

The Results of Oceanographic Observations  
by the Cruise of R/V Ryofu Maru  
from 16 July to 27 July, 2011

October 2011

Japan Meteorological Agency

# DATA EXPLANATION

## Hydrographic Observation

<i>STA-NO</i>	:Station number given by the ship code suffixed with four digits consecutive number.
<i>LOCATION</i>	:Latitude and longitude in degrees, minutes and tenth of minutes (if given) with the hemisphere indicated by 'N'/'S' and 'E'/'W'.
<i>DATE/TIME</i>	:Month, day and time of beginning and end of a hydrographic cast in the Japan Standard Time (JST), which is nine hours ahead of the Coodinated Universal Time (UTC).
<i>DEPTH</i>	:Water depth to the bottom in meters.

### **Standard Depth (Standard)**

<i>DEPTH</i>	:Standard depths in meters.
<i>TEMPERATURE</i>	:Temperature in “the International Temperature Scale of 1990 (ITS-90)”.
<i>SALINITY</i>	:Salinity in ”the Practical Salinity Scale, 1978 (PSS-78)”.
<i>O<sub>2</sub></i>	:Dissolved oxygen in micro mole per kilogram.

### **Standard Depth (Calculated)**

<i><math>\Delta st</math></i>	:Thermosteric anomaly in $10^{-8} \text{ m}^3\text{kg}^{-1}$
<i><math>\Delta D</math></i>	:Geopotential anomaly in $10 \text{ m}^2\text{sec}^{-2}$

### **Observed**

<i>DEPTH</i>	:Depth of sampling in meters.
<i>TEMPERATURE</i>	:CTD temperature in ITS-90.
<i>SALINITY</i>	:CTD salinity in PSS-78.
<i>O<sub>2</sub></i>	:Dissolved oxygen in micro mole per kilogram as determined titrimetrically by the Winkler Method.
<i>PO<sub>4</sub>-P</i>	:Inorganic phosphate-phosphorus in micro mole per kilogram as determined colorimetrically by the reduction method using ascorbic acid (Strickland and Parsons, 1965).
<i>NO<sub>3</sub>-N</i>	:(Nitrate+nitrite)-nitrogen in micro mole per kilogram as determined colorimetrically by the Muellin-Riley method using copper-cadmium reduction column (Wood, Armstrong and Richard, 1967).
<i>NO<sub>2</sub>-N</i>	:Nitrite-nitrogen in micro mole per kilogram as determined colorimetrically by the Bendschneider and Robinson method (Strickland and Parsons, 1965).
<i>SiO<sub>2</sub></i>	:Silicate-silicon in micro mole per kilogram as determined colorimetrically by the reduction method using ascorbic acid (Grasshoff et al, 1983).
<i>PH</i>	:Hydrogen-ion concentration at 25 degree-C as determined by the spectrophotometric technique using the indicator dye <i>m</i> -cresol purple (Clayton and Byrne, 1993).
<i>CHL</i>	:Chlorophyll-a in micrograms per liter as determined by the fluorometric technique.
<i>PHA</i>	:Phaeopigments in micrograms per liter as determined by the fluorometric technique.

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Note: Missing value is indicated by a mark “—”.

# DATA EXPLANATION

## Current Observation

<i>CRUISE NO</i>	:Cruise number identified with the year and consecutive number in the year.
<i>DATE</i>	:Date of beginning and end of the subsurface current observations.
<i>OCEAN AREA</i>	:Observation area.
<i>SHIP</i>	:Ship Code. 'KS' is Keifu maru, 'RF' is Ryofu maru.

### **Observed**

<i>STA-NO</i>	:Station number given by the ship code suffixed with three digits consecutive number.
<i>DATE/TIME</i>	:Month, day and time of an observation in JST.
<i>LOCATION</i>	:North latitude and east longitude in degrees, minutes and tenth of minutes (if given) with the hemisphere. Negative latitude means the south latitude.
<i>WATER DEPTH</i>	:Water depth to the bottom in meters.
<i>DEPTH(1)</i>	:Depth of the 1st (4th) layer in meters.
<i>DIR/SPEED(1)</i>	:True direction (in degrees) toward which current is flowing and speed given in tenths of knots of the subsurface current for the 1st (4th) layer determined with Acoustic Doppler Current Meter (ACM). When the speed is less than 0.05knots, direction is given as 0.
<i>DEPTH(2)</i>	:Same as above butfor the 2nd (5th) layer.
<i>DIR/SPEED(2)</i>	:idem
<i>DEPTH(3)</i>	:Same as above butfor the 3rd (6th) layer.
<i>DIR/SPEED(3)</i>	:idem
<i>TEMPERATURE</i>	:Surface temperature in “the International Temperature Scale of 1990 (ITS-90)”.
<i>SALINITY</i>	:Surface salinity in "the Practical Salinity Scale, 1978 (PSS-78)".
<i>CTD STN-NO</i>	:Corresponding station number of hydrographic data.
<i>BT STN-NO</i>	:Corresponding station number of subsurface temperature data.

# Hydrographic Observation

No. 1 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 6 3	2 1-5 9 N	1 6 5-0 1 E	7 m 1 8 d 0 4 h 3 3 m	7 m 1 8 d 0 8 h 3 6 m	5 4 8 8 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sub>st</sub> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
0 8 2 0	0	2 9.2 4 0	3 5.1 8 5	1 9 6.0	0.0 5	0.0 3	0.0 0	0.8	.		0.0 7	0.0 1		0	2 9.0 8 8	3 5.1 8 1	1 9 7.0	5 6 5	0.0 0 0
0 8 3 5	1 0	2 9.1 1 0	3 5.1 8 1	1 9 6.9	0.0 2	0.0 2	0.0 0	0.8	8.1 1 9		0.0 7	0.0 1		1 0	2 9.0 9 2	3 5.1 8 1	1 9 7.1	5 6 5	0.0 5 7
0 8 3 0	5 0	2 6.2 6 9	3 5.3 4 9	2 1 8.6	0.0 1	0.0 4	0.0 0	0.8	8.0 9 5		0.0 7	0.0 1		2 0	2 9.0 7 4	3 5.1 7 5	1 9 7.4	5 6 5	0.1 1 4
0 8 2 9	9 9	2 2.0 6 3	3 5.2 2 7	2 0 6.7	0.0 4	0.0 1	0.0 0	1.5	8.0 3 2		0.1 4	0.1 1		3 0	2 9.0 2 0	3 5.1 8 8	1 9 7.8	5 6 2	0.1 7 1
0 8 2 7	1 4 9	1 9.1 1 2	3 4.8 5 6	2 1 6.4	0.0 9	0.9 2	0.0 9	1.9	8.0 0 4		0.0 9	0.1 3		5 0	2 5.3 5 7	3 5.3 6 7	2 2 1.6	4 3 7	0.2 7 1
0 8 2 5	2 0 4	1 7.5 4 1	3 4.6 9 2	2 1 4.8	0.2 3	3.3 3	0.0 1	3.3	7.9 6 7		0.0 1	0.0 2		7 5	2 2.8 0 6	3 5.2 6 5	2 1 5.6	3 7 2	0.3 7 3
0 8 2 2	2 5 2	1 6.5 9 5	3 4.6 4 5	2 0 0.9	0.4 0	5.8 6	0.0 1	5.1	7.9 2 5		.	.		1 0 0	2 1.0 6 6	3 5.0 7 9	1 9 7.3	3 3 9	0.4 6 3
0 8 1 9	3 7 0	1 2.9 6 2	3 4.4 1 8	1 9 1.3	0.8 8	1 2.7 8	0.0 0	1 5.1	7.8 2 3		.	.		1 2 5	1 9.8 2 2	3 4.9 7 7	2 1 4.8	3 1 5	0.5 4 6
0 8 1 4	4 7 1	9.5 1 2	3 4.1 6 5	1 7 2.1	1.4 3	2 0.3 6	0.0 0	2 7.3	7.6 8 3		.	.		1 5 0	1 8.7 6 1	3 4.8 0 9	2 1 5.9	3 0 1	0.6 2 5
0 8 1 4	4 7 1	9.5 0 9	3 4.1 6 5	1 7 2.0	1.4 3	2 0.3 1	0.0 0	2 7.4	7.6 8 8		.	.		2 0 0	1 7.3 3 6	3 4.6 8 1	2 1 5.5	2 7 7	0.7 7 2
0 8 1 2	5 7 3	7.0 8 4	3 4.0 6 7	1 3 0.8	2.0 4	2 8.7 8	0.0 0	4 9.3	7.5 5 8		.	.		2 5 0	1 6.1 6 2	3 4.6 2 0	2 0 2.7	2 5 5	0.9 1 0
0 8 0 9	6 7 1	5.9 9 4	3 4.1 3 5	7 7.8	2.5 4	3 5.2 8	0.0 0	6 7.8	7.4 3 5		.	.		3 0 0	1 4.7 9 8	3 4.5 3 2	1 9 8.2	2 3 2	1.0 3 6
0 8 0 6	7 7 2	4.9 6 0	3 4.2 3 4	5 0.6	2.8 5	3 9.6 4	0.0 0	8 8.1	7.3 8 3		.	.		4 0 0	1 1.7 5 6	3 4.3 2 4	1 9 3.5	1 8 9	1.2 5 8
0 8 0 3	8 7 1	4.4 3 2	3 4.3 4 3	4 5.2	2.9 5	4 1.0 8	0.0 0	1 0 0.3	7.3 8 3		.	.		5 0 0	8.9 5 2	3 4.1 3 7	1 6 9.8	1 5 7	1.4 4 4
0 8 0 0	9 7 1	4.0 2 6	3 4.4 1 9	5 1.2	2.9 3	4 1.0 3	0.0 0	1 0 8.3	7.4 0 4		.	.		6 0 0	6.6 7 9	3 4.0 7 1	1 1 9.1	1 3 0	1.5 9 7
0 7 5 6	1 1 3 2	3.4 4 7	3 4.4 8 6	6 1.2	2.9 1	4 0.9 8	0.0 0	1 2 0.8	7.4 2 2		.	.		7 0 0	5.5 9 9	3 4.1 6 9	6 7.9	1 1 0	1.7 2 6
0 7 5 0	1 3 3 3	2.9 1 0	3 4.5 3 7	7 3.8	2.8 7	4 0.5 7	0.0 0	1 3 1.4	7.4 4 1		.	.		8 0 0	4.7 2 1	3 4.2 6 9	4 8.9	9 3	1.8 3 7
0 7 4 5	1 5 3 3	2.5 1 4	3 4.5 7 0	8 3.2	2.8 1	4 0.1 2	0.0 0	1 3 8.7	7.4 5 5		.	.		9 0 0	4.2 6 6	3 4.3 6 7	4 6.6	8 1	1.9 3 2
0 7 4 0	1 7 3 3	2.2 4 0	3 4.5 9 7	9 2.3	2.7 7	3 9.7 4	0.0 0	1 4 2.9	7.4 7 4		.	.		1 0 0 0	3.8 3 1	3 4.4 2 6	5 1.8	7 2	2.0 1 8
0 7 3 5	1 9 3 3	2.0 5 2	3 4.6 1 9	1 0 2.2	2.7 3	3 9.3 1	0.0 0	1 4 5.8	7.4 9 5		.	.		1 2 0 0	3.2 1 7	3 4.5 0 5	6 5.8	6 0	2.1 6 8
0 7 3 0	2 1 3 3	1.9 0 1	3 4.6 3 3	1 0 9.2	2.7 0	3 8.9 6	0.0 0	1 4 8.2	7.5 0 4		.	.		1 5 0 0	2.6 1 4	3 4.5 6 1	8 1.1	5 1	2.3 6 1
0 7 2 5	2 3 3 3	1.7 9 3	3 4.6 4 3	1 1 5.5	2.6 7	3 8.5 4	0.0 0	1 4 9.6	7.5 1 4		.	.		2 0 0 0	1.9 9 2	3 4.6 2 4	1 0 5.2	4 1	2.6 3 3
0 7 2 1	2 5 3 2	1.7 0 6	3 4.6 5 3	1 2 1.1	2.6 4	3 8.2 0	0.0 0	1 5 0.6	7.5 2 2		.	.		2 5 0 0	1.7 1 4	3 4.6 5 1	1 2 1.2	3 7	2.8 7 7
0 7 1 6	2 7 3 2	1.6 4 4	3 4.6 6 0	1 2 6.9	2.6 0	3 7.7 4	0.0 0	1 5 0.5	7.5 4 2		.	.		3 0 0 0	1.5 8 5	3 4.6 6 7	1 3 3.6	3 5	3.1 0 9
0 7 1 1	2 9 3 2	1.5 9 3	3 4.6 6 6	1 3 2.1	2.5 7	3 7.5 2	0.0 0	1 4 9.8	7.5 4 3		.	.		3 5 0 0	1.5 0 8	3 4.6 7 7	1 4 4.6	3 4	3.3 3 8

