POSTER SESSIONS

Disaster AWARE
The Pacific Disaster Center: Fostering Disaster-Resilient Communities through Information, Science and Technology

Tipsakorn Aiadmusik

The Pacific Disaster Center

Disaster AWARE increases the capacity of disaster managers to synthesize multiple data streams for critical early warning and quick decision support. The system integrates data from a variety of sources into an enterprise geospatial application for collaboration and analysis. Adopting an all hazards approach, its key features include:

- Hazard modelling and risk assessment
- Warning and notification dissemination
- Decision support
- Synthesis of base and real time information
- Common Operating Picture development and update

The system may be configured to disseminate hazard information, such as watch or warning messages, directly to the user via cell phone, pager, email, or fax. Parameters for such notification are established by the client's Systems Administrator. The end product is provided with a textual or graphical representation of a hazard's conditions, location, sphere of influence, expected damages, impacts, etc. Products are associated with specific hazards in the Hazard Listing either through automated or manual processes.

Disaster AWARE has two modes of operation for interacting with hazards and products. One is the Standard – Hazard Listing (Home), which is the default Disaster AWARE mode signified by having no map component. The second mode is GIS-enabled. This Disaster AWARE mode, also called the Automated Hazard Map, is signified by having the large map component in the middle of the application along with a set of map viewer tools to the left and a GIS layer table of contents to the right. Incorporating GIS with Internet map making requires many extra services. Should the map component become unavailable for whatever reason, the Disaster AWARE Hazard standard mode will continue to function.

Status of coastal and marine habitats in the Western Indian Ocean - A transboundary analysis

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The Western Indian Ocean (WIO) region comprises the western extremity of the tropical Indo-West Pacific, the world's largest marine biogeographic province. The region is characterized by biodiverse tropical coastal and marine ecosystems including coral reefs, sea grass beds, mangroves, sandy beaches, sand dunes, and terrestrial forests. These ecosystems underpin human wellbeing in the region through providing, provisioning, supporting, regulating and cultural services. Although the WIO region is still one of the least ecologically disturbed oceans relative to other regions in the world, it is increasingly threatened by natural- and human-induced stresses such as over-exploitation of living resources, modification of habitats, pollution, invasive species and climate change. For instance, more than half of the coral reefs in the region were severely

damaged by the El-Nino related bleaching mortality event in 1998. This paper provides a transboundary analysis of the main problems related to physical alterations and destruction of marine and coastal habitats in WIO, their main causes as well as environmental impacts and socioeconomic consequences.

Sea pollution caused by offshore drilling platforms

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Every day 3 million tonnes of oil are released into the sea by shipping traffic, sewage and offshore drilling platforms. Our project deals with the pollution of the sea caused by offshore drilling platforms.

About 5,000 to 8,000 km² of the seabed of the North Sea is polluted. In the 500 metre area around a platform, the biodiversity of species is highly limited compared to other areas. The harmful substances released by drilling activities have negative consequences for the whole food chain. Obviously, drilling companies do not sufficiently take into account endangered species.

For the future we suggest that companies should support the use of renewable energies and that drilling activities should be strictly regulated or should not take place in sensitive marine areas.

What could happen at home - A regional look on climate change

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The effect of global warming caused by man-made CO2-Emissions is nowadays generally accepted as a fact. There are varying hypothesises about how much the climate will change. This project describes possible impacts for Western Europe with a focus on the Northern German coastal region.

The melting of polar ice and glaciers with a consequent rise of the sea level will have severe impacts on the flat coastal areas. With regard to temperature, two opposite effects are discussed. On the one hand, global warming will lead to an increase of mean temperatures in Europe with consequences also for the marine environment. Other hypothesises suggest that ocean currents could change and that, for example, the Gulf Stream, the warm current that heats Western and Northern Europe, could change its current strength and position. This would at first lead to a decrease in temperatures in Europe.

The project aims at making clear how global warming can severely affect our home areas. It will be a prominent task to build new and higher dikes. However, these measures are insufficient. We propose that strict measures have to be taken, even on a personal level.

