

NO. 39  
NOV. 1972

# *CSK NEWSLETTER*



**JAPAN OCEANOGRAPHIC DATA CENTER**  
Hydrographic Department, Maritime Safety Agency  
Tokyo, Japan

Publication of

"THE KUROSHIO II", Proceedings of the Second CSK Symposium, Tokyo, 1970.

The Symposium took place in Tokyo during Sept. 27 - Oct. 1, 1970 with Dr. Ken Sugawara as convener for the purpose of letting those concerned know what kinds of works have been accomplished by individual scientists and scientist groups by using the data and samples collected through the past activities of the Cooperative Study of the Kuroshio and Adjacent Regions, IOC. and affording them materials for their own future programmes and at the same time to determine the general policies for advancing and elaborating the future programme of the Project as a whole.

The present volume contains in addition to the minutes of the Symposium four introductory lectures reviewing the past activities of the Project, two by Prof. A.M. Muromtsev and Prof. Y. Takenouti for the field of physical oceanography, one, by Prof. R. Marumo for biological oceanography and another by Prof. M. Uda for fisheries oceanography, and 61 contributed papers including 18 for physics, chemistry and geology, 26 for biology and biochemistry and 17 for fisheries oceanography, totaling 562 pages, size 21.5 x 28 cm.

All orders are received by SAIKON PUBLISHING CO., LTD., Wada Building, 1 - 8 - 13, Hirakawacho, Chiyodaku, Tokyo, Japan at a price U.S.\$ 40.00 per volume including mail charge.

C O N T E N T S

- I. Cruise Reports
  - 1. Japan
    - Kofu Maru ( 1 July - 11 August 1971)
    - Shumpu Maru (19 July - 17 August 1971)
    - Chofu Maru (19 July - 13 August 1971)
    - Seifu Maru (22 July - 28 August 1971)
    - Oshoro Maru ( 2 Nov. 1971 - 11 Jan. 1972)
- II. ROSCOP Form concerning the CSK Cruise
- III. Information Concerning the Holding of the 9th Meeting of the ICG for CSK and the 3rd CSK Symposium
- IV. Abstracts of the papers on CSK
- V. Publication pertinent to CSK
- VI. Publications
  - Data Report of CSK, Nos. 273, 276, 284, 285, 286, 287
  - List of Data Report of CSK & Errata
- VII. Number of Oceanographic Stations of CSK
- VIII. Data Received
  - Japan (Kaiyo, Chofu Maru), Singapore (Changi)
  - USSR (Priliv)

I. CRUISE REPORT

The following cruise reports were received by the Center from each participating agencies of Japan.

1. Japan

1.1 Kofu Maru

(1) Operating Agency

Hakodate Marine Observatory, Japan Meteorological Agency

(2) Personnel

Scientists: K. Hata, S. Kuronuma, S. Hosoda, K. Karoji,  
H. Okubo, I. Terashima, H. Hamano,  
H. Hayashi, K. Komura, T. Konya, S. Wakai,  
N. Ishikawa

Captain: C. Naka

Officers and Crew: 24

(3) Cruise Itinerary

| <u>Port</u> | <u>Arrive</u> | <u>Depart</u> |
|-------------|---------------|---------------|
| Hakodate    |               | 1 July 1971   |
| Tokyo       | 9 July        | 13 July       |
| Hakodate    | 20 July       | 23 July       |
| Abashiri    | 29 July       | 1 Aug.        |
| Hakodate    | 11 Aug. 1971  |               |

(4) Region

MSQ Nos. 130, 165, 166 (East of Japan and the Okhotsk Sea)

(5) Type of Observation

Serial:

No. of Stas. - 77  
Data - T, S, O<sub>2</sub>, P, Si, etc.  
Sampling Depths - 0, 10, 30, 50, 75, 100, 150, 200,  
250, 300, 400, 500, 600, 700, 800,  
1000, 1200, 1500m.

