

UNIVERSITY OF CALIFORNIA SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report
PHYSICAL AND CHEMICAL DATA

Cruise 7006
14-15 June 1970

CalCOFI Cruise 7008
17 August - 2 October 1970

CalCOFI Cruise 7102
8 February - 5 April 1971

Special Basin Cruises
1969-1971

SIO Reference 79-30
15 February 1980

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Cruise 7006
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Sponsored by
Marine Research Committee

and

Special Basin Cruises
1969-1971

Sponsored by
University of California

SIO Reference 79-30

Approved for distribution:

W. A. Nierenberg
W. A. Nierenberg, Director

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INTRODUCTION

The data in this report were collected during cruises 7008* and 7102 of the California Cooperative Fisheries Investigations (CalCOFI) program aboard the RV Alexander Agassiz, of the Scripps Institution of Oceanography. Both cruises were a continuation of the testing of zooplankton sampling gear begun on CalCOFI Cruise 6912 and consisted of opening-closing nets being deployed at selected stations both in daylight and at night to sample eight separate depth-ranges between 500m and the sea surface. Included also are two deep stations occupied in the Gulf of California in June 1970 during a special biological survey on the Agassiz. The report preceding this one in the series was SIO Ref. 79-29, which included the data for October and December 1969.

These data were collected in part and processed completely by personnel of the Data Collection and Processing Group (DCPG, MLR)**, Scripps Institution of Oceanography.

STANDARD PROCEDURES

Hydrographic Cast Data

Typical hydrographic casts consisted of 18 bottles. At most stations the maximum sampling depth was 1000 meters, bottom depth permitting. On cruise 7008 bottom casts were lowered on three stations. Salinity samples were drawn and run from all levels of the deep casts on these stations. Temperatures, oxygen, and nutrients were determined for all depths on each station, but usually samples from only four to eight selected depths were used to determine salinity for comparison with the STD.

In general, paired protected reversing thermometers were used to determine temperatures which were recorded in hundredths of a Celsius degree. Temperatures determined using unprotected (pressure) thermometers or surface "bucket" thermometers were recorded to tenths of a degree. Sample bottles used below 100 meters were equipped with unprotected thermometers.

A Washington conductive bridge was used to analyze all salinity samples collected on cruises 7008 and 7102. A Hytech (now Grundy Environmental Systems, Inc.) was used on cruise 7006. All samples were analyzed at sea.

The salinity values were recorded and are reported to three decimal places, provided accepted standards were met. If only one determination per sample was obtained, or there was doubt concerning the accuracy of the analytical results, the salinities are reported to two decimal places. All STD salinities are tabulated to hundredths.

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

On cruises 7008 and 7102, phosphate, silicate, nitrite, and nitrate were determined using a first generation Technicon^R AutoAnalyzer^R and methodologies developed at the National Marine Fisheries Service based on the methods of Strickland (1968). On cruise 7006, phosphates only were determined, using a Beckman spectrophotometer.

The observed data could not be evaluated using standard DCPG techniques (Klein, 1973) due to the sparsity of salinity data. Temperatures and salinities were compared with the STD values while oxygen and nutrient values were plotted against depth.

Chlorophyll and phaeophytin were determined fluorometrically according to the procedure of Yentch and Menzel (1963) as modified by Holm-Hansen et al. (1965).

*The first two digits represent the year and the second two digits the month of the cruise. The CalCOFI station designations have been in use for over twenty years. The first part specifies a line normal to the general trend of the coast line (CalCOFI line). The second part specifies a station position relative to the coast on the CalCOFI line.

**Now the Physical and Chemical Oceanographic Data Facility (PACODF).

In Situ Salinity/Temperature/Depth Recorder (STD) Data

A digital data logger Model 8114 was used for recording the data from the STD on both 7008 and 7102. After a few lowerings on 7008, the digitizer malfunctioned and all data were digitized from the analog recordings. Comparison with Nansen bottle data indicated a salinity correction of -0.12‰ for all but a few lowerings for which the correction was less. The temperature comparison was quite erratic and resulted in various corrections, the largest being -0.20°. The digitizer worked well on 7102 requiring no correction to the temperature. The salinity correction was minor until the second leg of the cruise when there was a large off-set on the first two lowerings. After repair the last few stations were again in close agreement with the Nansen bottle data.