No. 1 -2

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

# Hydrographic Observation

No. 2 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 6 4	2 1-3 0 N	1 6 5-0 0 E	7 m 1 8 d 1 1 h 0 8 m	7 m 1 8 d 1 5 h 0 3 m	5 5 3 8 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sub>st</sub> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
1 4 5 6	0	2 8.9 8 5	3 4.9 6 1	.	0.0 5	0.0 7	0.0 0	0.9	.		.	.		0	2 8.9 2 5	3 4.9 7 7	1 9 7.2	5 7 4	0.0 0 0
1 5 0 2	1 1	2 8.8 1 4	3 4.9 6 9	.	0.0 5	0.0 5	0.0 0	0.9	.		.	.		1 0	2 8.9 0 4	3 4.9 7 8	1 9 7.2	5 7 4	0.0 5 8
1 4 5 8	5 0	2 6.7 4 7	3 5.2 8 8	.	0.0 3	0.0 2	0.0 0	1.0	.		.	.		2 0	2 8.7 8 7	3 4.9 7 7	1 9 7.3	5 7 0	0.1 1 5
1 4 5 7	1 0 3	2 3.3 3 7	3 5.3 0 4	.	0.0 4	0.0 0	0.0 0	1.3	.		.	.		3 0	2 8.7 2 5	3 5.0 2 4	1 9 8.3	5 6 5	0.1 7 3
1 4 5 5	1 5 1	2 0.7 4 8	3 5.1 1 4	.	0.0 3	0.0 1	0.0 1	1.7	.		.	.		5 0	2 7.4 0 4	3 5.2 9 4	2 1 2.4	5 0 4	0.2 7 9
1 4 5 4	2 0 1	1 8.2 4 9	3 4.7 4 9	.	0.1 7	2.2 3	0.0 2	2.7	.		.	.		7 5	2 5.1 0 4	3 5.3 1 5	2 0 8.9	4 3 3	0.3 9 8
1 4 5 2	2 5 0	1 6.8 8 9	3 4.6 6 2	.	0.3 6	5.1 8	0.0 1	4.6	.		.	.		1 0 0	2 3.5 6 3	3 5.2 5 8	2 0 5.3	3 9 3	0.5 0 3
1 4 5 0	3 0 0	1 5.7 2 5	3 4.5 8 6	.	0.4 8	6.7 2	0.0 1	6.1	.		.	.		1 2 5	2 1.9 3 9	3 5.1 9 4	1 9 4.0	3 5 4	0.5 9 8
1 4 4 9	3 5 5	1 3.4 0 7	3 4.4 1 1	.	0.7 5	1 0.6 8	0.0 0	1 0.5	.		.	.		1 5 0	2 0.7 0 0	3 5.0 7 6	2 0 4.5	3 3 0	0.6 8 5
1 4 4 7	4 0 1	1 1.8 0 1	3 4.3 0 7	.	0.9 7	1 3.8 7	0.0 0	1 5.2	.		.	.		2 0 0	1 8.4 0 4	3 4.7 7 8	2 1 4.5	2 9 5	0.8 4 5
1 4 4 5	4 5 0	1 0.2 6 1	3 4.1 9 9	.	1.2 9	1 8.2 6	0.0 0	2 2.6	.		.	.		2 5 0	1 7.0 0 7	3 4.7 0 1	2 0 6.8	2 6 8	0.9 9 1
1 4 4 3	5 0 4	8.6 8 6	3 4.1 2 5	.	1.6 5	2 3.2 9	0.0 0	3 3.2	.		.	.		3 0 0	1 5.6 0 5	3 4.5 7 7	2 0 2.0	2 4 6	1.1 2 5
1 4 4 1	6 0 1	6.6 6 3	3 4.0 8 8	.	2.2 7	3 1.7 5	0.0 0	5 5.9	.		.	.		4 0 0	1 2.2 4 3	3 4.3 3 3	1 9 9.4	1 9 7	1.3 5 4
1 4 3 8	7 0 1	5.3 8 2	3 4.2 1 6	.	2.8 0	3 8.7 3	0.0 0	7 9.6	.		.	.		5 0 0	9.1 2 3	3 4.1 4 1	1 6 8.5	1 5 9	1.5 4 2
1 4 3 6	8 0 1	4.9 1 2	3 4.3 3 0	.	2.9 2	4 0.4 0	0.0 0	8 9.7	.		.	.		6 0 0	6.9 7 2	3 4.0 9 0	1 1 7.4	1 3 3	1.6 9 7
1 4 3 3	9 0 0	4.3 7 8	3 4.4 0 8	.	2.9 6	4 1.2 4	0.0 0	1 0 0.8	.		.	.		7 0 0	5.5 9 5	3 4.1 8 9	6 2.9	1 0 8	1.8 2 7
1 4 3 1	1 0 0 3	3.9 4 1	3 4.4 5 1	.	2.9 6	4 1.4 3	0.0 0	1 0 9.7	.		.	.		8 0 0	4.9 6 4	3 4.3 1 4	4 6.7	9 2	1.9 3 7
1 4 2 6	1 2 0 1	3.3 4 3	3 4.5 1 0	.	2.9 0	4 0.8 3	0.0 0	1 2 1.7	.		.	.		9 0 0	4.4 5 3	3 4.3 8 5	4 7.0	8 1	2.0 3 3
1 4 2 2	1 4 0 1	2.8 2 7	3 4.5 4 6	.	2.8 7	4 0.6 3	0.0 0	1 3 1.6	.		.	.		1 0 0 0	4.0 4 9	3 4.4 3 4	5 1.7	7 3	2.1 2 0
1 4 1 8	1 6 0 1	2.4 6 0	3 4.5 7 6	.	2.8 4	4 0.3 2	0.0 0	1 3 8.7	.		.	.		1 2 0 0	3.3 7 2	3 4.5 0 8	6 6.0	6 1	2.2 7 4
1 4 1 4	1 8 0 1	2.1 6 0	3 4.6 0 4	.	2.8 0	3 9.8 2	0.0 0	1 4 3.8	.		.	.		1 5 0 0	2.6 8 4	3 4.5 5 8	8 0.0	5 2	2.4 7 1
1 4 0 9	2 0 0 2	1.9 7 3	3 4.6 2 4	.	2.7 6	3 9.4 1	0.0 0	1 4 6.1	.		.	.		2 0 0 0	2.0 0 8	3 4.6 1 9	1 0 2.4	4 2	2.7 5 0
1 4 0 5	2 2 0 2	1.8 4 6	3 4.6 3 8	.	2.7 2	3 8.9 3	0.0 0	1 4 7.9	.		.	.		2 5 0 0	1.7 4 0	3 4.6 4 9	1 2 0.0	3 7	2.9 9 6
1 4 0 1	2 4 0 1	1.7 4 3	3 4.6 4 9	.	2.6 8	3 8.4 2	0.0 0	1 4 8.9	.		.	.		3 0 0 0	1.6 0 5	3 4.6 6 5	1 3 2.1	3 5	3.2 3 0
1 3 5 7	2 6 0 2	1.6 6 9	3 4.6 5 7	.	2.6 5	3 8.1 7	0.0 0	1 4 8.3	.		.	.		3 5 0 0	1.5 2 2	3 4.6 7 6	1 4 3.3	3 4	3.4 6 0

## No. 2 -2

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

# Hydrographic Observation

No. 3 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE-NO	SUB-NO
R F-4 0 6 5	2 1-0 0 N	1 6 4-5 9 E	7 m 1 8 d 1 7 h 3 8 m	7 m 1 8 d 2 1 h 4 6 m	5 5 4 0 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
2 1 2 5	0	2 9 0 7 7	3 4 9 9 8	1 9 4 0	0 1 0	0 0 4	0 0 0	0 8	.		0 0 8	0 0 1		0	2 9 3 4 7	3 4 9 8 3	1 9 6 4	5 8 7	0 0 0 0
2 1 4 5	1 0	2 9 0 7 0	3 4 9 9 8	1 9 6 0	0 0 4	0 0 6	0 0 0	0 8	8 1 2 0		0 0 4	0 0 1		1 0	2 9 0 0 4	3 4 9 8 3	1 9 6 7	5 7 6	0 0 5 9
2 1 4 0	4 9	2 8 6 2 3	3 5 0 6 2	1 9 7 9	0 0 3	0 0 2	0 0 0	0 8	8 1 1 9		0 0 6	0 0 1		2 0	2 8 8 5 9	3 4 9 8 8	1 9 7 1	5 7 1	0 1 1 7
2 1 3 8	9 9	2 5 0 7 3	3 5 3 2 2	2 0 7 4	0 0 3	0 0 0	0 0 0	0 9	8 0 8 2		0 1 6	0 0 9		3 0	2 8 7 2 1	3 4 9 8 8	1 9 8 2	5 6 7	0 1 7 4
2 1 3 5	1 5 0	2 2 8 1 1	3 5 2 9 6	1 9 4 3	0 1 0	0 4 1	0 1 6	1 4	8 0 2 5		0 1 3	0 2 0		5 0	2 8 5 6 5	3 5 0 8 7	2 0 0 7	5 5 5	0 2 8 7
2 1 3 3	2 0 4	2 0 4 3 1	3 5 0 5 3	1 8 4 0	0 2 4	2 3 4	0 0 2	2 3	7 9 6 2		0 0 4	0 0 8		7 5	2 6 2 9 9	3 5 3 4 1	2 1 4 6	4 6 7	0 4 1 7
2 1 3 1	2 5 3	1 7 3 5 5	3 4 7 2 9	1 7 4 8	0 5 5	6 7 2	0 0 1	5 1	7 8 8 1		.	.		1 0 0	2 4 4 3 9	3 5 3 2 9	2 0 5 5	4 1 3	0 5 2 8
2 1 2 9	3 3 1	1 3 8 4 1	3 4 4 3 7	1 9 3 3	0 7 5	1 0 4 5	0 0 0	1 0 0	7 8 3 4		.	.		1 2 5	2 3 1 7 0	3 5 2 9 9	1 9 9 7	3 7 9	0 6 2 9
2 1 2 7	3 8 0	1 1 9 6 1	3 4 2 9 5	1 6 0 9	1 2 2	1 6 4 1	0 0 0	1 6 7	7 7 2 8		.	.		1 5 0	2 2 0 3 5	3 5 2 1 7	1 8 9 1	3 5 5	0 7 2 3
2 1 2 5	4 3 0	1 0 6 9 9	3 4 2 2 8	1 8 8 0	1 1 7	1 6 6 6	0 0 0	2 0 0	7 7 3 9		.	.		2 0 0	1 9 2 3 2	3 4 9 2 3	1 8 2 7	3 0 4	0 8 9 0
2 1 2 3	4 8 1	9 5 2 1	3 4 1 6 8	1 6 7 5	1 4 7	2 0 7 9	0 0 0	2 7 7	7 6 7 4		.	.		2 5 0	1 6 2 9 2	3 4 6 3 8	1 9 3 9	2 5 7	1 0 3 4
2 1 2 1	5 3 0	8 1 1 7	3 4 1 0 5	1 4 4 2	1 8 2	2 5 5 6	0 0 0	3 9 0	7 6 0 7		.	.		3 0 0	1 4 6 5 1	3 4 4 9 4	1 8 9 0	2 3 2	1 1 6 1
2 1 1 9	6 3 1	6 0 9 8	3 4 1 2 7	8 2 6	2 5 1	3 4 8 0	0 0 0	6 6 0	7 4 4 6		.	.		4 0 0	1 1 7 6 9	3 4 2 9 3	1 7 4 8	1 9 2	1 3 8 1
2 1 1 6	7 3 2	5 2 9 2	3 4 2 4 8	5 0 0	2 8 6	3 9 2 2	0 0 0	8 2 3	7 3 9 1		.	.		5 0 0	8 7 5 9	3 4 1 2 8	1 6 1 9	1 5 5	1 5 6 4
2 1 1 3	8 3 0	4 7 8 1	3 4 3 6 0	4 8 3	2 9 1	4 0 4 1	0 0 0	9 2 6	7 3 9 8		.	.		6 0 0	6 4 6 6	3 4 1 1 1	9 6 8	1 2 5	1 7 1 3
2 1 1 0	9 3 1	4 2 7 6	3 4 4 1 8	4 9 4	2 9 6	4 1 1 0	0 0 0	1 0 3 1	7 4 0 1		.	.		7 0 0	5 4 7 9	3 4 2 1 9	5 6 2	1 0 5	1 8 3 7
2 1 0 7	1 0 7 1	3 7 8 6	3 4 4 8 6	6 0 0	2 9 4	4 0 9 2	0 0 0	1 1 2 9	7 4 3 1		.	.		8 0 0	4 8 8 7	3 4 3 4 3	4 7 8	8 9	1 9 4 3
2 1 0 2	1 2 7 1	3 1 8 6	3 4 5 3 0	7 1 0	2 8 8	4 0 5 8	0 0 0	1 2 5 0	7 4 4 0		.	.		9 0 0	4 3 4 4	3 4 3 9 9	4 7 7	7 9	2 0 3 7
2 0 5 8	1 4 7 1	2 7 3 6	3 4 5 6 3	7 9 6	2 8 6	4 0 2 6	0 0 0	1 3 3 0	7 4 5 3		.	.		1 0 0 0	4 0 1 4	3 4 4 6 0	5 5 7	7 1	2 1 2 1
2 0 5 4	1 6 7 0	2 3 6 6	3 4 5 8 9	8 9 6	2 8 1	3 9 8 5	0 0 0	1 4 0 2	7 4 7 3		.	.		1 2 0 0	3 3 4 1	3 4 5 1 7	6 8 0	6 0	2 2 7 2
2 0 4 9	1 8 7 1	2 1 1 4	3 4 6 0 9	9 7 6	2 7 7	3 9 5 8	0 0 0	1 4 5 0	7 4 8 5		.	.		1 5 0 0	2 6 6 4	3 4 5 6 7	8 1 8	5 1	2 4 6 7
2 0 4 4	2 0 7 1	1 9 6 0	3 4 6 2 6	1 0 4 9	2 7 4	3 9 1 8	0 0 0	1 4 7 1	7 4 9 9		.	.		2 0 0 0	2 0 0 7	3 4 6 2 0	1 0 2 6	4 2	2 7 4 4
2 0 4 0	2 2 7 1	1 8 2 4	3 4 6 4 2	1 1 4 6	2 6 9	3 8 5 2	0 0 0	1 4 8 1	7 5 1 3		.	.		2 5 0 0	1 7 2 8	3 4 6 5 0	1 2 0 7	3 7	2 9 8 9
2 0 3 5	2 4 7 0	1 7 4 0	3 4 6 5 0	1 1 9 1	2 6 7	3 8 3 4	0 0 0	1 4 9 2	7 5 2 4		.	.		3 0 0 0	1 5 9 7	3 4 6 6 6	1 3 2 6	3 5	3 2 2 2
2 0 3 1	2 6 7 1	1 6 8 1	3 4 6 5 7	1 2 4 2	2 6 4	3 8 0 1	0 0 0	1 4 9 1	7 5 3 2		.	.		3 5 0 0	1 5 2 0	3 4 6 7 6	1 4 3 5	3 4	3 4 5 2

