

**Intergovernmental Oceanographic Commission  
(Five years of work)**



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## PART I

### INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

#### Short history and description of current operations

Most countries of the world either border on the sea or have maritime interests. Even those countries having no coastline are concerned, as the sea affects weather, provides avenues for international trade, and abounds in exploitable resources. In many countries, however, oceanographic research is insufficiently developed and, due to lack of adequately-trained personnel and co-ordinated research activities, the potential for utilization of the ocean's resources is never realized.

While for a long time there has existed a great number of international organizations dealing either with regional or applied oceanographic problems, by the end of the preceding decade no single organization was taking full responsibility for international co-ordination of oceanographic research in the widest possible sense, with a view to repairing the situation just described. But the need was in the air ...

That is why the modest proposition to engage in "the joint operation by interested Member States of international research and training vessels for exploring the oceans more systematically than hitherto, for stimulating efforts in this direction, and for training specialized research personnel", formulated in 1958 by the tenth General Conference of Unesco, developed later into a large and dynamic enterprise which came into being in 1960 as the Intergovernmental Oceanographic Commission.

#### INTERNATIONAL VESSEL vs. INTERNATIONAL CO-ORDINATION

Scientists who gathered at Unesco House in March 1960<sup>(1)</sup> to discuss the proposition reasoned that: One international research ship for the vast stretch of 71% of the earth's surface would be just like one more drop of water in the ocean. The same or even less funds spent on co-ordination of national efforts (as IGY had already shown) would produce better results.

Thus, the eleventh General Conference established under the aegis of Unesco the Intergovernmental Oceanographic Commission whose Statutes state:

"The purpose of the ... Commission shall be to promote scientific investigation with a view to learning more about the nature and resources of the oceans through the concerted action of its members."

Now in the fifth year of the Commission's existence, with its membership comprising 55 governments, it is perhaps time to take a look at what has been done and see whether scientists' reasoning was correct.

#### INTERNATIONAL EXPEDITIONS

So far there have been three large-scale international expeditions<sup>(2)</sup> co-ordinated by the IOC:

(a) International Indian Ocean Expedition (1959-1965)

23 participating countries (14 of which ship-operating), 40 research vessels, 180 research cruises of varying duration and complexity.

(b) International Co-operative Investigations of the Tropical Atlantic (1963-1964)

Three stages ("EQUALANT I, II and III"), eight countries, 13 ships, 36 research cruises.

(c) Co-operative Study of the Kuroshio and Adjacent Regions of the Pacific (First stage: July 1965; Second stage: January 1966)

Eight countries, 36 research vessels, 36 cruises.

(1) Preparatory meeting for the Intergovernmental Conference on Oceanographic Research (INCOR), Paris, Unesco, March 1960.

(2) More detailed accounts are given further on in the booklet.

Altogether there have been approximately 250 scientific cruises with a very wide geographical coverage. Surely the number of cruises which one international research vessel might have carried out during the same five years could not stand comparison with the scope of work accomplished through the IOC's co-ordination of national efforts. Nor could it match the latter in terms of geographical coverage.

Unesco spends \$50,000 to \$80,000 annually on the Secretariat of the Commission, relevant meetings and publications, while the total national funds involved in co-operative field investigations amount to something like \$10 to \$20 million each year. It is left to Unesco to contribute towards preparing and publishing atlases and data reports based on the observations made and to issue "Collected Reprints" of scientific papers, as is already being done for the IIOE<sup>(1)</sup>.

No doubt one may attach a certain moral value to an international oceanographic vessel which, by visiting the ports of various developing countries

would bring to them a positive example of international co-operation. But the activities of the Intergovernmental Oceanographic Commission have provided more such examples. The Indian Ocean Biological Centre, organized in Cochin, India, through agreement between Unesco and the Indian Government, is one of these. Staffed with Indian scientists, supervised by an International Co-ordinator, and equipped with scientific instrumentation supplied by Unesco, this Centre maintains the first international collection of zooplankton open to all marine biologists of the world to study. The way this collection is being compiled is particularly instructive: Ships of countries participating in the Indian Ocean Expedition contribute to the Centre parts of their plankton collections taken with a specially-designed standard net. This, in a way,

(1) "Collected Reprints of the IIOE" Intergovernmental Oceanographic Commission, Unesco, Vol. I, 915 pp., Vol. II, 672 pp., 1965, Vol. III, 984 pp., 1966.

Photo : Unesco



France-Paris  
Unesco House - October 1961  
Opening of the 1st session  
of the Intergovernmental  
Oceanographic Commission.

Photo : Unesco



France-Paris  
Unesco House - October 1961  
Meeting of the  
Intergovernmental  
Oceanographic Commission.

reflects the general procedure governing today's international oceanographic co-operation. Countries contribute their share of oceanographic observations to world data centres - which have been working since the IGY - through which data become available to the oceanographic community.

#### DATA EXCHANGE

Efficient organizing of data exchange was particularly important for the success of the co-operative expeditions. But the Commission went further in requesting member governments to consider whether they could make available to the oceanographic community the data resulting from their national research activities non-related to the co-operative programmes. Governments were called on to declare open certain parts or the whole of their national programmes for free use of results by scientists of other countries. This decision called for revision of the rules governing international exchange of oceanographic data as established at the time of the International Geophysical Year. So a new set of rules reflecting the new situation was prepared. This also prompted publishing by Unesco of the quarterly newsletter "International Marine Science" (prepared jointly with FAO). In accordance with the above set of rules "declared" national programmes consist of lists of research cruises, either planned for a certain period of time ahead or already implemented in the past, and/or lists of other national oceanographic activities resulting or expected to result in oceanographic data specified in the agreed list. Such "declared" national programmes are communicated to the IOC Secretariat with a statement of declaration and in the format employed by the "International Marine Science". Data resulting from such "declared" programmes are then exchanged in accordance with provisions of the guide established by the IOC.

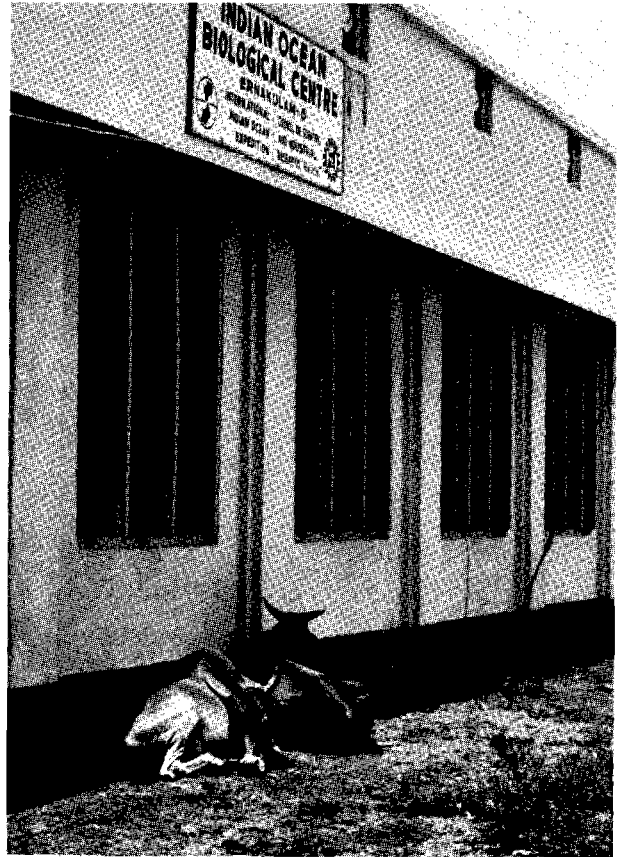
Agreement to exchange information and data on the national programmes so declared is an entirely new form of co-operation between the Commission's member governments.

#### CO-OPERATION BETWEEN MEMBERS OF THE COMMISSION

Organization of this co-operation is, technically, not an easy task. Even with all the willingness of governments to co-operate, the interests of individual scientists and the programmes of various institutions involved are very often so conflicting that to arrive at a co-ordinated scientific programme is sometimes a long and arduous process. The experience of the Commission has shown that unless an international expedition is planned as a co-operative venture from the very beginning its further co-ordination cannot be very efficient.

There are, however, certain aspects of work where smooth co-operation is more easily achieved. Building up of the IOBC plankton collection is one

Photo: Unesco/G. Hempel



India-Cochin-1965. Unesco-supported Indian Ocean Biological Centre. The Centre stores and processes marine biological samples gathered during the International Indian Ocean Expedition (I.I.O.E.)

Photo: Unesco/Ministry of Information Government of India



India-Cochin-1963. International Indian Ocean Expedition. At the Indian Ocean Biological Centre, specialists can be seen examining samples taken from the Ocean.

example. It has also become current procedure with international expeditions that the governments of participating and bordering countries grant to the research vessels engaged in such operations special port and customs facilities, e. g. exempting taxes, reducing charges and providing free services where possible. This alone tends to reduce the usually high cost of oceanographic work, not counting the much greater profit from the pooling of efforts in pursuit of a common goal.

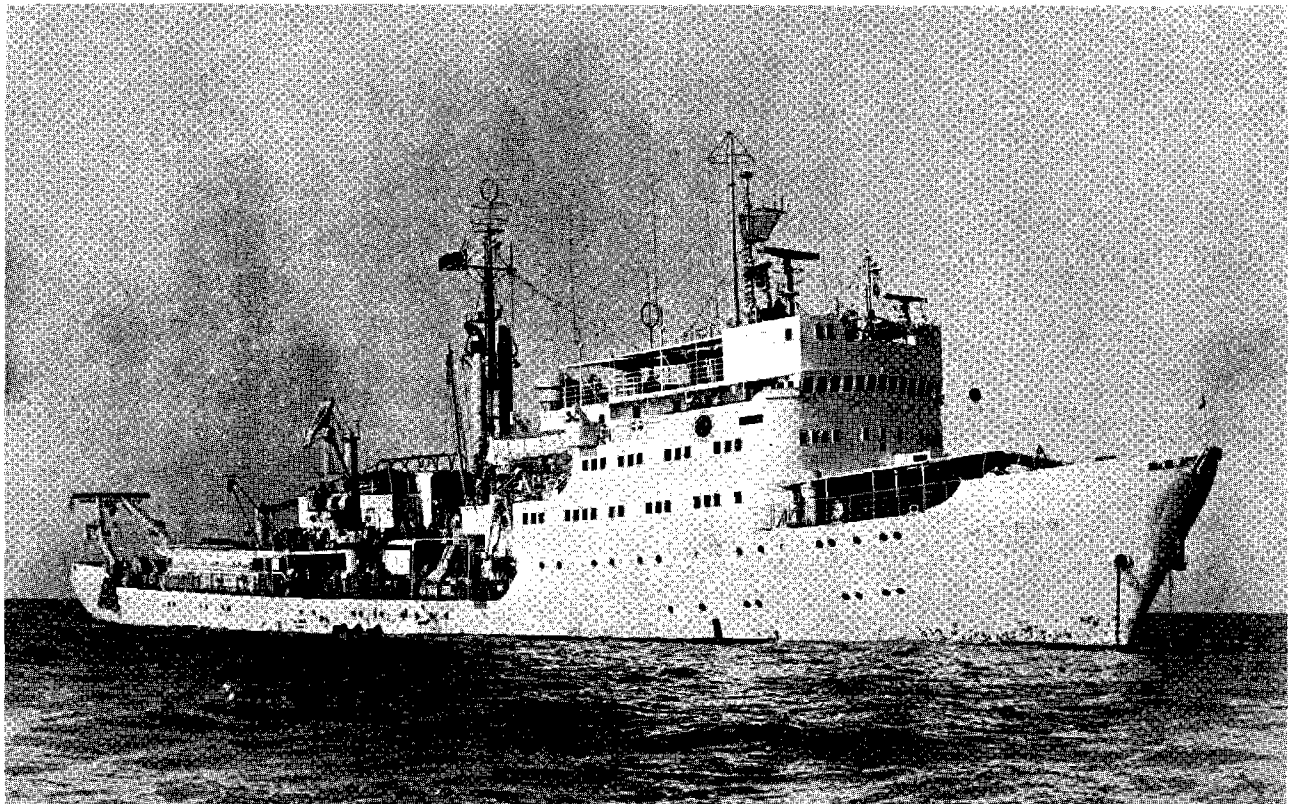
This pooling of efforts is profitable for other reasons besides a simply arithmetical one. It goes without saying that ten ships in a given area can accomplish ten times more work in a given period of time, or can accomplish a particular scientific task ten times quicker than one ship. But some scientific investigations cannot be accomplished successfully other than in a very short time and it follows that if their geographical scale is large they are then outside the possibilities of a country having only one or two research ships. A co-operative effort by a number of countries is the only way to accomplish such investigations. Thus the effect of pooling of efforts is not simply arithmetical but also scientific in that it permits study of such scientific problems as can be studied only through a multi-ship synoptic approach.