TABULATED DATA

The time reported is Greenwich Mean Time. For STD lowerings it is the "start down" time, and for bottle casts it is the time of messenger release. When more than one cast was lowered on a station, the messenger times for the first and last casts are given. Multiple casts, excluding the surface cast, are indicated by a footnote letter following the observed depth.

Bottom depths, determined acoustically, have been corrected using Matthews (1939) tables and are reported in meters. The weather and dominant waves are coded using the National Oceanographic Data Center (NODC) method.

Data for all cruises presented in this report were obtained by bottle casts and by the STD, and appear in two forms:

1. Data from the sample casts are tabulated with the observed levels of depth on the left of a page. When salinity samples were collected and analyzed for all observed levels, interpolated and computed values at standard levels of depth appear on the right of the page.
2. For each STD lowering, temperature and salinity values are tabulated only at standard levels of depth and appear with computed values of DT and DD on the right of the page. Corrections have been applied to the temperature and salinity values as discussed previously in this report.

The same parameters have been tabulated in this report as in previous reports. The decimal has been omitted from the CalCOFI station number so station 90.65 appears in the tabulated data as 90065. The column headings are to be interpreted as follows:

Z	Depth	Meters
T	Temperature	°C
S	Salinity	‰
O2	Dissolved oxygen	ml/L
P04	"Reactive" inorganic phosphate-phosphorous	µg at/L
SiO3	"Reactive" inorganic silicate-silicon	µg at/L
N02	"Reactive" nitrite-nitrogen	µg at/L
N03	"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 would have if moved isothermally to the sea surface.	g/L
DD	Geopotential anomaly, referred to the sea surface.	dyn. meters

FOOTNOTES

In addition to footnotes, several special notations are used without footnotes because the meaning is always the same.

U: Uncertain value. Values which are not used in interpolation because they seem to be in error without apparent reason.

V: Because of time differences, overlapping casts show some differences. Values not used in interpolation.

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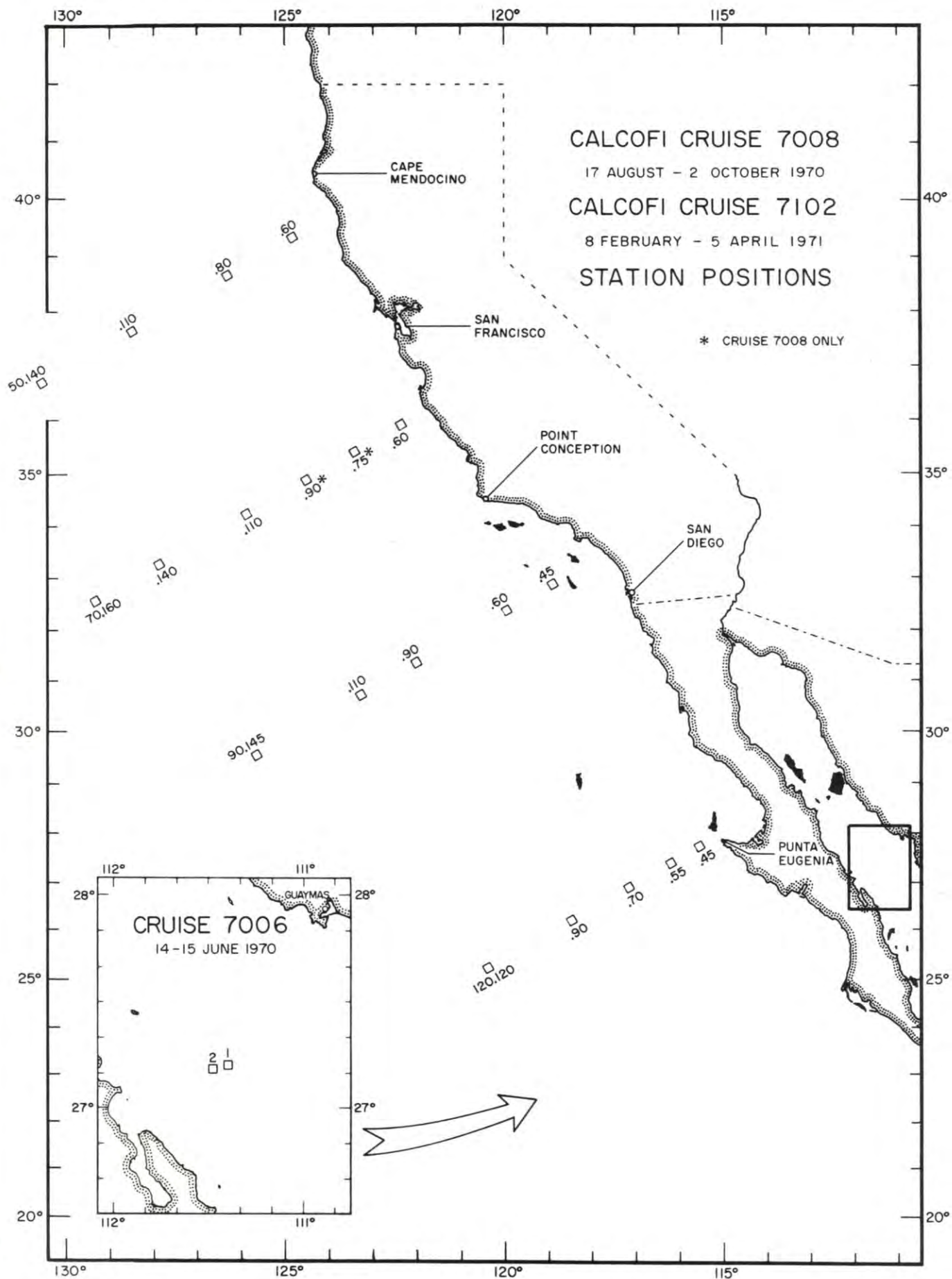


