

EMECS NEWSLETTER

13

International EMECS Center

MEDCOAST99-EMECS99 Joint Conference

9-12 Nov.1999
Antalya, Turkey



MEDCOAST99-EMECS99 Joint Conference was held over a period of four days from November 9 through November 12 at the Hotel Dedeman in Antalya, Turkey. The conference, whose theme was "Land - Ocean Interactions: Managing Coastal Ecosystems," was attended by 300 delegates from more than 50 countries.

Despite the massive earthquake that had occurred in Turkey in August, the joint conference proceeded on schedule thanks to the warmth and support of the local community. Researchers from around the world gathered in the lovely Mediterranean town of Antalya, located on the shores of the Turkish Riviera, to debate issues and deepen ties. On the final day, the delegates adopted the "The Antalya Declaration of Coastal Seas". It was also announced that the next EMECS conference would return to the venue of the very first EMECS conference, the city of Kobe and the nearby island of Awaji, Japan.

Opening Ceremony and Commemorative Address

The joint conference began in a relaxed atmosphere with a performance of classical music by local musicians. Dr. Erdal Ozhan, MEDCOAST conference chairman, and professor of the Middle East Technical University, officially welcomed the delegates on behalf of MEDCOAST, one of the two sponsoring organizations. In his address, Dr. Ozhan gave a brief outline of MEDCOAST activities and discussed the events leading to the decision to hold the conference jointly with the EMECS conference. Representing EMECS, the other sponsoring organization, Mr. Toshitami Kaihara (Chairman, Board of Directors, International

EMECS Center and Governor, Hyogo Prefecture), also welcomed the delegates to the conference. Mr. Kaihara first expressed his condolences regarding the destruction and loss of life resulting from the earthquake. He also emphasized the Center's resolve to continue to promote EMECS activities that seek the participation of organizations and researchers working to preserve enclosed coastal sea environments both at home and abroad in the effort to achieve sustainable development that balances the preservation of nature and ecosystems with societal needs. Mr. Kaihara also announced that the fifth EMECS conference would be held in Japan in the year 2001.

Additional words of welcome were heard from

several invited guests: the chairman of the Environmental Affairs Committee in the Turkish parliament and Antalya's mayor and provincial governor. In his address, the Environmental Affairs Committee chairman thanked Governor Kaihara and Mr. Jyozo Takeda, chairman of the Hyogo Prefectural Assembly, for the earthquake relief aid provided by Hyogo Prefecture.

Following on from this, a commemorative address entitled "Protecting Water Resources and the Bio-Environment: A Priority Policy for the Millennium" was given by Dr. Agni Vlavianos-Arvanitis representing the Biopolitics International Organization.

Keynote Addresses

Keynote addresses were given on two days, November 9 and 12. On November 9, there were presentations by three speakers: Mr. David Carroll (Board of Directors, International EMECS Center and Former Secretary, Maryland Department of the Environment, USA); Professor-Emeritus Bengt-Owe Jansson (Board of Directors and Scientific & Program Committee, International EMECS Center and professor emeritus, Stockholm University) and Mr. Yoshiaki Asano (director of the Office of Seto Inland Sea Environmental Conservation, Water Quality Bureau, Environmental Agency of Japan). The speakers reported on the current situation of, and future prospects for, environmental management in Chesapeake Bay, the Baltic Sea and the Seto Inland Sea, respectively.

On November 12, Dr. Adalberto Vallega (professor at the University of Genoa) spoke on ecosystem-related ocean management at the regional level; Dr. Harry Coccossis (University of Aegean) discussed integrated coastal zone and river management and planning; and Dr. Vittorio Barale (Joint Research Center of EC, SAI) spoke on the future of the Mediterranean from the perspective of satellite monitoring.

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Sessions (Oral Presentations)

In the four days from November 9 through November 12, fifteen sessions were held with presentations by about 90 speakers (15 of them from Japan), on topics that included environmental management, protection and restoration; environmental control of coastal zones; cultural treasures; interaction between land and sea regions; environmental education; changes in sea level and hydrodynamics; water pollution; seawater quality management and technology; sustainable development; ecosystems; and beaches and the tourist industry.



Poster Presentations

The poster sessions, with approximately 100 posters (29 of them from Japan), were held on November 10 and 11.



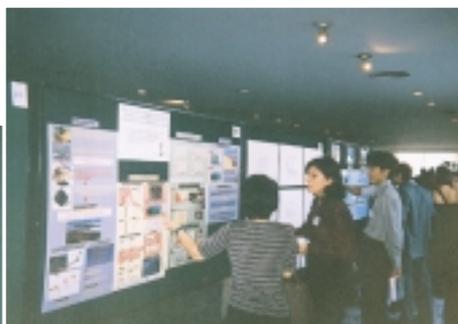
Workshops

On November 11 and 12, four workshops were held on the topics of "Environmental Management in the Black Sea" "Water Quality Modeling" "Remote Sensing" and "Economic Instruments". The Black Sea workshop was sponsored by the Japan Foundation based on the recognition that



environmental management in the Black Sea, which is bordered by six nations and fed by the Danube River that flows through 17 countries, will require wide-ranging cooperation from international organizations and relevant countries and groups, as well as verification based on the experience Japan has had in a similar context. The participants,

who discussed measures that should be taken in the Black Sea, included three researchers from Japan: Dr. Tomotoshi Okaichi (Professor Emeritus, Kagawa University), Dr. Tetsuo Yanagi (Professor, Kyushu University) and Dr. Masao Ukita (Professor, Yamaguchi University), and several researchers from Europe: Dr. Samuel Sage, Dr. Valentin



Bou, Dr. Sule Gunes, Dr. Arsen Pavasovic, Dr. Leonid Yarmak and Dr. Plamena Borisova and so on.

Closing Ceremony

The closing ceremony, which was held on the evening of November 12, was presided over by MEDCOAST chairman Dr. Erdal Ozhan and Professor Nobuo Kumamoto (Scientific & Program Committee, International EMECS Center and President, Hokkai-Gakuen University). The Antalya Declaration of Coastal Seas drafted by the



Antalya Declaration Drafting Committee (made up of Dr. Wayne Bell, Dr. Adalberto Vallega and Dr. Arsen Pavasovic) was read by Dr. Wayne Bell (Executive Committee and Scientific & Program Committee, International EMECS Center). The Declaration was subsequently adopted unanimously by the delegates.

After this, the Best Poster Prize Selection Committee (Dr. Kuns Hans, Dr. Allan Williams and Dr. Masataka Watanabe) announced the three winners of the Best Poster Award who included Dr. Shigeru Montani of Japan.

Presents were exchanged between MEDCOAST and EMECS representatives commemorating the hard work on the part of both organizations that culminated in bringing the conference to a successful conclusion.

Finally, a message from Dr. Jiro Kondo, President of the International EMECS Center, was read by Dr. Tomotoshi Okaichi (Executive Committee and Scientific & Program Committee, International EMECS Center and Professor Emeritus, Kagawa University), and a message from Mayor Kazutoshi Sasayama of Kobe City inviting the delegates to the 5th EMECS Conference in 2001 was conveyed by Mr. Osamu Yamamoto, head of the Kobe City Environment Bureau.

Following a witty speech on the success of the conference given by Dr. F. van der Meulen of the International Coastal Zone Management Center, the achievements of the joint conference were summed up by chairman Erdal Ozhan and declared officially closed.

SESSION PROGRAM

- No.1 Keynote Speech 1 (David A.C. Carroll, Bengt-Owe Jansson, Yoshiaki Asano)
- No.2 Land-Sea Interaction / Costal Management / Costal Engineering
- No.3 Costal & Marine Biology / Training, Education, Human Resources / Development, Costal Erosion & Shoreline Management
- No.4 Costal Marine Policy, Legistration / Costal Hydrodynamics
- No.5 Poster Session 1
- No.6 Conservation Management / Costal Water Quality and Management / Black Sea Workshop(1)
- No.7 Ecology, Ecosystem Management / Beachs and Costal Engineering / Black Sea Workshop(2)
- No.8 Restoration and Preservation, and Protected Areas / Tourism and Beaches / Black Sea Workshop(3)
- No.9 Poster Session2
- No.10 Keynote Speech2(Adalberto Vallega, H.Coccossis, Vittorio Barale)
- No.11 Land - Sea Interaction 2 / Economic Instruments Workshop Session / Hydrodynamic & Water Quality Modelling Workshop Session
- No.12 Workshop(Remote Sensing, Economic Instruments, Hydrodynamic and Water Quality Modelling)

THE ANTALYA DECLARATION OF COASTAL SEAS

This declaration is issued by more than 300 delegates from 50 countries who participated in the joint international conference, MEDCOAST '99/EMECS '99, Antalya, Turkey. The conference represents the convergence of two perspectives for improving environmental management of coastal seas: MEDCOAST, a regional initiative for the Mediterranean Sea and Black Seas, and EMECS, a global forum for policy makers, scientists, engineers, educators, and members of non-governmental organizations that is coordinated by the International EMECS Center, located in Kobe on the shore of the Seto Inland Sea of Japan. The unifying conference theme was, 'Land-Ocean Interactions: Managing Coastal Systems'.

We begin our conclusions with an allegory:

As the MEDCOAST and EMECS initiatives approach the end of their first decade, we recognize that we have crossed a familiar coastal landscape. We stand now overlooking a coast where a vast new sea sparkles in the sun. Today we see only a little of this new coastal sea, but future generations will surely walk its shore, sail its waters and harvest its resources.

The familiar landscape is still well marked by traditional boundaries. There are the political lines of local jurisdictions, states and nations. Researchers continue to define ecological differences between river, bay, land and sea. Each of us has become comfortable in our individual roles as biologist or hydrologist, engineer or manager, policy maker or citizen.

The new sea before us appears to be boundless. Automated monitoring techniques are generating large amounts of information, much of it in real time, that shows how the sea changes from day to day, month to month, year to year in response to changing land use and global climate trends. Satellite images are revealing how local coastal problems relate to regional sea processes and to those of the world ocean. Electronic communication is making this wealth of new information available to everyone at the same time: researcher, political official and concerned citizen alike. It is truly a seascape without familiar boundaries; its navigator is technology; day and night no longer dictate how clear we view its waters.

