



Moss Landing

Marine Laboratories

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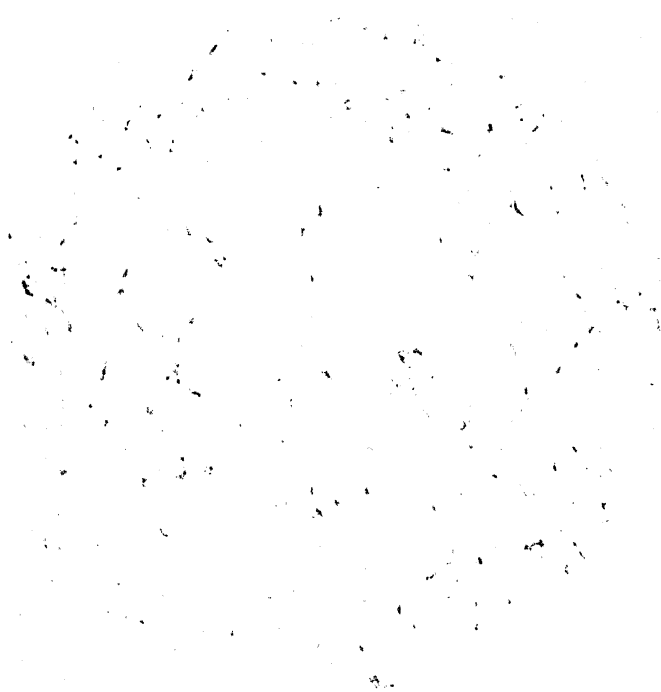
OCEANOGRAPHIC OBSERVATIONS IN MONTEREY BAY, CALIFORNIA
FEBRUARY 1971 TO DECEMBER 1971

A NATIONAL SEA GRANT PROJECT

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Grant No. 2-35137
and
ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

by
William W. Broenkow

Moss Landing Marine Laboratories
of the
California State University and Colleges
at
Fresno, Hayward, Sacramento, San Francisco, and San Jose



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TABLE OF CONTENTS

	<u>Page</u>
Introduction	1
Scientific Personnel	1
Acknowledgements	2
Station Locations	3
Map of Station Positions	4
Methods	5
Explanation of Tables	9
References	12
Data	
February Cruises 2, 3	13
March Cruises 4, 5	27
April Cruises 6, 7	42
May Cruises 8, 9	55
June Cruises 10, 11	70
July Cruises 12, 13	84
August Cruises 15, 16	101
September Cruise 17	118
October Cruise 18	140
November Cruise 19	162
December Cruise 20	184

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FEBRUARY 1971 TO DECEMBER 1971

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INTRODUCTION

Moss Landing Marine Laboratories began a study of the hydrography of Monterey Bay in February 1971 to determine seasonal and small scale spatial variations in some physical, chemical and biological parameters. These data have been obtained to determine the relative influences of the transport of offshore waters through the bay, the discharges of domestic sewages into the bay, and the biochemical changes that occur within the bay.

Initially the study was supported solely by a grant from the Office of Sea Grant Programs, and in September 1971 additional support to expand this work was received from the Association of Monterey Bay Area Governments. By incorporating results obtained under both grants into one report, the data will be readily accessible for detailed study.

SCIENTIFIC PERSONNEL

Sandra Benz	Oceanographic Technician
William Broenkow	Associate Professor, Oceanography
David Garrison	Sea Grant Teaching Assistant
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William Smethie	Sea Grant Teaching Assistant
Richard Smith	Sea Grant Teaching Assistant

In addition to the above, 37 students enrolled in the undergraduate research class, "Environmental Research Participation", have greatly aided in the shipboard sampling, laboratory analyses and data reduction.

ACKNOWLEDGEMENTS

Without the much appreciated assistance of Frank Monnich, Captain of R/V Amigo, the hydrographic observational program would not have been accomplished.

This research was supported by Grant 2-35137 from the Office of Sea Grant Programs, National Oceanic and Atmospheric Administration, Department of Commerce and by the Association of Monterey Bay Area Governments.

MONTEREY BAY HYDROGRAPHIC STATION LOCATIONS

<u>STATION NUMBER</u>	<u>LATITUDE N.</u>	<u>LONGITUDE W.</u>	<u>DEPTH</u>		<u>SAMPLING DEPTHS</u>
			<u>m</u>	<u>f_m</u>	
24	36°38.8'	121°56.3'	40	22	0, 5, 10, 20, 30
22	36°36.6'	121°52.9'	16	9	0, 5, 10
21	36°37.6'	121°51.2'	18	10	0, 5, 10
23	36°39.2'	121°53.1'	68	37	0, 5, 10, 20, 30, 50
20	36°43.1'	121°51.5'	57	31	0, 5, 10, 20, 30, 50
16	36°43.3'	121°55.6'	97	53	0, 5, 10, 20, 30, 50, 75
10	36°45.6'	121°52.0'	70	38	0, 5, 10, 20, 30, 50
1	36°44.7'	121°49.3'	15	8	0, 5, 10
3	36°48.1'	121°48.2'	110	60	0, 5, 10, 20, 30, 50, 75, 100
8	36°47.4'	121°50.0'	240	130	0, 5, 10, 20, 30, 50, 75, 100, 150
12	36°48.0'	121°52.2'	240	130	0, 5, 10, 20, 30, 50, 75, 100, 150
15	36°46.6'	121°57.2'	718	393	0, 10, 20, 30, 50, 75, 100, 150, 200, 250, 300, 400
57	36°50.2'	121°58.1'	366	200	0, 10, 20, 30, 50, 75, 100, 150
14	36°50.5'	121°52.7'	59	32	0, 5, 10, 20, 30, 50
5	36°50.8'	121°49.6'	15	8	0, 5, 10
54	36°55.2'	121°52.7'	15	8	0, 5, 10
58	36°55.1'	121°56.7'	26	14	0, 5, 10, 20
59	36°57.1'	121°56.2'	15	8	0, 5, 10
53	36°56.8'	122°00.1'	15	8	0, 5, 10
52	36°55.3'	122°04.4'	35	19	0, 5, 10, 20
50	36°52.9'	121°51.3'	18	10	0, 5, 10

Moss Landing Marine Laboratories Monterey Bay Hydrographic Stations.

METHODS

Station Position. When the shoreline was clearly visible, station positions were determined using horizontal sextant angles with an accuracy of about ± 0.1 mile within 1 mile of shore and ± 0.3 mile within 6 miles of shore. During inclement weather a combination of loran, radar ranges and bearings and fathometer readings were used, and in most cases the accuracy of the position was about ± 0.5 mile or better.

Hydrographic Sampling. Four 5-liter Niskin plastic sampling bottles were used to obtain discrete water samples at the standard sampling depths, 0, (5), 10, 20, 30, 50, 75, 100, 150, 200, 250, 300, and 400 m. Accepted sampling depths were determined from wire angle for depths less than 100 m and from a combination of wire angle and thermometric depth calculations for depths greater than 100 m.

Temperature. The in situ temperature was determined from paired reversing thermometers. The average temperature is recorded when the thermometers agreed to within 0.05° C.

Salinity. Salinity was determined using a Kahlisco precision induction salinometer. Analyses were made in the laboratory and salinity was computed from conductivity ratio using the equations of Cox, et al (1967). Substandard seawater was used to calibrate the salinometer before and after each set of 24 or fewer samples. Copenhagen water was used each month to standardize the substandard water.

Dissolved Oxygen. Water samples were treated aboard ship to fix the oxygen in the basic form. The samples were acidified and titrated in the laboratory within 12 hours of the sampling time using Carpenter's (1965) modification of the Winkler method. The total sample is titrated with approximately 0.02 N sodium thiosulfate to the starch endpoint. Precision of the analyses is about ± 0.06 ml/liter (2 SD).

Nutrient Ions. The 500 ml samples were filtered through 3 μ m glass fiber filters, quick frozen in a dry ice-alcohol solution aboard ship and were refrigerated at -10° C until analyzed ashore within 3 weeks of collection. Groups of 36 samples were quick-thawed in the laboratory just prior to the analyses for phosphate, nitrate, nitrite ammonia, and silica. Standards and reagent blanks were prepared fresh daily and were determined with each set of samples.

Dissolved reactive phosphate was determined by the method of Murphy and Riley (1962) described in Strickland and Parsons (1968) using ascorbic acid to reduce the phospho-molybdate complex. The sample absorbance was determined in 10 cm cells on a Beckman DU II Spectrophotometer at 885 nm. Precision of the analyses is about ± 0.03 μ g-atoms/liter (2 SD).

Nitrate was determined by the cadmium-reduction method of Wood et al (1967) followed by the nitrite color development. The sample absorbance was determined in 1 cm cells

using a Spectronic 20 Colorimeter at 543 nm. Precision of the analyses is about $\pm 0.5 \mu\text{g-atoms/liter}$ (2 SD).

Nitrite was determined by the method of Bendschneider and Robinson (1952) described by Strickland and Parsons (1967). The absorbance of the diazo color was determined on the Beckman DU using 10 cm cells at 543 nm. Precision of the method is about $\pm 0.03 \mu\text{g-atoms/liter}$ (2 SD).

Ammonia was determined by the indophenol method of Solorzano (1969) with the color absorbance determined with the Beckman DU at 640 nm using 10 cm cells. Precision of the method is about $\pm 0.1 \mu\text{g-atoms/liter}$ (2 SD).

Reactive silica was determined by the method of Mullin and Riley (1955) as modified by Strickland and Parsons (1968). The silicomolybdate complex was reduced by a metol-sulfite, oxalic acid solution, and the color absorbance was determined in 1 cm cells on a Spectronic 20 at 810 nm. Precision of the method is about $\pm \mu\text{g-atoms/liter}$ (2 SD).

Plant Pigments. Chlorophyll a and Phaeophytin a fluorescences were determined by the method of Holm-Hansen et al (1965) using the Turner Model 3 Fluorometer, and their concentrations were estimated using the equations of Strickland and Parsons (1968).

The glass fiber filters, from the nutrient sample filtration (3 μm pore size) were treated with MgCO_3 and quick frozen for plant pigment analysis ashore. Precision of the method is about $\pm 5\%$ (2 SD).

EXPLANATION OF TABLES

CRUISE	Moss Landing Marine Laboratories consecutive hydrographic cruise number.
STATION	Permanent hydrographic station number. 11 designates Moss Landing Marine Laboratories.
DATE	Local date of sampling.
HOUR	Local sampling time (Pacific Standard Time). Time of messenger release is given for one-cast stations, median time on station is given for multi-cast stations. For two-cast (8 bottle) stations the time on-station was generally under one hour.
N LATITUDE W LONGITUDE	Observed station position corresponding to sampling time given above. Drift while on station was generally less than 0.5 miles. When greater drift was experienced, the ship was brought back to the station for subsequent casts.
TRANSP	Secchi disk depth, meters.
WAVES	
dir	Direction from which the dominant waves are coming, in tens of degrees, according to WMO Code 0885.
ht	Height of dominant waves according to WMO Code 1555.
p	Period of dominant waves according to WMO Code 3155.
WIND	
dir	Direction from which the wind is blowing, in tens of degrees, according to WMO Code 0877.
speed	Wind speed in knots.
BAROM	Pressure in millibars.
AIR TEMP °C	
dry	Air temperatures were obtained about 2 m above sea surface. Dry-bulb air temperature in degrees centigrade.
wet	Wet-bulb air temperature in degrees centigrade.
WEATH	Present weather according to WMO Code 4677.

CLOUDS	
typ	Cloud type according to WMO Code 0500.
amt	Cloud amount in eights according to WMO Code 2700.
VISIB	Sea level visibility according to WMO Code 4300.
DEPTH	Accepted depth in meters from which the sample was obtained, determined from wire length, wire angle and thermometric depth calculation.
TEMP	<u>In situ</u> water temperature in degrees centigrade.
SALINITY	Salinity in grams/kilogram (°/oo or ppt).
SIGMA T	Potential density anomaly, computed from the equations in Knudsen's Hydrographical Tables (Knudsen, 1901).
OXYGEN	Dissolved oxygen concentration in ml(STP)/liter.
AOU	Apparent oxygen utilization in $\mu\text{g-atoms O}_2\text{-O/liter}$: the difference between the observed oxygen concentration and the oxygen solubility computed from the <u>in situ</u> temperature and salinity using the equations of Truesdale, <u>et al</u> (1955).
SAT	Percent of oxygen saturation computed from the <u>in situ</u> temperature and salinity using the equations of Truesdale, <u>et al</u> , (1955).
PHOSPHATE	Concentration of reactive phosphate in $\mu\text{g-atoms PO}_4\text{-P/liter}$.
NITRATE	Concentration of dissolved nitrate in $\mu\text{g-atoms NO}_3\text{-N/liter}$.
NITRITE	Concentration of dissolved nitrite in $\mu\text{g-atoms NO}_2\text{-N/liter}$.
AMMONIA	Concentration of dissolved ammonia in $\mu\text{g-atoms NH}_3\text{-N/liter}$.
SILICA	Concentration of reactive silica in $\mu\text{g-atoms SiO}_2\text{-Si/liter}$.
CHL-a	Concentration of chlorophyll <u>a</u> in $\mu\text{g/liter (mg/m}^3\text{)}$.
PHAEO	Concentration of phaeophytin <u>a</u> in $\mu\text{g/liter (mg/m}^3\text{)}$.

*

Questionable data point. These values are suspect based upon preliminary analysis of the data and should be used with caution.

REFERENCES

- Bendschneider, K. and R. J. Robinson. 1952. A new spectrophotometric determination of nitrite in sea water. *J. Mar. Res.*, 24:446-449.
- Carpenter, J. H. 1965. The chesapeake Bay Institute technique for the Winkler dissolved oxygen method. *Limnol. Oceanogr.*, 10:141-143.
- Cox, R. A., F. Culkin, and J. P. Riley. 1967. The electrical conductivity/chlorinity relationship in natural sea water. *Deep-Sea Res.*, 14:203-220.
- Holm-Hansen, O., C. J. Lorenzen, R. W. Holmes and J. D. H. Strickland. 1965. Fluorometric determination of chlorophyll. *J. Conseil, Conseil Perm. Intern. Exploration Mer*, 30:3-15.
- Knudsen, M. 1901. *Hydrographical Tables*. Tutein and Kock, Copenhagen. 63p.
- Mullin, J. B. and J. P. Riley. 1955. The colorimetric determination of silicate with special reference to sea and natural waters. *Anal. Chim. Acta*, 12:162-176.
- Murphy, J. and J. P. Riley. 1962. A modified single solution method for the determination of phosphate in natural waters. *Anal. Chim. Acta*, 27L:31-36.
- Solorzano, L. 1969. Determination of ammonia in natural waters by the phenylhypochlorite method. *Limnol. Oceanogr.*, 14:799-801.
- Strickland, J. D. H. and T. R. Parsons. 1968. *A Practical Handbook of Sea Water Analysis*. Bull. 167. Fish. Res. Bd. Canada. 311p.
- Truesdale, G. A., A. L. Downing and G. F. Lowden. 1955. Solubility of oxygen in pure water and sea water. *J. Appl. Chem.*, 5:53-62.
- Wood, E. D., F. A. J. Armstrong and F. A. Richards. 1967. Determination of nitrate in sea water by cadmium-copper reduction to nitrite. *J. Mar. Biol. Ass. U. K.*, 47:23-31.

Hydrographic StationsML CRUISE 2

16 February 1971

1101

1103

1105

1107

1114

1112

1110

1108

ML CRUISE 3

20 February 1971

1151

1152

1153

1154

1155

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 2	1101	16 FEB 1971	8.2	36° 44.8'	121° 49.5'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
5	29 4 7	10 4	1009.5	8.8 8.3		8 8	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/1	µg-at/1	%			µg-atoms/liter		
0	11.55	33.454	25.49	6.49	-45	108	.57	.8	.14	.77	10
5	11.54	33.446	25.49	6.86	-78	115	.43	1.1	.11	.13	7
10	11.46	33.457	25.51	6.58	-52	110	.67	3.2	.18	.30	5

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 2 1103 16 FEB 1971 9.5 36° 48.2' 121° 48.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 1008.8 11.1 9.4 8 8 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.54	33.455	25.50	6.72	-65	112	.79	2.2	.13	.18	5
5	11.52	33.454	25.50	6.68	-61	112	.55	2.3	.08	.14	4
10	11.42	33.470	25.53	6.45	-40	108	.84	3.7	.14	.53	6
20	11.10*	33.521	25.63	5.86	16	97	1.17	8.4	.19	.58	11
30	11.38	33.498	25.56	6.18	-15	103	1.02	6.1	.16	.39	8
49	9.62	33.767	26.07	3.52	242	57	2.08	22.4	.25	.26	25
74	9.04	33.866	25.25	2.80	313	44	2.36	24.5	.23	.09	35
98	8.52	33.953	26.39	2.42	354	38	2.62	28.9	.20	.07	40

* indicates questionable data: Paired thermometer read 11.02

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 2	1105	16 FEB 1971	10.7	36° 50.8'	121° 49.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb	mb	dry wet		typ amt	
5		5 6	1006.8	11.0 9.4		8 8	6

DEPTH	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.64	33.345	25.39	6.80	-73	114	1.17	3.8	.23	.44	6
5	11.70	33.446	25.46	6.68	-64	112	.78	2.4	.14	.27	5
10	11.52	33.457	25.50	6.40	-36	107	.98	4.7	.21	.57	8

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 2 1107 16 FEB 1971 12.1 36° 48.9' 121° 50.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 29 4 7 27 12 1006.4 11.6 10.4 8 8 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN T ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.60	33.437	25.47	6.86	-78	115	.53	1.7	.07	.20	3
10	11.52	33.441	25.49	6.66	-60	111	.63	3.4	.08	.24	4
20	11.34	33.442	25.52	6.32	-27	105	.90	5.1	.12	.00	6
30	10.92*	33.532	25.67	5.41	58	89	1.39	10.6	.22	.52	12
50	10.88	33.535	25.68	4.10	176	68	1.64	11.2	.24	.60	32*
75	10.14	33.660	25.90	3.17	267	51	1.96	17.6	.25	.36	20
100	9.62	33.759	26.07	3.41	252	55	2.21	21.4	.15	.00	25

* indicates questionable data: Paired thermometer read 10.85

* indicates questionable data: Silicate is anomalously high

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE			
ML		2	1114	16 FEB 1971	13.0	36° 50.8'		121° 52.4'			
TRANSP		WAVES		WIND	BAROM	AIR TEMP °C		WEATH	CLOUDS	VISIB	
m		dir	ht	p	dir	speed	mb	dry	wet	typ	amt
5			23	10	1005.1	11.8	10.6	8	8	6	
DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	11.64	33.431	25.46	7.06	-97	118	.63	1.1	.08	.28	5
10	11.58	33.433	25.47	6.98	-89	117	.69	.7	.09	.24	4
20	11.08	33.482	25.60	5.43	55	90	1.39	8.9	.27	.82	16
29	10.62	33.563	25.74	4.57	137	75	1.51	2.8*	.33	.37	16