## No. 3 -2

[illegible]

# Hydrographic Observation

No. 4 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 6 6	2 0-3 0 N	1 6 4-5 9 E	7 m 1 9 d 0 0 h 2 5 m	7 m 1 9 d 0 4 h 2 1 m	5 4 5 2 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 m <sup>2</sup> /sec <sup>2</sup>
0 4 0 5	0	2 8.9 1 5	3 4.7 8 8	.	0.0 5	0.0 4	0.0 0	0.8	.		.	.		0	2 8.9 9 7	3 4.7 8 8	1 9.6 4	5 9.0	0.0 0 0
0 4 1 9	1 1	2 8.9 4 2	3 4.7 8 7	.	0.0 5	0.0 5	0.0 0	0.8	.		.	.		1 0	2 9.0 1 6	3 4.7 8 8	1 9.6 3	5 9.1	0.0 5 9
0 4 1 4	5 0	2 8.7 6 6	3 4.9 9 9	.	0.0 2	0.0 0	0.0 0	0.8	.		.	.		2 0	2 8.9 4 7	3 4.7 9 7	1 9.6 7	5 8.8	0.1 1 9
0 4 1 3	1 0 1	2 6.3 1 5	3 5.3 3 7	.	0.0 2	0.0 0	0.0 0	0.9	.		.	.		3 0	2 8.8 9 4	3 4.8 1 7	1 9.7 1	5 8.5	0.1 7 8
0 4 1 1	1 5 3	2 3.4 0 7	3 5.2 6 7	.	0.0 4	0.0 2	0.0 2	1.2	.		.	.		5 0	2 8.8 3 7	3 4.9 8 7	1 9.8 0	5 7.1	0.2 9 4
0 4 0 9	2 0 0	2 1.0 7 6	3 5.0 7 3	.	0.1 4	1.5 2	0.0 2	1.9	.		.	.		7 5	2 7.1 3 1	3 5.2 7 6	2 1.3 6	4 9.7	0.4 3 0
0 4 0 7	2 5 2	1 7.4 4 3	3 4.6 9 6	.	0.3 1	4.6 3	0.0 0	3.7	.		.	.		1 0 0	2 5.5 0 5	3 5.3 4 6	2 0.9 5	4 4.3	0.5 4 8
0 4 0 6	2 8 1	1 6.6 7 7	3 4.6 5 7	.	0.4 2	6.1 4	0.0 0	5.1	.		.	.		1 2 5	2 4.1 5 7	3 5.3 0 4	1 9.9 9	4 0.7	0.6 5 6
0 4 0 4	3 3 3	1 4.7 5 4	3 4.5 1 7	.	0.6 2	9.0 3	0.0 0	8.0	.		.	.		1 5 0	2 2.6 4 6	3 5.2 1 4	1 9.6 4	3 7.1	0.7 5 5
0 4 0 2	3 7 4	1 2.8 0 2	3 4.3 6 3	.	0.9 0	1 2.7 2	0.0 0	1 2.5	.		.	.		2 0 0	1 9.6 2 2	3 4.9 2 2	1 9.1 9	3 1.4	0.9 2 9
0 4 0 0	4 7 1	9.6 0 5	3 4.1 7 1	.	1.4 4	2 0.5 1	0.0 0	2 6.8	.		.	.		2 5 0	1 7.1 6 1	3 4.6 9 3	1 9.8 3	2 7.2	1.0 7 8
0 3 5 7	5 7 2	7.1 1 1	3 4.1 5 9	.	2.3 2	3 2.2 5	0.0 0	5 3.0	.		.	.		3 0 0	1 5.6 5 1	3 4.5 8 5	1 9.6 4	2 4.6	1.2 1 3
0 3 5 4	6 7 1	5.8 6 0	3 4.2 2 0	.	2.6 9	3 7.4 0	0.0 0	7 2.2	.		.	.		4 0 0	1 2.0 9 8	3 4.3 1 8	1 8.4 7	1 9.6	1.4 4 3
0 3 5 1	7 7 2	5.1 6 0	3 4.3 0 8	.	2.8 5	3 9.7 7	0.0 0	8 5.1	.		.	.		5 0 0	8.7 9 9	3 4.1 3 8	1 5.5 0	1 5.5	1.6 2 8
0 3 4 9	8 7 0	4.6 9 4	3 4.4 2 2	.	2.8 5	4 0.0 2	0.0 0	9 3.7	.		.	.		6 0 0	6.5 4 2	3 4.1 6 3	8.0 9	1 2.2	1.7 7 7
0 3 4 5	9 7 1	4.2 8 0	3 4.4 7 8	.	2.8 4	4 0.0 2	0.0 0	1 0 1.6	.		.	.		7 0 0	5.6 6 1	3 4.2 3 1	5.9 1	1 0.6	1.8 9 9
0 3 4 2	1 1 3 2	3.6 9 8	3 4.5 2 4	.	2.8 4	4 0.1 5	0.0 0	1 1 2.4	.		.	.		8 0 0	5.0 6 6	3 4.3 5 0	5.3 4	9.0	2.0 0 7
0 3 3 8	1 3 3 1	3.0 8 4	3 4.5 5 1	.	2.8 4	4 0.2 9	0.0 0	1 2 5.4	.		.	.		9 0 0	4.5 1 2	3 4.4 4 5	6.0 0	7.7	2.1 0 0
0 3 3 3	1 5 3 1	2.6 2 9	3 4.5 7 6	.	2.8 0	4 0.0 1	0.0 0	1 3 2.7	.		.	.		1 0 0 0	4.1 0 0	3 4.4 9 2	6.7 0	7.0	2.1 8 4
0 3 2 9	1 7 3 1	2.3 0 9	3 4.6 0 0	.	2.7 3	3 9.3 9	0.0 0	1 4 4.1	.		.	.		1 2 0 0	3.5 0 9	3 4.5 3 1	7.4 1	6.1	2.3 3 4
0 3 2 5	1 9 3 1	2.0 7 2	3 4.6 2 1	.	2.7 4	3 9.4 5	0.0 0	1 4 4.4	.		.	.		1 5 0 0	2.7 4 5	3 4.5 7 0	8.4 3	5.1	2.5 3 2
0 3 2 0	2 1 3 1	1.9 3 4	3 4.6 3 3	.	2.7 1	3 9.0 1	0.0 0	1 4 6.5	.		.	.		2 0 0 0	2.0 6 9	3 4.6 2 1	1 0.4 0	4.2	2.8 1 1
0 3 1 6	2 3 3 1	1.8 2 2	3 4.6 4 3	.	2.6 9	3 8.8 5	0.0 0	1 4 8.2	.		.	.		2 5 0 0	1.7 6 8	3 4.6 4 9	1 1.9 1	3.8	3.0 5 9
0 3 1 1	2 5 3 0	1.7 5 1	3 4.6 5 1	.	2.6 6	3 8.5 7	0.0 0	1 4 8.7	.		.	.		3 0 0 0	1.6 0 9	3 4.6 6 6	1 3.2 5	3.5	3.2 9 4
0 3 0 7	2 7 3 0	1.6 7 2	3 4.6 5 9	.	2.6 2	3 8.1 9	0.0 0	1 4 8.9	.		.	.		3 5 0 0	1.5 1 5	3 4.6 7 7	1 4.4 3	3.4	3.5 2 4

