

# EMECS NEWSLETTER

No. **9**

International EMECS Center

## FIRST ANNOUNCEMENT TO BE MADE IN NEAR FUTURE 7th Stockholm water Symposium-3rd EMECS Conference



A Beautiful View of Stockholm in August

The first announcement of the joint Stockholm Symposium / EMECS Conference 1997, which will be held August 1997, will be made in late July and will be a call for papers.

The theme of the conference will be "WITH RIVERS TO THE SEA - Interaction of land activities, fresh water and enclosed coastal seas" officially. As a result of cooperation between EMECS, which has been focusing on enclosed coastal seas in the world, and the Stockholm Water Symposium, which has covered fresh water and land activities, a wider ranging conference concerning the environment of water quality will soon become a reality.

At EMECS, we are really looking forward to this joint conference as it is the first time for an EMECS Conference to be held in Europe Area.

The conference has been organized by Stockholm Water Company and International EMECS Center. Currently University of Maryland System, U.S.A., the executive organization of the Second EMECS Conference in Balti-

more, Maryland, Swedish Environmental Protection Agency, Stockholm Marine Center, Helsinki Commission, (HELCOM), Finland, and the World Bank, U.S.A., will also participate in the Executive Programme Committee of this joint conference.

The schedule for the conference, the themes of the workshops, and the call for papers will be as follows:

### 1 Schedule: August 3 - 8, 1997

|              |                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------|
| August 3     | Welcoming reception                                                                               |
| August 4     | Opening ceremony with Keynote address and Lecture by the winner of the Stockholm Water Prize 1997 |
| August 5 - 6 | Workshops, Poster Sessions                                                                        |
| August 7     | Poster Award Presentation, Reports from the workshops Conclusion                                  |
| August 8     | Technical Tours                                                                                   |

2 Themes for each workshop  
The joint Conference is organ-

ized in three groups of workshops, each dealing with a specific theme.

1. Understanding and solutions
2. Governance and policies
3. Citizens involvement / NGOs

The themes will center around six cases, which will also be presented in the plenary.

- |                       |                                    |
|-----------------------|------------------------------------|
| -The Baltic Sea       | Northern Europe                    |
| -The Black Sea        | Southern Europe and Southwest Asia |
| - Chesapeake Bay      | North America                      |
| - The Seto Inland Sea | Japan                              |
| - Gulf of Thailand    | Southeast Asia                     |
| - Lake Victoria       | Africa                             |

### 3 Call for papers

Deadline for Submission: October 1, 1996

Applicants will be notified directly of the result after February 1, 1997. Those selected will be required to submit 2 or 3 papers by April 1, 1997.

Official language: English

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Structure of the executive organizations of the conference



Papers submitted by July, 1997, will be published in the proceedings.

A number of executive committees were also organized in the second preparatory meeting held on January 8 - 9 in Stockholm and are progressing with preparation of the various aspects of the joint conference now.

1 Executive Programme Committee (15 members)

This committee will comprise members of the current Program Committee, which is in turn composed of members of the Executive Committee and Scientific Programme Committee of the Stockholm Water Symposium and members of International EMECS Center Scientific and Program Council, in addition to members of organizations involved in research and administration of Chesapeake Bay in the United States, the Royal Swedish Academy, and the Helsinki Commission. It will serve as the central committee for planning the conference agenda, holding sessions and selecting papers to be presented.

2 International Reference Committee

This committee will assist and serve as a think tank for the Executive Programme Committee. It will be made up of members of the Stockholm Water Symposium Scientific Programme Committee and International EMECS Center Scientific and Program Council.

3 Organizing Committee (15-20 members)

This committee will comprise members from the Swedish side. It will be responsible for planning the actual ceremonies and the like.

**Schedule for Future Events**

The first Executive Programme Committee meetings are going to be held in Stockholm this August to discuss and make final decisions on the workshops, technical tours. The second series of meetings will then be held in Kobe in December, 1996 to screen and select the articles submitted.

The second announcement of the conference program will be made in February, 1997.

If you or your colleagues have any questions regarding the first announcement of the joint conference, or if you would like to have a copy of it, please contact the secretariat of International EMECS Center. We will send it to you as soon as it is ready.

## EMECS 93 Conference Summarized Our Coastal Sea: Their Future

Dr. Jack Greer  
Director  
Maryland Sea Grant College

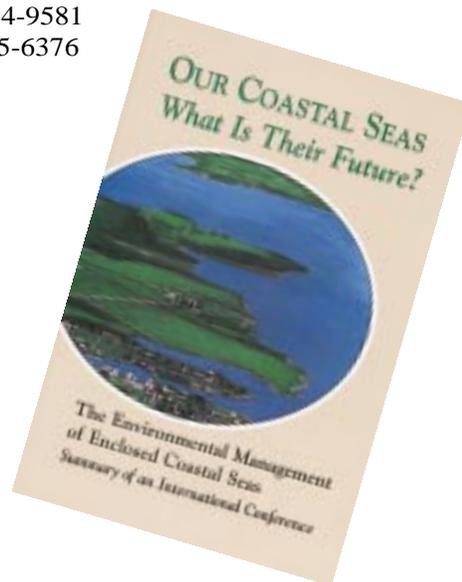
"Our Coastal Seas: What Is Their Future?" summarizes the 1993 conference held in Baltimore, Maryland on the Environmental Management of Enclosed Coastal Seas (EMECS). The 180-page softcover book begins with a dedication to Ian Morris, former director of the University of Maryland Center for Environmental and Estuarine Studies, and key originator of the international project that helped lead to the EMECS effort.

The volume includes remarks by the honorable Toshitami Kaihara, Governor of Japan's Hyogo Prefecture, who met with Ian Morris during the original coastal seas study, and by former Governor William Donald Schaefer, who was responsible for bringing the EMECS Conference to Baltimore. Our Coastal Seas includes brief summaries of fifty-four sessions under the headings of Philosophy and Policy, Citizen Involvement, Governance, Science and Research, Case Studies, and Special Problem.

Covered in the summaries are science and policy issues associated with such coastal seas as the Chesapeake Bay, the Gulf of Mexico, Puget Sound, the U.S. Great Lakes, the Baltic Sea, the Black and Caspian Seas, the Mediterranean Sea, and the Seto Inland Sea of Japan. The book also includes a brief description of the staged roundtable debate over the Madrigal Sea, a fictionalized and entertaining summit meeting which is also available on videotape from Maryland Sea Grant.

