UNIVERSITY OF CALIFORNIA SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

PHYSICAL, CHEMICAL AND CURRENT METER DATA

CalCOFI CRUISE 7601
6–7 January 1976

CalCOFI CRUISE 7602
16–20 February 1976

CRUISE 7603 (TWATE III)
30 March–2 April 1976

CRUISE 7604
17 April–10 May 1976

CRUISE 7611
11 November 1976

SIO Reference 88-4
29 February 1988

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CalCOFI CRUISE 7601
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Approved for distribution:

Edward A. Frieman, Director

CONTENTS

INTRODUCTION

The data in this report were collected during CalCOFI Cruises 7601* and 7602, and Cruises 7603 and 7604 aboard the RV *Alexander Agassiz*, and Cruise 7611 aboard the RV *Ellen B. Scripps* of the Scripps Institution of Oceanography, University of California, San Diego. Although all these cruises were in the area of the California Cooperative Oceanic Fisheries Investigations (CalCOFI), only during 7601 and 7602 were planned CalCOFI station positions occupied. Cruise 7603 was a Two-Way Acoustic Transmission Experiment (TWATE III) on which the principle work accomplished was sound velocity analyses in the vicinity of locations 33°N, 118°W and 31°N, 120°W. The object of Cruise 7604 was to investigate eddies in the California Current, to determine their size, their movement in relationship to other currents, and the length of time they remain a distinguishable feature. A series of airborne expendable bathythermographs (AXBTs) used in a program to observe the thermal structure in the Central Pacific were calibrated by comparison with eight STD lowerings during Cruise 7611. This field program has been described in SIO Reference 76-19, Observation of Thermal Structure in the Central Pacific, T. P. Barnett, M. H. Sessions, and P. M. Marshall.

These data were collected and processed by personnel of the Data Collection and Processing Group, Marine Life Research Group (DCPG**, MLRG), Scripps Institution of Oceanography.

STANDARD PROCEDURES

The difference in purpose of the five cruises in this report results in a variation of the data collected. Hydrographic casts were made on all cruises but varied from only one cast of eight Nansen bottles on the STD wire for Cruise 7601 to 20 casts of 18 Nansen bottles on the hydrographic wire for Cruise 7604. Temperature and salinity were determined for all depths sampled. Oxygen and nutrients were determined for Cruise 7602 only. On Cruise 7601 the four free vehicle current meters which had been deployed during CalCOFI Cruise 7510 were recovered.

On STD lowerings during Cruises 7601, 7602, 7603, and 7611 where hydrographic casts were not made, a Nansen bottle was usually placed a few meters above the STD and another bottle was lowered to approximately 10 meters. During Cruise 7602, both down and up recordings from the STD were made on two separate DDL systems as well as analog traces for all lowerings.

Paired protected reversing thermometers were used on all Nansen bottle casts 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 depth of sampling.

Salinity samples were determined at sea using inductive-type salinometers. The salinity values are recorded to three decimal places.

Dissolved oxygen on Cruise 7602 was determined by the Winkler method as modified by Carpenter (1965), using the equipment and procedure outlined by Anderson (1971).

Silicate, nitrate and nitrite for Cruise 7602 were determined at sea using an automated analyzer. The procedures used are similar to those described in Atlas *et al.* (1971). Phosphate samples were determined using a Gilford modified DU spectrophotometer. Reactive phosphate was analyzed using the method of Murphy and Riley (1962), with the specific procedure outlined by Anderson (1971).

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

The STD data for Cruises 7601, 7604, and 7611 were processed by computer from the DDL recordings and appear to compare well with the hydrographic data. Although extra effort was made on Cruise 7603 to compare the STD recordings on two separate DDL instruments, the tabulated data were digitized from the analog traces and also

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

** Now the Oceanographic Data Facility (ODF).

appear to compare well with the hydrographic data.

TABULATED DATA

The reported hydrographic cast time is the Greenwich Mean Time (GMT) of the 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 tabulations are presented in the following forms:

1) Data from the sample bottle casts are tabulated with the observed levels of depth on the left of the page, and standard depth values of temperature, salinity and oxygen interpolated from these observations are on the right of the page. Additional computed values are also presented.

2) Data from the STD 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. Additional computed values are also presented.

3) Calibration of the AXBTs on Cruise 7611 required the data from the STD to be tabulated at approximately 10 meter intervals of depth. The additional computed values are tabulated for each depth.

4) Current meter speed and direction data were calculated over one-half-hour intervals. This report includes only the resultant speeds and directions for the entire record lengths.

The same parameters have been tabulated in this report as in previous reports. Cruises 7601 and 7602 have the CalCOFI station designations which have been in use for over thirty years. The first part specifies a line normal to the general trend of the coastline (CalCOFI line). The second part specifies a station position relative to the coast on the CalCOFI line. On some closely-spaced special inshore stations, an additional superscript number may appear after the line number or station number to indicate a finer resolution of the non-standard station location.

