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**Workshop report No. 16**



**Workshop on the Western Pacific**

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# Workshop Report no.16

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<u>No.</u>	<u>Title</u>	<u>Publishing Body</u>	<u>Language(s)</u>
1	CCOP-IOC, 1974, Metallogenesis, Hydrocarbons and Tectonic Patterns in East Asia (Report of the IDOE Workshop on); Bangkok, Thailand, 24-29 September 1973, UNDP (CCOP), 158 pp.	Office of the Project Manager UNDP/CCOP c/o ESCAP Sala Santitham Bangkok, Thailand	English
2	CICAR Ichthyoplankton Workshop Mexico City, 16-17 July 1974, (Unesco Technical Paper in Marine Science, No.20).	Division of Marine Sciences, Unesco Place de Fontenoy 75700 Paris, France	English Spanish
3	Report of the IOC/GFCM/ICSEM International Workshop on Marine Pollution in the Mediterranean, Monte Carlo, 9-14 September 1974.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English French Spanish
4	Report of the Workshop on the Phenomenon known as "El Niño", Guayaquil, Ecuador, 4-12 December 1974.	FAO Via delle Terme di Caracalla 00100 Rome, Italy	English Spanish
5	IDOE International Workshop on Marine Geology and Geophysics of the Caribbean Region and its Resources, Kingston, Jamaica, 17-22 February 1975.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English Spanish
6	Report of the CCOP/SOPAC-IOC IDOE International Workshop on Geology, Mineral Resources and Geophysics of the South Pacific, Suva, Fiji, 1-6 September 1975.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English
7	Report of the Scientific Workshop to initiate planning for a co-operative investigation in the North and Central Western Indian Ocean, organized within the IDOE under the sponsorship of IOC/FAO (IOFC)/UNESCO/EAC, Nairobi, Kenya, 25 March - 2 April 1976.	IOC, Unesco Place de Fontenoy 75700 Paris, France	Full text English only. Extract and Recommendations: French Spanish Russian

<u>No.</u>	<u>Title</u>	<u>Publishing Body</u>	<u>Language(s)</u>
8	Joint IOC/FAO(IPFC)/UNEP International Workshop on Marine Pollution in East Asian Waters, Penang, 7-13 April 1976.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English
9	IOC/CMG/SCOR Second International Workshop on Marine Geoscience, Mauritius, 9-13 August 1976.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English French Spanish Russian
10	IOC/WMO Second Workshop on Marine Pollution (Petroleum) Monitoring, Monaco, 14-18 June 1976.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English French Spanish Russian
11	Report of the IOC/FAO/UNEP International Workshop on Marine Pollution in the Caribbean and adjacent regions, Port-of-Spain, Trinidad, 13-17 December 1976.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English Spanish
11 Suppl.	Collected contributions of invited lecturers and authors to the IOC/FAO/UNEP International Workshop on Marine Pollution in the Caribbean and adjacent regions, Port-of-Spain, Trinidad, 13-17 December 1976.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English Spanish
12	Report of the IOCARIBE Interdisciplinary Workshop on Scientific Programmes in support of Fisheries Projects, Fort-de-France, Martinique, 28 November - 2 December 1977.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English Spanish
13	Report of the IOCARIBE Workshop on Environmental Geology of the Caribbean Coastal Area, 16-18 January 1978.	IOC, Unesco Place de Fontenoy 75700 Paris, France	English Spanish
14	IOC/FAO/WHO/UNEP International Workshop on Marine Pollution in the Gulf of Guinea and adjacent areas, Abidjan, Ivory Coast, 2-9 May 1978.	UNEP Palais des Nations CH-1211 Geneva Switzerland	English French
15	CPPS/FAO/IOC/UNEP International Workshop on Marine Pollution in the Southeast Pacific Santiago de Chile 6-10 November 1978	IOC, Unesco Place de Fontenoy 75700 Paris, France  CPPS Dir. de Soberania Marítima Ministerio de Relaciones Exteriores Lima Peru	English  Spanish

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SUMMARY REPORT

1. Opening of the session

Mr. Desmond P.D. Scott, Secretary IOC, called the meeting to order. The Secretary recalled that the Workshop was held in accordance with decisions taken at the tenth session of the IOC Assembly October/November 1977, in order to define scientific priorities for WESTPAC. He reminded the participants that each attendee was acting in his personal capacity as a scientist.