To order either *Our Coastal Seas* (\$12.95) or *The Challenge of the Madrigal Sea* video (\$24.95), contact:

Maryland Sea Grant College  
0112 Skinner Hall, University of Maryland, College Park, MD 20742 U. S. A.  
Fax: +1 301-314-9581  
Tel: +1 301-405-6376



## SEIRYU(Clean Stream):New Hypertext Program for Disseminating Environmental Data

Our Group, the Amateur Water Quality Investigators, has created SEIRYU (Clean Stream), a hypertext computer program for accessing environmental data from water quality surveys conducted by private citizens. The program contains environmental data for water environments of Ibaragi Prefecture and surrounding areas. SEIRYU is a kind of database that contains not only water quality measurements but also pictures, graphs, charts and text. The program is designed to make it easy even for people who are unfamiliar with personal computers to view the data, simply by looking at the monitor and clicking the mouse. SEIRYU was created to provide as many people as possible with access to environmental data gathered by private citizens groups. The program is being distributed in three ways:

(1) On PCs located in places frequented by many people

Since April 1996, SEIRYU has been installed on a computer at the Kasumigaura Town Center (Tel: +81 298- 88-3118) in Ami-cho, Ibaragi Prefecture. All visitors to the Center are free to use the SEIRYU hypertext program.

(2) On the Internet The SEIRYU program is already available on the World Wide Web. The address of the home page is: <http://kasumi.sys.eng.shizuoka.ac.jp/ayumisaki>

Since SEIRYU was announced at the 6th International Conference on the Conservation and Management of Lakes held in Ibaragi last year, this home page has been accessed by more than five hundred people. Among the users were elementary schools, and one 4th-grade class used the SEIRYU hypertext program via the Internet as an environmental studies teaching aid.

(3) On a floppy disk (distributed free)

The SEIRYU hypertext program will be mailed free of charge to those who request it, on a 3.5 "floppy disk in either Windows or Macintosh format. To order a copy, or for more information about SEIRYU, please contact:

Dr. Yasunobu Maeda  
Shizuoka University  
Faculty of Engineering  
Department of System Engineering  
3-5-1 Jyohoku, Hamamatsu-shi, Shizuoka 432 Japan  
Tel: +81 53-478-1202  
e-mail: [maeda@sys.eng.shizuoka.ac.jp](mailto:maeda@sys.eng.shizuoka.ac.jp)

## Inauguration of Coalition of Prefectural Assembly Members to Promote International EMECS Activities

60 Hyogo Prefectural Assembly members have formed a nonpartisan coalition to work for the preservation of environment of the Seto Inland Sea and other enclosed coastal seas. The new coalition, called the Coalition of Prefectural Assembly Members to Promote International EMECS Activities, was unveiled at a general meeting held on December 20, 1995 at the Hyogo Prefectural Assembly Hall.

The general meeting was chaired by Yukio Tateishi, secretary-general of the local chapter of the Liberal-Democratic Party(LDP) at that time. Follow-



Gov. Kaihara of hyogo prefecture, the chairman of Executive Committee of International EMECS Center, delivered his congratulatory address at the inaugural general meeting.

ing words of welcome from Hiroshi Washio, representing the founders of the Coalition, hopes for the Coalition's success were expressed by invited guests Toshitami Kaihara, governor of Hyogo Prefecture and chairman of the Executive Committee, International EMECS Center, and Kazuo Ishida, chairman of the Hyogo Prefectural Assembly at that time.

Business conducted at the general meeting included the selection of assemblyman Hiroshi Ida, one of the Coalition founders, to serve as chairman, and the confirmation of the following officers by unanimous vote. Following the selection of officers, Masayoshi Izawa, the first president of the organization, expressed his hopes for the future of the Coalition.

Officers(in no particular order with titles omitted)

|                   |                                                                                                                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advisor           | Hiroshi Washio(former prefectural assembly chairman)(LDP)                                                                                                                                                    |
| President         | Masayoshi Izawa(former prefectural assembly chairman)(LDP)                                                                                                                                                   |
| Vice-President    | Satoshi Sugita(Democratic Socialist Party and Citizens' Union)<br>Furusawa Shoichi(Komeito)                                                                                                                  |
| Directors         | Hiroshi Ida(former prefectural assembly chairman)(LDP)<br>Shozo Takahata(LDP)<br>Kiyoharu Maeda(Democratic Socialist Party and Citizens' Union)<br>Motomu Hatano(Komeito)<br>Rin Mori(Japan Communist Party) |
| Secretary-general | Yukio Tateishi(LDP)                                                                                                                                                                                          |
| Auditor           | Kenzo Kamatani(LDP)<br>Hiromi Miyamoto(Democratic Socialist Party and Citizens' Union)                                                                                                                       |

## Trainig Course in Techniques of Environmental Management of Enclosed Coastal Seas

The sixth course in the series, Training in Techniques of Environmental Management of Enclosed Coastal Seas, was conducted between Sep. 25 - Dec. 1, 1995 in Kobe with the cooperation of JICA Hyogo International Center. This time, 7 people from Indonesia, the Philippines, Thailand, Saudi Arabia, Chile and Mexico participated.

From this year, the International EMECS Center has taken over making arrangements for the course instead of the Association for the Environmental Conservation of the Seto Inland Sea.

These training courses aim to provide participants, such as policymakers or engineers from developing countries with opportunities to gain the technical knowledge necessary to work in the environmental management of enclosed coastal seas. The curriculum includes short courses of Japanese conversation, a general review of semi- and enclosed coastal seas, legal systems, modeling, measurement, biological study to learn about various aspect of environmental management. (See diagram ;right) Two new topics were added last year: Lectures on research activities and field visits to local research facilities instead of central government facilities, and lecture on the environmental impact of spilt oil on enclosed coastal seas.

The seventh course in 1996 will therefore cover a wider range of topics.

