

EMECS NEWSLETTER

No. **5**

A Letter from Hyogo

Hyogo Prefectural Government, Japan



EMECS '93, Baltimore, Maryland, U.S.A.

EMECS '96 to be held in Stockholm, Sweden



Governor Schaefer's greeting at the opening session

The first International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS '90) was held in Kobe, Japan in 1990. The Maryland State Government carried on where EMECS '90 had left off, and the second conference (EMECS '93) was held in Baltimore on the shores of Chesapeake Bay, one of the major enclosed coastal seas in North America, from November 10 - 13, 1993. The conference focused on "Toward Effective Governance" of the world's enclosed coastal seas.

EMECS '93 was sponsored by the state of Maryland and the University of Maryland System, together with the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA) and other organizations.

All of the conference sessions took place at the Baltimore Convention Center. Among the 600 registered participants were scholars and government officials from 46 countries as well as representa-

tives from such organizations as the United Nations Environment Programme (UNEP), the Food and Agriculture Organization of the United Nations (FAO), the World Conservation Union (IUCN) and the World Wildlife Fund (WWF). Special guests included 18 Maryland school teachers and 15 private citizens who were able to attend through support from the Chesapeake Bay Trust.

From Japan, 110 researchers, corporate representatives and officials from the Environment Agency and local government organizations attended. During the conference, the Environment Agency of Japan and the Governors' and Mayors' Conference on the Environmental Protection of the Seto Inland Sea co-sponsored "Japan Day," a reception aimed at facilitating exchanges between conference Participants from various countries.

On the last day of the conference, Professor Bengt-Owe Jansson, Director of Sweden's Marine Baltic Center, proposed that the next EMECS conference be held

in Stockholm, Sweden in 1996. The proposal received the unanimous support of the delegates.

1. Opening Session

The opening session was held on November 10 with more than 500 delegates and with Torrey Brown, M.D., secretary of the Maryland Department of Natural Resources, as moderator. Words of welcome were given by Mayor Kurt Schmoke of Baltimore; Toshitami Kaihara, governor of Hyogo Prefecture and chairman of the Governors' and Mayors' Conference on the Environmental Protection of the Seto Inland Sea; and Dr. Donald Boesch, president of the University of Maryland's Center for Environmental and Estuarine Studies (CEES).

The following are some excerpts from the speeches made at the opening session:

- Torrey Brown, M. D., secretary of the Maryland Department of Natural Resources

Dr. Brown said that, if it were not for the human causes of problems, there would be no problems with enclosed coastal seas. He said countries, states and organizations must work together to

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determine what should be done to resolve these problems and how go about achieving solutions. In this respect, he said, the concept of the EMECS conferences is one that has hit the mark.

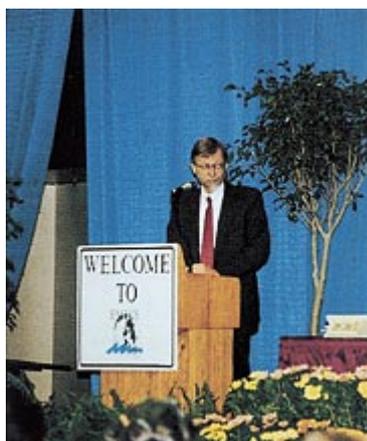
-Mayor Kurt Schmoke, City of Baltimore
 Mayor Schmoke thanked Governor Kaihara and all delegates for attending the conference. In his address he referred to Baltimore as "the city that reads" and further said, "we recognize that our coastal seas will be impacted by the activity of our citizens." He pointed out that the local harbor development had been done in an environmentally sensitive manner.

-Dr. Donald Boesch, President, CEES

Dr. Boesch said that the University of Maryland System has been among the leaders in the U. S., and around the world, in bringing science to bear on environmental management. He said that he believed that it was on a visit to Japan that his predecessor, the late Dr. Ian Morris, encouraged his Japanese colleagues to pursue the idea of developing the first EMECS conference, and so Dr. Boesch was now very pleased that they were now able to host the conference in Maryland.

- Governor Kaihara, Hyogo Prefecture, Japan

Governor Kaihara, who originally proposed the idea for the EMECS conferences, touched in his words of welcome on the growing move to hold EMECS conferences on a continuing basis. He also expressed the readiness of Hyogo Prefecture to establish an internationally-oriented body (tentatively called the International EMECS Center) in the city of Kobe, Japan, with the support and cooperation of related persons and



Keynote Speech NOAA Administrator, Dr. Baker

organizations, to serve as a nucleus for promoting efforts to preserve the environment of enclosed coastal seas throughout the world.

- Governor William Donald Schaefer, State of Maryland

In his words of welcome, Governor Schaefer expressed gratitude to Hyogo Prefecture for support in making EMECS '93 a reality, and expressed support for the idea of establishing an International EMECS Center - at which point the delegates applauded to express their support as well.

Subsequently, Governor Schaefer read aloud a statement, produced by the State of Maryland and other organizations, supporting the establishment of such a Center, and the governors signed both this document and an enlarged version for all to see. The enlarged version was subsequently signed by many EMECS delegates.

(1) Keynote Address

The keynote address was given by Administrator James Baker of the National Oceanic and Atmospheric Administration (NOAA). He said:

"A coastal zone is engaging and difficult because it cuts across scientific disciplines, geographic boundaries, government jurisdictions, populations and economic sectors. As coastal populations grow, the stresses on coastal resources are compounded. The resiliency of coastal ecosystems is stretched to the limit."

He went on to say that the issue of sustainable development is the central and defining issue for the 21st century and that importance of achieving sustainable development is nowhere more evident than in the coastal zone.

He said, "We need to work to build stronger links between our scientific researchers and the managers of coastal zone resources and all the different policy makers. Preserving and restoring the world's coastal seas requires what we call truly integrated coastal management."

He noted that a wide variety of symptoms of the stresses on coastal

ecosystems were appearing. One-third of U.S. shellfish beds are closed. Waste and sewage have prevented the use of many beaches. And toxic algal blooms have closed fisheries and reduced tourism. He pointed out that, for example, landings of fish and shellfish in the Gulf of Mexico and the Southeast U.S. have declined by 42% since 1982, because of habitat loss and pollution.

"Another major concern for coastal communities," he said, "is the loss of billions of dollars of property due to storms. During the past 18 months, the U.S. has experienced a number of recordsetting weather-related disasters in coastal areas." He cited the example of Hurricane Andrew, which, in August 1992, caused 22 fatalities and nearly \$30 billion in damages, a sum greater than all the earthquake damage in the U.S. in the 20th century. He said that NOAA's current



Audience of over five hundred people at the opening session

efforts regarding environmental quality were focusing on the coastal impact of nutrient over-enrichment and on on-site specific surveys of areas with known high concentrations of toxic chemical contaminants. A particularly important element of the program is what they call "Coastwatch," which is based on the rapid dissemination of satellite observation data to regional coastal sites.

He said that coastal issues are inherently global and that success in managing the coastal zone will depend on active participation from nations around the world.