## No. 4 -2

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

# Hydrographic Observation

No. 5 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 6 7	2 0-0 0 N	1 6 4-5 9 E	7 m 1 9 d 0 6 h 5 9 m	7 m 1 9 d 1 1 h 0 0 m	5 3 6 2 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> <sub>10<sup>-8</sup> m<sup>2</sup>/kg</sub>	ΔD <sub>10 m<sup>2</sup>/sec<sup>2</sup></sub>
1 0 4 0	0	2 9 0 9 5	3 4 7 0 3	1 9 6 1	0 1 2	0 1 8	0 0 1	1 2	.		0 0 6	0 0 1		0	2 8 9 0 7	3 4 7 1 2	1 9 7 0	5 9 3	0 0 0 0
1 0 5 9	1 2	2 9 0 1 7	3 4 6 9 8	1 9 7 0	0 0 6	0 0 9	0 0 1	1 2	8 1 2 2		0 0 6	0 0 1		1 0	2 8 9 0 6	3 4 7 1 2	1 9 7 0	5 9 3	0 0 6 0
1 0 5 5	5 0	2 8 8 4 6	3 4 7 1 1	1 9 6 8	0 0 6	0 1 1	0 0 1	1 1	8 1 2 0		0 0 7	0 0 1		2 0	2 8 8 6 8	3 4 7 1 2	1 9 7 2	5 9 2	0 1 1 9
1 0 5 3	1 0 2	2 6 5 7 0	3 5 2 4 3	2 0 5 3	0 0 5	0 1 0	0 0 1	1 2	8 1 0 2		0 1 4	0 0 5		3 0	2 8 8 7 0	3 4 7 1 2	1 9 7 2	5 9 2	0 1 7 9
1 0 5 2	1 5 0	2 4 0 1 5	3 5 3 0 3	1 9 4 1	0 0 6	0 1 9	0 0 7	1 6	8 0 5 0		0 1 9	0 2 7		5 0	2 8 8 3 5	3 4 7 8 6	1 9 8 4	5 8 5	0 2 9 8
1 0 5 0	2 0 1	2 0 9 8 9	3 5 0 8 5	1 7 8 5	0 2 1	2 4 6	0 0 3	2 5	7 9 7 1		0 0 5	0 1 1		7 5	2 7 2 4 5	3 5 1 2 2	2 1 0 7	5 1 1	0 4 3 6
1 0 4 8	2 4 9	1 8 2 0 0	3 4 7 5 4	1 9 9 8	0 2 5	3 5 2	0 0 1	3 5	7 9 5 6		.	.		1 0 0	2 6 5 9 5	3 5 2 2 4	2 0 7 2	4 8 4	0 5 6 1
1 0 4 6	3 0 0	1 6 2 5 0	3 4 6 2 2	1 8 6 6	0 5 4	7 4 5	0 0 1	6 4	7 8 8 6		.	.		1 2 5	2 5 2 0 1	3 5 3 3 9	2 0 4 3	4 3 4	0 6 7 8
1 0 4 4	3 5 0	1 3 8 1 9	3 4 4 4 0	1 8 8 1	0 7 9	1 1 0 7	0 0 1	1 0 6	7 8 3 3		.	.		1 5 0	2 3 7 1 9	3 5 2 8 0	1 9 8 2	3 9 6	0 7 8 4
1 0 4 2	4 0 1	1 1 7 6 6	3 4 2 9 9	1 8 0 8	1 0 9	1 5 2 7	0 0 1	1 6 9	7 7 6 1		.	.		2 0 0	2 0 3 1 4	3 5 0 0 5	1 8 3 5	3 2 5	0 9 6 9
1 0 4 0	4 5 0	1 0 2 1 1	3 4 2 1 5	1 5 6 8	1 4 7	2 0 2 5	0 0 1	2 4 6	7 6 7 7		.	.		2 5 0	1 7 8 8 8	3 4 7 4 0	2 0 0 7	2 8 5	1 1 2 7
1 0 3 8	5 0 1	8 8 8 3	3 4 1 5 3	1 4 2 9	1 7 3	2 4 2 5	0 0 1	3 3 8	7 6 2 3		.	.		3 0 0	1 5 9 2 4	3 4 6 0 0	1 8 9 8	2 5 1	1 2 6 7
1 0 3 5	6 0 1	6 4 5 3	3 4 1 6 1	7 7 9	2 5 1	3 4 8 0	0 0 1	6 2 3	7 4 4 8		.	.		4 0 0	1 2 2 7 7	3 4 3 3 9	1 9 4 4	1 9 8	1 5 0 0
1 0 3 3	7 0 0	5 5 0 7	3 4 2 7 3	5 3 7	2 8 1	3 8 8 3	0 0 1	7 9 1	7 4 1 0		.	.		5 0 0	9 3 2 3	3 4 1 6 9	1 5 5 7	1 6 0	1 6 9 1
1 0 3 0	8 0 1	4 9 7 1	3 4 3 8 9	5 5 8	2 8 6	3 9 6 4	0 0 1	8 8 8	7 4 2 2		.	.		6 0 0	6 8 5 4	3 4 1 5 0	9 0 9	1 2 7	1 8 4 4
1 0 2 7	9 0 1	4 5 4 6	3 4 4 5 3	6 2 8	2 8 6	3 9 9 3	0 0 1	9 6 9	7 4 3 6		.	.		7 0 0	5 7 4 7	3 4 2 3 8	5 8 9	1 0 6	1 9 7 0
1 0 2 4	1 0 0 1	4 1 4 6	3 4 4 9 5	6 9 7	2 8 4	3 9 7 9	0 0 0	1 0 4 0	7 4 5 0		.	.		8 0 0	5 0 8 6	3 4 3 6 8	5 5 1	8 9	2 0 7 8
1 0 1 7	1 2 0 1	3 5 1 5	3 4 5 3 6	7 5 9	2 8 4	3 9 8 1	0 0 0	1 1 5 7	7 4 5 8		.	.		9 0 0	4 5 0 7	3 4 4 4 6	6 0 5	7 7	2 1 7 0
1 0 1 3	1 4 0 1	2 9 9 9	3 4 5 5 9	8 0 8	2 8 4	3 9 9 5	0 0 0	1 2 5 8	7 4 6 2		.	.		1 0 0 0	4 1 7 8	3 4 4 8 9	6 7 8	7 1	2 2 5 4
1 0 0 8	1 6 0 2	2 6 4 1	3 4 5 8 4	8 8 3	2 8 2	3 9 7 9	0 0 0	1 3 3 0	7 4 7 2		.	.		1 2 0 0	3 5 0 0	3 4 5 3 6	7 6 4	6 1	2 4 0 4
1 0 0 4	1 8 0 1	2 3 8 7	3 4 5 9 8	9 3 6	2 8 0	3 9 7 0	0 0 0	1 3 8 3	7 4 8 0		.	.		1 5 0 0	2 7 5 0	3 4 5 7 5	8 6 1	5 1	2 6 0 0
1 0 0 0	2 0 0 1	2 1 0 7	3 4 6 1 8	1 0 1 7	2 7 6	3 9 2 8	0 0 0	1 4 3 2	7 4 9 4		.	.		2 0 0 0	2 0 9 0	3 4 6 1 9	1 0 3 0	4 2	2 8 8 2
0 9 5 5	2 2 0 1	1 9 3 4	3 4 6 3 4	1 1 0 1	2 7 2	3 8 8 7	0 0 0	1 4 5 9	7 5 0 8		.	.		2 5 0 0	1 7 6 2	3 4 6 4 9	1 1 9 9	3 8	3 1 3 1
0 9 5 0	2 4 0 1	1 8 0 5	3 4 6 4 6	1 1 6 5	2 6 9	3 8 4 9	0 0 0	1 4 7 5	7 5 2 1		.	.		3 0 0 0	1 5 9 4	3 4 6 6 7	1 3 3 5	3 5	3 3 6 6
0 9 4 6	2 6 0 0	1 7 3 2	3 4 6 5 3	1 2 1 8	2 6 6	3 8 1 5	0 0 0	1 4 7 7	7 5 2 5		.	.		3 5 0 0	1 5 0 9	3 4 6 7 7	1 4 5 0	3 4	3 5 9 5

No. 5 -2

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

# Hydrographic Observation

No. 6 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 6 8	1 9-3 0 N	1 6 4-5 9 E	7 m 1 9 d 1 3 h 3 5 m	7 m 1 9 d 1 6 h 5 4 m	3 3 9 7 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> <sub>10<sup>-8</sup> m<sup>2</sup>/kg</sub>	ΔD <sub>10 m<sup>2</sup>/sec<sup>2</sup></sub>
1 6 3 0	0	2 8.9 3 0	3 4.7 7 5	.	0.0 8	0.1 3	0.0 0	1.0	.		.	.		0	2 9.0 1 7	3 4.7 8 0	1 9.7 4	5 9.1	0.0 0 0
1 6 5 2	1 0	2 8.9 3 1	3 4.7 7 5	.	0.0 8	0.0 9	0.0 0	1.0	.		.	.		1 0	2 9.0 3 2	3 4.7 8 0	1 9.7 4	5 9.2	0.0 6 0
1 6 5 0	2 7	2 8.7 2 6	3 4.7 7 7	.	0.0 7	0.0 4	0.0 0	1.0	.		.	.		2 0	2 8.7 8 8	3 4.7 8 2	1 9.8 0	5 8.4	0.1 1 9
1 6 4 3	5 2	2 8.6 9 5	3 4.8 0 3	.	0.0 7	0.0 3	0.0 0	0.9	.		.	.		3 0	2 8.7 3 9	3 4.7 8 4	1 9.8 2	5 8.2	0.1 7 7
1 6 4 2	7 6	2 8.1 8 8	3 5.1 8 1	.	0.0 1	0.0 4	0.0 0	0.9	.		.	.		5 0	2 8.7 0 4	3 4.7 9 4	1 9.8 6	5 8.0	0.2 9 5
1 6 4 1	1 0 2	2 6.0 3 6	3 5.3 3 6	.	0.0 0	0.0 1	0.0 0	1.1	.		.	.		7 5	2 7.9 3 7	3 5.2 6 6	2 0.9 5	5 2.2	0.4 3 5
1 6 4 1	1 0 2	2 6.0 3 6	3 5.3 3 7	.	0.0 1	0.0 3	0.0 0	1.1	.		.	.		1 0 0	2 6.0 7 8	3 5.3 1 1	2 1.0 8	4 6.2	0.5 5 9
1 6 3 9	1 2 5	2 4.8 5 7	3 5.2 9 9	.	0.0 3	0.0 5	0.0 1	1.2	.		.	.		1 2 5	2 4.9 8 3	3 5.3 0 4	2 0.3 6	4 3.0	0.6 7 2
1 6 3 8	1 5 1	2 3.3 7 7	3 5.3 6 4	.	0.0 6	0.2 4	0.1 6	1.3	.		.	.		1 5 0	2 3.9 5 4	3 5.3 7 5	2 0.3 2	3 9.6	0.7 7 6
1 6 3 6	2 0 1	2 0.2 4 5	3 5.0 5 7	.	0.1 7	1.8 2	0.0 2	2.4	.		.	.		2 0 0	2 0.9 1 3	3 5.1 0 3	1 8.9 7	3 3.3	0.9 6 3
1 6 3 5	2 5 2	1 7.9 4 5	3 4.8 0 0	.	0.3 7	4.9 1	0.0 1	4.1	.		.	.		2 5 0	1 8.1 9 0	3 4.8 2 4	1 8.6 5	2 8.6	1.1 2 1
1 6 3 2	3 3 2	1 3.0 6 0	3 4.3 6 3	.	1.0 1	1 3.7 9	0.0 0	1 3.0	.		.	.		3 0 0	1 5.2 2 6	3 4.5 3 0	1 7.6 2	2 4.2	1.2 5 8
1 6 3 1	3 8 2	1 1.7 2 7	3 4.2 9 8	.	1.0 1	1 4.5 9	0.0 0	1 6.0	.		.	.		4 0 0	1 1.1 3 9	3 4.2 5 5	1 8.5 3	1 8.4	1.4 8 1
1 6 2 9	4 3 1	1 0.1 7 9	3 4.2 0 2	.	1.3 9	1 9.5 7	0.0 0	2 4.1	.		.	.		5 0 0	8.0 7 2	3 4.1 2 7	1 3.4 4	1 4.5	1.6 5 4
1 6 2 7	4 8 1	8.7 5 2	3 4.1 4 6	.	1.7 5	2 4.6 1	0.0 0	3 4.8	.		.	.		6 0 0	5.9 8 4	3 4.1 9 4	6.6 7	1 1.3	1.7 9 0
1 6 2 5	5 3 1	7.3 9 0	3 4.1 1 9	.	2.1 3	2 9.9 4	0.0 0	4 8.5	.		.	.		7 0 0	5.2 4 4	3 4.2 9 9	5.1 6	9.6	1.9 0 2
1 6 2 5	5 3 2	7.3 8 9	3 4.1 1 9	.	2.1 4	2 9.9 1	0.0 0	4 8.4	.		.	.		8 0 0	4.8 0 7	3 4.3 9 8	5.4 8	8.4	2.0 0 1
1 6 1 8	6 3 3	5.8 2 3	3 4.2 1 3	.	.	.	.	.	.		.	.		9 0 0	4.4 2 4	3 4.4 6 9	6.5 4	7.5	2.0 9 0
1 6 1 5	7 3 1	5.0 8 8	3 4.3 2 9	.	2.8 6	3 9.8 4	0.0 0	8 6.6	.		.	.		1 0 0 0	4.0 0 7	3 4.5 0 5	7.0 5	6.8	2.1 7 0
1 6 1 2	8 3 2	4.7 8 0	3 4.4 0 3	.	2.8 7	4 0.0 9	0.0 0	9 2.7	.		.	.		1 2 0 0	3.4 7 0	3 4.5 4 2	7.8 2	6.0	2.3 1 8
1 6 1 0	9 3 0	4.4 0 4	3 4.4 6 7	.	2.8 5	3 9.9 7	0.0 0	9 9.2	.		.	.		1 5 0 0	2.7 7 8	3 4.5 7 8	8.6 5	5.1	2.5 1 3
1 6 0 6	1 0 7 3	3.8 3 3	3 4.5 1 8	.	2.8 5	4 0.1 8	0.0 0	1 1 0.0	.		.	.		2 0 0 0	2.1 0 2	3 4.6 2 0	1 0.3 0	4.2	2.7 9 6
1 6 0 6	1 0 7 3	3.8 3 3	3 4.5 1 7	.	2.8 5	4 0.1 4	0.0 0	1 1 0.2	.		.	.		2 5 0 0	1.7 4 0	3 4.6 5 1	1 2.1 4	3.7	3.0 4 3
1 5 5 6	1 2 7 1	3.2 4 0	3 4.5 5 2	.	2.8 4	4 0.2 4	0.0 0	1 2 1.6	.		.	.		3 0 0 0	1.5 8 3	3 4.6 6 8	1 3.4 9	3.5	3.2 7 5
1 5 5 1	1 4 7 2	2.8 1 8	3 4.5 7 6	.	2.8 2	4 0.1 1	0.0 0	1 2 9.5	.		.	.							