The participants in MEDCOAST '99/ EMECS '99 invite our regional and global colleagues to join us in the task of building the best vessels possible to help our children and their children navigate this new seascape and sustain the full potential of its resources. We will work together across traditional boundaries and assume personal responsibility for achieving our goal, irrespective of our nation, our discipline, or our role in life. We will meld old values into a new ethic that takes into account the true contribution a clean and healthy coastal environment makes to our social and economic well being. Finally, we will use new information technology to provide to those who teach our young people the products of our research, the fruits of our wisdom and the benefits of our experiences.

We recommend that the following actions be undertaken by those who conduct national, regional and international environmental programs, as well as by individual policy makers, engineers, scientists, and concerned citizens:

1. Make every effort both to encourage and to improve communication between researchers and policy makers to ensure that environmental management of coastal seas is based on sound scientific information obtained by using the best technology available.
2. Pursue an interdisciplinary approach that includes not only the natural sciences and engineering but also economics, law, ethics, and aesthetics as the bases of more effective environmental policy, using coastal seas as excellent models for applying new remote sensing technologies and dealing with the complex interaction between land, water, and human endeavors.
3. Give paramount importance to active and informed public participation making every effort to inform citizens, directly and by working more closely with non-governmental organizations, about what all people can do to improve their coastal waters and sustain their irreplaceable resources.
4. Develop a new kind of environmental education for our young people, one that directly involves their schools and available Internet resources, enabling the use of coastal seas data and information to enrich curricula not only in science and mathematics but also in history, literature, and the arts.
5. Recognize the urgency of restoring and conserving coastal environments by turning policy into practice, realizing theory by taking action, sharing our knowledge and experiences instead of keeping them to ourselves, and eliminating delay by moving now.
6. Strengthen cooperation at local, national, and regional levels, recognizing that land-sea interactions transcend political boundaries and are part of the global ecosystem which we all share.

We encourage governments and organizations that fund environmental programs to join this commitment by providing urgently needed resources, paying special attention to the protection and restoration of coastal seas in developing regions. We recommend that such support be provided to help all nations, including those of the Black Sea area, to become full participants in regional and global initiatives for improved environmental management of the world's coastal seas.

Let us begin now!

Antalya, Turkey
12th November 1999

Opening Remarks

Dr. Erdal Ozhan
MEDCOAST



Governor Kaihara of the Hyogo Prefecture, Speaker Takeda of the Prefectural Assembly, Parliamentarian Ediz Hun, Governor Dokuzoglu of Antalya Province, and Mayor Kumbul of the Metropolitan City of Antalya, distinguished guests and participants of the Joint Conference, ladies and gentlemen.

It is my great pleasure this morning to make the opening speech of MEDCOAST 99 - EMECS 99 Joint Conference, which happens to be the fourth in both series. The idea of the Joint Conference dates back to the summer of 1993, when I participated in the second EMECS conference in Baltimore, Maryland. The idea was further developed during the second MEDCOAST conference Tarragona, Spain in the fall of 1995. After my membership of the Program and Scientific Committee of the International EMECS Center in 1996, both sides formally agreed to organize the joint conference with the theme of "Land - Ocean Interactions: Managing Coastal Ecosystems".

Our goal was to emphasize the important role of the land activities on the seas, and vice versa, and the importance of the "ecosystem approach to management". The event which we are starting this morning is the outcome of almost three-year long intensive work by the International EMECS Center and MEDCOAST.

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Despite the improvement, over the last three decades, in our understanding of the ecological and economic potential of the coastal and marine areas, and worldwide concern for the deterioration of the coastal and marine environment, and resources, these valuable areas are still misused and poorly managed in many localities worldwide. You may find several examples in the proceedings of the Joint Conference, illustrating the problems, which arise as the consequences of mismanagement. On the other hand, I am very pleased to mention that, there are also several reports in the proceedings, presenting not only the problems faced, but also the efforts for ecological and environmental restoration and rehabilitation of the damaged areas.

It is now well understood that the goal is not to repeat the mistakes of the past, and to pursue a pro-active management strategy for avoiding adverse environmental and ecological changes caused by the economic development and the human activities. The Joint Conference provides an ideal opportunity to learn from the experiences elsewhere, and to initiate joint efforts, both international and interdisciplinary, which aim the understanding of the system that needs to be managed, and the rules of good management.

Contribution to the above process at the Mediterranean and the Black Sea scale, has been the main drive for the MEDCOAST initiative, which emerged as the voluntary efforts of several concerned academics in 1990. The first MEDCOAST event was the 1993 conference organized in this same hotel. Since then, due to self sacrificing efforts of the MEDCOAST friends, MEDCOAST has grown to be a highly valued institution, contributing to the coastal and marine management over the Mediterranean and Black Sea basins, and elsewhere, through activities in several directions.

Organization of scientific and professional meetings is one of these. MEDCOAST has organized 6 international conferences over the last 6 years. These meetings have generated a wealth of useful data and information, which has been published in 12 volumes, adding up to almost 10,000 pages. The second strong line of action of MEDCOAST has been training and education at regional level. MEDCOAST has organized 6 international training programs on "integrated coastal management", and another 4 on "beach management" since 1994. We are now proud with more than 200 MEDCOAST alumni, representing 33 countries. Our alumni form the most important part of the MEDCOAST family, which we have been trying to develop for the protection and enhancement of the environmental and ecological values and resources of the Mediterranean and the Black Sea, through cooperative actions and programs.

These efforts of MEDCOAST were internationally recognized in 1997, when we were given the world's most prestigious marine award, the "PEW Fellows Award

for Marine Conservation". I am also pleased to inform that MEDCOAST has recently been elected as one of the NGO members of the Mediterranean Commission for Sustainable Development, which operates under the Mediterranean Action Plan of UNEP. This will open MEDCOAST a new avenue for contributing to management of the Mediterranean's coastal and marine areas.

I am also personally proud to be a member of the EMECS family, in my capacity as a member of the Program and Scientific Committee of the International EMECS Center. EMECS ideal has emerged at a very right time, and has made very significant, worldwide contributions since its inauguration with the first conference in Kobe in 1990. I would like to extend my heartfelt congratulations to Governor Kaihara of the Hyogo Prefecture, for his vision and leadership, for the initiation of the EMECS ideal and for its successful development.

Ladies and Gentlemen, I would like to conclude my opening speech by a few facts about our Joint Conference. We have three types of presentation sessions: Keynote, parallel and poster. Poster presentations form an important part of the Joint Conference, and we will have two such sessions, Wednesday morning and Thursday afternoon. A Jury will review the posters, and we will provide awards to the best three selected by the Jury. Then, we have four small workshops in the conference program.

The themes are; the Black Sea, the use of economical tools, the use of remote sensing for coastal and watershed management, and coastal water quality modelling. I do hope that you will find at least one of these workshops interesting, and will contribute to the discussions. Finally, we will produce a Joint Conference Statement in collaborative efforts. Three distinguished friends, Wayne Bell of University of Maryland, Arsen Pavasovic, the former director of Priority Actions Programs Regional Activity Center of Mediterranean Action Plan, and Adalberto Vallega of University of Genoa, have agreed to form the Conference Statement Reduction Committee. They will work to produce a draft statement. This draft will be made available to all participants with a request to contribute to its content. After receiving your inputs, the draft will be finalized and will be presented in the closing session for endorsement.

Ladies and Gentlemen, a busy program is ahead of us. I very sincerely hope that you will find the Joint Conference valuable and enjoyable!

Thank you all!



Mr. Toshitami Kaihara
International EMECS Center



Parliamentarian of Turkish Ediz Hun, Governor Dokuzoglu of Antalya Province, Mayor Bekir Kumbul of the City of Antalya, President C. Tayyar Sadiklar of the Turkish Japanese Foundation, and other honored delegates:

It is a great honor for me to address you at this MEDCOAST 1999 / EMECS '99 joint conference here in Antalya in the Republic of Turkey.

I would like to begin by expressing my deepest condolences to the people of Turkey regarding the loss of life and destruction caused by the recent earthquake.

We at the International EMECS Center have a special understanding of the suffering that you have been through. In January 1995, a magnitude 7.2 earthquake struck Kobe and the surrounding Hanshin-Awaji area, an area that is home to some 4 million people, causing massive destruction and tremendous loss of life. At that time, the large donations of aid and supplies sent by 72 countries and regions were a source of great comfort and encouragement to the people of the quake-stricken region. In the four-and-a-half years since the earthquake, recovery efforts have made great progress. I would like to once again express my profound gratitude for your generous assistance in our time of need. It is my hope that our experience, including both our successes and shortcomings, can be of some assistance in helping the people of Turkey to effect a speedy recovery. If there is any way in which we can be of help, we would be pleased to do whatever we can.

Turning to the topic of enclosed coastal seas, although improvements can be seen in the environments of some enclosed coastal seas throughout the world, many still suffer from the degradation of habitats, declining numbers of both species and populations, and reduced fishing catches. If this trend continues, enclosed

coastal sea environments will continue to worsen, possibly having an enormous impact on the global environment as well. Measures to correct this situation must be implemented without delay.

Under these circumstances, I think it very timely that we are able to hold the fourth EMECS conference jointly in partnership with the fourth in the series of highly successful and distinguished MEDCOAST conferences, under the theme "Land - Ocean Interactions: Managing Coastal Ecosystems."

By providing a forum for prominent researchers, scientists, private citizens, government officials and other parties working in both land and ocean regions to gather together and go beyond the boundaries of their individual disciplines in considering these issues, the joint conference will make a major contribution to the development of new techniques for managing coastal regions and surveying ecosystems. It will also help in the task of considering future directions for the relationship between land and sea regions and ensuring the future harmonious coexistence of human beings and nature.

Looking back on some of the achievements of past EMECS activities:

(a) In 1990, the first EMECS conference was held in Japan, concluding in the adoption of the Seto Inland Sea Declaration.

(b) Then, in 1993, the second EMECS conference was held in Baltimore, Maryland in the United States with the theme "Toward Effective Governance." The Declaration of Principles from EMECS '93 which was adopted at the conference called for the establishment of an international organization in Japan to serve as the nucleus for research and informational exchange.

(c) And in 1994, the International EMECS Center was established.

Based on the Stockholm Statement adopted at the third EMECS conference, held in Stockholm in 1997, the International EMECS Center has worked to use a network of personnel and information created through the international conferences held up to now, in order to accomplish two goals:

(a) firstly, to create an information system to gather and disseminate comprehensive information on preserving and creating enclosed coastal sea environments;

(b) secondly, to create regional networks.

