

Chapter 1 Outline of the Survey

1-1 Survey Title

The Cooperative Study on the Deepsea Mineral Resources in Selected Offshore Areas of the SOPAC Region, 2003
-Sea Area of Niue-

1-2 Survey Objective

The survey aims at the assessment of potential of manganese nodules by conducting deep seafloor mineral resources survey within the Exclusive Economic Zone (EEZ) of Niue, a member country of SOPAC. The survey comprises ship survey and data analysis for assessment of mineral resources and understanding of environmental characteristics within the sea area.

1-3 Survey Area

The survey area of the SOPAC project for fiscal year 2003 is a quadrilateral sea area (approximately 605,000 km²) within the EEZ of Niue, enclosed by geodesic lines connecting the following coordinates (Fig. 1-1). The area was selected in accordance with the joint study program for deepsea mineral resources in the EEZ of the SOPAC member countries agreed upon by the Japanese executing agency and South Pacific Applied Geoscience Commission (SOPAC) on February 27, 2003.

	Latitude	Longitude
a.	16° 00' S	173° 00' W
b.	16° 00' S	166° 00' W
c.	23° 00' S	166° 00' W
d.	23° 00' S	173° 00' W
a	16° 00' S	173° 00' W

1-4 Survey Period

Survey Period: November 8, 2003 to December 5, 2003

(Departed Majuro on November 10, 2003, and arrived at Majuro on December 4, 2003.

The period of survey in Niue area is from November 17, 2003 to November 23, 2003.)