The column headings are to be interpreted as follows:

Z	Depth	Meters
T	Temperature	°C
S	Salinity	‰
O2	Dissolved Oxygen	ml/L
PO4	"Reactive" inorganic phosphate-phosphorous	µg at/L
SiO3	"Reactive" inorganic silicate-silicon	µg at/L
NO2	"Reactive" nitrite-nitrogen	µg at/L
NO3	"Reactive" nitrate-nitrogen	µg at/L
DT	δ_T Thermosteric anomaly	cl/ton
SIGT	$\sigma_t = (\rho_{s,t,0} - 1)\ 10^3$ where $\rho_{s,t,0}$ is the density the parcel of sea water would have if moved isothermally to the sea surface.	g/L
DD	Geopotential anomaly, referred to the sea surface.	dyn. meters

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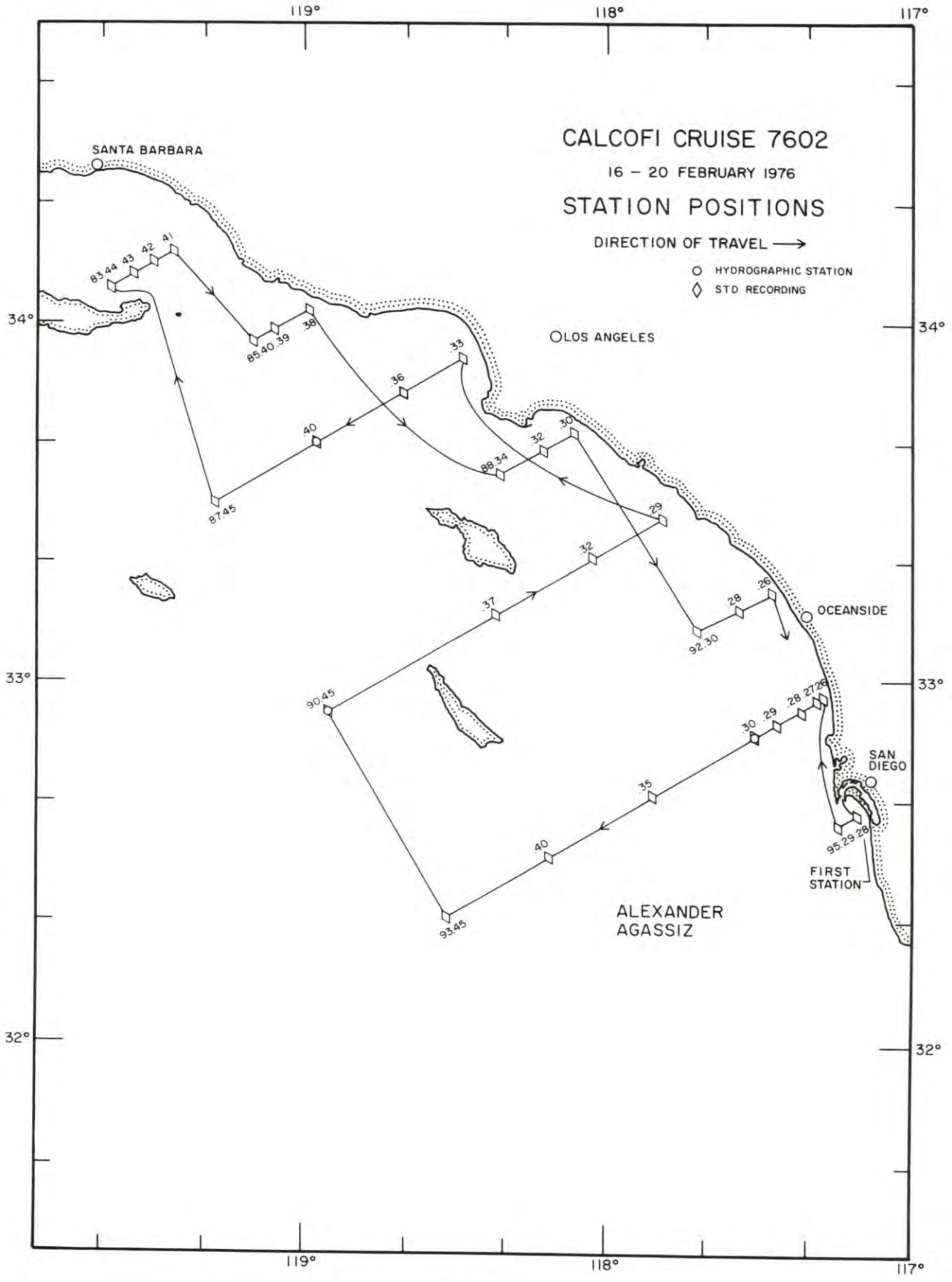
CALCOFI CRUISE 7602
16 – 20 FEBRUARY 1976
STATION POSITIONS
DIRECTION OF TRAVEL →
HYDROGRAPHIC STATION
STD RECORDING
SANTA BARBARA
LOS ANGELES
OCEANSIDE
SAN DIEGO
FIRST STATION
ALEXANDER AGASSIZ
119°
118°
117°
34°
33°
32°

FIGURE 2

PERSONNEL

CalCOFI Cruise 7602

SHIP'S CAPTAIN

Davis, Laurence E., RV *Alexander Agassiz*

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

Muus, David A. (in charge)	Staff Research Associate, SIO
Costello, James P.	Staff Research Associate, SIO
Dotson, Ronald C.	Biological Technician, NMFS
Fernandez, Enrigue	Student, Fullerton Junior College
Graham, Jery B.	Electronics Technician, SIO
Halas, Jonathan A.	Biological Technician, SIO
Hester, Arthur W.	Staff Research Associate, SIO
Jones, Ginger	Student, Fullerton Junior College
Kellogg, Durrant	Marine Technician, SIO
Sanchez, Carol A.	Biological Technician, NMFS

STATION 83 41 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
34 11.5 N	119 26. W	02/19/76	1726 GMT	60 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
270	20 KT	260 04 05	1	1002.1 MB	15.2 C	13.3 C	1/8 ST

Z	T	S	SIGT	DT	DD
0	13.80	33.56	25.138	283.6	0.000
10	13.80	33.56	25.138	283.6	0.028
20	13.40	33.56	25.219	275.8	0.056
30	13.01	33.56	25.297	268.4	0.084
50	12.40	33.57	25.424	256.3	0.136

CALCOFI CRUISE 7602 STATION 83 42

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
34 09.5 N	119 30. W	02/19/76	1548 GMT	220 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
270	12 KT	260 04 05	1	1002.0 MB	14.2 C	12.1 C	1/8 ST

