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Intergovernmental Review Meeting of  
Mediterranean Coastal States and  
First Meeting of the Contracting Parties  
to the Convention for the Protection of  
the Mediterranean Sea against Pollution  
and its related protocols

Geneva, 5 - 10 February 1979

CO-ORDINATED MEDITERRANEAN POLLUTION MONITORING AND  
RESEARCH PROGRAMME (MED POL)

PROGRAMME DESCRIPTION

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## INTRODUCTION

The United Nations Environment Programme (UNEP) was established by the United Nations General Assembly "to serve as a focal point for environmental action and co-ordination within the United Nations system".<sup>1)</sup>

While it was recognized that environmental deterioration was far advanced in many areas of the globe, the Mediterranean region was selected by UNEP as a "concentration area" where UNEP would attempt to fulfil its catalytic role in assisting the coastal States in an ambitious and consistent manner.

After extensive preparatory activities involving a number of United Nations bodies, UNEP convened the Intergovernmental Meeting on the Protection of the Mediterranean (Barcelona, 28 January - 4 February 1975). The meeting was attended by representatives of 16 States bordering on the Mediterranean Sea. At the end of the two-week meeting they approved an Action Plan<sup>2)</sup> consisting of three substantive components:

- legal (framework convention and related protocols)
- scientific (research and monitoring)
- integrated planning

All components of the Action Plan are interdependent and provide a framework for comprehensive action to promote both the protection and the continued development of the Mediterranean ecoregion. No component is an end in itself. Each activity is intended to assist the Mediterranean Governments in improving the quality of the information on the basis of which they formulate their national development policies. Each should also improve the ability of Governments to identify various options for alternative patterns of development and to make rational choices and appropriate allocations of resources.

The environmental assessment (scientific) component of the Mediterranean Action Plan has as its overall objectives:

- to assess the present state of pollution of the Mediterranean Basin,

- to identify the sources, pathways, amounts and effects of pollutants affecting the Mediterranean Sea,
- to establish the trends in the level of the pollution,
- to provide the basis for building predictive models of the biogeochemical cycle of pollutants and of their effects,
- to present the information thus obtained in such a way that it could be used as a management tool in the control of pollution,
- to help the riparian countries in making proper decisions with respect to the environmentally compatible socio-economic development strategies,
- to suggest methods for pollution control, including their cost-benefit analysis.

The purpose of this document is to provide a general outline of the environmental assessment component of the Mediterranean Action Plan.

## BACKGROUND

As early as 1969 the General Fisheries Council for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) formed a Working Party on Marine Pollution in the Mediterranean and its Effects on Living Resources and Fishing which, in co-operation with experts from the International Commission for the Scientific Exploration of the Mediterranean Sea (ICSEM), produced the first comprehensive review of the state of marine pollution in the Mediterranean in 1972.<sup>3)</sup>

The next important step was the UNEP-sponsored International Workshop on Marine pollution in the Mediterranean<sup>4)</sup>, convened in Monaco (9 - 14 September 1974) by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), GFCM of FAO and ICSEM. This meeting, attended by 40 scientists from Mediterranean research centres, defined pollution of coastal waters as the main environmental problem in the Mediterranean Sea and attributed it to the general lack of adequate systems for the treatment and disposal of domestic and industrial waste, to the input of pesticides and petroleum hydrocarbons, and to the presence of disease-causing micro-organisms. The Workshop also reviewed information on current subregional programmes as well as on existing research and monitoring facilities in the Mediterranean.

Based on the recommendation of the Monaco Workshop and on a subsequent study of the capabilities of existing national research institutions, conducted by IOC on behalf of UNEP, the 1975 Intergovernmental Meeting in Barcelona approved a Co-ordinated Mediterranean Pollution Monitoring and Research Programme (MED POL) consisting of seven pilot projects and requested UNEP's Executive Director to implement the Programme in close collaboration with the relevant specialized United Nations bodies: GFCM of FAO, IOC of UNESCO, the World Health Organization (WHO), the World Meteorological Organization (WMO), and the International Atomic Energy Agency (IAEA)<sup>2)</sup>.

