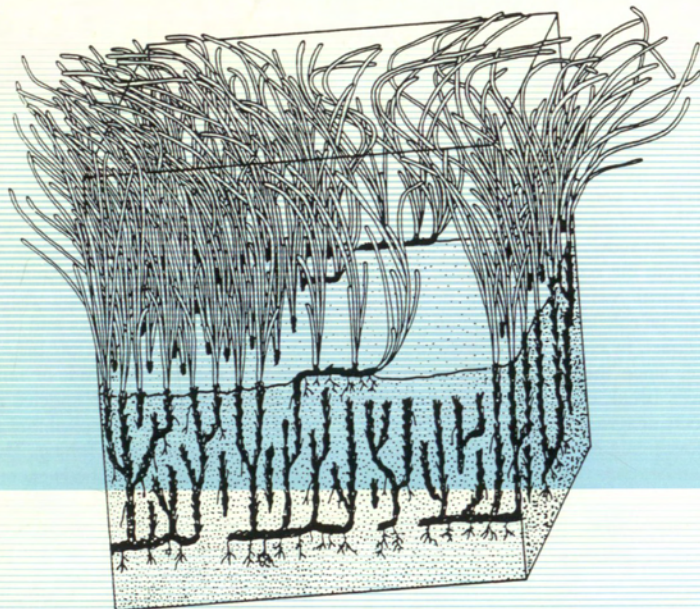




# MEDWAVES

MAP COORDINATING UNEP • NEWS BULLETIN PUBLISHED IN ENGLISH / ARABIC / FRENCH No 22 WINTER / SPRING 1991



◀ **DOSSIER:  
POSIDONIA  
OCEANICA**

**ALDO MANOS:  
HIS PARTING INTERVIEW** ▶



◀ **WHAT'S NEW IN THE  
MEDITERRANEAN ?**

# THE POSIDONIA BEDS: THEIR REGRESSION THREATENS THE MEDITERRANEAN COASTAL ECOSYSTEM

*Near the coast, in less than 35 to 40 m of water, the Posidonia beds represent for the Mediterranean true oases of marine life and protect the coastline. They are threatened by pollution and uncontrolled development of the coastal areas: urgent measures should be taken to protect them.*

Practically everyone who takes their holiday on the Mediterranean coasts knows **Posidonia oceanica**, very often without being aware of it. It is this elongated plant the prairies of which, in a short distance from the beach, form dark patches in the blue waters. The swimmers who wear a mask and swim above these seagrass beds only glimpse at a very small part of the treasure that they encompass. **Posidonia** is a marine phanerogam similar in many ways to thousands of land phanerogamia - like wheat for instance, to give just an example. It gives flowers and a fruit ("olive of the sea"), its leaves fall in droves after an autumn storm and form on the beaches dry heaps which are wrongly considered algae. It is a plant endemic to the region, i.e. found exclusively in the Mediterranean: beyond the straits no sign of it. It is unknown both in the sea of Marmara and the Black Sea and also in the Atlantic Ocean. It can only grow in the conditions of temperature, salinity, transparency and tides that the Mediterranean provides. If those conditions are no longer available, **Posidonia** immediately disappears. That is why it is not found in the estuaries of the large rivers like the Nile, the Po, the Rhone, the Ebro where the inflow of fresh water brings about a decrease in salinity, not to mention the effects of pollution. On the other hand, in areas where the conditions favouring its growth are more stable and where the length of the continental shelf provides hospitable grounds, **Posidonia** can cover extended stretches. This is the case of the Gabes Gulf in Tunisia extending to the Small Sirte in Libya, also of Sicily, the Balearic islands, the Ionian islands of Greece and Edremit Bay in Turkey. On the Eastern Coast of the Mediterranean, the **Posidonia** beds are rarer.

## A COASTAL RAMPART

Externally, the plant has densely growing band-like leaves which are 50 to 150 cm in length. All of this dense foliage constitutes the thick plant meadow. However, one of the key roles that **Posidonia** plays is hidden deep in the sea. In effect, the plant attaches itself to the sand by a crawling stalk (the rhi-

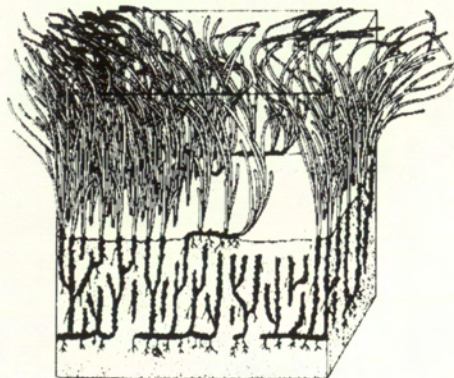
zome) which grows both horizontally and vertically. In this way, the seabed is "trapped" into the rhizome network and forms the "matte" which is very resistant; it gradually becomes very tall and finally almost reaches the surface of the water; it is thus a "reef with strands" or a "barrier reef" separated from the coast by a lagoon, exactly like the coral reefs. **Posidonia** beds thus play a crucial role in building up and protecting the coast, by ensuring in a sense its permanence, since they don't let the currents and waves break on it. Therefore anything that affects seagrass beds destabilizes sediment movements and in the end the Mediterranean beaches themselves.

## THE TREASURES OF THE ECOSYSTEM

Not all marine areas are equally rich in biological resources. In fact, life is concentrated in the coastal zone where light penetrates to the seabed and nutritive matter accumulates. Most of the fisheries resources are in less than 200 m of water, on the continental shelf. However, it is in the first 30 to 40 meters of depth near the coast that the

most important ecological phenomena occur. And that's exactly where **Posidonia** beds grow. In addition to their role as protector of the coast which we just described, they also act as "treasurers" of the ecosystem because they provide refuge, habitat and nourishment to about 400 species of plants and 600 species of animals of the most diverse animal groups, fish, bryozoa, hydroids, bivalve molluscs and of course all the microscopic forms of life. They act mainly as spawning grounds or nurseries for the young of several fish species and safeguard thus a biological capital that man eventually collects through fishing. The primary production of seagrass beds exceeds that of man's large crops and is evaluated at more than 20 tons of dry organic matter per hectare per year. The leaves fall and putrefy and thus are a part of the carbon cycle; the organic matter is available as food, either directly as fodder or used in the form of suspended particles in the water and stored in the sediment. A seagrass bed produces 10 liters of oxygen per m<sup>2</sup> per day. As regards the close links that govern the various members of the biological community (or "biocenosis") of the bed, they are similar to those of the forest with its fauna and flora. At the bottom, in the "matte" live worms and molluscs. Right above it, one finds chlorophyll algae responsible for photosynthesis, urchins (which eat leaves and rhizomes), holothurians (a tubular, crawling animal, which has suction cups and feeds on urchin feces and which is also called "sea cucumber") and gastropods. In the leaf mass feed the vegetarian fish, while the carnivorous fish treat the seagrass bed as their favourite hunting ground.

