



## With Rivers to the Sea

### 7th Stockholm Water Symposium / 3rd EMECS Conference 1997



Official opening address by Ms. Brigitta Dahl, speaker of the Swedish Parliament, Sweden

The third International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS) was held in Stockholm, Sweden for four days, from Monday, August 11 through Thursday, August 14, 1997, as a joint conference with the seventh Stockholm Water Symposium. This was the first international conference to be sponsored by the International EMECS Center, originally proposed by Hyogo Prefecture and established in 1994 through support from related organizations both at home and abroad. Twenty - five years ago, in 1972, Stockholm was the site of the [United Nations] Stockholm Conference on the Human Environment, at which the Declaration on the Human Environment was adopted - an event that could be called the starting point for our present - day efforts to solve environmental problems. Therefore 1997 marks a "triple anniversary":

the 25th anniversary of the Declaration on the Human Environment; the 20th anniversary of the UN Water Conference held in Mar del Plata, Argentina in 1977; and the 5th anniversary of the [United Nations] Rio Conference on Environment and Development (the "Earth Summit") held in Rio de Janeiro, Brazil in 1992. So The 3rd International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS) has therefore been held in a notable year and a notable city in terms of environmental issues.

#### 1. Significance and Objectives

This year's conference served as the forum for debate on many issues, principally those pertaining to land and coastal interaction, such as the role freshwater bodies in

carrying nutrients and harmful pollutants that flow from the land into the sea, and the relationship between land use and water quality. The discussion spanned many specialist fields, involving researchers in both freshwater and ocean

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fields, government officials and NGO organizations. The participants worked to enhance ties between researchers, considered the similarities and differences of land regions and coastal areas around the world, and strove for an integrated approach to promoting the environmental management of the world's enclosed coastal seas.

## 2. Conference Theme

The conference theme was 'With Rivers to the Sea: Interaction of Land Activities, Fresh Water and Enclosed Coastal Seas.' This unique theme was born at the Executive Program Committee meeting where the scientists both from Stockholm Water Symposium and EMECS joined.

## 3. Conference Schedule

Monday, August 11  
 Opening session  
 Plenary session 1  
 Tuesday, August 12  
 Workshop  
 Wednesday, August 13  
 Workshop  
 Poster Session  
 Thursday, August 14  
 Plenary session 2  
 Lecture by the 1997 Water Prize Laureate  
 Poster award  
 Closing session

## 4. Participants and Participating Countries

The conference was attended by approximately one thousand researchers, government representatives, NGO officials and others from 80 countries. These included approximately 250 delegates from Japan, more than any other country including the host country, Sweden.

### Opening Ceremony (Monday, August 11 10 a.m.- 12 noon)

The opening ceremony began with a performance of a traditional Viking dance. After the performance, Mr. Sven - Erik Skogsfors, chair and managing director of the Stockholm Water Company, welcomed the participants, urging all of the world's people to join hands and establish a "partnership with water." Next, Ms. Birgitta Dahl, speaker of the Swedish parliament, gave the official opening address for the conference, calling for an appropriate common recognition of the importance of the world's water



Ms. Brigitta Dahl, speaker of the Swedish Parliament, Sweden



Governor Parris N, Glendening, Maryland State, USA

resources. Following the official opening of the conference, Mr. Toshitami Kaihara, governor of Hyogo Prefecture and chairman of the Executive Committee of the International EMECS Center, addressed the participants (Page 5). At the outset, Mr. Kaihara thanked all of the participants for the assistance offered by their respective countries during the Great Hanshin - Awaji Earthquake of January 1995, saying that their help had greatly encouraged the victims of the earthquake, and reported that recovery efforts were progressing steadily. Next, he expressed concern for the present water situation, noting that large quantities of pollutants were flowing into enclosed coastal seas around the world from land areas, causing eutrophication, oil pollution and other problems, thus worsening the habitats of living organisms and reducing fish catches. While national and local governments were actively working to resolve this situation, he said, it was feared that the situation in coastal areas would worsen due to increased development, the centralization of population in these areas and other factors. He promised that the International EMECS Center would work harder to resolve these problems. Next, Mr. Parris N. Glendening, governor of the State of Maryland in the United States, welcomed the participants and cited Mr. Kaihara and the

late Dr. Morris of the University of Maryland as two persons whose vision and creative spirit had given birth to the EMECS conferences, and once more introducing Mr. Kaihara. The keynote address was given by Dr. Lars Hedin, a young environmental scientist from the United States, who spoke on the effect of human land-based activities on water ecosystems. Following the keynote address, the plenary speech was given by Professor Emeritus Bengt - Owe Jansson at Stockholm University, who spoke on the current status of pollution in the Baltic Sea.

