHT 2 BOTTOM 3832M WIND 340 23 KT WAVES 310 12 DE BAR 1016.0MB DRY 14.0C WET 12.0C CLOUDS 8/R SC	10	15.20	33.487	24.763 317.6
90	80	10/04/81 1011GMT	31 45.1N	121 18.9W	WEAHT 0 BOTTOM 3738M WIND 350 18 KT WAVES BAR 1015.3MB DRY 14.1C WET 12.4C CLOUDS	10	15.14	33.513	24.797 314.5
90	90	10/04/81 0415GMT	31 25.0N	121 59.3W	WEAHT 0 BOTTOM 4117M WIND 350 22 KT WAVES BAR 1016.9MB DRY 14.0C WET 11.9C CLOUDS	10	14.58	33.305	24.761 317.8
92	27	12/04/81 0604GMT	33 13.4N	117 30.4W	WEAHT 0 BOTTOM 131M WIND 330 08 KT WAVES BAR 1017.0MB DRY 15.7C WET 14.0C CLOUDS	10	13.84	33.579	25.123 283.4
92	30	12/04/81 0749GMT	33 07.4N	117 42.8W	WEAHT 0 BOTTOM 824M WIND 320 09 KT WAVES BAR 1017.3MB DRY 15.6C WET 13.9C CLOUDS	10	15.71	33.546	24.696 324.0
92	35	12/04/81 1022GMT	32 57.4N	118 03.3W	WEAHT 0 BOTTOM 944M WIND 330 04 KT WAVES BAR 1016.6MB DRY 14.6C WET 13.0C CLOUDS	10	14.80	33.546	24.896 305.0
92	40	12/04/81 1318GMT	32 47.4N	118 23.8W	WEAHT 1 BOTTOM 82M WIND 330 05 KT WAVES 250 03 DE BAR 1016.1MB DRY 13.5C WET 12.1C CLOUDS 6/R AC	10	15.06	33.548	24.841 310.3
92	45	12/04/81 1602GMT	32 37.4N	118 44.4W	WEAHT 1 BOTTOM 972M WIND 300 09 KT WAVES 300 06 DE BAR 1017.2MB DRY 15.3C WET 13.4C CLOUDS 6/R SC	10		33.557	
92	50	12/04/81 1950GMT	32 27.5N	119 04.7W	WEAHT 1 BOTTOM 82M WIND 310 17 KT WAVES 290 08 DE BAR 1017.6MB DRY 16.7C WET 13.8C CLOUDS 2/R SC	10	15.52	33.563	24.751 318.8
92	55	12/04/81 2255GMT	32 17.4N	119 25.2W	WEAHT 0 BOTTOM 1392M WIND 320 20 KT WAVES 330 06 DE BAR 1016.5MB DRY 15.9C WET 13.3C CLOUDS 0/R	10	15.22	33.529	24.791 315.0
93	26.7	08/04/81 0443GMT	32 57.4N	117 18.2W	WEAHT 1 BOTTOM 65M WIND 210 10 KT WAVES BAR 1015.8MB DRY 14.3C WET 11.8C CLOUDS	10	14.98	33.585	24.886 305.9
93	28	08/04/81 0615GMT	32 54.8N	117 23.7W	WEAHT 1 BOTTOM 639M WIND 250 10 KT WAVES BAR 1016.1MB DRY 14.2C WET 11.3C CLOUDS	10	13.88	33.563	25.103 285.3
93	30	08/04/81 0828GMT	32 50.8N	117 31.9W	WEAHT 0 BOTTOM 833M WIND 210 06 KT WAVES BAR 1015.8MB DRY 14.0C WET 10.8C CLOUDS	10	14.40	33.539	24.975 297.4
93	35	08/04/81 1205GMT	32 40.8N	117 52.4W	WEAHT 0 BOTTOM 602M WIND 310 04 KT WAVES BAR 1015.6MB DRY 14.2C WET 11.1C CLOUDS	10	15.81	33.499	24.637 329.6
93	40	08/04/81 1543GMT	32 30.9N	118 12.6W	WEAHT 2 BOTTOM 1710M WIND 300 12 KT WAVES 300 04 DE BAR 1015.8MB DRY 14.0C WET CLOUDS 8/R SC	10	15.54	33.509	24.705 323.1
93	45	08/04/81 1930GMT	32 20.7N	118 33.3W	WEAHT 2 BOTTOM 1572M WIND 310 12 KT WAVES 300 08 DE BAR 1017.2MB DRY 15.5C WET 13.2C CLOUDS 8/R SC	10	15.40	33.521	24.746 319.3
93	50	08/04/81 2359GMT	32 10.8N	118 53.6W	WEAHT 2 BOTTOM 1485M WIND 310 18 KT WAVES 320 08 DE BAR 1016.9MB DRY 15.2C WET 12.8C CLOUDS 8/R SC	10	15.24	33.560	24.811 313.1
93	55	09/04/81 0349GMT	32 00.9N	119 13.7W	WEAHT 1 BOTTOM 1577M WIND 320 21 KT WAVES BAR 1017.3MB DRY 14.2C WET 12.2C CLOUDS	10	15.07	33.544	24.836 310.7