The following pilot projects were approved at the Barcelona Meeting as parts of MED POL:

- MED POL I : Baseline Studies and Monitoring of Oil and Petroleum Hydrocarbons in Marine Waters (IOC/WMO/UNEP);
- MED POL II : Baseline Studies and Monitoring of Metals, particularly Mercury and Cadmium, in Marine Organisms (FAO(GFCM)/UNEP);

- MED POL III : Baseline Studies and Monitoring of DDT, PCBs and Other Chlorinated Hydrocarbons in Marine Organisms (FAO(GFCM)/UNEP);
- MED POL IV : Research on the Effects of Pollutants on Marine Organisms and their Populations (FAO(GFCM)/UNEP);
- MED POL V : Research on the Effects of Pollutants on Marine Communities and Ecosystems (FAO(GFCM)/UNEP);
- MED POL VI : Problems of Coastal Transport of Pollutants (IOC/UNEP);
- MED POL VII : Coastal Water Quality Control (WHO/UNEP).

Since the Barcelona Meeting, several other projects have been added as collaterals to MED POL, either to broaden the scope of the original seven MED POL pilot projects or to provide the necessary support for them. They are:

- MED POL VIII: Biogeochemical Studies of Selected Pollutants in the Open Waters of the Mediterranean (IAEA/IOC/UNEP);
- MED POL IX : Role of Sedimentation in the Pollution of the Mediterranean Sea (UNESCO/UNEP);
- MED POL X : Pollutants from Land-Based Sources in the Mediterranean (WHO/ECE/FAO/IAEA/UNESCO/UNIDO/UNEP);
- MED POL XI : Intercalibration of Analytical Techniques and Common Maintenance Services (IAEA/UNEP);
- MED POL XII : Input of Pollutants into the Mediterranean Sea Via Atmosphere (WMO/IAEA/ECE/UNIDO/WHO/UNEP);
- MED POL XIII: Modelling of Marine Systems (UNESCO/IOC/IMCO/UNEP).

Through these projects the co-operation with specialized bodies of the United Nations system was extended to the Economic Commission for Europe (ECE), the United Nations Industrial Development Organization (UNIDO) and the Inter-Governmental Maritime Consultative Organization (IMCO).



## OUTLINE OF THE PROGRAMME

### MED POL I : BASELINE STUDIES AND MONITORING OF OIL AND PETROLEUM HYDROCARBONS IN MARINE WATERS (IOC/WMO/UNEP)

The pollution of the Mediterranean by oil and petroleum hydrocarbons is a serious problem for beaches and other coastal, recreational areas, and as yet too little is known about the present levels of the pollution and about its effects on the Mediterranean ecosystem. The pilot project involves the visual observation of oil slicks and other floating pollutants, tar ball sampling, survey of tar on beaches and sea-water sampling to analyse the amount and composition of the petroleum hydrocarbons dissolved.

The pilot project is considered as a contribution to the Integrated Global Ocean Station System (IGOSS) organized by the Intergovernmental Oceanographic Commission (IOC) of UNESCO in co-operation with the World Meteorological Organization (WMO).

The measurement of present levels of petroleum in all its forms in the Mediterranean assumes greater importance in view of the reopening of the Suez Canal to the passage of oil tankers. The value of initiating the pilot project in the Mediterranean region rests mainly on three facts:

- an observational methodology (that of IGOSS) was available at the initiation of MED POL I which could be easily adapted to suit its purposes, and further developed during its first phase, bearing in mind the desirability of keeping its data fully comparable to those of the IGOSS Pilot Project,
- by using a common methodology and strategy, comparisons of effects of accidental and operational discharges from tankers, and shore facilities in the various parts of the Mediterranean Sea would become possible,
- within a common system of observation, the Mediterranean can be truly compared with other areas (e.g. the North Atlantic) with quite different oceanographic regimes, in which the possibilities for dispersion and dilution are greater and the possibilities of evaporation generally lower.

The aim of the Pilot Project is to develop a capability to assess the present level and the short and long-term trends of pollution of the Mediterranean by oil and petroleum hydrocarbons. This assessment would be achieved by using an accessible, commonly-agreed upon

technique and methodology, verified by a carefully co-ordinated intercalibration exercise. The expected results would substantially contribute to the formulation of contingency plans for action, both in cases of emergency and for dealing with effects of point sources resulting from operational spills. These contingency plans are expected to be developed by the Regional Oil Combating Centre in Malta.

