ISSN 0919-7060
October 23, 2002

EMECS NEWSLETTER

International EMECS Center

No. 21

International EMECS Center Announces New President

At the meeting of the Board of Trustees held on June 6, 2002, Dr. Yoichi Kaya was unanimously accepted as the president of the International EMECS Center, replacing former President Jiro Kondo.

Under the leadership of President Kaya, the International EMECS Center will continue to promote activities aimed at the achievement of the Kobe-Awaji Declaration adopted at the 5th International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS 2001).

President
International EMECS Center

Dr. Jiro Kondo served as president of the International EMECS Center ever since its founding in 1994. He has worked tirelessly, both in promoting the Center and in handling its day-to-day operations. On behalf of the staff and members of the Center, I would like to express our profound gratitude to Dr. Kondo for his years of dedicated service.

The International EMECS Center constitutes an organic network linking researchers, government agencies, companies, private citizens and other entities. The Center promotes scholarly interchange both at home and abroad and engages in a variety of projects, with the aim of helping to preserve and create enclosed coastal sea environments and to build a society capable of sustainable development in which human beings can coexist with the myriad forms of nature.

Last year, I attended the 5th International Conference on the Environmental Management of Enclosed Coastal seas (EMECS 2001) held in Kobe and on Awaji Island and I could feel the intense passion researchers, government officials, NGO representatives, private citizens and many other entities engaged in EMECS activities had for environmental issues.

Currently, I am Director-General of the Research Institute of Innovative Technology for the Earth (RITE). My work involves research & development, studies and other activities relating to industrial technologies designed to help preserve the global environment. Through the development of revolutionary environmental technologies, we hope to both preserve the global environment and help the development of the global economy.

With the Johannesburg Summit and other events, we are currently seeing new movement on environmental issues worldwide. In my capacity as president of the International EMECS Center, I will employ all my experience toward the achievement of the "Coastal Zone Management that Ensures Coexistence between People and Nature in the 21st Century" that was the theme of EMECS 2001.

I hope that we can count on your understanding and cooperation in our efforts to further expand the activities of the International EMECS Center.

Message from the Former President

Former President
International EMECS Center

In August 1990, the first International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS) was held in Kobe, Japan under the strong leadership of former Hyogo prefectural Governor Toshitami Kaihara. The conference achieved a great success, attracting many delegates from numerous countries around the world. At that time, I was able to support Governor Kaihara by my capacity of the chairman of Central Environment Council of the Japanese Governor for this conference in the event.

Based on the success of the first EMECS conference, the name "EMECS" became widely known among marine environmentalists and government officials throughout the world. In 1993, the second EMECS conference was held in Baltimore, Maryland in the United States, and at this conference it was decided to make the EMECS conferences a regular event. With the help of influential scientists from abroad, the International EMECS Center was established in Kobe in 1994.

To date, five EMECS conferences have been held - the first one in Kobe, the second in Baltimore, the third in Stockholm, Sweden and the fourth in Antalya, Turkey and in 2001, the EMECS conference completed its eastward tour around the globe by returning to its birthplace in Kobe, the venue for the fifth conference.

After more than ten years of involvement with EMECS activities, I recently stepped down as president of the International EMECS Center. However, we have been fortunate enough to have Dr. Yoichi Kaya, Director-General of the Research Institute of Innovative Technology for the Earth (RITE), take over as president of the Center. Dr. Kaya certainly needs no introduction. More than 15 years my junior, Dr. Kaya is a young leader known for his deep understanding of and high ideals regarding global environmental issues.

The sixth EMECS conference will take place in the year 2003 in the Kingdom of Thailand. Under the leadership of Dr. Kaya, I am confident that the Center will make a major contribution toward resolving the vital issues of managing and creating ideal enclosed coastal sea environments.

Contents

Summary Report on the 5th International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS2001)

■Introduction

"The coexistence between human beings and nature is, at the same time, the coexistence of human beings with one another. There are no boundary lines when it comes to the preservation of enclosed coastal seas. It spans both physical conditions and differences in historical development, and the people living in those regions take the leading role in coastal management. Industry, NGOs and private citizens must join hands and work together in a partnership to help achieve coexistence with nature." The 5th International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS 2001) opened on Kobe Portisland on November 19, 2001. In attendance were more than 2,000 scientists, government officials and NGO representatives from 41 nations around the world.