The significance of this co-operation does not stop with sharing amongst participating countries the information and data obtained. As soon as knowledge is accumulated various areas of application of this knowledge become evident and also become objects of national attention.

#### FURTHER ADVANTAGES TO BE GAINED FROM CO-OPERATION AND MUTUAL ASSISTANCE

One of the major preoccupations of the Commission is to make all its activities interesting and useful to its members so as to provide as much help as possible in the development of their national oceanographic programmes. In this the Commission's work has already been of value to a number of countries who have seized the numerous opportunities offered to build up the national element in their oceanographic research. For example, the national oceanographic programmes of both the United States and the USSR were considerably strengthened to meet the demands of the new large-scale co-operative expeditions of the IOC. The Government of India is developing, on the basis of its participation in the International Indian Ocean Expedition, its own National Oceanographic Institute. The Federal Republic of Germany acquired for the International Indian Ocean Expedition a new modern research vessel "METEOR". Numerous countries have established a national oceanographic data centre.

These are, of course, merely a few examples of the "by-products" of international co-operation. Their scale and impact depend very much on the degree of voluntary involvement of each member. The Commission therefore is constantly seeking ways and means by which this involvement - so beneficial for the countries themselves - may be further increased. To conduct this search the Commission created its Working Group on Mutual Assistance.



Planning of this Group's work was facilitated by the fact that, on the initiative of IOC members, numerous examples of mutual assistance already took place during recent years. The Government of Canada, for example, offered a number of tide gauges for installation by interested member countries. Applications for these tide-gauges were collected by the Secretariat and examined by the Permanent Service for Mean Sea Level. Tide gauges were then shipped to those countries whose requests were approved and subsequently installed. Brazil, Japan, USSR, U.S.A. and other countries offered places aboard their research vessels participating in cooperative expeditions to scientists and students of other countries.

However, the Commission went further and collected national reports on the actual status and needs for development of oceanography in every country. These reports were analysed by an expert invited by the Commission. The Working Group will study this analysis and associated proposals and will, it is hoped, come up with a plan for concerted actions in the domaine of mutual assistance. It is natural that this search brings IOC's activities into close relation with the oceanographic programme of Unesco and related programmes of other international agencies more specifically devoted to various aspects of technical assistance.

#### CO-OPERATION BETWEEN INTERNATIONAL BODIES

From the very outset the Intergovernmental Oceanographic Commission established close working relations with such United Nations agencies as FAO, whose primary interest lies in fishery resources of the ocean, with WMO, whose emphasis is on



Photo: Tass - USSR

During the meeting of the IOC working Group on Ocean Data Stations March 1966



IOC working Group in session March 1966

Photo: Tass - USSR



weather forecast, with IMCO, whose competence lies in the field of navigation and maritime safety, and with IAEA and WHO, whose responsibilities embrace various aspects of marine pollution, etc.

Co-operation with regional oceanographic organizations is one of the important elements of the Commission's work. Only by correlation of IOC's responsibilities with regional initiatives and activities of such organizations as the International Council for the Exploration of the Sea, the International Commission for the Scientific Exploration of the Mediterranean, the International Commission for the North West Atlantic Fisheries, etc., can adequate coverage of the World Ocean, both geographically and subject-wise, be ensured.

Through its close work with other agencies of the United Nations system and other international organizations, the Commission became a useful mechanism for solving, at intergovernmental level, such problems of scientific development as were too complicated to hope to resolve previously for any one scientific institution or any one government acting independently.

One of the problems of international character successfully resolved through co-operation between international agencies was the reaching of agreement on the marking of oceanographic buoy stations in the ocean for easy identification and safety purposes. Similarly successful co-operation is now developing in the field of co-ordinated sea level observations in the open ocean, in seeking radio frequencies for oceanographers' use, in studying air-sea interaction, and in countering the menace of marine pollution. To co-ordinate application of the increasing abundance of knowledge of the ocean and its further international exploration, a sensible division of responsibility among existing international organizations is a most essential prerequisite. For this purpose, the ACC Sub-Committee on Oceanography was created within the United Nations system and has been functioning now for four years.

The Commission is also aware of the great complexity of the existing system of international organizations dealing with marine sciences. It is natural that because of this complexity quite a number of oceanographers have to serve in several capacities in a number of different international organizations, which leads both to over-burden of work and very often duplication of effort. On the one hand this situation occurs because oceanographers are in general not numerous in the world, but on the other hand because, so far, no steps have been undertaken to rationalize the existing system of international bodies. It may happen that the IOC, jointly with other organizations, will look into the matter.

There is also a system of scientific advisory bodies which help the Intergovernmental Oceanographic Commission to act with authority on scientific matters.

## ADVISORY BODIES TO THE COMMISSION

These are two: the Scientific Committee on Oceanic Research of ICSU (also advisory body to Unesco), and the Advisory Committee on Marine Resources Research of FAO (also advisory body to FAO).

SCOR was initiator of the International Indian Ocean Expedition as well as organizer of the First International Oceanographic Congress (New York, 1959). The interrelationship of the activities of SCOR on the one hand, and of the IOC and Unesco on the other, is much more complex than simply a giving and taking of advice. SCOR, being non-governmental and having close contacts with a great many working scientists, represents an active unit where actual international scientific co-operation develops. It happens frequently that useful ideas and suggestions coming through IOC channels from governments cannot be implemented any other way but through SCOR and its working groups. Thus very important work on intercomparison and standardization of methods and techniques in oceanography, originally inspired by the IOC, is now being carried out by a number of groups of scientists selected and supported mainly by SCOR.

The ACMRR is a considerably more recent institution, created to ensure that fisheries interests are taken into account when basic studies of the ocean are planned by governments associated with the IOC.

One particularly important product of IOC's co-operation with its advisory bodies was the preparation and publishing of the "Draft of a General Scientific Framework for World Ocean Study"<sup>(1)</sup>. This document was conceived "as a basis for developing various national, regional and world-wide international programmes for ocean investigations"<sup>(2)</sup>. The draft was prepared through collaboration of several groups of authors associated with both SCOR and ACMRR and, after being published in all four languages of the IOC, was discussed and revised by the joint working group composed of all interested organizations. Finally the document developed into a very broad survey of the actual state and perspectives of future development of marine science. It was found to be of use to the research worker, the teacher of post-graduate students and, of course, to students themselves.

## CONCLUSION

Summarizing what is written above, one may recapitulate the Commission's aims as stimulation of national interest in oceanography, development of oceanographic research, both national and co-operative, and, finally, learning more about the

(1) "Draft of a General Scientific Framework for World Ocean Study". Intergovernmental Oceanographic Commission, Unesco, 1965.

(2) IOC resolution II-2, document UNESCO/NS/180 Annex I, p.14.

ocean, the processes and resources therein. These are the main reasons for such intensive international co-operation in oceanography as is presently going on. But there is one more thought which probably every oceanographer would like to interject into any consideration of international marine science, namely, that scientific knowledge, economic and other gains forthcoming from man's mastery of the ocean, may be no less impressive than those from the mastery of outer space. The keys to many cosmological problems, particularly those of the

earth's origin and evolution, lie in and beneath the oceanic abysses.

While, on the face of it, the work of the Intergovernmental Oceanographic Commission appears to progress in a rather matter-of-fact and routine way, certainly less spectacularly than the recent, rather limited, efforts of the International Geophysical Year, it is to be hoped that one day the scientific results of the Commission's work will receive their due share of public interest and attention.

## PART II

### INTERNATIONAL EXPEDITIONS

#### THE INTERNATIONAL INDIAN OCEAN EXPEDITION 1959-1965

Inception. The idea for a large-scale oceanographic study of the entire Indian Ocean was first considered in 1957. At that time the Scientific Committee on Oceanic Research (SCOR) assumed the task of developing a co-ordinated study of the Indian Ocean. Various working groups were formed and many ideas were put forward. Initially, a synoptic survey was suggested, but later an exploratory programme was adopted which allowed individual scientists to carry out their own specialized programmes of interest.

The Scientific Committee on Oceanic Research appointed Mr. Robert Snider (U.S.A.) as its IIOE Co-ordinator. In the initial stages of the expedition, Mr. Snider visited many countries, stimulated interest and helped with the developing of plans for participation. As the cruises progressed he produced composite track charts of completed and anticipated cruises. The following is a list of countries participating in the expedition:

Countries participating:

Ship-operating countries: Australia, France, Germany (Fed. Rep.), India, Indonesia, Japan, Pakistan, Portugal, Republic of South Africa, Thailand, USSR, United Kingdom, United States of America.

Other participants: Burma, Ceylon, China, Ethiopia, Israel, Italy, Malagasy Republic, Federation of Malaya, Mauritius, Sudan.

IOC Co-ordination. The expedition evolved into a large international enterprise and, in late 1960, Unesco agreed to co-sponsor the expedition. At the same time, the Intergovernmental Oceanographic Commission and the Office of Oceanography were established within the framework of Unesco. Under Unesco, special customs facilities and courtesies were arranged for ships and personnel of the expedition. The expedition co-ordination was assumed by the IOC Secretary. This co-ordination is carried on through various working groups and through the

IOC Information Paper issued by Unesco. Plans of activities are supplied by participants usually through National Co-ordinators for IIOE.

The advisory rôle on aspects of the expedition remained with SCOR and, to carry out this responsibility, SCOR appointed a small group of scientific disciplinary experts concerned with the expedition. They were:

Professor J. Krey (Germany): phytoplankton, zooplankton, primary production, pigments;

Professor L.A. Zenkevich (USSR): benthos, mid-water and deep fauna;

Professor P. Tchernia (France): dynamic and circulation chemistry.

In addition, Dr. R.L. Fisher was requested to consider geological and geophysical aspects of the expedition. The task of these experts was to review and evaluate the IIOE programmes in their respective fields and to advise on future studies.

International centres. An important outcome of the expedition has been the formation of the first international sorting station for zooplankton samples. This was developed on the advice of the IIOE biological working group of SCOR. Following an agreement between Unesco and the Indian Government, the station known as the Indian Ocean Biological Centre was established in 1963 at Ernakulam, South India, Dr. V. Hansen (Denmark) was appointed by Unesco as its first international curator. Dr. Brinton (U.S.A.) took over this responsibility in 1965. A consultative committee of IOBC, which is nominated by Unesco, meets periodically and advises on a general outline of the work to be carried out at the centre. Participants send plankton samples collected with a standard IIOE net to the centre where they are sorted for later analysis by local and international experts.

The international meteorological programme of the expedition was worked out at a meeting convened by SCOR and IOC in the middle of 1961. This

programme was facilitated by the establishment of the International Meteorological Centre which was set up at Bombay under a United Nations Special Fund Project, with the World Meteorological Organization (WMO) as executing agency for the project. Dr. C. Ramage (U.S.A.) was appointed as International Scientific Co-ordinator for Meteorology with headquarters at IMC Bombay. Of special interest were investigations into the general atmospheric circulation related to the monsoons and the energy exchange between ocean and atmosphere. These called for the use of aeroplane and field buoy observations.

For advice, evaluation and co-ordination of the fisheries aspects of IIOE, the IOC Secretary appointed a subject leader for the fisheries oceanography. Mr. D.N.F. Hall (Zanzibar)<sup>(1)</sup> was selected for this post. He completed his work by the end of 1964.

Co-ordination in field. Past international co-operative work in oceanography has shown that some differences exist between data obtained by different countries, due to variations in instruments and techniques. To eliminate these difficulties and to make observations in the Indian Ocean comparable and reliable, international standardization and inter-calibration tests were conducted by participating scientists from different countries.