Development and management of national disaster early warning system in the Indian Ocean: Thailand case study

Thaworn Charoendee

National Disaster Warning Center

The National Disaster Warning Center (NDWC) was officially established on May 30th, 2005. NDWC is responsible for end-to-end multi-hazards disaster early warning. During this early phase, it is placing emphasis on earthquakes and tsunamis and will eventually expand to include other more frequent hazards such as landslides and flash floods. Operational procedures for earthquake and tsunamis include receiving earthquake information from seismic stations and sea level gauges in Thailand, and from international and regional centers such as the Pacific Tsunami Warning Center (PTWC) in Hawaii and the Japan Meteorological Agency (JMA) in Japan. This information is then used for data analyses and simulation for visualization by experts of NDWC.

NDWC is the first country in the Indian Ocean Rim to develop a standard operating procedure (SOP) for earthquakes and tsunamis since 2005. To date, NDWC receives tsunami confirmation from a Deep-Ocean Assessment and Reporting of Tsunamis (DART) deployed in the High Seas of the Indian Ocean. NDWC utilizes a comprehensive decision support system for emergency management, namely DisasterAWARE, developed under technical cooperation with the Pacific Disaster Center (PDC). Output notification messages are issued through SMS, e-mail, radios and TV from the Center. Currently, it takes about 15 minutes to issue an early warning notification.

Multi-agencies and multi-projects are integrated to enhance local community awareness and resilience through local adaptive learning with multi-hazards early warning and evacuation exercises. These activities will improve capabilities in disaster preparedness and response, which will result in community disaster risk reduction. Thailand would like to ensure that foreign visitors to Thailand will be safe from earthquakes and tsunamis. NDWC's future visualization is to establish a Regional Training Center and Data Center for the Multi-hazards Early Warning System for the Indian Ocean countries.

Would the icebergs have impeded the Titanic in 2050? or How to reduce the carbon dioxide emissions caused by shipping?

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At present a worldwide discussion on the importance of air and road traffic as carbon dioxide polluters takes place. The role of shipping is thereby hardly taken into account. However, shipping contributes an almost twice as high amount of carbon dioxide as air traffic, thus having an even higher impact on global warming.

Our project presents new and alternative power sources. Our aim is to propose solutions to reduce the CO2 emissions of ships and therewith their impact on global warming.

Introducing an Active Role for Women in Small-Scale Fisheries: A Primary Experience in an Artisanal Fishing Community in Egypt

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The inland water fisheries in Egypt cover an area of over 8,700 km^2 in five northern lakes on the Mediterranean coast, some inland lakes and the Nile River basin. Although the inland fisheries are an important component of the fisheries sector in Egypt, providing significant employment opportunities and revenues, they are still considered small scale fisheries. A total of about 115,000 fishermen are engaged in these fisheries, normally using artisanal methods. Their fishing efforts, however, produce more than 69% of the Egyptian fish production.

The women in the fishermen communities of this type of fisheries are still not recognized as being economically active. In the framework of an IOI-sponsored project in Egypt, a pioneering program was initiated in April 2006 to enhance the role of women in a selected small scale fishing community in a fishing village in the Bardawil Lake area on the Mediterranean coast. The program included intensive hands-on training, intended to upgrade the skills of the participating women and to raise their awareness on how they can possibly increase their income, alleviate poverty and hence improve the livelihood of their families. The experience showed that by introducing an active role for women, sustainable development of the artisanal fisheries could be achieved; and that rational exploitation of the marine resources could be implemented only with the support of all members of the fishing communities, including women, that often constitute more than half the population in these communities. Replicability of such program in other similar communities was strongly recommended.

Offshore-Wind Park-Mariculture

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Due to the constantly growing population of the world, agriculture and fisheries already being at their limits, new sources of food production have to be found. The production of fish by aquaculture and its special branch, mariculture, is growing constantly.