RV DAVID STARR JORDAN CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
93	60	09/04/81	0649GMT	31 50.7N 119 34.2W WEATH BOTTOM 2043M WIND 350 18 KT WAVES BAR 1012.5MB DRY 14.4C WET 12.2C CLOUDS	10	14.92	33.530	24.857	308.7
93	70	09/04/81	1153GMT	31 30.8N 120 14.8W WEATH BOTTOM 3889M WIND 340 20 KT WAVES BAR 1016.1MB DRY 14.0C WET 11.5C CLOUDS	10	15.28	33.463	24.727	321.1
93	80	09/04/81	1658GMT	31 10.9N 120 55.2W WEATH 2 BOTTOM 3926M WIND 350 20 KT WAVES 320 10 08 BAR 1017.8MB DRY 14.8C WET 12.5C CLOUDS 8/8 SC	10	14.86	33.375	24.751	318.8
93	90	09/04/81	2213GMT	30 50.8N 121 35.4W WEATH 2 BOTTOM 4205M WIND 350 20 KT WAVES 360 10 07 BAR 1016.9MB DRY 15.2C WET 13.5C CLOUDS 8/8 SC	10	14.66	33.286	24.725	321.2
95	30	01/04/81	0353GMT	32 33.1N 117 20.3W WEATH 0 BOTTOM 108M WIND 250 03 KT WAVES BAR 1012.2MB DRY 15.4C WET 13.8C CLOUDS 0/0	10	14.38	33.520	24.765	298.4
95	30	07/04/81	0112GMT	32 33.1N 117 20.3W WEATH 1 BOTTOM 106M WIND 220 11 KT WAVES 210 03 05 BAR 1013.8MB DRY 17.1C WET 15.2C CLOUDS 6/8 ST	10	15.36	33.538	24.768	317.2
95	35	06/04/81	2158GMT	32 23.1N 117 40.8W WEATH 1 BOTTOM 1572M WIND 270 10 KT WAVES 270 02 08 BAR 1014.4MB DRY 19.7C WET 17.9C CLOUDS 3/8 ST	10	15.85	33.516	24.641	329.3
95	40	06/04/81	1903GMT	32 13.0N 118 01.1W WEATH 1 BOTTOM 1110M WIND 270 11 KT WAVES 270 06 05 BAR 1015.5MB DRY 19.8C WET 16.8C CLOUDS 6/8 SC	10	16.01	33.531	24.617	331.6
97	29	06/04/81	0531GMT	32 17.4N 117 04.8W WEATH BOTTOM 50M WIND 020 12 KT WAVES BAR 1015.5MB DRY 18.8C WET 12.8C CLOUDS	10	13.26	33.616	25.270	269.4
97	30	01/04/81	0904GMT	32 15.4N 117 08.8W WEATH BOTTOM 52M WIND 040 07 KT WAVES BAR 1012.3MB DRY 14.8C WET 13.0C CLOUDS	10	14.39	33.507	24.953	299.5
97	30	06/04/81	0652GMT	32 15.4N 117 08.8W WEATH BOTTOM 56M WIND 350 15 KT WAVES BAR 1015.5MB DRY 18.9C WET 13.8C CLOUDS	10	14.58	33.535	24.934	301.3
LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
97	30	08/04/81	2204GMT	32 15.4N 117 08.8W WEATH 0 BOTTOM 57M WIND 290 12 KT WAVES 290 04 06 BAR 1016.6MB DRY 16.4C WET 13.1C CLOUDS 0/8	10	14.81	33.543	24.891	305.5
LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
97	32	06/04/81	0900GMT	32 11.4N 117 17.0W WEATH BOTTOM 1332M WIND 290 10 KT WAVES BAR 1014.8MB DRY 17.0C WET 14.0C CLOUDS	10	15.32	33.518	24.760	317.9
LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
97	32	09/04/81	0038GMT	32 11.5N 117 16.7W WEATH 1 BOTTOM 648M WIND 290 11 KT WAVES 290 04 06 BAR 1016.6MB DRY 15.1C WET 13.0C CLOUDS 5/8 CU	10	15.72	33.554	24.700	323.7
LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
97	35	06/04/81	1140GMT	32 05.4N 117 29.2W WEATH BOTTOM 1313M WIND 310 18 KT WAVES BAR 1014.0MB DRY 15.5C WET 14.9C CLOUDS	10	15.52	33.508	24.709	322.8
LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
97	35	09/04/81	0307GMT	32 05.5N 117 28.6W WEATH BOTTOM 463M WIND 290 08 KT WAVES BAR 1018.0MB DRY 14.3C WET 12.0C CLOUDS	10	15.92	33.541	24.645	328.9
LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA	
97	40	06/04/81	1524GMT	31 55.6N 117 49.2W WEATH 1 BOTTOM 972M WIND 300 15 KT WAVES 270 05 05 BAR 1015.1MB DRY 15.4C WET 15.5C CLOUDS 5/8 SC	10	15.88	33.608	24.706	323.1

RV NEW HORIZON CALCOFI CRUISE 8104								10 METER DATA						
LINE	STA					Z	T	S	02	02	PCT	SIG	TH	SVA
97	40	09/04/81 0640GMT 31 55.3N 118 49.5W WEATH BOTTON 3017M WIND 340 06 KT WAVES BAR 1018.0MB DRY 14.0C WET 11.2C CLOUDS				10	15.93	33.5514				24.687	324.9	
97	45	09/04/81 0954GMT 31 45.1N 118 09.4W WEATH BOTTON 1468M WIND 280 07 KT WAVES BAR 1016.9MB DRY 13.7C WET 11.8C CLOUDS				10	15.56	33.5540				24.727	321.1	
97	50	09/04/81 1326GMT 31 35.0N 118 28.9W WEATH 2 BOTTON 2523M WIND 290 10 KT WAVES 300 04 04 BAR 1016.6MB DRY 13.9C WET 12.0C CLOUDS 8/8 ST				10	15.41	33.5565				24.762	317.8	
97	55	09/04/81 1708GMT 31 25.5N 118 50.3W WEATH 2 BOTTON 1017M WIND 290 18 KT WAVES 310 04 04 BAR 1017.6MB DRY 14.3C WET 12.4C CLOUDS 8/8 ST				10	15.88	33.5590				24.692	324.5	
97	60	09/04/81 2036GMT 31 15.5N 119 10.4W WEATH 2 BOTTON 3688M WIND 310 18 KT WAVES 310 07 04 BAR 1015.9MB DRY 15.7C WET 13.4C CLOUDS 8/8 SC				10	16.04	33.5584				24.651	328.3	
97	70	10/04/81 0201GMT 30 56.1N 119 50.6W WEATH 2 BOTTON 3597M WIND 310 20 KT WAVES 310 18 06 BAR 1015.9MB DRY 14.1C WET 12.6C CLOUDS 8/8 SC				10	16.01	33.5599				24.669	326.6	
97	80	10/04/81 0716GMT 30 35.2N 120 31.0W WEATH BOTTON 3889M WIND 310 18 KT WAVES BAR 1017.3MB DRY 14.1C WET 12.0C CLOUDS				10	15.32	33.5416				24.682	325.3	
97	90	10/04/81 1240GMT 30 14.9N 121 10.9W WEATH BOTTON 3730M WIND 320 16 KT WAVES BAR 1017.3MB DRY 14.0C WET 11.5C CLOUDS				10	14.78	33.5368				24.761	317.8	
RV DAVID STARR JORDAN CALCOFI CRUISE 8104								10 METER DATA						
LINE	STA					Z	T	S	02	02	PCT	SIG	TH	SVA
98	29	06/04/81 0243GMT 32 00.8N 116 54.0W WEATH 0 BOTTON 93M WIND 360 12 KT WAVES 340 02 02 BAR 1014.7MB DRY 18.3C WET 13.7C CLOUDS 0/8				10	14.58	33.5537				24.936	301.2	
98	30	01/04/81 1159GMT 31 58.8N 116 58.1W WEATH BOTTON 667M WIND 040 04 KT WAVES BAR 1012.0MB DRY 14.0C WET 13.1C CLOUDS				10	15.32	33.5501				24.748	319.1	
98	35	05/04/81 2333GMT 31 48.8N 117 18.4W WEATH 0 BOTTON 1184M WIND 320 15 KT WAVES 320 02 02 BAR 1016.2MB DRY 19.8C WET 15.8C CLOUDS 0/8				10	15.82	33.5554				24.677	325.8	
98	40	05/04/81 2047GMT 31 38.8N 117 38.6W WEATH 0 BOTTON 1387M WIND 340 12 KT WAVES 320 02 02 BAR 1018.8MB DRY 21.5C WET 16.9C CLOUDS 0/8				10	15.82	33.5545				24.670	326.5	
RV NEW HORIZON CALCOFI CRUISE 8104								10 METER DATA						
LINE	STA					Z	T	S	02	02	PCT	SIG	TH	SVA
100	29.2	12/04/81 1539GMT 31 42.8N 116 43.5W WEATH 2 BOTTON 84M WIND 300 10 KT WAVES 300 03 05 BAR 1017.6MB DRY 15.5C WET 13.5C CLOUDS 8/8 ST				10	14.28	33.5592				25.034	291.8	
RV DAVID STARR JORDAN CALCOFI CRUISE 8104								10 METER DATA						
LINE	STA					Z	T	S	02	02	PCT	SIG	TH	SVA
100	29.4	05/04/81 0533GMT 31 42.4N 116 44.1W WEATH BOTTON 108M WIND 080 12 KT WAVES BAR 1021.1MB DRY 16.7C WET 13.2C CLOUDS				10	13.15	33.702				25.359	260.9	
100	30	01/04/81 1447GMT 31 41.2N 116 46.6W WEATH 2 BOTTON 408M WIND 070 07 KT WAVES 270 06 06 BAR 1012.2MB DRY 14.5C WET 13.0C CLOUDS 8/8 SC				10	13.35	33.668				25.292	267.3	
100	30	05/04/81 0749GMT 31 41.1N 116 46.7W WEATH BOTTON 408M WIND 010 13 KT WAVES BAR 1021.3MB DRY 15.8C WET 14.1C CLOUDS				10	13.26	33.655				25.300	266.5	
RV NEW HORIZON CALCOFI CRUISE 8104								10 METER DATA						
LINE	STA					Z	T	S	02	02	PCT	SIG	TH	SVA
100	30	12/04/81 1440GMT 31 42.4N 116 46.5W WEATH 2 BOTTON 448M WIND 310 12 KT WAVES 310 02 04 BAR 1016.9MB DRY 16.0C WET 13.2C CLOUDS 8/8 ST				10	15.41	33.5549				24.765	317.5	
RV DAVID STARR JORDAN CALCOFI CRUISE 8104								10 METER DATA						
LINE	STA					Z	T	S	02	02	PCT	SIG	TH	SVA
100	35	05/04/81 1138GMT 31 31.2N 117 06.9W WEATH 0 BOTTON 1295M WIND 030 10 KT WAVES BAR 1019.9MB DRY 17.2C WET 14.8C CLOUDS 0/8				10	15.86	33.5543				24.660	327.5	