* indicates questionable data: Nitrate appears anomalously low

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 2 1112 16 FEB 1971 13.8 36° 48.0' 121° 52.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 19 7 1003.7 12.2 10.6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.64	33.441	25.47	7.01	-92	117	.54	.1	.03	.00	2
10	11.54	33.447	25.49	6.64	-58	111	.55	.1	.04	.00	4
20	10.50	33.584	25.78	4.57	138	75	1.48	8.2	.26	.31	17
30	10.12	33.656	25.90	3.82	209	62	1.60	11.3	.15	.16	21
49	9.62	33.770	26.08	3.77	220	61					
75	9.02	33.937	26.30	2.70	322	43	2.17	21.6	.02	.00	34
100	8.64	33.958	26.38	2.51	344	39	2.38	23.6	.06	.00	43
149	8.37	33.998	26.45	2.29	367	36	2.49	25.5	.03	.00	45
199	8.34	34.000	26.46	2.30	367	36	2.51	27.1	.03	.00	46

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 2	1110	16 FEB 1971	15.5	36° 45.3'	121° 51.8'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
5			1003.4	12.2 10.6		8 8	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	11.54	33.442	25.49	6.88	-80	115	.53	.9	.04	.00	7
10	11.49	33.449	25.50	6.77	-69	113	.58	1.1	.01	.00	7
20	11.20	33.473	25.57	6.22	-17	103	.81	3.6	.10	.03	10
30	10.62	33.577	25.76	4.82	114	79	1.44	14.2	.24	.50	18

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 2	1108	16 FEB 1971	16.7	36° 47.5'	121° 50.0'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
6		10 0	1003.0	11.2 10.0		8 8	5

DEPTH	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/l	NITRATE µg-atoms/l	NITRITE µg-atoms/l	AMMONIA µg-atoms/l	SILICA µg-atoms/l
0	11.55	33.438	25.48	6.93	-84	116	.63	1.9	.06	.00	7
10	11.17	33.505	25.60	5.94	8	99	.93	6.6	.12	.50	12
20	9.74	33.739	26.03	3.66	228	59	1.90	18.1	.11	.25	26
30	9.12	33.853	26.22	3.04	291	48	2.24	25.4	.09	.06	35
50	9.02	33.889	26.27	2.72	321	43	2.25	26.5	.18	.00	36
75	8.59	33.952	26.38	2.44	351	38	1.77*	11.7*	.08*	.00*	28*
100	8.18	34.010	26.49	2.13	384	33	2.83	19.6	.11	.00	
150	7.86	34.050	26.57	1.96	403	30	2.75	26.5	.09	.00	47

* indicates questionable data: All nutrients are anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 3	1151	20 FEB 1971	11.4	36° 53.8'	121° 59.3'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet	typ	amt	
5	27 2 4	8 2	1018.0	13.3 8.8	2	0 1	8

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	10.65*	33.522	25.71	6.01	8	99	1.23	9.5	.18	.40	11
10	10.36	33.522	25.76	5.20	84	85	1.56	12.6	.22	.06	13
20	9.75	33.689	25.99	3.45	247	56	1.99	20.2	.13	.07	19
30	9.54	33.764	26.08	3.17	274	51	2.27	20.6	.15	.43	23

* indicates questionable data: Paired thermometer read 10.59

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 3	1152	20 FEB 1971	13.0	36° 55.1'	122° 00.8'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
5		22 8	1016.7	11.1 7.7	2	0 2	8

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	10.86	33.547	25.69	5.31	68	87	1.66	11.8	.29	.55	14
10	10.38	33.561	25.79	5.56	51	91	1.74	12.5	.26	.90	14
20	10.16	33.615	25.86	4.76	125	77	1.87	15.4	.22	.30	17
30	9.88	33.677	25.96	3.88	207	63	2.09	18.2	.19	.53	20

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 3	1153	20 FEB 1971	13.6	36° 56.7'	122° 00.8'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
2		22 3	1016.7	14.6 8.3	2	0 3	8

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/1	µg-at/1	%	µg-atoms/liter				
0	10.94	33.321	25.50	4.95	100	82	2.51*	13.0	.49	2.39	24
5	10.50	33.587	25.78	4.59	136	75	2.06	13.5	.40	1.60	20
10	10.38	33.594	25.81	4.64	133	76	2.09	13.9	.37	1.61	19

* indicates questionable data: Phosphate appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 3	1154	20 FEB 1971	14.9	36° 54.7'	121° 52.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb	mb	dry wet		typ amt	
4	28 2 4	25 4	1016.7	12.3 9.4	2	0 3	8

DEPTH	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.33	33.503	25.57	7.14	-101	119	.87	2.2	.19	.18	8
5	11.12	33.508	25.61	6.92	-78	115	1.03	3.5	.24	.33	8
10	10.37	33.634	25.84	4.23	170	69	2.06	14.7	.36	1.50	19

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 3 1155 20 FEB 1971 16.0 36° 50.2' 121° 50.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 25 7 1016.6 12.3 10.1 2 0 4 8

DEPTH TEMP °C SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
 m ppt
 0 11.12 33.545 25.64 6.40 -32 106 1.40 6.5 .27 .70 10
 9 10.76 33.568 25.72 5.76 29 95 1.48 8.1 .25 .34 11
 19 10.62 33.572 25.75 5.35 67 88 1.55 10.4 .30 .92 14
 28 10.10 33.671 25.92 3.98 195 65 1.95 16.9 .35 .64 19

Hydrographic StationsML CRUISE 4

16 March 1971

1101

1103

1105

1107

1114

1112

1110

1108

ML CRUISE 5

20 March 1971

1155

1156

1154

1153

1152

1157

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 4	1101	16 MAR 1971	8.1	36° 44.8'	121° 49.2'

TRANSP		WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB				
m	dir	ht	p	dir	speed	mb	dry	wet				
3				6	3	1022.7	10.3	9.4	44	0	8	4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	9.80	33.514	25.85	6.95	-65	112	1.68	14.9	.46	.64	18
5	9.97	33.681	25.95	7.18	-88	116	1.31	10.8	.35	.00	14
10	9.82	33.693	25.98	6.95	-66	112	1.27	12.2	.36	.00	14

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 4 1103 16 MAR 1971 9.3 36° 48.1' 121° 48.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 4 27 2 4 35 3 1022.7 11.1 10.1 42 0 7 5

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.72	33.788	26.07	5.65	50	91	1.70	16.0	.37	.67	13
5	9.27	33.815	26.17				1.80	17.5	.40	.65	24
10	8.86	33.908	26.31	4.22	189	67	2.10	21.4	.33	.62	31
20	8.64	33.970	26.39	2.90	309	46	2.32	22.0	.29	.44	51
30	8.51	33.986	26.42	2.69	330	42	2.66	26.3	.37	1.05	39
50	8.44	34.001	26.44	2.48	349	39	2.49	27.2	.27	.01	48
75	8.36	34.005	26.46	2.43	355	38	2.63	28.1	.32	.51	50
100	7.54*	34.107*	26.66	1.51	447	23	2.95	32.6	.29	.07	61

* indicates questionable data

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 4 1105 16 MAR 1971 10.5 36° 50.8' 121° 49.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 3 27 1 4 0 0 1022.7 11.7 10.0 42 0 3 6

DEPTH TEMP SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
 m °C ppt ml/l µg-at/l % µg-atoms/liter
 0 10.44 33.578 25.79 6.74 -54 110 11.1 .39 3.28 18
 5 10.06 33.728 25.97 7.01 -74 114 1.32 11.6 .34 .50 14
 10 9.90 33.751 26.01 6.88 -61 111 1.32 11.4 .32 .30 14

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 4 1107 16 MAR 1971 11.6 36° 48.7' 121° 50.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt
5 27 1 4 0 0 1022.0 12.8 10.9 42 0 3 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.03	33.761	25.83	6.52	-43	108	1.23	10.4	.30	.00	16
10	9.84	33.758	26.03	3.93*	203	63	1.26	10.6	.28	.43	14
20	9.55	33.769	26.09	5.31	83	85	1.41	13.5	.29	.43	18
30	9.26	33.799	26.16	6.07	19	97	1.78	19.2	.30	.58	25
50	9.08	33.857	26.23	4.88	127	77	2.04	21.5	.39	.92	29
75	8.62	33.954	26.38	3.19	284	50	2.32	27.5	.32	.54	37
100	8.49	66.993	26.43	2.41	355	38	2.47	25.2	.32	.52	41

* indicates questionable data: Oxygen appears anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 4	1114	16 MAR 1971	12.9	36° 50.5'	121° 52.6'

TRANSP m	WAVES dir ht p	WIND dir speed	BAROM mb	AIR TEMP °C		WEATH	CLOUDS typ amt	VISIB
				dry	wet			
5	28 1 3	29 8	1021.7	11.1	10.6	5	0 7	6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.09	33.727	25.79	7.66	-145	127	1.13	6.8	.34	.37	14
10	9.80	33.725	26.01	6.89	-61	111	1.22	10.5	.32	.59	15
20	9.40	33.756	26.10	5.75	46	92	1.51	15.6	.31	1.10	20
30	9.00	33.862	26.25	4.12	196	65	2.04	22.6	.30	.96	29
50	8.68	33.959	26.37	2.80	318	44	3.08*	27.0	.34	1.04	38

* indicates questionable data: Phosphate appears anomalously high

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 4 1112 16 MAR 1971 14.0 36° 47.9' 121° 51.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 26 1 4 26 9 1021.0 11.7 11.2 1 0 5 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	10.29	33.719	25.92	6.79	-58	111	1.36	14.7	.33	.00	19
10	9.47	33.726	26.07	6.41	-14	103	1.42	14.2	.33	1.57	19
20	9.20	33.744	26.12	5.26	92	84	1.72	18.9	.32	.90	24
30	9.05	33.806	26.20	4.35	175	69	1.99	21.9	.33	1.05	30
49	8.82	33.916	26.32	3.25	276	51	2.28	25.7	.30	.09	34
98	8.54	33.975	26.41	2.57	340	40	2.33	28.5	.24	.00	37
147	8.40	34.026	26.47	2.28	367	36	2.48	28.6	.20	.18	41
195	8.30	34.032	26.49	2.09	386	33	2.57	29.2	.23	.11	38

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE

ML 4 1110 16 MAR 1971 15.1 36° 45.9' 121° 51.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt

7 27 4 3 28 12 1020.3 11.4 10.8 3 0 5 7

DEPTH TEMP SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
m °C ppt ml/l µg-at/l % µg-atoms/liter

0	9.64	33.716	26.03	6.67	-39	107	1.46	13.0	.08	.00	16
10	9.36	33.724	26.08	5.86	36	93	1.63	17.4	.04	.00	17
19	9.22	33.735	26.11	5.44	76	87	1.71	19.6	.03	.02	20
29	9.15	33.795	26.17	4.87	127	77	1.87	19.9	.08	.45	22
48	8.67	33.934	26.36	3.06	295	48	2.31	24.7	.08	.20	31

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 4	1108	16 MAR 1971	16.2	36° 47.5'	121° 49.8'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	9.80	33.735	26.02	6.82	-54	110	1.36	11.6	.06	.30	15
9	9.34	33.751	26.11	5.74	47	92	1.67	16.9	.05	.09	18
19	9.18	33.797	26.17	5.04	112	80	1.83	21.3	.04	1.09	23
28	9.17	33.817	26.19	4.70	142	75	1.88	22.9	.03	.33	22

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 5	1155	20 MAR 1971	10.0	36° 50.3'	121° 50.5'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	
4	15 1 2	16 13	1032.8	16.1 12.8	1	4 1	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	10.60	33.788*	25.92	6.72	-55	110	1.15	7.4	.33	1.32	20
10	10.28	33.770*	25.96	6.86	-64	112	1.18	8.1	.27	1.42	15
20	9.86	33.897*	26.14	6.03	14	97	1.36	10.5	.27	2.19	18
30	9.56	33.929*	26.21	5.50	65	88	1.51	13.9	.27	1.33	20

* indicates questionable data: Salinity appears to be approximately .1 ppt high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 5	1156	20 MAR 1971	11.3	36° 55.2'	121° 55.0'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet	typ	amt				
8	17	1	2	29	3	1017.6		12.8	11.1	2	4	1	7		

DEPTH	TEMP	SALINITY	SIGMA	T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt			ml/l	µg-at/l	%	µg-atoms/l	µg-atoms/l	µg-atoms/l	µg-atoms/l	µg-atoms/l
0	12.05	33.854*	25.71	9.09	-284	154	.55	.0	.07	.00		4
10	11.02*	33.858*	25.90	9.34	-295	155	.51	.0	.08	.25		4
20	10.34	33.862*	26.03	7.63	-134	125	.77	2.4	.17	1.30		8
30	9.40	33.932*	26.24	4.75	134	76	1.79	15.2	.30	3.31		23

* indicates questionable data: Paired thermometer read 10.94
 Salinity appears to be approximately 0.1 ppt high

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 5 1154 20 MAR 1971 12.0 36° 55.4' 121° 52.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 24 0 2 2 10 1018.3 17.2 13.1 2 0 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	12.60	33.869*	25.62	8.90	-273	153	.54	.0	.08	.15	5
5	11.24*	33.868*	25.87	9.33	-296	155	.46	.0	.07	.12	5
10	10.15	33.862*	26.06	7.99	-164	130	.81	1.8	.22	.56	32

* indicates questionable data: Paired thermometer reads 11.15
 Salinity appears to be approximately 0.1 ppt high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 5	1153	20 MAR 1971	13.3	36° 55.9'	122° 00.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb		dry wet		typ amt	
4	29 2 2	23 5	1015.9	14.3 12.5	2	0 1	7

DEPTH	TEMP °C	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m		ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	11.52	33.612*	25.62	7.99	-179	134	.64	.0	.13		7
5	10.33*	33.853*	26.02	8.93	-250	146	.48	.0	.08	.18	3
10	10.03*	33.882*	26.09	7.34	-104	119	.74	2.9	.18	.34	11

* indicates questionable data: Paired thermometers read 10.26 at 5 m, 9.97 at 10 m
 Salinity appears to be 0.1 high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 5	1152	20 MAR 1971	14.0	36° 54.9'	122° 00.8'

TRANSP m	WAVES dir ht p	WIND dir speed	BAROM mb	AIR TEMP °C		WEATH	CLOUDS typ amt	VISIB
				dry	wet			
4	27 1 2	25 4	1015.9	12.8	11.7	2	0 1	7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.42	33.882*	25.85	10.17	-374	170	.35	.0	.05	.18	6
10	10.32*	33.879*	26.04	8.14	-179	133	.58	1.7	.17	.33	6
19	9.85*	33.888*	26.13	7.12	-82	115	.97	7.3	.27	.73	12
29	9.30	33.934*	26.26	4.73	137	75	1.71	14.1	.31	2.54	23

* indicates questionable data: Paired thermometers read 10.25 at 10 m, 9.78 at 19 m
Salinity appears to be 0.1 high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 5	1157	20 MAR 1971	15.7	36° 51.3'	121° 58.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
4	0 0 0 0	0 0 0	1000.0	.0 .0	0 0 0	0 0 0	0

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	11.24	33.820*	25.83	10.18	-372	169	.29	.0	.05	.72	2
10	10.11*	33.821*	26.03	8.78	-234	143	.46	.0	.11	.29	17
20	9.85*	33.824*	26.08	7.14	-84	115	.85	6.5	.21	1.03	11
30	9.56	33.845*	26.14	6.14	8	98	1.29	14.2	.30	1.22	17
45	9.48	33.840*	26.15	5.90	31	94	1.25	14.5	.24	1.28	18
90	8.58	34.082*	26.49	2.72	326	43	2.15	28.6	.24	.63	35
136	8.50*	34.119*	26.53	2.39	356	37	2.21	28.1	.24	.33	37
159	8.27*	34.178*	26.61	1.82	410	28	2.34	29.2	.16	.26	40

* indicates questionable data: Paired thermometers read 10.04 at 10 m, 9.76 at 20 m, 8.42 at 136 m, 8.16 at 159 m
Salinity appears to be 0.1 ppt high

Hydrographic StationsML CRUISE 6

1101

13 April 1971

1103

1105

1107

1114

1112

1110

1108

ML CRUISE 7

1155

17 April 1971

1156

1154

1153

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 6	1101	13 APR 1970	8.1	36° 44.7'	121° 49.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb	dry wet	typ amt			
5	26 1 3	17 2	1015.6	11.7 10.0	0	8 7	8

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	11.66*	33.769	25.72	6.75	-71	113	.74	1.2	.02	.00	20
5	11.60	33.772	25.73	6.71	-66	113	.84	3.1	.02	.00	18
10	11.44	33.781	25.77	6.60	-55	110	.92	4.8	.01	.00	17

* indicates questionable data: Paired thermometer read 11.60

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 6 1103 13 APR 1971 9.2 36° 48.2' 121° 48.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 12 4 1015.6 11.9 10.4 1 8 7 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.62	33.792	25.74	6.60	-57	111	.84	7.6	.18	.77	15
5	11.52	33.793	25.76	6.49	-46	109	.90	8.1	.16	.14	16
10	11.52	33.785	25.76	6.49	-46	109	.90	7.9	.14	.44	17
20	10.75	33.829	25.93	5.28	71	87	1.39	13.8	.24	.77	22
30	8.60	33.948	26.38	2.75	323	43	2.35	26.3	.38	.50	37
50	8.54	33.962	26.40	2.72	327	43	2.29	26.0	.38	.91	34
75	8.38	33.979	26.44	2.51	347	39	2.46	26.4	.37	.31	40
100	8.24	34.000	26.47	2.36	363	37	2.59	28.3	.35	1.67	64*

* indicates questionable data

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE				
ML		6	1105	13 APR 1971	10.3	36° 50.9'		121° 49.5'				
TRANSP		WAVES		WIND	BAROM	AIR TEMP °C		WEATH	CLOUDS	VISIB		
m	dir	ht	p	dir	speed	mb	dry	wet	typ	amt		
4	0	0	0	0	0	1016.3	12.8	10.6	2	6	8	7
DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE		NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/1	µg-at/1	%	µg-atoms/liter					
0	11.64*	33.463	25.48	6.50	-47	109	1.32		10.6	.26	1.24	22
5	11.14	33.793	25.83	6.15	-11	102	1.17		12.3	.23	.48	20
10	11.90	33.806	25.70	5.94	-1	100	1.19		12.4	.25	.20	19

* indicates questionable data: Paired thermometer read 11.72

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 6 1107 13 APR 1971 11.4 36° 48.7' 121° 50.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 0 0 1015.6 15.7 12.8 2 6 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.36*	33.802	25.80	6.39	-35	107	1.17	7.7	.00	.00	15
10	10.92	33.798	25.87	6.29	-21	104	1.18	9.4	.02	.00	15
20	10.26	33.810	26.00	5.18	86	84	1.51	14.1	.03	.00	19
30	9.58	33.874	26.16	3.99	200	64	2.00	19.0	.02	1.62	35
50	8.68	33.931	26.35	2.99	301	47	2.27	23.3	.02	.18	32
75	8.58*	33.951	26.38	2.85	314	45	2.30	24.8	.00	.00	34
100	8.38	33.973	26.43	2.50	348	39	2.41	27.4	.01	.67	40

* indicates questionable data: Paired thermometers read 11.44 at 0 m, 8.38 at 75 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 6 1114 13 APR 1971 12.4 36° 50.3' 121° 52.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 24 7 1015.6 12.8 11.1 2 6 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.57			6.45	-43	108	1.04	9.9	.21	.37	15
10	10.36	33.797	25.97	5.51	55	90	1.43	14.7	.26	.22	18
20	9.43	33.813	26.14	4.18	185	67	1.82	21.3	.38	.83	22
30	8.80	33.848	26.27	3.07	292	48	2.31	25.1	.42	1.50	35
50	8.58*	33.953	26.39	2.76	322	43	2.12	1.9*	.06*	1.91	51

