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Introduction

1. In accordance with the programme of activities approved by the Twelfth Meeting of the Contracting Parties to the Barcelona Convention (Monaco, 14-18 November 2001), the Review Meeting on MED POL – Phase III Monitoring Activities was held from 5 to 7 December 2001 in Rome, , at the headquarters of the Italian National Council for Economy and Labour (CNEL). The meeting was organised jointly with the support of the Italian Ministry of the Environment and the association “Amici per la Vita”, in cooperation with the CNEL, the Istituto Centrale per la Ricerca Scientifica e Tecnologica Applicata al Mare (ICRAM) and the National Environmental Protection Agency (ANPA).

Participation

2. Representatives of the following Contracting Parties attended the meeting: Albania, Algeria, Bosnia and Herzegovina, Cyprus, Croatia, Egypt, Greece, Israel, Italy, Malta, Monaco, Morocco, Slovenia, Spain, Syrian Arab Republic, Tunisia, Turkey and the European Union. The Palestinian Authority attended the meeting as an observer.

3. The following UN Bodies and international, intergovernmental and non-governmental organizations were also represented by observers: International Atomic Energy Agency (IAEA), World Health Organization (WHO), World Meteorological Organization (WMO), European Environment Agency (EEA), MedGOOS (IOC-UNESCO), the RAMOGE Agreement, “Amici per la Vita”, MAREVIVO and World Wide Fund for Nature (WWF).

4. Finally, seven invited experts participated in the meeting.

5. The Mediterranean Action Plan was represented by the Secretariat of MED POL, which served as the secretariat for the meeting and by the Environment Remote Sensing Regional Activity Centre.

Item 1 of the Agenda: Opening of the Meeting

6. Mr Mario Sai, on behalf of the CNEL, opened the meeting and welcomed the participants, wishing them a pleasant stay in Rome. He emphasized that this was not a mere gesture of courtesy and that the CNEL was directly concerned by the matters that were to be addressed by the meeting, starting with the quality of the marine environment, which was part of the prospects for sustainable development in the region. The CNEL was engaged in a whole series of activities with the objective of reducing pressure on the environment, promoting decentralized cooperation in specific sectors through the transfer of knowledge and technologies, lightening or eliminating the debt burden of the countries of the South and developing new instruments, such as voluntary agreements with enterprises, systems of environmental audits, information networks and training at the regional and international levels. He called for the development of closer relations between the CNEL and MED POL. However, he reaffirmed that the establishment of lasting peace on the Eastern shore of the Mediterranean was a prerequisite for any success in achieving sustainable development in the region. It was therefore to be hoped that all men and women of good will would finally be able to impose an equitable solution to bring an end to the terrible current crisis.

7. Mr Aldo Iacomelli, Department of International and Regional Agreements of the Italian Ministry of the Environment, emphasized that three weeks earlier the Twelfth Meeting of the Contracting Parties to the Barcelona Convention had concluded with the official adoption of the operational process for the implementation of the Strategic Action Programme (SAP) to Address Pollution in the Mediterranean from Land-based Activities. The Land-based Sources Protocol, revised in 1996, which was expected to enter into force shortly, would provide the indispensable legal basis for a whole series of practical actions for the reduction of pollution

based on a predetermined timeframe. His own country would continue to provide unstinting support for MED POL and MAP, including through the preparation and hosting in Catania in 2003 of the Thirteenth Meeting of the Contracting Parties. In conclusion, he wished the present meeting every success.

8. Mr Sergio Illuminato, President of "Amici per la Vita", recalled that his association had been closely involved with MED POL for twelve years by contributing to the organization of many scientific meetings which had achieved scientific and political progress in combating pollution in the Mediterranean. In parallel, "Amici per la Vita" endeavoured to support the MAP/UNEP programme by undertaking awareness-raising and cultural activities among the youth of Italy.

9. Ms Maria Dalla Costa, on behalf of the National Environmental Protection Agency (ANPA), and Ms Annamaria Cicero, on behalf of the Istituto Centrale per la Ricerca Scientifica e Tecnologica Applicata al Mare (ICRAM), gave brief presentations of the objectives and activities of their respective institutions and emphasized the close relations already established with MED POL over recent years. The contribution that they had made to the organization of the present meeting should be seen in a perspective of cooperation, which could only be beneficial to the Mediterranean region as a whole.

10. Mr Francesco Saverio Civili, MED POL Coordinator, gave warm thanks to the previous speakers for their hospitality and the support that their institutions had generously provided on many occasions in the past for MED POL events and activities. It was possible to speak of a real "mosaic" of initiatives and contributions which had made it possible since the launching of the programme, under the aegis of the Italian Ministry of the Environment, to create favourable conditions and a climate for the implementation of MED POL objectives in practice.

11. Mr Civili then outlined the organization of the meeting's work over the next three days, which would concentrate on the implementation of three major aspects of Phase III: (1) the trend monitoring, which was already well under way in several countries; (2) the progressive introduction of bio-monitoring as an indispensable support for chemical monitoring in order to develop a "real picture" of the effects of pollution; and (3) the development of compliance monitoring as a decisive instrument which should enable policy-makers to decide upon the most appropriate measures. Finally, the meeting would be invited to consider a strategy for the monitoring of eutrophication, following a decision at the last meeting of MED POL National Coordinators (Venice, 28-31 May 2001) in response to a problem that was becoming increasingly acute in the region.