RV NEW HORIZON CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
100	35	12/04/81 0945GMT 31 31.6N 117 07.5W WEATH 0 BOTTOM 1196M WIND 290 10 KT WAVES 290 04 06 BAR 1018.0MB DRY 15.3C WET 13.6C CLOUDS 8/8 ST	10	16.12	33.554	24.610	332.2					
RV DAVID STARR JORDAN CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
100	40	05/04/81 1610GMT 31 21.3N 117 26.8W WEATH 0 BOTTOM 1849M WIND 010 15 KT WAVES 290 04 06 BAR 1019.5MB DRY 17.2C WET 15.0C CLOUDS 0/0	10	15.52	33.553	24.721	321.6					
RV NEW HORIZON CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
100	40	12/04/81 0457GMT 31 21.0N 117 27.2W WEATH 0 BOTTOM 1849M WIND 330 12 KT WAVES 310 04 03 BAR 1017.6MB DRY 14.7C WET 13.0C CLOUDS	10	15.72	33.561	24.705	323.2					
100	45	11/04/81 2328GMT 31 10.9N 117 47.7W WEATH 2 BOTTOM 1534M WIND 310 14 KT WAVES 310 04 03 BAR 1018.3MB DRY 16.0C WET 13.6C CLOUDS 8/8 SC	10	16.00	33.556	24.661	327.3					
100	50	11/04/81 2008GMT 31 01.0N 118 07.0W WEATH 2 BOTTOM 1755M WIND 310 18 KT WAVES 310 04 05 BAR 1019.3MB DRY 15.7C WET 13.0C CLOUDS 8/8 SC	10	16.09	33.592	24.646	328.8					
100	60	11/04/81 1249GMT 30 41.3N 118 48.2W WEATH 0 BOTTOM 2860M WIND 320 18 KT WAVES 310 04 05 BAR 1018.0MB DRY 14.9C WET 12.9C CLOUDS	10	16.66	33.765	24.649	328.7					
100	70	11/04/81 0722GMT 30 21.0N 119 27.6W WEATH 0 BOTTOM 3815M WIND 330 13 KT WAVES 310 04 05 BAR 1017.6MB DRY 15.0C WET 13.0C CLOUDS	10	15.78	33.446	24.604	332.9					
100	80	10/04/81 2355GMT 30 01.1N 120 07.6W WEATH 2 BOTTOM 3757M WIND 320 18 KT WAVES 330 04 04 BAR 1015.6MB DRY 15.0C WET 13.0C CLOUDS 8/8 SC	10	15.91	33.564	24.665	327.0					
100	90	10/04/81 1910GMT 29 43.6N 120 45.8W WEATH 2 BOTTOM 3824M WIND 310 16 KT WAVES 320 05 04 BAR 1017.3MB DRY 16.3C WET 13.3C CLOUDS 8/8 SC	10	15.03	33.337	24.685	325.1					
RV DAVID STARR JORDAN CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
102	29	05/04/81 0130GMT 31 25.5N 116 32.5W WEATH 0 BOTTOM 15M WIND 330 09 KT WAVES 300 02 04 BAR 1020.3MB DRY 16.8C WET 14.0C CLOUDS 0/0	10	13.13	33.705	25.365	260.4					
102	30	01/04/81 1748GMT 31 23.5N 116 35.2W WEATH 2 BOTTOM 28M WIND 360 02 KT WAVES 320 03 02 BAR 1012.6MB DRY 16.0C WET 14.8C CLOUDS 8/8 SC	10	13.00	33.737	25.415	255.6					
102	35	04/04/81 2207GMT 31 13.5N 116 55.4W WEATH 0 BOTTOM 1295M WIND 310 13 KT WAVES 320 03 03 BAR 1021.4MB DRY 17.7C WET 15.3C CLOUDS 0/0	10	15.22	33.499	24.768	317.2					
102	40	04/04/81 1912GMT 31 03.4N 117 15.5W WEATH 0 BOTTOM 2037M WIND 320 08 KT WAVES 330 06 08 BAR 1022.9MB DRY 17.7C WET 14.4C CLOUDS 0/0	10	15.46	33.537	24.745	319.4					
103	29	04/04/81 0512GMT 31 08.9N 116 20.5W WEATH 0 BOTTOM 24M WIND 340 18 KT WAVES 310 04 04 BAR 1019.2MB DRY 13.9C WET 11.8C CLOUDS	10	13.82	33.567	25.118	283.8					
RV NEW HORIZON CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
103	29	12/04/81 2055GMT 31 09.1N 116 21.3W WEATH 2 BOTTOM 29M WIND 290 11 KT WAVES 290 03 04 BAR 1016.2MB DRY 17.0C WET 15.2C CLOUDS 8/8 ST	10	13.13	33.607	25.289	267.6					
RV DAVID STARR JORDAN CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
103	30	01/04/81 2035GMT 31 06.9N 116 24.5W WEATH 2 BOTTOM 62M WIND 310 03 KT WAVES 300 02 02 BAR 1017.5MB DRY 16.8C WET 14.0C CLOUDS 8/8 SC	10	14.04	33.529	25.043	290.9					
103	30	04/04/81 0657GMT 31 06.9N 116 24.5W WEATH 0 BOTTOM 62M WIND 340 15 KT WAVES 320 03 03 BAR 1020.3MB DRY 14.0C WET 11.7C CLOUDS	10	14.06	33.51F	25.031	292.2					
RV NEW HORIZON CALCOFI CRUISE 8104							10 METER DATA					
LINE	STA		Z	T	S	02	02 PCT	SIG TH	SVA			
103	30	12/04/81 2225GMT 31 06.3N 116 24.5W WEATH 2 BOTTOM 68M WIND 300 12 KT WAVES 290 07 04 BAR 1015.2MB DRY 15.0C WET 14.6C CLOUDS 8/8 ST	10	12.77	33.566	25.328	265.8					

RV DAVID STARR JORDAN CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
103	35 04/04/81 1059GMT 30 56.9N 116 44.8W WEATH BOTTOM 1387M WIND 340 15 KT WAVES BAR 1019.6MB DRY 14.1C WET 12.1C CLOUDS	10	13.80	33.611			25.156	280.2