* indicates questionable data: Paired thermometer read 8.64
 Nitrate and nitrite values appear anomalously low

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 6 1112 31 APR 1971 13.4 36° 47.9' 121° 51.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 27 11 1014.6 11.8 10.7 2 6 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.58	33.788	25.75	6.66	-62	112	.71	4.6	.02	.37	13
10	10.24	33.816	26.01	5.47	60	89	1.30	12.9	.04	.39	14
20	9.15	33.865	26.23	3.79	223	60	2.00	22.4	.11	.99	36
30	8.90	33.901	26.29	3.35	266	53	1.50*	25.3	.05	.71	15*
50	8.57	33.962	26.39	3.09	293	48	2.12	27.9	.07	.88	29
75	8.42	33.973	26.43	2.62	337	41	2.11	29.6	.05	.77	29
100	8.30	33.993	26.46	2.45	354	38	2.26	29.1	.08	.39	33
150	7.96	34.039	26.55	2.02	396	31	2.06*	29.9	.03	.58	18*
200	7.74*	34.066	26.60	1.84	415	28	2.61	31.3	.06	.51	51

* indicates questionable data: Paired thermometer read 7.80
 Phosphate and silica appear anomalously low

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 6 1110 13 APR 1971 14.4 36° 45.8' 121° 51.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 23 2 2 29 6 1013.5 12.2 10.8 2 6 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.29*	33.799	25.81	6.67	-59	111	1.14	10.0	.20	.00	16
10	9.96	33.809	26.05	4.91	113	79	1.37	16.0	.06	.59	24
20	9.04	33.878	26.25	3.55	246	56	2.00	28.5	.12	.62	54*
30	8.78	33.922	26.33	3.17	283	50	2.11	26.3	.10	.46	35

* indicates questionable data: Paired thermometer read 11.36

Silica appears anomalously high

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 6 1108 13 APR 1971 15.3 36° 47.4' 121° 50.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 20 1 2 20 4 1013.9 12.8 11.4 1 6 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
1	11.08	33.798	25.85	6.52	-43	108	1.13	10.0	.20	.15	16
11	9.29*	33.857	26.20				1.95	22.9	.40	1.21	25
21	8.82	33.908	26.31	3.22	278	51					
31	8.58	33.959	26.39								
50	8.40	33.968	26.42	2.56	343	40	2.33	26.3	.43	.80	32
100	8.16	34.009	26.49	2.36	364	37	2.38	27.9	.37	.54	35
150	8.02	34.033	26.53	2.18	381	34	2.50	27.5	.34	.38	36
200	7.96	34.046	26.55	2.02	396	31	2.49	29.8	.32		40

* indicates questionable data: Paired thermometer read 9.19

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 7 1155 17 APR 1971 10.0 36° 50.2' 121° 50.9'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

5 25 4 5

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.11*	33.796	25.84	6.14	-10	102	1.10	11.0	.16	.00	20
10	11.04	33.791	25.85	6.20	-14	103	1.12	9.8	.15	.00	20
19	10.87	33.798	25.88	5.79	24	96	1.54	12.5	.24	.33	20
29	9.45*	33.883	26.19	3.68	229	59	2.11	21.1	.38	1.65	29

* indicates questionable data: Paired thermometers read 11.05 at 0 m, 9.37 at 29 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 7	1156	17 APR 1971	11.1	36° 52.7'	121° 54.9'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet			typ	amt		

4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	11.14	33.786	25.83	6.78	-67	113	.86	6.9	.13	.16	17
9	11.13	33.780	25.82	6.66	-56	111	.80	6.7	.11	.00	22
18	11.00	33.780	25.85	6.40	-32	106	.94	9.4	.10	.00	16
28	10.00*	33.832	26.06	4.79	124	78	1.66	17.8	.37	.39	22

* indicates questionable data: Paired thermometer read 10.06

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 7	1154	17 APR 1971	11.8	36° 55.3'	121° 53.8'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet			typ	amt		

4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
3	11.94	33.735	25.64	4.62*	116	78	.52	1.3	.07	.61	14
8	11.64	33.757	25.71	7.15	-106	120	.64	3.1	.10	.19	13

* indicates questionable data: Oxygen appears anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 7	1153	17 APR 1971	13.1	36° 56.6'	122° 00.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	10.10	33.818	26.03	4.47	151	73	1.98	18.3	.45	1.98	30
5	9.92	33.830	26.07	4.24	174	69	1.93	20.4	.46	2.06	47*
10	9.52	33.860	26.16	3.75	222	60	1.90	18.9	.46	1.73	29

* indicates questionable data: Silica appears anomalously high

Hydrographic StationsML CRUISE 8

11 May 1971

1101

1103

1105

1107

1114

1112

1110

1108

ML CRUISE 9

15 May 1971

1103

1155

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1154

1153

1152

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 8	1101	11 MAY 1971	7.5	36° 45.4'	121° 49.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
7	26 1 3	25 6	1016.3	10.3 10.0	44	7 8	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	11.80	33.725	25.66	7.56	-144	127	.92	1.4	.02	.54	31
5	11.81	33.729	25.66	7.54	-143	127	.92	1.8	.02	.70	28
10	10.91	33.721	25.82	6.64	-52	110	1.30	8.0	.02	1.28	28

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 8	1103	11 MAY 1971	8.7	36° 49.2'	121° 48.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
4	26 2 2	21 6	1015.9	10.6 10.0	44	7 8	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	10.93	33.734	25.82	6.08	-2	100	1.55	14.6	.05	1.42	22
5	11.58	33.761	25.73	5.57	35	93	1.66	16.9	.03	1.36	23
10	10.20	33.767	25.98	4.84	117	79	2.03	30.0	.04	1.54	28
20	8.83	33.891	26.30	3.17	283	50	2.27	26.0	.02	1.06	33
30	8.82	33.889	26.30	3.00	298	47	2.44	28.6	.04	1.01	33
50	8.63	33.921	26.35	2.84	315	45	2.34	29.3	.06	1.33	33
75	8.36	33.953	26.42	2.50	349	39	2.47	31.1	.04	.54	37
100	8.03	33.999	26.50	2.09	389	32	2.57	31.5	.03	.87	

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 8 1105 11 MAY 1971 9.7 36° 50.9' 121° 49.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 27 1 3 21 3 1016.3 10.6 10.3 44 7 8 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.70	33.573	25.56	6.53	-51	110	1.94*	22.0*	.03	2.31	27
5	11.28	33.718	25.75	6.24	-20	104	1.30	13.9	.03	.83	23
10	11.06	33.724	25.79	6.23	-17	103	1.38	15.4	.04	.56	21

* indicates questionable data: Phosphate appears anomalously high

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 8 1107 11 MAY 1971 10.5 36° 49.0' 121° 50.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 26 0 2 0 0 1016.3 11.1 10.6 50 7 8 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.93	33.754	25.66	6.99	-95	118	1.13	13.0	.24	.23	27
10	11.32	33.761	25.77	6.59	-52	110	1.25	16.1	.21	.55	24
20	10.98	33.743	25.82	6.21	-14	103	1.43	25.3	.23	.57	19
30	9.54	33.811	26.12	4.35	169	70	1.99	25.9	.32	.97	16
50	9.16	33.841	26.21	3.77	225	60	2.17	27.4	.33	1.15	29
74	8.70	33.911	26.33	2.98	301	47	2.35	27.0	.31	1.31	31
99	8.58	33.927	26.36	2.74	324	43	2.38	26.1	.30	.81	37

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 8 1114 11 MAY 1971 11.4 36° 50.5' 121° 52.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 28 0 2 27 5 1016.3 11.1 10.6 44 7 8 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.61	33.698	25.67	7.07	-98	119	1.20	13.0	.04	.25	22
10	11.06	33.710	25.78	6.49	-40	108	1.14	17.6	.04	.32	11
20	9.60	33.760	26.07	4.68	139	75	1.76	25.5	.08	.50	11
30	9.28	33.818	26.17	4.11	193	65	1.81	28.7	.12	.75	19
50	8.89	33.887	26.29	3.41	261	54	2.05	35.4	.12	.67	15

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE				
ML		8	1112	11 MAY 1971	12.5	36° 47.9'	121° 52.0'					
TRANSP		WAVES	WIND		BAROM	AIR TEMP °C		WEATH	CLOUDS	VISIB		
m	dir	ht	p	dir speed	mb	dry	wet	typ	amt			
7	25	1	3	27	3	1016.3	11.9 11.1	42	7	8 6		
DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE		NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter					
0	11.52	33.790	25.76	6.64	-59	111	1.35	15.1	.23	.86	13	
10	11.10	33.820	25.86	6.27	-21	104	1.40	15.0	.26	1.54	13	
20	9.30	33.814	26.16	4.20	185	67	2.06	25.6	.40	1.06	27	
30	8.90	33.849	26.25	3.36	265	53	2.17	30.1	.27	.84	31	
50	8.70	33.913	26.34	3.07	293	48	2.32	32.6	.31	.54	33	
74	8.72*	33.930	26.35	2.96	303	47	2.33	33.1	.33	.25	34	
99	8.61	33.944	26.37	2.90	310	46	2.35	33.0	.32	.29	34	
148	8.44	33.962	26.41	2.52	346	39	2.27	29.7	.31	.37	37	
198	8.20	33.982	26.47	2.22	376	35	2.21	26.5	.24	.33	40	

* indicates questionable data

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 8	1110	11 MAY 1971	13.6	36° 45.5'	121° 51.9'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet	typ	amt				
7	28	1	3	25	6	1016.3		11.1	10.6	2	7	8	7		

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg-atoms/liter	SILICA μg-atoms/liter
0	11.96	33.828	25.71	6.87	-85	116	1.23	12.9	.03	.69	31
10	10.22	33.827	26.02	5.78	32	94	1.55	17.7	.09	1.25	27
20	9.08	33.818	26.20	3.67	235	58	1.99	25.4	.04	.58	17
30	8.94	33.846	26.25	3.37	264	53	2.22	25.8	.13	.47	32
50	8.68	33.916	26.34	2.97	303	47	2.48	26.9	.20	.44	37

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 8 1108 11 MAY 1971 14.6 36° 47.5' 121° 49.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 28 1 3 24 8 1015.9 11.7 10.8 2 7 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.94	33.793	25.68	7.15	-109	121	1.32	14.8	.06	.49	12
10	9.92	33.774	26.03	5.20	88	84	1.47	24.3	.06	1.16	11
20	9.10	33.857	26.23	3.72	230	59	1.81	23.2	.04	1.03	14
30	9.33	33.815	26.16	4.22	183	67	2.55	34.3	.17	1.22	15
50*	8.97	33.881	26.27	3.42	259	54	1.94	33.8	.13	1.22	16
70	8.74	33.862	26.29	2.55	339	40	1.95*	37.1	.11	.59	16
120	8.52	33.945	26.39	2.57	340	40	2.40	28.6	.14	.62	39
169	8.38	33.960	26.42				2.51	30.7	.15	.71	45

* indicates questionable data: Depth uncertain
 Phosphate appears anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 9	1103	15 MAY 1971	9.6	36° 48.1'	121° 48.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb		dry wet		typ amt	
9	26 1 2	26 5	1016.9	13.9 13.3	44	7 8	4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0		33.255		4.75							
3		33.814		4.09							
5		33.830		3.68							
7		33.838		3.60							
10		33.845		3.49							
15		33.860		3.41							
20		33.834		3.22							
25		33.881		3.12							
30		33.904		2.90							
35		33.925		2.70							
40		33.936		2.68							
50		33.950		2.51							
65		33.961		2.42							
90		33.975		2.29							
100		33.975		2.29							

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 9 1155 15 MAY 1971 10.8 36° 50.4' 121° 50.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 4 26 4 1017.6 13.3 12.2 5 0 1 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg-atoms/liter	SILICA μg-atoms/liter
0	12.61	33.711	25.49	8.27	-217	142	.56	1.2	.12	.00	15
10	11.16*	33.775	25.81	6.69	-59	111	1.59	12.1	.38	.43	25
20	10.63	33.781	25.91	5.48	54	90	1.81	17.8	.39	.61	28
30	9.16	33.855	26.22	3.58	242	57	2.49	27.3	.45	.98	34

* indicates questionable data: Paired thermometer read 11.31

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE					
ML		9	1156	15 MAY 1971	11.8	36° 52.9'		121° 55.4'					
TRANSP		WAVES		WIND	BAROM	AIR TEMP °C		WEATH	CLOUDS	VISIB			
m		dir	ht	p	dir	speed	mb	dry	wet	typ	amt		
8		23	1	2	24	7	1017.9	12.8	12.2	5	0	1	6
DEPTH	TEMP	SALINITY	SIGMA	T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	
m	°C	ppt			ml/l	µg-at/l	%			µg-atoms/liter			
0	11.40	33.774	25.77		6.56	-51	110	1.42	13.5	.37	.34	24	
10	11.00*	33.779	25.85		5.92	11	98	1.64	16.8	.42	.66	27	
20	11.58*	33.822	25.77		4.15	162	70	2.10	22.7	.39	1.50	34	
30	9.28	33.825	26.17		3.80	221	61	2.18	25.4	.38	1.74	28	

* indicates questionable data: Paired thermometer read 10.84 at 10 meters

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 9	1154	15 MAY 1971	12.6	36° 55.3'	121° 52.9'

TRANSP m	WAVES dir ht	WIND p dir speed	BAROM mb	AIR TEMP °C		WEATH	CLOUDS typ amt	VISIB
				dry	wet			
4	26 0 2	10 3	1017.6	13.9	12.8	2	0 1	7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg-atoms/liter	SILICA μg-atoms/liter
0	11.74	33.727	25.67	8.75	-250	147	.51	.5	.08	1.35	12
5	12.10*	33.760	25.63	8.32	-216	141	.69	3.3	.18	.20	18
10	11.66	33.770	25.72	7.05	-97	118	.93	8.4	.20	1.14	20

* indicates questionable data

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 9	1153	15 MAY 1971	13.7	36° 56.7'	122° 00.5'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
3	26 2 2	8 3	1017.6	15.5 13.4			

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	13.61	33.743	25.32	9.43	-331	165	.37	1.2	.05	.87	12
5	11.57*	33.752	25.72	6.77	-71	113	1.06	7.4	.27	.90	34
10	11.46	33.752	25.74	6.39	-36	107	1.22	9.9	.27	2.21	25

* indicates questionable data: Paired thermometer read 11.45

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 9 1152 15 MAY 1971 14.2 36° 54.6' 122° 00.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 27 3 2 27 11 1017.3 13.9 12.8 2 0 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.42	33.778	25.77	3.59*	214	60	.98	10.6	.28	.48	22
9	10.58*	33.786	25.93	6.12	-2	100	1.28	11.6	.31	.84	23
17	9.48	33.818	26.14	4.09	193	65	2.09	22.5	.46	.66	30
26	9.18	33.850	26.21	3.47	252	55	2.32	24.1	.41	1.90	38

* indicates questionable data: Paired thermometer read 10.69
 Oxygen appears anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 10	1103	18 JUN 1971	10.0	36° 48.1'	121° 48.2'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet		typ	amt			

5

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	14.53	33.880	25.23	8.09	-221	144	.41	.0	.02	.00	8
5	13.00	33.909	25.57	9.23	-307	160	.61	.3	.02	.00	3
10	10.90	33.905	25.96	4.97	96	82	1.65	13.6	.27	.79	14
20	9.30	33.908	26.24	3.29	266	52	2.58	24.6	.38	2.55	37
30	9.16	33.927	26.27	3.05	289	49	2.67	24.8	.36	2.26	32
50	9.14	33.934	26.28	2.85	307	45	2.90	25.8	.35	2.27	34
75	8.92	33.940	26.32	2.65	328	42	3.06	26.8	.34	1.73	36
100	8.80	33.955	26.35	2.36	355	37	3.73*	26.2	.35	2.78	43

* indicates questionable data: Phosphate appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 10	1105	18 JUN 1971	11.4	36° 50.8'	121° 49.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

5

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	14.77	33.914	25.20	8.86	-293	159	.59	2.3	.02	.29	3
5	13.51	33.919	25.47	9.28	-317	162	.90	1.2	.01	.00	3
10	11.00	33.917	25.95	5.27	68	87	2.03	13.9	.22	.67	16

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 10 1107 18 JUN 1971 12.7 36° 49.1' 121° 50.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE	AMMONIA	SILICA
0	14.12	33.934	25.36	9.84	-374	174	.15	.0	.03	.00	0
10	9.64	33.913	26.18	3.96	202	64	2.12	21.5	.43	1.71	27
20	9.19	33.921	26.26	3.44	254	55	2.27	25.8	.46	.63	31
30	8.94	33.926	26.31	3.10	288	49	2.29	25.9	.36	.67	31
49	8.86	33.955	26.34	2.65	329	42	2.35	26.5	.37	.48	33
73	8.80	33.957	26.35	2.60	334	41	2.44	28.3	.40	.64	36
98	8.71	33.967	26.38	2.48	346	39	2.49	27.4	.39	2.09	41

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 10	1114	18 JUN 1971	15.4	36° 50.5'	121° 52.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	12.46	33.915	25.68	8.86	-268	152	.91	3.0	.12	.08	4
10	10.44	33.923	26.06	5.04	95	82	2.37	17.7	.31	1.35	20
20	9.26	33.928	26.26	3.40	257	54	2.50	24.5	.44	1.15	30
30	8.97	33.973	26.34	3.03	289	49	3.06	25.3	.41	.65	31
50	8.83	33.986	26.37	2.71	324	43	2.87	25.6	.34	1.32	35

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 10	1112	18 JUN 1971	16.8	36° 48.0'	121° 52.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	12.44	33.959	25.72	8.62	-247	147	.55	2.7	.19	.31	5
9	11.57	33.956	25.88	7.94	-176	133	.77	5.9	.19	.08	6
19	9.34	33.971	26.28	3.47	249	55	2.35	23.3	.44	1.16	25
28	8.94	33.956	26.33	3.14	284	50	2.35	26.5	.50	.31	30
40	8.81*	33.971	26.36	3.33	268	53	2.45	27.7	.49	.30	35
80	8.80	34.008	26.39	2.81	315	44	2.43	27.9	.44	.64	42
125	8.72	34.015	26.41	2.78	319	44	2.44	35.7*	.43	.67	36
173	8.56	34.033	26.45	2.31	363	36	2.55	28.6	.40	.00	39

* indicates questionable data: Paired thermometer read 8.92
Nitrate appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 10	1110	18 JUN 1971	18.2	36° 45.6'	121° 52.0'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb		dry wet		typ amt	

3

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	12.48	33.957	25.71	9.39	-316	161	.71	.9	.09	.15	4
10	10.26	33.965	26.12	5.18	85	84	1.81	15.3	.27	.31	8
20	9.41	33.964	26.26	4.05	197	65	2.44	23.4	.35	.88	27
29	9.12	33.979	26.32	3.44	255	55	2.66	25.1	.36	.98	31
49	8.82	33.993	26.38	3.05	293	48	2.98	27.0	.39	.36	35

