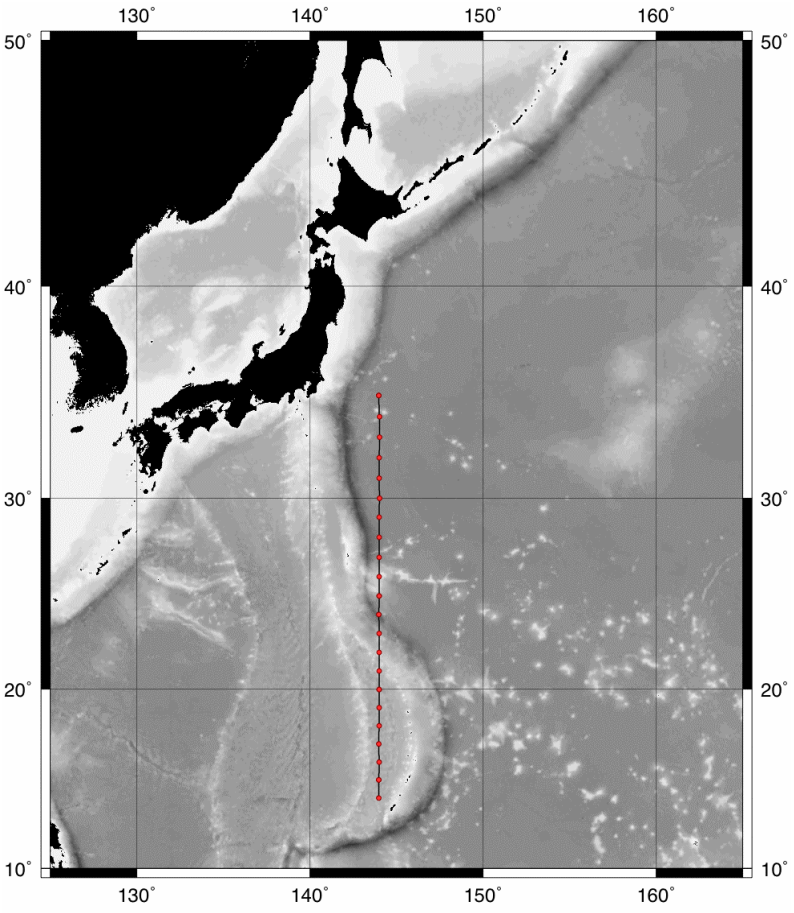
CRUISE REPORT: PR03

(Updated SEP 2011)



HIGHLIGHTS

CRUISE SUMMARY INFORMATION

WOCE Section Designation	**PR03**
Expedition designation (ExpoCodes)	**49RY9011_3**
Chief Scientists	**Shizuo Wakaki / JMA**
Dates	1990 DEC 4 to 1990 DEC 19
Ship	R/V *Ryofu Maru*
Ports of call	Guam, USA to Tokyo, Japan
Geographic Boundaries	35° 0' N 143° 58' E 144° 2' E 13° 59' N
Stations	5
Floats and drifters deployed	0
Moorings deployed or recovered	0

Recent Contact Information:

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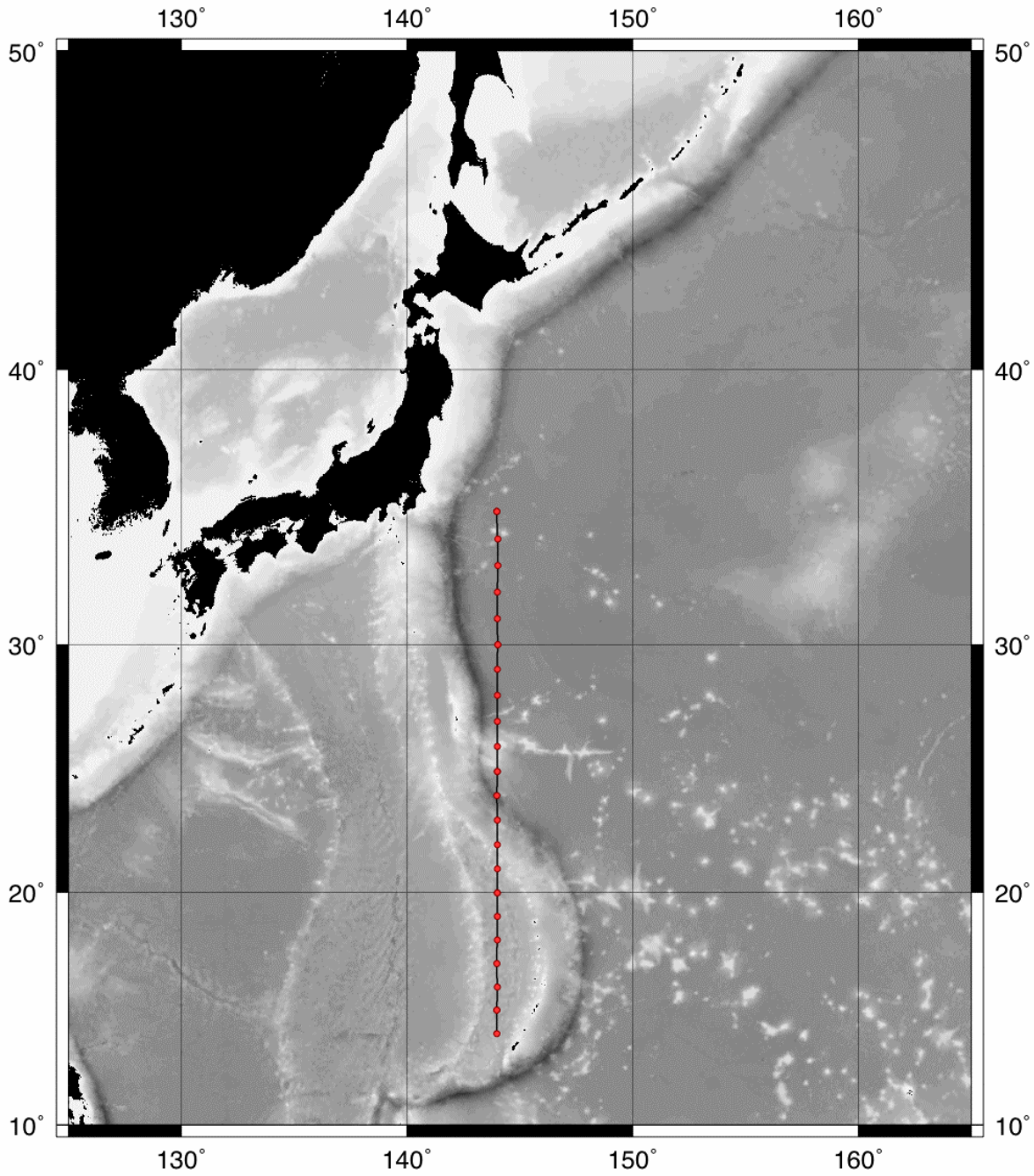
LINKS TO SELECT TOPICS

Shaded sections are not relevant to this cruise or were not available when this report was compiled.

Cruise Summary Information	Hydrographic Measurements
Description of Scientific Program	**CTD Data:**
Geographic Boundaries	Acquisition
Cruise Track (Figure): PI CCHDO	Processing
Description of Stations	Calibration
Description of Parameters Sampled	Temperature Pressure
Bottle Depth Distributions (Figure)	Salinities Oxygens
Floats and Drifters Deployed	**Bottle Data**
Moorings Deployed or Recovered	Salinity
	Oxygen
Principal Investigators	Nutrients
Cruise Participants	Carbon System Parameters
	CFCs
Problems and Goals Not Achieved	Helium / Tritium
Other Incidents of Note	Radiocarbon
Underway Data Information	**References**
Navigation Bathymetry	
Acoustic Doppler Current Profiler (ADCP)	
Thermosalinograph	
XBT and/or XCTD	
Meteorological Observations	**Acknowledgments**
Atmospheric Chemistry Data	
Data Processing Notes	

PR03 Wakaki/JMA (RYOFU MARU 1990) – 49RY9011_3



1. CRUISE SUMMARY INFORMATION

Cruise Track

The cruise track and station locations are shown in Figure 1. Observations of PR2 were carried out as part of the R/V RyofuMaru cruise RY9011 Leg 1 and Leg 2, and those of PR3 were Leg 3.

Stations Occupied

Observations of PR2 were carried out as part of the R/V Ryofu Maru cruise RY9011 Leg 1 and Leg 2, and those of PR3 were Leg 3.

Number Of Stations

A total of 28 CTD rosette stations for PR2 and 5 stations for PR3 was occupied using a General Oceanics 12 bottle rosette equipped with 12 1.7-liter Niskin water sample bottles, and an NBIS MK III B CTD. In addition, a total of 17 CTD stations for PR3 was occupied. No additional sensors were used with the CTD system.

Sampling

The following water sample measurements were made: salinity, oxygen, nitrate, nitrite and phosphate on all stations. The depths sampled were: 10, 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 400, 500, 600, 700, 800, 900, 1000, 1250, 1500, 2000, 2500, 3000, 4000 in meters on every station of PR2. On PR3, watersampling was carried out at only stations every 5 degrees in latitude. Surface water samples were collected by a bucket.

List Of Principal Investigators

The principal investigators responsible for the individual parameters measured on the cruise are listed in Table 1. (All the correspondence on these data should be addressed to the Director of the Oceanographical Division, Marine Department, Japan Meteorological Agency.)

Table 1: Principal Investigators for all measurements.