The aims of the conference were to verify problems that could not be resolved in the 20th century, to restore and create the environments of enclosed coastal seas in the new century, and to provide an opportunity to call for participation and cooperation on the part of scientists, government officials, industry representatives, private citizens and NGOs, as well as specific measures for environmental management activities in enclosed coastal seas around the world in the new century, including international joint action networks and environmental education. On the final day of the conference, November 22, the venue was changed to Awaji Yumebutai on the Island of Awaji, and the Kobe - Awaji Declaration was adopted, a fitting message and the first on this topic in the 21st century, calling for local regions, communities and private citizens to play a leading role in the environmental management of enclosed coastal seas. With the adoption of the Declaration, the four-day conference came to a close.

■Opening Ceremony, Keynote Address, Special Address (November 19)

On the afternoon of November 19, the opening ceremony was held at the Portopia Hotel in Kobe, with the Prince and Princess Akishinomiya in attendance.

The conference officially opened with words of welcome from Dr. Jiro Kondo, chairman of the EMECS 2001 Executive Committee. Then, representing the conference sponsors, Environment Minister Yoriko Kawaguchi gave a welcoming address that said, in part, that the ocean is the source of life and has provided us with many bounties, and that it was her hope that the conference would provide a new message on the subject of global environmental preservation.

Following on from this, Prince Akishinomiya addressed the delegates, saying that enclosed coastal seas have provided people with riches but that reports of worsening conditions have been received from various parts of the world. The Prince also said that he hoped the achievements of the conference would serve as a guide for future efforts to deal with marine environmental problems.

Next, congratulatory messages from Foreign Ministry Makiko Tanaka and Dr. Klaus Topfer, executive Director of the United Nations Environment Programme, were read to the delegates.

Following the opening ceremony, the keynote address was given by Ms. Joke Waller-Hunter, Director, OECD Environment Directorate. While citing specific examples, she said that the sustainable use of natural resources must be correctly evaluated in addition to economic aspects. She also said that the issues that EMECS is working on were linked to worldwide problems, and that it was important to learn from past experiences.

After the keynote address, there were special presentations from noted architect and Tokyo University professor Tadao Ando, who gave a presentation entitled, "From Environmental Protection to Environmental Management and Restoration," and Toshitami Kaihara, former governor of Hyogo Prefecture and currently president of the Hyogo Research Institute for Regional Policy.

■Asian Forum (November 20)

The Asian Forum, which was held to consider environmental problems in enclosed coastal seas in Asia, was planned, organized and sponsored by the Asia-Pacific Network for Global Change Research (APN), an international organization with a center in Kobe, the Institute for Global Environmental Strategies (IGES) Kansai Research Center, and the International EMECS Center.

The presentations and discussions dealt with the present situation of, and future prospects for, coastal zones in Asia and the direction of policy, including the environmental impact of municipal redevelopment in Guangzhou, China; coastal zone ecosystems in Southeast Asia; and ocean pollution in the Gulf of Thailand. A panel discussion made up of the speakers was also held on the topic of "toward the achievement of a comprehensive assessment of Asian coastal zones," and it was proposed that an overall evaluation of all coastal zones in Asia be conducted as soon as possible.

■NGO Forum (November 20)

NGO Forum was held, creating the first opportunity for NGO-related parties to gather together at an EMECS conference. The theme of the forum was "the future of the partnership between governments, researchers and NGOs working to preserve coastal zones: a consideration through the activities of NGOs working to preserve the Seto Inland Sea and other seas throughout the world."

The forum featured reports from organizations working to preserve and restore tidal flats in Japan and case studies of citizen's activities, as well as reports on overseas NGO activities relating to coastal zone environmental management in Korea and Thailand. These presentations were followed by a discussion with the participation of the delegates present. An NGO Declaration noting, among other matters, that active participation of NGOs is indispensable for the environmental management of enclosed coastal seas was adopted.

■Sessions (November 20-21)

From November 20 through 21, oral sessions on five themes were held, in addition to an Ariake Sea Session, a special session on oil spills ("Environmental Impact and Restoration") and a poster session.

・Sessions

Theme 1 ("Roles of Monitoring and Environmental Information on Coastal Areas")

Among the matters pointed out in this session were the need to accurately translate the scientific data that has been obtained and present it to people in an easy-to-understand form, and the need to create an organization, based on publicly released information, that enables many people to participate in an interactive discussion on environmental issues.

Theme 2 ("Recognition of the Interaction between Land and Sea")

In this session, various problems pertaining to Chesapeake Bay, Tokyo Bay and the Seto Inland Sea were presented, in addition to problems faced by numerous countries bordering the Baltic Sea and the Black Sea. Specific discussions focused on the view that problems faced by enclosed coastal

seas are not limited to economic matters but develop into international political problems, and the need for a comprehensive systematic approach.

