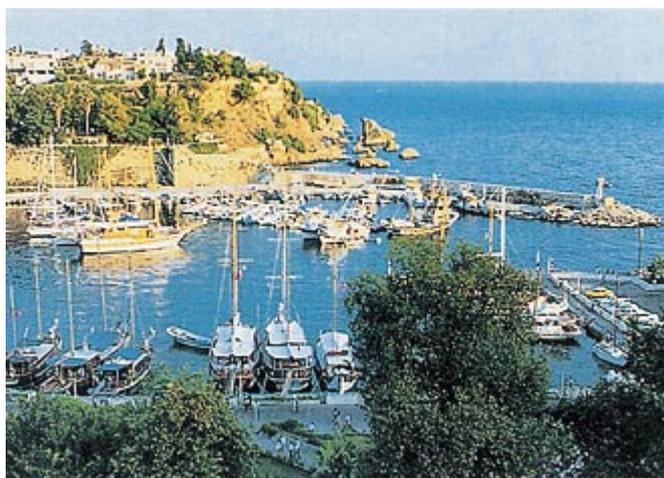




4th MEDCOAST / 4th EMECS Joint Conference Call for Papers



Antalya City

Fourth International Conference on the Mediterranean Coastal Environment (MEDCOAST 99) / the Fourth International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS 99) will be held in November 1999.

Date Tuesday, November 2 - Saturday, November 6, 1999
Place Hotel Dedeman, Antalya, Turkey
Theme Land-Ocean Interactions: Managing Coastal Ecosystems

As with the previous conference (the Joint 7th Stockholm Water Symposium / 3rd EMECS Conference), a Best Poster Award will be given to the most outstanding poster presentation.

Call for Papers

The first announcement for the joint conference was issued in June, and abstracts of papers to be presented at the conference are now being accepted. Please send abstracts to the MEDCOAST secretariat by

November 30, 1998.

Abstracts will be selected at the Executive Program Committee (EPC) meeting to be held in January, 1999 in Kobe. Applicants will be notified of the results of selection at the end of January.

MEDCOAST Secretariat
Middle East Technical University
06531 Ankara, Turkey
Fax: 90-312-210-1412
E-mail: medcoast@rorqual.cc.metu.edu.tr

150 oral presentations and 100 poster presentations will be selected. The workshops will be organized around the topics of the papers that have been chosen.

CONFERENCE TOPICS & SESSION THEMES

The sessions are to be organized according to accepted papers, and will be announced in the second announcement.

PHYSICAL, ECOLOGICAL, AND CONSERVATION ISSUES

Physical features, coastal ecosystems, coastal landscapes;
Conservation issues, biodiversity, endangered species, habitat protection, specially protected areas, coastal and marine parks.

INTEGRATED COASTAL AND OCEAN RESOURCE MANAGEMENT AND DEVELOPMENT

Land-Ocean Interactions;
Sustainable development of coastal and sea resources;
Coastal ecosystem management;
Integrated coastal management - theoretical framework and case report

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- Management of wetlands, coastal dunes, estuaries, deltas and lagoons
- Watershed management;
- Management of ancient sites, monuments and ship wrecks;
- Management of living resources: fisheries and mammals, problem of exotic species, mariculture;
- Coastal tourism planning and management: facility siting, marinas, ecotourism;
- Transportation issues: oil transport and pollution;
- Siting of major industrial facilities;
- Water quality issues: land based sources of pollution, toxic organisms and harmful algal blooms, pollution control, sea outfalls, hazardous and solid wastes management, transboundary pollution issues;
- Rehabilitation of damaged ecosystems;
- Coastal and sea policy, integration of science and policy;
- Institutional arrangements for implementing coastal management;
- Legal, economic and social issues;
- International aspects;
- Environmental and ecological economics
- Education and public involvement, NGO role, Media role;
- Environmental impact assessment for coastal projects.

COASTAL ENGINEERING, MODELLING AND DATA MANAGEMENT

- Coastal, environmental and ecosystem modelling;
- Coastal processes;
- Shoreline management and erosion control;
- Sea level rise and consequences;
- Ecocoastal engineering; environmentally sensitive development;
- Use of remote sensing technology and geographic information systems in coastal management, global monitoring of coastal environment.

Schedule

Below is a tentative schedule of events leading up to the Joint EMECS / MEDCOAST Conference.

Deadline for submission of abstracts	November 30, 1998
Selection of abstracts	Early January, 1999
Notification of acceptance	January 31, 1999
Second announcement issued	February, 1999
Deadline for submission of camera-ready final papers	June 30, 1999
Deadlina for early registration	September 1, 1999
Third announcement issued	September, 1999
Conference	November 2-6, 1999

About Antalya

Antalya is a major resort on the Mediterranean, whose beauty and historical treasures have captivated innumerable travelers. The city also has many hotels with excellent conference facilities. Regular flights link Antalya with Istanbul, and also several cities in Europe offer direct flights to Antalya. The climate in Antalya during the first week of November is very pleasant. Even on sunny days, it is not too hot; the maximum temperature is about 25 , and the temperature of the ocean water is also pleasant at around 22 -23 . As the tourist season ends on October 31, the city is unlikely to be crowded during the conference.

The MEDCOAST Conference

MEDCOAST is an international conference that has been held every two years since 1993 to promote environmental management in the Mediterranean, the Black Sea and other enclosed coastal seas. MEDCOAST conferences have been attended by scholars and researchers from the Near and Middle East and Europe as well as the U. S., Africa and other parts of the world.

The concept of a conference that would focus on the Mediterranean was first developed in July 1990 during the Littoral 1990 Conference organized by the EUROCOAST Association.

Professor Erdal Özhan of the Middle East Technical University (who currently serves as MEDCOAST chairman) played a leading role in the holding of the first MEDCOAST Conference in 1993 in Antalya, Turkey. 100 papers were presented at this conference, which was attended by delegates from 26 countries. The conference was cosponsored by numerous international organizations working to resolve coastal and ocean issues.

The second MEDCOAST Conference was held in Tarragona, Spain with an even greater number of sponsors and delegates, and there was lively debate on the 130 papers presented. On the final day of the conference, the participants approved the Tarragona Declaration that recognized the importance of a healthy Mediterranean Sea and Black Sea and outlined specific proposals for promoting coastal management.

The third MEDCOAST conference was attended by 153 delegates representing 31 countries and was held in the city of Qawra on the island of Malta with support of Dr. George Vella, the Maltese Environment Minister, and sponsorship of numerous international and Maltese institutions.