### Plenary Session (Monday, August 11, 1:30 - 5:10 p. m. Thursday, August 14, 8:30 - a. m.)

(1) Case Studies on Enclosed Coastal Seas Presentations were given on several of the world's major enclosed coastal seas by major researchers in these regions on Monday, August 11 and Thursday, August 14. Monday's presentations focused on Japan's Seto Inland Sea, Chesapeake Bay in North America, and the Black Sea. In the Seto Inland Sea, Dr. Tomotoshi Okaichi, professor of Tokushima Bunri University and former president of Kagawa University, reported on sustainable development in the Seto Inland Sea from the perspective of the fishing industry. Dr. Okaichi stressed the need to establish an integrated environmental assessment to consider the special features of, and problems in, the Seto Inland Sea and measures to prevent eutrophication and the occurrence of "red tides", while at the same time evaluating the importance of the Seto Inland Sea as a region that is significant in terms of both scenic beauty and Japanese history and tradition. In the Chesapeake Bay case study, Ms. Ann Pesiri Swanson, managing director of the Chesapeake Bay Council, spoke on the topic of ecosystem management. In the presentation on the Black Sea, Lawrence David Mee, director of Black Sea environmental planning and research, spoke on the need for continually increased awareness. On August 14, Mr. Christopher Nyirabu, executive director of the Lake Victoria Environmental Management and Planning Bureau of Tanzania, spoke on the present status of Lake Victoria. Next, Mr. Tapani Kohonen of Finland, secretary - general of the Helsinki Commission (an international organization for environmental management in the Baltic Sea), spoke on the history, organization and current status of environmental management in the Baltic Sea. Dr. Bjorn Stigson, managing director of the World Business Council, spoke on the role of industry in the sustained management of water resources. One other scheduled presentation

on the Gulf of Thailand had to be canceled because the presenter was unable to attend.

(2) Preview of Sessions

Starting at 3:40 p. m. on August 11, session chairpersons from each track reported on session objectives, trends and so on.

Area 1: Dr. Michael Kemp (U. S. A. )

Area 2: Ms. Terttu Melvasalo (Kenya)

Area 3 & 4: Professor Nobuo Kumamoto (President of Hokkaigakuen University, Japan)

**Workshops & Poster Sessions  
(Tuesday, August 12;  
Wednesday, August 13)**

(1) Workshops

The presentations were divided into 12 workshops in 5 tracks (though the 9th workshop was canceled). Discussion followed the presentation on each topic. Including invited guests, there were 165 speakers from 37 countries.

(2) Poster Session

In the poster session, presenters summarized their papers and conclusions in the form of a poster. These posters were mounted on boards and became the focus of discussion between creators and participants. A total of 72 posters from 8 countries were selected, but in several cases the posters were unavailable and so only about 70 were ultimately presented, including 16 from Japan. The posters were displayed inside the exhibition hall starting on August 11. During the Poster Session on the morning of the 13th, the creators of the posters explained their works. The award for Best Poster, given for excellence in terms of both content and design, was presented to Professor Keiji Nakatsuji of Osaka University. The committee that selected the Best Poster award was made up of the following members: Mr. Ulf Ehlin, Stockholm Inter-



Conclusion of the joint conference, Professor Malin Falkenmark, chair of the Executive & Program Committee, Sweden

national Water Institute (SIWI), Sweden (chairman) Mr. Lars Lindbrom, Stockholm Water Company, Sweden Mr. Boniface Eckborg, Nigeria Mr. Peter Naiberg, Stockholm Water Company, Sweden Dr. Masataka Watanabe, National Institute for Environmental Studies, Japan.

**Panels Showing the Present Status of the Seto Inland Sea, etc.**

The Seto Inland Sea Corner was set up in one corner of the exhibition hall with Panels, videos and leaflets showing the status of environmental preservation in the Seto Inland Sea and EMECS activities. Other panels showed the status of the recovery efforts in the wake of the Great Hanshin - Awaji Earthquake that occurred in January, 1995.

The Stockholm Water Prize, the "Nobel Prize of Water," was presented by Professor Peter Eagleson of the Massachusetts Institute of Technology (MIT). As mentioned previously, the Best Poster award was presented to Osaka University professor Keiji Nakatsuji. Dr. Nakatsuji

used computer - generated graphics to present the course of pollution, primarily in Osaka Bay.

**Closing Ceremony  
(Thursday, August 14  
11:15 a. m. - 12:15 p.m.)**

The closing ceremony began with a performance of Japanese koto music (by Yoko Makita and the Joyo - kai). Following the performance, Professor Malin Falkenmark, chair of the conference Executive Programme Committee, summarized the conclusions of each session. Next, Dr. Jiro Kondo, president of the International EMECS Center, read the Stockholm Statement which makes four recommendations for principles to reduce the pollution load to enclosed coastal seas (Page 6). Both the Stockholm Statement and the Proposal to hold the fourth EMECS conference in the Republic of Turkey as a joint conference with the Fourth International Conference on the Mediterranean Coastal Environment (MEDCOAST '99) were approved unanimously. Finally, Dr. Lars Ulmgren of the Stockholm International Water Institute, the secretary general of the Stockholm Water Symposium, expressed thanks to all and officially declared the conference closed.



Best Poster Award Presentation (1st Prize winner Professor Nakatsuji, University of Osaka, Japan (left))