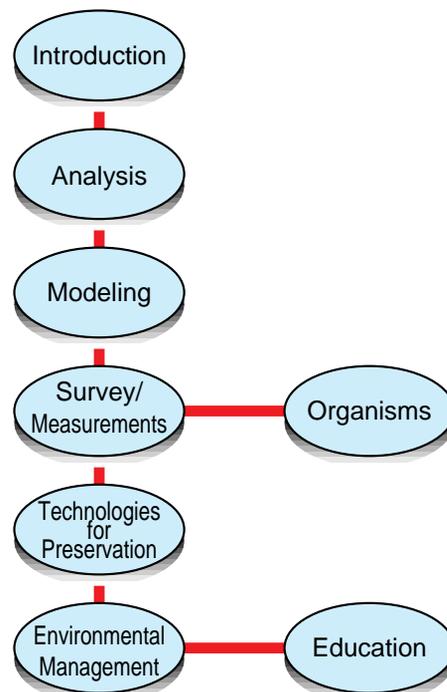
- Participants in 1995 -

Ms. Ratna Kartikasari  
Sub Directorate for Marine Pollution Control  
Environmental Impact Management Agency  
(Indonesia)



The farewell Party of 6th Trainig Course in Techniques of Environmental Management of Enclosed Coastal Seas

### Training Curriculum



- Ms. Ma. lourdes C. Aralar  
Scientist I  
Binangonan Freshwater Station, Aquiculture Department  
South Asian Fisheries Development Center (the Philip  
pines)
- Mr. John Francisco Abiog Pontillas  
Project Evaluation Officer  
Palawan Council for Sustainable Development Staff (the  
Philippines)
- Ms. Sanee Thipthabiankarn  
Environmental Scientist  
South region Environmental Office  
Office of Environmental Policy and Planning Ministry  
Ministry of Science, Technology and Environ ment (Thai  
land)
- Mr. Smeer Moh'd S. Bakhadlag  
Environmental Specialist  
Meterological and Environmental Protection Administra  
tion (Saudi Arabia)
- Mr. Gonzalo Andres Cid Badilla  
Consultant in Coastal Management  
Center for Research and Education on Environ mental Sci  
ence (Chile)
- Ms. Blanca Eugenia Lezcano Bustamante  
Subdirector of Environmental Management  
National Institute of Ecology (Mexico)



## Vancouver Workshop Focus on Modeling

A workshop entitled "Scientific Tools for Coastal Marine Management and Policy" was held in Vancouver, British Columbia, 22-25 Jan 1996. The meeting was co-chaired by Prof. Paul LeBlond, of the University of British Columbia, Vancouver, Canada, and Prof. Tetsuo Yanagi, of Ehime University, Matsuyama, Japan, under the sponsorship of the Japan-Canada Agreement in Science and Technology. Participants, about twenty in total, included research scientists, engineers, managers and policy makers from both countries. The workshop was prompted by a strong interest in marine development on the part of the Canadian Ocean Frontier Research Initiative, a foundation assisted by the Science Council of British Columbia, which brings together ocean scientists and managers from all sectors of Canada's Pacific coast.

Workshop objectives focused on problems of common concern to the two countries: generally speaking, the management of water quality and living resources within their respective EEZ's. Participants were unanimous in recognizing that issues arising from anthropogenic effluents could not be separated from those of fisheries or aquaculture in coastal areas, and required a common, ecosystem-based approach.

Models are the basic scientific tools for assessment of water properties and of the health or abundance of marine life. Without quantitative, predictive models, coastal management remains poorly based in science and unable to assess the relative impacts of various human activities. Without reliable models, managers operate with questionable assumptions and policy makers remain at the mercy of conflicting interests, unable to convincingly justify proposed strategies.

Areas of particular concern discussed included the Seto Inland Sea of Japan and the Strait of Georgia, on Canada's Pacific coast. The central place of models within a coastal zone management system was illustrated symbolically by one of the participants in an application to the Strait Georgia (See right figure).

While participants agreed on the need and utility of models, there was much discussion on the need to assess reliability and to establish standards of performance. Further refinements of hydrodynamics models are still required, but the state of the art is now shifting to ecosystem modeling. In their simplest form, ecosystem models include the lower trophic levels of marine life, phytoplankton and zooplank-

ton, in a formulation which begins to address directly problems of pollution and eutrophication.

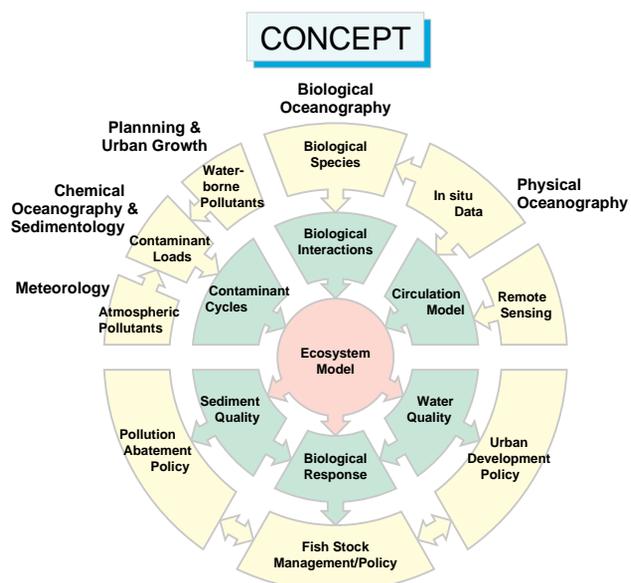
Considerable development and verification is required for even the simplest ecosystem models. Lively discussion focused on the strategy for model development and on whether it would be preferable to build complicated models, with detailed physics, chemistry and biology, or to develop a system of sampling and data assimilation which could keep simpler models on track as predictive tools.

Recommendations arising from the workshop focused on the needs for improved coastal management in both countries. Nevertheless, many of them are of general, international interest. Beyond the need for model improvement and especially verification -- perhaps through a well focused joint project -- there is also a definite requirement for monitoring techniques capable of providing reliable information at low cost and over broad spatial areas. Finally, scientific tools, to be useful, must be convincing to non-technical audiences and decision makers. Efforts should be made, in collaboration with communication experts, towards explaining the meaning of uncertainty in predictions, and in improving the visual impact of model results within locally adapted decision-making framework.

A fuller report of the activities and conclusions of the workshop on "Scientific Tools for Coastal Marine Management and Policy" is available from Paul H. LeBlond, Dept. Oceanography, University of British Columbia, Vancouver, B.C. V6T 1Z4, Canada.