The first two such tests were carried out in Honolulu: 4 to 9 September 1961, for nutrient chemistry and primary production; and Perth: 2 to 9 August 1962, for chemistry, zooplankton sampling and primary production.

In addition reference stations were established at fifteen locations throughout the Indian Ocean where the participating ships should, whenever possible, make oceanographic measurements that could be used for intercomparisons of methods as well as provide information on seasonal changes at these established positions. Co-ordinated field work of the expedition terminated on 31 December 1965.

Results. The magnitude of the IIOE in terms of personnel, ships, money and countries involved makes it the greatest oceanographic endeavour to date.

An important feature of the IIOE is that it has provided participation in educational opportunities for international scientists on the ships of countries other than their own. The expedition has stimulated interest in marine science in many countries. Unesco has also assisted by providing equipment and educational opportunities. The IIOE has also had the effect of further developing national organizations, with the result that they are better able to deal with international oceanographic problems.

The analysis and reporting of data collected from 1959 through 1965 will continue for many years. It is planned that copies of the data collected in connexion with the IIOE will be deposited in the two World Data Centres for Oceanography (Washington

and Moscow) and that eventually a number of atlases will be compiled based on all data<sup>(2)</sup>.

This programme, planned and carried out by individuals, institutions and countries but involving wide international co-ordination and co-operation, will undoubtedly contribute valuable scientific knowledge of the Indian Ocean.

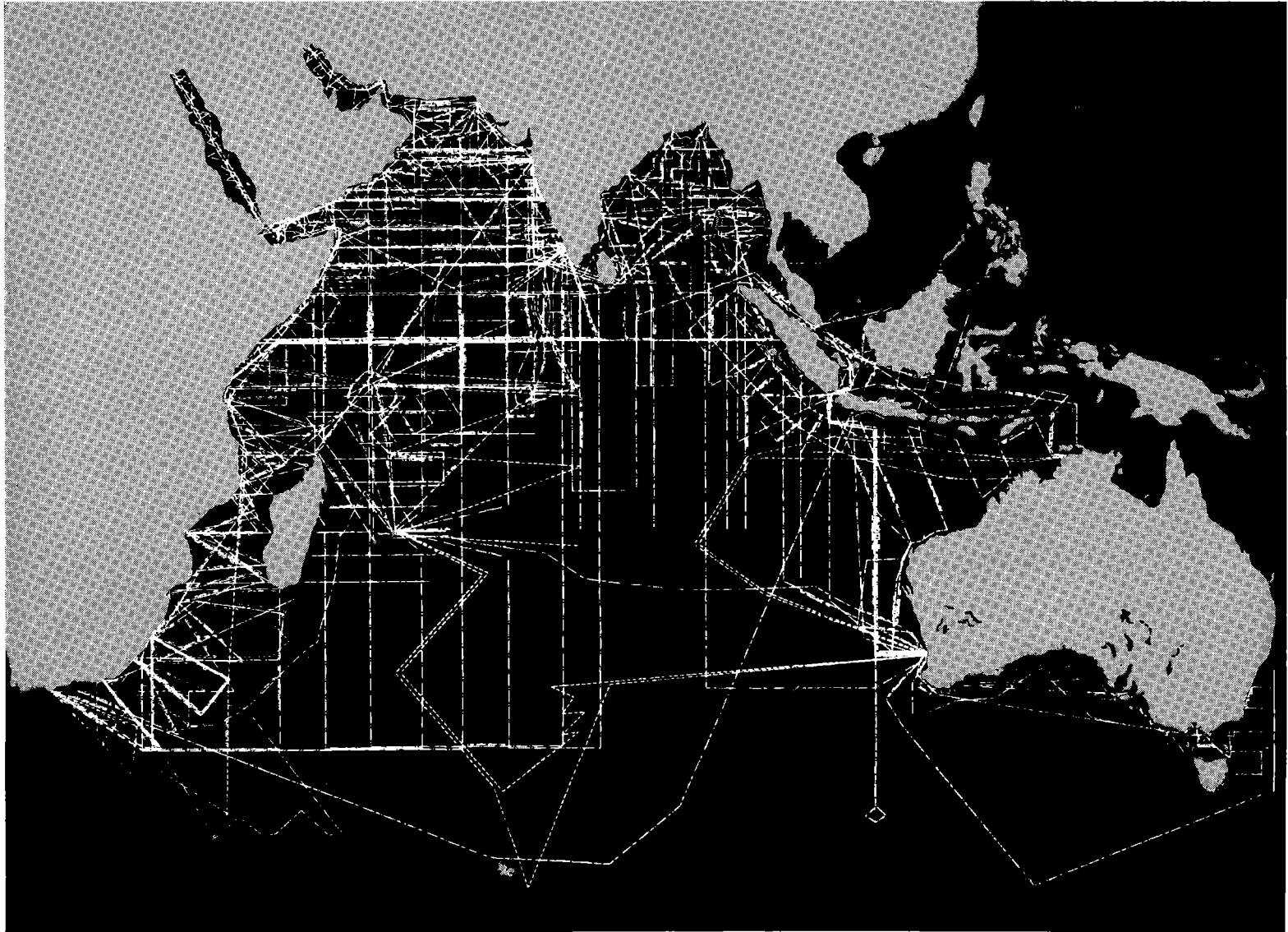
To facilitate access to this knowledge Unesco publishes the Collected Reprints of the IIOE, three volumes of which have already been printed and the fourth is presently being prepared.

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(1) Presently with the Ministry of Overseas Development, United Kingdom.

(2) Work on these atlases has already started.



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#### THE INTERNATIONAL CO-OPERATIVE INVESTIGATIONS OF THE TROPICAL ATLANTIC 1963-1964

Plans and schedules for the International Co-operative Investigations of the Tropical Atlantic (ICITA) were formulated by participants in an IOC working group meeting held in Washington, D.C. during June 1962. The ICITA, as approved by the second session of the IOC, consisted of a mid-winter (EQUALANT I) and a mid-summer (EQUALANT II) multiple-vessel survey of the tropical Atlantic, 18°N to 18°S latitudes, coasts of Africa to South America.

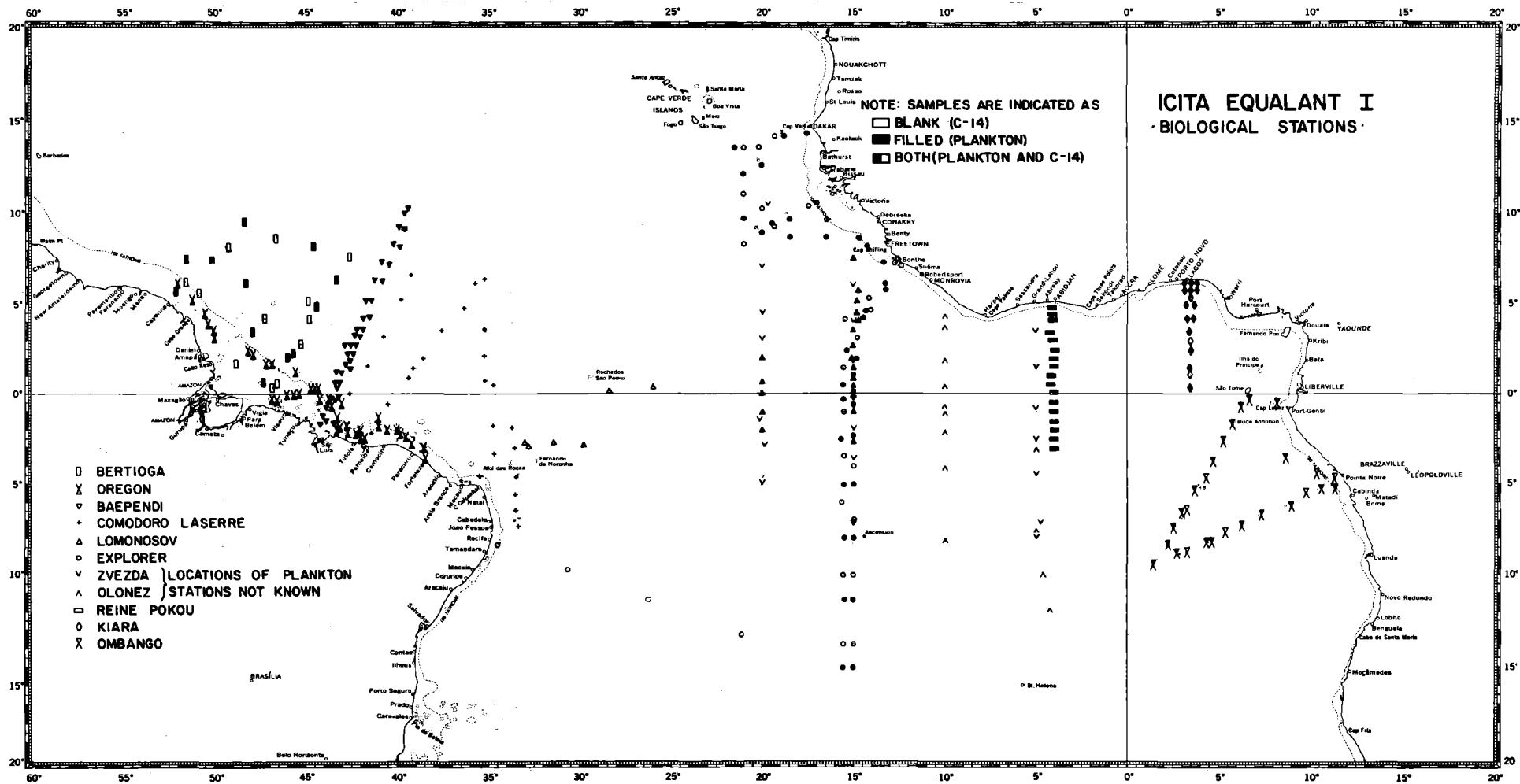
Fourteen vessels of seven nations (Argentina, Brazil, Republic of Congo (Brazzaville), Nigeria, Republic of Ivory Coast, U.S.A., and USSR) participated during EQUALANT I (February-April, 1963, figures 1 and 2). Eleven vessels from eight nations (Argentina, Brazil, Republic of Congo (Brazzaville), Republic of Ivory Coast, Nigeria, Spain, U.S.A. and USSR) participated in EQUALANT II (August-September 1963, figures 3 and 4). In addition to those from the operating activities, scientists from Germany, England and Venezuela, as well as from various federal, university, and private organizations of the U.S.A., participated aboard several of the above-mentioned vessels.