Poster exhibition

## WORKSHOP PROGRAM

TRACK / WORKSHOP		chairman	invited speaker
<b>TRACK 1 UNDERSTANDING LAND / SEA INTERACTIONS</b>			
Workshop 1	AN ECOSYSTEM APPROACH : DRAINAGE BASIN AND COASTAL SEA AS A WHOLE SYSTEM	Donald F. Boesch (USA)	Kenneth Sherman (USA)
Workshop 2	MODELS AS TOOLS FOR ECOSYSTEM UNDERSTANDING, COMMUNICATION, MANAGEMENT, AND RESTORATION	Lars Hedin (USA)	Fredrik Wulff (Sweden)
Workshop 3	MONITORING: A BASIS FOR TRACKING AND UNDERSTANDING FRESHWATER AND COASTAL RESPONSES	Henry Regier (Canada)	Bernard Sylvand (France)
Workshop 4	UNDERSTANDING LONG-TERM CHANGES IN DRAINAGE BASINS AND COASTAL SEAS	Masataka Watanabe (Japan)	Anders Grimwall (Sweden)
Workshop 5	ENVIRONMENTAL IMPACT ASSESSMENT AND VALUATION OF ECOLOGICAL SERVICES	Saburo Matsui (Japan)	Robert Costanza (USA)
<b>TRACK 2 MINIMIZING POLLUTANTS FROM LAND-BASED SOURCES</b>			
Workshop 6	CURBING OUTFLOW OF POLLUTANTS FROM DOMESTIC WASTE	Poul Harremoes (Denmark)	William J. Mitsch (USA)
Workshop 7	GREENING OF INDUSTRY: CURBING OUTFLOW OF INDUSTRIAL POLLUTANTS	Björn Stigson (WBCSD / Swizerland)	Curt Nicolin (Sweden)
Workshop 8	NON - POINT POLLUTION: CURBING OUTFLOW OF AGRICULTURAL POLLUTANTS AS GLOBAL FOOD NEEDS RISE	Curt Forsberg (Sweden)	Edwin D. Ongley (Canada)
<b>TRACK 3 POLICIES FOR OVERCOMING BARRIERS IN GOVERNANCE</b>			
Workshop 10	STRATEGIES AND INSTITUTIONAL ARRANGEMENTS FOR RESOLUTION OF STAKEHOLDER CONFLICTS IN DRAINAGE BASINS AND COASTAL SEAS	Nobuo Kumamoto (Japan)	Susan Hanna (USA) Héctor Garduño (Mexico)
<b>TRACK 4 CITIZEN INVOLVEMENT</b>			
Workshop 11	NGO'S : ROLES AND STRATEGIES IN WATER PROTECTION POLICY	Hans Lundberg (Sweden)	Frances Flanigan (USA)
Workshop 12	ETHICS AND ENVIRONMENTAL EDUCATION OF THE NEXT GENERATION	Wayne Bell (USA)	Richard Collins (USA)
<b>TRACK 5 GLOBAL INFORMATION EXCHANGE</b>			
Workshop 13	GLOBAL RESOURCE INFORMATION DATA EXCHANGE	Michael J. Donahue (USA)	Carol Ratza (USA) Sindre Langaas (Sweden)

## Welcoming Speech Monday, August 11, 1997

by Mr. Toshitami Kaihara  
Governor of Hyogo Prefecture  
Japan at the Opening Ceremony



The Honorable Birgitta Dahl, speaker of the Parliament of Sweden; the Honorable Ingemar Ingevik, president of the Stockholm City Council; the Honorable Parris N. Glendening, governor of Maryland; ladies and gentlemen: it's a great honor for me to speak at this 3rd EMECS Conference, jointly held with the 7th Stockholm Water Symposium in this wonderful city of Stockholm, which is so famous for the beauty of its waterfront.

First, I'd like to take this opportunity to thank all of you here on behalf of the people of Hyogo Prefecture for all the help you offered us in January 1995, when we were hit by a powerful earthquake. The earthquake, which registered 7.2 on the Richter scale, devastated a major part of Kobe, the capital of Hyogo Prefecture, and the surrounding area, seriously affecting more than 4 million people. At that time, we received relief funds and goods from 72 countries and areas of the world which not only helped us sustain our daily lives but also gave us great encouragement. Although we still have a lot of problems to solve, we are determined to overcome those problems and proceed with the reconstruction.

The United Nations Conference on the Human Environment was first held here in Stockholm on 5th June, 1972. It was then that our commitment to the protection of the global environment began. Twenty - five years on, it is no exaggeration to say that "The environment" is

now a key word with a substantial meaning. On the 23rd of June this year, a Special Session of the General Assembly was held with the aim of verifying the progress made in the five years since the opening of Agenda 21.

On the 1st of December, the UNFCCC COP3 will be held in Kyoto, a neighboring city of Kobe, with the object of finding ways to deal with the problem of global warming and determining carbon dioxide reduction targets. Today's conference in Stockholm is also one of the most important conferences addressing a series of global environmental problems.

The 3rd EMECS Conference is an epoch-making event in that this is the first time the Conference has been held jointly with the Stockholm Water Symposium, renowned worldwide as a very high level symposium on fresh water and water resources.

Enclosed coastal seas are deeply connected with the way we live. If coastal waters are not properly maintained and are contaminated as a result, it takes years of difficult operations to return them to a clean state. In this Conference, researchers of land areas and sea areas will discuss various subjects under the main theme, "With Rivers to the Sea," and I believe it will contribute a great deal to our effort to find out just how we can maintain the rivers and seas in a healthy condition from a global perspective.

I founded the International EMECS Center in 1994 with the support and cooperation of many people around the world who had common concerns. Around the world, with some exceptions, there are still many coastal seas into which huge amounts of contaminated substances are flowing from the inland areas, causing such problems as eutrophication, low oxygenation, toxic substance contamination, and oil contamination. These problems are leading to the deterioration of biological habitats, decreasing both the numbers of species and individuals as well as reducing fish hauls.

Although national and local governments that have interests in enclosed coastal seas are making action plans based on related treaties and agreements in an effort to tackle, these problems, there are still many places where improvements haven't been made, or, if

at all, are being made very slowly. Coastal areas facing enclosed coastal seas around the world, especially those in the developing countries, will be increasingly populated as they are developed and industrialized. Unless we start taking effective counter-measures, these enclosed coastal seas will only be more contaminated, which will eventually affect the environment on a global scale. The International EMECS Center has nurtured a human network through the international conferences held in the past. With the help of this resource, we can further increase our investigation and research into what is necessary for the protection of the environment regarding the enclosed coastal seas around the world. We are now thinking of making a system for carrying out this investigation and research and are further committing ourselves to solving the problems.

