SUMMARY REPORT ON THE JAPAN/SOPAC COOPERATIVE DEEP-SEA MINERAL RESOURCES STUDY PROGRAMME, FOUR R/V HAKUREI-MARU NO.2 CRUISES, FOR POLYMETARIC MANGANESE NODULES, THE EEZ OF THE COOK ISLANDS

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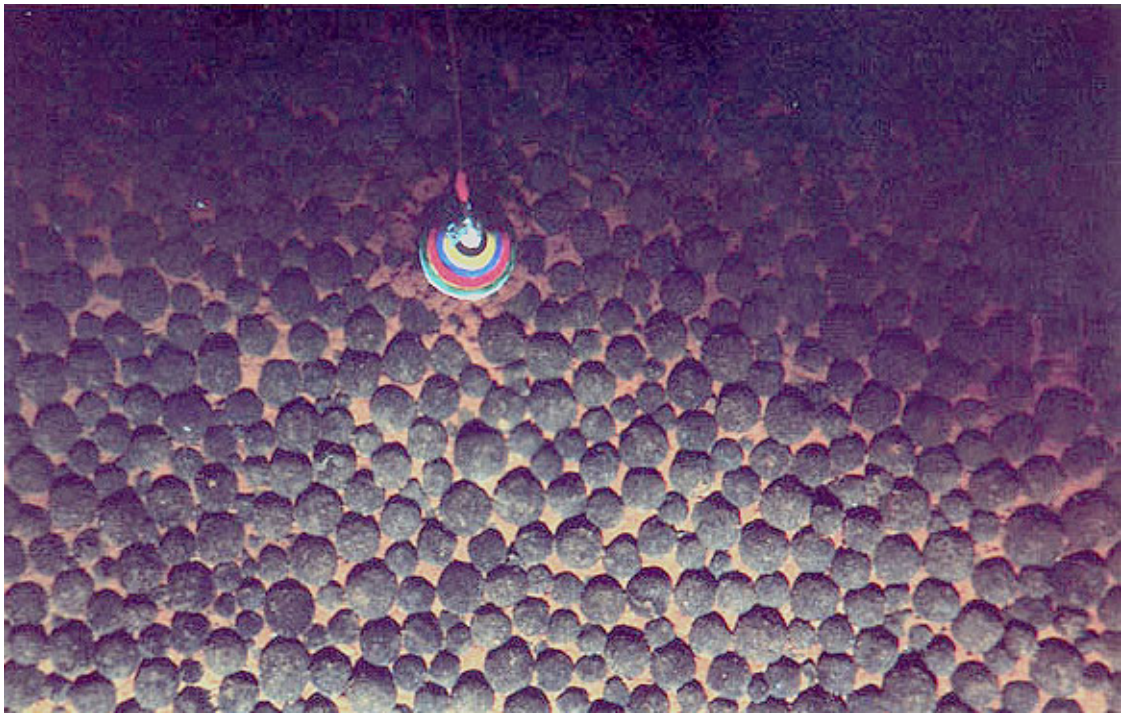

The Programme is funded by the Government of Japan

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I INTRODUCTION

The Government of Japan As the first year of the three-year Japan/SOPAC Cooperative Deep-sea Mineral Resources Study Programme (hereafter referred to as the Programme) as first phase of the second stage, a research cruise was carried out in the Exclusive Economic Zone (hereafter referred to as EEZ) of the Republic of the Cook Islands in May 2000.

Three cruises using the Research Vessel (R/V) Hakurei Maru No.2 surveyed the EEZ of the Cook Islands in 1985, 1986 and 1990 to assess the potential for manganese nodules (see Appendix-1) as the first stage of the Programme. The surveys identified and sampled a total of 146 sampling stations. In the results of the survey cruises, high concentration area of manganese nodule was confirmed within the central part of the EEZ of the republic of the Cook Islands.

The 2000 survey cruise has been conducted more detailed surveys of high concentration area for manganese nodule discovered in the EEZ of the Republic of the Cook Islands in 1985, 1986 and 1990, that were identified, to: estimate nodule resource; and, conduct environmental surveys to obtain the current environmental condition for future in marine mining activities.

Prior to the survey cruise, a cruise plan was finalized by the Metal Mining Agency of Japan (MMAJ) and SOPAC. The cruise carried out from June 6 to July 10 2002 by the R/V was implemented by scientists from Deep Ocean Resources Development Co. Ltd. (DORD) with crews from Ocean Engineering Development Co. Ltd (OED). Also, one scientist from the government of the Cook Islands as an on-board trainee joined the cruise. A representative from the SOPAC secretariat was cancelled to join the cruise due to the political situation in Fiji Islands.

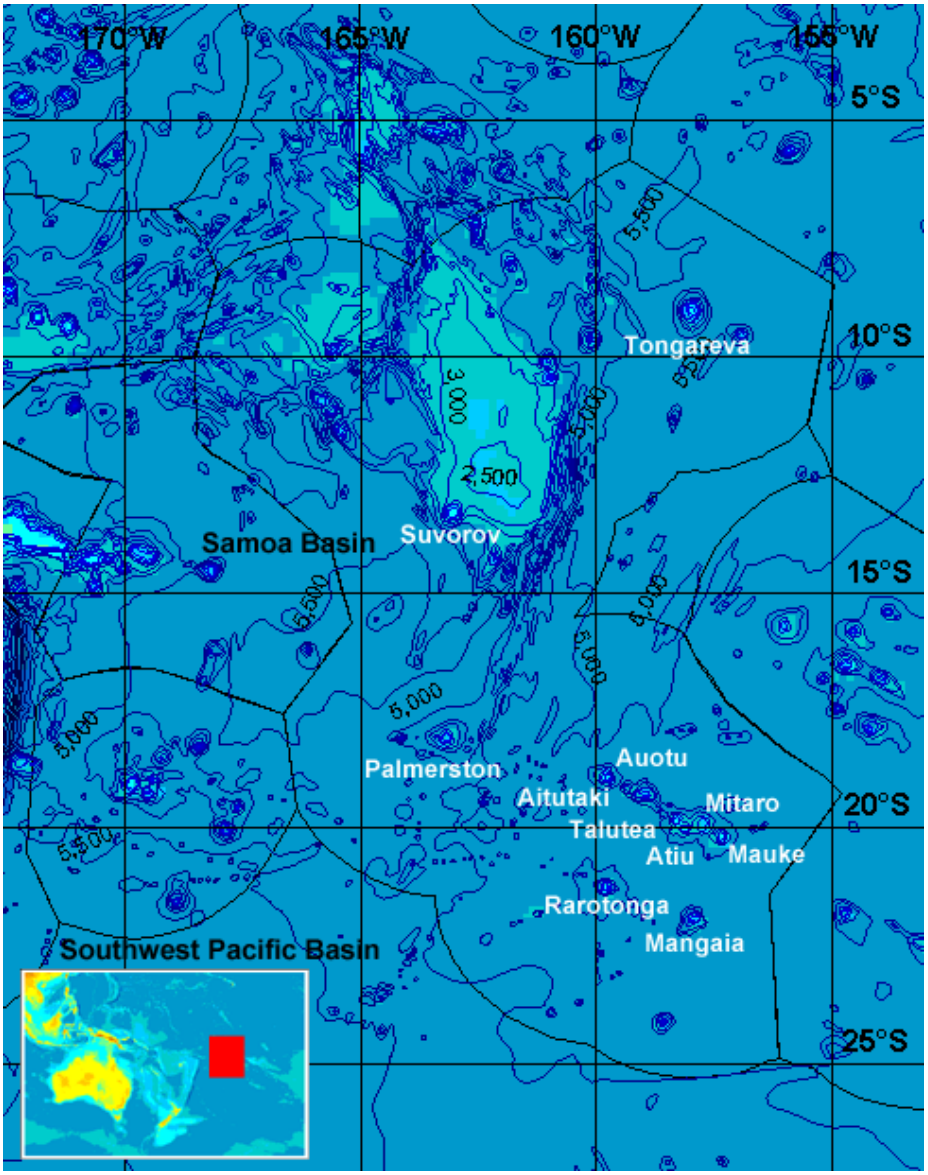
The 2000 survey cruise using the Free-fall Grab (FG) and a box corer call the Spade Corer (SC) had been conducted at 7.5 mile grid interval in the high concentration area of the central part of the EEZ of the Cook Islands and with supplementary sampling of the previous survey.

This report outlined the results of the survey cruise and analysis of samples and data collected during cruise including cruise results of previous survey.

II FEAUTURE OF THE EEZ OF THE COOK ISLANDS

The EEZ of the Cook Islands is located in the southwestern part of the Pacific Ocean and extends south-southeastward in a narrow zone from the Tongareva island of the western margin of the South Penrhyn Basin to the Southwest Pacific Basin (Figure 1).

On the northern part of the EEZ, Manihiki Plateau which is 500km in the east-west direction and 750km in the north-west direction.
A submarine ridge extends in the NNE-SSW direction from the eastern edge of the Manihiki Plateau. The Samoa Basin lies to the west. Palmerstone, Aitutaki, Mangaia and other islands of the South Cook Islands extend in the WNW-ESE direction of the south part of the EEZ.



Figiure-1 Location Map of the Survey Area

III SURVEYED AREA

Total of four (4) cruises for manganese nodules had been conducted in the EEZ of the Cook Islands in this Programme (see Figure-2).
Three cruises using the Research Vessel (R/V) Hakurei Maru No.2 surveyed the EEZ of the Cook Islands in 1985, 1986 and 1990 to assess the potential for manganese nodules. North, central and south part of the EEZ of the Cook Islands had been conducted in 1985, 1986 and 1990 respectively. Nodule sampling using Free-fall Grab (FG) and a box corer call Spade Corer (SC) was conducted at 38 in 1985, 60 in 1986 and 48 sampling stations in 1990.
The 2000 survey cruise as forth cruise has been conducted more detailed surveys of high concentration area for manganese nodule discovered in the EEZ of the Republic of the Cook Islands in 1985, 1986 and 1990, that were identified, to: estimate nodule resource; and, conduct environmental surveys to obtain the current environmental condition for future in marine mining activities.
Past cruise schedules, which had been conducted during the Programme, are shown in Appendix-2.

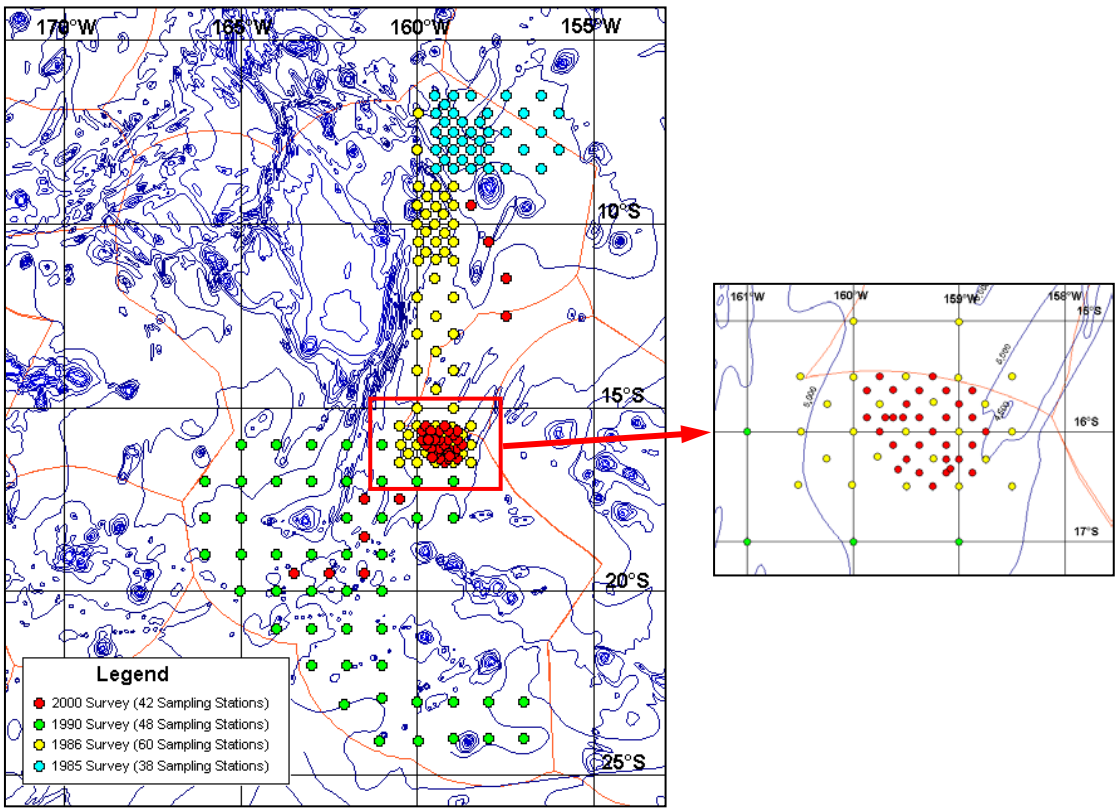


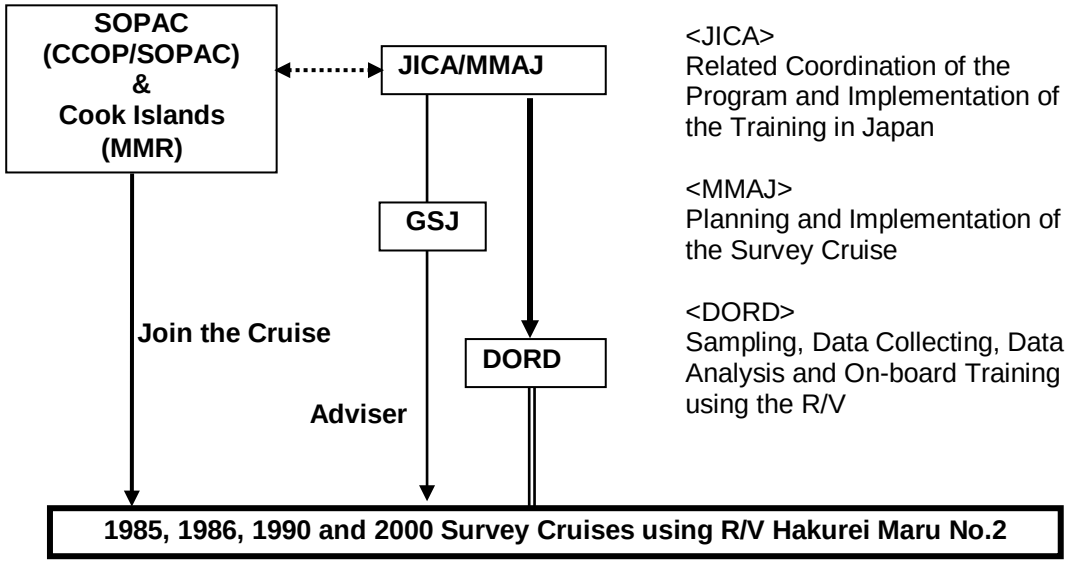
Figure-2 Survey Area conducted during Past Four Cruises in this Programme in 1985, 1986, 1990 and 2000 (Orange colour line indicates EEZs boundaries)

IV IMPLEMENTING STRUCTURE OF THE PROGRAMME

Implementation of the survey cruise had been consigned to the Japan International Cooperation Agency (JICA). Considering the technical nature of the geological and mineral prospecting studies, JICA commissioned the Metal Mining Agency of Japan (MMAJ) to execute the survey cruise.

MMAJ entrusted on-board sampling and data analysis including adequate education and training of Coastal State personnel to the Deep Ocean Resources Development Co., Ltd. (DORD) that was established to carry out the development of the deep-sea mineral resources by major private companies in 1982. Also, DORD assumed the status of "Pioneer Investor" from the Japanese government and received exclusive right call "Contractor Area", extending some 75,000km^2 to prospect manganese nodules in the Clarion-Clipperton zone, off south-east of Hawaii (see Figure-3).

List of on-board scientist s including representative of costal state are shown in Appendix-3.



JICA: Japan International Cooperation Agency
MMAJ: Metal Mining Agency of Japan
GSJ: Geological Survey of Japan

DORD: Deep Ocean Resources Co. Ltd.
SOPAC: South Pacific Applied Geoscience Commission
CCOP/SOPAC: Committee for Co-ordinationof Joint Prospecting for Mineral Resources in the South Pacific Offsgore Areas
MMR: Ministry of Marine Resources (Cook Islands)

Figure-3 Implementing System of the Programme

V SURVEY MMETHODS

5-1 Survey Strategy

Survey cruises comprised of three stages as survey strategy. The first stage of the survey for manganese nodules within the EEZ of the Cook Islands was conducted at 42 from 60 nautical miles or 78 from 111 km interval sampling using Free-fall Grab (FG) and a box corer call Spade Corer (SC).
Then, the second stage as a next step was sampled at 21 from 30 nautical miles or 39 from 56km interval within promising area found during the first step sampling using same samplers.
Final step, the third step was conducted in the nodule high concentration area at 10 nautical miles or 19 km interval.
Acoustic sounding data was also collected during the survey and sea bottom observation survey using deep-sea camera with TV camera to identify distribution of manganese nodules.
Figure-4 shows sampling interval in the prpgramme, and Table-1 shows the survey strategy for manganese nodule investigation within the EEZ of the Cook Islands in this Programme.

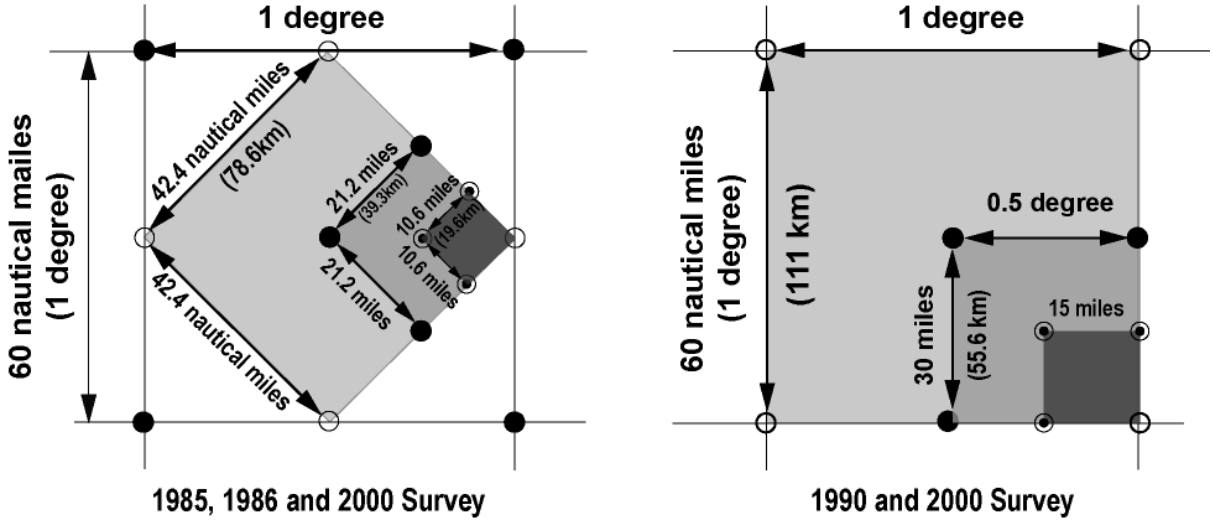


Figure-4 Stage of Sampling for Manganese Nodules in the EEZ of the Cook Islands in this Programme

Table-1 Survey Strategy within the EEZ of the Cook Islands in this Programme

Surveyed Year	Location	Sampling Stage	Area	Survey Methods
1985	North part of the EEZ	I	85,000km^2	42 mile grid sampling (20 Stations)
				Acoustic sounding survey (SBP, PDR, NBS and NFES): 2,659 nautical miles
				Deep-tow Survey (Deep-sea Camera (CDC): 64.56 miles with three track lines
		II	40,000km^2	21mile grid sampling (18 Stations)
1986	Central part of the EEZ	I	273,700km^2	42 mile grid sampling (26 Stations)
				Acoustic sounding survey (SBP, PDR, NBS and NFES): 4,187.4 nautical miles
				Deep-tow Survey (Deep-sea TV Camera (FDC): 98.0 nautical miles with four track lines
		II	50,000km^2	21mile grid sampling (34 Stations)
1990	South part of the EEZ	I	1,037,000 km^2	60 mile grid sampling (48 Stations)
				Acoustic sounding survey (SBP, PDR, NBS and NFES): 3,785 nautical miles
				Deep-tow Survey (Deep-sea Camera (CDC): 98.0 nautical miles with four track lines
2000	Central part of the EEZ	III	25,000km2	10 mile grid sampling (27 Stations)
				AD sampling: 2 Stations LC Sampling: 3 Stations
				Deep-tow Survey (Deep-sea Camera (FDC): 98.0 nautical miles with four track lines
				Environmental Survey
	North part of the EEZ	I	-	60 mile grid sampling (4 Stations)
	South part of the EEZ	II		30 mile grid sampling (6 Stations)
	Acoustic sounding survey (nSBP, MBES, NBS and MFES): 2,191.1 nautical miles			

5-2 Survey Tools and Sampling Methods

The survey cruise in the first stage consists of various acoustic sounding such as Precision Depth Recorder (PDR), Narrow Beam Sounder (NBS) and Sub Bottom Profiler (SBP), and sampling mainly by Free-fall Grab (FG), occasionally by a box corer call Spade Corer (SC) at each sampling station. The distribution of manganese nodules was also estimated from data obtained by Multi Frequency Exploration System (MFES) that is calculated continuously from sound pressure data of NBS, PDR and SBP. Seafloor observation. Seafloor observation using Continuous Deep-sea steal Camera or Finder-installed Deep-sea Camera for observation of the actual distribution of manganese nodules on the seafloor was established in the survey areas.

In 2000, the second stage, mainly FG same as that of the first stage, and only SC and Large-gravity Corer (LC) at certain points were used carried out sampling. Acoustic sounding using Multi narrow-Beam Echo Sounder (BMES) that area of mapping is twice that of the water depth, Narrow Beam Sounder (NBS) and narrow-beam Sub Bottom Profiler (nSBP) was conducted at selected areas from the results of the survey in the first stage. Seafloor observation using FDC for observation of the actual distribution of manganese nodules on the seafloor was established in the survey areas. Environmental survey was conducted to obtain environmental condition for use marine mining activities in future.
Survey and Sampling Platform Tools are shown in Figure-5 and main survey equipment using the survey Programme shows Figure-6. Table-2 indicates sampling tools each survey cruise for this Programme.

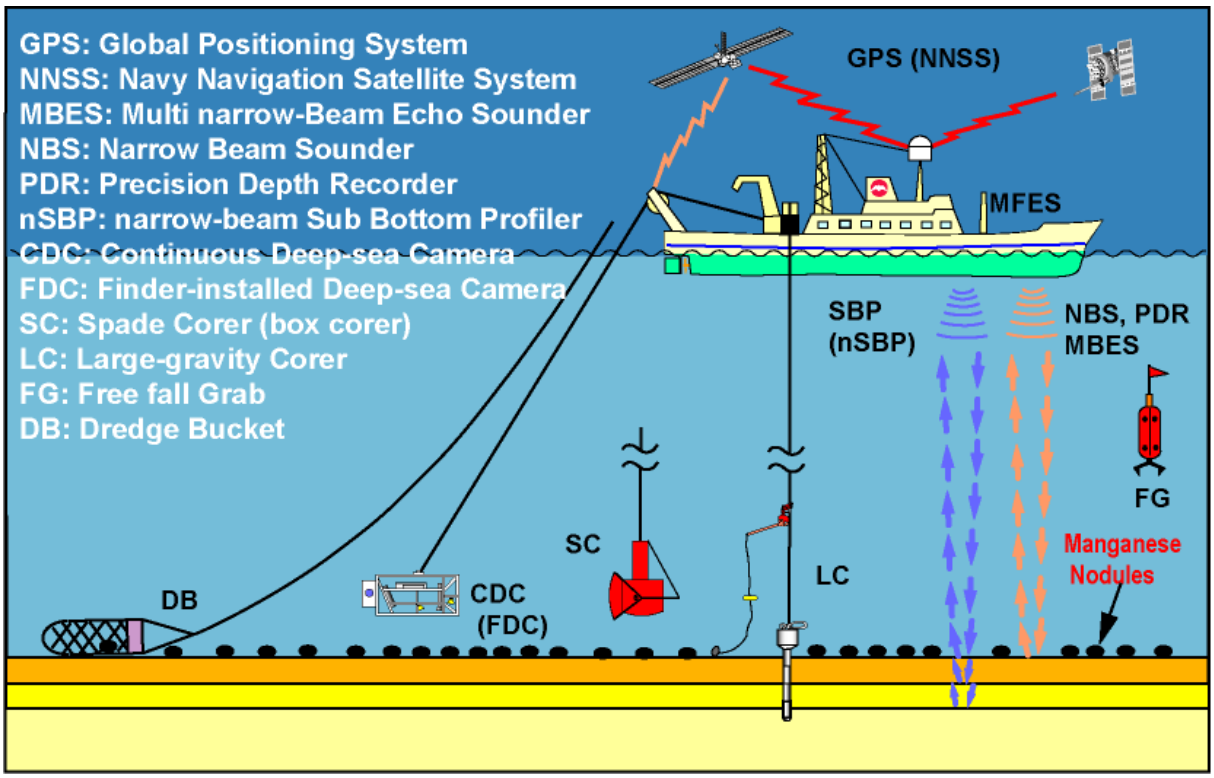
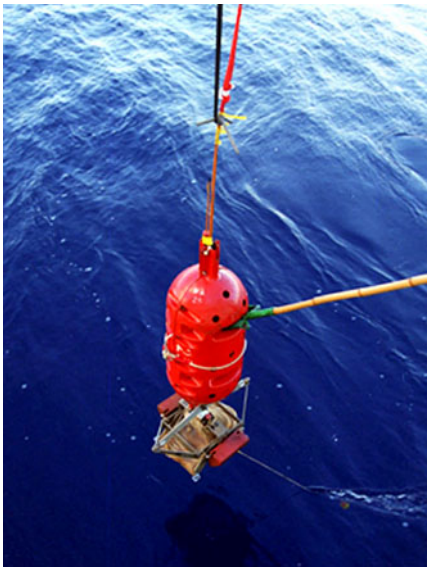
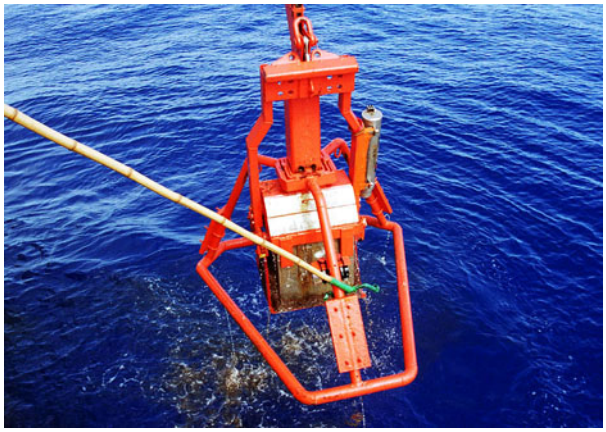


Figure-5 Survey and Sampling Platform Tools

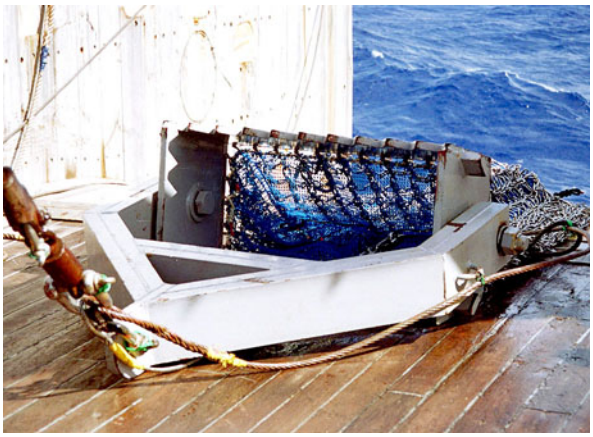


Free-fall Grab (FG)

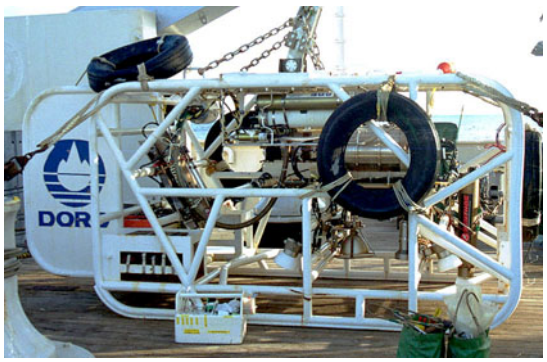


Spade Corer (SC)

Large gravity Corer (LC)



Armed Dredge (AD)



Dee-sea Camera (FDC, CDC)

Figure-6 Main Survey Equipment for the Survey Cruises

At each station, three samplings were done in the following manner. The base sampling point of each station was set at the southern apex of a right-angled isosceles triangle and two other samplings were done at the other two apexes of the triangle, each of which are respectively located at distance of 1.4 nm to the northwest and northeast of the base point. For each station sampling was done in clockwise direction as shown in Figure-7.

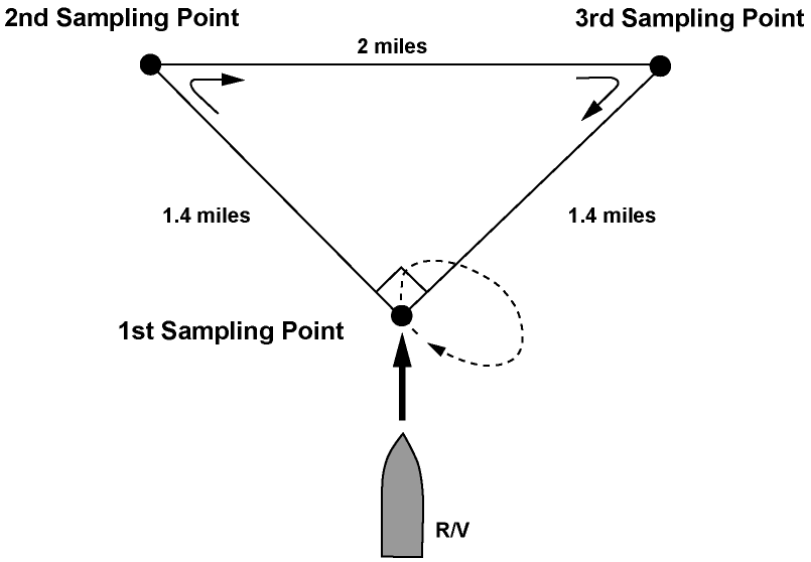


Figure-7 Setting Order of Three Sampling Points each Sampling Station

Table-2 Sampling Tools Each Survey Cruise for this Programme

Stage of the Programme	Surveyed Year	Survey Method	Survey Tools	
			Manganese Nodule Investigation	Environmental Survey
1st Stage	1985	Sampling	FG, SC	
		Seafloor Observation	CDC	
		Acoustic sounding	PDR, NBS, SBP, MFES	
	1986	Sampling	FG, SC	
		Seafloor Observation	FDC	
		Acoustic sounding	PDR, NBS, SBP, MFES	
	1990	Sampling	FG, SC, AD	
		Seafloor Observation	CDC	
		Acoustic sounding	PDR, NBS, SBP, MFES	
2nd Stage	2000	Sampling	FG, SC, LC, AD	SC
		Seafloor Observation	FDC	FDC
		Acoustic sounding	MBES, NBS, nSBP, MFES	

VI TOPOGRAPHY

This area is narrow and is elongated extensively with the NE-SW direction between the Samoa Basin and Southwest Pacific Basin in the south and the northern part is within the southern Penrhyn Basin of the Central Pacific Ocean. The northwest side is adjacent to the extensive Manihiki Plateau (relative height 1,500~2,000m). A linear submarine ridge extending in the NNE-SSW direction borders this area and the Manihiki Plateau (see Figure-8).

The Samoa Basin in the western part is a 5,000~5,700m deep area bordered by Manihiki Plateau and Palmerston Island. The Basin is deep and the seafloor flat, but many small sea knolls are observed within.

The southern Penrhyn Basin in the north has, on the whole, flat seafloor of 4,900~5,500m deep and it becomes deeper to the north with some troughs deeper than 5,500m to the south of the Penrhyn Island. The characteristics of these sea areas are mentioned below.

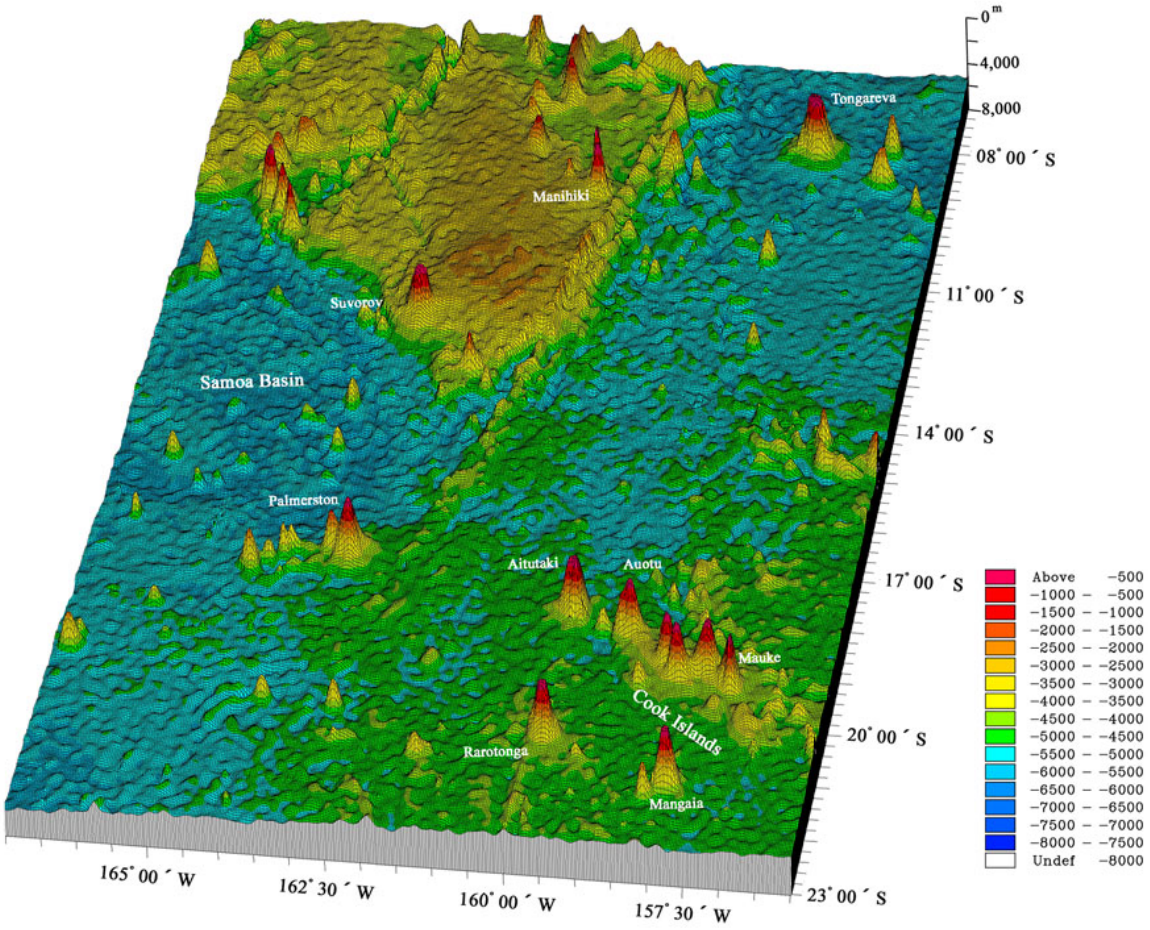


Figure-8 Bird's-eye View of the Survey Area using Satellite Data

Mapping using the Multi narrow-Beam Echo Sounder (BMES) had been conducted in the most concentrated area within the survey area, being carried out by 80 mile track lines in the E-W direction at 4 mile intervals by the 2000 survey cruise (Figure-9).

This area was classified as “semi-flat” by the 1986 survey, and many seamounts and sea knolls are observed. Most prominent and representative seamount is observed at 16º20’S, 159º33’E in the deepest basin in the southwestern part of the area and it’s summit is 2,900m deep with relative height of 3,000m. The summit of this seamount is the shallowest part of the area. This seamount is accompanied by many knolls and forms a seamount chain extending in the N30ºW direction. Caldera-type depressions are observed at the summits of these knolls. Small pinnacles of about 1 mile in diameter are, also, dominant near this seamount and the seafloor shallower than 5,000m have very complex topography with many undulations (see Figure-10).
At the northeastern end of this area, a small-scale sea knoll chain occurs elongated in the same direction as the above seamount chain and a relatively flat area extend between the two.

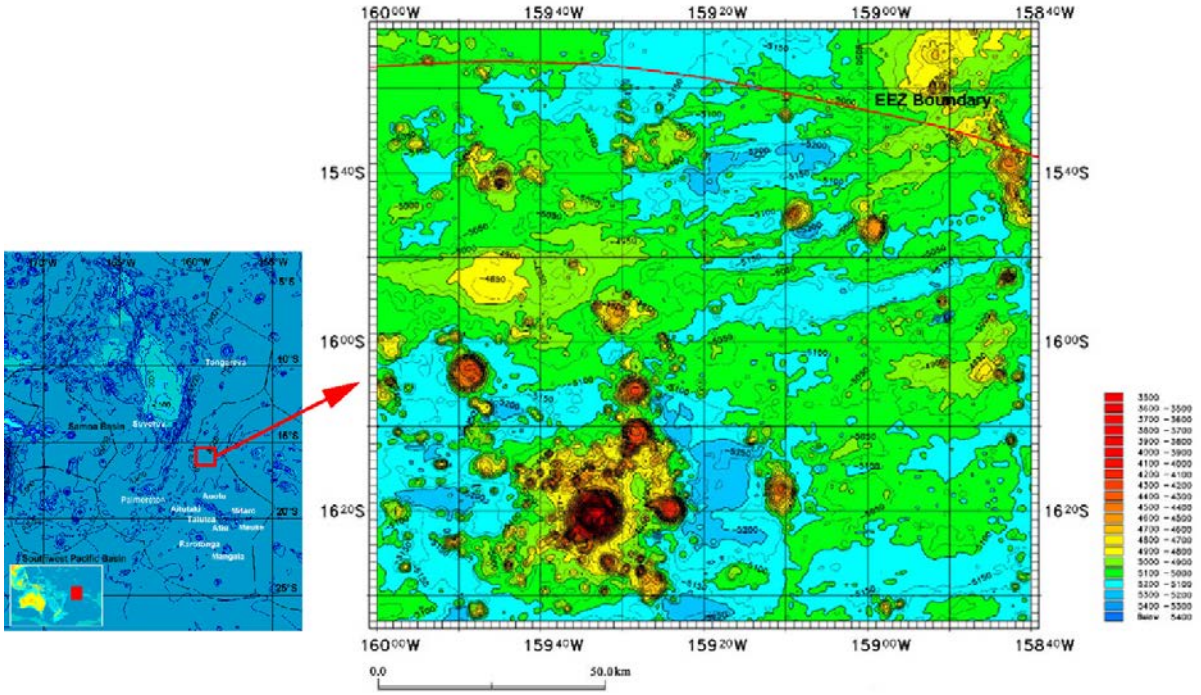


Figure-9 Bathymetry Mapped by the Multi narrow-Beam Echo Sounding Data

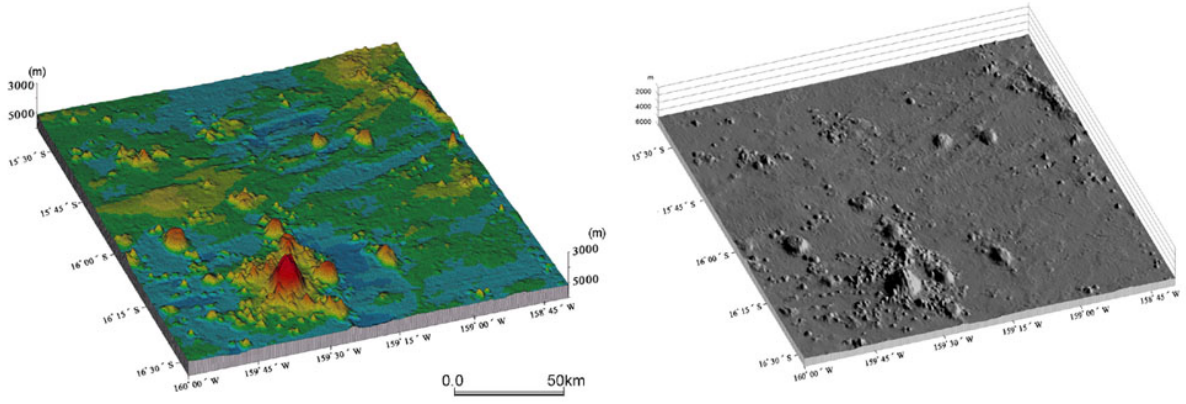


Figure-10 Bird’s-eye View of the Bathymetric Map (left) and Shaded Map (light)

VII DISTRIBUTION AND CHEMISTY OF MANGANESE NODULES IN THE EEZ OF COOK ISLANDS

7-1 Nodule Abundance

At a total of 188 stations in the EEZ of the Cook Islands, bottom samples of manganese nodules were collected with associated sediments, employing Free-fall Grab (FG), a box corer call Spade Corer (SC), a dredge bucket call Armed Dredge (AD) and/or Large-gravity Corer (LC). Calculated abundance at each sampling station, which means average abundance of sampling attempts conducted at a sampling station, ranges from nil to 36.7 kg/m^2.
The first three survey cruises revealed that there are up to 30kg/2 high nodule abundance area at the centre area of the EEZ of the Cook Islands. The fourth cruise in 2000, more detailed survey was conducted within the promising area. (see Figure-3).
Figure-11 shows nodule abundance based on the results of the Programme in the EEZ of the Cook Islands. The four cruises revealed that area of up to 30kg/m2 of nodule abundance is extended at around the central part of the EEZ of the Cook Islands.

The summaries of sampling results of past four survey cruises in this Programme are shown in Appendix-4.

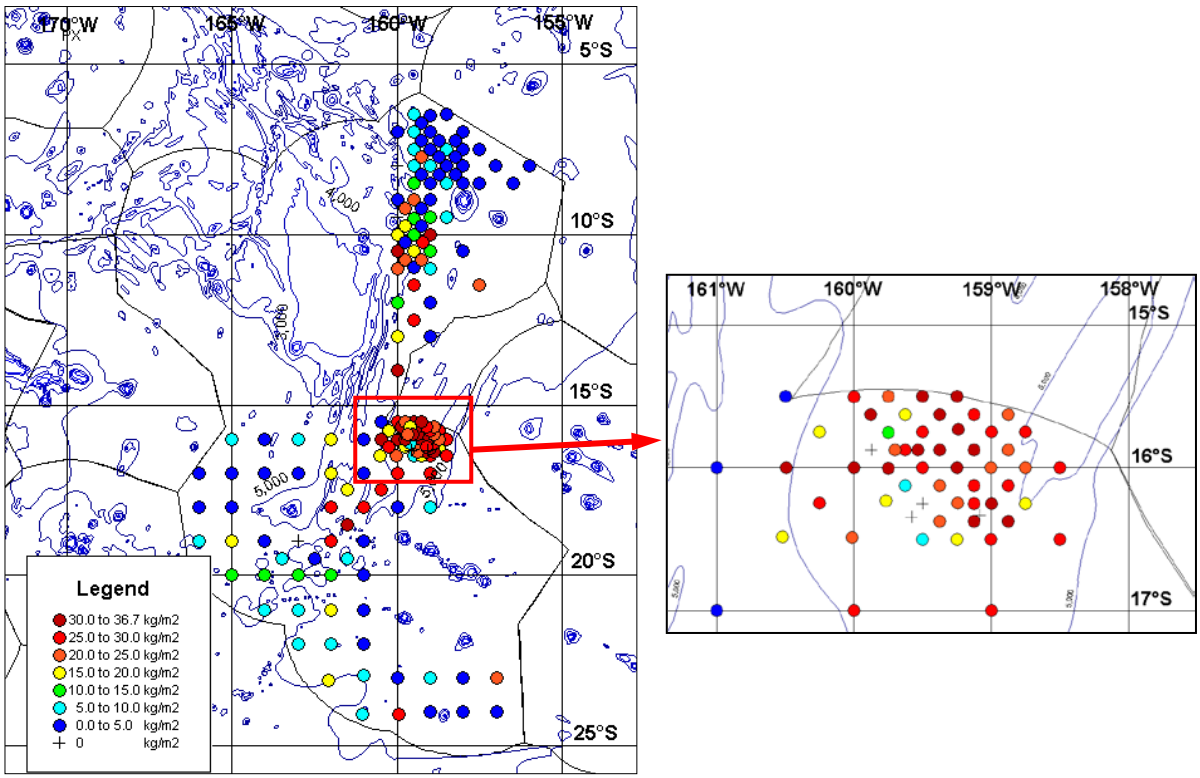


Figure-11 Nodule Abundance Confirmed by the Programme

Fifteen marine scientific research cruises for manganese nodules had been conducted by significant countries and organization, not only Japan but also New Zealand, Cook Islands, CCOP/SOPAC, US, Australia, Germany France since 1978. Table-3 indicates research cruises that have conducted for manganese nodule surveys in the EEZ of the Cook Islands.
Total of 317 sampling data collected by the fifteen survey cruises are inputted in a SOPAC Deep-sea Mineral Database.
The estimation of manganese nodule abundance should be used sampling data as many as possible.
Figure-12 shows counter map of nodule distribution described using the SOPAC deep-sea database collected from past fifteen cruises. Up to 15kg/m^2 of nodule abundance was extended over about 130,000km2 in the EEZ of the Cook Islands.
Particularly, up to 25kg/m^2 of nodule high abundance area, which extends over about 20,000km^2 was recognized at around 16^{o}S 160 ^{o}W, central area of the EEZ of the Cook Islands.