All these roles are not yet fully understood. For the last 20 years, several teams of experts in the Mediterranean countries have studied the **Posidonia**. Some of the most important work has been done at the Universities of Barcelona and Alicante in Spain, Aix-Marseille and Nice in France, at the Stazione Zoologica di Napoli at Ischia in Italy, at the Marine Studies Centre of Hagios Kosmas in Greece and there is also an important contribution from scientists from outside the Mediterranean (the Universities of



*This diagram shows how the **Posidonia** rhizomes overlap and reinforce one another to produce a very tight net which stabilizes sediments and is called "matte" (after Boudouresque and Meinsz). Extract from the Red book "Gerard Vuignier" of threatened marine plants, populations and landscapes. MAP Technical Reports Series No. 43, UNEP Athens 1990.*

Brussels and Liege in Belgium). Similar programmes were also supported by the Mediterranean Action Plan within the framework of the MED POL Programme. Neglected by scientists in the past (who thought it was only useful as food for sea urchins and some fish), *Posidonia* attracted the researchers' interest in the 70's when the work of C.F. Boudouresque from Marseille was published. From that point on, the pivotal role that this plant plays in the coastal ecosystem has been gradually clarified, documented, analysed. Now studies are focusing on the energy and matter that are produced in the *Posidonia* beds and flow out into other ecosystems. There is a methodology developed, called lepidochronology or analysis of the scales remaining on the rhizomes after the leaves have fallen off, which enables us to follow the evolution of seagrass beds over a 30 to 40-year period and thus study the extent of damage and the decrease of *Posidonia* beds, as a result of pollution, building activities and coastal land development.

#### THREATS AND REGRESSION OF BEDS

Because the plant is vulnerable to even slight variations in its environment - such as turbidity or murky state of the water, depriving *Posidonia* of the light which is absolutely necessary for its development - seagrass beds are threatened today by various forms of pollution and anthropogenic activities. This is a threat less for the plant itself (which could disappear only in the case of a true environmental catastrophe) but a lot more for the biocenosis that it gives shelter to. If a part of the bed is destroyed, all living forms that were associated with it die. The available data leave no doubt about it: the green marine flora cover is slowly regressing near the discharge points of urban and industrial effluents and under the influence of mechanized fishing activities, yachting and dredging. Thus, in the gulf of Marseille the *Posidonia* beds which in 1974 extended between 4 and 35 m of water, now form a band which only covers the depth between 10 and 25 m. The increase in water turbidity reduces the bed on its open sea side (where the light is less able to penetrate), whereas on the coastal side, the bed recedes under the direct effects of pollutants discharged into the marine environment. Caught between these two phenomena the grass bed shrinks inevitably with time. To this impact of pollution one must add the impact of mechanized activities like road construction, dams and airports built on the coast, damage from the anchors of pleasure and fishing craft, dredging of the seabottom to extract sand and gravel; finally damage from fishing activities like trawling.

Surveys of damage carried out over large sections of the Northern Mediterra-

nean coastline up to and including Greece and Turkey where there is construction of marinas, ports and tourist complexes show that each year new areas that act as a refuge to marine life are being destroyed. The tiger seagrass beds of the Gulf of Gabes are affected by pollution originating in the industrial areas of Sfax and Gabes. In France, even at the national park of Port-Cros which is frequently cited as an example of successful protection of the Mediterranean environment, the *Posidonia* beds are negatively impacted upon by the mooring of pleasure craft which bring visitors during the tourist season. The anchors do not directly destroy the beds but they do open gaps and create open spaces in the "matte", something like "giant cauldrons dug in the bed" which would lead to the beds regression and final disappearance.

#### PROTECTIVE MEASURES

The destruction of a *Posidonia* bed can be considered, at the human scale, as irreversible. We thus have to run against the clock if we want to protect the parts of the

Mediterranean coastline most affected by untreated effluents or construction fever. Some Mediterranean countries have launched replanting operations after similar efforts had been carried out in the United States in the 60's to re-establish the beds of other types of phanerogamia. However, this solution can only be applied in certain areas and under specific conditions; moreover it is a long term solution\* on which the scientific community is divided; some feel, like this researcher from the Hagios Kosmas centre that "one cannot reimplant *Posidonia* as if one were replacing the flowers in a bed an unconscionable neighbour trampled. The seabed is often changed in an irreparable fashion. Politicians and planners are in effect likely to say "since we can replant *Posidonia* beds further out we should not worry about destroying some closer to the coast".

Only one solution seems adequate, and that is to protect at all costs the remaining *Posidonia* beds through a complete revamping of coastal development policies and the generalization of impact studies to be integrated in the planning process. Is this threat felt at government level? One is tempted to say yes, if one looks at the Paris Charter adopted at the CSCE conference held in Paris in November 1990; one of the paragraphs refers specifically to the need to protect the *Posidonia* (see insert). Some countries have already included it in their legislation. However, experience shows that implementation is not always at the level of legal texts, no matter how explicit they are. The creation of mechanisms to intervene on the spot should be accompanied by more extended and in-depth research as well as by public awareness. Considerable progress has already been achieved in this direction. In 1990 and 1991, the EEC financed a study programme in the two axes of "A functional approach of the *Posidonia* ecosystem in the Mediterranean" and "The stocks and fluxes of elements in the *Posidonia* ecosystem". MAP for its part supports three relevant research projects. Finally on the level of dissemination of information, the awareness campaign launched by the Italian ecological association MAREVIVO is greeted with satisfaction: between the 27th April and the 10th October 1991, the two training ships of the Italian Navy, the *Americo Vespucci* and the *Palinuro* will go on a cruise to publicize the protection of *Posidonia*. They will stop at Taranto, Marseille, Trieste, Barcelona, Dubrovnik, Piraeus and Livorno where round table discussions and consciousness raising activities will be organized. It would be good if local and national authorities actively support the MAREVIVO initiative and extend to the two sailing ships the warm welcome that they deserve, all for the protection of the Mediterranean coast.

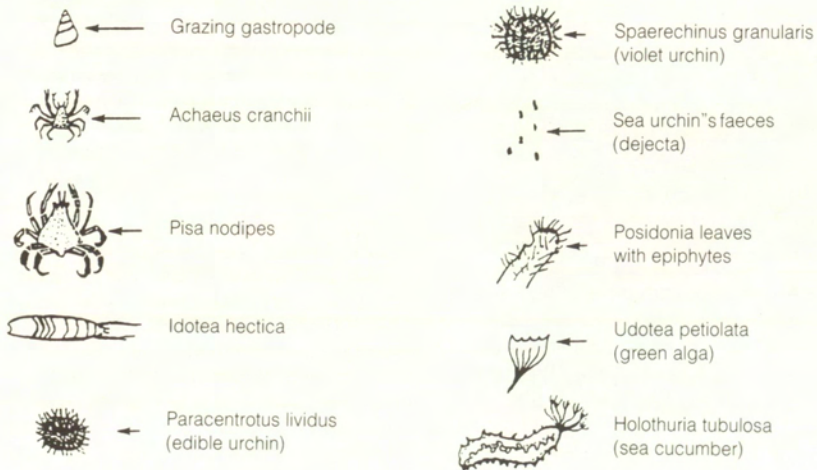
\* Since the stalk only grows at a rate of 10mm per year at best.

*In the document "Charter of Paris", signed by 11 Heads of State and 27 Heads of Government during the 2nd summit of the Conference on Security and Co-operation in Europe (CSCE) held in 1990, there is a precise commitment of the coastal Mediterranean States to "ensure the protection of *Posidonia oceanica* beds and all other seagrass beds that constitute essential plants of the Mediterranean ecosystem" and to control and regulate trawling and other activities which result in the destruction of *Posidonia* and all the other marine phanerogamia.*

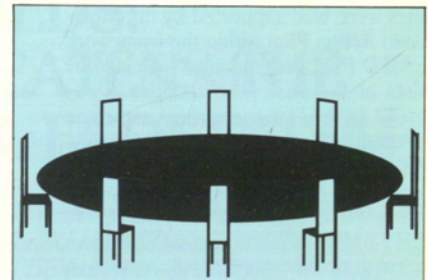
*It is doubtless the first time that such prestigious signatures (especially those of Presidents Bush and Gorbachev) protect seagrass beds. Of course this does not mean that the good intentions will be followed immediately and everywhere by the appropriate action. It does mean however that the work that we do, both scientific research and public awareness has borne fruit: from now on the environmental and economic importance of seagrass beds is widely known.*

*(Editorial of the "Posidonia Newsletter" published in February 1991 by SIG Posidonia).*

POSIDONIA BEDS (CONT.)