Last but not least, I'd like to express my most sincere appreciation to those people in Sweden who have made preparations for this joint conference with friendship and dedication over the past one and a half years, especially to Mr. Sven - Erik Skogsfors, managing director of the Stockholm Water Company; Dr. Malin Falkenmark, chair of the Executive Programme Committee; Dr. Lars Ulmgren, vice chair of the Executive Programme Committee; and all other committee members, staff, and faculty members of the Stockholm Water Symposium and the University of Stockholm; and many other people in Sweden.

I am now thinking of the time in history when the relationship between Sweden and Japan first began. In the 18th century, in 1755 to be exact, the first man to come to Japan from Sweden arrived on a Dutch ship. The Netherlands was the only foreign nation permitted to send vessels to Japan, which at that time was isolated from the rest of the world. The man was Dr. Carl Per Thunberg, who is still revered in Japan as the father of Japanese botany. After 200 years, the peoples of the two countries still enjoy a strong friendship, sharing a common interest in the field of global environment, for which I'd like to express my deepest appreciation.

Thank you very much for your kind attention.

**Stockholm Statement  
Thursday, August 14**

Dr. Jiro Kondo  
President, International EMECS Center  
Japan



**BACKGROUND**

The ongoing degradation of coastal seas and large inland lakes and rivers constitutes a major threat to global quality of life and to coastal and marine ecosystems. Nearly three-fourths of the world's population live within 100 km of the sea-coast where their physical as well as economic well-being depends on such activities as fishing, shipping, tourism, recreation, farming and industries. Some 80 percent of the pollutants responsible for this degradation are carried with rivers and groundwater flows to the sea and originate from land-based human activities in the drainage basins of rivers that discharge into coastal water. Also pollution caused by shipping, mining and drilling, as for oil exploitation, are causing concern.

Past Conferences on the Environmental Management of Enclosed Coastal Seas (EMECS) have resulted in a network linking many scientists and others studying enclosed coastal seas. A similar network has been created through previous Stockholm Water Symposia. The Joint 7th Stockholm Water Symposium / 3rd EMECS Conference 10 - 15 August 1997 in Stockholm brought together over one thousand participants from these two networks of respectively marine and freshwater specialists.

The Joint Conference participants, representing over eighty countries and intergovernmental and non-governmental organizations, expressed deep concern about the difficulties experienced around the world as nations attempt to cope with this threat to our planetary life support system. The Conference reviewed the experience and provided a forum for the dissemination of lessons learned. The application of these lessons and the development of management innovations is vital.

**RECOMMENDATIONS**

The Joint Stockholm Water Symposium/EMECS Conference recommends that all governments, intergovernmental and non-governmental organizations and other policy and decision making bodies take action aimed at reducing the pollution loads to safe levels, to enclosed coastal seas, based on the following four principles:

**Principle No.1. Pursue and holistic approach**

We must see the drainage basin and corresponding coastal sea as a dynamic whole, treating them as one complex system. The physical linkage between drainage areas and coastal sea through the mobility of water - a unique solvent that moves continuously from land to sea - demands an integrated approach to land use and water management. A systematic approach to the land-sea complex will facilitate diagnosis of physical and chemical problems, and hasten identification and implementation of remedies through holistic and proactive management.

**Principle No.2. improve understanding**

We must base the long-term sustainable management of coastal resources on the access to synthesized information about their inherent ecological, social, economic, and political importance. Finding effective solutions to prevent further pollution and restore ecosystems will depend on identifying the causal chain between destructive and polluting human activities in the drainage basin and the driving forces behind them and the degradation of coastal ecosystems. Only then can we reverse the unfortunate social and economic impacts that result from misuse of our resources.

**Principle No. 3. Develop and active dialogue**

We must base our decisions and actions on specific regional targets, and on realistic assessment of social, economic, technical, and professional resources in individual countries. International cooperation among concerned countries, and administrative responsibilities for the enclosed coastal seas should be considered as important factors to prevent continued degradation. Decisions will thus demand careful priority - setting, a process that in turn requires constructive dialogue and exchange of information between major stakeholder groups: citizens, industry leaders, farmers, fisheries, resource managers and decision-makers. Non - governmental organizations could function as active bridge-builders facilitating regional cooperation among stakeholders, municipalities and countries surrounding the world's coastal seas.

**Principle No.4. Act locally-Think regionally**

We must pursue the implementation of needed technical and legal measures on the local level. By targeting activities at the level of sub-basins, while maintaining a focus on ecosystem-wide goals based on an integrated land-sea approach, we can substantially improve efficiency and success. Building awareness among politicians, administrators, and the general public will be a crucial component in these efforts. Educational measures play an important role to achieve these goals.

**Final Comments**

The participants of the Joint Conference have finally taken note, with satisfaction, of an opportunity for further dialogue between freshwater and marine specialists at the Fourth EMECS Conference to be held in Antalya, Turkey, in November 1999, jointly with the Fourth International Conference on the Mediterranean Coastal Environment (MEDCOAST '99).