Max. Sample Depth - 1715m

BTs : 180

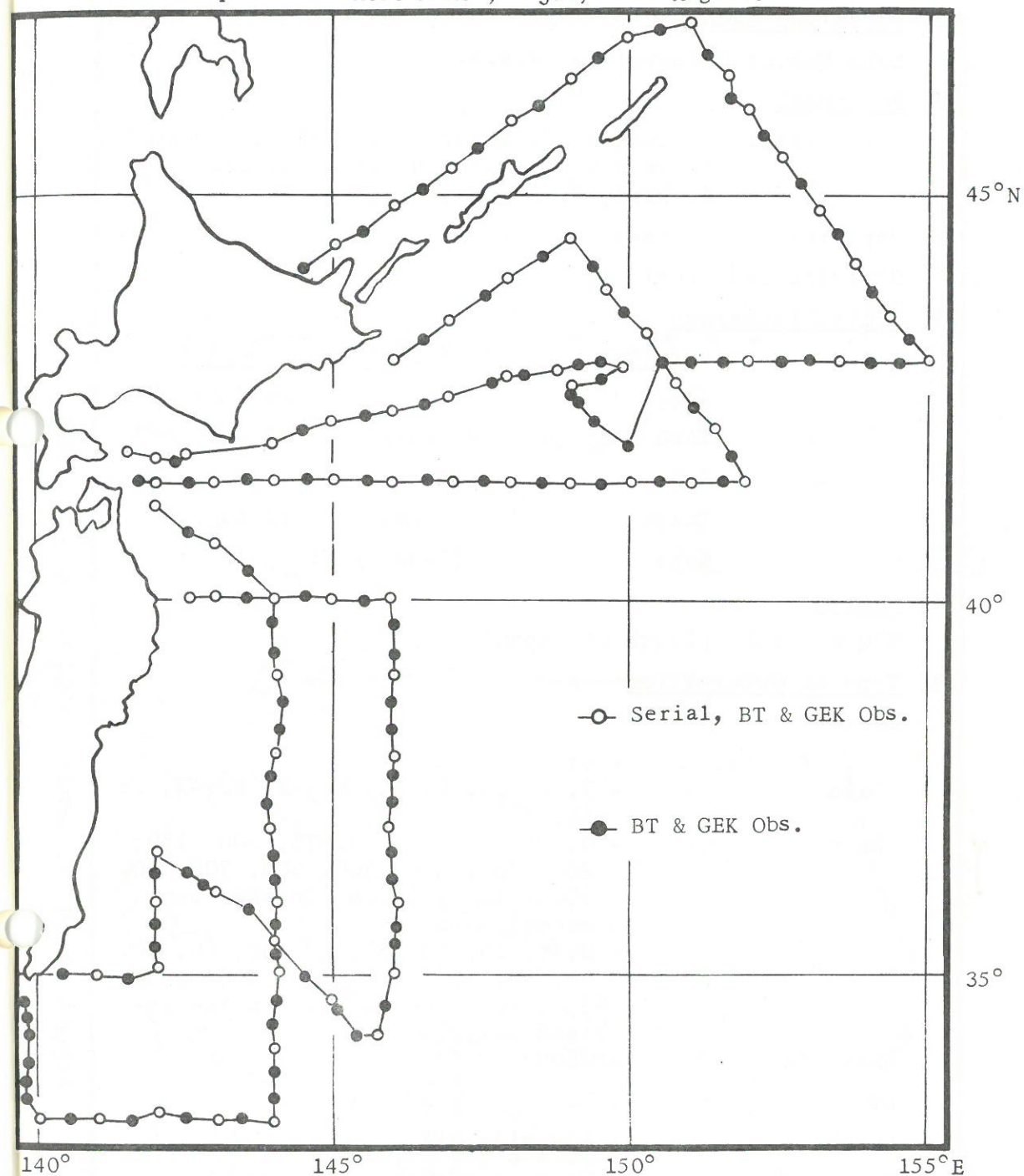
Currents : 182 with GEK

Biological : 21 with NORPAC net

Meteorological : Wind, Weather, Air Temp., Bar.,  
Clouds, etc.

Surface : Color, Transp., Swell, Waves, T, S,  
O<sub>2</sub>

Station Map of the "KOFU MARU", 1 July - 11 August, 1971



1.2 Shumpu Maru

(1) Operating Agency

Kobe Marine Observatory, J.M.A.

(2) Personnel

Scientists: K. Yamato, S. Konaga, K. Hori, T. Yamamoto,  
K. Onishi, T. Ueno, N. Baba, M. Jo,  
K. Irie, K. Kuroda, K. Shuto

Captain: S. Sakai

Officers and Crew: 17

(3) Cruise Itinerary

| <u>Port</u>  | <u>Arrive</u> | <u>Depart</u> |
|--------------|---------------|---------------|
| Kobe         |               | 19 July 1971  |
| Tosa Shimizu | 23 July       | 27 July       |
| Kobe         | 1 Aug.        | 7 Aug.        |
| Tokyo        | 11 Aug.       | 14 Aug.       |
| Kobe         | 17 Aug. 1971  |               |

(4) Region

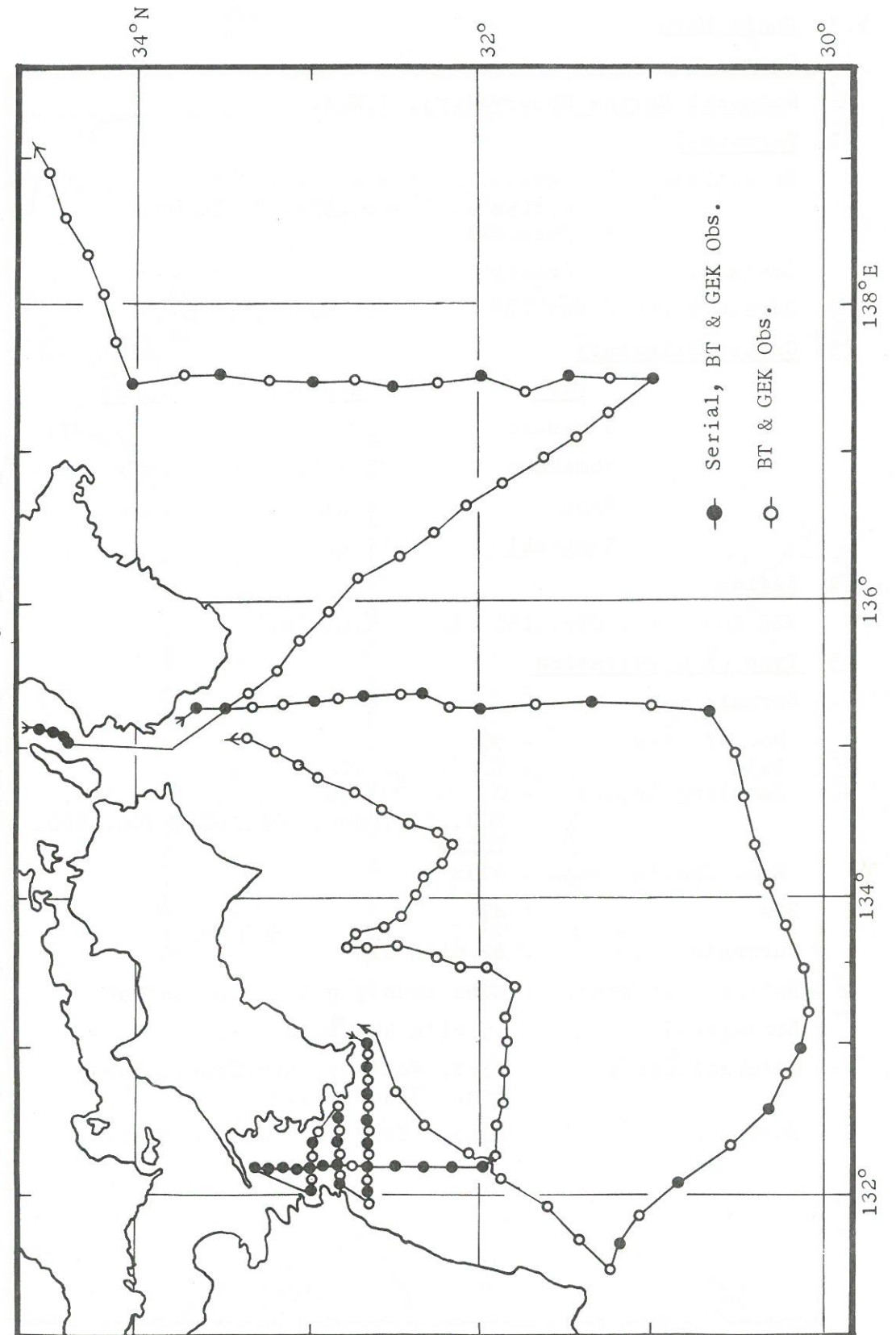
MSQ No. 131 (South of Japan)

