

## CRUISE REPORT:

# SAGAMI-NADA SEA INVESTIGATIONS

APRIL-MAY 1974

GH 74 -1 and -2 Cruises

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Geological Survey of  
Japan

## I. INTRODUCTION

Since 1969, the Geological Survey of Japan has continued activities on marine geology in the continental shelf and slope area off western Kyushu and has also carried out researches of deep sea mineral resources, especially ferro-manganese nodules, in the western part of the Pacific. All of these activities have been done by chartering research vessels from Tokai University and some private organizations. Because of the increasing demands for marine geological research, the marine geological part of the G.S.J. has developed. The G.S.J. has established two marine geological sections, in 1972 and 1973, and a marine geological department was made by uniting these sections with a new marine geophysical section in 1974.

### **Five year programme of marine geological research of G.S.J.**

According to the governmental programme for the development of marine science and technology marine geological activity of the G.S.J. will be expanded from 1974 using a new geological research vessel the 'Hakurei-maru'. The five year programme of the G.S.J. for marine geological research is based on the long term use of the new vessel. The programme is composed of two projects, which concern marine geological investigations on the continental shelves and slopes around Japan and deep sea mineral resources research. The former project, which forms part of this cruise report, is divided into two sub-projects; the detailed geological and geophysical surveys of continental shelves and reconnaissance research of slopes and deep sea areas around Japan. The main purpose of the former sub-project is to make geological and sedimentological maps to the scale of 1:200,000 and that of the latter is to make reconnaissance geological structure maps to the scale of 1:1,000,000.

The areas to be surveyed for the next five years are shown in Figure 1. The project includes six research cruises in 1974 which are as follows:-