Theme 3 ("Strategies for Environmental Restoration and Creation Aimed at Urban Renewal - Systems, Technology, Culture, and Nature")

This session featured presentations on case studies of environmental restoration and renewal. Among the matters pointed out in the session was the view that environmental renewal itself is not a goal but, when necessary, a means that should be used with the utmost care, and the importance of exchanging various types of information concerning excellent practical efforts, in order to create the strategic framework for the establishment of environmental restoration plans and the development of individual environmental restoration technologies.

Theme 4 ("Environmental Management of Coastal Areas and Environmental Education and Practical Activities")

Among the presentations in this session was one that divided the environment into three categories -- nature, society and spirit -- and stated that the goal for people nurtured by environmental problems was not "people who are trained to resolve global environmental problems" but "people who are rich in spirit," in order to nurture people who do not destroy but rather have consideration for the environment.

Theme 5 ("Participation in and Collaboration on the Environmental Management of Coastal Seas: Approaches for Governance")

This session featured an effort to link history and culture with the natural ecosystem, as well as a discussion of the role of NGOs and comprehensive governance and the need for cooperation among international organizations.

・Ariake Sea Session

The Ariake Sea Session was held as an evening session on November 20. This session featured discussion on many fronts, including a presentation on the topography of the Ariake Sea and the poor laver harvest that has become a major societal problem, and the results of two environmental monitoring assessments.

・Special Session on Oil Spills (Environmental Impact and Restoration)

At the special session on oil spills (Environmental Impact and Restoration) held on November 21, presentations and discussion on the environmental impact of, and restoration from, oil spills was conducted, based on the lessons learned from the oil spill in the Sea of Japan involving the Russian tanker Nakhodka.

The keynote address dealt with how to evaluate costs from a technical perspective when polluters make restitution. Presentations included environmental impact and restitution using the oil spill from the Nakhodka as a case study. The general discussion featured a panel discussion and a debate regarding the importance of long-term monitoring.

・Poster Session

From November 20 through November 21, a poster session was held, featuring approximately 180 presentations of research reports using posters, with extraordinarily high attendance by the conference delegates. At the hall, posters were exhibited showing visually the status of environmental pollution and the stages leading up to this state, and there were enthusiastic questions and answers and discussion between presenters and delegates. The Best Poster Awards were selected by a committee of working group members and was based partly on votes cast by delegates.

At the closing ceremony for the conference, held at Awaji Yumebutai on the Island of Awaji, some of the presentations were awarded the Premier and Second Grand Prix for the Best Poster, the Best Effort Award, and the Encouragement Award. The awards were presented by Dr. Jiro Kondo, chairman of the EMECS 2001 Executive Committee.

■Seto Inland Sea Session (November 22)

The theme of the Seto Inland Sea session was "Environmental management, restoration, and creation of a revived Seto Inland Sea for the 21st Century -What did, and did not, occur within the Seto Inland Sea, and directions for the future." Held using a roundtable format and with the Seto Inland Sea as a venue, the session provided the opportunity for researchers, NGOs, government officials and industry representatives to report on what has and has not been done in the Seto Inland Sea, and what should be done in the future, from their individual perspectives, while receiving comments from ordinary delegates in a free exchange of ideas. Through an exchange of information regarding efforts in Chesapeake Bay, policies for the Seto Inland Sea in the 21st century were verified and proposed. In addition, this was the first symposium in which representatives from the government, NGOs and various other sectors came together to discuss the environmental management of the Seto Inland Sea, and the need to hold such discussion forums on a regular basis in order to discuss the desirable status of the Seto Inland Sea in the future and decide on a realistic plan of action to make this a reality was confirmed.

■Conference Summary (November 22)

At the conference summary, a keynote address entitled ," EMECS Accomplishments and Its Prospects for the 21st Century" was given. Subsequently, the achievements of each of the regular and special sessions were reported by the rapporteur for each session, and a conference summary panel discussion was held featuring the coordinators for each of the regular and special sessions as panelists. The discussion verified and proposed, from a variety of perspectives, the issues and achievements identified during the conference and, based on these issues and achievements, the direction for future EMECS activities.

To bring the conference summary to a conclusion, the Kobe - Awaji Declaration prepared by the Declaration Draft Committee was reported by the committee chairman and a discussion of its content by all delegates was held. As a result, after some amendments, the proposal to request that the final draft be adopted at the closing ceremony was made and approved.

■Closing Ceremony (November 22)

At the closing ceremony, Dr. Nobuo Kumamoto, chairman of the Executive Committee's Steering Committee summed up the status and achievements of the sessions and emphasized the importance of citizen involvement in activities, saying that many important proposals for what to do next had been made, and that the employment of the knowledge and abilities of citizens was indispensable for preserving the environment.