# Stockholm Water Symposium / EMECS '97 Joint Conference

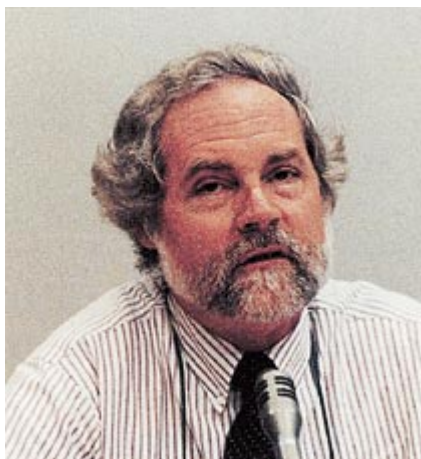
## Report from Maryland

Vice President for External Relations  
University of Maryland Center for Environmental Science

Dr. Wayne H. Bell

This was the seventh annual Stockholm Water Symposium and the third EMECS conference. It was co-organized by the Stockholm Water Company, Sweden, and the International EMECS Center, Kobe, Japan. More than 1000 delegates from 80 countries attended, making it the largest EMECS conference since this forum was initiated in 1990. Hyogo Prefecture Governor Toshitami Kaihara and Maryland Governor Parris Glendening formally convened the joint conference with speeches at the opening session.

The conference theme, "With Rivers to the Sea," brought individuals concerned with the supply and quality of freshwater together with those involved in restoring degraded coastal systems. Special presentations during the opening and closing plenaries addressed whole ecosystem problems and programs using 5 case studies as models: Baltic Sea, Chesapeake Bay (presented by A. Swanson, Chesapeake Bay Commission, and by a special display during the poster sessions), Seto - Inland Sea of Japan, Black Sea, and Lake Victoria. A series of 12 workshops on specific topics took place on the two days between the plenaries. Each workshop included presentations by an invited speaker with recognized expertise on the subject at hand, and by an invited young speaker at the beginning of his or her career in coastal research, environmental education, or management. There were approximately 300 papers and 100 posters presented at the joint confer-



ence.

Delegates from the Chesapeake Bay region actively participated in the conference as members of the Executive Programme Committee, invited speakers, workshop chairs, and workshop and poster presenters. The delegation, a cross-section of the Bay Program community, included elected officials, agency personnel, scientists, citizen group members, educators, and a graduate student in marine studies invited as a young speaker.

Formal conference products include a volume of presentation abstracts and another of poster abstracts, both of which were given to participants on arrival. Workshop chairs have prepared 1 - page summaries of their sessions for a conference report to be published in Stockholm Waterfront and the EMECS Newsletter. Extended workshop summaries, along with text of the 5 case study presentations, will be incorporated into the Conference Proceedings to be produced later in 1997. A formal edict, The Stockholm Statement on Interaction of Land Activities, Fresh-

water and Enclosed Coastal Seas, was issued at the conclusion of the conference.

### The Stockholm Statement

This formal statement of the conference's conclusions identifies 4 principles for undertaking more effective programs for sustained management of the world's coastal seas. This summary of conference findings and accomplishments from the perspective of the Chesapeake Bay delegation has been organized around these principles.

#### Principle No. 1: Pursue a Holistic Approach

The conference emphasized the growing understanding that coastal systems must be managed as whole land-sea ecosystems. Two aspects of this theme were highlighted:

##### Watershed or drainage basin

The conference theme, With Rivers to the Sea, drew attention to the influence land - based activities have on the degradation of coastal waters and loss of habitat for coastal living resources. While watershed management includes both point- and non-point pollution controls, the international community is not uniform in setting priorities. Many members of that community are concerned that non-point control may focus too heavily on nutrient runoff from agricultural land at a time when there are severe food shortages in many countries. Some delegates commented that nutrient loadings, which was the principal integrative subject



Conference venue (Stockholm City Conference Center)

under the conference theme, were drawing attention away from other pollutants such as chemical contaminants and other sources such as urban runoff. Indeed, the several presentations dealing with toxics suggested that the effects of these compounds are most pronounced on those coastal seas that have small watersheds relative to their size (surface area or volume). Despite these observations, it is clear that nutrient enrichment and its consequences in stimulating algal blooms and causing anoxia remain major world - wide concerns.

**Non-indigenous species** Case studies of the Black Sea (ctenophores) and Lake Victoria (water hyacinth) demonstrate the devastating effects introduced species can have on whole coastal ecosystems. However, the understandable emphasis of this joint conference on water quality precluded any extended discussion of living resources during the workshops or plenaries.

A holistic approach raises the problem of increasing scale in ecosystem management that was addressed in a plenary presentation by Dr. M. Kemp of the Chesapeake Bay delegation. It

is no longer acceptable to assume that predictions based on information gained from laboratory models and small-scale systems will accurately describe the future behavior of whole ecosystems. Managers need to be more aware of this uncertainty and much more research is needed to develop scaling principles that may help to reduce it.

**Principle No. 2 :  
Improve Understanding**

There is a growing appreciation that the degradation of coastal systems is less a consequence of neglect than it is a consequence of human social and economic systems. In the words of Distinguished Speaker L. Hedin, " No ecosystem on earth is buffered from human activity. "

Emphasis on what was formerly called "risk assessment" of the consequences of a particular activity is gradually turning to "environmental valuation" of the impacted resources. The joining of EMECS ' 97 with the Stockholm Water Symposium brought issues associated with clean water supply and management to the attention of the coastal seas' commu-

nity, while the workshop on ecological economics and environmental valuation significantly broadened the horizon of water managers. These are new waters that neither community yet understands clearly.

There is a tendency to look for technical solutions to coastal seas' degradation. Many conference delegates noted that three-fourth's of the world ' s population lives within 100 km the coast. Very few acknowledged that changing the behavior of those people could be instrumental in reducing coastal pollution. The adoption of a ban on phosphate-containing detergents within the Chesapeake Bay watershed is an example of such behavioral change. Similar action has not been taken under the auspices of advanced coastal programs (including the Baltic Sea). More interest was expressed about the technology of nitrogen control by biological nutrient removal than in reducing N deposition by driving automobiles less often (a scheduled workshop on control of car exhaust and atmospheric deposition was canceled due to lack of papers).