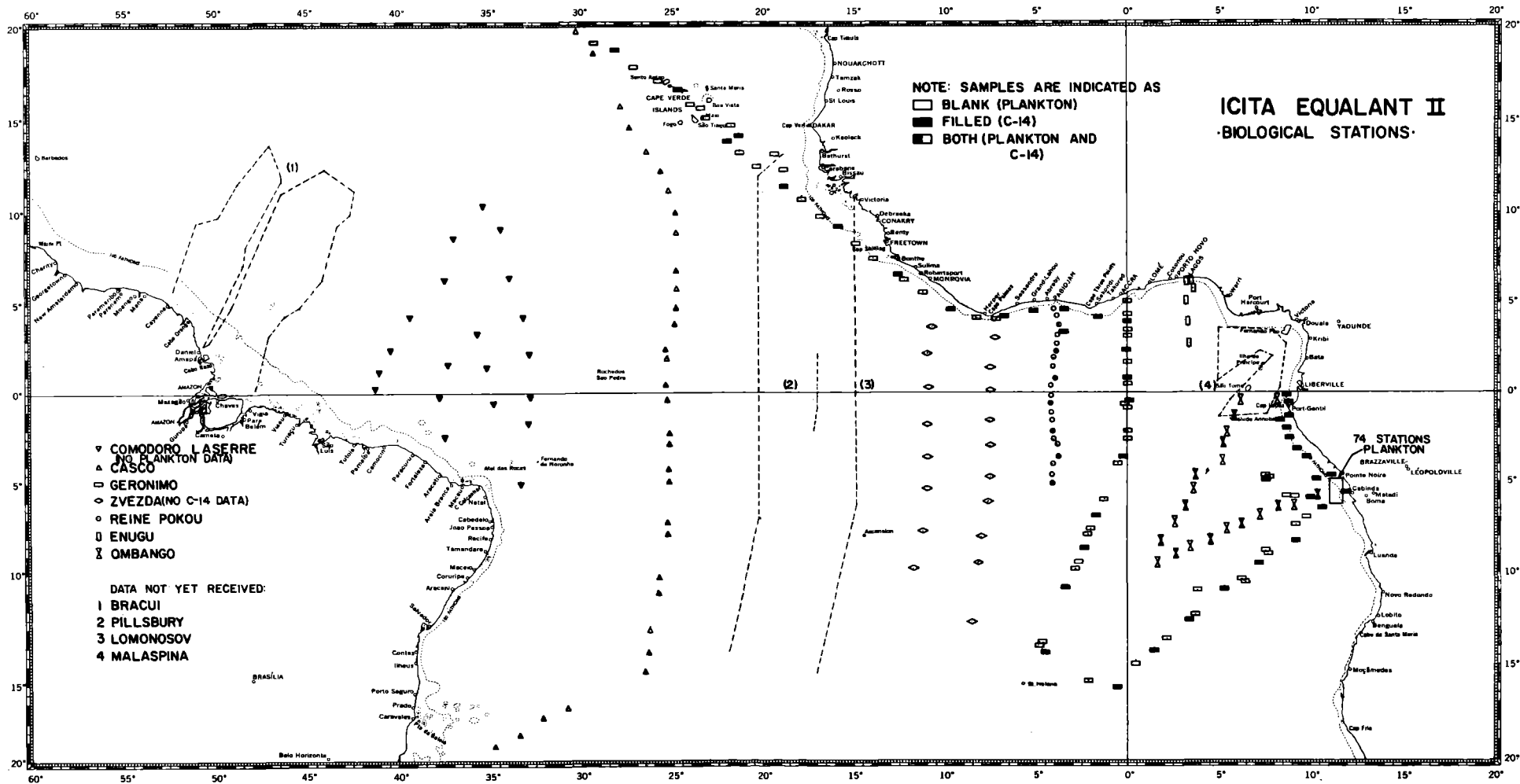
EQUALANT III (February-March 1964), proposed by members of the International Co-ordination

Group (ICG) for the ICITA (July 1963) and approved by the Bureau and Consultative Council of the IOC, involved work from eight vessels of six nations (Republic of Congo (Brazzaville), Ghana, Republic of Ivory Coast, Spain, U.S.A. and USSR). Direct current measurements, accompanied by oceanographic and marine biological observations, were made in an area between the latitudes 10°N and 10°S, from 30°W to the coast of Africa (figure 5).

Observations and samples collected from each vessel (EQUALANTS I and II), in an essentially standard manner, included meteorological, chemical and physical (temperature, salinity, oxygen and inorganic phosphate), marine biological (measurements of microbiomass and rate of primary productivity by the C-14 technique in samples from depths equivalent to 100%, 70%, 50%, 20% and 1% of incident radiation and zooplankton tows) and, from vessels adequately equipped, bathymetric and other geophysical data.

The data reports for EQUALANT I and II, compiled and prepared by the National Oceanographic Data Center (NODC), were printed by the U.S. Coast and Geodetic Survey and U.S. Naval Oceanographic Office, respectively, and were distributed in 1964.

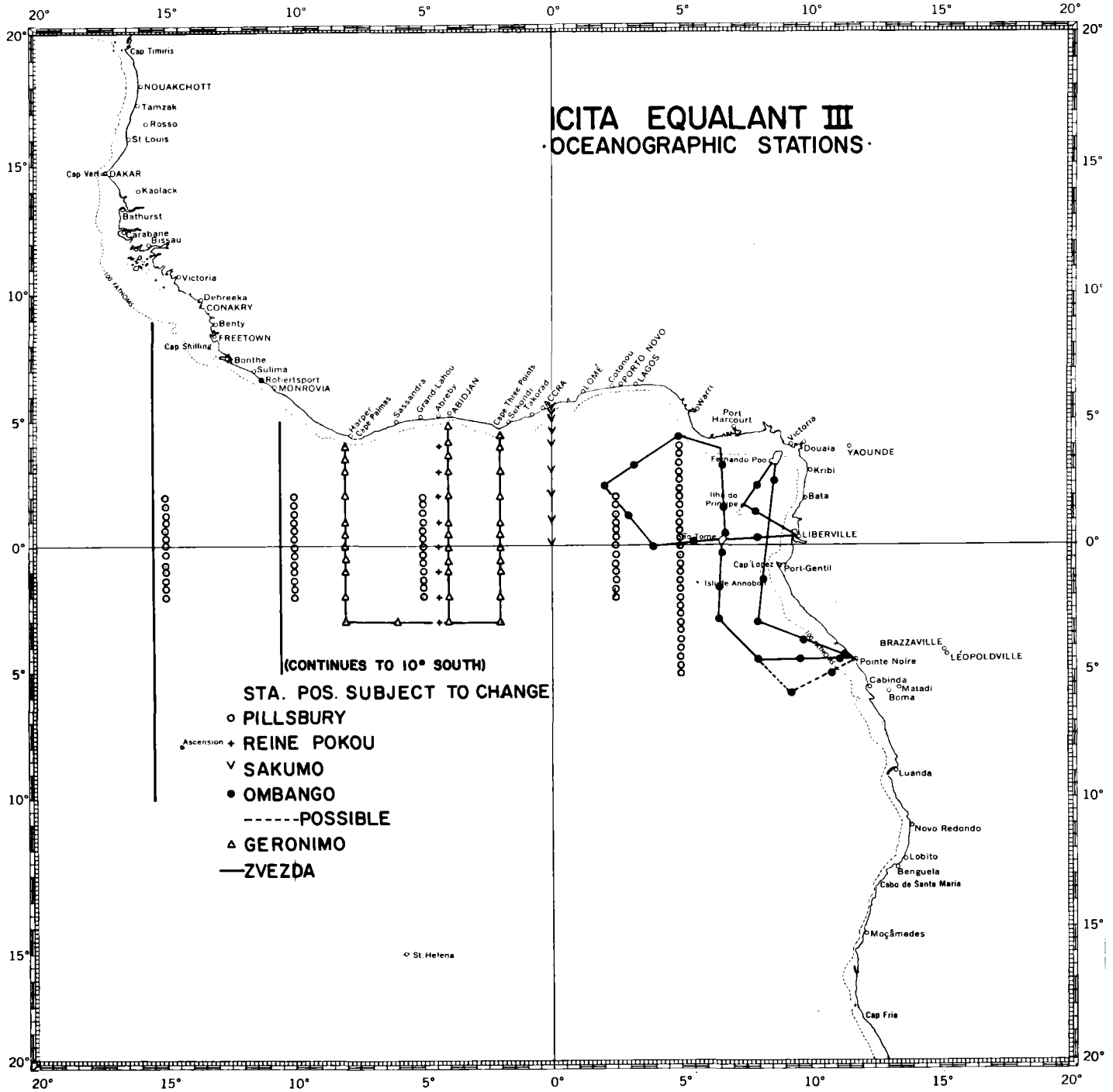












EQUALANT III data report, compiled and prepared by NODC, is being printed by the Argentina Hydrographic Service.

A proposal for the ICITA Atlas, prepared by NODC and the International Co-ordinator, was discussed by the International Co-ordination Group in June 1964 and the final plan was adopted by the Ad Hoc Editorial Board at its meeting in Washington in February. This plan consists of (a) drafting all the base maps and base sections by NODC (U.S.A) and the printing of these maps and sections by the Argentina Hydrographic Service; (b) plotting and drawing of all station curves by the NODC (with financial assistance from SCOR); (c) pre-plotting of the data on base maps and sections by the Argentina Hydrographic Service. Sections will be divided between interested institutions which will accomplish it under the guidance of the Chief Editor, Dr. F. Fuglister (U.S.A.).

The International Co-ordination Group, meanwhile, will continue to function in order to ensure exchange of information on any oceanographic work being carried out in the tropical Atlantic.

#### THE CO-OPERATIVE STUDY OF THE KUROSHIO AND ADJACENT REGION (CSK), 1965 ONWARDS

The idea of a co-operative study of the Kuroshio and its adjacent region was conceived at the Second Regional Meeting of Marine Science Experts in South East Asia, organized by Unesco in Manila in 1962. Consequently the Intergovernmental Oceanographic Commission (IOC), at its second session, instructed its Secretary to convene a meeting of marine science experts on the Kuroshio region in order to formulate basic plans for the co-operative study. The meeting was held in Tokyo from 29 to 31 October 1963 and one day was devoted to a symposium on the Kuroshio, co-sponsored by Unesco and the Oceanographic Society of Japan, with Dr. Kozo Yoshida, Professor of Oceanography at the University of Tokyo as convener. The purpose of the symposium was to review existing knowledge on the Kuroshio<sup>(1)</sup>.

The report of the meeting of marine science experts on the Kuroshio region, which presented a basic outline for the co-operative study was adopted at the third session of the Commission in June 1964. The Co-operative Study of the Kuroshio and its Adjacent Region (CSK) thus became one of the official programmes of the Commission. Its resolution III-5 commended this programme to its Member States for their active participation. An international co-ordination group was established in order to co-ordinate national efforts into a well-organized plan. Dr. Kiyoo Wadati (Japan) was appointed International Co-ordinator of the CSK.

The Kuroshio, whose name in Japanese means "black current", has been intensively studied off the coast of Japan, but very little is known about it further south or west. Its cycle of behaviour in time has not yet been properly determined. Thus

the CSK programme set forth three basic investigation targets:

- synoptic and multi-disciplinary surveys of the whole Kuroshio system at least twice a year;
- studies of the frequency and extent of the Kuroshio's short-term fluctuations;
- studies of its seasonal variations.

Oceanographers decided to learn the time and space scales of Kuroshio's variations and to study their effect on weather in the Far East. To learn more about the changes in the current is also very important for fisheries.

Responding to the appeal of the IOC, forty research vessels from seven countries carried out the expedition's first phase which lasted from July 1965 through to February 1966, and consisted of two synoptic surveys, summer and winter, supplemented by more frequent or continuous observations in key areas.

In 1965 and 1966 twenty-seven of the participating ships came from Japan, three each from the Soviet Union, the United States and the Republic of Korea, two from the Philippines and one each from the Republic of China and Hong Kong. Unesco provided ten "shipboard" fellowships to scientists from participating countries in order to enable them to take part in the expedition.

The preliminary results of the first synoptic surveys of CSK in the summer of 1965 were reported to the Commission at its fourth session in November 1965. Current information on the CSK is promulgated through the CSK Newsletter<sup>(2)</sup>.

The finding of the area of the Kuroshio's origin was announced in September 1965 by a Japanese survey group after a 75-day cruise aboard the Takuyo, one of 27 Japanese research vessels in the first phase of the study.

The "TAKUYO" team found that the northern half of the 600 mile wide north equatorial current turned north to become the Kuroshio between 13 and 15 degrees N. latitude when it reached the eastern coast of Luzon Island in the Philippines.

Measurements of the Kuroshio's depth were made by the "ATLANTIS II" of the Woods Hole Oceanographic Institution in the United States and showed it to be confined to the upper layers of the Pacific above a depth of 2,000 m. These studies were carried out with neutrally buoyant floats that can be set to drift at a given depth where their "pings" are followed by sonar apparatus aboard a research ship.

- (1) Proceedings of the symposium on the Kuroshio, Tokyo, 29 October 1963. Oceanographic Society, Japan and Unesco, 1965.
- (2) CSK Newsletter Nos. 1 to 7, - Co-operative Study of the Kuroshio and Adjacent Regions. Published by: Japanese Oceanographic Data Center, Hydrographic Division, Maritime Safety Agency, Tokyo, Japan, under the sponsorship of IOC and Unesco.

The "ULIANA GROMOVA", a Soviet vessel, was one of several ships that carried out this research programme despite a September typhoon which generated waves 18 metres high.