Next, Professor Wayne Bell, the chairman of the working group that drafted the Kobe - Awaji Declaration, introduced the significance of the final draft of the Declaration, and the Declaration was adopted by the delegates.

Dr. Osamu Matsuda, the chairman of the working group charged with selecting the winners of the Best Poster Awards, gave an overall evaluation and announced the various recipients and presented the awards.

Professor Piamsak Menasveta of Chulalongkorn University, representing the Thai Forestry Minister, gave words of welcome regarding the decision to hold the 6th EMECS conference in 2003 in Thailand, and expressed his hope that many delegates would attend.

The closing address for the conference was given by Toshizo Ido, governor of Japan's Hyogo Prefecture. He expressed his hopes for great achievements at the 6th EMECS Conference, based on the significance of the declaration that had been adopted. Finally, Dr. Yoichi Kaya, vice-chairman of the Executive Committee, declared the conference officially ended.

■Side Programs (November 18-19)

As side programs for EMECS 2001, on November 18 and November 19, at the Kobe International Exhibition Hall, an Environmental Restoration Expo and an Environmental Education Fair were held. The events during these two days were attended by a total of 2,600 persons including junior high school students.

・Environmental Restoration Expo

The Environmental Restoration Expo featured exhibits on a variety of state-of-the-art technologies being employed in coastal zones by industry, local governments, research institutions and other entities toward urban renewal and the restoration and creation of coastal zone environments in the 21st century. The state-of-the-art case studies included the following:

- Technologies for the creation of new water spaces (including "greening" of coastal zones and scaled revetments)
- An ongoing "ecotourism" project employing new water spaces
- Technologies to enhance revetment creation (including permeable breakwaters and gently sloping rubble mound seawalls)
- Land reclamation technologies for shallow sea areas (including the building of artificial tidal flats and artificial beaches)
- Technologies for (saltwater) marsh reclamation (including the construction of artificial lagoons)
- Technologies for creating unique habitats to restore crab populations on concrete embankments
- Technologies to improve water quality (including wastewater management, water purification and water treatment)

The expo afforded the opportunity for participants to join together to consider and exchange ideas these issues.

・Environmental Education Fair

The Environmental Education Fair reflected the themes of EMECS 2001 and was held with the objective of passing on beautiful coastal zones to our children. The Fair was held with the objective of providing the opportunity to discuss the direction for a new coastal zone environmental education and environmental preservation activities in the 21st century, and to provide linkage with concrete action in school and continuing education.

The Fair featured environmental education materials from UNESCO that are used overseas and typical environmental education materials that are used in various parts of Japan, reports of actual-practice activities to survey current landscapes with an eye to the environment and conduct environmental mapping, survey reports and efforts to protect the ecosystems of finless black porpoises and horseshoe crabs that are regional environmental symbols, exhibitions of oil spills and various actual coastal trash and the like, and exhibits designed to enable attendees to experience the wonder and importance of nature. The Fair served to deepen knowledge and understanding of the relationship between man and then environment that is important for a consideration of environmental restoration and creation.

(EMECS2003) 6th International Conference on the Environmental Management of Enclosed Coastal Seas

Preparations for holding the 6th International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS 2003) have begun in Thailand, the venue for the meeting. The following is an overview of the planned conference. The First Announcement will be issued shortly and will be sent to those persons and organizations concerned.

Provisional theme: Comprehensive and Responsible Coastal Management that Ensures Sustainable and Friendly Coexistence between Human Beings and Nature
Approximate date: November 18-21, 2003
Place: Bangkok, Kingdom of Thailand
Organizer: EMECS 2003 International Organizing Committee (IOC)

Further information contact EMECS 2003 Secretariat:
EMECS 2003 Secretariat
Address: c/o Department of Marine Science, Faculty of Science
Chulalongkorn University
Phyathai Rd., Bangkok 10330
Thailand
TEL: +66-2-2185393
FAX: +66-2-2550780
Email: supichai@sc.chula.ac.th

Report on Participation in the World Summit on Sustainable Development (WSSD)

Masahiko Inatsugi, International EMECS Center

The World Summit on Sustainable Development (WSSD) was held from August 26 through September 4, 2002 in Johannesburg, South Africa, climaxing with a summit conference of heads of state from September 2 to 4. The International EMECS Center took part in the conference on the basis it had been recognized by the United Nations as a major group that qualified to participate.