Item 2 of the Agenda: Election of Officers

12. In accordance with Rule 20 of the Rules of Procedure for Meetings and Conferences of the Contracting Parties, and taking into account the informal consultations held earlier between delegates, the meeting unanimously elected the following Officers:

Chairperson:	Ms Alenka Malej (Slovenia)
Vice-Chairperson:	Ms Samira Natèche (Algeria)
Vice-Chairperson:	Mr Aldo Iacomelli (Italy)
Rapporteur:	Ms Aysen Yilmaz (Turkey)

Item 3 of the Agenda: Adoption of the Agenda and Organization of Work

13. The Meeting adopted the provisional agenda (UNEP(DEC)/MED WG.196/1), including the work plan contained in the provisional annotated agenda (UNEP(DEC)/MED WG.196/2). The Secretariat proposed that major issues should be examined in plenary session and that between these sessions, as the need arose, working groups should be set

up to address more specific subjects. Soon after the meeting, a draft report would be prepared by the Secretariat and sent out to all participants, for their observations and modifications, with a view to the preparation of the final report. The meeting could therefore devote its three working days exclusively to scientific and technical discussions.

Item 4 of the Agenda: Examination of past MED POL Monitoring Activities: Achievements and Bottlenecks

14. Mr F.S. Civili introduced Mrs S. Çolpan Polat-Beken, MED POL Programme Officer responsible for the preparation and follow-up of national monitoring programmes and for "research". He then reviewed the major stages of MED POL Phases I and II. Among the successes, he referred to the assessments undertaken for some 20 major groups of pollutants in the Mediterranean, supported by the compilation of substantial data; the establishment through the IAEA laboratory in Monaco of an equipment and maintenance service in support of laboratories in the region, which had resulted in the strengthening of capacities; the organization of training courses and intercalibration exercises; the development of the first monitoring networks; the results of 500 research contracts with Mediterranean institutions; and activities to address the issue of climate change at the regional and local levels in the form of preliminary proposals for forward-looking responses.

15. On the deficit side, he noted that the initial goals of MED POL had been well designed, but that perhaps the objectives assigned had not been sufficiently detailed to permit the establishment of a fully reliable monitoring system. MED POL had also been marked by successes and shortcomings in the provision of the necessary data. Phase I and II data had been stored in the database, but without achieving an optimum level taking into account data quality assurance requirements. While the assessments made had been adopted by the biennial meetings of the Contracting Parties, including specific pollution control measures, these did not have binding force and had not therefore been extensively introduced into national legislation. The "research" function had not succeeded in fully exploiting their potential with a view to improving monitoring. In some cases, laboratories had not been sufficiently supported at the national level. Moreover, three Mediterranean countries which were Member States of the European Union, namely France, Italy and Spain, whose monitoring programmes were particularly effective, had remained on the sidelines of MED POL, even though the situation appeared to be developing somewhat in this respect. It had been precisely these deficiencies which had led to the design and establishment of Phase III, which was oriented towards concrete objectives that could be summarized in the principle of no longer making the measurement of pollutants an objective in itself, but a means of identifying responses to given situations, with mutual feedback between management and evaluation. In short, MED POL needed to be both a scientific instrument and a management tool, as illustrated by the composition of the present meeting, in which scientists were participating alongside managers.

16. All the speakers in the subsequent discussion congratulated the MED POL Coordinator on the pertinence and sincerity of his presentation. The situation had been described very clearly. With regard to the limited participation in the monitoring programme of the three Member States of the European Union, which was deplored by two participants, the representatives of the countries in question considered that the situation was being improved also through their cooperation with EEA. Moreover, problems sometimes arose even within countries in the field of internal relations and communications, in cases where they were decentralized with autonomous regions and governments, which prevented the central administration from ensuring the necessary flow of data. It should be recalled that the new European Union Water Framework Directive, which was already operational, had given rise to the establishment of nine working groups on the Common Implementation Strategy (CIS), and that harmonization and exchanges were necessary in view of the action undertaken in this respect, as well as with the Inter-Regional Forum. In any event, MED POL and the EEA

needed to work closely together and engage in the mutual exchange of data concerning Mediterranean countries which were members of the European Union.

17. One delegate expressed the opinion that the Secretariat should give greater priority to promoting bilateral cooperation and possibly to playing a role as an intermediary between subregional groupings, through which it was possible to take local action. The RAMOGE Agreement was a good example in this respect. Another delegate emphasized the importance for decision-makers of the work carried out on indicators, which were particularly difficult to develop for the marine environment.

18. One expert considered that the Coordinator's presentation had perhaps erred towards excessive self-criticism. MED POL had to be seen in its historical context. There had been nothing like it in the world when it had first been launched. The results obtained, including in the field of research, were the best that could have been achieved at the time. And if the Mediterranean had in some cases come to be considered the most polluted sea, that was primarily because it had come to be the most closely studied.