Figure Credit: Dr. D. O. Hodgings, Seaconsult Marine Research Ltd., 8805 Osler, St., Vancouver, BC V6P 4G1

### Georgia Bioregion Model





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



Erdal özhan  
 Chairman, MEDCOAST

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 Laboratorid'Enginyeria Maritima (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; Hydrodynamics 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 (see below) 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.

163 papers which were received by the MEDCOAST Secretariat before the deadline were included in the three volume conference proceedings (1 997 pages + indices), which were distributed to the participants at registration. Many of these are original work of high quality, and refer to issues which are significant to or specific for the Mediterranean and Black Sea. Among the papers printed in the proceedings, 142 papers (87%) are written by experts from the Mediterranean and Black Sea countries. The proceedings provide indeed a wealth of information and the conference presents a great opportunity for cross fertilization, both among different disciplines and interest groups, and among nations. This is very important for the management of a regional sea, and clearly illustrates the significant role that a regional conference with a valid goal and a correct vision can play. In this sense, MEDCOAST conferences set up a successful example for the other geographic regions covered in the Regional Seas Program of UNEP.

The only discouraging problem with the MEDCOAST 95 conference was the inability of several authors from the southern and eastern Mediterranean, and the Black Sea countries to participate at the conference due to lack of funds to meet their expenses. Several interesting, high quality papers could not be presented and discussed due to absence of the authors. The generation of international funding to support authors who can not meet their expenses, will be a major challenge for MEDCOAST Secretariat during the preparation of the next conference. All donor organizations which are concerned with the well being of the Mediterranean coastal and marine areas, and with their sustainable development, will be approached for supporting the future MEDCOAST conferences.

The MEDCOAST conferences convene every two years in a different Mediterranean or Black Sea town. The next conference, MEDCOAST 97, is scheduled to take place in late October or November of 1997. The venue will likely be Tunisia. The first announcement of MEDCOAST 97 will be sent to about 5 000 addresses included in the MEDCOAST mailing list. The MEDCOAST Secretariat assumes organizational and scientific responsibilities for all conferences, including the choice of the conference topics, organization of the paper selection process, editing of the proceedings, and publication of the selected papers in the referred media. The Secretariat also carries out promotional work at international level. In addition to finding international donors for sponsorship of the conferences, the Secretariat handles design, printing and mailing of the promotional publications (Call for Papers, Bulletins, Conference Programs, Posters, etc.), and arranges for printing of the conference information in the international media (journals, newsletters, periodical bulletins, etc.).

For information on MEDCOAST conferences and publications, or concerning other MEDCOAST events, contact:

MEDCOAST Secretariat, Middle East Technical University, 06531 Ankara, Turkey.  
 Tel:+90 312-210-5435  
 Fax:+90 312-210-1412  
 e-mail: medcoast@rorqual.cc.metu.edu.tr

- TARRAGONA DECLARATION -  
 The participants of MEDCOAST 95,

Conscious of the fundamental importance of the health of the Mediterranean and Black Seas including their coastal areas for the health of the coastal communities, the economies of coastal States, the cultural and spiritual life of the Mediterranean and Black Sea community;

Recognizing and fully supporting the important work accomplished by UNEP over the past twenty years in the framework of Barcelona Convention and the Mediterranean Action Plan, and the significant contributions of other competent Intergovernmental and Nongovernmental Organizations;

Aware of the need to adjust these instruments to the new tasks arising from the United Nations Conference on the Environment and Development, in particular, the implementation of Agenda 21 and integrated coastal management in the Mediterranean;

Conscious of the institutional implications of these decisions;

Appreciating the important beginning to meet the new challenges made by the 1995 amendments to the Barcelona Convention and MAP2, as well as by the adoption of the Mediterranean Agenda 21 in Tunis; and

Considering these decisions as a break-through conferring on the Mediterranean community, once more, a leadership role in the regional seas cooperation and development;

Convinced that integrated coastal management requires the further strengthening of regional cooperation and development as well as proper linkages between local, national, regional, and global decision-making, and is in fact unachievable without these;

Believing, therefore, that regional organization is an essential component of the system of ocean and coastal governance for the next century;

Noting the recent entry into force of the United Nations Convention on the Law of the Sea, of the Climate Convention and the Biodiversity Convention, their impact on coastal and marine management, the obligations arising and the benefits to be drawn from them;

have agreed on the following recommendations:

1. Coastal communities should, as soon as possible, establish appropriate institutional mechanisms for the planning, implementation, and evaluation of integrated coastal management. In accordance with Article 4 (paragraph 3e) and Article 11B (paragraph 2) of the 1995 amendments to the Barcelona Convention, these mechanisms should include the public, for instance, in the form of municipal councils including representatives of science, private sector, professional groups such as fishermen's associations and port authorities, and NGO's.

2. Management plans and strategies will vary from municipality to municipality and from State to State in accordance with needs. They must, however, follow general guidelines adopted at regional and national levels; they must balance economic development and environmental conservation concerns and harmonize long-term ecosystem requirements with short-term political and economic interests.

3. Proper linkages have to be established between the basic mechanisms for integrated coastal management mentioned in recommendation (1) and the Governments of coastal States, and with the institutions of the Barcelona Convention (Meeting of Contracting Parties ) so as to assure public participation in regional decision-making. Article 14b of the 1995 Amendments to the Barcelona Convention (" Observers"), provides the legal framework for this recommendation.

4. Recognizing the physical unity of the Mediterranean and the Black Sea, and various interactions among the two marine ecosystems, the management efforts for these two seas should be co-operative and harmonized. In this context;

a. transfer of knowhow and experience among the States of the Mediterranean and the Black Sea through decentralized cooperation, including creation of networks for joint research and training in the field of integrated coastal management, and integration of the existing international research programs, should be enhanced;

b. the progress in the development of the Black Sea Action Plan should be accelerated;

c. Euro-Black Sea programs, similar to Euro-Med programs of the European Union, in the fields of development and environmental management, especially in management of the coastal and sea areas, should be initiated.

5. The functions of the Mediterranean Commission for Sustainable Development and its relations with the Contracting Parties, with institutions of the Barcelona Convention, and the United Nations Commission for Sustainable Development should be clarified.

