



ANNEX II

GUIDE FOR RESPONSIBLE NATIONAL OCEANOGRAPHIC DATA CENTRES

UNESCO 1982

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FORWARD

The past two decades have seen a remarkable expansion in scientific investigations of the world's oceans, both on a national and international co-operative basis. The results of these investigations take many forms with data possibly being the first important measure of their success. Along with the growth of oceanographic programmes, a well-functioning network for the exchange of oceanographic data has been established under the guidance of the International Council of Scientific Unions (ICSU) and the Intergovernmental Oceanographic Commission (IOC). This network, comprised of world and national data centres, is a remarkable example of a system for supporting international co-operation in the marine sciences. The network is supported entirely by data services in Member States and, through their concerted efforts, it has been possible to serve users in all countries with centrally archived data and computerized data banks.

The growing complexity and diversity of data, and the sophistication of technical carriers used in data exchange, require the continued assistance of well equipped data centres. The Responsible National Oceanographic Data Centre (RNODC) scheme was proposed by IOC's Working Committee on International Oceanographic Data Exchange (IODE) as a way to let all Member States benefit from the expertise and the data capabilities offered to the international community by volunteering centres. Guided by the Group of Experts on RNODCs, the RNODC pilot scheme became an operational reality with the establishment of rules and procedures during the Tenth Session of the Working Committee on IODE in 1981.

This first edition summarizes the guidelines now used for the operation of RNODCs. The changing requirements of oceanographic programmes continually introduce new elements and capabilities into RNODC operations. Therefore, rather than set rigid rules, this Guide offers guidance for the accreditation and operation of RNODCs.

After ten years of RNODC programme development, it is hoped that this Guide will fill a longstanding need for guidance to Member States participating in the RNODC scheme.

Dieter Kohnke

Chairman, Working Committee on IODE

I. DEVELOPMENT OF THE RNODC CONCEPT

Responsible National Oceanographic Data Centres are accredited by the IOC and supported by Member States volunteering to establish an RNODC. They assist the World Data Centres for Oceanography within the IODE system by undertaking data missions needed for improving the international exchange of oceanographic data. The RNODC scheme is not intended to promote a system of archive centres competing in any way with established National or World Data Centres.

For an understanding of the importance of the RNODC scheme, it is useful to review the evolution of arrangements for international oceanographic data exchange.

The first large-scale international exchange of oceanographic data began with the International Council for the Exploration of the Sea (ICES) at the turn of the century. Oceanographic data collected by countries in the North-Eastern Atlantic and adjacent regions were regularly edited, sorted and published by ICES in the Bulletin Hydrographique (initially Bulletin Trimestriel). When the volume of data published became unwieldy and computer techniques became available, new data processing and dissemination methods were required.

To support the data needs of its Member States, ICES established the Service Hydrographique, the first international/intergovernmental data centre. The Centre set standards and procedures for oceanographic data processing, routine editing and quality control of accessioned data, sorting of data suitable for future studies, and data analyses and established a policy of free or low cost access to its holdings.

During the planning for the International Geophysical Year (IGY) (1957-1958), the International Council of Scientific Unions (ICSU) called for the establishment of World Data Centres to collect, archive and disseminate internationally the data collected from all parts of the world. Initially, the chief responsibilities of the World Data Centres were to collect, archive and inventory data and to release copies of these to requesters in the form in which they were received. During 1960-61 two events had a major impact on the development of data exchange arrangements: the establishment of the IOC and the development of National Oceanographic Data Centres (NODCs).

Two World Data Centres were established in 1958 specifically for Oceanography: the WDC-A for Oceanography in the U.S.A. and WDC-B in the U.S.S.R. Both operate entirely at the expense of the host countries. Four existing international oceanographic data centres were recognized as special or regional data centres operating within the framework of the WDC system: the Service Hydrographique, funded by ICES (as a regional centre) in Denmark, the Permanent Service for Mean Sea Level (PSMSL) in the United Kingdom, the Fisheries Data Centre operated by the Food and Agriculture Organization (FAO) in Rome, and the International Hydrographic Organization in Monaco.

The World Data Centres met a longstanding need of the international scientific community for enhanced access to data, and it was decided to continue their operations beyond the completion of IGY.

Among IOC's first actions was the establishment of a Working Group (now a Working Committee) on International Oceanographic Data Exchange (IODE) responsible for establishing guidelines for exchange of data and information among member nations, by promoting the establishment of new NODCs and, in co-ordination with ICSU, for expanded exchange through the WDCs for Oceanography.

The data now on modern automated data processing equipment, with quality control and computed "derived" parameters, were made available to the WDCs for Oceanography. It quickly became apparent that most users preferred computer-generated listings, cards and tapes instead of reproductions of data reports and tables; furthermore, data in these forms proved to be generally less costly to WDCs for Oceanography. It was this experience that furnished part of the impetus leading to the RNODC concept.

The 1960s saw a rapid expansion of the network of NODCs, growing from two in 1961 to twelve by the end of that decade, with more known to be in the formative stages. During that time, the volume, diversity and complexity of oceanographic data increased rapidly, and oceanographic data telecommunicated in near real-time needed to be incorporated in IOC's data management scheme.

At its Fifth Session in 1970, the IODE began to study (a) ways of strengthening the two WDCs for Oceanography by drawing on the capabilities of some of the better equipped NODCs, and (b) ways of assisting developing Member States with data programmes, data processing, and services to enable them to obtain the full benefit of IOC's international co-operative programmes.

IODE's deliberations led to a proposal to establish a "Responsible" NODC network within the existing network of centres. The term "Responsible" was adapted from the "Responsible Member" scheme for climatological summaries among World Meteorological Organization (WMO) Member States. While the IOC and WMO schemes are only partly similar, the term "Responsible" suggests the voluntary assumption of specified responsibilities toward other data centres or their precursors. In this case, these responsibilities are designed primarily to help both the WDCs for Oceanography and IOC Member States with data processing, data exchange, and provision of data services.