Past MEDCOAST Conferences

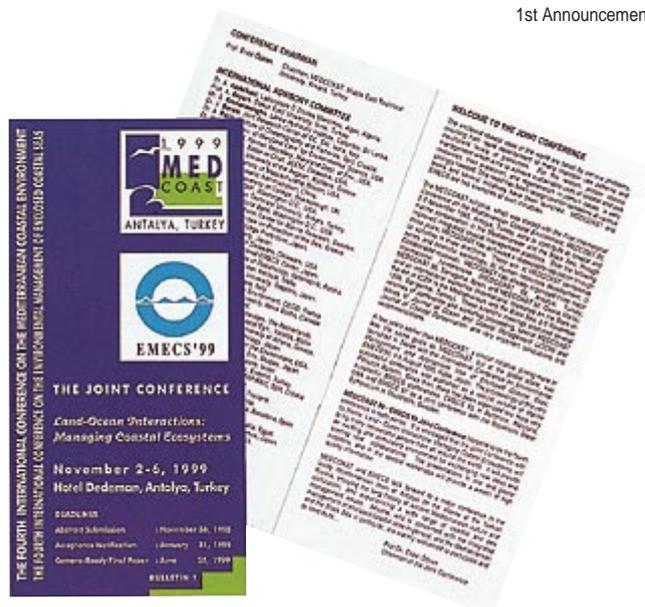
1st	1993	Antalya, Turkey
2nd	1995	Tarragona, Spain
3rd	1997	Qawra, Malta

Conference Themes

The first three MEDCOAST conferences all had the following themes in common:

- (i) Physical, Ecological, and Conservation Issues
- (ii) Integrated Coastal and Ocean Resource Management and Development
- (iii) Coastal Engineering, Modeling and Data Management

1st Announcement





The International Conference on the Mediterranean Coastal Environment-MEDCOAST

Dr. Erdal Özhan, Chairman, MEDCOAST/Professor, Middle East Technical University



Prof. Özhan (Center)



The Third International Conference on the Mediterranean Coastal Environment MEDCOAST 97: 11-14 November 1997, Qawra, Malta

The MEDCOAST Conference series focuses on the conservation and sustainable development of the coastal and marine areas of the Mediterranean and Black Seas.

MEDCOAST 97, was jointly organized by the MEDCOAST Secretariat (Middle East Technical University, Ankara, Turkey) and the Local Organizing Committee (led by Euro-Mediterranean Center on Coastal Dynamics, ICoD, Foundation for International Studies, University of Malta, Valletta, Malta). The conference was sponsored and/or supported by 27 organizations and institutions, including UNEP-Mediterranean Action Plan, UNESCO Intergovernmental Oceanographic Commission, the European Union, The GEF Black Sea Environmental Programme, International EMECS Center (Kobe, Japan), Pew Fellows Program in Conservation and Environment and environmental and/or coastal NGO's, including WWF, IUCN, EUCC, EUROCOAST. One hundred and fifty three participants from 31 countries, representing various disciplines and affiliations, attended the Conference.

The conference addressed three major subject areas, namely: "Physical, ecological and conservation issues", "Integrated coastal and sea resource management and development", and "Coastal engineering, modelling and data management". There were three parallel series of presentations, with 27 sessions in all, namely: Marine Biology; Habitats, Endangered Species, Landscapes and Conservation; Fisheries; Biological and Ecological Issues; Environmental Impacts; Liquid Waste Management; Marine Pollution; Coastal Management Principles, Techniques and Instruments; Coastal

Issues; ICZM Experiences (Mediterranean); ICZM Experiences (Black and Baltic Sea); Beaches and Dunes; Legislation and Public Participation; Sustainable Development and Regional Management; The Use of Remote Sensing and GIS; Physical Issues; Waves; Coastal Structures and EIA; Beaches; Mathematical Modelling; Coastal Erosion and Control; Sediment Transport; Water Level and Long Waves; Various Pollution Issues. More than 300 abstract submissions were reviewed by an international Abstract Selection Committee, and 125 of them were selected for oral or poster presentations.

A half-day and a full-day workshops were held in collaboration with the Euro-Mediterranean Center on Coastal Dynamics, ICoD, and MEDCOAST. The ICoD Workshop was entitled "Ocean and Coastal Risk Assessment". The title of the MEDCOAST workshop was "Education Training in ICM in the Mediterranean and the Black Sea". Additionally, a MEDCOAST session and a closing session were organized.

MEDCOAST 97 was a lively and stimulating meeting. One of the major goals of the MEDCOAST conference, "to bring together a wide variety of experts, scientists, managers, planners, policy makers, resource developers, users and conservationists from both Mediterranean and Black Sea countries, and elsewhere, who have been directly involved in coastal and sea management issues in the Mediterranean and the Black Sea, or have acquired experience and knowledge elsewhere on matters which are relevant to the Mediterranean and the Black Sea, was very satisfactorily fulfilled.

One hundred and seventeen papers which were received by the MEDCOAST Secretariat before the deadline were included in the two volume conference proceedings (1385 pages+indices), which were

distributed participants at registration.

The regional representation at the Conference is indicated below:

Mediterranean (including Turkey) 106 participants 69.3 %
 Black Sea (excluding Turkey) 13 participants 8.5 %
 (including Turkey) 35 participants 23.0 %
 Europe (non-Mediterranean) 23 participants 15.0 %
 Others 11 participants 7.2 %

The availability of experts in the Mediterranean and Black Sea countries are very important for regional management of these enclosed basins. The above figures clearly illustrate the significant role that a regional conference with a well-defined goal and a correct vision can play. In this sense, the three MEDCOAST conferences have constituted a successful example for the other geographic regions covered in the Regional Seas Program of UNEP.

The Proceedings of the previous MEDCOAST scientific meetings are available for sale from the MEDCOAST Secretariat. For further information on MEDCOAST conferences and publications, or concerning other MEDCOAST events, please contact the MEDCOAST Secretariat, at the address below.

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The Second International Conference on the Mediterranean Coastal Environment, MEDCOAST 95 24-27 October 1995, Tarragona, Spain

The Second International Conference on the Mediterranean Coastal Environment, MEDCOAST 95, which focused on the conservation and sustainable development of the coastal and marine areas of the Mediterranean and the Black Sea, was organized in collaboration by MEDCOAST Secretariat (Middle East Technical University, Ankara, Turkey) and the Local Organizing Committee, led by Laboratori d'Enginyeria Marítima (Universitat Politècnica de Catalunya, Barcelona, Spain). The conference was sponsored and/or supported by 27 organizations and institutions, including UNEP Mediterranean Action Plan, UNESCO Intergovernmental Oceanographic Commission, the European Union, The GEF Black Sea Environmental Programme, International EMECS Center (Kobe, Japan), International Commission for the Scientific Exploration of the Mediterranean (CIESM), and environmental and/or coastal NGO's including WWF, IUCN, EUCC, EUROCOAST, ICO.