6. A system of joint clean technology development for the Mediterranean (MEDCOAST) should be established. This would be in fulfilment of Articles 276 and 277 of the Law of the Sea Convention as well as Article 4 (Paragraph 1c and 5) of the Climate Convention recommending joint ventures in research and development in clean technologies. The system should be decentralized and project-oriented. It should be open to participation by regional and national scientific and technical institutions and enterprises both in the public and the private sector. It might follow the pattern provided by EUREKA, generating a synergism between private and public funding at the level of Mediterranean cooperation. It should stipulate that projects to be approved must have at least one developing country partner. Public funding should be provided by the industrialized countries, in accordance with Climate Convention Article 4 (Paragraph 3 and 5) and Article 11 (Paragraph 5).

7. Energy efficiency and utilization of renewable resources for energy production, water management, environmentally sound shoreline management, and clean aquaculture technology should be on the priority list of projects to be approved by MEDITECH.

8. As a regional management policy, further development along the coast should be planned in and around already developed areas. The development of pristine coastal areas should be carried out with great care, and in the case of the developed countries, such sites which still remain, should be preserved for future generations. The potential of the developing States for managing their environmentally or ecologically sensitive special coastal areas should be enhanced by centralized and decentralized regional cooperation.

9. information networking should be improved among Mediterranean and Black Sea countries. A database should be established on the coastal and marine environment in cooperation by the Mediterranean Observatory for Development and Environment (MEDO) and IOC/UNESCO, by facilitating the Mediterranean GOOS initiative. The information should be available to users through internet, and by other means.

10. Public information on Mediterranean Action Plan and the Agenda 21, especially among local communities, schools, and tourists, needs to be vastly improved if programme implementation is to be effective.

11. The growing importance of national and international NGO's and their networks, and the contributions they can make to the programme implementation at the local, national, and regional level should be realized and fully utilized.

12. Implementation of programs should be monitored, and rigorous and objective evaluations should be conducted on a periodic basis to determine the effectiveness of programs and efficiency of the system in achieving the goals and objectives of the Mediterranean Action Plan.

13. New ways of securing funding for the implementation of MAP2 should be identified, in accordance with the recommendations made by UNCED and every one of its follow-up conferences. In particular, a tax on tourist should be considered, in accordance with the recommendation put forward at the SIDS Conference (Barbados, 1994). The tax should be paid into the Mediterranean Trust Fund and be utilized for the implementation of MAP2, the Mediterranean Agenda 21, and the advancement of integrated coastal management for sustainable development in the developing coastal states. A precedent in international law for international taxation has been established by the Law of the Sea Convention which has entered into force.

14. Regional organization and development is a crucially important component of ocean and coastal governance. It will assume different structural forms in different parts of the world. There are, however, a number of basic issues common to all regional seas, both within and outside the UNEP-initiated system. To enhance the study of these issues, to ensure that regional organization and development keeps pace and properly interacts with the development of coastal management, and to define the place of regional organization and development within the United Nations system, the participants of MEDCOAST 95 recommend the calling of a World Conference on Regional Organization and Development (WOCROD) as part of the series of Conferences following the decisions of UNCED (Rio 1992), since none of the recommendations of the UNCED follow-up conferences can be implemented without regional cooperation and development.

## Restoration and Protection of the Baltic Sea



Ulf Ehlin  
Executive Secretary  
Helsinki Commission

For more than twenty years the riparians of the Baltic Sea have taken action jointly to protect the Baltic Sea marine environment. Inspired by the UN conference on the environment in Stockholm, Sweden, 1992, the Finnish Government invited the neighbour countries around the polluted sea area to a cooperation which resulted 1974 in the signing of the Convention on the Protection of the Marine Environment of the Baltic Sea Area. Signatories were all the Baltic Sea States at that time, namely Denmark, Federal Republic of Germany, Finland, Germany Democratic Republic, Poland, Soviet Union and Sweden. The aim of the convention is to protect the Baltic Sea from all kind of pollutants and it entered into force 1980. At the same time the Baltic Marine Environment Protection Commission -Helsinki Commission - or in short HELCOM was established and its permanent international secretariat set up in Helsinki, Finland.

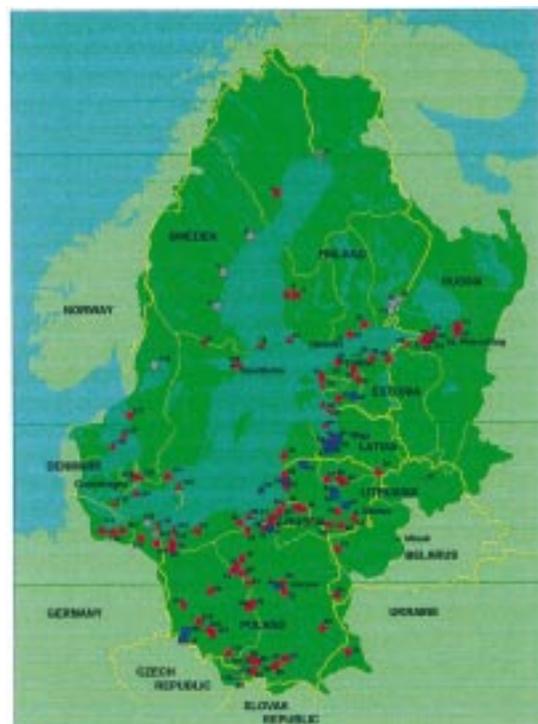
A revised convention was signed by the riparians 1992. It is based on many year's experiences with the original convention and modern environmental principles like the promotion of best available technology and best environmental practice as well as the use of the polluter pays principle. This convention

has become a model for similar actions in other parts of the world.

The Commission's decision are made in the form of recommendations which have to be implemented by the Contracting Parties through national legislation. In spite of the elaboration and adoption of many such recommendations, starting already in an interim phase during the 70ies, the pollution of the Baltic Sea grew worse. Input of large amounts of phosphorous and nitrogen compounds result in an accelerating eutrophication and excessive growth of biomass. Intensive algal blooms appear not only in coastal and archipelago areas but also in open sea and with an increasing component of toxic algae. The decay of this biomass depletes oxygen in the deep water isolated by salinity stratification and hydrogen sulfide is created over vast areas. The situation is only temporary improved when rare inflows of saline water from the North Sea pass through the shallow and narrow entrances and flushes the deep basins. Sometimes it takes decades between such events. Discharge of toxic substances affect seriously the biological life and e.g., populations of birds and seals were threatened by pollutants such as heavy metals and organochlorines.