Table-3 Marine Research Cruises Conducted for Manganese Nodule Surveys in the EEZ of the Cook Islands

Research Vessel	Surveyed Year	Country (Organization)
Tangaroa	1974	NZ
Ravakai	1976	Cook Islands
Acheron	1977	CCOP/SOPAC
Coriolis	1977	France
Sonne	1978	Germany
Marchias	1978	CCOP/SOPAC
Hakurei Maru (No.1)	1980	Japan (GSJ)
Marchias	1980	CCOP/SOPAC
Hakurei maru (No.1)	1983	Japan (GSJ)
Hakurei Maru No.2	1985	Japan (MMAJ)
Tui	1986	NZ (Tripartite with US & Aust.)
Hakurei Maru No.2	1986	Japan (MMAJ)
Thomas Washington	1987	US (Scripps)
Hakurei Maru No.2	1990	Japan (MMAJ)
Hakurei Maru No.2	2000	Japan (MMAJ)

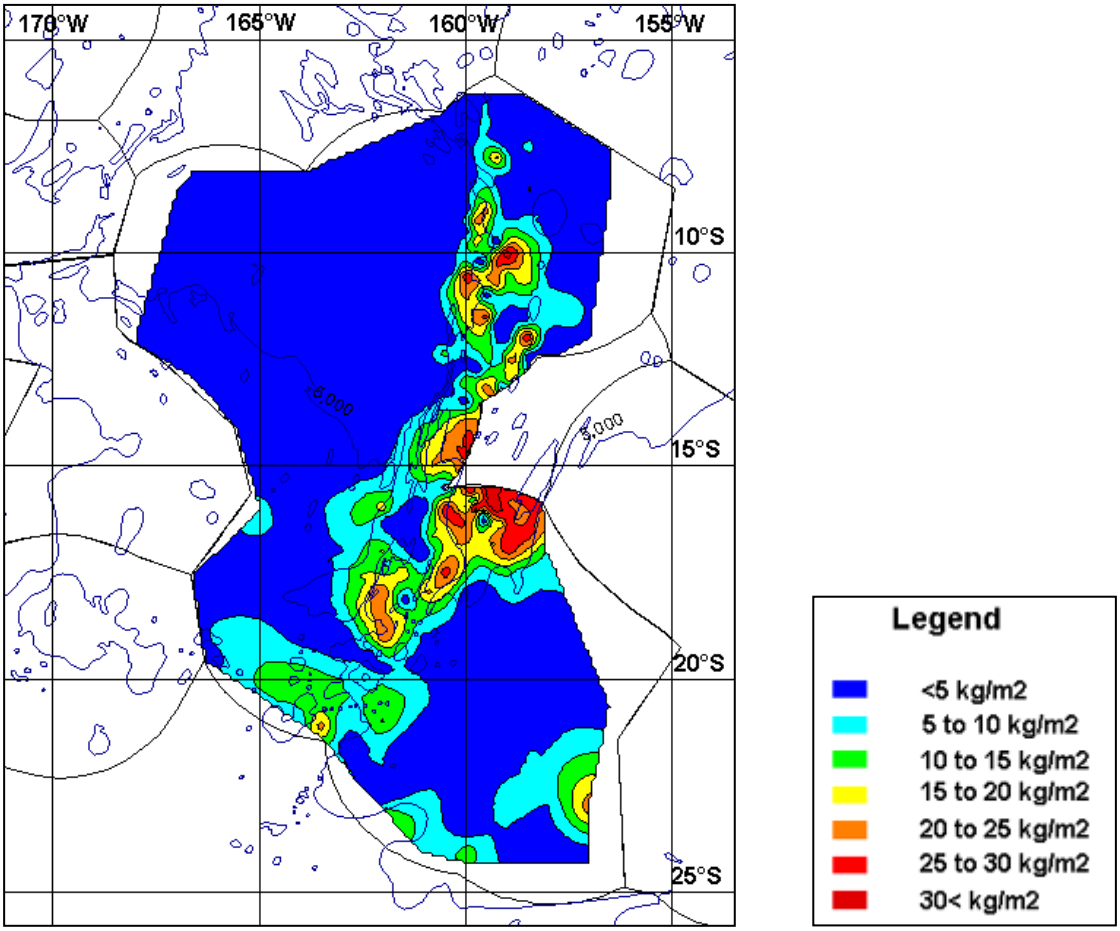


Figure-12 Nodule Abundance Counter Map in the EEZ of the Cook Islands

7-2 Chemical Composition Collected from the Survey Cruises

Chemical analysis using nodule samples collected from total of 177 sampling stations was conducted.
Ni, Cu, Co and Mn content ranges from 0.12 to 1.45%, 0.08 to 1.14%, and 0.13 to 0.64% and 1.13 to 28.61% respectively.
The Ni, Cu and Mn grade trends to be higher from southern part to northern part of the survey area in the EEZ of the Cook Islands. The Co grade trends to be higher from northern part to southern part of the survey area. Particularly, there are Co high content tendency at nodule high concentration area at around 16°S 160 °W, central area of the EEZ of the Cook Islands (see Figure-13). Co contents distributed in this area is twice as much as that of Clarion-Clipperton Zone (CCZ).

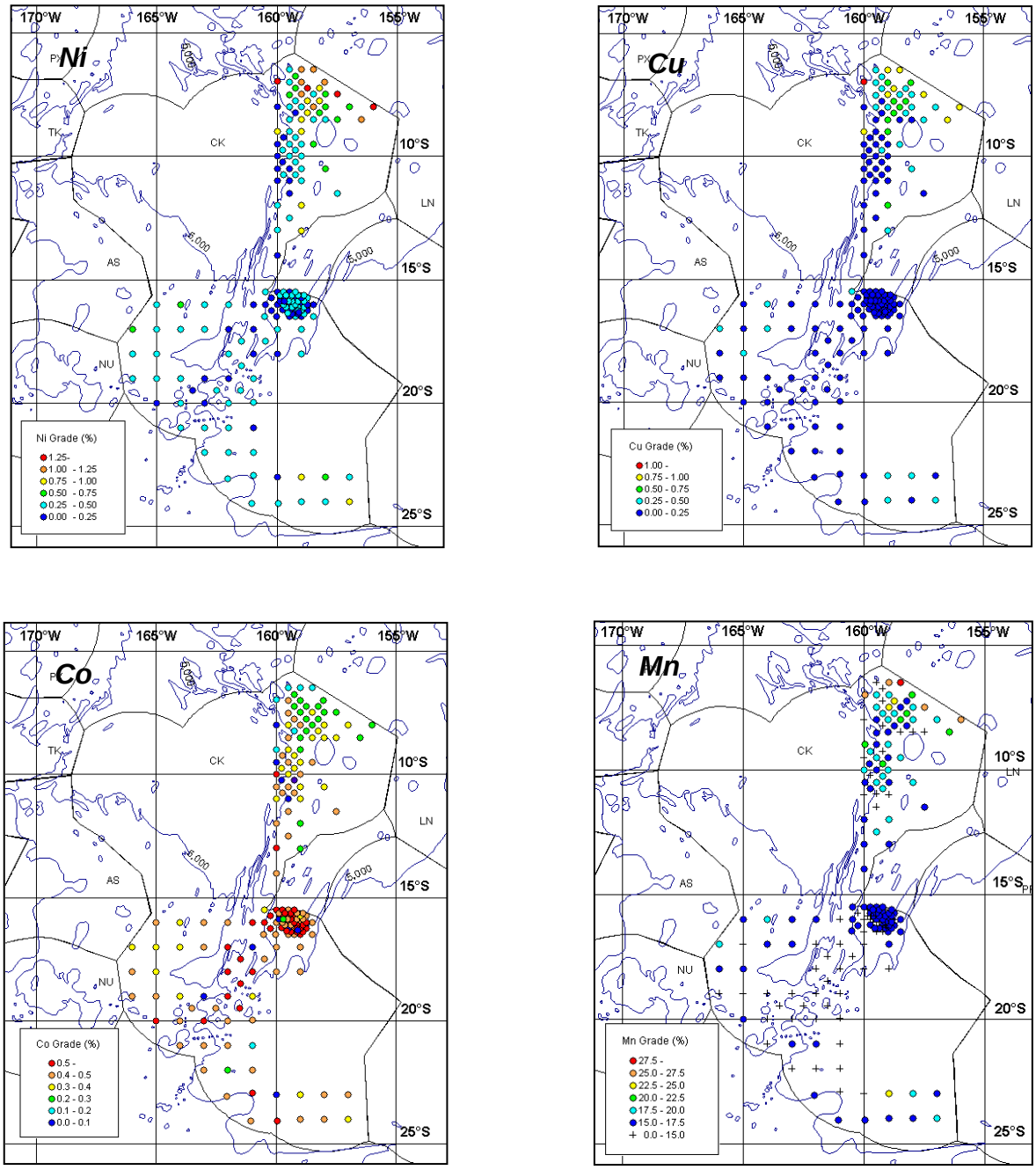


Figure-13 Chemical Contents assayed using samples collected by the Programme

7-3 Relationship between Nodule Abundance and Metal Contents

The relationship between nodule abundance and Ni, Cu and Co contents indicates Figure-14 and 15. The figures show that areas with high abundance tend to have low Ni and Cu contents in the nodules and Co tends to show relatively high correlation with abundance.

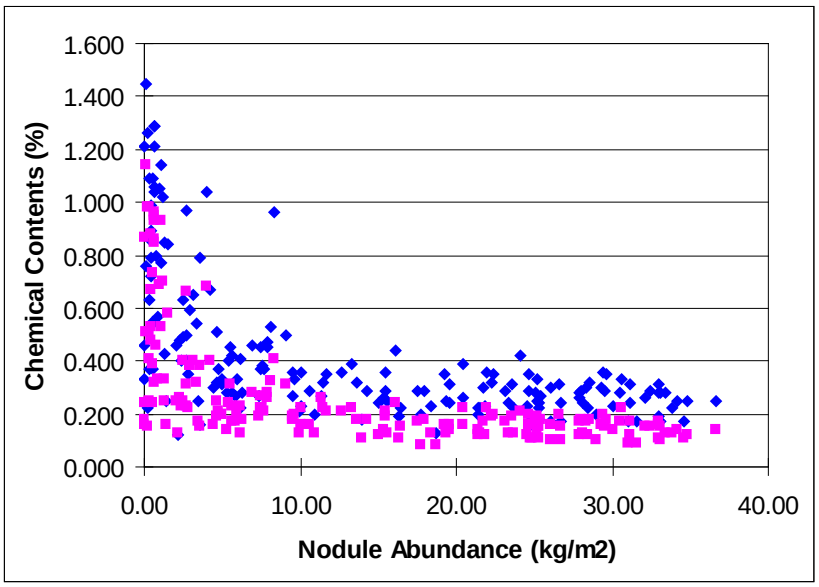


Figure-14 Relationship between Nodule abundance and Ni and Cu contents

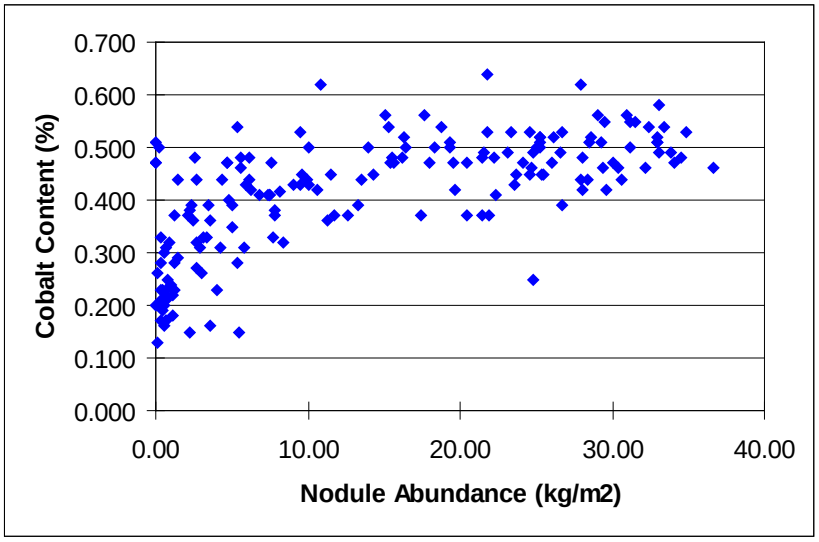


Figure-15 Relationship between Nodule Abundance and Co Content

VIII ENVIRONMENTAL SURVEY

Environmental baseline survey is carried out to collect information on chemical, physical and biological circumstances within a possible mining site so as to provide data for future environmental-impact study on nodule mining. Sediment samplings using Spade Corer (SC) and FDC observations were conducted to clarify population and living environments of macro-benthos and mega-benthos.
In this survey, the organisms of the seafloor were divided by their size as shown in Table-4.

Table-4 Classification of Benthic Fauna by Size

Fauna	Size categories
Nanobenthos	Smaller than 32 micro metre
Meiobenthos	Larger than 32 micro metre, smaller than 500 micro metre
Macrobenthos	Larger than 500 micro metre, smaller than 4cm
Megabenthos	Larger than 4cm (Can be identified by TV camera of FDC)

8-1 Study of Bottom Sediments

8-1-1 Study Area

Sampling using SC was carried out at three stations in the central area (station number; 00214, 00222 and 00230), and one station in the south area (00204), and one station in the north area (00239) (see Figure-16).

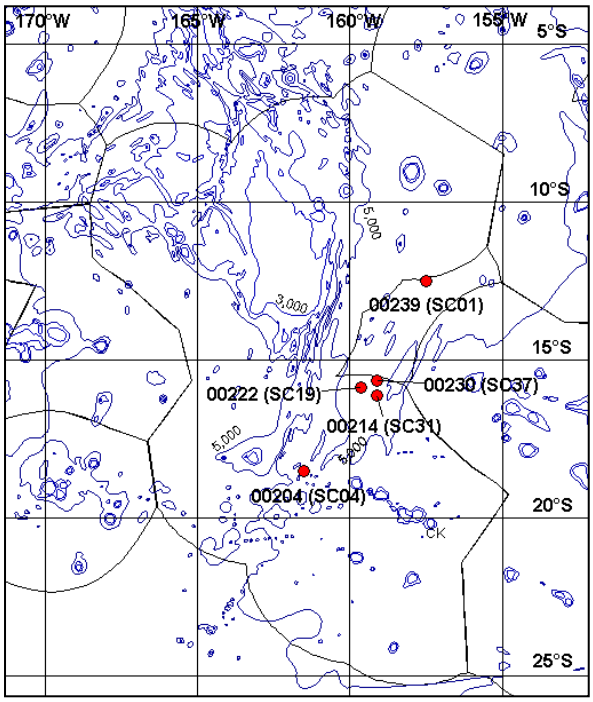


Figure-16 Sampling Stations of Environmental Survey (Parenthesis indicates sampling point number)

8-1-2 Study Properties

The following properties were investigated concerning the collected marine sediments.

- Nature of the marine sediments: Drying loss (water content), specific gravity, organic carbon content, total nitrogen content, grain-size composition.
- Benthos: Macro-benthos (identification, population density).

8-1-3 Sampling Methods

Spade corer (SC) was used for collecting deep-sea sediments. The collected deep-sea sediments were divided into nine equal parts and they were used as sub-cores. These sediments were prepared for further examination.

This preparation consists of; cutting every 1cm from the surface to 5cm depth, and each 1cm was designated as one sample and stored for analysis in a method shown in Table-5. The manganese nodules occurring on the sediments were washed by filtered seawater, and the attached organism was collected as macro-benthos samples.

Table-5 Storage Methods of Samples

Samples	Storage methods
Characteristics of sediments	
Water content	Freezed
Specific gravity	Stored at room temperatuer
Total organic carbon (TOC)	Freezed
Total nitrogen (T-N)	Freezed
Size distribution	Dipped into filtrated seawater and refrigerated
Benthos	
Macrobenthos	Fixed by neutralized formalin and dyed using Rose Bengal (The final concentration of neutralized formalin is 10%)

8-1-4 Analytical Methods

(1) Nature of Deep-sea Sediments

- *Loss on drying (water content)*

The wet samples were weighed, and then they were dried until they reached to constant weight in a drier to obtain the dry weight. The loss on drying was obtained from the weight ratio of wet and dry samples.

- *Specific gravity*

The samples were dried to constant weight at 110ºC, and ground in an agate mortar. Then about 10g were weighed accurately in a pycnometer, and heated for two hours in a water bath after adding distilled water. Left for twenty-four hours, measured the temperature and the weight of the pycnometer.

- *Organic carbon and total nitrogen*

Inorganic carbon was removed by; treating weighed dry samples by 4N hydrochloric acid, re-dried, and then the organic carbon and total nitrogen contents were measured by CHN analyser (Yanagimoto MT-5).

- *Grain-size distribution*

Grain-size distribution was measured by laser beam micro-track (LEEDS & NORTHRUP CO MODEL X-100) with dispersion medium of surface seawater of the area which passed through 0.2μm filter.

(2) Benthos

Samples were fixed by neutral formalin containing Rose Bengal, sized by 500μm sieve, and preserved in neutral formalin for analysis. They were analysed by stereoscopic microscope and appeared individuals were counted for each bio group.

8-1-5 Study Results

(1) Nature of Deep-sea Sediments

- *Loss on drying (water content)*

Vertical distribution of loss on drying of each station is shown in Figure-17. In all stations, the amount of loss tends to increase from the surface layer (0~1cm) toward the bottom layer (4~5cm), and the loss was the greatest in station No. 00239 (SC01 and the smallest in 00S21934SC04. The surface layers of the deep-sea sediments are said to have the highest population density of benthos, and the highest loss on drying of the surface layer was for 00S1736SC31 (79.7%) and the lowest amount was for 00S1636SC37 (64.1%).

Regarding the vertical distribution of loss on drying for surveyed areas; in the 3 stations of the Center Area the values were within 74.4~79.7% for 00S1736SC31, 72.9~78.5% for 00S1636SC19, and 75.6~79.6% for 00S1636SC37 and the vertical profiles were similar. On the other hand, they were 70.2~74.9% for all layers of 00S21934SC04 form South Area, and 58.2~64.1% for 00S1338SC01 from the North Area. These values are considerably lower than those of the Center Area and the vertical profiles also differ somewhat. Thus the difference of loss on drying was confirmed among the marine areas of the survey area.

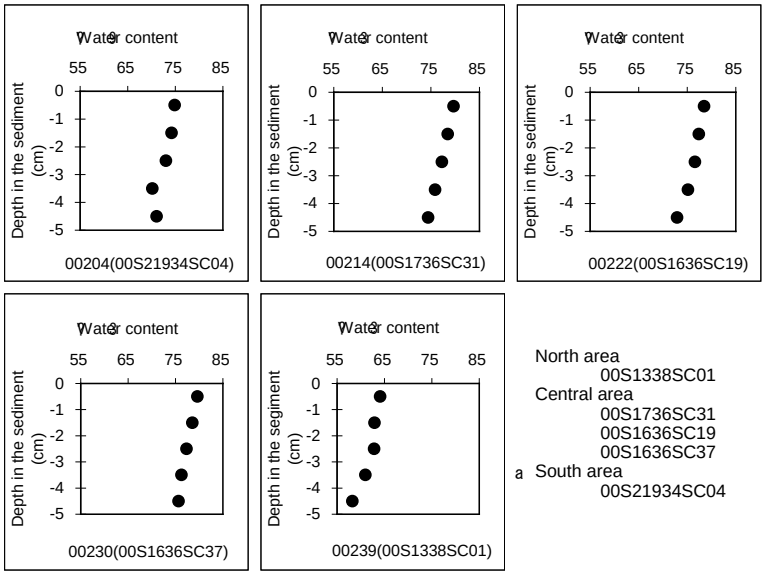


Figure-17 Vertical Profiles of Water Content in Sediment Samples

- *Specific gravity*

The vertical distribution of specific gravity of each station is shown in Figure-18. The specific gravity of deep-sea sediments does not vary vertically in a simple manner as in the case of loss on drying. The value lies within the range from 2.51 to 2.82 for all layers in all stations. The values for teach area are; 2.73 to 2.82 for all layers of 00204 (00S21934SC04) from the south area, 2.66 to 2.82 for 00214 (00S1736SC31), 2.64 to 2.82 for 00222 (00S1636SC19), and 2.73 to 2.79 for 00230 (00S1636SC37) from the central area. The specific gravity of the deep-sea sediments was similar for these two sea areas. On the other hand, the specific gravity of the deep-sea sediments of the North Area is 2.51 to 2.69 for 00239 (00S1338SC01), and thus is low compared to the other four stations.

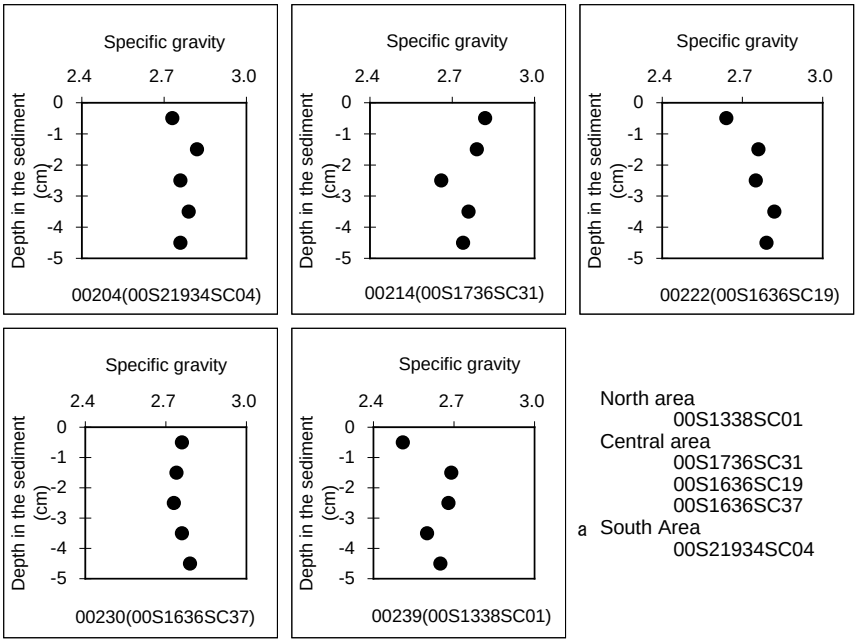


Figure-18 Vertical Profiles of Specific Gravity in Sediment Samples

- *Organic carbon, total nitrogen*

Vertical distribution of organic carbon content for all stations is shown in Figure-19 and that of the total nitrogen content in Figure-20. In all stations the contents of both organic carbon and total nitrogen tend to decrease from the surface layers (0 to 1cm) to bottom layers (4 to 5cm). The range of organic carbon content for surface layers is 2.1 to 4.1mg/gD and that of total nitrogen is 0.56 to 0.76mg/gD and those for bottom layers is 1.6~3.6mg/gD and 0.49 to 0.71mg/gD respectively. The population density of benthos is said to be highest in the mud surface layers and the highest content in these mud for organic carbon was in station number 00214 (00S1736SC31) and for total nitrogen was in 00230 (00S1636SC37). Lowest contents for both organic carbon and total nitrogen were in 00239 (00S1338SC01).

The vertical distribution of the above elements for each area is summarized as follows. In the central area, although the vertical profile of 00239 (00S1636SC01) differs from other two stations for both organic carbon and total nitrogen, the contents of these elements are similar for all stations. Namely the organic carbon content in

all layers is 2.7 to 4.1mg/gD in 00214 (00S1736SC31), 2.5~4.0mg/gD in 00222 (00S1636SC19), and 3.3 to 4.0mg/gD in 00230 (00S1636SC37) and that of total nitrogen is 0.58 to 0.72mg/gD in 00214 (00S1736SC31), 0.56 to 0.73mg/gD in 00222 (00S1636SC19), and 0.67 to 0.76mg/gD in 00230 (00S1636SC37).

On the other hand, in the south area, the organic carbon content for all layers is 2.3 to 3.5mg/gD and that of total nitrogen is 0.55 to 0.63 in 00204 (00S21934SC04). In the north area the contents are 1.6 to 2.1mg/gD for organic carbon and 0.49 to 0.56mg/gD for total nitrogen in 00239 (00S1338SC01). The figures for the north and south areas are lower than those for the three stations in the central area.

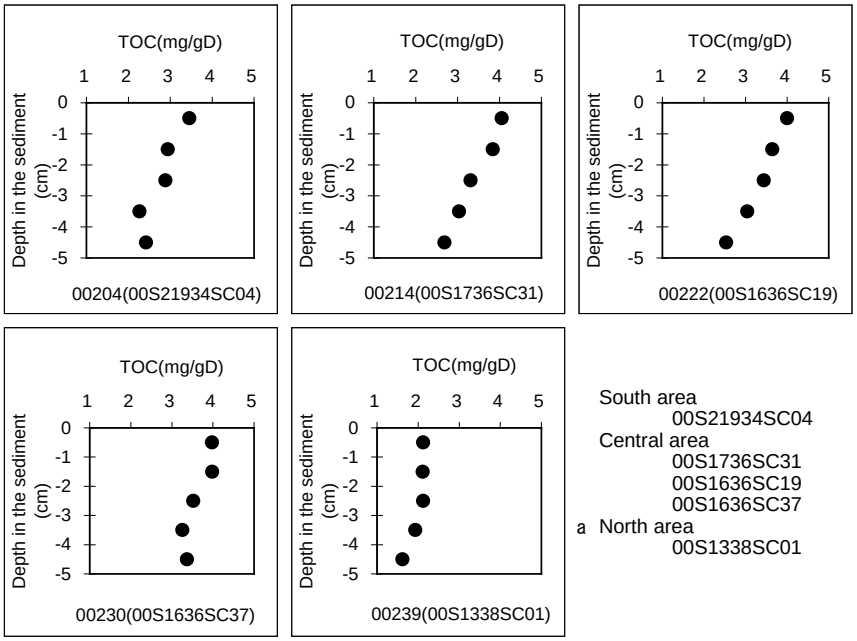


Figure-19 Vertical Profiles of Total Organic Carbon (TOC) in Sediment Samples

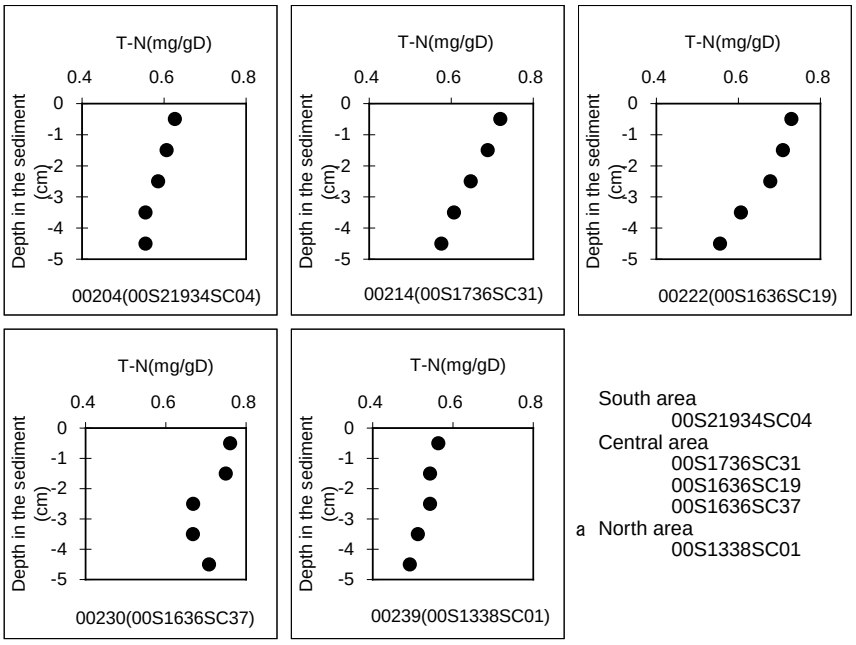


Figure-20 Vertical Profiles of Total Nitrogen (T-N) in Sediment Samples

- *Grain-size distribution*

Grain-size distribution of deep-sea sediments for each layer for the stations is shown in Figure-21. At all stations, all layers from the surface to bottom showed almost the same grain-size distribution and variation with depth was not observed.

The grain-size distribution of the four stations of the south and central areas shows close to normal distribution with maximum frequency at 5.9μm, while that of the north area shows a unique bimodal distribution with a high frequency at 5.0μm and a maximum frequency at 1.3μm.

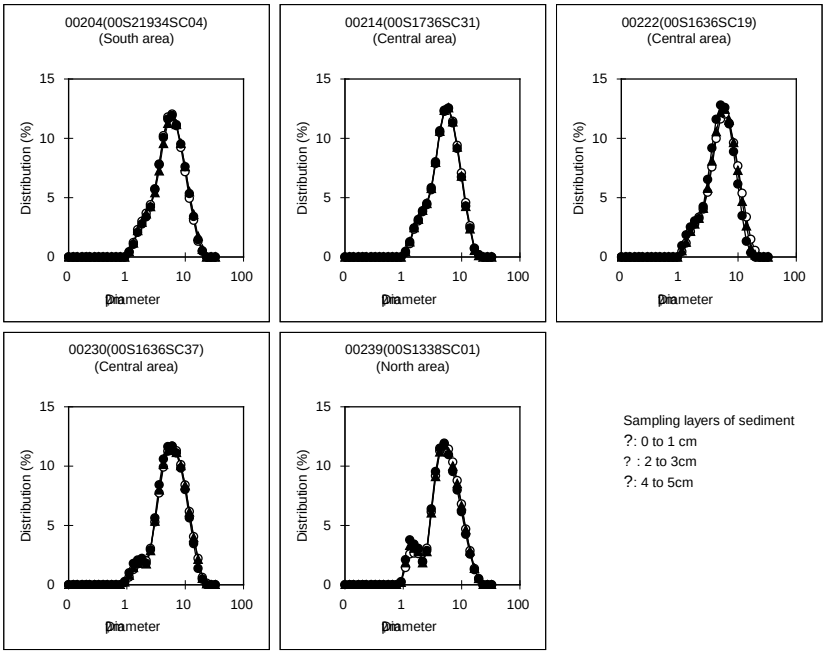


Figure-21 Typical Size Distributions of Sediment Samples

(2) Benthos

The results of the analysis of macro-benthos are shown in Table-6 and microscopic photographs of benthos are shown in Figure-22.

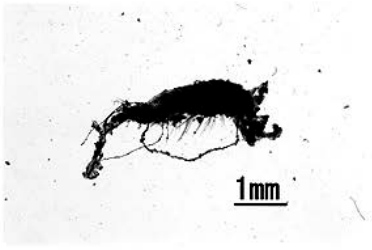
- *Composition of benthos communities*

Benthos belonging to nine groups and a few unknown organisms were confirmed at all stations. All of these are remainders of 300μm sieving but they are small with the largest being several millimetres. Sponges, echinoderms, and other larger organisms together with various trace fossils were found on the mud by FDC survey. But fauna belonging to the same group as these larger fauna and those which made these traces could not be collected by mud sampler.

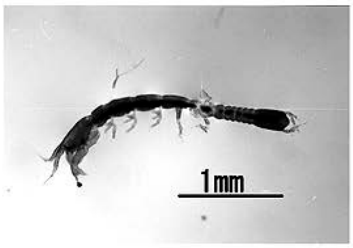
Fauna groups common to all stations were not observed. The most common fauna was ostracoda and isopoda which occurred at three stations. In addition to them foraminifera occur in all samples. But as counting foraminifera population and discrimination of the living and dead foraminifers were difficult, data on foraminifers are not included in Table-6.

Table-6 Abundance and Vertical Distribution of Macrobenthic Animals

taxon	area	South Area						Central Area																North Area					
	sampling point	00204(00S1934SC04)						00214(00S1736SC31)						00222(00S1636SC19)						00230(00S1636SC37)						00239(00S1338SC01)					
	depth (cm)	0	0-1	1-2	2-3	3-4	4-5	0	0-1	1-2	2-3	3-4	4-5	0	0-1	1-2	2-3	3-4	4-5	0	0-1	1-2	2-3	3-4	4-5	0	0-1	1-2	2-3	3-4	4-5
Nematoda																					7										
Bivalvia								9												7											
Polychaeta																				7						7	7				
unidentified annelids														7						7											
Ostracoda		11						9						7																	
Harpacticoida														7						7			7								
Tanaidacea			11																												
Isopoda										9					7					7	15		7								
Amphipoda			11																												
unidentified animals											9									7				7		7					
total (each layer)		11	22					18		9	9			21	7					42	22		14	7		14	7				
total (each sampling point)		33						36						28						85						21					

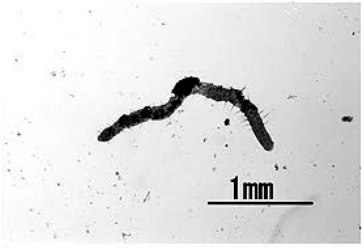


Polychaeta

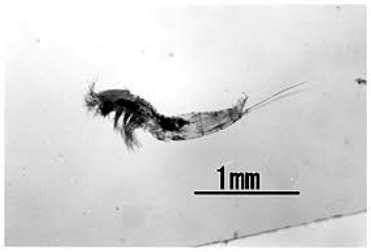


Tanaidacea

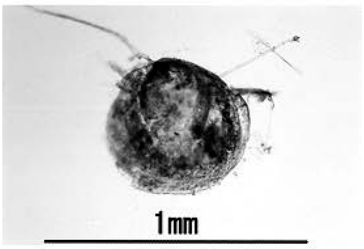
Isopoda



Annclida(supecies unknown)



Harpacticoida



Bivalvia

Amphipoda

Ostrocoda

Figure-22 Microscopic Photographs of Benthic Fauna

- *Density of individuals*

The density of individual fauna was within the range of 21 to 85/m^2 in all stations. With the exception of the highest value at sampling station number 00230(00S1636SC37) of the central area, the value ranged from 21 to 36 per square meter at the other four stations. Thus 00230(00S1636SC37) was exceptionally high and the difference among the remaining four stations was small.

- *Vertical distribution*

About 80% of the fauna inhabit the upper 1cm of the deep-sea sediments. Isopoda and parts of *harpacticoida* were collected from deeper layers, but they also inhabit the surface layers.

8-1-6 Conclusion of the Deep-sea Sediments Sampling

(1) Nature of the Deep-sea Sediments

From the above examination, it is clear that the deep-sea sediments from the 3 sampling points of the central area are similar and somewhat different from those of the south and north areas. The sediments of the south and central areas are similar in grain-size distribution and specific gravity, but those of the south area tend to be lower in drying loss, organic carbon and total nitrogen contents. Regarding the sediments of the central and north areas, the grain-size distribution of the central area show close to normal distribution with the maximum frequency at 5.9μm, hile that of the Northern Area have maximum frequency at 5.0μm and with a clear local maximum at 1.3μm. Thus the grain-size distribution differs between the sediments of the central and north areas. Other values of the sediments of north area are lower than those of the sediments of the central area and the difference is larger than that between the central and south areas. Therefore, the deep-sea sediments of the north area were unique.

(2) Benthos

- *Composition of communities*

Isopoda were the dominant fauna throughout the present survey area. Isopoda are very well known taxon among the deep-sea fauna community. It is shown by the past surveys of deep-sea organisms that polychaeta are often the dominant species of macro-benthos. In the present survey, however, polychaeta appeared only a few times from 1 locality in the central area and from the samples of the north area. These results do not agree with the past experience. But the amount and frequency of bottom sediment sampling during this survey was insufficient to conclude that this is a characteristic of the macro-benthos of this survey area.

- *Density of individuals*

Almost all fauna was distributed within 1cm depth of the seafloor at all sampling points. Within the 5 stations, the density of fauna was highest at station number 00230(00S1636SC37) in the central area and the difference among the other 4 stations was small. These values were, however, considerably lower than the values obtained by the past studies of deep-sea fauna. Further larger and frequent sampling is necessary to clarify this point.

- *Deep-sea sediments environment and benthos*

Clear correlation could not be observed between the characteristics of the deep-sea sediments (loss on drying, specific gravity, organic carbon, total nitrogen, grain-size distribution) and macro benthos. But as there is a possibility that organisms other than macro-benthos which are influenced by the nature of deep-sea sediments exist, further survey is necessary to clarify the relation between the deep-sea sediments environment and benthos.

8-2 FDC Survey

8-2-1 Survey Area

Towed FDC observation was carried out in the central area of the EEZ of the Cook Islands (Figure-23).

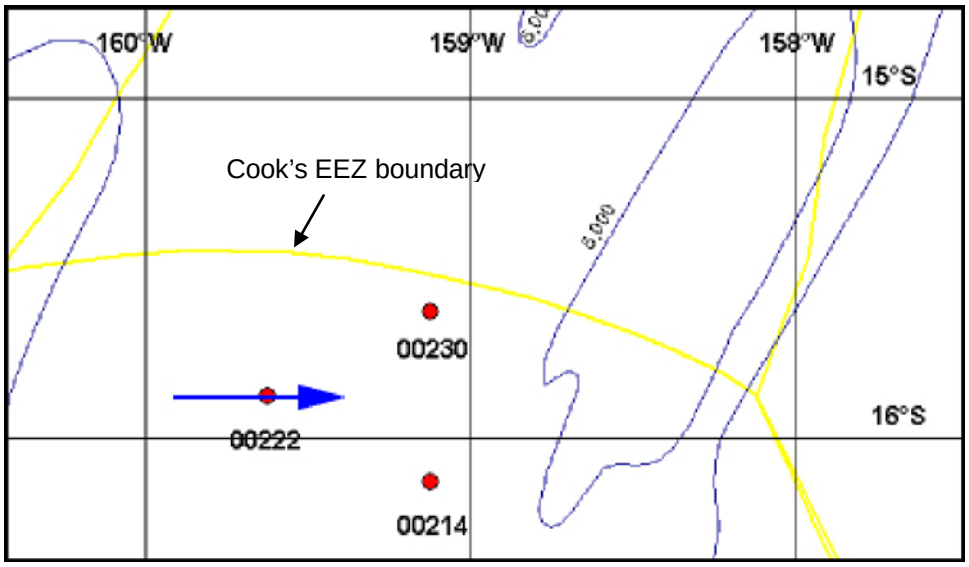


Figure-23 Location Map of the FDC Observation of Environmental Survey (blue arrow line indicates FDC track line)

8-2-2 Survey Items

Very little information regarding organisms was obtained by FDC observation. Thus the observed organisms were separated largely into bio groups and the observed location (time), number of individuals, conditions of the seafloor, and trace fossils were recorded.

8-2-3 Results of Seafloor Observation

(1) Appeared Fauna

Fauna and trace fossils, which appeared during the present survey, were divided into benthos, necton fauna, and trace fossils. These were further divided as follows.

- *Benthos*

  Sponges

  The external form of this fauna varies considerably, but several species are here grouped as sponge fauna. Typical forms are pot form, rods, and disks.

  Sea pen

  Fauna with stem-like form without antenna unlike crinoids is grouped in this category.

  Sea anemone

  Fauna with cylindrical form and open antenna are classified in this group.

  Sea cucumber

  Three major types of this fauna were observed in this survey area. i. Several lines of barb-like protrusions occur on the back and are easily distinguished. ii. Sail-like protrusions occur on the back. iii. The shape is short and thick compare to the former two types, and is at times floating.

  Starfish

  Star-shaped fauna believed to be close to hymenaster violaces occur in the survey area.

- *Nekton fauna*

  Jellyfish

  Jelly form swimming fauna was all grouped here. Many jellyfish with long antenna were observed.

  Fishes

  Many fishes of 20cm length were observed and their shapes were all similar. Several species are believed to have appeared.

  Shrimps

  Many reddish shrimps were observed to swim slowly in the area. Some of them difficult to distinguish from fishes were judged from the unique style of swimming. Photographs of Livings observed by FDC are shown in Figure-24.

- *Trace fossils*

  Mounds

  The term “mounds” are used in this report to indicate a small heap of sediments on the seafloor. Generally, radial trails of crawling from the summit of these mounds are interpreted to be caused by a kind of seaworm. When these mounds do not have particular features, they are inferred to have been formed by various activities of infauna. Almost all of the mounds observed during this survey were of the latter type, simple small heaps of sediments.

  Sediment sampling using the Multiple Corer (MC) was conducted to acquire environmental conditions on the selected seamounts for cobalt-rich manganese crust survey in the EEZ of the Marshall Islands.

  Feces

  Only large and clearly observable feces were counted during this survey. The most common ones were small and spiral shaped feces.

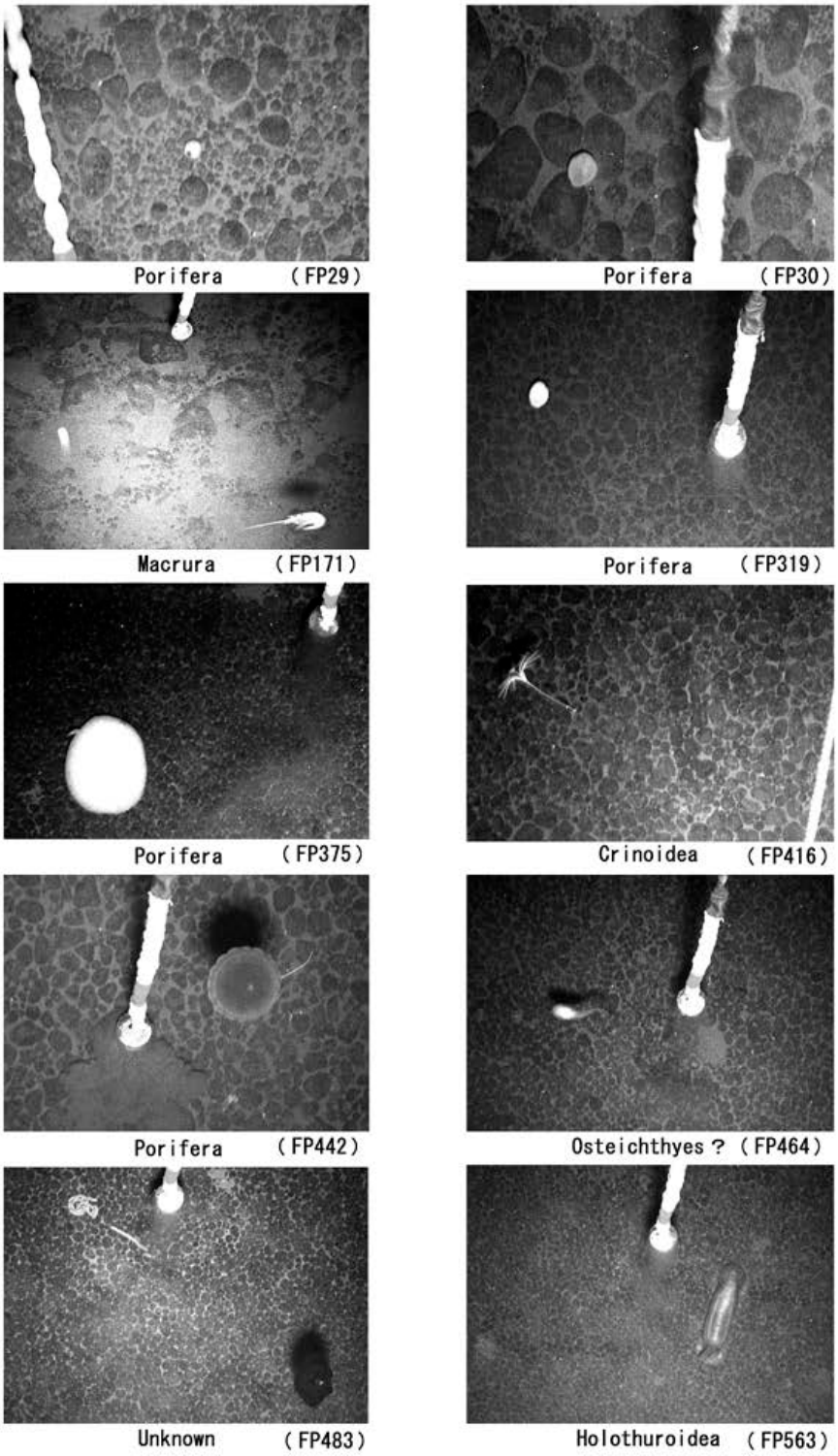


Figure-24 Photographs of Living Observed by FDC

Trails

There are many kinds of trails, but the most common type of trail observed were spiral shaped and they are inferred to have been made by sea cucumbers because most of them occur where sea cucumbers were frequently observed.

(2) Frequency of appearance

The ratio of confirmed appearance of the various fauna groups throughout the survey is shown in Figure-25. A total of 733 individual benthos fauna was confirmed during the whole observation, and this is an average of 27 individual sightings per hour of observation. Regarding the nektons, a total of 144 individuals were observed and this would average 5 individuals sightings per hour. This indicates about 5 times more sightings of benthos compared to nektons. Of the benthos fauna, sponges were most frequently observed at 593 individuals, followed by 70 sea cucumbers, and 44 starfish. Of the nektons, shrimps were most frequently found at 74 individuals, followed by 60 fish, and 10 jellyfish.

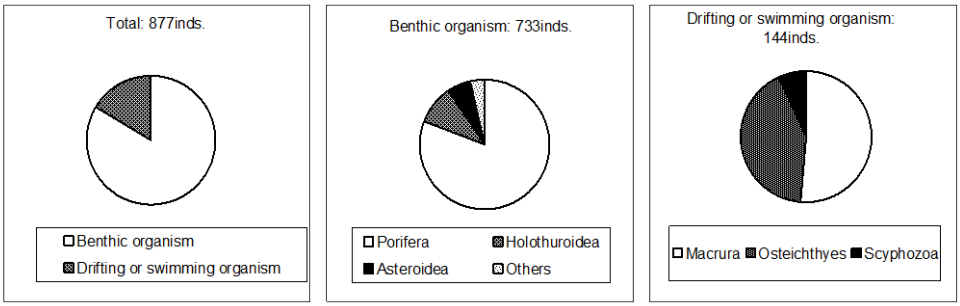


Figure-25 Appearances of Livings(1)

The seafloor conditions during observation largely consisted of crusts and pebbly crusts for the first 4 hours of observation, followed by 15 hours of crusts with few manganese nodules, then spherical manganese nodules were concentrated. The benthos and necton fauna observed during each hour is laid out in Figure-26. Clear relation between the appearance of fauna and seafloor conditions does not seem to exist. There is no clear relation between the seafloor conditions and the appearance of sponges, the most frequently sighted fauna, and other benthos. It is seen from Figure-27 that sea cucumbers tend to appear more frequently during the 4th to the 15th hour of observation where more crusts were found on the seafloor.

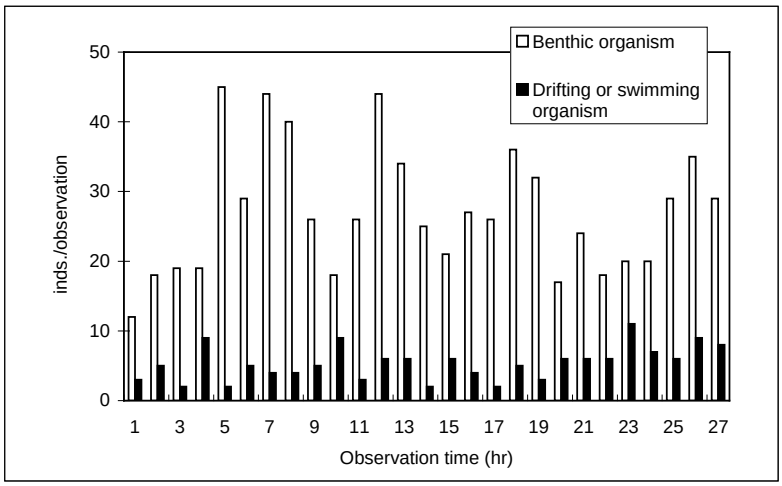


Figure-26 Appearances of Livings (2)

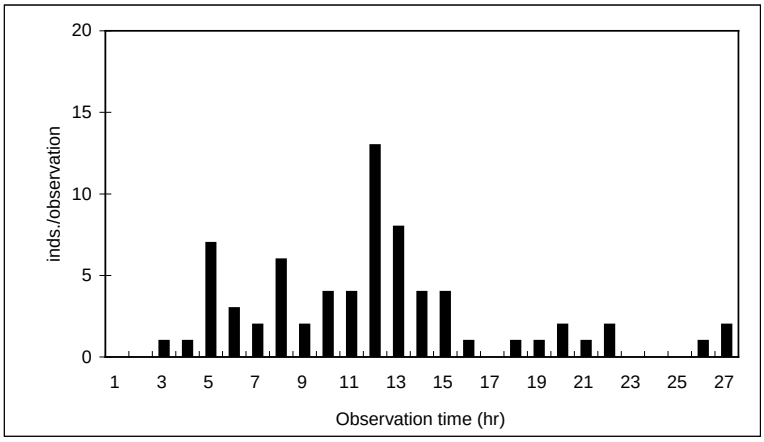


Figure-27 Appearances of Livings (3)

The number of trace fossils observed every 1 hour is shown in Figure-28. It is seen from this figure that mounds and trails were appeared frequently from 4th to 15th hours of observation where many crusts were observed. Many of the fossil feces were observed after the 15th hour where spherical manganese nodules were concentrated.

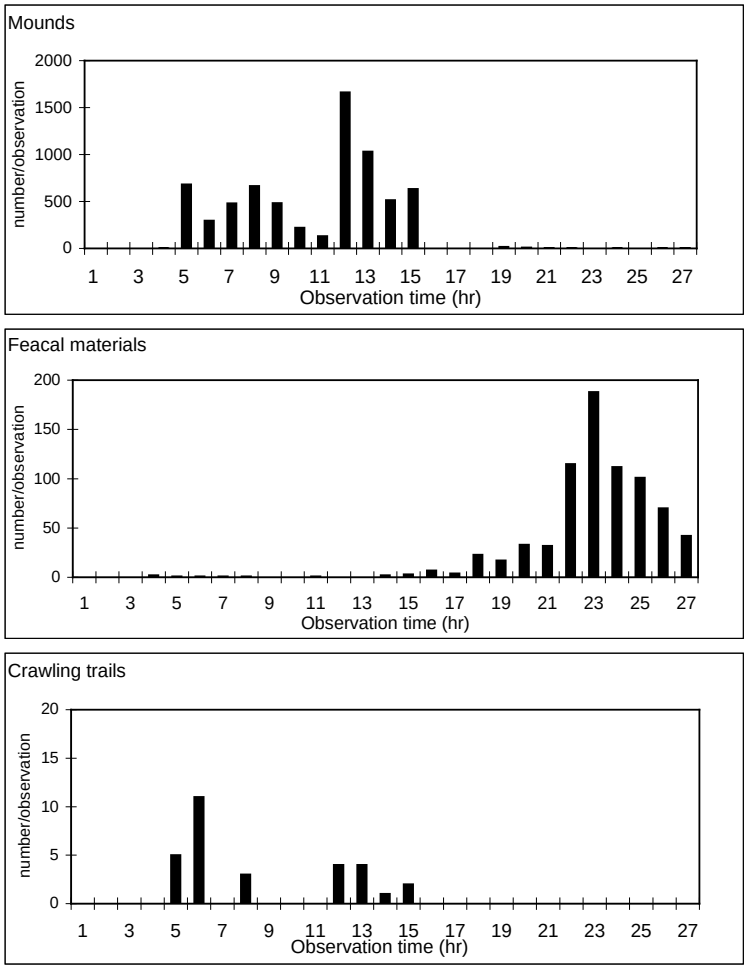


Figure-28 Appearances of Livings(4)

8-2-4 Conclusion of FDC Survey

The following five phylums and eight bio groups appeared during the survey, and the confirmed trace fossils are mounds, feces, and trails.