"Environmental inertia," the delay in predicted system response to intensive point-and non-point pollution control, is a concept quickly and independently emerging from long-term coastal programs such as those on the Baltic Sea, Chesapeake Bay, and Seto - Inland Sea. Groundwater pollution is being cited as the primary cause, but the fact remains that much more needs to be understood about atmospheric deposition and nutrient dynamics within whole ecosystems. Managers are especially concerned because lack of response discourages environmental program support by local jurisdictions and citizens.

### **Principle NO. 3: Develop an Active Dialogue**

Since the first EMECS conference in 1990 the world has undergone an unprecedented political revolution. What the former Soviet regimes left behind in Russia and Eastern Europe constitute an environmental disaster that whole - ecosystem programs are ill suited to address. At the same time, this political revolution is creating promising new potential for active dialogue between government officials, scientists, stakeholders, and citizens that is considered critical to the success of any coastal sea 's sustainable management program.

The perennial call for a more effective dialogue between science and management is becoming increasingly strident. Whole-ecosystem management requires knowledge of complex interactions and modeling capabilities that are at the forefront of scientific understanding. Many coastal seas are the sites of renowned research universities and marine stations. These institutions must assume major responsibility for communicating and interpreting the results of their programs to managers and the general public. And they must be more prepared to undertake research that is in direct response to management needs. " Scientists are too often concerned with doing the thing right rather than with doing the right thing."

Communication technology is advancing so rapidly that nations without access to the Internet are a vanishing exception. It already possible not only to exchange data and information electronically, but to inspect in real time the physical condition of many coastal waters around the world, links to which can be accessed via the EMECS home page

at <http://www.emecs.or.jp/>. The Internet can be an incredible learning tool if greater care is taken to help the user interpret the information that is posted to it.

The United Nations and institutions such as the International ENECS Center offer many capacity-building programs for developing nations. These programs often target local environmental managers. An active dialogue requires better understanding of environmental issues on the part of businesses and the citizens themselves. Capacity-building should not overlook the stakeholders. Further, such programs can make better use of a given country's existing capabilities. Environmental education programs for young people and adults alike could be effectively delivered through existing school systems. When it comes to an active dialogue on environmental issues, school teachers are an under-used resource.

An active dialogue is dependent on the existence of a civil society where the exchange of information is encouraged and points of view freely discussed. There is cause for optimism in seeing so many nations on the brink of creating such societies where secrecy and autocracy once dominated and seriously limited their environmental programs.

### **Principle No. 4: Act Locally Think Regionally**

Despite the importance of a holistic approach to sustainable coastal seas management, environmental awareness remains greatest at the local level. The very complexity of large-scale environmental programs makes it difficult to engender public understanding and support for their goals. This disconnect with local issues also threatens the cultural heritage of

coastal societies which has always been the single most important catalyst for environmental action.

Multi-jurisdictional programs are best implemented at the local jurisdictional level. The Chesapeake Bay tributary strategies, for example, divide the watershed into local components to address different local sources of pollutants. The Helsinki Commission coordinates local implementation of pollution control by each of the 9 countries on the Baltic Sea Watershed. In the case of the former Soviet nations of Eastern Europe, local programs are presently the only feasible actions that can be undertaken to begin the restoration of seriously degraded lakes, rivers, and coastal seas. Nevertheless, the integrative role that multi-jurisdictional programs play is extremely important. Local initiatives would not share common goals were it not for such entities as the Helsinki Commission, Chesapeake Bay Program, or Seto Inland Sea declaration. In the Black Sea, for example, environmental pollution from the Danube can related in part to the fact that there are 11 political jurisdictions on the watershed with no single integrative program.

Coastal societies enjoy a deep and abiding cultural legacy. The sea is a dominant feature in their folklore, their art, and their literature. Chesapeake Bay delegate R. Collins defined this sense of place as "caring capacity," and it should be as much a target of capacity-building programs as the local resource management community. Enhancement of caring capacity should not just be relegated to environmental educators; it requires the teaching of topics related to the environment in the sciences and in the arts. "If people think they linked to the environment, they will behave differently."

observed a delegate from Mexico.

Many delegates were astonished to learn that the Chesapeake Bay Program relies principally on voluntary participation. This may be a consequence of the U. S. political system, but it also reflects a strong public identity with the Bay or with the farmland that ultimately impacts it upstream. The level of voluntary public participation, as witnessed by the diversity of the Chesapeake Bay delegation itself, had a very positive impact in drawing attention to importance of caring capacity in developing sustainable coastal seas' management programs.

Management has a key role to play as an integrator of local programs into the large-scale restoration effort. This role is greatly promoted by advances in electronic communication and by the growing family of civil societies among which information is more freely exchanged. Holistic management places an additional premium on the need for better dialogue with the scientific community. Integration of local identities and actions has the potential for expanding the local sense of place into a regional and, ultimately, global environmental concern. Delegates were

struck by the message contained in a poster prepared by the host organization that depicted the earth surrounded by a drop of water.