Z	T	S	SIGT	DT	DD
0	13.52	33.58	25.210	276.7	0.000
10	13.52	33.58	25.210	276.7	0.028
20	13.52	33.58	25.210	276.7	0.055
30	13.35	33.58	25.245	273.4	0.083
50	13.02	33.58	25.311	267.1	0.137
75	11.92	33.58	25.523	246.9	0.202
100	10.07	33.73	25.971	204.4	0.259
125	9.18	33.93	26.273	175.6	0.307
150	8.72	34.03	26.424	161.3	0.350
200	8.32	34.11	26.548	149.5	0.429

STATION 83 43 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
34 08. N	119 34. W	02/19/76	1355 GMT	240 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
270	18 KT	270 04 05	1	1002.0 MB	13.2 C	11.8 C	1/8 ST

Z	T	S	SIGT	DT	DD
0	13.41	33.59	25.240	273.8	0.000
10	13.41	33.59	25.240	273.8	0.027
20	13.41	33.59	25.240	273.8	0.055
30	13.25	33.58	25.265	271.5	0.082
50	12.48	33.58	25.416	257.0	0.135
75	11.75	33.64	25.601	239.4	0.198
100	10.25	33.77	25.971	204.3	0.254
125	9.17	33.93	26.275	175.5	0.302
150	8.83	34.02	26.399	163.7	0.345
200	8.62	34.07	26.471	156.8	0.426
225	8.43	34.10	26.524	151.8	0.466

CALCOFI CRUISE 7602 STATION 83 44

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
34 05.5 N	119 38. W	02/19/76	1215 GMT	187 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
290	22 KT			1001.9 MB	13.0 C	11.9 C	

Z	T	S	SIGT	DT	DD
0	13.30	33.60	25.270	271.0	0.000
10	13.30	33.60	25.270	271.0	0.027
20	13.30	33.59	25.262	271.7	0.054
30	12.75	33.58	25.364	262.0	0.081
50	12.17	33.60	25.491	249.9	0.132
75	10.71	33.69	25.829	217.9	0.191
100	10.17	33.77	25.985	203.0	0.244
125	9.79	33.82	26.088	193.3	0.294
150	9.11	33.95	26.300	173.1	0.341
175	8.84	34.01	26.390	164.5	0.384

STATION 85 37.5 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
34 02. N	118 59.5 W	02/20/76	0157 GMT	65 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
280	20 KT	270 09 05	1	1001.8 MB	12.9 C	11.6 C	1/8 CU

Z	T	S	SIGT	DT	DD
0	13.95	33.59	25.130	284.3	0.000
10	13.93	33.58	25.126	284.7	0.028
20	13.10	33.57	25.287	269.4	0.056
30	12.71	33.58	25.372	261.3	0.083

CALCOFI CRUISE 7602 STATION 85 39

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 59. N	119 06.5 W	02/19/76	2345 GMT	711

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
290	38 KT	270 09 05	1	1001.7 MB	13.6 C	10.6 C	1/8 CU

Z	T	S	SIGT	DT	DD
0	13.79	33.60	25.170	280.5	0.000
10	13.78	33.60	25.172	280.3	0.028
20	13.76	33.60	25.177	279.9	0.056
30	13.68	33.60	25.193	278.3	0.084
50	11.98	33.57	25.504	248.7	0.137
75	10.93	33.63	25.743	226.0	0.197
100	10.33	33.71	25.910	210.1	0.252
125	9.70	33.83	26.110	191.1	0.302
150	9.21	33.95	26.284	174.6	0.349
200	8.49	34.09	26.507	153.4	0.432
250	8.11	34.15	26.612	143.5	0.509
300	7.73	34.19	26.699	135.2	0.581
400	6.87	34.23	26.852	120.7	0.714
500	6.20	34.31	27.004	106.3	0.834

STATION 85 40 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 57. N	119 10.5 W	02/19/76	2140 GMT	757 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
280	22 KT	270 06 05	1	1001.9 MB	13.5 C	10.5 C	1/8 CU

Z	T	S	SIGT	DT	DD
0	13.90	33.60	25.148	282.6	0.000
10	13.90	33.60	25.148	282.6	0.028
20	13.87	33.60	25.154	282.0	0.057
30	13.76	33.60	25.177	279.9	0.085
50	12.50	33.55	25.390	259.6	0.139
75	11.23	33.60	25.666	233.3	0.201
100	10.40	33.70	25.891	212.0	0.257
125	9.75	33.81	26.086	193.4	0.308
150	9.26	33.93	26.260	176.8	0.355
200	8.60	34.06	26.466	157.3	0.440
250	8.10	34.15	26.613	143.4	0.518
300	7.75	34.18	26.688	136.2	0.590
400	6.91	34.24	26.854	120.5	0.724
500	6.27	34.30	26.987	107.9	0.844

CALCOFI CRUISE 7602 STATION 87 33

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 54. N	118 29. W	02/18/76	1754 GMT	48 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
110	02 KT	240 01 06	4	1002.3 MB	14.2 C	12.4 C	

Z	T	S	SIGT	DT	DD
0	14.35	33.56	25.023	294.5	0.000
10	14.09	33.56	25.077	289.3	0.029
20	13.90	33.55	25.109	286.3	0.058
30	13.55	33.54	25.173	280.2	0.086
42	12.53	33.61	25.430	255.8	0.119

STATION 87 36 — RV ALEXANDER AGASSIZ — CALCOFI CRUISE 7602 — STATION 87 40

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 48. N	118 40.5 W	02/18/76	2115 GMT	888 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
360	06 KT	220 02 06	4	1002.1 MB	16.2 C	14.1 C	