(5) Type of Observation

Serial:

- No. of Stas. - 51
- Data - T, S, O<sub>2</sub>, P, Si, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Fe, AL, F
- Sampling Depths - 0, 10, 20, 30, 50, 75, 100, 150, 200, 300, 400, 500, 600, 700, 800, 1000, 1200, 1500m (in the open ocean)
- 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 125, 150, 200, 250, 350, 400m and bottom (in the inland sea)
- Max. Sample Depth - 1800m
- BTs : 141
- Currents : 109 with GEK
- Biological : Micro and Macro plankton-21
- Meteorological : Wind, Weather, Bar., Air temp.: dry, wet, Clouds, Vis.
- Surface : Color, Sea and Swell, Transp., Radioactivity

Station Map of the "SHUMPU MARU"; 19 July - 17 August 1971



1.3 Chofu Maru

(1) Operating Agency

Nagasaki Marine Observatory, J.M.A.

(2) Personnel

Scientists: S. Yamano, K. Yamaguchi, Y. Maeda, S. Fujita,  
S. Morikawa, Y. Hanzawa, M. Takahashi,  
A. Takeuchi

Captain: M. Amamiya

Officers and Crew: 22      Other Members: 6

(3) Cruise Itinerary

| <u>Port</u> | <u>Arrive</u> | <u>Depart</u> |
|-------------|---------------|---------------|
| Nagasaki    |               | 19 July 1971  |
| Yamakawa    | 25 July       | 29 July       |
| Nase        | 6 Aug.        | 8 Aug.        |
| Nagasaki    | 13 Aug. 1971  |               |

(4) Region

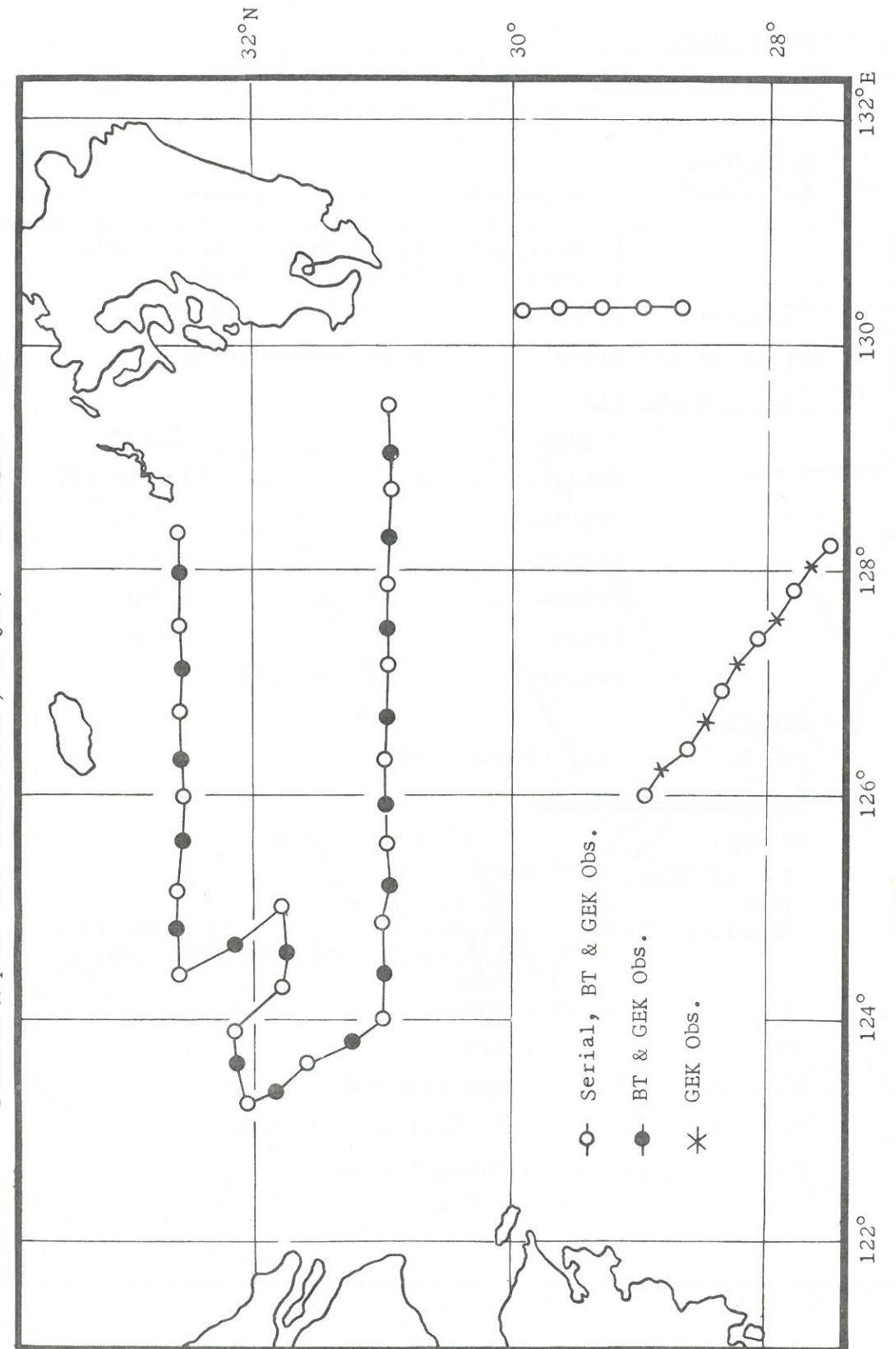
MSQ Nos. 095, 096, 132 (East China Sea)