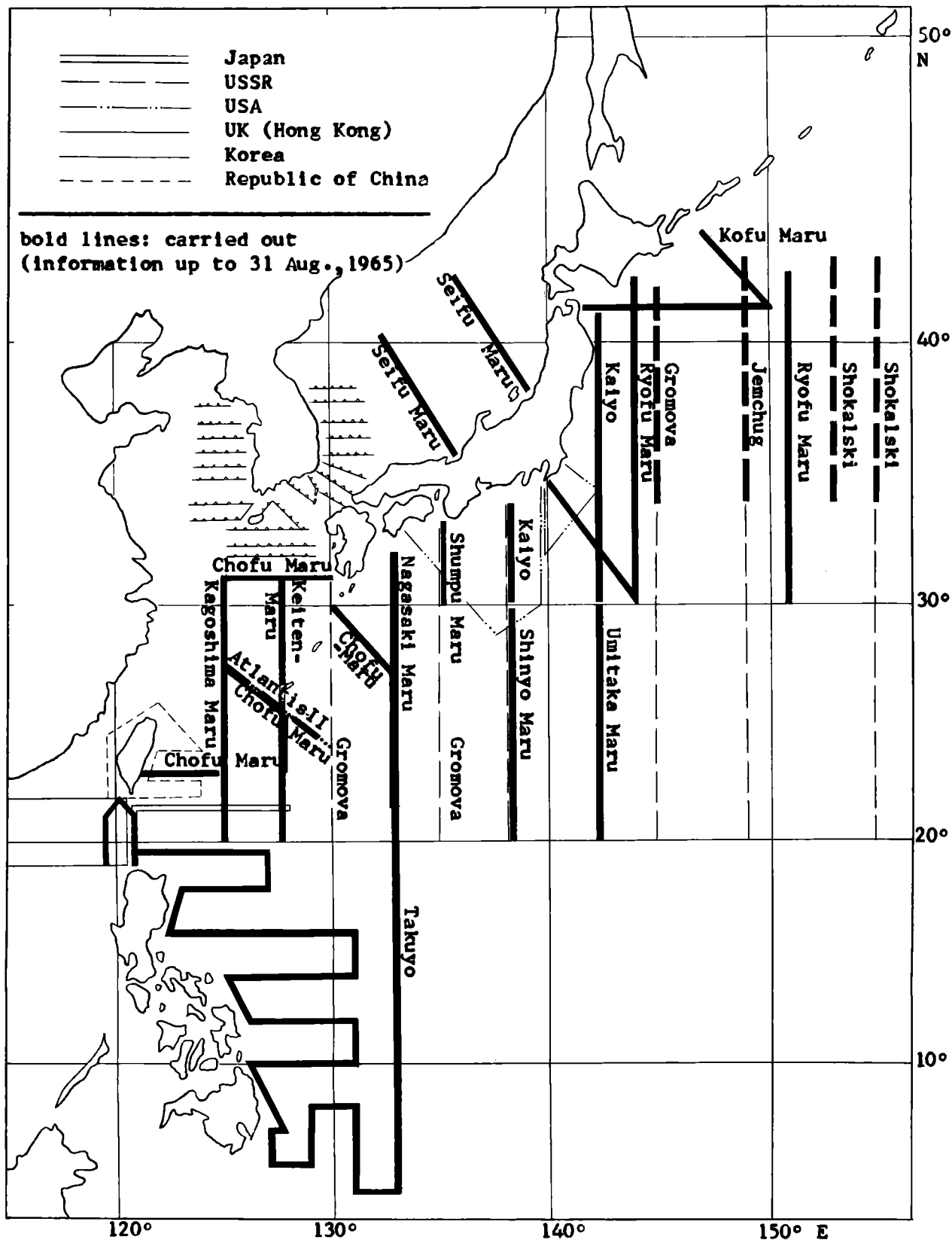
During this summer phase, research vessels ran transects over an area ranging 1,000 miles into the Pacific and running from Luzon Straits in the south to northern Japan. The same area is now being covered during winter months to determine seasonal variations.

The Kuroshio study has a strong fisheries focus because this is one of the regions where fisheries industries are highly developed and important, the peoples in the region relying for their protein food on marine products. The fisheries aspect of CSK is therefore developed in close co-operation with the FAO and the IPFC since its early stage of planning. Dr. John Marr of the Honolulu

laboratory of the United States Bureau of Commercial Fisheries was appointed as its assistant international co-ordinator for fisheries. One of the study's long-term goals is an explanation of variations in fish stocks and for this purpose the close co-operation of IPFC is envisaged.

Knowledge obtained during the first phase of the CSK is expected to serve as an essential guide to launch more concentrated and elaborated plans for the second phase of the CSK. The emphasis will be put on the studies of variations of the Kuroshio and their effects on fisheries and meteorological phenomena in the region. More attention will be devoted to geological and geophysical studies. The recent meeting of the International Co-ordination Group, which was held in Tokyo in August this year, discussed the future programme of the CSK.

COOPERATIVE STUDY OF THE KUROSHIO  
 CRUISES FOR SYNOPTIC SURVEY, SUMMER 1965



PART III

LIST OF IOC WORKING AND CO-ORDINATION  
GROUPS; THEIR MEETINGS, MEMBERSHIP  
AND TERMS OF REFERENCE

THE WORKING GROUP ON FIXED OCEANO-  
GRAPHIC STATIONS

1st Meeting: Paris, 6-10 August 1962

Members:

U.S.A.	Dr. W. Richardson (Chairman)
Federal Republic of Germany	Dr. J. Joseph
Norway	Dr. J. Eggvin
United Kingdom	Lt. Cdr. D. P. D. Scott (Rapporteur)
USSR	Dr. N. P. Goptarev, Dr. N. N. Syssoev
Belgium	Dr. G. Capart
France	Mr. J. Gonella, Mr. J. Morhange

Observers:

IAEA	Mr. G. W. C. Tait
IMCO	Mr. R. Grosclaude
IMCO	Mr. T. S. Busha
WMO	Mr. J. A. Van Duijnen Montijn

(for Report see Doc. UNESCO/NS/180, Annex V)

2nd Meeting: Paris, 18 February-3 March 1966

Members present:

Federal Republic of Germany	Dr. G. Tomczak
France	Mr. J. Gonella (Prof. H. Lacombe)
Norway	Dr. J. Eggvin
United Kingdom	Capt. G. P. Britton Lt. Cdr. D. P. D. Scott (Rapporteur)

U.S.A.	Dr. W. S. Richardson (Chairman) Mr. W. C. Jacobs Mr. J. Snodgrass
USSR	Mr. N. P. Goptarev Mr. P. D. Barabolya

Representatives:

IMCO	Capt. Z. N. Sdougos
WMO	Mr. H. C. Morales

Observers:

Netherlands	Lt. Cdr. J. P. H. Huijskens
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(for Report see Doc. UNESCO/AVS/9/89E-ODS)

THE WORKING GROUP ON COMMUNICATIONS

1st Meeting: Paris, 6-10 August 1962

Members:

Belgium	Prof. G. Capart
Federal Republic of Germany	Capt. K. H. Hille
Norway	Dr. J. Eggvin
United Kingdom	Mr. R. Wilson
U.S.A.	Mr. J. Snodgrass
USSR	Dr. N. N. Syssoev

Observers:

ITU	Mr. F. Dellamula
WMO	Mr. H. Ribault

(for Report see Doc. UNESCO/NS/180, Annex IV)

2nd Meeting: Paris, 2-6 September 1963

Members:

Belgium	Mr. L. Dufour, Mr. R. Tastenoy
Canada	Mr. R.O. Hewitt, (Rapporteur)
Chile	Mr. Q. Rivera,
China	Mr. Wei-Ning Li
Cuba	Mrs. M. Frayde (Observer)
France	Mr. J. Bes Mr. Delaporte Mr. H. Ribault
Federal Republic of Germany	Mr. K.H. Hille, Mr. H. Piper
India	Mr. M.V. Pai
Italy	Mr. Diego Bottari Mr. Angelo Petti
Monaco	S. Exc. Solamito Mr. Vaissiere
Netherlands	Mr. D.J. van Dorrinck,
Norway	Mr. Arne Bøe
Philippines	Mr. Dominador C. Canlas
United Kingdom	Mr. R. Bowers Mr. R. Wilson
U.S.A.	Mr. J.M. Snodgrass, (Chairman)
USSR	Mr. S.M. Myers, Mr. N.P. Goptarev Mr. J.S. Atserov

Observers:

ITU/IFRB	Mr. F. Dellamula
WMO	Dr. G. Weiss
IMCO	Mr. G. Dente
ICS <sup>(1)</sup>	Mr. R.G. Swallow
ICAO	Mr. J.P. Palencia
CIRM <sup>(2)</sup>	Mr. J.D. Parker Col. Raro

(for Report see Doc. UNESCO/IOC/III-12)

Extraordinary Meeting: Geneva, 1-3 September 1965

Members and representatives:

France	Prof. P. Tchernia Mr. P. Chaspoul Mr. P. Villat Mr. J. Bes
Federal Republic of Germany	Dr. Marienfeld Mr. K.H. Hille Mr. H. Barth
Japan	Mr. F. Tadokoro
Norway	Dr. J. Eggvin
United Kingdom	Mr. R. Wilson
U.S.A.	Mr. J.M. Snodgrass

U.S.A.	Mr. W.E. Denny Mr. S.M. Myers
USSR	Dr. N.P. Goptarev
IFRB	Mr. F. Dellamula
ICAO	Mr. P. Oomen
WMO	Mr. P. Rogers Dr. G.K. Weiss Mr. S.R. Barbagallo
IMCO	Capt. Z.N. Sdougos
IOC	Dr. A.Y. Takenouti

Observers:

CIRM	Col. J.D. Parker
ICS	Capt. R.G. Swallow

(for Report see Doc. IOC/IV-19 or Doc. UNESCO/NS/203, Annex VI)

IOC WORKING GROUP ON OCEANOGRAPHIC DATA EXCHANGE

1st Meeting: held at the National Oceanographic Data Center, Washington, 7-10 August 1962

Members and representatives:

World Data Centre A

Dr. W.C. Jacobs  
Advisers: Mr. W.L. Sullivan, Jr.  
Mr. T.S. Austin, Mr. J.E. Woolhiser

World Data Centre B

Commodore K.P. Ryzhkov  
Adviser: Lt. Cdr. V.G. Dyakin

World Meteorological Organization

Dr. P.H. Kurschenreuter

Scientific Committee on Oceanic Research

Dr. R. Revelle

International Hydrographic Bureau

R. Adm. E.C. Stephan

Permanent Service for Mean Sea Level

Dr. J.R. Rossiter

International Council for the Exploration of the Sea

Dr. J.W. Smed

Intergovernmental Oceanographic Commission/Unesco

Dr. W.S. Wooster (Chairman)

(1) International Chamber of Shipping

(2) Comité International Radio-Maritime.



Observers:

U.S.A.: Mr. R.Y. Dow, NAS; Mr. H.W. Dubach, NODC-WDC-A; Mr. H.H. Eckles, BCF; Dr. P.J. Hart, NAS; Dr. D.F. Leipper, TEXAS A & M; Dr. A. Maxwell, ONR; Mr. R.V. Ochintero, NODC; Mr. B.S. Richmond, WDC-A; Mr. R.W. Taber, NODC; Mr. R.C. Vetter, NAS; Mr. W.G. Watt, HYDRO; Mr. T. Winterfield, NODC.