19. The Secretariat noted the comments, which it considered to be very constructive, and the proposals to intensify their cooperation with MED POL made by the observers representing the EEA, WWF and MedGOOS, as well as the importance attached by the representative of IAEA to data quality assurance as the key aspect of the programme which needed to be strengthened still further. With regard to the historical context of MED POL, there may have been some misunderstanding: the design of the programme during Phases I and II was in no way being challenged, but rather the manner in which its findings had been applied and made use of in practice. It could not be denied that MED POL had played a pioneering role from the very start and had served as a model for other regions of the world.

Item 5 of the Agenda: MED POL – Phase III Monitoring Activities: Problems and Progress

5.1. Trend monitoring

20. Ms S.Çolpan Polat-Beken introduced this sub-item of the Agenda and the relevant sections of the document UNEP(DEC)/MED WG. 196/3 on trend monitoring activities and outlined the programme objectives and design criteria (selection of monitoring stations, sampling matrices, species and number of samples, and sampling strategy etc.). She stressed that the MED POL Phase III trend monitoring programme was an objective-oriented study and all the individual National programmes had to be designed according to the same criteria which had to be thoroughly followed during the implementation phase. It was also emphasized that the programmes were designed with certain statistical significance and the collection of the data within the design requirements was critical in order to perform the necessary statistical tests. Ms Polat-Beken then reviewed the current national monitoring programmes and stated that the ongoing programmes generally satisfied the trend monitoring criteria; however, consistent annual monitoring had to be performed in order to obtain the possible trends in the contaminant levels measured in biota and sediments. She finally provided a preliminary evaluation of the first data sets compiled through the current national programmes and pointed out some problems encountered in the data transmitted. She also mentioned that there was a number of countries without a formal MED POL National Monitoring Programme who had sent data and regularly participated in the intercalibration exercises. It was hoped that such countries would soon formalize the MED POL Programme.

21. Ms. Polat Beken indicated that monitoring of loads from land-based point and non-point sources of pollution had been formulated within the trend monitoring activities. The sampling matrices were domestic/industrial effluents, river water and air for the recommended set of parameters, including the flow rate (discharge volume) measurements.

22. Most participants who spoke following the presentation agreed on the principle points concerning trend monitoring: the need for strict observance of the agreed criteria, the selection of biota and sediments as matrices, of the mussel *Mytilus galloprovincialis* and the fish *Mullus barbatus* in so far as possible, the taking in all pilot studies of at least 5 samples at each station and of 15 specimens for each of five composite samples in the case of *M. galloprovincialis*. It was also recalled that the sampling should be performed annually at a limited number of fixed, geo-referenced stations at the pre-spawning period and during the most stable hydrographic conditions. The participants were also unanimous in emphasizing the need for the regular participation of laboratories in intercalibration and for the application of internal quality measures.

23. Several comments were made concerning adjustments to be carried in the Programmes as a result of the information provided in the presentation: specifying the manner in which data would be exploited, or i.e. how trends would be shown; simplifying still further the range of criteria proposed with a view to their applicability in all countries and therefore the effectiveness of the programme; specifying more precisely the criteria for the classification of areas to be monitored ("coastal/reference", "hot spots") when formulating new programmes; the value of sediments in obtaining a historical profile of the site, provided that very rigorous measurements were made over periods of five, ten and twenty years with, if possible, data on the grain size analysis and sedimentation rate; the inclusion of river loads, which can "overturn" the interpretation of results, for example during winter or high water periods; and measuring the volume discharges of point sources. Regarding the presentation of the outputs, representative of EEA suggested that, when preparing future reports/reviews of the implementation of the monitoring activities, the expected products of MED POL - Phase III (i.e. paper and web reports, standard graphs, indicator fact sheets) should be described, including the process by which these products will be prepared in order to meet users' needs.

24. At the invitation of the Chairperson, some delegates provided details on the situation of their national programmes. In the case of Egypt, trend monitoring had been undertaken for three years with the assistance of Denmark, combined with a data quality assurance programme. As their capacities were strengthened, Egyptian scientists had then progressively continued the programme alone. Israel had been undertaking monitoring programmes since the 1970s, with the monitoring of heavy metals introduced systematically since 1978, the monitoring of atmospheric flows since 1996 and of nutrients and algal populations since 2000. The Syrian Arab Republic had participated in Phases I and II of MED POL, was measuring contaminants in biota and sediments, participated in several inter-laboratory comparison exercises organized by (MEL/IAEA), and was currently on the point of concluding its national trend monitoring programme. Albania had established a draft national programme in 1998 and had finalized it one year later, entrusting trend monitoring in biota and sediments to two institutes, and it had participated in intercalibration exercises. The observer from the Palestinian Authority considered that the assistance received from the programme was very useful, but emphasized the financial constraints faced in the area of waste treatment by the Authority's environmental services.