During the 1970s, subsidiary bodies of IODE carefully elaborated the RNODC scheme and a pilot programme was implemented. At its Tenth Session in 1981, the Working Committee on IODE transformed the pilot programme into an operational network.

II. FUNCTIONS OF THE RNODC

During the development of the RNODC programme, when a number of oceanographic data centres in IOC Member States volunteered to carry out specific tasks assigned to RNODCs, it became clear that it was practical and compatible with the objectives of the scheme to allow national centres to specialize in functions for which they were best suited and which would benefit IODE and the WDCs for Oceanography. Thus the early concept of a number of RNODCs taking on the responsibility for a wide range of data processing services was replaced by RNODCs taking over specified tasks, either temporarily or permanently.

One of the main responsibilities of all types of RNODCs is to co-operate closely with the WDCs-Oceanography and to ensure regular shipments to the WDCs, at least once a year, of complete data sets for each past year for archiving and distribution so that the sets can be available, without considerable delay, at both centres. RNODCs would develop, as resources permit, suitable data summary and service capability free of charge or on a minimum-cost basis.

Types of RNODCs

Descriptions of presently envisaged types of RNODCs are as follows:

Data Type RNODC. This type of RNODC serves as a global centre of expertise and a "repository for a particular type of specialized oceanographic data such as subsurface currents, instrumented wave measurements, sea level and tidal data, marine biological data, marine pollution data, etc. To fulfil its responsibilities, the RNODC would inventory these data on specially developed inventory formats, publish inventories periodically, and provide answers to queries on data location. It would also act as a centre of expertise for these specialized data including their preferred mode of processing, validation and standard IODE-compatible formatting for archival and exchange. Whenever feasible, the RNODC for specialized data would acquire all exchangeable data of its type suitable for processing and archiving and establish a uniformly formatted data base with regional or global coverage on behalf of the WDCs for Oceanography.

Specific Project RNODC. This type of RNODC would assume responsibility for the collecting, processing, archiving and provision of services for agreed upon data types resulting from international co-operative ventures. Such a venture may be limited in time (e.g., FGGE) or acquire the status of a fully operational programme (e.g. IGOSS). In the case of ventures such as FGGE, the RNODC would phase out its work after the close of the project and deposit all data in the WDCs for Oceanography or possibly in another RNODC if, for example, special computer services were required. For ventures such as IGOSS, the RNODCs

supporting the programme could be expected to continue the RNODC functions indefinitely, even though the actual centre(s) involved may change identity. RNODCs for specific projects may, as agreed upon in project data management plans, perform additional services. Examples of such services are: reduction of raw data into adjusted data in physical units; application of sophisticated numerical validation techniques; creation of special data bases from subsets of the data collected, e.g. data interpolated to standard spaced grids; special inventories; rapid advance compilation of observational programme plans, etc. It is possible that RNODCs could require an acceleration in the flow of data through IODE channels and may need IOC concurrence to establish special data channels to serve the project. Any adjustment in the flow of data into the WDCs for Oceanography, such as delivery of the data both in routinely processed and specially processed form, would also need to be defined in the project data management plan.

Specific Region RNODC. In a region where a need exists, an RNODC can be established to function in the same manner as a Regional Data Centre, within IODE, but take on additional responsibilities such as data conversion into standard formats. Examples of RNODCs for a specific region are the RNODC-IOCARIBE and the RNODC-MEDALPEX, which were formed from Regional Data Centres with the concurrence of Member States. Another example is the RNODC-WESTPAC. Although perceived primarily as a regional RNODC, it can also be considered a Specific Project RNODC because WESTPAC is both a regional activity and an international programme. Another type of regional RNODC which may logically evolve is one that provides data services only, such as atlases or data summaries, for a specific region, but depends upon NODCs, RNODCs and the WDCs for the necessary data; i.e. it does not receive the data directly from Member States. This type of RNODC may be of value in regions where Member States have not called for the establishment of a regional RNODC with a greater range of functions.

Technical RNODC. A need is clearly developing for a type of RNODC that does not handle any data or inventories per se but serves as IODE's focal point for a technical component of the data exchange scheme. Thus, an RNODC for Formats serves, for example, as the authoritative centre for the latest status, correct usage and applicable standard codes for standard exchange formats used by IODE system participants.

As the RNODC scheme develops, great care must be taken within IODE's data network to define, case by case, the relationship between the regional RNODCs and the RNODCs for special data types and special projects. For instance, an agreement could be required on the disposition of inventories and special data collected in a regional context when a specialized RNODC exists. For example, instrumented wave data and IGOSS data would best be handled initially by specialized RNODCs for these data and then be made available to the regional RNODCs. In this case, it is important that the data originator not be required to send multiple copies of data to different international addresses. It is the responsibility of the IODE data centre network, through its exchange procedures, to feed the data into the appropriate data repositories.

IODE Hierarchical levels and the place of RNODCs in the IODE System

The IODE system can be thought of as subdivided into three hierarchical operational levels, each with specific functions.

The first operational level - data accumulation, recording of data on technical media in national formats, standardization, compilation of catalogues, and storage in the national repository is occupied by organizations such as National Oceanographic Data Centres or Designated National Agencies.

Responsible National Oceanographic Data Centres (RNODCs) operate at the second level - reformatting data from national into international standard formats, merging of national data into international general and specialized files, compilation of specialized catalogues, provision of data to participants in international projects, etc. The incompatibility among national oceanographic data formats, the increasing volumes of data, the complexity of processing of oceanographic data, and the emergence of large international projects (such as CARP, WESTPAC, "El Nino") contribute to the need for such services.

The third and top operational level - collection, storage and provision of oceanographic data, catalogues and other information to data users in different countries - concerns the World Data Centres A and B. Despite the efforts of the developing RNODC network, it is probable that diverse data will continue to arrive at the WDCs for Oceanography in non-standard formats and technical carriers and not be fully processed. No reason or impediment exists to discourage or prevent other Member States from offering assistance with the processing, quality control and conversion into standard format of data available to international exchange at this level.