Some of the direct or indirect consumers of Posidonia. Vegetarian fish, certain crustacea, gastropoda and urchins all graze on the leaves. The violet urchins eat mostly the rhizomes, whereas the sea cucumbers (holothurians) feed on the organic matter contained in the sediments and especially on urchin feces.  
(Adapted from the Red Book "Gerard Vuignier", UNEP).



MAP CALENDAR

Consultation on health effects of bathing in sea water	15-18 May, Athens Greece.
Workshop on guidelines and reference methods on treatment of samples for organic contaminant analysis	May, Monaco
Training course on statistical treatment and interpretation of data on marine communities	3-13 June, Alexandria Egypt
Training course on hydrocarbon pollution	10-15 June Malta
Training course on crisis management	17-21 June Malta
Meeting of the Bureau of the Contracting Parties	16-17 July Cyprus
Workshop on biological effects of pollutants on marine organisms	10-14 September Malta
Meeting of Arab experts on restoration methodology of historic establishments	22-24 September Tripoli Libya

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## MR. ALDO MANOS DRAWS A PICTURE OF 15 YEARS OF CO-OPERATION IN THE MEDITERRANEAN

**MEDWAVES.** *Mr. Manos, you have been active in MAP from the time it was launched in 1975; you assumed its co-ordination in 1980. Through your post you have, in these 15 years, been instrumental in bringing about the main phases of this development. As you are about to leave this post, you and others involved in MAP can draw a general picture of Mediterranean co-operation. Is this balance sheet a positive one?*

**A.M.** If I say that it is very positive, one might think that it is a subjective and conventional judgement dictated by the circumstances. However, I see that this judgement is shared by ever more numerous neutral observers, with no connection to MAP. For a while now, we have been witnessing the publication of many works on the Mediterranean environment. The authors are university professors, legal experts, experts on American or European affairs, in other words they come from outside the region and cannot be considered prejudiced. They all underline the pioneering role, the original structure and the legal base of MAP as well as the success of the co-operation which it launched among the coastal states. I could also mention the numerous articles that the international press in its most authoritative newspapers and magazines has devoted to us. However, in order to place the balance in perspective, one should distinguish the main phases. The first is that which I will call "field reconnaissance". In 1975 we were starting practically from zero. We had to learn everything on the Mediterranean, its pollution and even pollution in general. We had to create and give form to concepts, structures and mechanisms, to identify the problems and their extent. This took us about 10 years. It is MED POL, the pollution monitoring and research programme that played the fundamental role. It was a totally new programme at that point, unique in the world. Unlike other projects, such as "the year of the climate" or "the year of the water" which were limited in time, we established a permanent network of scientists...

**MEDWAVES.** *There was nothing similar in other regions?*

**A.M.** No. There were of course studies, working groups, colloquia on specific environmental problems, but the idea to

**1975-1991: In the following interview, which he gave to MEDWAVES, Mr. Manos, MAP Co-ordinator, objectively looks at action carried out in these 15 years, highlighting the positive aspects, but candidly also pointing out the gaps that must be filled in the future by the Mediterranean Coastal States.**

create a common structure to bring together scientists to develop a programme in which participate on a permanent basis all the countries of a region by adopting common methods and standards in specific areas, oil, mercury, microbiological contamination etc. that idea did not exist. It was the first time that a geographical region became active in this manner to save its marine environment. This network did not just survive, proving thus its effectiveness, but it became fully fledged and developed. Which means that it filled a need. All those that have participated want to continue and many want to be included. And it was the success of this first phase which one might roughly call "the MED POL phase" that convinced other regional seas. We then entered the second phase - it was around 1985 - which was that of common decisions, the first common measures to combat pollution taken on the basis of the first global scientific evaluations. This was a more difficult phase, because important funds had to be invested, financial interests to be countered, laws to be voted in each country. This phase is still far from being over...

**MEDWAVES.** *One might also say that it never will be...*

**A.M.** Indeed, since environmental problems are constantly evolving, at any moment new aspects of pollution that one did not know existed may spring up - and here I am thinking of the ozone, climatic changes, transport of toxic wastes. Then there is the press and the mass media that exert a lot of pressure, the public that becomes more and more aware of the problems, all the social classes up and down the ladder. Wanting a clean sea in 1991 does not mean the same thing as it did back in 1975. The new generations

are a lot more demanding when it comes to quality of life or environmental quality, so the objectives must be re-examined in a stricter way.

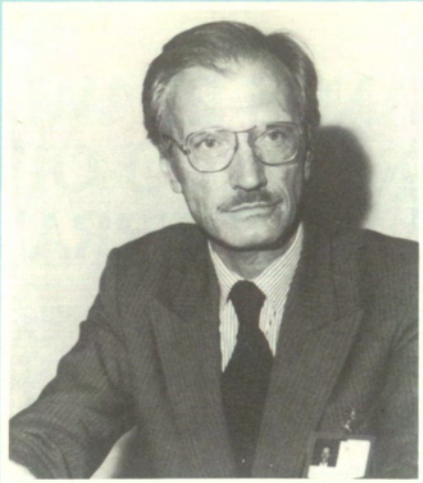
**MEDWAVES.** *In other words even the "field reconnaissance" phase has not been completed?*

**A.M.** Science never stops, technology either: the environment must continuously be explored and better understood. We have today more sophisticated methods to detect pollutants, which means that they loom larger. Thus the environmental quality indicators are constantly re-examined. Coliforms for instance are no longer considered sufficient indicators of water quality. Thus we have a reconnaissance phase and a decision making phase that move along and mutually overlap. However, a third phase has begun, that of concrete, in the field, implementation. Up to now, governments were telling us: let's wait for the scientific evaluations and the adoption of a legislative framework. They don't have this excuse any more. We know for instance what a treatment station is and what type must be set up under a specific set of circumstances. What is left now is to make available the necessary credits to set up treatment plants in all large cities, which is what the coastal states themselves have asked for in their 1985 Genoa Declaration. Now it is the turn of governments and local authorities which have the authority to finance the projects to move to action. Furthermore, other groups of nations - like the EEC through the Nicosia Charter - and institutions like the World Bank have in their turn engaged themselves in the same direction. I think that we will witness states, groups of states even cities emulating one another and spurring each other on. The World Bank projects involve 30, 50 and even 100 plus million dollars. This is an important development, unthinkable a few years ago. However even the most solid studies, the most appropriate regulations cannot improve the state of the environment if they are not accompanied by a mechanism for practical implementation.