(5) Type of Observation

Serial:

- No. of Stas. - 30
- Data - T, S, O<sub>2</sub>, NO<sub>2</sub>-N, NO<sub>3</sub>-N
- Sampling Depths - 0, 10, 20, 30, 50, 75, 100, 150, 200, 300, 400, 500, 600, 700, 800, 1000m
- Max. Sample Depth - 978m
- BTs : 47
- Currents : 42 with GEK
- Bottom Topography : Echo sounding at each station
- Biological : 15 with NORPAC net
- Meteorological : Wind, Weather, Air Temp., Bar., Hum., Clouds, Vis.
- Surface : Color, Transp., Sea and Swell

Station Map of the "CHOFU MARU", 19 July - 13 August, 1971



1.4 Seifu Maru

(1) Operating Agency

Maizuru Marine Observatory, J.M.A.

(2) Personnel

Scientists: K. Furuhashi (Chief), H. Akamatsu, M. Owada,  
K. Hayashi, M. Morioka, K. Tanioka, F. Ogawa,  
Y. Hashimoto, Z. Horiguchi, M. Shibata,  
Y. Sawada, T. Yasuoka, K. Harami

Captain: M. Nakamura

Officers and Crew: 24      Other Members: 6

(3) Cruise Itinerary

| <u>Port</u> | <u>Arrive</u> | <u>Depart</u> |
|-------------|---------------|---------------|
| Maizuru     |               | 22 July 1971  |
| Tsuruga     | 28 July       | 31 July       |
| Maizuru     | 5 Aug.        | 9 Aug.        |
| Miyazu      | 14 Aug.       | 17 Aug.       |
| Otaru       | 23 Aug.       | 25 Aug.       |
| Maizuru     | 28 Aug. 1971  |               |

(4) Region

MSQ Nos. 131, 167 (Japan Sea)

(5) Type of Observation

Serial:

No. of Stas. - 69  
Data - T, S, O<sub>2</sub>, P  
Sampling Depths - 0, 10, 20, 30, 50, 75, 100, 125,  
150, 200, 250, 300, 400, 500,  
600m