FIGURE 1

PERSONNEL

Cruise 7006

SHIP'S CAPTAIN

Davis, Laurence E., RV Alexander Agassiz

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

R/V Alexander Agassiz:

Boden, Elizabeth M. K.	Associate Research Biologist (in charge)
Brennan, Robert	Marine Technician
Conway, Carol B.	Senior Engineering Aide
Fernandez, Hector	Assistant Professor, USC
Hector, Fred	Journalist
Horton, Robert	Student
Huffer, Jeffrey	Student
McConnaughey, Ronald	Marine Technician
Sertic, Peter	Graduate Student

Z	LATITUDE			LONGITUDE			MO/DA/YR			MESSENGER TIME			POTTM	WIND	SPEED	WEATHER	DOMINANT WAVES		
	27 12.3N	111 24.9W		6/14/70			1722 1948	GMT	1890M	360	8KT	1					200	2	5
Z	T	S	02	P04	S103	N02	N03	DT	Z	T	S	02	SI6T	DT	DD				
0	26.13	35.334	4.97	0.56				462.0	0	26.13	35.334	4.97	23.265	462.0	0.000				
10	23.76	35.159	5.60	0.58				406.0	10	23.76	35.159	5.60	23.853	406.0	0.043				
30	18.43	35.097	4.42	1.29				272.1	20	20.93	35.100	5.21	24.608	334.0	0.080				
50	16.52	35.116	3.30	1.95				226.8	30	18.43	35.097	4.42	25.258	272.1	0.111				
74	14.68	34.965	1.60	2.48				198.4	50	16.52	35.116	3.30	25.735	226.8	0.161				
99	13.96	34.915	1.26	2.57				187.5	75	14.64	34.962	1.59	26.040	197.8	0.215				
148	13.06	34.893	1.33	2.74				171.5	100	13.94	34.913	1.26	26.152	187.1	0.263				
197	12.16	34.830	0.72	2.62				159.3	125	13.44	34.899	1.30	26.245	178.3	0.310				
246	11.47	34.807	0.71	2.69				148.6	150	13.02	34.890	1.31	26.322	171.0	0.354				
305	10.29	34.697	0.17	2.88				136.6	200	12.12	34.829	0.72	26.453	158.6	0.439				
369	9.16	34.627	0.11	2.94				123.7	250	11.39	34.800	0.68	26.567	147.8	0.518				
444	8.31	34.602	0.11	3.04				112.9	300	10.39	34.708	0.22	26.675	137.6	0.593				
512	7.46	34.568	0.09	3.11				103.4	400	8.78	34.615	0.11	26.871	118.9	0.728				
601	6.66	34.545	0.09	3.47				94.5	500	7.61	34.575	0.09	27.018	105.0	0.848				
689	5.98	34.536	0.11	3.21				86.8	600	6.67	34.546	0.09	27.127	94.6	0.957				
797	5.35	34.531	0.15	3.26				79.8	700	5.91	34.535	0.11	27.219	86.0	1.056				
905	4.92	34.543	0.19	3.34				74.1	800	5.24	34.532	0.15	27.286	79.6	1.149				
988A	4.51	34.557	0.33V	3.50V					1000	4.47	34.542	0.25	27.393	69.5	1.316				
1033	4.37	34.551	0.28	3.31				67.7	1200	3.77	34.577	0.43	27.494	59.9	1.468				
1086A	4.10	34.566	0.34	3.58				63.8	1500	3.05	34.610	0.69	27.590	50.8	1.655				
1185A	3.82	34.574	0.42	3.43				60.5	1750	2.92	34.619	0.74	27.610	48.9	1.817				
1284A	3.52	34.604	0.48	3.33															
1380A	3.30	34.596	0.61	3.59				53.9											
1482A	3.08	34.607	0.68	3.48				51.2											
1581A	2.96	34.611	0.74	3.36				49.8											
1681A	2.92	34.614	0.76					49.2											
1781A	2.92	34.619	0.72	3.48				48.9											
1879A	2.89	34.615	0.69	3.92				48.9											