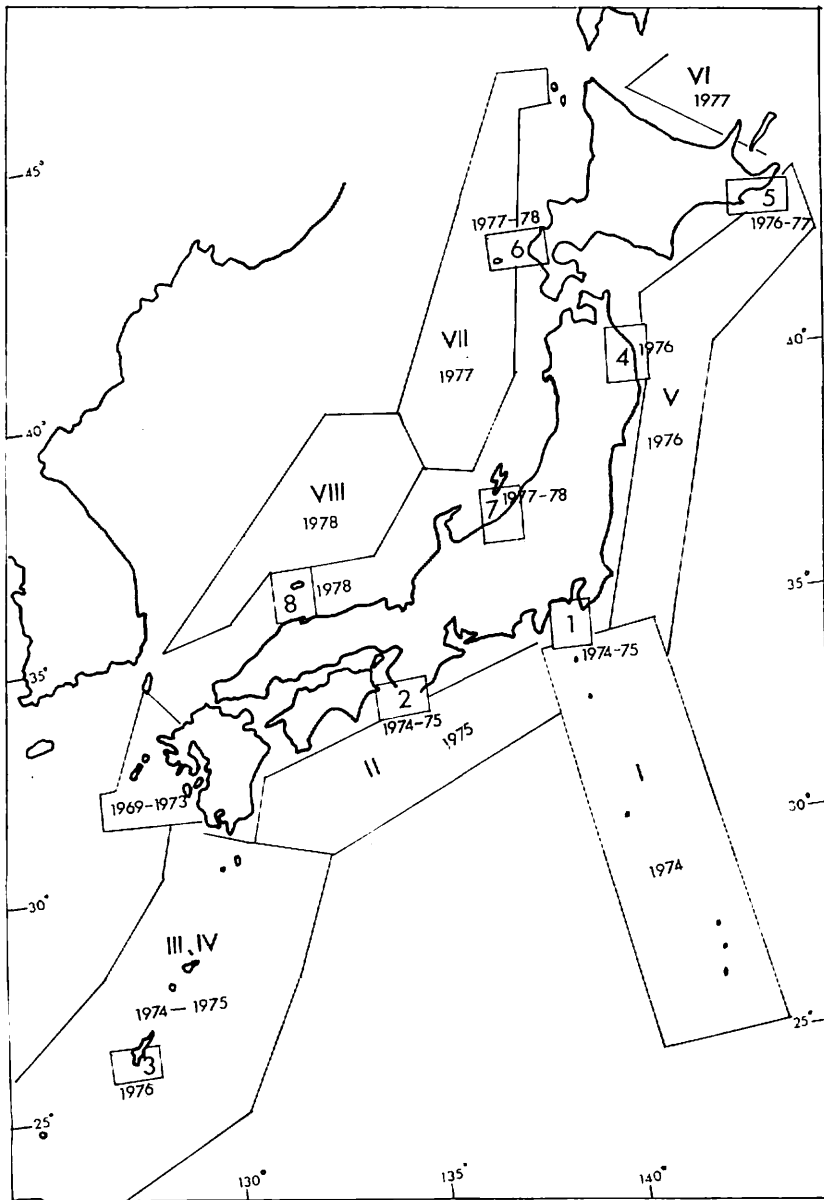


Fig. 1. Five year programme of Marine Geological Investigations on the Continental Shelves and Slopes around Japan Project. I-VIII areas will be mapped on scale of 1:1,000,000 and 1-8 areas will be mapped on scale of 1:200,000. I: Izu-Ogasawara, II: Pacific side of southwestern Japan, III-IV: Nansei (Ryukyu) Islands, V: Pacific side of northeastern Japan and Hokkaido, VI: Okhotsk Sea side of Hokkaido, VII: Japan Sea side of northeastern Japan, and VIII: off Sanin. 1: Sagami-nada, 2: South of Kii-suido, 3: Okinawa, 4: Off Sanriku, 5: South of Nemuro, 6: Okujiri Island, 7: South of Sado-gashima, and 8: Near Okinoshima.

No. of cruise	Duration	month	areas and objects
GH74-1	5 days	April	Sagami-nada Sea. For tests of survey machinery and for reconnaissance research.
GH74-2	20 days	May	Sagami-nada Sea. For mapping the geology of the sea bed.
GH74-3	20 days	June	Around the Izu-Ogasawara Arc and Trench. For reconnaissance research of geology.
GH74-4	20 days	July	South of the Kii-suido Channel. For mapping of sea bed and research of superficial sediments.
GH74-6	5 days	October	Izu-Ogasawara area. For supplementary research.
GH75-1	30 days	January to February, 1975	Around Okinawa (Ryukyu) Islands. For reconnaissance research of geological structure.

Among them, GH74-6 is also planned for the training of foreign students under the plan of the Overseas Technology Cooperation Association. Cruises GH74-3 and -7, which are not listed above, are concerned with the project of deep sea mineral resources investigations.

This report is concerned with GH74-1 and -2 cruises which have been done in the Sagami-nada Sea, which includes Sagami Bay and its adjacent area as far as the northern extremity of the Izu-Ogasawara Trench, during April 17-21 and May 10-29. The first cruise was carried out in order to outline the geology of the Sagami-nada area testing the survey machinery and the second cruise was done for rock and sediment sampling and a geophysical survey.

#### **Note on the new geological research vessel 'Hakurei-maru'**

In 1969, the national programme for the development of marine science and technology was set up by the Interministerial Marine Science and Technology Committee. According to the programme the Ministry of International Trade and Industry (M.I.T.I.) decided to construct a new research vessel for geological investigations. Subsequently the Geological Research Vessel Construction Committee was established in the Metal Mining Agency, the corporation of M.I.T.I., and designed the new vessel. The construction of the vessel was carried out by the Mitsubishi Heavy Industries Ltd. at the Shimonoseki Shipyard. The new vessel was launched in October, 1973, and completed at the end of March, 1974.

The owner is the Metal Mining Agency and the ship's main user is the G.S.J. The G.S.J. entrusts the Nippon Marine Service & Engineering Co., Ltd. with the operation of the vessel.