RV NEW HORIZON CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
103	35 13/04/81 0111GMT 30 57.2N 116 42.1W WEATH 2 BOTTOM 1017M WIND 300 15 KT WAVES 300 04 04 BAR 1015.6MB DRY 15.2C WET 13.2C CLOUDS 8/8 ST	10	16.36	33.540			24.544	338.5

RV DAVID STARR JORDAN CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
103	40 04/04/81 1521GMT 30 46.8N 117 04.8W WEATH 1 BOTTOM 1856M WIND 330 10 KT WAVES 330 10 09 BAR 1021.7MB DRY 16.5C WET 13.2C CLOUDS 6/6 CU	10	15.52	33.545			24.737	320.1

RV NEW HORIZON CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
103	40 13/04/81 0441GMT 30 46.9N 117 04.8W WEATH BOTTOM 1635M WIND 270 12 KT WAVES BAR 1018.0MB DRY 14.4C WET 12.7C CLOUDS	10	16.12	33.539			24.598	333.4
103	45 13/04/81 0815GMT 30 36.5N 117 24.8W WEATH BOTTOM 2222M WIND 320 13 KT WAVES BAR 1018.0MB DRY 15.0C WET 13.0C CLOUDS	10	16.02	33.586			24.657	327.8
103	50 13/04/81 1120GMT 30 26.9N 117 44.8W WEATH BOTTOM 2803M WIND 310 14 KT WAVES BAR 1017.6MB DRY 14.8C WET 12.6C CLOUDS	10	15.82	33.566			24.687	324.9
103	60 13/04/81 1636GMT 30 07.0N 118 24.5W WEATH 1 BOTTOM 3540M WIND 310 13 KT WAVES 330 04 05 BAR 1019.6MB DRY 15.7C WET 13.2C CLOUDS 4/8 SC	10	16.53	33.706			24.632	330.1
103	70 13/04/81 2145GMT 29 46.8N 119 04.1W WEATH 1 BOTTOM 3549M WIND 330 13 KT WAVES 340 05 05 BAR 1018.6MB DRY 15.3C WET 13.2C CLOUDS 7/8 CU	10	16.35	33.561			24.562	336.8
103	80 14/04/81 0257GMT 29 26.7N 119 42.6W WEATH 1 BOTTOM 3748M WIND 320 14 KT WAVES 330 06 05 BAR 1019.6MB DRY 14.3C WET 12.4C CLOUDS 3/8 AC	10	15.71	33.396			24.580	335.0

RV DAVID STARR JORDAN CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
105	30 04/04/81 0153GMT 30 49.2N 116 13.2W WEATH 0 BOTTOM 22M WIND 320 21 KT WAVES 290 04 06 BAR 1018.0MB DRY 14.7C WET 11.9C CLOUDS 0/8	10	13.58	33.556			25.159	280.0
105	31 01/04/81 2340GMT 30 47.2N 116 17.2W WEATH 1 BOTTOM 39M WIND 310 07 KT WAVES BAR 1015.5MB DRY 16.9C WET 14.3C CLOUDS 1/8 SC	10	14.56	33.517			24.925	302.2
105	35 03/04/81 2250GMT 30 39.2N 116 33.2W WEATH 1 BOTTOM 1295M WIND 320 19 KT WAVES 280 06 08 BAR 1014.8MB DRY 16.2C WET 12.5C CLOUDS 1/8 CU	10	15.32	33.499			24.746	319.3
105	40 03/04/81 1921GMT 30 29.2N 116 53.2W WEATH 1 BOTTOM 1763M WIND 330 17 KT WAVES 310 10 08 BAR 1021.5MB DRY 17.1C WET 13.1C CLOUDS 2/5 CU	10	15.34	33.497			24.740	319.8
107	31 02/04/81 0232GMT 30 29.5N 116 05.8W WEATH 1 BOTTOM 22M WIND 310 09 KT WAVES BAR 1013.5MB DRY 16.2C WET 13.5C CLOUDS 2/8 SC	10	14.09	33.529			25.033	291.9
107	31 03/04/81 0537GMT 30 29.5N 116 05.8W WEATH BOTTOM 21M WIND 330 16 KT WAVES BAR 1017.2MB DRY 14.0C WET 11.0C CLOUDS	10	13.73	33.573			25.141	281.6

RV NEW HORIZON CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
107	31 15/04/81 1611GMT 30 29.5N 116 05.7W WEATH 2 BOTTOM 26M WIND 320 11 KT WAVES 330 02 03 BAR 1019.3MB DRY 14.9C WET 12.8C CLOUDS 8/8 ST	10	14.43	33.567			24.991	296.0

RV DAVID STARR JORDAN CALCOFI CRUISE 8104 10 METER DATA

LINE	STA	Z	T	S	02	02 PCT	SIG TH	SVA
107	32 03/04/81 0744GMT 30 27.5N 116 09.8W WEATH BOTTOM 136M WIND 050 14 KT WAVES BAR 1017.2MB DRY 13.0C WET 10.8C CLOUDS	10	15.83	33.504			24.636	329.7