Max. Sample Depth - 2938m

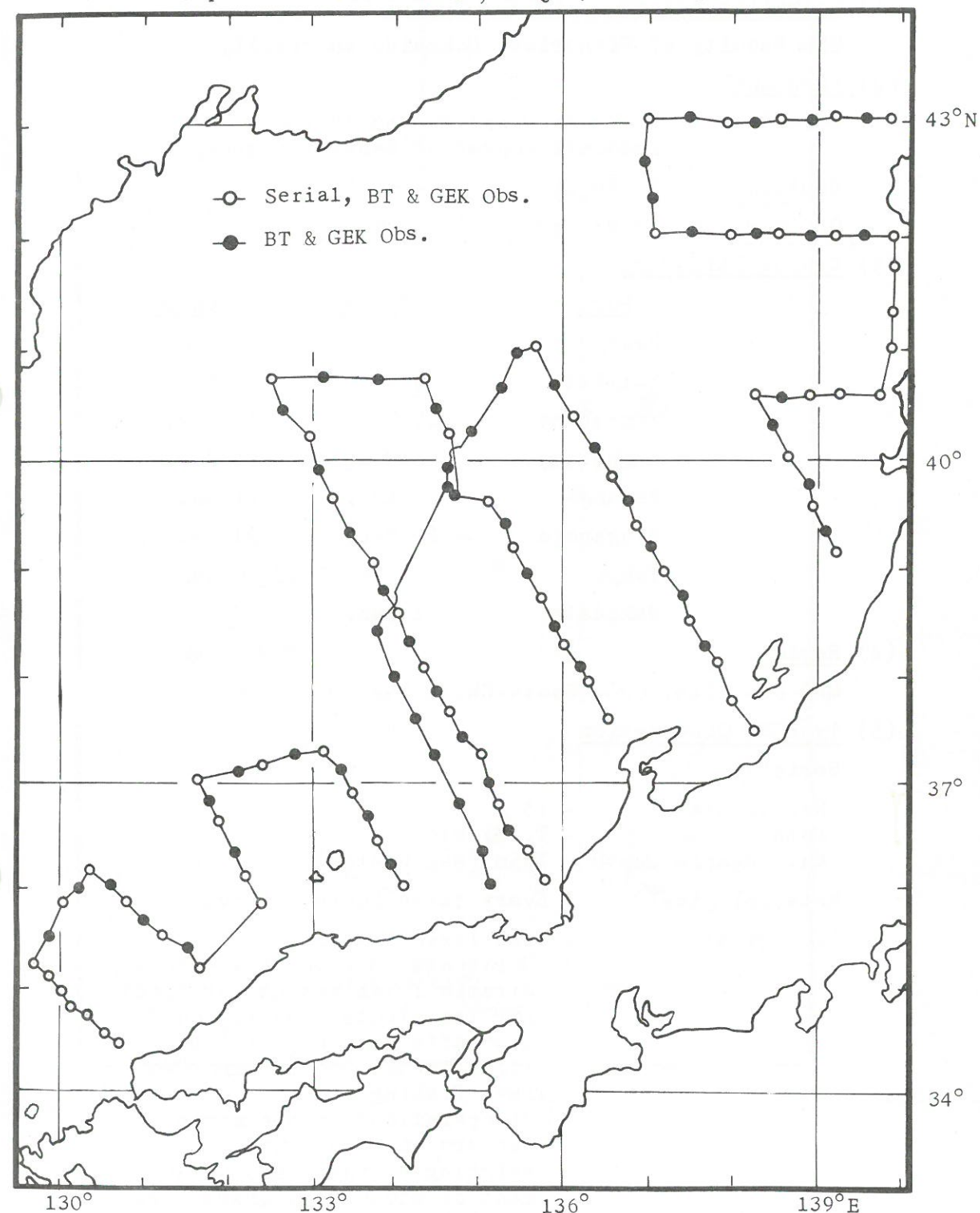
BTs : 129

Currents : 129 with GEK

Biological : 39 (0-150m with NORPAC net)

Meteorological : Every 3 hours

Station Map of the "SEIFU MARU", 22 July - 28 August, 1971



1.5 Oshoro Maru

(1) Operating Agency

The Faculty of Fisheries, Hokkaido University

(2) Personnel

Scientists: K. Kyushin and 20 cadets in the Undergraduate Course of General Fishery

Captain: T. Fujii

Officers and Crew: 37

(3) Cruise Itinerary

| <u>Port</u> | <u>Arrive</u> | <u>Depart</u> |
|-------------|---------------|---------------|
| Hakodate    |               | 2 Nov. 1971   |
| Shimizu     | 4 Nov.        | 7 Nov.        |
| Kagoshima   | 10 Nov.       | 13 Nov.       |
| Kaohsiung   | 18 Nov.       | 23 Nov.       |
| Penang      | 6 Dec.        | 11 Dec.       |
| Singapore   | 20 Dec.       | 24 Dec.       |
| Tokyo       | 5 Jan. 1972   | 9 Jan.        |
| Hakodate    | 11 Jan.       |               |

(4) Region

MSQ Nos. 025, 026 (South China Sea)

(5) Type of Observation

Serial:

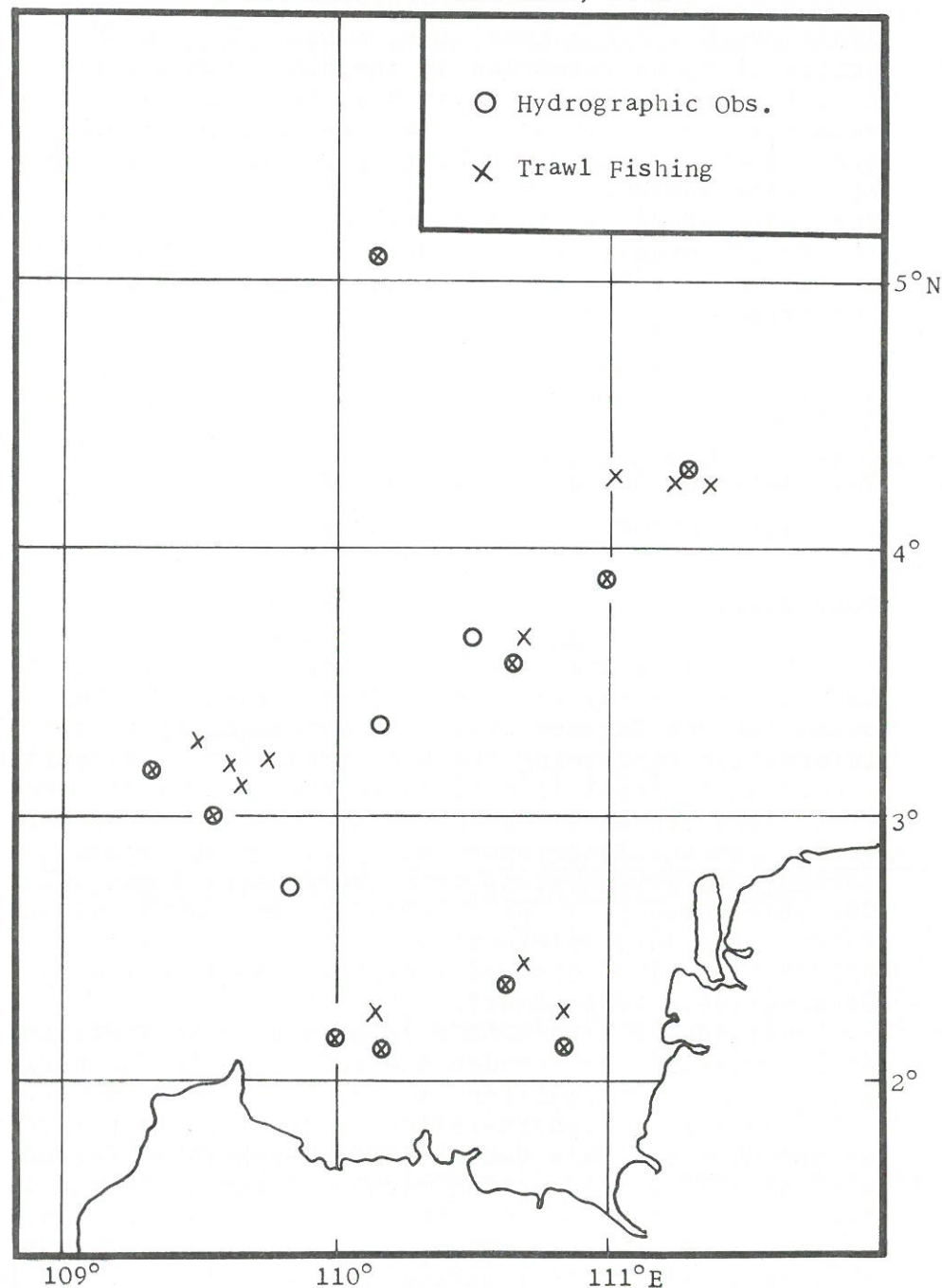
- No. of Stas. - 13
- Data - T, S, etc.
- Max. Sample Depth - 135m (sea bottom)