**MEDWAVES.** *You mentioned the role and the programmes of the EEC and the World Bank. The investments are considerable if compared with MAP's modest budget. Is MAP running the risk of becom-*

# ALDO MANOS

An Italian, of Dalmatian origin, Aldo Manos has drawn from the complex cloth that History has woven on the Adriatic coast "a special vision" of the Mediterranean. A kind of humanism open to all the winds of the open sea, even when they blow in opposite directions. A graduate of the University of Genoa in both international law and political science, Aldo Manos works in the private sector for 5 years, then joins the United Nations in New York in 1962 in the Division of Public Administration. In 1967 he is based in Bangkok, Thailand, in charge of the UN Regional projects in Asia and the Far East. In 1972, the Stockholm Conference is convened and the great adventure of environment protection is launched. The United Nations Environment Programme (UNEP) whose headquarters are in Nairobi, Kenya, is set up. In 1973 Aldo Manos is the Head of Programme Management, then Deputy Director of the World Environment Fund. In Geneva, in 1980 while he is UNEP Director for Europe, he is appointed as the first Co-ordinator of the



Mediterranean Action Plan; its headquarters are transferred to Athens two years later. He brings to the region and to an unprecedented co-operation programme among coastal States a temperament not at all "Mediterranean" if one thinks of the

- very conventional - stereotype that one associates with the word. However, under the attentive discretion of behaviour, the extreme politeness and sobriety of speech his reasoning goes straight to the heart of things; sometimes his humour comes to the surface. The "Manos style" is very useful in keeping the discussions on the right track during the innumerable meetings which for 10 whole years have contributed to making gradually the Mediterranean cooperation as solid and effective as it is today. The Mediterranean Action Plan owes to Aldo Manos first and foremost the fact that it was able to overcome with no major crisis the traps usually awaiting such large scale projects in their first steps. "The train is well on the track now, I can go" was his comment on leaving MAP. Those that will continue the trip without him, will in the next few phases remember that he was instrumental in giving it the orientation it needed. All in the name of that "special vision" of the Mediterranean.

*Medwaves*

*ing marginal for lack of equally high sums?*

**A.M.** I don't think there is such a risk because the respective roles are different. Take the World Bank. It does not finance scientific programmes and is not under the obligation to develop new legal bases. It helps governments implement their environmental programmes by granting them loans. However, such programmes will always need a priori the scientific and legal structure of MAP on which this type of investment can be based. Secondly, MAP is the only programme common to all Mediterranean countries. It remains the only forum where the Mediterranean states can, as partners, carry out a dialogue, exchange views and take action. Finally, it represents a group of countries which have taken a formal commitment within the framework of the Barcelona Convention which remains for each one of them a legal reference that cannot be circumvented; outside this framework there are only bilateral agreements between states or between one state and a financial institution.

**MEDWAVES.** Surely though the time has come when Mediterranean governments allocate more considerable sums to MAP if they want to see the concrete implementation of the programme they jointly adopted.

**A.M.** All the conditions are now in place to do so, and if they didn't they would risk losing the benefit from so many years of preparation and effort. The public might be somewhat confused about the choices to make, or the programmes to imple-

ment as a matter of priority, because there are at times differing opinions on one pollution problem or another. One should then be in a position to distinguish between the opinion of one scientist given wide media coverage and that of a large network of scientists working in a framework of co-operation under the auspices of United Nations agencies, whose judgement and proposals are widely respected. Furthermore, those making political and economic decisions shouldn't use these discordant voices to avoid implementing solutions. The important thing is to provide decision makers and the public with sound information by proving to them the solidity of choices which are the fruit of innumerable exchanges of views and consultations among scientists.

**MEDWAVES.** In this very general picture you have drawn, certain shadowy areas are emerging. Could you enlarge upon them, since it is here that future action has to be taken?

**A.M.** Mediterranean governments still need a lot to do. In fact in certain cases they are unwilling to act, which considerably hinders MAP's work. The first thing that springs to mind is the national data on sources and quantities of pollutants which are not always communicated to the Co-ordinating Unit.

**MEDWAVES.** And this despite the fact that the countries themselves when they meet every two years always urge compliance!

**A.M.** Yes and it underlines the ridiculous and deplorable aspect of this lack of com-

pliance. Ridiculous because of the following contradiction: even though we can now measure in the environment smaller and smaller quantities of very complex pollutants, we still do not know the figures that each country has on its pollution. Very high figures, thousands of tons of pollutants concerning visible and known sources, from industrial complexes, or sewage from large cities. Such data are not sent in, even though for a year and a half now we have had a programme of collection and centralized processing. This is a fundamental problem. MAP is somewhat in the shoes of the Chinese doctor of a bygone era who could not examine his patient (especially if it was a lady) and who had to make a diagnosis and decide on therapy by looking at a doll on which the persons accompanying the patient described the symptoms. Our patient is the real state of the Mediterranean environment. In 1977 we had to make estimates by deduction and extrapolation on the basis of hypothetical values for each pollutant per capita or per factory. However today this is no longer acceptable. Without knowing accurately the numerical data of pollution, it is difficult to propose and even more so to urge implementation of the measures needed by concentrating on the most critical areas. There is still the tendency to study the problem down the line - pollutants in seawater, in food, in the air etc. where it is diffuse, scattered, without studying the sources of pollution to attack it effectively. Moreover, governments do not communicate to us their national laws translating their international commitments in environmental matters, mainly

in the framework of the Barcelona Convention.

**MEDWAVES.** *But legislation is public by definition. It is just a matter of consulting the official texts!*

**A.M.** In theory yes. But in practice, it is truly a legislative jungle scattered pretty much everywhere, since environmental problems, depending on the case are dealt with by various ministries, administrations, agencies and not least local authorities which have often the authority to vote laws and regulations on sewage, bathing waters, land development. To get a global and coherent picture we had to carry out an extensive and in depth study covering 2-3 countries. This could be justified as a model, to illustrate the methodology. But it is not the role of MAP to try and find out what is going on in the Coastal States. Rather, it is up to each one of them to communicate to us of their own accord this global view. Finally, in order to limit myself to the main black spots of this balance sheet, there is the question of determining liability and compensation for damage in cases of serious pollution, which affects a neighbouring country. On this, the Barcelona Convention is very clear. The Parties have committed themselves to co-operate as soon as possible to set up and adapt mechanisms to determine liability and repair damage. What have they done since? They have wasted time by claiming that nothing could be set up at regional level until there was agreement on the principles at international level. However, the Convention mentions nothing about debating principles; it only refers to mechanisms.

**MEDWAVES.** *Mechanisms of a dissuasive nature.*

**A.M.** It would be "the polluter pays" principle extended to all coastal states which would make it possible for those - sometimes the less well off among them - affected by pollution for which another state is responsible to be compensated. The argument advanced against this is that the Convention stipulates bilateral agreements between states. This argument is very old, in fact as old as international relations themselves. The Barcelona Convention goes a lot beyond that with the mechanisms it provides for. The creation of an Interstate Guarantee Fund for the reparation of damages was discussed, but the possibilities opened by the Convention were not taken advantage of and this question must be re-examined at a later date.

**MEDWAVES.** *In 1987 the refocusing of MAP on integrated planning and coastal management was adopted. It was translated into a series of coastal pilot projects*

*in four Mediterranean states; in a short time there will be projects in two more countries. Is this in your opinion, a definitive development in MAP or a simple transition phase before a new expansion of activities?*

**A.M.** In no way do I see in this a transition phase but rather a crucial evolution which will mark MAP for several years. It is the coast where we actually confront the problems in all their acuteness with the dangerous embroilment of environment and development. On the coast one gets a synoptic view of the problems. In the past there was the tendency to compartmentalize environmental action, here hydrocarbon pollution, there erosion problems, somewhere else protection of historic sites. Refocusing makes possible a global and complex approach to the problems. And this is actually the crux of the matter: which must be the objectives of rational development? The approach must be very flexible, multidimensional, interdisciplinary. There is no place for rigid formulae such as "5-year plans". As was the case with MEDPOL 15 years ago, ideas, methods, mechanisms had to be created. And as to the second part of your question, I would say that refocusing does not exclude extension of the scope of action, quite the contrary, since all MAP components - priority actions, protected areas, Blue Plan etc. - are used in the field. That's why these pilot projects are important. Now the experience gained through MAP is tested in the field, theory gives way to concrete action. MAP can play again a pioneer role in this area.