Z	T	S	SIGT	DT	DD
0	14.32	33.54	25.014	295.4	0.000
10	14.06	33.53	25.060	290.9	0.029
20	14.00	33.54	25.081	289.0	0.058
30	13.95	33.54	25.091	288.0	0.087
50	13.40	33.54	25.204	277.3	0.144
75	11.70	33.54	25.533	245.9	0.210
100	10.35	33.66	25.868	214.1	0.268
125	9.72	33.79	26.076	194.4	0.319
150	9.22	33.93	26.267	176.2	0.366
200	8.53	34.07	26.485	155.5	0.451
250	8.07	34.14	26.610	143.7	0.528
300	7.72	34.18	26.693	135.8	0.600
400	6.97	34.23	26.838	122.0	0.734
500	6.33	34.29	26.971	109.4	0.857

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 40.0 N	118 58.0 W	02/19/76	0005 GMT	743 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
310	06 KT	260 01 05	4	1002.0 MB	13.3 C	12.0 C	

Z	T	S	SIGT	DT	DD
0	14.12	33.60	25.102	287.0	0.000
10	13.89	33.60	25.150	282.4	0.028
20	13.66	33.60	25.197	277.9	0.057
30	13.15	33.60	25.300	268.1	0.084
50	12.05	33.58	25.499	249.2	0.136
75	10.82	33.62	25.755	224.9	0.195
100	10.40	33.68	25.875	213.5	0.251
125	9.95	33.78	26.030	198.8	0.303
150	9.52	33.87	26.171	185.3	0.352
200	8.89	34.03	26.397	163.8	0.440
250	8.38	34.14	26.563	148.1	0.521
300	7.83	34.19	26.684	136.6	0.594
400	7.05	34.23	26.827	123.1	0.730
500	6.31	34.29	26.974	109.1	0.852

RV ALEXANDER AGASSIZ — CALCOFI CRUISE 7602 — STATION 87 40

LATITUDE	LONGITUDE	MO/DAY/YR	MESSENGER TIME	BOTTOM	WIND	SPEED	WEATHER	DOMINANT WAVES
33 40. N	118 58. W	02/19/76	0037 GMT	743 M	310	06 KT	4	260 01 05

Z	T	S	O2	PO4	SIO3	NO2	NO3	DT
0	14.12	33.599	5.97	0.26	5.4	0.00	0.1	287.0
9	13.82	33.594	6.06	0.23	4.1	0.07	0.0	281.5
29	12.68	33.582	6.10	0.60	5.7	0.04	4.7	260.6
39	12.56	33.580	6.07	0.64	6.9	0.02	5.6	258.5
49	12.03	33.574	5.66	0.86	8.8	0.00	8.7	249.3
65	11.14	33.598	5.31	1.11	12.1	0.00	13.0	231.9
80	10.81	33.630	4.85	1.20	14.3	0.00	14.6	223.9
100	10.52	33.683	4.35	1.32	16.6	0.00	16.2	215.2
125	9.98	33.769	3.69	1.48	20.4	0.00	19.3	200.0
145	9.59	33.856	3.31	1.60	24.6	0.00	22.0	187.4
174	9.19	33.964	3.02	1.86	29.4	0.00	24.5	173.2
204	8.80	34.065	2.83	2.06		0.00		159.9
234	8.56	34.108	2.52	2.19	39.4	0.00	28.9	153.1
273	8.07	34.172	1.90	2.50	47.0	0.00	31.6	141.3
332	7.45	34.207	1.10	2.75	56.4	0.01	34.4	130.1
405	7.00	34.245	0.70	2.86	64.0	0.00	36.2	121.3
478	6.49	34.275	0.45	3.02	72.8	0.00	38.1	112.5
557	5.96	34.317	0.35	3.08	83.3	0.00	39.5	102.9

Z	T	S	O2	SIGT	DT	DD
0	14.12	33.599	5.97	25.101	287.0	0.000
10	13.76	33.593	6.06	25.172	280.3	0.028
20	13.16	33.586	6.08	25.287	269.3	0.056
30	12.67	33.582	6.10	25.381	260.4	0.082
50	11.97	33.575	5.63	25.510	248.1	0.133
75	10.89	33.619	5.01	25.742	226.1	0.193
100	10.52	33.683	4.35	25.857	215.2	0.249
125	9.98	33.769	3.69	26.016	200.0	0.301
150	9.51	33.876	3.25	26.177	184.8	0.350
200	8.85	34.054	2.86	26.423	161.4	0.438
250	8.37	34.136	2.28	26.561	148.3	0.518
300	7.76	34.193	1.50	26.696	135.5	0.591
400	7.03	34.243	0.71	26.841	121.8	0.725
500	6.34	34.286	0.42	26.967	109.8	0.848

STATION 87 45 — RV ALEXANDER AGASSIZ — CALCOFI CRUISE 7602 — STATION 88.5 30.4

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 30. N	119 18.5 W	02/19/76	0351 GMT	1696 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
310	14 KT			1002.0 MB	13.7 C	12.5 C	

Z	T	S	SIGT	DT	DD
0	13.83	33.58	25.147	282.7	0.000
10	13.83	33.58	25.147	282.7	0.028
20	13.52	33.58	25.210	276.7	0.056
30	13.46	33.58	25.222	275.5	0.084
50	11.15	33.60	25.680	231.9	0.135
75	10.25	33.69	25.909	210.3	0.191
100	9.87	33.78	26.043	197.5	0.242
125	9.55	33.84	26.143	188.0	0.291
150	9.23	33.94	26.273	175.6	0.337
200	8.68	34.07	26.462	157.7	0.422
250	8.12	34.15	26.610	143.7	0.499
300	7.68	34.19	26.706	134.5	0.571
400	6.86	34.24	26.861	119.8	0.704
500	6.22	34.29	26.986	108.0	0.824