## Hydrographic Observation

No. 6 -2

[illegible][illegible]

# Hydrographic Observation

No. 7 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE-NO	SUB-NO
R F-4 0 6 9	1 9-0 0 N	1 6 4-5 9 E	7 m 1 9 d 1 9 h 3 4 m	7 m 1 9 d 2 1 h 3 1 m	1 9 4 4 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
2 1 1 0	0	2 8.7 8 5	3 4.7 0 9	1 9 6.3	0.1 4	0.0 8	0.0 0	1.0	.		0.0 6	0.0 1		0	2 8.8 1 5	3 4.7 0 8	1 9 7.9	5 9 0	0.0 0 0
2 1 3 0	1 1	2 8.7 8 9	3 4.7 0 9	1 9 7.3	0.0 8	0.0 5	0.0 0	1.1	8.1 1 1		0.0 4	0.0 1		1 0	2 8.8 1 5	3 4.7 0 9	1 9 7.9	5 9 0	0.0 5 9
2 1 2 8	2 5	2 8.7 6 3	3 4.7 0 9	1 9 7.2	0.0 9	0.0 9	0.0 0	1.0	8.1 1 2		0.0 6	0.0 0		2 0	2 8.8 0 6	3 4.7 0 7	1 9 8.0	5 9 0	0.1 1 9
2 1 2 4	5 1	2 8.6 5 7	3 4.7 0 3	1 9 7.9	0.0 8	0.0 2	0.0 0	1.0	8.1 1 1		0.0 5	0.0 1		3 0	2 8.7 4 1	3 4.7 0 6	1 9 8.1	5 8 8	0.1 7 8
2 1 2 3	7 4	2 8.5 7 9	3 4.7 6 0	2 0 0.5	0.0 9	0.0 1	0.0 0	1.0	8.1 1 3		0.0 7	0.0 1		5 0	2 8.6 4 5	3 4.7 0 1	1 9 8.8	5 8 5	0.2 9 7
2 1 2 1	1 0 0	2 7.4 1 4	3 5.0 3 8	2 0 7.3	0.0 6	0.0 4	0.0 0	1.0	8.1 0 5		0.1 3	0.0 4		7 5	2 8.5 8 3	3 4.8 1 7	2 0 1.0	5 7 5	0.4 4 4
2 1 2 0	1 2 5	2 5.7 8 7	3 5.2 9 4	2 0 3.9	0.0 4	0.1 0	0.0 0	1.1	8.0 8 5		0.2 4	0.1 7		1 0 0	2 7.0 5 1	3 5.1 4 0	2 0 8.2	5 0 4	0.5 8 0
2 1 1 8	1 5 1	2 4.7 0 8	3 5.3 3 4	1 9 9.6	0.0 5	0.0 6	0.0 1	1.2	8.0 6 6		0.1 6	0.2 2		1 2 5	2 5.4 0 2	3 5.3 2 5	2 0 5.1	4 4 1	0.6 9 9
2 1 1 6	2 0 0	2 0.4 5 8	3 5.0 5 7	1 8 4.5	0.2 3	2.4 6	0.0 2	2.5	7.9 6 4		0.0 3	0.0 5		1 5 0	2 4.2 6 7	3 5.3 1 1	2 0 0.5	4 0 9	0.8 0 7
2 1 1 5	2 5 1	1 7.9 6 8	3 4.7 9 4	1 9 2.3	0.3 2	4.4 1	0.0 1	3.9	7.9 3 2		.	.		2 0 0	1 9.6 8 5	3 4.9 6 5	1 8 9.1	3 1 2	0.9 9 3
2 1 1 3	2 8 0	1 6.5 9 3	3 4.6 5 9	1 9 4.1	0.4 5	6.3 0	0.0 1	5.3	7.9 0 6		.	.		2 5 0	1 7.3 2 9	3 4.7 2 9	1 9 6.8	2 7 3	1.1 4 3
2 1 1 1	3 3 0	1 4.4 1 4	3 4.4 8 9	1 9 1.4	0.6 9	9.7 9	0.0 0	9.1	7.8 4 8		.	.		3 0 0	1 5.1 8 3	3 4.5 4 6	1 9 5.0	2 3 9	1.2 7 6
2 1 0 9	3 7 0	1 2.6 5 3	3 4.3 4 1	1 7 5.3	1.0 1	1 3.8 3	0.0 0	1 3.7	7.7 7 6		.	.		4 0 0	1 1.1 3 0	3 4.2 6 8	1 4 1.6	1 8 2	1.4 9 8
2 1 0 7	4 2 1	1 0.6 7 7	3 4.2 4 7	1 3 7.4	1.5 6	2 0.8 5	0.0 0	2 3.3	7.6 5 4		.	.		5 0 0	8.5 0 5	3 4.1 7 5	1 2 1.0	1 4 8	1.6 7 4
2 1 0 5	4 7 2	9.2 5 1	3 4.1 8 4	1 3 7.0	1.7 4	2 3.8 4	0.0 0	3 1.3	7.6 1 8		.	.		6 0 0	6.3 7 6	3 4.1 9 8	7 3.3	1 1 7	1.8 1 4
2 0 5 9	5 7 1	7.1 6 3	3 4.1 8 1	8 5.1	2.3 6	3 2.6 7	0.0 0	5 3.3	7.4 8 0		.	.		7 0 0	5.7 4 5	3 4.3 0 3	6 0.4	1 0 2	1.9 3 5
2 0 5 6	6 7 1	5.8 7 2	3 4.2 5 7	6 0.7	2.6 8	3 7.5 1	0.0 0	7 2.6	7.4 2 2		.	.		8 0 0	5.0 0 0	3 4.3 9 7	5 8.6	8 6	2.0 3 7
2 0 5 3	7 7 1	5.1 3 7	3 4.3 6 7	5 6.1	2.8 1	3 9.3 5	0.0 0	8 5.8	7.4 1 8		.	.		9 0 0	4.5 7 2	3 4.4 5 0	6 3.2	7 8	2.1 2 8
2 0 5 0	8 7 1	4.6 1 0	3 4.4 4 2	6 1.3	2.8 3	3 9.7 9	0.0 0	9 5.0	7.4 4 2		.	.		1 0 0 0	4.1 9 2	3 4.4 9 3	6 9.4	7 0	2.2 1 3
2 0 4 7	9 7 1	4.2 4 2	3 4.4 8 8	6 8.3	2.8 2	3 9.8 6	0.0 0	1 0 1.5	7.4 4 5		.	.		1 2 0 0	3.3 8 7	3 4.5 4 6	7 8.2	5 9	2.3 6 1
2 0 4 0	1 1 3 1	3.5 7 3	3 4.5 3 5	7 5.1	2.8 3	4 0.1 3	0.0 0	1 1 4.3	7.4 5 5		.	.		1 5 0 0	2.7 0 9	3 4.5 8 2	8 7.4	5 0	2.5 5 3
2 0 4 0	1 1 3 1	3.5 7 4	3 4.5 3 4	7 5.5	2.8 4	4 0.1 0	0.0 0	1 1 4.3	7.4 5 5		.	.			.	.	.	.	.
2 0 3 5	1 3 3 3	3.0 1 5	3 4.5 6 5	8 2.2	2.8 2	4 0.1 4	0.0 0	1 2 5.1	7.4 6 8		.	.			.	.	.	.	.
2 0 3 0	1 5 3 1	2.6 3 7	3 4.5 8 4	8 8.0	2.8 1	4 0.0 8	0.0 0	1 3 2.7	7.4 7 4		.	.			.	.	.	.	.
2 0 2 2	1 7 3 1	2.3 9 8	3 4.6 0 0	9 3.6	2.8 0	3 9.7 9	0.0 0	1 3 7.3	7.4 8 4		.	.			.	.	.	.	.

## Hydrographic Observation

No. 7 -2

[illegible][illegible]

# Hydrographic Observation

No. 8 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 7 0	1 8-3 0 N	1 6 4-5 9 E	7 m 2 0 d 0 0 h 1 6 m	7 m 2 0 d 0 2 h 1 9 m	1 7 4 8 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sub>10<sup>-8</sup></sub> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
0 2 1 1	0	2 8.7 2 3	3 4.7 1 6	.	0.1 0	0.1 1	0.0 0	1.1	.		.	.		0	2 8.7 3 9	3 4.7 1 6	1 9.7 6	5 8.7	0.0 0 0
0 2 1 8	1 2	2 8.7 3 1	3 4.7 1 6	.	0.1 0	0.0 8	0.0 0	0.9	.		.	.		1 0	2 8.7 4 6	3 4.7 1 6	1 9.7 8	5 8.7	0.0 5 9
0 2 1 6	2 6	2 8.7 3 2	3 4.7 1 6	.	0.1 0	0.0 2	0.0 0	1.1	.		.	.		2 0	2 8.7 3 9	3 4.7 1 6	1 9.7 6	5 8.7	0.1 1 8
0 2 1 2	5 1	2 8.7 2 4	3 4.7 1 5	.	0.1 0	0.0 0	0.0 0	1.1	.		.	.		3 0	2 8.7 4 4	3 4.7 1 6	1 9.7 8	5 8.7	0.1 7 7
0 2 1 1	7 6	2 8.5 6 3	3 4.8 5 4	.	0.0 8	0.0 1	0.0 0	1.0	.		.	.		5 0	2 8.6 9 0	3 4.7 1 3	1 9.8.3	5 8.6	0.2 9 6
0 2 0 9	1 0 0	2 7.1 4 7	3 5.1 5 2	.	0.0 5	0.0 1	0.0 0	1.0	.		.	.		7 5	2 8.5 2 7	3 4.8 2 4	2 0.1 9	5 7.3	0.4 4 3
0 2 0 9	1 0 0	2 7.1 3 9	3 5.1 5 5	.	0.0 6	0.0 5	0.0 0	1.1	.		.	.		1 0 0	2 7.5 2 8	3 5.0 4 2	2 0.9.5	5 2.6	0.5 8 2
0 2 0 8	1 2 5	2 5.5 4 7	3 5.3 1 7	.	0.0 4	0.0 0	0.0 0	1.2	.		.	.		1 2 5	2 5.9 3 5	3 5.2 7 8	2 0.8.8	4 6.0	0.7 0 7
0 2 0 6	1 5 1	2 3.7 8 6	3 5.3 1 5	.	0.0 8	0.2 1	0.1 5	1.3	.		.	.		1 5 0	2 4.1 6 6	3 5.3 1 5	2 0.0.9	4 0.6	0.8 1 8
0 2 0 4	2 0 1	2 0.7 2 9	3 5.0 7 3	.	0.2 3	2.0 4	0.0 2	2.4	.		.	.		2 0 0	2 1.0 7 7	3 5.1 0 1	1 8.8.9	3 3.8	1.0 1 0
0 2 0 1	2 5 0	1 7.3 1 3	3 4.7 3 6	.	0.3 7	5.0 9	0.0 1	4.3	.		.	.		2 5 0	1 7.9 7 7	3 4.8 0 4	1 9.6.3	2 8.3	1.1 6 9
0 1 5 9	3 0 2	1 4.4 7 6	3 4.4 7 0	.	0.7 3	9.8 9	0.0 0	8.9	.		.	.		3 0 0	1 5.2 1 3	3 4.5 4 7	1 9.7.3	2 4.0	1.3 0 3
0 1 5 7	3 5 0	1 2.6 3 2	3 4.3 3 8	.	1.0 5	1 4.1 4	0.0 0	1 4.1	.		.	.		4 0 0	1 0.6 7 0	3 4.2 3 0	1 6.8.6	1 7.7	1.5 1 9
0 1 5 7	3 5 1	1 2.6 2 0	3 4.3 3 7	.	1.0 4	1 4.1 6	0.0 0	1 4.0	.		.	.		5 0 0	7.7 4 4	3 4.1 8 1	9.8.9	1 3.6	1.6 8 4
0 1 5 5	4 0 1	1 0.5 4 8	3 4.2 2 3	.	1.3 6	1 8.8 4	0.0 0	2 2.3	.		.	.		6 0 0	6.2 3 9	3 4.2 2 0	6.7.6	1 1.4	1.8 1 8
0 1 5 3	4 5 1	8.8 9 6	3 4.1 7 5	.	.	.	.	.	.		.	.		7 0 0	5.4 5 1	3 4.3 1 9	5.6.9	9.7	1.9 3 2
0 1 5 1	5 0 0	7.7 6 1	3 4.1 8 0	.	2.2 2	3 0.4 5	0.0 0	4 6.4	.		.	.		8 0 0	5.0 5 5	3 4.3 8 3	5.7.4	8.8	2.0 3 3
0 1 4 3	6 0 1	6.1 3 7	3 4.2 2 6	.	2.6 5	3 6.5 7	0.0 0	6 8.1	.		.	.		9 0 0	4.5 3 4	3 4.4 5 5	6.4.2	7.7	2.1 2 5
0 1 4 0	7 0 1	5.2 9 1	3 4.3 4 2	.	2.8 1	3 9.0 5	0.0 0	8 3.0	.		.	.		1 0 0 0	4.0 7 0	3 4.5 0 4	7.1.6	6.8	2.2 0 7
0 1 3 7	8 0 3	4.8 7 5	3 4.4 1 0	.	2.8 4	3 9.5 5	0.0 0	9 0.5	.		.	.		1 2 0 0	3.4 4 9	3 4.5 4 1	7.6.9	6.0	2.3 5 6
0 1 3 4	9 0 1	4.4 3 4	3 4.4 6 8	.	2.8 4	3 9.6 9	0.0 0	9 8.5	.		.	.		1 5 0 0	2.7 5 9	3 4.5 8 0	8.6.5	5.1	2.5 5 3
0 1 2 8	1 0 0 1	4.0 7 5	3 4.5 0 3	.	2.8 5	3 9.8 8	0.0 0	1 0 4.7	.		.	.			.	.	.	.	.
0 1 2 8	1 0 0 1	4.0 7 2	3 4.5 0 3	.	2.8 5	3 9.9 2	0.0 0	1 0 5.2	.		.	.			.	.	.	.	.
0 1 2 0	1 2 0 5	3.4 3 5	3 4.5 4 3	.	2.8 5	4 0.1 5	0.0 0	1 1 7.4	.		.	.			.	.	.	.	.
0 1 1 6	1 4 0 2	2.9 7 5	3 4.5 6 6	.	2.8 4	4 0.1 4	0.0 0	1 2 6.3	.		.	.			.	.	.	.	.