(2) Panel Discussion

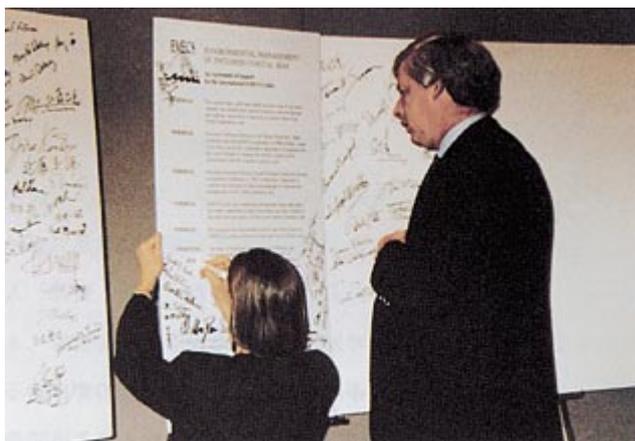
A panel discussion was held between three panelists representing the three major themes of EMECS '93: science, governance and citizen involvement. The three panelists were Dr. Takeshi Goda,

professor emeritus of Kyoto University; Robert Perciasepe, assistant administrator for Water Administration, the EPA; and Dr. Patrick Holligan, chair of the Planning Committee for Land-Ocean Interactions in the Coastal Zone (LOICZ). The moderator was David Carroll, secretary of the Maryland Department of the Environment. Each of the panelists pointed out issues and concerns from his particular standpoint.

2. Presentations

The sessions, which were held concurrently, were divided into six main tracks:

- (1) Philosophy and Policy
- (2) Citizen Involvement
- (3) Governance
- (4) Science and Research
- (5) Case Studies
- (6) Special Problems



Participants signing the Agreement of Support for the International EMECS Center

165 papers were presented at 54 sessions. These provided participants with a forum for debate and the exchange of information on activities to solve the problems faced by enclosed coastal seas. Poster sessions and video presentations were held in the afternoons of November 11 and 12.

The expectation that the International EMECS Center will build a better opportunity for networking and exchanging experience and information was also expressed in the Governance session, "Coastal Seas Governance after UNCED" by the chair, Peter Thacher, executive director of the Earth Council Foundation, U.S.A.

3. Japan Day

On the evening of November 12, "Japan Day," an international reception,

was sponsored by the Japanese side and attended by around 500 delegates.

Hiroshi Onodera, Director, Office of the Seto Inland Sea Environmental Conservation, Environment Agency of Japan, welcomed everyone and then Dr. Jiro Kondo, president of the Science Council of Japan, spoke on the importance of preserving the environment of enclosed coastal seas and on EMECS '90 and the International EMECS Center proposed by Hyogo Prefecture.

4. Coastal Forum

On November 12, a case study was presented on an imaginary enclosed coastal sea called the 'Madrigal Sea,' with the theme of "Resolving Our Coastal Conflicts." Eight scholars from around the world participated in a spirited mock debate with Dr. Richard Collins of the University of Virginia as moderator.

The discussion began by introducing the scenario for the Madrigal Sea, written by Dr. Jack Greer, University of Maryland - once a place of remarkable beauty where the graceful Madrigal Seals frolicked, but one that is now beset with numerous environmental problems including water quality which has declined as a result of heavy metals and toxic compounds. While the need for better cooperation between countries bordering the sea was recognized as crucial for devising measures to solve the problems of the Madrigal Sea, appropriate development is also needed to improve the lifestyles of the local citizens. The issues involved were discussed by the eight participants, each representing one of the conflicting interests: a citizen activist, an industry representative & economist, a fisherman, a government environment and fisheries official, a political leader, an environmental leader, an academic & analyst and a coastal researcher.

The Coastal Forum succeeded in illustrating the difficulties in solving issues among the various interests involved in enclosed coastal seas.



Speech at the Japan Day Reception
Dr. Kndo, President, Science Council of Japan

5. Closing Session

On the last day of the conference, November 13, Torrey Brown, M.D., secretary, the Maryland Department of Natural Resources, presided over the meeting of all conference delegates. After words of welcome by David Carroll, Secretary, the Maryland Department of the Environment, there were speeches summing up the achievements of the conference. The following are some excerpts from these speeches: 1

- Dr. Christopher D'Elia, Director, Maryland Sea Grant College Program

Dr. D'Elia said that it has been known for some time now that nations of the world with coastal areas have shared common problems and that EMECS is beginning to prove that there may be common solutions. He said, "We can learn from each other about how to approach our problems in a way that will allow us to benefit in a great way from what experiences have gone before."

- Dr. Donald Boesch, President, CEES

Dr. Boesch summed up by saying, "We decided to build the conference around some prepared themes: citizen involvement, governance and the world's science and technology and research. What we found was that the really important questions are not within the themes but between the themes, between those sectors, and I think that we have seen many cases and many sessions which have emphasized that."

He added, "One of the things that we knew we were trying to bridge in EMECS '93 is to get an East-West perspective on our environment and see how we approach it from those parts of the globe." He said he thought participants

Declaration of Principles from the
Second International Conference on
Environmental Management of Enclosed Coastal Seas

EMECS '93

We, the participants of the second EMECS Conference, thank Governor Toshitami Kaihara for his vision in initiating this international forum with the first EMECS Conference in 1990. We also thank Governor William Donald Schaefer for inviting us to Baltimore and for hosting the second Conference on the shores of the beautiful Chesapeake Bay. We believe that EMECS has proven its value as a stimulating forum for sharing information and ideas on issues of great concern to us all.

We affirm that EMECS is dedicated to the following principles:

- facilitating the international exchange of scientific information, including advances in research and modeling on coastal phenomena;
- fostering understanding among policy makers and researchers of the motivations and interests of citizens which are essential to the implementation of sound policy;
- improving communication and cooperation across the increasingly important science policy interface;
- building upon common commitments to protect coastal seas because of their importance as places of physical beauty and cultural and historic meaning;
- providing a venue for exchange of technology useful to solving problems of coastal seas; and,
- pursuing new approaches to governance informed by our concern for ecosystems that cross the jurisdictional boundaries that mankind has imposed.

We agree that EMECS must be committed to pursuing these principles into the Twenty-first Century, and we hope they will guide the organization and participation of future EMECS Conferences. In addition, we welcome Governor Kaihara's intention to establish an international EMECS center in Kobe, Japan, to pursue ongoing efforts to protect and maintain our precious coastal seas and their irreplaceable natural resources.

Finally, we enthusiastically endorse the generous offer of Sweden to host EMECS '96 in Stockholm as consistent with our recommendation that future EMECS conferences should take place on various sites representing coastal seas around the world.

stage where we are beginning to share more than information from one enclosed coastal sea to another. He said, for example, that we are beginning to share organisms from one enclosed coastal sea to another and suggested that the next EMECS forum may be an appropriate forum for studies especially of that kind of sharing as well.

"In the next couple of years," he said, "we can see 17 or 18 comprehensive conservation management plans, or CCMPs, coming out of the National Estuary Program in the U.S. It seems that those will all represent interesting experiments in governance and new arrangements, the governance of the nation's estuaries, and I think that will produce a lot of thought for future EMECS meetings of this type."

- Chair, Science & Research track: Prof. Bengt-Owe Jansson, Director, Marine Baltic Center, University of Stockholm

Dr. Jansson said there are only the limits of time, the limits of resources and the limits of the human mind. He said that although they are theoretical, many problems can be of utmost importance for those who practice in coastal management.

"It is my strong belief," he said, "that the present scientific knowledge we have is enough for taking strong and immediate actions against the overuse of coastal resources. I think that this conference has proven that to a great extent."