There is still much work that must be done, but with the continued cooperation and assistance from relevant parties we will continue to improve and expand these activities.

The International EMECS Center is working toward the goal of "attaining the sustainable development of nature, ecosystems and human society in a harmonious and balanced manner," through the effective use of its network and database and the participation of the organizations and researchers that are working to preserve enclosed coastal sea environments both at home and abroad. We are working to accomplish this goal in three ways:

(a) by expanding and upgrading our survey and research functions and information systems;

(b) by conducting research into such topics as plans for the restoration of environments in coastal regions; and

(c) by proposing our achievements and the knowledge we have gained as policy options and presenting the results at the 5th EMECS Conference in the year 2001, for which the venue will revert to Japan.

Before closing, I would like to express our profound gratitude to Dr. Erdal Ozhan, MEDCOAST conference chairman and professor of Middle East Technical University; to the members of the Executive Programme Committee; to the members of the MEDCOAST Secretariat; and to the many other people in Turkey whose friendship, dedicated cooperation and enthusiasm over a period of more than a year, in spite of the difficulties caused by the recent earthquake, have made this joint conference a reality.

Turkey has been called the birthplace of civilization, a bridge between Asia and Europe. Ancient historical sites are scattered throughout the country, displaying the unique features of each of these myriad cultures. The first community was established in Catal Huyuk in the Neolithic era around 6,500 B.C. Since that time, Turkey's glorious culture has continued to thrive through the centuries up to the present, making major contributions to modern culture in many parts of the world. I am both delighted and very grateful that we are able to hold this joint conference, a forum for creating new information and forming new ties, in such a location.

And finally, I would also like to take this opportunity to invite all of you present here today to come to Japan in the year 2001 to the EMECS 2001 conference, which will be based on the past ten years of EMECS research and achievements. I look forward to seeing you all there.

Thank you very much.



Dedeman Hotel Antalya



Commemorative Address

"Protecting Water Resources and the Bio-Environment: A Policy for the Millennium"

Dr. Agni Vlavianos-Arvanitis
The Biopolitics International Organization



Dear Friends, It's a unique privilege, honor and joy to be here today, and to be able to thank Professor Ozhan for this very kind invitation and to have the opportunity to congratulate you for this enormous success of bringing together MEDCOAST and EMECS. I would like to take this opportunity to greet Governor Kaihara. I was in the EMECS Conference in your beautiful country. Also, please convey my highest esteem to Professor Kondo, a great friend. I would like to greet distinguished friends, and the honorable parliamentarian, Ediz Hun. I would like to thank him very much for his greetings. The mayor Bekir Kumbul, Ertugrul Dokuzoglu and all the dear friends who welcome us here today. Thank you.

It is a hard task to capture some needed dimensions of thinking in just ten minutes. But I would like to try. Also I would like to share with you some feelings that are based mainly on what a little child said to his father in the late 80's.

The father was the ambassador of Morocco in Athens. The son said, "Father, what are we doing with the environment?" The father had not thought much about the environment yet. But the little boy went on to say, "I think I can have children. But will I be able to have grandchildren?" He was only an eight-year old boy at that time. Since that time, the father became very committed to all environmental issues. So, this is basically the issue that we deal with in the Bio-politics International Organization.

How can we all share the deep responsibility

for what we possess -the greatest gift, the greatest source of joy, and unified vision- which is bios, life itself. With all of our great technology, we have been able to see the micro-cosmos and the universe. We have learned so much about the micro-cosmos and the miracle of life at the micro-cosmic level.

However, we have not been able to find life on any other planet. As a result, we share a unique responsibility and we share this responsibility at a moment when the swing of the pendulum of time is forcing us to understand our use of space. However, the understanding of time is also of utmost importance, because the gift of life has existed with us for hundreds of millions of years. And yet, as human beings, we have come to raise our arrogance to the point where life itself is threatened - where we think that everything belongs to us. Consequently, we keep on dividing this tiny little spot - the globe - into smaller and smaller pieces. So, finally here as people from Japan and people from the Mediterranean Coast have come together, we may begin to understand that we have ways of sharing and that we have common needs to save coastal seas and water resources which are so basic to life. We have a unique opportunity to start thinking of the new vision that needs to be established before the change of millennium. This meeting may be of utmost importance for arriving at the resolutions that could make a difference to the entire world. The swing of a pendulum can bring new hope, but at the same time, the pendulum of time brings destruction to bio-diversity and enormous damage to the environment, a destruction that we all witness and share every minute.

So how can we go about it? How can we bring about these changes if we don't change our educational system radically, if we don't place a core of values in every education. We cannot afford to think of our understanding of the environment and our knowledge of science separately and bring about only great technological progress.

At the same time that we advance the process of globalization, we witness an enormous crisis of values. If this crisis of values continues, we will not have a future. So, basically it is a question about continuity of our very existence.

We owe this continuity of life to our children

and grandchildren. We believe that if we are to switch our basic thinking - be it in government, industry, university or any other form of schooling - into a bio-centric vision, where we place the continuity of life at the core of thinking and action, then protection of the environment will become our main objective. We have life not only in order to address problems inherent in preserving it, but also for the purposes of enjoyment. In biological terms, one second of life is an eternity. It is a continuous miracle that belongs not only to human beings but also all life forms. If we understand this, we stress our interdependence with all forms of life. It is only in this way that we can continue to exist as humans with dignity and with new vision.

Thus, what is needed is a rebirth, a renaissance for the millennium, where we will think in new ways, not only about education but urgently also about new economics. We only look at stock markets and economic wealth as a measure of our growth. We are forgetting the wealth of bio-diversity, we are forgetting the wealth of culture and inner beauty. What we need to have is a package of growth. A package of measuring profit that would be three dimensional. It is thus an open request for every school of economics, for every individual on our planet, to see how we can quantify profit in new ways where bio-diversity and beautiful coastal seas could represent a very big percentage of the wealth of a country. Because what is profit for if quality of life is completely destroyed? What is profit for, if we have a lot of money in the bank and no one is able to cash that money?

So, new economics especially through a Parliamentary vision is greatly needed. However, we also need a new diplomacy. We must have a diplomacy that is not only in the hands of ambassadors, not only the representatives of government, but in the hands of every individual. We need to understand that besides having to co-exist, we have one body of bios where plants and animals play a very important role. They provide the lungs of the body through diversity and differentiation. This body has to function in harmony because all parts are dependent on each other. It is only through diversity and differentiation of bios that this body will be able to continue to exist in the years to come.

In this way, the richness of a culture like Japan, the richness found in the culture of the Mediterranean could all mean so much in keeping the body of bios in harmony. In keeping with this vision, diplomacy is not about dividing and ruling, but diplomacy is sharing and working together for environmental issues. If we achieve this new vision for the millennium, then we will have more of an understanding of the co-existence of common goals. We could even hope to change the vision of the entire defense system without threatening any vested interest of any party in the world. Defense could be used for life too. It should be used to save life. We can start by converting it into the marine equipment used to save oceans and coastal seas. It can be made into equipment to clarify the soil from pollution, radiation and other toxic materials.

Thus, as the pendulum of the new millennium is coming, we need to hear these sounds. We don't want to threaten anyone, but we need

to hear the call for a new dimension in the way we think of saving life. This understanding - the real intelligence - will only come through sharing and co-existence. It is as though this progress of technology right now is in the hands of Phaethon, the son of Apollo, trying to drive the horses without any control. He did not know how to hold the reins, so all the horses ran towards the sun. Without control, technology could lead us to fire and destruction. But if we start a new evaluation of technology which provides the leaderships and expertise that is needed, then we can take the reins of progress in our hands. We can take these reins of progress to march into light, into brightness, into the hope of the new millennium. We can march with the sense of responsibility and knowledge that life will continue on our planet.

I would like to share a poem with you, a poem written out of this concern. It was written at the end of last year.

Millennium of Peace

*Can you hear the gong
resonate the dawning of the new era*

*Can you see the bright stars
send messages of light and hope*

*Can you feel the breathing
of every creature on our planet*

*the waves of love
the whispers of life*

*Can you listen to the beat of your heart
embrace us all with warmth*

*Share the new vision
of joy, peace and harmony*

Keynote Addresses

"Chesapeake 2000: The Chesapeake Renewal Project"

Mr. David Carroll
Former Secretary, Maryland
Department of the Environment, USA



As I prepared for this conference and this speech I reflected back on the fact that almost ten years ago I was visited in Maryland by representatives of Governor Kaihara to request our participation in the first EMECS conference in Kobe and that Maryland host the second conference in Baltimore. Then Governor Schaefer fully embraced the idea that was at the center of EMECS and Governor Kaihara's approach; that we share information about the crucial task of restoring and protecting the waters and living resources of our bays. As we in Maryland worked

together for the 1993 conference in a Baltimore, the third conference in Stockholm, and now in Turkey, we have formed new friendships, shared important science, and continued to build new partnerships to find success in our shared goals restored and healthy bays. I am proud to be part of this remarkable effort and deeply thank Governor Kaihara, the leaders and staff at the International EMECS Center, and our hosts here in Antalya.

Today I would like to spend a few moments sharing with you our experiences from a restoration program that is almost twenty five years old and preparing to move into the new century. The Chesapeake Bay Program, like the efforts in the Baltic Sea, the Mediterranean, and the Seto Inland Sea programs while exhibiting different characteristics, varied land and water conditions and diverse populations, offers the chance to understand the complexities of what we are about when we attempt to repair the damage of hundreds of years, or more, of neglect. Hopefully our experience in the Bay region will be useful to others faced with similar challenges.

I would like to organize the presentation into three broad sections. The first is to take a look at the development of the Chesapeake Bay

Program, beginning in the 1970's and extending to today. The second part of the presentation will address the Chesapeake Renewal Project currently underway. The conclusion of my presentation will outline a few of the "lessons learned" for the restoration program and the renewal project.

Let me share with you some basic background information on the Chesapeake Bay and its watershed. It is North America's largest estuary, the watershed encompassing over 64,000 square miles. It stretches from New York State into southern Virginia where it joins the Atlantic Ocean. It drains portions of six states including almost 90% of the land area of Maryland. The main body of the bay stretches almost 200 miles north from the Atlantic Ocean. The watershed encompasses almost every type of landscape and use, from agricultural production land to highly developed areas and our national capital, Washington, DC.