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 41.5 N	118 07. W	02/20/76	1025 GMT	17 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
100	04 KT			1002.0 MB	12.1 C	9.6 C	

Z	T	S	SIGT	DT	DD
0	14.10	33.44	24.983	298.3	0.000
5	14.10	33.44	24.983	298.3	0.015
10	14.00	33.47	25.027	294.1	0.030
14	13.60	33.56	25.178	279.7	0.041

STATION 88.5 32 — RV ALEXANDER AGASSIZ — CALCOFI CRUISE 7602 — STATION 88.5 34

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 38.5 N	118 13. W	02/20/76	0908 GMT	32 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
010	10 KT			1002.0 MB	13.1 C	8.6 C	

Z	T	S	SIGT	DT	DD
0	13.62	33.46	25.097	287.4	0.000
10	13.60	33.51	25.140	283.3	0.029
20	12.35	33.55	25.418	256.9	0.056
25	11.95	33.57	25.510	248.2	0.068

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 34.5 N	118 22. W	02/20/76	0649 GMT	870 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
330	22 KT			1002.0 MB	12.9 C	10.0 C	

Z	T	S	SIGT	DT	DD
0	14.31	33.60	25.062	290.8	0.000
10	14.31	33.60	25.062	290.8	0.029
20	14.25	33.60	25.075	289.6	0.058
30	12.87	33.58	25.340	264.3	0.086
50	11.90	33.58	25.527	246.5	0.137
75	10.67	33.64	25.797	220.9	0.196
100	10.28	33.71	25.919	209.3	0.250
125	9.55	33.83	26.135	188.7	0.301
150	9.23	33.94	26.273	175.6	0.347
200	8.61	34.08	26.480	155.9	0.431
250	8.12	34.14	26.602	144.4	0.508
300	7.78	34.18	26.684	136.6	0.581
400	6.91	34.24	26.854	120.5	0.715
500	6.40	34.28	26.954	111.0	0.837

STATION 90 29 RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 90 32

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 27. N	117 49.5 W	02/18/76	0843 GMT	630 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
120	02 KT			1002.2 MB	14.2 C	13.2 C	

Z	T	S	SIGT	DT	DD
0	14.68	33.45	24.868	309.2	0.000
10	14.13	33.54	25.054	291.6	0.030
20	13.93	33.55	25.103	286.9	0.059
30	13.58	33.55	25.175	280.0	0.087
50	12.49	33.54	25.383	260.2	0.142
75	10.75	33.64	25.783	222.2	0.202
100	10.12	33.80	26.016	200.0	0.256
125	9.58	33.91	26.192	183.3	0.304
150	9.07	33.97	26.322	171.0	0.349
200	8.52	34.08	26.494	154.6	0.432
250	8.08	34.15	26.616	143.1	0.508
300	7.67	34.18	26.700	135.1	0.580
400	6.98	34.24	26.845	121.4	0.714
500	6.31	34.29	26.974	109.1	0.836

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 20.5 N	118 03. W	02/18/76	0410 GMT	750 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
360	02 KT			1002.2 MB	15.1 C	13.8 C	

Z	T	S	SIGT	DT	DD
0	14.65	33.63	25.013	295.4	0.000
10	14.38	33.62	25.063	290.7	0.029
20	14.34	33.62	25.071	289.9	0.058
30	14.30	33.62	25.080	289.1	0.087
50	13.17	33.59	25.288	269.2	0.143
75	11.42	33.60	25.631	236.6	0.207
100	10.62	33.72	25.868	214.1	0.264
125	9.96	33.84	26.075	194.5	0.316
150	8.99	33.94	26.311	172.0	0.362
200	8.62	34.10	26.495	154.6	0.445
250	8.22	34.17	26.611	143.6	0.522
300	7.81	34.19	26.687	136.3	0.594
400	6.91	34.23	26.847	121.2	0.729
500	6.21	34.29	26.987	107.9	0.850

STATION 90 37 RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 90 45

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 11. N	118 22.5 W	02/18/76	0056 GMT	1197 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
320	02 KT	270 02 06	1	1002.2 MB	14.6 C	12.8 C	7/8 CS

Z	T	S	SIGT	DT	DD
0	14.58	33.60	25.005	296.2	0.000
10	14.38	33.60	25.047	292.2	0.029
20	14.33	33.60	25.058	291.2	0.059
30	14.25	33.59	25.067	290.3	0.088
50	12.60	33.59	25.401	258.5	0.143
75	11.55	33.60	25.608	238.9	0.205
100	10.75	33.69	25.822	218.5	0.263
125	10.00	33.81	26.044	197.4	0.316
150	9.45	33.90	26.206	182.0	0.364
200	8.79	34.06	26.437	160.1	0.451
250	8.05	34.12	26.597	144.9	0.529
300	7.72	34.19	26.701	135.1	0.602
400	6.62	34.24	26.894	116.8	0.733
500	6.14	34.28	26.988	107.8	0.851

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 54.5 N	118 55.5 W	02/17/76	2027 GMT	1757 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
330	04 KT	270 04 05	1	1002.2 MB	14.6 C	13.5 C	4/8 SC

Z	T	S	SIGT	DT	DD
0	14.16	33.60	25.094	287.7	0.000
10	13.84	33.60	25.160	281.4	0.028
20	13.79	33.60	25.170	280.5	0.057
30	13.78	33.60	25.172	280.3	0.085
50	12.80	33.56	25.339	264.4	0.139
75	11.88	33.57	25.523	246.9	0.204
100	10.85	33.60	25.734	226.8	0.263
125	10.00	33.74	25.990	202.5	0.318
150	9.59	33.85	26.144	187.9	0.367
200	8.88	33.97	26.352	168.1	0.458
250	7.97	34.08	26.578	146.7	0.539
300	7.60	34.13	26.671	137.9	0.612
400	6.85	34.23	26.855	120.4	0.747
500	6.17	34.29	26.992	107.4	0.867

RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 90 45

LATITUDE	LONGITUDE	MO/DAY/YR	MESSENGER TIME	BOTTOM	WIND	SPEED	WEATHER	DOMINANT WAVES
32 54.5 N	118 55.5 W	02/17/76	2047 GMT	1737 M	330	04 KT	1	270 04 05

Z	T	S	O2	PO4	SIO3	NO2	NO3	DT
0	14.17	33.598	6.20	0.31	1.8	0.00	0.2	288.1
9	13.84	33.596	6.31	0.36	1.7	0.00	0.2	281.7
30	13.80	33.597	5.48	0.35	1.6	0.01	0.2	280.9
40	13.78	33.597	5.35	0.37	1.6	0.01	0.3	280.5
50	13.01	33.578	4.94	0.58	3.5	0.16	3.6	267.1
65	12.36	33.568	4.38	0.81	5.8	0.03	6.6	255.7
80	11.73	33.576	4.30	0.97	8.6	0.01	9.5	243.8
100	10.89	33.630	4.05	1.27	13.2	0.00	12.3	225.3
125	10.00	33.759	3.68	1.59	19.4	0.01	17.0	201.1
145	9.62	33.848	3.23	1.62	23.5	0.01	19.3	188.5
175	9.23	33.938	2.89	1.93	27.8	0.01	21.7	175.8
204	8.86	33.994	2.41	2.05	31.6	0.01	23.3	166.0
234	8.34	34.034	2.10	2.24	37.4	0.00	25.7	155.4
273	7.86	34.109	1.46	2.43	46.1	0.00	28.7	143.0
331	7.40	34.196	1.02	2.79	56.2	0.00	31.6	130.2
404	6.83	34.240	0.77	2.99	66.0	0.00	34.0	119.4
478	6.29	34.285	0.54	3.20	75.4	0.00	37.0	109.3
558	5.79	34.326	0.31		84.8	0.00	38.2	100.2

Z	T	S	O2	SIGT	DT	DD
0	14.17	33.598	6.20	25.090	288.1	0.000
10	13.84	33.597	6.28	25.157	281.7	0.029
20	13.82	33.597	5.92	25.162	281.3	0.057
30	13.80	33.597	5.48	25.166	280.9	0.085
50	13.01	33.578	4.94	25.311	267.1	0.140
75	11.94	33.571	4.33	25.513	247.9	0.205
100	10.89	33.630	4.05	25.750	225.3	0.264
125	10.00	33.759	3.68	26.005	201.1	0.318
150	9.55	33.866	3.16	26.164	186.0	0.367
200	8.91	33.988	2.48	26.361	167.3	0.457
250	8.12	34.064	1.84	26.543	150.1	0.539
300	7.63	34.155	1.20	26.686	136.4	0.613
400	6.86	34.239	0.78	26.860	120.0	0.746
500	6.15	34.296	0.48	26.999	106.8	0.866

STATION 91.5 26.5 RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 91.5 28

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 14.5 N	117 28. W	02/20/76	1822 GMT	19 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
270	06 KT	270 02 05	0	1002.3 MB	15.1 C	11.2 C	0/8

Z	T	S	SIGT	DT	DD
0	14.07	33.50	25.035	293.3	0.000
5	13.98	33.50	25.054	291.5	0.015
10	13.90	33.51	25.078	289.2	0.029
16	13.13	33.63	25.327	265.5	0.046

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 11.5 N	117 34.5 W	02/20/76	1640 GMT	741 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
080	02 KT	270 03 05	0	1002.3 MB	14.2 C	9.8 C	0/8

Z	T	S	SIGT	DT	DD
0	14.20	33.52	25.024	294.4	0.000
10	14.28	33.57	25.045	292.4	0.029
20	14.31	33.59	25.054	291.5	0.059
30	14.20	33.58	25.070	290.0	0.088
50	12.50	33.54	25.382	260.4	0.143
75	10.68	33.64	25.795	221.0	0.204
100	9.98	33.81	26.048	197.0	0.256
125	9.46	33.94	26.236	179.2	0.304
150	9.05	34.04	26.380	165.5	0.348
200	8.58	34.11	26.509	153.3	0.429
250	8.41	34.18	26.589	145.6	0.506
300	7.95	34.22	26.690	136.0	0.579
400	6.83	34.24	26.865	119.4	0.712
500	6.26	34.28	26.973	109.3	0.833

STATION 91.5 30 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
33 08.5 N	117 42.5 W	02/20/76	1433 GMT	833 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
350	05 KT	270 03 05	1	1002.2 MB	13.1 C	11.2 C	3/8 SC

Z	T	S	SIGT	DT	DD
0	14.40	33.63	25.066	290.4	0.000
10	14.40	33.63	25.066	290.4	0.029
20	14.34	33.63	25.079	289.2	0.058
30	14.31	33.62	25.077	289.3	0.087
50	12.05	33.59	25.506	248.5	0.141
75	10.89	33.64	25.758	224.6	0.201
100	10.17	33.77	25.985	203.0	0.254
125	9.75	33.87	26.133	188.9	0.304
150	9.50	33.93	26.221	180.6	0.351
200	8.65	34.11	26.498	154.3	0.436
250	8.33	34.18	26.602	144.4	0.513
300	7.76	34.18	26.687	136.4	0.586
400	6.72	34.24	26.880	118.0	0.718
500	6.24	34.30	26.991	107.5	0.837