(1)Phylum Porifera → (Sponge)
(2) Phylum Cnidaira
Class Scyphozoa → (jellyfish)
Class Anthozoa
Order Pennatulacea → (Seapen)
Order Actiniaria → (Anemonefish)
(3) Phylum Anthropoda
Class Crustacea
Order Macrura → (Shrimp)
(4)Phylum Echinodermata
Class Holothurioidea → (Holothurian)
Class Euasteroidea
(5) Phylum Vertebrata
Class Osteichthyes → (Fish)

Appearance of 733 benthos individuals was confirmed during the observation. The average appearance per hour is about 27 individuals and this is about 5 times the appearance of planktonic and nekton organism. The most common benthos was sponges (593 individuals) followed by sea cucumbers (70 individuals), starfish (44 individuals). Of the planktonic and nektons shrimps were most common (74 individuals) followed by fishes (60) and jellyfish (10).
Regarding the relation between the seafloor environment and organisms, many sea cucumbers tend to appear where crust was observed. Regarding the seafloor environment and trace fossils, many mounds and trails appear in area of crust and many feces tend to appear where small manganese nodules densely occur.
Since sea cucumbers inhabit in areas of crust where many trails appear, it is believed that the trails on the crust were left by sea cucumber. Concerning the many mounds in crust areas, since sea cucumbers do not form mounds, many sediment-eating organisms which were not observed by FDC probably inhabited the area and formed many mounds on the sediments between the crusts.

IX NODULE RESOUCE IN AN PROMISING SITE

9-1 Method of Resource Estimation

Kohpina and Usui (1996) estimated nodule resources in the northern part of the Central Pacific Basin adopting the method of polygons. The method has been often used in calculation of ore reserves of on-land deposits including coal beds, placer and bedded manganese ores, which show simple distribution morphologically (Kuzvalt and Bohmer, 1986). The method can be reasonably applied to estimating the resource of nodule deposits by assuming that the nodule deposit is a simple two-dimensional formation (Kohpina and Usui, 1996). In this report, nodule resource is also estimated using the method of polygons.

The method of polygon is summarised as follows:

1) An area with available nodule data is divided into a series of polygons centred at individual stations, by drawing perpendicular bisectors of combined lines between sampling stations.
2) A uniform value is assumed to be equal to the average of the samples within each polygon.
3) The nodule resource within each polygon is calculated by the following equation:
4) $R_N = A*(1-W)*S$, where:
5) R_N = nodule resource, A = nodule abundance, W = water content, S = area of polygon
6) The resource potential in the area is obtained by summing the resource for all polygons located within the area.

9-2 Resource in an Promising Site

Sampling by the past four cruises in this Prpgramme revealed that there are high nodule concentration area with high Co contents in the central area in the EEZ of the Cook Islands (see Figure-10, 11 and 12).
Considering nodule abundance of up to 30kg/m2, boundary of the EEZ, and available data density, an area of 8000 km^2 is selected as a promising site within the central area in the EEZ of the Cook Islands (see Figure-29).

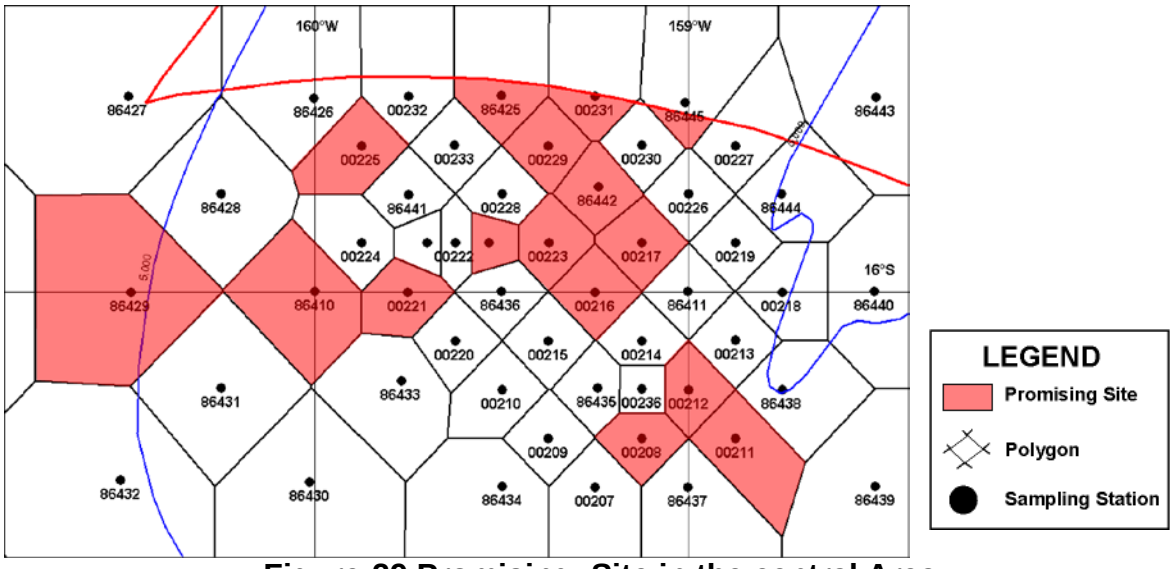


Figure-29 Promising Site in the central Area of the EEZ of the Cook Islands

Table-7 shows nodule resource and cobalt resource in the promising site, estimated by the method of polygons.

Table-7 Nodule and Cobalt Resources in Promising Site

Station No.	Abundance (kg/m2)	Water Content (%)	Co Grade (%)	Area (km2)	Nodule Resources (thousand metric ton)	Cobalt Resources (metric ton)
86410	33.09	31.10	0.49	1,031	23,506	115,178
86425	34.57	28.60	0.48	304	7,504	36,017
86429	31.00	31.50	0.56	2,177	46,229	258,880
86442	31.54	30.50	0.55	369	8,089	44,487
86445	32.93	26.40	0.51	99	2,399	12,237
00208	31.18	22.20	0.50	325	7,884	39,419
00211	32.39	27.93	0.54	651	15,197	82,062
00212	31.14	23.73	0.55	325	7,719	42,454
00216	34.81	29.96	0.53	373	9,094	48,199
00217	32.16	25.99	0.46	378	8,997	41,386
00221	36.66	23.37	0.46	403	11,321	52,078
00223	33.08	30.33	0.58	368	8,481	49,191
00225	30.44	22.94	0.46	522	12,245	56,325
00229	32.96	27.52	0.52	369	8,815	45,839
00231	32.93	24.91	0.51	205	5,069	25,852
00234	30.63	33.63	0.44	185	3,761	16,548
Total				8,084	186,309	966,153

Using polygon method, 186,000 thousand metric ton of nodule resources was estimated with up to 30kg/m2 of abundance in the promising site.
Assuming that 50% of the nodules can be harvested and 80% of the contained cobalt can be recovered, the deposits in the site represent 386,000 metric ton of cobalt to be produced. It is calculated to be ten times of cobalt annual consumption in the world in 2000.

X CONCLUSION

Past four survey cruises in this Programme revealed that the aerial extent of the site with nodule abundance higher than 30kg/m2 is around 8,000km2 in the central area of the EEZ of the Cook Islands.

Average of Co grade of manganese nodules using all sampling data collected by the programme is 041%, and average in nodule abundance area over 30kg/m2 calculated as 0.51%. This is higher than that of Clarion-Clipperton Zone , but Ni and Cu contents are lower.

Although the detailed distribution of manganese nodules at the vicinity of the promising site is not clear yet, up to 25kg/m^2 of nodule high abundance area, which extends over about 20,000km^2 was estimated.

Furthermore, it is estimated that up to 15kg/m^2 of nodule abundance was extended over about 130,000km2 in the EEZ of the Cook Islands.

Therefore, manganese nodule distributed the EEZ of the Cook Islands is one of mineral resources with an economic potential in the South Pacific Ocean.

Further detailed survey for determination of accurate metal quantity is desired in the vicinity of the promising site within the central area of the EEZ of the Cook Islands.

REFERENCE

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APPENDIX

1 Manganese Nodules

2 Cruise Schedules conducted by the past four cruises in this Programme

3 List of On-board Scientists of Past Four (4) Cruises in this Programme

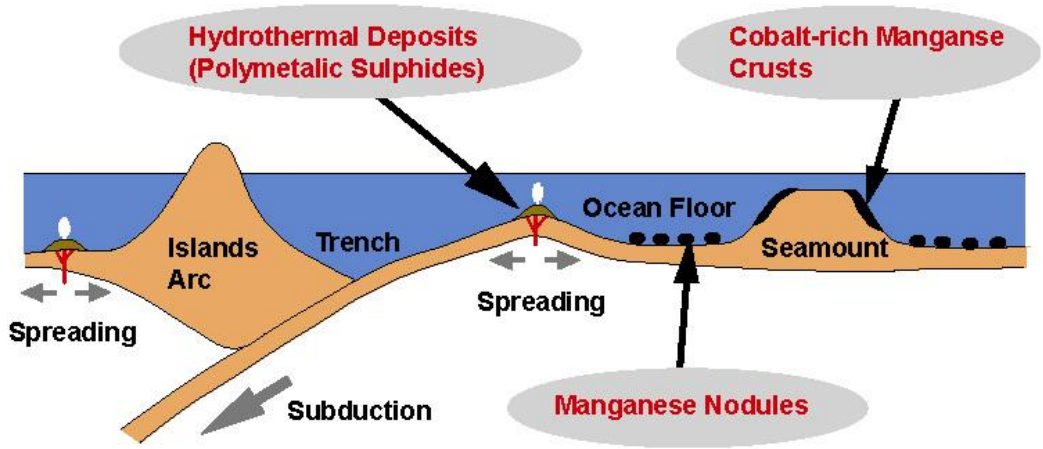
4 Data Files of Results obtained from Four Survey Cruises in this Programme

APPENDIX - 1

MANGANESE NODULES

Manganese nodules is one of deep ocean mineral resources which comprises of manganese nodules, cobalt-rich manganese crusts and polymetallic massive sulphides.

Manganese nodules are distributed on the ocean floor at the depth of 4,000-6,000m. Cobalt-rich manganese crusts are paved on hard rocks formed on submerged seamounts and Polymetallic massive sulphides are recognized around the spreading centre. (See figure below)



Nodules are small, very dark, “potato-like” balls of metals [Nickel, Copper, Cobalt, Manganese and Iron] and other minerals that have accreted around a central core, over millions of years. They vary in size and generally have a diameter of between 2 and 15 centimetres.

Nodules are most abundant on areas of the seafloor where sedimentation rates are low. Therefore they tend to occur far from major continental land-masses such as in the mid-Pacific Ocean. The nodule fields that have been discovered, studied and assessed show that they can cover extensive areas of the seafloor, in water depths of between 4,000 and 6,000 metres.

Manganese Nodule on the seafloor

Cross-section of manganese nodule

Cruise Schedules conducted by the past four cruises in this Programme

1985 Cruise

Date	Activities
September 24 1985	Leave Honolulu
September 30 1985	Arrive at survey site
	(Sampling and Data collecting: 23 days)
October 22 1985	Leave survey site
October 28 1985	Arrive at Honolulu

1986 Cruise

Date	
September 05 1986	Leave Honolulu
September 11 1986	Arrive at survey area
	(Sampling and Data collecting: 33 days)
October 13 1986	Leave survey area
October 20 1986	Arrive at Honolulu

1990 Cruise

Date	
September 18 1990	Leave Apia (Samoa)
September 20 1990	Arrive at survey area
	(Sampling and Data collecting: 28 days)
October 16 1990	Leave survey area
October 25 1990	Arrive at Honolulu

2000 Cruise

Date	
May 19 2000	Leave Suva (Fiji Islands)
May 22 2000	Arrive at survey area
	(Sampling and Data collecting: 26 days)
June 14 2000	Leave survey area
June 23 2000	Majuro (Marshall Islands)

Total cruise duration at survey area : 110 days

APPENDIX - 3

List of On-board Scientists of Past Four (4) Cruises in this Programme

1985		1986	
Motohide HIROTA***	DORD	Motohide HIROTA***	DORD
Sakiyuki MONONOBE	DORD	Toshio TAKAHASHI	DORD
Hiroshi KUSAKA	DORD	Hiroshi KUSAKA	DORD
Kohei MAEDA	DORD	Kenji KINAGAI	DORD
Kiyoshi TONO	DORD	Masami HAMANO	DORD
Taizo MATSUMOTO	DORD	Kiyoshi TONO	DORD
Masatoshi HOSODA	DORD	Kazunori MATSUI	DORD
Hisanori TAKAHASHI	DORD	Hisanori TAKAHASHI	DORD
Kenji SHINOHARA	DORD	Kenji SHINOHARA	DORD
Atusshi SHINDO	DORD	Atusshi SHINDO	DORD
Hiromitsu SHIMOGAMA	DORD	Hiromitsu SHIMOGAMA	DORD
Masaki HASHIMOTO	DORD	Koichi HISATANI	DORD
Nobuyuki MURAYAMA	DORD	Nobuyuki MURAYAMA	DORD
Ichiro YAMASHITA	DORD	Katsuhiko EBISUI	DORD
Masayuki SUZUKI	DORD	Ichiro YAMASHITA	DORD
Toru MIURA****	MMAJ	Masatoshi SHINMYO	DORD
Seizo NAKAO****	GSJ	Makoto ISHIDA****	MMAJ
Yoshiyuki KITA****	MMAJ	Seizo NAKAO****	GSJ
		Yoshiyuki KITA****	MMAJ
Teariki RONGO*****	GOK	Vaitoti TUPA*****	GOK

1990		2000	
Jiro DATE***	DORD	Katsutoki MATSUMOTO***	DORD
Takashi KYRIYAMA**	DORD	Masatsugu OKAZAKI**	DORD
Michio TANAHASHI*	DORD	Nadao SAITO*	DORD
Kiyoshi TONO	DORD	Nobuyuki MURAYAMA	DORD
Teruyoshi SUGIYAMA	DORD	Kazunori MATSUI	DORD
Masamitsu SATO	DORD	Junzou YOSHIWAKA	DORD
Suetaka NAGATE	DORD	Hiroyuki II	DORD
Yasunori EGAWA	DORD	Yoshikazu TAKASHIMA	DORD
Shinichiro YAMAZAKI	DORD	Takeki YOSHIDA	DORD
Shiro OYAMA	DORD	Shigenobu MARUYAMA	DORD
Osamu KUTAMOTO	DORD	Toshitaka OSAWA	DORD
Terumi MURAKAWA	DORD	Tadashi SATOU	DORD
Makoto TSUCHIYA	DORD	Takafumi TOMINAGA	DORD
Terumi YAMAMICHI	DORD	Yutaka HISAMOTO	DORD
Shintaro KOMAGATA	DORD	Toshiyuki OIKAWA	DORD
Yoshiki IMAI	DORD		
Tokuro KOBAYASHI	DORD		
Seiji IWASAKI	DORD		
Masamichi MAEJIMA*****	MMAJ		
Aturangi HOSKING*****	GOK	Ngatamaroa MAKIKIRITI*****	GOK

*** Chief Scientist **Chief Geologist *Chief Geophysicist
**** Supervisor ***** On-board Trainee (Representative of Costal States)
GSJ: Geological Survey of Japan
MMAJ: Metal Mining Agency of Japan
DORD: Deep Ocean Resources Development Co. Ltd.
GOK: Government of the Cook Islands

APPENDIX - 4

Data Files of Results obtained from Four Survey Cruises in this Programme

Data Files of Results obtained from Four Survey Cruises in this Programme (1/19)

(No. 85-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules										Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm			Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	85S736FG01	06º 30.07′S	159º 30.18′W	4,944	Mount	20	11	29	16	24		8.27	M, Pl	2.00	28.4	0.37	0.29	0.10	3.56	8.72	BC			b	20	
	85S736FG02	06º 29.01′S	159º 31.02′W	4,944	Mount	25	26	1		48		5.57	Pl, Ot	2.05	24.4	0.54	0.32	0.21	9.02	7.98	BC			b	20	
1	85S736FG03	06º 29.07′S	159º 29.27′W	4,958	Mount	86	12	2				2.74	Ot, E	2.12	18.8	0.51	0.33	0.16	7.25	7.44	BC			d2	0	
	(85501)																									
	Average					33	16	15	8	28		5.53	Pl, M	2.04	25.4	0.45	0.31	0.15	8.09	8.24						
	85S837FG01	07º 00.25′S	159º 00.01′W	5,390	Mount	75	25					0.58	Sp, E	2.05	22.5	1.02	0.68	0.19	18.74	7.69	BC			b	20	
	85S837FG02	06º 59.04′S	159º 00.94′W	5,452	Mount	57	43					0.28	Sp, E	-	-	-	-	-	-	-	BC			a	5	
2	85S837FG03	06º 58.99′S	158º 58.96′W	5,353	Mount	3	27	58	12			20.95	E, Sp	2.09	28.8	0.21	0.12	0.48	15.37	18.35	BC			b	10	
	(85502)																									
	Average					70	24	6				0.58	Sp, E	2.12	22.0	1.09	0.73	0.20	19.92	7.58						
	85S936FG01	08º 30.50′S	159º 29.80′W	5,551	Mount	2	51	31	12	4		20.94	E	2.10	28.3	0.35	0.23	0.48	17.76	16.91	BC			d2	0	
	85S936FG02	08º 29.61′S	159º 30.73′W	5,510	Mount	0	10	47		43		5.16	Ef, Sp	1.94	32.8	0.13	0.12	0.55	17.4	16.28	BC			ds	0	
3	85S936FG03	08º 29.66′S	159º 28.76′W	5,474	Mount	7	66	22	5			8.43	E,Pl	1.91	31.8	0.37	0.23	0.37	11.93	15.43	BC			ds	0	
	(85503)																									
	Average					3	49	31	8	9		11.51	E, Ef	2.03	29.8	0.32	0.22	0.45	16.33	16.47						
	85S836FG01	07º 30.10′S	159º 30.05′W	5,281	Mount	10	78	12				12.28	E, Pt	2.01	26.2	0.52	0.32	0.41	17.34	14.27	BC			ds	0	
	85S836FG02	07º 29.18′S	159º 31.04′W	5,060	Mount	11	84	3	2			13.18	Pt, E	2.05	27.6	0.45	0.28	0.47	18.34	15.86	CSC			ds	0	
4	85S836FG03	07º 29.24′S	159º 29.18′W	5,425	Mount	18	68	14				1.78	E, Pl	2.10	24.1	0.68	0.37	0.30	14.98	11.43	ZC			ds	0	
	(85504)																									
	Average					11	80	8	1			9.08	E, Pt	2.04	26.7	0.5	0.31	0.43	17.66	14.84						
	85S737FG01	06º 30.03′S	158º 30.04′W	5,269	Plain	60	40					0.12	Sp, E	-	-	-	-	-	-	-	BC			b	60	
	85S737FG02	06º 29.15′S	158º 31.12′W	5,277	Plain	17	83					0.63	E, Sp	2.06	22.9	1.09	0.98	0.17	28.08	6.92	BC			b	50	
5	85S737FG03	06º 29.13′S	158º 29.36′W	5,292	Plain	24	76					0.25	E, Sp	-	-	-	-	-	-	-	BC			b	80	
	(85505)																									
	Average					24	76					0.33	E,Sp	2.06	22.9	1.09	0.98	0.17	28.08	6.92						
	85S838FG01	06º 59.74′S	158º 00.96′W	5,383	Plain	88	12					0.12	Sp, E	-	-	-	-	-	-	-	BC			b	10	
	85S838FG02	06º 58.80′S	158º 02.09′W	5,381	Plain	65	35					0.58	E,Sp	2.23	24.5	1.25	0.82	0.21	22.79	7.58	BC			b	10	
6	85S838FG03	06º 58.70′S	158º 00.31′W	5,369	Plain	49	45	6				2.33	E, Sp	2.09	27.0	0.99	0.65	0.25	21.01	9.34	BC			ds	0	
	(85506)																									
	Average					54	42	5				1.01	E, Sp	2.12	26.5	1.05	0.69	0.24	21.38	8.98						
	85S837FG04	07º 30.05′S	158º 29.93′W	5,280	Plain	14	41	30	15			12.48	Pt, M	1.99	28.3	0.37	0.22	0.44	17.25	15.11	BC			b	5	
	85S837FG05	07º 29.14′S	158º 30.88′W	5,471	Plain	72	28					1.88	Sp, Pl	2.06	21.7	0.63	0.41	0.21	11.76	9.24	BC			ds	0	
7	85S837FG06	07º 29.09′S	158º 28.91′W	5,321	Plain	20	57	16	7			9.29	Pt, E	2.08	26.8	0.57	0.34	0.32	15.13	12.75	BC			ds	0	
	(85507)																									
	Average					21	46	22	11			7.87	Pt, M	2.03	27.2	0.47	0.28	0.37	15.95	13.68						
	85S937SC01	08º 00.13′S	159º 00.12′W	5,415	Mount	5	47	33	15			8.82	Pt, M	1.97	26.6	0.44	0.27	0.42	18.18	14.52	BC	IBC		b	5	
	85S937FG02	07º 59.11′S	159º 00.95′W	5,444	Mount	92	8					0.88	Sp, E	2.06	23.8	0.64	0.43	0.23	12.22	9.22	BC			b	10	
8	85S937FG03	07º 59.15′S	158º 59.01′W	5,443	Mount	2	40	40	18			12.68	M, Pt	1.96	28.6	0.45	0.27	0.42	18.19	13.78	BC			b	5	
	(85508)																									
	Average					7	42	38	16			7.48	M, Pt	1.97	27.6	0.45	0.27	0.41	17.94	13.88						
	85S937FG04	08º 29.93′S	158º 29.92′W	5,395	Plain	41	57	2				3.18	Pl	1.89	29	0.25	0.17	0.21	5.52	12.7	BC			ds	0	
	85S937FG05	08º 28.91′S	158º 30.81′W	5,490	Plain	23	43	24	10			8.42	E, M	1.93	34	0.27	0.17	0.35	11.45	15.03	BC			c	0	
9	85S937FG06	08º 28.71′S	158º 28.78′W	5,157	Plain							(0.00)	-	-	-	-	-	-	-	-	-			ds	0	Sampling Failed
	(85509)																									
	Average					28	47	18	7			5.80	Pl, E	1.92	32.6	0.27	0.17	0.31	9.74	14.36						
	85S938FG01	08º 00.04′S	158º 00.10′W	5,423	Plain	71	29					3.88	Sp, E	2.03	27.1	0.65	0.4	0.31	17.03	11.75	BC			c	0	
	85S938FG02	07º 59.13′S	158º 01.14′W	5,431	Plain	46	54					3.74	Pl, Sp	1.98	26.8	0.61	0.38	0.36	19.24	13.27	BC			c	0	
10	85S938FG03	07º 59.11′S	157º 59.30′W	5,418	Plain	79	21					1.84	Sp, E	2.04	24.2	0.73	0.46	0.29	17.5	11.17	BC			c	0	
	(85510)																									
	Average					63	37					3.15	Sp, E	2.01	26.4	0.65	0.4	0.33	17.99	12.23						

Data Files of Results obtained from Four Survey Cruises in this Programme (2/19)

(No. 85-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology				Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	85S938FG07	08º 30.14′S	157º 59.93′W	4,895	Plain							0	-	-	-	-	-	-	-	-	-				ds	0	
	85S938FG08	08º 29.26′S	158º 00.94′W	5,046	Plain	11	3	9		77		1.38	Pl, E	2.12	25.90	0.37	0.24	0.30	14.45	13.04	CC			ds	0	
21	85S938FG09	08º 29.22′S	157º 59.01′W	4,910	Plain	73	27					0.2	Pl, Ot	-	-	-	-	-	-	-	CC	FO		ds	0	
	(85521)																									
	Average					19	6	8		67		0.53	Pl, E	2.12	25.90	0.37	0.24	0.30	14.15	13.04						
	85S937FG07	08º 14.99′S	158º 14.82′W	5,583	Plain	80	20					2.71	Sp, E	2.06	25.80	0.56	0.33	0.32	15.74	12.95	BC			c	0	
	85S937FG08	08º 14.07′S	158º 15.75′W	5,582	Plain	73	27					3.56	E, Sp	2.02	25.10	0.54	0.32	0.33	16.24	13.25	BC			c	0	
22	85S937FG09	08º 14.05′S	158º 13.79′W	5,576	Plain	67	33					3.91	E, Sp	2.01	29.80	0.54	0.32	0.34	16.37	13.35	BC			c	0	
	(85522)																									
	Average					73	27					3.39	E, Sp	2.03	27.10	0.54	0.32	0.33	16.15	13.21						
	85S936FG04	08º 00.17′S	159º 29.52′W	5,260	Mount	40	60					3.58	E, Pt	1.97	29.80	0.64	0.35	0.36	17.86	14.17	BC			b	5	
	85S936FG05	07º 59.16′S	159º 30.40′W	5,152	Mount	10	62	19	5	4		18.63	E, Pt	1.97	30.00	0.40	0.26	0.39	15.69	16.21	SCC			ds	0	
23	85S936FG06	07º 59.10′S	159º 28.34′W	5,256	Mount	59	41					1.32	E, Sp	2.06	29.20	0.69	0.40	0.32	17.56	12.50	BC			b	20	
	(85523)																									
	Average					17	61	15	4	3		7.84	E, Pt	1.97	30.00	0.45	0.28	0.38	16.12	15.69						
	85S936FG07	08º 14.95′S	159º 14.88′W	5,778	Mount							0	-	-	-	-	-	-	-	-	BC			c	0	
	85S936FG08	08º 14.01′S	159º 15.89′W	5,657	Mount	17	75	8				10.66	Pl, M	1.91	29.10	0.16	0.15	0.16	2.23	15.30	BC			ds	0	
24	85S936FG09	08º 13.96′S	159º 14.00′W	5,770	Mount	100						0.02	Ot, E	-	-	-	-	-	-	-	BC			c	0	
	(85324)																									
	Average					17	75	8				3.56	Pl, M	1.91	29.10	0.16	0.15	0.16	2.23	15.30						
	85S937FG10	08º 14.96′S	158º 44.69′W	5,604	Plain	82	18					0.5	Sp, E	2.04	28.60	1.08	0.77	0.22	21.53	9.13	BC			c	0	
	85S937FG11	08º 13.96′S	158º 45.58′W	5,596	Plain	58		42				0.85	M, Sp	2.24	19.30	0.66	0.48	0.14	11.94	4.98	BC			c	0	
25	85S937FG12	08º 13.88′S	158º 43.49′W	5,613	Plain	32	42			26		2	Sp, M	0.00	30.90	0.74	0.50	0.26	16.95	10.48	BC			c	0	
	(85525)																									
	Average					48	28	11		16		1.12	Sp, M	2.17	27.60	0.77	0.53	0.22	16.21	8.73						
	85S937FG13	08º 30.07′S	159º 00.05′W	5,524	Mount	100						0.05	Sp, Ot	0.00	25.90	0.76	0.51	0.26	16.31	10.78	BC			c	0	
	85S937FG14	08º 29.01′S	159º 01.03′W	5,515	Mount	100						0.12	Sp. E	-	-	-	-	-	-	-	BC			c	0	
26	85S937FG15	08º 29.00′S	159º 59.12′W	5,538	Mount	100						0.04	Sp, E	-	-	-	-	-	-	-	BC			c	0	
	(85526)																									
	Average					100						0.07	Sp. E	0.00	25.90	0.76	0.51	0.26	16.31	10.78						
	85S836FG04	07º 44.96′S	159º 14.91′W	5,550	Mount	4	37	24	23	12		20.82	E, Pt	1.97	29.50	0.31	0.20	0.48	18.40	16.44	BC			b	10	
	85S836FG05	07º 43.96′S	159º 15.88′W	5,525	Mount	2	12	16	22	48		31.87	Ef, E	1.92	29.50	0.27	0.15	0.51	18.39	16.27	BC			b	5	
27	85S836FG06	07º 43.78′S	159º 13.90′W	5,634	Mount	3	70	21	6			13.98	Pt, E	1.91	32.00	0.48	0.26	0.40	14.70	14.70	BC			b	5	
	(85527)																									
	Average					3	32	20	19	27		22.22	E, Ef	1.94	30.00	0.32	0.19	0.48	17.64	16.00						
	85S837FG07	07º 29.98′S	158º 59.93′W	5,392	Plain	77	23					1.02	Sp, E	2.05	28.20	1.17	0.86	0.23	23.52	8.49	BC			b	10	
	85S837FG08	07º 29.05′S	159º 00.96′W	5,395	Plain	43	57					0.32	E, Sp	-	-	-	-	-	-	-	BC			b	10	
28	85S837FG09	07º 28.97′S	158º 59.05′W	5,398	Plain	83	17					0.59	E, Sp	2.00	20.50	1.26	0.90	0.23	24.31	8,23	BC			c	0	
	(85528)																									
	Average					73	27					0.64	Sp, E	2.03	25.40	1.21	0.87	0.23	23.83	8.39						
	85S937FG16	07º 59.99′S	158º 29.99′W	5,535	Plain	57	43					1.26	Sp, E	1.93	26.40	0.98	0.65	0.23	19.54	9.79	BC			c	0	
	85S937FG17	07º 59.08′S	158º 30.96′W	5,538	Plain	64	36					1.27	E, Sp	2.01	25.20	1.00	0.70	0.22	19.77	8.44	BC			c	0	
29	85S937FG18	07º 58.98′S	158º 29.05′W	5,521	Plain	87	13					1.2	Sp, E	2.09	25.80	1.09	0.76	0.23	21.25	8.56	BC			c	0	
	(85529)																									
	Average					69	31					1.24	Sp, E	2.01	25.80	1.02	0.70	0.23	20.17	8.93						
	85S837FG10	07º 44.87′S	158º 45.07′W	5,559	Plain	54	46					0.77	E, Sp	2.17	30.3	0.99	0.67	0.23	19.69	9.58	BC			c	0	
	85S837FG11	07º 43.94′S	158º 46.12′W	5,529	Plain	71	29					0.26	SP. E	-	-	-	-	-	-	-	BC			b	0	
30	85S837FG12	07º 43.92′S	158º 44.20′W	5,553	Plain	79	21					0.22	Sp, E	-	-	-	-	-	-	-	BC			b	0	
	(85530)																									
	Average					62	38					0.42	Sp. E	2.17	30.30	0.99	0.67	0.23	19.69	9.58						

Data Files of Results obtained from Four Survey Cruises in this Programme (3/19)

(No. 85-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	85S838FG07	07º 29.79′S	157º 59.85′W	5,416	Plain	15	85					1.02	E, Pt	2.07	25.00	0.72	0.48	0.28	18.80	11.30	BC			ds	0	
	85S838FG08	07º 28.84′S	158º 00.84′W	5,320	Plain							0.00	-	-	-	-	-	-	-	-	—			ds	0	
31	85S838FG09 (85531)	07º 28.66′S	157º 58.88′W	5,493	Plain	81	19					0.12	E, Sp	-	-	-	-	-	-	-	BC			el	10	
	Average					22	78					0.38	E, Pt	2.07	25.00	0.72	0.48	0.28	18.80	11.30						
	85S837FG13	07º 45.12′S	158º 14.96′W	5,440	Plain	58	33	11				3.19	Sp. E	1.98	28.00	1.03	0.71	0.26	22.42	10.06	BC			el	10	
	85S837FG14	07º 44.06′S	158º 15.90′W	5,428	Plain	46	54					2.11	E, Sp	1.99	31.00	1.03	0.73	0.26	23.56	10.12	BC			el	10	
32	85S837FG15 (85532)	07º 44.01′S	158º 13.98′W	5,439	Plain	65	17	8	10			2.73	Sp. E	2.06	24.50	0.87	0.56	0.30	21.54	11.57	BC			d2	0	
	Average					56	33	7	3			2.68	Sp. E	2.01	27.60	0.97	0.66	0.27	22.40	10.61						
	85S837FG16	07º 15.03′S	158º 14.99′W	5,339	Plain	100						0.21	E, Sp	-	-	-	-	-	-	-	BC			el	10	
	85S837FG17	07º 14.12′S	158º 16.02′W	5,320	Plain	70	30					0.15	E, Sp	-	-	-	-	-	-	-	BC			el	10	
33	85S837FG18 (85533)	07º 14.06′S	158º 14.13′W	5,312	Plain	26	62		12			1.94	M, Pt	2.05	28	0.8	0.46	0.25	15.41	10.77	BC			ds	0	
	Average					36	54		10			0.77	M, Pt	2.05	28	0.8	0.46	0.25	15.41	10.77						
	85S837FG19	07º 14.77′S	158º 45.04′W	5,304	Plain	68	32					0.38	E, Sp	2.13	28.10	1.25	0.84	0.21	22.83	7.95	BC			b	20	
	85S837FG20	07º 13.85′S	158º 46.02′W	5,332	Plain	92	8					0.57	Sp, E	2.06	27.50	1.24	0.83	0.22	23.23	7.94	BC			b	10	
34	85S837FG21 (85534)	07º 13.75′S	158º 44.10′W	5,326	Plain	67	19	14				0.94	Sp, E	2.05	30.00	1.34	0.86	0.21	24.04	7.53	BC			b	10	
	Average					75	18	7				0.63	Sp. E	2.07	28.90	1.29	0.85	0.21	23.55	7.74						
	85S737FG04	06º 30.16′S	158º 59.86′W	5,259	Plain	6	39	55				1.04	E, Ef	2.02	26.20	1.06	0.97	0.17	27.93	7.09	BC			b	40	
	85S737FG05	06º 29.29′S	159º 00.90′W	5,283	Plain	3	97					0.66	E	2.08	28.30	1.00	0.93	0.16	25.32	6.55	BC			b	50	
35	85S737FG06 (85535)	06º 29.26′S	158º 58.95′W	5,261	Plain	10	90					0.37	E, Sp	0.00	23.30	1.07	0.98	0.18	28.56	7.04	BC			b	40	
	Average					6	67	28				0.69	E, Ef	2.04	26.40	1.04	0.96	0.17	27.24	6.92						
	85S736FG04	06º 45.04′S	159º 15.10′W	5,212	Mount	56	44					3.80	E, M	2.03	28.80	0.64	0.40	0.32	17.06	11.90	BC			ds	0	
	85S736FG05	06º 44.20′S	159º 16.20′W	5,318	Mount	49	51					1.39	E, M	2.11	24.00	0.93	0.59	0.21	17.29	8.96	BC			ds	0	
36	85S736FG06 (85536)	06º 44.33′S	159º 14.40′W	5,292	Mount	36	45	19				3.72	E, M	2.27	19.80	0.43	0.29	0.23	10.56	10.30	BC			ds	0	
	Average					47	46	8				2.97	E, M	2.14	24.30	0.59	0.38	0.26	14.22	10.73						
	85S836FG07	06º 59.97′S	159º 30.14′W	5,274	Mount		11		89			2.25	Sp, Ot	1.96	29.80	0.18	0.09	0.52	18.02	18.42	—			d2	0	
	85S836FG08	06º 59.06′S	159º 31.13′W	5,331	Mount	17	51	20	12			6.22	M, Pt	1.97	28.40	0.60	0.36	0.38	18.96	13.30	BC			b	10	
37	85S836FG09 (85537)	06º 59.08′S	159º 29.29′W	5,237	Mount	14	64	22				12.15	Pt, E	2.02	28.50	0.44	0.28	0.41	19.20	15.72	BC			b	10	
	Average					13	54	19	13			6.87	Pt, M	2.00	28.60	0.46	0.28	0.41	19.00	15.28						
	85S836FG10	07º 14.85′S	159º 15.15′W	5,372	Mount							0	-	-	-	-	-	-	-	-	-			ds	0	
	85S836FG11	07º 13.88′S	159º 16.10′W	5,310	Mount	42	58					0.48	E, Sp	2.00	30.60	0.87	0.56	0.31	21.38	11.29	BC			el	10	
38	85S836FG12 (85538)	07º 13.78′S	159º 14.33′W	5,431	Mount	82	18					0.55	E, Ot	2.04	20.90	0.44	0.29	0.17	7.20	8.75	BC			c	0	
	Average					63	37					0.34	E, Sp	2.02	25.40	0.63	0.41	0.23	13.35	9.85						

T.P.L: Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (4/19)

(No. 86-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S0836FG01	07º 00.00'S	159º 59.93'W	5,610	(Mount) Channel	21	79					0.11	E. Sp	-	-	-	-	-	-	-	BC	2	0	c	0	
	86S0836FG02	06º 59.00'S	160º 00.89'W	5,521	(Mount) Channel	100						0.08	E. Sp	-	-	-	-	-	-	-	BC	5	0	c	0	
1	86S0836FG03 (86401)	06º 58.90'S	159º 58.80'W	5,677	(Mount) Channel	65	35					0.13	E. Sp	2.00	36.4	1.45	1.14	0.13	27.19	5.61	BC	8	0	c	0	
	Average			5,603		59	41					0.11	E. Sp	2.00	36.4	1.45	1.14	0.13	27.19	5.61						
	86S0936FG01	08º 00.00'S	160º 00.00'W	3,751	(Mount) Seamount							0.00	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S0936FG02	07º 58.90'S	160º 01.00'W	3,475	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
2	86S0936FG03 (86402)	08º 58.69'S	159º 59.04'W	3,755	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	Average			3,660								0.00	-	-	-	-	-	-	-	-						
	86S1036FG01	08º 59.98'S	159º 59.92'W	5,572	(Mount) Flat							0	-	-	-	-	-	-	-	-	BC	4	0	d2	0	
	86S1036FG02	08º 58.97'S	160º 00.87'W	5,490	(Mount) Flat							0	-	-	-	-	-	-	-	-	BC	4	0	ds	0	
3	86S1036FG03 (86403)	08º 58.88'S	159º 58.80'W	5,368	(Mount) Flat	19	45	36				1.42	E. P	2.15	28.6	0.89	0.88	0.19	22.16	8.93	BC	5	0	ds	0	
	Average			5,477		19	45	36				0.47	E. P	2.15	28.6	0.89	0.88	0.19	22.16	8.93						
	86S1136FG01	09º 59.92'S	160º 00.13'W	4,603	(Mount) Seamount	1	5	84	10			35	Sp	2.01	28.1	0.2	0.08	0.56	19.28	17.99	-	-	-	ds	0	
	86S1136FG02	09º 58.92'S	160º 01.22'W	4,630	(Mount) Seamount	9	43	43	5			(16.82)	Sp. E	2.08	28.1	0.19	0.08	0.57	18.86	17.9	FO	0	70	ds	0	
4	86S1136FG03 (86404)	09º 58.79'S	159º 59.35'W	5,350	(Mount) Channel	56	44					0.37	P	2.09	27.7	0.11	0.06	0.56	19.2	17.97	-	-	-	ds	0	
	Average			4,861		2	5	83	10			17.69	Sp	2.01	28.1	0.2	0.08	0.56	19.2	17.97						
	86S1236FG01	10º 59.98'S	159º 59.88'W	4,948	(Hilly) Seanknoll	26	53	16	5			14.15	Pl. M	2.05	24.3	0.10	0.1	0.22	5.16	12.67	CSC	2	10	ds	0	
	86S1236FG02	10º 59.01'S	160º 00.92'W	5,432	(Hilly) Seanknoll	2	75	21	2			28.67	E. Sp	1.99	31.8	0.28	0.16	0.45	17.38	19.15	CSC	2	5	d2	0	
5	86S1236FG03 (86405)	10º 58.94'S	159º 58.98'W	4,911	(Hilly) Seanknoll	1	13	53	33			(30.21)	Sp	2.02	31.0	0.17	0.09	0.5	17.25	18.7	-	-	-	ds	0	
	Average			5,097		10	68	19	3			21.41	E. Pl	2.01	29.3	0.22	0.14	0.37	13.04	16.85						
	86S1336FG01	11º 59.89'S	160º 00.30'W	4,920	(Plain) Flat	100						0.02	Sp	-	-	-	-	-	-	-	BC	2	0	ds	0	
	86S1336FG02	11º 59.90'S	160º 01.39'W	4,955	(Plain) Flat	42	58					0.15	E	2.2	36.4	0.68	0.38	0.29	19.45	12.47	BC	3	0	e1	0	
6	86S1336FG03 (86406)	11º 58.78'S	159º 59.53'W	4,833	(Plain) Flat	0	40	54	6			31.6	Sp. E	2.00	29.5	0.29	0.16	0.42	16.48	16.4	CSC	3	5	d1	0	
	Average			4,903		0	40	54	6			10.59	Sp. E	2.01	29.6	0.29	0.16	0.42	16.49	16.38						
	86S1436FG01	13º 00.00'S	160º 00.02'W	5,275	(Plain) Flat	2	45	49	4			29.41	Sp	1.95	33.1	0.25	0.13	0.53	17.95	18.6	BC	3	0	bc	0	
	86S1436FG02	12º 59.07'S	160º 01.08'W	5,244	(Plain) Flat	100						0.01	Sp. P	-	-	-	-	-	-	-	-	-	-	bc	0	
7	86S1436FG03 (86407)	12º 58.99'S	159º 59.07'W	5,284	(Plain) Flat	3	70	20	7			28.51	Sp. E	2.04	30.8	0.26	0.14	0.50	16.55	18.35	-	-	-	bc	0	
	Average			5,268		3	57	35	5			19.31	Sp. E	1.99	32	0.25	0.13	0.51	17.25	18.47						
	86S1536FG01	14º 00.12'S	160º 00.03'W	5,127	(Plain) Flat	1	61	34	4			35.53	Sp. E	1.94	30.3	0.22	0.13	0.48	16.09	18.6	BC	2	0	a	0	
	86S1536FG02	13º 59.17'S	160º 01.08'W	5,161	(Plain) Flat	1	61	38				32.22	Sp	1.99	30.3	0.22	0.12	0.5	16.32	18.4	BC	2	0	a	0	
8	86S1536FG03 (86408)	13º 59.14'S	159º 59.11'W	4,960	(Plain) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			5,083		1	61	36	2			33.88	Sp	1.96	30.3	0.22	0.13	0.49	16.2	18.5						
	86S1636FG01	14º 59.97'S	159º 59.98'W	5,158	(Quasi) Flat	3	55	39	3			29.95	Sp. E	1.94	30.3	0.22	0.13	0.48	16.09	18.06	BC	2	0	e1	0	
	86S1636FG02	14º 58.99'S	160º 01.00'W	4,962	(Quasi) Flat						100	(6.09)	Pl	1.89	32.9	0.13	0.08	0.5	11.77	16.21	-	-	-	d1	0	
9	86S1636FG03 (86409)	14º 58.83'S	159º 59.01'W	5,180	(Quasi) Flat	100						0.12	P	-	-	-	-	-	-	-	BC	2	0	e1	0	
	Average			5,100		3	55	39	3		0	15.04	Sp, P	1.97	32.4	0.24	0.12	0.56	17.57	18.06						
	86S1736FG01	15º 59.97'S	159º 59.94'W	4,822	(Quasi) Flat	2	25	67	6			47.52	Sp. Ec	1.98	31.1	0.14	0.08	0.53	15.77	19.46	CSC	2	10	d1	0	
	86S1736FG02	15º 58.99'S	160º 00.89'W	5,039	(Quasi) Flat	1	64	35				26.62	Sp. Ec	2.03	26.2	0.20	0.12	0.44	14.11	19.23	BC	3	0	d2	0	
10	86S1736FG03 (86410)	15º 58.91'S	159º 58.89'W	5,030	(Quasi) Flat	1	92	7				36.48	Sp. P	2.04	25.2	0.20	0.12	0.46	14.67	19.30	BC	2	0	d2	0	
	Average			4,964		1	55	41	3			36.87	Sp. Ec	2.01	28.1	0.17	0.10	0.49	14.98	19.35	BC					

Data Files of Results obtained from Four Survey Cruises in this Programme (5/19)