The conference addressed three major subject areas, namely: "Physical, ecological and conservation issues", "Integrated coastal and sea resource management and development", and "Coastal engineering, modelling and data management". More than 300 abstract submissions were reviewed by an international Abstract Selection Committee, and 235 of them were selected for oral or poster presentations. The paper presentations were carried out in 4 parallel sessions, which had the following themes: Keynote Session; Coastal and Marine Ecosystems; Ecological Issues; Ecosystem Management; Integrated Ecosystem Management and Conservation; Coastal and Marine Conservation; Biochemical Issues; Protected Areas; Historical and Archaeological Issues; Tourism; Beach and Dune Management; Coastal Planning; National and Regional CZM Practices; Socio-economical Aspects; Social Issues; Education; Legislation and Legal

Issues; International Cooperation; Deltas; Lagoons; Coastal Processes; Human Impact; Coastal Erosion and Control; Sediment Transport; Beaches; Sea Level Rise & Consequences; EIA; Remote Sensing; Data Management and GIS; Water Quality Issues; Water Pollution; Pollution Assessment; Coastal and Marine Pollution; Coastal Water. Quality Management; Hydrodynamic Modelling; Transport Processes and Modelling; Physical Oceanography and Climatology; Coastal Engineering; Marinas; Harbours and Navigation; Wind Waves; Wind Wave Modelling and Climatology.

As a part of the MEDCOAST 95 conference program, two half day long workshops were held in collaboration with the European Union for Coastal Conservation (EUCC) and the International Center for Coastal and Ocean Policy Studies (ICCOPS). The theme of the EUCC Workshop was: Marine pollution and tourism: how informed and involved are local governments? The theme of the ICCOPS/MEDCOAST joint workshop was: The futures of the Mediterranean co-operation. Additionally, a MEDCOAST Session and a Closing Session were organized. Through significant preparatory work by Prof. E. Mann-Borgese (Dalhousie University, Halifax, Canada), the participants of MEDCOAST 95 produced a very valuable document during the Closing Session. MEDCOAST Tarragona Declaration summarized the present system of international co-operation for coastal and sea management in the Mediterranean and the Black Sea, and included 14 significant courses of action to be taken at regional, national and local levels in order to improve national and regional practices addressing sustainable development of the coastal and marine areas.

MEDCOAST 95 was a lively and stimulating meeting. One hundred seventy participants from 26 countries, representing various disciplines and affiliations, attended the Conference. One of the major functions of the MEDCOAST conferences, which is to bring together a wide variety of experts scientists, managers, planners, policy makers, resource developers, users and conservationists from both Mediterranean and Black Sea countries, and elsewhere, who have been directly involved in coastal and sea management issues in the Mediterranean and the Black Sea, or have acquired experience and knowledge elsewhere on matters which are relevant to the Mediterranean and the Black Sea, was very satisfactorily fulfilled.



International MEDCOAST Workshop on the State-of-the-Art of ICZM in the Mediterranean & Black Sea:

Immediate Needs for Research, Education / Training, & Implementation (MED & Black Sea ICZM 96)
Sarigerme, Turkey, 2-5 November 1996. Dr. Erdal Özhan, Chairman, MEDCOAST



This specialty MEDCOAST Workshop, convened in Sarigerme, Turkey, on 2-5 November 1996, was attended by 62 participants from 22 countries. It gathered experts from most of the Mediterranean and the Black Sea countries, the leading ICM authorities, and representatives of international organizations and programs. The work was carried out in two parallel paper presentation sessions, followed by three parallel group study sessions. The Workshop was sponsored by two prominent international programs for the Mediterranean and Black Sea, namely by the Mediterranean Action Plan Priority Action Programs Regional Activity Center of UNEP, and the GEF Black Sea Environmental Programme, in addition to Euro-Mediterranean Center on Insular Coastal Dynamics (ICOD, Malta), the Turkish Ministries and several international and Turkish institutions.

The Workshop produced two-volumes of proceedings, and a final document adopted by all participants in the ~ Session ' of the Workshop, which included thirteen conclusions and fourteen recommendations. The two-volume proceedings totalling 531 pages + indices, contained the forty-eight papers presented by the participants during the first half of the meeting. Subjects covered included reviews of coastal management practices and institutions in various Mediterranean and Black Sea countries, international integrated coastal management initiatives and the programs in the region, and several topics which are important for coastal management such as biological/ecological issues, pollution, remote sensing & GIS, tourism, beach management, modeling, sea level rise, coastal processes and coastal engineering.

In the second half of the Workshop, the participants were divided into three groups, for discussing independently the state-of-the-art of Integrated Coastal Zone Management (ICZM) in the Mediterranean and the Black Sea and the future needs from the following aspects:

Group A: Research, data collection and management related to ICZM.

Group B: Education and training related to ICZM, & International collaboration in ICZM (networks, programs, donors)

Group C: Implementation of ICZM (policies, legislation, pilot projects, programs)

The major task of the groups was set as, after a through discussion of their subject matter, to identify up to ten facts and findings describing the

difficulties & limitations existing today, up to ten recommendations addressing these, up to five opportunities for the Mediterranean and Black Sea interaction, up to five roles and contributions of networks in the future, and up to three roles and contributions of international donor institutions.

Each group prepared a report on these issues. The reports of the three groups were combined by a selected group of participants, including the chairpersons and rapporteur for presentation to the general assembly of the participants and for further discussion in the closing session. This document paved the way towards the 'Conclusions & Recommendations' of the Workshop, which was approved by the participants in the Closing Session.

The 'Recommendations' part of this document, which include fourteen courses of action for improving national and international coastal management practices in the Mediterranean and the Black Sea, is given below.

RECOMMENDATIONS

1. In several countries of the region, institutional arrangements need to be strengthened, particularly in the form of inter-agency planning and decision making, and coordinating agencies, at both national and local levels, in order to move away from classical sectoral approach towards integration of several, often conflicting interests.

The role of all actors, including NGOs, scientific community, private sector, and general public, in the process of ICZM should be clearly identified and ensured in a bottom-up approach. National capabilities for using important ICZM tools and instruments including strategic planning, GIS, land and sea use planning, models and decision support systems, EIA, cost-benefit analysis, risk analysis, and economic instruments should be enhanced. Measures for adequate enforcement of legislation should be undertaken by all countries of the region.

2. ICZM should be integrated into national development strategies by catalyzing domestic and external sources of funding, and by providing arrangements for preparation and execution of ICZM plans, programs and pilot projects.

3. The socio-economic benefits of ICZM should be publicized and communicated to the policy makers and professionals. Similarly, rigorous

cost-benefit analysis and other environmental economic tools should be applied to policies and management regimes affecting coastal and marine areas to identify true social and environmental costs associated with decisions. A tourist tax should be levied throughout the region, and the revenues collected should be used for environmental rehabilitation and infrastructure.

4. For demonstrating the benefits of ICZM and for enhancing national capabilities, local scale pilot projects, with active participation of local authorities, NGOs, scientific community, private sector, and with inputs from the general public, would be highly beneficial.