Z	LATITUDE			LONGITUDE			MO/DA/YR			MESSENGER TIME			POTTM	WIND	SPEED	WEATHER	DOMINANT WAVES		
	27 11.4N	111 29.3W		6/15/70			1414 1614	GMT	1856M	310	14KT	1					310	3	5
Z	T	S	02	P04	S103	N02	N03	DT	Z	T	S	02	SI6T	DT	DD				
0	25.56	35.383	5.04	0.66				441.6	0	25.56	35.383	5.04	23.480	441.6	0.000				
10	24.87	35.315	5.17	0.61				426.3	10	24.87	35.315	5.17	23.639	426.3	0.043				
30	18.11	35.108	3.77	1.64				263.8	20	21.65	35.160	4.63	24.458	348.3	0.082				
50	16.02	34.992	1.99	2.38				224.9	30	18.11	35.108	3.77	25.346	263.8	0.113				
74	14.98	34.925	1.14	2.63				207.6	50	16.02	34.992	1.99	25.755	224.9	0.162				
98	14.39	34.937	0.86	2.69				194.6	75	14.95	34.924	1.12	25.943	207.0	0.216				
146	13.53	34.900	0.95	2.76				180.1	100	14.35	34.936	0.86	26.082	193.8	0.267				
195	12.78	34.891	1.09	2.80				166.4	125	13.87	34.919	0.91	26.170	185.4	0.315				
244	11.39	34.750	0.22	2.92				151.4	150	13.48	34.901	0.96	26.238	179.0	0.362				
302	10.90	34.739	0.26	2.94				143.7	200	12.63	34.875	1.01	26.389	164.7	0.450				
363	9.44	34.654	0.17	3.09				126.1	250	11.33	34.748	0.22	26.538	150.5	0.532				
434	9.55	34.608	0.13	3.13				115.9	300	10.91	34.740	0.26	26.607	144.0	0.609				
502	7.92	34.596	0.15	3.20				107.7	400	8.91	34.627	0.14	26.860	120.0	0.748				
587	6.80	34.550	0.11	3.23				96.0	500	7.94	34.598	0.15	26.987	108.0	0.870				
673	6.15	34.536	0.09	3.24				88.8	600	6.68	34.547	0.11	27.127	94.7	0.981				
779	5.52	34.532	0.12	3.28				81.6	700	5.98	34.534	0.09	27.209	86.9	1.081				
882	4.90	34.538	0.15	3.34				74.2	800	5.35	34.533	0.12	27.282	80.0	1.174				
959A	4.64	34.545	0.23	3.28				70.9	1000	4.47	34.554	0.30	27.403	68.6	1.342				
1008	4.44	34.555	0.31	3.31				68.1	1200	3.84	34.573	0.39	27.485	60.8	1.492				
1055A	4.30	34.583	0.25	3.42				64.5	1500	3.08	34.605	0.67	27.584	51.3	1.692				
1153A	3.96	34.565	0.36	3.42				62.5	1750	2.90	34.613	0.66	27.607	49.2	1.845				
1250A	3.71	34.581	0.43	3.40				58.9											
1349A	3.41	34.585	0.55	3.40				55.8											
1449A	3.15	34.601	0.62	3.32				52.2											
1548A	3.03	34.607	0.70	3.33				50.7											
1649A	2.92	34.620	0.66	3.35				48.8											
1749A	2.90	34.612	0.66	3.30				49.2											
1847A	2.88	34.611	0.69	3.34				49.1											

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