MED POL II : BASELINE STUDIES AND MONITORING OF METALS,  
PARTICULARLY MERCURY AND CADMIUM, IN MARINE  
ORGANISMS (FAO(GFCM)/UNEP)

Metals, and particularly heavy metals like mercury, are more or less toxic to man and to practically all marine organisms. They can reach man through the food chain, and the source of greatest concern is, therefore, the level of concentration of such metals in fish, shell-fish and other edible marine organisms.

It is recognized that the Mediterranean is a tectonically rich region and that some metals may have high natural levels and great variations in their concentration in sea-water and sediments. The bluefin tuna, as well as other tuna, is known to accumulate mercury and, although there is no strong evidence that the Mediterranean stock is separate from the Atlantic stock as a whole, Mediterranean tuna apparently have much higher levels than those from the Atlantic.

The pilot project deals primarily with the concentration of selected metals, particularly mercury and cadmium in marine organisms. In addition to these elements the measurement of the levels of copper, lead, manganese, selenium and zinc is recommended, particularly when detection methods providing for multi-elemental analysis are used. The striped mullet, the Mediterranean mussel and the bluefin tuna have been selected for the monitoring programme so that representative ecotypes are included. The sampling frequency is seasonal.

The information on the level of selected metals in representative marine organisms is collected primarily to assess the eventual risk stemming from consumption of seafood. Furthermore, data collected through the project will contribute to the understanding of the causes of relatively elevated concentrations of some metals in Mediterranean organisms which, after all, may be due to natural phenomena.

MED POL III : BASELINE STUDIES AND MONITORING OF DDT, PCBs AND  
OTHER CHLORINATED HYDROCARBONS IN MARINE ORGANISMS  
(FAO(GFCM)/UNEP)

Similar arguments to those advanced for the monitoring of metals (MED POL II) apply to chlorinated hydrocarbons. They are persistent, they

are usually accumulated by organisms, they are usually harmful to man indirectly, through effects on the stocks of marine organisms he exploits. Even less is known about the present concentrations of these chemicals than about the concentrations of metals. Since virtually all chlorohydrocarbons are generated by man, natural background levels of these substances are not a problem in baseline studies.

The pilot project deals with levels of selected organochlorine compounds which are considered as specially relevant to representative elements of the Mediterranean ecosystem. DDT, PCBs, dieldrin and their metabolites were singled out as falling into this category. Whenever possible, other persistent organic compounds are also identified in analysed samples. The organisms selected as monitoring targets (striped mullet, Mediterranean mussel, pink shrimp) are representative of the different Mediterranean ecotypes, of great economic importance and almost ubiquitous in the whole Mediterranean. The sampling frequency is seasonal.

There is no evidence of direct harm to man from the present levels of chlorinated hydrocarbons accumulated through marine food-chains but, due to the nature of these substances, one can reasonably expect that their build-up may lead to damage of certain components of the marine ecosystems, in particular the crustaceans. Therefore, the results of the project will primarily contribute to the assessment of the present distribution of chlorinated hydrocarbons in the Mediterranean Sea and thus to a better understanding of the eventual risk to which the marine ecosystems may be exposed.

MED POL IV : RESEARCH ON THE EFFECTS OF POLLUTANTS ON MARINE ORGANISMS AND THEIR POPULATIONS (FAO(GFCM)/UNEP)

The marine environment is characterized by relatively constant physical and chemical conditions. Most marine organisms are therefore not adapted to sudden changes in their environmental conditions, to certain substances not normally present in sea-water, or to unusually high concentrations of substances which normally appear only as sea-water microconstituents.

The project does not deal with acute toxicity experiments unless the organisms cannot be kept long enough under culture conditions to allow long-term toxicity tests. Instead, long-term experiments are envisaged with the aim of investigating the sub-lethal effects of potential pollutants, and functional as well as morphological changes.

The experiments are not limited to individual organisms but rather cover populations where subtle changes in the behavioural pattern could serve as early warning signs and lead to the possibility of

predicting the moment at which the organisms will be harmed at the population level. The influence transmitted through the trophic chains, particularly in experiments on populations, is not neglected.