Two additional accomplishments are not readily incorporated under the Stockholm Statement:

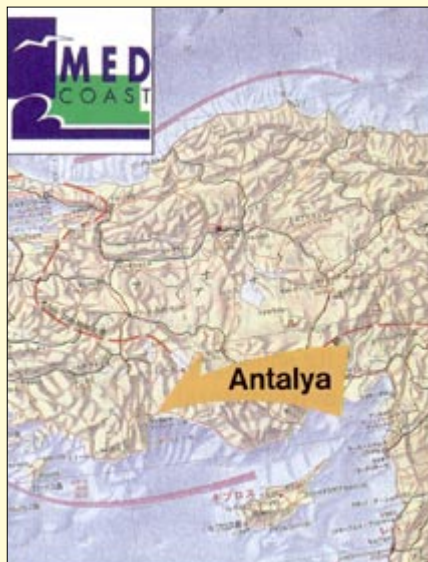
Although the world ' s coastal seas remain seriously threatened and the task to restore them is daunting, there have been successes. Examples include control of pesticides and PCB's that have resulted in recovery of seals and white-tailed eagles in the Baltic; point-source pollution control that has reduced the incidence of toxic red tides in the Inland Sea of Japan; and the phosphate detergent ban that has significantly decreased the loadings of this nutrient to Chesapeake Bay. In fact, point-source controls continue to reduce nutrient loadings to many coastal waters even though "environmental inertia" may preclude any observable improvement in water quality at the present time. While successes such as these have not reversed global trends, they provide evidence that environmental programs can work and that the degradation of the world ' s coastal seas is not a necessary consequence of human impact

on these ecosystems.

National leadership is essential and highly effective. The Mayor of Riga was very impressed that Governors Glendening and Kaihara not only came to the conference but made substantive contributions through their respective speeches. He pledged to carry their message and their example back to his colleagues in Latvia and other nations in the southern Baltic.

Finally, representatives from the Stockholm Water Company echoed an opinion expressed by many delegates that the inclusion of stakeholders to the conference was an "exceptional perhaps even unique accomplishment." This is a hallmark of EMECS. These stakeholders, and the countries they represent, should be increased in number and their active participation ensured when the next conference takes place in conjunction with MEDCOAST in Antalya, Turkey, in November 1999.

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### 4th EMECS Conference

As announced at the end of the joint 3rd EMECS Conference / 7th Stockholm Water Symposium in Stockholm, the 4th EMECS conference will be held from Monday, November 2 to Friday, November 6, 1999 in the city of Antalya, Turkey, a beautiful resort on the Mediterranean Sea. This will be a joint conference with the Fourth International Conference on the Mediterranean Coastal Environment (MEDCOAST '99). The schedule for events leading up to the conference is shown below. Further details will be given in the First Announcement to be issued in January 1998. These will be mailed to readers of the EMECS Newsletter as soon as they published by the MEDCOAST Secretariat.

- 1998
- February: Announcement issued (call for papers)
- September: Deadline for submission of abstracts
- December: Notification of the results of the abstract review
- 1999
- January: 2nd Announcement issued (announcement of accepted papers)
- August: 3rd Announcement issued (conference program)
- September: Deadline for early registration
- November: Conference begins

#### MEDCOAST Secretariat

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## A New International Organization to Overcome the Crisis in the Global Water Environment.

### The Global Water Partnership (GWP)

Professor Saburo Matsui

Director, Environmental Quality Control Research Center, Department of Engineering, University of Kyoto

Forecasts for the global environment in the 21st century are showing signs of crisis from all sides. Water environments in particular are beset by competition and contradictions between the four principal users of water; agriculture, municipalities, industry and nature conservation. Viewed in terms of water quantity and water quality, it is agriculture that uses the most water, followed by industry and the cities, leaving barely enough for the natural environment to exist. From the standpoint of water quality, the greatest polluter of water is industry, followed by municipalities and agriculture.

In those parts of the developing world where there is little rainfall for example, the Sahara Desert and South Africa in Africa, the Mideast, central Asia and the southern part of South America the main industry is agriculture. Yet in these areas the population is increasing rapidly, and the lack of water makes it difficult to increase agricultural yields. Making matters even more serious is the fact that people are leaving the farms and moving to the city centers, creating slums and accelerating the already serious shortage of water in urban areas. In these countries, farms and cities compete for the water distributed by rivers. The quality of the water sources used by the cities is severely affected by the pollution from chemicals used by farmers. Moreover, the fast-growing slums lack both the waterworks that could supply safe drinking water and any measures to dispose of human wastes and ensure proper sanitation. This is one of the factors that results in infant mortality rates that are sometimes twenty times the rates found in the developed world. Meanwhile, the high death rate spurs people to have more children and thus is one of the factors that results in a population increase, creating a vicious cycle. In developed nations, the use large quantities of the nitrogenous fertilizers that helped increase agricultural yields (in only the past 50 years) has made it impossible for people to use the crucial ground water that has become contaminated with nitrates. Rivers, lakes and ground water are also being polluted by inadequate processing of waste water and garbage from the cities and drain water and waste from factories. Although the competition and contradictions surrounding water use



are becoming more and more complex, the one thing that has not changed is that nature (meaning living things other than man) is still last in line when it comes to obtaining water, and we are at last coming to realize that the decimation of nature is a sign that mankind's existence is also in danger. In the "Agenda 21" adopted at the Rio Conference held in 1992, Section 18 is entitled "Measures for Sustainable Use of Freshwater Resources." This section describes the current problems in developing nations and points out ways of resolving these problems. However, there was no organization that could implement practical action on a worldwide scale. It was suggested that a single body was needed at which all of the world's organizations and individuals who use water could exchange views, within the framework of that single organization, and create solutions founded on scientific grounds. On August 9 of this year, such an organization was founded in Stockholm, Sweden. Its name is the Global Water Partnership (GWP). Spearheading the move to create the new organization were Ismail Serageldin, vice-president of the World Bank, Johan Holmberg, Director of the Bureau of Natural Resources and the Environment of the Swedish International Development Authority (SIDA), and Anders Wickman, assistant superintendent of the United Nations Development Programme (UNDP). The founders are asking for contributions to the new organization, in the form of yearly dues, from the overseas assistance organizations in various countries, United Nations organizations involved with water issues, international organizations of scholars, non-governmental organizations (NGO), individual re-