"There is a need," he continued, "for trans-disciplinary science, which is - needless to say - very difficult to bring about but maybe the most important finding of this conference is that it has shown the very strong need for cooperation between these different tracks."

-Chair, Philosophy & Policy track: Prof. Mark Sagoff, Director, Institute for Philosophy and Public Policy, University of Maryland College Park

"There was a clear contrast," Dr. Sagoff began, "between nature and the environment. Nature is an object of religious, esthetic and cultural appreciation and environment is chiefly an economic term. This is based on culture-based conceptions of what is at risk and the ways that different cultural groups look at environmental risk and look at the fragility or resilience of nature."

In his track, they questioned the nature

had tried to make a concerted effort to not only look East-West but also North-South, as there are some very important issues that need to be understood that are taking place in the developing world. In many respects, these issues are very different and much more challenging given the nature of population growth and resource utilization.

- Chair, Citizen Involvement track: William Eichbaum, Vice President for Environmental Quality, World Wildlife Fund

Mr. Eichbaum started off by saying that it was important not to treat the themes and ideas in the sessions in isolation but to look for linkages between them. He said a second theme that emerged from the discussions was a reaffirmation of the importance of education and that a further theme was the fact that citizens must be a part of the solution.

"A final point that I will make," he said, "is the question of being focused on the right thing. Are we really looking at the right sets of problems? Are we really dealing with the most critical problems or

are we dealing with symptoms, are we only dealing with easy things?"

- Chair, Governance track: Prof. Robert Knecht, Center for the Study of Marine Policy, University of Delaware

Dr. Knecht described how in his track, Dr. Danny Elder of the IUCN had presented an interesting visualization of integrated coastal management. Dr. Elder pictured a triangular model where one corner depicted key social economic concerns, as expressed by the usage of the coastal zone. In another corner were the legal, institutional and administrative arrangements as expressed by the managers. At the bottom was the biophysical world, the realities of the biophysical situation as expressed by the scientists. The interactions, the feedback, the intercommunications between these three prefocal points really represented a useful way of thinking about integrated coastal management.

Dr. Knecht went on to say how Dr. John Caddy of the FAO made an interesting observation, namely, that we are at a

of the scientific community and said that they found that within each scientific community there is immense disagreement over ways of interpreting data. The boundaries are always shifting. There are always many differences within communities but EMECS is a great success story because it is an expression of all kinds of chaos on both sides that has finally 'percolated up.' He said that the borders are always shifting and that they need to be shifting in order to have that ecological balance that is necessary to sustain not only nature but also our own political and social lives.

At the end of the conference, the EMECS '93 Declaration of Principles was adopted (see Page 4).

6. Summary / Coastal Forum Video

A summary of the conference will be available in August 1994. In addition, a VHS video of the Coastal Forum is available for U.S.\$20. For details, contact the Coastal and Environmental Policy Program (CEPP) office at the address given below.

The summary of the conference will be sent to conference delegates by the GEPP at no charge.

For further information, write to:

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Seto Inland Sea Research Forum in Kagawa

The Seto Inland Sea Research Forum in Kagawa, a conference sponsored by the Research Institute for the Seto Inland Sea, was held November 25 - 26, 1993 in Takamatsu, Kagawa Prefecture. All together, approximately 600 researchers, government representatives and members of the general public attended the forum, which was held under the theme, "The Principle of Environmental Preservation and Sustainable Development of the Seto Inland Sea."

At the opening ceremony, Dr. Takeshi Goda, professor emeritus of the University of Kyoto and chairman of the Institute, welcomed the delegates and told them that the purpose of the Forum was to discuss what should be done to ensure that the heritage of the Seto Inland Sea, one of the world's foremost enclosed coastal seas,

will be passed on to the next generation. Dr. Goda also noted that the scope of the Institute's activities had become international, as witnessed by the announcement at EMECS '93 that an international center will be established in Kobe.

Comments from Kazuo Nonaka, director general of the Water Quality Bureau of the Environment Agency of Japan, (read by a colleague), and congratulatory messages from Governor Kazuo Hirai of Kagawa Prefecture and Mayor Nobuo Waki of Takamatsu City, were followed by an outline of the objectives of the conference given by Dr. Tomotoshi Okaichi, president of Kagawa University and chairperson of the Forum's steering committee. Dr. Okaichi said that to preserve the environment of the Seto Inland Sea, it would be necessary to identify and study the circumstances surrounding problems encountered in protecting the ecosystem and ensuring the sustainable growth of the marine products industry. With regard to passing on the cultural heritage of the Seto Inland Sea, he called for the need to help define principles for preserving the environment of the Seto Inland Sea.

The forum was divided into four sessions. The first two sessions - entitled "Environment and Growth of Organisms in the Seto Inland Sea" and "Present and Future Status of Fishing and Cultivation Industries" - were held to discuss the preservation of the ecosystem and the sustainable growth of the marine products industry. Environmental preservation measures were discussed in the third session - "Interaction between Land and Sea Areas" - While cultural aspects were debated in the fourth session, "Passing on Our Cultural Heritage to the Future."

Session 1: "Environment and Growth of Organisms in the Seto Inland Sea"

Chair: Dr. Osamu Matsuda, professor, Faculty of Applied Biological Science, Hiroshima University

- "Total Volume of Basic Production Supporting Fishing in the Seto Inland Sea." (Tamiji Yamamoto, Hiroshima University)

- "Marine Pollution and Fishing in the Seto Inland Sea" (Keiji Washio, Hayashizaki Fishery Cooperative)

- "Fish Breeding through Seeding Discharge and its Effect on the Ecosystem" (Katsumi Tsukamoto, Ocean Research Institute, University of Tokyo)

- "Trial Cleanup of Pollution in Fish Breeding Grounds Using Benthic Organisms" (Shigeru Montani, Kagawa University)

Session 2: "Present and Future Status of Fishing and Farming Industries"

Chair: Kohachi Hayashi, Manager, Inland Sea Resources Management Division, Nansei National Fisheries

Research Institute

- "Manufacturing Activities and Offshore Fishing" (Tadashi Ovhi, Kagawa University)

- "Sustainable Fishing Yields and Resource Management" (Tatsuki Nagai, Nansei National Fisheries Research Institute)

- "Using Biotechnology and Other New Technologies in Farming" (Eiichi Yamamoto, Tottori Prefectural Fisheries Experimental Station)

- "Policies for Environmental Management of Fish Breeding Grounds" (Hidetaka Takeoka, University of Tokushima)

Session 3: "Interaction between Land and Sea Areas"

Chair: Hiroshi Mitsui, Professor, Faculty of Engineering, Tokushima University

- "Fluctuations in the Global Environment and the Environment in Coastal Sea Areas" (Shinichi Ue, Hiroshima University)

- "The use of Coastal Sea Areas and Mitigation" (Hideki Ueshima, Chugoku National Industrial Research Institute)

- "Capacity for the Environmental Cleanup of Tidelands and Beaches" (Hitoshi Murakami, University of Tokushima)

- "Amount of Inflow and Primary Production" (Hiroshi Nakanishi, Yamaguchi University)

Session 4: "Passing on Our Cultural Heritage to the Future"

Chair: Seiji Komori, President, Himeji College of Hyogo

- "Maritime Transport in the Seto Inland Sea from the Standpoint of Sunken Cargo" (Atsuyuki Manabe, Seto Inland Sea Folk History Museum)

- "The Struggle between the Genji and Heike Clans from the Standpoint of Oceanography" (Tetwuo Yanagi, Ehime University)