**MEDWAVES.** *You have pleaded the Mediterranean environment cause throughout the world, in various fora and the authorities of many countries. How is the Mediterranean perceived from the outside? Is it an abstract entity? Or does it remain this crossroads, the cradle of civilization that it has been throughout history?*

**A.M.** I see that the farther away one moves from the Mediterranean the weaker the concept of the region becomes. In Africa, in America, in the Far East, the Mediterranean is not perceived as an entity with coastal states bound by common solidarity bonds. Even in Europe, the North has in the past neglected the South, and this even in one country. On the other hand, within the region itself, I have truly felt that there exists a Mediterranean identity. Or a Mediterranean conscience if you prefer. The Mediterranean peoples feel Mediterranean, even if this does not rest on any formal framework. But more on a common heritage, a common past. Moreover, this "mare nostrum" is not the privilege of any one side, or any national culture. The Mediterranean identity was

built in the course of history, through sea and land exchanges, through the rise and fall of empires, ideological clashes and military conflicts. However one must sustain and develop this common conscience, this feeling of belonging to an exceptional region by multiplying meetings and bonds, since, at Mediterranean level, the opportunities for meetings are still relatively rare. It is rather "sections" of the Mediterranean that come together, rarely all of it. However, each time one looks at a "section" one distinguishes all the mutual links. Therefore there are subregions, as we call them in our jargon, which know themselves better and which are more extensively studied, others that have remained in the shadow, even from a historical point of view. Last year, a large exhibit on the Carthaginian civilization was organized in Venice. It was the first time that the public could realize the extraordinary radius of this culture around the Mediterranean, whereas usually, it is thought of as belonging to its home, Tunisia. The South Adriatic has also been neglected. The Adriatic Initiative may thus be the occasion to awaken a whole subregion which was important in Roman times as the passage way between the two peninsulas, the Royal way between Rome and Byzantium. The prospective study of the Blue Plan has shown that the Mediterranean countries need one another. The historic, political and economic problems that impede co-operation must gradually be solved.

**MEDWAVES.** *You don't like talking about yourself, but everyone is aware of the fact that between the often contradictory interests of the Mediterranean States you have been able to avoid clashes and have patiently woven the fabric of MAP through persuasion, objectivity and diplomacy. If you look back on those years you spent as Director of the Co-ordinating Unit, which would you say have been your greatest reasons for satisfaction and for why not disillusionment?*

**A.M.** It is not easy to "manage", if you allow the expression, the Mediterranean countries as a whole. History has bequeathed sequellae, dark areas of problems, not to mention causes of conflict always looming in the region. What MAP/UNEP has always wished to practice has been the scrupulous respect of sovereignty, the views and interests of each country; we have avoided classifying countries as "large" or "small", "wealthy" or "poor". This principle of equality has constantly guided us toward unity. In order to have certain projects, certain choices adopted we could have attempted to solicit the support of majorities, of certain groups of countries by leaving others aside. However, we have always wanted

that decisions be taken unanimously. A second principle also guided us and that is transparency in our contacts and our programmes vis-a-vis governments. There are no "top secret" files in MAP. Everything is done in broad daylight, as is fitting in the Mediterranean. The documents published are distributed to all, discussed by all, by the Bureau, the Committees, the expert groups. This transparency has been crucial to win and preserve the confidence of the Mediterranean States. They know we are here to serve them. This is the reason why the Mediterranean Action Plan has moved forward and it will continue to do so. The greatest satisfaction I had was doubtless last September in Palma, at the CSCE Conference on the Mediterranean Ecosystems. The role of MAP was mentioned emphatically by the Ministers and heads of delegation of all European countries and especially of the non-Mediterranean countries. It was for me a tangible proof that our work had been recognized and this despite the fact that we had minimal resources in financial means and human potential. By "we" I mean our team of the

Co-ordinating Unit in Athens, very small, but with a great team spirit, devoted to the Mediterranean cause and very competent. I am also thinking of the teams of the various Activities Centres. Disillusionment, which is the other side of the coin if you will, comes when I see that governments have kept back a programme that could charge ahead, by constantly cutting back on budgets and personnel. What trouble to arrive finally at an annual budget of 5 million! A budget that is actually divided between 18 countries! Everytime we had to fight hard in order to obtain a 5% increase even though the average inflation rate galloped way ahead; that was a disappointment, I don't hide it, as was also the fact that it was not always the large contributors that were the more reticent, but the small ones which for a modest increase of a few thousand dollars would have benefited tenfold through aid to training, research or their national projects. The wish I make for my successor is that he be successful in convincing governments to break this financial straightjacket imposed on the programme, mostly through bureaucratic laziness and mean spiritedness.

ness and mean spiritedness.

**MEDWAVES.** *And a last, perhaps indiscreet, question: will the cause of the Mediterranean environment lose you?*

**A.M.** Well, when the Mediterranean holds you it won't let you go easily! My future plans are not concrete yet, but they will inevitably be in the field of environmental protection. For that I am hoping to keep the contact with all those - experts, scientists, officials, NGOs, whose value and competence I was able to appreciate these last few years. The experience lived and shared within MAP cannot be abandoned without emotion, because even if environmental protection seems well established today, we have the feeling that we were the pioneers, which leaves us with memories and bonds of a truly rare quality. But life goes on and I feel very confident in MAP's future; its structure is solid and it can shoulder the increased load of the solutions for the problems that the region will face. But I say one more time that governments must agree to grant it adequate means in order that it accomplish its goals.

## CRISIS AND PROSPECTIVE

The short text published below was written during the Persian Gulf war. It was "hot off the press" that we saw it and we print it here to underline its importance and place it again in the context of the actual developments. In January 1991 in the Proceedings of recent activities, those responsible for RAC/BP at Sophia Antipolis had pointed out that they were encountering difficulties from the fact that "certain partners were not convinced of the use of prospective studies, given the recent geopolitical upheavals". In other words, when the repercussions of the Gulf war events on the Mediterranean region appeared somber and still unpredictable it was felt that one could wonder about the validity of the Blue Plan scenarios. MEDWAVES had asked then those responsible for RAC-BP to give their first reaction on this abrupt disillusionment; the reply was given by Michel Grenon, former technical director of the Blue Plan and one of the two authors of the Report. Meanwhile, the war stopped, the crisis although not resolved was partially defused. The consequences that had been feared the most - like a North-South cleavage - did not materialize, even though one might expect further developments in the region (social, economic and mostly

in the area of tourism). On the other hand, one might fear the negative impact on the environment and the climate in the Mediterranean region of the 500 oil wells put to the torch which will burn, it is expected, for between 3 and 5 years. In general then, it would not seem that the facts, data, trends and assumptions which form the basis for the Blue Plan, have been questioned. Michel Grenon's act of faith to consider the concerns and uncertainties of the hour as an additional reason to turn to prospective is in this respect all the more convincing.