Due attention is paid to establishing the most sensitive stages in the life-cycle of the organisms tested. Physiological and biochemical studies are conducted in order to provide information on the mechanisms involved in the effects and transport of pollutants.

The functional and structural damage to the genetic material of individuals and their populations is also studied.

The objective of the project is to develop the necessary scientific background for biological monitoring and to contribute data required as the scientific rationale for the development of water quality criteria in general. Naturally, these criteria cannot be based solely on biological tests, but the results expected might provide a basis for a better understanding of the potential hazard to the ecosystem, including man, from the increased level of pollutants in the marine environment.

MED POL V : RESEARCH ON THE EFFECTS OF POLLUTANTS ON MARINE  
COMMUNITIES AND ECOSYSTEMS (FACO(GFCM)/UNEP)

Theoretically, several types of marine communities and ecosystems could be studied in the framework of this pilot project. For practical purposes, the project deals with natural marine communities and ecosystems under stress in coastal waters, including lagoons and brackish coastal lakes, in areas where ecosystem changes may be anticipated as a consequence of men's activities, and with ecosystems in relatively unpolluted areas, such as marine parks, for reference.

Ecosystems are particularly investigated in areas which have been repeatedly studied in the past in order to detect long-term changes.

To the largest possible extent the ecosystems are studied as integral units, taking into account the dynamic interactions among their various components. Special attention is paid to the transport of pollutants through the trophic levels by those organisms which are used in the monitoring pilot projects (MED POL II and MED POL III).

The parameters and effects to be studied vary, depending on the community and ecosystem. The most common ones are: community structure, functional indices and body burden of pollutants.

The over-all objective of the project is to provide information on the structural and functional state of Mediterranean marine communities and ecosystems as the basis for analysing the trends in their changes.

Furthermore, it is expected that through this project a methodology could be developed and tested for the possible use of observed community and ecosystem modifications in determining the waste-receiving capacity of various parts of the Mediterranean, and maybe of the Mediterranean Sea as a whole. In connection with these objectives the project will directly contribute to the development of principles and guidelines for the selection and management of specially protected marine areas.

#### MED POL VI : PROBLEMS OF COASTAL TRANSPORT OF POLLUTANTS (IOC/UNEP)

The mean pattern of sea surface transport in the Mediterranean is generally cyclonic (counterclockwise) in both the eastern and western basins. But coastal currents are very complex and manifest a strong variability. Due to the large ratio of coastline to the surface in the Mediterranean, and to the presence of divergence zones, the circulation pattern has an important longshore component. Therefore pollutants discharged into coastal waters tend to be transported along the coasts. Water leaves the Mediterranean at depth and is replaced by Atlantic water at the surface through the Straits of Gibraltar. The majority of pollutants enter the sea in the upper layers. However, due to the vertical mixing, and to strong convective motions in some areas during the winter, they can be spread into the deep Mediterranean water, and flow slowly through the Straits. On the basis of the general hydrography of the Mediterranean and of mass transport measurements in the Straits the residence time of entering water is estimated to be of the order of magnitude of 100 years.

Although the general nature of the mass transport of sea-water in the Mediterranean is reasonably well understood, the knowledge of local circulation patterns is still meagre. The former may serve in studies of the distribution of pollutants entering the sea via the atmosphere, but the latter is much more important in studies of the distribution of pollutants entering the sea via rivers.

As part of this project the water circulation in coastal areas and the exchange of water between the coastal and off-shore regions is investigated. Special attention is paid to the movement of the surface layer as this contributes considerably to the rapid spread of certain pollutants (e.g. petroleum hydrocarbons, floating litter, etc.).

The main objective of the pilot project is to provide the necessary information on the physical processes contributing to the transport of pollutants in the Mediterranean Sea and thus to facilitate the interpretation of data obtained through the other pilot projects when the Mediterranean models of the pollutants' biogeocycles are formulated and tested.

## MED POL VII : COASTAL WATER QUALITY CONTROL (WHO/UNEP)

The serious and rapidly growing pollution of the coastal waters of the Mediterranean is having an increasing impact on the social and economic well-being of the countries bordering it. In addition to the millions of inhabitants living along the coastline of the Mediterranean, millions of tourists spend their holidays on the shores of this sea, and there is a considerable potential for exchange of disease-causing micro-organisms.