In the German coastal region of the North Sea, nearshore mariculture is currently hardly carried out because of complicated laws, conflicts of users and contamination. In order to avoid these problems, it is being discussed to develop mariculture in combination with offshore-wind parks. By using the already existing infrastructure of these parks, there would be wide areas and better water as well as oxygen conditions. Furthermore, new jobs could be created, also as a possible alternative to the struggling fishing industry, while the coastal region could be maintained as a local recreation area. However, only local species should be cultivated to avoid the introduction of non-native species into the ecosystem. Possible damage on the environment can also be caused by the use of chemicals or antibiotics. Wind parks as such might disturb the navigation of animals and also ships.

Provided that further research is done to study possible impacts and clear guidelines are defined, this special method of mariculture could present a desirable possibility for the North Sea as well as other coastal regions.

Effect of public awarness on the environmental protection of coral reef ecosystems at the Egyptian Red sea coast- Egyptian experience

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Coral reef ecosystems are highly valued for their biological, ecological, cultural and economic resources, as well as their aesthetic qualities. In the past few decades, competing demands and increasing threats from both natural and anthropogenic stressors have contributed to a significant decline in the coral reef ecosystem. The Red Sea is not far from this worldwide event of coral damaging. In response to this decline and in order to preserve and protect the biodiversity, heritage, social and economical value of Red Sea coral reef ecosystems, this work was carried out to involve the public, stakeholders in the protection of these ecosystems. In this work a public awareness programme was carried out for the resident populations at three different sites along the Egyptian Red Sea coast.

Zafarana recorded the largest population between the three sites (1000 persons), with 250 youth, 330 women and 420 others (children and old persons). Nabaq at the Gulf of Aqaba recorded a small population of 400 persons; it is mainly a Bedouin population with 125 youth, 180 women and another 105 persons. While the population recorded at Al-Hamraween was of 600 persons, namely 220 youth, 170 women and 210 others. Between the three investigated sites, Al-Zafarana recorded the highest number of educated persons (700 persons), while it recorded the lowest percentage of persons dependant on the sea, i.e. 30% of the total population. Whereas the Napaq area recorded the lowest number of educated persons and the highest percentage of persons dependant on the sea (100%).

Two indicators were used to measure the programme's success, i.e. the attendance of targeted persons. From all three populations, the youth recorded the maximum percentage of attendance, while women recorded the minimum. The second indicator used was whether the programme increases the sense of marine environment protection as a sustainable resource. The different parameters of marine ecosystems were monitored before, six months after and 12 months after the programme was operated. At the three sites, coral reef ecosystems were suffering and subjected to high stresses. The knowledge acquired from the programme helped the people in the Napaq area the most, followed by Al-Hamraween (although at a much slower rate than Napaq), while Al-Zafarana showed no improvement whatsoever in coral cover.

The second parameter measured was the fisheries, which are major activities in the three areas. The fish size composition was monitored. The Napaq population had the best response, they decreased the percentage of small fishes in their catch composition from 63 % before the programme to 58% after 12 months from the beginning of the programme. These were followed by the Al-Hamraween population, while Al-Zafarana showed no success in this respect.

Other parameters measured were: the sedimentation rate, which decreased from 12 mg cm-2day-1 4 mg cm-2 day-1 at Napaq, and from 18 mg cm-2 day-1 to 6 mg cm-2 day-1 at Al-Hamraween; the number of boats anchoring on coral, which were reduced from 8 boats to 0 boats in the Napaq area and from 11 boats to 0 boats in Al-Hamraween area. While Al-Zafarana showed no changes for both parameters. Also, Napaq showed great improvement in diversity indexes, with El-Hamraween showing a similar pattern, while Al-Zafarana showing no sign of recovery whatsoever.

Participation in the “Environmental restoration project on enclosed coastal sea” in Ago Bay, Japan

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A very unique “Environmental Restoration Project on Enclosed Coastal Seas” is now being conducted in Ago Bay. This Bay is semi-enclosed with calm waters facing the Pacific Ocean in central Japan, and is known as a world famous region for pearl culture. However, the bay is contaminated by sediment eutrophication, frequent red tides and low oxygen waters attributed to the continuation of pearl culture spanning 110 years.