## Hydrographic Observation

No. 8 -2

[illegible][illegible]

# Hydrographic Observation

No. 9 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH					CRUISE.NO	SUB.NO
R F-4 0 7 1	1 8-0 0 N	1 6 4-5 9 E	7 m 2 0 d 0 4 h 5 7 m	7 m 2 0 d 0 9 h 1 1 m	5 4 5 6 m					1 1-0 8	-
Rem	CTD										

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> <sub>10<sup>-8</sup> m<sup>2</sup>/kg</sub>	ΔD <sub>10 m<sup>2</sup>/sec<sup>2</sup></sub>
0 9 0 0	0	2 8.8 3 8	3 4.7 2 1	1 9.7 6	0.1 5	0.0 9	0.0 0	1.0	.		0.0 6	0.0 1		0	2 8.7 3 4	3 4.7 4 5	1 9.8 0	5 8.5	0.0 0 0
0 9 1 0	1 0	2 8.7 3 6	3 4.7 1 8	1 9.7 4	0.1 0	0.0 1	0.0 0	1.0	8.1 1 1		0.0 6	0.0 1		1 0	2 8.7 3 5	3 4.7 4 4	1 9.7 9	5 8.5	0.0 5 9
0 9 0 7	5 1	2 8.6 3 9	3 4.7 4 2	1 9.8 5	0.1 0	0.0 0	0.0 0	0.9	8.1 1 2		0.0 7	0.0 2		2 0	2 8.7 3 8	3 4.7 4 4	1 9.7 8	5 8.5	0.1 1 8
0 9 0 5	1 0 0	2 7.1 2 4	3 5.1 7 2	2 0.8 8	0.0 6	0.0 1	0.0 0	1.0	8.1 0 6		0.1 5	0.0 6		3 0	2 8.7 3 9	3 4.7 4 4	1 9.8 0	5 8.5	0.1 7 7
0 9 0 3	1 5 1	2 4.3 9 8	3 5.3 2 5	1 9.7 9	0.0 7	0.0 9	0.0 8	1.2	8.0 5 9		0.1 7	0.2 4		5 0	2 8.6 8 7	3 4.7 4 8	1 9.9 0	5 8.3	0.2 9 5
0 9 0 1	1 9 9	2 1.0 5 9	3 5.0 9 0	1 9.0 2	0.1 5	1.2 9	0.0 2	2.1	7.9 9 3		0.0 4	0.0 9		7 5	2 8.1 1 7	3 4.9 2 5	2 0.7 7	5 5.2	0.4 4 0
0 8 5 9	2 4 9	1 7.2 5 1	3 4.7 1 3	1 9.9 0	0.3 6	4.9 0	0.0 0	4.3	7.9 3 5		.	.		1 0 0	2 7.1 0 6	3 5.1 5 2	2 0.9 7	5 0.5	0.5 7 3
0 8 5 7	3 3 1	1 3.5 0 7	3 4.4 2 6	1 9.4 1	0.7 9	1 0.9 7	0.0 0	1 0.7	7.8 3 8		.	.		1 2 5	2 5.6 8 7	3 5.2 8 5	2 0.3 9	4 5.3	0.6 9 5
0 8 5 5	3 8 1	1 1.6 2 7	3 4.2 9 1	1 8.3 2	1.1 1	1 5.1 6	0.0 0	1 6.7	7.7 6 3		.	.		1 5 0	2 4.3 1 6	3 5.3 2 3	1 9.6 5	4 1.0	0.8 0 5
0 8 5 3	4 3 1	9.9 5 1	3 4.2 0 6	1 4.9 0	1.5 7	2 1.3 3	0.0 0	2 6.3	7.6 6 0		.	.		2 0 0	2 0.2 4 6	3 5.0 0 3	1 9.1 2	3 2.3	0.9 8 9
0 8 5 1	4 8 2	8.4 3 0	3 4.1 7 0	1 1.8 4	2.0 1	2 7.2 1	0.0 0	3 8.8	7.5 6 4		.	.		2 5 0	1 7.2 8 8	3 4.7 1 8	2 0.1 3	2 7.3	1.1 4 3
0 8 4 8	5 3 3	7.7 0 5	3 4.1 8 5	9.4 9	2.2 6	3 0.7 1	0.0 0	4 6.9	7.5 1 5		.	.		3 0 0	1 4.7 8 9	3 4.5 1 6	2 0.0 7	2 3.3	1.2 7 5
0 8 4 5	6 3 0	6.1 8 5	3 4.2 3 3	6.3 0	2.7 0	3 6.6 0	0.0 0	6 7.6	7.4 2 5		.	.		4 0 0	1 1.4 3 2	3 4.2 8 0	1 9.2 7	1 8.7	1.4 9 2
0 8 4 3	7 3 1	5.3 2 9	3 4.3 3 0	5.4 7	2.8 5	3 9.0 3	0.0 0	8 2.3	7.4 1 5		.	.		5 0 0	8.1 4 5	3 4.1 7 4	1 1.1 9	1 4.2	1.6 6 3
0 8 4 0	8 3 1	4.7 9 2	3 4.4 1 6	5.8 7	2.8 8	3 9.7 8	0.0 0	9 2.2	7.4 2 4		.	.		6 0 0	6.3 2 2	3 4.2 2 4	6.7 3	1 1.4	1.7 9 8
0 8 3 7	9 3 2	4.3 8 5	3 4.4 7 5	6.6 8	2.8 7	3 9.6 9	0.0 0	9 9.3	7.4 5 1		.	.		7 0 0	5.3 2 4	3 4.3 2 8	5.4 9	9.5	1.9 1 0
0 8 3 3	1 0 7 2	3.8 4 7	3 4.5 2 2	7.5 3	2.8 6	3 9.7 5	0.0 0	1 0 9.1	7.4 5 8		.	.		8 0 0	4.8 1 2	3 4.4 1 4	5.8 9	8.3	2.0 0 8
0 8 2 9	1 2 7 2	3.2 5 1	3 4.5 6 1	7.9 5	2.8 7	4 0.1 3	0.0 0	1 2 0.5	7.4 6 3		.	.		9 0 0	4.4 4 9	3 4.4 6 6	6.5 9	7.5	2.0 9 6
0 8 2 4	1 4 7 2	2.8 5 8	3 4.5 8 1	8.4 3	2.8 7	4 0.1 7	0.0 0	1 2 8.0	7.4 6 8		.	.		1 0 0 0	4.0 2 4	3 4.5 0 9	7.3 4	6.8	2.1 7 7
0 8 1 9	1 6 7 2	2.5 1 0	3 4.5 9 8	9.1 4	2.8 4	4 0.0 0	0.0 0	1 3 5.7	7.4 8 0		.	.		1 2 0 0	3.4 5 9	3 4.5 4 3	7.8 5	6.0	2.3 2 3
0 8 1 4	1 8 7 2	2.2 5 9	3 4.6 1 1	9.7 8	2.8 1	3 9.6 9	0.0 0	1 4 0.6	7.4 9 0		.	.		1 5 0 0	2.7 5 4	3 4.5 7 9	8.6 7	5.1	2.5 1 8
0 8 1 0	2 0 7 0	2.0 3 7	3 4.6 2 9	1 0.5 4	2.7 8	3 9.3 7	0.0 0	1 4 4.9	7.4 9 7		.	.		2 0 0 0	2.0 7 8	3 4.6 2 4	1 0.4 4	4.2	2.7 9 9
0 8 0 5	2 2 7 1	1.9 0 6	3 4.6 4 0	1 1.1 6	2.7 4	3 9.0 4	0.0 0	1 4 6.9	7.5 0 9		.	.		2 5 0 0	1.7 4 1	3 4.6 5 3	1 2.1 0	3.7	3.0 4 5
0 8 0 0	2 4 7 2	1.7 5 1	3 4.6 5 3	1 1.9 2	2.7 0	3 8.4 9	0.0 0	1 4 8.8	7.5 2 6		.	.		3 0 0 0	1.5 9 5	3 4.6 6 8	1 3.3 1	3.5	3.2 7 8
0 7 5 5	2 6 7 2	1.6 8 7	3 4.6 5 9	1 2.4 4	2.6 7	3 8.1 0	0.0 0	1 4 9.2	7.5 3 3		.	.		3 5 0 0	1.5 1 5	3 4.6 7 8	1 4.4 2	3.4	3.5 0 7

## No. 9 -2

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

# Hydrographic Observation

No. 10 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 7 2	1 7-2 9 N	1 6 4-5 9 E	7 m 2 0 d 1 1 h 4 4 m	7 m 2 0 d 1 5 h 5 2 m	5 2 5 4 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 m <sup>2</sup> /sec <sup>2</sup>
1 5 2 8	0	2 8.9 4 0	3 4.8 0 6	.	0.0 9	0.0 3	0.0 0	0.9	.		.	.		0	2 9.1 1 2	3 4.9 0 3	1 9 7.0	5 8 6	0.0 0 0
1 5 5 0	1 2	2 8.9 5 2	3 4.8 0 7	.	0.0 8	0.0 1	0.0 0	1.0	.		.	.		1 0	2 9.0 8 7	3 4.9 0 0	1 9 7.3	5 8 5	0.0 5 9
1 5 4 6	5 1	2 8.8 5 0	3 4.7 9 3	.	0.0 9	0.0 4	0.0 0	0.8	.		.	.		2 0	2 8.9 5 8	3 4.8 8 5	1 9 7.5	5 8 2	0.1 1 8
1 5 4 2	1 0 1	2 7.1 9 1	3 5.1 3 5	.	0.0 7	0.0 0	0.0 0	0.9	.		.	.		3 0	2 8.9 4 5	3 4.8 8 5	1 9 7.7	5 8 2	0.1 7 6
1 5 4 0	1 5 0	2 4.1 8 3	3 5.3 8 5	.	0.0 6	0.0 0	0.0 0	1.1	.		.	.		5 0	2 8.8 8 8	3 4.8 7 6	1 9 8.1	5 8 0	0.2 9 4
1 5 3 8	2 0 1	2 1.0 4 9	3 5.0 9 1	.	0.2 1	1.5 8	0.0 2	2.1	.		.	.		7 5	2 7.8 2 3	3 5.0 0 4	2 0 9.9	5 3 8	0.4 3 6
1 5 3 5	2 5 0	1 7.2 7 4	3 4.7 2 0	.	0.4 6	6.0 1	0.0 1	4.8	.		.	.		1 0 0	2 6.4 6 2	3 5.2 3 9	2 0 8.8	4 7 9	0.5 6 5
1 5 3 3	2 8 0	1 5.4 3 3	3 4.5 5 4	.	0.6 6	8.8 5	0.0 0	7.4	.		.	.		1 2 5	2 5.7 0 8	3 5.3 1 5	2 0 8.0	4 5 1	0.6 8 3
1 5 3 0	3 3 1	1 2.5 1 3	3 4.3 3 5	.	0.9 9	1 3.6 5	0.0 0	1 3.6	.		.	.		1 5 0	2 4.4 1 7	3 5.3 9 4	2 0 7.8	4 0 8	0.7 9 2
1 5 2 8	3 7 2	1 1.1 5 8	3 4.2 5 6	.	1.4 2	1 8.9 8	0.0 0	2 0.2	.		.	.		2 0 0	2 1.5 1 1	3 5.1 3 0	1 8 7.6	3 4 7	0.9 8 5
1 5 2 6	4 2 1	9.5 3 0	3 4.1 9 3	.	1.6 6	2 3.0 4	0.0 0	2 9.3	.		.	.		2 5 0	1 7.1 3 8	3 4.7 0 3	1 7 7.2	2 7 1	1.1 4 1
1 5 2 3	4 7 0	8.3 0 0	3 4.1 6 7	.	2.0 0	2 7.6 7	0.0 0	3 9.8	.		.	.		3 0 0	1 4.4 4 1	3 4.4 6 9	1 8 1.0	2 3 0	1.2 7 0
1 5 1 3	5 7 1	6.3 3 0	3 4.1 7 7	.	2.5 4	3 5.4 2	0.0 0	6 4.4	.		.	.		4 0 0	9.9 7 0	3 4.2 0 1	1 5 6.6	1 6 8	1.4 7 6
1 5 1 0	6 7 5	5.4 3 2	3 4.3 1 2	.	2.7 9	3 8.9 8	0.0 0	8 0.7	.		.	.		5 0 0	7.4 9 2	3 4.1 5 0	1 0 5.0	1 3 5	1.6 3 5
1 5 0 5	7 7 1	5.0 8 3	3 4.4 1 8	.	2.7 7	3 8.8 9	0.0 0	8 6.9	.		.	.		6 0 0	5.8 0 4	3 4.2 1 0	6 2.5	1 0 9	1.7 6 5
1 5 0 2	8 7 2	4.7 0 3	3 4.4 9 0	.	2.7 9	3 9.3 5	0.0 0	9 3.1	.		.	.		7 0 0	5.1 6 1	3 4.3 5 9	5 7.1	9 1	1.8 7 2
1 4 5 6	9 7 2	4.2 4 4	3 4.5 1 7	.	2.8 2	3 9.7 8	0.0 0	1 0 1.1	.		.	.		8 0 0	4.8 3 5	3 4.4 6 1	6 9.3	7 9	1.9 6 6
1 4 5 2	1 1 3 2	3.7 2 9	3 4.5 4 5	.	2.8 4	4 0.2 8	0.0 0	1 1 1.2	.		.	.		9 0 0	4.4 2 5	3 4.5 0 4	7 2.8	7 2	2.0 5 0
1 4 4 8	1 3 3 1	3.1 5 7	3 4.5 6 6	.	2.8 2	4 0.2 7	0.0 0	1 2 2.0	.		.	.		1 0 0 0	4.1 3 2	3 4.5 2 1	7 5.4	6 8	2.1 3 0
1 4 4 3	1 5 3 1	2.6 9 0	3 4.5 8 3	.	2.8 0	4 0.1 2	0.0 0	1 3 2.6	.		.	.		1 2 0 0	3.5 0 1	3 4.5 5 0	7 9.7	5 9	2.2 7 7
1 4 3 8	1 7 3 1	2.4 2 3	3 4.6 0 1	.	2.7 8	3 9.9 5	0.0 0	1 3 8.2	.		.	.		1 5 0 0	2.7 4 8	3 4.5 8 0	8 7.1	5 1	2.4 7 1
1 4 3 4	1 9 3 2	2.1 7 0	3 4.6 1 9	.	2.7 4	3 9.6 4	0.0 0	1 4 2.8	.		.	.		2 0 0 0	2.0 9 0	3 4.6 2 3	1 0 3.6	4 2	2.7 5 0
1 4 2 9	2 1 3 2	1.9 8 9	3 4.6 3 4	.	2.7 2	3 9.3 1	0.0 0	1 4 6.4	.		.	.		2 5 0 0	1.7 5 7	3 4.6 5 2	1 2 0.1	3 7	2.9 9 8
1 4 2 5	2 3 3 1	1.8 5 0	3 4.6 4 5	.	2.6 7	3 8.7 6	0.0 0	1 4 8.3	.		.	.		3 0 0 0	1.5 9 9	3 4.6 6 7	1 3 3.1	3 5	3.2 3 2
1 4 2 1	2 5 3 1	1.7 3 8	3 4.6 5 4	.	2.6 4	3 8.4 6	0.0 0	1 4 9.0	.		.	.		3 5 0 0	1.5 1 3	3 4.6 7 8	1 4 4.2	3 4	3.4 6 1