Arrangements should be made for implementation and follow up of pilot projects as essential tools for further strengthening of ICZM in both regions. It would be beneficial to establish procedures for monitoring, evaluation and reporting, following the implementation of ICZM programs and pilot projects.

5. The Mediterranean and Black Sea Action Plan should design and implement mechanisms for encouraging Parties to the relevant Conventions to develop effective de-centralized cooperation at bilateral and/or regional scale, for generating information and designing tools and methodologies for ICZM and for developing the required expertise and human resources in the countries. A standing unit, including representation of NGOs and the scientific community, should be established under the Action Plans for the purposes of monitoring the national progresses of the riparian countries in conforming with the agreed regional goals and actions, and reporting the state-of-the-progress reports at regular intervals. The Mediterranean Commission for Sustainable Development may carry out this function for the Mediterranean.

6. A fact finding study aiming at identification of common regional or sub-regional coastal and marine issues and problems on the one hand, and national resources (infrastructural and human) and needs for addressing these issues on the other, would be highly valuable to design the future programs involving collaborated research, data collection and monitoring. A logical procedure for such a study would be;

- (a) short state-of-the-art reports for each country by national experts,
- (b) a questionnaire sent to all institutions mentioned in national reports,
- (c) a team of experts visiting each of the Mediterranean and Black Sea countries for on-site observation of capabilities and issues, and
- (d) preparation of the regional fact finding report.

MEDCOAST network could be used for carrying out this study.

7. Creation of decentralized networks of academic institutions for collaborated research on important coastal and marine issues, through a holistic approach at regional or sub-regional scale, should be encouraged and supported by inter-national organizations and donors active in the region. Significant benefits would be derived from regional or sub-regional research projects on several important issues including; wind and wave climate; coastal erosion; water pollution modelling; coastal and marine ecosystems; ecosystem modelling; management issues of special coastal areas such as lagoons, wetlands, dunes, etc.; management of migratory endangered species; fisheries research; tourism; coastal resource use patterns, etc.

8. Consolidation of the available information on coastal and marine resources, uses, and issues, together with environmental quality parameters, for generating a GIS data base for the entire Mediterranean and Black Sea, would greatly help the existing and future management

efforts at national and regional levels.

9. Common international formats and standards for monitoring and data collection should be followed by all institutions of the riparian countries in order to facilitate the ready ensemble of the data and accuracy of the information. Both of these features are essential for building a reliable data base, national or regional. A regional coastal and marine center should be established, which could promote the common formats and standards, and could function as a server to guide users to the source where the required data and/or information is available.

10. Creation of updated directories of individual experts and institutions (research, training education, implementation), working on issues relevant to coastal and marine management in the Mediterranean and Black Sea countries, would provide a valuable source of information, which would contribute to enhancement of collaboration in the region. These directories could be put into internet, under MEDCOAST home page, and can be updated regularly.

11. An internationally accredited university degree in ICZM at the masters level, which would be available for students from the region, should be developed with external resources currently directed at non-degree level training (e.g. certificate or diploma). As an interim measure to fill the need for formal training of ICZM professionals and to foster their continuing development, twinning arrangements between universities, within and outside the region, with expertise in ICZM, should be encouraged. This would avail the Mediterranean and Black Sea institutions of expertise not readily available in either region. An assessment quantifying the ICZM training needs in the region, and the demand for ICZM professionals, including current and projected employment opportunities, should be undertaken.

12. Centralized and decentralized networks should be promoted and supported for enhancing sharing of experience and information at international, inter-regional (e.g. Mediterranean and Black Sea), and regional levels. Networks in both regions should be mutually inclusive, accessible and reinforcing. There should be a more effective interaction and collaboration between two regions in designing and implementing ICZM.

13. In the light of the above conclusions and recommendations, MEDCOAST should:

- (a) encourage and support professionals to better contribute to the enhancement of public awareness in the field of ICZM;
- (b) develop a masters level education and training program in coastal and sea management for the Mediterranean and Black Seas, and continue with the already existing short term training programs;
- (c) facilitate joint projects by involving the institutions within its network so as to encourage collaborative research at the regional or sub-regional level;
- (d) act as a data and information storage and management center for serving data and information which, when passed to the scientific community via newsletter, internet, workshops and training programs, etc., would also diffuse out to the general public.

The participants of the MED & Black Sea ICZM Workshop 96 recommends the establishment of International MEDCOAST Center to serve as a permanent base and facility for carrying out the above functions, together with the already developed MEDCOAST activities.

14. The above thirteen recommendations can not be implemented without the assistance of the international development community, in partnership

with the national and regional institutions of the regions, including the public sector, private sector, educational and research organizations, networks, NGOs and community based organizations.

International organizations and donors active in the region are encouraged to identify and support regional environmental and scientific networks, research, training and educational activities, pilot ICZM implementation projects and ICZM programs, development and enhancement of the national ICZM capabilities, and investment activities required by ICZM, which are particularly appropriate to their mandate and program scope in the Mediterranean and Black Sea regions.

For purchasing the proceedings of the Workshop, obtaining the complete "Conclusions & Recommendations", and other MEDCOAST information, please contact the MEDCOAST secretariat.



PSE&G's ESTUARY ENHANCEMENT PROGRAM-AN INNOVATIVE SOLUTION TO AN ENVIRONMENTAL ISSUE

by Michael P Weinstein, Ph.D. and Marcia D. Walton

Industrial organizations engage in environmental activities for a variety of reasons. For some, it is a simply matter of compliance with legislative or administrative mandates. For others, increased environmental awareness instills a deeper desire for environmental stewardship where the law is not as restrictive. And for some, the combination of administrative mandates and environmental principles forge innovative solutions to complex environmental problems.

An example of the latter approach is found in the Estuary Enhancement Program (EEP) developed by Public Service Electric & Gas Company (PSE&G) one of New Jersey's largest electric and gas utilities and the fourth largest combined utility in the United States. Their comprehensive program is designed to mitigate for losses of fish and other aquatic organisms in the Delaware Estuary resulting from once-through cooling at the Salem Generating Station. The station's cooling system was and still is the center of debate and controversy among regulatory agencies, scientists, and environmentalists. In 1990, the New Jersey Department of Environmental Protection (NJDEP) issued a Draft New Jersey Discharge Pollutant Elimination System (NJPDDES) permit that would have required the immediate shut down of the station for the construction and retrofit of a closed-cycle cooling system with cooling towers as means for addressing concerns about the potential for impact on aquatic populations.

This decision launched a heated public debate. PSE&G, environmental groups and other regulatory agencies including USEPA submitted extensive comments on the Salem permit. PSE&G's comments presented additional updated and enhanced scientific information not previously available to the NJDEP. The overall conclusion of PSE&G's comments was that while closed-cycle cooling would reduce the station's dependence on river water for cooling, the station was not causing an adverse environmental impact and that the costs, estimated at \$1 to \$2 billion depending on scheduling, for implementing the draft permit would have been disproportionate to the benefits. NJDEP's consideration of the comments received on the 1990 Draft Permit led PSE&G and the NJDEP to consider alternative means for resolving the NJDEP's concerns.