25. The observer representing WMO considered that insufficient emphasis had been placed on load monitoring, which was absolutely necessary to determine the correct policies to combat pollution. In this respect, he reported on evaluations made for the North Sea showing that, of the total loads, 90 per cent of lindane, 40 per cent of Pb and 23 per cent of Hg were atmospheric in their origin. He recalled the SAP set schedules for the elimination of groups of pollutants (for example, 50 per cent of the 12 priority POPs by 2005) and he wondered how this would be possible if their values and origins were not known. The representative of WMO indicated the importance of assessment of loads and the correlations with physical and meteorological data. It considered helpful to prepare a guideline for the evaluation of the loads. He also mentioned that the cooperation of MED POL with EMEP

would facilitate the work for the assessment of atmospheric deposition of the pollutants to the Mediterranean. In this respect, he referred to the meeting of LRTAP (Long-range Transboundary Air Pollution) which would be held in Geneva.

26. Mr Civili agreed that this was a very important point and that it was necessary to commence a new phase of integrated monitoring which should include atmospheric flow monitoring. With the adoption of the operational process for the implementation of the SAP, the various countries would have to agree upon a baseline for releases/emissions of the principle groups of pollutants within two years. Atmospheric pollution would therefore have to be taken into account if these baselines were to be representative. Finally, in response to two delegates who had requested clarifications as to the timeframe within which trends could be identified for the region as a whole, he recalled that trend monitoring needed to be understood as being specific to individual sites, or in other words carried out on a "site by site" basis and that the first trends could be seen after an indicative period of at least 5 years.

27. The meeting agreed to convene two working groups to discuss trend monitoring activities more in detail. In the first group, countries which were not yet participating in the MED POL monitoring discussed the objectives and the details of the programme with the experts. The second working group, composed of the representatives of the countries which have ongoing programmes, representatives of the UN Agencies and the Secretariat, discussed the major problems encountered in the implementation phase of the trend monitoring programmes including the data quality assurance activities and agreed to follow a more interactive communication among the MED POL Secretariat, MED POL designated laboratories and the UN Agencies.

5.2. *Biological effects monitoring*

28. The Secretariat introduced this sub-item of the Agenda and the relevant sections of document UNEP(DEC)MED WG.196/3 and indicated that, the addition of this new component to conventional chemical monitoring, carried out since 1996 in the form of pilot projects in eight coastal countries, should make it possible to obtain a complete review of the real impact of pollution on marine flora and fauna, and therefore very valuable indices for decision-making. Eleven countries had participated the MED POL Bio-monitoring Programme including the RAMOGE partners and seven countries had submitted their results. The RAMOGE Agreement had been of great assistance in developing a manual and a video on biomarkers. Finally, MED POL bio-monitoring had been accompanied by training and data quality assurance activities under the supervision and coordination of the University of Genoa, the direction of which had been entrusted to Professor A. Viarengo.

29. Professor Aldo Viarengo, responsible for training and data quality assurance for MED POL bio-monitoring, reviewed the organization of the programme, the selection of sampling organisms (essentially lamellibranch muscles and species of the fish *Mullus*), the various biomarkers (of stress and of exposure), and the use of biomarkers to evaluate the stress induced by pollutants on selected organisms. The discussion that followed the presentation emphasized the importance of the activity, able to link chemical data related to the concentration of the different pollutants in the tissues of the sentinel organisms (fish and molluscs) to their biological effects. It was also mentioned that the biomonitoring by sentinel organisms and the use of simple biomarkers to evaluate the stress syndrome due to the effects of toxic chemicals seemed to be the simpler way to estimate the biological effects for pollutants, considering that a more complete study of the biological alterations may be only achieved by utilizing bioassays (on different organisms of ecological relevance) and studies at the population/community level. In the context of the data quality assurance programme, the manual and video had been distributed, two training courses and an intercalibration programme had been organized over the past two years with the participation of 30 scientists.

30. Mr Viarengo then described the European Biological Effects of Environmental Pollution (BEEP) programme, which would offer a particularly useful parallel framework for MED POL. BEEP in fact constituted the most advanced research programme in this field, with which 30 marine biology institutes were associated, divided respectively into three groups for the Baltic, the Atlantic and the Mediterranean. The objective of BEEP was to develop new biomarkers, standardize bio-monitoring methodologies in order to obtain comparable results and establish a system of experts capable of analysing the information drawn from the various biomarkers and thereby obtain a qualitative evaluation of the stress affecting living organisms in polluted waters.

31. Finally, Mr A. Viarengo outlined the possible prospects for the MED POL bio-monitoring programme: (1) additional studies on benthic community to follow the pollutant effects from the organisms to population/community levels (2) extension of the battery of biomarkers and their use in an integrated stress index, in accordance with the results of BEEP; (3) the implementation of chemical analyses of organisms showing stress with a view to identifying the toxic components affecting the ecosystem; (4) the identification of toxic chemical waste sources for the whole coastline by means of simple and low-cost biological tests; and (5) the continuation of the data quality assurance programme with a view to guaranteeing the replicability and comparability of the data.