## Hydrographic Observation

No. 10 -2

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 7 2	1 7-2 9 N	1 6 4-5 9 E	7 m 2 0 d 1 1 h 4 4 m	7 m 2 0 d 1 5 h 5 2 m	5 2 5 4 m				1 1-0 8	-
Rem	CTD									

[illegible]

# Hydrographic Observation

No. 11 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 7 3	1 6-5 8 N	1 6 4-5 9 E	7 m 2 0 d 1 8 h 2 6 m	7 m 2 0 d 2 2 h 4 8 m	5 4 4 6 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
2 2 4 0	0	2 8.8 9 6	3 4.8 9 7	1 9 6.6	-	0 0 9	0 0 0	0.4	.		0.0 6	0.0 1		0	2 8.9 1 6	3 4.8 8 6	1 9 7.7	5 8 1	0.0 0 0
2 2 4 7	1 1	2 8.9 0 1	3 4.8 9 7	1 9 7.0	0.1 4	0 0 3	0 0 0	0.3	8.1 2 1		0.0 5	0.0 1		1 0	2 8.9 1 5	3 4.8 8 7	1 9 7.7	5 8 0	0.0 5 8
2 2 4 3	5 0	2 8.9 0 0	3 4.9 8 1	1 9 7.9	0.1 3	0 0 2	0 0 0	0.3	8.1 2 3		0.0 8	0.0 2		2 0	2 8.9 1 9	3 4.8 8 7	1 9 7.7	5 8 1	0.1 1 7
2 2 4 1	1 0 0	2 5.8 6 3	3 5.2 7 7	2 0 8.9	0.1 2	0 0 2	0 0 0	0.5	8.0 9 6		0.2 2	0.1 1		3 0	2 8.9 0 7	3 4.8 8 7	1 9 7.8	5 8 0	0.1 7 5
2 2 3 9	1 5 1	2 2.8 5 4	3 5.2 6 7	1 8 9.9	0.2 1	0.4 6	0.1 8	0.9	8.0 2 3		0.1 1	0.1 9		5 0	2 8.8 8 0	3 4.8 9 3	1 9 8.0	5 7 9	0.2 9 2
2 2 3 7	2 0 1	1 9.0 7 1	3 4.9 0 5	1 8 4.4	0.3 9	3.6 2	0.0 1	2.6	7.9 4 5		0.0 2	0.0 5		7 5	2 7.8 6 3	3 5.1 0 0	2 1 0.6	5 3 2	0.4 3 4
2 2 3 5	2 5 4	1 6.3 0 7	3 4.6 3 4	1 9 0.9	0.5 6	6.9 4	0.0 0	5.2	7.9 0 8		.	.		1 0 0	2 5.8 5 3	3 5.2 6 1	2 1 2.1	4 5 9	0.5 6 0
2 2 3 2	3 0 4	1 3.2 4 9	3 4.3 6 4	1 5 7.8	1.1 7	1 4.1 9	0.0 0	1 2.3	7.7 6 9		.	.		1 2 5	2 4.5 7 8	3 5.3 1 1	2 0 7.8	4 1 8	0.6 7 2
2 2 3 0	3 5 1	1 1.1 8 7	3 4.2 6 0	1 7 3.3	1.2 9	1 6.8 9	0.0 0	1 8.4	7.7 4 1		.	.		1 5 0	2 2.7 1 0	3 5.2 0 7	1 9 6.4	3 7 3	0.7 7 1
2 2 2 7	4 0 3	9.3 4 4	3 4.1 7 5	1 4 6.0	1.7 2	2 2.6 7	0.0 0	2 9.0	7.6 4 5		.	.		2 0 0	1 9.4 5 4	3 4.9 3 2	1 8 0.0	3 0 9	0.9 4 7
2 2 2 5	4 5 3	8.1 8 1	3 4.1 6 6	1 1 6.6	2.0 9	2 7.7 7	0.0 0	4 0.4	7.5 7 0		.	.		2 5 0	1 6.5 5 2	3 4.6 5 3	1 9 6.3	2 6 1	1.0 9 3
2 2 2 2	5 0 2	6.9 9 2	3 4.1 5 7	9 1.1	2.4 2	3 2.4 4	0.0 0	5 3.8	7.4 9 2		.	.		3 0 0	1 3.6 4 7	3 4.3 9 8	1 6 9.4	2 1 9	1.2 1 7
2 2 1 8	6 0 4	5.7 8 9	3 4.3 0 2	6 1.1	2.7 9	3 7.5 3	0.0 0	7 3.8	7.4 3 7		.	.		4 0 0	9.8 3 0	3 4.1 9 8	1 5 3.7	1 6 6	1.4 1 7
2 2 1 5	7 0 2	5.4 4 0	3 4.4 0 7	6 2.3	2.8 5	3 8.4 8	0.0 0	8 0.2	7.4 5 3		.	.		5 0 0	7.0 1 9	3 4.1 6 0	9 2.3	1 2 8	1.5 7 4
2 2 1 1	8 0 4	5.0 0 4	3 4.4 7 3	6 4.2	2.8 9	3 9.2 5	0.0 0	8 6.6	7.4 6 3		.	.		6 0 0	5.9 5 0	3 4.3 0 3	6 2.2	1 0 4	1.6 9 8
2 2 0 8	9 0 3	4.5 9 6	3 4.5 0 6	6 4.7	2.9 4	3 9.9 5	0.0 0	9 3.5	7.4 5 6		.	.		7 0 0	5.4 0 2	3 4.4 1 6	6 3.4	8 9	1.8 0 3
2 2 0 4	1 0 0 3	4.2 1 7	3 4.5 3 0	6 5.4	2.9 8	4 0.5 6	0.0 0	1 0 0.5	7.4 5 5		.	.		8 0 0	4.9 8 8	3 4.4 7 1	6 5.8	8 0	1.8 9 7
2 1 5 9	1 2 0 2	3.5 3 3	3 4.5 5 2	7 4.7	2.9 4	4 0.2 6	0.0 0	1 1 4.1	7.4 6 6		.	.		9 0 0	4.6 4 8	3 4.5 0 5	6 4.0	7 4	1.9 8 4
2 1 5 5	1 4 0 1	3.0 5 1	3 4.5 7 1	8 1.1	2.9 5	4 0.2 4	0.0 0	1 2 3.7	7.4 7 5		.	.		1 0 0 0	4.2 3 6	3 4.5 2 8	6 5.8	6 8	2.0 6 5
2 1 5 0	1 6 0 1	2.6 6 3	3 4.5 9 2	8 7.4	2.9 1	4 0.1 6	0.0 0	1 3 2.2	7.4 8 4		.	.		1 2 0 0	3.5 5 5	3 4.5 5 4	7 4.0	6 0	2.2 1 3
2 1 4 5	1 8 0 2	2.3 4 1	3 4.6 1 0	9 4.7	2.8 8	3 9.8 6	0.0 0	1 3 9.0	7.4 9 6		.	.		1 5 0 0	2.8 7 5	3 4.5 8 2	8 4.1	5 1	2.4 1 1
2 1 4 1	2 0 0 0	2.1 1 2	3 4.6 2 5	1 0 2.5	2.8 4	3 9.4 7	0.0 0	1 4 3.2	7.5 0 3		.	.		2 0 0 0	2.1 0 7	3 4.6 2 5	1 0 2.8	4 2	2.6 9 4
2 1 3 7	2 1 9 9	1.9 3 7	3 4.6 3 8	1 1 0.2	2.8 0	3 9.0 1	0.0 0	1 4 5.8	7.5 1 7		.	.		2 5 0 0	1.7 6 8	3 4.6 5 1	1 1 9.5	3 7	2.9 4 3
2 1 3 2	2 3 9 8	1.8 0 2	3 4.6 4 9	1 1 7.0	2.7 7	3 8.5 8	0.0 0	1 4 7.2	7.5 2 9		.	.		3 0 0 0	1.5 8 8	3 4.6 6 8	1 3 3.5	3 5	3.1 7 6
2 1 2 8	2 5 9 8	1.7 1 1	3 4.6 5 8	1 2 2.7	2.7 2	3 8.1 5	0.0 0	1 4 8.0	7.5 4 3		.	.		3 5 0 0	1.5 0 4	3 4.6 7 9	1 4 4.9	3 4	3.4 0 4

## Hydrographic Observation

No. 11 -2

[illegible][illegible]

# Hydrographic Observation

No. 12 -1

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 7 4	1 6-2 9 N	1 6 4-5 9 E	7 m 2 1 d 0 1 h 1 1 m	7 m 2 1 d 0 5 h 2 8 m	5 4 7 4 m				1 1-0 8	-
Rem	CTD									