Interspersed in the first two levels are other kinds of centres such as Permanent Services, Regional Data Centres, Analytical Centres and Special Data Centres.

The technological, hierarchical and operational position of RNODCs demonstrates their basic role in the IODE system, to provide assistance to the WDCs in compiling global oceanographic data bases. The appointment and functioning of the RNODCs in the IODE system strengthens the IODE/NODC system through utilization of national hardware and local capabilities for data processing. The use of RNODCs can also enhance the effectiveness of international groups of specialists in data management and exchange working on the development, co-ordination, standardization and approval of international data formats, computer programmes and methods of data control.

The role of RNODCs as technical assistants of WDCs for Oceanography defines the procedure of their subordination and reporting.

RNODCs operate following the guidance provided by Resolutions and Recommendations of the IOC governing bodies (Assembly and Executive Council), the Working Committee on IODE and its subsidiary bodies.

Bearing in mind that WDCs for Oceanography report annually on their activities to the Chairman of the IOC Working Committee on IODE and to the Secretary IOC, RNODCs are also requested to submit annual reports for study to the Chairman of the Group of Experts on RNODCs, the Secretary IOC and Heads of WDCs for Oceanography, who may solicit other assessments. The Group of Experts on RNODCs will make recommendations on ways to overcome any deficiencies or difficulties an RNODC may be experiencing in achieving its objectives.

RNODC Products and Services

The potential exists for an increased availability of services and products from the IODE system. Consequently, RNODC activities should not be regulated by fixed guidelines but should allow for each new RNODC to present a specific contribution to the exchange system according to its own sphere of responsibility, types of available services and duration of operation. Although some duplication and overlapping of data files may result, the net result of the RNODC scheme in the IODE system has to be highly beneficial, e.g., in the case of Regional and Specialized Data Centres for GARP, CICAR, CSK, CIM, FGGE and IGOSS.

With respect to the IODE system hierarchy, the following are examples of data management services that might be provided by the RNODCs at no charge, a nominal charge, or full cost recovery, as appropriate: - preparation of guidelines for data collection and transmission;

- compilation of planned work;
- accessioning and processing of inventory reports;
- accessioning of data, processing and quality control of data;
- conversion of data into standard IODE formats (e.g. GF-3) (may include conversion from hard copy);
- computation of derived parameters;
- special sorting, structuring of data bases or selection and design of subsets of data (plus provision of copies);
- general ad hoc advice and assistance on data and programming matters.

Examples of data products that might be provided:

- inventory reports, e.g., GODI, Guide to CICAR Data; -
- listings of processed data;

- statistical summaries in tabular form;
- numerical inventory plots of available data;
- geographic distribution of data by cruise, or of all archived data;
- data averages plotted numerically;
- computer contoured vertical and horizontal sections;
- publication of charts, atlases and tabular aids.

Comprehensive descriptions of oceanographic data and data product services that are obtainable from Member States are published by IOC and by ICES.

Training Offered by RNODCs

At the inception of the RNODC scheme, it was decided that RNODCs should devote some effort to the training of personnel associated with data activities in Member States. This decision was based on a realization that the strength of the IODE system as a whole, and thus its component RNODC scheme, rests on the ability of Member States to participate in the system and have the technical expertise to reap its full benefits. Training can be accomplished either at a specific RNODC (e.g., since 1970 the U.S. NODC has conducted extensive training in data management) or through regional seminars and workshops.

Training offered by the RNODC family could include elements of:

- data centre management
- data centre operation
- development of national arrangements to support a data centre - data processing
- data quality control
- computer operations
- computer programming for data processing and services
- design of data products, summaries and displays.

III. SELECTION AND DESIGNATION OF RNODCs

The procedures given here for establishing an RNODC are only guidelines, not strict rules. The steps taken to establish each new RNODC differ according to the interest of the applicant(s). There are two kinds of interest: the applicant wishes to become an RNODC, or seeks to have an RNODC established to meet a specific need.

1. Any NODC, DNA or other appropriate institution can apply for recognition as an RNODC. Any international organization, IOC subsidiary body or IOC Member State can request the establishment of an RNODC or RNODCs to serve a need.
2. All RNODCs operate within the IODE system and follow its established procedures.
3. An institution in an IOC Member State or an international organization wishing to become an RNODC submits to the Secretary IOC a "Letter of Intent" to act as an RNODC, giving a specification of the responsibilities it will carry out and details of its capabilities to provide the services.
4. An international organization, IOC subsidiary body or IOC Member State proposing the establishment of an RNODC submits a "Letter of Request" to the Secretary IOC. This serves to notify IOC of the applicant's interest in having an RNODC established to meet a specific need. The applicant also submits to the Secretary IOC draft TERMS OF REQUIREMENTS for the proposed RNODC. The Secretary IOC notifies IODE National Co-ordinators and IOC Member States of the request by a circular letter containing the TERMS OF REQUIREMENTS, as a means of soliciting offers to act as an RNODC, or comments on the TERMS OF REQUIREMENTS.

Any IODE Co-ordinator or institution of an IOC Member State that, in response to this circular letter, expresses its willingness to provide the required services, must submit a "Letter of Intent" to act as an RNODC with the responsibilities specified in the TERMS OF REQUIREMENTS, accompanied by a description of its capabilities to provide the services.