RV NEW HORIZON			CALCOFI CRUISE 8104			10 METER DATA						
LINE	STA					Z	T	S	02	02 PCT	SIG TH	SVA
110	35	15/04/81 2351GMT 29 46.9N 115 59.4W WEATH 7 BOTTOM 333M WIND 310 15 KT WAVES 317 04 03 BAR 1018.6MB DRY 15.4C WET 13.2C CLOUDS 8/R SC				10	14.76	33.555			24.912	303.5
RV DAVID STARR JORDAN			CALCOFI CRUISE 8104			10 METER DATA						
LINE	STA					Z	T	S	02	02 PCT	SIG TH	SVA
110	40	02/04/81 1559GMT 29 37.1N 116 19.5W WEATH 1 BOTTOM 2416M WIND 300 11 KT WAVES 300 04 04 BAR 1014.6MB DRY 15.1C WET 13.7C CLOUDS 3/R CR				10	16.38	33.581			24.571	336.0
RV NEW HORIZON			CALCOFI CRUISE 8104			10 METER DATA						
LINE	STA					Z	T	S	02	02 PCT	SIG TH	SVA
110	40	16/04/81 0453GMT 29 36.3N 116 19.3W WEATH BOTTOM 2390M WIND 310 13 KT WAVES BAR 1020.0MB DRY 14.7C WET 12.7C CLOUDS				10	16.32	33.561			24.569	336.1
110	45	16/04/81 0752GMT 29 26.6N 116 38.8W WEATH BOTTOM 814M WIND 310 14 KT WAVES BAR 1019.6MB DRY 14.7C WET 12.4C CLOUDS				10	16.88	33.678			24.529	339.9
110	50	16/04/81 1309GMT 29 17.4N 116 58.8W WEATH BOTTOM 2879M WIND 310 18 KT WAVES BAR 1019.3MB DRY 15.0C WET 13.0C CLOUDS				10	17.13	33.733			24.513	341.5
110	60	16/04/81 1830GMT 28 57.1N 117 38.8W WEATH 1 BOTTOM 3540M WIND 330 14 KT WAVES 320 04 03 BAR 1021.3MB DRY 16.9C WET 14.8C CLOUDS 7/R SC				10	16.85	33.627			24.497	343.0
110	70	17/04/81 0139GMT 28 37.1N 118 17.9W WEATH 2 BOTTOM 3424M WIND 310 15 KT WAVES 320 04 03 BAR 1018.3MB DRY 16.5C WET 14.7C CLOUDS B/R SC				10	16.70	33.653			24.552	337.8
110	80	17/04/81 0650GMT 28 16.8N 118 57.2W WEATH BOTTOM 3853M WIND 330 17 KT WAVES BAR 1019.3MB DRY 15.6C WET 14.0C CLOUDS				10	16.00	33.464			24.568	336.3
113	29	18/04/81 2150GMT 29 25.2N 115 14.3W WEATH 1 BOTTOM 25M WIND 270 13 KT WAVES 270 03 03 BAR 1016.9MB DRY 17.1C WET 15.0C CLOUDS 1/R CI				10	12.92	33.765			25.453	252.0
113	30	18/04/81 2019GMT 29 23.2N 115 18.2W WEATH 2 BOTTOM 57M WIND 270 13 KT WAVES 270 03 03 BAR 1018.0MB DRY 15.9C WET 14.3C CLOUDS 8/R SC				10	13.44	33.745			25.333	263.4
113	35	18/04/81 1633GMT 29 12.7N 115 37.8W WEATH 2 BOTTOM 1156M WIND 300 14 KT WAVES 300 03 03 BAR 1018.6MB DRY 16.1C WET 13.6C CLOUDS B/R SC				10	15.38	33.604			24.814	312.8
113	40	18/04/81 1233GMT 29 02.6N 115 59.3W WEATH BOTTOM 1896M WIND 310 13 KT WAVES BAR 1015.9MB DRY 15.5C WET 13.3C CLOUDS				10	16.33	33.562			24.568	336.3
113	45	18/04/81 0902GMT 28 52.9N 116 17.7W WEATH BOTTOM 2083M WIND 300 19 KT WAVES BAR 1015.9MB DRY 15.8C WET 13.8C CLOUDS				10	17.28	33.806			24.533	339.6
113	50	18/04/81 0541GMT 28 43.6N 116 36.7W WEATH BOTTOM 3502M WIND 320 13 KT WAVES BAR 1016.2MB DRY 15.9C WET 13.5C CLOUDS				10	17.50	33.834			24.502	342.6
113	60	18/04/81 0017GMT 28 23.0N 117 16.0W WEATH 2 BOTTOM 3578M WIND 330 14 KT WAVES 330 04 03 BAR 1018.6MB DRY 17.0C WET 15.2C CLOUDS 8/R SC				10	17.33	33.681			24.425	349.8
113	70	17/04/81 1832GMT 28 02.7N 117 55.9W WEATH 2 BOTTOM 2991M WIND 310 13 KT WAVES 330 04 03 BAR 1018.6MB DRY 17.7C WET 16.0C CLOUDS 8/R SC				10	16.66	33.615			24.532	339.7
113	80	17/04/81 1300GMT 27 43.5N 118 34.7W WEATH BOTTOM 3871M WIND 350 18 KT WAVES BAR 1018.0MB DRY 15.7C WET 14.8C CLOUDS				10	16.90	33.729			24.564	336.7
117	25	19/04/81 0328GMT 28 57.8N 114 36.0W WEATH BOTTOM 42M WIND 300 17 KT WAVES BAR 1018.6MB DRY 15.2C WET 13.2C CLOUDS				10	14.06	33.701			25.172	278.7
117	30	19/04/81 0637GMT 28 47.7N 114 55.1W WEATH BOTTOM 99M WIND 300 17 KT WAVES BAR 1020.3MB DRY 15.3C WET 13.9C CLOUDS				10	15.21	33.571			24.826	311.7
117	35	20/04/81 0417GMT 28 37.5N 115 15.6W WEATH BOTTOM 205M WIND 320 22 KT WAVES BAR 1019.6MB DRY 15.4C WET 13.3C CLOUDS				10	16.35	33.561			24.562	336.8
117	40	20/04/81 1109GMT 28 27.7N 115 35.1W WEATH BOTTOM 1008M WIND 310 17 KT WAVES BAR 1018.3MB DRY 15.6C WET 13.0C CLOUDS				10	16.90	33.704			24.545	338.5
117	45	20/04/81 1415GMT 28 17.6N 115 57.8W WEATH 1 BOTTOM 3163M WIND 320 15 KT WAVES 320 03 05 BAR 1019.3MB DRY 15.7C WET 13.9C CLOUDS 4/R SC				10	16.48	33.563			24.534	339.5
117	50	20/04/81 1705GMT 28 07.5N 116 14.4W WEATH 1 BOTTOM 4683M WIND 330 17 KT WAVES 330 03 03 BAR 1019.3MB DRY 17.3C WET 14.4C CLOUDS 3/R CT				10	16.33	33.591			24.590	334.1