Meteorological : Every three hours interval

Biological : Fish larva sampling -  
 Horizontal surface tow with a stramin larva net at low speed for ten minutes, mostly one hour after sunset, at 5 stations in the South China Sea.  
 Trawl fishing -  
 21 operations in the north-western coast of Borneo.  
 Weighing of catch and measurement of biological characters of each species caught.

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Station Map of the "OSHORO MARU"  
 27 November - 17 December, 1971





II. ROSCOP FORM CONCERNING THE CSK CRUISE

ROSCOP (Report of Observations/Samples Collected by Oceanographic Programmes) form concerning the CSK cruise is to be forwarded to the WDC's through the Kuroshio Data Center, it has been decided. Accordingly, we hereafter substitute the above-mentioned ROSCOP for the CSK Cruise Report hitherto published by the Kuroshio Data Center.

For your reference, in the following there is shown the letter of request from the Director of the KDC, addressed to the National Coordinators for CSK of member countries.

JODC28/72

Sept. 13, 1972

To: National Coordinators for CSK  
Subject: ROSCOP form for CSK cruise

Dear Sirs:

Up to this time the Cruise Report inserted in the CSK Newsletter has been known to the participating countries and further widely internationally as the information concerning the CSK expeditions. Hereafter, according to Resolution VII-6 adopted at the 7th session of Intergovernmental Oceanographic Commission held in Paris, October 26-November 5, 1971, the information concerning the expeditions which were carried out under the CSK programmes is to be reported by making use of the interim standard international data inventory form, ROSCOP (Report of Observations/Samples Collected by Oceanographic Programmes).

Originally, the ROSCOP forms are to be forwarded, either directly or through the NODC's of the countries performing the expedition, to the appropriate WDC's.

However, in consideration of the role of our center as the Kuroshio Data Center (KDC), we have conferred with the WDC-A, and as the result of consultations it has been decided that the ROSCOP concerning the CSK will be sent from the performing countries directly to the KDC, which will, after making a copy of the report, forward the ROSCOP to the WDC's. Furthermore, as it is scheduled that the KDC will prepare its manuscript for the Newsletter from this ROSCOP report, it is not necessary hereafter that the cruise report concerning CSK be sent to us in the same way as hitherto. Accordingly,

as for the CSK observations have carried out after 1972, it is requested that you would, on having entered in the ROSCOP form in accordance with the instructions herewith enclosed, please forward the form to the KDC/Japan Oceanographic Data Center.

ROSCOP forms are available from the WDC-A, but I will send you some copies of them under separate cover, and your kind cooperations in this respect are greatly appreciated in advance.

Sincerely yours,

( S i g n e d )

Hideo Nitani  
Director  
Kuroshio Data Center/Japan  
Oceanographic Data Center

c.c.: International Coordinator for CSK  
Secretary, IOC  
Chairman, W.G. for IODE  
WDC-A  
WDC-B

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III. INFORMATION CONCERNING THE HOLDING OF THE 9TH MEETING OF THE ICG FOR CSK AND THE 3RD CSK SYMPOSIUM

In regard to the 9th Meeting of the International Coordination Group for the Cooperative Study of the Kuroshio and Adjacent Regions and to the 3rd CSK Symposium, the holding of these two meetings is under conference between the International Coordinator and the Thailand National Coordinator.

According to their consultation, probably these two meetings will held in May 1973 in Bangkok. Details for this matter will be informed in the next number.

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IV. ABSTRACTS OF THE PAPERS ON CSK

(Continued from the previous issue, Nos. 37/38 of the CSK Newsletter)

- (83) Henry Stommel\* and Kozo Yoshida\*\*: Some Thoughts on the Cold Eddy South of Enshunada. Journal of the Oceanographical Society of Japan, Vol. 27, No. 5, pp. 213-217, October 1971. (in English)

Abstract: On the basis of the results confirmed in the new volume "Kuroshio", a figure is presented on subsurface temperature arranged chronologically for the selected one-degree square to clearly document the bimodal state of the Kuroshio in this area. To extend this analysis of the state further into the non-documented past, a preliminary survey is attempted with the data on air and sea-temperatures at Hachijojima of these 45 years. As may be anticipated, those data are found to bear little in-phase correlation with the Cold Eddy, though they might prove useful after further analysis. Some ideas of analyzing tree-rings on Hachijojima and shallow sea sediments are also discussed in this connection.

\* Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, U.S.A.