***The accelerated development of the countries of the East and the Persian Gulf war are the two major events that shocked experts in prospective around the world. From that fact stems the temptation in some quarters to take the prospective to task, or even to declare that it is useless. It would obviously be easy to counterbalance these two "failures" with solid successes. It would also be very easy to say that prospective isn't prediction or forecasting! In fact, prospective, half-way between art and science, has as its ambitious goal to imagine what possible forms the future***

***might take. Honesty compels us to admit that they were either too timid or too conservative. This is a lesson that can be learned immediately: when uncertainty increases, everything can happen, everything must be envisaged, both the probable and the improbable. Thus, it is by covering as many possibilities as it is able to that prospective will fulfil its true mission which is to imagine not only the likely but the unlikely as well. Moreover to propose solutions if the unlikely does occur, reducing thus the shock effect, by replacing the improvisation through spontaneous reactions with solutions which have already been analyzed, their consequences weighed. The objective of prospective is not only to imagine possible developments while remaining a spectator, but to propose to decision makers possible and suitable actions for each one of those possible future developments. It is in this spirit that the Mediterranean scenarios of the Blue Plan have been formulated. It is also in this spirit that prospective appears to us now more needed than ever...***

**Michel Grenon**



## MAP ACTIVITIES

### MEETING OF THE EXPERT WORKING GROUP ON THE "OFFSHORE PROTOCOL" ATHENS 8-11 JANUARY 1991.

This was the second meeting (the first had been held in May 1990) to examine the draft Protocol for the Exploration and Exploitation of the Continental Shelf and the Sea-Bed and its Sub-Soil, on the basis of the new comments submitted by the Contracting Parties. The text was reexamined and the provisions on which agreement could not be reached were put in parentheses in order to be finally negotiated by the Conference of Plenipotentiaries. Given the lengthy process of drafting and examination of the draft "Offshore" protocol, the Secretariat felt that it would not be appropriate either to convene another meeting or to solicit further comments from the Contracting Parties. The Bureau was thus requested to examine the Meeting Report and authorize the Executive Director of UNEP to convene the Conference of Plenipotentiaries which would review and adopt the Draft Protocol. During its meeting in Brussels on the 9th and 10th April 1991 (see below), the Bureau took the decision to include the Secretariat's proposal in the Agenda of the next meeting of the Contracting Parties (Cairo, 8-11 October 1991) in order that they take a decision on the matter. An expert meeting will be organized a few days prior to the Contracting Parties meeting to examine the Annexes and the questions still pending in order to facilitate decision taking at Cairo.

### MEETING OF THE WORKING GROUP ON THE MEDITERRANEAN REPORT ON THE 1992 UN CONFERENCE ON ENVIRONMENT AND DEVELOPMENT (ATHENS 16-18 JANUARY 1991)

The group consisted of experts appointed by the governments of 12 Contracting Parties and was charged with adopting the final version of the Report on the Mediterranean countries to the 1992, Rio de Janeiro UN Conference on Environment and Development. This is a synthesis report of the MAP objectives and experience and briefly underlines the importance of the integrated approach, the successes and the role that MAP can play as a model for the other regions. It was agreed that the meeting of the Contracting Parties in October 1991 should be the occasion to adopt a strong declaration to be transmitted to the UN 1992 Conference. The meeting further decided that additional documents would be prepared concerning: 1) A commitment of the States on the "Agenda 21", i.e. on future developments in the eve of the 21st century, 2) A summary, in the form of a table, on the socio-economic and environmental development 1970-1990-2010 and 3) Printed and audiovisual material for the layman which would present in a concise and attractive manner the Mediterranean and the perspectives for the future. At the Brussels April 1991 Bureau Meeting, the Draft Report was approved for transmission to the UN 1992 Rio

Conference Secretariat. The Bureau also decided to refer to the October Cairo Meeting the matter of a political declaration of the Mediterranean States.

### BUREAU MEETING IN BRUSSELS (9-10 APRIL 1991)

Italy announced the setting up at Venice of a Mediterranean Studies Centre. During the last Bureau Meeting in Brussels, the Representative of Italy, Mr. I. Butini, announced that his Government intended to set up in Venice a Mediterranean Studies Centre in the MAP framework. The municipality of Venice has already offered the premises. The Secretariat was requested to make the necessary contacts with the Italian authorities concerning the activities of the Centre. For his part, the Representative of Egypt announced that his country, in collaboration with UNDP and the support of Italy was offering to host a new Centre for the development and environment in the Arab region (CEDARE). This new centre could, along with the Venice Centre, be integrated in a network (which would mostly prepare the impact assessment of certain projects on the environment). The Bureau decided to hold its next meeting in Cyprus, July 16-17, 1991.

## ECHOES OF MEDITERRANEAN COUNTRIES

### INTERNATIONAL TRAINING SESSIONS/WATER RESOURCES MANAGEMENT CEFIGRE, SOPHIA ANTIPOLIS, FRANCE

CEFIGRE was founded in 1977 to promote, through training and the exchange of information and experience, the management of water resources in the developing countries. It is supported by the work of an international Scientific Council (consisting of representatives of 25 countries) and an expert network. The training sessions are open to nationals of developing countries and certain technical and administrative staff from developed countries. Each session is scheduled for about 15 participants. The 1991 programme consists of 21 sessions distributed among Asia, Africa and Sophia Antipolis on the following subjects: Water Resources, Water in the Cities, Water and Rural Development, Environmental Management, Institutional Development. (For detailed programme write to: CEFIGRE, B.P. 113 - Sophia Antipolis, 06561 Valbonne Cedex - France, tel. 0033-92945800).

## NEWS OF COASTAL MANAGEMENT PROGRAMMES (CAMPS)

**In the one but last number MEDWAVES reported on the signing of the agreements on the Syrian Coast and Izmir Bay. The agreements on the Island of Rhodes and on Ka-**

**stela Bay were signed on June 20, 1990 and in December 1990 respectively. We can now report on the following developments regarding the 4 Coastal Areas Management Programmes in progress.**

### The Coastal Region of Syria

An integrated planning study prepared by PAP/RAC Split in 1989 was presented to the Government of Syria together with a set of recommendations for immediate action. A PAP mission was organized to assess the possibility, develop detailed programmes and lay the ground for work on the preparation of the Coastal Resources Management Plan (CAMP), training on Geographic Information System (GIS) and an Environmental Impact Assessment (EIA) on the tourist complex at Amrit. It is envisaged that by the end of 1991 both the training on GIS and the basic document for the EIA will be completed.

A preliminary survey of microbiological quality of bathing waters along the Syrian coast was carried out by MED POL as a component of this CAMP.

### The Bay of Izmir (Turkey)

Two expert meetings were organized, a synthesis of available data completed, contracts for additional data collection signed. A PAP mission was organized to define the necessary conditions, and the programmes of activities related to the Integrated Planning Study and training on GIS were developed.

Full implementation of PAP related activities is envisaged to start in the second quarter of 1991. The completion of these activities however is directly dependant on a timely provision of the financial support of the World Bank and the collection of data necessary for the assessment of the assimilative capacity of the bay.

The Blue Plan for its part provides advice directly to the Turkish experts.

### The Bay of Kastela

Documents presenting the model of wind-driven exchange of sea water, the mechanism of red tide phenomena, the pilot application of GIS and the definition of criteria for waste water disposal in the Bay were completed and submitted to the local authorities concerned, as well as to the management of the national project. The terms of reference for all PAP-related activities were prepared and the commitments of local teams regulated by contracts.

The first meeting of the Task Team on Implications of Climatic Changes on Kastela Bay was held in Split (25-26 April 1991) as part of MED POL activities at which a detailed programme and calendar of implementation were adopted. The preparations for the survey of land-based sources of pollution in Kastela Bay with the support of MED POL are in progress.

### The Island of Rhodes

In the beginning of 1991, meetings were held with the Greek authorities to review progress in the implementation of the workplan contained in the Agreement (Athens, Rhodes, February 1991). During a mission to Rhodes, organized in the same period, conditions were defined for starting some activities in May 1991.

The first meeting of the Task Team on the implications of climatic changes on the Island of Rhodes was organized by MED POL in Athens; the monitoring programme and the calendar of implementation were agreed upon.