The present situation constitutes a significant health hazard in many places: salmonellosis, dysentery, viral hepatitis and poliomyelitis have all been endemic in the Mediterranean area, and during recent years there have been a number of cholera outbreaks. There is a distinct need for better statistics concerning correlation between diseases and coastal water pollution. There is ample evidence that contaminated shellfish are an important concern to public health. The risk of infection from swimming and other recreational activities in coastal waters is enhanced in certain areas by the absence or inadequacy of beach sanitary facilities. Thus, the actual and potential health effects are of prime importance.

Using a commonly agreed methodology the project initiates a sanitary and health surveillance of coastal recreational waters and of shellfish-growing waters in selected coastal areas. Microbiological indicators are used as the most significant criteria of the sanitary quality of coastal waters and organisms living in them, particularly the most commonly eaten molluscs.

Scientific studies are prepared on the epidemiological evidence of effects on health caused by inadequate sanitary conditions in coastal areas.

The over-all objective of the project is to produce statistically significant data, scientific information and technical principles which are required for the assessment of the present levels of coastal pollution as it concerns human health and are indispensable for the rational design and efficient implementation of national programmes for the control of coastal pollution from land-based sources in the Mediterranean area.

MED POL VIII : BIOGEOCHEMICAL STUDIES OF SELECTED POLLUTANTS IN  
THE OPEN WATERS OF THE MEDITERRANEAN (IAEA/IOC/UNEP)

Heavy metals and chlorinated hydrocarbons are two types of pollutants identified in all oceans. Although the edges of the ocean are the most polluted, being the areas most affected by man's activities, the levels in the open Mediterranean are important for purposes of

comparison with other seas and oceans and with the levels found in coastal waters to ascertain the degree of degradation of the Mediterranean as a whole.

By measuring the amounts of heavy metals and chlorinated hydrocarbons in water, sediments, biota and, in some cases, the air, one can define transport pathways and reservoirs in the open Mediterranean. This should provide the unifying concept that will help understand the results obtained through MED POL II and MED POL III in the coastal area.

Data obtained through the project, combined with those which will be collected through the other Mediterranean projects, will provide a sound basis for a model on the biogeochemical cycle of pollutants in the Mediterranean (see MED POL XIII).

The immediate goal of the project is to obtain data on pollution in open waters of the Mediterranean which are necessary for the assessment of the total present load of pollutants in the Mediterranean, and, in particular, for an understanding of the dynamics of pollutants (entry, transport, transformation and decay) and thus complement the coastal monitoring undertaken by the original seven MED POL pilot projects.

Long-term goals are to carry out objective assessments of problems affecting the marine environment and its living resources and to contribute to the development of a programme for monitoring of marine pollution and its effects on marine ecosystems.

#### MED POL IX : ROLE OF SEDIMENTATION IN THE POLLUTION OF THE MEDITERRANEAN SEA (UNESCO/UNEP)

The comparison between dissolved and particulate elemental concentrations in the aquatic environment shows that most heavy metals and organic pollutants are relatively higher in the solid phase than in the liquid phase with which they are in contact. Comparison of the relative amounts of pollutants transported in river waters and in the suspended sediments clearly shows the importance of the latter for any waste load assessment.

In addition to natural particulates from various origins, secondary enriched particulates such as pesticides fixed on clay minerals and organic matter eroded and carried by rivers increase their contaminated load. Pollutants from sewage and industrial wastes may be adsorbed on to suspended particles or directly discharged in particulate form into the receiving waters. The solid/liquid equilibria are sometimes influenced by a change in the concentration of pollutants resulting in solubilization of heavy metals.

Development of common procedures for representative sampling of river-suspended sediments is initiated under this project. Also, compatible methods for separation of solids, analytical extraction and determination need to be established and agreed upon. Pollutants of concern are various organics and heavy metals.

In addition to the river-dissolved pollution load estimates carried out under project MED X, a selection has been made of Mediterranean rivers to be sampled and analysed for substances carried by suspended sediments. Results will be used in the over-all assessment of pollutants contributed by major rivers.