(No. 86-2)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1737FG01	15º 59.95'S	159º 00.15'W	5,025	(Quasi) Flat	1	64	35				38.01	Sp. Ec	2.00	30.6	0.20	0.12	0.49	15.54	19.03	CSC	2	5	a	0	
	86S1737FG02	15º 58.88'S	159º 01.17'W	5,013	(Quasi) Flat	1	48	51				44.49	Sp	1.97	30.5	0.18	0.11	0.48	15.21	18.89	CSC	3	5	a	0	
11	86S1737FG03 (86411)	15º 58.86'S	158º 59.26'W	5,004	(Quasi) Flat	3	27	58	12			20.95	Sp. Ec	2.09	28.8	0.21	0.12	0.48	15.37	18.35	BC	2	0	a	0	
	Average			5,014			52	44	2			34.48	Sp. Ec	2.01	30.2	0.20	0.12	0.48	15.41	18.85	CSC					
	86S1637FG01	15º 00.03'S	159º 00.06'W	5,147	(Quasi) Flat	1	42	57				28.62	Sp. P	1.97	29.4	0.21	0.11	0.53	16.85	18.7	BC	1	0	d2	0	
	86S1637FG02	14º 59.10'S	159º 01.11'W	5,135	(Quasi) Flat	0	54	46				31.84	Sp. P	1.97	28.3	0.23	0.12	0.54	17.95	17.96	BC	1	0	a	0	
12	86S1637FG03 (86412)	14º 59.23'S	158º 59.23'W	5,171	(Quasi) Flat	15	61	16	4	4		13.23	P. Sp	2.00	30.4	0.29	0.17	0.48	16.45	17.87	BC	1	0	d2	0	
	Average			5,151		3	51	45	1	1		24.56	Sp. P	1.97	29.1	0.23	0.12	0.53	17.26	18.23						
	86S1537FG01	13º 59.91'S	158º 59.97'W	5,196	(Plain) Flat	5	33	45	17			18.93	Ot. P	1.99	34.8	0.24	0.16	0.36	12.76	18.23	BC	1	0	d2	0	
	86S1537FG02	13º 58.94'S	159º 00.98'W	5,183	(Plain) Flat	0	31	34	30	5		20.24	Pl	2.07	29.2	0.26	0.16	0.35	13.87	17.87	BC	1	0	e1	0	
13	86S1537FG03 (86413)	13º 59.00'S	158º 58.97'W	5,261	(Plain) Flat	6	53	31	10			22.16	P. Sp	1.97	30.4	0.28	0.17	0.4	14.63	17.99	BC	1	0	b	0	
	Average			5,213		4	40	36	19	2		20.44	Pl. P	2.01	31.4	0.26	0.16	0.37	13.82	18.02						
	86S1437FG01	13º 00.29'S	158º 59.64'W	5,270	(Plain) Flat	4		96				0.65	Sp	1.91	36.4	0.42	0.22	0.3	18.11	16.02	BC	2	0	b	0	
	86S1437FG02	12º 59.42'S	159º 00.50'W	5,265	(Plain) Flat	53	47					1.11	P. Pl	2.00	31	0.58	0.33	0.19	11.84	9.37	CSC	3	5	ds	0	
14	86S1437FG03 (86414)	12º 59.47'S	158º 58.39'W	5,157	(Plain) Flat	36	27	37				2.05	P. Ef	2.06	30.0	0.63	0.36	0.32	19.19	12.67	BC	2	0	ds	0	
	Average			5,231		35	28	36				1.27	P. Ef	2.02	31.4	0.58	0.33	0.28	16.87	12.23						
	86S1337FG01	12º 00.00'S	158º 59.96'W	5,253	(Plain) Flat	92	8					0.28	Sp. P	2.13	30.3	0.81	0.48	0.23	18.25	10.45	BC	3	0	ac	0	
	86S1337FG02	11º 59.05'S	159º 00.95'W	5,242	(Plain) Flat	100						0.22	P. Sp	2.15	26.1	0.81	0.46	0.22	17.37	10.04	BC	3	0	ac	0	
15	86S1337FG03 (86415)	11º 58.96'S	158º 58.98'W	5,298	(Plain) Flat	100						0.35	P. Sp	2.14	20.8	0.93	0.57	0.2	18.85	9.26	BC	5	0	ac	0	
	Average			5,264		97	3					0.28	P. Sp	2.14	25.3	0.88	0.51	0.21	18.29	9.83						
	86S1237FG01	11º 00.11'S	158º 59.79'W	5,341	(Plain) Flat	3	64	33				5.59	M. P	1.97	28.5	0.42	0.25	0.36	17.62	14.38	BC	2	0	bc	0	
	86S1237FG02	10º 59.30'S	159º 00.68'W	5,339	(Plain) Flat	100						0.18	P. Sp	2.00	23.5	,95	0.64	0.19	20.69	8.9	BC	2	0	bc	0	
16	86S1237FG03 (86416)	10º 59.44'S	158º 58.44'W	5,184	(Plain) Flat	25	41	14	7	13		17.32	P. Ef	2.04	28.7	0.35	0.2	0.32	13.34	13.22	BC	2	0	ds	0	
	Average			5,288		20	46	18	5	10		7.70	P. M	2.02	28.6	0.37	0.21	0.33	14.44	13.46						
	86S1137FG01	09º 59.88'S	159º 00.09'W	5,180	(Hilly) Flat	1	24	44	31			34.58	Sp. M	2.00	28.6	0.24	0.13	0.49	18.16	16.83	CSC	2	3	a	0	
	86S1137FG02	09º 58.82'S	159º 01.13'W	5,148	(Hilly) Flat	1	57	29	13			35.62	Sp. M	2.00	29.9	0.23	0.13	0.48	17.68	17.3	CSC	3	5	d2	0	
17	86S1137FG03 (86417)	09º 58.74'S	158º 59.13'W	5,132	(Hilly) Flat	1	31	22	22	24		32.12	M. E	1.97	30.1	0.26	0.15	0.44	17.51	16.42	CSC	3	5	a	0	
	Average			5,153		1	38	32	22	8		34.11	Sp. M	1.99	29.5	0.25	0.14	0.47	17.79	16.87						
	86S1037FG01	09º 00.02'S	159º 00.06'W	5,532	(Hilly) Flat	89	11					0.43	Sp. P	2.00	32.5	0.78	0.52	0.21	17.46	9.66	IBC	4	0	c	0	
	86S1037FG02	08º 59.09'S	159º 01.01'W	5,534	(Hilly) Flat	87	13					0.41	Sp. P	2.00	26.5	0.79	0.53	0.22	18.09	9.93	IBC	5	0	c	0	
18	86S1037FG03 (86418)	08º 59.01'S	158º 58.99'W	5,536	(Hilly) Flat	100						0.43	Sp. P	2.00	23.4	0.79	0.53	0.21	17.23	9.47	IBC	5	0	c	0	
	Average			5,534		92	8					0.42	Sp. P	2.00	27.5	0.79	0.53	0.21	17.58	9.68						
	86S1038SC04	09º 31.43'S	159º 29.29'W	5,680	(Hilly) Flat	4	41	55				3.6	M. P	1.98	29.3	0.54	0.33	0.32	20.01	13.07	BC	4	0	d2	0	
	86S1038FG05	09º 29.87'S	159º 30.67'W	5,518	(Hilly) Seanknoll	11	35	43	11			7.74	M. P	1.99	29.1	0.41	0.24	0.36	17.7	14.5	BC	5	0	a	0	
19	86S1038FG06 (86419)	09º 29.75'S	159º 28.85'W	5,055	(Hilly) Seanknoll	4	48	35	13			29.38	Sp. M	2.00	31.9	0.27	0.15	0.48	17.45	16.55	BC	5	0	d1	0	
	Average			5,418		5	45	38	11			13.57	M. Sp	2.00	31.1	0.32	0.18	0.44	17.73	15.83						
	86S1136FG04	10º 29.92'S	159º 30.00'W	4,773	(Hilly) Flat	0	59	41				23.42	Sp	1.92	27.6	0.29	0.17	0.42	17.58	16.86	FO	1	70	ds	0	
	86S1136FG05	10º 28.88'S	159º 31.02'W	4,878	(Hilly) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
20	86S1136FG06 (86420)	10º 28.82'S	159º 29.03'W	4,690	(Hilly) Flat		13	85	2			35.28	Sp. M	2	28.9	0.21	0.11	0.50	17.58	18.2	-	-	-	ds	0	
	Average			4,780		0	31	67	1			19.57	Sp	1.97	28.4	0.24	0.14	0.47	17.58	17.66						

Data Files of Results obtained from Four Survey Cruises in this Programme (6/19)

(No. 86-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1236SC04	11º 29.67'S	159º 30.19'W	4,900	(Plain) Flat	3	25	36	36			24.67	Sp. M	1.97	28.8	0.27	0.15	0.4	14.72	15.45	CSC	4	5	ds	0	
	86S1236FG05	11º 28.79'S	159º 30.81'W	5,080	(Plain) Flat	6	23	12	1		58	21.9	Pl	1.93	34.8	0.33	0.19	0.29	10.86	13.64	CSC	2	5	ds	0	
21	86S1236FG06 (86421)	11º 28.96'S	159º 28.95'W	4,950	(Plain) Flat	15	85					37.62	Sp. P	2.06	34.3	0.17	0.08	0.52	16.27	19.15	BC	3	0	ds	0	
	Average			4,977		9	51	14	11		15	28.06	Sp. Pl	2	32.8	0.24	0.13	0.42	14.42	16.61						
	86S1336FG04	12º 29.95'S	159º 29.92'W	5,232	(Plain) Flat	9	70	16	5			17.59	Sp. P	2.05	31.9	0.34	0.18	0.45	17.69	16.9	BC	3	0	bc	0	
	86S1336FG05	12º 28.87'S	159º 30.88'W	4,901	(Plain) Platform	1	8	42	49			31.82	Sp. M	1.95	29.6	0.22	0.12	0.51	17.57	17.66	CSC	2	5	d1	0	
22	86S1336FG06 (86422)	12º 28.82'S	159º 28.87'W	5,181	(Plain) Flat	2	83	15				28.62	Sp. M	1.99	29.9	0.37	0.21	0.45	18.44	17.17	BC	4	0	d1	0	
	Average			5,105		3	49	26	21			26.01	Sp. M	1.99	30.2	0.3	0.16	0.47	17.92	17.31						
	86S1436FG04	13º 29.88'S	159º 29.96'W	5,102	(Plain) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ac	0	
	86S1436FG05	13º 29.04'S	159º 30.97'W	5,116	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	d2	0	
23	86S1436SC06 (86423)	13º 28.83'S	159º 29.11'W	5,140	(Plain) Flat	4	35	53	8			15	E. Pl	2.04	28.2	0.33	0.2	0.39	15.73	19.13	BC	3	0	ds	0	
	Average			5,119		4	35	53	8			5.00	E. Pl	2.04	28.2	0.33	0.2	0.39	15.73	19.13	BC					
	86S1536FG04	14º 29.99'S	159º 30.01'W	5,126	(Plain) Flat	64	36					2.52	Sp. P	2.01	30	0.51	0.28	0.29	15.78	14.04	BC	2	0	ac	0	
	86S1536FG05	14º 28.88'S	159º 31.04'W	5,111	(Plain) Flat	49	37	2	12			11.77	P. Sp	2.08	25.4	0.37	0.2	0.42	16.68	17.15	BC	2	0	ac	0	
24	86S1536FG06 (86424)	14º 28.80'S	159º 29.10'W	5,119	(Plain) Flat	17	75	8				14.31	P. Sp	2.07	29.9	0.33	0.18	0.46	17.65	17.29	BC	2	0	ac	0	
	Average			5,119		34	56	5	5			9.53	P. Sp	2.07	28	0.36	0.19	0.43	17.08	16.95						
	86S1636FG04	15º 29.86'S	159º 30.07'W	4,919	(Quasi) Flat	2	40	58				40.56	Sp. P	1.97	28.6	0.13	0.08	0.51	15.11	19.57	CSC	2	5	ds	0	
	86S1636FG05	15º 28.88'S	159º 31.15'W	5,140	(Quasi) Flat	1	63	36				39.27	M. Sp	2.03	31.4	0.20	0.13	0.46	16.0	18.89	BC	2	0	e1	0	
25	86S1636SC06 (86425)	15º 29.05'S	159º 29.02'W	5,140	(Quasi) Flat	2	60	38				39.33	Sp	2.00	27.0	0.20	0.12	0.47	15.72	19.35	BC	3	0	b	0	
	Average			5,066		2	54	45				39.72	Sp. M	2.00	28.9	0.17	0.11	0.48	15.57	19.30						
	86S1636FG07	15º 30.22'S	160º 00.07'W	5,055	(Quasi) Flat	7	30	12	44	7		26.65	Ec. P	1.97	29.3	0.18	0.10	0.52	15.58	18.55	BC	2	0	e1	0	
	86S1636FG08	15º 29.26'S	160º 01.10'W	5,070	(Quasi) Flat	4	54	38	4			30.33	Sp. E	1.93	31.3	0.13	0.08	0.54	15.22	19.63	BC	2	0	e1	0	
26	86S1636FG09 (86426)	15º 29.26'S	159º 59.14'W	5,067	(Quasi) Flat	1	63	36				32.80	Sp. M	1.95	29.7	0.19	0.11	0.54	15.89	19.22	BC	2	0	bc	0	
	Average			5,064		4	49	29	16	2		29.93	Sp. Ec	1.95	30.1	0.17	0.10	0.53	15.56	19.13						
	86S1635FG01	15º 29.97'S	160º 29.96'W	4,953	(Quasi) Flat	8	55	25	12			6.22	Pl. P	2.12	26.7	0.46	0.25	0.37	16.72	17.42	BC	2	0	d2	0	
	86S1635FG02	15º 28.99'S	160º 30.90'W	4,885	(Quasi) Flat							0	-	-	-	-	-	-	-	-	-	-	-	d2	0	
27	86S1635FG03 (86427)	15º 28.92'S	160º 28.81'W	4,929	(Quasi) Flat							0	-	-	-	-	-	-	-	-	-	-	-	d2	0	
	Average			4,916		8	55	25	12			2.07	Pl. P	2.12	26.7	0.46	0.25	0.37	16.72	17.42						
	86S1635FG04	15º 44.93'S	160º 14.96'W	5,017	(Quasi) Flat	9	63	9	19			11.95	Sp. E	1.99	30.4	0.21	0.12	0.51	14.8	19.21	BC	1	0	d2	0	
	86S1635FG05	15º 43.83'S	160º 16.00'W	5,005	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	d2	0	
28	86S1635FG06 (86428)	15º 43.70'S	160º 14.02'W	4,830	(Quasi) Flat	17	74	6	3			20.6	Sp. P	1.98	30.3	0.18	0.11	0.52	14.83	19.5	BC	1	0	ds	0	
	Average			4,951		14	70	7	9			16.28	Sp. P	1.98	30.3	0.19	0.11	0.52	14.82	19.4						
	86S1735FG04	16º 00.00'S	160º 29.53'W	4,821	(Quasi) Flat	3	84	13				28.77	Sp. P	1.97	31.5	0.15	0.08	0.6	16.66	19.47	FO	0	50	a	0	
	86S1735FG05	15º 58.99'S	160º 30.41'W	4,812	(Quasi) Flat	4	21	55	16	4		33.77	Sp. M	1.96	29.6	0.19	0.1	0.53	14.91	19.59	FO	0	60	a	0	
29	86S1735FG06 (86434)	15º 58.98'S	160º 28.30'W	4,854	(Quasi) Flat	7	85	5	3			30.47	Sp. P	1.97	30.8	0.16	0.08	0.56	15.95	18.78	FO	0	40	a	0	
	Average			4,829		5	61	26	7	1		31.00	Sp. P	1.97	30.6	0.17	0.09	0.56	15.78	19.29						
	86S1736FG04	16º 30.19'S	159º 59.85'W	5,058	(Quasi) Flat	9	41	34	10	6		22.95	Sp. M	1.99	29.2	0.20	0.12	0.48	13.44	18.25	BC	1	0	a	0	
	86S1736FG05	16º 29.23'S	160º 00.83'W	5,020	(Quasi) Flat	3	43	54				32.73	Sp. M	2.02	28.9	0.20	0.12	0.53	15.21	18.82	BC	1	0	a	0	
30	86S1736FG06 (86430)	16º 29.29'S	159º 58.80'W	5,087	(Quasi) Flat	6	37	32	19	6		26.64	Sp. M	1.99	29.7	0.19	0.11	0.49	14.13	18.63	BC	1	0	a	0	
	Average			5,055		7	39	33	15	6		27.44	Sp. M	1.99	29.5	0.19	0.11	0.49	13.81	18.46						

Data Files of Results obtained from Four Survey Cruises in this Programme (7/19)

(No. 86-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1735FG04	16º 14.76'S	160º 15.02'W	4,890	(Quasi) Flat	5	61	34				29.02	Sp	1.93	28.1	0.2	0.1	0.56	16.03	19.4	CSC	1	3	a	0	
	86S1735FG05	16º 13.73'S	160º 16.02'W	4,882	(Quasi) Flat	8	89	3				(13.35)	Sp. P	2.01	28.6	0.21	0.11	0.55	16.00	19.44	CSC	1	5	e1	0	
31	86S1735FG06 (86431)	16º 13.53'S	160º 14.05'W	4,901	(Quasi) Flat	4	90	6				(9.75)	Sp. P	2.03	28.5	0.2	0.11	0.54	15.85	19.34	CSC	1	6	a	0	
	Average			4,891		5	61	34				29.02	Sp	1.93	28.1	0.2	0.1	0.56	16.03	19.4						
	86S1735FG07	16º 30.00'S	160º 30.08'W	4,730	(Quasi) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1735FG08	16º 29.02'S	160º 31.13'W	4,845	(Quasi) Flat	0	8	22	52	18		31.24	M. Sp	1.98	25.4	0.25	0.13	0.47	15.27	16.91	BC	2	0	e1	0	
32	86S1735FG09 (86432)	16º 28/98'S	160º 29.24'W	4,498	(Quasi) Seaknoll	1	1	7	91			(28.35)	Sp	1.93	25.2	0.17	0.09	0.53	15.9	18.08	-	-	-	d1	0	
	Average			4,691		0	8	22	52	18		15.62	M. Sp	1.98	25.4	0.25	0.13	0.47	15.27	16.91						
	86S1736FG07	16º 14.78'S	159º 45.11'W	4,773	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1736FG08	16º 13.75'S	159º 46.14'W	4,836	(Quasi) Flat	6	87	7				62.91	Sp. P	2.09	31.5	0.13	0.08	0.55	16.00	20.04	CSC	1	5	d1	0	
33	86S1736FG09 (86433)	16º 13.67'S	159º 44.15'W	4,998	(Quasi) Sea Knoll	19	74	2	5			25.76	Sp. P	1.90	32.4	0.13	0.07	0.53	15.52	19.95	BC	1	0	d1	0	
	Average			4,869		12	81	5	2			29.56	Sp. P	2.01	31.9	0.13	0.08	0.54	15.80	20.01						
	86S1736FG10	16º 29.98'S	159º 29.88'W	5,082	(Quasi) Flat	23	56	8	13			5.92	Oth. P	1.93	31.9	0.27	0.14	0.44	14.15	17.21	BC	1	0	e1	0	
	86S1736FG11	16º 29.07'S	159º 30.78'W	4,911	(Quasi) Sea Knoll							0.00	-	-	-	-	-	-	-	-	-	-	-	d1	0	
34	86S1736FG12 (86434)	16º 29.03'S	159º 28.71'W	4,951	(Quasi) Flat	12	63	22	3			25.46	Sp. E	2.00	30.6	0.19	0.13	0.44	13.12	19.43	CSC	1	5	d1	0	
	Average			4,981		14	62	19	5			10.46	Sp. E	1.99	30.9	0.21	0.13	0.44	13.32	18.99						
	86S1736FG13	16º 14.82'S	159º 14.67'W	5,139	(Quasi) Flat	4	89	7				31.93	Sp. P	2.10	28.4	0.21	0.13	0.48	15.05	19.30	BC	1	0	ts	0	
	86S1736FG14	16º 13.88'S	159º 15.62'W	5,225	(Quasi) Flat	6	40	48	6			22.36	Sp. M	1.97	30.5	0.22	0.12	0.52	15.76	19.04	BC	2	0	e1	0	
35	86S1736FG15 (86435)	16º 13.72'S	159º 13.60'W	5,084	(Quasi) Flat	4	50	30	5	11		26.85	Sp. M	1.98	28.8	0.22	0.13	0.48	14.68	18.30	BC	1	0	ds	0	
	Average			5,149		5	60	27	4	5		27.05	Sp. M	2.02	29.1	0.22	0.13	0.49	15.07	18.82						
	86S1736FG16	15º 59.93'S	159º 30.08'W	5,018	(Quasi) Flat	9	68	23				27.39	Sp. M	1.97	30.8	0.15	0.09	0.51	14.74	20.28	BC	1	0	e1	0	
	86S1736FG17	15º 58.97'S	159º 31.17'W	4,796	(Quasi) Flat	3	44	45	8			38.16	E. Sp	2.01	29.3	0.19	0.11	0.53	15.81	19.41	CSC	1	3	ds	0	
36	86S1736FG18 (86436)	15º 58.92'S	159º 29.21'W	4,978	(Quasi) Flat	7	23	26	26	18		36.14	E. M	1.98	29.0	0.18	0.11	0.51	15.76	16.25	BC	1	0	ds	0	
	Average			4,931		6	45	33	11	5		33.90	E. Sp	1.99	29.7	0.17	0.10	0.52	15.50	18.74						
	86S1737FG04	16º 30.03'S	159º 00.10'W	5,150	(Quasi) Flat	3	86	11				31.84	Sp. M	2.04	25.6	0.25	0.14	0.45	15.41	18.35	BC	1	0	a	0	
	86S1737FG05	16º 29.13'S	159º 01.13'W	5,087	(Quasi) Flat	2	71	27				38.74	Sp	2.13	28.1	0.21	0.12	0.52	15.89	18.67	BC	1	0	a	0	
37	86S1737FG06 (86437)	16º 29.10'S	158º 59.23'W	5,114	(Quasi) Flat	2	83	13	2			34.16	Sp. M	2.06	25.2	0.23	0.13	0.49	15.67	18.94	BC	1	0	a	0	
	Average			5,117		2	76	21	1			34.91	Sp. M	2.10	26.9	0.22	0.12	0.51	15.79	18.79						
	86S1737FG07	16º 15.04'S	158º 45.04'W	5,065	(Quasi) Flat	2	75	23				53.26	Sp	2.00	30.7	0.23	0.13	0.50	15.64	18.65	BC	1	0	a	0	
	86S1737FG08	16º 14.11'S	158º 46.06'W	5,050	(Quasi) Flat	2	40	58				50.82	Sp	2.05	31.4	0.20	0.11	0.51	15.60	18.65	BC	1	0	a	0	
38	86S1737FG09 (86438)	16º 14.12'S	158º 44.15'W	5,050	(Quasi) Flat	1	23	31	41	4		48.50	Ec. Sp	1.95	28.2	0.21	0.12	0.50	15.35	18.05	BC	1	0	a	0	
	Average			5,055		0	0	0	0	0		50.86	Sp. Ec	2	30.1	0.21	0.12	0.5	15.5	18.46						
	86S1737FG10	16º 29.94'S	158º 30.04'W	4,236	(Quasi) Seamount	4	65	27	4			(17.57)	Sp. M	2.02	28.8	0.27	0.15	0.45	16.90	18.19	FO	0	90	d1	0	
	86S1737FG11	16º 29.03'S	158º 30.95'W	4,386	(Quasi) Seamount	1	9	25	65			(22.37)	Sp	1.96	29	0.23	0.12	0.47	16.88	17.78	-	-	-	d1	0	
39	86S1737FG12 (86439)	16º 28.99'S	158º 28.95'W	4,508	(Quasi) Seamount	1	8	75	16			29.57	Sp	1.97	31.7	0.35	0.18	0.42	17.39	16.39	FO	0	90	d2	0	
	Average			4,377		1	8	75	18			29.57	Sp	1.97	31.7	0.35	0.18	0.42	17.39	16.39						
	86S1737FG13	15º 59.99'S	158º 30.16'W	5,002	(Quasi) Flat	6	94					23.46	Sp	1.98	25.7	0.17	0.11	0.48	14.84	19.36	BC	1	0	e1	0	
	86S1737FG14	15º 59.07'S	158º 31.21'W	4,834	(Quasi) Flat	21	57	6	16			23.20	P. Pt	1.97	30.4	0.16	0.11	0.38	16.37	18.81	BC	2	0	ds	0	
40	86S1737FG15 (86440)	15º 58.98'S	158º 29.32'W	4,949	(Quasi) Flat	8	20	21	37	14		29.39	M. Sp	1.98	26.2	0.19	0.11	0.49	14.99	17.51	BC	1	0	d1	0	
	Average			4,928		11	54	10	19	5		25.35	Sp. P	1.98	27.3	0.18	0.11	0.45	15.35	18.47						

Data Files of Results obtained from Four Survey Cruises in this Programme (8/19)

(No. 86-5)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1636FG10	15º 45.05'S	159º 45.00'W	4,980	(Quasi) Flat	5	52	33	4	6		54.67	Sp. M	2.01	30.8	0.21	0.14	0.45	14.00	18.83	BC	1	0	ds	0	
	86S1636FG11	15º 44.11'S	159º 46.02'W	4,988	(Quasi) Flat	100						0.01	Oth	-	-	-	-	-	-	-	-	-	-	ds	0	
41	86S1636FG12 (86441)	15º 44.16'S	159º 44.03'W	4,969	(Quasi) Flat	6	91	3				31.14	Sp. P	2.00	28.9	0.18	0.11	0.50	15.17	19.96	CSC	1	3	d2	0	
	Average			4,979		6	91	3	0	0		28.61	Sp	2.00	28.9	0.18	0.11	0.50	15.17	19.96	BC					
	86S1636FG13	15º 44.97'S	159º 15.12'W	5,038	(Quasi) Flat		77	21	2			40.43	Sp	2.02	31.0	0.19	0.10	0.55	16.85	19.02	BC	1	0	a	0	
	86S1636FG14	15º 43.91'S	159º 16.25'W	5,046	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	b	0	
42	86S1636FG15 (86442)	15º 43.81'S	159º 14.48'W	5,022	(Quasi) Flat	0	84	16				37.11	SP. P	2.05	30.5	0.16	0.09	0.56	16.60	19.38	BC	1	0	a	0	
	Average			5,035		0	80	19	1			38.77	Sp. P	2.03	30.7	0.17	0.09	0.55	16.73	19.20	BC					
	86S1637FG04	15º 30.11'S	158º 29.95'W	4,895	(Quasi) Flat	5	19	23	30	23		22.59	E, P	1.98	30	0.27	0.26	0.36	15.13	17.94	CSC	1	2	ds	0	
	86S1637FG05	15º 29.24'S	158º 30.98'W	4,896	(Quasi) Flat	1	9	19		71		(5.15)	E. Sp	1.96	28.6	0.21	0.14	0.45	14.97	16.04	-	-	-	ds	0	
43	86S1637FG06 (86443)	15º 29.36'S	158º 28.98'W	4,789	(Quasi) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			5,078		5	19	23	30	23		11.30	E. P	1.98	30.0	0.27	0.26	0.36	15.13	17.94						
	86S1637FG07	15º 44.98'S	158º 45.10'W	5,105	(Quasi) Flat	5	48	41	6			33.20	M. Ec	1.96	30.1	0.27	0.17	0.45	15.89	17.55	BC	1	0	a	0	
	86S1637FG08	15º 43.97'S	158º 46.00'W	5,088	(Quasi) Flat	3	26	65	6			45.84	Sp. M	1.97	30.3	0.19	0.11	0.50	16.00	19.37	BC	1	0	a	0	
44	86S1637FG09 (86444)	15º 43.83'S	158º 44.02'W	5,040	(Quasi) Flat	3	26	41	30			40.83	M. Ec	2.02	30.2	0.29	0.17	0.42	15.29	17.09	BC	1	0	bc	0	
	Average			5,078		4	36	41	19			39.96	M. Ec	1.99	30.1	0.28	0.17	0.44	15.57	17.31						
	86S1637FG10	15º 30.88'S	159º 00.56'W	5,022	(Quasi) Flat	2	89	9				40.71	Sp. P	2.03	26.4	0.22	0.12	0.51	16.55	18.73	BC	1	1	a	0	
	86S1637FG11	15º 29.91'S	159º 01.59'W	5,032	(Quasi) Flat	1	47	52				46.49	Sp. M	1.98	25.2	0.16	0.09	0.54	16.16	18.93	BC	1	1	b	0	
45	86S1637FG12 (86445)	15º 29.95'S	158º 59.61'W	5,007	(Quasi) Flat	2	84	14				35.25	Sp. P	2.00	29.0	0.21	0.13	0.48	15.59	18.98	CSC	1	2	a	0	
	Average			5,020		1	65	34				40.82	Sp. M	1.99	27.0	0.19	0.11	0.51	15.89	18.95	BC					
	86S1137FG04	10º 30.06'S	158º 59.95'W	5,078	(Hilly) Flat	32	28	3		37		13.42	P. M	1.99	27.1	0.34	0.21	0.36	13.99	13.55	BC	1	0	d2	0	
	86S1137FG05	10º 29.17'S	159º 00.91'W	4,941	(Hilly) Flat	84	16					2.85	P	1.99	26.2	0.44	0.27	0.27	11.92	11.95	BC	1	1	b	0	
46	86S1137FG06 (86446)	10º 29.15'S	158º 58.92'W	4,940	(Hilly) Flat	4	36	33	27			18.81	P. E	2.01	31.0	0.35	0.21	0.39	16.91	15.59	CSC	1	3	ds	0	
	Average			4,986		21	31	19	14	14		11.69	P. E	2	29.1	0.35	0.21	0.37	15.34	14.48						
	86S1136FG07	10º 14.98'S	159º 14.75'W	5,048	(Hilly) Seaknoll	2	71	25	2			30	E. P	2	30.8	0.3	0.18	0.42	17.57	16.89	BC	5	1	d1	0	
	86S1136FG08	10º 14.03'S	159º 15.67'W	5,334	(Hilly) Seaknoll	2	48	50				19.55	M. E	2.07	27.3	0.37	0.21	0.38	17.8	15.11	BC	2	0	d2	0	
47	86S1136FG09 (86447)	10º 13.99'S	159º 13.59'W	4,867	(Hilly) Seaknoll	3	28	44	25			35.52	M. Ef	1.99	27.7	0.26	0.14	0.48	18.52	16.87	FO	2	40	d1	0	
	Average			5,083		2	48	39	11			28.36	M. E	2.01	28.7	0.3	0.17	0.44	18.03	16.46						
	86S1136FG10	10º 00.37'S	159º 30.34'W	4,802	(Hilly) Platform	1	3	7	15	74		(46.68)	M. Sp	1.96	27.9	0.23	0.12	0.43	16.86	16.26	-	-	-	d1	0	
	86S1136FG11	09º 59.47'S	159º 31.41'W	5,095	(Hilly) Platform	86	14					3.35	P	2.04	21.4	0.55	0.33	0.26	13.65	11.50	BC	1	0	a	0	
48	86S1136FG12 (86448)	09º 59.54'S	159º 29.524'W	4,973	(Hilly) Platform	5	9			86		21.85	M. P	1.88	31.1	0.33	0.18	0.39	16.51	15.24	BC	1	0	e1	0	
	Average			4,957		16	10	0	0	75		12.60	M. P	1.9	29.8	0.36	0.21	0.37	16.09	14.68						
	86S1136FG13	10º 45.01'S	159º 45.12'W	5,290	(Hilly) Platform	4	28	31	15	22		20.71	E. P	1.98	27.3	0.36	0.22	0.37	15.32	14.85	BC	1	0	d2	0	
	86S1136FG14	10º 43.96'S	159º 46.16'W	5,133	(Hilly) Platform	1	66	33				25.63	M. P	2.02	28.8	0.31	0.18	0.43	17.24	17.02	BC	1	0	d1	0	
49	86S1136FG15 (86449)	10º 43.92'S	159º 44.16'W	5,176	(Hilly) Platform	7	26	31	30	6		20.87	M. P	1.98	30.6	0.39	0.21	0.44	18.31	15.14	BC	1	0	d1	0	
	Average			5,200		4	42	32	14	9		22.40	M. P	2	28.9	0.35	0.2	0.41	16.96	15.77						
	86S1238FG07	10º 59.91'S	159º 30.00'W	3,325	(Hilly) Seamount		100					0.05	P	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1238FG08	10º 58.97'S	159º 31.06'W	3,342	(Hilly) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
50	86S1238FG09 (86450)	10º 58.92'S	159º 29.08'W	3,981	(Hilly) Seamount	61	39					(0.82)	P	2.08	30.6	0.24	0.11	0.45	17.09	16.87	FO	0	90	d1	0	
	Average			3,549		0	100					0.03	P	-	-	-	-	-	-	-						

Data Files of Results obtained from Four Survey Cruises in this Programme (9/19)

(No. 86-6)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1136FG16	10º 45.01'S	159º 15.05'W	4,888	(Hilly) Flat	1	85	11	3			23.8	Sp. Ot	1.95	28.7	0.29	0.17	0.45	17.87	17.45	FO	0	70	e1	0	
	86S1136FG17	10º 44.04'S	159º 16.04'W	4,846	(Hilly) Flat	2	68	27	3			23.29	M. Sp	2	28.1	0.33	0.2	0.41	17.48	16.60	FO	2	60	e1	0	
51	86S1136FG18	10º 44.05'S	159º 14.13'W	4,894	(Hilly) Flat	2	89	9				(2.18)	Ot. P	2.03	26.3	0.42	0.28	0.36	18.12	15.61	FO	5	60	e1	0	
	(86451)																									
	Average			4,869		1	77	19	3			23.55	Sp. M	1.97	28.4	0.31	0.19	0.43	17.68	17.03						
	86S1136FG19	10º 30.38'S	159º 59.29'W	4,639	(Mount) Seamount	1	38	56	5			31.02	Sp. P	2.01	28.4	0.2	0.11	0.5	16.75	18.37	FO	3	70	d1	0	
	86S1136FG20	10º 29.45'S	159º 45.55'W	5,306	(Mount) Seamount	0	34	43	12	11		29.02	M. E	1.95	30.9	0.28	0.18	0.43	17.32	16.70	BC	1	80	d1	0	
52	86S1136FG21	10º 29.45'S	159º 58.13'W	4,633	(Mount) Seamount							(0.00)	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	(86452)																									
	Average			4,859		1	36	50	8	5		30.02	Sp. M	1.98	29.6	0.23	0.14	0.47	17.02	17.57						
	86S1136FG22	10º 15.04'S	159º 44.81'W	5,509	(Hilly) Channel							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	86S1136FG23	10º 13.97'S	159º 45.55'W	5,476	(Hilly) Channel	17	59	24				(6.01)	P. Ot	2.01	33.3	0.31	0.17	0.45	18.22	18.37	-	-	-	ds	0	
53	86S1136FG24	10º 13.92'S	159º 43.17'W	5,505	(Hilly) Channel							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	(86453)																									
	Average			5,497		0	0	0				0.00	-	-	-	-	-	-	-	-						
	86S1036FG07	09º 00.06'S	159º 29.86'W	5,522	(Hilly) Seaknoll	1	56	43				19.08	M. P	2.02	28.3	0.34	0.22	0.37	17.5	15.94	BC	5	0	ds	0	
	86S1036FG08	08º 59.11'S	159º 30.86'W	5,299	(Hilly) Seaknoll	4	47	35	7	7		24.27	P. E	1.98	30.0	0.37	0.21	0.38	15.95	15.18	BC	3	0	ds	0	
54	86S1036FG09	08º 59.06'S	159º 28.75'W	5,380	(Hilly) Seaknoll	1	50	33	12	4		22.42	P. Pl	2.02	29.8	0.36	0.23	0.36	16.69	14.81	BC	5	0	ds	0	
	(86454)																									
	Average			5,400		2	51	37	7	4		21.92	P. M	2.01	29.5	0.36	0.22	0.37	16.66	15.28						
	86S1036FG10	09º 15.02'S	159º 44.92'W	5,549	(Hilly) Seaknoll	2	7	50	34	7		23.55	M. Sp	1.94	27.9	0.23	0.13	0.5	18.87	17.69	-	-	-	ds	0	
	86S1036FG11	09º 14.04'S	159º 45.89'W	5,720	(Hilly) Seaknoll	4	73	19	4			23.73	P. Sp	2.01	31.9	0.22	0.14	0.41	16.3	19.21	BC	3	0	ds	0	
55	86S1036FG12	09º 14.00'S	159º 43.92'W	5,633	(Hilly) Seaknoll							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	(86455)																									
	Average			5,634		3	40	34	19	3		23.64	Sp. M	1.98	29.9	0.22	0.13	0.45	17.62	18.43						
	86S1036FG13	09º 30.00'S	160º 00.03'W	2,859	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1036FG14	09º 29.01'S	160º 01.07'W	2,823	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
56	86S1036FG15	09º 28.98'S	159º 59.10'W	3,479	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	(86456)																									
	Average			3,054								0.00	-	-	-	-	-	-	-	-						
	86S1036FG16	09º 45.10'S	159º 15.21'W	5,412	(Hilly) Platform	19	12	69				0.72	M. P	2.67	6.2	0.01	0.04	,04	0	1.06	BC	3	0	b	0	
	86S1036FG17	09º 44.13'S	159º 16.24'W	5,397	(Hilly) Platform	100						0.15	Ot	2	31.6	0.37	0.25	0.33	20.26	15.18	SC	15	0	d2	0	
57	86S1036FG18	09º 44.13'S	159º 14.35'W	5,255	(Hilly) Platform							0.00	-	-	-	-	-	-	-	-	-	-	-	d2	0	
	(86457)																									
	Average			5,355		33	10	57				0.29	M. P	2.55	10.6	0.37	0.25	0.33	20.26	15.18						
	86S1036FG19	09º 44.99'S	159º 44.63'W	5,290	(Hilly) Seaknoll	36	53	11				6.05	P. M	1.97	29.1	0.54	0.29	0.33	16.95	13.16	BC	3	0	ds	0	
	86S1036FG20	09º 44.00'S	159º 45.63'W	5,513	(Hilly) Seaknoll	1	7	15		77		6.52	Pl, M	1.76	31.7	0.28	0.16	0.16	5.27	11.34	BC	2	0	d1	0	
58	86S1036FG21	09º 43.98'S	159º 43.56'W	5,014	(Hilly) Seaknoll	0	22	29	49			39.88	M. Ef	1.99	28.3	0.25	0.16	0.41	17.06	16.78	SCC	10	5	d1	0	
	(86458)																									
	Average			5,272		4	24	25	37	10		17.48	M. Pl	1.96	28.8	0.29	0.17	0.37	15.64	15.72						
	86S1036FG22	09º 14.99'S	159º 14.96'W	5,352	(Hilly) Platform	10	17	3	70			2.25	M. Pt	1.96	26.5	0.31	0.2	0.35	14.85	13.34	-	-	-	d2	0	
	86S1036FG23	09º 13.98'S	159º 15.89'W	5,305	(Hilly) Platform	4	37	37	22			(8.57)	Ot. P	1.96	29.3	0.35	0.22	0.36	15.56	14.88	BC	8	0	ds	0	
59	86S1036FG24	09º 13.81'S	159º 13.92'W	5,372	(Hilly) Platform	13	41	24	22			(4.15)	M. P	2.01	25.8	0.42	0.27	0.29	15.48	13.68	BC	5	0	d2	0	
	(86459)																									
	Average			5,343		10	17	3	70			2.25	M. Pt	1.96	26.5	0.31	0.2	0.35	14.85	13.34						
	86S1037FG04	09º 30.03'S	159º 00.03'W	5,397	(Hilly) Flat	13	67	20				8.43	P. E	2.01	25.7	0.38	0.21	0.36	15.66	13.36	BC	5	0	ds	0	
	86S1037FG05	09º 28.89'S	159º 01.03'W	5,309	(Hilly) Flat	1	47	39	13			30.09	M. Sp	2.02	31.0	0.38	0.21	0.41	18.49	14.80	BC	3	0	ds	0	
60	86S1037FG06	09º 28.69'S	158º 59.10'W	5,439	(Hilly) Flat	24	60	16				5.22	P.Ot	1.99	31.1	0.45	0.24	0.30	14.32	12.81	BC	1	0	ds	0	
	(86460)																									
	Average			5,382		7	53	32	9			14.58	M. P	2.01	29.9	0.39	0.22	0.39	17.33	14.23						

*Sil%:siliceous fossil% , Cal% :calcareous fossil%, T.P.L:Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (10/19)

(No. 90-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S1830FG01	16º 59.94′S	166º 00.04′W	5,502	(Plain) Flat	4	96					0.35	Sp	1.95	29.7	0.54	0.32	0.28	16.71	14.69	BC	0	0	b	10	
	90S1830FG02	16º 59.01′S	166º 01.00′W	5,527	(Plain) Flat	37	63					0.12	Sp	1.9	26.7	0.52	0.31	0.30	16.92	14.75	BC	0	0	b	10	
1	90S1830FG03 (90401)	16º 59.08′S	165º 59.06′W	5,567	(Plain) Flat	13	44			44		1.45 4.05	Sp. Pl	2	28.2	0.55	0.32	0.31	18.36	14.34	BC	0	0	b	10	
	Average			5,532		13	54			33		0.64	Sp. Pl	1.98	28.4	0.55	0.32	0.31	17.98	14.43						
	90S1930FG01	17º 59.96′S	165º 59.99′W	5,313	(Plain) Flat	28	72					2.62	Sp	2.01	25.7	0.39	0.23	0.44	16.87	16.95	BC	0	0	b	40	
	90S1930FG02	17º 58.96′S	166º 01.01′W	5,339	(Plain) Flat	9	45	46				3.77	Sp	1.92	25.5	0.43	0.23	0.44	17.90	16.03	BC	0	0	b	30	
2	90S1930FG03 (90402)	17º 59.01′S	165º 58.97′W	5,323	(Plain) Flat	7	36	57				1.74	Sp	2.02	27.1	0.37	0.21	0.45	16.51	16.68	BC	0	0	b	30	
	Average			5,325		15	52	34				2.71	Sp	1.97	25.9	0.40	0.23	0.44	17.27	16.47						
	90S2030FG01	19º 00.00′S	166º 00.02′W	4,776	(Hilly) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	90S2030FG02	18º 58.96′S	166º 01.04′W	5,010	(Hilly) Seaknoll	32	20	31	17			18.72	P. E	1.96	30.1	0.28	0.18	0.42	11.15	18.49	BC	0	0	ds	10	
3	90S2030FG03 (90403)	18º 58.99′S	165º 59.00′W	4,925	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	ds	10	
	Average			4,904		32	20	31	17			6.24	P. E	1.96	30.1	0.28	0.18	0.42	11.15	18.49						
	90S2131FG01	20º 00.03′S	165º 00.27′W	4,285	(Plain) Seaknoll	64	36					15.18	Sp	1.92	29.6	0.2	0.12	0.63	16.01	19.97	CSC	5	10	d1	0	
	90S2131FG02	19º 59.02′S	165º 01.03′W	4,778	(Plain) Seaknoll	39	9		52			0.94	Pl. Sp	1.94	29.6	0.25	0.18	0.29	6.48	15.26	BC	0	0	d1	0	
4	90S2131FG03 (90404)	19º 59.04′S	164º 59.16′W	4,392	(Plain) Seaknoll	22	78					16.5	Sp	1.92	31.2	0.2	0.13	0.62	15.28	20.26	-	-	-	b	40	
	Average			4,485		42	57			2		10.87	Sp	1.92	30.4	0.2	0.13	0.62	15.36	19.98						
	90S2031FG01	18º 59.99′S	164º 59.99′W	5,152	(Plain) Flat	25	56	8	11			16.64	Sp. P	1.98	29.5	0.3	0.19	0.45	13.88	19.53	BC	0	0	b	10	
	90S2031FG02	18º 59.01′S	165º 01.02′W	5,117	(Plain) Seaknoll	17	56	19	8			10.17	Sp. P	1.98	28.7	0.27	0.17	0.5	14.63	20.29	BC	0	0	ds	0	
5	90S2031FG03 (90405)	18º 59.00′S	164º 59.01′W	4,921	(Plain) Flat	31	57	10	2			19.51	Sp. P	2.00	28.1	0.3	0.2	0.48	14.3	20.13	BC	0	0	ds	0	
	Average			5,063		26	56	11	7			15.44	Sp. P	1.99	28.8	0.29	0.19	0.47	14.22	19.95						
	90S1931FG01	18º 00.01′S	164º 59.95′W	5,347	(Plain) Flat	23	57	20				0.97	P. Pl	2.03	27.9	0.51	0.29	0.37	16.28	15.36	BC	0	0	ts	10	
	90S1931FG02	17º 59.06′S	165º 01.03′W	5,419	(Plain) Flat	62	38					0.89	Sp. Pl	2.04	31.1	0.53	0.31	0.31	15.41	15	BC	0	0	c	0	
6	90S1931FG03 (90406)	17º 59.02′S	164º 58.99′W	5,441	(Plain) Flat	19	38	3	8	32		4.92	Sp. Pl	1.93	29.3	0.47	0.25	0.39	16.13	15.3	BC	0	0	e1	0	
	Average			5,402		25	41	5	6	23		2.26	Sp. Pl	1.96	29.3	0.48	0.26	0.38	16.06	15.27						
	90S1831FG01	16º 59.96′S	165º 00.01′W	5,429	(Plain) Flat	1	5	3	17	74		8.04	Pl. Sp	1.91	32.8	0.34	0.21	0.31	10	12.87	BC	0	0	b	20	
	90S1831FG02	16º 58.91′S	165º 01.01′W	5,441	(Plain) Flat	3	15	82				0.42	Pl	1.9	29.5	0.54	0.31	0.32	16.04	13.62	BC	0	0	c	0	
7	90S1831FG03 (90407)	16º 58.99′S	164º 58.99′W	5,448	(Plain) Flat	33	67					0.11	P. Sp	1.83	26.3	0.55	0.32	0.24	14.4	13.23	BC	0	0	c	0	
	Average			5,439		2	6	7	16	69		2.86	Pl. Sp	1.91	32.5	0.35	0.22	0.31	10.37	12.92						
	90S1731FG01	15º 59.99′S	164º 59.99′W	5,528	(Plain) Flat	3	28	21	35	13		9.63	Sp. Pt	1.97	27.6	0.36	0.22	0.41	16.39	16.58	BC	0	0	b	30	
	90S1731FG02	15º 58.97′S	165º 00.96′W	5,546	(Plain) Flat	5	32	12	15	36		4.22	E. Sp	1.96	27.6	0.41	0.24	0.39	17.2	16.41	BC	0	0	b	20	
8	90S1731FG03 (90409)	15º 59.00′S	164º 58.97′W	5,502	(Plain) Flat		5	36	16	43		8.57	E. Sp	1.98	27.4	0.35	0.21	0.42	16.42	16.05	BC	0	0	b	10	
	Average			5,525		2	20	25	24	29		7.47	Sp. E	1.97	27.5	0.37	0.22	0.41	16.55	16.34						
	90S1832SC01	17º 00.03′S	163º 59.96′W	5,490	(Plain) Flat	34	66					0.77	P	2.04	28.9	0.55	0.30	0.34	17.03	16.56	BC	0	0	c	0	
	90S1832FG02	16º 58.92′S	164º 01.00′W	5,547	(Plain) Flat	21	79					1.26	P	1.93	31.2	0.42	0.24	0.39	16.13	16.58	BC	0	0	c	0	
9	90S1832FG03 (90409)	16º 58.99′S	163º 59.04′W	5,486	(Plain) Flat	10	18	11	61			2.02 4.05	Pl. Sp	1.95	31.4	0.39	0.23	0.37	15.42	17.13	BC	0	0	c	0	
	Average			5,508		18	44	6	32			1.35	P. Pl	1.96	30.8	0.43	0.25	0.37	15.95	16.86						
	90S2032FG01	18º 59.99′S	163º 59.99′W	5,054	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2032FG02	18º 59.04′S	164º 01.00′W	5,111	(Plain) Flat	60	20	20				1.95	P	2.05	30.0	0.42	0.25	0.36	13.00	17.47	BC	0	0	c	0	
10	90S2032FG03 (90410)	18º 59.04′S	163º 59.04′W	5,074	(Plain) Flat	70	14	16				2.37	P. E	2.06	29.5	0.40	0.23	0.39	14.39	17.90	BC	0	0	c	0	
	Average			5,080		66	17	18				1.44	P. E	2.05	19.7	0.41	0.24	0.38	13.77	17.71						

Data Files of Results obtained from Four Survey Cruises in this Programme (11/19)