32. Most of the participants expressed appreciation for the programme and for the information provided by Mr Viarengo and in particular requested clarifications on the BEEP programme, the assistance that could be provided by MED POL for this form of monitoring and the first results that were being achieved in the pilot phase that was under way in several countries. The Secretariat emphasized several points in this respect. All countries were henceforth encouraged to include bio-monitoring in their national programmes. Modest financial assistance was provided to laboratories for this activity and it was particularly into training and intercalibration exercises that MED POL was throwing its weight. The MAP Website would be updated for the dissemination of information, with a window for MED POL in which information and data on bio-monitoring would be posted, in parallel with the Web sites which had already or would be established by BEEP and other programmes in this field. Efforts would also be made to ensure that the same statistical tools were used. Finally, it was emphasized that BEEP was essentially a research programme intended to supplement and renew the traditional battery of biomarkers and that operational results should not therefore be expected of it. The Website address of BEEP was also provided as <http://beep.proxprod.com> for further information and contacts.

33. All the participants stressed the great importance of the QA programme that included training courses and an intercalibration programme as main activities in order to guarantee the correct development of the bio-monitoring programme and to produce high quality and comparable data.

34. The discussion then turned to the purely scientific aspects of bio-monitoring. One expert indicated that it was necessary to take into account the absorption of pollutants by organisms, or in other words the importance of the food chain. With regard to sample organisms, it was difficult at this stage to evaluate whether there were differences between animals in captivity and wild animals. Preliminary data showed that these differences were low with regard to genotoxicity. It would evidently be ideal to have organisms of the same origin, size and age. Parameters from the sample's environment (temperature, salinity, location, etc.) should be taken into account to ensure that the animals examined came from similar sites. Mr Viarengo added that a protocol was being prepared to this effect. According to another expert, the role that could be played by indices in making it possible for decision-makers to be aware of environmental consequences should not be neglected. One participant wondered whether *Mullus barbatus*, a species which was not ubiquitous, was the right organism to use. The reply was given that this fish lived at the bottom of the sea, moved little and reflected the conditions of the site from which it had been taken. But in future a fuller

study of biological effects should be based on a series of sample organisms, with emphasis being placed on population levels and benthic communities. In this respect, emphasis should be placed on the importance of experts in the field of taxonomy, a discipline which was frequently overlooked by decision-makers. Finally, annual bio-monitoring reports should include data on the participation of laboratories in intercalibration exercises with a view to ensuring that they respected the procedures adopted.

Presentation of the CD-ROM of data from Phases I and II

35. The MED POL Coordinator indicated that during MED POL Phases I and II (1975-1996) an impressive volume of data had been collected, including 25 000 entries on trace metals (TM) and 15 000 on chlorinated hydrocarbons (CH). The question had arisen very early on of how to make best use of these data. In 1994-96, a project financed by Italy and implemented by the MAP Coordinating Unit had been undertaken with the objective of improving the processing of the data. It had emerged that much of the data provided by laboratories had not been validated, that basic information was lacking for their proper exploitation and that they were not well adapted to any type of analysis. MED POL had decided to return to the question and entrust the data to an expert with a view to producing a CD-ROM including all the validated data with an accompanying document. In view of the scope and complexity of this task, the expert had been obliged to prolong the work and had been invited to the meeting to provide it with a preliminary progress report.

36. Mr Michael Bernhard, expert responsible for evaluating the databank on trace elements and chlorinated hydrocarbons supplied by the participating institutes during MEDPOL Phases I and II, described the work which had already been undertaken and which was under way. He reported that because not all participating institutes had intercalibrated, he has utilized the concentrations in species living in a habitat that is remote from pollution sources (REMOTE SPECIES) to establish background concentrations for the pollutants contained in the database. Comparing these background concentrations with the data supplied by the participating institutes he was able to identify 'questionable' and reliable data for the REMOTE SPECIES. In his presentation he showed some examples of errors and questionable data found and some major results he had obtained with 'reliable' data. Mr. Bernhard informed the audience that a CD-ROM would be prepared for distribution in which errors has been corrected as far possible. The data on this CD-ROM could be used freely, for example, for comparing own data with those in the data bank and/or integrating them.

37. All the experts and delegates who spoke following this presentation welcomed the considerable effort involved in this processing operation, which certainly deserved publication. Irrespective of the quality of the data, they should be sufficient to establish some trends, comparisons and provide a basis for anti-pollution measures. Several questions were raised on the improvements observed in current data in comparison with earlier data, the possibility of returning the information to the original institutes, the combination of recent and earlier data and the preparation of maps to visualize the results of the analyses.

38. Mr Bernhard added that it was admittedly surprising that such a processing operation had been carried out only now, over 10, 20 or 25 years after the compilation and transmission of the data. But it was necessary to take into account the situation at that time. Countries then considered that these data were confidential and that their publication could harm their image and their industrial interests. The ecological movements and its pressure groups had then been in their very early stages and divulging information on "hot spots" had been unthinkable at that time.

39. The MED POL Coordinator subscribed to this interpretation. In a period of satellites, in which it was no longer possible to hide anything, attitudes had changed and it was now in the interests of the States themselves to divulge their problems so that they could be resolved more effectively with the cooperation of the competent organizations and the

support of public opinion. Taking that into consideration, the Secretariat felt that at this stage it would have been great pity not to make use of such a wealth of data from which some conclusions could in any case be drawn.