searchers, and private organizations (both companies and consultants). The consulting groups and advisory committees of the Global Water Partnership are made up of representatives from organizations involved with water issues, as well as individually chosen representatives. In the future, regional consulting groups will be established in each part of the developing world. These groups will, on a volunteer basis, exchange information regarding problems with the water environment in developing countries, particularly the integrated management of water resources in both land areas and drainage basins, and propose methods for cooperation and assistance in resolving these problems. Even looking only at the situation in Japan, the separate, vertically structured central government agencies that deal with water issues have clearly reached the limit of their effectiveness, and control of drainage basins is needed to preserve the water environment and ensure efficient water use in terms of both quantity and quality. This is becoming necessary for rivers that cross international boundaries as well as those within the borders of both developed and developing nations. The Global Water Partnership will meet in early August of each year following the Stockholm Water Symposium. (In August of this year, the 7th Stockholm Water Symposium was held as a joint conference with the third International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS), and sponsored jointly with the International EMECS Center, with the theme "WITH RIVERS TO THE SEA" on the continuing problems in rivers and sea environments.) As the active participation and direction of the World Bank and the UNDP will form the foundation of the new organization's activities, it is expected to play a major role in efforts to resolve the problems facing the global water environment. >From Japan, active support will be needed from the Japan International Cooperation Agency (JICA) and other international aid organizations.



Saburo Matsui

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Committee Foundation (ILEC) / Member, Science Committee,  
Stockholm Water Symposium / Member, Scientific Advisory  
committee, United Nations Environmental Programme  
International Environmental Technology Center (UNEP / IETC)

## Forthcoming Conferences

### March 10-13, 1998

Oceanology International 98-The Global Ocean Exhibition & Conference Brighton, U.K.  
**Contact:** Spearhead Exhibitions Ltd. Ocean House  
**Address:** 50 Kingston Road, New Malden, Surrey KT3 3LZ U.K.  
**Fax:** +44 181-8186  
**E-mail:** versha @ spearhead. co. uk

### March 11-13, 1998

Options for Closed Water System-sustainable water management Wageningen, the Netherlands  
**Contact:** Joost Meulenbroek  
**Address:** Congress Office WAU. Costerweg 50, 6701 BH Wageningen, the Netherlands  
**E-mail:** joost.meulenbroek@alg.vl.wau. nl

### May 15, 1998

Second Black Sea International Conference on Environmental Protection Technologies for Coastal Areas  
**Contact:** Tzvetanka Anguelova  
**Address:** Black Sea Conference, BNAWQ Oborishte Str. N: 3, Sofia 1504, Bulgaria  
**Fax:** +359-2-43-55-19  
**E-mail:** waterql @ ttm. bg

### May 20-23, 1998

International Conference on Water Quality Management in National Parks & Other Protected Areas Primosten, Croatia  
**Contact:** Bojan Zmaic  
**Address:** Rakusina 1, 10000 Zagreb, Croatia  
**Fax:** +385-1-61-19-588  
**E-mail:** bzmaic @ zg. igh. hr

### May 25-29, 1998

International Conference on Education and Training in Integrated Coastal Area Management - The Mediterranean Prospect Genoa, Italy  
**Contact:** Sceretariat  
**Address:** Stefano Belfore, Francesca Borneto, Ombrina, Pistarino  
**Fax:** +39 10-209-5840  
**E-mail:** icoops @ polis. unige. it

### June 18-20, 1998

Environmental Management in the Mediterranean Region  
**Contact:** Prof. Gunay Kocasoy  
**Address:** Bogazici Univ. 80815 Bebek, Istanbul, Turkey  
**Fax:** +90-212-265-1800

### June 21-26, 1998

Water Quality International 19th IAWQ Biennial International Conference & Exhibition  
**Contact:** WQI '98 Conference Secretariat  
**Address:** 645-375 Water Street, Vancouver BC, V6B 5C6 Canada  
**Fax:** +1 604 681-2503

### August 10-13, 1998

8th Stockholm Water Symposium Stockholm, Sweden  
**Contact:** Stockholm Water Symposium  
**Address:** SIWI SE- 106 36 Stockholm, Sweden  
**Fax:** +46-8-736-20-22  
**E-mail:** sympos @ siwi. org. se

### November 2-6, 1999

4th MEDCOAST / 4th EMECS Antalya, Turkey  
**Contact:** Chairman Erdal Özhan, MEDCOAST  
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## Bulletin Board

### International EMECS Center Moves to a New Location

At the end of March 1998, the International EMECS Center will move to the IHD Building in the new city center that is being constructed in the eastern part of Kobe. The new location should improve



office operations and make it easier for visitors to use our facilities.

### Visit Our Home Page !

The International EMECS Center home page, which went online in June 1997, is intended to serve as a database for information on the Seto Inland Sea and other enclosed coastal seas throughout the world. We hope that all relevant institutions and researchers will contribute data and lend their support toward the achievement of this goal. You can access the International EMECS Center home page at the following URL: [http:// www. emecs. or. jp](http://www.emecs.or.jp)



### 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. The next issue is scheduled for publication in March 1998. Contributions from readers (reports of research in enclosed coastal seas, conference information, etc.) would be greatly appreciated.

### All submissions to: International EMECS Center

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