A survey of land-based sources of pollution for the Island of Rhodes was organized through

MED POL and is being carried out. A study implemented through BP/RAC involves the analysis of an environmental system, a report of the resources and possibly a preliminary ecological balance sheet, the analysis of the political and administrative system of the island and the analysis of trends and development factors in the socio-economic sphere.

## MAP PUBLICATIONS

### MAP Technical Reports Series

**Transport of pollutants by sedimentation** (in English, except for a short article summary in French): These are the collected papers from the first Mediterranean Workshop on the subject held at Villefranche-sur-Mer, France, 10-12 December 1987. These are the reports of the various studies carried out in the framework of the MED POL Programme. The first part deals with the general processes of transfer in the Mediterranean: Particle transport, interaction of sedimentary pollutants with biota, use of tracers, vertical transport. The second part contains case studies carried out in the Venice Lagoon, the Adriatic Sea, the Ligurian Sea, in the water and sediments of the Axios River. Finally, the third part contains abstracts and extended abstracts of papers as well as the verbatim report of the Workshop discussions. The Workshop was jointly organized by the UNEP Co-ordinating Unit, ILRM of Monaco and IOC. It is an essential contribution to a better understanding of the fate and behaviour of pollutants in the marine environment. The reader will find in it basic information for future MED POL research projects in this area (MAP Technical Reports Series, No. 45, Transport of pollutants by sedimentation, 302 pp.).

**Epidemiological studies related to environmental quality criteria for bathing waters, shellfish-growing waters and edible marine organisms: final report on project on relationship between microbial quality of coastal seawater and Rotavirus-induced gastroenteritis among bathers (1986-88)** (in English, introduction also in French): This report presents the results of a prospective epidemiological study of 4 Mediterranean beaches in Israel in 1986 to study the swimming-associated morbidity linked to water quality measured by the concentrations of bacterial indicators. A total of 253 families of 784 persons were interviewed. One of the conclusions of the study is that the swimmers themselves can be an important source of morbidity inducing agents (gastroenteritis). Risks are higher for those swimming in congested areas and in areas with restricted water exchange (MAP Technical Reports Series, No. 46, 64 pp.).

**Jellyfish blooms in the Mediterranean: Proceedings of the II Workshop on Jellyfish in the Mediterranean Sea (Trieste, 2-5 September 1987)** (English, 4 papers in French). This workshop was organized by the University of Trieste in collaboration with the MAP Co-ordinating Unit. This volume contains the Proceedings of the Workshop, all papers presented there including some by non-Mediterranean

scientists and a synthesis of the main conclusions of the MED POL Programme on Jellyfish. The papers are divided into two groups; those on jellyfish biology and impact on pelagic ecosystems and those on biochemical, toxicological and public health aspects. The MED POL programme produced a wealth of new data on the physiology, reproduction, development, behavioural reactions, histology, biochemistry and the distribution in space and time of **Pelagia Noctiluca** which is the species, whose coastal swarmings produced the greatest concern. From these studies it becomes clear that even though anthropogenic activities, such as excessive fishing and land-based pollution can contribute to maintaining jellyfish (**Pelagia**) blooms, their occurrence is a natural phenomenon; furthermore, that to date no direct relationship between coastal aggregations and pollution can be proved. There are indications that this phenomenon does not represent a serious health hazard, since only few cases of stinging led to severe medical complications (MAP Technical Reports Series, No. 47, 320 pp.). (To obtain copies of any of the MAP Technical Reports, write to: United Nations Environment Programme, Co-ordinating Unit for the Mediterranean Action Plan, P.O. Box 18019, 48 Vassileos Konstantinou, GR 116 35 Athens, Greece).

### BLUE PLAN: THE FIRST THREE SPECIALIZED BROCHURES HAVE COME OUT IN A COMMERCIAL EDITION IN FRANCE.

Blue Plan involved three aspects: the publication in September 1988 of both the main Report and the Executive Summary and the publication of a series of specialized brochures, which based in the global analysis of the main report would focus on the subjects that the latter would only touch upon. The first three brochures came out recently in France (Publisher: Economica, which also published the main Report in 1989; the English edition was issued later by the Oxford University Press). Each brochure has an introduction by Michel Batisse, RAC/BP President, on the history and objectives of MAP, the Blue Plan and its results. It can be read independently of the Main Report on the scenarios, but it is based on the latter in its prospective part. Thus the brochures consist of specialized reading on the specific subjects. Each brochure bears the name of one author, but it is the fruit of collective work which aims at an objective analysis of the topic discussed. Thus when the series is completed, the prospective component of the Blue Plan will have been fleshed out.

**Brochure 1:** The Mediterranean forests, by Henri Marchand et al. There is first a brief description of the historical development of the forest, certain clarifications on its geographical delimitation, its structure and ecological characteristics; then there is the presentation of the current situation and the problems. Finally, the various scenarios of the Blue Plan from the point of view of the possible futures for the Mediterranean forests are discussed.

**Brochure 2:** Fishing and aquaculture in the Mediterranean, by Daniel Charbonnier et al. There is first a review of the hydrological and ecological characteristics of the Mediterranean and the marine ecosystem, then a review of the

situation and the problems of fishing in the region, then a discussion of the perspectives offered by aquaculture and finally a prospective view in connection with the Blue Plan scenarios.

**Brochure 3:** Preservation of Mediterranean ecosystems, by François Ramade et al. The authors review the preservation problems in the Mediterranean, with special emphasis on threatened species and the current situation of protected areas. They then deal with the factors of ecosystem degradation and list the measures to be taken to improve preservation in the region. Finally, they give the reader a prospective view of preservation in the area on the basis of Blue Plan scenarios. (Editions Economica, 49 rue Hericart, 75015 Paris, France. The cost is 10 FF per volume).

## BOOKS - MAGAZINES



**Resources:** Magazine in Arabic and French published jointly by UNESCO, the UN Fund for population activities and the Directorate General for Urbanism, Land Use and the Environment of the Ministry of the Interior of Morocco. It comes out every two months - the first issue came out in November 1990 - and gives a very complete review of environmental problems mainly in Morocco, but in other parts of the world also. There is a section called "Reperes" (Flash) on new books, magazines and future meetings and conferences. In the centre of the magazine there is a large photograph which links the French and Arabic components of the magazine. The presentation is attractive, the texts well written and the information provided fills many gaps in the knowledge of environmental problems in that part of the Mediterranean.

5 - 11 June 1991

# THE MEDITERRANEAN ENVIRONMENT WEEK IS DEVOTED TO CLIMATE CHANGE

**5 - 11 June 1991  
The World Environment Day, 5 June, and the Mediterranean Environment Week which follows it (5-11 June) will both have as their topic climatic change and the need for international solidarity. The relevant activities that will be carried out in the Mediterranean can be the basis for serious reflection and promote our knowledge by making us take stock of what we know and what we are not certain of as yet.**

## What's new since Split?

In October 1988, 25 scientists from 15 countries had looked at climatic change within the framework of a UNEP Study Programme (see MEDWAVES, 14, 3rd quarter 1988). They issued a warning by adopting in the main the assumptions of the Villach conference convened 3 years earlier. What is new since Split? We can answer at two levels, international and regional. At the world level, what is most striking is the extraordinary scientific and political activity to which the topic of climatic change gave rise. This exchange of ideas, which brought to the fore certain differences of opinion among various countries, made possible the clarification of certain "facts" concerning CO<sub>2</sub> emissions and other greenhouse gases; furthermore it promotes thinking on policies of prevention of climate change linked to the greenhouse effect and of adjustment to such change. It has become clear that these policies will have a much higher cost than the classic antipollution measures and that they will question the big decisions that societies make, especially in the field of energy and transport. The International Panel for Climatic Changes (IPCC), established by UNEP and WMO in 1988, presented the results of its work during the 2nd World Climate Conference held in Geneva between October 29 and 7 November 1990 which brought together 747 scientists from 116 countries. They studied the conclusions of other programmes as well, like the World Climate Programme. The Conference concluded that "notwithstanding scientific and economic uncertainties nations should now take steps towards reducing sources and increasing sinks of greenhouse gases through national and regional actions, and negotiation of a global conven-



tion on climate change and related legal instruments. The long-term goal should be to halt the build-up of greenhouse gases at a level that minimizes risks to society and natural ecosystems. The remaining uncertainties must not be the basis for deferring societal responses to these risks. Many of the actions that would reduce risk are also desirable on other grounds".