- "Red Tides and the History of Cultivation in Kagawa" (Chitari Ono, Kagawa Prefectural Fisheries Experimental Station)

- "Takamatsu Port - Past and Present" (Hiroshi Yokota, Kagawa Prefecture Takamatsu Port Area Development Bureau)

Following the sessions, panel discussion entitled "Coastal Development and the Environment in the Seto Inland Sea" was held, with forum steering committee chairman Dr. Okaichi acting as coordinator. There was spirited debate between panelists and participants on such topics as the need for a society based on recycling, the efforts of fish breeders to preserve the fishing industry through improved feeding and the like, planning difficulties in areas where land and sea intersect, the "life of water" and "ways of living"



MEDITERRANEAN ASSOCIATION TO SAVE THE SEA TURTLES (MEDASSET)

Organizations in the Field of Enclosed Coastal Seas No.4

Lily Venizelos

Founder/President of MEDASSET



Loggerhead turtle (Credit: D. Schrichter)

Having existed for over 100 million years, marine turtles are now threatened with extinction. Despite the various researches, debates and paper protection measures over the last few years, their situation in the Mediterranean is grave in the extreme, and continues to decline.

Females used to nest on several Mediterranean shores. Today Greece, Turkey and

Cyprus retain the largest concentration of nesting females. The last remaining important nesting beaches are threatened by loss of habitat due to coastal development for tourism, injury, death via fisheries, pollution, sand removal, and other human interferences. Because the Mediterranean is an enclosed sea, it rapidly becomes affected by toxic effluents, dumped waste, and coastal destruction which affect all marine life including the turtles.

Added to these pressures are the harvesting and exploitation of turtles and their eggs, the flouting of their protection laws and the indifference of Governments in not enforcing them.

- MEDASSET is an international non-governmental organisation that was set up in October 1988 in the U.K. It became a Charitable Trust (Charity No. 1023630) in July 1993 under U.K.law.

- MEDASSET - Greece is an entirely separate and independent legal entity that was set up in Greece as a Society in 1994. Its goals completely coincide with those of the U.K. international entity.

- MEDASSET is the only organisation of experts working specifically for the protection of sea turtles throughout the Mediterranean.

Its aims and objects are:

- (1) To maximise efficiency in this field through up to date advice and information to all funding and influential bodies, while fully supporting all programmes of applied conservation.
- (2) To co-ordinate and update the conservation requirements of the species.
- (3) To promote the conservation of these species in any on its forms and in any part or parts of the world.
- (4) To promote international co-operation in relation to research and conservation in particular in all Mediterranean

states.

Activities include research of coastlines and offshore throughout the area, political liaison, publicity and education, fund raising etc.

MEDASSET has a good working relationship with governments, governmental organisations and non-governmental organisations (N.G.O.'s) and projects have been co-funded by the European Union (EU), the Regional Activity Center for Specially protected Areas Tunisia (UNEP/Mediterranean Action Plan), The National Institute of Oceanography and Fisheries of Egypt (support in kind), and by several European N.G.O.'s (Greek Animal Welfare Fund/U.K., Archipelagos/Greece, the British Chelonia Group/U.K., Herpetofauna Conservation International/U.K.).

One of MEDASSET's marine turtle conservation priorities in the Mediterranean is the survey of potential nesting beaches which are unknown to date. Since 1989, six important areas were assessed in various parts of the Mediterranean.

These projects are:



The Syrian coast is the most polluted in the Mediterranean area (Credit: Maxkasperek)

(1) 1989 Conservation Assessment of South East Peloponese, Greece, for Caretta Caretta;

Diffuse nesting was recorded on several beaches which have not as yet received the attention of large scale tourism development. The study area was catalyzed by reports of plans to develop sections of the coast.

(2) 1991-An Assessment of Beaches for Loggerhead Turtles Nesting in Sardinia (Italy);

Over 750 kms of coastline was surveyed.

No evidence of nesting was found and there is no evidence of any nesting populations of significant size on sardinia. Tourism has completely overrun the beaches making nesting almost impossible.

(3) 1991-A survey of potential Nesting Beaches in the Northern Aegean Sea of Greece:

2,078 kms of coast were surveyed. It was concluded that no significant breeding takes place on the N. Aegean beaches.

(4) 1991- Sea Turtles in Syria, Results of a Coastal Survey:

This was the first ever survey of the entire (200 kms) coastline of Syria in the Near Eastern Mediterranean. Significant nesting for Loggerhead and Green turtles was found only on one beach and human predation of eggs was severe. The coastline of Syria is probably the most polluted in the whole Mediterranean.

(5) 1993-Marine Turtles in Egypt, Survey of the Mediterranean Coast Between Alexandria and El Salum (Phase I):

602 kms of coast were surveyed.



A nesting beach in Zakynthos (Greece) overtaken by tourism (Credit: MEDASSET)

Large, almost unspoiled, coastal ecosystems were found to be unique in the Mediterranean. But tourist development is rapidly growing in that area. Scattered, very low numbers of nesting, (Loggerhead only) was confirmed for the first time in this part of the Mediterranean.

Consumption of marine turtle meat and drinking of their blood takes place occasionally. Serious pollution of the sea and beaches was recorded.

(6) 1989-1993-Incidental catches of Loggerhead Turtles, *Caretta Caretta*, in Swordfish Long Lines in the Ionian Sea, Greece.

Monitoring of incidental catches of turtles continued for the fifth consecutive year.

Data has shown that most turtles caught were relatively small. This may indicate that the adult fraction has decreased due to death in drift nets.

The opportunity was taken to prepare a detailed inventory of all beaches in all five areas. Information on the physical structure of the coast, on human use, on nature protective value, on visible coastal and sea pollution and information on other animal species was also recorded and evaluated. A thorough photographic documentation of the beaches was compiled in each case. Recommendations for the protection of nesting beaches and for the turtles in the sea have been widely disseminated to all involved parties and states and international media.

MEDASSET's survey projects in the Mediterranean for the last four seasons, have failed to find any important nesting beaches. To date, the island of Zakynthos in Greece (Ionian

sea) remains vital for the survival of the Loggerhead in the Mediterranean, as it bears the largest concentration of nesting turtles in the Mediterranean.

Since 1989 MEDASSET has taken an active role at Bern Convention meetings (Council of Europe) lobbying for the implementation of national Greek laws in Zakynthos, and fighting to save Dalyan and Patara in Turkey for the turtles. It continues to campaign tirelessly against drift net fishing in the Mediterranean, and to participate in and give papers at all relevant national and international meetings and is ensuring that the struggle for the conservation of the marine turtle does not falter.

Planned research activities for 1994 include;

- (1) Phase II of a survey of the Mediterranean coast of Egypt from Alexandria to Port Said.
- (2) Continuation, for the sixth ongoing year, of monitoring incidental catches of Loggerhead on swordfish long lines in the Greek waters of the Ionian Sea.
- (3) A Survey of the entire Libyan coast (2,000 kms) for nesting beaches.

There are six major international Agreements affecting marine turtles and Party States thereto, in the Mediterranean. Albeit there is no evidence of international efforts to manage the species during its migratory pattern.

Existing international agreements are not adequately, if at all, implemented to improve the conservation status of the species by several Mediterranean countries.