The project’s aim is “Better life through wise and sustainable use of the coastal environment”, and seeks to include participation of local people and local activities based on the idea of “SATO-UMI”, defined as “the coastal sea with high productivity and high biodiversity under mankind’s interaction”.

Seagrass, *Zostera marina Linnaeus* is one of the most important biological resources in shallow inner bay areas in that it acts as a nursery ground for coastal fishes and animals, absorbs excess nutrients such as nitrogen and phosphate, and has high potential for organic production. In Japan, *Z. marina* is distributed in almost all coastal regions, but since the 1950s the beds have decreased drastically. So, recovery programs have started since the 1960s in various regions for conservation of the coastal environment and propagation of fishery resources.

In the project, a new method for recovering Zostera beds in cooperation with fisherman was developed, together with a “chamber method” for measuring photosynthetic productivity of seagrass. This new method will help estimate productivity of other seaweeds and become a basal first step of a restoration program for *Z.marina* beds.

The integration of intergovernmental coordination and information management in response to immediate crises

Tavida Kamolvej

Thailand Emergency Management

Recent occurrences of natural disasters and severe manmade hazards have increased awareness of the need for effective mitigation and response to extreme events. States of emergency require multiple agencies to perform multiple tasks simultaneously to return the situation to normal. This study proposes an inter-organizational model supported by the efficient use of information and communication technologies to assist multiple agencies in coordinating their actions more effectively during states of emergency. The model will assist participating agencies to develop the capacity to adapt to emergency conditions as well as the ability to replace other functions that fail, in order to maintain the continuity of basic operations for the community until the state of emergency is cleared.

Three recent cases of emergency operations in Thailand are examined to assess whether coordination among response agencies can be improved by using appropriately designed interagency operations. The complex environment of emergency response operations offers an extraordinary opportunity to investigate methods that may be used to understand and identify factors that build strength or lead to weakness in practice. The interdependence of sequential failures from sudden impacts, such as the collapse of electrical transmission lines or a

communication system, provides a practical challenge for assessing the use of information and communication technologies in managing emergencies. Insights gained from this project may assist public agencies to work together more effectively.

This research is conducted as an exploratory study with a nested case design. It employs both qualitative and quantitative methods of observation, interviews, social network analysis, document review and structured surveys to identify complementary characteristics rather than advocating a single style of research. Units of analysis are the emergency response organizations at national, provincial and local levels, while units of observation are emergency response personnel in each organization. In addition, units of observation are stratified into top, middle, and operational levels of management in order to obtain information that may vary by levels of authority. Information obtained from multiple sources is analyzed to understand better the existing emergency response operations and how to improve the system effectively and efficiently.

An alternative approach based on lessons learned from this study is to build systematic and adaptive collaboration among agencies, at national, provincial and local levels, in the emergency management of Thailand. The primary actors, i.e. the Department of Disaster Prevention and Mitigation (DDPM), the Bangkok Metropolitan Authority (BMA), the Civil Emergency Relief Department (CERD), and the District Offices (DO) can play effective roles in emergency response under different scales of emergency. Insufficient information support and communication channels increase the difficulties of activating the action plan in wider response in states of emergency. Information technology and communication systems allow multiple agencies to share their knowledge and the information they need in making informed decisions. Communication is a significant means to enable participating agencies to coordinate their operations simultaneously. These functions of information technology and communication help connect the entire emergency operation into a well-organized direction.

2007 International Day for Disaster Risk Reduction at the Asia Pacific Regional Workshop and the 36th Rajaphajanugroh School in Phuket, Thailand

Natthasan Leelabutra

International Ocean Institute-Thailand

In 1989, the United Nations General Assembly designated the second Wednesday of October to be International Day for Natural Disaster Reduction. The International Day was observed annually during the International Decade for Natural Disaster Reduction, 1990-1999. The International Day for Disaster Risk Reduction aimed to raise general awareness of disaster risk reduction all over the world. The ISDR secretariat, together with ISDR partners, launched the 2006-2007 World campaign under the theme of Disaster Risk Reduction Begins at School, with events planned by governments and ISDR partners focusing on safer schools and disaster risk reduction education.