In March of 1993, PSE&G submitted an addendum to the application for renewal of the NJPDDES permit that proposed several alternatives for resolving the NJDEP's concerns. The measures proposed included an extensive wetland restoration and preservation program. This effort, one of the largest of its kind ever undertaken, will return twice daily tidal inundation to diked salt hay (*Spartina patens*) farms, other impoundments, and *Phragmites australis* degraded areas. Tidal flows will be restored to three salt hay farms comprising 5,500 acres, as well as other individual or contiguous parcels ranging in size from at least 25 or more acres. As required by the permit, PSE&G will restore and/or preserve at least 14,500 acres of wetlands and uplands along the Delaware Estuary. In addition, PSE&G and the state of Delaware have reached an agreement (in March 1995) that will result in the restoration and/or preservation of an additional 6,000 acres of wetlands and uplands in Delaware. Overall, this ambitious initiative will contribute to the restoration, enhancement and/or preservation of more than 20,500 acres (12,500 acres in New Jersey and 8,000 acres in Delaware), or more than thirty-two square miles, of wetlands and uplands along the Delaware Estuary. By undertaking this effort, natural salt marsh function will be restored, and it is anticipated that the concomitant increase in secondary production will more than offset any fish losses at the plant.

After a lengthy four-year public process and thorough evaluation of the information in the administrative record and the alternatives proposed by PSE&G, the NJDEP issued a Final NJPDDES permit which became effective on September 1, 1994, that incorporated the wetland restoration program. The issuance of the permit is a landmark event.

The EEP offered the regulators with an opportunity to become involved with an environmental improvement program that truly addresses the ecosystem as a whole rather than requiring a technological fix that would only address a single component of a very complex ecosystem.

The decision represents a cooperative and cost-effective approach to resolving a complex environmental issue while still providing for the balanced uses of valuable natural resources.

Overall, the mission of the EEP is to promote aquatic productivity and to improve and protect aquatic habitat to ensure a balanced population of fish

and other aquatic species in the Delaware Estuary. While there still may be some disagreement over the potential for station impacts on local fish populations--there is little argument that protecting and preserving wetlands will provide long-term, broad-based benefits for the ecology of the Delaware Estuary for generations to come.



Proceedings
With Rivers to the Sea
7th Stockholm Water Symposium/3rd
EMECS Conference

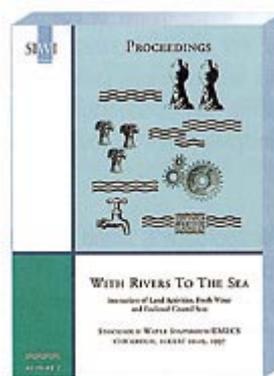
The Proceeding were published by the Stockholm Water Company in Stockholm, Sweden.

Size: A4
Volume: 464 pages

The Company have mailed them to participants in the joint conference.

If you want the Proceedings, you can purchase a copy of it by U.S.\$20 from the International EMECS Center. Please contact us by e-mail or fax. The includes airmailing expense.

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Training Course in Techniques for the Environmental Management of Enclosed Coastal Seas

The 8th Training Course in Techniques for the Environmental Management of Enclosed Coastal Seas was held at the Japan International Cooperation Agency (JICA) Hyogo International Center in Kobe from September 22 through December 3, 1997.

Participating in the training course were seven policymakers and environmental management engineers from seven countries (Egypt, Iran, Kuwait, the Philippines, Saudi Arabia, Thailand and Turkey).

The course was first held in 1990 and is now conducted by the International EMECS Center at the request of JICA. Designed for mid-level policymakers from developing countries, the course endeavors to give participants the technical training needed to conduct environmental management activities in enclosed coastal seas.

The training consisted of a ten-day orientation conducted by JICA and a short course in conversational Japanese, followed by a curriculum designed by the International EMECS Center. A short description of the training program is given below (as well as a diagram showing the course organization). The training course incorporates lectures, practice (workshop) and observation (field trips) to give students a well-rounded knowledge of the techniques of environmental management.

Curriculum

- 1 Theory of Water Quality Pollution
The characteristics of water quality pollution and outline of phenomena
- 2 Phenomena and Mechanisms of Water Quality Pollution
Features of hydraulic; the mechanism by which water pollution occurs; the pollutant load and the circulation of substances; the mechanism of eutrophication; pollution by organic substances

3 Tidal and Pollution Simulation Models

Fluid analysis; fluid models; procedures for modeling; types of models

4 Monitoring Techniques

Remote sensing techniques; monitoring schedules; monitoring equipment; biological indicators

5 Analysis / Measurement Techniques

Sampling methods; methods for preserving and transporting samples; summary of methods of analysis; practice in conducting measurements; practice in conducting analysis

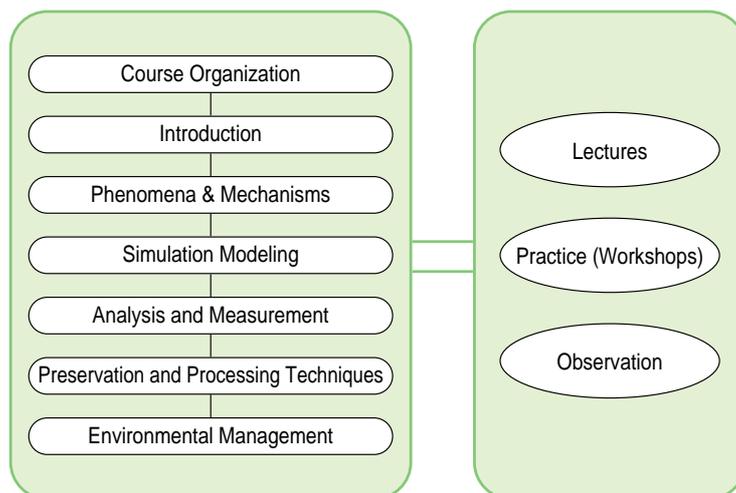
6 Waste Water Treatment Techniques

Theory of waste water treatment; field trip to observe a working waste water treatment facility

7 Theory and Practical Examples of Environmental Management

Environmental impact assessment systems; legal systems and policies for water quality management; chemical assessment; processing of wastes; oil pollution measures; organization for environmental management in the workplace; practical examples of implementation in inner bays.

Curriculum of the Training Course



MARINE ENVIRONMENTAL MONITORING IN REGIONAL SEAS-The French approach in the Mediterranean

Yves Hénocque, Ph.D. French Institute of Research and Exploitation of the Sea (IFRFMER)



1. General pattern of water circulation in the Mediterranean

The Mediterranean Sea, located between Europe, Minor Asia and Africa, has a surface of about 2.5 millions Kilo sq. about equally divided into an eastern and western basin. These two basins can be subdivided further into numerous seas or sub-basins with the Alboran Sea, the Balearic Sea, the Ligurian Sea, the Thyrrenian Sea on the Western part, and the Adriatic Sea, the Ionian Sea, the Levantine Sea, the Aegean Sea, the Marmara Sea on the Eastern part.