It is a very shallow estuary. The average depth is only 4 to 5 meters. There is a very large land to water body ratio, something that we are discussing and focusing in this conference. The ratio is 17 to 1 for every 17 units of land, there is only one unit of water, which means what we do on the land directly and dramatically

impacts the quality of water and fisheries in the Chesapeake Bay. We are also struggling with a very large population, some 15 million people live in the bay watershed with greatest concentration from Baltimore, the District of Columbia, Northern Virginia and capital of Virginia, Richmond. Approximately 15 million, and we expect that to grow to 17 million in less than 20 years.



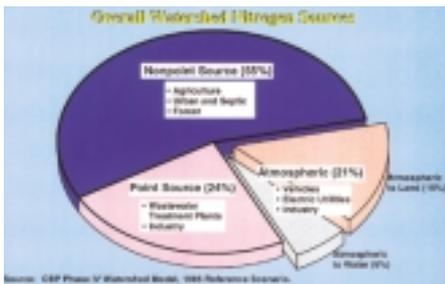
Beginning in late 1970s, when governments and citizen organizations acknowledged the degradation of the Bay, we first undertook an effort with the Federal Environmental Protection Agency to determine basic causes for that decline. There are 5 major programs identified in the Bay and these became evident to us in the report by the federal government to the states in early 1980s. Nutrients, sediments, toxic chemicals, habitat loss and over-fishing. The overwhelming majority of problems stem from the first; nutrients. And those are, of course, two major nutrients, nitrogen and phosphorus.

Here you can see the representation of where nitrogen sources come from. Over a half of them come from what we call 'non-point sources'. That is runoff from agricultural uses, urban uses and forest cover. About 24% from waste water treatment plants and industry and again about 21% from atmospheric deposition both directly to the water and to land, as it runs off. As we gathered the knowledge, we began to see very clearly where we needed to focus our attention.

And in 1983, the governors of three states, the mayor of the District of Columbia and the head of the Federal EPA signed the Chesapeake Bay Agreement. It was only one page long and had very few specific goals as targets. But it did agree that we would improve the water quality and improve our habitats and use monitoring programs to guide our way.

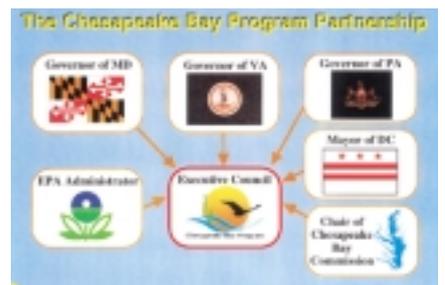
What is unique about this program is as early as 1983, there was, in fact a partnership between us, as I mentioned before, the states of Maryland, Virginia, the District of Columbia,

Pennsylvania, federal EPA for all the federal agencies, and later joined by Chair of Chesapeake



Bay Commission, which is a commission representing all the legislatures of those three states. The program is actually run by the Executive Council who meet each you to determine the direction of the restoration program.

Another point we should emphasize is the critical role that citizens have played in this project from the very beginning. I would say there were two fairly unique points to the program. One is that it is based on science, as I mentioned earlier. Before we started our programs, we looked to



science to lay the ground work and we also looked to citizen organizations. Ones on the left are part of the Chesapeake Bay Program and they represent scientific and technical community, local governments and citizens from all three states. The organization that I work for also works for the Bay Program and other major NGOs; Chesapeake Bay Foundation and watershed organizations. We are all part of the Chesapeake Bay Cleanup.

This is how we run the program. This is a very complicated and large program. And you can see here at the top are governors and the head of EPA, their cabinet secretaries, all who make decisions and recommendations. Central to this process is something that we call, the 'Implementation Committee'. Representatives of all the major states, agencies, everything from water quality to fisheries, who actually manage the program. They meet every 6 weeks and make major decisions about how to spend the money on the Bay Agreement and the Bay Program. We receive approximately 18 million U.S \$ each year to run the program that you

see in front of you. And you can see there are numerous sub-committees which make recommendations with other advisory committees here and also directly to the Executive Council.

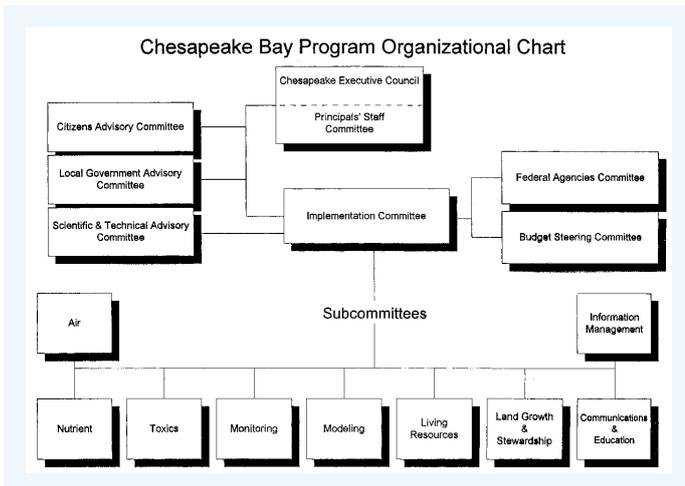
Working in that framework, we developed with help of science and modeling and monitoring, enough background knowledge that we could move from the 1983 Bay Agreement, one page, into to a new agreement in 1987. It was much longer and it had some specific targets. It dealt with living sources, water quality, population growth and development, public information, public access and governance, how we deal with the program. So, it had very specific recommendations for achieving goals in each one of those topic areas. The entire 1987 Bay Agreement was keyed to reaching those goals in our steady progress of improvement to the year 2000. So obviously, as we moved toward the year 2000, we needed to reevaluate where we have been, and where we are going.

Critical to that new agreement was the agreement between the states and the federal government that we would reduce the major pollutants to the Chesapeake Bay by 40% by the year 2000. That was from all sources that we can control, from the 1985 levels, those point and non-point sources.

This was the major goal agreed to by the states and the federal government in meeting the Chesapeake Cleanup. 40% reduction was developed through water quality and land use model, which taught us that we had to reduce those inputs by that amount if we are to achieve a certain water quality to support living resources. So, again, the year 2000 is a major milestone in our program.

This moves us to the second point of the discussion. We often ask in our program, 'how are we doing?' We are spending a considerable amount of money, the public's money. If you look at the federal participation in this program, each year since it's inception in 1983, we have spent over a quarter billion U.S. \$ on just federal money to run and manage this program. And the public deserves to know how we are doing. That was what led us to the Chesapeake Bay Renewal Project.

In late 1998, the Alliance for Chesapeake Bay and the Bay partners agreed, with the year 2000 fast upon us, that we needed to start a very public process to ask the public and participants in the program how we are doing. We initiated the Chesapeake renewal process called 'Chesapeake 2000'. And here you can see a time line of



this process which we are currently working on, with the Bay Program. The Alliance for Chesapeake Bay, manages the public portion of this process, beginning in January of 1999 and through June, 2000.

We went through a very detailed analysis with public. We are now looking at the comments by the public. We are in the middle of beginning to draft the new agreement, the Executive Council, will meet in December and will approve a draft agreement. It will go out to the public for 3 months with the New Chesapeake Bay Agreement targeted for June, 2000. Let me speak very briefly about the process of renewal project.

So, how do we go about asking the public that question? With 15 million people, that's a very hard question to ask and get useful answers. We began with a questionnaire to ask the public specifically about 'where have our successes been?' 'where have our shortcomings been?' 'what should we do about the future of the Bay?' 'what are the emerging issues?' The Alliance prepares each month the newspaper called, 'Chesapeake Bay Journal'. It is circulated to 55 thousand participants in the Chesapeake Bay watershed. We included in that journal, and increased its circulation to 60 thousand, the questionnaire asking the public those questions and receiving their answers back.

The response now, reaches over 1000 by completing the questionnaires and mailing back to us. We also held a series of focus groups, totaling over 250 people, very carefully asking them about what they thought problems were. We conducted 95 one-on-one, person-on-person interviews with many of the program mangers, people who are intimately involved in the program. And to date we have pulled together all those responses and produced several documents which summarize those responses. Let me go over very quickly what we found.

We asked the public essentially what are the emerging issues in the Chesapeake Bay, what we need as managers of the program need to pay attention to. The overwhelming majority of the public, 70% of the respondents, said managing growth. That is very sensitive, delicate problem to deal with, because we have to deal with all of these

various aspects of the population growth, sprawl and land use. Can we revitalize urban areas to encourage people to live in downtowns they have left? Where do we need to project critical areas? And we have to encourage land and nature resource conservation.

The overwhelming majority said that was the principal issue that we had to address. Let me move quickly through the other issues. We go through to the second issue, very important one is in fact education to effectuate behavioral change. How, in fact, do we change our lifestyle to project the Bay? We heard the keynote speaker this morning speaking very directly about that.

The third issue was in fact maintaining that 40 % reduction in the nutrients coming into the Bay. Understand that once we have attained reduction of nutrients into the Bay, that is a cap. No matter how much we grow , we cannot go beyond the level established by that cap.

The fourth is managing our living resources and restoring habitats. The fifth was moving our program into local watersheds. We found, overwhelmingly, 60% of respondents said it is fine that states and the federal government wish to deal with larger issues, but we the public want to have direct input into the solutions in the Chesapeake Bay restoration efforts.

The sixth issue was about managing the program itself. It's a large program, you saw it from that chart. And the seventh is something that surprised us and that is a need to articulate the vision; what are you trying to accomplish? What does the restored Bay look like and what individuals have to do as part of that process?

Let me finish with just a few things that we learned through this process and that we learned from the Bay Program itself. And these are

things, as I mentioned, that we learned from almost twenty years of working with the restoration project.

First of all, restoration programs must be based on good science. That should be a fundamental underpinning of restoration programs, that we need to make adequate resources available in the earlier stages of the restoration to have adequate science. However, scientists must also learn to respond to the needs of the program managers, and the political leaders. Answers like "We are not sure" or "Just give us ten more years to study this program" are not adequate answers.

We have to acknowledge that most environmental restoration programs have a number of effects that we do not anticipate, when we start them out, no matter how well planned they may be; they will almost always take much longer than originally imagined, they will cost much more, they will involve more people, they will have different results than we anticipated. They will require answers that we often don't even know how to frame the questions. The public must be involved at all levels; intimately. That, as we heard earlier, the environmental restoration programs are economically based. They often make good economic sense. Pollution prevention is almost always less costly than restoration. And we must look at all costs, not just environmental cost, but health cost, social cost and public well-being.