A Ministerial Declaration adopted by 730 representatives of 137 countries (among

them 66 ministers) gave political approval to the recommendations and conclusions of scientists. In the meantime, the Intergovernmental Negotiating Committee for Framework Convention on Climate Change was set up and held its first meeting in Washington in February 1991. This legal instrument should be completed by the opening in 1992, at Rio de Janeiro, of the UN Conference on Environment and Development, so that on this occasion it can be available for signing. On the Mediterranean level, the activities carried out within the framework of MAP and OCA/PAC (Nairobi) continued. They included the preparation of site-specific case studies, or studies on specific sites chosen because of their vulnerability to sea-level rise, such as the deltas of large rivers in the region. Such studies are divided into two categories: those completed and submitted, or first-generation studies (Deltas of rivers Ebro, Rhone, Nile and Po, Thermaikos Gulf, Greece, Ichkeul and Bizerte lakes, Tunisia) and those that are still in progress, or second generation studies (island of Rhodes, Kastela Bay, Izmir Bay, Syrian coast, Malta). The studies of the 2nd generation are particularly interesting since they must be integrated in the corresponding Coastal Areas Management Programmes. A regional scenario on climate changes in the Mediterranean Basin resulting from the world greenhouse effect is being prepared by the University of East Anglia with the financial support of OCA/PAC. The results, which will be locally specific, will focus on forecasts of changes in temperature and precipitation and will contribute greatly to future studies. Finally, in the meeting held in Singapore between 12 and 16 November 1990 the conclusions of the various regional Task Teams working on implications of climate change in the framework of UNEP were compared.

## IMPLICATIONS OF CLIMATIC CHANGES IN THE MEDITERRANEAN

At Singapore, the Co-ordinator of the Mediterranean Task Team, Mr. L. Jeftic from MAP/UNEP presented the main findings on the region. Obviously, some of them are the same as those pertaining to other regions and thus we will give below a summary of the findings which are more specifically Mediterranean:

With an assured temperature increase of 1.5° C by the year 2025, potential evapotranspiration will increase throughout the Mediterranean, coupled with a possible decrease in precipitation in the South and an increase in the North. Hot dry summers and exceptional events of drought or rainfall and floods, marine storms, tidal surges and a water stagnation and eutrophication, could increase in frequency. A 1.5° C increase in temperature would lead to an increase in land degradation, deterioration of water resources, decline in agricultural production.

The future impacts on Mediterranean society of non-climatic factors (e.g. population increases, present development plans) may far exceed the direct impacts of climate change.

A global rise in mean sea level of about 20 cm by 2025 would not in itself have a significant impact in the Mediterranean, except locally, where the rise could be up to five times this amount because of natural land subsidence, enhanced by excessive groundwater withdrawal.

Most of the deltaic lowlands are experiencing serious environmental problems which will be increased by adverse socio-economic conditions, the effects of which will be superimposed upon those of climatic change.

According to the Report of the Mediterranean Task Team, the immediate task would be to identify all "high risk" areas. Engineering solutions, such as dikes and walls, are not likely to represent a long term solution to the problem of rising sea level, except in very special cases. It is most likely that adaptation, evolution and land use change will represent the most appropriate responses to sea level rise.

### TO ENLIST THE POLITICIANS

At Singapore, all the Regional Task Teams reported that generally they had not found on the part of the relevant national authorities an interest in the matter to match the challenge of the implications of climatic change. This was the case for the Mediterranean, although, three of the completed site-specific case studies (deltas of Nile, Po and Ebro were presented to national seminars (in Egypt, Italy and Spain) in 1988 and 1989. However, very little impact on national policies was seen. In this connection, the Singapore meeting participants stated that national and local authorities had not been suffi-

ciently associated with the preparation of assessment and the selection of sites for case studies. The participants discussed and approved the principles presented by the Mediterranean Task Team Co-ordinator. They include specifically the idea that studies must be prepared at the request of potential "users", that they must be prepared not "for them" but "with them". At the MAP level, there is already a framework for consultation with those responsible for the coastal area management programmes of Izmir, Kastela, Rhodes and the Syrian coast. For these four areas working groups on the implication of climate change have already been appointed. Their conclusions will be integrated in the respective projects and will be an essential element of planning and integrated management of coastal zones.

### SOLIDARITY NEEDED

The topic of international solidarity chosen for the World Environment Day and the Mediterranean Environment Week is crucial. It would be futile to try and meet the challenge of climate change through partial and regional responses not integrated into a whole. We are aware of the responsibility of the industrialized countries which consume three fourths of the global reserves in fossil fuel. Thus it is up to these countries to take draconian measures needed to mitigate the greenhouse effect. But in the future, the responsibility of the developing countries will continue to increase as far as the emission of greenhouse gases is concerned, since they will become more industrialized, will promote agricultural use of their land, will cut down forests and all of this associated with the demographic boom that is a characteristic of developing countries. To reconcile development and the control of climatic change at a global scale will be an enormous task which will imply technology transfers and economic assistance flowing from the countries in which the phenomenon originated to those that support and amplify it. Many more years of world-scale observation and study are needed to reduce our current uncertainty about the projected temperature increase (level, rate, distribution, environmental impact, retroactions, i.e. greenhouse effect reactions that in turn enhance the greenhouse effect, and the impact of CO<sub>2</sub> on plant cover and oceans). Satellites to observe clouds and oceans, spatial stations to measure the gases in the atmosphere and state-of-the-art computers to test the most reliable forecast models will be necessary. It is all an enormous effort to which all nations should contribute and which will need, according to the Director of the Geosphere-Biosphere Programme of the International Council of Scientific Unions, "greater investment and involvement than the Space Programme".



## TWO MEDITERRANEAN LAUREATES OF THE 1991 INTERNATIONAL ENVIRONMENT AWARD

On the eve of the World Environment Day (5 June), UNEP made public the names of the winners of the 1991 "Global 500" Awards, the international environment competition launched in 1987 to honour 500 persons or associations who have actively contributed to the protection of the environment. This year there are two winners from Mediterranean countries whom MEDWAVES congratulates most warmly. They are:

**JOAQUIN ARAUJO**, Spain, a writer and director of documentary films. His lectures on ecology and his newspaper and magazine articles aim at raising public awareness and protecting the environment. He is the author of 15 books and has directed several documentary series for television. Moreover he has founded several Spanish environmental societies and served as president of the first State Centre for Environmental Education in Spain.

**AHMAD ABU MUSA**, Syria, is the president of the Ba'ath Pioneer Organization. This organization aims to promote environmental consciousness among young people through seminars, symposia and tree planting projects in camps and schools, "Green Carpet" competitions, exhibitions for plants and flowers, and theatre are also used to convey the message of sustainable development.