Dr. Takashi Fujii, Chairman of the Science Committee, Japanese National Commission for Unesco, welcomed the participants, noting that the significance of the WESTPAC programmes was well recognized. He indicated that Japan supported the regional programme strongly through its fisheries research in the region and that the Japanese National Commission for Unesco views WESTPAC as having very high priority.

Mr. Scott, Secretary IOC, thanked the Japanese National Commission for Unesco for making all arrangements for hosting the three meetings held during this period 14-24 February, the 4th CSK Symposium, the WESTPAC Workshop and the first session of the Working Group for WESTPAC, Mr. Scott proposed Dr. James Brodie as chairman of the Workshop, Dr. Brodie was formerly the Director of the New Zealand Oceanographic Institute and is now a Consultant with the Unesco Regional Office for Science and Technology, Jakarta, Indonesia. The nomination was accepted unanimously.

2. Administrative arrangements

Administrative arrangements for the meeting were then clarified by the Secretary. Mr. Robert Dennis was appointed rapporteur for the meeting.

The Secretary addressed the group regarding the purposes of the three meetings. The Symposium was held as a terminal presentation forum for research conducted under CSK during the previous 13 years. The WESTPAC Workshop is being held to define scientific priorities for the WESTPAC region. The Working Group session later in the week will be an inter-governmental meeting to identify and initiate planning for a small number of projects in the WESTPAC area. He then reviewed the documents distributed for information to the Workshop attendees.

3. Purpose of the meeting

The Secretary reiterated that the purpose of the meeting was to formulate a number of projects to be carried out in the region, which are neither too general nor too localized in interest and which do not overlap ongoing work. He urged that scientific priorities be considered and assigned to projects.

The Chairman summarized the definition of projects applicable to WESTPAC. In any of the disciplines the projects proposed must be confined to problems that cannot be solved nationally or individually and are not already being executed.

In response to a question from Dr. Nasu, the Secretary reviewed the structure of WESTPAC as a semi-permanent body under general IOC administration. In this context, individual projects could have a duration of any length of time, to be decided by the intergovernmental working group which adopted the project. He again stressed the concept that the Workshop mandate was to establish scientific priorities and to propose several attainable projects without regard to the individual durations of these projects.

The Workshop felt that many smaller island nations which do not presently participate in IOC or WESTPAC should be invited to become active members since their interests will be served by work in the region.

#### 4. Review of Potential Regional Studies

The Chairman asked spokesmen for each of three disciplines to give short summaries of potential scientific investigations within the region.

Dr. B.A. Taft summarized physical oceanographic problems as falling into four categories:

- (i) The large-scale structure of the upper ocean (0-1000 m) and its variability. These studies will lead to an understanding of climate and the nature of the large-scale air-sea interaction.
- (ii) The near-surface convergent and divergent zones (frontal zones). These problems bear strongly on ocean productivity.
- (iii) Deep water circulation ( $> 1000$  m). Deep circulation is important for heat budget analysis and understanding of climate. These studies require long-term direct current velocity measurements since analysis of water mass characteristics cannot be expected to provide much additional insight due to the weak gradients in water properties in the deeper layers.
- (iv) The circulation of marginal seas. This knowledge is important for understanding productivity and the dispersal of pollutants.

Dr. K. Wyrteki called attention to the importance of establishing a long-term monitoring programme in the WESTPAC region. Only by constant careful monitoring will it be possible to predict ocean behaviour successfully and translate this knowledge into economic benefit. He reviewed present capabilities in monitoring and other large-scale experiments designed to improve forecasting ability. He suggested that the monitoring network within the region be expanded where applicable and necessary, especially to include non-physical oceanographic parameters and that a real-time regional data centre be established to maintain the monitoring of data.

Dr. Y. Dandonneau urged that chlorophyll be included as a standard monitoring parameter.

Professor I. Ronquillo reviewed problems of biological oceanography in the region. He stated that there appear to be two areas of concern:

- (i) productivity of shallow waters;
- (ii) productivity of deep waters.

Specific areas that have received attention are coral reef ecology, studies of tuna and other pelagic species, and problems of returning species (Japanese sardines). Dr. Ronquillo concluded that fish eggs, larvae and plankton distribution should continue to be sampled, mapped and studied. He noted that air/sea interaction, especially monsoon effects, should have priority in planning.