5. Draft proposals outlined in a "Letter of Intent" are evaluated by the Group of Experts on Responsible National Oceanographic Data Centres of the IOC Working Committee on IODE, assisted by the Directorates of WDC-A and WDC-B for Oceanography. Additional experts may be designated for any special case by the Chairman of the Working Committee on IODE.
6. Since the nature of RNODCs varies considerably, it is difficult to give specific guidelines to National Co-ordinators who wish to submit "Letters of Intent". Several options can be suggested. IODE National Co-ordinators may:
 - (a) offer to cover all of the TERMS OF REQUIREMENTS, or
 - (b) offer to meet some of the TERMS OF REQUIREMENTS, keeping in mind that others might offer to meet the remaining terms, or

- (c) modify the draft TERMS OF REQUIREMENTS, suggesting alternative methods to achieve the same objectives.
7. The expanded Group of Experts on RNODCs as specified in 5. above, reviews the TERMS OF REQUIREMENTS and prepares the final version in consultation with the applicant(s) and with the volunteering IOC Member State. Depending on the nature of the prospective RNODC, the following items could apply and should be included in the final version of the TERMS OF REQUIREMENTS:
- (a) background information on aims, scale, participants and nature of the programme or project;
 - (b) period of time for which the RNODC is being established;
 - (c) availability of automated oceanographic data processing capabilities, including both equipment features and qualifications of personnel involved in the pre-processing.
 - (d) capability in the use of IODE GF-3 format (see Manuals and Guides No.9, Annex 1) or other IODE standard formats where applicable for international oceanographic data exchange;
 - (e) volume and type of data and inventory lists that will be compiled in the RNODC;
 - (f) provision of samples of processed data and data products such as data reports, atlases, data analysis, data listings, maps, compilations, inventories, files, etc. related to the Terms of Requirements.
 - (g) time necessary to get output products;
 - (h) approved data/products flow between the RNODC and other data centres in the hierarchy of the IODE system;
 - (i) description of personnel training, if available, indicating methods, techniques and philosophy of handling and processing of oceanographic data.
8. The Chairman of the Group of Experts on RNODCs recommends to the Chairman of the Working Committee on IODE acceptance or rejection of the proposal submitted by an applicant. When more than one offer is submitted, the expanded Group of Experts recommends the offer that appears to best meet the needs of the IODE system.
9. The Chairman of the Working Committee on IODE, in consultation with the Secretary IOC, makes the final decision on whether to accept an applicant as an RNODC. In the affirmative, the Chairman requests the Secretary IOC to issue a formal "Letter of Accreditation" to the successful applicant to act as an RNODC for the stipulated period of time. Information on the newly accredited RNODC should be given wide dissemination by the IOC using all appropriate channels. The WDCs for Oceanography should be requested to include the information in appropriate publications.

APPENDIX 1. EXISTING RNODCs

A number of RNODCs have been established and have begun operations since the beginning of the implementation of the RNODC scheme. Below is a summary of existing RNODCs with brief information on services they provide:

RNODC-FOY: Operated by the U.S. NODC in collaboration with BNDO in France. This RNODC compiles project and data inventories (GODI) and a GF-3 formatted data base of physical oceanographic data collected during the FGGE Operational Year (November 1978-March 1980). RNODC-FOY completed publication of two editions of GODI which include 2000 data sets already collected. With the completion of FGGE its operations are being phased out and data will be deposited in the WDCs for Oceanography. The final FGGE oceanographic data base in GF-3 is scheduled for completion in December 1983.

RNODC for IGOSS (BATHY and TESAC): Operated by NODCs of Japan, U.S.A. and U.S.S.R. These centres process and provide long-term archiving of telecommunicated data obtained from the IOC/WMO IGOSS programme and provide limited services on request.

RNODC IOCARIBE: Operated by the U.S. NODC. This is a continuation of the U.S. NODC's Regional Data Center for CICAR and IOCARIBE. Functions are assistance to Member States with processing of data in the IOCARIBE region and service from contemporary and historic data bases.

RNODC CIM: Operated by NODC of U.S.S.R. As of July 1981 the Centre had collected data from 97 cruises performed in the CIM period. "Data Report of CIM" is being published regularly. The Centre is able to disseminate data on magnetic tapes in GF-3 format.

RNODC MEDALPEX: Operated by NODC of U.S.S.R. since the commencement of the programme in 1981. Due to the short period of the experiment it is planned that the complete MEDALPEX data base will be developed by 1984. To the end of 1982 the Centre received about 4000 messages containing different kinds of oceanographic data that is recorded on magnetic tapes.

RNODC Formats: Operated by the Service Hydrographique of ICES from the end of 1981. The Centre provides services regarding GF-3 to other oceanographic data centres in IOC and ICES Member States and acts as an archive centre for international marine environmental data formats, maintaining a full set of documentation on all such formats.

RNODCs for MAPMOPP: Operated by NODCs of Japan and U.S.A. between 1974 and 1981. These centres process, archive and provide services from data collected world-wide under the IOC/WMO Marine Pollution Monitoring Pilot Project. The project has come to an end and the data files are closed except for a special regional MAPMOPP programme "CARIPOL" handled by the RNODC IOCARIBE. JODC reviewed MAPMOPP data collected in the period specified above and sent these data on a magnetic tape to the WDCs for Oceanography.

RNODC FOR MARPOLMON-P: U.S. NODC has agreed to function as an interim RNODC for the Marine Pollution Monitoring-Petroleum project. JODC showed readiness to play the role of this type of RNODC for the WESTPAC region. A permanent RNODC for other regions of the World Ocean to handle pollution data to be generated by the MARPOLMON programme remains to be established.

RNODC Waves: Operated by MIAS, U.K., with the advice of PIANC. This centre presently compiles comprehensive inventories of instrumented wave data using a standard reporting form and world-wide community of national co-ordinators for wave data. It publishes a catalogue of wave data. Efforts are under way by the RNODC Waves to begin compilation of a data base of actual wave data and to advise IODE activities on wave data management.

RNODC WESTPAC: Operated by JODC since the commencement of the programme. RNODC compiles and processes data gathered during WESTPAC cruises. RNODC compiled and printed a "WESTPAC Data Management Plan" and publishes on a regular basis "RNODC Newsletter for WESTPAC". Another activity of the centre is a short-term training course on data management for data managers from the region.