(No. 90-2)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S2132FG01	20º00.06′S	163º59.95′W	5,054	(Hilly) Channel	33	32	24	11			17.75	P	1.96	27.6	0.26	0.16	0.43	10.23	18.78	BC	5	3	ds	0	
	90S2132FG02	19º59.00′S	164º01.00′W	4,869	(Hilly) Flat	16	61	23				16.21	Sp. P	2.00	27.9	0.31	0.19	0.47	14.15	18.88	BC	5	2	ts	10	
11	90S2132FG03 (90411)	19º59.05′S	163º59.05′W	4,930	(Hilly) Flat	26	48	26				10.37	Sp. P	2.03	28.3	0.32	0.19	0.48	14.95	18.66	BC	3	2	ts	10	
	Average			4,951		26	46	24	5			14.78	P. Sp	1.99	27.9	0.29	0.18	0.45	12.71	18.78						
	90S2232FG01	21º 00.01′S	163º 59.97′W	5,061	(Plain) Flat	10	19		71			1.39	P	1.99	24.4	0.4	0.24	0.43	16.77	17.11	BC	2	1	c	0	
	90S2232FG02	20º 59.02′S	164º 00.94′W	5,100	(Plain) Flat	29	26	7		38		6.72	P. Sp	2.04	30.2	0.4	0.22	0.43	16.09	17.78	BC	1	0	c	0	
12	90S2232FG03 (90412)	20º 59.03′S	163º 59.01′W	4,967	(Plain) Flat	27	27	35	11			9.8	P	1.98	30.3	0.27	0.18	0.44	12.58	18.87	BC	1	0	c	0	
	Average			5,043	26	26	26	22	12	14		5.97	P. Sp	2.00	29.7	0.33	0.2	0.43	14.24	18.32						
	90S2333FG01	22º 00.00′S	163º 00.00′W	4,603	(Hilly) Seaknoll	23	22		28	27		5.73	P. Sp	1.9	31.5	0.25	0.16	0.51	12.94	19.06	BC	3	0	c	0	
	90S2333FG02	21º 58.92′S	163º 00.96′W	4,867	(Hilly) Flat	26	27	26	21			6.66	P. M	2.02	27.6	0.54	0.29	0.39	16.52	15.36	BC	0	0	b	30	
13	90S2333FG03 (90413)	21º 58.99′S	162º 59.03′W	4,608	(Hilly) Seaknoll	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,693		25	25	14	24	13		6.19	P. Sp	1.97	29.4	0.41	0.23	0.44	14.92	17.02						
	90S2233SC01	20º 59.99′S	162º 59.99′W	4,990	(Plain) Flat	100						0.02	P	-	-	-	-	-	-	-	BC	2	2	c	0	
	90S2233FG02	20º 58.97′S	163º 00.94′W	4,946	(Plain) Flat							0	-	-	-	-	-	-	-	-	BC	0	0	c	0	
14	90S2233FG03 (90414)	20º 59.01′S	162º 58.99′W	4,928	(Plain) Flat	7	32	21	33	7		16.78	P. Sp	2.07	26	0.42	0.23	0.46	16.17	16.58	BC	3	3	c	0	
	Average			4,955		7	32	21	33	7		27.96	P. Pl	2.07	26	0.42	0.23	0.46	16.17	16.58						
	90S2133FG01	20º 00.08′S	162º 59.93′W	4,822	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2133FG02	19º 58.96′S	163º 00.89′W	4,907	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
15	90S2133FG03 (90415)	19º 58.98′S	162º 59.02′W	4,855	(Plain) Flat	1	18	60	21			30.28	Sp	1.90	27.3	0.23	0.16	0.50	13.55	19.02	BC	0	0	b	40	
	Average			4,861		1	18	60	21			10.09	Sp	1.90	27.3	0.23	0.16	0.50	13.55	19.02						
	90S2033FG01	18º 59.98′S	162º 59.98′W	4,946	(Plain) Platform							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2033FG02	18º 58.99′S	163º 00.97′W	4,841	(Plain) Platform							0.00	-	-	-	-	-	-	-	-	BC	3	0	c	0	
16	90S2033FG03 (90416)	18º 59.05′S	162º 59.02′W	4,812	(Plain) Platform	100						0.13	P	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,866		100						0.04	-	-	-	-	-	-	-	-						
	90S2034FG01	18º 59.99′S	161º 59.96′W	4,857	(Hilly) Flat	19	57	8	16			24.12	P. E	2.00	27.8	0.23	0.13	0.60	16.35	19.34	BC	0	0	ts	10	
	90S2034FG02	18º 59.01′S	162º 00.94′W	4,996	(Hilly) Flat	8	55	37				29.83	P	1.99	27.7	0.20	0.14	0.55	14.95	20.04	BC	0	0	ts	10	
17	90S2034FG03 (90417)	18º 59.00′S	161º 59.00′W	5,011	(Hilly) Flat	2	10	11	11	46	20	29.92	Pl. P	1.96	25.9	0.26	0.18	0.43	12.48	19.97	BC	0	0	ts	20	
	Average			4,955		9	38	18	9	18	8	27.96	P. Pl	1.98	27.0	0.24	0.15	0.52	14.40	19.97						
	90S2134FG01	20º 00.00′S	162º 00.03′W	5,039	(Plain) Flat	17	31	44	8			9.61	P. M	1.88	33.7	0.43	0.23	0.42	12.78	17.23	BC	0	0	c	0	
	90S2134FG02	19º 58.99′S	162º 00.93′W	4,995	(Plain) Flat	19	42	20	19			9.78	P. E	1.91	32.1	0.34	0.23	0.44	12.95	19.48	BC	0	0	c	0	
18	90S2134FG03 (90418)	19º 59.00′S	161º 59.00′W	4,988	(Plain) Flat	19	24	21	10	26		10.85	P. M	1.89	33.1	0.33	0.20	0.44	12.96	18.87	BC	0	0	c	0	
	Average			5,007		18	32	28	12	9		10.08	P. M	1.89	33.0	0.36	0.22	0.43	12.90	18.55						
	90S2234FG01	20º 59.97′S	161º 59.99′W	4,736	(Hilly) Flat	4	15	20	24	37		17.73	P. E	1.98	25.1	0.37	0.22	0.48	15.51	17.08	BC	1	0	c	0	
	90S2234FG02	20º 58.98′S	162º 00.94′W	4,647	(Hilly) Seaknoll	10	53	16		21		19.48	Sp. E	2	27.4	0.36	0.21	0.48	15.01	17.85	BC	2	4	c	0	
19	90S2234FG03 (90419)	20º 59.01′S	161º 58.96′W	4,734	(Hilly) Flat	8	54	18		20		9.32	Sp. E	2.06	25.7	0.37	0.21	0.5	16.2	18.17	BC	2	3	b	30	
	Average			4,706		7	39	18	9	27		15.51	Sp. E	2.00	26.2	0.36	0.21	0.48	15.44	17.62						
	90S2334FG01	22º 00.02′S	161º 59.92′W	4,833	(Hilly) Flat	18	28	44	10			2.46	Pl	1.96	28.3	0.53	0.3	0.28	12.34	19.67	BC	0	0	c	0	
	90S2334FG02	21º 59.03′S	162º 00.88′W	4,775	(Hilly) Flat	6	5	3	2	42	42	8.27	Pl	1.89	42.8	0.35	0.22	0.28	8.07	18	BC	0	0	b	20	
20	90S2334FG03 (90420)	21º 59.02′S	161º 59.03′W	4,783	(Hilly) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,797		9	10	12	4	32	32	5.37	Pl	1.9	39.5	0.4	0.24	0.28	9.23	18.45						

Data Files of Results obtained from Four Survey Cruises in this Programme (12/19)

(No. 90-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S2434FG01	23º 03.98′S	162º 03.97′W	4,847	(Hilly) Flat	10	18	29	43			8.24	P. Pf	2.02	25.7	0.43	0.23	0.47	15.52	16.93	BC	0	0	b	10	
	90S2434FG02	23º 03.03′S	162º 05.03′W	4,821	(Hilly) Flat	6	19	66	9			13.38	Sp. P	2.04	28.7	0.41	0.22	0.49	16.42	16.76	BC	2	1	b	30	
21	90S2434FG03 (90421)	23º 03.04′S	162º 02.97′W	4,908	(Hilly) Flat	5	15	58	22			26.82	P	2.02	27.1	0.45	0.25	0.47	16.49	16.63	BC	2	1	a	20	
	Average			4,859		6	17	55	22			16.15	P. Sp	2.02	27.3	0.44	0.24	0.48	16.30	16.72						
	90S2535FG01	24º 03.98′S	161º 03.97′W	5,313	(Hilly) Flat							0	-	-	-	-	-	-	-	-	BC	1	0	b	10	
	90S2535FG02	24º 02.97′S	161º 04.97′W	5,256	(Hilly) Flat		30	34	36			4.10	Sp. P	2.04	28	0.76	0.41	0.33	22.55	12.6	BC	1	0	b	20	
22	90S2535FG03 (90423)	24º 03.01′S	161º 02.98′W	5,287	(Hilly) Flat	13	76	9	2			18.76	P	2.03	28.9	0.29	0.18	0.51	14.74	20.1	BC	0	1	a	20	
	Average			5,285		11	68	14	8			7.62	P. Sp	2.03	28.7	0.38	0.22	0.47	16.15	18.74						
	90S2536FG01	24º 03.97′S	159º 58.08′W	4,999	(Plain) Seaknoll	2	9	82	7			35.88	Sp	1.9	29.7	0.37	0.21	0.51	16.09	17.45	BC	3	2	ts	30	
	90S2536FG02	23º 58.99′S	160º 00.97′W	4,851	(Plain) Seaknoll	48	39	6	7			18.98	P	2.02	28.5	0.30	0.19	0.54	14.26	20.98	BC	2	1	ts	20	
23	90S2536FG03 (90424)	23º 58.99′S	159º 58.99W	5,003	( )	27	48	19	6			20.79	P. Sp	1.99	29.1	0.29	0.18	0.53	13.98	20.49	BC	0	1	ts	10	
	Average			4,951		20	27	46	7			25.22	P. Sp	1.96	29.3	0.33	0.19	0.52	15.04	19.18						
	90S2537FG01	24º 00.00′S	159º 00.00′W	4,329	(Hilly) Seaknoll	89	11					7.55	Sp	2.09	28.8	0.49	0.25	0.48	16.77	18.07	CSC	4	7	ds	0	
	90S2537FG02	23º 59.01′S	159º 00.96′W	4,199	(Hilly) Seaknoll	100						0.03	P	-	-	-	-	-	-	-	-	-	-	ds	0	
24	90S2537FG03 (90425)	23º 59.02′S	158º 58.97′W	4,251	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			4,260		89	11					2.53	Sp	2.09	28.8	0.49	0.25	0.48	16.77	18.07						
	90S2538SC01	23º 59.51′S	157º 59.96′W	4,870	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2538SC02	23º 59.01′S	158º 00.97′W	4,969	(Hilly) Flat		100					(0.05)	P	2	28.6	0.46	0.24	0.47	16.22	17.14	-	-	-	c	0	
25	90S2538SC03 (90428)	23º 58.99′S	157º 58.99′W	4,739	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			4,828			0					0.00	-	-	-	-	-	-	-	-						
	90S2539FG01	24º 00.07′S	156º 59.90′W	4,893	(Plain) Flat	30	36	34				4.77	P. Pf	1.99	29.2	0.84	0.39	0.34	18.72	13.00	BC	1	0	c	0	
	90S2539FG02	23º 59.04′S	157º 00.94′W	4,898	(Plain) Flat	65	35					2.66	P	1.99	31.2	0.79	0.39	0.37	19.2	14.59	BC	0	0	c	0	
26	90S2539FG03 (90429)	23º 59.03′S	156º 58.99′W	4,895	(Plain) Flat	46	51	3				3.32	Pt	2.11	27.7	0.72	0.34	0.37	18.06	14.93	BC	0	0	c	10	
	Average			4,895		44	40	16				3.58	P. Pf	2.02	29.2	0.79	0.38	0.36	18.63	13.99						
	90S2439FG01	23º 00.26′S	156º 59.93′W	4,952	(Plain) Flat	1	9	77	13			24.95	Sp	1.94	29.7	0.44	0.22	0.48	17.91	16.18	BC	0	0	a	30	
	90S2439FG02	22º 59.03′S	157º 00.95′W	4,964	(Plain) Flat	1	23	76				13.48	Sp	2.04	29	0.43	0.22	0.49	17.9	16.02	BC	0	0	a	30	
27	90S2439FG03 (90430)	22º 59.00′S	156º 59.00′W	4,893	(Plain) Flat	1	1	11	67	20		33.84	Sp	1.85	30.4	0.39	0.21	0.46	16.21	17.22	BC	0	0	a	30	
	Average			4,936		1	8	46	36	9		24.09	Sp	1.92	29	0.42	0.21	0.47	17.12	16.63		-	-			
	90S2438FG01	22º 59.75′S	157º 59.83′W	4,783	(Hilly) Flat	31	30		39			2.35	P	1.96	28.7	0.57	0.27	0.45	19.18	14.49	BC	0	0	a	30	
	90S2438FG02	22º 58.99′S	158º 01.00′W	4,757	(Hilly) Flat	24	23		53			2.51	P	2.02	29.3	0.6	0.29	0.46	19.97	14.78	BC	0	0	a	30	
28	90S2438FG03 (90431)	22º 59.01′S	157º 59.03′W	4,778	(Hilly) Flat		28	72				9.11	P	1.99	28.7	0.47	0.24	0.48	18.02	15.28	BC	0	0	a	30	
	Average			4,773		10	27	47	16			4.66	P	1.99	28.8	0.51	0.25	0.47	18.57	15.06						
	90S2437FG01	23º 00.04′S	159º 59.97′W	4,839	(Hilly) Flat	9	40	37	3	11		10.24	P. Pl	2.02	27.8	0.85	0.36	0.36	21.18	13	BC	0	0	c	0	
	90S2437FG02	22º 58.99′S	159º 00.93′W	4,849	(Hilly) Flat	100						0.11	P	2	35.7	0.5	0.28	0.29	10.44	16.07	BC	0	0	c	0	
29	90S2437FG03 (90432)	22º 59.01′S	159º 59.01′W	4,849	(Hilly) Flat	1	15	62	22			14.7	Pf	2.07	27.5	1.05	0.45	0.30	26.16	9.89	BC	0	0	c	0	
	Average			4,846		5	25	52	14	5		8.35	Pf. P	2.05	27.6	0.96	0.41	0.32	24.07	11.18						
	90S2436FG01	23º 00.03′S	160º 00.00′W	4,319	(Hilly) Seaknoll	38	62					0.02	P	-	-	-	-	-	-	-	-	-	-	ds	0	
	90S2436FG02	22º 58.99′S	160º 00.98′W	4,596	(Hilly) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
30	90S2436FG03 (90433)	22º 59.01′S	159º 58.99′W	4,222	(Hilly) Seaknoll	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			4,379		38	62					0.01	P	-	-	-	-	-	-	-						

Data Files of Results obtained from Four Survey Cruises in this Programme (13/19)

(No. 90-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S2435FG01	22º 54.98′S	161º 00.01′W	4,928	(Plain) Flat							0	-	-	-	-	-	-	-	-	-	2	1	c	0	
	90S2435FG02	22º 54.00′S	161º 01.00′W	4,934	(Plain) Flat	4	19	36	37	4		28.25	P	1.95	28.8	0.27	0.17	0.54	14.67	19.16	BC	-	-	c	0	
31	90S2435FG03 (90434)	22º 54.03′S	160º 59.02′W	4,932	(Plain) Flat	27	73					0.25	P	2.08	27.3	0.58	0.29	0.44	16.86	16.85	BC	1	0	c	0	
	Average			4,931		4	20	36	37	4		9.50	P	1.95	28.7	0.27	0.18	0.53	14.69	19.14						
	90S2335FG01	21º 59.98′S	160º 59.99′W	4,711	(Plain) Flat			8	14	78		4.22	Pl	1.88	35.6	0.25	0.16	0.44	8.81	20.27	-	-	-	c	0	
	90S2335FG02	21º 58.96′S	161º 01.05′W	4,747	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
32	90S2335FG03 (90435)	21º 58.99′S	160º 59.04′W	4,757	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,738				8	14	78		1.41	Pl	1.88	35.6	0.25	0.16	0.44	8.81	20.27						
	90S2235FG01	20º 59.99′S	160º 59.98′W	4,833	(Plain) Flat	4	15	19	42	20		6.38	Pl. P	1.88	36.9	0.12	0.13	0.14	1.02	14.94	BC	1	0	a	10	
	90S2235FG02	20º 58.99′S	161º 00.96′W	4,843	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	BC	1	0	a	10	
33	90S2235FG03 (90436)	20º 59.02′S	160º 58.99′W	4,799	(Plain) Flat	28	72					0.19	P	2.27	35	0.2	0.16	0.2	4.75	14.93	-	-	-	a	10	
	Average			4,825		5	17	19	41	19		2.19	Pl. P	1.89	36.9	0.12	0.13	0.15	1.13	14.94						
	90S2135FG01	19º 59.04′S	160º 59.94′W	4,811	(Plain) Seaknoll	20	57	23				13.92	P. Sp	2.00	25.4	0.32	0.19	0.47	14.01	18.70	BC	0	0	ds	0	
	90S2135FG02	19º 59.04′S	161º 00.97′W	4,228	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
34	90S2135FG03 (90437)	19º 59.00′S	160º 59.00′W	4,884	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	BC	0	0	ds	0	
	Average			4,641		20	57	23				4.64	P. Sp	2.00	25.4	0.32	0.19	0.47	14.01	18.70						
	90S2035FG01	18º 59.98′S	161º 00.01′W	4,997	(Plain) Flat	20	23	20	37			6.82	Pl. P	1.97	31.8	0.25	0.17	0.39	9.67	17.08	BC	0	0	ts	10	
	90S2035FG02	18º 59.00′S	161º 01.00′W	5,156	(Plain) Channel							0.00	-	-	-	-	-	-	-	-	-	-	-	ts	10	
35	90S2035FG03 (90438)	18º 59.02′S	160º 59.04′W	4,978	(Plain) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	ts	10	
	Average			5,044		20	23	20	37			2.27	Pl. P	1.97	31.8	0.25	0.17	0.39	9.67	17.08						
	90S1934FG01	17º 59.98′S	162º 00.00′W	4,698	(Hilly) Seaknoll	19	66	15				28.84	Sp. P	2.06	26.6	0.26	0.16	0.51	14.22	20.00	CSC	4	7	ds	0	
	90S1934FG02	17º 59.01′S	162º 00.97′W	4,984	(Hilly) Seaknoll	17	46	30		7		20.14	P. Sp	2.03	26.0	0.33	0.19	0.48	14.02	18.39	BC	0	0	ds	0	
36	90S1934FG03 (90439)	17º 59.02′S	161º 59.04′W	4,686	(Hilly) Seaknoll	11	33	56				34.52	Sp. P	2.00	25.6	0.25	0.17	0.50	14.27	20.33	CSC	5	6	ds	0	
	Average			4,789		16	49	33		2		27.83	Sp. P	2.03	26.1	0.28	0.17	0.50	14.18	19.69						
	90S1935FG01	17º59.94′S	161º00.02′W	4,826	(Plain) Flat	10	13	17	28	32		23.46	Pl. P	1.96	29.0	0.21	0.14	0.48	12.28	18.59	BC	0	1	b	40	
	90S1935FG02	17º59.00′S	161º00.98′W	4,780	(Plain) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	b	20	
37	90S1935FG03 (90440)	17º58.99′S	160º58.99′W	4,715	(Plain) Flat	13	46	41				27.08	Sp. P	1.97	29.4	0.23	0.15	0.53	15.12	19.18	CSC	4	6	e1	10	
	Average			4,774		12	31	30	13	15		16.85	Sp. Pl	1.96	29.2	0.22	0.15	0.51	13.80	18.90						
	90S1936FG01	17º 59.97′S	159º 59.98′W	5,021	(Plain) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S1936FG02	17º 58.99′S	160º 00.99′W	5,005	(Plain) Flat	100						0.06	P	2.21	26.7	0.24	0.16	0.47	13.16	19.81	BC	0	0	c	0	
38	90S1936FG03 (90441)	17º 59.01′S	159º 59.06′W	5,014	(Plain) Flat	100						0.01	P	-	-	-	-	-	-	-	BC	1	1	c	0	
	Average			5,013		100						0.02	P	2.21	26.7	0.24	0.16	0.47	13.16	19.81						
	90S1937FG01	18º 00.00′S	159º 00.00′W	4,905	(Plain) Seaknoll	23	46	25	1	5		15.75	P. Pl	1.95	30.9	0.25	0.18	0.42	11.63	20.00	BC	0	0	ts	10	
	90S1937FG02	17º 59.01′S	159º 00.98′W	4,760	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ts	10	
39	90S1937FG03 (90442)	17º 59.03′S	158º 59.01′W	5,070	(Plain) Flat	50	35	15				6.36	P. Pf	2.02	28.5	0.29	0.20	0.39	10.84	19.66	BC	0	0	ts	10	
	Average			4,912		31	43	22	1	4		7.37	P	1.97	30.2	0.27	0.19	0.41	11.40	19.90						
	90S1837FG01	16º 59.98′S	158º 59.96′W	5,073	(Plain) Flat	2	61	37				27.92	Sp	2.05	23.5	0.31	0.18	0.48	15.45	18.48	BC	0	0	a	10	
	90S1837FG02	16º 59.00′S	159º 01.00′W	5,049	(Plain) Flat	1	77	22				25.52	Sp	2.01	24.7	0.30	0.18	0.48	15.51	18.47	BC	0	0	a	10	
40	90S1837FG03 (90443)	16º 59.01′S	158º 59.01′W	5,059	(Plain) Flat	1	64	35				30.55	Sp	2.04	25.5	0.26	0.18	0.48	14.80	19.02	BC	0	0	a	10	
	Average			5,060		1	67	32				28.00	Sp	2.03	24.6	0.29	0.18	0.48	15.24	18.67						

Data Files of Results obtained from Four Survey Cruises in this Programme (14/19)

(No. 90-5)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S1836FG01	16º 59.96′S	160º 00.02′W	4,786	(Plain) Flat	4	37	48	11			33.41	Sp	1.97	27.5	0.27	0.18	0.46	14.08	19.50	CSC	4	7	e1	10	
	90S1836FG02	16º 58.99′S	160º 00.95′W	4,633	(Plain) Seaknoll	11	53	20		16		25.28	Sp. P	1.97	30.6	0.21	0.15	0.46	13.14	19.99	CSC	5	15	ds	0	
41	90S1836FG03 (90444)	16º 59.01′S	159º 58.97′W	4,837	(Plain) Flat	4	25	46	25			25.38	P. Sp	2.02	28.3	0.30	0.20	0.43	13.55	18.57	BC	0	1	e1	10	
	Average			4,752		6	37	41	13	4		28.02	Sp. P	1.99	28.5	0.27	0.18	0.45	13.69	19.30						
	90S1835FG01	16º 59.96′S	161º 00.01′W	4,946	(Plain) Sea knoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	90S1835FG02	16º 59.01′S	161º 00.99′W	4,963	(Plain) Sea knoll	100						0.04	P	-	-	-	-	-	-	-	-	-	-	ds	0	
42	90S1835FG03 (90445)	16º 58.98′S	160º 59.03′W	4,910	(Plain) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,940		100						0.02	P	-	-	-	-	-	-	-						
	90S1834FG01	17º 00.00′S	162º 00.00′W	4,863	(Hilly) Seaknoll	57	30	13				28.85	P. SP	1.95	30.4	0.19	0.13	0.52	12.62	19.14	BC	2	4	d1	0	
	90S1834FG02	16º 58.99′S	162º 01.01′W	4,894	(Hilly) Flat	23	27	11	39			3.95	P. Pl	2.03	26.3	0.46	0.26	0.36	12.72	14.88	BC	1	1	c	0	
43	90S1834FG03 (90446)	16º 58.98′S	161º 59.04′W	4,474	(Hilly) Sea knoll	100						1.41	P	-	-	-	-	-	-	-	-	-	-	d1	0	
	Average			4,744		53	30	13	5			11.40	P. Sp	1.96	29.9	0.22	0.15	0.50	12.63	18.60						
	90S1833FG01	17º 00.01′S	163º 00.00′W	5,274	(Plain) Flat	4	34	62				0.36	Pl	2.00	35.5	0.42	0.23	0.31	13.14	14.05	BC	0	0	c	0	
	90S1833FG02	16º 59.00′S	163º 00.93′W	5,282	(Plain) Flat	1	13	3	12	71		7.92	Pl. P	1.93	29.0	0.38	0.22	0.41	16.00	17.07	BC	0	0	c	0	
44	90S1833FG03 (90447)	16º 58.99′S	162º 59.06′W	5,286	(Plain) Flat	3	11	19	41	26		6.12	E. P	1.97	27.2	0.36	0.21	0.41	15.50	15.85	BC	0	1	ds	0	
	Average			5,281		2	13	11	24	51		4.80	Pl. E	1.95	28.4	0.37	0.21	0.40	15.74	16.49						
	90S1732FG01	16º 00.00′S	163º 59.98′W	5,541	(Plain) Flat	10	57	33				1.10	Sp. P	2.02	25.2	0.53	0.31	0.34	19.14	14.62	BC	0	0	b	10	
	90S1732FG02	15º 59.00′S	164º 00.90′W	5,589	(Plain) Flat	100						0.16	P	2	21.4	0.68	0.42	0.22	17.9	12.9	BC	0	0	b	10	
45	90S1732FG03 (90448)	15º 59.02′S	163º 58.99′W	5,515	(Plain) Flat	20	39		41			1.48	Sp. E	1.99	26.7	0.59	0.33	0.31	18.39	14.56	BC	0	0	b	10	
	Average			5,548		21	44	13	22			0.91	Sp. E	2	25.8	0.57	0.33	0.32	18.66	14.48						
	90S1733FG01	15º 59.98′S	162º 59.94′W	5,490	(Plain) Flat	4	21	29	8	38		8.11	Pl	1.96	31.2	0.38	0.22	0.41	15.78	17.75	BC	0	0	ts	0	
	90S1733FG02	15º 59.00′S	163º 00.99′W	5,254	(Plain) Seaknoll	1	22	24	6	47		19.88	P. Pl	2	27.5	0.31	0.2	0.46	16.2	17.64	BC	0	0	ds	0	
46	90S1733FG03 (90449)	15º 59.00′S	162º 59.00′W	5,320	(Plain) Flat		7	93				0.88	P	2	24.8	0.29	0.17	0.51	15.95	17	-	-	-	ds	0	
	Average			5,320		2	21	28	6	43		9.62	Pl. P	1.99	28.5	0.33	0.2	0.45	16.08	17.65						
	90S1734FG01	15º 59.97′S	162º 00.02′W	4,843	(Plain) Flat	1	5	2	5	87		11.96	M. E	1.90	30.2	0.31	0.19	0.44	13.72	16.01	BC	0	0	b	10	
	90S1734FG02	15º 59.00′S	162º 00.96′W	4,695	(Plain) Seaknoll	18	66	16				23.39	P	2.06	30.3	0.24	0.15	0.49	15.70	18.78	CSC	4	12	ds	0	
47	90S1734FG03 (90450)	15º 59.00′S	161º 59.01′W	4,762	(Plain) Flat	6	26	18	21	29		18.51	P. M	1.92	28.2	0.33	0.2	0.45	15.58	17.41	CSC	4	7	ts	20	
	Average			4,767		10	39	14	8	29		17.95	P. M	1.98	29.6	0.29	0.18	0.47	15.23	17.69						
	90S1735FG01	15º 59.99′S	160º 59.99′W	4,750	(Plain) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ts	30	
	90S1735FG02	15º 59.01′S	161º 00.97′W	4,810	(Plain) Flat							(0.00)	-	-	-	-	-	-	-	-	BC	0	0	c	0	
48	90S1735FG03 (90451)	15º 59.00′S	160º 59.06′W	4,713	(Plain) Flat			100				0.51	P	1.94	28.8	0.22	0.15	0.50	14.78	19.31	-	-	-	c	0	
	Average			4,758				100				0.26	P	1.94	28.8	0.22	0.15	0.50	14.78	19.31						

*Sil%:siliceous fossil% , Cal% :calcareous fossil%, T.P.L:Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (15/19)

(No. 00-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S2032SC04	19º 30.00′ S	163º 30.00′W	4,203	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	—			d1	0	
	00S2032FG05	19º 29.99′S	163º 31.00′W	4,731	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	—			d1	0	
1	00S2032FG06 (00201)	19º 28.99′S	163º 29.00′W	4,656	(Plain) Seaknoll					100		18.55	E	2.29	13.31	0.22	0.13	0.48	12.04	23.10	CC			d1	0	
	Average			4,530						100		6.18	E	2.29	13.31	0.22	0.13	0.48	12.04	23.10						
	00S2033FG04	19º 30.02′S	162º 29.99′W	4,981	(Plain) Slop		100					0.08	P	2.23	12.31	0.56	0.33	0.44	14.40	17.20	IBC			ds	0	
	00S2033FG05	19º 29.00′S	162º 31.02′W	5,071	(Plain) Hollow	1	2			49	48	10.22	Pl. P	1.82	22.81	0.25	0.13	0.43	10.82	25.36	IBC			ds	0	
2	00S2033FG06 (00202)	19º 28.99′S	162º 29.00′W	5,053	(Plain) Hollow	11	22	23		44		2.92	M. P	1.80	26.92	0.45	0.24	0.48	13.86	20.52	-			ds	0	
	Average			5,035		3	7	5	0	48	37	4.41	Pl. P	1.82	23.65	0.30	0.16	0.44	11.51	24.24						
	00S2034FG04	19º 30.01′S	161º 30.02′W	4,749	(Plain)Seaknoll	32	53	15				15.98	E. P	1.83	34.66	0.28	0.14	0.54	12.59	23.01	IBC			d1	0	
	00S2034FG05	19º 28.97′S	161º 31.01′W	4,515	(Plain)Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
3	00S2034FG06 (00203)	19º 29.00′S	161º 28.98′W	4,788	(Plain)Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
	Average			4,684		32	53	15				5.33	E. P	1.83	34.66	0.28	0.14	0.54	12.59	23.01						
	00S1934SC04	18º 30.01′S	161º 29.99′W	4,862	(Plain) Slop	5	13	28	29	25		43.79	Sp. P	2.00	15.47	0.27	0.13	0.56	14.62	17.82	IBC			ds	0	
	00S1934FG05	18º 28.99′S	161º 31.00′W	4,833	(Plain) Slop	14	16	29	41			31.30	Sp. E	2.12	17.35	0.24	0.12	0.53	14.41	19.24	BC			ds	0	
4	00S1934FG06 (00204)	18º 28.99′S	161º 29.01′W	4,894	(Plain) Slop	7	22	19	18	34		25.21	Sp. Pl	2.07	16.65	0.38	0.16	0.51	14.17	18.29	IBC			ds	0	
	Average			4,863		7	15	27	30	21		33.43	Sp. E	2.04	16.14	0.28	0.13	0.54	14.48	18.25						
	00S1834FG04	17º 30.04′S	161º 29.99′W	4,804	(Hill) Slop							0.00	-	-	-	-	-	-	-	-	-			ds	0	
	00S1834FG05	17º 29.00′S	161º 31.01′W	4,713	(Hill) Slop	3	19	47	31			40.25	Sp. P	2.14	35.04	0.32	0.15	0.51	14.67	17.50	BC			d1	0	
5	00S1834FG06 (00205)	17º 28.99′S	161º 29.00′W	4,840	(Hill) Slop	26	56	18				17.58	Sp. E	2.14	21.72	0.41	0.18	0.50	14.71	18.89	IBC			ds	0	
	Average			4,786		11	32	37	20			19.28	Sp. E	2.14	30.52	0.35	0.16	0.50	14.68	17.97						
	00S1835FG04	17º 30.01′S	160º 30.00′W	5,009	(Plain) Slop	14	47	36	3			24.18	E. P	1.88	24.61	0.18	0.11	0.56	13.86	21.15	BC			ds	0	
	00S1835FG05	17º 29.01′S	160º 31.01′W	4,896	(Plain) Slop	8	16	65	11			41.62	Sp. P	1.92	26.59	0.24	0.12	0.49	13.95	18.85	BC			ds	0	
6	00S1835FG06 (00206)	17º 28.99′S	160º 29.01′W	4,956	(Plain) Other	23	45	15	8	9		22.35	E. SP	1.92	16.10	0.56	0.31	0.37	13.11	17.11	BC			ds	0	
	Average			4,954		16	37	35	7	4		29.38	E. Sp	1.91	21.54	0.36	0.20	0.46	13.56	18.77						
	00S1736FG19	16º 30.01′S	159º 14.99′W	5,144	(Quasi) Flat	12	61	27				27.88	Sp. P	1.91	30.68	0.34	0.19	0.38	15.54	20.36	BC			be	40	
	00S1736FG20	16º 29.01′S	159º 16.00′W	5,102	(Quasi) Flat	5	59	33	3			30.84	SP. Pl	1.98	33.80	0.27	0.14	0.47	13.52	21.37	BC			be	50	
7	00S1736FG21 (00207)	16º 28.99′S	159º 13.99′W	5,052	(Quasi) Flat	100						0.12	P. SP	1.94	27.19	0.28	0.13	0.46	16.39	16.20	-			d1	0	
	Average			5,099		9	60	30	1			19.61	Sp. P	1.94	32.14	0.31	0.16	0.42	14.59	20.82	BC					
	00S1736FG22	16º 22.52′S	159º 07.50′W	5,071	(Quasi) Flat	1	67	32				30.84	Sp. P	1.94	17.79	0.23	0.11	0.46	16.00	17.95	BC			a	10	
	00S1736FG23	16º 21.51′S	159º 08.51′W	5,133	(Quasi) Flat	4	27	69				29.03	Sp. E	1.98	31.12	0.21	0.11	0.44	14.27	17.19	BC			a	10	
8	00S1736FG24 (00208)	16º 21.50′S	159º 06.50′W	5,089	(Quasi) Flat	3	46	51				33.67	Sp	2.03	18.55	0.27	0.14	0.59	15.32	19.53	BC			a	10	
	Average			5,098		3	47	50				31.18	Sp. E	1.98	22.20	0.24	0.12	0.50	15.22	18.28						
	00S1736LC25	16º 22.53′S	159º 22.51′W	5,210	(Quasi) Flat		43	57				28.44	Sp. E	1.94	18.24	0.24	0.14	0.59	16.12	18.08	IBC			a	10	
	00S1736FG26	16º 21.50′S	159º 23.50′W	4,911	(Quasi) Other	78	22					15.14	Sp. P	1.93	31.09	0.23	0.12	0.64	15.78	20.29	BC			d1	0	
9	00S1736FG27 (00209)	16º 21.49′S	159º 21.51′W	5,209	(Quasi) Flat	100						(0.01)	P		15.39	0.35	0.23	0.47	13.79	19.60	BC			d2	0	
	Average			5,110		71	24	5				21.79	Sp. P	1.93	29.93	0.23	0.12	0.64	15.81	20.09						
	00S1736FG28	16º 15.01′S	159º 30.00′W	4,487	(Quasi) Seaknoll	100						0.01	P	2.33	-	-	-	-	-	-	-			d1	0	
	00S1736FG29	16º 14.01′S	159º 31.01′W	4,853	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
10	00S1736FG30 (00210)	16º 14.00′S	159º 29.00′W	4,699	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
	Average			4,680		100						0.00	P	2.33	-	-	-	-	-	-	-					

Data Files of Results obtained from Four Survey Cruises in this Programme (16/19)

(No. 00-2)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S1737FG16	16º 22.50′S	158º 52.49′W	5,081	(Quasi) Flat	8	22		70			31.52	E. Sp	2.01	28.28	0.26	0.13	0.51	15.06	17.09	BC			a	15	
	00S1737FG17	16º 21.51′S	158º 53.50′W	5,066	(Quasi) Flat	2	50	48				34.32	Sp. P	1.93	25.40	0.29	0.15	0.55	15.18	18.36	BC			a	15	
11	00S1737FG18 (00211)	16º 21.49′S	158º 51.51′W	5,077	(Quasi) Flat	2	85	13				31.34	Sp	2.01	30.73	0.29	0.16	0.54	15.19	18.27	BC			a	20	
	Average			5,075		2	65	30	3			32.39	Sp. E	1.97	27.93	0.29	0.15	0.54	15.18	18.28						
	00S1737FG19	16º 15.01′S	158º 59.98′W	5,119	(Quasi) Flat	2	64	34				29.71	Sp. P	1.96	23.86	0.32	0.17	0.58	16.02	18.67	BC	1		a	30	
	00S1737FG20	16º 14.01′S	159º 01.00′W	5,068	(Quasi) Flat	3	64	33				31.08	Sp. P	1.99	21.37	0.32	0.17	0.53	16.45	17.48	BC	1		a	15	
12	00S1737FG21 (00212)	16º 13.98′S	158º 59.00′W	5,070	(Quasi) Flat	3	59	38				32.63	Sp. P	1.94	25.81	0.31	0.16	0.53	16.65	18.07	BC	1		a	20	
	Average			5,086		3	62	35				31.14	Sp. P	1.96	23.73	0.31	0.17	0.55	16.38	18.07						
	00S1737FG22	16º 07.48′S	158º 52.50′W	5,060	(Quasi) Flat	21	33	33	13			20.69	Sp. P	1.88	11.93	0.31	0.17	0.52	14.45	19.00	BC	1		ac	0	
	00S1737FG23	16º 06.51′S	158º 53.50′W	5,053	(Quasi) Flat	2	14	31	37	16		42.02	Sp. Ec	1.89	27.42	0.27	0.15	0.51	15.95	17.29	BC	1		ac	0	
13	00S1737FG24 (00213)	16º 06.49′S	158º 51.50′W	5,051	(Quasi) Flat	9	40	51				25.22	Sp. P	1.87	15.93	0.32	0.17	0.51	15.45	17.98	BC			ac	0	
	Average			5,055		10	26	37	20	7		29.31	Sp. P	1.88	20.10	0.30	0.16	0.51	15.42	17.93						
	00S1736SC31	16º 07.60′S	159º 07.52′W	5,071	(Quasi) Flat	2	57	39	2			28.24	Sp. P	1.90	18.88	0.26	0.13	0.63	16.43	18.73	BC	1		a	15	
	00S1736FG32	16º 06.51′S	159º 08.51′W	5,106	(Quasi) Flat	3	78	15	4			33.20	Sp. P	1.93	35.61	0.26	0.13	0.62	16.52	19.16	BC	1		a	20	
14	00S1736FG33 (00214)	16º 06.49′S	159º 06.50′W	5,082	(Quasi) Flat		36	61	3			22.32	Sp. E	1.94	27.48	0.23	0.12	0.61	15.89	19.34	BC	1		a	15	
	Average			5,086		2	59	36	3			27.92	Sp. P	1.92	26.04	0.26	0.12	0.62	16.34	19.00						
	00S1736FG34	16º 07.51′S	159º 22.50′W	5,217	(Quasi) Flat	10	45	45				22.36	Ec. Sp	2.00	31.77	0.31	0.17	0.50	14.43	18.05	BC	1		d2	0	
	00S1736FG35	16º 06.51′S	159º 23.50′W	5,202	(Quasi) Flat	10	34	25	31			21.81	E. Sp	1.94	35.97	0.32	0.18	0.47	14.72	18.35	BC	1		d2	0	
15	00S1736FG36 (00215)	16º 06.49′S	159º 21.50′W	5,153	(Quasi) Flat	1	33	24	32	10		29.77	E. Sp	2.02	23.34	0.25	0.15	0.43	14.20	17.39	BC	1		d2	0	
	Average			5,191		6	34	26	29	5		24.65	E. Sp	1.99	29.33	0.29	0.16	0.46	14.44	17.85						
	00S1736FG37	16º 00.00′S	159º 14.98′W	5,083	(Quasi) Slop		71	27	2			34.91	Sp. E	1.96	28.69	0.27	0.13	0.53	17.31	18.48	BC	1		a	20	
	00S1736FG38	15º 59.01′S	159º 16.00′W	5,071	(Quasi) Slop	1	58	36	5			33.83	Sp. P	1.99	28.91	0.26	0.12	0.54	17.97	18.23	BC	1		a	15	
16	00S1736FG39 (00216)	15º 58.99′S	159º 14.01′W	5,094	(Quasi) Flat		45	49	6			35.68	Sp. P	1.99	32.21	0.24	0.11	0.51	17.09	18.38	BC	1		a	30	
	Average			5,083		1	58	37	4			34.81	Sp. E	1.98	29.96	0.25	0.12	0.53	17.45	18.36						
	00S1636FG16	15º 52.50′S	159º 07.49′W	5,143	(Quasi) Slop	5	65	30				30.19	Sp. E	1.97	17.36	0.31	0.16	0.43	16.80	17.16	BC	1		a	20	
	00S1636FG17	15º 51.46′S	159º 08.51′W	5,067	(Quasi) Slop	3	16	74	7			37.42	Sp. E	1.89	32.37	0.24	0.14	0.47	16.72	17.79	BC	1		a	20	
17	00S1636FG18 (00217)	15º 51.49′S	159º 06.50′W	5,137	(Quasi) Slop	2	74	24				28.88	Sp. P	1.97	31.66	0.23	0.13	0.49	15.03	18.72	BC	1		a	10	
	Average			5,116		3	58	37	1			32.16	Sp. E	1.95	25.99	0.26	0.15	0.46	16.09	17.89						
	00S1737FG25	16º 00.00′S	158º 44.99′W	4,910	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
	00S1737FG26	15º 58.99′S	158º 46.02′W	5,009	(Quasi) Seaknoll	6	37	57				38.16	Sp. P	2.01	18.89	0.26	0.16	0.53	15.20	18.03	BC	5		d1	0	
18	00S1737FG27 (00218)	15º 58.99′S	158º 44.01′W	5,014	(Quasi) Seaknoll	4	65	31				31.80	Sp. P	2.03	28.99	0.23	0.12	0.53	14.13	18.71	BC	5		ds	0	
	Average			4,978		5	57	38				23.32	Sp. P	2.02	26.25	0.24	0.13	0.53	14.42	18.53						
	00S1637FG13	15º 52.50′S	158º 52.48′W	5,190	(Quasi) Flat	5	51	44				38.10	Sp. P	2.05	31.35	0.29	0.17	0.49	15.23	18.08	BC	1		a	10	
	00S1637FG14	15º 51.49′S	158º 53.53′W	5,126	(Quasi) Flat	3	36	61				31.29	E. Sp	2.00	29.86	0.29	0.17	0.49	14.46	19.37	BC	1		d2	0	
19	00S1637FG15 (00219)	15º 51.51′S	158º 51.52′W	5,100	(Quasi) Slop							0	-	-	-	-	-	-	-	-	-			d1	0	
	Average			5,139		5	49	46				23.13	Sp. P	2.04	31.14	0.29	0.17	0.49	15.13	18.25						
	00S1736SC40	16º 07.50′S	159º 37.49′W	5,161	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-			d2	0	
	00S1736FG41	16º 06.51′S	159º 38.51′W	5,166	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-			d2	0	
20	00S1736FG42 (00220)	16º 06.50′S	159º 36.50′W	5,155	(Quasi) Flat	9	54	37				5.61	E. Sp	1.97	28.98	0.28	0.17	0.48	13.58	18.95	BC	1		d2	0	
	Average			5,161		9	54	37				5.61	E. SP	1.97	28.98	0.28	0.17	0.48	13.58	18.95						

Data Files of Results obtained from Four Survey Cruises in this Programme (17/19)

(No. 00-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S1736SC43	16º 00.01′S	159º 45.06′W	5,062	(Quasi) Seaknoll							(0.00)	-	-	-	-	-	-	-	-	-			d1	0	
	00S1736FG44	15º 59.01′S	159º 46.00′W	5,081	(Quasi) Flat	1	12	38	27	22		35.58	E. SP	1.88	28.45	0.26	0.14	0.45	14.14	17.99	BC	1		bc	0	
21	00S1736FG45 (00221)	15º 59.00′S	158º 44.00′W	5,050	(Quasi) Seaknoll		32	68				37.74	SP. E	2.09	19.85	0.24	0.14	0.47	14.17	18.46	BC	1		ds	0	
	Average			5,064		0	24	56	11	9		36.66	Sp. E	2.00	23.37	0.25	0.14	0.46	14.16	18.26						
	00S1636SC19	15º 52.48′S	159º 37.50′W	4,982	(Quasi) Flat	4	43	48	5			31.37	E. SP	2.01	31.54	0.25	0.15	0.48	15.23	18.90	BC	2	3	ac	40	
	00S1636FG20	15º 51.50′S	159º 38.50′W	4,972	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			d2	0	
22	00S1636FG21 (00222)	15º 51.51′S	159º 36.52′W	4,968	(Quasi) Flat	2	19	51	22	6		44.29	E. Ec	1.96	26.09	0.24	0.13	0.53	15.75	19.52	BC	2	3	ac	20	
	Average			4,974		3	35	49	11	2		25.22	Sp. E	1.99	29.73	0.25	0.14	0.50	15.40	19.10						
	00S1636FG22	15º 52.46′S	159º 22.47′W	5,039	(Quasi) Flat	1	43	40	16			33.74	Sp. Ec	2.03	30.09	0.25	0.13	0.58	16.48	19.31	BC	1		a	10	
	00S1636FG23	15º 51.51′S	159º 23.50′W	5,094	(Quasi) Flat	6	56	31	7			30.57	Sp. E	1.96	29.68	0.30	0.17	0.56	16.51	18.12	BC	1		bc	0	
23	00S1636FG24 (00223)	15º 51.49′S	159º 21.53′W	5,080	(Quasi) Flat	3	68	27	2			34.94	Sp. P	2.03	31.10	0.29	0.14	0.59	17.38	18.86	BC	1		a	40	
	Average			5,071		3	57	32	8			33.08	Sp. E	2.01	30.33	0.28	0.15	0.58	16.82	18.76						
	00S1636FG25	15º 52.50′S	159º 52.49′W	4,932	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
	00S1636FG26	15º 51.50′S	159º 53.50′W	4,967	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
24	00S1636FG27 (00224)	15º 51.48′S	159º 51.48′W	4,935	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
	Average			4,945								0.00	-	-	-	-	-	-	-	-	-					
	00S1636FG28	15º 37.51′S	159º 52.52′W	5,111	(Quasi) Flat	1	25	50	24			31.92	E. P	1.99	29.51	0.32	0.19	0.42	13.69	18.24	BC	1		d2	0	
	00S1636FG29	15º 36.51′S	159º 53.51′W	5,100	(Quasi) Flat	4	47	24	20	5		25.55	E. Sp	1.89	16.77	0.27	0.16	0.49	14.25	19.29	BC	1		d2	0	
25	00S1636FG30 (00225)	15º 36.48′S	159º 51.54′W	5,101	(Quasi) Flat	3	8	19	57	13		33.84	E. P	1.96	25.81	0.29	0.17	0.44	14.41	17.74	BC	1		d2	0	
	Average			5,104		3	24	25	39	9		30.44	E. Sp	1.94	22.94	0.28	0.17	0.46	14.27	18.37						
	00S1637FG16	15º 45.00′S	159º 00.00′W	4,968	(Quasi) Seaknoll	2	33	65				41.46	Sp. P	1.92	17.24	0.19	0.11	0.30	15.77	11.90	CC	15	10	a	10	
	00S1637FG17	15º 44.01′S	159º 01.00′W	4,923	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
26	00S1637FG18 (00226)	15º 44.00′S	158º 59.01′W	5,039	(Quasi) Seaknoll	4	25	43	28			38.53	E. Ec	1.92	15.92	0.28	0.18	0.48	14.74	18.11	BC	7	5	a	20	
	Average			4,977		3	29	53	15			26.66	Sp. E	1.92	16.55	0.24	0.15	0.39	15.23	15.13						
	00S1637FG19	15º 37.51′S	158º 52.51′W	5,026	(Quasi) Flat	1	60	39				23.50	Sp. P	2.11	34.54	0.32	0.16	0.51	15.80	18.04	BC	1	2	e1	10	
	00S1637FG20	15º 36.50′S	158º 53.49′W	4,951	(Quasi) Other	7	42	22	11	18		15.14	Oth. E	1.95	19.31	0.50	0.33	0.32	13.87	14.02	BC	1		d1	0	
27	00S1637FG21 (00227)	15º 36.50′S	158º 51.51′W	5,031	(Quasi) Flat	1	34	45	20			35.21	Ec. Sp	1.97	23.04	0.34	0.19	0.44	15.05	16.48	BC	1		e1	10	
	Average			5,003		2	44	40	12	2		24.62	Sp. Ec	2.02	26.65	0.35	0.20	0.45	15.17	16.73						
	00S1636FG31	15º 45.00′S	159º 30.00′W	5,106	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-			ac	0	
	00S1636FG32	15º 43.99′S	159º 31.00′W	5,052	(Quasi) Flat	7	36	57				32.74	Sp. P	1.90	22.14	0.30	0.17	0.56	15.69	19.32	BC	1		bc	0	
28	00S1636FG33 (00228)	15º 44.00′S	159º 29.01′W	5,094	(Quasi) Flat	16	18	27	39			26.20	Ec. P	1.83	29.31	0.29	0.15	0.54	16.24	18.50	BC	1		bc	0	
	Average			5,084								29.47	Ec. Sp	1.84	28.68	0.29	0.15	0.55	16.19	18.57						
	00S1636LC34	15º 37.53′S	159º 22.50′W	5,062	(Quasi) Seaknoll	3	97					29.93	Sp. P	2.04	34.41	0.56	0.29	0.42	15.20	15.70	BC	1		a	20	
	00S1636FG35	15º 36.51′S	159º 23.50′W	4,977	(Quasi) Seaknoll	1	79	20				32.68	Sp. P	2.00	18.44	0.31	0.17	0.48	14.85	18.46	BC			a	20	
29	00S1636FG36 (00229)	15º 36.50′S	158º 21.50′W	4,988	(Quasi) Seaknoll	1	44	55				36.28	Sp. P	1.87	35.53	0.31	0.15	0.57	16.22	18.43	BC			a	25	
	Average			5,009		1	61	38				32.96	Sp. P	1.93	27.52	0.31	0.16	0.52	15.57	18.41						
	00S1636SC37	15º 37.50′S	159º 07.51′W	5,233	(Quasi) Flat	3	76	20	1			27.87	Sp. E	1.93	18.41	0.30	0.19	0.52	15.02	18.49	BC			a	10	
	00S1636FG38	15º 36.45′S	159º 08.62′W	5,232	(Quasi) Flat	2	42	38	18			24.11	E. P	2.10	16.97	0.35	0.23	0.43	14.33	17.83	BC			a	10	
30	00S1636FG39 (00230)	15º 36.50′S	159º 06.51′W	5,237	(Quasi) Flat	4	71	25				27.82	Sp. E	2.06	32.74	0.29	0.17	0.50	14.77	19.46	BC			a	5	
	Average			5,234		3	67	25	5			26.60	Sp. E	2.00	21.56	0.31	0.20	0.49	14.80	18.57						