RV NEW HORIZON		CALIF/ET CROZEE 11/04		TIMER METER DATA
LINE	STA			Z T S 00 02 ECT SIG TH SVA
117	60	20/04/81 2215GMT 27 47.8N 116 53.1W WEATH 1 BOTTOM 3672M WIND 310 17 KT WAVES 320 05 04 BAR 1017.3MB DRY 17.30 WET 14.40 CLOUDS 5/7 CU	10 17.55 33.717	25.782 353.5
117	70	21/04/81 0333GMT 27 27.4N 117 31.4W WEATH 0 BOTTOM 3980M WIND 320 20 KT WAVES 340 05 04 BAR 1018.3MB DRY 15.20 WET 14.10 CLOUDS	10 17.45 33.644	24.407 351.6
117	80	21/04/81 0847GMT 27 07.0N 118 10.5W WEATH 0 BOTTOM 4341M WIND 320 17 KT WAVES 340 05 04 BAR 1017.6MB DRY 15.80 WET 13.30 CLOUDS	10 17.34 33.744	24.581 342.6
118	39	20/04/81 0705GMT 28 16.2N 115 22.4W WEATH 0 BOTTOM 183M WIND 320 20 KT WAVES 340 05 04 BAR 1019.3MB DRY 15.90 WET 13.10 CLOUDS	10 16.82 33.753	24.601 333.1
119	33	20/04/81 0048GMT 28 17.3N 114 52.7W WEATH 0 BOTTOM 106M WIND 320 21 KT WAVES 320 05 04 BAR 1018.0MB DRY 16.30 WET 14.00 CLOUDS 0/0	10 16.41 33.659	24.570 336.1
120	24	19/04/81 1326GMT 28 25.4N 114 10.9W WEATH 0 BOTTOM 36M WIND 340 14 KT WAVES 340 05 04 BAR 1020.0MB DRY 15.10 WET 13.50 CLOUDS	10 16.48 33.697	24.637 329.7
120	25	19/04/81 1409GMT 29 23.8N 114 14.7W WEATH 0 BOTTOM 51M WIND 330 12 KT WAVES 320 02 04 BAR 1020.6MB DRY 16.00 WET 14.00 CLOUDS 0/0	10 16.80 33.704	24.558 336.2
120	30	19/04/81 1827GMT 28 17.2N 114 34.7W WEATH 0 BOTTOM 95M WIND 310 10 KT WAVES 320 02 04 BAR 1021.0MB DRY 17.20 WET 14.10 CLOUDS 0/0	10 16.75 33.689	24.568 336.2
120	35	19/04/81 2059GMT 28 03.6N 114 53.8W WEATH 1 BOTTOM 79M WIND 340 14 KT WAVES 340 02 04 BAR 1019.3MB DRY 17.00 WET 14.00 CLOUDS 1/1 CI	10 16.49 33.696	24.634 330.0
120	38.5	22/04/81 1956GMT 27 56.3N 115 07.3W WEATH 1 BOTTOM 46M WIND 270 15 KT WAVES 280 03 04 BAR 1013.9MB DRY 19.80 WET 16.00 CLOUDS 1/1 CI	10 16.79 33.621	24.560 337.0
120	45	22/04/81 1359GMT 27 43.2N 115 33.4W WEATH 0 BOTTOM 2037M WIND 310 16 KT WAVES 340 02 04 BAR 1013.2MB DRY 16.00 WET 14.00 CLOUDS	10 16.90 33.652	24.505 342.3
120	50	22/04/81 0816GMT 27 33.3N 115 51.5W WEATH 0 BOTTOM 3918M WIND 310 17 KT WAVES 340 02 04 BAR 1013.2MB DRY 17.00 WET 15.00 CLOUDS	10 17.16 33.744	24.514 341.4
120	60	22/04/81 0339GMT 27 13.2N 116 30.9W WEATH 1 BOTTOM 3862M WIND 310 15 KT WAVES 310 05 04 BAR 1013.2MB DRY 18.90 WET 15.00 CLOUDS 6/7 CU	10 17.99 33.963	24.492 344.5
120	70	21/04/81 2018GMT 26 53.4N 117 10.4W WEATH 1 BOTTOM 4034M WIND 310 18 KT WAVES 320 05 04 BAR 1015.9MB DRY 18.30 WET 14.30 CLOUDS 5/7 CU	10 17.82 33.939	24.428 349.6
120	80	21/04/81 1522GMT 26 33.4N 117 48.0W WEATH 1 BOTTOM 3918M WIND 320 17 KT WAVES 320 04 04 BAR 1017.3MB DRY 15.90 WET 13.00 CLOUDS 5/7 CU	10 18.10 33.925	24.404 351.9
123	36	23/04/81 0112GMT 27 27.0N 114 36.3W WEATH 1 BOTTOM 53M WIND 280 29 KT WAVES 280 05 02 BAR 1011.8MB DRY 16.40 WET 14.30 CLOUDS 1/1 CI	10 17.46 33.921	25.465 250.8
123	37	23/04/81 0232GMT 27 24.9N 114 40.5W WEATH 0 BOTTOM 73M WIND 310 19 KT WAVES 310 04 02 BAR 1013.5MB DRY 15.60 WET 14.20 CLOUDS 0/0	10 14.14 33.937	25.260 270.3
123	42	23/04/81 0528GMT 27 14.9N 114 59.5W WEATH 0 BOTTOM 953M WIND 310 15 KT WAVES 340 02 04 BAR 1015.6MB DRY 16.40 WET 15.10 CLOUDS	10 17.19 33.703	24.475 345.1
123	45	23/04/81 0759GMT 27 08.9N 115 11.2W WEATH 0 BOTTOM 4206M WIND 320 14 KT WAVES 340 02 04 BAR 1015.9MB DRY 16.40 WET 14.40 CLOUDS	10 17.08 33.686	24.489 343.8
123	50	23/04/81 1105GMT 26 59.1N 115 29.9W WEATH 0 BOTTOM 3730M WIND 320 14 KT WAVES 340 02 04 BAR 1015.9MB DRY 16.60 WET 14.70 CLOUDS	10 17.16 33.681	24.466 346.0
123	60	23/04/81 1616GMT 26 39.1N 116 09.2W WEATH 2 BOTTOM 3824M WIND 310 13 KT WAVES 330 04 05 BAR 1018.0MB DRY 16.90 WET 14.50 CLOUDS 8/7 SC	10 17.65 33.830	24.443 346.3
127	33	24/04/81 1355GMT 25 57.7N 114 02.0W WEATH 0 BOTTOM 64M WIND 360 15 KT WAVES 340 01 03 BAR 1015.2MB DRY 15.80 WET 14.10 CLOUDS 0/0	10 13.02 33.944	25.572 240.7
127	35	24/04/81 1211GMT 26 53.7N 114 10.2W WEATH 0 BOTTOM 100M WIND 350 19 KT WAVES 340 01 03 BAR 1014.9MB DRY 15.70 WET 14.30 CLOUDS	10 16.79 33.697	24.555 336.6
127	40	24/04/81 0859GMT 26 43.7N 114 29.4W WEATH 0 BOTTOM 3067M WIND 320 20 KT WAVES 340 01 03 BAR 1015.9MB DRY 15.90 WET 15.70 CLOUDS	10 17.10 33.685	24.483 344.4
127	45	24/04/81 0543GMT 26 32.9N 114 48.3W WEATH 0 BOTTOM 3372M WIND 320 20 KT WAVES 340 01 03 BAR 1016.2MB DRY 15.70 WET 15.20 CLOUDS	10 17.05 33.617	24.471 345.4

RV NEW HORIZON		CALCULATED POSITION X174	TIDAL METER DATA						
LIN#	STA		Z	T	S	02	02 PCT	SIG TH	SVA
127	50	24/04/81 0226GMT 26 23.2N 115 07.7W WEATH 1 BOTTOM 3278M WIND 310 12 KT WAVES 310 04 02 BAR 1015.6MB DRY 17.4C WET 15.7C CLOUDS 7/8 CU	10	17.35	33.268			24.411	351.3
127	60	23/04/81 2121GMT 26 03.5N 115 46.3W WEATH 2 BOTTOM 3808M WIND 310 16 KT WAVES 310 05 03 BAR 1015.6MB DRY 17.2C WET 15.6C CLOUDS 7/8 SC	10	16.83	34.103			24.380	354.2
130	28	24/04/81 1837GMT 26 33.3N 113 21.6W WEATH 2 BOTTOM 528M WIND 210 06 KT WAVES 260 01 04 BAR 1011.8MB DRY 17.9C WET 16.1C CLOUDS 0/8	10	14.78	33.736			25.046	220.7
130	30	24/04/81 2041GMT 26 29.2N 113 29.3W WEATH 2 BOTTOM 75M WIND 260 15 KT WAVES 260 03 04 BAR 1010.5MB DRY 18.5C WET 16.6C CLOUDS 0/8	10	14.90	33.520			25.085	287.0
130	35	25/04/81 0110GMT 26 19.4N 113 48.5W WEATH 0 BOTTOM 592M WIND 280 24 KT WAVES 240 05 03 BAR 1009.1MB DRY 17.1C WET 16.2C CLOUDS 0/8	10	15.83	33.700			24.787	315.4
130	40	25/04/81 0357GMT 26 06.5N 114 07.6W WEATH BOTTOM 2236M WIND 300 18 KT WAVES BAR 1012.2MB DRY 17.2C WET 16.1C CLOUDS	10	17.37	33.483			24.417	350.6
130	50	25/04/81 1049GMT 25 49.4N 114 46.3W WEATH BOTTOM 3634M WIND 320 20 KT WAVES BAR 1012.5MB DRY 16.7C WET 15.7C CLOUDS	10	17.66	33.746			24.396	352.7
130	60	25/04/81 1521GMT 25 27.6N 115 19.5W WEATH 1 BOTTOM 3824M WIND 330 15 KT WAVES 340 05 04 BAR 1014.2MB DRY 17.8C WET 16.0C CLOUDS 7/8 SC	10	17.61	33.761			24.420	350.4
133	23	26/04/81 1924GMT 26 09.1N 112 41.3W WEATH 0 BOTTOM 71M WIND 280 11 KT WAVES 280 03 05 BAR 1012.5MB DRY 18.0C WET 15.7C CLOUDS 0/8	10	16.49	33.585			24.772	316.1
133	25	26/04/81 1735GMT 26 04.9N 112 48.7W WEATH 0 BOTTOM 84M WIND 050 08 KT WAVES 320 03 05 BAR 1014.2MB DRY 18.5C WET 16.3C CLOUDS 0/8	10	16.41	33.570			24.786	315.5
133	30	26/04/81 1417GMT 25 54.5N 113 07.7W WEATH 0 BOTTOM 205M WIND 340 15 KT WAVES 320 03 04 BAR 1013.5MB DRY 17.0C WET 15.3C CLOUDS 0/8	10	17.06	33.753			24.544	338.5
133	35	26/04/81 1028GMT 25 45.0N 113 27.6W WEATH BOTTOM 666M WIND 340 18 KT WAVES BAR 1012.2MB DRY 16.4C WET 15.5C CLOUDS	10	18.03	33.935			24.374	354.7
133	40	26/04/81 0716GMT 25 34.8N 113 46.9W WEATH BOTTOM 2902M WIND 320 24 KT WAVES BAR 1012.5MB DRY 17.0C WET 16.1C CLOUDS	10	17.89	33.761			24.352	356.9
133	50	26/04/81 0200GMT 25 15.3N 114 24.8W WEATH 1 BOTTOM 3408M WIND 330 20 KT WAVES 330 04 04 BAR 1011.2MB DRY 17.2C WET 16.3C CLOUDS 3/4 SC	10	18.90	34.038			24.313	360.6
133	60	25/04/81 2050GMT 24 57.0N 115 00.4W WEATH 1 BOTTOM 3814M WIND 330 20 KT WAVES 330 06 05 BAR 1011.2MB DRY 19.0C WET 17.1C CLOUDS 4/5 CU	10	18.94	34.030			24.297	362.1

