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TEMA IN GIPME:
AN OUTLINE OF A TRAINING PROGRAMME IN MARINE POLLUTION
RESEARCH AND MONITORING

The Secretary IOC was requested by the Fourth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment (GIPME), New York, 6-12 January 1982, which was later approved by Resolution EC-XV.3, to distribute this information document on Training, Education and Mutual Assistance in marine sciences (TEMA) to Member States. This document contains general guidelines for developing training programmes and nominating individuals to participate in such programmes.

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GENERAL

Any activity dealing with monitoring of the marine environment must involve methods and techniques which produce comparable results. It is therefore essential that prior to the initiation of any programme, an assessment be made of the technical capabilities in the region, and, if found lacking, training should be scheduled. In addition, intercalibration exercises must also be conducted, even in those instances where training is not required. When a training programme is deemed necessary, such a programme should be drawn up first by subject, second by region. It should, nevertheless, be related to present or planned marine pollution research and monitoring programmes. In the first instance, these programmes should be IOC ones: IOCARIBE, WESTPAC, and, in due course, CINCWIO, and other regional subsidiary bodies of the Commission. In the second instance they could be programmes in which IOC is collaborating with another organization, such as the UNEP Regional Seas Actions Plans and similar programmes, whenever they become operational, providing extra budgetary resources are available.

GIPME-TEMA PROJECTS BY SUBJECT

1. Analytical Techniques

1.1 Heavy metals

- atomic absorption spectrometry
- anodic stripping voltametry
- neutron activation analysis
- others

1.2 Hydrocarbons (petroleum, halogenated, etc.)

- gas chromatography
- mass spectrometry
- spectrofluorimetry

The analytical methods noted above often require adaptation depending on whether the material is air, water, sediments, suspended matter or organisms.

It is also understood that training would only be given in techniques for which the trainee's home laboratory has the necessary instrumentation.

2. Intercalibration Exercises

All institutions in a given region interested in studying the marine pollution thereof must participate in an intercalibration exercise: their analyses of a given sample of water, whatever the method used, must agree to within a previously agreed level of accuracy, and with a previously agreed level of precision; that is, repeated analyses are all equally (more

or less, as agreed) accurate. Such exercises are hard to organize, and the results are often disappointing, but it is better to know the difficulties of making accurate and precise measurements than to ignore them. Also, specially prepared samples (i.e., reference standards) must be analyzed in an intercalibration exercise, as well as natural samples.

3. Sampling Procedures

The very business of obtaining samples can be the subject of special training, as well as being the subject of intercalibration. The methods are basically related to the medium to be sampled; air, water, sediments, suspended matter or organisms; but they are also related to the pollutants of interest since the question of contamination of samples by sources of pollutants from outside the sample (e.g., sampling vessel's paint, engine-room emissions) arises.

4. Sample-treatment Procedures

The sample, once obtained, must often be treated prior to actual analysis. This pre-treatment is itself often a source of contamination. It is also a proper subject of training either in connection with 3, or with 1. It is also a proper subject of intercalibration.

5. Other Subjects

At the present time, the development of training courses in such difficult matters as dose/response relationships of pollutants in organisms, or the effects of pollutants on organisms, are considered to be a secondary priority. For the moment, a training programme in marine pollution research and monitoring should place emphasis on determining levels (concentrations) of selected elements and compounds in marine environmental media and organisms. Analysis and interpretation of remotely sensed data should be left to the few institutions expert in this field.

GIPME-TEMA PROJECTS BY REGION

At present, a TEMA-GIPME programme should concentrate on the Caribbean (IOCARIBE) and the Western Pacific (WESTPAC). These are the two IOC regional subsidiary bodies that have ongoing programmes in marine pollution research and monitoring.

1. IOCARIBE

The principal interest is oil. Training should be given in: (i) the collection and measurement of floating or suspended tar-balls; (ii) likewise, of tar on beaches; and (iii) the analysis of dissolved/dispersed petroleum hydrocarbons in seawater. At present, training on the effects of hydrocarbons on organisms or ecosystems should be considered as a follow-on activity, once expertise in the former activities is developed.

If the IOCARIBE Programme were expanded to include trace metals and halogenated hydrocarbons, then it would be appropriate to include such training.

2. WESTPAC

The principal interest is in heavy metals and halogenated hydrocarbons in commercially important shellfish. The main thrust of the training should therefore be this. However, their analysis in seawater would be appropriate in view of the close association of the organisms with the water. Similar analyses of sediments (marine geochemistry) or air should be viewed as a future training activity, once presently existing questions concerning methodology and techniques are resolved, and a technical capability for the analyses of these parameters in biological tissue exists, which can be further broadened.

MECHANISM

For each region and each topic the proposed training programme requires an experienced host institution and an appropriate number (enough, but not too many) of trainees. It is not enough to have a willing host institution; it must be an institution with a proven record of capability in the subject of the programme and in the provision of training. Member States with donor institutions should notify the Secretary of the details of the courses on offer. These details should be made known to all Member States declaring training needs. These needs should likewise be made known to the Secretary IOC, who should notify all donor Member States, and generally act as a broker for the Member States. He should also, as far as possible, assist Member States, at their request, to determine their training needs in this field.

It should be noted that, in the past, Member States have rarely notified the Secretary IOC of potential donors or potential recipients of training, even when specifically requested to do so.

The general structure of courses, the fields covered by any one course, their duration, etc. should be specified by host institutions in the light of the content of regional programmes and of the suggested topics in sections 1 and 2 above.

The details of nomination and selection of candidates require study, as to the budgetary aspects. Many host institutions require some extra budget to cover special costs of giving a training course, although the main cost should be in providing travel and daily subsistence allowance for the trainees. These costs should be clearly identified and sources earmarked at an early stage.

Candidates should be required to submit detailed curricula vitae which should, as appropriate, indicate the relevant experience required for the training for which they are candidates, and show proof of proficiency in the language in which the training is to be given. Institutions proposing candidates must give an assurance that the trainees will be able to apply in their own countries the experience gained during the training; special attention should be paid to the possibility of secondary training of staff by the trainees upon their return.