The average depth is 1500 meters although some parts of these sub-basins can reach depths between 3000 and 5000 meters.

The Mediterranean Sea has a negative hydrological balance, with water losses through evaporation exceeding the gains of water through run-off and precipitation. This water loss is compensated by the inflow of Atlantic surface water through the Straits of Gibraltar which gives birth to the general pattern of surface circulation in the Mediterranean.

Most of the evaporation occurs during winter and spring, due to the prevailing cold and dry continental winds and is closely associated with the process of deep water formation. The increase of salinity and the winter cooling of surface waters provide the necessary preconditioning for it to sink to intermediate depths, especially in the Levantine basin. This, in turn, triggers a midwater circulation, characteristic of the whole Mediterranean, the Levantine Intermediate Water (LIW) layer. Both intermediate and deep waters, believed to be reproduced annually (vertical circulation) are responsible for the high oxygen content of the whole water column in the Mediterranean.

As a consequence of these fluxes, the renewal time of the Mediterranean Sea water by surface Atlantic water is estimated to be about 100 years for the entire basin and half this time for the Eastern basin.

The Mediterranean Sea is thought to rank among the least productive areas (oligotrophic) of the world oceans. It is true that primary productivity in the central parts of the eastern and western Mediterranean Sea and in many of the coastal areas away from the influence of major rivers or urban agglomerations is rather low. However, fishing activities in the Mediterranean Sea have been going on for centuries, adapting themselves to the local conditions very efficiently. Among the factors which may contribute to this high efficiency figures the distribution in time and space of the fertilizing mechanisms due to strong horizontal and vertical waters recirculation.

The atmospheric forcing over the Mediterranean has a large gradient in the East-West direction and large interannual variabilities which are crucial in this non tidal sea.

2. Some biological features

The Mediterranean Sea has a high species diversity but its biological productivity, while being extremely varied, is among the lowest of the world because of low level of nutrients, as said before. The biodiversity of the western Mediterranean tends to be greater than that of the eastern.

The extensive seagrass beds of *Posidonia oceanica* are an important part of the Mediterranean marine ecosystem, often occupying a considerable part of the littoral zone. These beds have suffered greatly from physical modifications of the coast.

There are important fisheries in the Mediterranean, with fish such as mullet (*Mugilidae*) and hake (*Merluccius spp*) being in most demand. Other fish as anchovy (*Engraulis encrasicolus*), sardines (*Sardina pilchardus*) and mackerel (*Trachurus spp*) in the northwest are also intensively fished.

3. The human influence

According to UNEP projections, the population of the 18 Mediterranean countries, which numbered 360 millions inhabitants in 1985, will jump to 570 millions in 2025. In the meantime, the number of tourists will increase from 170 to 340 millions people per year, of whom 200 millions will be so-called international, coming from non-Mediterranean countries.

Such an increase in the population, the shift in distribution of population from the northwest (Spain, France, Italy) to the south and east (Turkey, Egypt, Algeria, Morocco) will lead to increased needs for water, energy and industrial development mainly concentrated in the coastal area.

As a consequence, the scarcity of water and the concentration of the population in the coastal areas lead to the spilling of considerable amounts of urban-industrial waste waters into the lower courses of rivers and mainly into the sea.

From a general point of view, the coasts of the northwestern Mediterranean are still the most affected by pollution because of the concentration of urban populations, industrial activities and discharges of major rivers including the Ebro and the Rhone.

4. State of the Mediterranean marine environment

As we understood from the previous lines, pressures on the marine environment vary widely depending on the local or regional situation.

On a global scale, it is therefore very difficult to get an accurate description of the state of the marine environment in the Mediterranean, as well as a provisional estimate of contribution of inputs to the Mediterranean or an indication of temporal trends of contaminants in marine organisms.

However, without going too much into details, a special emphasis may be put on several facts:



- the pollution from sewage, riverine and runoff inputs, which was recognized in the past as the major one, is important, particularly for the so called local «hot spots», but it is not the major one. The long distance atmospheric transport of pollutants, mainly from the Northern part (Europe), is more and more considered, being the prevailing one for a certain number of substances (lead, cadmium, copper, zinc, organohalogen compounds...);

- similarly, the inputs from the Atlantic and the Black Sea are also very important for some elements (zinc, copper, etc.), although they still have to be studied more thoroughly;

- all inputs and particularly those entering the Mediterranean associated with liquid discharges have the tendency to be trapped in a narrow nearshore zone mainly on the continental shelf, although in several cases there is evidence that through underwater canyons fine sediments and colloids are transported under favourable hydrometeorological conditions, in fluxes, towards the open sea;

- strong evidence shows that deep sea Mediterranean sediments are affected by anthropogenic particles brought there also through the atmosphere.

Also some cases are obvious, the distinction between short and long term natural trends and the alterations resulting from human interference are often problematic. One of the typical examples concern abnormal population burst, maintaining itself over several years and then, gradually or suddenly, dropping to normal or subnormal levels with no apparent relation to human activity. Such has been the case for the jellyfish *Pelagia noctiluca* appearing in massive swarms between 1980-1983, from the French and Italian coastlines to the Central Mediterranean, the Adriatic and the Greek waters. Several hypotheses have been advanced, including localized eutrophication, a change in the equilibrium between the species and its predators or competitors and hydroclimatic changes favouring its development, but no conclusive evidence of a relation to anthropogenic activities have been presented.

This shows the importance long-time series of observations in order to identify the relative impacts of natural processes cycles/trends (climatic change being one) and human activities.

As for climatic change and its possible implications in the future, an important research and forecasting work has been started in 1987 and is still running under the UNEP's Coordinating Unit for the Mediterranean Action Plan, for 11 site-specific case studies.

Generally speaking, it is estimated that potential evapotranspiration is likely to increase throughout the Mediterranean. Coupled with increases in temperature, this would lead to an increase in land degradation, deterioration of water resources and, in the long-run, may affect aquatic ecosystems.

5. The MED POL monitoring programme and the European Union MAST programme

Most of the results which have been got so far are originating from studies funded by the European Union and the Mediterranean Action Plan (UNEP Regional Seas Programme) and its MED POL component for research, monitoring and assessment of the state of pollution and of protection measures.

To date, MED POL has consisted of two phases:

- Phase I, which began in 1975 and concluded in 1980, in which the member states acquired experience in marine pollution measurements and began to compile data on baseline levels of contaminants in the Mediterranean Sea;
- Phase II, which was extended to 1995; in which the experience gained in Phase I was used to carry out long term pollution monitoring and research work;
- Phase III, starting from 1996, will be more devoted to pollution prevention or mitigation of pollution impact and effectiveness of their implementation linked to the general objective of sustainable development.