(for Report see Doc. UNESCO/NS/180, Annex VI)

2nd Meeting: Paris, 27-30 January 1964

Members and representatives:

United Kingdom	Dr. John B. Tait (Chairman)
Brazil	Captain Paulo de Castro Moreira da Silva Lt. Roberto Fernandez Rodrigues
Canada	Mr. C.D. Sauer
China	Mr. Wi-Ning Li
Cuba	Dr. M. Frayde
France	Prof. H. Lacombe Prof. P. Tchernia
Federal Republic of Germany	Prof. Dr. J. Krey Dr. Tomczak
India	Dr. N.K. Panikkar Mr. R. Jayaraman
Israel	Mr. D. Ariel
Japan	Dr. M. Uda
Korea	Mr. Soong Soo Lee
Morocco	Mr. El Bacha Mr. Collignon
Netherlands	Mr. J.A. van Duijnen Montijn
Pakistan	Cdr. S.R. Islam
Spain	Prof. N. Menendez
Switzerland	Dr. K. Mongold-Wirz
Thailand	Capt. V. Srindu
United Kingdom	Mr. R.I. Currie Mr. G.W. Andison Mr. W.S. Wooster (Rapporteur)
U.S.A.	Dr. E. Chin Dr. R.L. Fisher Dr. W.C. Jacobs Dr. J. Lyman Dr. D.W. Pritchard Mr. J.F. Splain
USSR	Commodore K.P. Ryzhkov Prof. P.L. Bezrukov
World Data Centre A	Dr. W.C. Jacobs
World Data Centre B	Commodore K.P. Ryzhkov
WMO	Mr. J.A. van Duijnen Montijn
IHB	Vice-Admiral A. Viglieri
ICES	Dr. J.B. Tait
SCOR	Dr. G.F. Humphrey
Unesco (IOC)	Dr. K.N. Fedorov Dr. E.C. Lafond Dr. A.Y. Takenouti Dr. T.R. Parsons

Observers:

IMC	Prof. C.S. Ramage
IOBC	Mr. V. Hansen
IPFC	Dr. N.K. Panikkar
FAO	Dr. V.E. Brock
IAPO	Dr. Eyries

Participants present on Thursday, 30 January 1964 (morning meeting)

Mr. G.W. Andison  
Mr. R.I. Currie  
Cdr. S.R. Islam  
Prof. H. Lacombe  
Prof. N. Menendez  
Mr. J.A. van Duijnen Montijn  
Dr. N.K. Panikkar  
Dr. D.W. Pritchard  
Lt. R.F. Rodrigues  
Cdr. K.P. Ryzhkov  
Capt. Paulo de Castro  
Moreira da Silva  
Dr. R. Serene  
Dr. J.B. Tait  
Dr. Tomczak  
Dr. W.S. Wooster  
and members of the Secretariat

(for Report see Doc. UNESCO/NS/191, Annex X)

3rd Meeting: Copenhagen, 31 March-2 April 1966

Members:

Canada	Mr. C.D. Sauer
Denmark	Dr. Vagn Hausen
Federal Republic of Germany	Dr. G. Tomczak
Finland	Prof. I. Hela
France	Mr. Ch. Allain
Israel	Dr. O.H. Oren
Italy	Mr. A. Barlaam Mr. S. di Santillo
Japan	Dr. T. Matsuzaki
Monaco	Comm. L. Grinda
Netherlands	Dr. R. Dorrestein
Norway	Mr. R. Ljøen
Poland	Prof. F. Pautsch
Spain	Prof. N. Menendez
Sweden	Mr. A. Svansson
Thailand	Mr. Phaibul Nayanetr
Turkey	Capt. Nafiz Iiçak Lt. Cdr. Sevet Güclüer
United Kingdom	Mr. A.J. Lee Mr. G.W. Andison
U.S.A.	Dr. J.B. Tait (Chairman) Dr. H.B. Stewart Dr. B. Ketchum Mr. A. Bargeski <sup>(1)</sup>
USSR	Comm. K.P. Ryzhkov <sup>(2)</sup>

(1) Also WDC-A

(2) Also WDC-B

International Council for the Exploration of the Sea (ICES)  
 International Hydrograph Bureau (IHB)  
 Permanent Service for Mean Sea Level (PSMSL)

Prof. I. Hela  
 Mr. M. Tambs-Lyche  
 Mr. Jeus Smed  
 Adm. A. Viglieri  
 Dr. J.R. Rossiter

Observers:

United Nations  
 FAO  
 International Council of Scientific Unions (ICSU)  
 SCOR  
 International Council for the Scientific Exploration of the Mediterranean (ICSEFM)  
 International Commission for the Northwest Atlantic Fisheries (ICNAF)  
 Permanent International Association of Navigational Congresses (PIANC)

Mr. I. Gudmundsson  
 Mr. S.J. Holt  
 Prof. I. Hela  
 Prof. W.S. Wooster (Rapporteur)  
 Mr. Ch. Allain  
 Mr. A.J. Lee  
 Prof. H. Lundgren

(for Report see Doc. UNESCO/AVS/9/89-F)

INTERNATIONAL CO-ORDINATION GROUP FOR THE INTERNATIONAL INDIAN OCEAN EXPEDITION

1st Meeting: Paris, 22-24 January 1964

Members and representatives:

Unesco (IOC) Dr. K.N. Fedorov (Chairman)  
 International Co-ordinator  
 Australia Dr. G.F. Humphrey<sup>(1)</sup>, also representing SCOR  
 Canada Mr. C.D. Sauer  
 China Mr. Wi-Ning Li  
 France Prof. P. Tchernia<sup>(1)</sup>, disciplinary expert of SCOR (physical oceanography)  
 Federal Republic of Germany Prof. Dr. G. Dietrich<sup>(1)</sup>  
 Prof. Dr. J. Krey, disciplinary expert of SCOR (plankton)  
 Prof. Dr. E. Siebold  
 India Dr. N.K. Panikkar<sup>(1)</sup>  
 Mr. R. Jayaraman  
 Japan Dr. M. Uda<sup>(1)</sup>  
 Madagascar Mr. M. Angot<sup>(1)</sup>  
 Malaysia Dr. J.B. Alexander<sup>(1)</sup>

Pakistan Cdr. S.R. Islam<sup>(1)</sup>  
 South Africa Capt. J.K. Mallory  
 Thailand Capt. V. Sarindu<sup>(1)</sup>  
 United Kingdom Mr. G.E. Hemmen<sup>(1)</sup>  
 (Rapporteur)  
 Mr. R.I. Currie  
 U.S.A. Dr. J. Lyman<sup>(1)</sup>  
 Dr. Edward Chin  
 Dr. R.L. Fisher, disciplinary expert of SCOR (marine geology)  
 Dr. W.C. Jacobs  
 Dr. J.A. Knauss  
 Mr. J.F. Splain  
 Dr. W.S. Wooster  
 Dr. A.R. Miller  
 USSR Prof. P.L. Bezrukov<sup>(1)</sup>  
 Commodore K.P. Ryzhkov  
 IMC Prof. C.S. Ramage - Director, Meteorological Programme  
 IOBC Mr. V. Hansen  
 WMO Mr. J.A. van Duijnen Montijn

Secretariat:

Unesco (IOC) Dr. E.C. Lafond  
 Dr. A.Y. Takenouti  
 Dr. T.R. Parsons

(for Report see Doc. UNESCO/NS/191, Annex IV)

2nd Meeting: Paris, 7-9 June 1965

Members and representatives:

Unesco (IOC) Dr. K.N. Fedorov (Chairman)  
 International Co-ordinator  
 Australia Dr. G.F. Humphrey<sup>(1)</sup>, also representing SCOR  
 China Mr. Keh-Ming Chao  
 France Dr. P. Tchernia<sup>(1)</sup>, disciplinary expert of SCOR (physical oceanography)  
 Federal Republic of Germany Dr. W. Düing  
 Prof. G. Dietrich<sup>(1)</sup>  
 Prof. J. Krey, disciplinary expert of SCOR (plankton)  
 India Mr. E. Pouchpadass  
 Dr. N. Panikkar<sup>(1)</sup>  
 Japan Prof. M. Uda<sup>(1)</sup>  
 Prof. K. Sugawara  
 Madagascar Mr. Ramansarivo<sup>(1)</sup>  
 Thailand Capt. V. Sarindu<sup>(1)</sup>  
 United Kingdom Mr. R. Currie<sup>(1)</sup>  
 U.S.A. Dr. R. Bader<sup>(1)</sup>  
 Prof. W. Wooster  
 Dr. A. Miller  
 Dr. R. Fisher, disciplinary expert of SCOR (marine geology)

(1) National co-ordinators.

U.S.A. Prof. C Ramage, Director,  
 Meteorological Programme  
 USSR Prof. L. Zenkevich, disciplinary expert of SCOR (benthos)

INTERNATIONAL CO-ORDINATION GROUP FOR ICITA

1st Meeting: Paris, 19 September 1962

Observers:

IOBC Mr. R. Glover  
 Dr. Vagn Hansen (retired  
 curator of the IOBC)  
 FAO/ACMRR Dr. M. Ruivo

Secretariat:

Unesco/IOC Dr. A. Takenouti  
 Dr. G. Hempel

(for Report see Doc. UNESCO/IOC/IV-10 and also UNESCO/NS/203, Annex IV)

INTERNATIONAL CO-OPERATIVE INVESTIGATIONS OF THE TROPICAL ATLANTIC

IOC Working Group Meeting, National Oceanographic Data Center, Washington, D.C. 20-22 June 1962

Members:

Brazil Cmdr. Paulo de Castro  
 Moreira da Silva  
 Canada Dr. W.M. Cameron  
 Chile Cmdr. A.F. Walbaum  
 France Dr. de Lignac  
 Prof. A.T. Monod - also  
 representing CCTA/CSA  
 Federal Republic of Germany Mr. W. Koehler  
 Dr. J. Krey  
 Morocco Mr. Abdeslam Tadlaoui  
 Spain Capt. Carlos Pardo  
 Uruguay Lieut. Mario Bolivar  
 Capt. Homer Murdoch  
 U.S.A. Mr. T.S. Austin  
 Dr. W.C. Jacobs  
 Dr. J. Lyman  
 Dr. H.B. Stewart, Jr.  
 Mr. R.C. Wilson  
 USSR Prof. V.G. Kort  
 Lieut. Y.M. Mezenin  
 Lt. Cmdr. Lev Vtorygin

Observers:

China Mr. You Yu Bao  
 Korea Mr. Sang Moon Chang  
 Sierra Leone Mr. H.E. Tucker  
 FAO Dr. D.B. Finn

In addition 40 advisers, observers and guests from the U.S.A. were present at the meeting.

(for Report see Doc. UNESCO/IOC/INF-21).

Members:

U.S.A. Dr. V. Brock, Chairman,  
 International Co-ordinator  
 Argentina Capt. L. Capurro  
 United Kingdom Dr. A.J. Lee  
 Brazil Cdr. P. Moreira da Silva  
 Ivory Coast Dr. P. Rancurel  
 USSR Comm. K.P. Ryzhkov

Observers:

IOC Dr. W.M. Cameron  
 USA R. Adm. H. Arnold Karo  
 Dr. H.B. Stewart, Jr.  
 Dr. A.E. Maxwell  
 Dr. W.M. Chapman  
 IIOE Mr. R. Snider  
 Dr. C. Ramage  
 FAO Dr. M. Ruivo  
 WMO Dr. K. Langlo

Secretariat:

IOC/Unesco Dr. W.S. Wooster  
 Dr. Y. Takenouti  
 Dr. T.R. Parsons  
 Dr. L. Howell-Rivero

(for Report see Doc. UNESCO/NS/180, Annex III)

2nd Meeting: Paris, 2-4 July 1963

Members:

U.S.A. Mr. T.S. Austin, Chairman,  
 International Co-ordinator  
 Mr. W.C. Jacobs  
 Mr. W.L. Sullivan, Jr.  
 Brazil Cmdr. Paulo de Castro  
 Moreira da Silva  
 Spain Mr. N. Menendez  
 Argentina Mr. L.R.A. Capurro  
 United Kingdom Mr. P.G.W. Jones  
 Federal Republic of Germany Mr. J. Krey

USSR Mr. Kolesnikov  
 Ivory Coast Mr. P. Rancurel  
 France Mr. E. Postel  
 Mr. M. Delais  
 Mr. Poinsard  
 Congo (Brazzaville) Mr. G.R. Berrit  
 Mr. J.P. Troades

Observers:

CCTA/CSA Mr. F. Williams  
 FAO Mr. Miroslav Zei  
 Mr. Mario Ruivo

Secretariat:

Unesco Mr. Warren S. Wooster  
Mr. A.Y. Takenouti  
Mr. D. Behrman

(for Report see Doc. UNESCO/NS/89D)

3rd Meeting: Paris, 12-13 June 1964

Members:

U.S.A. Mr. T S. Austin, Chairman,  
International Co-ordinator  
ICITA  
Argentina Capt. L.R.A. Capurro  
Brazil Capt. Moreira da Silva  
Federal Republic  
of Germany Dr. A. Kotthaus  
Dr. E. Hagmeier  
Prof. J. Krey  
France Mr. M. Delais  
Congo (Brazzaville) Mr. M.G.R. Berrit  
Ivory Coast Mr. Kaul-Meledie  
Mr. M.P. Rancurel  
Poland Prof. S. Szymborski  
Spain Mr. E. Seco Serrano  
Mr. F. Luzano Cabu  
U.S.A. Dr. W.M. Chapman  
Ukrainian SSR Prof. A.G. Kolesnikov  
USSR Dr. I.P. Kucherov  
Dr. A.P. Metalnikov

Observers:

WMO Mr. J.A. van Duijnen Montign  
FAO Prof. M. Zei  
Dr. M. Ruivo  
ICSEM Mr. J. Dardignac  
Nigeria Mr. E.N.C. Ezuizo  
United Arab Republic Dr. M. Hassan

Secretariat:

Unesco/IOC Dr. K.N. Fedorov

(for Report see Doc. UNESCO/NS/191, Annex V)

EDITORIAL COMMITTEE ON ICITA ATLAS

1st Meeting: Washington

Participants:

Dr. K.N. Fedorov, Secretary, IOC  
Captain L. Capurro, Argentina  
Dr. P.G. Rancurel, Republic of Ivory Coast  
Mr. F. Fuglister, U.S.A.  
Mr. Thomas S. Austin, International Co-  
ordinator  
Dr. W.C. Jacobs, Director, NODC  
Mr. Wm. Sullivan, Department of State, U.S.A.