### Action programme to fight pollution

To take action against this serious development the Prime Ministers of the Baltic Sea States decided at a meeting in Sweden 1990 to elaborate an action programme to eliminate the worst pollution sources and restore the Baltic Sea to a sound ecological balance.



A Diplomatic Conference of Environment Ministers adopted the programme, called the Baltic Sea Joint Comprehensive Environmental Action Programme, JCP, was adopted by strategies and principle 1992 and a Programme Implementation Task Force, HELCOM PITF, was established. All the fourteen countries within the drainage area of the Baltic Sea, a number of the main international financial institutes, the International Baltic sea Fishery Commission as well as several non-governmental international organizations participate in the Task Force.

JCP identifies 132 environmental hot spots in the drainage area being by and large municipalities and industries without or with insufficient waste water treatment and needing investments for remedial actions. Some of the hot spots are areas with agriculture and livestock husbandry contributing to the high nutrient load on the Baltic. Of the 132 hot spots 47 were pointed out to be given the highest priority for investments. Most of the hot spots identified are place in the formerly socialistic countries on the eastern and southern side of the Baltic Sea but some are also found in the formerly called "western" countries.

In addition to the investment element other elements complement the JCP, namely development and harmonization of environmental legislation, institutional strengthening management programmes for coastal lagoons and wetlands, applied research as well as public awareness and environmental education. The programme is a twenty year programme with estimated cost of 18 billion ECU, or 21.5 billion US\$.

#### Successful implementation

The first three years of implementation of the action programme have been rather successful. More than 2 billion ECU have been allocated or reserved for investments and progress can be noted in the other programme elements as well. The international financial institution have been active and coordinated the investment activities together with several donor countries and the European Commission. A number of waste water treatment plants are under construction or in an advanced planning phase. Ten hot spots have been removed from the list of worst pollution sources, four pulp and paper industries in Finland and Sweden respectively and two municipal waste water treatment plants in Germany.

It can be noted that the countries in transition themselves are firmly committed to tackle their pollution problems to the extent possible. Poland has currently more than 1000 waste water treatment plants under construction and about 300 are completed annually. About 95% of the costs for environmental actions are covered nationally. Lithuania has, for example, allocated 2.7% of their national budget for waste water treatment and Estonia about 3%.

As to the non-point sources of pollution agriculture and traffic, an annex to the Helsinki Convention on agricultural practices should be developed until 1998.

A HELCOM recommendation with the potential to strongly reduce the emissions from traffic has also been adopted and several important measures like harmonization of emission standards, phasing out of leaded gasoline, decrease of sulfur content in diesel etc., should be implemented during the next coming years.

Also within other elements of the JCP many activities have been organized and are ongoing. A great interest has been shown in the development of environmental work within the Baltic Sea States in transition not only from countries within Europe but also from other parts of Europe and the world.

#### Positive results

The status of the environment of the Baltic Sea is regularly assessed. The third periodic assessment is underway and will be published in 1997. However, already now some positive results from the ongoing assessment work have been made public. As an Example can be mentioned that the concentrations of toxic organic compounds like PCB and DDT are decreasing in biota and the populations of threatened species like the white-tailed eagle and seals are growing again. This is an inspiring message for all involved in the work to restore the Baltic Sea environment and a good basis for future efforts to reach a sound ecological balance for the still suffering sea basins.

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## Nitrogen and phosphorus flowing into an eutrophic estuary from the outer ocean

### Missing N and P in an estuary



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#### Introduction

Nitrogen and phosphorus from human activities make semi-enclosed seas eutrophic. In highly populated bay areas, such as Tokyo Bay, Ise Bay and Osaka Bay in Japan (Fig. 1), red tide may occur throughout the year near the bay head, where large amounts of terrestrial N and P collect. Until recently it has been widely believed that greater part of this inflow of N and P is transported to the open ocean by water exchange between the bay water and oceanic water. However, the research necessary to verify this hypothesis has not been carried out because of the difficulty of observation. To measure the flux of N and P, we conducted a new type of field observation at the mouth of the Seto Inland Sea, which includes Osaka Bay, and obtained results contrary to the previous hypothesis. We found that N and P flow into the

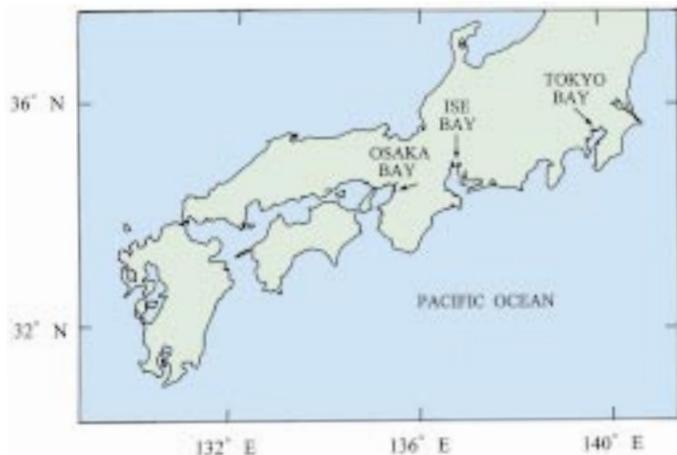


Figure 1. Map of Japan showing Osaka Bay, Ise bay and Tokyo bay

Seto Inland Sea from the outer ocean, and their fluxes exceed the terrestrial N and P loads.

#### Observation and Analysis

N and P fluxes were measured on the 23 and 24 of August, 1995 at a cross-section of the Kii Channel, which connects Osaka Bay to the Pacific Ocean (Fig. 2). STD casts and sea water sampling were conducted at the stations on longitudinal and lateral transects by using the training vessel *Yuge Maru* of Yuge Mercantile Marine College. The collected sea water was

filtered and frozen on board, and analyzed at Kyoto University (NO<sub>3</sub>-N, NO<sub>2</sub>-N, PO<sub>4</sub>-P), Hyogo Prefectural Institute of Environment Science (Total dissolved N) and Chugoku National Industrial Research Institute (SS and Particulate N).