The incidental catch and deliberate harvest of marine turtles should be stopped immediately, given the present poor conservation status of Mediterranean populations. It could be that incidental catch has been removing more turtles than nest annually on Mediterranean beaches. It is possible that as the adults which are currently active die off, Mediterranean sea turtle populations will suffer rapid declines in the face of steadily declining recruitment (Groombridge 1990).

MEDASSET's declared aim is to halt the increasing threat to the highly endangered Mediterranean marine turtle and indeed other life.

Time is running out but it is not too late to put things right if action is taken now on the recommendations based on exhaustive research, made available by MEDASSET.

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MEDASSET ACTIVITIES 1990-1993

Integrating Coastal and Watershed Systems: Yale University Devotes an Academic Program to the Study of Coastal Watersheds

Dr. Anita van Breda

Program Director
Center for Coastal and Watershed Systems
School of Forestry and Environmental Studies
Yale University

Introduction

The Center for Coastal and Watershed Systems (CCWS) in the School of Forestry and Environmental Studies at Yale University serves as a mechanism for addressing interdisciplinary research of coupled coastal and watershed ecosystems. The mission of the Center integrates expertise in terrestrial ecology with research of coastal watersheds, to address science, management and policy problems focused at the land/sea margin. A unique aspect of the Center's mission is the belief that coastal waters and their watersheds are inextricably linked, interdependent systems.

Research Issues

Those involved with Center view the coastal zone as a linked terrestrial-marine-atmospheric system with a crucial role in biological, chemical, and geological cycles. Traditionally, most oceanographers avoid the coast because it is not entirely marine influenced and therefore is somehow considered "terrestrial". For similar reasons, most terrestrial ecologists avoid research along the shoreline because of the waters' influence on ecological processes. Even when researchers. Even study estuaries, river basins, and coastlines, they tend to see them as strictly aquatic regions where fresh and salt water mix, de-emphasizing the importance of interactions with the adjacent shoreline. Environmental conditions of near-shore water bodies however, are often exclusively dependent on interaction with terrestrial factors. Key problems that contribute to the deterioration of coastal waters such as: pathogens, toxins, hypoxia caused by nutrients, floatable debris, and degraded water quality - almost always originate of land.

Although terrestrial ecological processes and human activity greatly influence the biological function and health of coastal water bodies, at the same time, coastal waters influence ecological processes of the land. Significant climate effects, contribution of sea salts in rain, coastal erosion of land forms, invasion by exotic species, and offshore sediment supply to near-shore systems, are examples of effects of biological, chemical and physical processes of the water on the land.

The many policy and management issues to be addressed regarding the coastal zone are just as numerous and complex as the natural science questions. Human activities have altered many aspects of the coastal environment. Serious and significant ramifications to economic, political, and commercial policies are evident where humankind's influence on the global ocean is concentrated - the coastal zone. The Center therefore views policy and management studies of the coastal zone as an integral component of a holistic approach to coastal research. In order to synthesize large quantities of natural and social science information, the use of geographic information systems (GIS) and computer modeling are also critical components of the Center's research design.

Research Methods

The Center's research efforts are designed to view coastal waters and their watersheds as linked and interdependent systems. Modeled after the Hubbard Brook Ecosystem Study, a long term multidisciplinary investigation of the interactions between atmospheric, terrestrial, and aquatic components of small watershed-ecosystems, the Center seeks to similarly

initiate long-term multidisciplinary studies of coastal ecosystems, including the structure, function and interaction of terrestrial and marine resources within the entire watershed. Local potential research sites in Connecticut include the West River, Quinnipiac River, New Haven Harbor, Jordon Cove, and the Hoadley Creek watershed. In addition, Tivoli Bay in New York and the Copper River delta in Alaska, are examples of sites where faculty and student research is already in progress. These investigations serve as examples of potential long-term multidisciplinary projects that can incorporate aspects of coastal and watershed inquiries.

Fortunately, several examples of integrated coastal/watershed systems appropriate for research exist locally. The conceptual framework for such research however, is not site specific, but will be applicable to any region of the world. The Center's program will address coastal concerns on a regional, national, and international level for complete studies of global resources. Research at international sites already in progress include Honda Bay, in the Philippines.

Principle faculty associated with CCWS are Faculty Director Dr. Gaboury Benoit, Assistant Professor of Environmental Chemistry; Dr. Paul K. Barten, Associate Professor of Water Resources; and Dr. Jared L. Cohon, Dean, and Professor of Environmental Systems Analysis.

Education

The Center's education programs continue to grow in 1993. Thirty students registered for the Center's Spring 1993 seminar course "Current Marine Research at Yale University" which brought together 12 faculty members from departments. A public lecture series continued with a collection of talks by local experts addressing Long Island Sound (LIS) issues such as land use patterns and coastal changes in Connecticut, and citizen participation in management options for LIS.

In August 1993, the Center also offered a coastal watershed summer field class. The course consisted of a Connecticut watershed-study, a natural history tour of one of the two remaining tidal salt marshes in New Haven, and an oyster boat excursion along the Quinnipiac River and New Haven Harbor. The course illustrated to the new students the mission of the Center in terms of the role of the land/sea margin in environmental studies, and the concept of the interaction between watersheds and shoreline resources and water dependent management issues.

Recognizing that coastal ecosystems are an integral part of the environment and an essential aspect of a holistic approach to environmental studies, the School's administration formally recognized a new advanced study area devoted to coastal and watershed studies. Core courses, tailored to needs and qualifications of individual students, are selected from a range of F&ES classes in addition to offerings in the Biology and Geology and Geophysics departments, and the Schools of Law, Organization and Management, and Epidemiology and Public Health. In the Spring of 1994 Estuarine Science and Policy will again be taught by Dr. Richard Burroughs, Visiting professor from the University of Rhode Island. A Caribbean Field research class focusing on the relationship between coral reefs and coastal zone management is also in the planning stages. To take place during Spring(1994), the course will be taught in the Bay Islands in Honduras and will focus on coral reef assessment, coastal zone development and economic analysis of marine protected areas.

Student initiated research in the coastal zone also continues to grow. Several students received full funding for research projects from the sounds Conservancy, a regional marine conservation organization. Projects include a study of the chemical and ecological impacts of railroad embankment material on salt marshes; an investigation of the recent geological history of Jordan Cove(CT) as recorded in sediments; and

curriculum development for a course on the history of US marine policy and diplomacy.

The Center faculty and staff look forward to a busy academic year as we strive to address the many varied and complex science and social issues found at the waters edge. Please feel free to contact us at any time.

Contact:
COWS, School of Forestry and Environmental Studies, Yale University
301 Prospect Street, New Haven
CT 06511, USA
Fax: +1 203-432-3817

Training Course for Environmental Management Following Industrialization

The second Program for Industrialization and Environmental Protection (PIEN) was held from September 13 through September 24, 1993 at the Kansai training center of the Association for Overseas Technical Scholarship(AOTS)in Suita, Osaka Prefecture. The theme of the course was "Environmental Control Problems Caused by Industries." The course was attended by 19 persons from 15 countries.

The course has been sponsored by AOTS, a non-profit association run with Japanese government subsidies from the Ministry of International Trade and Industry (MITI) since 1992. The objective of the course was to illuminate measures that Japan as a major industrialized country has taken in the field of environmental management, in order to contribute to environmental management efforts on the part of developing countries. Assistance was provided by the prefectures of Hyogo and Osaka, the city of Osaka, and by private companies.