Mr. H. Coulter, Interpreter, Department of  
State  
Mr. Rene Cuzon du Rest, Interpreter, NODC  
Mr. Milan Kravanja, Interpreter, Bureau of  
Commercial Fisheries  
Mr. A. Bargeski, NODC

(for Report see Doc. UNESCO/IOC/IV-14)

WORKING GROUP ON CO-OPERATIVE INVESTI-  
GATIONS OF VARIABILITY IN THE OCEAN

1st Meeting: Paris, 2 and 5 November 1965

Members:

Canada Dr. Cedric Mann  
Federal Republic  
of Germany Dr. Weidemann (not present)  
France Prof. H. Lacombe  
Norway Dr. L. Midttun (nominated  
by ICES)  
Poland Prof. F. Pautsch  
United Kingdom Dr. A. Lee (also nominated by  
ICNAF)  
U.S.A. Dr. A. Maxwell  
Prof. W. Wooster, Chairman  
Dr. H. Stewart, Jr.  
USSR Prof. V.G. Kort

Observers:

IAPO Prof. I. Hela  
Dr. J. Lyman (not present)  
ICES Dr. L. Midttun  
ICNAF Dr. A. Lee  
WMO Dr. C. Morales  
SCOR Prof. V.G. Kort  
Prof. T. Braarud

Invited consultants:

Dr. J. Tait (United Kingdom)  
Dr. H. Mosby (Norway)  
Dr. R. Stewart (Canada)

Other participants:

Prof. P. Tchernia (France)  
Dr. W.H. Cameron (Canada)  
Dr. N. Campbell (Canada)  
Capt. Moreira da Silva (Brazil)  
Mr. L. Day (Exec. Secretary, ICNAF)

Secretariat:

Dr. K.N. Fedorov, Secretary, IOC  
Dr. R.P. Von Herzen, Assistant Secretary,  
IOC

(for Report see Doc. UNESCO/NS/203, Annex III)

INTERNATIONAL CO-ORDINATION GROUP FOR  
THE CO-OPERATIVE STUDY OF THE KUROSHIO  
AND ADJACENT REGIONS (CSK)

1st Meeting: Manila, 8-11 February 1965

Members:

China	Professor Chu Tsu-You <sup>(1)</sup>
Japan	Dr. K. Wadati <sup>(1)</sup> Dr. M. Uda Dr. J. Masuzawa Dr. R. Marumo
Korea	Mr. Hi Soo Han <sup>(1)</sup> Mr. Kwang Yoon Hahn
Philippines	Captain C. Legaspi <sup>(1)</sup> Dr. D. Canlas Dr. D. Villadolid Mr. I. Ronquillo Dr. E. Tan Mrs. P. Borja Mr. P. Esquires Mr. M. Manansala Mr. C. Santos Mr. J. Lirios Mr. C. Araffles Mr. G. Armea Professor T. Megia Cdr. A. Ventura Mr. A. Mines
United Kingdom (Hong Kong)	Mr. J.D. Bromhall <sup>(1)</sup>
USSR	Professor A.M. Muromtsev <sup>(1)</sup>
U.S.A.	Dr. K.K. Musatov Mr. J.C. Marr <sup>(1)</sup> Capt. T.K. Treadwell

Representatives:

IOC/UNESCO	Dr. K.N. Fedorov Dr. W.A. Mills Dr. R. Serene
FAO(IPFC)	Mr. J.A. Tubb
WMO	Dr. R.L. Kintanar
IAPO	Capt. T.K. Treadwell

(for Report see Doc. UNESCO/IOC/IV-12)

2nd Meeting: Paris, 2 and 5 November 1965

Members:

China	Prof. Chu Tsu-You <sup>(1)</sup>
Japan	Dr. K. Wadati <sup>(1)</sup> Prof. K. Sugawara Dr. D. Shoji Mr. M. Ogata
Korea	Dr. D.H. Bae Mr. S.K. Chi
Philippines	not represented
Thailand	Dr. D. Menasveta <sup>(1)</sup> Capt. V. Sarindu

United Kingdom (Hong Kong)	Mr. J.D. Bromhall <sup>(1)</sup> Dr. K.M. Chan
USSR	Adm. A.I. Rassokho Prof. A.M. Muromtsev <sup>(1)</sup> Dr. N. Parin
U.S.A.	Dr. J.C. Marr <sup>(1)</sup> Dr. J. Lyman <sup>(1)</sup> Dr. W.V. Burt Capt. T.K. Treadwell
Viet-Nam	Dr. Nguyen-Hai <sup>(1)</sup>

Representatives:

IOC/UNESCO	Dr. A.Y. Takenouti
FAO	Dr. M. Ruivo Mr. S. Holt Dr. K. Terada
IAPO	Capt. T.K. Treadwell

(for Report see Doc. UNESCO/IOC/IV-INF.92)

3rd Meeting: Tokyo, 18-20 August 1966

Members:

China	Prof. Chu Tsu-You <sup>(1)</sup>
Japan	Prof. V.C. Juan Dr. K. Wadati <sup>(1)</sup> Dr. T. Ino <sup>(2)</sup> Prof. K. Sugawara Prof. M. Uda Prof. S. Motoda Dr. D. Shoji Prof. R. Marumo Dr. J. Masuzawa Prof. Y. Ogura Prof. Y. Sasaki Prof. H. Irie Prof. T. Takahashi Dr. K. Tanii Dr. T. Matsuzaki Dr. H. Futi Mr. M. Ogata Mr. A. Niwa Mr. M. Yamanaka Mr. Y. Nakamura Mr. Han Hak Soo <sup>(1)</sup> Mr. Sok-U Yi Dr. Dong Hwan Bae Mr. Hahm Jae Yoon Mr. Hue Jong Soo
Korea	Prof. N.A. Pidlaoan
Philippines	Capt. V. Sarindu
Thailand	Mr. W. Lai-ye Chan <sup>(1)</sup>
United Kingdom (Hong Kong)	Dr. D. Eggleston
USSR	Prof. A.M. Muromtsev <sup>(1)</sup> Dr. Maria Kun <sup>(2)</sup> Mr. A. Rogotskiy
U.S.A.	Mr. J.C. Marr <sup>(1)</sup> Mr. O.S. Lee
Viet-Nam	Dr. Nguyen-Hai <sup>(1)</sup>

(1) National Co-ordinators

(2) Assistant National Co-ordinators

Representatives:			
IOC/UNESCO	Dr. A.Y. Takenouti	Ivory Coast	Mr. Kaul-Meledje
	Prof. J. Krey	Japan	not represented
	Dr. Tham-Ah-Kow	Mexico	not represented
FAO	Mr. H. Rosa Jr.	Philippines	not represented
	Dr. I. Yamanaka	Spain	Prof. N. Menendez
WMO	Mr. A. Imazato	Thailand	not represented
ECAFE	Dr. C.Y. Li	United Arab Republic	Dr. M. Hassan
		United Kingdom	Dr. J.R. Rossiter
		U.S.A.	Dr. A.E. Maxwell
			Dr. I.E. Wallen
			Dr. R.J. Hurley
			Prof. V.G. Kort
			Mr. R.A. Insausti
WORKING GROUP ON MUTUAL ASSISTANCE		USSR	
		Venezuela	

(for Report see Doc. CSK/ICG-III/INF.4)

1st Meeting: Paris, Unesco, 14-17 June 1966

Members:			Observers and representatives:
Argentina	Not represented	Chile	Dr. H.L. Barrales
Australia	Dr. G.F. Humphrey (Chairman)	Dominican Republic	Dr. M. Pastoriza
Federal Republic of Germany	Dr. A.H. Meyl	Ecuador	Dr. D. Paredes-Pena
France	Professor H. Lacombe	Italy	Prof. M. Picotti
Ghana	not represented	Monaco	Mr. A. Barlaam
India	Dr. N.K. Panikkar	Tunisia	Commander L. Grinda
		IAPO/IUGG/PSMSL	Dr. A. Azouz
		ICSEM	Dr. J.R. Rossiter
			Dr. Charles Allain

## TERMS OF REFERENCE

### IOC WORKING GROUPS

<u>Name of group</u>	<u>Terms of reference</u>	<u>Remarks</u>
Working Group on Communications	*The study and establishment of oceanographic radio communication requirements and the submission of its initial report in time for approval, adoption and presentation by the Commission and its member governments to the next study session of the Administrative Radio Conference.	Established by res.I-6
Working Group on Ocean Data Stations	*To study the existing network of fixed stations and the need to extend it (types, number, locations, kinds of observations and their spacing in time) and to prepare proposals for meeting this need.	Established by res.I-7. Originally named Working Group on Fixed Oceanographic Stations
Working Group on Oceanographic Data Exchange	*Facilitating the exchange of oceanographic data; standardization of forms for reporting and coding data; encouragement of the preparation of data catalogues; assistance to development of national oceanographic data centres.	Established by res. I-9
Working Group on Mutual Assistance	1. Encourage sister-relationships between universities and government agencies in advanced countries on the one hand and developing countries on the other.	Established by res.III-15. Terms of reference were revised by res.IV-8

<u>Name of group</u>	<u>Terms of reference</u>	<u>Remarks</u>
Working Group on Variability of the Ocean	2. Obtain and arrange for dissemination of information on the availability of reliable, easily-operated and relatively inexpensive oceanographic instruments and on standard methods and procedures.	Established by the Bureau at its fourth session as pursuant of decision of the IOC-III. The res.IV-7 resolves to call the second meeting in September 1966
	3. Study and advise on curricula and methods for educating marine scientists and technicians.	
	4. Help Member States to obtain needed financial and technical assistance for development of marine sciences.	
	5. Arrange for places on research vessels for the training of marine scientists and technicians of developing countries.	
	6. Encourage regional collaboration between institutions working in neighbouring areas.	
	7. Work out details relating to selection, operation and responsibilities of visiting experts and committees.	
	8. Consider the desirability of stimulating the holding of regional symposia to discuss problems and exchange ideas relative to the development of national oceanographic programmes.	
	9. Consider means of assisting in the procurement of essential equipment requiring foreign currency.	
	10. Consider what actions should be taken to encourage governments to recognize the importance of oceanography for their own countries.	
	11. Consider the most appropriate means by which the Technical Assistance and Special Fund financing within the United Nations system may be utilized for mutual assistance.	
	1. Status of analysis of existing time series	
2. Criteria for choice of section location; review of oceanographic knowledge, evaluation of climate and weather, sea and swell, and tides.		
3. Design of experiment; parameters to be measured, methods, sampling, frequency in time and space, and associated meteorological observations.		
4. Problems of standardization and inter-calibration.		
5. Data processing, analysis, interpretation and publication of results.		
6. Resources and facilities which might be available.		