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 10	1108	18 JUN 1971	19.3	36° 47.4'	121° 50.0'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	13.61	33.969	25.49	10.13	-394	178	.33	1.3	.04	.00	2
10	11.96	33.965	25.81	8.93	-269	151					
20	9.40	33.977	26.27	3.81	218	61	2.24	22.4	.41	1.76	24
30	8.98	33.968	26.33	3.45	256	55	2.37	25.8	.42	3.92	30
50	8.98	33.977	26.34	3.29	270	52	2.42	26.5	.41	.68	32
75	8.88	33.985	26.36	3.17	282	50	2.39		.39	.38	34
100	8.82	33.990	26.38	3.06	292	48	2.41	27.2	.37	.11	34
150	8.75	34.002	26.40	2.79	317	44	2.56	27.2	.40	.98	37

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 11 1157 19 JUN 1971 8.8 36° 51.2' 121° 57.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 27 1 2 29 2 1017.3 11.1 11.1 9 8 3

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	11.46	33.935	25.88	7.75	-158	130	.67	5.2	.21	.13	16
10	10.16	33.934	26.11	5.01	102	81	2.20	15.0	.25	.26	22
20	9.24	33.956	26.28	3.34	262	53	2.79	23.5	.42	1.27	37
30	9.00	33.969	26.33	3.02	294	48	3.32*	17.3	.34	1.08	22
48	8.78	33.981	26.38	2.62	332	41	3.09	26.9	.38	1.84	40
72	8.72	33.998	26.40	2.31	361	36	3.04	28.2	.32	1.56	39
97	8.68	33.993	26.40	2.25	367	35	2.81	28.3	.30	1.34	41
145	8.36	34.029	26.48	1.95	397	30	3.22	30.1	.23	.86	56

* indicates questionable data: Phosphate appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 11	1152	18 JUN 1971	10.1	36° 54.4'	122° 00.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
4	23 0 2	28 1	1017.3	13.9 13.1	1	0 2	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	11.57	33.928	25.86	7.13	-104	120	.69	5.9	.27	.14	11
10	10.94	33.932	25.98	6.29	-22	104	.95	10.1	.33	.29	16
19	10.12	33.936	26.12	4.74	126	77	1.57	18.5	.51	.81	32
29	8.97	33.958	26.33	3.00	296	48	2.38	26.9	.60	1.50	43

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 11	1153	19 JUN 1971	11.1	36° 56.8'	122° 00.5'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet	typ	amt	
5	23 0 2	23 4	1018.6	14.4 13.9	1	0 1	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	15.00	33.902	25.15	8.20	-236	148	.39	.4	.12	.22	7
5	12.98	33.938	25.59	7.62	-163	132	.57	1.5	.15	.49	7
10	12.03	33.943	25.78	6.62	-64	112	.92	4.0	.26	.54	10

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 11	1154	19 JUN 1971	12.4	36° 55.6'	121° 52.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb	mb	dry wet		typ amt	
6	25 1 2	25 2	1018.3	16.9 14.7	2	0 1	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	15.10	33.963	25.17	9.60	-362	173	.59	.8	.03	.05	4
5	14.26	33.960	25.35	9.40	-336	167	.43	.6	.01	.05	4
10	14.00	33.957	25.40	9.46	-339	167	.42	.4	.05	.05	6

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 11	1156	19 JUN 1971	13.1	36° 53.0'	121° 54.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
4	25 2 2	25 8	1017.6	13.9 13.3	2	0 1	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	12.32	33.942	25.73	7.85	-177	134	.49	2.2	.09	.39	11
10	11.68	33.945	25.85	7.38	-128	124	.59	4.2	.16	.21	10
20	9.28	33.954	26.28	3.44	253	55	2.16	24.3	.41	1.54	35
30	9.04	33.974	26.33	2.88	306	46	2.14	21.7	.35	1.92	36

Hydrographic StationsML CRUISE 12

23 July 1971

1103

1108

1112

1115

1116

1110

1101

ML CRUISE 13

24 July 1971

1114

1157

1152

1153

1158

1159

1154

1156

1105

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 12 1103 23 JUL 1971 7.9 36° 48.2' 120° 48.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 29 1 2 17 1 994.9 11.7 11.1 X 8 1

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	14.36	33.742	25.16	6.43	-71	114	.46	4.5	.05	2.38	3
5	11.10	33.799	25.84	5.52	45	92	1.15	12.2	.09	3.47	9
10	9.64	33.878	26.16	3.65	230	59	2.03	22.9	.17	3.71	25
20	9.62	33.882	26.16	3.61	233	58	2.04	21.5	.20	2.21	25
30	10.12	33.835	26.04	4.02	191	65	1.72	18.6	.27	2.91	18
50	9.67	33.887	26.16	3.60	234	58	2.01	24.0	.29	2.26	25
75	9.52	33.895	26.19	3.56	239	57	2.04	22.1	.28	3.00	27
100	8.77	34.002	26.39	2.52	341	40	2.41	27.5	.28	2.41	36

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 11 1108 23 JUL 1971 9.7 36° 47.4' 121° 49.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 29 1 9 13 1 995.3 12.7 12.1 X 8 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	13.56	33.751	25.33	7.64	-171	134	.25	1.9	.05	.68	1
10	10.80	33.698	25.82	5.74	30	95	1.05	10.8	.31	1.79	2
20	10.37	33.729	25.92	5.04	97	82	1.51	13.5	.29	3.18	6
30	10.14	33.773	25.99	4.64	135	75	1.60	17.9	.30	2.97	12
44	10.22	33.773	25.98	4.63	135	75	1.59	15.5	.29	3.71	13
93	9.66	33.891	26.16	3.63	231	58	1.95	23.0	.36	3.35	23
142	9.42	33.916	26.22	3.25	268	52	2.13	24.2	.41	2.12	30
191	8.72	34.006	26.40	2.42	351	38	2.44	28.0	.32	1.14	38

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 12 1112 23 JUL 1971 11.5 36° 48.0' 121° 52.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 30 1 3 29 4 995.6 12.8 12.1 X 8 6

DEPTH TEMP SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
 m °C ppt ml/1 µg-at/1 % µg-atoms/liter
 0 13.12 33.696 25.38 7.21 -128 125 .35 3.9 .14 .75 2
 10 10.70 33.686 25.83 5.29 71 87 1.31 13.5 .41 1.61 7
 20 10.19 33.716 25.94 4.65 134 76
 30 9.98 33.800 26.04 4.48 152 73 1.78 18.5 .32 1.26 19
 49 9.57 33.864 26.16 4.55 150 73 2.00 23.3 .34 .93 25
 98 9.44 33.930 26.23 3.22 270 52 2.17 25.8 .37 1.21 28
 148 8.91 33.989 26.36 2.64 329 42 2.39 27.9 .39 .97 33
 197 8.38 34.060 26.50 2.02 391 32 2.49 28.6 .28 .41 39

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 12 1115 23 JUL 1971 13.8 36° 46.8' 121° 55.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 30 2 2 29 6 995.6 13.3 12.7 X 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	12.84	33.656	25.40	7.00	-106	120	.41	4.3	.24	1.22	2
10	11.01*	33.668	25.76	5.89	14	97	1.07	10.7	.44	1.82	10
20	10.14	33.705	25.94	4.56	143	74	1.60	17.8	.28	1.09	17
30	9.80	33.749	26.03	4.20	179	68	1.82	21.3	.31	.85	20
46	9.73	33.846	26.12	3.83	213	62	1.94	23.2	.36	1.10	23
71	9.52	33.892	26.19	3.43	251	55	2.14	25.0	.35	1.78	31
95	9.41	33.908	26.22	3.25	268	52	2.19	26.0	.37	1.44	27
144	8.82	33.990	26.38	2.43	349	38	2.37	27.2	.33	1.24	32
165	8.56	34.050	26.46	2.01	389	32	2.97*	34.9	.11	.34	58*
209	8.08	34.104	26.58	1.67	426	26	2.65	31.3	.20	.71	43
252	7.66	34.148	26.68	1.45	451	22	2.73	32.8	.09	.52	48
297	7.24	34.185	26.76	1.19	480	18	2.49*	31.3	.18	.00	38*

* indicates questionable data: Paired thermometer read 11.07

Phosphate and silica appear anomalously high at 165 m
 Phosphate and silica appear anomalously low at 297 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 12	1116	23 JUL 1971	15.7	36° 43.6'	121° 54.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

8

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	13.02	33.681	25.39	7.78	-177	134	.26	.6	.03	.84	3
5	12.54	33.685	25.49	7.79	-173	133	.28	.8	.03	.55	1
10	11.01	33.729	25.80	6.31	-23	104	.69	4.5	.04	1.35	0
19	10.22	33.748	25.96	4.66	133	76	1.79	14.8	.14	2.97	7
28	10.68	33.733	25.87	5.38	63	88	1.69	10.8	.07	2.35	0
46	10.59	33.882	26.00	5.72	33	94	1.61	12.8	.09	2.79	5
70	9.84	33.877	26.12	4.22	176	68	1.73	19.9	.13	2.38	21

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 12	1110	23 JUL 1971	16.8	36° 45.0'	121° 51.8'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet			typ	amt		
7								13.3	12.5	0*	X	X	4	6	

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg-atoms/liter
0	13.36	33.725	25.35	7.69	-173	134	.22	.3	.09	.45	0
10	12.36	33.714	25.54	7.98	-188	136	.30	.6	.06	.53	0
19	10.77	33.745	25.86	5.57	45	92	1.18	8.3	.18	2.17	5
29	10.08	33.776	26.00	4.51	148	73	1.88	15.9	.28	2.53	11
48	9.95	33.837	26.07	4.08	188	66	1.97	18.9	.21	2.77	47*

* indicates questionable data: Silica appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 12	1101	23 JUL 1971	17.6	36° 44.9'	

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
8				13.6 12.5			

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	13.86	33.738	25.26	7.84	-192	138	.19	.2	.05	.53	2
5	13.86	33.738	25.26	7.76	-185	136	.21	.0	.07	.38	0
10	13.48	33.750	25.35	7.93	-200	139	.26	.2	.13	.35	4

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 13	1114	24 JUL 1971	8.8	36° 50.4'	121° 52.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
6	29 0 3	29 0	1012.9	12.8 12.2	44	7 8	4

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	13.30	33.766	25.40	7.64	-168	133	.34	.2	.08	.42	9
10	10.73	33.657	25.80	5.26	73	86	1.23	11.6	.60	.67	12
20	10.01	33.681	25.94	4.45	154	72	1.15*	21.8	.47	.39	23*
30	9.84	33.810	26.07	4.06	191	66	1.91	18.4	.36	2.23	21

* indicates questionable data: Silica appears anomalously high and phosphate appears anomalously low

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE

ML 13 1157 24 JUL 1971 9.5 36° 51.2' 121° 52.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt

9 29 1 3 29 0 1012.8 12.8 12.8 44 8 7 4

DEPTH TEMP SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
m °C ppt ml/l µg-at/l % µg-atoms/liter

0	12.66	33.770	25.53	6.07	-21	104	.56	2.9	.20	.36	7
10	11.46	33.722	25.72	4.69	115	78	1.05	8.4	.28	.60	58*
20	10.24	33.718	25.93	3.31	253	54	1.12*	20.4	.33	.76	24
30	9.88	33.771	26.03	4.17	181	67	1.83	20.7	.39	.53	23
48	9.60	33.860	26.15	3.64	231	58	1.45*	26.4	.32	.82	38*
72	9.33	33.910	26.23	2.91	300	46	2.30	24.8	.38	1.62	33
96	9.04	33.955	26.31	2.50	340	40	2.41	24.3	.25	.83	52*

* indicates questionable data: Silica appears anomalously high and phosphate appears anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 13	1152	24 JUL 1971	10.7	36° 54.8'	122° 1.5'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet	typ	amt				
8	27	1	5	27	1	1014.2		13.3	12.7	2	7	8	6		

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	13.54	33.807	25.38	7.37	-147	129	.29	1.3	.09	.12	10
10	10.07	33.687	25.94	4.49	150	73	1.62	16.3	.41	.46	23
20	9.92	33.824	26.07	4.23	175	68	1.81	15.5	.36	2.01	17
30	9.64	33.839	26.13	3.69	226	59	1.45*	21.8	.33	1.87	34*

* indicates questionable data: Phosphate appears anomalously low and silica appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 13	1153	24 JUL 1971	11.5	36° 56.8'	122° 00.3'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	
7	25 1 2	25 2	1013.9	14.4 13.3	2	7 8	6

DEPTH	TEMP °C	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m		ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	14.88	33.780	25.08	7.46	-168	134	.76	.4	.10	2.44	7
5	14.10	33.811	25.27	7.65	-178	135	.54	.8	.08	1.44	6
10	12.26	33.819	25.64	6.45	-51	110	.92	.0	.16	2.48	6

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 13	1158	24 JUL 1971	12.2	36° 55.4'	121° 57.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb		dry wet		typ amt	
6	26 2 2	26 2	1013.5	14.4 13.4	2	7 8	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	13.29	33.787	25.41	7.71	-174	134	.28	.4	.10	.01	8
5	12.43	33.765	25.57	7.12	-112	122	.53	3.3	.20	.00	18
10	10.97	33.724	25.81	5.76	26	95	1.12	11.0	.34	.47	12
20	9.90	33.763	26.02	4.42	158	71	1.63	20.2	.37	2.01	26

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 13 1159 24 JUL 1971 12.8 36° 57.1' 121° 56.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 24 1 6 24 1 1013.5 15.0 13.9 2 7 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	14.80	33.771	25.09	7.33	-156	131	.53	1.6	.10	.74	31
5	13.58	33.771	25.34	7.94	-198	139	.32	1.5	.07	.08	44*
10	12.99	33.767	25.46	7.91	-189	137	.51	2.6	.09	.21	72*

* indicates questionable data: Silica appears anomalously high

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 13 1154 24 JUL 1971 13.6 36° 55.5' 121° 53.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 25 1 6 25 1 1013.9 16.1 14.0 2 7 8 6

DEPTH TEMP °C SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
 m ppt ml/l µg-at/l % µg-atoms/liter
 0 14.04 33.757 25.24 7.53 -166 133 .41 1.0 .10 .14 5
 5 13.35 33.761 25.38 7.21 -130 125 .53 2.5 .11 .16 3
 10 12.34 33.774 25.59 6.57 -62 112 .75 4.6 .17 .57 6

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 13	1156	24 JUL 1971	14.4	36° 53.9'	121° 54.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
6	25 2 5	25 2	1013.9	14.7 13.6	1	7 6	7

DEPTH	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	13.44*	33.779	25.38	7.70	-175	134	.34	.5	.07	.00	6
10	11.43	33.697	25.70	6.01	-2	100	.97	8.8	.31	.49	8
20	9.96	33.696	25.96	4.43	157	72	1.64	21.8	.39	.83	20
30	9.68	33.824	26.11	3.59	235	58	2.18	21.6	.37	2.83	29

* indicates questionable data: Paired thermometer read 13.38

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 13	1105	24 JUL 1971	15.3	36° 50.6'	121° 50.1'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
8	25 2 5	25 2	1013.5	16.1 13.9	3	7 6	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter				
0	13.58	33.759	25.33	7.42	-151	130	.36	1.0	.33	.10	4
5	13.08	33.743	25.42	7.31	-136	126	.65	2.9	.11	.53	3
10	12.88	33.766	25.48	6.99	-106	120	.71	4.0	.14	.60	11

Hydrographic StationsML CRUISE 15

27 August 1971

1103

1108

1112

1115

1116

1110

1101

ML CRUISE 16

28 August 1971

1114

1157

1152

1153

1158

1159

1154

1156

1105

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 15 1103 27 AUG 1971 8.1 36° 48.1' 121° 48.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 28 0 2 1015.9 15.8 14.4 0 6 7 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	16.48	33.145	24.23	5.78	-32	107	.76	1.5	.15	2.77	6
5	15.72	33.185	24.43	6.13	-56	111	.49	.4	.10	.64	5
10	14.78	33.214	24.66	6.14	-48	110	.53	1.0	.08	1.20	4
20	12.98	33.242	25.06	6.17	-32	106	.63	2.4	.16	1.42	5
30	11.74*	33.320	25.35	5.49	42	92	.85	5.8	.41	1.27	21
50	11.30	33.595	25.65				1.34	10.9	.34	2.76	15
75	10.82*	33.682	25.80	4.19	168	69	1.60	14.1	.41	3.00	21
100	10.42	33.743	25.92	3.61	224	59	1.73	17.1	.37	3.77	37

* indicates questionable data: Paired thermometers read 11.66 at 30 m, 10.97 at 75 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 15 1108 27 AUG 1971 9.3 36° 47.4' 121° 50.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 20 28 0 2 1016.6 16.1 14.4 2 6 7 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	15.01*	33.242	25.63	6.33	-67	114	.52	1.1	.08	.54	4
10	12.92	33.208	25.04	6.30	-42	108	.64	2.6	.16	.91	4
20	12.02*	33.183	25.19	6.09	-14	103	.70	3.5	.21	.49	9
30	11.16	33.139	25.32	5.90	13	98	.84	5.4	.24	.40	8
50	11.29*	33.423	25.52	5.37	58	89	1.08	8.4	.35	3.60	10
100	10.80	33.718	25.83	3.77	205	62	1.63	15.7	.43	2.52	26
150	9.46*	33.879	26.19	2.82	306	45	2.17	23.1	.29	1.86	39
200	8.43	34.031	26.47	1.93	398	30	2.57	29.3	.21	.51	52

* indicates questionable data: Paired thermometers read 14.95 at 0 m, 12.14 at 20 m,
 11.20 at 50 m, 9.54 at 150 m

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE				
ML 15		1112	27 AUG 1971		10.6	36° 48.0'		121° 52.2'				
TRANSP		WAVES	WIND		BAROM	AIR TEMP °C		WEATH	CLOUDS	VISIB		
m		dir	ht	p	dir	speed	mb	dry	wet	typ	amt	
20		28	0	2	1016.6		16.4	15.0	2	6	7	7
DEPTH	TEMP	SALINITY	SIGMA	T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt			ml/l	µg-at/l	%	µg-atoms/liter				
0	14.60	33.338	24.80		6.77	-102	121	.56	.7	.07	.99	3
10	13.02	33.369	25.15		6.79	-88	117	.57	.7	.09	.92	2
20	12.55*	33.468	25.31		6.27	-37	107	.78	2.7	.13	1.80	4
30	12.10	33.476	25.41		5.93	-1	100	.92	5.0	.17	2.15	13
20	12.61*	33.464	25.30		6.21	-32	106	.79	2.7	.14	1.51	5
70	11.04	33.672	25.75		4.38	148	73	1.47	13.5	.42	2.28	21
120	10.52*	33.739	25.90		3.87	200	63	1.73	18.2	.40	2.19	25
170		33.868			2.90			2.10	23.4	.31	.77	35