Finally a word about environmental education, because we will hear much about it during this conference. We have learned that environmental education must be more than just marketing. We are not selling soap or commercial products, we are trying to impact people's lives and try to change the way they live. We need to develop an environmental ethic. It is essential of individual citizens to develop personal responsibility for our quality of lives and environment. We must start education at a very young age. It is not enough to begin with 13, 14 and 15 year olds. Environmental education must be positive, it must be repeated often and it must begin at earlier ages, our 4, 5 and 6 year olds. There must be mentors and the programs must be dealing with the actual results that impact our lives. Environmental education in fact can act as an organizing element in learning about our lives and our responsibilities to each other. I believe we heard that clearly talked about this morning. That we have fundamental responsibility to each other and the future generations to inoculate children with the environmental education ethic. With that I will end, and thank you very much for your time.

"Systems Approach to Land-Sea Management - Theory meets Practice in the Baltic Region"

Professor Emeritus Bengt-Owe Jansson
Dept. of Systems Ecology,
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Fig.1 The Baltic Sea and its drainage area, hosting some 90 million people in nine different countries. Numerous rivers drain areas with various types of land use, and therefore transporting different loads of sediment, nutrients and hazardous substances (Source: Stockholm Marine Research Center).

a too large disturbance force them to flip to a more degraded and less productive state.

An ecosystem can have any size and exists in an input- and output environment, that is, a larger system. A bay is a smaller component of a coastal area, which in turn is a part of a sea. A tree is part of a forest, which is part of a landscape. This arrangement like Chinese boxes we call nested hierarchies.

Breaking of ecosystem principles

I shall exemplify five basic concepts with experiences from a three-year study, financed by the

After several decades of ecological research we have now a good knowledge of the principles of ecosystem behaviour. New technique has been developed both facilitating adequate registration of the crucial variables in the field and effectively processing the often large data sets from continuous measurements and for explorative and predictive simulations of ecosystem models.

But when it comes to practising our knowledge we still violate even the most basic principles for systems behaviour, causing waste of time and money and sometimes even irreparable damage. Basic concepts of ecosystem science has to be satisfied at every exploitation enterprise in order to create a sustainable society by minimizing time, money and waste of natural resources. The Baltic Sea Basin offers a whole range of examples being an enclosed sea surrounded by nine nations of different histories and in different stages of economic development (Fig.1).

Ecosystem structure

Ecosystems are self-organizing and self-maintaining systems (Odum, 1971). Fig. 2, left half, contains a highly aggregated model of a marine ecosystem with:

- * dynamic independent variables (circles) like sun and rain, indicating the boundaries of the system
- * producer system (bullet) of plants like plankton and seaweed (PROD)
- * "storages" ("birdhouse") of substances like nutrients (N)
- * consumers (hexagon, C) like fish, actually on top of a foodweb of micro-macroscopic organisms
- * storage of organic matter from dead organisms,

associated with a foodweb of bottom-living consumers, decomposers (D)

* biogeochemical cycles, the "nervous system" of the ecosystem, including feedbacks and recycling flows from activity of the organisms, like that from decomposers to nutrients

* processes (broad arrows) like the killing off of producers and consumers by toxic substance

* Biodiversity is another basic component of an ecosystem. It covers different types: genetic diversity which constitutes differences between populations of the same species, species-, functional-, habitat- and cultural diversity.

* Resilience (Holling, 1973) is a property of ecosystems of basic importance for natural

European Commission - the Baltic Basin Case Study , BBCS (<http://www.ecology.su.se/bbcs>). Four drainage basins around the Baltic were studied to find out the effects and complications of their major types of resource use: agriculture, forestry, tourism and transnational watershed management (Fig.3). Watersheds or drainage areas are natural entities for integrated management of coastal resources. Rivers are transecting the different parts of the landscape like branches of a tree connecting the producing leaves and like those transporting matter from the different activities of the system to the sea.

The five, basic concepts are :

1. the importance of a systems view
2. the importance of time and space scale
3. the need for closing biogeochemical cycles
4. the conservation of ecosystem services
5. the urge for transdisciplinarity

1. IMPORTANCE OF A SYSTEMS VIEW

Of the ecosystems properties given above the boundary conditions are crucial. They should be set to incorporate the major processes in the system and where the exchange to the adjacent ecosystem is at the weakest. The larger

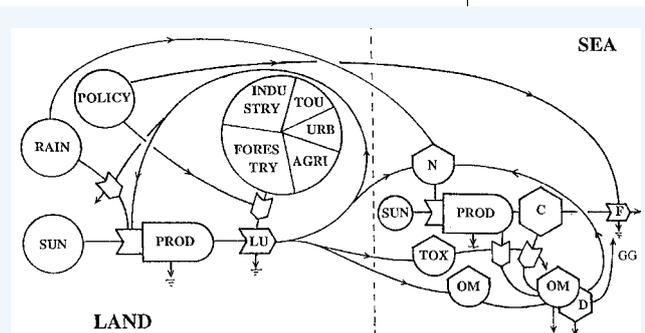


Fig.2 Conceptual model of the Baltic Basin showing large-scale storages: AGRI agriculture; C consumers; D decomposers; F fishing; GG greenhouse gases; LU land use; N nutrients; OM organic matter; PROD producers; TOU tourism; TOX toxics; URB urban areas. The connecting lines symbolize both material flows and information flows (like policy decisions). Feedback flows from sea to land are e.g. fish landings and atmospheric downfall due to greenhouse gases.

resources management. It is a measure of how much disturbance a system can stand without losing its basic structure and productivity. Ecosystems have multiple stability domains, and

base for the system is important: climate, soil type, land cover. In the Baltic Basin, for example, the southern part is dominated by glacio-fluvial deposits from the last Ice Age, which are the

basis for the dominating agricultural activities. Towards the north primary rocks increase and the forested areas support large-scale forestry. Coastal management has to consider the dynamics of the whole drainage basin (Fig.2). The mixture of land use: industry, forestry, agriculture, urban activities, tourism, are based on the production potential of the land area, structured through policy decisions and determine the quantity and quality of exports to the sea of nutrients, toxic substances and organic matter. These imports affect the marine system and its productivity and also its exports of fishery products and green house gases, which in turn constitute feedback flows to the land system.

2. IMPORTANCE OF SCALE

Scale of space

Systems boundaries have to be set to incorporate the crucial feedback loops to the next higher system. Different aspects can have different space scales, compared to the natural system: drainage area, legislative area, economic area, linguistic area. The solution to the pollution problems of the Baltic Sea lies not in the sea but in the drainage basin. Quite often society tries to solve emerging problems in the wrong scale, usually not recognizing the important feedback mechanisms between the hierarchical systems. The Assuan dam was built focusing on society's energy problems not recognizing the effect on agriculture in the delta region or the effects on the coastal fisheries. The rapid development of society has increased the scale: local to regional to global. The Lake Peipus Case Study, however, is a striking example that this direction also can be reversed.

Scale of time

The time scale is often set by the dynamics of the forcing functions, which are usually strongly pulsed. The annual variations in solar insolation is obvious in the different blooms of the marine algae or in the crops succession of the agricultural cycle. Land runoff has in the temperate latitudes an annual pulse, which in some areas have been changed by e.g. building of hydroelectrical dams, affecting the behaviour of migrating fish like the Assuan dam. The turnover time of a coastal sea, of the Baltic some 25 years, determines the time-scale for recovery. For the whole Baltic Sea it is therefore a matter of decades.

Natural pulsing

A frequent breaking of one of the fundamental ecological principles is the neglect of the pulsing behaviour of the natural system, especially



Fig.3 Drainage area of the Baltic Sea with the four areas for case studies indicated: the Vistula drainage area - agriculture, the Dalälven drainage area - forestry, the Baltic Archipelago - tourism, the Lake Peipus area - transboundary management.

in fisheries and agriculture. When a good year class of fish is becoming scarce both due to natural mortality and to hard fishing pressure, we usually increase the fishing efforts instead of giving the fish populations time to recover. Adaptive management, sensu Walters (1986), has to be commonly adopted. The fossil fuel has become a powerful tool of overcoming the natural lag periods of nature but is unfortunately never used at the same time to reinforce the natural feedback mechanisms like speeding up decomposition/recycling.

3. CLOSING OF BIOGEOCHEMICAL

CYCLES Tight recycling of nutrients

Old mature systems in stable climate, like the coral reef or the rainforest, are very greedy - they do not want to part with their nutrients, which are recycled within the system over and over again. These highly productive systems have developed tight biogeochemical cycles which explains why the rich biological life of a coral reef can exist in a surrounding oceanic water with very low nutrient levels. The same picture is met in the pre-industrial farming, where the absence of artificial fertilizers forced an inventive and strong recycling of the phosphorus and nitrogen, incorporated in the plant and animal biomass. In the most productive ecosystems, like the coral reef, the salt marsh, the tropical rainforest, the spacial distance between the production and consumption/degradation of organic matter is very small, facilitating recycling. In a coral head the photosynthesizing cover of microscopic algae lives a few mms from the underlying animal polyps, consuming parts of the produced products,

in turn delivering respirative carbon dioxide to the plants. In a salt marsh the plant material is consumed and decomposed at the plant roots and transport to the producer facilitated by the water. The cycling of nutrients is fast and economical.

High-tech agriculture

In today's agriculture the processes of production and consumption/decomposition can be hundreds of miles apart. In Sweden the center of grain production lies in the middle of the country, whereas the production of cattle has a center in the south part of Sweden. Nobody would transport manure from the cattle farms to the grain areas in the north, instead environmental problems with accumulating manure and transport expenses of animal feed and artificial fertilizers are accepted. In our urge to increase production of different matter we single out wanted processes like plant production or meat production in order to manipulate them individually, totally forgetting the natural feedbacks between them. In an ecological agriculture they should be spatially and timely tightly coupled.

Aquaculture

In some types of aquaculture fish are kept stocked in pen cultures and fed with food, usually from systems far away. The natural large life supporting area of a pelagic fish, is capable to recycle the wastes but not the restricted areas of a fish farm. In the northern Archipelago Sea in the Baltic large-scale fish farming has caused eutrophication of the water and decrease of the species diversity.