1 Overview

The World Summit on Sustainable Development (WSSD) was held in South Africa, not in the capital Pretoria but in the country's largest commercial center, Johannesburg, and its environs, where spring had just arrived. The city is situated on a plateau at an elevation of 1,000 meters above the sea level. The conference was held in four major venues: (1) the Sandton Convention Centre area, the center for international organizations such as the United Nations, the sponsor, and the International Union for Conservation of Nature and Natural Resources (IUCN); (2) the Ubuntu Village, which housed the national government exhibits from each country together with exhibits by international and other organizations (in addition to Tensile 1, the largest moveable event venue in the world), as well as the pavilion of the host nation, South Africa, the Japan Pavilion, and the international conference rooms and other temporary facilities; (3) the Expo Centre (NASREC) in a suburb of Johannesburg, which was used to display exhibits and hold workshops by a variety of organizations, primarily NGOs; and (4) the Water Dome, used as the venue for exhibits and workshops by international organizations on the subject of water environments. The venues were separated by distances of some 10 to 30 kilometers, but delegates were able to purchase a pass and travel by bus to each venue.

According to the official figures announced by the United Nations, the summit was attended by approximately 21,100 delegates from United Nations organizations, government representatives, and principal organizations registered with the United Nations, from a total of 191 countries. Unofficial figures put the number of NGO personnel and other attendees at the events held at the Ubuntu Village and NASREC venues at some 4,000 persons.

The International EMECS Center sponsored a joint exhibition at Tensile 1 in the Ubuntu Village, together with the Japanese government, Japan International Cooperation Agency (JICA) and the International Tropical Timber Organization (ITTO).

In addition, the Japan Pavilion set up by the Japanese Government featured exhibitions on environmental management by Toyota Motor Corporation and other entities as well as workshops on sustainable development in Japan and

EMECS booth

other topics, sponsored by the Japanese Government, JICA, ITTO and other organizations.

The Ministry of Foreign Affairs, the contact for the WSSD in Japan, had hoped that Japanese NGOs would conduct exhibitions at the Ubuntu Village, and this hope was became a reality thanks to the participation of the International EMECS Center. The International EMECS Center subsequently received a very courteous thank-you from the United Nations Administration Division of the Ministry.

2 EMECS Exhibition

Tensile 1 was open from 10 a.m. to 8 p.m. daily from the first day of the conference until two days after its conclusion (August 26 - September 6). However, August 26 was the day when the exhibits were completed, and September 6 was the day when they were dismantled so, in effect, the EMECS exhibit was on display for the entire duration of the Summit. In addition to the EMECS exhibit, Tensile 1 featured more than 300 booths sponsored by the governments of France, Germany, Sweden, the United States, Canada, China, Korea, Malaysia and other countries, and by international organizations and NGOs. Accordingly, the venue was very well attended, with some 500 to 600 persons coming everyday. However, as most of the visitors were Africans from South Africa and other nations, they were most interested in exhibits relating to agriculture, tropical forests and other themes to which Africans feel a close connection. Moreover, most of the visitors were from international organizations, with very few being university researchers.

The EMECS booth featured an explanation of the importance of enclosed coastal seas and environmental management efforts in Japan's Seto Inland Sea.

3 Summary

As this was a development-oriented summit, and as it was held in Africa, there was great interest in agriculture, climate and water issues. On the contrary, the interest in environmental problems in coastal zones was not so great, and I was disappointed to note that, as far as I could tell, only the president of Ghana among all of the various heads of state touched on the issue of coastal zone environments in his address at the Summit. In conclusion, it was still very significant that the International EMECS Center was able to participate in a major event that takes place only once every ten years, at which various heads of state discuss global environmental issues, and that the Center was able to publicize its activities and interact with the participants of other related organizations.

International Exhibition Hall (Tensile 1)

Report on Technological Transfer for the Environmental Management of Enclosed Coastal Seas in Thailand

Dr. Y. Okubo and Dr. Y. Saito, National Institute of Advanced Industrial Science and Technology, Japan

Introduction

We visit Office of Environmental Policy & Planning (OEPP), which is located at Bangkok, during 6 and 20 December 2001 as JICA experts, aiming at improvement of data analysis technology for protection against coastal erosion and impacts of sea level rise. We joined a field excursion to Cha-am and Hua Hin areas and Rayong and Patthaya areas during 11 and 14 December to survey coastal erosions.

Coastal erosion of Gulf of Thailand

Rayong and Patthaya

These areas are famous for tourism. Rayong has been developed rapidly since 10 years before and is now utilized for multi-purposes. Industrial areas, a huge reclaimed man-made peninsula, in the sea (Fig. 1) and dams at the upper streams of river were established now. There has been a naval base at the south of Patthaya since World War II. A new naval port with storage house and docks are now under construction.