Presentation of MedGOOS

40. Ms Silvana Vallerga, President of MedGOOS and I-GOOS, presented the network for cooperation between European and Mediterranean institutions for monitoring and operational forecasting in the Mediterranean Sea. The Global Ocean Observing System was supported by IOC-UNESCO, UNEP, WMO and ICSU. EuroGOOS had been established in 1994 and brought together 31 partners from 17 countries. MedGOOS had been established in November 1997 and consisted of 15 institutions in 13 countries. The Mediterranean countries had approved its strategy in Rabat in November 1999.

41. She added that, one year later, the thematic network known as MAMA of the European Union's Energy, Environment and Sustainable Development Programme had been created with the objective of strengthening marine monitoring and forecasting activities in the Mediterranean basin, with 31 partners all from Mediterranean countries and international organizations. The objectives of MAMA for the period 2002-04 included identifying gaps and, as a result, strengthening the capacities of systems for monitoring, modelling and forecasting the ecosystem and raising awareness of ocean forecasting. The meeting to launch MAMA was to be held in Paris early in 2002. Ms Vallerga concluded that MedGOOS and MED POL should work together more closely in a framework of synergy and complementarity for the benefit of the entire region.

5.3. Compliance monitoring

42. Mr George Kamizoulis, WHO/EURO Senior Scientist at the MAP Coordinating Unit, introduced this sub-item of the Agenda and the relevant sections of document UNEP(DEC)/MED WG. 196/3. He referred to the three types of compliance monitoring, namely of health-related conditions (bathing waters, shellfish waters and the quality of seafood), effluents and "hot spot" areas, and he reviewed the current programmes, including the parameters used and the respective numbers of stations. He noted that the countries did not provide reports on the quality of their bathing waters or shellfish waters, and that out of 20 Mediterranean countries only two had decided to carry out monitoring of "hot spots". Much therefore remained to be done in respect of this type of monitoring. It was also recalled that as part of the compliance monitoring of MED POL Phase III, the only requirement was to provide the evaluation of the analysis (which is the outcome of the elaboration of the raw data) and to show which stations comply or not with the standards within a *compliance report*. Finally, he described new trends in coastal and recreational waters monitoring based on the Annapolis Protocol and the European Union's vulnerability profile.

43. This presentation was followed by a series of interventions emphasizing the importance of the new concepts and approaches which had just been described. Requests were made for a better definition of "hot spots" and the differences which might exist in their case between trend monitoring and compliance monitoring in accordance with the selection of stations. Delegates from certain countries provided details of their compliance monitoring programmes and the areas that they covered. For certain countries, such monitoring came under the responsibility of the Ministry of Health, the Ministry of Agriculture or the Ministry of Tourism. Another delegate advocated the introduction of new parameters (such as nutrient elements), while the representative of the European Union indicated that, under the terms of the Water Framework Directive, monitoring of shellfish waters was not included among Community obligations, but was left to the competence of Member States. Finally, the participants all admitted that the value of identifying all coliform bacteria was now under challenge.

44. A number of countries' representatives stated that, although their country had not presented compliance monitoring data, compliance monitoring activities were being implemented as part of other international cooperative projects or agreements and that the data would soon be transmitted for inclusion in the MED POL database. Considering the importance of bathing water monitoring for the Mediterranean region, in view of its direct link to health and tourism, the need to include this activity in the National Monitoring Programmes was stressed by many participants. Regarding compliance monitoring of effluents, some participants stressed that such activity had not been included in their programmes mainly because the relevant legislation was missing. This type of monitoring would be included in their programmes as the appropriate legislation would become effective.

45. Mr Kamizoulis replied that, with regard to the definition of "hot spots", this was covered in the document on the identification of priority hot spots and referred to areas with high pollutant loads, with their primary indicators and their system of classification. The lack of response concerning compliance monitoring of pollution hot spots was mainly due to the fact that related environmental quality criteria had not been established by the countries. It was suggested that following the trends of contaminants in biota and sediments on hot spots, it would also be useful to monitor the other matrix (water) in order to have some indications of the quality of the waters. With regard to the European Union's Framework Directive, he added that the Secretariat was in contact with the European Commission and that MAP would undertake to finalize the bathing water standards adopted in 1985. With regard to the new parameters proposed for shellfish waters, any proposal in this respect would naturally have to be adopted by the Contracting Parties and a preliminary evaluation undertaken.

Item 6 of the Agenda: Establishment and Management of MED POL Database

46. Ms Çolpan Polat-Beken introduced this item of the Agenda and the relevant sections of document UNEP(DEC)/MED WG. 196/3. She explained that the various aspects of monitoring which had been discussed during the Meeting required high-quality data for appropriate processing and analysis at the right time. It was therefore necessary to have uniform data formats which were immediately usable and allowed the proper storage and management of the data in an adequately structured database. The existing formats had therefore been improved, discussed, finalized and standardized on EXCEL worksheets. EXCEL files had been developed separately based on the various combinations of matrices/parameters. With regard to the current restructuring of the MED POL database, for which the conceptual design had been completed, she indicated that it would respond to all the current and future needs of the programme, would be partially accessible over the Internet with an agreed protocol and, among other functions, would allow the development of a "basic map" with the position of the stations in the Mediterranean and preparation of various reports.