Dr. Nasu reviewed the status of geological studies in the ocean, as indicated both by the recent CSK Symposium and by previous SEATAR work. He stated that WESTPAC represents an active margin area with active subduction observed. He said that progress has been made in plate tectonics studies within the region, that continuous seismic profiling has yielded valuable results and that the Deep Sea Drilling Project has given a better understanding of the ocean floors. Dr. Nasu indicated that the ridges and trenches in the WESTPAC region were of great interest to geologists and work on these areas should be given high scientific priority.

The group adjourned to individual ad hoc disciplinary sub-groups as follows:

Physical Oceanography	- Dr. Bruce Taft
Marine Biology and Pollution	- Dr. Inocencio Ronquillo
Marine Geology and Geophysics	- Dr. Noriyuki Nasu.

## 5. Reports of Sub-groups

The Chairman expressed his appreciation to the Chairmen of the ad hoc Sub-groups for their leadership in the several sessions of the disciplinary sub-groups. Each Sub-group Chairman was then invited to summarize the report of his group. The sub-group reports are attached as Annexes I, II and III.

Referring to the report of the Physical Oceanography Sub-group, the Secretary drew attention to an article in the latest issue of the International Marine Science newsletter regarding IGOSS products. He also mentioned that loss of data from IGOSS was often due to failure of coastal stations to maintain continuous watches on the Global Telecommunications System (GTS). The Joint Working Committee for IGOSS is addressing this problem.

The desirability of including tsunami research in the WESTPAC programme was discussed. It was noted that the IOC International Co-ordination Group for the Tsunami Warning System in the Pacific is responsible for all matters concerned with tsunami predictions and warnings, including the collection of seismic and sea-level data for this purpose. Tsunami research is carried out by an IUGG working group under the chairmanship of Dr. Soloviev (USSR); the IOC provides a certain amount of support for this group.



A general discussion regarding specific regional programmes followed. It was felt that mention of these programmes in any recommendations was not appropriate but rather should be detailed by the Working Group in the development of plans and programmes.

The reports of the Sub-groups proposing programmes and projects were adopted. In so doing, the Workshop participants wished to place on record that careful consideration had been given to prior recommendations of the ad hoc Task Team on WESTPAC, Nouméa, June 1977, and to proposals for scientific programmes submitted by participating members. Furthermore the interdisciplinary nature of many of the problems facing scientists and governments within the WESTPAC region had been fully recognized.

#### 6. Studies of Shelves and Marginal Seas

The Secretary presented a draft of ideas for a proposal regarding "Continental Shelf and Marginal Seas Studies". Strong support was expressed by the group. Dr. Aprilani Soegiarto particularly urged that IOC take special note of the importance of regional programmes being developed independently in the marginal seas such as the SNELLIUS II Expedition. Dr. Richmond expressed strong support for the idea of a newsletter.

Throughout the discussions, the need for interdisciplinary projects became increasingly apparent. The Chairman noted that many of the recommendations of the Sub-group cross disciplinary boundaries. Furthermore the problems of the WESTPAC region held in common with other scientific groups will require the Working Group for WESTPAC to establish mechanisms for interchange of technology, methods, information and training among the various programmes.

#### 7. Adoption of Summary Report and recommendations

The Summary Report of the Workshop, incorporating three recommendations dealing with:

1. the central programme of investigations for WESTPAC;
2. requests for support for workshops and task teams to be provided by IOC; and
3. transfer of knowledge and technology;

was adopted for forwarding to the first session of the Working Group for WESTPAC.

The recommendations are contained in Annex IV.

#### 8. Closure of the session

The Chairman closed the session at 1700 on Tuesday 20 February 1979.

WESTPAC PHYSICAL OCEANOGRAPHY SUB-GROUP

Chairman: Dr. B. Taft

Programme

The central theme of the discussion in the Sub-group was the importance of improving the large-scale monitoring of the WESTPAC region. This was viewed as an appropriate activity for WESTPAC because of its scientific significance, the social benefits and the extent of the resources required to maintain such a monitoring system. The scientific objective is to provide a description of the large-scale, low frequency fluctuations of the heat content and the geostrophic circulation of the upper layer (1,000 m) of the Western Pacific Ocean and its interaction with the atmosphere.