Name	Responsibility	Affiliation
H. Minami	CTD, S	JMA/MD
K. Fushimi	O2, Nutrients	JMA/MD

JMA/MD Marine Department, Japan Meteorological Agency

2. MEASUREMENT TECHNIQUES AND CALIBRATIONS

2.1 CTD

The CTD is NBIS Mark III B. An HP9000 Series 300 model 330 (Hewlette Packard) with 4 MByte of memory was used as the primary data collection device and all FSK signals of CTD data were backed up using the digital audio tape (DAT). The original sampling rate is 31.25 samples per second, however, our software gets around 20 samples per second and compress these into one tenth of collecteddata.

The temperature sensor was calibrated at the calibration facility of HAKUTO Co., Ltd. before the cruise. The results are shown in Table 2.

Table 2: CTD Calibration contents at laboratory

Temperature; linear fit

Time	Bias	Slope
Pre-Cruise	-0.0027	0.99977
(24 August 1987)		

The conductivity sensor was calibrated at sea using data from the measurements of salinity collected at 8 stations on PR2 and 5 stations on PR3. The salinometer is AUTOLAB model 1601 for the measurements of salinity of the water samples. The results are shown in Table 3. The calibration constant is determined assuming that the bias zero.

Table 3: The conductivity scaling factor

	Bias	Slope
RY7822-7834 (Leg 1)	0.0	0.99958
RY7835-7849 (Leg 2)	0.0	0.99978
RY7850-7871 (Leg 3)	0.0	0.99965

The temperature in "-.SEA" and "-.CTD" files are described with the international practical temperature scale of 1968 (IPTS-68).

2.2 Oxygen Measurements

The determination of dissolved oxygen was done by the modified version of the Winkler method described in "Kaiyo Kansoku Shishin (Manual on Oceanographic Observation)" published by the Japan Meteorological Agency(1970). The reagent blank was not subtracted. No estimation of accuracy and precision has been done.

Because no temperature data when samples were taken from bottles are recorded, it was assumed that the density of samples is 1022.156 kg/m3 (which assume the temperature for 28 degree C and salinity for 34.68) and use this value to convert from µmol/l to µmol/kg.

2.3 Nutrients Analyses

The nutrients analyses were done by the Technicon Auto Analyzer II described in "Kaiyo Kansoku Shishin (Manual on Oceanographic Observation)" published by the Japan Meteorological Agency(1970). No estimation of accuracy and precision has been done.

Because no temperature data while analyses are recorded, it was assumed that the density of samples is 1022.156 kg/m3 (which assume the temperature for 28 degree C and salinity for 34.68) and use this value to convert from µmol/l to µmol/kg.

2.4 Noted for the -.SUM, -.SEA and -.CTD files

2.4.1 -.SUM

The positions of observation stations were recorded at the beginning and end of the observation and these values were only recorded in minutes, so we describe the averaged position as the bottom (BO).

Since the surface water samples were taken by a stainless steel water bucket, "Number of bottle" includes this bucket sampling.

2.4.2 -.SEA

Our following parameters have the less precision than the required, we describe the last digit of data as blank to meet the data format: CTD temperature, CTD salinity, salinity, oxygen and nitrates.

2.4.4 -.CTD

CTD temperature and salinity data have the less precision than the required, we describe the last digit of data as blank to meet the data format.

The number of samples averaged at the pressure level was not available because our software was not recording the number of data during data processing.

3. REFERENCES

Japan Meteorological Agency, 1970: Kaiyo Kansoku Shishin (Manual on Oceanographic Observation). (in Japanese)

WHPO DATA PROCESSING NOTES

Event Date	Concat	Date Type	Summary
2000-08-04	Saiki, Masaro	BTL	Data are public
	I am pleased to inform you that the PIs and participants of the one-time and repeat cruises conducted by the Japan Meteorological Agency's vessels agreed to change most of the data status to public.		
2000-08-28	Buck, Heidi	CTD/BTL/SUM	Data added to website
	Added SUM, CTD, and BOT to website. Data are public. BOT file has some errors.		
2000-11-27	Uribe, Karla	Cruise Report	found in 'sum file' directory
	2000.11.27 KJU File contained here is a CRUISE SUMMARY and NOT sumfile. Documentation is online. 2000.10.11 KJU Files were found in incoming directory under whp_reports. This directory was zipped, files were separated and placed under proper cruise. All of them are sum files. Received 1997 August 15th.		
2001-01-31	Uribe, Karla	BTL	See Note:
	Carriage returns were removed from bottle data. The only error found with the bottle data was the following: following stn/csts had duplicate depths: RY7830/ 1 RY7830/ 2 station/casts converted= 56		
2001-04-17	Uribe, Karla	BTL	Exchange file online
	Bottle file was converted into Exchange format. Website now contains a link to the CSV file.		
2001-10-30	Uribe, Karla	SUM	Reformatted data online
	Small reformatting was done to the sumfile.		
2001-11-07	Uribe, Karla	CTD	Exchange file online
	CTD data has been converted to exchange format using the new WHPO code. Old file has been put inside the original directory and new file has been put online.		
2002-07-18	Uribe, Karla	CTD	file headers corrected, put online
	Original CTD files had a slight formatting problem in the Expocodes. The / were replaced by _. New files online.		