\*\* Geophysical Institute, University of Tokyo, Tokyo 113, Japan

- (84) Sooji Shimura\* and Shun-ei Ichimura\*: Primary Productivity in Coastal Water Adjacent to the Kuroshio off Shimoda. Journal of the Oceanographical Society of Japan, Vol. 28, pp. 8-17, February, 1972. (in English)

Abstract: The primary productivity in coastal water adjacent to the Kuroshio off Shimoda was measured as part of the International Biological Program. The total amount of chlorophyll a in the euphotic zone varied widely from 20 mg/m<sup>2</sup> to 60 mg/m<sup>2</sup> throughout the year and the maximum values were measured in early summer. These values were higher than those in the Kuroshio but agreed with those in the Oyashio. Vertical differentiation of photosynthetic characteristics was well developed and it was strongly related to the stratification of the water column. The light-saturated photosynthetic rate of surface phytoplankton varied from 5.8 mgC/(mg chl.h) in May to 2.0 mgC/(mg chl.h) in January. These rates were higher than those in the Kuroshio. The daily

primary production was estimated by the chlorophyll method. Highest value was 0.5-1.5 gC/(m<sup>2</sup>day) in early summer and the lowest was 0.2 gC/(m<sup>2</sup>day) in winter. The primary productivity in the coastal water studied accorded fairly well with that in the Oyashio.

\* Department of Botany, Faculty of Science, Tokyo Kyoiku University, Otsuka, Tokyo 112, Japan.

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V. PUBLICATION PERTINENT TO CSK

The following publication was recently issued by University of Tokyo Press.

KUROSHIO - ITS PHYSICAL ASPECTS, edited by Henry Stommel and Kozo Yoshida, University of Tokyo Press, pp. 1-517, 1972.

Papers of authors which are contributed to this publication are as follows:

- Chapter 1 : History of the Japanese Observation Program of the Kuroshio and Adjacent Regions by Toshihiko Teramoto.
- Chapter 2 : Bathymetry of the Kuroshio Region by Akio Mogi.
- Chapter 3 : Distribution of Stations, and Properties at Standard Depths in the Kuroshio Area by Thomas Winterfeld and Henry Stommel.
- Chapter 4 : Water Characteristics of the North Pacific Central Region by Jotaro Masuzawa.
- Chapter 5 : Beginning of the Kuroshio by Hideo Nitani.
- Chapter 6 : Characteristics of the Flow of the Kuroshio South of Japan by B.A. Taft.
- Chapter 7 : Time Variation of the Kuroshio South of Japan by Daitaro Shoji.
- Chapter 8 : Hydrography of the Kuroshio Extension by Hideo Kawai.
- Chapter 9 : The Tsushima Current by Shigeo Moriyasu.

Chapter 10 : Comparison between Deep Sections across the Kuroshio and the Florida Current and Gulf Stream by L. V. Worthington and Hideo Kawai.

Chapter 11 : Deep Waters in the Western North Pacific by Shigeo Moriyasu.

Chapter 12 : Direct Current Measurements by Toshihiko Teramoto.

Chapter 13 : Some Aspects of Theoretical Studies on the Kuroshio -- A Review by Kojo Yoshida.

Chapter 14 : Bibliography of Studies on Kuroshio by Kojo Yoshida and Yoko Shimizu.

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### VI. PUBLICATIONS

The following 6 volumes of the "Data Report of CSK" series, and List of Data Report of CSK & Errata were published by KDC (JODC) from June to October 1972.

| No. | Ship & Area                                      | Period             | KDC Ref. No. |
|-----|--|--------------------|--------------|
| 273 | Keiten Maru<br>East China Sea &<br>East of Luzon | April - May 1970   | 49K129       |
| 276 | Orlick<br>N.W. of North<br>Pacific               | April - June 1970  | 90K032       |
| 284 | Ryofu Maru<br>East of Japan                      | July 1970          | 49K133       |
| 285 | Kofu Maru<br>East of Japan &<br>Okhotsk Sea      | July - August 1970 | 49K132       |
| 286 | Chofu Maru<br>East China Sea                     | July - August 1970 | 49K134       |
| 287 | Seifu Maru<br>Japan Sea                          | July - August 1970 | 49K135       |

List of Data Report of CSK & Errata, August 1972.

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Line -- No. of Stations/Cruises on hand as of 31 Dec. 1971 ;  
Line 2. -- No. of Stations/Cruises received from 1 Jan. to 31 Oct. 1972 ;  
Line 3. -- No. of Stations/Cruises on hand as of 31 Oct. 1972.