* indicates questionable data: Paired thermometers read 12.48 at 20 m, 12.55 at 20 m, 10.40 at 120 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 15 1115 27 AUG 1971 12.6 36° 46.6' 121° 57.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 18 25 0 2 1017.3 17.8 15.8 1 6 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	16.90*	33.257	24.22	6.03	-58	112	.41	2.9	.00	.02	2
10	15.04	33.147	24.56	6.26	-61	112	.37	2.3	.00	.05	2
20	12.80*	33.226	25.08	6.48	-57	111	.59	2.0	.08	.25	2
30	10.50	33.094*	25.40	5.77	33	94	.93	6.3	.11	.33	8
50	10.01	33.172*	25.54	5.41	71	87	1.12	10.3	.06	.13	13
75	11.00*	33.598	25.70	4.62	128	76	1.40	13.0	.16	1.35	13
99	10.15*	33.636	25.88	4.00	193	65	1.61	17.3	.19	.81	18
149	9.50*	33.732	26.07	3.51	244	56	1.80	20.1	.12	.04	23
200	9.16	33.931	26.28	2.50	338	40	2.33	23.3	.05	.66	34
250	8.26	34.087	26.54	1.74	417	27	2.58	28.0	.01	.24	45
300	7.82*	34.113	26.63	1.42	452	22	2.69	29.6	.00	.14	51
350	7.52	34.143	26.69	1.32	465	20	2.78	29.1	.03	.00	54

* indicates questionable data: Paired thermometers read 16.84 at 0 m, 12.93 at 20 m, 10.05 at 99 m, 7.91 at 300 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 15 1116 27 JUL 1971 14.0 36° 43.3' 121° 55.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 17 26 0 2 2 6 1017.3 17.8 15.8 1 0 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	17.28	33.261	24.13	5.97	-56	112	.36	2.8	.07	.00	4
5	16.41	33.242	24.32	6.11	-61	113	.36	.0	.06	.14	2
10	15.50*	33.177	24.48	6.19	-59	112	.35	.0	.04	.33	2
20	11.99	33.006*	25.06	6.35	-36	107	.57	1.8	.13	.53	7
30	12.19*	33.204	25.18	6.21	-26	105	.68	3.5	.21	.70	6
50	11.51	33.476	25.52	5.26	65	88	1.14	8.7	.31	2.02	10
74	9.98*	33.473*	25.78	4.52	149	73	1.41	14.3	.28	.05	19

* indicates questionable data: Paired thermometers read 15.57 at 10 m, 12.13 at 30 m, 10.09 at 74 m
 Salinity appears anomalously low

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 15	1110	27 AUG 1971	15.2	36° 45.6'	121° 52.0'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB	
m	dir	ht	p	dir	speed	mb		dry	wet	typ	amt				
10	28	0	8	30	8	1017.3		17.8	16.1	2	0	1	1	7	

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	16.00	33.380	24.52	6.43	-86	118	.51	.3	.10	1.52	2
10	14.25*	33.346	24.88	6.69	-92	118	.51	.6	.10	.65	26*
19	11.92	33.180	25.21	6.15	-18	103	.72	3.3	.33	.73	7
29	10.43*	33.133*	25.44	5.64	45	92	.97	7.4	.36	1.28	21
48	11.18	33.439	25.55	5.35	61	89	1.08	9.0	.33	2.20	9

* indicates questionable data: Paired thermometers read 14.18 at 10 m, 10.57 at 29 m
 Salinity appears anomalously low
 Silica appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 15	1101	27 AUG 1971	16.0	36° 44.7'	121° 49.3'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
13	28 0 2	27 7	1017.3	17.8 16.1	2	0 1	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	15.66*	33.336	25.56	6.45	-84	117	.47	.7	.03	.77	2
5	15.46	33.326	24.60	6.52	-89	118	.46	.9	.03	.36	1
10	13.28*	33.239	24.99	6.59	-72	114	.49	1.3	.05	.21	1

* indicates questionable data: Paired thermometers read 15.59 at 0 m, 13.36 at 10 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 16 1114 28 AUG 1971 7.5 36° 50.5' 121° 52.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 16 0 2 1016.6 13.9 13.3 0 0 3 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	14.78	33.290	24.72	6.64	-92	119	.49	1.6	.15	.95	11
10	12.64	33.266	25.14	6.66	-72	114	.63	2.7	.19	.73	10
20	12.33*	33.466	25.36	6.15	-23	105	.84	4.3	.19	1.55	10
30	11.28	33.522	25.59	5.24	69	87	1.24	9.9	.32	1.76	11

* indicates questionable data: Paired thermometer read 12.21

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 16 1157 28 AUG 1971 8.6 36° 50.2' 121° 57.1'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 13 0 2 1016.6 15.0 14.2 2 0 3 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/1	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	15.85*	33.304	24.50	6.27	-70	114	.43	1.3	.03	.72	34*
10	13.34	33.186	24.94	6.29	-46	109	.49	1.4	.07	.59	6
20	12.39*	33.365	25.27	6.92	-92	118	.60	1.1	.10	.81	4
30	12.22	33.450	25.36	6.36	-41	108	.91	3.6	.13	1.33	7
49	10.91*	33.619	25.74	4.62	129	76	1.45	13.3	.26	1.47	17
74	10.44	33.703	25.88	4.06	184	66	1.70	17.6	.25	1.53	25
98	9.93*	33.803	26.05	3.27	260	53	1.96		.39	.91	25
147	9.48	33.885	26.19	2.77	310	44	2.14	24.0	.26	.33	30

* indicates questionable data: Paired thermometers read 15.79 at 0 m, 12.49 at 20 m, 10.82 at 49 m,
 10.02 at 98 m
 Silica appears anomalously high

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1152	28 AUG 1971	10.2	36° 55.3'	122° 4.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
19	25 0 2		1017.9	16.7 15.0	1	0 2	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	15.06*	33.218	24.61	6.37	-71	114	.51	1.4	.32	.83	4
10	13.02	33.228	25.04	6.43	-55	111	.56	2.0	.12	.75	5
20	12.78*	33.456	25.26	6.61	-69	113	.65	1.6	.10	1.37	5
30	12.36*	33.432	25.32	5.85	3	99	.96	3.6	.21	2.29	9

* indicates questionable data: Paired thermometers read 14.90 at 0 m, 12.88 at 20 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1153	28 AUG 1971	10.8	36° 56.8'	122° 00.1'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
14	25 0 2		1017.9	15.8 15.3	2	0 2	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	15.49*	33.221	24.51	6.36	-74	115	.46	.5	.06	.27	5
5	14.90	33.222	24.64	6.37	-69	114	.44	.5	.06	.53	5
10	14.70	33.239	24.70	6.30	-61	112	.55	1.0	.10	1.52	5

* indicates questionable data: Paired thermometer read 15.55

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1158	28 AUG 1971	11.7	36° 55.1'	121° 56.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p	dir speed	mb	dry wet	typ amt	
13	25	0	2	25	6	1017.6	16.9 15.8 3 0 2 7

DEPTH	TEMP	SALINITY	SIGMA	T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt			ml/l	µg-at/l	%				µg-atoms/liter	
0	16.72*	33.185	24.21	6.20	-71	115	.49	.5	.16	.56	7	
5	15.44	33.214	24.52	6.37	-75	115	.41	.4	.07	.48	5	
10	14.21*	33.226	24.79	6.41	-66	113	.51	.8	.14	.64	5	
20	12.92	33.278	25.09	6.25	-38	107	.70	1.8	.22	1.31	7	

* indicates questionable data: Paired thermometers read 16.79 at 0 m, 14.15 at 10 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1159	28 AUG 1971	12.4	36° 57.1'	121° 56.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
13	25 0 2	25	1017.6	16.9 15.8	2	0 2	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	15.92*	33.226	24.42	6.26	-69	114	.48	.3	.09	.52	5
5	14.96	33.228	24.63	6.29	-63	113	.51	.6	.12	1.11	5
10	14.75*	33.262	24.71	6.09	-43	109	.83	.8	.14	2.34	8

* indicates questionable data: Paired thermometers read 15.86 at 0 m, 14.81 at 10 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1154	28 AUG 1971	13.1	36° 55.2'	121° 52.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
13	25 0 2	25 7	1017.6	17.8 16.4	2	0 2	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	16.74	33.207	24.22	6.32	-82	117	.43	.4	.10	.51	6
5	16.17	33.222	24.36	6.36	-81	117	.45	.2	.09	.55	4
10	15.39*	33.234	24.55	6.36	-73	115	.59	.3	.09	1.31	6

* indicates questionable data: Paired thermometer read 15.45

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1156	28 AUG 1971	13.9	36° 53.0'	121° 55.0'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
10	27 0 2		1016.9		2	0 2	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	16.92*	33.180	24.16	6.19	-72	115	.52	.2	.10	1.00	5
10	12.87	33.195	25.04	6.49	-59	111	.57	2.3	.13	1.23	5
20	11.60	33.369	25.42	5.85	12	98	.92	5.1	.26	1.74	9
30	11.45	33.468	25.52	5.33	59	89	1.14	7.2	.35	2.48	13

* indicates questionable data: Paired thermometer read 16.98

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 16	1105	28 AUG 1971	14.9	36° 50.8'	121° 49.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
14	27 0 2	27 12	1016.3	18.1 16.1	2	0 2	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	15.74	33.297	24.52	6.38	-79	116	.44	.3	.05	.87	4
5	15.06	33.273	24.65	6.53	-85	117	.46	.3	.08	1.26	4
10	14.30*	33.302	24.83	6.52	-77	115	.51	.5	.10	1.08	4

* indicates questionable data: Paired thermometer read 14.39

Hydrographic Stations

<u>ML CRUISE 17</u>	1114
29 September 1971	1157
	1152
	1153
	1159
	1158
	1154
	1150
	1105
30 September 1971	1103
	1108
	1112
	1115
	1110
	1101
1 October 1971	1120
	1123
	1121
	1122
	1124
	1116

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1114 29 SEP 1971 6.8 36° 50.5' 121° 52.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 27 2 2 8 2 991.5 12.2 11.2 3 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	AMMONIA	SILICA	CHL-a μg/l	PHAEO μg/l
0	15.34	33.427	24.71	7.21	-149	130		1.0	.44	21	.52	.84
10	15.28	33.424	24.72	7.15	-143	129	.36	.5	.00	0	.63	1.06
20	12.67	33.511	25.33	5.37	42	92	.69	.1	.00	27	.57	.54
30	12.00	33.542	25.48	5.03	80	85	1.20	4.9	1.84	14	.60	.51
50	11.04	33.586	25.69	4.40	147	73	1.46	12.5	.86	23	.08	.15

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1157 29 SEP 1971 8.6 36° 49.7' 121° 56.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 12 27 2 2 7 29 1011.9 13.4 12.3 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	14.65	33.446	24.87	6.50	-79	116	.41	.3	.06	.05	5	.32	.25
10	13.78	33.447	25.05	6.36	-58	111	.69	1.1	.17	.62	11	1.17	.74
20	13.41	33.469	25.15	5.94	-16	103	.61	.9	.11	.38	14	.29	.07
30	12.38	33.538	25.40	5.18	62	88	.79	1.3	.18	.45	13	.09	.12
50	11.08	33.570	25.67	4.53	135	75	1.38	12.2	.57	.94	21	.03	.11
75	9.92	33.736	26.00	3.28	260	53	1.85	21.2	.37	.00	27	.06	.12
100	9.30	33.878	26.21	2.84	306	45	2.04	25.6	.11	.00	46	.04	.09
150	8.70	33.972	26.38	2.37	356	37	2.27	28.4	.14	.00	40	.01	.06

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1152 29 SEP 1971 10.6 36° 55.6' 122° 2.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

8 26 1 2 26 8 1011.9 15.0 15.6 3 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	14.50	33.437	24.90	6.39	-68	114	.53	1.4	.09	.25	8	.24	.16
5	13.98	33.440	25.01	6.05	-32	106	.66	.9	.14	.47	12	1.09	.85
10	13.86	33.442	25.03	5.91	-18	104	.69	.6	.16	.69	13	.66	.25
20	12.38	33.483	25.36	4.61	113	78	1.32	3.0	.47	2.70	28	.17	.45

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 17	1153	29 SEP 1971	11.4	36° 55.6'	122° .3'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	
7	26 1 2	26 12	1011.9	15.8 14.5		1	9

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter				µg/l	
0	14.72	33.429	24.84	6.34	-66	113	.60	.0	.08	.00	5	1.97	1.70
5	14.46	33.433	24.90	6.07	-39	108	.73	.3	.12	.38	16	1.47	1.12
10	14.02	33.440	25.00	5.70	-1	100	.94	.3	.17	1.43	16	.29	.54

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1159 29 SEP 1971 12.3 36° 57.4' 121° 55.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 10 26 2 2 26 1010.3 2 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.52	33.428	24.67	7.37	-165	134	.32	.0	.03	.00	0	.51	.36
5	15.50	33.429	24.67	7.41	-169	134	.30	.0	.02	.00	1		
10	15.20	33.434	24.74	7.73	-194	139	.28	.0	.04	.00	6	2.08	1.75

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1158 29 SEP 1971 13.2 36° 54.8' 121° 57.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 16 26 2 2 27 13 1010.5 16.1 14.2 2 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg-atoms/liter	SILICA μg/l	CHL-a μg/l	PHAEO μg/l
0	14.60	33.440	24.88	6.26	-57	112	.49	.0	.11	.08	6		
4	14.08	33.409	24.96	6.24	-50	110	.58	.6	.14	.33	2	.25	.27
9	13.08	33.436	25.19	5.78	1	100	.79	1.6	.21	.89	12	.34	.30
17	12.56	33.507	25.34	5.28	51	90	.88	.8	.13	1.22	14	.09	.14

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1154 29 SEP 1971 14.1 36° 55.2' 121° 52.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 11 25 1 2 25 12 1010.8 16.2 15.3 2 2 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL--a µg/l	PHAEO
0	15.09	33.420	24.76	7.42	-166	133	.30	.0	.04	.00	0	.37	.23
5	15.04	33.419	24.77	7.46	-169	134	.28	.0	.02	.00	0		
10	14.98	33.420	24.78	7.62	-182	137	.29	.0	.06	.00	0	1.15	.65

CRUISE		STATION	DATE	HOUR	N LATITUDE	W LONGITUDE							
ML 17		1150	29 SEP 1971	14.8	36° 52.9'	121° 51.2'							
DEPTH m	TEMP °C	WAVES		WIND dir speed	BAROM mb	AIR TEMP °C dry wet	WEATH typ	CLOUDS amt	VISIB				
		m	ht										
6		27	2 2	27 13	1009.1			3	2 9				
DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/1	AOU µg-at/1	SAT %	PHOSPHATE		AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO	
							NITRATE						
							NITRITE						
							µg-atoms/liter						
0	15.31	33.411	24.70	8.03	-222	145	.25	.0	.06	.00	0	1.47	.74
5	15.28	33.411	24.71	8.04	-223	145	.26	.1	.05	.00	2	4.73	.00
10	15.20	33.411	24.72	7.99	-218	144	.32	.0	.13	.00	0		

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 17	1105	29 SEP 1971	15.6	36° 50.9'	121° 49.8'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	
8	26 2 2	26 11	1009.1		3	6	9

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter				µg/l	
0	15.44	33.409	24.67	7.78	-201	141	.33	.0	.06	.00	3	1.79	1.16
5	15.42	33.408	24.67	7.75	-198	140	.27	.0	.04	.00	0	1.45	.88
10	15.40	33.410	24.68	7.83	-205	142	.30	.0	.08	.00	0	2.35	1.20

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1103 30 SEP 1971 6.6 36° 48.1' 121° 48.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 4 26 1 2 15 5 11.8 11.1 2 3 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	16.06	33.422	24.54	6.93	-131	127	.49	.4	.04	.19	7	3.78	.00
5	12.86	33.509	25.29	5.43	34	93	.74	.1	.05	.01	9	2.27	1.26
10	12.30	33.528	25.41	4.92	86	84	.96	1.8	.19	1.44	10	.68	.40
20	11.97	33.535	25.48	4.30	145	73	1.08	4.5	.28	2.35	11	.35	.32
7*	13.03	33.504	25.25	5.49	27	95	.71	.6	.07	.08	9	1.87	1.56
25*	11.60	33.573	25.58	4.58	124	77	1.29	10.2	.36	2.27	15	.12	.27
50*	10.28	33.684	25.90	4.15	178	68	1.73	18.1	.43	1.12	24	.06	.24

* indicates questionable data: Depths uncertain

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1108 30 SEP 1971 8.5 36° 47.4' 121° 50.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 29 2 2 30 4 1013.9 12.8 10.6 2 3 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	15.20	33.428	24.74	7.58	-181	137	.31	.8	.02	.10	5	2.36	1.34
10	12.52	33.544	25.38	4.97	79	85	.70	.3	.04	.05	10	.68	.51
20	11.37	33.586	25.63	4.47	137	75	1.28	.4	.51	1.13	14		
30	10.24	33.671	25.89	3.72	217	61	1.74	19.2	.46	.28	22	.04	.18
50	9.64	33.764	26.07	2.17*	362	35	1.85	26.1	.15	.00	26	2.15	11.2
75	9.32	33.816	26.16	2.99	293	48	2.02	24.1	.23	.19	31	.04	.11
100	9.14	33.857	26.22	2.89	304	46	2.08	26.3	.15	.10	32	.04	.09
150	8.44	33.985	26.43	2.34	362	37	2.35	29.8	.13	.02	40	.02	.11

* indicates questionable data

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE

ML 17 1112 30 SEP 1971 11.8 36° 46.9' 121° 52.1'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt

9 29 2 2 33 1 1014.6 13.9 12.1 2 3 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	15.50	33.428	24.67	7.38	-166	134	.26	1.3	.01	.00	5	.50	.32
10	15.25	33.429	24.73	7.61	-184	137	.28	.3	.01	.00	3	2.39	.00
20	12.08	33.549	25.47	4.95	86	84							
30	11.35	33.557	25.61	4.60	125	77	1.33	11.7	.47	2.45	13	.04	.11
50	10.37	33.658	25.86	3.08	272	50	1.71	18.6	.39	1.02	22	.03	.17
75	9.25	33.908	26.24	2.62	326	42	2.07	26.6	.10	.13	29	.02	.07
100	8.98	33.930	26.30	2.51	340	40	2.15	27.8	.14	.08	34	.02	.07
150	8.16	34.017	26.50	2.04	392	32	2.43	30.0	.13	.00	44	.02	.11

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1115 30 SEP 1971 12.4 36° 46.8' 121° 58.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 31 4 3 32 16 1015.6 13.6 12.1 3 3 2 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a μg/l	PHAEO
0	13.98	33.528	25.07	6.97	-115	123	.43	.5	.03	.11	6	5.33	.00
10	13.98	33.528	25.07	5.34*	30	94	.39	.0	.02	.05	6	5.57	.00
19	13.88	33.533	25.10	6.52	-73	115	.41	.2	.04	.22	6	1.26	.95
28	12.49	33.574	25.41	4.33	136	74	.72	.5	.08	.00	9	.49	.54
36	11.85	33.638	25.58	4.39	138	74	1.07	4.7	.43	.16	14	.34	.18
60	10.90	33.677	25.78	4.15	170	69	1.50	16.1	.55	.00	16	.09	.20
84	10.30	33.747	25.94	3.74	214	61	1.72	18.6	.11	.00	19	.03	.12
134	9.08	34.013	26.35	2.51*	338	40	2.37*	22.6*	.08*	.06*	19*	.02	.06
155	8.98	34.065	26.41	2.51	339	40	2.19	27.4	.08	.21	34	.02	.05
195	8.54	34.133	26.53	2.05	386	32	2.38	30.1	.08	.04	39	.01	.05
240	8.12	34.148	26.61	1.93	402	30	2.48	31.1	.07	.43	43	.02	.06
330	7.04	34.187	26.79	1.43	461	22	2.76	35.6	.02	.19	54	.01	.03