In 2007, the UN/ISDR organized the Asia Pacific Regional Workshop on school education and disaster risk reduction from 8-10 October 2007 at the UN Building in Bangkok, Thailand, to inform and mobilize Governments, communities and individuals to ensure that disaster risk reduction is fully integrated into school curricula in high risk countries and that school buildings are built to withstand natural hazards.

During the workshop, the representatives of Thailand, the Deputy Minister of Education and the Secretary-General of the Office of Basic Education Commission (OBEC), gave a presentation on school education and disaster risk reduction. They also provided visibility to Thailand's work and commitments toward Disaster Risk Reduction. A school director and school child from the 36th

Rajaphajanugroh School in Phuket attended the workshop to give their special addresses on the role of schools and school children in increasing community awareness on disaster risk reduction. The school child spoke in front of the audience to share his experience of a disaster situation which happened in the South of Thailand and how he had been involved and contributed to disaster risk reduction.

In addition, an event to promote the International Day for Disaster Risk Reduction was organized at the 36th Rajaphajanugroh School in Phuket on October 17, 2007. Other school directors and children from schools in Phuket and Phung Nga attended the event. The event included statements made at the Asia Pacific Regional workshop, a discussion on disaster risk reduction in schools as well as exhibitions of children's artworks on disaster risk reduction displayed to increase disaster awareness and resilience.

Seagrass-Watch: Engaging Torres Strait Islanders in Marine Habitat Monitoring

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Involvement in scientifically-structured habitat monitoring is a relatively new concept to the peoples of Torres Strait. The approach used was to focus on awareness, and to build the capacity of groups to participate using Seagrass-Watch as the vehicle to provide education and training in monitoring marine ecosystems. The project successfully delivered quality baseline information on the seasonality of seagrass in the Torres Strait – a first for this region. Eight seagrass species were identified across the monitoring sites. Variations in seagrass cover occurred inter-annually as well as intra-annually. Preliminary evidence indicated that drivers for seagrass variability were climate related. Generally seagrass abundance increased during the north-west monsoon (Kuki), possibly a consequence of elevated nutrients, lower tidal exposure times, less wind and higher air temperatures. Low seagrass abundance coincided with the presence of greater winds and longer periods of exposure at low tides during the south-east trade wind season (Sager). No seasonal patterns were apparent when frequency of disturbance from high sedimentation and human impacts was high.

Seagrass-Watch has been incorporated into the Thursday Island High School's Marine Studies Unit ensuring continuity of monitoring. The students involved in Seagrass-Watch have mastered the necessary scientific procedures to monitor seagrass meadows, developed skills in coordinating a monitoring program and skills in mentoring younger students. This has increased self-esteem and confidence and given insight into how they may participate in the future management of their sea country.

Project for Supporting Coral Self-Recovery

Nao Nishino

IOI Japan / WestField Co.

Corals are important because they absorb carbon dioxide and sustain biodiversity. In the Southern Sea area of Japan, one of the world's largest coral reefs stretches from Okinawa to Ishigaki Island. The reef, however, is dramatically diminishing in size due to ocean pollution and global warming.

This project started with a wish of Mr. Takashi Shimazaki, a diving shop attendant in Okinawa. He wanted to restore the beautiful ocean of Okinawa that had so much impressed him 10 years ago, when he first saw it. He wondered what he and his supporters could do on their own. Considering that restoration of nature should be achieved only by the power of nature itself and humans can only help it happen, a suitable method of implantation was chosen. Ceramic implantation tools, developed by Associate Professor Mineo Okamoto of the Tokyo University of Marine Science and Technology, were used. These have the size of a Japanese sake cup and facilitate settlement of baby corals (planulae).

In June of 2006 and 2007, during the coral spawning season, racks containing 960 implantation tools were set up for data collection and 300 individual implantation tools were buried in hand-drilled holes one by one so as to prepare the favourable environment for coral larvae to grow. During an inspection in November 2006, it was found that the implantation rate was 16% (17 out of 104), a dramatic improvement on the figure of less than 1% in 2003.