The course focused on environmental management to prevent water contamination, air pollution and industrial waste treatment. It consisted of lectures on the history and current status of environmental management in Japan, as well as related technologies and legal considerations. The participants were largely technicians and others such as plant managers involved in environment-related work in developing countries. There was a lively discussion regarding practical measures for environmental management being implemented in Japan.

Since 1993, AOTS has increased the number of target countries for which this training has been offered and has held training courses at both the Kansai Kanshu Center and the Tokyo Kanshu Center. For further information, please contact AOTS:

AOTS Kansai Kanshu Center
3, Tsukumodai 3-chome, Suita
Osaka 565, Japan
Tel:+81 6-871-1681
Fax:+81 6-831-9119

Training in Techniques of Environmental Management of Enclosed Coastal Seas

The Fourth Group Training Course in Systems of Environmental Management of Enclosed Sea Areas was held from September 17, 1993 through December 1, 1993 at the Hyogo International Center in Kobe. Participants were administrators and researchers from five developing countries: Korea, Republic of the Philippines, Thailand, Saudi Arabia, and Mexico. The Association for Environmental Conservation of the Seto Inland Sea, one of the organizers of EMECS '90' as well as Hyogo Prefectural Government, has conducted this course since 1990 under the sponsorship of the Japan International Cooperation Agency (JICA).

The purpose of this course is to provide technical instruction that will help mid-level administrators and technicians from developing countries to more effectively manage enclosed sea environments.

The theoretical and practical subjects covered include seven areas (see Table). This year's course was designed to add training in how to use algae as an indicator of water quality, as well as touring effluent facilities for agricultural hamlets and small factories.

Participants in the 1993 course were as follows:

- * Mr. Lee Jong Chan
Senior Research Engineer
Marine Environment Engineering Lab.
Korea Ocean Research & Development Institute(Korea)
- * Mr. Josefino P. Belocura, Jr.
Supervisor of Environment Management Specialist
Environment Management & Protected Areas
Department of Environment & Natural Resources of Region IX (Philippines)
- * Mr. Chatchai Thaitoongchin
Researcher
Department of Aquaculture
Faculty of Fisheries
Kasetsart University (Thailand)
- * Mr. Jamal Ali Bamaileh
Environmental Health Specialist

Marine Environment Department
Meteorology & Environmental Protection Administration (Saudi Arabia)

* Mr. Gonzales Hernandez Javier
Coordinator
National Institute of Ecology (Mexico)

The training course in 1994 will be similar to the schedule of the 1993 training course.

SUBJECTS
GENERAL OVERVIEW Definition of enclosed coastal seas Social aspects of enclosed coastal seas Characteristics of the Seto Inland Sea
PHENOMENA & MECHANISM OF WATER POLLUTION General view of water pollution Organic/inorganic pollution Eutrophication Water flow of the Seto Inland Sea
MODELING Eutrophication & circulation of substances in enclosed coastal seas Foundation of water pollution modeling Simulation technique
INVESTIGATION & MEASUREMENT Monitoring plan Analytical methods Instrumentation Remote sensing technique
MANAGEMENT TECHNIQUES Waste water treatment technique Sewage treatment technique Administration of waste disposal Mangrove conservation
ENVIRONMENTAL MANAGEMENT POLICIES Legal systems Environmental impact assessment Water quality criteria Environmental management plan
PUBLIC AWARENESS Environmental education



Participants collecting marine algae as an indicator of water quality (Credit; Asahi Shimbun Publishing Company)

The Danger to the " Lancelet " in the Seto Inland Sea

Dr. Shigeto Mizuoka
President, Iwakuni Junior College

What is a Lancelet?

The lancelet is probably unfamiliar to most people, not being particularly highly regarded either as a food item or as an ornament.

The Japanese name for lancelet is "namekujio." Although the suffix "uo" in its name would tend to indicate that it is a fish, in fact it is not; nor is it a member of the slug family, as the word " namekuji " would suggest. It normally grows to a length of no more than 5 or 6 centimeters. Both ends are pointed and the sides are flat, forming a long, thin spindle. It has a semi-translucent white color that can appear slightly pinkish. As it is not a fish, it has no vertebrae, and neither does it have any head, eyes, scales, pectoral fins or ventral fins, yet it is able to swim by wiggling its body. It lives in clean, sandy, ocean areas uncontaminated by mud (Photo).

Vertebrates develop from egg to adulthood in stages, developing a notochord on their back which is finally replaced by vertebrae. The lancelet, on the other hand, develops a notochord from front to back but does not develop vertebrae. In the case of the lancelet, neural canals develop on the back of this notochord while alimentary canals develop on its belly, and these are wound with numerous myotomes. This body construction harks back to the first vertebrates, and therefore the lancelet is very valuable for research into how vertebrates developed.

There are two genera and 34 species of lancelet throughout the world, three of which are native to Japan. (Nishikawa, 1979). The "namekujio" is native to Hiroshima Prefecture, being found from Misaki, Miura Kanagawa Prefecture to the south of Kyushu. They are particularly abundant in Aichi Prefecture, near Sumoto on Awaji Island, in coastal areas of the Seto Inland Sea, and in Amakusa in Kyushu.

However, the lancelet has not been seen since the spring of 1968 in Oshima

off the coast of Miya, Gamagori, Aichi Prefecture, an area which has been designated as a protected area (Nishikawa & Mizuoka 1990). It has also disappeared completely from the littorals of the Ariake Sea (Yamaguchi & Kikuchi 1985).

Lancelet on the Island of Uryu, Hiroshima Prefecture

The uninhabited island of Uryu lies approximately 300 meters off the coast of Saizaki in Toyota, Hiroshima Prefecture (now known as Saizaki-cho in the city of Mihara). Southwest from the western end of this island to the island of Okuno off the coast of Tadanoumi, Takehara, Hiroshima Prefecture, there was an enormous sand bar, or shoal, that stretches for around 6 kilometers (see Fig.) A very tiny portion of this shoal was connected to the island of Uryu and, following the issue of Notification No. 270 by the Ministry of Home Affairs, an area approximately 400 to 500 meters in length exposed at low tide during the spring tides was designated on March 24, 1928 as a protected area. This occurred after Sawahara, an instructor at the then Tadanoumi Junior High School in Hiroshima Prefecture, collected numerous samples of the lancelet in this region during the summer of 1921 and reported his findings to Professor Watase at the then Tokyo Imperial University (Sawahara, 1932).

According to Kaburagi (1932), the reason for this designation was the fact that in terms of taxonomy the lancelet ranks near the bottom of the vertebrates and was considered valuable research material for ancient animal morphology; many valuable papers have been presented on the subject. This valuable specimen flourished on one part of the shoal and was easily caught, and as a result it was one of the creature ' s most important habitats not only in Japan but in the world as a whole.