Rayong is now suffering from severe erosion (Pict. 1). The change of sea current by the reclamation and dredging and the reduction of sediment supply by dam construction may cause the erosion (Pict. 2).

Pict.1 An inclined palm tree and a jetty of Ban Phe (Rayong).

Cha-am and Hua Hin

Cha-am and Hua Hin areas are tourist spots, where the grand palace is located. Eastern Seaboard, where Pathayya is located, is also a tourist spot. These areas are socially important.

Fig.1 Remote-sensing images taken by JERS-1 on 28 December 1995.

Pict.2 Breakwaters of Song Chao Beach.

The Thai government now gives a high priority for prevention of their rapid coastal erosions. Since the King commonly stays in the palace of Hua Hin, such coastal erosions are impending issues for Thai kingdom.

The length of coastal erosion reaches one hundred several tens kilometers. Jetties for fishery harbor at the mouth of river constructed by the harbor management office are expected to be main causes of the erosion. The harbors are very useful for the fishermen, but erosions caused by the harbors annoy neighboring residents and owners of resort houses (Pict. 3).

Pict.3 In front of Milford Hotel (Northern of Prankiri Beach).

Products

(1) The recent counter actions against coastal erosion are not fully effective.

They constructed breakwaters of about 20 m in length and 20 to 30 m away from the shoreline, fish-tale-shaped dikes and seawall of rocks (Pict. 4). But these counter actions are not fully effective.

There are several possible reasons. One is the random and large modification without any evaluation about its impact. The restricted budget allowances and the first priority of conservation of nature have made counter-actions modest. The second is the ineffective man-made construction. The method, which is mainly for a sandy beach, hardly functions for a muddy delta area.

(2) An integrated master plan for whole of the Gulf of Thailand is necessary.

The management actions to coastal zone are performed individually in different regions and sectors. The Thai government starts to consider a national master plan or a national framework of the coastal management.

Pict.4 Revetment/ Seawall near Maputa phut Industrial Estate.

The Thai government; however, gives the first priority to the protection for Hua Hin area, where the Grand palace is located, and to Pathayya, an important place for tourism. They are tying to manage them individually.

We recommend an integrated study to care of this issue. The Gulf of Thailand and its coastal areas, where Cha-am and Hua Hin areas and Eastern Seaboard are located, forms one dynamic system. The total coordination could give a fundamental and essential solution.

(3) This visit gave us a hint of a new coastal management technology.

The effective way for this issue is to develop new technology that fully utilizes sustainability of nature as delta and mangrove forests poses. In fact, 5-year old natural mangrove grows between 10-year old breakwaters and shorelines (Pict. 5). This indicates that a mix way of man-made structure and ecology could be effective.

Pict.5 Breakwaters and natural mangrove in Ban Bang Kaew.

It is hard for the Thai government to cover all of the advanced technology and a large budget to develop the technology. Japan has a variety of knowledge about this issue and can offer technological assistance. The cooperation between Thailand and Japan develops a new technology for coastal management in the near future. We hope that the technology is applied not only to Thailand but also to the other Asian countries that suffer similar damages.

Project Aimed at Packaging Optimal Environmental Restoration Technologies for Enclosed Coastal Seas

International EMECS Center

1. Introduction: background and objectives of our research

Industrial activities that achieved high-level growth in the 20th century and daily lifestyles supported by large-scale consumption have had a major impact on coastal zones. The result has been the accumulation of excessive quantities of nutrient salts and organic pollutants in enclosed coastal seas, leading to problems such as "red tides" and oxygen-deficient water masses that still have not been resolved. In the Port of Amagasaki, where the current study was conducted (located at the farthest interior portion of Osaka Bay, in which reclamation has formed an extremely enclosed ocean area), water quality and bottom quality have also declined drastically, and in the summertime the oxygen-deficient status at the lower and middle levels expands, limiting both the varieties and quantities of ocean plants and animals that can inhabit these regions. Finding ways to restore such environments is becoming a major concern in many enclosed coastal seas.

Research into element technologies such as artificial tidelands and seaweed beds as one facet of the techniques for environmental restoration in coastal zones is underway on many fronts. However, to apply these to actual ocean regions and produce effective results, it is necessary to resolve the question of how these techniques should be combined.

For this reason, this study was conducted to determine the ideal combination of environmental restoration techniques to restore material circulation and ecosystems to a favorable status, and to "package" the technologies so the knowledge obtained through the study could be applied to other ocean regions.