* indicates questionable data

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1110 30 SEP 1971 14.3 36° 45.4' 121° 51.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 29 6 3 29 14 1015.2 14.0 12.1 1 3 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.58	33.444	24.67	7.76	-201	141	.36	.5	.02	.00	4	2.45	.85
5	15.58	33.441	24.66	7.78	-203	141	.47	.2	.02	.00	4	2.23	1.52
10	14.00	33.507	25.05	6.13	-40	108	.47	.4	.02	.00	6	.98	.79
16	13.60	33.537	25.16	5.84	-10	102	.53	.2	.02	.00	6	1.76	1.19
24	12.60*	33.560	25.38	5.14	63	88	.76	.6	.06	.00	9	.34	.18
41	11.75	33.580	25.55	4.67	114	78	1.30	7.6	.35	2.40	15	.20	.33

* indicates questionable data: Paired thermometer read 12.68

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1101 30 SEP 1971 15.0 36° 44.9' 121° 49.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 29 6 3 28 1014.6 1 3 1 9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.67	33.433	24.64	7.83	-208	142	.42	.0	.03	.00	6	4.56	.00
5	15.65	33.429	24.64	7.89	-213	144	.41	.2	.03	.00	5	2.30	.00
10	15.49	33.431	24.68	7.66	-191	139	.42	.3	.02	.00	5	2.24	.00

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1120 1 OCT 1971 7.1 36° 43.0' 121° 51.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 4 28 0 2 12 8 1019.3 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.19	33.447	24.75	7.63	-185	138	.35	2.8	.07	.00	5	3.49	.12
5	15.20	33.445	24.75	7.21	-148	130	.36	.1	.06	.00	5	7.15	.61
10	14.72	33.473	24.88	6.89	-115	123	.47	.0	.05	.39	5	.42	.33
20	13.52	33.501	25.15	6.01	-24	105	.54	.0	.09	.10	7	.64	.40
30	12.54	33.535	25.37	4.98	78	85	.90	.9	.17	.18	10	1.01	.78
50	11.76	33.560	25.54	4.73	109	79	1.33	7.2	.42	2.24	13	.61	.40

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 17 1123 1 OCT 1971 8.4 36° 39.0' 121° 53.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt
6 29 0 2 5 3 1019.6 13.8 11.7 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.23	33.495	24.78	8.12	-230	147	.30	.1	.05	.00	5	5.23	.67
5	15.18	33.494	24.79	7.96	-215	144	.24	.0	.04	.00	4	4.73	.00
10	15.00	33.495	24.83	7.43	-166	133	.38	.1	.04	.54	4	.80	.53
20	12.48	33.540	25.38	5.08	70	87	.79	.0	.08	.00	9	.38	.35
30	11.80	33.559	25.53	4.74	108	80	1.30	5.3	.37	2.31	15	.51	.41
50	11.53	33.642	25.64	3.91	185	65	1.77	18.2	.57	.85	21	.10	.20

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1121 1 OCT 1971 9.3 36° 37.3' 121° 51.6'

TRANSP WAVES WIND AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 2 29 2 0 6 3 16.3 12.8 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO µg/l
0	15.89	33.492	24.63	9.22	-334	169	.30	.2	.05	.07	8	31.10	.58
5	15.52	33.478	24.71	7.17	-148	130	.49	.1	.06	.00	8	1.56	1.55
10	14.20	33.529	25.03	6.41	-67	113	.57	.3	.02	.19	16	.80	1.16

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1122 1 OCT 1971 9.8 36° 36.7' 121° 53.1'

TRANSP WAVES WIND AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 2 32 0 2 2 5 1019.6 15.7 12.7 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.94	33.496	24.63	9.66	-374	177	.19	1.1	.02	.08	7	14.5	.00
5	15.52	33.501	24.72	8.42	-259	153	.16	.2	.02	.28	5	.64	.48
10	14.14	33.522	25.04	6.55	-79	116	.53	.3	.04	.15	11	.70	.60

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1124 1 OCT 1971 10.7 36° 39.8' 121° 56.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 29 0 2 35 4 1019.6 15.6 13.9 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg-atoms/liter	SILICA μg/l	CHL-a μg/l	PHAEO μg/l
0	15.70	33.502	24.68	8.81	-296	160	.18	.0	.04	.07	7	1.59	1.14
5	15.04	33.494	24.82	7.65	-186	138	.21	.3	.02	.00	5	.77	.56
10	12.81	33.536	25.32	5.12	63	88	.70	.2	.05	.00	9	.45	.32
20	12.25	33.548	25.44	4.74	103	80	.86	.1	.03	.00	13		
30	11.60	33.584	25.59	4.37	143	73	1.36	3.6	.39	1.82	19	.75	.74

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 17 1116 1 OCT 1971 12.0 36° 43.0' 121° 55.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 29 0 2 29 8 1020.0 14.7 12.9 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	15.52	33.466	24.70	7.91	-214	144	.33	.1	.05	.00	5	7.05	.00
5	13.90	33.465	25.04	6.30	-98	119	.50	.3	.05	.00	6	1.37	.91
10	13.74	33.501	25.10	6.42	-63	112	.46	.1	.07	.00	6	.64	.56
20	12.38	33.555	25.42	4.96	81	84	.84	.9	.19	.12	10	.53	.52
30	11.82	33.573	25.54	4.68	113	79	1.11	4.9	.34	.29	13	.27	.37
50	10.74	33.641	25.78	4.13	174	68	1.55	16.2	.23	.00	17	.12	.11
75	10.01	33.761	26.00	3.32	255	54	1.83	21.2	.17	.00	24	.06	.16

Hydrographic StationsML CRUISE 18

1105

20 October 1971

1150

1154

1158

1159

1153

1152

1157

1114

21 October 1971

1103

1108

1112

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1110

1101

22 October 1971

1120

1123

1121

1122

1124

1116

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1105 20 OCT 1971 6.5 36° 50.8' 121° 49.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 27 0 2 11 1 1017.9 9.4 8.3 40 7 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a μg/l	PHAEO
0	12.50	33.550	25.39	6.33	-42	108	.73	6.9	.22	.40	19	2.15	1.40
5	12.42	33.543	25.40	6.37	-44	109	.71	1.9	.19	.15	11	3.54	.84
10	11.68	33.455	25.47	6.50	-47	109	.64	3.0	.13	.02	9	4.22	.00

CRUISE		STATION	DATE	HOUR	N LATITUDE	W LONGITUDE						
ML 18		1150	20 OCT 1971	7.3	36° 52.7'	121° 51.5'						
TRANSP	WAVES	WIND	BAROM	AIR TEMP °C		CLOUDS	VISIB					
	m dir ht p	dir speed	mb	dry	wet	typ amt						
6	27 0 2	10 2	1017.9	10.0	8.3	40 7 8	7					
DEPTH	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt	ml/l	µg-at/l	%	µg-atoms/liter			µg/l			
0	11.81	33.462	6.59	-57	111	.59	5.4	.13	.00	8	6.16	.37
5	11.86	33.498	6.19	-22	104	.70	2.3	.15	.18	10	4.30	.08
10	11.89	33.518	6.01	-6	101	.79	2.8	.17	.15	11	1.70	1.18

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 18	1154	20 OCT 1971	8.1	36° 55.3'	121° 52.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
3	18 1 5	16 2	1019.3	11.1 8.9	5	7 8	7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHABO
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter	µg-atoms/liter				µg/l	
0	13.04	33.620	25.34	8.59	-250	148	.49	.0	.04	.01	18	23.6	.40
5	12.72	33.609	25.39	7.85	-180	135	.54	.0	.04	.00	19	8.27	.00
10	12.48	33.611	25.44	5.02	75	86	.78	.0	.06	.11	20	2.32	1.11

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1158 20 OCT 1971 9.0 36° 55.3' 121° 56.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 2 18 1 5 18 3 1019.3 11.7 9.4 5 7 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.96	33.615	25.35	8.18	-212	141	.48	.0	.06	.01	17	29.6	.00
5	12.84	33.609	25.37	7.49	-149	129	.51	.0	.04	.00	16	14.7	.00
10	12.64	33.604	25.40	6.66	-73	114	.56	.0	.04	.17	15	7.43	.36
20	12.40*	33.581	25.43	6.13	-23	104	.66	.0	.11	.36	14	1.47	.66

* indicates questionable data: Paired thermometer read 12.34

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 18 1159 20 OCT 1971 9.7 36° 57.3' 121° 56.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt
4 29 2 6 28 8 1017.6 13.3 12.8 0 7 7 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.52	33.577	25.41	7.19	-119	123	.55	.0	.04	.03	14	19.3	.00
5	12.38	33.573	25.43	6.58	-63	112	.59	.0	.06	.00	14	4.16	.00
10	12.38	33.599	25.45	5.36	46	91	.82	.0	.07	.40	19	8.33	.15

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1153 20 OCT 1971 10.5 36° 56.7' 122° .3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 0 0 0 1019.3 12.8 11.1 5 7 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.22	33.558	25.45	6.63	-65	113	.60	1.6	.12	.24	12	4.40*	.61*
5	12.12	33.559	25.47	6.36	-40	108	.66	1.1	.17	.34	13	4.56	.18
10	12.07	33.559	25.48	6.66	-66	113	.71	1.3	.20	.76	6	3.71	.31

* indicates questionable data

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1152 20 OCT 1971 11.2 36° 55.4' 122° 2.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 6 28 1 5 25 6 1018.6 13.3 11.7 1 7 6 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.00	33.408	25.37	7.30	-122	123	.40	2.5	.06	.08	4	3.66	.00
5	11.96	33.472	25.43	6.91	-87	117	.52	.0	.09	.00	7	5.16	.66
10	12.06	33.506	25.44	6.74	-73	114	.57	.3	.10	.07	9	3.61	.00
20	12.00*	33.551	25.48	5.96	-3	101	.78	2.4	.20	.20	12	1.08	.58

* indicates questionable data: Paired thermometer read 11.94

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1157 20 OCT 1971 12.7 36° 50.1' 121° 58.1'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	13.18*	33.479	25.20	6.05	-24	105	.65	2.0	.10	.08	.01	.07
10	12.22	33.483	25.39	5.74	14	97	.73	1.8	.15	.10	.93	1.01
19	11.71	33.489	25.49	5.77	17	97	.89	4.1	.27	.30	.68	.71
29	11.02	33.475	25.59	5.43	55	90	1.00	6.5	.33	.05	.39	.37
50	10.92	33.541	25.67	4.74	118	78	1.27	13.7	.34	.00	.41	.44
74	10.52	33.567	25.77	4.49	145	73	1.40	17.0	.19	.04	.15	.28
99	10.04	33.632	25.90	4.08	187	66	1.63	18.9	.19	.21	.08	.13
149	9.44	33.852	26.17	2.81	307	45	2.09	26.0	.11	.00	.02	.04

* indicates questionable data: Paired thermometer read 12.96

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1114 20 OCT 1971 14.2 36° 50.8' 121° 52.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 29 2 5 31 10 1017.6 13.9 12.2 0 7 7 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.83	33.497	25.28	6.29	-41	108	.61	5.4	.25	.11	7	1.52	1.38
10	12.38	33.515	25.38	6.51	-56	111	.62	5.9	.13	.16	8	1.13	.93
19	12.15	33.528	25.44	6.24	-30	106	.71	2.6	.18	.42	9	.23*	.33*
28	11.76	33.502	25.49	6.07	-10	102	.77	5.9	.21	.22	10	1.61	1.06
48	11.47*	33.520	25.56	5.46	47	91	1.15	7.5	.38	2.05	12	.00	1.89

* indicates questionable data: Paired thermometer read 11.38

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE								
ML 18		1103	21 OCT 1971		6.5	36° 48.1'		121° 48.4'								
DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE		NITRATE		NITRITE		AMMONIA µg-atoms/liter	SILICA	CHL-a µg/l	PHAEO
							µg-atoms/l	µg-atoms/l	µg-atoms/l	µg-atoms/l	µg-atoms/l	µg-atoms/l				
0	12.84	33.509	25.29	6.07	-22	104	.65	1.2		.10			.00	11	2.20	1.55
5	12.80	33.527	25.31	6.16	-30	106	.63	1.3		.10			.00	20	1.71	1.53
10	12.64	33.535	25.35				.58	1.3		.12			.00	10	1.44	1.27
20	12.26*	33.538	25.43	5.77	11	98	.68	2.3		.18			.15	11	1.41	.83
30	11.88	33.535	25.49	5.61	29	95	.69	2.2		.50			.57	6	.53	.58
50	11.28	33.553	25.62	5.11	81	85	1.11	8.5		.30			.22	15	.25	.22
75	10.95	33.581	25.70	4.77	115	79	1.25	11.2		.30			.02	18	.28	.41
100	10.72*	33.636	25.78	4.46	145	73	1.37	12.7		.28			.73	21	.30	.45

* indicates questionable data: Paired thermometers read 12.18 at 20 m., 10.66 at 100 m.

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1108 21 OCT 1971 7.8 36° 47.6' 121° 49.9'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 10 27 1 2 13 4 1019.3 9.9 9.3 5 2 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg/l	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	12.94	33.506	25.27	5.90	-8	102	.50	.6	.12	.00	7	1.02	1.25
10	12.98	33.499	25.26	5.79	1	100	.53	.9	.08	.00	6	.64	.74
20	12.72	33.499	25.31	5.78	5	99	.63	1.6	.12	.00	7	.76	.72
30	11.98*	33.507	25.45	4.01*	171	68	.91	4.7	.24	.65	10	.38	.52
50	11.84	33.516	25.49	4.98	86	84	.90	5.0	.23	.04	11	.38	.49
75	11.39	33.531	25.58	4.96	93	83	1.09	11.2	.30	.26	16	.30	.40
100	11.10	33.548	25.65	4.26	159	71	1.22	16.0	.34	.00	16	.24	.23
150	9.44	33.825	26.15	3.15	277	50	1.92	20.8	.10	.00	32	.12	.24

* indicates questionable data: Paired thermometer read 11.89

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE						
ML 18		1112	21 OCT 1971		8.9	36° 48.2'		121° 52.0'						
DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE		NITRATE µg-atoms/liter	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
							AIR TEMP °C	WEATH						
TRANSP		WAVES		WIND		BAROM		AIR TEMP °C	WEATH	CLOUDS	VISIB			
m	dir	ht	p	dir	speed	mb	dry	wet	typ	amt				
8	28	1	2	14	4	1020.7	11.8	10.7	5	2	1	7		
0	13.32	33.505	25.19	5.60	14	97	.48	.5	.09	.00	.80	.42		
10	13.22	33.500	25.21	5.86	-7	102	.59	1.5	.13	.00	.89	.65		
20	12.86	33.507	25.29	5.64	16	97	.68	3.2	.02	.00	.85	.72		
30	12.17*	33.500	25.41	5.25	58	89	.90	7.5	.21	.00	.68	.65		
50	11.68	33.509	25.51	4.89	96	82	1.04	8.1	.22	.00	.24	.30		
75	11.04	33.567	25.67	4.35	151	72	1.32	12.9	.29	.00	.17	.22		
100	10.71	33.567	25.73	4.45	146	73	1.42	13.6	.38	.00	.16	.18		
150	9.86*	33.737	26.01	3.63	229	59	1.82	19.7	.22	.00	.11	.17		

* indicates questionable data: Paired thermometers read 12.08 at 30 m., 9.80 at 150 m.

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1115 21 OCT 1971 10.6 36° 46.6' 121° 56.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 28 1 2 29 6 1020.7 13.3 11.7 5 2 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg-atoms/liter	SILICA μg/l	CHL-a μg/l	PHAEO μg/l
0	13.36	33.445	25.14	5.72	3	99	.66	1.5	.14	.00	6	.46	.36
10	12.32	33.454	25.35	5.88	0	100	.76	3.2	.14	.00	7	1.01	1.08
20	12.07	33.476	25.41	5.39	47	91	.94	4.1	.19	.00	8	.77	.60
30	11.04*	33.540	25.65	4.67	123	77	1.39	11.6	.29	.00	13	.21	.24
50	10.88	33.569	25.70	4.59	132	76	1.40	13.9	.29	.00	15	.13	.22
75	10.47	33.590	25.79	4.23	169	69	1.45	14.2	.28	.00	18	.16	.24
100	10.14	33.657	25.90	4.11	183	67	1.65	17.4	.21	.00	20	.11	.15
150	9.20	33.923	26.26	2.84	307	45	2.21	24.2	.14	.00	29	.02	.05
200	8.90	34.021	26.39	2.42	348	38	2.35	25.5	.11	.00	33	.02	.05
250	8.44	34.077	26.50	2.07	385	32	2.48	26.9	.07	.00	40	.02	.04
300	7.78	34.106	26.63	1.62	434	25	2.67	33.2	.07	.00	50	.02	.04
400	6.74	34.161	26.81	1.22	484	18	2.81	36.3	.08	.00	64	.03	.06

* indicates questionable data: Paired thermometer read 10.97

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1110 21 OCT 1971 12.0 36° 45.4' 121° 51.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 11 28 1 2 29 8 1019.6 14.4 13.1 5 2 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	13.48	33.500	25.16	5.95	-18	104	.52	.7	.06	.39	8	.78	.61
5	13.04	33.497	25.24	5.91	-10	102	.33	1.3	.05	.27	4	1.24	1.01
10	12.94	33.488	25.25	5.89	-7	101	.54	1.3	.06	.27	5	1.32	1.35
20	12.78*	33.485	25.28	5.66	15	97	.69	3.1	.10	.25	7	.91	.59
29	12.57	33.494	25.33	5.45	36	93	.76	4.2	.16	.21	8	.88	.65
49	11.67	33.522	25.52	4.77	107	80	1.10	10.1	.25	.45	11	.30	.33

* indicates questionable data: Paired thermometer read 12.69

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1101 21 OCT 1971 13.7 36° 44.7' 121° 49.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 28 1 2 29 9 1019.3 15.0 13.3 5 2 1 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	13.42	33.510	25.18	6.18	-38	108	.40	.2	.04	.25	2	1.36	.80
5	13.06	33.507	25.25	6.22	-38	107	.59	.4	.05	.32	7	1.51	1.03
10	12.96	33.505	25.26	6.18	-33	106	.51	.0	.04	.30	6	1.62	1.06

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1120 22 OCT 1971 7.0 36° 43.2' 121° 51.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 26 0 2 14 1 1018.6 10.1 9.6 0 0 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	13.16	33.508	25.23	5.77	1	100	.50	.6	.30	.98	.97
5	13.20	33.512	25.22	6.13	-31	106	.54	.0	.21	.82	.66
10	13.10	33.511	25.24	6.07	-25	105	.55	.7	.28	.91	.71
20	12.32*	33.501	25.39	5.44	39	92	.85	5.0	.48	.58	.39
30	11.88	33.510	25.48	4.88	94	82	1.00	7.2	.55	.50	.24
50	10.78	33.608	25.75	4.17	170	69	1.43	14.2	1.03	.14	.25

* indicates questionable data: Paired thermometer read 12.24

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1123 22 OCT 1971 8.2 36° 39.1' 121° 53.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 10 0 0 16 0 1020.0 11.4 10.1 0 0 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg/l	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	13.20	33.493	25.21	6.08	-27	105	.53	1.3	.09	.24	6	.29	1.34
5	12.90	33.497	25.27	5.35	41	92	.43	1.0	.10	.32	2	.50	.61
10	12.42	33.501	25.37	5.44	38	93	.79	4.7	.20	.61	8	.38	.43
20	12.04*	33.501	25.44	5.19	65	88	.98	7.5	.24	.63	10	.27	.25
30	11.70	33.517	25.51	4.98	88	84	1.11	8.1	.32	1.27	13	.28	.40
50	10.53	33.618	25.80	4.16	174	68	1.50	17.5	.26	.33	18	.10	.17