DISTRIBUTION LIST

INTER-AMERICAN TROPICAL TUNA COMMISSION  
(C/O SCRIPPS INSTITUTION OF OCEANOGRAPHY)

DR. JAMES JOSEPH

NATIONAL MARINE FISHERIES SERVICE  
(C/O SCRIPPS INSTITUTION OF OCEANOGRAPHY)

DIRECTOR'S OFFICE

MR. RON DOTSON

DR. REUBEN LASKER

DR. A. ALVARINO DE LEIRA

LIBRARY (2)

MR. RONALD LYNN

DR. GEOFFREY MOSER

DR. ROBERT OWEN, JR.

MR. NELSON C. ROSS, JR.

DR. PAUL SMITH

SCRIPPS INSTITUTION OF OCEANOGRAPHY

DR. MARK ABBOTT

DR. LAURENCE ARMI

DR. EDWARD BRINTON

DR. RICHARD W. EPPLEY

DR. ABRAHAM FLEMINGER

DR. JORIS M. T. M. GIESKES

DR. LOREN R. HAURY

DR. THOMAS L. HAYWARD

MRS. KITTIE KUHNS

LIBRARY, SIO (DR. PETER BRUEGGEMAN)

LIBRARY, SIO (STELLA WADE) (4)

MR. ARNOLD W. MANTYLA

DR. JOHN A. McGOWAN

DR. W. A. NIERENBERG

DR. PEARL P. NIILER

PROF. JOSEPH L. REID

DR. RICHARD H. ROSENBLATT

DR. JAMES J. SIMPSON

DR. KENNETH L. SMITH

MR. GEORGE H. SNYDER

DR. ROBERT E. STEVENSON

DR. MIZUKI TSUCHIYA

#### AFRICA

M. Henri Rotschi  
Centre de Recherches  
Oceanographiques  
29, Rue des Pecheurs  
B.P.V. 18 - Abidjan  
Republique de Cote d'Ivoire

#### AUSTRALIA

Dr. John A. T. Bye  
Flinders Institute for Atmospheric  
and Marine Sciences  
The Flinders University of S.A.  
Bedford Park 5042, S.A.  
Australia

Prof. R. Radok, Director  
Horace Lamb Institute of Oceanography  
P. O. Box 167  
Kingswood 5062, S.A.  
Australia

#### CANADA

Director  
Institute of Oceanography  
University of British Columbia  
Vancouver, B.C. V6T 1W5  
Canada

Library  
Pacific Biological Station  
Fisheries and Marine Service  
Nanaimo, B.C. V9R 5K6  
Canada

Dr. C. S. Wong  
Institute of Ocean Sciences  
Department of Fisheries and  
Environment  
P. O. Box 6000  
Sidney, B.C. V8L 4B2  
Canada

Library  
Science Services  
Dalhousie University  
Halifax, N.S. B3H 4J3  
Canada

Dr. Cedric R. Mann  
Bedford Institution of Oceanography  
P. O. Box 1006  
Dartmouth, N.S. B2Y 4A2  
Canada

Prof. Gordon A. Riley  
Institute of Oceanography  
Dalhousie University  
Halifax, N.S. B3H 3J5  
Canada

#### GERMANY

Akademie der Wissenschaften der DDR  
Institut fur Meereskunde Bibliothek  
253 Warnemunde  
East Germany

Deutsches-Hydrographisches Institut  
Tauschstelle  
Postfach 220  
Bernhard-Hocht-Str. 78  
D-2000 Hamburg  
West Germany

Dr. Reimer Simonsen  
Institut fur Meeresforschung  
285 Bremerhaven  
Am Handelshafen 12  
West Germany

#### ICELAND

Dr. Unnsteinn Stefansson  
Hafrannsoknastofnunin  
Skulagata 4  
Reykjavik  
Iceland

#### JAPAN

Dr. Kiyomitsu Kitano  
Hokkaido Regional Fisheries  
Research Laboratory  
Katsurakoi 116, Kushiro City  
Hokkaido  
Japan

Director  
Kobe Marine Observatory  
Nakayamate 7  
Kobe, 650  
Japan

The Public Health Institute  
of Hyogo Prefecture  
Arata-Cho, Hyogo-Ku  
2-1 Kobe  
Japan

Prof. Hideo Kawai  
Kyoto University  
Department of Fisheries  
Faculty of Agriculture  
Kyoto  
Japan

Mr. Hajime Yamanaka  
Far Seas Fisheries  
Research Laboratory  
Orido, Shimizu 424  
Shizuoka-Ken  
Japan

Director  
Japan Oceanographic Data Center  
Hydrographic Department  
Maritime Safety Agency  
No. 3-1, 5 Chome, Tsukiji  
Chuo-Ku, Tokyo  
Japan 104

Library  
Ocean Research Institute  
University of Tokyo  
Nakano-Ku, Tokyo  
Japan

Oceanography Division  
Marine Department  
Japan Meteorological Agency  
1-3-4 Ohte-Machi, Chiyoda-Ku  
Tokyo, 100  
Japan

#### KOREA

Library  
Fisheries Research and  
Development Agency  
16-2KA, Namhang Dong  
Youngdo-Ku Busan 606  
Korea

#### MEXICO

Biblioteca  
Centro de Investigacion Cientifica y  
Educacion Superior de Ensenada  
Apartado Postal 2732  
Ensenada, Baja California  
Mexico

Biblioteca  
Instituto Nacional de Pesca  
Centro de Investigacion Pesquera  
Apartado Postal 1306  
Ensenada, Baja California  
Mexico

Biblioteca  
Unidad de Ciencias Marinas  
Universidad Autonoma de Baja  
California  
Apartado de Correos 453  
Ensenada, Baja California  
Mexico

Biblioteca, U.N.A.M.  
Centro de Ciencias del  
Mar y Limnologia  
Apartado Postal 811  
Mazatlan, Sinaloa  
Mexico

Biblioteca  
Centro de Promocion Pesquera  
Apartado Postal 396  
Mazatlan, Sinaloa  
Mexico