The ultimate objective of the project is to allow for an over-all assessment of the total pollution load of the Mediterranean by including pollutants associated with suspended river sediments through the collection of a first set of river-sediment pollution data.

MED POL X : POLLUTANTS FROM LAND-BASED SOURCES IN THE MEDITERRANEAN  
(WHO/ECE/UNIDO/FAO/UNESCO/IAEA/UNEP)

The main land-based sources of pollution of Mediterranean coastal waters are municipal sewage and industrial effluents discharging through rivers or directly to the sea. Pollution is aggravated in the Mediterranean, which is an almost entirely enclosed area, by very small tidal effects, long periods of calm weather and relatively high ambient temperatures.

In order to obtain comprehensive information on all major pollution inputs into the Mediterranean from land-based sources, the following tasks are undertaken within this project:

- preparation of an inventory of land-based sources of pollutants discharging directly into the Mediterranean;
- assessment of the nature and quantity of pollutants from coastal sources;
- assessment of the nature and quantity of pollutants carried by major rivers;
- review of present waste disposal and pollution management practices.

The project covers those coastal zones of the Mediterranean proper which directly influence the quality of the marine waters by the discharge of liquid, dumping of solid or emission of gaseous wastes.

This project is closely linked to the other MED POL projects and to the legal components of the Mediterranean Action Plan. In particular,



it provides technical information for the preparation of the protocol on the protection of the Mediterranean from land-based sources of pollution and for the project on coastal water quality control (MED POL VII).

The ultimate objective of the project is to provide the Governments of the Mediterranean coastal States with appropriate information on the type and quantity of pollution inputs from major land-based sources and rivers, and on the present status of waste discharge and management practices relevant to marine pollution. This information, combined with that collected through the MED POL projects on the biogeocycles, levels and effects of various pollutants on human health and marine ecosystems will be used to assist the Mediterranean Governments in their negotiation of the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources.

MED POL XII : INPUT OF POLLUTANTS INTO THE MEDITERRANEAN SEA VIA ATMOSPHERE (WMO/IAEA/WHO/UNIDO/ECE/UNEP)

At present, it appears that practically no data are available on the atmospheric contribution to the pollution of the Mediterranean although the input of airborne pollutants may turn out to be the major unknown parameter needed to assess the state of pollution in the Mediterranean Basin.

The first phase of the project is intended to develop the scientific rationale for the second phase which may include field measurements on the transport of pollutants through the atmosphere, exchange of pollutants through the air/sea interface and modelling of these processes.

The objective of the project is to provide information on the relevance of airborne pollution to the present state of pollution of the Mediterranean Sea and thus contribute to the understanding of the biogeochemical cycle of pollutants in the Mediterranean Basin. As the airborne transport of pollutants may be one of the major mechanisms contributing to the transboundary pollution, the results of this project could eventually contribute to the negotiation of a legal instrument designed to control airborne pollution of the region.

MED POL XIII : MODELLING OF MARINE SYSTEMS (UNESCO/FAO/IOC/UNEP)

Modelling is an essential component of any overall plan designed to assess the impact of pollutants on natural systems and to provide information needed by those in charge of the rational management of these systems. Modelling is, in particular, one of the most effective

scientific tools to explore the functioning of marine ecosystems and their response to environmental stresses.

The project includes the development of two- and three-dimensional hydrodynamic circulation models, models of biogeochemical cycles of pollutants and models of ecosystem responses to pollutants.

The objective of the project is to provide information needed for the design, co-ordination and balance of sampling programmes carried out under MED POL monitoring projects, and for a better understanding of the complex relationship between the sources of pollution and their effects on marine ecosystems, human health and socio-economic development. Such models would provide the means by which the results of the individual projects of the Mediterranean Action Plan, and of MED POL in particular, could be synthesized and better understood.

These models, having predictive capabilities, could be used by the Governments of the Mediterranean coastal States as management tools in the prevention and control of marine pollution affecting the Mediterranean Basin.