Projects

1. There is a need to provide a data base in the open-ocean, with associated meteorological observations, which will not only allow the variability of the open-ocean to be studied, but is also essential for studies of nearshore processes, as these are influenced by the transfer of energy from the open-ocean. This data base will lead to the identification of the problems of sub-regions that should be worked on more intensively in the future. The Sub-group noted that knowledge of the temperature structure of the upper ocean is of critical importance to studies of both climate fluctuations (large-scale air-sea interaction) and fisheries oceanography.

Two ways in which the monitoring effort may be improved were discussed: (i) increase the proportion of BATHY/TESAC data which is reported; and (ii) increase the number of platforms from which observations are taken.

If all BATHY data were submitted to a central archive, a doubling of the data base might be expected. This could be accomplished at a cost which is small compared with the costs of funding new observations. The best insurance that data does not get lost is to have it reported in real-time. The IGOSS system exists and is the proper vehicle to use in the effort to reduce the data lost. WESTPAC should make one of its primary goals the stimulation of the IGOSS system to obtain a much larger fraction of the available data. Because at present 40% of the data is unusable because of coding and transmission errors, IGOSS should be urged to consider how data quality can be improved.

2. The problem of deciding how the data set should be incremented is complex. Different monitoring schemes are required for different scientific problems, e.g., a different space-time sampling scheme is needed to resolve the coastal upwelling regime than is needed for the baroclinic circulation of the subtropical gyre. Enhancement of the sampling programme will obviously depend on the present level of sampling, e.g. it is likely that there is a greater need for additional

data south of  $30^{\circ}\text{N}$  than in the Kuroshio and adjacent regions, since there are extensive ongoing programmes in the Kuroshio.

3. We propose that a task team be formed under WESTPAC to consider the overall monitoring programme. This team should review the adequacy of the monitoring system and data base, define the levels of effort required to improve the monitoring scheme and propose programmes to WESTPAC to implement these improvements. This would provide a solid basis for further planning in WESTPAC of projects to accomplish the desired scientific objectives.

4. The group noted that it was desirable to extend the sea level programme for the equatorial Pacific into all regions of WESTPAC; this could be accomplished by a modest increase of resources.

In addition to the large-scale monitoring programme the following programmes were seen as potential future WESTPAC activities: (i) a study of the structure of frontal systems which have important effects on both biological productivity and air-sea interaction; (ii) a study of vertical exchange processes at oceanic divergence zones and in the vicinity of islands; (iii) a study of meanders and eddy formation in strong currents, such as the Kuroshio, and their role in influencing the general circulation in the Western Pacific; and (iv) a study of the physical oceanography of the marginal seas and continental shelves of the Western Pacific.

WESTPAC WORKSHOP MARINE BIOLOGY AND POLLUTION SUBGROUP

Chairman: Professor I. Ronquillo

Programme

Developing states face several difficulties in that they do not have enough qualified personnel to collect and interpret data which would allow such states to: (i) utilize their resources more appropriately; (ii) recognize that potentially hazardous problems related to the marine environment and ecology of their states may exist; and (iii) recognize that such problems as do exist may have already been solved in analogous situations elsewhere and the solution readily applied to their case.

A useful function which WESTPAC could serve would be in offering assistance in the identification of such problems and as a technical and literature resource for solving them. Another major function of WESTPAC would be as a data storage, synthesis and dispersal facility for pertinent information regarding the WESTPAC area per se as well as any given sub-unit of this area.

Projects

The following major research topics and comments regarding each are recommended for adoption by the Working Group:

1. CSK recommendations regarding marine ecosystem dynamics, as well as monitoring of eggs, larvae, phyto- and zoo-plankton, micronekton and the benthos, should be expanded with respect to local conditions for member countries. Efforts should be made: (i) to organize existing data into taxonomic monographs for the WESTPAC region and subregions; (ii) to form a specimen reference collection for both training and research purposes; (iii) to encourage the expansion of existing institutes or university departments in less developed member states by training workers at both the technician and professional levels in states in WESTPAC and other states which have the necessary expertise in these areas; and (iv) to generate synoptic maps resulting from seasonal climatic changes, both monsoonal and otherwise.