In forestry large-scale clearcuttings have shown now well-known negative effects of increased erosion and flows of nutrients with decrease of the coastal fisheries like in the Bay of Thailand. An interesting case is the development in Lake Peipus watershed, where previous agriculture has been replaced by primitive logging, leaking nutrients to the lake.

4. CONSERVATION OF THE ECOSYSTEM SERVICES

Ecosystem services (Odum, 1973) are those products and processes of the ecosystem, which are fundamental parts of the human life support system, like freshwater, food, building material, waste processing, usually free of use. They need a healthy ecosystem for proper functioning, which means high diversity of species and functions (Fig. 4). Several basic examples of violation of ecosystem capacity is found in the Baltic Basin Case Study:

Keystone species

In most systems some single species have important functions like the pine tree in a pine forest or the blue mussels, filtering and clearing the water.

The brown seaweed *Fucus* in the Baltic is such a species, forming communities, important as spawning and nursery ground for fish.

Excess nutrients have decreased water transparency and decreased the distribution of this seaweed. Examples from other areas are the decrease of kelp at the northwest and northeast coast of North America due to overgrazing by sea urchins because of decimation of their predators seaotters and lobsters, respectively.

Freshwater production

Decrease of the capacity of producing high quality of freshwater due to the pollution of streams and lakes is a wide-spread phenomenon. The water of the Vistula River has a satisfactory quality only in the mountains, polluted by industry and agriculture and transporting nutrients to the coastal areas (Fig 5).

Reclamation of wetlands is another wellknown example which in excess leads to sinking of the groundwater level and decrease of soil layer for example on the island of Gotland, and large-scale flooding events like those in the Oder and Vistula watershed in 1997. Excess water in the order of one week's runoff of the total Baltic watershed entered the coastal area, here increasing the amount of chlorophyll about ten times.

Both pollution and rough cleaning of the riverbeds negatively affect the spawning grounds of migrating fish such as trout and salmon, thereby restricting the life-support areas of their populations.

Habitat diversity is both an important basis for overall species diversity and for the new industry - tourism. When many countrysides suffer from immigration to cities due to shortages of jobs, scenic areas offer targets of ecotourism. Following the ecological principles this is a positive development as it gives a direct, economic incentive to conserve many ecosystem services of high potential in pristine areas. The Baltic archipelago is a patchy mixture of land and sea with a high diversity of habitats, species and functions (Fig. 6). The fish production is high and the seascape has been the basis of a low-energy society, running mainly on renewable energy sources. The harsh conditions have caused immigration to the mainland and the society has

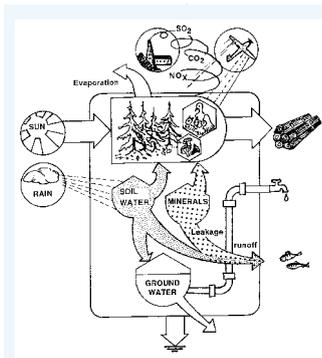


Fig.4 Ecosystem services exemplified by a forest ecosystem. Maintained by solar energy and rain the system builds a forest, using minerals from soil water, making high quality groundwater for drinking. In the forest birds help to disperse the seed and mushrooms in symbiosis with trees fix atmospheric nitrogen for them, getting carbohydrates in exchange. Forests deliver building material and absorb part of the air pollutants from society (from Jansson and Jansson, 1994).

switched to a leisure community, favouring tourism. The system is highly pulsed both in its natural and human part. Sometimes the pulses collide - minimum freshwater supply and maximum freshwater demand during summer.

The redevelopment of a living archipelago offers an interesting study of matching a common societal system of job opportunities, education, transportation, trade, with a natural system of patches and pulses. This means restoration and

political sciences contribute with the basic processes of the human system. For the proper governing of our natural resources we need a participatory definition of the goals and adequate institutional tools for the realization of a sustainable society. These were the main reasons for starting the Baltic Basin Case Study (BBCS).

The Lake Peipsi Case is a good practical example of this sequence (Fig. 7). Lake Peipsi is the fourth largest lake in Europe and one of the most productive, maintaining some 30 species of fish in an exceptionally species rich ecosystem. A good part of the drainage area has still a pristine character. During the Soviet era large-scale agriculture in the eastern parts maintained a large export of agricultural products to the Russian North-West, effecting the water quality of the lake. After the Soviet period the Lake is shared by Estonia and Russia. The big market in the former Soviet Union has gone, both the Estonians and the Peipsi people have to find new partners for trading. Immigrations to the

Fig.5 Concerned fishermen at the mouth of Vistula River, looking at the drifting filamentous algae, stopping them from fishing, and cursing the people in Warsaw, polluting the river.

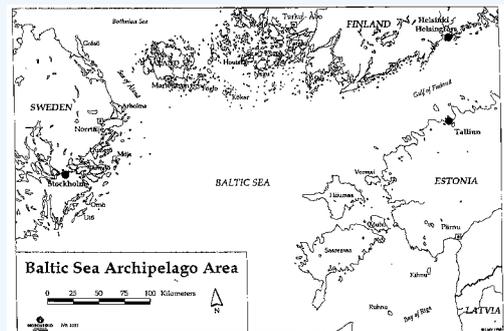


Fig.6 The Baltic Sea Archipelago. Courtesy Tomas Hanell, Nordregio (Nordic Centre for Spatial Development, www.nordregio.a.se).

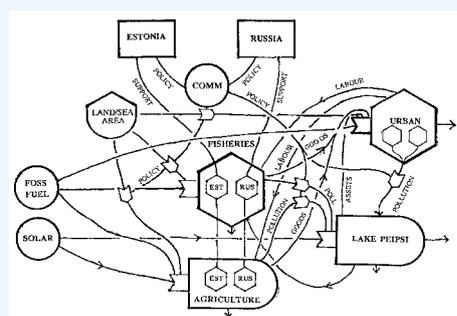
conservation of the basic ecological services through enhancing the biodiversity, favouring locally produced food and other necessities and a holistic long-term thinking.

5. ENHANCING TRANSDISCIPLINARITY

Successful managing of coastal seas needs a transdisciplinary approach, where the natural sciences guarantee a proper description of the ecosystem dynamics and the socioeconomic and

cities of the young people and lack of money is checking a development of a long-term agriculture. The rich fish resources are not fully exploited, partly due to lack of economic means. In order to survive household fishing and homegardening is flourishing, and the products offered at local markets (Fig. 8). The two-national management of the common resource has had cooperation problems in maintaining the previous monitoring program of the lake, utilization of the

Fig.7 Conceptual model of Lake Peipsi drainage area, strongly aggregated to show the major couplings between natural resources, human activities and policy-making. Of the major resource uses agriculture, fisheries and urban systems, agriculture is based mainly on solar energy, and the urban areas on fossil fuel and fisheries are maintained by Lake Peipsi ecosystem with additional non-renewable energies. The proportion of the land/sea area between the three activities is determined through policy discussions between Estonia and Russia through i.a. the Transboundary Commission(COMM). The Estonian and Russian populations active in resp. resource use get more or less support by their countries, determining their degree success. The flows of pollution from the three activities to Lake Peipsi is regulated by the Commission. The urban centers and the Commission show their central role through the dense net of material and informations flows apparent in the model. (Jansson and Stalvant, 1999. BBCS, www.ecology.su.se/bbcs).



fishery resources, sewage treatment, customs. A strong driving force in the successful process of transboundary management is the NGO organization "the Lake Peipsi Project". It has recreated a Transboundary Commission, established international contacts for a high-quality monitoring program, a Bilateral Fisheries Commission is active.

Our workshop with participants of different kinds from the two countries: scientists, sector experts, central administrators, local/regional managers, showed very clear the

importance of personal participation for successive planning and understanding of necessary actions. The importance of a local agenda was stressed to stimulate more grassroots activities. Also direct information from outside and not filtered through too busy authorities.

These are certainly basic problems in most coastal areas and should gain main attention in our future work of bringing the coastal areas of the world ocean towards sustainability.



Fig.8 Women on the main street of Pskov, offering dried fish from Lake Peipsi. Pike, perch, whitefish and pike-perch are the main species.

New Measures For Environmental Conservation and Restoration in the Seto Inland Sea

Mr.YOSHIOAKI ASANO

Director of Office of SetoInland Sea Environmental Conservation, Water Quality Bureau, Environmental Agency of Japan



Honored delegates, Prof. Ozhan and members of the Executive Program Committee of this Joint Conference, and Merhaba Ladies and Gentlemen: I am ASANO with Environment Agency of Government of Japan. At the beginning, I sincerely appreciate for this glorious opportunity given to me, and it is a great honor for me to deliver the keynote speech at this International joint Conference to so many participants from Turkey and other countries.

The Seto Inland Sea is the largest semi-enclosed sea in Japan and blessed with scenic beauty and abundant fishery resources. However, this sea has been suffering from environmental deterioration due to the nature of being, "enclosed sea". The Government of Japan enacted the special law for the environmental conservation of Seto Inland Sea more than 25 years ago. This January, the Council of the Government concerning the environmental conservation of Seto Inland Sea made recommendations to the Government on "new measures for environmental conservation and restoration of the Seto Inland Sea". I would like to introduce these recommendations and advices, particularly new direction for environmental conservation and basic approach to the development of future environmental management measures in Seto Inland Sea.

Firstly, I would like to describe the outline and characteristics of the Seto Inland Sea, and the public administration concerning water quality conservation in Japan.

Japan is made up of four major islands and a large number of small islands, and has complex topography and coastline. For this reason, Japan is spotted with many inlets and bays, and there are a large number of semi-enclosed seas, so-called enclosed coastal seas. The Seto Inland Sea, Tokyo Bay and Ise Bay are large enclosed coastal seas in Japan. These three



SetoInland Sea

coastal areas all extend from the coast of huge cities which have large population.

The Seto Inland Sea is the largest Enclosed Coastal Sea in Japan, which is surrounded by three large islands. The length from east to west is about 450 km. "Seto" means a small channel in Japanese, the name really expresses the meaning of "enclosed". Regarding the Depth of water and the elevation of land area, the Seto Inland Sea is very shallow sea except channel zone, an average depth is only 38 m. The annual average temperature is 15 degree C, average annual precipitation is 1000 to 1500 mm, which is rather small in Japan. Population in the Watershed area is about 30 million, one-fourth of total of Japan. This mild climate and calm sea make the Seto Inland Sea region suitable for residence and industry, a large number of factories of heavy chemical industry were constructed along its coast during the high economic growth period. This Sea has been also used as an important area of marine transportation since olden times.