Data Files of Results obtained from Four Survey Cruises in this Programme (18/19)

(No. 00-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules														Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L	
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S1636FG40	15º 30.00′S	159º 15.00′W	5,111	(Quasi) Flat	3	61	36				32.63	Sp. P	1.88	34.23	0.28	0.15	0.51	16.28	18.80	BC			a	15	
	00S1636FG41	15º 29.01′S	159º 16.00′W	5,127	(Quasi) Flat	1	36	48	15			36.82	E. SP	1.93	24.25	0.27	0.18	0.53	15.29	18.66	BC			a	10	
31	00S1636FG42 (00231)	15º 29.00′S	158º 14.01′W	5,124	(Quasi) Flat	3	29	68				29.34	E. SP	2.18	17.66	0.28	0.18	0.49	15.47	19.41	BC			a	10	
	Average			5,121		2	41	51	6			32.93	Sp. E	2.00	24.91	0.28	0.17	0.51	15.62	18.94						
	00S1636LC43	15º 30.00′S	159º 45.00′W	5,129	(Quasi) Flat	100						10.58	P	1.85	16.51	0.42	0.27	0.51	15.84	19.30	BC			bc	0	
	00S1636FG44	15º 29.00′S	159º 46.00′W	5,125	(Quasi) Flat	2	25	52	21			31.24	SP. P	1.85	23.63	0.27	0.13	0.57	16.67	18.83	BC			bc	0	
32	00S1636FG45 (00232)	15º 28.99′S	159º 44.01′W	5,128	(Quasi) Flat	6	32	41	21			23.47	E. P	1.92	31.00	0.34	0.22	0.48	15.05	18.49	BC			bc	0	
	Average			5,127		4	28	47	21			21.76	E. Sp	1.88	26.79	0.30	0.17	0.53	15.97	18.68						
	00S1636FG46	15º 37.49′S	159º 37.52′W	5,068	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
	00S1636FG47	15º 36.51′S	159º 38.50′W	5,044	(Quasi) Flat	44	56					18.29	E	1.95	35.71	0.21	0.14	0.52	14.37	21.15	-			ac	0	
33	00S1636FG48 (00233)	15º 36.50′S	158º 36.50′W	5,054	(Quasi) Flat	3	12	27	41	17		27.70	Ec. Sp	1.89	20.78	0.26	0.14	0.55	16.13	18.65	BC			bc	0	
	Average			5,055		5	14	26	39	16		15.33	Ec. E	1.89	21.50	0.26	0.14	0.54	16.04	18.78						
	00S1338SC01	12º 30.00′S	157º 29.99′W	5,199	(Hilly) Flat	25	34		41			1.84	Sp. Ec	1.92	24.01	0.77	0.58	0.30	21.17	13.59	BC			d2	0	
	00S1338FG02	12º 29.01′S	157º 31.00′W	5,203	(Hilly) Flat	100						1.00	P	2.00	30.07	0.97	0.58	0.28	20.69	11.30	BC			d2	0	
34	00S1338FG03 (00239)	12º 29.00′S	157º 28.99′W	5,205	(Hilly) Flat	100						1.58	P	1.98	28.19	1.03	0.57	0.31	21.63	11.90	BC			d2	0	
	Average			5,202								1.47	P. Sp	1.94	25.69	0.84	0.58	0.29	21.13	12.94						
	00S1238FG01	11º 30.00′S	157º 30.00′W	5,257	(Hilly) Flat	16	11	29	44			16.53	Sp. Ec	1.86	27.04	0.39	0.20	0.46	17.01	16.02	BC			bc	0	
	00S1238FG02	11º 29.00′S	157º 30.98′W	5,297	(Hilly) Flat	21	24	33	22			18.04	Sp. P	1.88	28.94	0.45	0.24	0.48	17.71	16.27	BC			ds	0	
35	00S1238FG03 (00240)	11º 29.00′S	157º 29.00′W	5,299	(Hilly) Flat	5	43	52				26.72	Sp. Oth	1.91	20.71	0.37	0.22	0.47	17.40	17.18	BC			d2	0	
	Average			5,284		12	29	41	18			20.43	Sp. P	1.89	24.45	0.39	0.22	0.47	17.35	16.63						
	00S1138LC01	10º 30.00′S	158º 00.00′W	5,478	(Hilly) Flat							0.00									BC			d2	0	
	00S1138FG02	10º 29.00′S	158º 01.00′W	5,497	(Hilly) Flat	8	30	20	42			7.41	Oth. P	1.93	25.63	0.63	0.40	0.36	19.11	14.39	IBC			ds	0	
36	00S1138FG03 (00241)	10º 29.00′S	157º 59.01′W	5,349	(Hilly) Flat							0.00									-			d1	0	
	Average			5,441		8	30	20	42			2.47	Oth. P	1.93	25.63	0.63	0.40	0.36	19.11	14.39						
	00S1037FG07	09º 30.01′S	158º 30.01′W	5,495	(Hilly) Flat	45	46	9				7.10	P. E	1.95	29.91	0.52	0.32	0.38	18.46	14.90	BC			d2	0	
	00S1037FG08	09º 29.00′S	158º 31.00′W	5,497	(Hilly) Flat	21	73	6				7.59	Sp. P	2.00	18.75	0.54	0.32	0.43	20.10	15.41	BC			d2	0	
37	00S1037FG09 (00242)	09º 29.00′S	158º 29.01′W	5,478	(Hilly) Flat	32	49	19				9.65	Sp. P	1.94	21.10	0.54	0.34	0.43	19.66	16.20	BC			d2	0	
	Average			4,490		32	56	12				8.11	P. Sp	1.96	22.93	0.53	0.32	0.42	19.45	15.58						

*Sil%:siliceous fossil%, Cal% :calcareous fossil%, T.P.L:Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (19/19)

(No. 00-5)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-dance (Kg/m^2)	Shape	S.G. Wet	H_2O (%)	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm					Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
38	00S1636LC49 (00234)	15º 52.49′S	159º 32.01′W	5,038	(Quasi) Platform	3	25			72		(30.63)	Pl. Sp	1.95	33.63	0.33	0.22	0.44	14.94	19.05	BC					
	Average					3	25			72				1.95	33.63	0.33	0.22	0.44	14.94	19.05						
39	00S1636LC50 (00235)	15º 52.50′S	159º 42.01′W	4,912	(Quasi) Platform		56		44			(24.86)	E. Oth	1.85	29.31	0.16	0.11	0.25	9.76	10.20	ISC					
	Average						56		44					1.85	29.31	0.16	0.11	0.25	9.76	10.20						
40	00S1736LC46 (00236)	16º 14.98′S	159º 07.47′W	5,133	(Quasi) Hollow	6	94					(28.58)	Sp. P	1.97	33.12	0.32	0.18	0.52	14.75	19.70	BC					
	Average					6	94							1.97	33.12	0.32	0.18	0.52	14.75	19.70						
41	00S1736AD47 (00237)	Start 16º 20.75′S	159º 34.61′W	3,455	(Quasi) Slop										22.45	0.33	0.18	0.51	17.43	20.65						
	Average	End 16º 21.23′S	159º 34.17′W	3,151											22.45	0.33	0.18	0.51	17.43	20.65						
42	00S1736AD48 (00238)	Start 16º 19.99′S	159º 04.98′W	5,109	(Quasi) Flat									w/o	w/o	w/o	w/o	w/o	w/o	w/o						
	Average	End 16º 20.26′S	159º 04.70′W	5,099																						

Data Files of Results obtained from Four Survey Cruises in this Programme (1/19)

(No. 85-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm			Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	85S736FG01	06º 30.07′S	159º 30.18′W	4,944	Mount	20	11	29	16	24		8.27	M, Pl	2.00	28.4	0.37	0.29	0.10	3.56	8.72	BC			b	20	
	85S736FG02	06º 29.01′S	159º 31.02′W	4,944	Mount	25	26	1		48		5.57	Pl, Ot	2.05	24.4	0.54	0.32	0.21	9.02	7.98	BC			b	20	
1	85S736FG03	06º 29.07′S	159º 29.27′W	4,958	Mount	86	12	2				2.74	Ot, E	2.12	18.8	0.51	0.33	0.16	7.25	7.44	BC			d2	0	
	(85501)																										
	Average					33	16	15	8	28		5.53	Pl, M	2.04	25.4	0.45	0.31	0.15	8.09	8.24							
	85S837FG01	07º 00.25′S	159º 00.01′W	5,390	Mount	75	25					0.58	Sp, E	2.05	22.5	1.02	0.68	0.19	18.74	7.69	BC			b	20	
	85S837FG02	06º 59.04′S	159º 00.94′W	5,452	Mount	57	43					0.28	Sp, E	-	-	-	-	-	-	-	BC			a	5	
2	85S837FG03	06º 58.99′S	158º 58.96′W	5,353	Mount	3	27	58	12			20.95	E, Sp	2.09	28.8	0.21	0.12	0.48	15.37	18.35	BC			b	10	
	(85502)																										
	Average					70	24	6				0.58	Sp, E	2.12	22.0	1.09	0.73	0.20	19.92	7.58							
	85S936FG01	08º 30.50′S	159º 29.80′W	5,551	Mount	2	51	31	12	4		20.94	E	2.10	28.3	0.35	0.23	0.48	17.76	16.91	BC			d2	0	
	85S936FG02	08º 29.61′S	159º 30.73′W	5,510	Mount	0	10	47		43		5.16	Ef, Sp	1.94	32.8	0.13	0.12	0.55	17.4	16.28	BC			ds	0	
3	85S936FG03	08º 29.66′S	159º 28.76′W	5,474	Mount	7	66	22	5			8.43	E,Pl	1.91	31.8	0.37	0.23	0.37	11.93	15.43	BC			ds	0	
	(85503)																										
	Average					3	49	31	8	9		11.51	E, Ef	2.03	29.8	0.32	0.22	0.45	16.33	16.47							
	85S836FG01	07º 30.10′S	159º 30.05′W	5,281	Mount	10	78	12				12.28	E, Pt	2.01	26.2	0.52	0.32	0.41	17.34	14.27	BC			ds	0	
	85S836FG02	07º 29.18′S	159º 31.04′W	5,060	Mount	11	84	3	2			13.18	Pt, E	2.05	27.6	0.45	0.28	0.47	18.34	15.86	CSC			ds	0	
4	85S836FG03	07º 29.24′S	159º 29.18′W	5,425	Mount	18	68	14				1.78	E, Pl	2.10	24.1	0.68	0.37	0.30	14.98	11.43	ZC			ds	0	
	(85504)																										
	Average					11	80	8	1			9.08	E, Pt	2.04	26.7	0.5	0.31	0.43	17.66	14.84							
	85S737FG01	06º 30.03′S	158º 30.04′W	5,269	Plain	60	40					0.12	Sp, E	-	-	-	-	-	-	-	BC			b	60	
	85S737FG02	06º 29.15′S	158º 31.12′W	5,277	Plain	17	83					0.63	E, Sp	2.06	22.9	1.09	0.98	0.17	28.08	6.92	BC			b	50	
5	85S737FG03	06º 29.13′S	158º 29.36′W	5,292	Plain	24	76					0.25	E, Sp	-	-	-	-	-	-	-	BC			b	80	
	(85505)																										
	Average					24	76					0.33	E,Sp	2.06	22.9	1.09	0.98	0.17	28.08	6.92							
	85S838FG01	06º 59.74′S	158º 00.96′W	5,383	Plain	88	12					0.12	Sp, E	-	-	-	-	-	-	-	BC			b	10	
	85S838FG02	06º 58.80′S	158º 02.09′W	5,381	Plain	65	35					0.58	E,Sp	2.23	24.5	1.25	0.82	0.21	22.79	7.58	BC			b	10	
6	85S838FG03	06º 58.70′S	158º 00.31′W	5,369	Plain	49	45	6				2.33	E, Sp	2.09	27.0	0.99	0.65	0.25	21.01	9.34	BC			ds	0	
	(85506)																										
	Average					54	42	5				1.01	E, Sp	2.12	26.5	1.05	0.69	0.24	21.38	8.98							
	85S837FG04	07º 30.05′S	158º 29.93′W	5,280	Plain	14	41	30	15			12.48	Pt, M	1.99	28.3	0.37	0.22	0.44	17.25	15.11	BC			b	5	
	85S837FG05	07º 29.14′S	158º 30.88′W	5,471	Plain	72	28					1.88	Sp, Pl	2.06	21.7	0.63	0.41	0.21	11.76	9.24	BC			ds	0	
7	85S837FG06	07º 29.09′S	158º 28.91′W	5,321	Plain	20	57	16	7			9.29	Pt, E	2.08	26.8	0.57	0.34	0.32	15.13	12.75	BC			ds	0	
	(85507)																										
	Average					21	46	22	11			7.87	Pt, M	2.03	27.2	0.47	0.28	0.37	15.95	13.68							
	85S937SC01	08º 00.13′S	159º 00.12′W	5,415	Mount	5	47	33	15			8.82	Pt, M	1.97	26.6	0.44	0.27	0.42	18.18	14.52	BC	IBC		b	5	
	85S937FG02	07º 59.11′S	159º 00.95′W	5,444	Mount	92	8					0.88	Sp, E	2.06	23.8	0.64	0.43	0.23	12.22	9.22	BC			b	10	
8	85S937FG03	07º 59.15′S	158º 59.01′W	5,443	Mount	2	40	40	18			12.68	M, Pt	1.96	28.6	0.45	0.27	0.42	18.19	13.78	BC			b	5	
	(85508)																										
	Average					7	42	38	16			7.48	M, Pt	1.97	27.6	0.45	0.27	0.41	17.94	13.88							
	85S937FG04	08º 29.93′S	158º 29.92′W	5,395	Plain	41	57	2				3.18	Pl	1.89	29	0.25	0.17	0.21	5.52	12.7	BC			ds	0	
	85S937FG05	08º 28.91′S	158º 30.81′W	5,490	Plain	23	43	24	10			8.42	E, M	1.93	34	0.27	0.17	0.35	11.45	15.03	BC			c	0	
9	85S937FG06	08º 28.71′S	158º 28.78′W	5,157	Plain							(0.00)	-	-	-	-	-	-	-	-	-			ds	0	Sampling Failed
	(85509)																										
	Average					28	47	18	7			5.80	Pl, E	1.92	32.6	0.27	0.17	0.31	9.74	14.36							
	85S938FG01	08º 00.04′S	158º 00.10′W	5,423	Plain	71	29					3.88	Sp, E	2.03	27.1	0.65	0.4	0.31	17.03	11.75	BC			c	0	
	85S938FG02	07º 59.13′S	158º 01.14′W	5,431	Plain	46	54					3.74	Pl, Sp	1.98	26.8	0.61	0.38	0.36	19.24	13.27	BC			c	0	
10	85S938FG03	07º 59.11′S	157º 59.30′W	5,418	Plain	79	21					1.84	Sp, E	2.04	24.2	0.73	0.46	0.29	17.5	11.17	BC			c	0	
	(85510)																										
	Average					63	37					3.15	Sp, E	2.01	26.4	0.65	0.4	0.33	17.99	12.23							

Data Files of Results obtained from Four Survey Cruises in this Programme (2/19)

(No. 85-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	85S938FG07	08º 30.14′S	157º 59.93′W	4,895	Plain							0	-	-	-	-	-	-	-	-	-				ds	0	
	85S938FG08	08º 29.26′S	158º 00.94′W	5,046	Plain	11	3	9		77		1.38	Pl, E	2.12	25.90	0.37	0.24	0.30	14.45	13.04	CC			ds	0	
21	85S938FG09	08º 29.22′S	157º 59.01′W	4,910	Plain	73	27					0.2	Pl, Ot	-	-	-	-	-	-	-	CC	FO		ds	0	
	(85521)																										
	Average					19	6	8		67		0.53	Pl, E	2.12	25.90	0.37	0.24	0.30	14.15	13.04							
	85S937FG07	08º 14.99′S	158º 14.82′W	5,583	Plain	80	20					2.71	Sp, E	2.06	25.80	0.56	0.33	0.32	15.74	12.95	BC			c	0	
	85S937FG08	08º 14.07′S	158º 15.75′W	5,582	Plain	73	27					3.56	E, Sp	2.02	25.10	0.54	0.32	0.33	16.24	13.25	BC			c	0	
22	85S937FG09	08º 14.05′S	158º 13.79′W	5,576	Plain	67	33					3.91	E, Sp	2.01	29.80	0.54	0.32	0.34	16.37	13.35	BC			c	0	
	(85522)																										
	Average					73	27					3.39	E, Sp	2.03	27.10	0.54	0.32	0.33	16.15	13.21							
	85S936FG04	08º 00.17′S	159º 29.52′W	5,260	Mount	40	60					3.58	E, Pt	1.97	29.80	0.64	0.35	0.36	17.86	14.17	BC			b	5	
	85S936FG05	07º 59.16′S	159º 30.40′W	5,152	Mount	10	62	19	5	4		18.63	E, Pt	1.97	30.00	0.40	0.26	0.39	15.69	16.21	SCC			ds	0	
23	85S936FG06	07º 59.10′S	159º 28.34′W	5,256	Mount	59	41					1.32	E, Sp	2.06	29.20	0.69	0.40	0.32	17.56	12.50	BC			b	20	
	(85523)																										
	Average					17	61	15	4	3		7.84	E, Pt	1.97	30.00	0.45	0.28	0.38	16.12	15.69							
	85S936FG07	08º 14.95′S	159º 14.88′W	5,778	Mount							0	-	-	-	-	-	-	-	-	BC			c	0	
	85S936FG08	08º 14.01′S	159º 15.89′W	5,657	Mount	17	75	8				10.66	Pl, M	1.91	29.10	0.16	0.15	0.16	2.23	15.30	BC			ds	0	
24	85S936FG09	08º 13.96′S	159º 14.00′W	5,770	Mount	100						0.02	Ot, E	-	-	-	-	-	-	-	BC			c	0	
	(85324)																										
	Average					17	75	8				3.56	Pl, M	1.91	29.10	0.16	0.15	0.16	2.23	15.30							
	85S937FG10	08º 14.96′S	158º 44.69′W	5,604	Plain	82	18					0.5	Sp, E	2.04	28.60	1.08	0.77	0.22	21.53	9.13	BC			c	0	
	85S937FG11	08º 13.96′S	158º 45.58′W	5,596	Plain	58		42				0.85	M, Sp	2.24	19.30	0.66	0.48	0.14	11.94	4.98	BC			c	0	
25	85S937FG12	08º 13.88′S	158º 43.49′W	5,613	Plain	32	42			26		2	Sp, M	0.00	30.90	0.74	0.50	0.26	16.95	10.48	BC			c	0	
	(85525)																										
	Average					48	28	11		16		1.12	Sp, M	2.17	27.60	0.77	0.53	0.22	16.21	8.73							
	85S937FG13	08º 30.07′S	159º 00.05′W	5,524	Mount	100						0.05	Sp, Ot	0.00	25.90	0.76	0.51	0.26	16.31	10.78	BC			c	0	
	85S937FG14	08º 29.01′S	159º 01.03′W	5,515	Mount	100						0.12	Sp. E	-	-	-	-	-	-	-	BC			c	0	
26	85S937FG15	08º 29.00′S	159º 59.12′W	5,538	Mount	100						0.04	Sp, E	-	-	-	-	-	-	-	BC			c	0	
	(85526)																										
	Average					100						0.07	Sp. E	0.00	25.90	0.76	0.51	0.26	16.31	10.78							
	85S836FG04	07º 44.96′S	159º 14.91′W	5,550	Mount	4	37	24	23	12		20.82	E, Pt	1.97	29.50	0.31	0.20	0.48	18.40	16.44	BC			b	10	
	85S836FG05	07º 43.96′S	159º 15.88′W	5,525	Mount	2	12	16	22	48		31.87	Ef, E	1.92	29.50	0.27	0.15	0.51	18.39	16.27	BC			b	5	
27	85S836FG06	07º 43.78′S	159º 13.90′W	5,634	Mount	3	70	21	6			13.98	Pt, E	1.91	32.00	0.48	0.26	0.40	14.70	14.70	BC			b	5	
	(85527)																										
	Average					3	32	20	19	27		22.22	E, Ef	1.94	30.00	0.32	0.19	0.48	17.64	16.00							
	85S837FG07	07º 29.98′S	158º 59.93′W	5,392	Plain	77	23					1.02	Sp, E	2.05	28.20	1.17	0.86	0.23	23.52	8.49	BC			b	10	
	85S837FG08	07º 29.05′S	159º 00.96′W	5,395	Plain	43	57					0.32	E, Sp	-	-	-	-	-	-	-	BC			b	10	
28	85S837FG09	07º 28.97′S	158º 59.05′W	5,398	Plain	83	17					0.59	E, Sp	2.00	20.50	1.26	0.90	0.23	24.31	8,23	BC			c	0	
	(85528)																										
	Average					73	27					0.64	Sp, E	2.03	25.40	1.21	0.87	0.23	23.83	8.39							
	85S937FG16	07º 59.99′S	158º 29.99′W	5,535	Plain	57	43					1.26	Sp, E	1.93	26.40	0.98	0.65	0.23	19.54	9.79	BC			c	0	
	85S937FG17	07º 59.08′S	158º 30.96′W	5,538	Plain	64	36					1.27	E, Sp	2.01	25.20	1.00	0.70	0.22	19.77	8.44	BC			c	0	
29	85S937FG18	07º 58.98′S	158º 29.05′W	5,521	Plain	87	13					1.2	Sp, E	2.09	25.80	1.09	0.76	0.23	21.25	8.56	BC			c	0	
	(85529)																										
	Average					69	31					1.24	Sp, E	2.01	25.80	1.02	0.70	0.23	20.17	8.93							
	85S837FG10	07º 44.87′S	158º 45.07′W	5,559	Plain	54	46					0.77	E, Sp	2.17	30.3	0.99	0.67	0.23	19.69	9.58	BC			c	0	
	85S837FG11	07º 43.94′S	158º 46.12′W	5,529	Plain	71	29					0.26	SP. E	-	-	-	-	-	-	-	BC			b	0	
30	85S837FG12	07º 43.92′S	158º 44.20′W	5,553	Plain	79	21					0.22	Sp, E	-	-	-	-	-	-	-	BC			b	0	
	(85530)																										
	Average					62	38					0.42	Sp. E	2.17	30.30	0.99	0.67	0.23	19.69	9.58							

Data Files of Results obtained from Four Survey Cruises in this Programme (3/19)

(No. 85-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	85S838FG07	07º 29.79′S	157º 59.85′W	5,416	Plain	15	85					1.02	E, Pt	2.07	25.00	0.72	0.48	0.28	18.80	11.30	BC			ds	0	
	85S838FG08	07º 28.84′S	158º 00.84′W	5,320	Plain							0.00	-	-	-	-	-	-	-	-	—			ds	0	
31	85S838FG09 (85531)	07º 28.66′S	157º 58.88′W	5,493	Plain	81	19					0.12	E, Sp	-	-	-	-	-	-	-	BC			el	10	
	Average					22	78					0.38	E, Pt	2.07	25.00	0.72	0.48	0.28	18.80	11.30						
	85S837FG13	07º 45.12′S	158º 14.96′W	5,440	Plain	58	33	11				3.19	Sp. E	1.98	28.00	1.03	0.71	0.26	22.42	10.06	BC			el	10	
	85S837FG14	07º 44.06′S	158º 15.90′W	5,428	Plain	46	54					2.11	E, Sp	1.99	31.00	1.03	0.73	0.26	23.56	10.12	BC			el	10	
32	85S837FG15 (85532)	07º 44.01′S	158º 13.98′W	5,439	Plain	65	17	8	10			2.73	Sp. E	2.06	24.50	0.87	0.56	0.30	21.54	11.57	BC			d2	0	
	Average					56	33	7	3			2.68	Sp. E	2.01	27.60	0.97	0.66	0.27	22.40	10.61						
	85S837FG16	07º 15.03′S	158º 14.99′W	5,339	Plain	100						0.21	E, Sp	-	-	-	-	-	-	-	BC			el	10	
	85S837FG17	07º 14.12′S	158º 16.02′W	5,320	Plain	70	30					0.15	E, Sp	-	-	-	-	-	-	-	BC			el	10	
33	85S837FG18 (85533)	07º 14.06′S	158º 14.13′W	5,312	Plain	26	62		12			1.94	M, Pt	2.05	28	0.8	0.46	0.25	15.41	10.77	BC			ds	0	
	Average					36	54		10			0.77	M, Pt	2.05	28	0.8	0.46	0.25	15.41	10.77						
	85S837FG19	07º 14.77′S	158º 45.04′W	5,304	Plain	68	32					0.38	E, Sp	2.13	28.10	1.25	0.84	0.21	22.83	7.95	BC			b	20	
	85S837FG20	07º 13.85′S	158º 46.02′W	5,332	Plain	92	8					0.57	Sp, E	2.06	27.50	1.24	0.83	0.22	23.23	7.94	BC			b	10	
34	85S837FG21 (85534)	07º 13.75′S	158º 44.10′W	5,326	Plain	67	19	14				0.94	Sp, E	2.05	30.00	1.34	0.86	0.21	24.04	7.53	BC			b	10	
	Average					75	18	7				0.63	Sp. E	2.07	28.90	1.29	0.85	0.21	23.55	7.74						
	85S737FG04	06º 30.16′S	158º 59.86′W	5,259	Plain	6	39	55				1.04	E, Ef	2.02	26.20	1.06	0.97	0.17	27.93	7.09	BC			b	40	
	85S737FG05	06º 29.29′S	159º 00.90′W	5,283	Plain	3	97					0.66	E	2.08	28.30	1.00	0.93	0.16	25.32	6.55	BC			b	50	
35	85S737FG06 (85535)	06º 29.26′S	158º 58.95′W	5,261	Plain	10	90					0.37	E, Sp	0.00	23.30	1.07	0.98	0.18	28.56	7.04	BC			b	40	
	Average					6	67	28				0.69	E, Ef	2.04	26.40	1.04	0.96	0.17	27.24	6.92						
	85S736FG04	06º 45.04′S	159º 15.10′W	5,212	Mount	56	44					3.80	E, M	2.03	28.80	0.64	0.40	0.32	17.06	11.90	BC			ds	0	
	85S736FG05	06º 44.20′S	159º 16.20′W	5,318	Mount	49	51					1.39	E, M	2.11	24.00	0.93	0.59	0.21	17.29	8.96	BC			ds	0	
36	85S736FG06 (85536)	06º 44.33′S	159º 14.40′W	5,292	Mount	36	45	19				3.72	E, M	2.27	19.80	0.43	0.29	0.23	10.56	10.30	BC			ds	0	
	Average					47	46	8				2.97	E, M	2.14	24.30	0.59	0.38	0.26	14.22	10.73						
	85S836FG07	06º 59.97′S	159º 30.14′W	5,274	Mount		11		89			2.25	Sp, Ot	1.96	29.80	0.18	0.09	0.52	18.02	18.42	—			d2	0	
	85S836FG08	06º 59.06′S	159º 31.13′W	5,331	Mount	17	51	20	12			6.22	M, Pt	1.97	28.40	0.60	0.36	0.38	18.96	13.30	BC			b	10	
37	85S836FG09 (85537)	06º 59.08′S	159º 29.29′W	5,237	Mount	14	64	22				12.15	Pt, E	2.02	28.50	0.44	0.28	0.41	19.20	15.72	BC			b	10	
	Average					13	54	19	13			6.87	Pt, M	2.00	28.60	0.46	0.28	0.41	19.00	15.28						
	85S836FG10	07º 14.85′S	159º 15.15′W	5,372	Mount							0	-	-	-	-	-	-	-	-	-			ds	0	
	85S836FG11	07º 13.88′S	159º 16.10′W	5,310	Mount	42	58					0.48	E, Sp	2.00	30.60	0.87	0.56	0.31	21.38	11.29	BC			el	10	
38	85S836FG12 (85538)	07º 13.78′S	159º 14.33′W	5,431	Mount	82	18					0.55	E, Ot	2.04	20.90	0.44	0.29	0.17	7.20	8.75	BC			c	0	
	Average					63	37					0.34	E, Sp	2.02	25.40	0.63	0.41	0.23	13.35	9.85						

T.P.L: Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (4/19)

(No. 86-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules														Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L	
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S0836FG01	07º 00.00'S	159º 59.93'W	5,610	(Mount) Channel	21	79					0.11	E. Sp	-	-	-	-	-	-	-	BC	2	0	c	0	
	86S0836FG02	06º 59.00'S	160º 00.89'W	5,521	(Mount) Channel	100						0.08	E. Sp	-	-	-	-	-	-	-	BC	5	0	c	0	
1	86S0836FG03 (86401)	06º 58.90'S	159º 58.80'W	5,677	(Mount) Channel	65	35					0.13	E. Sp	2.00	36.4	1.45	1.14	0.13	27.19	5.61	BC	8	0	c	0	
	Average			5,603		59	41					0.11	E. Sp	2.00	36.4	1.45	1.14	0.13	27.19	5.61						
	86S0936FG01	08º 00.00'S	160º 00.00'W	3,751	(Mount) Seamount							0.00	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S0936FG02	07º 58.90'S	160º 01.00'W	3,475	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
2	86S0936FG03 (86402)	08º 58.69'S	159º 59.04'W	3,755	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	Average			3,660								0.00	-	-	-	-	-	-	-	-						
	86S1036FG01	08º 59.98'S	159º 59.92'W	5,572	(Mount) Flat							0	-	-	-	-	-	-	-	-	BC	4	0	d2	0	
	86S1036FG02	08º 58.97'S	160º 00.87'W	5,490	(Mount) Flat							0	-	-	-	-	-	-	-	-	BC	4	0	ds	0	
3	86S1036FG03 (86403)	08º 58.88'S	159º 58.80'W	5,368	(Mount) Flat	19	45	36				1.42	E. P	2.15	28.6	0.89	0.88	0.19	22.16	8.93	BC	5	0	ds	0	
	Average			5,477		19	45	36				0.47	E. P	2.15	28.6	0.89	0.88	0.19	22.16	8.93						
	86S1136FG01	09º 59.92'S	160º 00.13'W	4,603	(Mount) Seamount	1	5	84	10			35	Sp	2.01	28.1	0.2	0.08	0.56	19.28	17.99	-	-	-	ds	0	
	86S1136FG02	09º 58.92'S	160º 01.22'W	4,630	(Mount) Seamount	9	43	43	5			(16.82)	Sp. E	2.08	28.1	0.19	0.08	0.57	18.86	17.9	FO	0	70	ds	0	
4	86S1136FG03 (86404)	09º 58.79'S	159º 59.35'W	5,350	(Mount) Channel	56	44					0.37	P	2.09	27.7	0.11	0.06	0.56	19.2	17.97	-	-	-	ds	0	
	Average			4,861		2	5	83	10			17.69	Sp	2.01	28.1	0.2	0.08	0.56	19.2	17.97						
	86S1236FG01	10º 59.98'S	159º 59.88'W	4,948	(Hilly) Seanknoll	26	53	16	5			14.15	Pl. M	2.05	24.3	0.10	0.1	0.22	5.16	12.67	CSC	2	10	ds	0	
	86S1236FG02	10º 59.01'S	160º 00.92'W	5,432	(Hilly) Seanknoll	2	75	21	2			28.67	E. Sp	1.99	31.8	0.28	0.16	0.45	17.38	19.15	CSC	2	5	d2	0	
5	86S1236FG03 (86405)	10º 58.94'S	159º 58.98'W	4,911	(Hilly) Seanknoll	1	13	53	33			(30.21)	Sp	2.02	31.0	0.17	0.09	0.5	17.25	18.7	-	-	-	ds	0	
	Average			5,097		10	68	19	3			21.41	E. Pl	2.01	29.3	0.22	0.14	0.37	13.04	16.85						
	86S1336FG01	11º 59.89'S	160º 00.30'W	4,920	(Plain) Flat	100						0.02	Sp	-	-	-	-	-	-	-	BC	2	0	ds	0	
	86S1336FG02	11º 59.90'S	160º 01.39'W	4,955	(Plain) Flat	42	58					0.15	E	2.2	36.4	0.68	0.38	0.29	19.45	12.47	BC	3	0	e1	0	
6	86S1336FG03 (86406)	11º 58.78'S	159º 59.53'W	4,833	(Plain) Flat	0	40	54	6			31.6	Sp. E	2.00	29.5	0.29	0.16	0.42	16.48	16.4	CSC	3	5	d1	0	
	Average			4,903		0	40	54	6			10.59	Sp. E	2.01	29.6	0.29	0.16	0.42	16.49	16.38						
	86S1436FG01	13º 00.00'S	160º 00.02'W	5,275	(Plain) Flat	2	45	49	4			29.41	Sp	1.95	33.1	0.25	0.13	0.53	17.95	18.6	BC	3	0	bc	0	
	86S1436FG02	12º 59.07'S	160º 01.08'W	5,244	(Plain) Flat	100						0.01	Sp. P	-	-	-	-	-	-	-	-	-	-	bc	0	
7	86S1436FG03 (86407)	12º 58.99'S	159º 59.07'W	5,284	(Plain) Flat	3	70	20	7			28.51	Sp. E	2.04	30.8	0.26	0.14	0.50	16.55	18.35	-	-	-	bc	0	
	Average			5,268		3	57	35	5			19.31	Sp. E	1.99	32	0.25	0.13	0.51	17.25	18.47						
	86S1536FG01	14º 00.12'S	160º 00.03'W	5,127	(Plain) Flat	1	61	34	4			35.53	Sp. E	1.94	30.3	0.22	0.13	0.48	16.09	18.6	BC	2	0	a	0	
	86S1536FG02	13º 59.17'S	160º 01.08'W	5,161	(Plain) Flat	1	61	38				32.22	Sp	1.99	30.3	0.22	0.12	0.5	16.32	18.4	BC	2	0	a	0	
8	86S1536FG03 (86408)	13º 59.14'S	159º 59.11'W	4,960	(Plain) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			5,083		1	61	36	2			33.88	Sp	1.96	30.3	0.22	0.13	0.49	16.2	18.5						
	86S1636FG01	14º 59.97'S	159º 59.98'W	5,158	(Quasi) Flat	3	55	39	3			29.95	Sp. E	1.94	30.3	0.22	0.13	0.48	16.09	18.06	BC	2	0	e1	0	
	86S1636FG02	14º 58.99'S	160º 01.00'W	4,962	(Quasi) Flat						100	(6.09)	Pl	1.89	32.9	0.13	0.08	0.5	11.77	16.21	-	-	-	d1	0	
9	86S1636FG03 (86409)	14º 58.83'S	159º 59.01'W	5,180	(Quasi) Flat	100						0.12	P	-	-	-	-	-	-	-	BC	2	0	e1	0	
	Average			5,100		3	55	39	3		0	15.04	Sp, P	1.97	32.4	0.24	0.12	0.56	17.57	18.06						
	86S1736FG01	15º 59.97'S	159º 59.94'W	4,822	(Quasi) Flat	2	25	67	6			47.52	Sp. Ec	1.98	31.1	0.14	0.08	0.53	15.77	19.46	CSC	2	10	d1	0	
	86S1736FG02	15º 58.99'S	160º 00.89'W	5,039	(Quasi) Flat	1	64	35				26.62	Sp. Ec	2.03	26.2	0.20	0.12	0.44	14.11	19.23	BC	3	0	d2	0	
10	86S1736FG03 (86410)	15º 58.91'S	159º 58.89'W	5,030	(Quasi) Flat	1	92	7				36.48	Sp. P	2.04	25.2	0.20	0.12	0.46	14.67	19.30	BC	2	0	d2	0	
	Average			4,964		1	55	41	3			36.87	Sp. Ec	2.01	28.1	0.17	0.10	0.49	14.98	19.35	BC					

Data Files of Results obtained from Four Survey Cruises in this Programme (5/19)

(No. 86-2)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1737FG01	15º 59.95'S	159º 00.15'W	5,025	(Quasi) Flat	1	64	35				38.01	Sp. Ec	2.00	30.6	0.20	0.12	0.49	15.54	19.03	CSC	2	5	a	0	
	86S1737FG02	15º 58.88'S	159º 01.17'W	5,013	(Quasi) Flat	1	48	51				44.49	Sp	1.97	30.5	0.18	0.11	0.48	15.21	18.89	CSC	3	5	a	0	
11	86S1737FG03 (86411)	15º 58.86'S	158º 59.26'W	5,004	(Quasi) Flat	3	27	58	12			20.95	Sp. Ec	2.09	28.8	0.21	0.12	0.48	15.37	18.35	BC	2	0	a	0	
	Average			5,014			52	44	2			34.48	Sp. Ec	2.01	30.2	0.20	0.12	0.48	15.41	18.85	CSC					
	86S1637FG01	15º 00.03'S	159º 00.06'W	5,147	(Quasi) Flat	1	42	57				28.62	Sp. P	1.97	29.4	0.21	0.11	0.53	16.85	18.7	BC	1	0	d2	0	
	86S1637FG02	14º 59.10'S	159º 01.11'W	5,135	(Quasi) Flat	0	54	46				31.84	Sp. P	1.97	28.3	0.23	0.12	0.54	17.95	17.96	BC	1	0	a	0	
12	86S1637FG03 (86412)	14º 59.23'S	158º 59.23'W	5,171	(Quasi) Flat	15	61	16	4	4		13.23	P. Sp	2.00	30.4	0.29	0.17	0.48	16.45	17.87	BC	1	0	d2	0	
	Average			5,151		3	51	45	1	1		24.56	Sp. P	1.97	29.1	0.23	0.12	0.53	17.26	18.23						
	86S1537FG01	13º 59.91'S	158º 59.97'W	5,196	(Plain) Flat	5	33	45	17			18.93	Ot. P	1.99	34.8	0.24	0.16	0.36	12.76	18.23	BC	1	0	d2	0	
	86S1537FG02	13º 58.94'S	159º 00.98'W	5,183	(Plain) Flat	0	31	34	30	5		20.24	Pl	2.07	29.2	0.26	0.16	0.35	13.87	17.87	BC	1	0	e1	0	
13	86S1537FG03 (86413)	13º 59.00'S	158º 58.97'W	5,261	(Plain) Flat	6	53	31	10			22.16	P. Sp	1.97	30.4	0.28	0.17	0.4	14.63	17.99	BC	1	0	b	0	
	Average			5,213		4	40	36	19	2		20.44	Pl. P	2.01	31.4	0.26	0.16	0.37	13.82	18.02						
	86S1437FG01	13º 00.29'S	158º 59.64'W	5,270	(Plain) Flat	4		96				0.65	Sp	1.91	36.4	0.42	0.22	0.3	18.11	16.02	BC	2	0	b	0	
	86S1437FG02	12º 59.42'S	159º 00.50'W	5,265	(Plain) Flat	53	47					1.11	P. Pl	2.00	31	0.58	0.33	0.19	11.84	9.37	CSC	3	5	ds	0	
14	86S1437FG03 (86414)	12º 59.47'S	158º 58.39'W	5,157	(Plain) Flat	36	27	37				2.05	P. Ef	2.06	30.0	0.63	0.36	0.32	19.19	12.67	BC	2	0	ds	0	
	Average			5,231		35	28	36				1.27	P. Ef	2.02	31.4	0.58	0.33	0.28	16.87	12.23						
	86S1337FG01	12º 00.00'S	158º 59.96'W	5,253	(Plain) Flat	92	8					0.28	Sp. P	2.13	30.3	0.81	0.48	0.23	18.25	10.45	BC	3	0	ac	0	
	86S1337FG02	11º 59.05'S	159º 00.95'W	5,242	(Plain) Flat	100						0.22	P. Sp	2.15	26.1	0.81	0.46	0.22	17.37	10.04	BC	3	0	ac	0	
15	86S1337FG03 (86415)	11º 58.96'S	158º 58.98'W	5,298	(Plain) Flat	100						0.35	P. Sp	2.14	20.8	0.93	0.57	0.2	18.85	9.26	BC	5	0	ac	0	
	Average			5,264		97	3					0.28	P. Sp	2.14	25.3	0.88	0.51	0.21	18.29	9.83						
	86S1237FG01	11º 00.11'S	158º 59.79'W	5,341	(Plain) Flat	3	64	33				5.59	M. P	1.97	28.5	0.42	0.25	0.36	17.62	14.38	BC	2	0	bc	0	
	86S1237FG02	10º 59.30'S	159º 00.68'W	5,339	(Plain) Flat	100						0.18	P. Sp	2.00	23.5	,95	0.64	0.19	20.69	8.9	BC	2	0	bc	0	
16	86S1237FG03 (86416)	10º 59.44'S	158º 58.44'W	5,184	(Plain) Flat	25	41	14	7	13		17.32	P. Ef	2.04	28.7	0.35	0.2	0.32	13.34	13.22	BC	2	0	ds	0	
	Average			5,288		20	46	18	5	10		7.70	P. M	2.02	28.6	0.37	0.21	0.33	14.44	13.46						
	86S1137FG01	09º 59.88'S	159º 00.09'W	5,180	(Hilly) Flat	1	24	44	31			34.58	Sp. M	2.00	28.6	0.24	0.13	0.49	18.16	16.83	CSC	2	3	a	0	
	86S1137FG02	09º 58.82'S	159º 01.13'W	5,148	(Hilly) Flat	1	57	29	13			35.62	Sp. M	2.00	29.9	0.23	0.13	0.48	17.68	17.3	CSC	3	5	d2	0	
17	86S1137FG03 (86417)	09º 58.74'S	158º 59.13'W	5,132	(Hilly) Flat	1	31	22	22	24		32.12	M. E	1.97	30.1	0.26	0.15	0.44	17.51	16.42	CSC	3	5	a	0	
	Average			5,153		1	38	32	22	8		34.11	Sp. M	1.99	29.5	0.25	0.14	0.47	17.79	16.87						
	86S1037FG01	09º 00.02'S	159º 00.06'W	5,532	(Hilly) Flat	89	11					0.43	Sp. P	2.00	32.5	0.78	0.52	0.21	17.46	9.66	IBC	4	0	c	0	
	86S1037FG02	08º 59.09'S	159º 01.01'W	5,534	(Hilly) Flat	87	13					0.41	Sp. P	2.00	26.5	0.79	0.53	0.22	18.09	9.93	IBC	5	0	c	0	
18	86S1037FG03 (86418)	08º 59.01'S	158º 58.99'W	5,536	(Hilly) Flat	100						0.43	Sp. P	2.00	23.4	0.79	0.53	0.21	17.23	9.47	IBC	5	0	c	0	
	Average			5,534		92	8					0.42	Sp. P	2.00	27.5	0.79	0.53	0.21	17.58	9.68						
	86S1038SC04	09º 31.43'S	159º 29.29'W	5,680	(Hilly) Flat	4	41	55				3.6	M. P	1.98	29.3	0.54	0.33	0.32	20.01	13.07	BC	4	0	d2	0	
	86S1038FG05	09º 29.87'S	159º 30.67'W	5,518	(Hilly) Seanknoll	11	35	43	11			7.74	M. P	1.99	29.1	0.41	0.24	0.36	17.7	14.5	BC	5	0	a	0	
19	86S1038FG06 (86419)	09º 29.75'S	159º 28.85'W	5,055	(Hilly) Seanknoll	4	48	35	13			29.38	Sp. M	2.00	31.9	0.27	0.15	0.48	17.45	16.55	BC	5	0	d1	0	
	Average			5,418		5	45	38	11			13.57	M. Sp	2.00	31.1	0.32	0.18	0.44	17.73	15.83						
	86S1136FG04	10º 29.92'S	159º 30.00'W	4,773	(Hilly) Flat	0	59	41				23.42	Sp	1.92	27.6	0.29	0.17	0.42	17.58	16.86	FO	1	70	ds	0	
	86S1136FG05	10º 28.88'S	159º 31.02'W	4,878	(Hilly) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
20	86S1136FG06 (86420)	10º 28.82'S	159º 29.03'W	4,690	(Hilly) Flat		13	85	2			35.28	Sp. M	2	28.9	0.21	0.11	0.50	17.58	18.2	-	-	-	ds	0	
	Average			4,780		0	31	67	1			19.57	Sp	1.97	28.4	0.24	0.14	0.47	17.58	17.66						

Data Files of Results obtained from Four Survey Cruises in this Programme (6/19)