APPENDIX 2. SAMPLES OF PRODUCTS AND SERVICES OF EXISTING RNODCs

CAPTIONS

- Sample 1. GODI Data Set Description (USA)
- Sample 2. Sea Surface Temperature (USSR)
- Sample 3. 0 Meter Annual Average Density (Sigma-t) (USA)
- Sample 4. Distribution of Tar in the Western North Pacific:
 A. Summer 1977. B. Winter 1978
 C. Summer 1978 D. Winter 1979 (Japan)
- Sample 5. MIAS Catalogue of Instrumentally-measured
 Wave Data Descriptions (U.K.)
- Sample 6. Temperature (OC), 200m, April-June 1977 (Japan)
 (modified from IGOSS)
- Sample 7. Sea Surface Temperature Anomaly (from drifting buoys)
 (modified from IGOSS) (Canada)

DATASET DESCRIPTION

PART OF FGGE IIc

**TEMPERATURE, SALINITY AND CONDUCTIVITY CTD'S AT 10 STATIONS
6 TIMES A DAY IN THE PHILIPPINE SEA.**

PRINCIPAL INVESTIGATOR: ASAI, T.
UNIVERSITY OF TOKYO
OCEAN RESEARCH INSTITUTE
1-15-1, MINAMIDAI, NAIKANO-KU
TOKYO 164
JAPAN

GEOGRAPHIC AREA AND DESCRIPTION:

PHILIPPINE SEA, FROM NEW GUINEA TO JAPAN

TOP LATITUDE: 35° - 0' N LEFT LONGITUDE: 130° - 0' E
BOTTOM LATITUDE: 2° - 0' S RIGHT LONGITUDE: 150° - 0' E

TIME OF OBSERVATIONS:

STARTING DATE: 1 MAY 1979 HOUR: 0
ENDING DATE: 9 JUNE 1979 HOUR: 23

PROJECT/CRUISE INFORMATION:

PROJECT: GARP-MONSOON EXPERIMENT (MONEX)
STATUS: PLANNED
DOCUMENTATION: PRE-FIELD PLAN

SHIP: HAKUHO MARU
CRUISE: KH-79-2

***** PARAMETERS *****

PLATFORM: SHIP

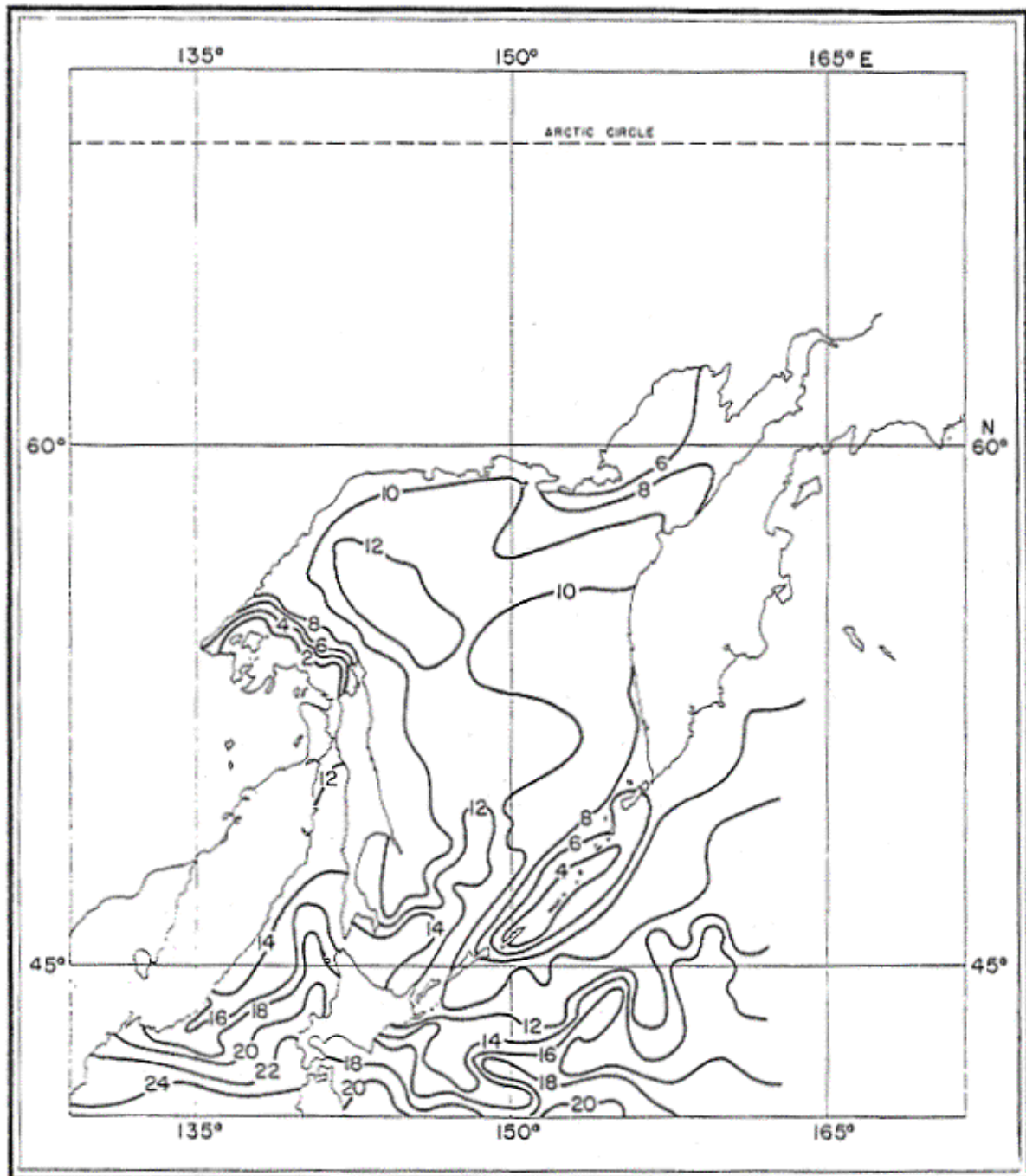
1) SALINITY	(WATER)	UNITS: PPT
METHOD: STD SALINITY		FREQUENCY: 6/DAY
2) TEMPERATURE	(WATER)	UNITS: DEG
C METHOD: RESISTANCE THERMOMETER (STD AND CTD)		FREQUENCY: 6/DAY
3) TEMPERATURE	(WATER)	UNITS: DEG
C METHOD: XBT		FREQUENCY:
SECTION		
4) CONDUCTIVITY(ELECTRICAU	(WATER)	UNITS:
MMHOS/CM		
METHOD: IN SITU CONDUCTIVITY/TEMP CORRECTED (CTD)		FREQUENCY:
6/DAY		

