Distribution: limited
Agenda Item 5.1.3

IOC/INF-501
Paris, 27 September 1982
English only

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of Unesco)

Twelfth Session of the Assembly
Paris, 3-20 November 1982

SUMMARY REPORT OF THE SECOND JOINT IOC/SCOR/ECOR INFORMAL CONSULTATIVE MEETING ON DRIFTING BUOY PROGRAMMES

(Sidney, B.C., Canada, 13-15 September 1982)

(SC-82/CONF.218/COL.27)

The Second Joint IOC/SCOR/ECOR Informal Consultative Meeting on Drifting Buoy Programmes was held from 13-15 September 1982 under the chairmanship of Dr. J. Garrett, Chairman of SCOR Working Group 66 on the Oceanographic Applications of Drifting Buoys. The List of Participants is attached as Annex 3.

The meeting took place in the Institute of Ocean Sciences, Sidney, B.C., Canada, commencing at 10:00 a.m.

The Chairman welcomed the participants and highlighted the agenda items. The Agenda was adopted as it stands in Annex 1. Dr. I. Oliounine, on behalf of the Secretary IOC, expressed his gratitude to the Canadian authorities for hosting the meeting and for the facilities provided. He stressed the importance of such kind of meetings for the successful development of future drifting buoy programmes and for specifying the mode of, and needs for, future co-operation of different international organizations in the programme's implementation.

1. STATUS OF THE IMPLEMENTATION OF RECOMMENDATIONS OF THE FIRST JOINT IOC/SCOR/ECOR INFORMAL CONSULTATIVE MEETING ON DRIFTING BUOY PROGRAMMES

Dr. I. Oliounine informed the Meeting that the Conclusions of the First Meeting were received with great interest by many international bodies and by IOC and WMO, in particular. International Organizations had noted with satisfaction the Recommendations of the First Meeting which called for increasing co-operation and co-ordination of the international aspects of the application of drifting buoys to different oceanographical and meteorological problems.

With regard to the implementation of Recommendations of the First Meeting, it was agreed that most of the Recommendations had been successfully implemented or proper steps have been taken towards their successful implementation.

The Meeting noted with appreciation the decision of the ECOR governing body to establish the ECOR Drifting Buoy Working Group which took into account the guidelines outlined in the Summary Report and in Recommendations 2 and 6 of the First Meeting.

The Argos Tariff Agreement satisfied the needs of Recommendation 4.

The Meeting was informed of the consultations being held with the IMO officials with respect to Recommendation 7 and of the arrangements for the proposed Second Preparatory Conference on ODAS.

This Second Joint Consultative Meeting was arranged in response to Recommendations 6 and 8, and money was allocated for a consultant to cover specific items to assist SCOR and ECOR in their studies.

The Meeting recognized the importance of the actions accomplished but expressed concern over the status of the implementation of Recommendation 2 by which the establishment of a small, quasi-operational buoy information centre was called for. Although some actions have been taken by the IOC Secretariat, no national or international institution expressed its readiness to take on the role of such a centre. The Meeting urged the IOC and WMO Secretariats to continue their efforts in this regard.

2. STATUS OF THE PREPARATION OF SCOR AND ECOR REPORTS ON DRIFTING BUOYS FOR OCEANOGRAPHIC APPLICATIONS FOR CONSIDERATION BY THE TWELFTH SESSION OF THE ASSEMBLY

The attention of the Meeting was drawn to Resolution EC-XIII.10 requesting SCOR and ECOR to assist the Commission in defining the oceanographic applications of drifting buoys.

Dr. Garrett reported that the SCOR WG 66 report promised for the Twelfth Session of the IOC Assembly had been unfortunately delayed, but he hoped to have it completed by early October. This report will contain a brief summary of previous and current scientific applications of drifting buoys, followed by a discussion of potential future applications. It will also review the oceanographic needs for new and improved sensors, and will suggest some areas in which improved international co-ordination might be helpful. A bibliography of reports on drifting-buoy applications and technical developments will be included.

During the discussion it was mentioned that this WG had deferred actions on some of its terms of reference because most of the members felt that oceanographic applications of drifting buoys were developing rapidly and that much of the information of interest to potential users would soon appear in the open literature.

The SCOR WG decided against recommending the standardization of sensors and techniques, since it concluded that any such recommendation would be premature on account of the rapid evolution taking place in those areas.

During discussion of this point, it was suggested that projections of current trends in sensor development might be useful to those agencies currently planning future large-scale experiments, since their choice of strategy could depend on the price and/or availability of particular sensors.