2. Overview of research

In fiscal 2001, this project was adopted as an "issue for research and development aimed at practical application," under the Environmental Technology Development, etc. Promotion Projects of the Ministry of the Environment, and it is being conducted at demonstration test facilities constructed in the Port of Amagasaki (Figure 1). It is a joint research project with Dr. Hideki

Ueshima, of the National Institute of Advanced Industrial Science and Technology (AIST), as research representative and the International EMECS Center as secretariat. Members of the project are Kobe University, The University of Tokushima, Osaka Prefecture University, the National Institute of Advanced Industrial Science and Technology (AIST), the National Institute for Environmental Studies, the Port and Airport Research Institute (PARI), the Hyogo Prefectural Institute of Public Health and Environmental Sciences, Ohbayashi Corporation, Kobe Steel, Ltd. and Sohgoh Kagaku Inc.

The following is an overview of the test facilities and the tests conducted at these facilities.

(1) Artificial tideland (Figure 2): Study of material circulation configuration, centering on bottom sediment and bottom-dwelling organisms; purification of water quality by bivalves; establishment of techniques for maintenance of artificial tidelands

(2) Artificial lagoon (Figure 3): Purification of water quality, such as improved transparency; formation of biological habitats and creation of areas in which people can come in contact with the ocean

(3) Inhabitable quaywall (Figure 4): Improvement of the ecosystem on vertical breakwaters; reduction of the deposit load on bottom sediment

(4) Floating seaweed bed (rafts) (Figure 5): Seaweed cultivation in ocean areas with extremely poor transparency; purification of water quality through nutrients removal by harvesting seaweed; restoration of biodiversity through the creation of seaweed beds

Fig.1 Port of Amagasaki and experimental site

Fig.2 Artificial tideland

Fig.3 Artificial lagoon

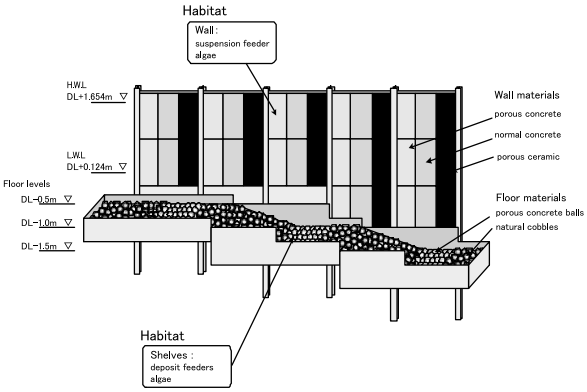


Fig.4 Inhabitable quaywall

Fig.5 Floating seaweed bed (rafts)

(5) Seaweed biomass utilization: Development of effective tecnologies for utilization of seaweed produced in the sea area.

(6) Flow control: Creation of a flow environment suited for habitation by living organisms

The individual effect of the individual technologies in restoring ecosystems and material circulation, as well as the synergy among the technologies, will be identified, and the ideal combination of technologies will be studied. In addition, flow control tests are being conducted using a large hydraulic model at the National Institute of Advanced Industrial Science and Technology (AIST), and tests of ocean plant biomass utilization technologies are being conducted at the test facilities of Osaka Prefecture University and Kobe Steel.

3. Implementation

To determine the current status of the test area, a preliminary survey was conducted, and the test facilities were designed based on the results. Following the start of seaweed cultivation in December 2001, the artificial tideland, lagoon and inhabitable quaywall were constructed from February to March 2002. Currently site monitoring, sea lettuce biomass utilization tests and flow control tests are in progress.

4. Major achievements at present

Achievements of the project so far include the achievement of designs of the artificial tideland, artificial lagoon and inhabitable quaywall suited to the site environment; validation of the techniques for monitoring the maturation of bivalves (clams) ; knowledge relating to practical application of techniques to improve water quality through the cultivation of seaweed and the like (Figure 6); and so forth. Ingression of various organisms and their adherence is being observed (Figures 7 - 9).

Fig.6 Seaweed (Undaria pinnatifida) cultivated using rafts

Fig.7 Seaweed (Enteromorpha linza) and lugworm scat on Artificial tideland

Fig.8 Juvenile flatfish found in artificial tideland

Fig.9 Crabs (Charybdis japonica) found on inhabitable quaywall

5. Conclusion

This research is only in the initial stages but in the future, data will be accumulated and the ideal combination of environmental restoration technologies will be studied. The achievements of this research are expected to improve the water quality and restore the rich ecosystems of enclosed coastal seas, and they are also expected to lead to the creation of beaches that can be enjoyed by the general public. Plans also call for the achievements of this research to be provided to other ocean regions that face similar problems.