2. A marine pollution research and monitoring programme along the lines of that proposed in document IOC/WESTPAC-I/7 should be initiated with special emphasis on commercially exploited shellfish as outlined in the CSK-IV Symposium recommendation 3.2. WESTPAC can play a valuable role in the dissemination of information regarding analytical techniques, of organizing intercalibration of research techniques and of possibly supplying standard materials in sufficient quantities for routine cross-checking of procedures. WESTPAC should encourage the training of people at both professional and technician levels in less developed states. Active participation in a marine pollution monitoring programme is also strongly recommended for all member states. In order for monitoring to begin immediately, special sampling procedures and sample containers could be given to less developed member states and the samples in turn analysed by those states having more adequate facilities and procedures. It should

be possible to combine these analyses with the training of personnel from the specific member state involved. In addition, educational materials regarding short- and long-term effects (both economic and health) should be made available to all member states and to those who may wish to join WESTPAC, in a form which may be readily usable by the states involved.

3. The development of simple and effective methods for the study and interpretation of physical dispersion processes relative to marine biological systems (for example CSK-IV Symposium recommendation 3.4) should be encouraged and persons trained in their usage. Emphasis on simplicity of design and durability (items such as drift bottles and cards may in many cases be sufficient) should be stressed. At the same time, the development of instrumentation which can be used by ships of opportunity should also be encouraged, as well as the storage and useful manipulation of such information by the WESTPAC data centre. At the same time there is a need for ready access to biologically relevant data which may be collected by physical oceanographers and stored in the data bank. Again, production of changes in such parameters by area and by season as well as the regular distribution of such information should be encouraged.

4. It was noted that during the initial few years of WESTPAC, there may be no real need or advantage of dividing WESTPAC into climatic or geophysical sections because of the greater problems of the training of personnel, and collection, storage and dissemination of existing information in a timely manner.

WESTPAC WORKSHOP MARINE GEOLOGY AND GEOPHYSICS SUB-GROUP

Chairman: Professor N. Nasu

Present activities

The present activities in the WESTPAC region are due mainly to the work of Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP) in East Asia, Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas (CCOP/SOPAC) in the South Pacific, and of institutions funded by Australia, France, Germany (Fed. Rep.), Japan, New Zealand, USSR, UK and USA in these areas and in the North Pacific region.

Since the 1973 CCOP-IOC SEATAR workshop much progress has been made in the transect studies in east and south-east Asia which proved an effective method of integrating data from all branches of geology and geophysics with cross sections from the deep sea, across shallow shelves to the land areas. In the South Pacific, work has been concentrated mainly on geophysical studies of the New Hebrides-Fiji Plateau-Tonga area. A great number of studies have been carried out in the north-west Pacific region during the past decade and more by various national and international organizations and especially, through the Geodynamics Project and the International Phase of Ocean Drilling (IPOD). The Glomar Challenger has drilled many holes in the WESTPAC region for the Deep Sea Drilling Project (DSDP) and has contributed significant additional information on the whole region as well as raising new problems.

Problems and new programmes

Work carried out to date has shown that the dynamics of subduction processes, including the genesis of back-arc and fore-arc basins, accretionary processes, and driving mechanisms of subduction are still not well known. Also the Deep Sea Drilling Project has revealed a significant Tertiary depositional hiatus in the WESTPAC area. These factors were taken into account in considering the programmes for WESTPAC.

The Sub-group assessed the recommendations of the ad hoc Task Team for WESTPAC, Nouméa, June 1977 and of the CSK-IV Symposium, Tokyo, 14-17 February 1979, and took note of the USSR proposals tabled at the 1977 Nouméa meeting (doc. IOC/WESTPAC ad hoc-I/3, Annex VI). The recommendations of the 2nd CCOP-IOC Workshop on IDOE Studies of East Asia Tectonics and Resources, Bandung, Indonesia, October 1978, were also studied.

Programmes

The Sub-group believes the broad programmes of greatest significance in the WESTPAC region to be:

(i) Detailed studies of the subduction processes at the convergence zones at the western margins of the Pacific including island arc development, back arc basin origins, and sedimentary and structural histories of the marginal seas.

(ii) Investigations of the depositional environment and history of sedimentation in Western Pacific Basins, noting particularly the problem of the Tertiary depositional hiatus.