Special characteristics of this sea are a valuable treasury of fish resources and natural conditions favored with excellent natural beauty. The productivity of fish resources is ranked at high level in the world and the species of fish are very diversified. In recent years, fish cultivation has surpassed ocean fishing in terms of both fishing catch and yield. The characteristics of the scenery have been called "inland sea abundant with many islands." and "white sand and blue pine tree". These scenery are not only natural landscape, but many of them are harmonized

with human activities.

The excellent natural beauty was recognized since olden time, main part of the sea, islands and coastal regions were designated as National Park in 1934 in the early stage of designation of national parks in Japan. Besides, there are many white sand beaches for marine recreation.

Next, I would like to introduce public administration concerning the Seto Inland Sea

During the period of industrial construction following World War , water pollution problems such as Minamata Disease emerged in Japan. So-called "the high economic growth period" started from around 1960 in Japan, The Government enacted the Basic Law for Environmental Pollution Control and the Water Pollution Control Law to promote comprehensive countermeasures against the various forms of environmental deterioration, and Env. Agency was founded in 1971. The Seto Inland Sea became rapidly polluted in the decade around 1965, which invited demands for vigorous enforcement of measures for environmental conservation.

This picture is red tide. Red tide largely damaged the fishery. A new law was demanded for the Seto Inland Sea at the basement of the regulation of basic laws. Thus, the Interim Law for Conservation of the Environment of the Seto Inland sea was enacted in 1973. This Law was revised in 1978 to include new policies and became a permanent law, under which overall measures have been taken.

Main measures of the law are as follows:

Outline of the LAW CONCERNING SPECIAL MEASURES FOR CONSERVATION OF THE ENVIRONMENT OF THE SETO INLAND SEA

1. Plans for Conservation of Environment of the Seto Inland Sea

Islands



Fishing

2. *Permission for the Installation of Specified Facilities*
Persons who give the permission --Governors of prefectures or designated cities
Specified Facilities--Industries and Business Places discharging wastewater of more than 50 m³/day
Pre-assessment of environmental impact by the operation of the facilities are required.
3. *Reduction of Total Amount of Pollution Load*
Designated Pollutant; COD
4. *Guideline for Reduction of Specified Substances*
5. *Countermeasures for Natural Seashore Conservation*
Designation of Natural Seashore Conservation Area
The prefectures concerned designate the area by ordinance.
91 areas are designated at the end of December in 1997.
6. *Special Consideration even to Reclamation*
In considering the license for reclamation taken in the Seto Inland Sea, the governor of the prefecture concerned should take into account the peculiarities of the Seto Inland Sea. The basic policy for reclamation proposed by the Seto Inland Sea Conservation Council in May, 1974, should be applied.
7. *The Others*
 - 1) Promotion of improvement and construction of sewer systems and solid waste treatment facilities
 - 2) Prevention of oil spill by accident
 - 3) Promotion of development of technologies for Environmental Conservation
 - 4) Relief of fishermen damaged by red tide

After that, many measures have been implemented according to this law and National Basic Plan. As a result, the environmental situation of the sea has improved: Accordingly, the number of occurrence of red tide is reduced to less than half. But, we observed red tide all over the sea in those days. And the area of reclamation reduced to one quarter. However, problems of current measures have been identified now. Total load of COD has been reduced certainly. But, achievement of environmental quality standards of sea water has not been improving. Regarding the year average COD at the monitoring points for environmental standard, recently, this shows no marked decrease. Regarding the change of tidal flats, valuable natural environments such as tidal flats, seaweed beds and natural seashores were reduced. We lost many scenic seashore landscapes by industrial development and reclamation. Thus, deterioration of Environment is gradually progressing even now.

The implementation of various measures in the quarter-century since the Law was enacted has shown limited results in reducing the burden on the environment caused by human activities.

Many problems still remain to be resolved, such as the accumulated burden on the environment due to development in the past and measures to deal with new environmental problems.

On the other hand, the approach to environmental management has shifted recently from an initial emphasis on pollution control to the much wider goal that includes ensuring biodiversity, restoring and ensuring healthy water circulation, promoting the circulation of substances, ensuring abundant opportunities for contact with nature and so on.

Great changes have also occurred in the environmental awareness of the general public, and great strides have been made in the whole range of environment related technologies.

When we meet a new century, unified and comprehensive measures must be taken to preserve the Seto Inland Sea as a place in which human being co-exist with nature, with consideration given to the unique geographical, natural and socio-economic conditions in each water region.

This will require measures based on new environmental trends to deal appropriately with the many problems we currently face.

Therefore, the Environment Agency of Japan sought the



Red Tide

advice of the Council of the Government on "New Measures for environmental conservation and restoration of the Seto Inland Sea" in 1997. The Council concluded the discussion based on the opinions from various sectors in the area and made recommendations to the Agency this January.

This recommendation of the Council shows three basic directions for the future policy measures of Japanese Government

- (1) Strengthening of conservation measures
 - (2) Development of measures to restore favorable environment damaged before
 - (3) Promoting wide-ranging cooperation and participation
- I will introduce these three directions in more detail.

First is "Strengthening of conservation measures".

What is needed first of all is to preserve to the greatest extent possible the remaining natural Environment and prevent additional burdens being placed on the env, and to promote the circulation of substances and thereby further reduce the environmental burden caused by human beings. For this purpose, conservation measures must be improved and more sewerage and other facilities designed to reduce the environmental burden must be constructed. There are five important viewpoints for strengthening conservation measures like these.

Particularly, the Government of Japan intends to introduce reduction system of total Nitrogen and Phosphorus load in addition to COD load. Nitrogen and Phosphorus are considered as a main factor of interior production of COD. And the importance of seaweed beds, tidal flats and natural seashore must be recognized and measures studied to appropriately evaluate their worth.

To preserve remaining natural env, adequate recognition of the value of Environment of the Seto Inland Sea should be established through appropriate contact with nature.

Second direction is "development of measures to restore favorable environments damaged",

With only conservation measures composed mainly of restrictions, it will be difficult to succeed in the physical and ecological restoration of the natural coastline consisting of seaweed beds, tidal flats, natural seashores and other shallow areas, that offer beautiful scenery and places where people come to contact with nature. To secure the diverse environments suited to the S.I.S, we need measures to restore lost environments and to conduct active environmental maintenance. In implementing measures, it is important to study what kind of environment should be created by these efforts, based on the status of the environment in the past, at present and that desired in the future. As such restoration will take time, these efforts must be made with a good planning from a medium- and long-term perspective.

In such cases, suitable technologies must be selected in consideration with the following three points;

/ use of nature's restorative capabilities / priority for technologies that help restore biodiversity and promote the

circulation of substances, / and reflection of regional characteristics and resident's views

In addition, as many aspects of the effect of creating natural Environment are not yet understood, the status and effect of restoring Environment must be studied through appropriate monitoring, and efforts must be made to develop, improve, and accumulate technologies for environmental management.

And for the carrying into effect these concrete measures, these four perspectives;

- (1) Improvement of Natural Purifying Capabilities
 - (2) Creation of Environments as Habitats for Living Things
 - (3) Improvement of Ocean Access
 - (4) Improvement of Scenic Beauty
- are very important.

Regarding the restoration technology, artificial beach, restoration such as creation of tidal flats and shallows for various ocean creatures, creation of seaweed beds, artificial beach to restore lost beach areas, and artificial shore and seawall so-called "co-existence with nature type" and so on, are already practiced now in Japan. But, of course, such technologies are mainly under development and insufficient.

Next is third direction.

To preserve the existing natural Environment and to reduce the environmental burden, and at the same time to restore the Environment that has been lost, promoting wide-ranging cooperation and participation are really required. Concrete measures like these should be adopted.

- (1) Promotion of environmental education and study
- (2) Improvement of information access and dissemination
- (3) Expansion of wide-ranging cooperation

For relevant parties, much wider and closer contacts than ever before and the systematic promotion of their activities will be required to deepen their understanding of the Seto Inland Sea Environment and to work actively to implement a variety of measures.

As current activities by private citizens often result in damage to the natural environment, it is necessary to recognize the importance of co-existence with nature, and of the relationship between human being and nature, and to promote environmental education and study in order to foster a desire to protect nature and willingness to participate in environmental management activities.

On the other hand, to actively promote citizen participation, accurate data must be provided to citizens in an easy-to-understand form. This data is also indispensable for promoting environmental education and study, research and technical development. And for these reasons, a strengthening of the so-called three liaisons of inter-regional, inter-entity and cross-generational contacts is important. The inter-regional involves increased "lateral" cooperation between the prefectures, cities, and towns bordering the Seto Inland Sea, as well as "vertical" cooperation of river basin. The inter-entity involves increased cooperation between the national government, local public organizations, companies, residents, researchers and other principal entities. The cross-generational involves increased cooperation on environmental management spanning generation. Particularly, it is very important to reflect the opinions of residents on the policy decision and reduction of pollution load. I think that it is necessary to draw up a system which will promote the citizen participation.

This May, epoch-making project, namely three major routes crossing the Seto Inland Sea and connecting with two large islands have all completed, this means spatial integration of region and that the Seto Inland Sea region will really meet the new era. We consider that we must make every effort in future for further conservation and sustainable development of this region by the future policy measures that I showed and the integration of such measures. And, we must hand over such beautiful and excellent landscapes and environments of the Seto Inland Sea to our future generations.

Lastly, I sincerely hope that our efforts in the Seto Inland Sea will contribute to the environmental conservation of other enclosed coastal seas in the world.

Thank you very much for your kind attention.

The Work and Abstract of Best Posters

Water Quality Assessment: Coupling Science and Education

Laura Murray
Patricia Chambers

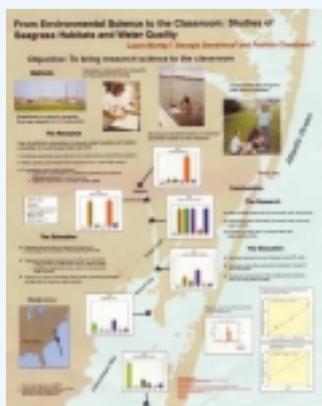
The Maryland Coastal Bays are a group of five shallow water estuaries under pressure of residential and commercial development. Associated with this development is the potential for eutrophication of the bay waters and subsequent deterioration of habitats sensitive to poor water quality, e. g. seagrass beds.