## SUPPORTING ACTIVITIES

### MED POL XI : INTERCALIBRATION OF ANALYTICAL TECHNIQUES AND COMMON MAINTENANCE SERVICES (IAEA/FAO/IOC/UNEP)

#### Intercalibration

Past experience gained through various intercalibration exercises on the measurements of trace pollutants shows that the data of different laboratories on an identical sample can sometimes differ quite considerably. In co-ordinated studies, when many laboratories are involved in measuring trace pollutants such as heavy metals, chlorinated and petroleum hydrocarbons by various methods, it is essential to ensure the comparability of the data obtained by different laboratories to deduce any sensible conclusion. Thus, a joint effort by the laboratories participating in the same projects towards improving the comparability of the data is essential to make the measurements meaningful.

Through this project, reference materials are distributed to all participants in MED POL II and MED POL III. By analysing these samples, which have matrices as closely identical to those of the environmental samples to be analysed for their pollution content, the participants in MED POL II and MED POL III are able to improve their analytical performances and eventually ensure the comparability of the data produced as a group.

The primary objective of the intercalibration programme is to give specific assistance for analytical quality control to Mediterranean laboratories participating in the MED POL. Considering the importance of the comparability and reliability of the data produced, the present intercalibration programme is regarded as one of the key elements in the baseline studies and monitoring of the levels of pollutants in the Mediterranean.

#### Maintenance

The proper maintenance and rapid repair of the often very sophisticated analytical laboratory instruments or field equipment used in various MED POL projects are of great importance for the day-to-day work of the laboratories using them. As laboratories in many Mediterranean countries cannot rely on the efficiency of maintenance services provided by local representatives of the producers of these instruments and equipment, the only way to ensure a smooth flow of data is by organizing help to the disadvantaged participants in MED POL.

## INSTITUTIONAL AND FINANCIAL ARRANGEMENTS

## PARTICIPANTS IN THE PROGRAMME

The MED POL projects are being carried out by existing national institutions. Participation in the projects is open to all institutions in the region, subject to nomination by their national authorities. At present 83 research centres from 16 Mediterranean countries<sup>11)</sup> and the European Economic Community (EEC) have been identified as active participants in one or more of the MED POL projects, but additional nominations are still expected. The participation in the pilot projects is not limited to well developed research centres able to deal with the task in a complex way but is open to all institutions capable of a limited contribution in order to further their own development.

The monitoring and research activities to be undertaken by the research centres nominated are specified in a signed agreement between them and the relevant specialized United Nations organization co-operating with UNEP on the implementation of the programme.

## CO-ORDINATION

The MED POL activities are organized in close collaboration between UNEP and the specialized United Nations bodies (ECE, UNIDO, FAO, GFCM of FAO, UNESCO, IOC of UNESCO, WHO, WMO, INCO and IAEA) which have a major role in their implementation. Throughout the planning period, and in particular during the whole of the pilot project phase lasting until 31 March 1979, a high degree of co-operation has been and is being maintained between UNEP, acting as the over-all co-ordinator, and these specialized United Nations bodies.

The co-ordination of MED POL with similar ongoing and planned programmes in the other regions of the globe (Caribbean, Kuwait Action Plan Region, South-East Pacific, Red Sea, West Africa and others) is done by UNEP's Regional Seas Programme Activity Centre (RS/PAC).

In consultation with the Mediterranean Governments and the specialized United Nations bodies concerned, in August 1976, one research centre in each of the seven networks of institutions co-operating in the original seven MED POL projects was nominated by UNEP as a Regional Activity Centre (RAC). The role of the RACs is to assist UNEP and the relevant specialized United Nations bodies in the organization and execution of the pilot projects.

Close collaboration has been established between the Regional Activity Centre for the pilot project on baseline studies and monitoring of oil and petroleum hydrocarbons in marine waters (MED POL I) and the Regional Oil Combating Centre in Malta making use of their complementary role in assessing the extent of the present pollution by petroleum hydrocarbons, in preparing contingency plans for dealing with oil spills and in organizing proper training relevant to their activities.

#### ASSISTANCE TO PARTICIPANTS

Substantive support has already been provided by UNEP, through the co-operating specialized United Nations organizations, to the participants in the programme in order to facilitate or make possible their full participation in the pollution monitoring and research activities. This support includes a large training programme, furnishing of necessary equipment, organization of a permanent intercalibration of analytical techniques mandatory for all participants, and provision of common maintenance services for the more sophisticated instruments used in analytical work.

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