CALCOFI CRUISE 7602 STATION 93 26

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 57. N	117 17.5 W	02/16/76	2233 GMT	37 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
310	10 KT	300 02 06	1	1002.3 MB	14.8 C	12.7 C	4/8 CC

Z	T	S	SIGT	DT	DD
0	14.78	33.47	24.862	309.8	0.000
10	14.53	33.46	24.908	305.4	0.031
20	14.45	33.48	24.940	302.4	0.061
30	14.23	33.54	25.033	293.6	0.091
34	13.99	33.57	25.106	286.6	0.103

STATION 93 27 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 57. N	117 19. W	02/16/76	2337 GMT	127 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
290	09 KT	300 02 07	1	1002.3 MB	14.9 C	13.5 C	4/8 CC

Z	T	S	SIGT	DT	DD
0	14.50	33.58	25.006	296.1	0.000
10	14.38	33.60	25.047	292.2	0.029
20	14.41	33.61	25.049	292.0	0.059
30	14.37	33.61	25.057	291.3	0.088
50	13.40	33.56	25.219	275.8	0.145
75	11.40	33.56	25.604	239.2	0.210
100	9.92	33.79	26.043	197.5	0.265

CALCOFI CRUISE 7602 STATION 93 28

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 54.5 N	117 22. W	02/17/76	0048 GMT	563 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
300	09 KT	310 03 05	1	1002.3 MB	14.6 C	12.8 C	5/8 CC

Z	T	S	SIGT	DT	DD
0	14.51	33.59	25.012	295.5	0.000
10	14.43	33.58	25.021	294.6	0.030
20	14.23	33.58	25.063	290.6	0.059
30	14.09	33.57	25.085	288.6	0.088
50	12.67	33.55	25.356	262.8	0.143
75	11.08	33.63	25.716	228.5	0.205
100	10.41	33.75	25.928	208.4	0.260
125	9.90	33.80	26.053	196.5	0.311
150	9.43	33.92	26.225	180.2	0.359
200	8.65	34.06	26.459	158.0	0.445
250	8.20	34.11	26.567	147.8	0.524
300	7.69	34.16	26.681	136.9	0.597
400	6.98	34.23	26.837	122.1	0.732
500	6.41	34.27	26.945	111.9	0.856

STATION 93 29 RV ALEXANDER AGASSIZ

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 52.5 N	117 26.5 W	02/17/76	0242 GMT	606 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
290	07 KT	290 02 06		1002.2 MB	14.6 C	13.5 C	

Z	T	S	SIGT	DT	DD
0	14.57	33.62	25.022	294.5	0.000
10	14.57	33.62	25.022	294.5	0.029
20	14.45	33.62	25.048	292.1	0.059
30	14.42	33.62	25.054	291.5	0.088
50	12.78	33.58	25.358	262.6	0.144
75	11.33	33.60	25.648	235.0	0.206
100	10.58	33.68	25.844	216.4	0.263
125	10.12	33.78	26.001	201.5	0.316
150	9.63	33.91	26.184	184.1	0.365
200	8.69	34.05	26.445	159.3	0.452
250	8.14	34.12	26.583	146.2	0.531
300	7.70	34.17	26.688	136.3	0.604
400	7.06	34.24	26.834	122.5	0.739
500	6.45	34.28	26.948	111.6	0.862

CALCOFI CRUISE 7602 STATION 93 30

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 50. N	117 31.0 W	02/17/76	0430 GMT	829 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
300	06 KT			1002.3 MB	14.5 C	13.1 C	

Z	T	S	SIGT	DT	DD
0	14.55 A	33.59 A	25.003	296.3	0.000
10	14.53 A	33.59 A	25.008	295.9	0.030
20	14.35 A	33.60 A	25.054	291.6	0.059
30	13.50 A	33.59 A	25.222	275.6	0.087
50	12.48	33.57	25.409	257.8	0.141
75	11.05	33.61	25.706	229.5	0.202
100	10.40	33.73	25.914	209.8	0.258
125	10.00	33.81	26.044	197.4	0.309
150	9.72	33.86	26.131	189.2	0.358
200	8.67	34.02	26.424	161.3	0.447
250	8.42	34.14	26.557	148.7	0.527
300	8.07	34.21	26.665	138.5	0.601
400	7.12	34.22	26.810	124.7	0.739
500	6.37	34.27	26.950	111.4	0.863

A) THE ANALOG RECORDING BEGAN AT APPROXIMATELY 40 METERS. THE EXTRAPOLATED VALUES WERE DETERMINED BY COMPARISON WITH SAMPLE BOTTLE CAST LOWERED ONE HALF HOUR LATER.

RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 93 30

LATITUDE	LONGITUDE	MO/DAY/YR	MESSENGER TIME	BOTTOM	WIND	SPEED	WEATHER	DOMINANT WAVES
32 50. N	117 31. W	02/17/76	0501 GMT	820 M	300	06 KT		

Z	T	S	O2	PO4	SIO3	NO2	NO3	DT
0	14.55	33.587	6.00	0.25		0.00	0.1	296.6
9	14.52	33.586	6.04	0.28		0.00	0.1	296.0
29	13.62	33.605	5.69	0.41		0.43	1.9	276.8
39	13.13	33.587	5.46	0.58	5.8	0.30	3.7	268.7
49	12.79	33.589	5.24	0.68	7.4	0.04	3.9	262.1
63	11.76	33.563	4.94	0.96	9.6	0.04	9.5	245.3
78	10.99	33.639	4.29	1.22	14.4	0.01	14.3	226.3
98	10.44	33.733	3.81	1.38	18.8	0.00	17.1	210.2
122	10.05	33.815	3.49	1.54	21.6	0.00	19.3	197.8
142	9.77	33.858	3.35	1.50	23.2	0.00	20.7	190.1
172	9.43	33.966	3.08	1.85	27.6	0.00	23.0	176.8
201	8.62	34.019	2.73	2.04	34.4	0.00	26.4	160.6
231	8.54	34.117	2.23	2.27	39.0	0.06	28.1	152.2
270	8.25	34.166	1.75	2.48	44.4	0.00	30.1	144.3
330	7.86	34.223	1.25	2.73	51.3	0.00	32.2	134.6
405	7.09	34.235	0.87	2.87	61.6	0.00	35.2	123.2
479	6.54	34.270	0.56	3.13	70.9	0.00	37.6	113.5
559	5.97	34.314	0.37		80.4	0.00		103.2