The Meeting felt that there would not be too much overlap between this report and similar studies being undertaken by the WMO, because of the differences between primarily operational meteorological applications and research-oriented oceanographic applications. These differences were discussed at some length. Some areas of potential conflict in joint programmes were foreseen, such as buoy spacing, droguing, and speed of data return vs. position accuracy. It would be difficult to "standardize" oceanographic buoys because of the differing objectives of various research programme, whereas information from meteorological buoys was generally intended for use either in weather forecasting or in climate research, making such buoys easier to standardize.

Dr. M. Hall, Chairman of the ECOR Working Group on the Engineering Applications of Drifting Buoys, informed the Meeting that after the IOC/SCOR/ECOR Consultative Meeting in London (April 1981), ECOR requested its U.S. adhering body, the Marine Board of the National Academy of Sciences, to form an international working group to assist the IOC in "defining the oceanographic application of drifting buoys." The Marine Board examined the recommendations of the report of the London meeting, set initial terms of reference based on that report, and enlisted a group of experts from several countries to establish an ECOR Working Group on the Engineering Applications of Drifting Buoys, The Terms of Reference for the Working Group are as follows:

1. Identify selected ocean engineering areas that could benefit significantly from application of drifting buoy technology.

2. Summarize observational needs (for these applications) in terms of parameters, sampling density and duration, and geographical emphasis.

3. Identify technical and operational deficiencies likely to be encountered in applying today's technology to new (engineering) applications.

4. Identify logistical opportunities and constraints associated with these applications.

5. Advise IOC on the probable extent of engineering programmes employing drifters during the next decade, and inform the secretariat of areas in which buoy observations made through IOC and others could provide information suitable for engineering purposes.

6. Establish liaison with SCOR WG 66 (Oceanographic Applications of Drifting Buoys) and the appropriate WMO Advisory Group; identify potential areas of mutual concern.

Early discussion with the Marine Board and members of the Working Group revealed that those engineering interests concerned with buoy development represented a largely different community from those concerned with applying such technology to engineering problems in the ocean, and it was determined that the most effective role of ECOR was to address the latter issue; the Working Group was constituted on that basis. The Working Group functioned primarily through a working session of international professionals associated with ocean engineering and industry, at the Joint Oceanographic Assembly, Halifax, Nova Scotia, 13 August, 1982. The consensus views developed at this session were supplemented by submissions from corresponding members of the Working Group. A draft report has been completed, recommendations had been formulated, and a review of the document by members of the Working Group and participants at the Halifax meeting is underway. This "interim report" will be submitted to the Twelfth IOC Assembly in November 1982. Final Marine Board comments or minor modification, resulting from a parallel review, will be submitted to the IOC Secretariat by January 1983.

The Meeting was concerned with the delay of the reports and agreed that they should be submitted to the IOC Secretariat before the Twelfth Session of the IOC Assembly.

3. FUTURE CO-OPERATION BETWEEN SCOR AND ECOR ON SCIENTIFIC USES OF AND TECHNOLOGICAL ASPECTS OF DRIFTING BUOYS

Future co-operation between SCOR and ECOR on the oceanographic applications of drifting buoys was discussed in light of the status of the present Working Group's activities. It was noted that the present terms of reference, in which ECOR does not address the issue of engineering development of drifters, left that subject largely to the longer-term SCOR activity, which was considered more appropriate.

The Chairman of the ECOR Working Group also conveyed the intention of the Marine Board to finalize its report to IOC on behalf of ECOR, and to dissolve the present Working Group. He reported further that ECOR is prepared to continue work on the problem beyond the present effort if requested by IOC. The ECOR representatives expressed concern that engineering interests (particularly commercial/industrial) did not have sufficient means to remain fully informed of the activities of the international groups planning drifting buoy programmes.

The Meeting took the view that some means of communicating regularly and involving engineering interests on a continuing basis will be desirable in future activities.

4. ARGOS TARIFF AGREEMENT

The Meeting agreed that the present Argos Tariff Agreement is a positive step.

The Argos processing centre is a small computer centre operating on a continuous, round-the-clock, basis. The only cost to be recovered is the relatively modest one for this centre: the rest of the Argos System is provided free of charge to users by the governments of France and the U.S. The annual operating cost of the processing centre is less than that of a medium-sized oceanographic ship, while its scientific benefits surely outweigh those of any single ship. The current charging system has the effect of discouraging buoy use, particularly for small users.