Analysis and other works: April 1, 2003 to March 31, 2004

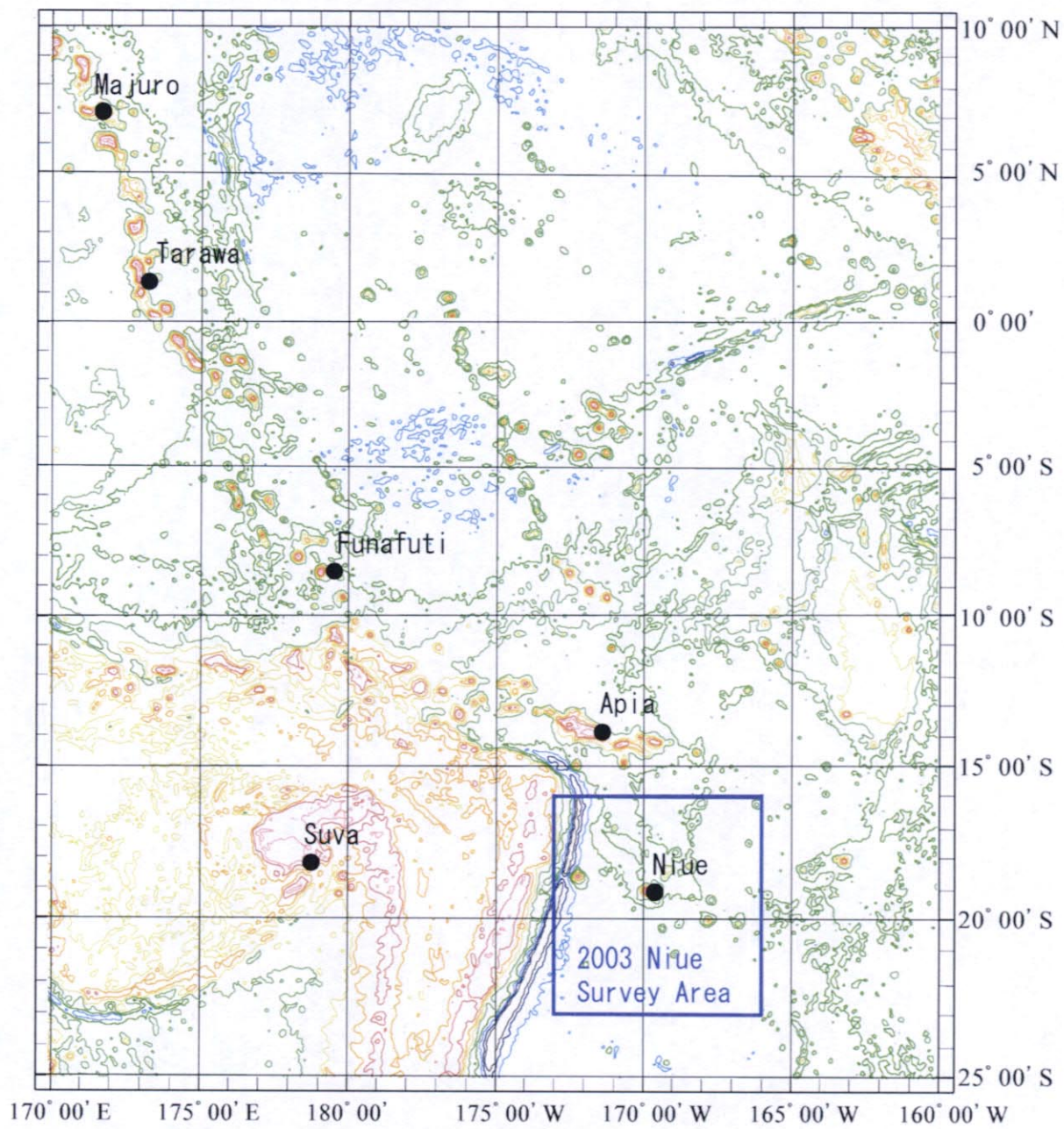


Fig. 1-1 Location Map of the Survey Area

1-5 Survey Participants

Negotiation for the Agreement

Japanese Participants

Yoshitaka HOSOI (Metals Research & Development Group, JOGMEC)

Hiroyuki YASUNO (Mineral and Natural Resources Division, Agency for Natural Resources and Energy)

Masayoshi KAMEYAMA (Metals Research & Development Group, JOGMEC)

Norihiro YAMAJI (Overseas Cooperation Section, JICA)

Natsumi KAMIYA (Representative, JOGMEC Canberra Office)

Consigning Participants

Kodaro GALLEN (Federated States of Micronesia)

Tania T. TAGICAKIBAU (The Republic of the Fiji Islands)

Bhaskar RAO (The Republic of the Fiji Islands)

Meita BEIABURE (The Republic of Kiribati)

Alfred SIMPSON (The Government of Niue)

Alfred SIMPSON (SOPAC SECRETARIAT)

Russell HOWORTH (SOPAC SECRETARIAT)

Cristelle PRATT (SOPAC SECRETARIAT)

Nobuyuki OKAMOTO (SOPAC SECRETARIAT)

Survey Members

Team Leader Nobuyuki MURAYAMA

(Deep Ocean Resources Development Co., Ltd.: DORD)

Survey Members

Nobuhiro GOTO (DORD)

Kazunori MATSUI (DORD)

Saburo TACHIKAWA (DORD)

Mutsuo KONDO (DORD)

Kazuyuki KADOSHIMA (DORD)

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Tsutomu SATO (OED)

Takeshi SETSUTAI (OED)

Susumu KANZAKI (OED)

Takashi SOEJIMA (OED)

Nobuhiro YAMAMOTO (OED)

Trainee

Richard A. T. SIATAGA (The Government of Niue)

Atauea NAOMI (The Republic of Kiribati)

1-6 Amount of Work

The work given on Table 1-6-1 was conducted according to the schedule given on Table 1-6-2.

Table 1-6-1 List of Survey Achievements

	Item	Achievements
Survey Schedule	Depart Majuro Arrive in the survey area of Niue Start Survey Finish Survey Depart survey area of Niue Arrive Majuro	Nov. 10 10:00 Nov. 16 15:03 Nov. 17 06:08 Nov. 23 21:18 Nov. 24 21:57 Dec. 4 12:00
Sampling	Free-Fall Grab (FG) Spade Corer (SC) Arm Dredge (AD)	29 points 7 points 2 points
Deep Sea Observation	Use of Deep Sea One-Shot Camera Acquired Photographs with FG Acquired Photographs with SC	 29 Sheets 7 Sheets
CTD	Effective TD Effective CTD	1 location 1 location
Acoustic Sounding	NBS 30.0 KHz PDR 12.0 KHz nSBP 3.5 KHz MBES 15.5 KHz	Length of Traverse 858.2nm 858.2nm 858.2nm 858.2nm
Data Processing	MBES Map Composing	CD-ROM Traverse Line, Sea Bottom Topography, Profile and Bird-eye Map etc.