Biblioteca  
Centro de Investigacion Pesquera  
Seccion de Hidrologia  
Instituto Nacional de Pesca  
Apartado Postal 550  
Mazatlan, Sinaloa  
Mexico

American Embassy (4)  
Regional Fishery Attaché  
Apartado Postal 83-BIS  
Mexico 1, D.F.  
Mexico

Biblioteca  
Departamento de Pesca  
Alvaro Oregon 269  
Mexico 7, D.F.  
Mexico

Biblioteca Universidad Nacional Autonoma de Mexico Apartado Postal 70-223 Mexico 20, D.F. Mexico	UNITED STATES	Director Operations Research Branch Department of Fish and Game 1416 Ninth Street Sacramento, CA 95814
Director Inst. de Geofisica Torre de Ciencias, 3ER Piso Universidad Nacional Autonoma de Mexico Villa Obregon, D.F. Mexico	ALASKA	Mr. David Farris Department of Biology San Diego State University San Diego, CA 92182
NEW ZEALAND	CALIFORNIA	Intersea Research Corporation 11760 Sorrento Valley Road San Diego, CA 92121
Director New Zealand Oceanographic Institute P. O. Box 8009 Wellington New Zealand	Library Department of Oceanography Humboldt State University Arcata, CA 95521	Library Department of the Navy Naval Ocean Systems Center San Diego, CA 92152
PERU	Marine Technical Information Center Department of Fish and Game 245 W. Broadway, Suite 350 Long Beach, CA 90802	Library San Diego Society of Natural History P. O. Box 1390 San Diego, CA 92112
Biblioteca, Instituto del Mar Apartado Postal 22 Callao Peru	Dr. Donn S. Gorsline Department of Geology University of Southern California Los Angeles, CA 90007	Eric Shulenberger San Diego Natural History Museum P. O. Box 1390 San Diego, CA 92112
UNITED KINGDOM	Hancock Library of Biology and Oceanography University of Southern California Los Angeles, CA 90007	Library California Academy of Sciences Golden Gate Park San Francisco, CA 94118
Science Reference Library (A) 25 Southampton Buildings Chancery Lane London WC2A 1AW England United Kingdom	Dr. Dale Straughan University of Southern California Los Angeles, CA 90007	Director Center for Coastal Marine Studies University of California Santa Cruz, CA 95064
Library Subscription Department New South Wales Government Offices 66 Strand London, WC2N 5LZ, England United Kingdom	Naval Environmental Prediction Research Facility Monterey, CA 93940	NMFS/NOAA Tiburon Laboratory 3150 Paradise Drive Tiburon, CA 94920
Library Fisheries Laboratory Ministry of Agriculture, Fisheries and Food Lowestoft, Suffolk NR33 0HT, England United Kingdom	Prof. C. N. K. Mooers, Chairman Department of Oceanography U. S. Naval Postgraduate School Monterey, CA 93940	CONNECTICUT
Head of Library and Information Service Plymouth PL1 2PB, England United Kingdom	Director Pacific Environmental Group NMFS/NOAA C/O Fleet Numerical Weather Central Monterey, CA 93940	Prof. George Veronis Department of Geology and Geophysics Yale University P. O. Box 2161, Yale Station New Haven, CT 06520
Library Inst. of Oceanographic Science Wormley, Godalming Surrey GU8 5UB, England United Kingdom	Commanding Officer (Code 40) (2) Fleet Numerical Weather Central Monterey, CA 93940	FLORIDA
Library Department of Agriculture and Fisheries for Scotland Marine Laboratory P. O. Box 101, Victoria Road Torry, Aberdeen AB9 8DB, Scotland United Kingdom	Library Geology-Oceanography Department California State University Northridge, CA 91324	R.S.M.A.S. Library University of Miami 4600 Rickenbacker Causeway Miami, FL 33149
Bernard Cohenour Code 3144, Bldg. 514 Pacific Missile Test Center Point Mugu, CA 93042	E. J. List California Technical Institution Pasadena, CA 91125	Library Southwest Fisheries Center NMFS/NOAA 75 Virginia Beach Drive Miami, FL 33149

**HAWAII**

Library  
Southwest Fisheries Center  
NMFS/NOAA  
P. O. Box 3830  
Honolulu, HI 96812

**MAINE**

Director  
Center for Marine Studies  
University of Maine  
Orono, ME 04469

**MARYLAND**

Secretary for Publications  
Chesapeake Bay Institute  
The Johns Hopkins University  
Baltimore, MD 21218

Acquisitions Section, JRDB/D823  
Library and Information Services  
Division, NOAA  
6009 Executive Blvd.  
Rockville, MD 20852

Chief  
Oceanic Services Division (W16)  
Office of Meteorology and  
Oceanography  
National Weather Service  
8060 13th Street, Room 1213  
Silver Spring, MD 20910

**MASSACHUSETTS**

Dr. John M. Edmond  
Department of Earth and  
Planetary Sciences  
Bldg. 54, Room 1326  
Mass. Institute of Technology  
Cambridge, MA 02139

Prof. Henry M. Stommel  
Dept. of Physical Oceanography  
Woods Hole Oceanographic Inst.  
Woods Hole, MA 02543

Dr. Bruce A. Warren  
Woods Hole Oceanographic Inst.  
Woods Hole, MA 02543

Dr. L. V. Worthington  
Woods Hole Oceanographic Inst.  
Woods Hole, MA 02543

**MISSISSIPPI**

NAV OCEAN  
NSTL Station, MS 39522

**NEW JERSEY**

Princeton Geology Library  
Department of Geological and  
Geophysical Sciences  
Guyot Hall  
Princeton University  
Princeton, NJ 08540

**NEW YORK**

Prof. Gerhard Neumann  
Department of Meteorology  
and Oceanography  
New York University  
Bronx.  
New York, NY 10453

Dr. Arnold L. Gordon  
Lamont-Doherty Geological  
Observatory of Columbia Univ.  
Palisades, NY 10964

**OREGON**

Pattullo Study  
School of Oceanography  
Oregon State University  
Corvallis, OR 97331

Pacific Marine Fisheries Commission  
528 S. W. Mill  
Portland, OR 97201

**RHODE ISLAND**

Pell Marine Science Library  
University of Rhode Island  
Narragansett Bay Campus  
Narragansett, RI 02882

**TEXAS**

Working Collection  
Department of Oceanography  
Texas A&M University  
College Station, TX 77843

**VIRGINIA**

Professor Ronald E. Johnson  
Institute of Oceanography  
Old Dominion University  
Norfolk, VA 23508

**WASHINGTON**

Library  
Fisheries-Oceanography WB-30  
151 Oceanography Teaching Bldg.  
University of Washington  
Seattle, WA 98195

Prof. Gunnar I. Roden  
Dept. of Oceanography WB-10  
University of Washington  
Seattle, WA 98195

**WASHINGTON, D.C.**

British Navy Staff  
British Embassy  
3100 Massachusetts Avenue, N.W.  
Attn: Scientific Information Officer  
Washington, DC 20008

Commanding Officer  
U. S. Coast Guard Oceanographic Unit  
Bldg. 159-E, Navy Yard Annex  
Washington, DC 20590

Commander (2)  
U. S. Naval Oceanographic Office  
Library Code 3330  
Washington, DC 20373

Director (3)  
National Oceanographic Data Center  
NOAA  
Washington, DC 20235

Director (6)  
World Data Center A  
NOAA  
Washington, DC 20235

Dr. Robert H. Gibbs, Jr.  
Division of Fisheries  
U. S. National Museum  
Washington, DC 20560

Director  
National Marine Fisheries Service  
NOAA  
Washington, DC 20235