PROCESSING CENTER CONTACT:

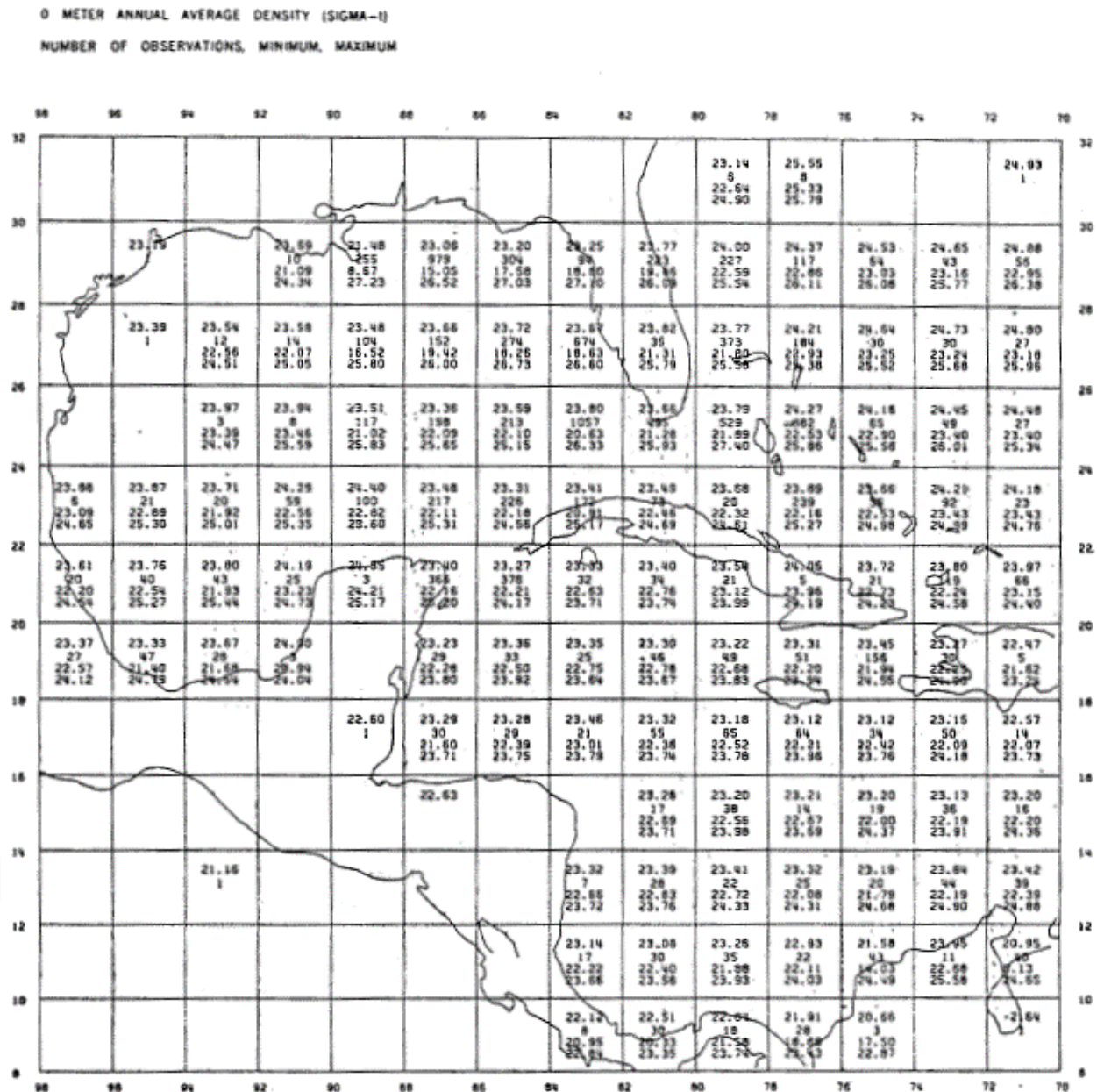
TAKEUCHI, K.
CENTER
UNIVERSITY OF TOKYO
OCEAN RESEARCH INSTITUTE
1-15-1, MINAMIDAI, NAIKANO-KU
TOKYO 164
JAPAN