(No. 86-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1236SC04	11º 29.67'S	159º 30.19'W	4,900	(Plain) Flat	3	25	36	36			24.67	Sp. M	1.97	28.8	0.27	0.15	0.4	14.72	15.45	CSC	4	5	ds	0	
	86S1236FG05	11º 28.79'S	159º 30.81'W	5,080	(Plain) Flat	6	23	12	1		58	21.9	Pl	1.93	34.8	0.33	0.19	0.29	10.86	13.64	CSC	2	5	ds	0	
21	86S1236FG06 (86421)	11º 28.96'S	159º 28.95'W	4,950	(Plain) Flat	15	85					37.62	Sp. P	2.06	34.3	0.17	0.08	0.52	16.27	19.15	BC	3	0	ds	0	
	Average			4,977		9	51	14	11		15	28.06	Sp. Pl	2	32.8	0.24	0.13	0.42	14.42	16.61						
	86S1336FG04	12º 29.95'S	159º 29.92'W	5,232	(Plain) Flat	9	70	16	5			17.59	Sp. P	2.05	31.9	0.34	0.18	0.45	17.69	16.9	BC	3	0	bc	0	
	86S1336FG05	12º 28.87'S	159º 30.88'W	4,901	(Plain) Platform	1	8	42	49			31.82	Sp. M	1.95	29.6	0.22	0.12	0.51	17.57	17.66	CSC	2	5	d1	0	
22	86S1336FG06 (86422)	12º 28.82'S	159º 28.87'W	5,181	(Plain) Flat	2	83	15				28.62	Sp. M	1.99	29.9	0.37	0.21	0.45	18.44	17.17	BC	4	0	d1	0	
	Average			5,105		3	49	26	21			26.01	Sp. M	1.99	30.2	0.3	0.16	0.47	17.92	17.31						
	86S1436FG04	13º 29.88'S	159º 29.96'W	5,102	(Plain) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ac	0	
	86S1436FG05	13º 29.04'S	159º 30.97'W	5,116	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	d2	0	
23	86S1436SC06 (86423)	13º 28.83'S	159º 29.11'W	5,140	(Plain) Flat	4	35	53	8			15	E. Pl	2.04	28.2	0.33	0.2	0.39	15.73	19.13	BC	3	0	ds	0	
	Average			5,119		4	35	53	8			5.00	E. Pl	2.04	28.2	0.33	0.2	0.39	15.73	19.13	BC					
	86S1536FG04	14º 29.99'S	159º 30.01'W	5,126	(Plain) Flat	64	36					2.52	Sp. P	2.01	30	0.51	0.28	0.29	15.78	14.04	BC	2	0	ac	0	
	86S1536FG05	14º 28.88'S	159º 31.04'W	5,111	(Plain) Flat	49	37	2	12			11.77	P. Sp	2.08	25.4	0.37	0.2	0.42	16.68	17.15	BC	2	0	ac	0	
24	86S1536FG06 (86424)	14º 28.80'S	159º 29.10'W	5,119	(Plain) Flat	17	75	8				14.31	P. Sp	2.07	29.9	0.33	0.18	0.46	17.65	17.29	BC	2	0	ac	0	
	Average			5,119		34	56	5	5			9.53	P. Sp	2.07	28	0.36	0.19	0.43	17.08	16.95						
	86S1636FG04	15º 29.86'S	159º 30.07'W	4,919	(Quasi) Flat	2	40	58				40.56	Sp. P	1.97	28.6	0.13	0.08	0.51	15.11	19.57	CSC	2	5	ds	0	
	86S1636FG05	15º 28.88'S	159º 31.15'W	5,140	(Quasi) Flat	1	63	36				39.27	M. Sp	2.03	31.4	0.20	0.13	0.46	16.0	18.89	BC	2	0	e1	0	
25	86S1636SC06 (86425)	15º 29.05'S	159º 29.02'W	5,140	(Quasi) Flat	2	60	38				39.33	Sp	2.00	27.0	0.20	0.12	0.47	15.72	19.35	BC	3	0	b	0	
	Average			5,066		2	54	45				39.72	Sp. M	2.00	28.9	0.17	0.11	0.48	15.57	19.30						
	86S1636FG07	15º 30.22'S	160º 00.07'W	5,055	(Quasi) Flat	7	30	12	44	7		26.65	Ec. P	1.97	29.3	0.18	0.10	0.52	15.58	18.55	BC	2	0	e1	0	
	86S1636FG08	15º 29.26'S	160º 01.10'W	5,070	(Quasi) Flat	4	54	38	4			30.33	Sp. E	1.93	31.3	0.13	0.08	0.54	15.22	19.63	BC	2	0	e1	0	
26	86S1636FG09 (86426)	15º 29.26'S	159º 59.14'W	5,067	(Quasi) Flat	1	63	36				32.80	Sp. M	1.95	29.7	0.19	0.11	0.54	15.89	19.22	BC	2	0	bc	0	
	Average			5,064		4	49	29	16	2		29.93	Sp. Ec	1.95	30.1	0.17	0.10	0.53	15.56	19.13						
	86S1635FG01	15º 29.97'S	160º 29.96'W	4,953	(Quasi) Flat	8	55	25	12			6.22	Pl. P	2.12	26.7	0.46	0.25	0.37	16.72	17.42	BC	2	0	d2	0	
	86S1635FG02	15º 28.99'S	160º 30.90'W	4,885	(Quasi) Flat							0	-	-	-	-	-	-	-	-	-	-	-	d2	0	
27	86S1635FG03 (86427)	15º 28.92'S	160º 28.81'W	4,929	(Quasi) Flat							0	-	-	-	-	-	-	-	-	-	-	-	d2	0	
	Average			4,916		8	55	25	12			2.07	Pl. P	2.12	26.7	0.46	0.25	0.37	16.72	17.42						
	86S1635FG04	15º 44.93'S	160º 14.96'W	5,017	(Quasi) Flat	9	63	9	19			11.95	Sp. E	1.99	30.4	0.21	0.12	0.51	14.8	19.21	BC	1	0	d2	0	
	86S1635FG05	15º 43.83'S	160º 16.00'W	5,005	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	d2	0	
28	86S1635FG06 (86428)	15º 43.70'S	160º 14.02'W	4,830	(Quasi) Flat	17	74	6	3			20.6	Sp. P	1.98	30.3	0.18	0.11	0.52	14.83	19.5	BC	1	0	ds	0	
	Average			4,951		14	70	7	9			16.28	Sp. P	1.98	30.3	0.19	0.11	0.52	14.82	19.4						
	86S1735FG04	16º 00.00'S	160º 29.53'W	4,821	(Quasi) Flat	3	84	13				28.77	Sp. P	1.97	31.5	0.15	0.08	0.6	16.66	19.47	FO	0	50	a	0	
	86S1735FG05	15º 58.99'S	160º 30.41'W	4,812	(Quasi) Flat	4	21	55	16	4		33.77	Sp. M	1.96	29.6	0.19	0.1	0.53	14.91	19.59	FO	0	60	a	0	
29	86S1735FG06 (86434)	15º 58.98'S	160º 28.30'W	4,854	(Quasi) Flat	7	85	5	3			30.47	Sp. P	1.97	30.8	0.16	0.08	0.56	15.95	18.78	FO	0	40	a	0	
	Average			4,829		5	61	26	7	1		31.00	Sp. P	1.97	30.6	0.17	0.09	0.56	15.78	19.29						
	86S1736FG04	16º 30.19'S	159º 59.85'W	5,058	(Quasi) Flat	9	41	34	10	6		22.95	Sp. M	1.99	29.2	0.20	0.12	0.48	13.44	18.25	BC	1	0	a	0	
	86S1736FG05	16º 29.23'S	160º 00.83'W	5,020	(Quasi) Flat	3	43	54				32.73	Sp. M	2.02	28.9	0.20	0.12	0.53	15.21	18.82	BC	1	0	a	0	
30	86S1736FG06 (86430)	16º 29.29'S	159º 58.80'W	5,087	(Quasi) Flat	6	37	32	19	6		26.64	Sp. M	1.99	29.7	0.19	0.11	0.49	14.13	18.63	BC	1	0	a	0	
	Average			5,055		7	39	33	15	6		27.44	Sp. M	1.99	29.5	0.19	0.11	0.49	13.81	18.46						

Data Files of Results obtained from Four Survey Cruises in this Programme (7/19)

(No. 86-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1735FG04	16º 14.76'S	160º 15.02'W	4,890	(Quasi) Flat	5	61	34				29.02	Sp	1.93	28.1	0.2	0.1	0.56	16.03	19.4	CSC	1	3	a	0	
	86S1735FG05	16º 13.73'S	160º 16.02'W	4,882	(Quasi) Flat	8	89	3				(13.35)	Sp. P	2.01	28.6	0.21	0.11	0.55	16.00	19.44	CSC	1	5	e1	0	
31	86S1735FG06 (86431)	16º 13.53'S	160º 14.05'W	4,901	(Quasi) Flat	4	90	6				(9.75)	Sp. P	2.03	28.5	0.2	0.11	0.54	15.85	19.34	CSC	1	6	a	0	
	Average			4,891		5	61	34				29.02	Sp	1.93	28.1	0.2	0.1	0.56	16.03	19.4						
	86S1735FG07	16º 30.00'S	160º 30.08'W	4,730	(Quasi) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1735FG08	16º 29.02'S	160º 31.13'W	4,845	(Quasi) Flat	0	8	22	52	18		31.24	M. Sp	1.98	25.4	0.25	0.13	0.47	15.27	16.91	BC	2	0	e1	0	
32	86S1735FG09 (86432)	16º 28/98'S	160º 29.24'W	4,498	(Quasi) Seaknoll	1	1	7	91			(28.35)	Sp	1.93	25.2	0.17	0.09	0.53	15.9	18.08	-	-	-	d1	0	
	Average			4,691		0	8	22	52	18		15.62	M. Sp	1.98	25.4	0.25	0.13	0.47	15.27	16.91						
	86S1736FG07	16º 14.78'S	159º 45.11'W	4,773	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1736FG08	16º 13.75'S	159º 46.14'W	4,836	(Quasi) Flat	6	87	7				62.91	Sp. P	2.09	31.5	0.13	0.08	0.55	16.00	20.04	CSC	1	5	d1	0	
33	86S1736FG09 (86433)	16º 13.67'S	159º 44.15'W	4,998	(Quasi) Sea Knoll	19	74	2	5			25.76	Sp. P	1.90	32.4	0.13	0.07	0.53	15.52	19.95	BC	1	0	d1	0	
	Average			4,869		12	81	5	2			29.56	Sp. P	2.01	31.9	0.13	0.08	0.54	15.80	20.01						
	86S1736FG10	16º 29.98'S	159º 29.88'W	5,082	(Quasi) Flat	23	56	8	13			5.92	Oth. P	1.93	31.9	0.27	0.14	0.44	14.15	17.21	BC	1	0	e1	0	
	86S1736FG11	16º 29.07'S	159º 30.78'W	4,911	(Quasi) Sea Knoll							0.00	-	-	-	-	-	-	-	-	-	-	-	d1	0	
34	86S1736FG12 (86434)	16º 29.03'S	159º 28.71'W	4,951	(Quasi) Flat	12	63	22	3			25.46	Sp. E	2.00	30.6	0.19	0.13	0.44	13.12	19.43	CSC	1	5	d1	0	
	Average			4,981		14	62	19	5			10.46	Sp. E	1.99	30.9	0.21	0.13	0.44	13.32	18.99						
	86S1736FG13	16º 14.82'S	159º 14.67'W	5,139	(Quasi) Flat	4	89	7				31.93	Sp. P	2.10	28.4	0.21	0.13	0.48	15.05	19.30	BC	1	0	ts	0	
	86S1736FG14	16º 13.88'S	159º 15.62'W	5,225	(Quasi) Flat	6	40	48	6			22.36	Sp. M	1.97	30.5	0.22	0.12	0.52	15.76	19.04	BC	2	0	e1	0	
35	86S1736FG15 (86435)	16º 13.72'S	159º 13.60'W	5,084	(Quasi) Flat	4	50	30	5	11		26.85	Sp. M	1.98	28.8	0.22	0.13	0.48	14.68	18.30	BC	1	0	ds	0	
	Average			5,149		5	60	27	4	5		27.05	Sp. M	2.02	29.1	0.22	0.13	0.49	15.07	18.82						
	86S1736FG16	15º 59.93'S	159º 30.08'W	5,018	(Quasi) Flat	9	68	23				27.39	Sp. M	1.97	30.8	0.15	0.09	0.51	14.74	20.28	BC	1	0	e1	0	
	86S1736FG17	15º 58.97'S	159º 31.17'W	4,796	(Quasi) Flat	3	44	45	8			38.16	E. Sp	2.01	29.3	0.19	0.11	0.53	15.81	19.41	CSC	1	3	ds	0	
36	86S1736FG18 (86436)	15º 58.92'S	159º 29.21'W	4,978	(Quasi) Flat	7	23	26	26	18		36.14	E. M	1.98	29.0	0.18	0.11	0.51	15.76	16.25	BC	1	0	ds	0	
	Average			4,931		6	45	33	11	5		33.90	E. Sp	1.99	29.7	0.17	0.10	0.52	15.50	18.74						
	86S1737FG04	16º 30.03'S	159º 00.10'W	5,150	(Quasi) Flat	3	86	11				31.84	Sp. M	2.04	25.6	0.25	0.14	0.45	15.41	18.35	BC	1	0	a	0	
	86S1737FG05	16º 29.13'S	159º 01.13'W	5,087	(Quasi) Flat	2	71	27				38.74	Sp	2.13	28.1	0.21	0.12	0.52	15.89	18.67	BC	1	0	a	0	
37	86S1737FG06 (86437)	16º 29.10'S	158º 59.23'W	5,114	(Quasi) Flat	2	83	13	2			34.16	Sp. M	2.06	25.2	0.23	0.13	0.49	15.67	18.94	BC	1	0	a	0	
	Average			5,117		2	76	21	1			34.91	Sp. M	2.10	26.9	0.22	0.12	0.51	15.79	18.79						
	86S1737FG07	16º 15.04'S	158º 45.04'W	5,065	(Quasi) Flat	2	75	23				53.26	Sp	2.00	30.7	0.23	0.13	0.50	15.64	18.65	BC	1	0	a	0	
	86S1737FG08	16º 14.11'S	158º 46.06'W	5,050	(Quasi) Flat	2	40	58				50.82	Sp	2.05	31.4	0.20	0.11	0.51	15.60	18.65	BC	1	0	a	0	
38	86S1737FG09 (86438)	16º 14.12'S	158º 44.15'W	5,050	(Quasi) Flat	1	23	31	41	4		48.50	Ec. Sp	1.95	28.2	0.21	0.12	0.50	15.35	18.05	BC	1	0	a	0	
	Average			5,055		0	0	0	0	0		50.86	Sp. Ec	2	30.1	0.21	0.12	0.5	15.5	18.46						
	86S1737FG10	16º 29.94'S	158º 30.04'W	4,236	(Quasi) Seamount	4	65	27	4			(17.57)	Sp. M	2.02	28.8	0.27	0.15	0.45	16.90	18.19	FO	0	90	d1	0	
	86S1737FG11	16º 29.03'S	158º 30.95'W	4,386	(Quasi) Seamount	1	9	25	65			(22.37)	Sp	1.96	29	0.23	0.12	0.47	16.88	17.78	-	-	-	d1	0	
39	86S1737FG12 (86439)	16º 28.99'S	158º 28.95'W	4,508	(Quasi) Seamount	1	8	75	16			29.57	Sp	1.97	31.7	0.35	0.18	0.42	17.39	16.39	FO	0	90	d2	0	
	Average			4,377		1	8	75	18			29.57	Sp	1.97	31.7	0.35	0.18	0.42	17.39	16.39						
	86S1737FG13	15º 59.99'S	158º 30.16'W	5,002	(Quasi) Flat	6	94					23.46	Sp	1.98	25.7	0.17	0.11	0.48	14.84	19.36	BC	1	0	e1	0	
	86S1737FG14	15º 59.07'S	158º 31.21'W	4,834	(Quasi) Flat	21	57	6	16			23.20	P. Pt	1.97	30.4	0.16	0.11	0.38	16.37	18.81	BC	2	0	ds	0	
40	86S1737FG15 (86440)	15º 58.98'S	158º 29.32'W	4,949	(Quasi) Flat	8	20	21	37	14		29.39	M. Sp	1.98	26.2	0.19	0.11	0.49	14.99	17.51	BC	1	0	d1	0	
	Average			4,928		11	54	10	19	5		25.35	Sp. P	1.98	27.3	0.18	0.11	0.45	15.35	18.47						

Data Files of Results obtained from Four Survey Cruises in this Programme (8/19)

(No. 86-5)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1636FG10	15º 45.05'S	159º 45.00'W	4,980	(Quasi) Flat	5	52	33	4	6		54.67	Sp. M	2.01	30.8	0.21	0.14	0.45	14.00	18.83	BC	1	0	ds	0	
	86S1636FG11	15º 44.11'S	159º 46.02'W	4,988	(Quasi) Flat	100						0.01	Oth	-	-	-	-	-	-	-	-	-	-	ds	0	
41	86S1636FG12 (86441)	15º 44.16'S	159º 44.03'W	4,969	(Quasi) Flat	6	91	3				31.14	Sp. P	2.00	28.9	0.18	0.11	0.50	15.17	19.96	CSC	1	3	d2	0	
	Average			4,979		6	91	3	0	0		28.61	Sp	2.00	28.9	0.18	0.11	0.50	15.17	19.96	BC					
	86S1636FG13	15º 44.97'S	159º 15.12'W	5,038	(Quasi) Flat		77	21	2			40.43	Sp	2.02	31.0	0.19	0.10	0.55	16.85	19.02	BC	1	0	a	0	
	86S1636FG14	15º 43.91'S	159º 16.25'W	5,046	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	b	0	
42	86S1636FG15 (86442)	15º 43.81'S	159º 14.48'W	5,022	(Quasi) Flat	0	84	16				37.11	SP. P	2.05	30.5	0.16	0.09	0.56	16.60	19.38	BC	1	0	a	0	
	Average			5,035		0	80	19	1			38.77	Sp. P	2.03	30.7	0.17	0.09	0.55	16.73	19.20	BC					
	86S1637FG04	15º 30.11'S	158º 29.95'W	4,895	(Quasi) Flat	5	19	23	30	23		22.59	E, P	1.98	30	0.27	0.26	0.36	15.13	17.94	CSC	1	2	ds	0	
	86S1637FG05	15º 29.24'S	158º 30.98'W	4,896	(Quasi) Flat	1	9	19		71		(5.15)	E. Sp	1.96	28.6	0.21	0.14	0.45	14.97	16.04	-	-	-	ds	0	
43	86S1637FG06 (86443)	15º 29.36'S	158º 28.98'W	4,789	(Quasi) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			5,078		5	19	23	30	23		11.30	E. P	1.98	30.0	0.27	0.26	0.36	15.13	17.94						
	86S1637FG07	15º 44.98'S	158º 45.10'W	5,105	(Quasi) Flat	5	48	41	6			33.20	M. Ec	1.96	30.1	0.27	0.17	0.45	15.89	17.55	BC	1	0	a	0	
	86S1637FG08	15º 43.97'S	158º 46.00'W	5,088	(Quasi) Flat	3	26	65	6			45.84	Sp. M	1.97	30.3	0.19	0.11	0.50	16.00	19.37	BC	1	0	a	0	
44	86S1637FG09 (86444)	15º 43.83'S	158º 44.02'W	5,040	(Quasi) Flat	3	26	41	30			40.83	M. Ec	2.02	30.2	0.29	0.17	0.42	15.29	17.09	BC	1	0	bc	0	
	Average			5,078		4	36	41	19			39.96	M. Ec	1.99	30.1	0.28	0.17	0.44	15.57	17.31						
	86S1637FG10	15º 30.88'S	159º 00.56'W	5,022	(Quasi) Flat	2	89	9				40.71	Sp. P	2.03	26.4	0.22	0.12	0.51	16.55	18.73	BC	1	1	a	0	
	86S1637FG11	15º 29.91'S	159º 01.59'W	5,032	(Quasi) Flat	1	47	52				46.49	Sp. M	1.98	25.2	0.16	0.09	0.54	16.16	18.93	BC	1	1	b	0	
45	86S1637FG12 (86445)	15º 29.95'S	158º 59.61'W	5,007	(Quasi) Flat	2	84	14				35.25	Sp. P	2.00	29.0	0.21	0.13	0.48	15.59	18.98	CSC	1	2	a	0	
	Average			5,020		1	65	34				40.82	Sp. M	1.99	27.0	0.19	0.11	0.51	15.89	18.95	BC					
	86S1137FG04	10º 30.06'S	158º 59.95'W	5,078	(Hilly) Flat	32	28	3		37		13.42	P. M	1.99	27.1	0.34	0.21	0.36	13.99	13.55	BC	1	0	d2	0	
	86S1137FG05	10º 29.17'S	159º 00.91'W	4,941	(Hilly) Flat	84	16					2.85	P	1.99	26.2	0.44	0.27	0.27	11.92	11.95	BC	1	1	b	0	
46	86S1137FG06 (86446)	10º 29.15'S	158º 58.92'W	4,940	(Hilly) Flat	4	36	33	27			18.81	P. E	2.01	31.0	0.35	0.21	0.39	16.91	15.59	CSC	1	3	ds	0	
	Average			4,986		21	31	19	14	14		11.69	P. E	2	29.1	0.35	0.21	0.37	15.34	14.48						
	86S1136FG07	10º 14.98'S	159º 14.75'W	5,048	(Hilly) Seaknoll	2	71	25	2			30	E. P	2	30.8	0.3	0.18	0.42	17.57	16.89	BC	5	1	d1	0	
	86S1136FG08	10º 14.03'S	159º 15.67'W	5,334	(Hilly) Seaknoll	2	48	50				19.55	M. E	2.07	27.3	0.37	0.21	0.38	17.8	15.11	BC	2	0	d2	0	
47	86S1136FG09 (86447)	10º 13.99'S	159º 13.59'W	4,867	(Hilly) Seaknoll	3	28	44	25			35.52	M. Ef	1.99	27.7	0.26	0.14	0.48	18.52	16.87	FO	2	40	d1	0	
	Average			5,083		2	48	39	11			28.36	M. E	2.01	28.7	0.3	0.17	0.44	18.03	16.46						
	86S1136FG10	10º 00.37'S	159º 30.34'W	4,802	(Hilly) Platform	1	3	7	15	74		(46.68)	M. Sp	1.96	27.9	0.23	0.12	0.43	16.86	16.26	-	-	-	d1	0	
	86S1136FG11	09º 59.47'S	159º 31.41'W	5,095	(Hilly) Platform	86	14					3.35	P	2.04	21.4	0.55	0.33	0.26	13.65	11.50	BC	1	0	a	0	
48	86S1136FG12 (86448)	09º 59.54'S	159º 29.524'W	4,973	(Hilly) Platform	5	9			86		21.85	M. P	1.88	31.1	0.33	0.18	0.39	16.51	15.24	BC	1	0	e1	0	
	Average			4,957		16	10	0	0	75		12.60	M. P	1.9	29.8	0.36	0.21	0.37	16.09	14.68						
	86S1136FG13	10º 45.01'S	159º 45.12'W	5,290	(Hilly) Platform	4	28	31	15	22		20.71	E. P	1.98	27.3	0.36	0.22	0.37	15.32	14.85	BC	1	0	d2	0	
	86S1136FG14	10º 43.96'S	159º 46.16'W	5,133	(Hilly) Platform	1	66	33				25.63	M. P	2.02	28.8	0.31	0.18	0.43	17.24	17.02	BC	1	0	d1	0	
49	86S1136FG15 (86449)	10º 43.92'S	159º 44.16'W	5,176	(Hilly) Platform	7	26	31	30	6		20.87	M. P	1.98	30.6	0.39	0.21	0.44	18.31	15.14	BC	1	0	d1	0	
	Average			5,200		4	42	32	14	9		22.40	M. P	2	28.9	0.35	0.2	0.41	16.96	15.77						
	86S1238FG07	10º 59.91'S	159º 30.00'W	3,325	(Hilly) Seamount		100					0.05	P	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1238FG08	10º 58.97'S	159º 31.06'W	3,342	(Hilly) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
50	86S1238FG09 (86450)	10º 58.92'S	159º 29.08'W	3,981	(Hilly) Seamount	61	39					(0.82)	P	2.08	30.6	0.24	0.11	0.45	17.09	16.87	FO	0	90	d1	0	
	Average			3,549		0	100					0.03	P	-	-	-	-	-	-	-						

Data Files of Results obtained from Four Survey Cruises in this Programme (9/19)

(No. 86-6)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	86S1136FG16	10º 45.01'S	159º 15.05'W	4,888	(Hilly) Flat	1	85	11	3			23.8	Sp. Ot	1.95	28.7	0.29	0.17	0.45	17.87	17.45	FO	0	70	e1	0	
	86S1136FG17	10º 44.04'S	159º 16.04'W	4,846	(Hilly) Flat	2	68	27	3			23.29	M. Sp	2	28.1	0.33	0.2	0.41	17.48	16.60	FO	2	60	e1	0	
51	86S1136FG18	10º 44.05'S	159º 14.13'W	4,894	(Hilly) Flat	2	89	9				(2.18)	Ot. P	2.03	26.3	0.42	0.28	0.36	18.12	15.61	FO	5	60	e1	0	
	(86451)																									
	Average			4,869		1	77	19	3			23.55	Sp. M	1.97	28.4	0.31	0.19	0.43	17.68	17.03						
	86S1136FG19	10º 30.38'S	159º 59.29'W	4,639	(Mount) Seamount	1	38	56	5			31.02	Sp. P	2.01	28.4	0.2	0.11	0.5	16.75	18.37	FO	3	70	d1	0	
	86S1136FG20	10º 29.45'S	159º 45.55'W	5,306	(Mount) Seamount	0	34	43	12	11		29.02	M. E	1.95	30.9	0.28	0.18	0.43	17.32	16.70	BC	1	80	d1	0	
52	86S1136FG21	10º 29.45'S	159º 58.13'W	4,633	(Mount) Seamount							(0.00)	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	(86452)																									
	Average			4,859		1	36	50	8	5		30.02	Sp. M	1.98	29.6	0.23	0.14	0.47	17.02	17.57						
	86S1136FG22	10º 15.04'S	159º 44.81'W	5,509	(Hilly) Channel							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	86S1136FG23	10º 13.97'S	159º 45.55'W	5,476	(Hilly) Channel	17	59	24				(6.01)	P. Ot	2.01	33.3	0.31	0.17	0.45	18.22	18.37	-	-	-	ds	0	
53	86S1136FG24	10º 13.92'S	159º 43.17'W	5,505	(Hilly) Channel							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	(86453)																									
	Average			5,497		0	0	0				0.00	-	-	-	-	-	-	-	-						
	86S1036FG07	09º 00.06'S	159º 29.86'W	5,522	(Hilly) Seaknoll	1	56	43				19.08	M. P	2.02	28.3	0.34	0.22	0.37	17.5	15.94	BC	5	0	ds	0	
	86S1036FG08	08º 59.11'S	159º 30.86'W	5,299	(Hilly) Seaknoll	4	47	35	7	7		24.27	P. E	1.98	30.0	0.37	0.21	0.38	15.95	15.18	BC	3	0	ds	0	
54	86S1036FG09	08º 59.06'S	159º 28.75'W	5,380	(Hilly) Seaknoll	1	50	33	12	4		22.42	P. Pl	2.02	29.8	0.36	0.23	0.36	16.69	14.81	BC	5	0	ds	0	
	(86454)																									
	Average			5,400		2	51	37	7	4		21.92	P. M	2.01	29.5	0.36	0.22	0.37	16.66	15.28						
	86S1036FG10	09º 15.02'S	159º 44.92'W	5,549	(Hilly) Seaknoll	2	7	50	34	7		23.55	M. Sp	1.94	27.9	0.23	0.13	0.5	18.87	17.69	-	-	-	ds	0	
	86S1036FG11	09º 14.04'S	159º 45.89'W	5,720	(Hilly) Seaknoll	4	73	19	4			23.73	P. Sp	2.01	31.9	0.22	0.14	0.41	16.3	19.21	BC	3	0	ds	0	
55	86S1036FG12	09º 14.00'S	159º 43.92'W	5,633	(Hilly) Seaknoll							(0.00)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	(86455)																									
	Average			5,634		3	40	34	19	3		23.64	Sp. M	1.98	29.9	0.22	0.13	0.45	17.62	18.43						
	86S1036FG13	09º 30.00'S	160º 00.03'W	2,859	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	86S1036FG14	09º 29.01'S	160º 01.07'W	2,823	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
56	86S1036FG15	09º 28.98'S	159º 59.10'W	3,479	(Mount) Seamount							0	-	-	-	-	-	-	-	-	-	-	-	d1	0	
	(86456)																									
	Average			3,054								0.00	-	-	-	-	-	-	-	-						
	86S1036FG16	09º 45.10'S	159º 15.21'W	5,412	(Hilly) Platform	19	12	69				0.72	M. P	2.67	6.2	0.01	0.04	,04	0	1.06	BC	3	0	b	0	
	86S1036FG17	09º 44.13'S	159º 16.24'W	5,397	(Hilly) Platform	100						0.15	Ot	2	31.6	0.37	0.25	0.33	20.26	15.18	SC	15	0	d2	0	
57	86S1036FG18	09º 44.13'S	159º 14.35'W	5,255	(Hilly) Platform							0.00	-	-	-	-	-	-	-	-	-	-	-	d2	0	
	(86457)																									
	Average			5,355		33	10	57				0.29	M. P	2.55	10.6	0.37	0.25	0.33	20.26	15.18						
	86S1036FG19	09º 44.99'S	159º 44.63'W	5,290	(Hilly) Seaknoll	36	53	11				6.05	P. M	1.97	29.1	0.54	0.29	0.33	16.95	13.16	BC	3	0	ds	0	
	86S1036FG20	09º 44.00'S	159º 45.63'W	5,513	(Hilly) Seaknoll	1	7	15		77		6.52	Pl, M	1.76	31.7	0.28	0.16	0.16	5.27	11.34	BC	2	0	d1	0	
58	86S1036FG21	09º 43.98'S	159º 43.56'W	5,014	(Hilly) Seaknoll	0	22	29	49			39.88	M. Ef	1.99	28.3	0.25	0.16	0.41	17.06	16.78	SCC	10	5	d1	0	
	(86458)																									
	Average			5,272		4	24	25	37	10		17.48	M. Pl	1.96	28.8	0.29	0.17	0.37	15.64	15.72						
	86S1036FG22	09º 14.99'S	159º 14.96'W	5,352	(Hilly) Platform	10	17	3	70			2.25	M. Pt	1.96	26.5	0.31	0.2	0.35	14.85	13.34	-	-	-	d2	0	
	86S1036FG23	09º 13.98'S	159º 15.89'W	5,305	(Hilly) Platform	4	37	37	22			(8.57)	Ot. P	1.96	29.3	0.35	0.22	0.36	15.56	14.88	BC	8	0	ds	0	
59	86S1036FG24	09º 13.81'S	159º 13.92'W	5,372	(Hilly) Platform	13	41	24	22			(4.15)	M. P	2.01	25.8	0.42	0.27	0.29	15.48	13.68	BC	5	0	d2	0	
	(86459)																									
	Average			5,343		10	17	3	70			2.25	M. Pt	1.96	26.5	0.31	0.2	0.35	14.85	13.34						
	86S1037FG04	09º 30.03'S	159º 00.03'W	5,397	(Hilly) Flat	13	67	20				8.43	P. E	2.01	25.7	0.38	0.21	0.36	15.66	13.36	BC	5	0	ds	0	
	86S1037FG05	09º 28.89'S	159º 01.03'W	5,309	(Hilly) Flat	1	47	39	13			30.09	M. Sp	2.02	31.0	0.38	0.21	0.41	18.49	14.80	BC	3	0	ds	0	
60	86S1037FG06	09º 28.69'S	158º 59.10'W	5,439	(Hilly) Flat	24	60	16				5.22	P.Ot	1.99	31.1	0.45	0.24	0.30	14.32	12.81	BC	1	0	ds	0	
	(86460)																									
	Average			5,382		7	53	32	9			14.58	M. P	2.01	29.9	0.39	0.22	0.39	17.33	14.23						

*Sil%:siliceous fossil% , Cal% :calcareous fossil%, T.P.L:Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (10/19)

(No. 90-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S1830FG01	16º 59.94′S	166º 00.04′W	5,502	(Plain) Flat	4	96					0.35	Sp	1.95	29.7	0.54	0.32	0.28	16.71	14.69	BC	0	0	b	10	
	90S1830FG02	16º 59.01′S	166º 01.00′W	5,527	(Plain) Flat	37	63					0.12	Sp	1.9	26.7	0.52	0.31	0.30	16.92	14.75	BC	0	0	b	10	
1	90S1830FG03	16º 59.08′S	165º 59.06′W	5,567	(Plain) Flat	13	44			44		1.45	Sp. Pl	2	28.2	0.55	0.32	0.31	18.36	14.34	BC	0	0	b	10	
	(90401)											4.05														
	Average			5,532		13	54			33		0.64	Sp. Pl	1.98	28.4	0.55	0.32	0.31	17.98	14.43						
	90S1930FG01	17º 59.96′S	165º 59.99′W	5,313	(Plain) Flat	28	72					2.62	Sp	2.01	25.7	0.39	0.23	0.44	16.87	16.95	BC	0	0	b	40	
	90S1930FG02	17º 58.96′S	166º 01.01′W	5,339	(Plain) Flat	9	45	46				3.77	Sp	1.92	25.5	0.43	0.23	0.44	17.90	16.03	BC	0	0	b	30	
2	90S1930FG03	17º 59.01′S	165º 58.97′W	5,323	(Plain) Flat	7	36	57				1.74	Sp	2.02	27.1	0.37	0.21	0.45	16.51	16.68	BC	0	0	b	30	
	(90402)																									
	Average			5,325		15	52	34				2.71	Sp	1.97	25.9	0.40	0.23	0.44	17.27	16.47						
	90S2030FG01	19º 00.00′S	166º 00.02′W	4,776	(Hilly) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	90S2030FG02	18º 58.96′S	166º 01.04′W	5,010	(Hilly) Seaknoll	32	20	31	17			18.72	P. E	1.96	30.1	0.28	0.18	0.42	11.15	18.49	BC	0	0	ds	10	
3	90S2030FG03	18º 58.99′S	165º 59.00′W	4,925	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	ds	10	
	(90403)																									
	Average			4,904		32	20	31	17			6.24	P. E	1.96	30.1	0.28	0.18	0.42	11.15	18.49						
	90S2131FG01	20º 00.03′S	165º 00.27′W	4,285	(Plain) Seaknoll	64	36					15.18	Sp	1.92	29.6	0.2	0.12	0.63	16.01	19.97	CSC	5	10	d1	0	
	90S2131FG02	19º 59.02′S	165º 01.03′W	4,778	(Plain) Seaknoll	39	9		52			0.94	Pl. Sp	1.94	29.6	0.25	0.18	0.29	6.48	15.26	BC	0	0	d1	0	
4	90S2131FG03	19º 59.04′S	164º 59.16′W	4,392	(Plain) Seaknoll	22	78					16.5	Sp	1.92	31.2	0.2	0.13	0.62	15.28	20.26	-	-	-	b	40	
	(90404)																									
	Average			4,485		42	57			2		10.87	Sp	1.92	30.4	0.2	0.13	0.62	15.36	19.98						
	90S2031FG01	18º 59.99′S	164º 59.99′W	5,152	(Plain) Flat	25	56	8	11			16.64	Sp. P	1.98	29.5	0.3	0.19	0.45	13.88	19.53	BC	0	0	b	10	
	90S2031FG02	18º 59.01′S	165º 01.02′W	5,117	(Plain) Seaknoll	17	56	19	8			10.17	Sp. P	1.98	28.7	0.27	0.17	0.5	14.63	20.29	BC	0	0	ds	0	
5	90S2031FG03	18º 59.00′S	164º 59.01′W	4,921	(Plain) Flat	31	57	10	2			19.51	Sp. P	2.00	28.1	0.3	0.2	0.48	14.3	20.13	BC	0	0	ds	0	
	(90405)																									
	Average			5,063		26	56	11	7			15.44	Sp. P	1.99	28.8	0.29	0.19	0.47	14.22	19.95						
	90S1931FG01	18º 00.01′S	164º 59.95′W	5,347	(Plain) Flat	23	57	20				0.97	P. Pl	2.03	27.9	0.51	0.29	0.37	16.28	15.36	BC	0	0	ts	10	
	90S1931FG02	17º 59.06′S	165º 01.03′W	5,419	(Plain) Flat	62	38					0.89	Sp. Pl	2.04	31.1	0.53	0.31	0.31	15.41	15	BC	0	0	c	0	
6	90S1931FG03	17º 59.02′S	164º 58.99′W	5,441	(Plain) Flat	19	38	3	8	32		4.92	Sp. Pl	1.93	29.3	0.47	0.25	0.39	16.13	15.3	BC	0	0	e1	0	
	(90406)																									
	Average			5,402		25	41	5	6	23		2.26	Sp. Pl	1.96	29.3	0.48	0.26	0.38	16.06	15.27						
	90S1831FG01	16º 59.96′S	165º 00.01′W	5,429	(Plain) Flat	1	5	3	17	74		8.04	Pl. Sp	1.91	32.8	0.34	0.21	0.31	10	12.87	BC	0	0	b	20	
	90S1831FG02	16º 58.91′S	165º 01.01′W	5,441	(Plain) Flat	3	15	82				0.42	Pl	1.9	29.5	0.54	0.31	0.32	16.04	13.62	BC	0	0	c	0	
7	90S1831FG03	16º 58.99′S	164º 58.99′W	5,448	(Plain) Flat	33	67					0.11	P. Sp	1.83	26.3	0.55	0.32	0.24	14.4	13.23	BC	0	0	c	0	
	(90407)																									
	Average			5,439		2	6	7	16	69		2.86	Pl. Sp	1.91	32.5	0.35	0.22	0.31	10.37	12.92						
	90S1731FG01	15º 59.99′S	164º 59.99′W	5,528	(Plain) Flat	3	28	21	35	13		9.63	Sp. Pt	1.97	27.6	0.36	0.22	0.41	16.39	16.58	BC	0	0	b	30	
	90S1731FG02	15º 58.97′S	165º 00.96′W	5,546	(Plain) Flat	5	32	12	15	36		4.22	E. Sp	1.96	27.6	0.41	0.24	0.39	17.2	16.41	BC	0	0	b	20	
8	90S1731FG03	15º 59.00′S	164º 58.97′W	5,502	(Plain) Flat		5	36	16	43		8.57	E. Sp	1.98	27.4	0.35	0.21	0.42	16.42	16.05	BC	0	0	b	10	
	(90409)																									
	Average			5,525		2	20	25	24	29		7.47	Sp. E	1.97	27.5	0.37	0.22	0.41	16.55	16.34						
	90S1832SC01	17º 00.03′S	163º 59.96′W	5,490	(Plain) Flat	34	66					0.77	P	2.04	28.9	0.55	0.30	0.34	17.03	16.56	BC	0	0	c	0	
	90S1832FG02	16º 58.92′S	164º 01.00′W	5,547	(Plain) Flat	21	79					1.26	P	1.93	31.2	0.42	0.24	0.39	16.13	16.58	BC	0	0	c	0	
9	90S1832FG03	16º 58.99′S	163º 59.04′W	5,486	(Plain) Flat	10	18	11	61			2.02	Pl. Sp	1.95	31.4	0.39	0.23	0.37	15.42	17.13	BC	0	0	c	0	
	(90409)											4.05														
	Average			5,508		18	44	6	32			1.35	P. Pl	1.96	30.8	0.43	0.25	0.37	15.95	16.86						
	90S2032FG01	18º 59.99′S	163º 59.99′W	5,054	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2032FG02	18º 59.04′S	164º 01.00′W	5,111	(Plain) Flat	60	20	20				1.95	P	2.05	30.0	0.42	0.25	0.36	13.00	17.47	BC	0	0	c	0	
10	90S2032FG03	18º 59.04′S	163º 59.04′W	5,074	(Plain) Flat	70	14	16				2.37	P. E	2.06	29.5	0.40	0.23	0.39	14.39	17.90	BC	0	0	c	0	
	(90410)																									
	Average			5,080		66	17	18				1.44	P. E	2.05	19.7	0.41	0.24	0.38	13.77	17.71						

Data Files of Results obtained from Four Survey Cruises in this Programme (11/19)

(No. 90-2)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S2132FG01	20º00.06′S	163º59.95′W	5,054	(Hilly) Channel	33	32	24	11			17.75	P	1.96	27.6	0.26	0.16	0.43	10.23	18.78	BC	5	3	ds	0	
	90S2132FG02	19º59.00′S	164º01.00′W	4,869	(Hilly) Flat	16	61	23				16.21	Sp. P	2.00	27.9	0.31	0.19	0.47	14.15	18.88	BC	5	2	ts	10	
11	90S2132FG03 (90411)	19º59.05′S	163º59.05′W	4,930	(Hilly) Flat	26	48	26				10.37	Sp. P	2.03	28.3	0.32	0.19	0.48	14.95	18.66	BC	3	2	ts	10	
	Average			4,951		26	46	24	5			14.78	P. Sp	1.99	27.9	0.29	0.18	0.45	12.71	18.78						
	90S2232FG01	21º 00.01′S	163º 59.97′W	5,061	(Plain) Flat	10	19		71			1.39	P	1.99	24.4	0.4	0.24	0.43	16.77	17.11	BC	2	1	c	0	
	90S2232FG02	20º 59.02′S	164º 00.94′W	5,100	(Plain) Flat	29	26	7		38		6.72	P. Sp	2.04	30.2	0.4	0.22	0.43	16.09	17.78	BC	1	0	c	0	
12	90S2232FG03 (90412)	20º 59.03′S	163º 59.01′W	4,967	(Plain) Flat	27	27	35	11			9.8	P	1.98	30.3	0.27	0.18	0.44	12.58	18.87	BC	1	0	c	0	
	Average			5,043	26	26	26	22	12	14		5.97	P. Sp	2.00	29.7	0.33	0.2	0.43	14.24	18.32						
	90S2333FG01	22º 00.00′S	163º 00.00′W	4,603	(Hilly) Seaknoll	23	22		28	27		5.73	P. Sp	1.9	31.5	0.25	0.16	0.51	12.94	19.06	BC	3	0	c	0	
	90S2333FG02	21º 58.92′S	163º 00.96′W	4,867	(Hilly) Flat	26	27	26	21			6.66	P. M	2.02	27.6	0.54	0.29	0.39	16.52	15.36	BC	0	0	b	30	
13	90S2333FG03 (90413)	21º 58.99′S	162º 59.03′W	4,608	(Hilly) Seaknoll	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,693		25	25	14	24	13		6.19	P. Sp	1.97	29.4	0.41	0.23	0.44	14.92	17.02						
	90S2233SC01	20º 59.99′S	162º 59.99′W	4,990	(Plain) Flat	100						0.02	P	-	-	-	-	-	-	-	BC	2	2	c	0	
	90S2233FG02	20º 58.97′S	163º 00.94′W	4,946	(Plain) Flat							0	-	-	-	-	-	-	-	-	BC	0	0	c	0	
14	90S2233FG03 (90414)	20º 59.01′S	162º 58.99′W	4,928	(Plain) Flat	7	32	21	33	7		16.78	P. Sp	2.07	26	0.42	0.23	0.46	16.17	16.58	BC	3	3	c	0	
	Average			4,955		7	32	21	33	7		27.96	P. Pl	2.07	26	0.42	0.23	0.46	16.17	16.58						
	90S2133FG01	20º 00.08′S	162º 59.93′W	4,822	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2133FG02	19º 58.96′S	163º 00.89′W	4,907	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
15	90S2133FG03 (90415)	19º 58.98′S	162º 59.02′W	4,855	(Plain) Flat	1	18	60	21			30.28	Sp	1.90	27.3	0.23	0.16	0.50	13.55	19.02	BC	0	0	b	40	
	Average			4,861		1	18	60	21			10.09	Sp	1.90	27.3	0.23	0.16	0.50	13.55	19.02						
	90S2033FG01	18º 59.98′S	162º 59.98′W	4,946	(Plain) Platform							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2033FG02	18º 58.99′S	163º 00.97′W	4,841	(Plain) Platform							0.00	-	-	-	-	-	-	-	-	BC	3	0	c	0	
16	90S2033FG03 (90416)	18º 59.05′S	162º 59.02′W	4,812	(Plain) Platform	100						0.13	P	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,866		100						0.04	-	-	-	-	-	-	-	-						
	90S2034FG01	18º 59.99′S	161º 59.96′W	4,857	(Hilly) Flat	19	57	8	16			24.12	P. E	2.00	27.8	0.23	0.13	0.60	16.35	19.34	BC	0	0	ts	10	
	90S2034FG02	18º 59.01′S	162º 00.94′W	4,996	(Hilly) Flat	8	55	37				29.83	P	1.99	27.7	0.20	0.14	0.55	14.95	20.04	BC	0	0	ts	10	
17	90S2034FG03 (90417)	18º 59.00′S	161º 59.00′W	5,011	(Hilly) Flat	2	10	11	11	46	20	29.92	Pl. P	1.96	25.9	0.26	0.18	0.43	12.48	19.97	BC	0	0	ts	20	
	Average			4,955		9	38	18	9	18	8	27.96	P. Pl	1.98	27.0	0.24	0.15	0.52	14.40	19.97						
	90S2134FG01	20º 00.00′S	162º 00.03′W	5,039	(Plain) Flat	17	31	44	8			9.61	P. M	1.88	33.7	0.43	0.23	0.42	12.78	17.23	BC	0	0	c	0	
	90S2134FG02	19º 58.99′S	162º 00.93′W	4,995	(Plain) Flat	19	42	20	19			9.78	P. E	1.91	32.1	0.34	0.23	0.44	12.95	19.48	BC	0	0	c	0	
18	90S2134FG03 (90418)	19º 59.00′S	161º 59.00′W	4,988	(Plain) Flat	19	24	21	10	26		10.85	P. M	1.89	33.1	0.33	0.20	0.44	12.96	18.87	BC	0	0	c	0	
	Average			5,007		18	32	28	12	9		10.08	P. M	1.89	33.0	0.36	0.22	0.43	12.90	18.55						
	90S2234FG01	20º 59.97′S	161º 59.99′W	4,736	(Hilly) Flat	4	15	20	24	37		17.73	P. E	1.98	25.1	0.37	0.22	0.48	15.51	17.08	BC	1	0	c	0	
	90S2234FG02	20º 58.98′S	162º 00.94′W	4,647	(Hilly) Seaknoll	10	53	16		21		19.48	Sp. E	2	27.4	0.36	0.21	0.48	15.01	17.85	BC	2	4	c	0	
19	90S2234FG03 (90419)	20º 59.01′S	161º 58.96′W	4,734	(Hilly) Flat	8	54	18		20		9.32	Sp. E	2.06	25.7	0.37	0.21	0.5	16.2	18.17	BC	2	3	b	30	
	Average			4,706		7	39	18	9	27		15.51	Sp. E	2.00	26.2	0.36	0.21	0.48	15.44	17.62						
	90S2334FG01	22º 00.02′S	161º 59.92′W	4,833	(Hilly) Flat	18	28	44	10			2.46	Pl	1.96	28.3	0.53	0.3	0.28	12.34	19.67	BC	0	0	c	0	
	90S2334FG02	21º 59.03′S	162º 00.88′W	4,775	(Hilly) Flat	6	5	3	2	42	42	8.27	Pl	1.89	42.8	0.35	0.22	0.28	8.07	18	BC	0	0	b	20	
20	90S2334FG03 (90420)	21º 59.02′S	161º 59.03′W	4,783	(Hilly) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,797		9	10	12	4	32	32	5.37	Pl	1.9	39.5	0.4	0.24	0.28	9.23	18.45						

Data Files of Results obtained from Four Survey Cruises in this Programme (12/19)

(No. 90-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S2434FG01	23º 03.98′S	162º 03.97′W	4,847	(Hilly) Flat	10	18	29	43			8.24	P. Pf	2.02	25.7	0.43	0.23	0.47	15.52	16.93	BC	0	0	b	10	
	90S2434FG02	23º 03.03′S	162º 05.03′W	4,821	(Hilly) Flat	6	19	66	9			13.38	Sp. P	2.04	28.7	0.41	0.22	0.49	16.42	16.76	BC	2	1	b	30	
21	90S2434FG03 (90421)	23º 03.04′S	162º 02.97′W	4,908	(Hilly) Flat	5	15	58	22			26.82	P	2.02	27.1	0.45	0.25	0.47	16.49	16.63	BC	2	1	a	20	
	Average			4,859		6	17	55	22			16.15	P. Sp	2.02	27.3	0.44	0.24	0.48	16.30	16.72						
	90S2535FG01	24º 03.98′S	161º 03.97′W	5,313	(Hilly) Flat							0	-	-	-	-	-	-	-	-	BC	1	0	b	10	
	90S2535FG02	24º 02.97′S	161º 04.97′W	5,256	(Hilly) Flat		30	34	36			4.10	Sp. P	2.04	28	0.76	0.41	0.33	22.55	12.6	BC	1	0	b	20	
22	90S2535FG03 (90423)	24º 03.01′S	161º 02.98′W	5,287	(Hilly) Flat	13	76	9	2			18.76	P	2.03	28.9	0.29	0.18	0.51	14.74	20.1	BC	0	1	a	20	
	Average			5,285		11	68	14	8			7.62	P. Sp	2.03	28.7	0.38	0.22	0.47	16.15	18.74						
	90S2536FG01	24º 03.97′S	159º 58.08′W	4,999	(Plain) Seaknoll	2	9	82	7			35.88	Sp	1.9	29.7	0.37	0.21	0.51	16.09	17.45	BC	3	2	ts	30	
	90S2536FG02	23º 58.99′S	160º 00.97′W	4,851	(Plain) Seaknoll	48	39	6	7			18.98	P	2.02	28.5	0.30	0.19	0.54	14.26	20.98	BC	2	1	ts	20	
23	90S2536FG03 (90424)	23º 58.99′S	159º 58.99W	5,003	( )	27	48	19	6			20.79	P. Sp	1.99	29.1	0.29	0.18	0.53	13.98	20.49	BC	0	1	ts	10	
	Average			4,951		20	27	46	7			25.22	P. Sp	1.96	29.3	0.33	0.19	0.52	15.04	19.18						
	90S2537FG01	24º 00.00′S	159º 00.00′W	4,329	(Hilly) Seaknoll	89	11					7.55	Sp	2.09	28.8	0.49	0.25	0.48	16.77	18.07	CSC	4	7	ds	0	
	90S2537FG02	23º 59.01′S	159º 00.96′W	4,199	(Hilly) Seaknoll	100						0.03	P	-	-	-	-	-	-	-	-	-	-	ds	0	
24	90S2537FG03 (90425)	23º 59.02′S	158º 58.97′W	4,251	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			4,260		89	11					2.53	Sp	2.09	28.8	0.49	0.25	0.48	16.77	18.07						
	90S2538SC01	23º 59.51′S	157º 59.96′W	4,870	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S2538SC02	23º 59.01′S	158º 00.97′W	4,969	(Hilly) Flat		100					(0.05)	P	2	28.6	0.46	0.24	0.47	16.22	17.14	-	-	-	c	0	
25	90S2538SC03 (90428)	23º 58.99′S	157º 58.99′W	4,739	(Hilly) Seaknoll							0	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			4,828			0					0.00	-	-	-	-	-	-	-	-						
	90S2539FG01	24º 00.07′S	156º 59.90′W	4,893	(Plain) Flat	30	36	34				4.77	P. Pf	1.99	29.2	0.84	0.39	0.34	18.72	13.00	BC	1	0	c	0	
	90S2539FG02	23º 59.04′S	157º 00.94′W	4,898	(Plain) Flat	65	35					2.66	P	1.99	31.2	0.79	0.39	0.37	19.2	14.59	BC	0	0	c	0	
26	90S2539FG03 (90429)	23º 59.03′S	156º 58.99′W	4,895	(Plain) Flat	46	51	3				3.32	Pt	2.11	27.7	0.72	0.34	0.37	18.06	14.93	BC	0	0	c	10	
	Average			4,895		44	40	16				3.58	P. Pf	2.02	29.2	0.79	0.38	0.36	18.63	13.99						
	90S2439FG01	23º 00.26′S	156º 59.93′W	4,952	(Plain) Flat	1	9	77	13			24.95	Sp	1.94	29.7	0.44	0.22	0.48	17.91	16.18	BC	0	0	a	30	
	90S2439FG02	22º 59.03′S	157º 00.95′W	4,964	(Plain) Flat	1	23	76				13.48	Sp	2.04	29	0.43	0.22	0.49	17.9	16.02	BC	0	0	a	30	
27	90S2439FG03 (90430)	22º 59.00′S	156º 59.00′W	4,893	(Plain) Flat	1	1	11	67	20		33.84	Sp	1.85	30.4	0.39	0.21	0.46	16.21	17.22	BC	0	0	a	30	
	Average			4,936		1	8	46	36	9		24.09	Sp	1.92	29	0.42	0.21	0.47	17.12	16.63		-	-			
	90S2438FG01	22º 59.75′S	157º 59.83′W	4,783	(Hilly) Flat	31	30		39			2.35	P	1.96	28.7	0.57	0.27	0.45	19.18	14.49	BC	0	0	a	30	
	90S2438FG02	22º 58.99′S	158º 01.00′W	4,757	(Hilly) Flat	24	23		53			2.51	P	2.02	29.3	0.6	0.29	0.46	19.97	14.78	BC	0	0	a	30	
28	90S2438FG03 (90431)	22º 59.01′S	157º 59.03′W	4,778	(Hilly) Flat		28	72				9.11	P	1.99	28.7	0.47	0.24	0.48	18.02	15.28	BC	0	0	a	30	
	Average			4,773		10	27	47	16			4.66	P	1.99	28.8	0.51	0.25	0.47	18.57	15.06						
	90S2437FG01	23º 00.04′S	159º 59.97′W	4,839	(Hilly) Flat	9	40	37	3	11		10.24	P. Pl	2.02	27.8	0.85	0.36	0.36	21.18	13	BC	0	0	c	0	
	90S2437FG02	22º 58.99′S	159º 00.93′W	4,849	(Hilly) Flat	100						0.11	P	2	35.7	0.5	0.28	0.29	10.44	16.07	BC	0	0	c	0	
29	90S2437FG03 (90432)	22º 59.01′S	159º 59.01′W	4,849	(Hilly) Flat	1	15	62	22			14.7	Pf	2.07	27.5	1.05	0.45	0.30	26.16	9.89	BC	0	0	c	0	
	Average			4,846		5	25	52	14	5		8.35	Pf. P	2.05	27.6	0.96	0.41	0.32	24.07	11.18						
	90S2436FG01	23º 00.03′S	160º 00.00′W	4,319	(Hilly) Seaknoll	38	62					0.02	P	-	-	-	-	-	-	-	-	-	-	ds	0	
	90S2436FG02	22º 58.99′S	160º 00.98′W	4,596	(Hilly) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
30	90S2436FG03 (90433)	22º 59.01′S	159º 58.99′W	4,222	(Hilly) Seaknoll	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	Average			4,379		38	62					0.01	P	-	-	-	-	-	-	-						

