

SCOR WORKING GROUP 43
OCEANOGRAPHY RELATED TO GATE
Summary Report of 1975 Meetings

The Group met in June 1975 in Southampton, UK, following a GATE Oceanography C-Scale Workshop in Southampton, and again in August 1975 in Grenoble, France, during the IUGG General Assembly, following a GATE Oceanography Equatorial and A-Scale Workshop in Geneva, Switzerland. A combined and shortened version of the reports and recommendations of these meetings is given here.

Participants of the meeting in Southampton, 20-21 June 1975

WG 43: W. Düing, G. Needler, F. Ostapoff, G. Siedler (Chairman), J. Woods.

By invitation: R. Landis (IOC), G. Peluchon (OSDC/BNDO Brest, France), R. Pollard (University of Southampton, UK), A. Rybnikov (Government Oceanography Institute, Moscow, USSR).

Participants of the meeting in Grenoble, 29 August 1975

WG 43: W. Düing, I. Galindo, J. Gonella, G. Siedler (Chairman), J. Woods. By invitation: J. Elliott (Bedford Institute, Dartmouth, Canada), D. Halpern (NOAA, Seattle, USA).

1. Status of International GATE Activities

The Group discussed the implications of the termination of the ISMG and the necessary interaction between SCOR, IOC and the new bodies, the JOC Panel on GATE and the GARP Activities Office (GAO). It was understood that direct cooperation between SCOR WG 43 and the GAO will be essential for the analysis phase of GATE. When discussing the international cooperation in GATE, the members of SCOR WG 43 noted with concern that its two USSR members had been unable to attend any of the meetings to date and expressed strong hopes that they would be able to participate in the remaining meetings and Workshops devoted to the coordination of scientific analysis and the review of results, where their contributions would be particularly important.

2. GATE Oceanography Workshops in 1975

Two GATE Oceanography Workshops were organized by SCOR in close consultation between GAO at WMO, IOC and SCOR in 1975.

The Convenor of the C-Scale Workshop, held in Southampton from 16 to 20 June 1975, was Professor J. Woods; the convenor of the Equatorial and A-Scale Workshop in Geneva from 15 to 23 August 1975 was Professor W. Düing. The quantity, quality and the stage of processing of the oceanographic data was examined in detail, and it was found that in general the data set is sufficient to meet the objectives of the GATE Equatorial, A-Scale and C-Scale Oceanography programmes. During the Workshop the principal investigators discussed the physical interpretation of the data and formulated plans for future continued cooperation. While C-Scale oceanographer thought it sufficient to encourage direct international contacts between groups involved in this programme, the Equatorial oceanographers set up several small ad hoc Working Groups for specific topics. Recommendations concerning data exchange, data analysis and further meetings originated from these Workshops which were taken up by SCOR WG 43. The participants of the Workshops considered the progress made at these Workshops a very essential step in achieving a fast scientific analysis of the data set. Reports on the results of the two Workshops were prepared by the participants and were later duplicated and distributed by the GARP Activities Office.

3. Plans for further Workshops and Symposia

One Workshop similar (in number of participants) to the two Workshops of 1975 was proposed for late 1976, close to the time of the Joint Oceanographic Assembly in Edinburgh, covering C-Scale and B-Scale processes and simultaneously problems of the general oceanic circulation of the Tropical Atlantic. In addition three meetings of small ad hoc Groups were proposed. The analysis meetings proposed for 1976 thus are:

- a) Workshop of "C/B-Scale processes and general oceanic circulation of the tropical Atlantic", September 1976, Europe

- b) Small Workshop on "Currents and Water Masses of the Western Atlantic".
April 1976, Mexico City
- c) Small Workshop on "Time Series Observations Related to the Equatorial Region".
November 1976, Leningrad
- d) Small Workshop on "Quasi-Synoptic Spatial Observations in the Equatorial Region".
December 1976, Miami

The distinct nature of the surface wave programme may require a special Workshop in order to facilitate the final data analysis, but specific recommendations could not be made at this time.

SCOR WG 43 proposed that a major symposium for the presentation and discussion of scientific results on GATE Oceanography be organized in 1977, with the participation of meteorologists. It was suggested to explore the possibility of holding such a symposium under the joint auspices of SCOR, IAPSO and IAMAP. *

4. GATE Oceanographic Atlas

Members of the Group reaffirmed their belief that a GATE Oceanographic Atlas could provide a useful service, especially to oceanographers who did not have direct access to the original data. It was felt that the time was now ripe for a detailed study of the form that such an atlas might take. Dr Landis (IOC) asked whether it would be appropriate to submit the plan to produce an atlas at the forthcoming IOC Assembly, with a view to obtaining funds within the next two years. After reviewing the scheduled dates for completion of the oceanographic data set, it was agreed that presentation at the 9th Assembly would be premature.

5. Future Role of SCOR WG 43

The Group felt that there is a need for it to continue the task of advising the GAO and the OSDC on data management and to organize the scientific analysis phase and oceanographic meetings in close consultation with IOC and GAO. Looking to the future, the Group could only see a requirement for its services until late 1977 or early 1978 by which date all the oceanographic data should have been processed and a large portion of the scientific analysis should be completed. The members felt that it would be appropriate to make their final activities as a SCOR Working Group in sponsoring the major symposium proposed for that date above.