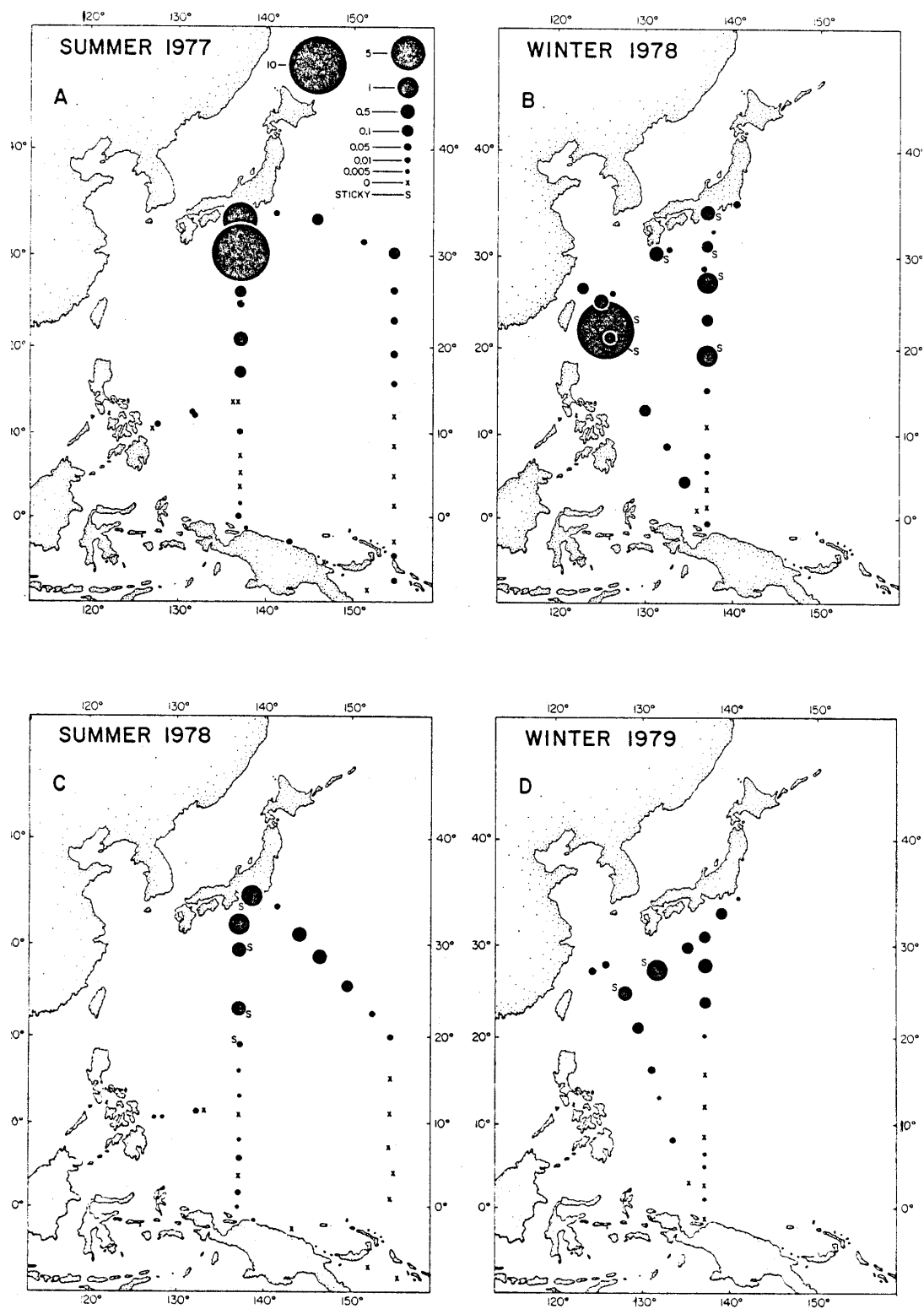
HOLDING CENTER:

JAPAN OCEANOGRAPHIC DATA
HYDROGRAPHIC DEPARTMENT
MARITIME SAFETY AGENCY
NO.3-1, TSUKIJI 5-CHOME, CHUO-KU
TOKYO
JAPAN



Sample 2. Sea Surface Temperature (USSR)





Sample 4. Distribution of Tar in the Western North Pacific (Japan)

MIAS REF. 411

SQUARE 0522 68

LOCATION

Position: 33°58'44" S 151°13'14" E
 Location: Revetment 115, Botany Bay, New South Wales, Australia. Sea area: Tasman Sea.
 Period covered: Start date: 01 Apr 1971 End date: Continuing *
 Mean water depth: 4 m
 Mean tidal range: 1.32 m (Spring) 0.83 m (Neap)
 Maximum currents: m/sec.
 Local environment: Sandy sea' bed.

INSTRUMENT

Instrument type: Waverider
 Type of mounting: Elastic mooring
 Sample frequency: 2 Hz.
 Record duration: 20 min.
 Record interval: 6 hr.

REASON FOR RECORDING

Port development.

DATA

Success rate: 87% to 95% of possible records were taken.
 Processed data: Listings as printout or on punched paper tape; Tz, Tc, Hs, Hrms, Energy, Hmax, Epsilon, (for all recordings).
 Presentations: Spectral analysis and peak period of spectrum (selected recordings only).

REPORTS See Appendix C.

REPORTS

NOTES

Hydraulic Mode 1 of Botany Bay.
 * Continuing as of June 1979.

DATA CONTACT

Maritime Services Board of New South Wales, New South Wales, Australia.

MIAS REF. 412

SQUARE 0522 68

LOCATION

Position: 33°58'53" S 151°12'58" E
 Location: Revetment 117, Botany Bay, New South Wales, Australia. Sea area: Tasman Sea.
 Period covered: Start date: 01 Apr 1971 End date: Continuing *
 Mean water depth: 10 m
 Mean tidal range: 1.32 m (Spring) 0.83 m (Neap)
 Maximum currents: m/sec:
 Local environment: Sandy sea bed.

INSTRUMENT

Instrument type: Waverider.
 Type of mounting: Elastic mooring
 Sample frequency: 2 Hz.
 Record duration: 20 min.
 Record interval : 6 hr.

REASON FOR RECORDING

Port development.

Success rate: 87% to 95% of possible records were taken.
 Processed data: Listings as printout or on punched paper Tz, Tc, Hs, Hrms, Energy, Hmax, Epsilon, (for all recordings).
 Presentations: Spectral analysis and peak period of spectrum (selected recordings only). .

REPORTS See Appendix C.