Z	T	S	SIGT	DT	DD
0	14.55	33.587	25.001	296.6	0.000
10	14.49	33.588	25.014	295.3	0.030
20	14.10	33.599	25.105	286.7	0.059
30	13.57	33.604	25.218	275.9	0.087
50	12.72	33.586	25.374	261.1	0.141
75	11.12	33.620	25.702	229.9	0.203
100	10.40	33.742	25.922	208.9	0.258
125	10.01	33.822	26.053	196.6	0.309
150	9.70	33.887	26.155	186.9	0.358
200	8.65	34.018	26.426	161.1	0.446
250	8.41	34.147	26.564	148.0	0.526
300	8.06	34.199	26.657	139.2	0.600
400	7.14	34.235	26.818	123.9	0.737
500	6.39	34.281	26.956	110.8	0.861

STATION 93 35 RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 93 40

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 40.5 N	117 51.5 W	02/17/76	0811 GMT	630 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
320	09 KT			1002.2 MB	10.5 C	10.3 C	

Z	T	S	SIGT	DT	DD
0	14.37	33.61	25.057	291.3	0.000
10	14.37	33.61	25.057	291.3	0.029
20	14.35	33.61	25.061	290.8	0.058
30	14.32	33.61	25.068	290.2	0.087
50	14.01	33.59	25.117	285.5	0.145
75	11.50	33.60	25.617	238.0	0.211
100	10.60	33.75	25.895	211.6	0.268
125	10.05	33.83	26.052	196.7	0.319
150	9.74	33.90	26.158	186.6	0.368
200	8.98	34.09	26.430	160.7	0.456
250	8.64	34.21	26.578	146.7	0.535
300	7.82	34.21	26.701	135.0	0.608
400	6.81	34.23	26.860	119.9	0.741
500	6.14	34.29	26.996	107.0	0.861

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 30. N	118 11.5 W	02/17/76	1135 GMT	1775 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
330	08 KT	320 04 06	I	1002.1 MB	13.7 C	12.6 C	

Z	T	S	SIGT	DT	DD
0	14.31	33.63	25.085	288.6	0.000
10	14.31	33.63	25.085	288.6	0.029
20	14.31	33.63	25.085	288.6	0.058
30	14.31	33.63	25.085	288.6	0.087
50	13.30	33.60	25.270	271.0	0.143
75	11.80	33.61	25.569	242.6	0.207
100	10.55	33.70	25.864	214.5	0.265
125	9.71	33.85	26.124	189.8	0.316
150	9.29	34.00	26.310	172.1	0.362
200	8.93	34.12	26.462	157.7	0.446
250	8.15	34.15	26.605	144.1	0.524
300	7.68	34.16	26.683	136.7	0.596
400	6.71	34.22	26.866	119.4	0.730
500	6.09	34.29	27.002	106.4	0.849

STATION 93 45 RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602 STATION 95 28

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 20. N	118 32. W	02/17/76	1457 GMT	1202 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
330	08 KT	310 04 05	5	1002.1 MB	13.8 C	12.9 C	7/8 SC

Z	T	S	SIGT	DT	DD
0	14.26	33.63	25.096	287.6	0.000
10	14.26	33.63	25.096	287.6	0.029
20	14.26	33.63	25.096	287.6	0.058
30	13.60	33.62	25.225	275.3	0.086
50	12.20	33.61	25.493	249.7	0.138
75	11.09	33.65	25.730	227.2	0.198
100	10.35	33.74	25.930	208.2	0.253
125	9.90	33.86	26.100	192.1	0.304
150	9.52	33.98	26.257	177.2	0.351
200	8.70	34.06	26.451	158.8	0.436
250	7.81	34.09	26.609	143.8	0.514
300	7.28	34.15	26.732	132.1	0.585
400	6.53	34.23	26.898	116.4	0.715
500	6.02	34.30	27.019	104.9	0.832

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 37. N	117 10.5 W	02/16/76	1800 GMT	19 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
360	02 KT	310 02 08	1	1002.5 MB	12.6 C	10.3 C	1/8 CI

Z	T	S	SIGT	DT	DD
0	14.56	33.37	24.832	312.6	0.000
5	14.56	33.37	24.832	312.6	0.016
10	14.50	33.41	24.876	308.5	0.031
15	14.28	33.56	25.038	293.1	0.046

STATION 95 29 RV ALEXANDER AGASSIZ CALCOFI CRUISE 7602

LATITUDE	LONGITUDE	MO/DAY/YR	START TIME	BOTTOM
32 35. N	117 14.5 W	02/16/76	1919 GMT	47 M

WIND	SPEED	WAVES	WEA	BAROMETER	DRY	WET	CLOUDS
320	08 KT	320 03 07	1	1002.5 MB	13.2 C	11.4 C	2/8 CI

Z	T	S	SIGT	DT	DD
0	14.56	33.48	24.917	304.6	0.000
10	14.47	33.54	24.982	298.4	0.030
20	14.07	33.53	25.058	291.1	0.060
28	12.73	33.61	25.391	259.5	0.082

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