We developed an "early warning system" for eutrophication by exploring the relationship between water quality and epiphytic mass on natural and artificial substrates at various sites in the Coastal Bays. A strong correlation was found between epiphytic colonization on natural and artificial substrates and historic water quality data. The first phase couples science with teacher education by providing a summer research internship for a public school teacher from the local area. Working directly with the scientists, the teacher learned sampling techniques, computer skills, and data analysis.

In the second phase, students used this technique to monitor streams within the Coastal Bays watershed. They placed artificial substrates in tidal creeks of the Coastal Bays. A correlation was then made between water quality and the colonization on the substrates following the method explained above. Students applied authentic scientific methods and procedures in their study of aquatic ecology and human impacts. As a multi-discipline component, students wrote an article for public dissemination regarding their work.

This two phase project can serve as a model for other research centers where scientists can work with teachers during the summer months and teachers can, in turn, apply the knowledge back to the classroom.

(Picture1)



(Picture1)

Setting-up an Observational Strategy for the Submerged Archaeological Site of Alexandria

Walid A. N. Younes and
Jean-Claude Romano

Alexandria with its famous Light House (PHAROS) and its library suffered series of tectonic instabilities and mostly disappeared through its subsidence. Series of recent underwater discoveries revealed the importance of these sites. In addition, these reference submerged sites can provide a scientific and historical knowledge about the natural processes and man-made impacts through the different eras. Submarine archaeological and historical surveys took place to investigate these sites. Besides, several punctual oceanographic studies had been performed in the coastal and offshore waters of Alexandria. The data obtained from previous studies showed that these precious sites are suffering from risks of deterioration as a result of the increase degradation of the coastal water quality (YOUNES, 1997 & YOUNES et al., 1997). The rapid urbanization, overpopulation and continuous wastewater dumping in Alexandria coastal waters which contains most of the submerged ruins necessitate a special strategy to observe and monitor the sites in order to manage this valuable economic and touristic resource. A quick intervention with the aid of the concerned national and international scientific organisms is the only way to implement durable measures for the sustainable protection and preservation of these sites. This could be done by applying simple and low cost technologies as well as setting-up a small scale periodical survey (punctual multidisciplinary studies and monitoring) coupled with large scale screening strategy.

(Picture2)



(Picture2)



(Picture3)

Eco-technological Approach for Improving Environment in a Hypertrophic Enclosed Bay, Japan

Shigeru Montani
Takeshi Kohama
Machiko Yamada

To improve the water quality in a hyper-eutrophic enclosed bay, we have established an interdisciplinary research project from 1995 to 1997. This study was conducted for development of new eco-technology to treat hyper-eutrophicated water. In this research project, we are aiming at promoting material circulation with activities of mussels in the bay ecosystem. The system, which consists of 50cm-long ropes to collect mussels, is settled from surface to 1.5m depth. Two ropes, which settled at upper layer (0-0.5m) and lower layer (1.0-1.5m), are collected for each month from February to September 1997. After retrieval of the rope, mussels were numbered, and their shell length and body weight were measured. Furthermore, we conducted some experiment in the laboratory to determine the clearance rate and the assimilation efficiency of mussel. Total settling mussels biomass are rapidly increased from April to September. The integrated values of settling *Mytilus galloprovincialis* biomass on each 50cm long rope increased from 0g in February to ca.7800g in August at upper layer, and 0g to ca. 4700g at lower layer. In the experiment, the clearance rate of *M.galloprovincialis* increased with the magnitude of shell length, are expressed in (V) according to the following: $V \mu\text{molC/h} = 0.896 \cdot SL + 0.202$ where SL is shell length. About the assimilation efficiency, it is expressed with 36% for nitrogen and 20% for phosphorus. Total nitrogen and phosphorus contents in *M.galloprovincialis* were 11.8 mgN/g (d.w.) and 1.1 mgP/g (d.w.), respectively. However, the role of mussels cultured on rope collector was estimated from biomass and individual activities, the clearance rate (gC/rope/d) of the whole rope collected in August was as same value as the 18m² of primary productivity, when the red tide was occurred. Furthermore, assuming one rope collected in August was submerged into the water mass with the volume of 25m³ (5x5x1m), the relationship between the values of assimilation rates and loading rates indicate that 70.1% of DIN and 163% of DIP loaded to the 25m³ box were assimilated by them. Therefore, mussels can play good role as a N, P cleaner in hyper-eutrophic enclosed bay, such as Dokai Bay.

(Picture3)

Closing Remarks

Message from International EMECS Center President Dr. Jiro Kondo

As president of the International EMECS Center, I would like to address you as we come to the end of this 4th MEDCOAST / 4th EMECS joint conference.

I am deeply sorry that, for reasons of health, I was unable to attend this joint conference. I am also very disappointed that I have not been able to meet with all of you and participate in the spirited debate on the future of the environmental management of enclosed coastal seas, under the theme "Land - Ocean Interactions : Managing Coastal Ecosystems." Therefore I would like to address you by proxy from far-away Japan.

First, to the people of the Republic of Turkey, please accept my deepest condolences on the loss of life and tremendous destruction caused by the earthquake that occurred in August. The earthquake was also a great shock to the people of Japan, a country in which earthquakes have also caused great suffering. It is my hope that we can be of some assistance in helping you to effect a speedy recovery from the earthquake.

Secondly, I would like to express my gratitude to Chairman Erdal Ozhan of MEDCOAST and all of the other people whose dedication and hard work, in spite of the recent earthquake, have made this joint conference a success. And I would also like to thank the people of Turkey for the kindness and goodwill that they have shown to all of the participants from overseas at such a difficult time.

It has been nine years since the first EMECS conference was held in Kobe, Japan. Subsequent conferences have been held in Baltimore, Stockholm and now Antalya. At each conference, researchers, scientists, private citizens, government representatives and others working in both land and sea regions have gathered to go beyond the boundaries of their individual disciplines to exchange knowledge and techniques. And in each case, the result has been an expansion of our scientific knowledge and our experience in environmental measures relating to the management of enclosed coastal seas. It is my firm conviction that EMECS conferences will continue to produce major achievements in the effort to consider the relationship between land and sea and the harmonious coexistence of human beings and nature.

Everyone has voiced their support to hold the fifth EMECS conference once again in the city of Kobe in the year 2001, exactly 11 years after the first international conference was held. This will be the first EMECS conference of the new millennium, and we will strive to make it a meaningful one that benefits from the participation of individuals and organizations who are working to preserve the environments of enclosed coastal seas both at home and abroad, and that integrates knowledge from many different scientific disciplines including both the natural sciences and the social sciences in an effort to promote "the sustainable development of nature, ecosystems and human society in a harmonious and balanced manner".

In closing, let me say I am looking forward to seeing you in Kobe in two years' time. Thank you very much.

Welcoming remarks from the mayor of vaneu of the next EMECS Conference

Good afternoon ladies and gentlemen. My name is Osamu Yamamoto, and I am the director of the Environment Bureau of the City of Kobe, located in Hyogo Prefecture in Japan. I am speaking to you on behalf of Kazutoshi Sasayama, mayor of Kobe and vice-chairman of the board of directors of the International EMECS Center, who was unable to attend the conference.

As this 4th MEDCOAST / 4th EMECS joint conference draws to a close, I would like to express my profound gratitude to all of the participants whose enthusiasm and hard work has helped to make the conference a success. In addition, I would like to address you as a representative of Kobe, which has been selected as the venue of the 5th EMECS conference to be held in the year 2001.

First of all, I would like to express my deepest sympathies to the people of the Republic of Turkey regarding the destruction and loss of life caused by the recent earthquake.

In Kobe as well, a magnitude 7.2 earthquake struck the city and surrounding areas in January 1995, causing tremendous destruction and loss of life. At that time, the large donations of aid and supplies sent by individuals and organizations around the world were a source of great comfort and encouragement to the people of the quake-stricken region. In the four and a half years since the earthquake, recovery efforts have been making steady progress. On behalf of the City of Kobe, I would like to take this opportunity to once again express my profound gratitude for your generous assistance in our time of need.

It is my sincere hope that the people of Turkey will effect a speedy recovery from the earthquake.

The first EMECS conference was held in Kobe in 1990, and this joint conference is the fourth such conference. It is a great honor that, in the year 2001, the city of Kobe will once again be the venue for an EMECS conference, the first of the 21st century. I feel that it is deeply significant that scientists, private citizens, and representatives from NGOs and government organizations will once again gather in the birthplace of the EMECS conferences - Kobe, located on the shores of the Seto Inland Sea, one of the world's major enclosed coastal seas - to exchange information on the management of enclosed coastal seas, in the first year of the new millennium.

I would like to take this opportunity to invite you to see the progress that Kobe and the surrounding region have made in recovering from the earthquake, and to participate in what I know will be a very rewarding conference.

I know I speak for all of the people of Kobe when I say that we look forward to seeing you at the 5th EMECS conference - EMECS 2001.

Thank you very much.

The number of Registered Participants

Bosnia and Hercegovina	3
Bulgaria	1
Canada	1
China	2
Chinese Taipei	5
Croatia	6
Egypt	6
Estonia	1
France	6
Germany	8
Greece	2
Israel	2
Italy	5
Jordan	2
Japan	194
Korea	4
Luxembourg	1
Malta	1
Mexico	1
Monaco	1
Netherlands	3
Poland	1
Romania	1
Russia	9
Spain	2
Sweden	3
Thailand	1
Tunisia	1
Turkey	37
Ukraine	1
United Kingdom	9
United States of America	19
Others	4

Total: 32 countries 344 persons

Joint Meeting of Board of Directors and Scientific Program Committee

The Joint meeting of Board of Directors and Scientific Program Committee was held at the Dedeman Hotel, Antalya on November 11th, 1999. The main topic of this meeting was the theme, schedule and arrangement of the EMECS 2001. We have just taken off for the next Conference!



Bulletin Board

Notice

We still have the CD-ROM and report on "Water Quality Conservation for Enclosed Water Bodies in Japan" in stock. Please feel free to ask the Secretariat if you need. Regarding Proceedings of the Joint Conference, you can purchase it from MEDCOAST Secretariat (medcoast@metu.edu.tr)

Call for Articles

Contributions from readers (reports on research in enclosed coastal seas, conference information, etc) would be greatly appreciated.

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