(iii) Studies of the nature of the oceanic lithosphere, the nature and origin of oceanic plateaux, and oceanic volcanic features.

### Projects

1. The Sub-group noted that projects within these broad programmes, specifically within those relating to subduction studies and to the depositional environment, are already being carried out in the joint CCOP/IOC SEATAR Working Group activities within the Indo-Pacific sub-region and no specific new projects have therefore been proposed under programmes (i) and (ii) for this sub-region. It was recalled with satisfaction that considerable progress that is being made in the SEATAR and CCOP activities.

2. The Sub-group noted further that projects under programmes (i) and (iii) are of specific interest to CCOP/SOPAC in the southern sub-region. The Sub-group recommends to the proposed WESTPAC-CCOP/SOPAC workshop to be held in Nouméa in 1980 that particular consideration should be given to the following projects among those which might be adopted for action by a joint working group between WESTPAC and CCOP/SOPAC analogous to SEATAR:

(a) Study of subduction processes by means of concentrated observations of geological and geophysical properties along critical transects in the area between the Melanesian Borderland and the Tonga Trench; and

(b) Study by means of geophysical and geological observations of the nature and origin of the Fiji Plateau and the Ontong Java Plateau.

3. For the northern sub-region, in addition to projects incorporated in the SEATAR programme, the Sub-group recommends the following new projects under programmes (i), (ii) and (iii). These projects should be studied for advancement by a future workshop to be held (hopefully in Japan) in 1979 or 1980:

(a) Study of the various subduction processes such as the tensional type (Mariana Trench), compressional type (Aleutian Trench), and intermediate type (Japan and Kurile Trenches) which cause seismicity and tectonism, and are the major controlling factors of volcanism, mineralization, back-arc opening, and island arc formation.

(b) Study of long-term changes in the morphology and palaeo-temperature distribution of the region, to determine palaeo-environmental history of the western Pacific with special emphasis on the great western

Pacific Tertiary hiatus. Subsidence of the back-arc basins such as the Sea of Japan and the Okhotsk Sea and their insular slopes, is of related interest.

(c) Study of the Pacific plate, where the oceanic crust is the oldest. The nature of the Jurassic and Cretaceous magnetic quiet zone and structure of deep lithosphere should be investigated. Studies of the nature and origin of oceanic plateaux and volcanic islands such as the Shatsky Rise, the mid-Pacific mountains, and the Emperor Sea-mount Chain will provide information on intraplate tectonism and volcanism which are quite different from the mid-oceanic ridge system.

4. The Sub-group urges the importance of utilizing deep-sea drilling through the IPOD programme at selected sites in the Western Pacific to further aid studies of the crust and of the depositional history of basins in all three sub-regions. It was noted that in addition to the range of usual geological and geophysical techniques much valuable data can be obtained by applying, for example, deep-towed sensors including side-scan sonars, multiple beam echo-sounders, multi-channel seismic reflection profiling equipment, submersibles, ocean bottom sensors, and space sensors.

#### General

The Sub-group noted that an annual review of its activities can be made by the joint Working Group on SEATAR and a similar mechanism may be established with CCOP/SOPAC. The desirability of a further review mechanism being established for north Pacific activities was stressed. The Sub-group also recommended that the whole WESTPAC geoscience activity should be reviewed at successive meetings of WESTPAC, and overall by means of a workshop every five years.



RECOMMENDATIONS

The Workshop recommends to the Working Group for the West Pacific (WESTPAC):

1. that the programmes and projects described under the three headings Physical Oceanography, Marine Biology and Pollution, and Marine Geology and Geophysics be adopted as the marine science activities of WESTPAC;
2. that IOC be asked to provide (a) opportunities for Workshop meetings on specific topics in 1979, 1980 and succeeding years, the needs for which are foreseen in the programme and project proposals and (b) support for a Task Team, as proposed, to investigate needs in ocean monitoring, such a team to work in close collaboration with the IGOSS Sub-group of experts on Operations and Technical Applications;
3. that the importance for the Member States of WESTPAC, particularly the smaller developing countries, of the transfer and exchange of technical capability, information and literature resources, and data, be recognized. It was considered that the Working Group should set up mechanisms to achieve this purpose. Where common factors can be seen in local projects, the Working Group should provide opportunities including workshops, for discussion of methodology and standardization, and of common problems.

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