The Decimation of Lancelet on Uryu Island

Although Uryu Island was thus said to be one of the most abundant habitats of lancelet in the world, the lancelet population there has been reduced to a point where it is now faced with ' extinction. At present, there is insufficient material for us to judge the extent of their



Lancelet (Credit, Ms Keiko Ohta)

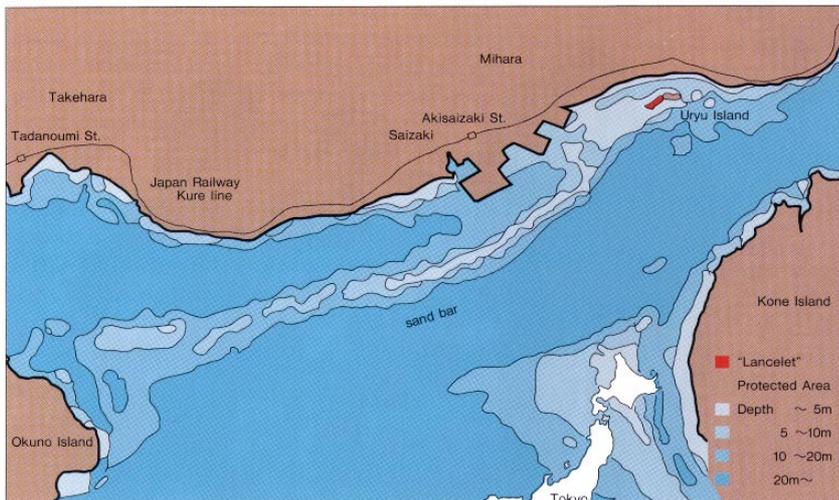
decline. Table shows records of lancelet collected, recorded by Sato (1972), to which has been added all the existing sampling recorded up to the present time. The records from 1951 to 1969 are those recorded by Sato (1972). According to him, the data are incomplete with regard to giving an indication of population density; however, it shows the results of lancelet sampling within approximately one hour at low tide, so it should be sufficient to give a general indication of trends. To this data has been added the work of Sakata (1939), Mizuoka (1978), Sato (an unpublished study conducted during the summer of 1987) as well as the results of studies performed from 1988 to 1990 (by Mizuoka, Katayama and Torigoe 1991). Although these materials are incomplete, they indicate the following with regard to the population density of lancelet in the area of Uryu Island that is designated as a protected area.

In a study performed by Mizuoka (1978) on November 13, 1977, a total of 10 to 15 people worked for 1 hour and collected 14 lancelet from an area of the sandbar measuring 140 square meters. This represents one lancelet for every ten square meters and between 0.9 to 1.4 lancelet per person per hour. This is about one-tenth the number collected in the study done by Sakata (1939). In the study by Mizuoka et al carried out in August 1998, 0.04 lancelet were collected per ten square meters, representing 0.02 lancelet per person, per hour. Subsequently, in December 1989, February 1990 and July 1990, researchers were unable to collect a single lancelet. In the April 1990 study by Katayama, however, 0.03 lancelet per ten square meters were collected, representing 0.02 lancelet per person, per hour.

From these data, we can conclude that on Uryu Island the population of lancelet, which was once at least one lancelet per square meter, had begun to show signs of decline by around 1960 and was further greatly diminished in the 1980's, approaching the level of extinction.

Reasons for the Decimation of Lancelet on Uryu Island

There are two major reasons for the decimation of lancelet on Uryu Island. One is that the nature of the sand on the sand bar has changed due to the influx of mud in most of the areas of the sand bar designated as a protected area. Lancelet live in the sand, burrowing into it until the bottom half of their bodies are covered. Nishikawa (1978) showed that



Uryu Island and shoals in Saizaki, Mihara, (From a navigational chart published in 1963)

lancelet are normally discovered in areas of rough sand that include shell fragments, while Yamaguchi and Kikuchi (1985) found that lancelet are distributed from the low tide mark down to a depth of 50 meters. From this evidence, we can conclude that while lancelet are somewhat flexible with respect to water depth, they are very selective with respect to the particle size of the sediment. Moreover, in 1987, Sanyo Techno Marine Inc. (formerly, Sanyo Hydrographic Survey Co., Ltd.) conducted a survey of the habitat of lancelet on Oshima (off the coast of Miya, Gamagori, Aichi Prefecture) and found that the lancelet population collects in sediment whose central particle diameter falls within a narrow range of between 0.31 and 0.81 mm - thus showing that the lancelet tend to select sand of a certain particle size.

Regarding the sand bar on Uryu Island, Sawahara (1932), in a survey recorded in 1927, noted that the entire island was covered with pine trees, casting a green shimmering shadow flowing out into the sea. The sand bar was composed entirely of granite sand, washed constantly by an ebb tide flowing west through the Mihara Channel and the incoming tide running along the northern part of Kuno Island. The sand particles move according to the current, thus preventing even a single aquatic plant from taking root. In a survey conducted in April 1932, kaburagi (1932) also stated that the sand bar was made of granite sand, and there were no aquatic plants, while Sato (1966) refers to it as a large sand bar made of shell sand.

Moreover, in a face-to-face survey conducted in 1977, respondents commented that the sand used to be clean and soft, and when you walked on it your feet would sink fairly far down into the sand, but recently, they said, the sand had become harder.

The following change in the inhabiting plants and animals is also evidence of the gradual influx of mud into the sand bar. Mizuoka (1978) notes the presence of the following animals: pudding wife, flatfish, conger eel, greenling, sea urchin, sea star, stone crab, elbow crab, mantis shrimp, snapping shrimp, varnished venus, razor clam, common northern moon shell and others. These animals live in comparatively clean sand or sand with

small quantities of mud. A survey carried out in 1988, however, did not find any of these creatures except elbow crab. Conversely, it also noted the presence of such animals as violet-mouthed moon, senhouse's mussel, short-necked clam, elbow crab, peanut worm, and the plant, eelgrass. These animals and eelgrass inhabit areas ranging from those with slight to considerable concentrations of mud; the senhouse's mussel in particular is a shellfish that lives in mud with a considerable population of living organisms.

As shown in Table since 1960 the sea water has been muddied, and from this time mud and shellfish have begun to encroach upon the areas designated as a protected area. Although there are some areas with comparatively clean sand, I think that most of the sand bar has changed into one containing large quantities of mud. At present, the lancelet is found on rare occasions in the areas of clean sand, but is not found at all in the very muddy areas. I think that the particle size of sand in most of the areas designated as a protected area was between 0.5 and 2.0mm, making it the ideal habitat for lancelet before the increase in the amount of mud was seen.

The increased quantity of mud and shells in the sand bar are thought not to have flowed in from nearby rivers but to have been caught up in a phenomenon that we shall refer to as "gravel collection" and carried there by the tides.

One reason for the present decimation of lancelet on Uryu Island is the disappearance of their habitat and a place for them to lay eggs due to this "gravel collection" phenomenon. In a navigational chart published in 1963, there was a large sand bar, or shoal, stretching between Uryu Island and Okuno Island for a distance of around 6 kilometers with a depth of around 5 meters (see Fig.). On this shoal, "gravel collection" occurred from about 1960 to 1987; in a navigational chart published in 1986, the sand bar on this shoal had completely disappeared, leaving only a tiny area designated as a protected area for the lancelet; it had turned into an ocean with a depth of around 30 meters.

According to Kaburagi (1932), the lancelet thrived on a part of the shoal

stretching about 4 kilometers southwest of Uryu Island. However, Sawahara (1932) found difficulty in collecting any lancelet in areas of the shoal exposed during normal neap tides but states that a particularly large number could be collected in areas exposed only at high tides. At present, too, lancelet cannot be found in areas exposed at neap tides but can be found in areas exposed at high tides.

From this evidence, it is thought that the main egg laying sea beds and habitats for the lancelet on the shoal were on the sand bar that has been decimated by "gravel collection." I also think that the lancelet that lived on the now nonexistent sand bar were caught up in the "gravel collection" and that almost all of them must have perished.