* indicates questionable data: Paired thermometers read 11.95

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1121 22 OCT 1971 9.0 36° 37.8' 121° 51.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 0 0 1019.3 12.3 11.0 0 0 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	13.52	33.512	25.16	6.09	-31	106	.56	1.2	.06	.68	6	1.12	.97
5	13.48	33.503	25.16	6.09	-31	106	.39	.3	.07	.76	3	1.45	1.25
10	13.41	33.493	25.16	6.11	-32	106	.60	1.2	.08	.79	7	.83	.90

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1122 22 OCT 1971 9.5 36° 36.4' 121° 52.9'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 0 34 1 1020.0 12.7 11.1 2 0 2 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	13.60	33.507	24.14	6.28	-49	110	.53	.4	.07	.04	6	4.89	.11
5	13.60	33.503	24.13	6.21	-43	108	.51	.3	.17	.57	6	1.71	1.53
10	13.46	33.500	24.16	6.19	-39	108	.57	.3	.17	.23	5	1.44	1.05

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1124 22 OCT 1971 10.5 36° 38.9' 121° 56.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 10 27 1 2 31 1 1019.6 12.2 10.7 0 0 2 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	13.14	33.491	25.22	6.63	-75	115	.79	4.0	.17	1.04	7	.38	.49
5	12.34	33.512	25.39	5.28	53	90	.98	6.3	.19	.90	10	.32	.39
10	12.00	33.523	25.46	5.05	78	85	1.07	8.5	.23	.70	11	.25	.40
20	11.16	33.562	25.65	4.56	131	76	1.30	11.0	.23	.45	13	.13	.20
30	11.05*	33.566	25.67	4.50	138	74	1.33	13.8	.24	.44	14	.13	.17

* indicates questionable data: Paired thermometer read 11.13

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 18 1116 22 OCT 1971 11.6 36° 43.4' 121° 55.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 10 28 2 1 25 1 1013.8 12.3 11.6 0 0 2 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE μg-atoms/liter	AMMONIA μg/l	SILICA μg/l	CHL-a μg/l	PHAEO μg/l
0	13.82	33.432	25.03	6.10	-24	105	.53	1.2	.06	.40	5	.58	.58
5	13.36	33.432	25.13	6.10	-30	106	.50	.6	.06	.34	5	.89	.99
10	13.00	33.409	25.18	6.08	-24	105	.53	2.3	.08	.21	5	.88	.93
20	12.31*	33.445	25.34	6.11	-20	104	.65	2.3	.11	.31	6	1.05	1.10
30	11.96	33.474	25.43	5.64	26	95	.83	4.1	.17	.40	9	.72	.66
50	11.17	33.540	25.63	4.48	138	74	1.25	10.9	.23	.27	13	.78	1.58
75	10.14	33.689	25.93	3.65	224	59	1.60	15.9	.27	.25	24	.15	.19

* indicates questionable data: Paired thermometer read 12.21

Hydrographic Stations

<u>ML CRUISE 19</u>	1114
17 November 1971	1157
	1152
	1153
	1158
	1159
	1154
	1150
	1105
18 November 1971	1103
	1108
	1112
	1115
	1110
	1101
19 November 1971	1120
	1123
	1121
	1122
	1124
	1116

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 19	1114	17 NOV 1971	8.8	36° 50.7'	121° 53.1'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	

7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter	µg-atoms/liter				µg/l	
0	12.02	33.425	25.38	5.47	40	92	.62	3.6	.07	.83	8	.99	.98
10	12.04	33.416	25.37	6.22	-26	105	.99	3.1	.08	.52	12	1.05	.94
20	12.04	33.418	25.37	4.46	130	75	.73	3.4	.11	1.00	8	.78	.75
30	11.79*	33.465	25.46	4.72	110	79	.96	3.7	.16	1.59	8	.42	.60
50	10.28	33.689	25.90	3.19	264	52	1.55	18.1	.25	.96	22	.11	.29

* indicates questionable data: Paired thermometer read 11.88

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1157 17 NOV 1971 10.7 36° 50.2' 121° 58.1'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

9

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE	AMMONIA	SILICA	CHL-a μg/l	PHAEO
0	12.23	33.410	25.33	5.40	44	92	.63	3.5	.16	.43	7	.26	.25
10	12.15	33.405	25.34	5.82	8	99	.59	2.9	.16	.20	7	.39	.38
20	12.04*	33.405	25.36	5.97	-4	101	.63	3.3	.16	.17	7		
30	12.01	33.411	25.37	5.82	9	98	.73	5.0	.23	.12	8	.30	.33
50	10.84	33.582	25.72	4.43	146	73	1.33	15.1	.37	.73	20	.08	.22
75	9.94	33.735	26.00	3.41	248	55	1.74	31.2*	.30	.22	25	.09	.21
100	9.33*	33.844	26.18	2.93	298	47	1.95	31.0*	.17	.40	30	.01	.05
149	9.14	33.901	26.26	2.49	339	40	2.14	31.7	.18	.17	36	.06	.18

* indicates questionable data: Paired thermometers read 12.10 at 20 m, 9.42 at 100 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 19	1152	17 NOV 1971	12.2	36° 55.3'	122° 2.4'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

5

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter	µg-atoms/liter				µg/l	
0	12.23	33.410	25.34	6.06	-14	103	.78	4.7	.28	.99	13	.71	.48
5	11.90	33.405	25.39	6.06	-10	102	.96	4.2	.26	1.03	11	1.15	.97
10	11.87*	33.402	25.39	5.68	23	96	.80	6.1	.29	1.04	12	1.24	.68
20	11.83	33.403	25.40	5.92	3	100	.82	5.2	.30	1.26	11	.58	.61

* indicates questionable data: Paired thermometer read 11.78

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1153 17 NOV 1971 12.9 36° 56.8' 122° 00.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

5

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	12.40	33.397	25.29	5.56	29	95	.71	3.8	.27	.94	12	.76	.62
5	12.04	33.374	25.34	5.70	20	96	.72	2.1	.20	1.24	10	2.90	2.01
10	11.82*	33.365	25.37	5.92	3	99	.85	3.1	.24	1.99	12	.96	.98

* indicates questionable data: Paired thermometer read 11.93

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1158 17 NOV 1971 13.8 36° 55.2' 121° 56.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

11

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	12.36	33.391	25.29	5.21	60	89	.60	3.9	.21	.19	11	1.01	.79
5	12.29	33.388	25.30	5.41	43	92	.65	2.9	.18	.26	8	.90	.81
10	11.99*	33.384	25.36	4.55	123	77	.59	3.0	.19	.23	7	.88	.88
20	11.98	33.395	25.37	4.96	87	84	.70	4.1	.24	.77	9	.29	.44

* indicates questionable data: Paired thermometer read 12.08

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1159 17 NOV 1971 14.6 36° 57.1' 121° 56.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt

5

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg-atoms/liter	CHL-a µg/l	PHAEO µg/l
0	12.28	33.356	25.28	6.33	-38	107	.74	1.7	.18	1.60	12	1.88	1.42
5	11.98	33.351	25.33	4.74	106	80	.77	2.5	.17	1.74	11	1.23	1.24
10	11.90*	33.365	25.36	5.51	38	93	.64	1.5	.16	1.25	10	1.19	1.17

* indicates questionable data: Paired thermometer read 12.00

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 19	1154	17 NOV 1971	15.2	36° 55.2'	121° 52.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	

7

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter				µg/l	
0	12.48	33.382	25.27	6.05	-16	103	.59	1.7	.15	.40	10	.34	.38
5	12.16	33.372	25.32	6.44	-47	109	.65	1.3	.16	.68	8	.96	.88
10	12.05*	33.378	25.34	4.07	164	69	.64	1.4	.15	.94	8	1.05	1.00

* indicates questionable data: Paired thermometer read 12.14

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 19	1150	17 NOV 1971	15.8	36° 52.8'	121° 51.1'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	

11

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter					µg/l	
0	12.39	33.390	25.29	6.51	-56	111	.73	1.7	.14	.61	10	1.32	.98
5	12.14	33.377	25.32	6.28	-33	106	.68	3.0	.10	.38	20*	1.10	2.04
10	11.99*	33.380	25.35	6.13	-17	103	.83	1.6	.13	.84	7	1.76	1.59

* indicates questionable data: Paired thermometer read 12.08

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 19	1105	17 NOV 1971	16.4	36° 50.8'	121° 49.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	

11

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%		µg-atoms/liter				µg/l	
0	12.38	33.397	25.30	6.46	-51	110	.52	.6	.08	.52	8		
5	12.25	33.393	25.32	5.63	24	96	.59	.9	.11	1.58	6	.70	.62
10	12.07*	33.396	25.35	5.92	0	100	.76	2.2	.13	1.12	7	.31	2.58

* indicates questionable data: Paired thermometer read 12.07

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1103 18 NOV 1971 8.2 36° 48.2' 121° 48.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 8 0 3 9 1 1017.6 7.2 5.2 2 0 6 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.10	33.400	25.35	6.29	-33	106	.64	4.1	.09	.06	6	1.03	.37
5	12.10	33.401	25.35	6.12	-18	103	.62	2.1	.02	.00	6	1.19	.00
10	12.02*	33.402	25.37	5.19	66	88	.60	2.2	.02	.06	7	1.07	.00
20	11.98	33.426	25.39	5.72	19	96	.79	4.6	.07	.30	9	1.19	.43
30	11.86	33.447	25.43	5.12	73	86	.85	6.0	.04	.62	12	.58	.30
50	11.54	33.424	25.47	4.76	109	80	.74	5.3	.04	.90	9	.86	.34
.75	11.01*	33.579	25.69	3.22	252	53	1.29	11.8	.07	.51	19	.33	.43
100	10.80	33.627	25.76	2.94	280	48	1.48	14.0	.06	.65	20	.31	.22

* indicates questionable data: Paired thermometers read 12.11 at 10 m, 11.11 at 75 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 19 1108 18 NOV 1971 10.0 36° 47.5' 121° 50.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt
10 8 1 3 20 2 1017.6 10.0 9.0 1 0 8 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	SILICA µg/l	CHL-a µg/l	PHAEO µg/l
0	12.20	33.405	25.33	6.01	-10	102	.64	2.7	.17	.13	5	.32
10	12.16	33.409	25.34	5.96	-4	101	.66	2.5	.19	.10	5	.30
20	11.36*	33.513	25.57	4.80	108	80	1.09	8.3	.27	1.16	12	.19
30	10.85	33.591	25.73	4.55	136	75	1.30	11.8	.29	.55	14	.09
49	10.62*	33.623	25.79	3.64	219	60	1.47	14.2	.32	.91	18	.08
74	10.34	33.675	25.88	3.79	209	62	1.63	17.7	.31	.45	20	.09
98	10.02*	33.699	25.95	3.83	210	62	1.68	17.6	.32	.31	21	.08
148	9.88	33.759	26.02	2.63	318	42	1.77	20.0	.25	.36	25	.07

* indicates questionable data: Paired thermometers read 11.47 at 20 m, 10.69 at 40 m, 10.20 at 98 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1112 18 NOV 1971 11.2 36° 47.8' 121° 52.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 14 10 1 3 29 1 1017.3 12.0 10.3 1 0 6 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.24	33.421	25.34	3.97	172	67	.61	2.8	.20	.43	4	.38*	
10	12.11	33.418	25.36	4.41	134	75	.66	2.9	.22	.00	5	.59*	
20	11.59*	33.475	25.50	4.28	151	72	.99	6.6	.30	.75	10	.05*	
30	11.26	33.548	25.62	3.56	219	59	1.19	11.1	.42	.25	12	.03*	
50	10.13	33.715	25.95	2.99	283	49	1.66	19.0	.23	.10	21	.03*	
75	9.84	33.766	26.04	2.82	302	45	1.78	20.0	.22	.14	23	.02*	
100	9.68*	33.787	26.08	2.85	301	46	1.81	20.4	.20	.25	23	.02*	
150	9.48	33.838	26.15	2.17	364	35	1.95	24.5	.20	.00	27	.02*	

* indicates questionable data: Paired thermometer read 11.69 at 20 m, 9.79 at 100 m
 Incorrect filter used on fluorometer, correction applied

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 19 1115 18 NOV 1971 13.0 36° 46.5' 121° 56.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt
11 10 2 3 36 2 1015.9 13.9 12.2 1 0 5 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a μg/l
0	12.51	33.411	25.28	6.07	-18	103	.61	4.8	.24	.41	7	.38*
10	12.28	33.407	25.32	6.00	-9	102	.60	3.3	.25	.10	6	.30*
20	12.19*	33.430	25.36	5.89	1	100	.60	3.2	.03	.19	6	.18*
29	11.60	33.524	25.54	5.31	59	89	.96	9.2	.06	.19	10	.05*
49	10.51*	33.656	25.84	3.77	209	62	1.39	15.1	.01	.00	17	.02*
73	10.23	33.687	25.91	3.92	199	64	1.61	18.3	.02	.06	21	.02*
98	9.91*	33.723	25.99	3.53	238	57	1.67	19.8	.01	.06	22	.02*
147	9.59	33.822	26.12	2.37	345	38	1.60	17.7	.01	.09	21	.01*
197	9.06	33.895	26.26	2.55	335	40	2.03	24.5	.00	.05	34	.02*
246	7.71	34.106	26.64	1.60	437	25	2.12	22.7	.00	.05	37	.01*
295	7.18*	34.129	26.73	1.38	464	21	2.56	28.9	.00	.11	50	.01*
394	6.76	34.169	26.82	1.09	496	16	2.91	34.8	.00	.00	68	.01*

* indicates questionable data: Paired thermometers read 12.27 at 20 m, 10.40 at 49 m, 10.01 at 98 m, 7.28 at 295 m
Incorrect filter used on fluorometer, correction applied

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1110 18 NOV 1971 14.6 36° 45.2' 121° 51.6'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 14 1 3 34 2 1014.2 16.2 11.1 2 0 5 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	AMMONIA μg/l	SILICA μg/l	CHL-a μg/l	PHAEO μg/l
0	12.31	33.390	25.30	5.83	6	99	.65	3.2	.02	.12	.28	.22
5	12.30	33.388	25.30	5.84	4	99	.61	2.2	.02	.23	.28	.25
10	12.13	33.387	25.33	6.13	-19	104	.57	2.1	.04	.27	.20	.22
19	12.18	33.405	25.34	5.46	40	92	.56	2.0	.05	.27	.20	.20
29	12.08	33.401	25.35	5.65	24	95	.64	3.3	.02	.11	.34	.37
49	10.92	33.561	25.69	4.63	128	76	1.03	7.4	.03	.71	.11	.18

* indicates questionable data: Paired thermometer read 12.92

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1101 18 NOV 1971 15.3 36° 44.8' 121° 49.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 12 12 2 3 36 3 1014.2 15.6 10.6 2 0 5 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE μg-atoms/liter	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO μg/l
0	12.18	33.405	25.34	6.47	-50	110	.52	1.3	.03	.16	4	1.30	.96
5	12.18	33.405	25.34	6.34	-38	107	.60	1.9	.09	.31	6	1.43	1.02
10	11.88*	33.429	25.41	6.07	-11	102	.75	3.0	.15	.50	8	.74	.54

* indicates questionable data: Paired thermometer read 11.94

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1120 19 NOV 1971 8.3 36° 43.3' 121° 51.8'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 11 29 2 3 3 7 1024.0 8.4 6.2 1 0 6 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	11.84	33.421	25.41	5.97	-2	100	.74	2.9	.21	.46	8	.46	.43
5	11.90	33.420	25.40	6.14	-17	103	.70	2.7	.20	.47	7	.65	.32
10	11.82*	33.420	25.42	6.10	-13	103	.70	2.9	.21	.50	7	.51	.43
20	11.66	33.468	25.48	4.81	103	81	1.08	6.2	.33	.52	9	.16	.21
30	11.07*	33.562	25.66	4.70	120	78	1.32	9.6	.46	1.70	16	.17	.22
49	10.50	33.644	25.83	4.07	182	67	1.59	15.0	.38	.83	19	.10	.32

* indicates questionable data: Paired thermometers read 11.90 at 10 m, 11.15 at 30 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1123 19 NOV 1971 10.1 36° 39.2' 121° 53.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 19 29 2 3 3 6 1023.0 11.9 8.4 1 0 3 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.08	33.427	25.37	6.01	-8	102	.84	3.8	.22	1.19	8	.45	.44
5	12.08	33.424	25.37	5.63	25	95	1.02	3.1	.21	1.23	8	.39	.41
10	11.83*	33.444	25.43	5.51	39	93	.91	4.7	.25	1.31	9	.25	.27
20	11.02	33.554	25.67	4.04	179	67	1.27	11.4	.39	.53	14	.27	.31
30	10.78*	33.578	25.73	4.13*	167	68	1.41	13.4	.39	.35	16	.06	.53
50	10.46	33.650	25.84	3.59*	226	59	1.53	16.4	.34	.06	19	.02	.05

* indicates questionable data: Paired thermometers read 11.91 at 10 m, 10.84 at 30 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1121 19 NOV 1971 11.3 36° 37.4' 121° 51.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 15 32 2 3 2 6 1023.0 15.0 10.0 2 0 2 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE µg-atoms/liter	NITRITE µg-atoms/liter	AMMONIA µg-atoms/liter	SILICA µg-atoms/liter	CHL-a µg/l	PHAEO µg/l
0	12.13	33.435	25.37	5.62	26	95	.90	5.0	.21	1.12	9	1.38	.14
5	12.09	33.436	25.38	5.53	34	94	.85	3.6	.21	1.36	8	.78	.62
10	11.92*	33.445	25.42	6.05	-10	102	.89	4.2	.24	1.36	9	.86	.64

* indicates questionable data: Paired thermometer read 12.02

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 19	1122	19 NOV 1971	12.2	36° 36.4'	121° 52.7'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht	p dir speed	mb	dry wet		typ amt	
14	34 1 3	33 6	1022.7	13.9 10.8	2	0 2	8

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a	PHAEO
m	°C	ppt		ml/l	µg-at/l	%	µg-atoms/liter					µg/l	
0	12.20	33.426	25.35	5.20	63	88	1.27	4.9	.34	3.31	13	.20	.38
5	11.63*	33.491	25.51	5.67	27	95	1.11	8.1	.33	1.10	12	.14	.16
10	11.20*	33.528	25.61	5.63	35	93	1.85*	9.5	.37	.90	13		

* indicates questionable data: Paired thermometers read 11.57 at 5 m, 11.33 at 10 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 19 1124 19 NOV 1971 13.2 36° 38.7' 121° 56.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 12 32 2 3 33 2 1022.7 14.2 10.8 2 0 3 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	11.56	33.528	25.55	5.40	52	90	1.23	16.7	.38	1.04	15	.02	.11
5	11.21*	33.541	25.62	5.28	66	88	1.42	13.8	.41	.72	14	.10	.15
10	11.21	33.541	25.62	5.14	79	85	1.50	13.5	.38	.66	14	.11	.15
20	11.14*	33.545	25.64	4.91	100	81	1.21	13.6	.34	.49	14	.11	.13
30	10.98	33.566	25.68	4.60	130	76	1.30	12.8	.32	.37	13	.09	.17