Data Files of Results obtained from Four Survey Cruises in this Programme (13/19)

(No. 90-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S2435FG01	22º 54.98′S	161º 00.01′W	4,928	(Plain) Flat							0	-	-	-	-	-	-	-	-	-	2	1	c	0	
	90S2435FG02	22º 54.00′S	161º 01.00′W	4,934	(Plain) Flat	4	19	36	37	4		28.25	P	1.95	28.8	0.27	0.17	0.54	14.67	19.16	BC	-	-	c	0	
31	90S2435FG03 (90434)	22º 54.03′S	160º 59.02′W	4,932	(Plain) Flat	27	73					0.25	P	2.08	27.3	0.58	0.29	0.44	16.86	16.85	BC	1	0	c	0	
	Average			4,931		4	20	36	37	4		9.50	P	1.95	28.7	0.27	0.18	0.53	14.69	19.14						
	90S2335FG01	21º 59.98′S	160º 59.99′W	4,711	(Plain) Flat			8	14	78		4.22	Pl	1.88	35.6	0.25	0.16	0.44	8.81	20.27	-	-	-	c	0	
	90S2335FG02	21º 58.96′S	161º 01.05′W	4,747	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
32	90S2335FG03 (90435)	21º 58.99′S	160º 59.04′W	4,757	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,738				8	14	78		1.41	Pl	1.88	35.6	0.25	0.16	0.44	8.81	20.27						
	90S2235FG01	20º 59.99′S	160º 59.98′W	4,833	(Plain) Flat	4	15	19	42	20		6.38	Pl. P	1.88	36.9	0.12	0.13	0.14	1.02	14.94	BC	1	0	a	10	
	90S2235FG02	20º 58.99′S	161º 00.96′W	4,843	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	BC	1	0	a	10	
33	90S2235FG03 (90436)	20º 59.02′S	160º 58.99′W	4,799	(Plain) Flat	28	72					0.19	P	2.27	35	0.2	0.16	0.2	4.75	14.93	-	-	-	a	10	
	Average			4,825		5	17	19	41	19		2.19	Pl. P	1.89	36.9	0.12	0.13	0.15	1.13	14.94						
	90S2135FG01	19º 59.04′S	160º 59.94′W	4,811	(Plain) Seaknoll	20	57	23				13.92	P. Sp	2.00	25.4	0.32	0.19	0.47	14.01	18.70	BC	0	0	ds	0	
	90S2135FG02	19º 59.04′S	161º 00.97′W	4,228	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
34	90S2135FG03 (90437)	19º 59.00′S	160º 59.00′W	4,884	(Plain) Flat							0.00	-	-	-	-	-	-	-	-	BC	0	0	ds	0	
	Average			4,641		20	57	23				4.64	P. Sp	2.00	25.4	0.32	0.19	0.47	14.01	18.70						
	90S2035FG01	18º 59.98′S	161º 00.01′W	4,997	(Plain) Flat	20	23	20	37			6.82	Pl. P	1.97	31.8	0.25	0.17	0.39	9.67	17.08	BC	0	0	ts	10	
	90S2035FG02	18º 59.00′S	161º 01.00′W	5,156	(Plain) Channel							0.00	-	-	-	-	-	-	-	-	-	-	-	ts	10	
35	90S2035FG03 (90438)	18º 59.02′S	160º 59.04′W	4,978	(Plain) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	ts	10	
	Average			5,044		20	23	20	37			2.27	Pl. P	1.97	31.8	0.25	0.17	0.39	9.67	17.08						
	90S1934FG01	17º 59.98′S	162º 00.00′W	4,698	(Hilly) Seaknoll	19	66	15				28.84	Sp. P	2.06	26.6	0.26	0.16	0.51	14.22	20.00	CSC	4	7	ds	0	
	90S1934FG02	17º 59.01′S	162º 00.97′W	4,984	(Hilly) Seaknoll	17	46	30		7		20.14	P. Sp	2.03	26.0	0.33	0.19	0.48	14.02	18.39	BC	0	0	ds	0	
36	90S1934FG03 (90439)	17º 59.02′S	161º 59.04′W	4,686	(Hilly) Seaknoll	11	33	56				34.52	Sp. P	2.00	25.6	0.25	0.17	0.50	14.27	20.33	CSC	5	6	ds	0	
	Average			4,789		16	49	33		2		27.83	Sp. P	2.03	26.1	0.28	0.17	0.50	14.18	19.69						
	90S1935FG01	17º59.94′S	161º00.02′W	4,826	(Plain) Flat	10	13	17	28	32		23.46	Pl. P	1.96	29.0	0.21	0.14	0.48	12.28	18.59	BC	0	1	b	40	
	90S1935FG02	17º59.00′S	161º00.98′W	4,780	(Plain) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	b	20	
37	90S1935FG03 (90440)	17º58.99′S	160º58.99′W	4,715	(Plain) Flat	13	46	41				27.08	Sp. P	1.97	29.4	0.23	0.15	0.53	15.12	19.18	CSC	4	6	e1	10	
	Average			4,774		12	31	30	13	15		16.85	Sp. Pl	1.96	29.2	0.22	0.15	0.51	13.80	18.90						
	90S1936FG01	17º 59.97′S	159º 59.98′W	5,021	(Plain) Flat	-	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	90S1936FG02	17º 58.99′S	160º 00.99′W	5,005	(Plain) Flat	100						0.06	P	2.21	26.7	0.24	0.16	0.47	13.16	19.81	BC	0	0	c	0	
38	90S1936FG03 (90441)	17º 59.01′S	159º 59.06′W	5,014	(Plain) Flat	100						0.01	P	-	-	-	-	-	-	-	BC	1	1	c	0	
	Average			5,013		100						0.02	P	2.21	26.7	0.24	0.16	0.47	13.16	19.81						
	90S1937FG01	18º 00.00′S	159º 00.00′W	4,905	(Plain) Seaknoll	23	46	25	1	5		15.75	P. Pl	1.95	30.9	0.25	0.18	0.42	11.63	20.00	BC	0	0	ts	10	
	90S1937FG02	17º 59.01′S	159º 00.98′W	4,760	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ts	10	
39	90S1937FG03 (90442)	17º 59.03′S	158º 59.01′W	5,070	(Plain) Flat	50	35	15				6.36	P. Pf	2.02	28.5	0.29	0.20	0.39	10.84	19.66	BC	0	0	ts	10	
	Average			4,912		31	43	22	1	4		7.37	P	1.97	30.2	0.27	0.19	0.41	11.40	19.90						
	90S1837FG01	16º 59.98′S	158º 59.96′W	5,073	(Plain) Flat	2	61	37				27.92	Sp	2.05	23.5	0.31	0.18	0.48	15.45	18.48	BC	0	0	a	10	
	90S1837FG02	16º 59.00′S	159º 01.00′W	5,049	(Plain) Flat	1	77	22				25.52	Sp	2.01	24.7	0.30	0.18	0.48	15.51	18.47	BC	0	0	a	10	
40	90S1837FG03 (90443)	16º 59.01′S	158º 59.01′W	5,059	(Plain) Flat	1	64	35				30.55	Sp	2.04	25.5	0.26	0.18	0.48	14.80	19.02	BC	0	0	a	10	
	Average			5,060		1	67	32				28.00	Sp	2.03	24.6	0.29	0.18	0.48	15.24	18.67						

Data Files of Results obtained from Four Survey Cruises in this Programme (14/19)

(No. 90-5)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	90S1836FG01	16º 59.96′S	160º 00.02′W	4,786	(Plain) Flat	4	37	48	11			33.41	Sp	1.97	27.5	0.27	0.18	0.46	14.08	19.50	CSC	4	7	e1	10	
	90S1836FG02	16º 58.99′S	160º 00.95′W	4,633	(Plain) Seaknoll	11	53	20		16		25.28	Sp. P	1.97	30.6	0.21	0.15	0.46	13.14	19.99	CSC	5	15	ds	0	
41	90S1836FG03 (90444)	16º 59.01′S	159º 58.97′W	4,837	(Plain) Flat	4	25	46	25			25.38	P. Sp	2.02	28.3	0.30	0.20	0.43	13.55	18.57	BC	0	1	e1	10	
	Average			4,752		6	37	41	13	4		28.02	Sp. P	1.99	28.5	0.27	0.18	0.45	13.69	19.30						
	90S1835FG01	16º 59.96′S	161º 00.01′W	4,946	(Plain) Sea knoll							0.00	-	-	-	-	-	-	-	-	-	-	-	ds	0	
	90S1835FG02	16º 59.01′S	161º 00.99′W	4,963	(Plain) Sea knoll	100						0.04	P	-	-	-	-	-	-	-	-	-	-	ds	0	
42	90S1835FG03 (90445)	16º 58.98′S	160º 59.03′W	4,910	(Plain) Flat							(0.00)	-	-	-	-	-	-	-	-	-	-	-	c	0	
	Average			4,940		100						0.02	P	-	-	-	-	-	-	-						
	90S1834FG01	17º 00.00′S	162º 00.00′W	4,863	(Hilly) Seaknoll	57	30	13				28.85	P. SP	1.95	30.4	0.19	0.13	0.52	12.62	19.14	BC	2	4	d1	0	
	90S1834FG02	16º 58.99′S	162º 01.01′W	4,894	(Hilly) Flat	23	27	11	39			3.95	P. Pl	2.03	26.3	0.46	0.26	0.36	12.72	14.88	BC	1	1	c	0	
43	90S1834FG03 (90446)	16º 58.98′S	161º 59.04′W	4,474	(Hilly) Sea knoll	100						1.41	P	-	-	-	-	-	-	-	-	-	-	d1	0	
	Average			4,744		53	30	13	5			11.40	P. Sp	1.96	29.9	0.22	0.15	0.50	12.63	18.60						
	90S1833FG01	17º 00.01′S	163º 00.00′W	5,274	(Plain) Flat	4	34	62				0.36	Pl	2.00	35.5	0.42	0.23	0.31	13.14	14.05	BC	0	0	c	0	
	90S1833FG02	16º 59.00′S	163º 00.93′W	5,282	(Plain) Flat	1	13	3	12	71		7.92	Pl. P	1.93	29.0	0.38	0.22	0.41	16.00	17.07	BC	0	0	c	0	
44	90S1833FG03 (90447)	16º 58.99′S	162º 59.06′W	5,286	(Plain) Flat	3	11	19	41	26		6.12	E. P	1.97	27.2	0.36	0.21	0.41	15.50	15.85	BC	0	1	ds	0	
	Average			5,281		2	13	11	24	51		4.80	Pl. E	1.95	28.4	0.37	0.21	0.40	15.74	16.49						
	90S1732FG01	16º 00.00′S	163º 59.98′W	5,541	(Plain) Flat	10	57	33				1.10	Sp. P	2.02	25.2	0.53	0.31	0.34	19.14	14.62	BC	0	0	b	10	
	90S1732FG02	15º 59.00′S	164º 00.90′W	5,589	(Plain) Flat	100						0.16	P	2	21.4	0.68	0.42	0.22	17.9	12.9	BC	0	0	b	10	
45	90S1732FG03 (90448)	15º 59.02′S	163º 58.99′W	5,515	(Plain) Flat	20	39		41			1.48	Sp. E	1.99	26.7	0.59	0.33	0.31	18.39	14.56	BC	0	0	b	10	
	Average			5,548		21	44	13	22			0.91	Sp. E	2	25.8	0.57	0.33	0.32	18.66	14.48						
	90S1733FG01	15º 59.98′S	162º 59.94′W	5,490	(Plain) Flat	4	21	29	8	38		8.11	Pl	1.96	31.2	0.38	0.22	0.41	15.78	17.75	BC	0	0	ts	0	
	90S1733FG02	15º 59.00′S	163º 00.99′W	5,254	(Plain) Seaknoll	1	22	24	6	47		19.88	P. Pl	2	27.5	0.31	0.2	0.46	16.2	17.64	BC	0	0	ds	0	
46	90S1733FG03 (90449)	15º 59.00′S	162º 59.00′W	5,320	(Plain) Flat		7	93				0.88	P	2	24.8	0.29	0.17	0.51	15.95	17	-	-	-	ds	0	
	Average			5,320		2	21	28	6	43		9.62	Pl. P	1.99	28.5	0.33	0.2	0.45	16.08	17.65						
	90S1734FG01	15º 59.97′S	162º 00.02′W	4,843	(Plain) Flat	1	5	2	5	87		11.96	M. E	1.90	30.2	0.31	0.19	0.44	13.72	16.01	BC	0	0	b	10	
	90S1734FG02	15º 59.00′S	162º 00.96′W	4,695	(Plain) Seaknoll	18	66	16				23.39	P	2.06	30.3	0.24	0.15	0.49	15.70	18.78	CSC	4	12	ds	0	
47	90S1734FG03 (90450)	15º 59.00′S	161º 59.01′W	4,762	(Plain) Flat	6	26	18	21	29		18.51	P. M	1.92	28.2	0.33	0.2	0.45	15.58	17.41	CSC	4	7	ts	20	
	Average			4,767		10	39	14	8	29		17.95	P. M	1.98	29.6	0.29	0.18	0.47	15.23	17.69						
	90S1735FG01	15º 59.99′S	160º 59.99′W	4,750	(Plain) Flat							0	-	-	-	-	-	-	-	-	-	-	-	ts	30	
	90S1735FG02	15º 59.01′S	161º 00.97′W	4,810	(Plain) Flat							(0.00)	-	-	-	-	-	-	-	-	BC	0	0	c	0	
48	90S1735FG03 (90451)	15º 59.00′S	160º 59.06′W	4,713	(Plain) Flat			100				0.51	P	1.94	28.8	0.22	0.15	0.50	14.78	19.31	-	-	-	c	0	
	Average			4,758				100				0.26	P	1.94	28.8	0.22	0.15	0.50	14.78	19.31						

*Sil%:siliceous fossil% , Cal% :calcareous fossil%, T.P.L:Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (15/19)

(No. 00-1)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S2032SC04	19º 30.00′ S	163º 30.00′W	4,203	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	—			d1	0	
	00S2032FG05	19º 29.99′S	163º 31.00′W	4,731	(Plain) Seaknoll							0.00	-	-	-	-	-	-	-	-	—			d1	0	
1	00S2032FG06 (00201)	19º 28.99′S	163º 29.00′W	4,656	(Plain) Seaknoll					100		18.55	E	2.29	13.31	0.22	0.13	0.48	12.04	23.10	CC			d1	0	
	Average			4,530						100		6.18	E	2.29	13.31	0.22	0.13	0.48	12.04	23.10						
	00S2033FG04	19º 30.02′S	162º 29.99′W	4,981	(Plain) Slop		100					0.08	P	2.23	12.31	0.56	0.33	0.44	14.40	17.20	IBC			ds	0	
	00S2033FG05	19º 29.00′S	162º 31.02′W	5,071	(Plain) Hollow	1	2			49	48	10.22	Pl. P	1.82	22.81	0.25	0.13	0.43	10.82	25.36	IBC			ds	0	
2	00S2033FG06 (00202)	19º 28.99′S	162º 29.00′W	5,053	(Plain) Hollow	11	22	23		44		2.92	M. P	1.80	26.92	0.45	0.24	0.48	13.86	20.52	-			ds	0	
	Average			5,035		3	7	5	0	48	37	4.41	Pl. P	1.82	23.65	0.30	0.16	0.44	11.51	24.24						
	00S2034FG04	19º 30.01′S	161º 30.02′W	4,749	(Plain)Seaknoll	32	53	15				15.98	E. P	1.83	34.66	0.28	0.14	0.54	12.59	23.01	IBC			d1	0	
	00S2034FG05	19º 28.97′S	161º 31.01′W	4,515	(Plain)Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
3	00S2034FG06 (00203)	19º 29.00′S	161º 28.98′W	4,788	(Plain)Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
	Average			4,684		32	53	15				5.33	E. P	1.83	34.66	0.28	0.14	0.54	12.59	23.01						
	00S1934SC04	18º 30.01′S	161º 29.99′W	4,862	(Plain) Slop	5	13	28	29	25		43.79	Sp. P	2.00	15.47	0.27	0.13	0.56	14.62	17.82	IBC			ds	0	
	00S1934FG05	18º 28.99′S	161º 31.00′W	4,833	(Plain) Slop	14	16	29	41			31.30	Sp. E	2.12	17.35	0.24	0.12	0.53	14.41	19.24	BC			ds	0	
4	00S1934FG06 (00204)	18º 28.99′S	161º 29.01′W	4,894	(Plain) Slop	7	22	19	18	34		25.21	Sp. Pl	2.07	16.65	0.38	0.16	0.51	14.17	18.29	IBC			ds	0	
	Average			4,863		7	15	27	30	21		33.43	Sp. E	2.04	16.14	0.28	0.13	0.54	14.48	18.25						
	00S1834FG04	17º 30.04′S	161º 29.99′W	4,804	(Hill) Slop							0.00	-	-	-	-	-	-	-	-	-			ds	0	
	00S1834FG05	17º 29.00′S	161º 31.01′W	4,713	(Hill) Slop	3	19	47	31			40.25	Sp. P	2.14	35.04	0.32	0.15	0.51	14.67	17.50	BC			d1	0	
5	00S1834FG06 (00205)	17º 28.99′S	161º 29.00′W	4,840	(Hill) Slop	26	56	18				17.58	Sp. E	2.14	21.72	0.41	0.18	0.50	14.71	18.89	IBC			ds	0	
	Average			4,786		11	32	37	20			19.28	Sp. E	2.14	30.52	0.35	0.16	0.50	14.68	17.97						
	00S1835FG04	17º 30.01′S	160º 30.00′W	5,009	(Plain) Slop	14	47	36	3			24.18	E. P	1.88	24.61	0.18	0.11	0.56	13.86	21.15	BC			ds	0	
	00S1835FG05	17º 29.01′S	160º 31.01′W	4,896	(Plain) Slop	8	16	65	11			41.62	Sp. P	1.92	26.59	0.24	0.12	0.49	13.95	18.85	BC			ds	0	
6	00S1835FG06 (00206)	17º 28.99′S	160º 29.01′W	4,956	(Plain) Other	23	45	15	8	9		22.35	E. SP	1.92	16.10	0.56	0.31	0.37	13.11	17.11	BC			ds	0	
	Average			4,954		16	37	35	7	4		29.38	E. Sp	1.91	21.54	0.36	0.20	0.46	13.56	18.77						
	00S1736FG19	16º 30.01′S	159º 14.99′W	5,144	(Quasi) Flat	12	61	27				27.88	Sp. P	1.91	30.68	0.34	0.19	0.38	15.54	20.36	BC			be	40	
	00S1736FG20	16º 29.01′S	159º 16.00′W	5,102	(Quasi) Flat	5	59	33	3			30.84	SP. Pl	1.98	33.80	0.27	0.14	0.47	13.52	21.37	BC			be	50	
7	00S1736FG21 (00207)	16º 28.99′S	159º 13.99′W	5,052	(Quasi) Flat	100						0.12	P. SP	1.94	27.19	0.28	0.13	0.46	16.39	16.20	-			d1	0	
	Average			5,099		9	60	30	1			19.61	Sp. P	1.94	32.14	0.31	0.16	0.42	14.59	20.82	BC					
	00S1736FG22	16º 22.52′S	159º 07.50′W	5,071	(Quasi) Flat	1	67	32				30.84	Sp. P	1.94	17.79	0.23	0.11	0.46	16.00	17.95	BC			a	10	
	00S1736FG23	16º 21.51′S	159º 08.51′W	5,133	(Quasi) Flat	4	27	69				29.03	Sp. E	1.98	31.12	0.21	0.11	0.44	14.27	17.19	BC			a	10	
8	00S1736FG24 (00208)	16º 21.50′S	159º 06.50′W	5,089	(Quasi) Flat	3	46	51				33.67	Sp	2.03	18.55	0.27	0.14	0.59	15.32	19.53	BC			a	10	
	Average			5,098		3	47	50				31.18	Sp. E	1.98	22.20	0.24	0.12	0.50	15.22	18.28						
	00S1736LC25	16º 22.53′S	159º 22.51′W	5,210	(Quasi) Flat		43	57				28.44	Sp. E	1.94	18.24	0.24	0.14	0.59	16.12	18.08	IBC			a	10	
	00S1736FG26	16º 21.50′S	159º 23.50′W	4,911	(Quasi) Other	78	22					15.14	Sp. P	1.93	31.09	0.23	0.12	0.64	15.78	20.29	BC			d1	0	
9	00S1736FG27 (00209)	16º 21.49′S	159º 21.51′W	5,209	(Quasi) Flat	100						(0.01)	P		15.39	0.35	0.23	0.47	13.79	19.60	BC			d2	0	
	Average			5,110		71	24	5				21.79	Sp. P	1.93	29.93	0.23	0.12	0.64	15.81	20.09						
	00S1736FG28	16º 15.01′S	159º 30.00′W	4,487	(Quasi) Seaknoll	100						0.01	P	2.33	-	-	-	-	-	-	-			d1	0	
	00S1736FG29	16º 14.01′S	159º 31.01′W	4,853	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
10	00S1736FG30 (00210)	16º 14.00′S	159º 29.00′W	4,699	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
	Average			4,680		100						0.00	P	2.33	-	-	-	-	-	-	-					

Data Files of Results obtained from Four Survey Cruises in this Programme (16/19)

(No. 00-2)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S1737FG16	16º 22.50′S	158º 52.49′W	5,081	(Quasi) Flat	8	22		70			31.52	E. Sp	2.01	28.28	0.26	0.13	0.51	15.06	17.09	BC			a	15	
	00S1737FG17	16º 21.51′S	158º 53.50′W	5,066	(Quasi) Flat	2	50	48				34.32	Sp. P	1.93	25.40	0.29	0.15	0.55	15.18	18.36	BC			a	15	
11	00S1737FG18 (00211)	16º 21.49′S	158º 51.51′W	5,077	(Quasi) Flat	2	85	13				31.34	Sp	2.01	30.73	0.29	0.16	0.54	15.19	18.27	BC			a	20	
	Average			5,075		2	65	30	3			32.39	Sp. E	1.97	27.93	0.29	0.15	0.54	15.18	18.28						
	00S1737FG19	16º 15.01′S	158º 59.98′W	5,119	(Quasi) Flat	2	64	34				29.71	Sp. P	1.96	23.86	0.32	0.17	0.58	16.02	18.67	BC	1		a	30	
	00S1737FG20	16º 14.01′S	159º 01.00′W	5,068	(Quasi) Flat	3	64	33				31.08	Sp. P	1.99	21.37	0.32	0.17	0.53	16.45	17.48	BC	1		a	15	
12	00S1737FG21 (00212)	16º 13.98′S	158º 59.00′W	5,070	(Quasi) Flat	3	59	38				32.63	Sp. P	1.94	25.81	0.31	0.16	0.53	16.65	18.07	BC	1		a	20	
	Average			5,086		3	62	35				31.14	Sp. P	1.96	23.73	0.31	0.17	0.55	16.38	18.07						
	00S1737FG22	16º 07.48′S	158º 52.50′W	5,060	(Quasi) Flat	21	33	33	13			20.69	Sp. P	1.88	11.93	0.31	0.17	0.52	14.45	19.00	BC	1		ac	0	
	00S1737FG23	16º 06.51′S	158º 53.50′W	5,053	(Quasi) Flat	2	14	31	37	16		42.02	Sp. Ec	1.89	27.42	0.27	0.15	0.51	15.95	17.29	BC	1		ac	0	
13	00S1737FG24 (00213)	16º 06.49′S	158º 51.50′W	5,051	(Quasi) Flat	9	40	51				25.22	Sp. P	1.87	15.93	0.32	0.17	0.51	15.45	17.98	BC			ac	0	
	Average			5,055		10	26	37	20	7		29.31	Sp. P	1.88	20.10	0.30	0.16	0.51	15.42	17.93						
	00S1736SC31	16º 07.60′S	159º 07.52′W	5,071	(Quasi) Flat	2	57	39	2			28.24	Sp. P	1.90	18.88	0.26	0.13	0.63	16.43	18.73	BC	1		a	15	
	00S1736FG32	16º 06.51′S	159º 08.51′W	5,106	(Quasi) Flat	3	78	15	4			33.20	Sp. P	1.93	35.61	0.26	0.13	0.62	16.52	19.16	BC	1		a	20	
14	00S1736FG33 (00214)	16º 06.49′S	159º 06.50′W	5,082	(Quasi) Flat		36	61	3			22.32	Sp. E	1.94	27.48	0.23	0.12	0.61	15.89	19.34	BC	1		a	15	
	Average			5,086		2	59	36	3			27.92	Sp. P	1.92	26.04	0.26	0.12	0.62	16.34	19.00						
	00S1736FG34	16º 07.51′S	159º 22.50′W	5,217	(Quasi) Flat	10	45	45				22.36	Ec. Sp	2.00	31.77	0.31	0.17	0.50	14.43	18.05	BC	1		d2	0	
	00S1736FG35	16º 06.51′S	159º 23.50′W	5,202	(Quasi) Flat	10	34	25	31			21.81	E. Sp	1.94	35.97	0.32	0.18	0.47	14.72	18.35	BC	1		d2	0	
15	00S1736FG36 (00215)	16º 06.49′S	159º 21.50′W	5,153	(Quasi) Flat	1	33	24	32	10		29.77	E. Sp	2.02	23.34	0.25	0.15	0.43	14.20	17.39	BC	1		d2	0	
	Average			5,191		6	34	26	29	5		24.65	E. Sp	1.99	29.33	0.29	0.16	0.46	14.44	17.85						
	00S1736FG37	16º 00.00′S	159º 14.98′W	5,083	(Quasi) Slop		71	27	2			34.91	Sp. E	1.96	28.69	0.27	0.13	0.53	17.31	18.48	BC	1		a	20	
	00S1736FG38	15º 59.01′S	159º 16.00′W	5,071	(Quasi) Slop	1	58	36	5			33.83	Sp. P	1.99	28.91	0.26	0.12	0.54	17.97	18.23	BC	1		a	15	
16	00S1736FG39 (00216)	15º 58.99′S	159º 14.01′W	5,094	(Quasi) Flat		45	49	6			35.68	Sp. P	1.99	32.21	0.24	0.11	0.51	17.09	18.38	BC	1		a	30	
	Average			5,083		1	58	37	4			34.81	Sp. E	1.98	29.96	0.25	0.12	0.53	17.45	18.36						
	00S1636FG16	15º 52.50′S	159º 07.49′W	5,143	(Quasi) Slop	5	65	30				30.19	Sp. E	1.97	17.36	0.31	0.16	0.43	16.80	17.16	BC	1		a	20	
	00S1636FG17	15º 51.46′S	159º 08.51′W	5,067	(Quasi) Slop	3	16	74	7			37.42	Sp. E	1.89	32.37	0.24	0.14	0.47	16.72	17.79	BC	1		a	20	
17	00S1636FG18 (00217)	15º 51.49′S	159º 06.50′W	5,137	(Quasi) Slop	2	74	24				28.88	Sp. P	1.97	31.66	0.23	0.13	0.49	15.03	18.72	BC	1		a	10	
	Average			5,116		3	58	37	1			32.16	Sp. E	1.95	25.99	0.26	0.15	0.46	16.09	17.89						
	00S1737FG25	16º 00.00′S	158º 44.99′W	4,910	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
	00S1737FG26	15º 58.99′S	158º 46.02′W	5,009	(Quasi) Seaknoll	6	37	57				38.16	Sp. P	2.01	18.89	0.26	0.16	0.53	15.20	18.03	BC	5		d1	0	
18	00S1737FG27 (00218)	15º 58.99′S	158º 44.01′W	5,014	(Quasi) Seaknoll	4	65	31				31.80	Sp. P	2.03	28.99	0.23	0.12	0.53	14.13	18.71	BC	5		ds	0	
	Average			4,978		5	57	38				23.32	Sp. P	2.02	26.25	0.24	0.13	0.53	14.42	18.53						
	00S1637FG13	15º 52.50′S	158º 52.48′W	5,190	(Quasi) Flat	5	51	44				38.10	Sp. P	2.05	31.35	0.29	0.17	0.49	15.23	18.08	BC	1		a	10	
	00S1637FG14	15º 51.49′S	158º 53.53′W	5,126	(Quasi) Flat	3	36	61				31.29	E. Sp	2.00	29.86	0.29	0.17	0.49	14.46	19.37	BC	1		d2	0	
19	00S1637FG15 (00219)	15º 51.51′S	158º 51.52′W	5,100	(Quasi) Slop							0	-	-	-	-	-	-	-	-	-			d1	0	
	Average			5,139		5	49	46				23.13	Sp. P	2.04	31.14	0.29	0.17	0.49	15.13	18.25						
	00S1736SC40	16º 07.50′S	159º 37.49′W	5,161	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-			d2	0	
	00S1736FG41	16º 06.51′S	159º 38.51′W	5,166	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-			d2	0	
20	00S1736FG42 (00220)	16º 06.50′S	159º 36.50′W	5,155	(Quasi) Flat	9	54	37				5.61	E. Sp	1.97	28.98	0.28	0.17	0.48	13.58	18.95	BC	1		d2	0	
	Average			5,161		9	54	37				5.61	E. SP	1.97	28.98	0.28	0.17	0.48	13.58	18.95						

Data Files of Results obtained from Four Survey Cruises in this Programme (17/19)

(No. 00-3)

No.	Sampling No. (Station No.)	Location				Manganese Nodules																Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)						Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S1736SC43	16º 00.01′S	159º 45.06′W	5,062	(Quasi) Seaknoll							(0.00)	-	-	-	-	-	-	-	-	-			d1	0	
	00S1736FG44	15º 59.01′S	159º 46.00′W	5,081	(Quasi) Flat	1	12	38	27	22		35.58	E. SP	1.88	28.45	0.26	0.14	0.45	14.14	17.99	BC	1		bc	0	
21	00S1736FG45 (00221)	15º 59.00′S	158º 44.00′W	5,050	(Quasi) Seaknoll		32	68				37.74	SP. E	2.09	19.85	0.24	0.14	0.47	14.17	18.46	BC	1		ds	0	
	Average			5,064		0	24	56	11	9		36.66	Sp. E	2.00	23.37	0.25	0.14	0.46	14.16	18.26						
	00S1636SC19	15º 52.48′S	159º 37.50′W	4,982	(Quasi) Flat	4	43	48	5			31.37	E. SP	2.01	31.54	0.25	0.15	0.48	15.23	18.90	BC	2	3	ac	40	
	00S1636FG20	15º 51.50′S	159º 38.50′W	4,972	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			d2	0	
22	00S1636FG21 (00222)	15º 51.51′S	159º 36.52′W	4,968	(Quasi) Flat	2	19	51	22	6		44.29	E. Ec	1.96	26.09	0.24	0.13	0.53	15.75	19.52	BC	2	3	ac	20	
	Average			4,974		3	35	49	11	2		25.22	Sp. E	1.99	29.73	0.25	0.14	0.50	15.40	19.10						
	00S1636FG22	15º 52.46′S	159º 22.47′W	5,039	(Quasi) Flat	1	43	40	16			33.74	Sp. Ec	2.03	30.09	0.25	0.13	0.58	16.48	19.31	BC	1		a	10	
	00S1636FG23	15º 51.51′S	159º 23.50′W	5,094	(Quasi) Flat	6	56	31	7			30.57	Sp. E	1.96	29.68	0.30	0.17	0.56	16.51	18.12	BC	1		bc	0	
23	00S1636FG24 (00223)	15º 51.49′S	159º 21.53′W	5,080	(Quasi) Flat	3	68	27	2			34.94	Sp. P	2.03	31.10	0.29	0.14	0.59	17.38	18.86	BC	1		a	40	
	Average			5,071		3	57	32	8			33.08	Sp. E	2.01	30.33	0.28	0.15	0.58	16.82	18.76						
	00S1636FG25	15º 52.50′S	159º 52.49′W	4,932	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
	00S1636FG26	15º 51.50′S	159º 53.50′W	4,967	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
24	00S1636FG27 (00224)	15º 51.48′S	159º 51.48′W	4,935	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
	Average			4,945								0.00	-	-	-	-	-	-	-	-	-					
	00S1636FG28	15º 37.51′S	159º 52.52′W	5,111	(Quasi) Flat	1	25	50	24			31.92	E. P	1.99	29.51	0.32	0.19	0.42	13.69	18.24	BC	1		d2	0	
	00S1636FG29	15º 36.51′S	159º 53.51′W	5,100	(Quasi) Flat	4	47	24	20	5		25.55	E. Sp	1.89	16.77	0.27	0.16	0.49	14.25	19.29	BC	1		d2	0	
25	00S1636FG30 (00225)	15º 36.48′S	159º 51.54′W	5,101	(Quasi) Flat	3	8	19	57	13		33.84	E. P	1.96	25.81	0.29	0.17	0.44	14.41	17.74	BC	1		d2	0	
	Average			5,104		3	24	25	39	9		30.44	E. Sp	1.94	22.94	0.28	0.17	0.46	14.27	18.37						
	00S1637FG16	15º 45.00′S	159º 00.00′W	4,968	(Quasi) Seaknoll	2	33	65				41.46	Sp. P	1.92	17.24	0.19	0.11	0.30	15.77	11.90	CC	15	10	a	10	
	00S1637FG17	15º 44.01′S	159º 01.00′W	4,923	(Quasi) Seaknoll							0.00	-	-	-	-	-	-	-	-	-			d1	0	
26	00S1637FG18 (00226)	15º 44.00′S	158º 59.01′W	5,039	(Quasi) Seaknoll	4	25	43	28			38.53	E. Ec	1.92	15.92	0.28	0.18	0.48	14.74	18.11	BC	7	5	a	20	
	Average			4,977		3	29	53	15			26.66	Sp. E	1.92	16.55	0.24	0.15	0.39	15.23	15.13						
	00S1637FG19	15º 37.51′S	158º 52.51′W	5,026	(Quasi) Flat	1	60	39				23.50	Sp. P	2.11	34.54	0.32	0.16	0.51	15.80	18.04	BC	1	2	e1	10	
	00S1637FG20	15º 36.50′S	158º 53.49′W	4,951	(Quasi) Other	7	42	22	11	18		15.14	Oth. E	1.95	19.31	0.50	0.33	0.32	13.87	14.02	BC	1		d1	0	
27	00S1637FG21 (00227)	15º 36.50′S	158º 51.51′W	5,031	(Quasi) Flat	1	34	45	20			35.21	Ec. Sp	1.97	23.04	0.34	0.19	0.44	15.05	16.48	BC	1		e1	10	
	Average			5,003		2	44	40	12	2		24.62	Sp. Ec	2.02	26.65	0.35	0.20	0.45	15.17	16.73						
	00S1636FG31	15º 45.00′S	159º 30.00′W	5,106	(Quasi) Flat							(0.00)	-	-	-	-	-	-	-	-	-			ac	0	
	00S1636FG32	15º 43.99′S	159º 31.00′W	5,052	(Quasi) Flat	7	36	57				32.74	Sp. P	1.90	22.14	0.30	0.17	0.56	15.69	19.32	BC	1		bc	0	
28	00S1636FG33 (00228)	15º 44.00′S	159º 29.01′W	5,094	(Quasi) Flat	16	18	27	39			26.20	Ec. P	1.83	29.31	0.29	0.15	0.54	16.24	18.50	BC	1		bc	0	
	Average			5,084								29.47	Ec. Sp	1.84	28.68	0.29	0.15	0.55	16.19	18.57						
	00S1636LC34	15º 37.53′S	159º 22.50′W	5,062	(Quasi) Seaknoll	3	97					29.93	Sp. P	2.04	34.41	0.56	0.29	0.42	15.20	15.70	BC	1		a	20	
	00S1636FG35	15º 36.51′S	159º 23.50′W	4,977	(Quasi) Seaknoll	1	79	20				32.68	Sp. P	2.00	18.44	0.31	0.17	0.48	14.85	18.46	BC			a	20	
29	00S1636FG36 (00229)	15º 36.50′S	158º 21.50′W	4,988	(Quasi) Seaknoll	1	44	55				36.28	Sp. P	1.87	35.53	0.31	0.15	0.57	16.22	18.43	BC			a	25	
	Average			5,009		1	61	38				32.96	Sp. P	1.93	27.52	0.31	0.16	0.52	15.57	18.41						
	00S1636SC37	15º 37.50′S	159º 07.51′W	5,233	(Quasi) Flat	3	76	20	1			27.87	Sp. E	1.93	18.41	0.30	0.19	0.52	15.02	18.49	BC			a	10	
	00S1636FG38	15º 36.45′S	159º 08.62′W	5,232	(Quasi) Flat	2	42	38	18			24.11	E. P	2.10	16.97	0.35	0.23	0.43	14.33	17.83	BC			a	10	
30	00S1636FG39 (00230)	15º 36.50′S	159º 06.51′W	5,237	(Quasi) Flat	4	71	25				27.82	Sp. E	2.06	32.74	0.29	0.17	0.50	14.77	19.46	BC			a	5	
	Average			5,234		3	67	25	5			26.60	Sp. E	2.00	21.56	0.31	0.20	0.49	14.80	18.57						

Data Files of Results obtained from Four Survey Cruises in this Programme (18/19)

(No. 00-4)

No.	Sampling No. (Station No.)	Location				Manganese Nodules														Geology					Remarks
						Size distribution (%)						Abun-	Shape	S.G.	H_2O	XRF Analyses (%)					Sediment			*T.P.L	
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm	dance (Kg/m^2)		Wet	(%)	Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
	00S1636FG40	15º 30.00′S	159º 15.00′W	5,111	(Quasi) Flat	3	61	36				32.63	Sp. P	1.88	34.23	0.28	0.15	0.51	16.28	18.80	BC			a	15	
	00S1636FG41	15º 29.01′S	159º 16.00′W	5,127	(Quasi) Flat	1	36	48	15			36.82	E. SP	1.93	24.25	0.27	0.18	0.53	15.29	18.66	BC			a	10	
31	00S1636FG42 (00231)	15º 29.00′S	158º 14.01′W	5,124	(Quasi) Flat	3	29	68				29.34	E. SP	2.18	17.66	0.28	0.18	0.49	15.47	19.41	BC			a	10	
	Average			5,121		2	41	51	6			32.93	Sp. E	2.00	24.91	0.28	0.17	0.51	15.62	18.94						
	00S1636LC43	15º 30.00′S	159º 45.00′W	5,129	(Quasi) Flat	100						10.58	P	1.85	16.51	0.42	0.27	0.51	15.84	19.30	BC			bc	0	
	00S1636FG44	15º 29.00′S	159º 46.00′W	5,125	(Quasi) Flat	2	25	52	21			31.24	SP. P	1.85	23.63	0.27	0.13	0.57	16.67	18.83	BC			bc	0	
32	00S1636FG45 (00232)	15º 28.99′S	159º 44.01′W	5,128	(Quasi) Flat	6	32	41	21			23.47	E. P	1.92	31.00	0.34	0.22	0.48	15.05	18.49	BC			bc	0	
	Average			5,127		4	28	47	21			21.76	E. Sp	1.88	26.79	0.30	0.17	0.53	15.97	18.68						
	00S1636FG46	15º 37.49′S	159º 37.52′W	5,068	(Quasi) Flat							0.00	-	-	-	-	-	-	-	-	-			bc	0	
	00S1636FG47	15º 36.51′S	159º 38.50′W	5,044	(Quasi) Flat	44	56					18.29	E	1.95	35.71	0.21	0.14	0.52	14.37	21.15	-			ac	0	
33	00S1636FG48 (00233)	15º 36.50′S	158º 36.50′W	5,054	(Quasi) Flat	3	12	27	41	17		27.70	Ec. Sp	1.89	20.78	0.26	0.14	0.55	16.13	18.65	BC			bc	0	
	Average			5,055		5	14	26	39	16		15.33	Ec. E	1.89	21.50	0.26	0.14	0.54	16.04	18.78						
	00S1338SC01	12º 30.00′S	157º 29.99′W	5,199	(Hilly) Flat	25	34		41			1.84	Sp. Ec	1.92	24.01	0.77	0.58	0.30	21.17	13.59	BC			d2	0	
	00S1338FG02	12º 29.01′S	157º 31.00′W	5,203	(Hilly) Flat	100						1.00	P	2.00	30.07	0.97	0.58	0.28	20.69	11.30	BC			d2	0	
34	00S1338FG03 (00239)	12º 29.00′S	157º 28.99′W	5,205	(Hilly) Flat	100						1.58	P	1.98	28.19	1.03	0.57	0.31	21.63	11.90	BC			d2	0	
	Average			5,202								1.47	P. Sp	1.94	25.69	0.84	0.58	0.29	21.13	12.94						
	00S1238FG01	11º 30.00′S	157º 30.00′W	5,257	(Hilly) Flat	16	11	29	44			16.53	Sp. Ec	1.86	27.04	0.39	0.20	0.46	17.01	16.02	BC			bc	0	
	00S1238FG02	11º 29.00′S	157º 30.98′W	5,297	(Hilly) Flat	21	24	33	22			18.04	Sp. P	1.88	28.94	0.45	0.24	0.48	17.71	16.27	BC			ds	0	
35	00S1238FG03 (00240)	11º 29.00′S	157º 29.00′W	5,299	(Hilly) Flat	5	43	52				26.72	Sp. Oth	1.91	20.71	0.37	0.22	0.47	17.40	17.18	BC			d2	0	
	Average			5,284		12	29	41	18			20.43	Sp. P	1.89	24.45	0.39	0.22	0.47	17.35	16.63						
	00S1138LC01	10º 30.00′S	158º 00.00′W	5,478	(Hilly) Flat							0.00									BC			d2	0	
	00S1138FG02	10º 29.00′S	158º 01.00′W	5,497	(Hilly) Flat	8	30	20	42			7.41	Oth. P	1.93	25.63	0.63	0.40	0.36	19.11	14.39	IBC			ds	0	
36	00S1138FG03 (00241)	10º 29.00′S	157º 59.01′W	5,349	(Hilly) Flat							0.00									-			d1	0	
	Average			5,441		8	30	20	42			2.47	Oth. P	1.93	25.63	0.63	0.40	0.36	19.11	14.39						
	00S1037FG07	09º 30.01′S	158º 30.01′W	5,495	(Hilly) Flat	45	46	9				7.10	P. E	1.95	29.91	0.52	0.32	0.38	18.46	14.90	BC			d2	0	
	00S1037FG08	09º 29.00′S	158º 31.00′W	5,497	(Hilly) Flat	21	73	6				7.59	Sp. P	2.00	18.75	0.54	0.32	0.43	20.10	15.41	BC			d2	0	
37	00S1037FG09 (00242)	09º 29.00′S	158º 29.01′W	5,478	(Hilly) Flat	32	49	19				9.65	Sp. P	1.94	21.10	0.54	0.34	0.43	19.66	16.20	BC			d2	0	
	Average			4,490		32	56	12				8.11	P. Sp	1.96	22.93	0.53	0.32	0.42	19.45	15.58						

*Sil%:siliceous fossil%, Cal% :calcareous fossil%, T.P.L:Transparent Layer

Data Files of Results obtained from Four Survey Cruises in this Programme (19/19)

(No. 00-5)

No.	Sampling No. (Station No.)	Location				Manganese Nodules															Geology					Remarks
						Size distribution (%)						Abun-dance (Kg/m^2)	Shape	S.G. Wet	H_2O (%)	XRF Analyses (%)					Sediment			*T.P.L		
		Latitude	Longitude	Depth (m)	Topography	0-2 cm	2-4 cm	4-6 cm	6-8 cm	8-16 cm	16- cm					Ni	Cu	Co	Mn	Fe		* Sil%	* Cal%	type	thick (m)	
38	00S1636LC49 (00234)	15º 52.49′S	159º 32.01′W	5,038	(Quasi) Platform	3	25			72		(30.63)	Pl. Sp	1.95	33.63	0.33	0.22	0.44	14.94	19.05	BC					
	Average					3	25			72				1.95	33.63	0.33	0.22	0.44	14.94	19.05						
39	00S1636LC50 (00235)	15º 52.50′S	159º 42.01′W	4,912	(Quasi) Platform		56		44			(24.86)	E. Oth	1.85	29.31	0.16	0.11	0.25	9.76	10.20	ISC					
	Average						56		44					1.85	29.31	0.16	0.11	0.25	9.76	10.20						
40	00S1736LC46 (00236)	16º 14.98′S	159º 07.47′W	5,133	(Quasi) Hollow	6	94					(28.58)	Sp. P	1.97	33.12	0.32	0.18	0.52	14.75	19.70	BC					
	Average					6	94							1.97	33.12	0.32	0.18	0.52	14.75	19.70						
41	00S1736AD47 (00237)	Start 16º 20.75′S	159º 34.61′W	3,455	(Quasi) Slop										22.45	0.33	0.18	0.51	17.43	20.65						
	Average	End 16º 21.23′S	159º 34.17′W	3,151											22.45	0.33	0.18	0.51	17.43	20.65						
42	00S1736AD48 (00238)	Start 16º 19.99′S	159º 04.98′W	5,109	(Quasi) Flat									w/o	w/o	w/o	w/o	w/o	w/o	w/o						
	Average	End 16º 20.26′S	159º 04.70′W	5,099																						