VENICE AND ITS LAGOON: AN ENCLOSED COASTAL SEA IN CRISIS

Dr. Thomas J. Schoenbaum, Professor, School of Law, Dean Rusk Center for International and Comparetive Law, University of Georgia (U.S.A)

The city of Venice and its lagoon constitute one of the most important coastal sea controversies anywhere in the world. Venice with its storied history of fifteen hundred years and its magnificent store of art, architecture, and culture, is now threatened by three overwhlming forces. First, there is the physical force of the sea. Venice lies near the center of 212 square miles of marshland and shallow waters known as the Venice Lagoon. This area is separated from the Adriatic Sea by narrow strips of land broken in three places by inlets that let ships and water through. Because of land subsidence, industrial development, and rising sea level, Venice is increasingly threatened by a lethal combination of high waters (aquae alte) and pollution.

A second threat to Venice comes from socioeconomic forces. For a variety of reason Venice has been losing population as well as its economic viability. in 1950 the population of Venice was about 240,000; today it has dwindled to about 60,000 residents. The majority of the Italian work force commute to Venice-about 30,000 people each day. Major employers have left Venice in recent years.

Third,Venice is threatened by the very tourists that love it so much. Over 11million people visit Venice every year, but eight million of these are day trippers. Tourists overwhelm the city and its services, they require or for their impact on the fragile city.

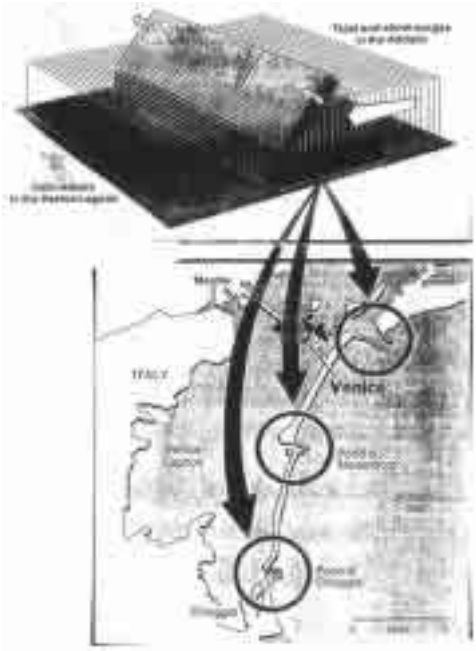
I recently visited Venice for discussions with city officials, universities, and private foundations about what is being done about these problems.

As to the "aquae alte"the Italian government is taking action that is very controversial. Total control has been delegated to the Consorzio Venezia Nuova, a consortium of large private companies, operating under the supervision of the Venice Water Authority. Their plan to save Venice consists of constructing three sea gates-mobile barriers at the entrances of each of the three inlets to the Venice Lagoon. During times of high waters these sea gates would be raised to block incoming waters.

This project will cost billions of dollars and will take about ten years to implement. There is doubt in many quarters, especially among environmentalists, whether this solution will work. At any rate, this engineering solution should be accompanied by measures to restore the environment of the Venice Lagoon. This may include: (1) pollution controls, (2) restoration of beaches and marshland, and (3) controls on dredging and ship traffic.

The socioeconomic problems of Venice also must be addressed. If Venice is to remain a vibrant city and not become a king artistic Disneyland park, ways must be found to attract stable enterprises to the city and to diminish the negative impact of the hordes of tourists. To address the first point, Venice is ideal for certain enterprises:educational institutions, financial and communications industries, and foundations. Incentives must be constructed to attract clean, appropriate development to the city of Venice. As for the tourists, ways must be found to encourage longer and overnight tourism and discourage day-trippers. This may involve some system of charges placed upon tourist cars and buses as well as users of the Venice railway station.

In any case, the crisis of Venice merits our attention and help.



Holding back the sea

According to one plan, sea gates placed inside three passages that separate the Adriatic Sea and the Venice Lagoon would help protect Venice from flooding. During storms and high tides, the barriers would rise, blocking water from entering the lagoon and inundating the city. At other times, the barriers would be lowered to let ships pass.

Bulletin Board

Call for Articles

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

International EMECS Center
IHD Bldg. 5-1 Wakinohama-kaigandori 1-chome, Chuo-ku,
Kobe 6510073 Japan
TEL: +81-78-252-0234 TEL: +81-78-252-0404
URL: http://www.emecs.or.jp E-mail: secret@emecs.or.jp

R100 (Printed on recycled paper)