TIME JST	DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	PO <sub>4</sub> -P μmol/kg	NO <sub>3</sub> -N μmol/kg	NO <sub>2</sub> -N μmol/kg	SiO <sub>2</sub> μmol/kg	pH		CHL μg/l	PHA μg/l		DEPTH m	TEMPERATURE ℃	SALINITY (psu)	O <sub>2</sub> μmol/kg	Δ <sup>st</sup> 10 <sup>-8</sup> m <sup>2</sup> /kg	ΔD 10 <sup>-3</sup> m <sup>2</sup> /sec <sup>2</sup>
0 5 1 5	0	2 8.7 8 5	3 4.8 8 2	.	0.0 7	0.1 4	0.0 0	0.8	.		.	.		0	2 8.7 9 8	3 4.9 0 9	1 9.7 3	5 7.5	0.0 0 0
0 5 2 7	1 2	2 8.7 9 3	3 4.8 8 1	.	0.0 7	0.1 1	0.0 0	0.7	.		.	.		1 0	2 8.7 9 3	3 4.9 1 0	1 9.7 3	5 7.5	0.0 5 8
0 5 2 4	5 0	2 8.7 9 8	3 4.8 8 2	.	0.0 7	0.0 5	0.0 0	0.7	.		.	.		2 0	2 8.8 0 0	3 4.9 0 9	1 9.7 5	5 7.5	0.1 1 6
0 5 2 2	1 0 0	2 4.6 9 6	3 5.2 1 0	.	0.0 9	0.1 0	0.0 0	1.1	.		.	.		3 0	2 8.8 0 5	3 4.9 0 9	1 9.7 5	5 7.5	0.1 7 4
0 5 2 0	1 5 1	2 2.2 5 9	3 5.2 1 3	.	0.1 3	0.5 6	0.2 0	1.6	.		.	.		5 0	2 8.8 0 9	3 4.9 0 9	1 9.7 4	5 7.5	0.2 9 0
0 5 1 8	2 0 2	1 8.5 7 9	3 4.8 4 0	.	0.4 4	5.0 5	0.0 1	3.9	.		.	.		7 5	2 8.2 3 4	3 5.0 7 4	2 0.4 6	5 4.5	0.4 3 4
0 5 1 6	2 5 1	1 6.2 4 2	3 4.6 2 3	.	0.5 7	7.5 9	0.0 1	5.9	.		.	.		1 0 0	2 5.9 0 1	3 5.2 7 5	2 1.1 8	4 6.0	0.5 5 8
0 5 1 4	3 3 3	1 1.8 2 0	3 4.2 9 0	.	1.1 4	1 5.7 1	0.0 0	1 6.4	.		.	.		1 2 5	2 4.1 2 9	3 5.2 3 0	2 0.3 4	4 1.1	0.6 6 9
0 5 1 2	3 8 1	1 0.0 3 3	3 4.2 0 2	.	1.4 8	2 0.6 4	0.0 0	2 5.2	.		.	.		1 5 0	2 2.6 8 0	3 5.2 5 9	1 9.2 6	3 6.9	0.7 6 8
0 5 1 0	4 3 2	8.3 9 9	3 4.1 6 5	.	1.9 4	2 6.8 5	0.0 0	3 8.1	.		.	.		2 0 0	1 9.2 2 4	3 4.9 1 7	1 8.3 5	3 0.4	0.9 4 1
0 5 0 7	5 3 2	6.6 2 2	3 4.2 3 0	.	2.5 3	3 5.1 2	0.0 0	6 1.4	.		.	.		2 5 0	1 6.4 5 7	3 4.6 4 3	1 8.8 3	2 6.0	1.0 8 5
0 5 0 4	6 3 4	5.8 9 9	3 4.3 6 6	.	2.7 5	3 8.2 0	0.0 0	7 3.2	.		.	.		3 0 0	1 2.5 5 9	3 4.3 6 0	1 9.3 2	2 0.1	1.2 0 2
0 5 0 1	7 3 5	5.3 0 2	3 4.4 5 8	.	2.8 5	3 9.8 4	0.0 0	8 2.3	.		.	.		4 0 0	9.1 8 1	3 4.1 8 5	1 3.5 8	1 5.7	1.3 8 7
0 4 5 8	8 3 4	4.7 6 0	3 4.4 9 8	.	2.8 7	4 0.2 0	0.0 0	9 1.3	.		.	.		5 0 0	7.1 5 9	3 4.1 7 6	8.9 3	1 2.9	1.5 3 7
0 4 5 5	9 3 4	4.4 0 4	3 4.5 2 3	.	2.8 8	4 0.5 6	0.0 0	9 7.6	.		.	.		6 0 0	6.2 0 4	3 4.3 1 4	5.8 7	1 0.6	1.6 6 1
0 4 5 0	1 0 7 4	3.9 0 0	3 4.5 4 3	.	2.8 7	4 0.6 2	0.0 0	1 0 7.1	.		.	.		7 0 0	5.5 1 5	3 4.4 3 7	5.2 1	8.9	1.7 6 8
0 4 4 5	1 2 7 2	3.2 5 9	3 4.5 6 3	.	2.8 5	4 0.2 9	0.0 0	1 2 0.5	.		.	.		8 0 0	5.0 3 0	3 4.4 8 4	5.8 5	8.0	1.8 6 2
0 4 3 3	1 4 7 2	2.9 1 1	3 4.5 8 1	.	2.8 3	4 0.3 0	0.0 0	1 2 7.7	.		.	.		9 0 0	4.6 3 1	3 4.5 0 6	6.1 7	7.4	1.9 4 8
0 4 3 2	1 4 7 3	2.9 1 2	3 4.5 8 1	.	2.8 3	4 0.1 9	0.0 0	1 2 7.0	.		.	.		1 0 0 0	4.3 0 5	3 4.5 2 7	6.5 1	6.9	2.0 3 0
0 4 2 8	1 6 7 4	2.5 2 5	3 4.6 0 0	.	2.8 0	4 0.0 2	0.0 0	1 3 5.4	.		.	.		1 2 0 0	3.6 5 7	3 4.5 5 0	7.2 7	6.1	2.1 8 1
0 4 2 3	1 8 7 4	2.2 4 5	3 4.6 1 8	.	2.7 7	3 9.6 1	0.0 0	1 4 1.5	.		.	.		1 5 0 0	2.8 1 2	3 4.5 8 3	8.5 3	5.1	2.3 8 0
0 4 1 9	2 0 7 3	2.0 4 3	3 4.6 3 3	.	2.7 3	3 9.3 3	0.0 0	1 4 4.4	.		.	.		2 0 0 0	2.0 9 8	3 4.6 2 7	1 0.3 8	4.2	2.6 6 0
0 4 1 4	2 2 7 1	1.8 5 9	3 4.6 4 4	.	2.7 2	3 9.1 6	0.0 0	1 4 4.8	.		.	.		2 5 0 0	1.7 5 3	3 4.6 5 4	1 2.0 5	3.7	2.9 0 7
0 4 1 0	2 4 7 1	1.7 5 1	3 4.6 5 3	.	2.6 6	3 8.5 8	0.0 0	1 4 9.1	.		.	.		3 0 0 0	1.5 7 0	3 4.6 7 0	1 3.4 7	3.5	3.1 3 9
0 4 0 5	2 6 7 2	1.6 7 1	3 4.6 6 0	.	2.6 3	3 8.1 7	0.0 0	1 4 9.6	.		.	.		3 5 0 0	1.4 9 5	3 4.6 8 0	1 4.5 6	3.3	3.3 6 6

## Hydrographic Observation

No. 12 -2

STA-NO	LOCATION(Lat.)	LOCATION(Long.)	DATE/TIME(START) (JST)	DATE/TIME(END) (JST)	DEPTH				CRUISE.NO	SUB.NO
R F-4 0 7 4	1 6-2 9 N	1 6 4-5 9 E	7 m 2 1 d 0 1 h 1 1 m	7 m 2 1 d 0 5 h 2 8 m	5 4 7 4 m				1 1-0 8	-
Rem	CTD									

[illegible]

## No. 1

CRUISE NO			DATE (START)	DATE (END)	OCEAN AREA																	SHIP
1 1 0 8			7 1 8	7 2 1	WESTERN P A C I F I C																	R F
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80				
STA-NO	DATE	TIME JST	LOCATION (Lat.) N	LOCATION (Long.) E	WATER DEPTH m	DEPTH m	CURRENT DIRECTION (deg.)	SPEED kt	DEPTH m	CURRENT DIRECTION (deg.)	SPEED kt	DEPTH m	CURRENT DIRECTION (deg.)	SPEED kt	REM.	Temperature	Salinity (psu)	CTD STN-NO	BT STN-NO			
A F - 4 1 6	7 1 8	0 3 5 5	2 2-0 4 .	1 6 5-0 0 .	5 5 3 8	3 6	1 1 7	0.8	5 6	1 2 2	0.9	9 6	1 3 2	0.7								
A F - 4 1 6						1 5 6	1 2 9	0.5	1 9 6	1 2 0	0.5					2 9 0 9	3 5 1 8 1	R F - 4 0 6 3				
A F - 4 1 7	7 1 8	1 0 2 5	2 1-3 5 .	1 6 5-0 0 .	5 5 3 3	3 6	9 4	0.6	5 6	1 1 6	0.5	9 6	1 2 4	0.4								
A F - 4 1 7						1 5 6	1 7 1	0.2	1 9 6	1 8 6	0.2					2 8 9 2	3 4 9 7 7	R F - 4 0 6 4				
A F - 4 1 8	7 1 8	1 7 0 5	2 1-0 5 .	1 6 5-0 0 .	5 5 5 0	3 6	9 1	0.2	5 6	9 6	0.2	9 6	7 1	0.4								
A F - 4 1 8						1 5 6	1 1	0.3	1 9 6	4 9	0.3					2 9 3 5	3 4 9 8 3	R F - 4 0 6 5				
A F - 4 1 9	7 1 8	2 3 5 5	2 0-3 4 .	1 6 5-0 0 .	5 5 0 2	3 6	1 3 3	0.5	5 6	1 2 2	0.5	9 6	1 2 1	0.4								
A F - 4 1 9						1 5 6	8 6	0.3	1 9 6	7 5	0.2					2 9 0 0	3 4 7 8 8	R F - 4 0 6 6				
A F - 4 2 0	7 1 9	0 6 2 5	2 0-0 5 .	1 6 5-0 0 .	5 3 9 0	3 6	1 1 2	0.3	5 6	1 0 2	0.3	9 6	8 4	0.3								
A F - 4 2 0						1 5 6	1 0	0.2	1 9 6	2 0 8	0.2					2 8 9 1	3 4 7 1 2	R F - 4 0 6 7				
A F - 4 2 1	7 1 9	1 3 0 5	1 9-3 5 .	1 6 5-0 0 .	4 8 2 7	3 6	4 9	0.2	5 6	2 6	0.1	9 6	2 4 6	0.1								
A F - 4 2 1						1 5 6	1 9 1	0.3	1 9 6	2 3 1	0.3					2 9 0 2	3 4 7 8 0	R F - 4 0 6 8				
A F - 4 2 2	7 1 9	1 9 0 0	1 9-0 5 .	1 6 5-0 0 .	1 6 3 1	3 6	1 0	0.2	5 6	5	0.4	9 6	3 3 4	0.7								
A F - 4 2 2						1 5 6	3 3 8	0.8	1 9 6	3 3 6	0.6					2 8 8 2	3 4 7 0 8	R F - 4 0 6 9				
A F - 4 2 3	7 1 9	2 3 4 5	1 8-3 4 .	1 6 5-0 0 .	2 8 1 0	3 6	2 8 8	0.4	5 6	2 8 7	0.4	9 6	3 0 6	0.3								
A F - 4 2 3						1 5 6	3 3 4	0.4	1 9 6	3 1 4	0.5					2 8 7 4	3 4 7 1 6	R F - 4 0 7 0				
A F - 4 2 4	7 2 0	0 4 2 5	1 8-0 5 .	1 6 5-0 0 .	5 4 3 5	3 6	2 7 6	0.2	5 6	2 4 3	0.2	9 6	3 1 9	0.2								
A F - 4 2 4						1 5 6	3 0 4	0.3	1 9 6	3 0 8	0.3					2 8 7 3	3 4 7 4 5	R F - 4 0 7 1				
A F - 4 2 5	7 2 0	1 1 1 5	1 7-3 4 .	1 6 4-5 9 .	5 2 7 5	3 6	2 2 4	0.5	5 6	2 2 5	0.7	9 6	2 4 7	0.6								
A F - 4 2 5						1 5 6	2 5 2	0.5	1 9 6	2 4 0	0.4					2 9 1 1	3 4 9 0 3	R F - 4 0 7 2				
A F - 4 2 6	7 2 0	1 7 5 5	1 7-0 5 .	1 6 4-5 9 .	5 4 6 3	3 6	2 0 8	0.7	5 6	2 0 4	0.6	9 6	1 9 3	0.3								
A F - 4 2 6						1 5 6	2 1 6	0.5	1 9 6	2 1 4	0.5					2 8 9 2	3 4 8 8 6	R F - 4 0 7 3				
A F - 4 2 7	7 2 1	0 0 4 0	1 6-3 5 .	1 6 4-5 9 .	5 4 3 9	3 6	1 8 4	0.6	5 6	1 9 6	0.7	9 6	1 9 5	0.7								
A F - 4 2 7						1 5 6	2 2 4	0.3	1 9 6	2 1 9	0.4					2 8 8 0	3 4 9 0 9	R F - 4 0 7 4				
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80				