The Meeting was concerned that the present arrangement does not go far enough towards ensuring the continued existence of the global data collection and location system. More specifically, it considered it highly desirable to find some way of directly funding the operation of the Argos processing centre which avoided the current method of charging each user according to his buoy usage.

The Meeting therefore recommended to IOC and WMO that they seek some alternative method of funding the Argos processing centre so that it would be more easily accessible to the oceanographic community.

5. IMPLICATIONS OF THE NEW OCEAN REGIME FOR THE IMPLEMENTATION OF DRIFTING BUOY PROGRAMMES

The Meeting was informed, by the IOC Assistant Secretary, of discussions that had taken place between the respective secretariats of IOC and the Intergovernmental Maritime Organization (IMO, formerly the Intergovernmental Maritime Consultative Organization (IMCO)). The discussions had centred upon problems arising from the use of drifting buoys and included such items as liability, legal status, access to data and repatriation of buoys. It was recognized that such problems may be affected by the changes in national jurisdictions following the agreement reached in the United Nations Conference on the Law of the Sea (UNCLOS).

The Meeting also heard of problems experienced by COST-43, especially with regard to Ocean Data Acquisition Systems (ODAS) that entered the waters under a jurisdiction other than that of their country of origin. Repatriation of ODAS drifting ashore or recovered in a foreign country also constitutes a problem in the

operational use of drifting ODAS. The representative from the WMO brought to the attention of the participants an interpretation by the Chairman of Committee III of UNCLOS which expressed the opinion that the legal provisions of the UNCLOS did not apply to WMO's operational activities over the oceans. WMO therefore concluded that drifting buoys deployed for operational purposes were also excluded from the legal provisions of the UNCLOS.

The Meeting agreed that problems exist for the international use of drifting buoys but noted that many are of a technical or scientific nature and could be dealt with by agreements reached without specific legal debate with, or amongst, existing organizations such as IOC, WMO and IMO. The Meeting also noted that this item is scheduled for discussion at the Twelfth Session of the IOC Assembly and that future actions will, in a way, depend on a decision of that body.

6. REVIEW OF FORESEEN INTERNATIONAL ACTIVITIES IN WHICH DRIFTING BUOYS ARE EXPECTED TO PLAY AN IMPORTANT ROLE

In introducing this Agenda Item the attention of the Meeting was directed to

- CCCO Action Plan on Ocean Observing Systems
- WMO EC XXXIV, items 3.1, 4.7
- IOC Resolution EC-XIII.10
- Summary Report of Argos Joint Tariff Agreement Meeting, November 1981
- Document IOC-XII/8, section 5.1; Action Paper for Twelfth Session of IOC Assembly

all of which either mention or require internationally co-ordinated actions involving drifting buoys.

After considerable discussion, the Meeting noted that the recommendations of a number of previous meetings (e.g., IOC/SCOR/ECOR Consultative Meeting on Oceanographic Applications of Drifting Buoys, London, 6-7 April 1981), namely the establishment of a small dedicated, quasi-operational buoy centre, remained not only essential to achieving effective information exchange and co-ordination, but was also necessary for arranging bilateral co-operation.

The Meeting was of the opinion that the early creation of a staff position, attached to the appropriate international body, would be helpful in promoting the development of effective international co-operation on drifting buoy programmes and could eventually lead to the establishment of such a centre. It was realized, however, that a more detailed examination of the mechanism required to establish and manage such a system was a necessary first step. A small ad hoc group consisting of the representatives of IOC, WMO, SCOR and ECOR was set up by the Meeting to draft a proposal for consideration by the governing bodies of IOC and WMO.

In developing its proposal, the ad hoc group considered a number of alternate methods of arriving at the desired result, such as the establishment of a new WMO/IOC Committee for Drifting Buoys and/or the assignment of the functions to IOC or WMO Secretariats. One conclusion was that, in view of the need for speedy resolution of the problem so as to deal effectively with the use of buoys in the WCRP and other large programmes, it would be more expedient to work within the

framework of an existing Joint IOC/WMO body. Another was that the combination of operational and advisory functions was such that the work could not be done on a part-time basis within one of the secretariats, although one of them might be a suitable location for the dedicated staff required. The ad hoc group recommended that the Joint IOC/WMO Working Committee for IGOSS would be an appropriate existing body to undertake a detailed examination of a cost-effective mechanism for co-ordinating drifting buoy activities. The proposal in that respect is outlined in the document IOC-XII/8, Annex 8.