Under an evaluation carried out in 1993, it has been concluded that although MED POL had greatly contributed to the improvement of the analytical capabilities of the developing member countries, there are still serious bottlenecks to be overcome. The main recommendations concerned:

- precise monitoring objectives for more efficient planning;
- insist on monitoring of the sources of pollution;
- establish a reliable contamination baseline identifying sub-regions as specific marine entity;
- start a biological effects monitoring programme;
- keep priority to the Quality Assurance activity;
- improve the marine environment natural processes knowledge.

Regarding the last recommendation, one should admit that, so far, research activities and progresses have poorly influenced the general monitoring strategy developed in the Mediterranean.

In this respect, it is worth mentioning the second Mediterranean Target Programme supported by the European Union (Marine Science and Technology Programme - MAST) and which is planned to start in 1996.

It is a huge multidisciplinary study integrating biogeochemistry with physics, to understand the coupling between the dynamics of the water masses and the behaviour of dissolved and particulate, biogenic and abiogenic substances (source, transportation, transformation and sink). This will require the definition of the time and space scales of the processes and their variability, and the drawing up of budgets between the different compartments of the system (between the sub-basins, between the surface layer and the water-sediment interface through the water column).

6. The French marine environment monitoring experience

6.1. Basic principles regarding monitoring

<Monitoring>, in the context of the assessment and protection of the marine environment, has been defined as the repeated measurement of an activity or a contaminant or of its effects, whether direct or indirect.

In practice, the previous definition covers a wide variety of programmes aiming at monitoring the marine environment. But the nature of all of these programmes can be related to one of the following three categories.

- monitoring for compliance purposes(control),
- monitoring of patterns and trends,
- monitoring for research purposes.

Those three categories, in fact are linked because they are different steps of a main concern which is the protection of the environment. The monitoring for scientific purposes is generally the main step for establishing monitoring of levels and trends which in turn provides useful information for defining the parameters of control (monitoring to comply with a regulation).

The objectives of marine environmental monitoring are usually identified as following:

- Protection of public health;
- Protection of marine life and its habitat;
- Evaluation of levels and trends of general quality parameters and of pollutants.

6.2. French monitoring networks

Most of the monitoring networks on the French Mediterranean coast exist since about ten years or more, which gives way to rather probant long term series. However, for historic and administrative reasons, they still lack connections between each other. In general, their different objectives, procedures, data archival and treatment systems do not allow intercomparison of data for a more integrated interpretation, although the situation is on the verge of changing.

On other hand, regarding each network, one of the main bottleneck identified relies in the incomplete geographic coverage of the coastal zone, although the main <hot spots> are

generally rather well covered.

All located in a narrow coastal strip, they usually cover the waters which are in the very nearshore zone, leaving the farer feds of the continental shelf untouched.

Apart the long term series related to research activities, one of the most significant of existing networks is the mussel watch programme called the «National Network for the Observation of the Quality of the Marine Environment» which is under operation since 1979.

On the Mediterranean coast, the bioaccumulating bivalve generally used to that purpose is the blue mussel *Mytilus galloprovincialis*. Concentration levels of metal (Hg, Cd, Pb...) and organic contaminants (PAH, PCB, DDT) are determined on soft parts of mussels sampled on a quarterly basis.

>From the data obtained through all these years, it has been possible to gain significant knowledge about the contamination levels and to identify the presence of a few hot spots.

Nevertheless, as said before, the monitoring sites depend on the availability of natural or cultivated mussel beds, which, especially in the Mediterranean, limits seriously the geographic coverage.

Subsequently, it has been decided to proceed to an extension of these monitoring sites using artificial stations consisting of mussels caging all along the French Mediterranean coast, in a depth of 20 to 30 meters. This is a first step towards a more integrated (on technical and institutional arrangements levels) monitoring effort which is under planning and will be developed progressively from 1997.

6.3. Coastal zoning for better management

Some years ago, IFREMER and the Water Agency, «Rhone-Méditerranée-Corse» (covering the whole river basin) responded to the demand of the 1992 Water Law for the creation of a management plan for each of the French drainage basin units.

The three steps that have taken place so far are:

- Breaking down the coastal zone (with the land/water interface) into «functional» units based on detailed criteria related to their physics, biology and anthropogenic characteristics;
- Classifying these units with regard to unit quality and risk levels;
- Establishing a Management board for water quality management and a geographic information system (GIS) for mapping georeferenced data, which is still under development.

This work has been implemented through consultation with the users and decision-makers concerned. This plan has then given way to a global rethinking of waters monitoring strategy, as a whole and as specific to each type of coastal unit. This new strategy will promote scientific research and technological development, first to set up appropriate environment indicators and second for measuring instrumentations and automatic systems.

6.4. Towards trans national monitoring for assessment of regional seas

As it has been said before, the Mediterranean Sea is subdividable in sub-basins or regional units characterized by typical natural processes and contamination fluxes. Such it is the case of the Ligurian Sea or more specifically of the Corso-Liguro-Provencal sub-basin, located between France, Monaco and Italy, where a preliminary study for an integrated surveillance system has been carried out.

Such an integrated surveillance system covering the whole region should include:

- «in situ» sensors embarked on moored or mobile platforms: various significant data have to be collected for obtaining a complete and coherent evaluation of coastal waters quality. Some instruments are already available or under development for real-time automatic multiparameters measurements physico-chemical analysers, sonars, radars, lidars, biological analysers...)
- airborne and satellite remote sensors, with some of them already used for operational observations (active and passive sensors);
- geographical information system and decision support tools, with numerous examples already existing in meteorology, land or air environment;
- a coherent set of 2D and 3D (coastal models): even though several 2D and 3D models exist today (oil slick prediction, transport of matter, currents effects, etc.), it should be noted that most of them have not been developed specifically for Mediterranean coastal environment, where surface effects (wind, currents) are critical (no tide). Furthermore, the coupling of various models is still very complex and will require specific studies before getting operational.

The underlying idea of the ARCOBLEU project is thus to benefit from advanced communication and information tools and techniques in association with the latest

system analysis and design concepts, in order to develop and to implement an operational and integrated system for surveillance of both chronic and accidental pollution. Such an approach has already been successfully used in other complex industrial sectors.

The global (sub-basin scale) surveillance function does require data coming from various appropriate sources, resulting in an architecture organised around Control and Surveillance Centers (CSC) which will synthesise the present situation and, upon demand, predicts its evolution.