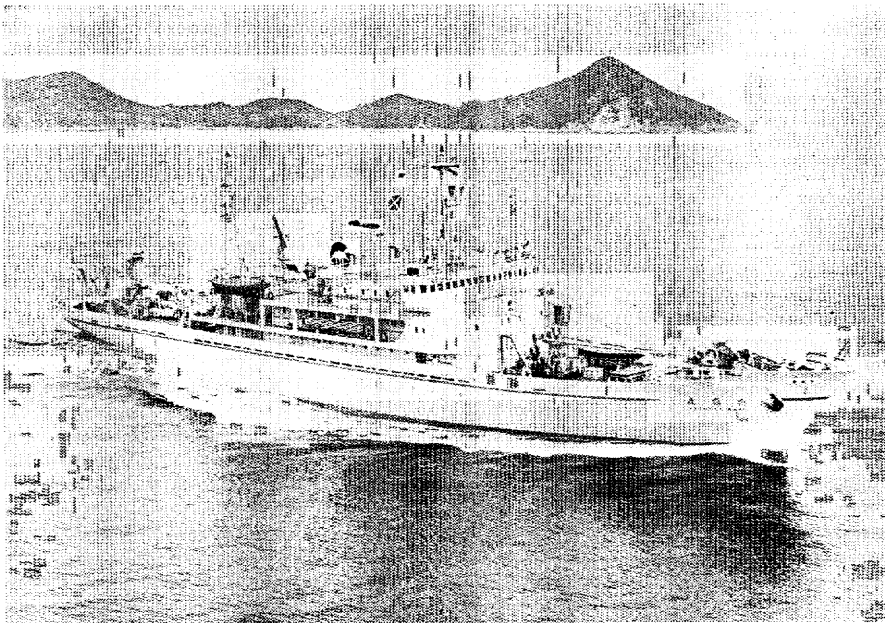


Fig. 2-a. New geological research vessel-Hakurei-maru.

The specifications of the Hakurei-maru (Figure 2) are as follows:-

Length (o.a.)	86.95 m
Length (p.p.)	77.00 m
Breadth (mld.)	13.40 m
Depth (mld.)	5.30 m
Draft (mld.)	5.00 m
Gross tonnage	1,821.60 tons
Service speed	15.00 kt
Trial speed	17.78 kt
Endurance	15,000 sea-miles
Complement	55 persons
Officers and crew	35 persons
Scientists	20 persons
Main engine	3,800 ps 230 rpm 1 set
Main generator	600 kw 3 sets
Propeller	4 bladed variable pitch type 1 set
Special equipment	Bow thruster 1 set

The vessel has five main winches, several small winches, three cranes, a gantry, two gallows and a bow thruster. The main winches for geological sampling are as follows:-

No. 1 winch      With 10,000 m, 12mm dia., and 3 strand straight wire rope, placed in the winch room of the hold, and used for dredging

- and air-gun towing through the gantry at the stern.
- No. 2 winch With 10,000 m, 12mm dia., and 7 strand straight wire rope, placed in the winch room of the hold, and for piston-coring and grab sampling through a gallows at the starboard.
- No. 3 winch With 13,000 m, 5.4–8.1mm dia., stepped wire rope, mounted on the foredeck, and used for water sampling, grab sampling and deep sea camera operation through a gallows at the fore-deck.
- No. 4 winch With 6,700 m, 17.2mm dia, coaxial armoured cable. mounted on quarterdeck, and for deep sea television operation.
- No. 5 winch With 1,000 m, 3mm dia., stainless steel wire rope. mounted on quarterdeck, and for water sampling and grab sampling through davit.

The vessel has five laboratories; namely, a geophysical, chemical, sedimentological, geochemical and mineralogical, and satellite navigation and gravity measurement rooms.

The main facilities and equipment for geological and geophysical research mounted on board are as follows:-

Satellite navigation system, gravity-meter, data processing system, precision depth recorder (PDR), echo-sounder, side-scan sonar, 3.5 kHz subbottom profiler, sparker and air-gun seismic profiling equipment, proton magnetometer, deep sea television, deep sea camera, various types of dredges, grab samplers, piston-corer, marine drill, STD, atomic absorption spectrophotometer and x-ray diffractometer.