7. EXCHANGE AND ARCHIVAL OF DRIFTING BUOY DATA

The Meeting briefly discussed existing and foreseen problems to be addressed relating to data from drifting buoys. It was accepted that the international DRIBU code that was prepared for the First GARP Global Experiment (FGGE) would need to be replaced. A more flexible format is required that could be adapted to include many of the new parameters and sub-surface measurements that are now being collected or contemplated for the near future. Any replacement code for the present DRIBU code must be forwarded for approval to the WMO Commission on Basic Systems (CBS) before use on the Global Telecommunication System (GTS), and, where appropriate, prior consultation with the Commission should take place. The IGOSS Sub-group of Experts on Operations and Technical Applications is addressing operational aspects of this problem and the IOC Working Committee on International Oceanographic Data Exchange (IODE) is addressing data archival problems. A proposal for a new format for GTS use has been submitted to the CBS by COST-43 for approval on a regional basis.

The Meeting agreed that the preparation of internationally accepted formats for drifting buoy data is necessary for data exchange and archival. The Meeting also urged that consideration be given by appropriate bodies to the establishment of a global drifting buoy data set at some data centre(s).

The Meeting noted that Local User Terminals (LUTS) are being used increasingly to provide local or regional data from the Argos system when these data are required within one hour of the satellite pass; e.g., for synoptic meteorology. The data thus received are also potentially available through Service Argos. However the data from some LUT's are not made available through Service Argos because of the associated extra costs to the LUT operators. Nevertheless, co-operative action between operators of LUT's can assure relatively complete data recovery from a particular area. Bi-lateral and multi-lateral co-operative operation of LUTs and buoy networks may lead to the development of more extensive regional and global networks.

The Meeting agreed that one of the responsibilities of any proposed drifting-buoy co-ordinating mechanims should be the development of guidelines for Member States operating LUTs. These guidelines would ensure that LUTs and related buoy networks are managed in a way consistent with the viability of the global system and with the needs of the scientific community, thus facilitating the operational exchange and archival of drifting buoy data.

8. COST-43 Seminar

Mr. Thor Kvinge, COST-43 Project Leader, informed the meeting that the COST-43 Management Committee is organizing a Seminar in June 1983 on ODAS-related topics including drifting buoys. He drew attention to the technical arrangements and to the topics to be discussed at the Seminar.

The participants appreciated that international organizations will be invited to participate in the Seminar and to present scientific papers. The Meeting agreed that advanced information on the Seminar should be published in the relevant international organizations' bulletins or newsletters. The participants were of the opinion that the following topics are of particular interest for their organizations,

- ODAS Technology
- Need for, and application of, ODAS Data
- ODAS Data Characteristics and Quality.

The COST-43 Secretariat was urged to direct official invitations to the relevant organizations in due course.

AGENDA

1. Status of the implementation of Recommendations of the First Joint IOC/SCOR/ECOR Informal Consultative Meeting on Drifting Buoy Programmes.

2. Status of the preparation of SCOR and ECOR reports on drifting buoys for oceanographic applications for consideration by the Twelfth Session of the Assembly.

3. Future co-operation between SCOR and ECOR on scientific uses of and technological aspects of drifting buoys.

4. ARGOS Tariff Agreement.

5. Possible implications of the new ocean regime for the implementation of drifting buoy programmes.

6. Review of foreseen international activities in which drifting buoys are expected to play an important role.

7. Exchange and archival of drifting buoy data.

8. COST-43 Seminar.

CONCLUSIONS AND RECOMMENDATIONS

1. The Meeting urged the IOC and WMO Secretariats to continue their efforts towards the establishment of a small quasi-operational buoy centre, as previously recommended by the London Consultative Meeting. It also proposed that the Joint Working Committee for IGOSS prepare a report on an appropriate cost-effective mechanism for co-ordinating drifting buoy activities.

2. The Meeting felt that some means of communicating regularly and involving engineering interests on a continuing basis will be desirable in future activities. It was also noted that neither the ECOR or SCOR WG's had addressed the problems of development of new buoy technology.

3. The Meeting recommended to IOC and WMO that they seek an alternative method of funding the Argos processing centre which would avoid the assessment of charges on the basis of each buoy.

4. The Meeting supported the need for improved codes and formats for drifting buoy data exchange and archival. It also urged that means be found to establish a global drifting buoy data bank.

5. The Meeting agreed that Recommendation 6 of the First IOC/SCOR/ECOR Consultative Meeting on Drifting Buoy Programmes is still valid and addressed IOC and WMO Secretariats to provide financial support for hiring a consult to prepare general documentation for the information of potential buoy users.

LIST OF PARTICIPANTS

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