* indicates questionable data: Paired thermometers read 11.27 at 5 m, 11.02 at 20 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 19 1116 19 NOV 1971 14.4 36° 43.1' 121° 56.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt
14 32 2 3 31 2 1022.0 13.0 10.5 2 0 2 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA	CHL-a µg/l	PHAEO
0	12.48	33.402	25.28	5.69	16	97	.64	2.9	.23	.11	7	.57*	
5	12.16	33.407	25.34	6.20	-26	105	.69	2.4	.19	.36	6	.35*	
10	12.06*	33.407	25.36	5.40	46	91	.87	3.0	.23	.21	7	.52*	
20	11.64	33.488	25.50	4.68	115	78	.98	8.3	.50	.38	10	.07*	
30	11.50*	33.495	25.53	4.77	109	80	1.18	7.7	.48	.39	12	.07*	
50	10.81	33.542	25.70	4.68	125	77	1.37	12.6	.28	.16	14	.05*	
75	10.32*	33.661	25.87	3.63	224	59	3.01*	15.8	.26	.00	20	.03*	

* indicates questionable data: Paired thermometers read 12.12 at 10 m, 11.56 at 30 m, 10.40 at 75 m
Incorrect filter used on fluorometer, correction applied

Hydrographic StationsML CRUISE 20

15 December 1971

1114

1157

1152

1153

1158

1159

1154

1150

1105

16 December 1971

1103

1108

1112

1115

17 December 1971

1110

1101

1120

1123

1121

1122

1124

1116

CRUISE		STATION	DATE		HOUR	N LATITUDE		W LONGITUDE					
ML 20		1114	15 DEC 1971		7.9	36° 50.4'		121° 52.5'					
TRANSP		WAVES	WIND		BAROM	AIR TEMP °C		WEATH	CLOUDS	VISIB			
m		dir ht	p	dir speed	mb	dry	wet		typ amt				
6		31	3	2	0	0	1018.6	7.2	6.1	3	6	1	6
DEPTH	TEMP	SALINITY	SIGMA	T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA	
m	°C	ppt			ml/l	µg-at/l	%				µg-atoms/liter		
0	9.96	33.607	25.89		5.42	69	88						
10	9.99*	33.609	25.89		5.37	73	87						
20	9.96	33.613	25.90		5.44	67	88	1.45	14.7	.20	.44	21	
30	9.94	33.618	25.90		5.26	83	85	1.45	14.5	.26	.45	18	
50	9.38	33.854	26.18		2.98	293	48	1.99	22.9	.09	.22	26	

* indicates questionable data: Paired thermometer read 9.92

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE

ML 20 1157 15 DEC 1971 9.7 36° 49.8' 121° 58.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt

6 31 3 2 31 2 1021.0 8.9 7.2 3 6 1 6

DEPTH TEMP SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
m °C ppt ml/l µg-at/l % µg-atoms/liter

0 9.92 33.598 25.89 5.13 95 83 1.43 15.3 .22 .73 18
10 9.91 33.596 25.89 5.34 76 86 1.42 14.8 .24 .20 18
20 9.88 33.597 25.90 5.32 79 86 1.41 15.0 .23 .11 18
30 9.92 33.675 25.95 4.39 161 71 1.63 17.1 .28 .18 22
50 9.12 33.908 26.27 2.67 324 42 2.09 24.1 .12 .26 30
74 8.98 33.948 26.32 2.43 347 38 2.16 25.5 .09 .00 32
99 8.74 33.989 26.39 2.42 351 38 2.20 25.5 .05 .31 32
149 8.20 34.049 26.52 2.04 391 32 2.22 27.3 .06 .00 36

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1152 15 DEC 1971 11.3 36° 55.3' 122° 2.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 31 3 2 18 2 1021.0 8.9 7.2 3 6 1 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.93*	33.525	25.83	5.48	64	88	1.42	14.3	.28	.33	18
5	9.86	33.528	25.85	5.46	67	88	1.41	14.7	.27	.19	17
10	9.90	33.538	25.85	5.35	76	86	1.42	14.6	.26	.13	18
20	9.82	33.692	25.98	4.04	193	65	1.72	18.9	.32	.31	23

* indicates questionable data: Paired thermometer read 9.85

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 20	1153	15 DEC 1971	12.1	36° 56.8'	122° 00.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb	dry wet	typ amt			
5	31 3 3	18 2	1021.0	10.0 7.8	2	6	1 6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	9.99*	33.525	25.82	5.27	82	85	1.51	14.8	.40	.87	21
5	9.82	33.530	25.86	5.22	89	84	1.49	15.3	.40	.55	19
10	9.98	33.616	25.90	4.19	178	68	1.54	16.3	.40	.72	21

* indicates questionable data: Paired thermometer read 9.93

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 20	1158	15 DEC 1971	13.0	36° 55.2'	121° 56.6'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed mb		dry wet		typ amt	
6	31 3 3	18 2	1020.3	10.0 7.8	2	6 1	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%			µg-atoms/liter		
0	10.13*	33.594	25.85	5.49	60	89	1.41	14.2	.33	.77	19
5	9.90	33.595	25.89	5.42	69	87	1.41	14.3	.32	.17	18
10	9.84	33.601	25.91	5.35	76	86	1.42	14.7	.30	.35	19
20	9.84	33.617	25.92	4.81	125	78	1.50	15.2	.32	.45	20

* indicates questionable data: Paired thermometer read 10.06

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 20	1159	15 DEC 1971	13.6	36° 57.0'	121° 56.2'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
4	31 3 4	18 2	1020.3	10.0 7.8	2	6 1	6

DEPTH	TEMP	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m	°C	ppt		ml/l	µg-at/l	%				µg-atoms/liter	
0	10.16*	33.553	25.82	5.26	81	85	1.46	14.2	.36	.64	19
5	9.88	33.556	25.87	5.00	107	81	1.49	14.8	.38	.92	19
10	9.82	33.560	25.88	5.10	99	82	1.46	14.1	.39	1.25	19

* indicates questionable data: Paired thermometer read 10.10

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1154 15 DEC 1971 14.5 36° 55.2' 121° 52.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 31 3 4 18 4 1020.7 11.1 8.3 2 6 1 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	10.20*	33.567	25.82	5.72	39	93	1.24	11.5	.36	.39	15
5	9.93	33.559	25.86	5.63	50	91	1.37	13.0	.36	.48	18
10	9.88	33.564	25.87	5.39	73	87	1.27	12.1	.34	.29	16

* indicates questionable data: Paired thermometer read 10.13

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1150 15 DEC 1971 15.1 36° 52.8' 121° 51.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 3 31 3 3 31 4 1020.7 10.6 8.3 2 6 1 6

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	10.06*	33.572	25.85	6.03	13	98	1.33	12.2	.39	.37	18
5	9.94	33.568	25.87	5.75	40	93	1.34	12.7	.37	.81	18
10	9.88	33.577	25.88	5.24	86	84	1.36	13.1	.36	.73	18

* indicates questionable data: Paired thermometer read 10.15

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1105 15 DEC 1971 15.8 36° 50.8' 121° 49.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 4 31 3 3 31 2 1021.7 10.6 8.3 2 6 1 6

DEPTH TEMP °C SALINITY SIGMA T OXYGEN AOU SAT PHOSPHATE NITRATE NITRITE AMMONIA SILICA
 m ppt ml/l µg-at/l % µg-atoms/liter
 0 10.11* 33.590 25.85 5.81 32 94 1.50 14.2 .22 .41 20
 5 9.96 33.604 25.89 5.64 49 91 1.48 14.0 .18 .32 20
 10 9.85 33.602 25.91 5.64 50 91 1.41 14.0 .18 .28 18

* indicates questionable data: Paired thermometer read 10.17

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1103 16 DEC 1971 8.2 36° 48.2' 121° 48.5'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 5 29 4 6 13 10 1027.8 5.0 3.6 5 2 2 7

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.91	33.628	25.92	3.29	259	53	1.60	15.8	.33	.61	23
5	9.89	33.627	25.92	3.33	256	54	1.58	16.0	.32	.39	24
10	9.84	33.663	25.96	3.85	210	62	1.65	16.8	.34	.34	23
20	9.80	33.672	25.97	3.23	266	52	1.65	17.2	.31	.22	23
29	9.85	33.736	26.01	3.61	231	58	1.68	18.9	.32	.38	27
48	9.61	33.683	26.01	3.18	273	51	1.68	17.4	.31	.36	25
73	9.26	33.836	26.19	2.26	359	36	1.89	21.2	.30	.19	31
97	8.76	33.927	26.34	1.59	425	25	2.06	21.8	.22	.21	42*

* indicates questionable data: Silica appears anomalously high

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1108 16 DEC 1971 9.3 36° 47.5' 121° 50.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 29 5 4 10 8 1028.8 5.8 4.2 5 4 2 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.97	33.586	25.87	4.40	160	71	1.34	14.1	.20	.02	17
10	9.93	33.584	25.88	4.54	148	73	1.35	14.5	.21	.01	18
20	9.98	33.604	25.89	4.13	184	67	1.28	15.4	.19	.00	20
30	9.72	33.769	26.06	3.33	258	54	1.77	20.4	.18	.03	25
50	9.67	33.811	26.10	3.01	287	48	1.84	19.7	.22	.07	25
74	9.36	33.862	26.19	2.69	319	43	1.97	20.8	.16	.04	28
99	9.18	33.898	26.25	2.10	374	33	1.99	21.1	.21	.16	30
149	8.66	33.964	26.38	1.89	399	30	2.25	24.1	.16	.07	38

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1112 16 DEC 1971 10.4 36° 47.8' 121° 52.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 29 5 4 3 8 1029.5 7.2 5.6 5 4 2 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	10.01*	33.580	25.86	5.35	74	87	1.34	14.4	.21	.00	17
10	9.97	33.581	25.87	4.55	146	74	1.31	15.0	.20	.01	18
20	9.94	33.586	25.88	5.33	77	86	1.36	15.1	.20	.12	18
30	9.86	33.737	26.01	3.03	283	49	1.73	20.1	.08	.00	22
50	9.45*	33.868	26.18	2.89	300	46	1.95	21.9	.04	.00	28
74	9.06	33.948	26.31	2.58	332	41	2.09	23.0	.06	.00	33
99	8.90*	33.965	26.34	2.31	358	37	2.19	23.5	.09	.04	33
148	8.42	34.017	26.46	1.73	416	27	2.31	25.2	.09	.00	40

* indicates questionable data: Paired thermometers read 9.95 at 0 m, 9.38 at 50m,
 8.97 at 99 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
ML 20 1115 16 DEC 1971 12.1 36° 46.8' 121° 57.4'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
m dir ht p dir speed mb dry wet typ amt

9 28 5 4 7 10 1029.5 8.3 6.1 5 4 2 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.97*	33.538	25.84	5.54	58	89	1.29	15.4	.19	.21	17
10	9.88	33.560	25.87	3.91	205	63	1.37	16.8	.17	.00	17
20	9.85*	33.661	25.95	3.32	257	54	1.62	19.2	.16	.05	29
30	9.69*	33.714	26.02	3.58	236	58	1.75	21.2	.11	.00	21
50	9.60	33.755	26.07	3.46	248	56	1.78	19.9	.07	.01	22
75	9.10	33.943	26.30	2.65	326	42	2.10	22.6	.02	.21	29
99	8.86*	33.965	26.35	2.38	353	38	2.17	24.4	.05	.18	32
149	8.57	34.017	26.44	2.08	383	33	2.28	26.0	.04	.00	32
199	8.92	33.972	26.35	1.93	392	31	2.13	24.7	.05	.06	33
249	8.32	34.049	26.50	2.00	393	31	2.39	27.0	.03	.10	40
298	7.91*	34.110	26.61	1.74	422	27	2.46	28.5	.04	.04	43
398	7.21	34.140	26.73	1.40	462	21	2.69	30.3	.05	.30	53

* indicates questionable data: Paired thermometers read 9.89 at 0 m, 9.92 at 20 m, 9.76 at 30m,
8.96 at 99 m, 8.02 at 298 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1110 16 DEC 1971 13.8 36° 45.2' 121° 52.0'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 28 3 4 4 8 1027.8 10.6 7.8 5 4 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	10.12	33.584	25.85	5.13	93	83	1.35	14.4	.12	.07	18
5	10.10	33.579	25.85	4.48	151	73	1.13	10.0	.14	.13	18
10	10.11	33.580	25.85	5.14	92	83	1.08	10.4	.08	.03	7
20	9.94	33.627	25.91	4.84	121	78	1.29	12.8	.10	.25	12
30	9.92	33.727	25.99	3.63	229	59	1.49	15.2	.11	.22	17
50	9.49*	33.863	26.17	2.67	319	43	1.79	18.0	.15	.09	20*

* indicates questionable data: Paired thermometer read 9.41
 Silica appears anomalously low

CRUISE		STATION	DATE		HOUR		N LATITUDE		W LONGITUDE							
ML 20		1101	17 DEC 1971		7.8		36° 44.6'		121° 49.5'							
TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH		CLOUDS		VISIB		
m		dir	ht	p	dir	speed	mb	dry	wet			typ	amt			
5		29	2	6	9	11	1016.6	7.2	5.0	1	0	1	8			
DEPTH m	TEMP °C	SALINITY ppt	SIGMA T		OXYGEN		AOU	SAT	PHOSPHATE		NITRATE		NITRITE		AMMONIA	SILICA
					ml/l		µg-at/l	%					µg-atoms/liter			
	0	9.80*	33.690	25.98		3.08		279	50	1.70	17.7	.39	.47	25		
	5	9.79*	33.701	25.99		4.46		156	72	1.59	17.2	.34	.48	25		
10	9.77*	33.720	26.01		2.88		297	46	1.75	17.5	.23	.35	26			

* indicates questionable data: Paired thermometers read 9.74 at 0 m, 9.79 at 5m, 9.77 at 10 m

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1120 17 DEC 1971 8.6 36° 43.1' 121° 51.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 10 29 2 6 9 12 1016.6 7.2 5.0 1 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU μg-at/l	SAT %	PHOSPHATE μg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.98	33.664	25.93	3.38	250	55	1.57	16.6	.19	.39	21
5	9.98	33.664	25.93	3.35	253	54	1.55	16.5	.18	.30	21
10	9.97	33.664	25.94	3.91	203	63	1.57	16.7	.25	.31	21
20	9.91	33.676	25.95	4.55	147	73					
30	9.83*	33.766	26.04	3.32	257	54	1.81	20.4	.14	.16	24
49	9.28	33.896	26.23	2.57	331	41	2.07	23.9	.23	.37	33

* indicates questionable data: Paired thermometer read 9.76

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1123 17 DEC 1971 9.8 36° 39.2' 121° 53.2'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 7 29 2 6 9 9 1024.0 7.8 5.6 1 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.87*	33.653	25.94	4.96	111	80	1.40	15.4	.16	.18	23
5	9.83*	33.655	25.95	4.24	175	68	1.37	15.9	.19	.00	20
10	9.87	33.673	25.96	4.65	138	75	1.46	15.5	.21	.03	23
20	9.58	33.811	26.11	2.97	291	48	1.86	17.4	.18	.07	30
30	9.50*	33.854	26.16	3.08	282	49	1.91	23.1	.15	.12	30
49	9.33	33.889	26.22	2.06	375	33	1.98	24.8	.10	.00	31

* indicates questionable data: Paired thermometers read 9.81 at 0 m, 9.89 at 5 m, 9.42 at 30 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 20	1121	17 DEC 1971	10.6	36° 37.7'	121° 51.1'

TRANSP		WAVES		WIND		BAROM		AIR TEMP °C		WEATH	CLOUDS	VISIB
m	dir ht	p	dir speed	mb	dry	wet				typ amt		
4	29	1	7	0	0	1023.4	10.0	7.2	1	0	1	8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
							µg-atoms/liter				
0	10.08*	33.620	25.88	6.25	-6	101	1.62	14.2	.26	1.56	20
5	9.91*	33.623	25.91	5.94	23	96	1.65	14.3	.27	1.36	22
10	9.84	33.635	25.93	5.76	40	93	1.54	14.4	.26	.80	20

* indicates questionable data: Paired thermometers read 10.00 at 0 m, 9.85 at 5 m

CRUISE	STATION	DATE	HOUR	N LATITUDE	W LONGITUDE
ML 20	1122	17 DEC 1971	11.2	36° 36.6'	121° 52.9'

TRANSP	WAVES	WIND	BAROM	AIR TEMP °C	WEATH	CLOUDS	VISIB
m	dir ht p	dir speed	mb	dry wet		typ amt	
6	29 1 7	0 0	1022.4	11.1 7.8	1	0 1	8

DEPTH	TEMP °C	SALINITY	SIGMA T	OXYGEN	AOU	SAT	PHOSPHATE	NITRATE	NITRITE	AMMONIA	SILICA
m		ppt		ml/l	µg-at/l	%		µg-atoms/liter			
0	10.04	33.628	25.90	6.04	12	98	1.37	11.3	.27	.32	19
5	9.98	33.628	25.91	6.07	10	98	1.40	14.2	.27	.42	20
10	9.96	33.634	25.91	5.87	28	95	1.49	14.9	.30	.51	21

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1124 17 DEC 1971 12.2 36° 38.8' 121° 56.3'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 8 29 1 7 2 2 1022.4 11.7 8.9 1 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	9.84	33.738	26.01	5.60	54	90	1.62	16.4	.26	1.07	21
5	9.76*	33.742	26.03	4.92	115	79	1.64	16.3	.26	.84	21
10	9.68	33.758	26.06	5.09	101	82	1.69	17.0	.26	.76	20
20	9.68	33.771	26.07	4.91	117	79	1.63	17.4	.22	.27	20
30	9.60	33.779	26.09	4.89	120	78	1.70	17.9	.22	.65	20

* indicates questionable data: Paired thermometer read 9.70

CRUISE STATION DATE HOUR N LATITUDE W LONGITUDE
 ML 20 1116 17 DEC 1971 13.3 36° 44.5' 121° 55.7'

TRANSP WAVES WIND BAROM AIR TEMP °C WEATH CLOUDS VISIB
 m dir ht p dir speed mb dry wet typ amt
 9 31 1 5 4 1 1021.3 12.8 10.0 1 0 1 8

DEPTH m	TEMP °C	SALINITY ppt	SIGMA T	OXYGEN ml/l	AOU µg-at/l	SAT %	PHOSPHATE µg-atoms/liter	NITRATE	NITRITE	AMMONIA	SILICA
0	10.11*	33.694	25.93	5.28	79	86	1.45	15.3	.24	.22	21
5	9.92	33.696	25.97	5.25	84	85	.94	9.3	.20	.14	10
10	9.88	33.698	25.98	4.86	119	78	1.47	13.6	.20	.30	25
20	9.82	33.700	25.99	5.18	91	83	1.43	12.9	.26	.01	13
30	9.82*	33.739	26.02	4.35	165	70	1.63	17.1	.13	.12	22
50	9.36	33.906	26.22	2.97	294	47	2.05	21.2	.03	.17	29
75	9.06	33.952	26.31	2.37	351	38	1.46	13.0	.06	.16	18*

* indicates questionable data: Paired thermometers read 10.05 at 0 m, 9.75 at 30 m
 Silica appears anomalously low