Currents were measured with an ADCP (Acoustic Doppler Current Profiler) attached to *Yuge Maru*. This vessel steamed back and forth on the lateral transect connecting Ishima Island and Hinomisaki Peninsula for 25 hours continuously measuring currents at 2 m depth intervals starting at the depth of 8 m from the sea surface. At each point on the transect, current velocities were measured 18 times during the observation. These data were analyzed by the harmonic method and decomposed into the residual current, diurnal tidal current and semi-diurnal tidal current.

The flux of each substance was calculated by integrating VC over the cross sectional area, where C is the concentration of the substance and V is the component of the residual current normal to the cross section. It was estimated that fluxes caused by tidal components and high frequency components of the current were negligibly smaller than those caused by the residual current; i.e. the fluxes through the cross section are an effect of shear dispersion of the residual currents.

#### Results

Figure 3 represents the normal component of residual current on the lateral cross section, looking northward. The sea water flows into Kii Channel through the lower half of the cross section and the water flows out through the upper half. The inflow of water is cooler and saltier, thus heavier than the outflow of water. This flow structure is a manifestation of an estuarine circulation, which is characterized by the outflow in the upper layer and the compensating inflow in the lower layer. Figure 4 and 5 represent the concentrations of NO<sub>3</sub>-N and PO<sub>4</sub>-P, respectively. The concentrations of these nutrients are higher in the lower layer than in the upper layer, which suggests depletion of nutrients in the euphotic upper layer. Comparing these figures with Figure 3, we can see that the nutrient-rich water flows in and nutrient-poor water flows out. This results in a net inflow of nutrients from the outer ocean into the Seto Inland Sea. The obtained fluxes are listed in Table 1.

#### Discussion

The inflow of these oceanic nutrients is caused by the coexistence of two factors: the estuarine circulation and nutrient depletion in the upper layer. Both phenomena are common in many stratified estuaries. We can therefore estimate that the inflow of the oceanic nutrients is not a unique but rather common phenomenon. Annual mean loads of the terrestrial N and P flowing into Osaka Bay are estimated to be 200 tons and 20 tons / day, respectively. On the other hand, equivalent amounts of oceanic N and P also flow into the Osaka Bay and Kii Channel system. These oceanic nutrients may be transported further on, as far as the head of the bay, by the estuarine circulation. Where is the terminal of these large

amounts of terrestrial and oceanic nutrients? We don't have an appropriate answer yet. Montani *et al.* (1991) estimated the burial fluxes of N and P in the sediment in Osaka bay to be 16 tons and 3.4 tons / day, respectively. However, these fluxes are too small to balance the inflow fluxes. As is well known, N and P are the basic elements of the primary production, and transport of these elements is essential in the ecosystem of estuaries. To manage water quality in eutrophic estuaries, we must thoroughly research these fluxes.

We are looking forward to receiving response from the readers who treat other semi-enclosed seas.

Reference

Montani, S., Y. Mishima and T. Okaichi (1991) : Nitrogen and phosphorus circulation and eutrophic feature related with the marine organisms in Osaka Bay. Bulletin on Coastal Oceanography, **29**, 13-27. (in Japanese)

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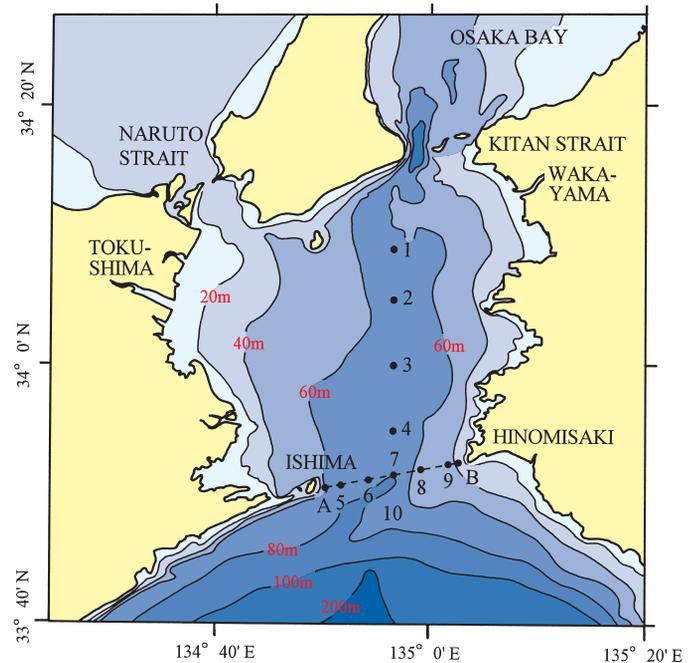


Figure 2. Bathymetry of Kii Channel and station locations. (Osaka Bay is located to the north of Kitan Strait.)

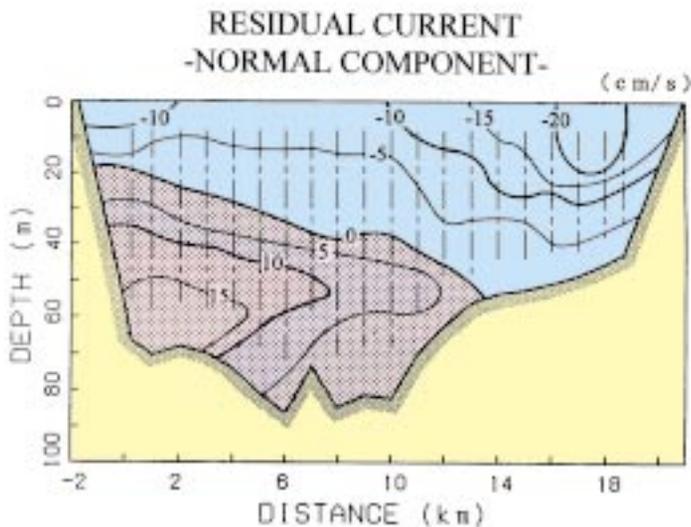


Figure 3. The normal component of residual current on the lateral cross section, looking northward. (The Shaded area represents positive area, i.e. inflow area)