This "gravel collection" is thought to have had a very great impact not only on the decimation and extinction of the lancelet but on other animal life as well. It is very possible that the fish that inhabit this sand bar for example, the sand eel have also been reduced in number, and it is also quite possible that this has caused a reduction in the animals that in turn feed on them, such as sea bream, sea bass and other fish, seabirds such as the red-throated loon, and mammals such as the finlessback porpoise. The reduction of lancelet on Uryu Island should serve as a warning to us of the nature and mechanism of "gravel collection" which causes damage that occurs under the ocean and is therefore not directly visible.

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Sampling Record of Lancelet on Uryu Island

Year	Surveyor	Quantity Sampled	Condition of seawater in sand
1939	Takashi Sakata	10 per hour	
1951	Kunio Matsumoto	More than 50	Clear seawater
1955	Kunio Matsumoto	More than 60	Same
1959	Kunio Matsumoto	32	Same
1960	Tsukini Sato	12	Muddy seawater
1964	Kunio Matsumoto	0	Muddy water
1969	Tsukini Sato	2	Same
1977	Mizuoka et al (group of 15)	14(0.9)	Same
1987 (Sept.)	Tsukini Sato	1	
1988 (August)	Mizuoka et al (group of 24)	1(0.02)	Clumps of mud observed
1989 (August)	Mizuoka et al (group of 26)	1	Shoreline muddy
1989 (December)	Mizuoka et al (group of 28)	0	Unable to see bottom
1990 (February)	Katayama et al (group of 24)	0	Same
1990 (April)	Katayama et al (group of 24)	1(0.02)	Same
1990 (July)	Mizuoka et al (group of 24)	0	Same

Sampling figures in parentheses indicate the number sampled per person. pre hour

Forthcoming Conferences

(1994)

Apr. 12-15
HYDROTOP '94
Marseille, France
Contact:Paul-Henri Roux, Association
SIEM
Address:314 Ave. du Prado, 13008
Marseille
France
Tel:+33 91-227272
Fax:+33 91-227171

May 2-7

EUCC-WWF Conf. on Coastal
Conservation & Management
in the Baltic Region
Gdansk-Kaliningrad-Riga
Contact:EUCC Baltic Office
Address:Kareiviniu gt. 4-7, LT-5800
Klaipeda, Lithuania
Fax:+370 61-96593

May 8-13

3rd Int. Conf. on Marine Debris
Miami, Florida, U.S.A.
Contact:Mona Bregman
Conf. Coordinator
Bregman & Company, Inc
Address:4827, Rugby Ave. Suite 300
Bethesda
MD 20814-3034 U.S.A.

May 30-June 9

ACTIM Info.Session
Paris, Brest, and Marseille, France
Contact:Agence Pour La Cooperation
Technique Industrielle Et Economique
Address:14, avenue d'Edylau 75116
Paris, France
Tel:+33 1-44345000
Fax:+33 1-44345001

June 29-Jul.2

Coast to Coast '94
Hobart, Tasmania, Australia
Contact:Penelope Archer
Address:c/o Conf. Design PTY Ltd.
GPO Box 844, Hobart, Tasmania, 7001
Australia
Fax:+61 2-313224

Jul. 24-30

IAWQ 17th Biennial Cof. & Exhibition
(Water Quality Int. '94)
Budapest, Hungary
Contact:Elizabeth Izod, IAWQ
Address:1, Queen Anne's Gate, London
SW1H9BT, England
Fax:+44 71-2331197

Aug. 9-13

4th Stockholm Water Sympo.
Stockholm, Sweden
Contact:Secretariat
Address:c/o Stockholm Water
Company
S-106 36, Stockholm, Sweden
Fax:+46 87362022

Aug. 21-23

Modelling & Control of Activated
Sludge Processes
Copenhagen, Denmark
Contact:Mia Clausen, Conf. Secretariat
Address:c/o Dept. of Environmental
Eng, Technical Univ. of Denmark
DK-2800, Lyngby, Denmark

Sep. 5-9

Northern & Southern European
Estuaries & Coastal Areas
Aveiro, Portugal
Contact:ECSA 24 Secretariat
Address:Dpto de Biologia
Universiade de Aveiro
Campus Universitario de Santiago
3800 Aveiro, Portugal

Sep.20-23

Coastal Zone Canada '94
Halifax, Nova Scotia, Canada
Contact+:Bedford Institute of
Oceanography
Address:P.O. Box 1006, Dartmouth
N.S., B2Y 4A2 Canada
Tel:+1 902-4299497
Fax:+1 902-4299491

Oct. 15-24

Annual Meeting of the North Pacific
Marine Science Organization (PICES)
Nemuro, Japan
Contact:PICES Secretariat
Address:c/o Institute of Ocean
Sciences
P.O. Box 6000, Sidney, B.C.
V8L 4B2, Canada
Tel:+1 604-3636366
Fax:+1 604-3636827

Oct. 16-20

4th Int. Conf. on Pipeline Construction
Hamburg, Germany
Contact:Hamburg Messe und Congress
GmbH
Address:P.O. Box 302480 20308
Hamburg, Germany
Tel:+49 40-35692244
Fax:+49 40-35692343

Oct. 23-28

24th Int. Conf. on Coastal Engineering
(ICCE '94)

Kobe, Japan

Contact:Secretariat
Address:c/o Inter Group
Shiroguchi Bldg.
2-15, Kakuta-cho, Kita-ku, Osaka 530
Japan
Tel:+81 6-3759477
Fax:+81 6-3726127

Nov.3-4

Pollution of the Mediterranean Sea
Nicosia, Cyprus
Contact:M. Nicolaou, WTSAC
Address:P.O. Box 1735, Limassol
Cyprus
Fax:+357 5-391271

Nov. 6-10

4th Int. Conf. on Wetland Sys. for Water
Pollution Control
Guangzhou, China
Contact:Secretariat
Address:7 West St. Yuancun
Guangzhou
510655, China
Fax:+86 20-5524439

Nov. 28-30

7th Int. Biennial Conf. on Physics of
Estuaries & Coastal Seas (7th PECS)
Woods Hole MA, U.S.A.
Contact:David G. Aubrey
Address:c/o Department of Geology &
Geophysics
Woods Hole Oceanographic Institution
Woods Hole, MA 02543, U.S.A.
Fax:+1 508-4572187
Tel:+1 508-5481400

(1995)

May 14-16
1st Specialized Conf. on River
Basin Management for Sustainable
Development
Kruger, National Park
Contact:Secretariat
Address:P.O. Box 82, Irene 1675
South Africa
Fax:+27 12-631680

Oct. 23-27

6th Int. Conf. on the Conservation &
Management of Lakes
(Kasumigaura '95)
Tsuchiura & Tsukuba, Japan
Contact:Secretariat
Address:c/o Ibaraki Pref. Gov.
5-38, Sannomaru 1-chome, Mito 310 Japan
Tel:+81 292-246905
Fax:+81 292-332351

Call for articles

EMECS Newsletter is targeted at researchers and individuals affiliated with organizations related to the study of enclosed coastal seas. Its purpose is to provide a forum for the exchange of information on enclosed coastal seas and to disseminate this information to as wide a readership as possible, linking concerned persons and organizations throughout the world.

Your contributions would be greatly appreciated.

All submissions to:

The publisher
Water Quality Division, Environment Bureau
Public Health and Environment Department
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