VII. NUMBER OF OCEANOGRAPHIC STATIONS OF CSK

| NATION               |    | Year Data were Observed |        |        |          |        |          |          |          |          | TOTALS   |          |        |           |            |  |
|----------------------|----|-------------------------|--------|--------|----------|--------|----------|----------|----------|----------|----------|----------|--------|-----------|------------|--|
|                      |    | 1965                    | 1966   | 1967   | 1968     | 1969   | 1970     | 1971     | 1972     |          |          |          |        |           |            |  |
| 21. China (Taiwan)   | 1. | 38/ 1                   | 76/ 2  | 65/ 2  | 73/ 2    | 38/ 1  |          |          |          |          |          |          |        |           |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        |           |            |  |
|                      | 3. | 38/ 1                   | 76/ 2  | 65/ 2  | 73/ 2    | 38/ 1  | 57/ 1    | 87/ 1    |          |          |          |          |        |           |            |  |
| 42. Indonesia        | 1. |                         |        | 94/ 3  |          |        |          |          |          |          |          | 87/ 1    |        | 290/ 8    |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        |           |            |  |
|                      | 3. |                         |        | 94/ 3  |          |        |          |          |          |          |          | 87/ 1    |        | 290/ 8    |            |  |
| 24. Korea            | 1. | 266/ 5                  | 315/ 6 | 431/ 8 | 466/ 8   | 482/ 8 |          |          |          |          |          | 33/ 1    |        | 2,278/ 42 |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        | 33/ 1     |            |  |
|                      | 3. | 266/ 5                  | 315/ 6 | 431/ 8 | 466/ 8   | 482/ 8 | 318/ 7   | 33/ 1    |          |          |          | 33/ 1    |        | 2,311/ 43 |            |  |
| 49. Japan            | 1. | 482/23                  | 642/35 | 794/49 | 1,124/42 | 557/21 |          |          |          |          |          | 91/ 3    |        | 4,211/190 |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          | 431/10   |        | 467/ 11   |            |  |
|                      | 3. | 482/23                  | 642/35 | 794/49 | 1,124/42 | 557/21 | 521/17   | 522/13   |          |          |          | 522/13   |        | 4,678/201 |            |  |
| MS. Malaysia         | 1. |                         |        |        |          |        |          |          |          |          | 130/ 1   | 20/ 1    |        | 150/ 2    |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        |           |            |  |
|                      | 3. |                         |        |        |          |        |          |          |          |          | 130/ 1   | 20/ 1    |        | 150/ 2    |            |  |
| 60. Philippines      | 1. |                         |        |        |          |        |          |          |          |          |          |          |        | 196/ 2    |            |  |
|                      | 2. |                         |        |        |          | 101/ 1 |          |          |          |          |          |          |        |           |            |  |
|                      | 3. |                         |        |        |          | 101/ 1 |          |          |          |          |          |          |        | 196/ 2    |            |  |
| SI. Singapore        | 1. |                         |        |        |          |        |          |          |          |          |          |          |        |           |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          | 17/ 2    |        | 112/ 6    |            |  |
|                      | 3. |                         |        |        |          |        |          |          |          |          |          | 17/ 2    |        | 112/ 6    |            |  |
| 86. Thailand         | 1. |                         |        |        |          |        |          |          |          |          |          |          |        |           |            |  |
|                      | 2. |                         |        | 368/ 6 | 210/ 5   | 3/ 3   |          |          |          |          |          |          |        | 581/ 14   |            |  |
|                      | 3. |                         |        | 368/ 6 | 210/ 5   | 3/ 3   |          |          |          |          |          |          |        | 581/ 14   |            |  |
| 90. U.S.S.R.         | 1. | 199/ 3                  | 967/ 7 | 448/ 7 | 424/ 6   | 497/ 7 |          |          |          |          |          |          |        |           |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        | 2,718/ 33 |            |  |
|                      | 3. | 199/ 3                  | 967/ 7 | 448/ 7 | 424/ 6   | 497/ 7 | 183/ 3   | 154/ 2   |          |          |          | 154/ 2   | 40/ 1  | 194/ 3    |            |  |
| 74. U.K. (Hong Kong) | 1. | 27/ 1                   | 142/ 4 | 102/ 2 | 146/ 3   | 81/ 3  |          |          |          |          |          |          |        | 2,912/ 36 |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        | 548/ 15   |            |  |
|                      | 3. | 27/ 1                   | 142/ 4 | 102/ 2 | 146/ 3   | 81/ 3  | 50/ 2    | 49/ 2    |          |          |          | 49/ 2    |        | 49/ 2     |            |  |
| 31. U.S.A.           | 1. | 106/ 1                  | 310/ 4 | 8/ 1   |          |        |          |          |          |          |          |          |        | 597/ 17   |            |  |
|                      | 2. |                         |        |        |          |        |          |          |          |          |          |          |        | 473/ 7    |            |  |
|                      | 3. | 106/ 1                  | 310/ 4 | 8/ 1   |          | 49/ 1  |          |          |          |          |          |          |        | 473/ 7    |            |  |
|                      |    |                         |        |        |          |        | 1,118/34 | 2,452/58 | 2,310/78 | 2,538/67 | 1,808/45 | 1,259/31 | 882/22 | 135/ 5    | 12,538/341 |  |

VIII. DATA RECEIVED

Catalogue of Data Received by KDC (JODC), 1 June - 31 October 1972

| Date Received<br>Mo. Day/Yr. | KDC<br>Ref. No. | Ship Code* | Agency | Period | Area | No.<br>of<br>Stas. | Serial Data | BTs | Currents | Bottom<br>Topography | Biological |
|------------------------------|-----------------|------------|--------|--------|------|--------------------|-------------|-----|----------|----------------------|------------|
|------------------------------|-----------------|------------|--------|--------|------|--------------------|-------------|-----|----------|----------------------|------------|

JAPAN

|          |        |    |        |                  |              |    |         |     |     |   |  |
|----------|--------|----|--------|------------------|--------------|----|---------|-----|-----|---|--|
| 06.02/72 | 49K148 | KA | HDMSA  | 08.21-09.21,1971 | S. JAPAN     | 21 | T S O P | 156 | 164 | D |  |
| 10.19/72 | 49K149 | CH | NMOJMA | 01.27-02.16,1972 | E. CHIN. SEA | 36 | T S O P |     |     | D |  |

SINGAPORE

|          |        |    |      |                  |              |    |     |  |  |  |   |
|----------|--------|----|------|------------------|--------------|----|-----|--|--|--|---|
| 06.26/72 | SIK005 | CH | MFRD | 04.20-05.12,1972 | S. CHIN. SEA | 56 | T O |  |  |  | F |
| 07.19/72 | SIK006 | CH | MFRD | 06.17-06.25,1972 | S. CHIN. SEA | 26 | T   |  |  |  | F |

USSR

|          |        |    |       |                  |          |    |               |  |  |  |       |
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| 08.08/72 | 90K036 | PR | TINRO | 02.20-02.27,1972 | E. JAPAN | 40 | T S O P AL N2 |  |  |  | SI PH |
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JAPAN

Ship Code\* KA: KAIYO  
CH: CHOFU MARU

SINGAPORE

CH: CHANGI

USSR

PR: PRILIV