47. The Chairperson indicated that countries should make a major effort to comply with the requirements of the standardized data reporting formats, as a prerequisite for the success of the programme. The representative of the EEA said that the Agency's intention was to rely on the data generated by MED POL programme in order to simplify the data collection, as long as the programme could meet the EEA's time constraints.

48. Ms Polat-Beken, with regard to the question of whether intercalibration exercises would be contained in the database, said that it would include the quality codes of laboratories, but that clearly everything could not be placed on the Internet.

Item 7 of the Agenda: Eutrophication Monitoring Strategy

49. The MED POL Coordinator briefly introduced document UNEP(DEC)/MED WG. 196/4 "Monitoring of Mediterranean marine eutrophication: Strategy, parameters and indicators". The discussion was divided into two parts, the first of a general nature on the overall

proposal based on the EEA approach, and the second taking a more practical approach to the strategy to be adopted in the short, medium and long term.

50. Dr Giulio Izzo, ENEA, MED POL Consultant, reviewed the main points of the above document. He said that the concept and definition of eutrophication had developed over the years, with emphasis increasingly being placed on the excess of nutrients. He reviewed the probable mechanisms for the emergence of eutrophication, presented tables on river loads and total nutrient loads and described the DSPIR approach used by the EEA for indicators of the phenomenon.

51. Most of the many participants who intervened following this presentation congratulated Mr Izzo on the very full picture that he had given of the phenomenon. Eutrophication was in itself a very complex problem which took on different aspects from one site to another. It was better to speak of "states" of eutrophication in order to adopt a practical approach. Even in the context of OSPAR, much remained to be done to better manage the phenomenon. It was important to work on indicators and to cooperate with other regional seas. The representative of the European Union considered that it was necessary to take advantage of the work of the European Commission, which could, in the context of the Water Framework Directive, in addition to the initiatives for the Baltic, the North Sea and the Atlantic, include the establishment of a group for the Mediterranean. In this respect, it was important for the Mediterranean countries which were Member States of the European Union and which participated in the existing working groups to advance the cause of MED POL.

52. According to one expert, there were grounds for wondering whether it was necessary to develop a definition of eutrophication in view of the long debates to which this had given rise. A definition was welcome at the theoretical level, but could be done without at the level of practical application. Eutrophication was primarily a natural phenomenon, compounded by another phenomenon resulting from the influx of nutrients running off agricultural land. Many publications had been devoted to the question, but a sound review of the situation with regard to nutrients in the Mediterranean had still not been developed. A distinction should be made between various situations: coastal waters, estuaries, coastal lagoons and effluents. With regard to indicators, an extremely good supporting instrument was satellite imaging (surface chlorophyll), as models were needed to forecast phenomena. However, care needed to be taken not to apply data and interpretations to the Mediterranean that were valid for Northern European coastlines. Three other participants added that satellite imaging could make an important contribution and that it was necessary to strengthen activities and networks in this field.

53. Another expert forcefully argued for the establishment of a permanent working group to address the problem in its full complexity, if need be seeking funding from the European Union. This working group would develop a definition responding to the specific needs of the region. In view of the myriad and contradictory meanings and definitions which had been attributed to the term, it would also be better no longer to speak of "eutrophication", but of "primary over-production".

54. A delegate added that the situation arising out of the proliferation of marinas and other leisure ports should have been mentioned in the document, since they constituted real storage areas for algae.

55. The representative of MedGOOS, speaking in particular on behalf of the IOC, indicated that the latter organization had recently established a programme on ICZM with a research group on eutrophication, but that funds were lacking. She hoped that the issue of financing could be addressed by the forthcoming meeting to launch MAMA Project. She also emphasized the importance of the work to be carried out on coastal lagoons.

56. With regard to the parameters proposed in the document, certain participants indicated the difficulties involved in measuring global levels of phosphorus, and drew attention to the value of other parameters, such as organic carbons, transparency, certain oceanic parameters and the vertical profile of the water column. In contrast, another delegate called for simplification, with the retention only of "sufficient but minimum" parameters to give an indication of eutrophication.

57. The representative of IAEA informed the meeting that, in the framework of the Agency's work on the peaceful applications of atomic energy, a meeting of experts had been held in Monaco in November 2001 on the application of radioactive isotopes, which offered prospects for studying eutrophication. The IAEA envisaged providing assistance to countries which used radiomarkers (for discharges of waste water and irrigation water, etc.).

58. Concluding a debate which had added much to the issue and shown its great pertinence in the region, the MED POL Coordinator said that the Secretariat's proposals appeared to him to be accepted in the main. It would be necessary to proceed to more practical aspects in 2002 with the forthcoming monitoring programmes, in which countries would be asked whether they wished to include eutrophication monitoring as a pilot exercise. With regard to the proposed working group, he said that it would be difficult for the Secretariat to establish it as a permanent group, since no budgetary allocations had been made for this purpose by the Contracting Parties for the new biennium. However, it was entirely possible to envisage, by using certain credits set out under other headings, such as research, establishing an informal group of experts which would meet next year to examine the parameters, methods to be recommended and data quality assurance. In this way, it would be possible to develop conclusions by 2003 on this type of monitoring and on the methods to be recommended to all countries for its application.