6. Recommendations

Arising from Southampton meeting:

- i. That scientists working on oceanographic C-scale problems meet again in late 1976, possibly close to the time of the Joint Oceanographic Assembly at Edinburgh, and, taking advantage of increased understanding of the finer scale processes, the group of C-scale oceanographers be extended to consider the B-scale oceanographic objectives of GATE.
- ii. That every effort be made to encourage the rapid analysis of the data set by means of collaboration between scientists working in small international groups or as visitors to institutes in other participating countries, in addition to the major Workshops and symposia proposed by SCOR WG 43.
- iii. That a major symposium for the presentation and discussion of scientific results from the GATE Oceanographic Subprogramme be organized in 1977, with the participation of meteorologists.
- iv. That SCOR re-consider the earlier proposal for providing expert oceanographic advice for data validation at the Oceanographic Subprogramme Data Centre (OSDC) in Brest, France. The Group felt that this advice should be supplied by an available part-time consultant for the remainder of 1975 and early 1976, but that it is necessary that an oceanographer join the OSDC for one to two years, starting in 1976. This oceanographer should have experience in handling and interpreting large oceanographic data sets and in modern oceanographic instrumentation.
- v. That, in order to overcome special problems connected with the surface wave data and their international validation, wave spectra from all GATE contributors be first examined

IAPSO and IAMAP subsequently welcomed these suggestions. A joint symposium will possibly be deferred until early 1978.

at one central institute (such as the Max Planck Institute of Meteorology in Hamburg, F. R. G.) for validation purposes. When completed, the validated data set should be submitted to the OSDC.

- vi. That all scientists involved in the GATE oceanographic programme send preprints of publications to interested oceanographers including all SCOR WG 43 members.
- vii. That all publications resulting from GATE should be identified by the phrase "Gate Contribution" and that lists of existing publications and reports including titles and possibly abstracts be published in the GARP Newsletters. The members were unenthusiastic about the use of a numbering system for GATE contributions.
- viii. That a small study group, comprising Drs W. Duing, G. Philander and J. Woods, should be set up to consider the form that a GATE Oceanographic Atlas might take, with a view to presenting a draft scheme to SCOR WG 43.

Arising from Geneva meetings:

- i. It is recommended that the National Processing Centres as well as individual scientists make every effort to ensure the delivery of their data sets to the OSDC, Brest, by the previously agreed upon deadline of 1 April 1976.
- ii. In order to proceed efficiently with the synthesis of data from the Equatorial and A-Scale programme, it is recommended that ten working teams be established for this part of the programme.
- iii. It is recommended that the Director of OSDC contact the Synoptic Scale Data Centre, Bracknell, to determine if the information requested below is available and how it should be obtained. Results of the determination by the Director of OSDC should be distributed to N. Tyabin (USSR) and C. Rooth (USA) to permit formulation of final specific recommendations.

Synoptic maps and tabulations, prepared from observations of sea-surface temperature and surface winds by all GATE ships, are required to support investigation of large-scale features and to provide ground truth for satellite sea-surface temperature observations. These maps should cover all three phases of GATE at 6-hour intervals (at 0, 6, 12 and 18 hours) daily for: (a) sea-surface temperature, (b) surface wind velocity, (c) curl of wind stress, and (d) divergence of wind stress. It is desirable to know if maps of the above quantities are routinely available and at what scales they are produced. If these quantities are not routinely available, can they be produced as special products and, if so, by whom and over what time frame?

- iv. Recognizing the necessity and importance of international validation before introducing oceanographic data into the final GATE ARCHIVE, it is recommended that:
 - (a) OSDC retain the basic responsibility for the final validation of these data;
 - (b) a preliminary validation be done by each of the ten working teams in the time period between April and September 1976; this work will be coordinated by the chairmen of the working teams in close contact with OSDC;
 - (c) the results of this work will be submitted to OSDC by December 1976, and must include complete documentation of validation procedures to assist in the international validation of the data.
- v. To ensure high-quality data validation at OSDC, we recommend that:
 - (a) funds be made available through international channels for visits (including residence) to OSDC of one or more international experts on various types of data over the course of two years. These experts should act as advisors to OSDC and be given the opportunity to do oceanographic research.
 - (b) as soon as possible, an oceanographer, experienced in data validation, should be added by OSDC to their staff for a period of two years.
- vi. GATE Equatorial Oceanographers need to obtain maps at an early date. It is recommended that:

- (a) by the end of 1976, a report be compiled from all graphs produced by the Working Groups;
 - (b) in order to facilitate this compilation, it is essential that the previously established common scales be adhered to; an ad hoc committee on common scales has been established under the chairmanship of Mr P. Hisard, with Dr Rybnikov, Mr Peluchon, Dr Weisberg and Professor Woods as additional members;
 - (c) by 1 January 1976, this committee is to propose a more comprehensive set of scales than those attached to this report;
 - (d) by the end of 1976, a final recommendation on the production of a more comprehensive atlas will be made by the Atlas Study Group of SCOR WG 43.
- vii. Bathymetric measurements during GATE. Investigators who made bathymetric measurements during GATE are urged to submit their data to IOC before 31 December 1975 (see report on the bathymetric programme).
- viii. Distribution of scientific results pertaining to GATE Oceanography. It is recommended that one copy of any report or publication describing GATE oceanographic results, including internal Institute reports, be sent to the Director, GARP Activities Office, WMO, Geneva. The Director is requested to circulate a list of reports and publications received in Geneva to as many members of the oceanographic community as possible every three months. Scientists are urged to obtain copies of reports directly from the authors, rather than from the GARP Activities Office.