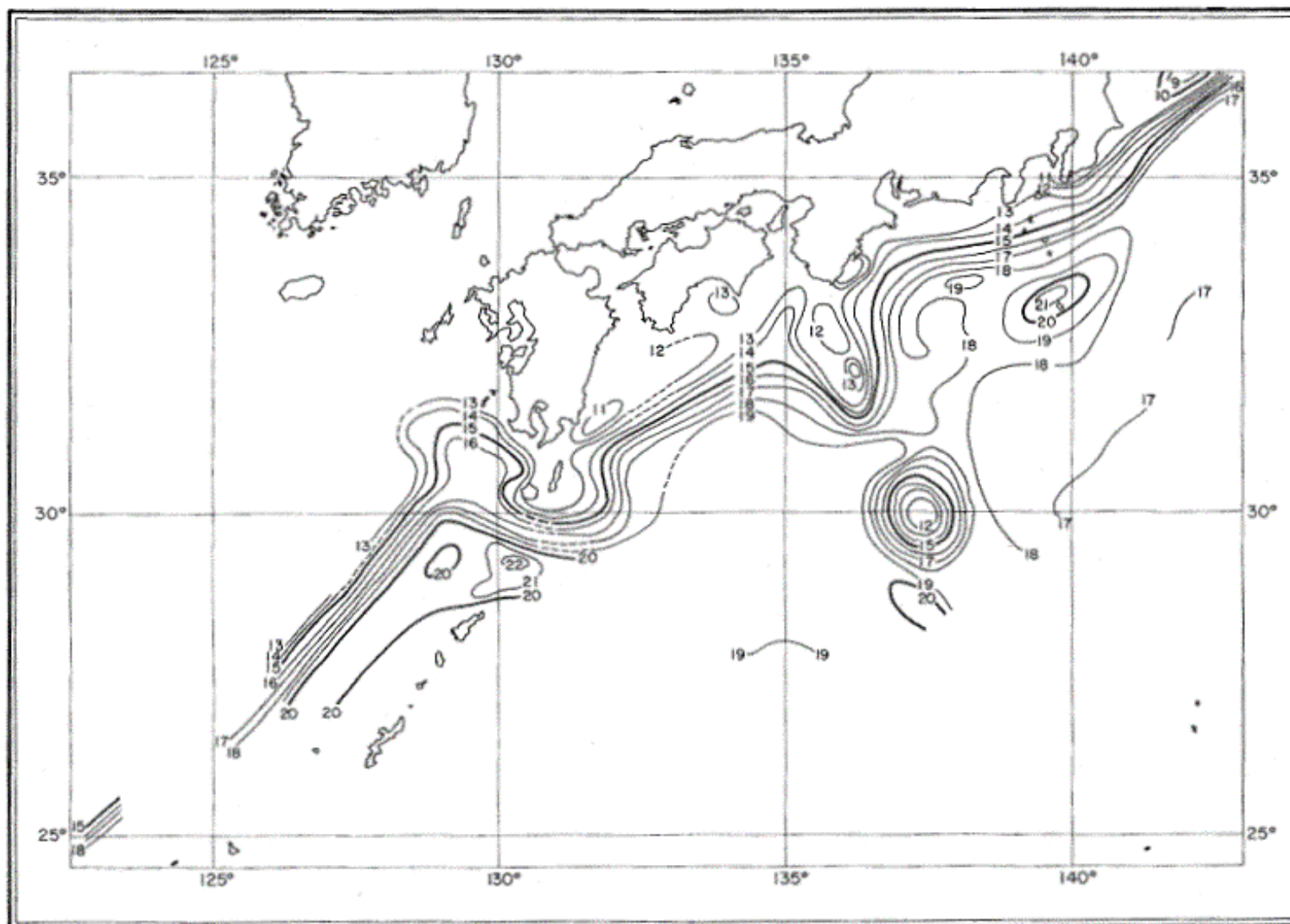
NOTES

Hydraulic Mode 1 of Botany Bay.
 * Continuing as of June 1979.

DATA CONTACT

Maritime Services Board of New South Wales, New South Wales, Australia.

Sample 5. MIAS Catalogue of Instrumentally-measured Wave Data Descriptions (U.K.)



Sample 6. Temperature (°C), 200m April-June 1977 (Japan) (modified from IGOSS)



Sample 7. Sea Surface Temperature Anomaly (from drifting buoys) (Canada)
(modified from IGOSS)

APPENDIX 3. LIST OF ACRONYMS

BATHY	-	Bathythermograph Report Format, Designator for Radio Message
BNDO	-	Bureau National des Donneés Oceaniques
CAR IPOL	-	IOCARIBE's Marine Pollution Programme
CICAR	-	Co-operative Investigation of the Caribbean and Adjacent Regions
CIM	-	Co-operative Investigations in the Mediterranean
CSK	-	Co-operative Study of the Kuroshio and Adjacent Regions
DNA	-	Designated National Agency
EDIS	-	Environmental Data and Information Service
FAO	-	Food and Agriculture Organization of the United Nations
<i>FGGE</i>	-	First GARP Global Experiment
<i>FOY</i>	-	<i>FGGE</i> Operational Year
GARP	-	Global Atmospheric Research Programme
GF-3	-	IOC General Format 3
GIPME	-	Global Investigation of Pollution in the Marine Environment
GODI	-	Global Ocean Data Inventory
ICES	-	International Council for the Exploration of the Sea
ICSU	-	International Council of Scientific Unions
IG/GCI	-	International Geological/Geophysical Cruise Inventory
IGOSS	-	Integrated Global Ocean Services System
IGY	-	International Geophysical Year (1957-1958)
IHO	-	International Hydrographic Organization
IOC	-	Intergovernmental Oceanographic Commission
IOCARIBE	-	IOC Association for the Caribbean and Adjacent Regions
IODE	-	International Oceanographic Data Exchange
JODC	-	Japan Oceanographic Data Centre
MAPMOPP	-	Joint IOC/WMO Marine Pollution (Petroleum) Monitoring pilot Project
MARPOLMON	-	Marine Pollution Monitoring Programme (IOC/GIPME)
MEDALPEX	-	Mediterranean Alpine Experiment
MIAS	-	Marine Information and Advisory Service
NODC	-	National Oceanographic Data Centre
PIANC	-	Permanent International Association of Navigational Congresses
PSMSL	-	Permanent Service for Mean Sea Level
RNODC	-	Responsible National Oceanographic Data Centre
ROMBI	-	Reports of Marine Biological Investigations

ROSCOP	-	Report of Observations/Samples Collected by Oceanographic Programmes
TESAC	-	Temperature, Salinity, Currents Format, Designator for Radio Message
WDC	-	World Data Centre
WESTPAC	-	IOC Working Group for the Western Pacific
WMO	-	World Meteorological Organization