Table 1-6-2 Records of Survey Schedule

No. of Days	Month/Day		Survey Items	Topography Survey (Cumulative Length)	Remarks
1	11/8	Sat			Preparation for Sailing
2	9	Sun			Preparation for Sailing
3	10	Mon			Lv. Majuro (10:00)
4	11	Tue			Sailing & Preparation
5	12	Wed			Sailing & Preparation
6	13	Thu			Sailing & Preparation
7	14	Fri			Sailing & Preparation
8	15	Sat			Sailing & Preparation
9	16	Sun			Sailing & Preparation
10	1	17	Mon	Mn Nodule Survey 03501 (SC01,FG02,03) 03502 (FG01,02,03)	142.3 (142.3) Arrive survey area (15:03) Start survey (06:00)
11	2	18	Tue	Mn Nodule Survey 03503 (SC01,FG01,02) 03504 (FG01,02,03)	138.4 (280.7)
12	3	19	Wed	Mn Nodule Survey 03505 (SC01,FG02,03) 03506 (FG01,02,03)	138.6 (419.3)
13	4	20	Thu	Mn Nodule Survey 03507 (SC01,FG02,03) 03508 (FG01,02,03)	141.3 (560.6)
14	5	21	Fri	Mn Nodule Survey 03509 (AD01) 03510 (FG01,02,03)	157.4 (718.0)
15	6	22	Sat	Mn Nodule Survey 03511 (AD01) 03512 (SC01,FG02,03)	140.2 (858.2)
16	7	23	Sun	Mn Nodule Survey 03513 (SC01,FG02,03) 03514 (SC01,FG02,03)	Finish survey and Depart for Kiribati
17	24	Mon			Depart survey area (21:57)
18	25	Tue			Sailing & Preparation
19	26	Wed			Sailing & Preparation
20	27	Thu			Sailing & Preparation
21	28	Fri			Sailing & Preparation
22	29	Sat			Sailing & Preparation
23	30	Sun	Co-rich Crust Survey 03SE01 MC01	137.1 (137.1)	Arrive survey area (05:26) Start survey (11:30)
24	8	12/1	Mon	Co-rich Crust Survey 03SE01 MC02,03,04,	93.1 (230.2)
25	9	2	Tue	Co-rich Crust Survey 03SE01 AD10,11,12,13	77.7 (307.9)
26	10	3	Wed	Co-rich Crust Survey 03SE01 AD14,15,16	Finish survey (16:42) Depart survey area (17:58)
27	4	Thu			Ar. Majuro (12:00)
28	5	Fri			Meeting

1-7 Survey Apparatus and Equipments

Major apparatus and equipments used for the survey are shown in Table 1-7-1, and photographs of main survey equipments are shown in Figure 1-7-1.

Table 1-7-1 Survey Apparatus and Equipments

	Survey Method	Survey Apparatus and System	Abbreviation
Positioning	Satellite Navigation	Global Positioning System	GPS
Sea Bottom Topography and Geological Survey	Acoustic Sounding Bathymetry Topography	Multi narrow-Beam Echo Sounder	MBES
		Narrow Beam Echo Sounder	NBS
		Precision Depth Recorder	PDR
	Sea bottom Sound Pressure	Multi Frequency Exploration System	MFES
	Subsurface Geological Structure	narrow-Beam Sub-Bottom Profiler	nSBP
	Seawater Sonic-Velocity Survey	Conductivity, Temperature and Pressure Measuring System	CTD TD
Sampling		Free-Fall Grab	FG
		Spade Corer	SC
Sea Bottom Observation	Photograph	Deep Sea One-Shot Camera	
Data Recording and Processing	On-Line Functions	LAN	DAS
		MBES Real-time Mapping System	
	Data Storage Functions	Data Sampling System	
	Off-Line Functions	MBES Post-processing System Off-line recovering system Analysis PC	
Image Processing PC		Traverse Line, Sea Bottom Topography, Various Plane Map and Profile etc.	



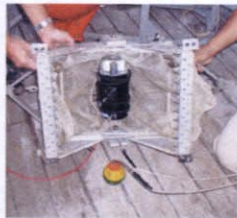
Spade Corer (SC)



Free-fall Grab (FG)



Grab for Collecting samples



One-shot Deepsea Camera



AD



Arm Dredge Bucket (AD)



Conductivity, Temperature and Depth Measuring System (CTD)



Bottom Pinger (Transmitter)



Weights for AD (250kg/piece)

Fig. 1-7-1 Photographs of Main Survey Equipments