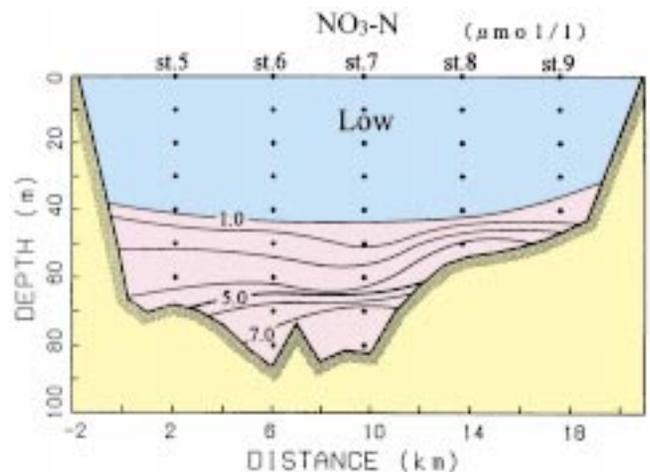


Figure 4. Same as Figure 3, but for the concentration of NO<sub>3</sub>-N

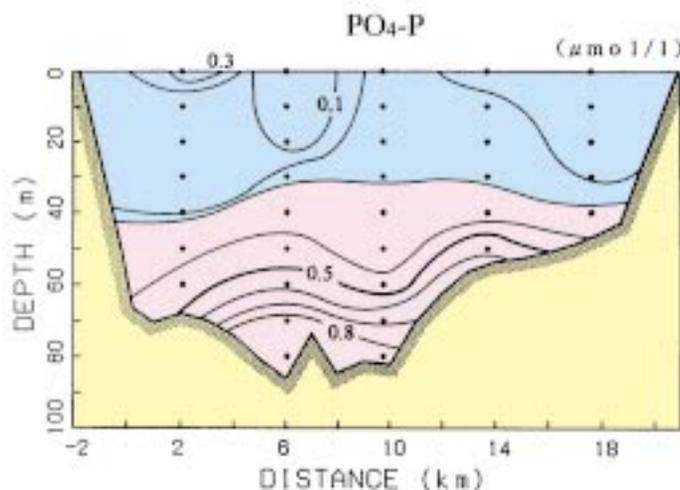


Figure 5. Same as Figure 3, but for the concentration of PO<sub>4</sub>-P

Table 1. Fluxes (ton/day) flowing into the Kii Channel from the outer ocean. (TDN: Total Dissolved N)

|      | TDN | NO <sub>3</sub> -N | NO <sub>2</sub> -N | Partic.N | PO <sub>4</sub> -P |
|------|-----|--------------------|--------------------|----------|--------------------|
| Flux | 206 | 183                | 21                 | -34      | 34                 |

## Forthcoming Conference

(1996)

August 11-16  
6th Stockholm Water Symposium  
Stockholm, Sweden  
Contact: Stockholm Water Company  
Address: S-106, 36, Stockholm, Sweden  
Fax: + 46 8-736-2022

August 12-17

COASTAL ZONE 96  
Rimouski, Québec, Canada  
Contact: Secretariat  
Address: c/o Groupe de recherche  
Université du Québec  
310, allée des Ursulines  
Rimouski, Québec G5L3A1 Canada

September 9-11

8th International Conference on  
Physics of Estuaries and Coastal  
Seas  
Rijkswaterstaat, The Netherlands  
Contact: Maarten Scheffers, National  
Institute for  
Coastal and Marine Management/RIKZ  
Address: Kortenaerkade 1, P.O.Box  
20907  
2500EX, The Hague, The Netherlands  
Tel: + 31 70-311-4258  
Fax: + 31 70-311-4321

September 15-19

5th International Conference on  
Wetland System  
for Water Pollution Control  
Vienna, Austria  
Contact: Dr. R. Perfler  
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Address: Nussdorfer laende 11  
A1190 Vienna, Austria  
Tel: + 43 1-369-2924  
Fax: + 43 1-368-9949

September 16-20

Estuarine and Coastal Science  
Association and Estuarine Research  
Federation Conference

Middelburg, The Netherlands  
Contact: Dr. Carlo Heip, Director  
Delta Hydrobiological Research  
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NL4401 EA  
The Netherlands  
E-mail: Heip@cemo.nioo.nl

September 29 - October 3

The Explorers Club International  
Symposium  
Ocean Pulse: A Critical Diagnosis  
Istanbul, Turkey  
Contact: Mr. Sedat Nemli, MEGA-  
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307  
New York, NY 10017 U.S.A.  
Tel: + 1 212-888-9422  
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October 16-18

Pretreatment of Industrial Wastewaters  
Athens, Greece  
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Fax: + 30 1-601-5275

October 23-25

Techno-Ocean '96 International Sym-  
posium  
Kobe, Japan  
Contact: Secretariat  
Japan International Marine Science  
and Technology  
Federation Kansai Office  
Address: c/o IBC Forum, Kitahama-  
Matsuoka Bldg.  
2-1-26 Kitahama, Chuo-ku, Osaka  
541 Japan  
Tel: + 81 6-203-6061  
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November 5-8

Adsorption in Water Environment  
and Control  
Wakayama, Japan

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Tel: + 81 824-22-7111  
Fax: + 81 824-22-2406

(1997)

May 13-16  
Asian Waterqual 1997 - 6th IAWQ  
Asia-Pacific Regional Conference  
Seoul, Korea  
Contact: Korea Institute of  
Construction Technology  
(Attn. Ms. Mi Kyung Lee)  
Address: 142 Umyon-Dong, Socho-Gu  
Seoul 137-140 Korea

July 20-26

COASTAL ZONE 97  
Boston, U.S.A.  
Contact: Dr. Martin C. Miller  
USAE Waterways Experiment Station  
(Attn. CEWES-CR-O)  
Address: 3909 Halls Ferry Rd.  
Vicksburg, MS 39180 U.S.A.

August 3-8

the Joint 7th Stockholm Water Sym-  
posium  
- 3rd EMECS - Conference  
Stockholm, Sweden  
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Stockholm Water Symposium /  
Stockholm  
Water Company  
Address: S-106, 36, Stockholm,  
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(1998)

June 21-26  
IAWQ 19th Biennial International  
Conference  
Vancouver, BC, Canada  
Contact: IAWQ  
Address: 1 Queen Anne's Gate, Lon-  
don SW1H9BT UK  
Fax: + 44 171-223-3848  
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### Call for Articles

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 to disseminate this information to as wide a readership as possible, linking concerned persons and organizations throughout the world.

Your contributions would be greatly appreciated. All submissions to:

The publisher

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