7. Some lessons learned for an integrated monitoring system

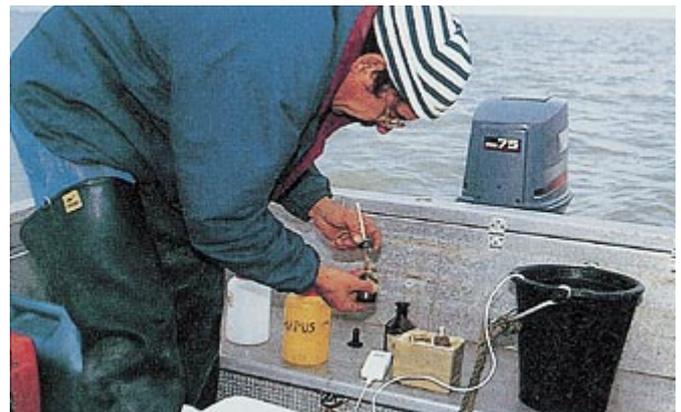
1. Although modelling of physical processes on global scale (general circulation) is rather well advanced and reliable, modelling of chemical processes and particularly ecological processes is only in the very early stages. Still far from being usable for decision-making purposes, computer-based mathematical models have to be developed and evaluate in offshore and coastal areas for:

- assessing the reliability of models being used (model intercomparison, validation, verification, etc.);
- permitting the full range of information now held in improved databases to be assessed and used;
- allowing models to be used as reliable management tools to determine or predict the effectiveness of existing or planned strategies to control the input of nutrients and contaminants to the Mediterranean Sea.

2. The choice of determinands and sampling locations should be related to the subjects under consideration. This can mean, for instance, that the monitoring programme is not necessarily uniform for the whole area, rather that certain determinands are considered relevant only for specific areas.

3. Programmes collecting data on the concentrations and effects of contaminants in the environment should be closely coordinated with programmes collecting information on the inputs of these contaminants from all relevant sources and similar standards of quality assurance should be applied to both programmes. As a consequence, all measurements of atmospheric and riverine inputs and marine monitoring data must be brought together.

4. It is clear that coastal water pollution monitoring and control policies are shifting more and more to integrated marine and coastal resources policies in which the natural, socio-economic and institutional subsystems play a dominant role. Modern technologies such as system analysis, optimization, empirical and simulation models, graphical presentation, GIS and database systems as well as modern technologies such as remote sensing, on line monitoring and computer technology are stimulating and facilitating progress towards integrated marine and coastal resources policy development and management.



Forthcoming Conferences

(1998)

September 27 - October 2**6th Int. Conf. On Woodland Systems for Water Pollution Control**

Sao Pedro, Brazil

Contact: Dr. Samia Maria Tauk-Tomisielo, Centro de Estudos Ambientais/UNESP

Ambientais/UNESP

Address: Av. 24-A, Bela Vista, Rio Claro, SP Brazil. CEP 13.506-900

E-mail: cea@life.ibrc.unesp.br

Fax: +55-19-534-2358

October 5-9**Int. Symp. On Marine Pollution**

Monaco

Contact: Int. Atomic Energy Agency

Address: IAEA-SM-354, Vienna International Centre, Wagramerstrasse 5,

PO Box 100, A-1400 Vienna, Austria

E-mail: official.mail@iaea.org

Fax: +43-1-20607

October 21-23**2nd Int. Black Sea Conf. On Environmental Protection Technologies for Coastal Areas**

Varna, Bulgaria

Contact: Mrs. Galina Grigorova, Bulgarian National Asso. on Water Quality

Address: 22 Maria Luisa Str. Floor 3, Room 23 Sofia 1000, Bulgaria

E-mail: waterql@ttm.bg

Fax: +359-2-980-3547

October 26-29**Biotur 98, first Int. Conf. On Biodiversity & Tourism**

Playa Esmeralda, Holguin, Cuba

Contact: Dr. Manuel Fernandez

Address: Universidad de Santiago de Compostela, Praza de Mazarelos, s/n

15703 Santiago de Compostela, Galicia, Spain

E-mail: iccmora@usc.es

Fax: +981-583-489

October 29**Joint Int. Conf. "Man and the Ocean"**

Tokyo, Morioka & Kamaishi, Iwate Prefecture, Japan

Contact: Marine Research Institute, Tokyo University

Address: 15-1 Minamidai 1-chome, Nakano-ku, Tokyo 164 Japan

E-mail: ohwada@ori.u-tokyo.ac.jp

Fax: +81-3-5351-6482

November 25-27**TECHNO-OCEAN '98**

Kobe, Japan

Contact: TECHNO-OCEAN '98 Secretariat

Address: 11-1 Minatojima-nakamachi 6-chome, Chuo-ku, Kobe 6500046

Japan

E-mail: p074207@kia.exd.city.kobe.jp

Fax: +81-78-302-1870

(1999)**March 27-30****Int. MEDCOAST Conf. on Wind & Wave Climate of the Mediterranean & the Black Sea**

Antalya, Turkey

Contact: Prof. Dr. Saleh Abdalla

Address: Middle East Technical University, 06531 Ankara, Turkey

E-mail: abdalla@metu.edu.tr

Fax: +90-312-210-1412

July 24-30**Coastal Zone 99**

San Diego, U. S. A.

Contact: CZ99 Secretariat

Address: Urban Harbors Institute, Univ. Of Massachusetts Boston

100 Morrissey Boulevard Boston, MA 02125-3393 U. S. A.

E-mail: CZ99@umbosky.cc.umb.edu

Fax: +1-617-287-5575

November 2-6**4th MEDCOAST/4th EMECS**

Antalya, Turkey

Contact: MEDCOAST Secretariat

Address: Middle East Technical University, 06531 Ankara, Turkey

E-mail: medcoast@rorqual.cc.metu.edu.tr

Fax: +90-312-210-1412

November 16-18**3rd Conf. Marine Pollution & Effluent Management**

Kuwait

Contact: Dr. Saleh Al-Muzaini, Kuwait Inst. For Scientific Research

Address: PO Box 24885 Safat, 13109 Safat, Kuwait

E-mail: smuzaini@safat.kisr.edu.kw

Fax: +965-484350

Bulletin Board

New Home Pages !

The EMECS home pages (URL: <http://www.emecs.or.jp>) have been updated. Please visit the web site. Also, the interactive function is available for visitors to the pages. You can contact us by clicking the secretariat e-mail address on the pages. The e-mail address is secret@emecs.or.jp

Contents:

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- What is EMECS?
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- International Environmental Cooperation Forum, West Japan (IECF)
- The Association for the Environmental Conservation of the Seto Inland Sea

Call for Articles

The EMECS Newsletter is targeted at researchers and individuals affiliated with organizations related to the study of enclosed coastal seas. Its

purpose is to provide a forum for the exchange of information on enclosed coastal seas and disseminate this information to as wide a readership as possible, linking concerned persons and organizations throughout the world. The next issue is scheduled for publication in March 1999. Contributions from readers (reports on research in enclosed coastal seas, conference information, etc.) would be greatly appreciated.

New Address

The International EMECS Center secretariat moved to a permanent location in March, 1998 as we had informed you by the previous bulletin board.

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