<u>Name of group</u>	<u>Terms of reference</u>	<u>Remarks</u>
	7. Problems of scheduling and logistic support	
	8. Organizational problems	
Working Group on Ocean-Atmosphere Interaction	<p>1. To evaluate the results of scientific investigations of air-sea interaction in order to ascertain their applicability to intergovernmental programmes of joint action.</p> <p>2. To consider the instrumental and operational problems involved in the development of such programmes.</p> <p>3. To consider the ways in which intergovernmental action could strengthen the forecasting of sea surface conditions, and facilitate the exploitation of marine food resources.</p> <p>4. To recommend appropriate programmes of intergovernmental action to the Commission, to WMO, and to other international bodies concerned.</p>	Established by res.IV-1
Working Group on Marine Pollution	*To report to the fifth session how the Commission can further the national and international studies of relevant oceanographic processes and to consider further the documents on marine pollution submitted at the fourth session.	Established by res.IV-10
Working Group on Follow-up of ICITA and GTS	*To study how to ensure the most complete application of the results of ICITA and GTS and to develop co-operative research programmes to investigate any gaps in knowledge as a result of ICITA and GTS.	
INTERNATIONAL CO-ORDINATION GROUPS		
International Co-ordination Group for the International Indian Ocean Expedition (IIOE)	General and scientific co-ordination of the Expedition.	Established by res. II-3
International Co-ordination Group for the Co-operative Study of the Kuroshio and Adjacent Region (CSK)	General and scientific co-ordination of the Expedition.	Established by res. III-5
International Co-ordination Group for Tsunami Warning System	*To effect liaison among participating Members; to promote exchange of information on developments of observing methods and of techniques of tsunami forecasting; to effect liaison with other interested organizations; and to provide advice on the operation of the International Tsunami Information Centre.	

\* Terms of reference are edited from the resolution concerned.



ANNEX I

LIST OF IOC MEMBERS  
AS AT 1 OCTOBER 1966

1. Algeria
2. Argentina
3. Australia
4. Austria
5. Belgium
6. Brazil
7. Canada
8. Chile
9. China
10. Congo (Brazzaville)
11. Cuba
12. Denmark
13. Dominican Republic
14. Ecuador
15. Federal Republic of Germany
16. Finland
17. France
18. Ghana
19. Greece
20. Iceland
21. India
22. Indonesia
23. Israel
24. Italy
25. Ivory Coast
26. Japan
27. Korea
28. Lebanon
29. Malaysia
30. Mauritania
31. Mexico
32. Monaco
33. Morocco
34. Netherlands
35. New Zealand
36. Norway
37. Pakistan
38. Peru
39. Philippines
40. Poland
41. Romania
42. Spain
43. Sweden
44. Switzerland
45. Thailand
46. Tunisia
47. Turkey
48. United Arab Republic
49. Ukrainian SSR
50. United Kingdom
51. Uruguay
52. U.S.A.
53. USSR
54. Venezuela
55. Viet-Nam

## ANNEX II

### STATUTES OF THE COMMISSION (as approved by the eleventh session and amended by the thirteenth session of the General Conference of Unesco)

#### Article 1

1. An Intergovernmental Oceanographic Commission, hereafter called the Commission, shall be established within the United Nations Educational, Scientific and Cultural Organization.

2. The purpose of the Commission shall be to promote scientific investigation with a view to learning more about the nature and resources of the oceans, through the concerted action of its members.

#### Article 2

1. Membership of the Commission shall be open to all Member States of the United Nations Educational, Scientific and Cultural Organization, the Food and Agriculture Organization, the United Nations and other agencies of the United Nations system which are willing to participate in oceanographic programmes that require concerted action by them.

2. Member States of the above-mentioned organizations shall acquire membership of the Commission by notifying the executive head of one of the organizations to which they belong that they are willing to participate in oceanographic programmes which require concerted action. Any such notice received by the executive head of an organization other than the United Nations Educational, Scientific and Cultural Organization shall be transmitted to the Director-General of the latter.

3. Any member of the Commission may withdraw from it by giving notice of its intention to do so to the Director-General of the United Nations Educational, Scientific and Cultural Organization or to the executive head of one of the organizations mentioned in paragraph 1 above of which the said State is a member, who shall transmit such notice to the Director-General of the United Nations Educational, Scientific and Cultural Organization. Such notice shall take effect at the end of the first session of the Commission which follows the date on which

notice has been given or, if notice has been given during the course of a session of the Commission, at the end of that session.

#### Article 3

1. The Commission shall be convened, as a rule, every two years, except that other intervals between sessions may be determined by the Commission.

2. Each Member State shall have one vote and may send at its own expense such representative advisers and experts as are required to the session of the Commission.

3. The Commission shall determine its own rules of procedure and voting.

#### Article 4

1. The Commission shall consider and recommend international programmes for oceanographic investigation, together with the necessary steps for their execution which call for concerted action by its members. The Commission shall review the results of scientific investigation and define the basic problems requiring international co-operation.

2. The Commission shall also recommend, in accordance with the international programmes of oceanographic investigation referred to in paragraph 1 above, the nature, forms and methods of exchange of oceanographic data through world data centres, specialized data centres, and by other means.

#### Article 5

1. The Commission may create, for the examination and execution of specific projects, committees composed of members interested in such projects.

2. The Commission may delegate to any such

committee all or any of its powers with respect to the project for which the committee was created.

#### Article 6

1. During the course of each session, the Commission shall elect a Chairman and two Vice-Chairmen, who shall together constitute the Bureau of the Commission between sessions and throughout the following session. The term of office of the members of the Bureau shall commence at the end of the session during which they have been elected and expire at the end of the next session. The Bureau may be convened, if necessary, between sessions at the request of the Director-General of the United Nations Educational, Scientific and Cultural Organization or of one of the members of the Bureau.

2. During the interval between sessions, the Bureau of the Commission shall perform such functions as may be assigned to it by the Commission.

3. During the course of each session and after electing the members of its Bureau, the Commission shall designate certain Member States which will appoint representatives to a Consultative Council. The Bureau shall seek the advice of the Consultative Council on all matters it considers substantial between sessions prior to taking action on such matters, and shall serve with the Consultative Council as a steering committee at sessions.

4. The representatives on the Consultative Council and their alternates and advisers, may attend all meetings of the Bureau, except executive sessions. The Consultative Council may not meet except with the Bureau and shall have no officers.

5. The Member States designated in accordance with paragraph 3 above shall hold office from the end of the session during which they have been designated until the end of the next session. No Member State which is represented on the Bureau shall be designated to the Consultative Council at the same time.

#### Article 7

1. Representatives of Member States of the United Nations Educational, Scientific and Cultural Organization, the Food and Agriculture Organization, the United Nations and other agencies of the United Nations system which are not members of the Commission may participate in meetings of the Commission without the right to vote.

2. Representatives of the organizations mentioned in Article 2, paragraph 1 above, may participate in meetings of the Commission, without the right to vote.

3. The Commission shall determine the conditions under which other intergovernmental organizations and non-governmental organizations shall be invited to participate in meetings of the Commission without the right to vote.

#### Article 8

1. The Secretariat of the Commission shall be provided, under the authority of the Director-General

of the United Nations Educational, Scientific and Cultural Organization, by the Department of Natural Sciences of that Organization, which shall make available to the Commission such personnel and material as are necessary for its work. The Secretariat shall be headed by the Director of the Unesco Office of Oceanography. Members of the staff of the Food and Agriculture Organization and other interested organizations listed in Article 2, paragraph 1 above, may be added to this personnel by agreement with these organizations.

2. The Secretariat shall be responsible for servicing the meetings of the Commission.

3. The Secretariat shall ensure the day-to-day co-ordination of the international programmes of oceanographic investigations recommended by the Commission; it shall also fix the date of the next session of the Commission, under instructions from the Bureau, and take the necessary steps for the convening of the session.

4. The Secretariat shall collect from the Member States of the Commission and from various international organizations concerned, suggestions for international programmes of oceanographic investigation and shall prepare them for consideration by the Commission.

5. In addition to its duties for the Commission, the Secretariat shall co-operate actively with the Secretariats of the Food and Agriculture Organization, the World Meteorological Organization (WMO) and other agencies mentioned in Article 2, paragraph 1 above, which are engaged on the study of the oceans.

#### Article 9

The international programmes of oceanographic investigation recommended by the Commission to its Member States for their concerted action shall be carried out with the aid of the resources of participating Member States, in accordance with the obligations that each State is willing to assume. However, the Commission may also recommend to the United Nations Educational, Scientific and Cultural Organization and other organizations mentioned in Article 2, paragraph 1 above, activities related to the training of oceanographers, assistance to countries in promoting oceanographic investigation, exchange of experience, and expenditure entailed in connexion with the unification and standardization of means and methods of oceanographic research. These activities, if accepted by the said organizations, shall be financed by them in accordance with their respective constitutions and regulations.

#### Article 10

The Commission shall submit reports on its activities to the General Conference of the United Nations Educational, Scientific and Cultural Organization and shall request the Director-General of this Organization to transmit copies of these reports to all other interested organizations mentioned in Article 2, paragraph 1 above.

## ANNEX III

### LIST OF DOCUMENTS AND PUBLICATIONS PERTAINING TO IOC ACTIVITIES

International Marine Science (World list abbrev. Int. Mar. Sci.). Quarterly newsletter, prepared jointly by Unesco and FAO and published by Unesco, English only. Volumes I to III, 1963-1965, continuing.

Collected Reprints. International Indian Ocean Expedition. (World list abbrev.: Coll. Repr. Int. Indian Oc. Exped.). Published by Unesco. Languages of the originals. Vol. I, 915 pp., Vol. II, 672 pp., 1965, Vol. III, 984 pp., 1966 continuing.

Technical Series. Intergovernmental Oceanographic Commission. No. 1 - 1965. Manual on international oceanographic data exchange. (English, French, Spanish, Russian), published by Unesco.

Intergovernmental Oceanographic Commission. Reports of sessions. Intergovernmental Oceanographic Commission, First Session, Unesco, Paris, 19-27 October 1961, Summary Report (UNESCO/NS/176, English, French, Spanish, Russian), 45 pp.

Intergovernmental Oceanographic Commission, Second Session, Unesco, Paris, 20-28 September 1962, Summary Report (UNESCO/NS/180, English, French, Spanish, Russian), 66 pp.

Intergovernmental Oceanographic Commission, Third Session, Unesco, Paris, 10-19 June 1964. Summary Report (UNESCO/NS/191, English, French, Spanish, Russian). 96 pp.

Intergovernmental Oceanographic Commission, Fourth Session, Unesco, Paris, 3-12 November 1965, Summary Report. (UNESCO/NS/203, English, French, Spanish, Russian)

### SPECIAL PUBLICATIONS

IIOE Information Papers, Nos. 1 to 17, 1962-1966, continuing, English only. Published by Unesco, 4 to 6 issues a year.

CSK Newsletter - Co-operative Study of the Kuroshio and Adjacent Regions. Published by: Japanese Oceanographic Data Center, Hydrographic Division, Maritime Safety Agency, Tokyo, Japan, under the sponsorship of IOC and Unesco. Available Nos. 1, 2, 3, 4, 5, 6, 7, . . . 1965-1966. Continuing, 4-5 issues a year.

Fixed oceanographic stations of the world, 1963. Published by Unesco upon the recommendation of IOC, 1964.

International Indian Ocean Expedition - SCOR-Unesco Chemical Intercalibration Tests. Results of 2nd series, R.S. Vityaz, 2-9 August 1962, Australia, by D.J. Rochford

Report of SCOR-Unesco working group 17 on determination of photosynthetic pigments, which met on 4-6 June 1964, at Unesco, Paris, Sydney, 1964.

A manual of sea water analysis, by J.D.H. Strickland and T.R. Parsons. Bull. Fish. Res. Bd. Can., (125) (2nd edition revised). Published by special arrangement with the Intergovernmental Oceanographic Commission and the Unesco Office of Oceanography, 1965, 203 pp.

Proceedings of symposium on the Kuroshio, Tokyo, 29 October 1963. Published by the Oceanographical Society of Japan and Unesco, 1965. 66 pp.