59. With regard to the possibilities that had been mentioned for coordination and cooperation with the European Commission, the Secretariat wished to recall that it had always endeavoured to harmonize its activities with those of the Commission and to take into account the Commission's initiatives. However, at this stage, a mutual effort was also needed by the European Commission. The representatives of Mediterranean countries which were members of the European Union were therefore urged to take every opportunity in the meetings of European technical groups to highlight the role of MED POL.

Item 8 of the Agenda: Towards an integrated monitoring system for coastal zone management

60. Following two-and-a-half days of rich debate which had reviewed many aspects of monitoring, the MED POL Coordinator believed it important to review the situation of MED POL within the current MAP system at this precise stage of its development. The adoption in 1996 of the amended Land-based Sources Protocol had changed many provisions directly involving MED POL in the areas of general obligations, the regulatory system and its scope (which now encompassed hydrologic basins, brackish and coastal salt waters, marshes and lagoons communicating with the Mediterranean), and reporting requirements. This new legal framework, which was expected to enter into force in the near future, had led to the formulation and adoption in 1997 of the SAP, which was an instrument envisaging the development of plans and guidelines at the regional level, national action plans (NAPs), the identification of pollution "hot spots" officially acknowledged by the countries, all within a specific timeframe for the progressive or total elimination of certain categories of pollutants, as well as the preparation of pre-investment studies for pollution hot spots and the identification of financial instruments for the long-term implementation of the SAP. With a view to preparing the countries for the implementation of the SAP, the GEF project for the Mediterranean (2000-2003), which had entered its operational phase last January, would serve to strengthen capacities and benefited from a budget of 12 million US dollars. Finally, as from the entry into force of the LBS Protocol, the SAP would become binding for all

Contracting Parties. In the new phase, which was of more of a managerial nature, and which was about to commence, work on indicators would be a determining factor, as they were understood by decision-makers.

61. Following this brief review, in which the MED POL Programme appeared to be in perspective a solid management tool, the delegates emphasized the need to coordinate MED POL/MAP with other programmes in terms of the time schedule and to improve awareness of the SAP. The representative of RAMOGE considered that scientific meetings such as the present one were very useful, but that once they had returned to their laboratories, the experts and researchers needed to remain in contact, be able to exchange information and materials and benefit from the support of the Secretariat, particularly at a time when a new component such as bio-monitoring was being introduced. It would also perhaps be beneficial to prepare a document on the interpretation of results. The observer representing the Palestinian Authority noted that the financial assistance of MED POL was of great importance and it was necessary to give priority to countries which had only participated in the recent phase of the programme.

62. The Secretariat fully subscribed to the proposal made by the representative of RAMOGE, adding that Professor Viarengo was available for site visits and the provision of technical assistance. Professor Viarengo added that the interpretation of results was one of the essential elements of the qualitative and quantitative evaluation of data. In any case, the participation of laboratories in data quality assurance exercises remained a prerequisite for the assistance that would be provided to them.

Item 9 of the Agenda: Other Business

63. Under this item, Ms Monique Viel, Environment Remote Sensing Regional Activity Centre (ERS/RAC), gave a brief presentation of the possibilities that the Palermo Centre offered MED POL. As the Meeting had emphasized when discussing monitoring, satellite imaging could be very useful in measuring certain parameters, such as water temperature, dissolved organic matter, chlorophyll, suspensions and oceanographic conditions (wind, waves and the condition of the water), as well as for modelling the dispersion of pollutants and detecting the dumping at sea of hydrocarbons. The Centre had already made an important contribution to training and technical assistance in this field, particularly in the context of coastal development programmes, which had provided an opportunity for the transfer of technology.

64. The representative of Turkey announced the Second International Conference on the "Oceanography of the Eastern Mediterranean and Black Sea: Similarities and Differences of Two Interconnected Basins" which will be held in Ankara during October 2002 of which the further details would be provided from http://www.ims.metu.edu.tr/2002_Ankara_Conference/.

Item 10 of the Agenda: Adoption of the record of conclusions

65. The Secretariat presented to the meeting a list of informal conclusions which had been prepared in consultation with the Officers of the meeting, other participants and experts on the matters addressed during the first two days. The meeting agreed on the conclusions which would be used for the preparation of the report of the meeting. The Secretariat indicated that the report of the meeting would be sent to the participants in the near future for their comments, before being finalized.

Item 11 of the Agenda: Closure of the Meeting

66. Following the customary exchange of courtesies, the Chairperson closed the meeting on Friday 7 December 2001 at 14.05 p.m.

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ANNEX II

AGENDA

- 1. Opening of the Meeting**
- 2. Election of Officers**
- 3. Adoption of Agenda and Organization of Work**
- 4. Examination of past MED POL Monitoring Activities: Achievements and Bottlenecks**
- 5. MED POL – Phase III Monitoring Activities: Problems and Progress**
 - 5.1 Trend monitoring
 - 5.2 Biological effects monitoring
 - 5.3 Compliance monitoring
- 6. Establishment and Management of MED POL Database**
- 7. Eutrophication Monitoring Strategy**
- 8. Towards an integrated monitoring system for coastal zone management**
- 9. Other Business**
- 10. Adoption of the record of conclusions**
- 11. Closure of the Meeting**