The investigation showed that improvement of the implantation tools, which are easy to break against red clay outflows and typhoons, was necessary and that increasing awareness in the local community to prevent red clay outflows into the ocean is also essential. It will take time, but the team is committed to continuing their activities until the original beauty of the ocean of Okinawa which so impressed Mr. Shimazaki is recovered.

The Role and Social Significance of Women and Youth in Ancient Mediterranean Cultures in Sustaining Development Through Connection with the Sea, as Revealed by Implied Symbolisms of Marine Mythology

George Pararas-Carayannas

Throughout human history and in all ancient societies women constituted a significant and active force in sustaining the development of communities, safeguarding resources, educating youth and ensuring continuity of social, cultural and historical heritage values. Although this role is not explicitly stated in ancient texts, the impact and influence of women and youth are evident by implied symbolisms in mythology. For example the circum-Mediterranean area, a cradle of civilization, embodied a rich variety of feminine symbolic expressions that echoes the socioeconomic structures of past societies, as well as the impact of the sea upon their fate. Noteworthy is also the fact that water was initially part of feminine symbolism.

The connection between the feminine element and water involving Mediterranean coastal communities dates back to Prehistoric Times, as aquatic features, marine disasters and natural phenomena (tsunami, flooding, stormy winds & rainfalls, submergence of islands and coastal

areas, coastal erosion and transgression /regression of the seashore, sea currents, isthmuses and straits, tides and whirlpools) were strongly interrelated with human life and the progress of civilization (i.e. navigation, archaeoastronomy, socioeconomic contacts via a sea communication network, wars and geopolitical conflicts). Women helped increase the awareness of youth through communication, education and by remediation of damage caused by environmental or man-induced hazards. Youth, upon reaching maturity, were better prepared to assume roles of leadership in alleviating the impact of environmental hazards threatening communities and their resources.

This poster seeks to: illustrate the presence and importance of the aforementioned feminine and youth elements in the marine mythology of the ancient Mediterranean through philological (i.e. ancient Greek texts) and archaeological evidence (i.e. templed promontories, artistic representations), along with other social and religious testimonies (i.e. celebrations and cults, customs and traditions, local names); determine their spatio-temporal distribution within the process of symbols' migration; and group them into coherent cycles - thematic, phyletic, other - in order to elucidate their creation, reproduction, diffusion and importance in the ancient world.

In brief, the analysis of the mythological symbolisms illustrates the important and continuous role that women and youth have always played in protecting marine resources and in helping conserve the heritage of mankind - a role that must be properly acknowledged, appreciated and encouraged, now and in the future.

Action-research project: technical and socially innovative sanitation solutions for fishing communities in environmental protected areas - the case of Island das Peças, Paraná, Brazil

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The project is an action-research extension activity that aims at improving the sanitation conditions at Vila das Peças, a small-scale fishing community at the coast of Paraná.

The project outstands in the involvement of the community in the solution and management of their own problems, which is the basis for the long-term sustainability of the solutions in the sense of breaking through the paternalistic culture prevalent in the region.

The basic assumption of this approach is that the decision process needs to be participative, from the onset of the identification of the problems, definition of solutions, up to the construction and maintenance of the improvements themselves. Under this perspective, the problem is turned into opportunity. The sanitation problems are transformed into opportunities of capacity building and above all of awareness and empowerment of the community in regard to their potential to seek for the solutions of their own problems.

A second associated assumption is that the sanitation solutions have to be technically and socially suitable in terms of complexity and cost, so that they could be manageable at community level. A highlight of the experience is the establishment of partnership among different organizations to share responsibilities and abilities, whereby each contributes at the reach of its capacity. The second highlight is that besides contributing directly to the communities´ sanitation demands, the project also managed to develop a highly replicable model for sanitation improvement for isolated fishing communities in coastal areas.

IOI-Ukraine Participation in Women, Youth and the Sea Programme

Viktorya Radchenko

IOI-Ukraine

In 2005-2007, the Operational Center of the International Ocean Institute in Ukraine (IOI-Ukraine) implemented projects within the framework of the "Women/Youth and the Sea" programme. All implemented projects aimed to increase public awareness on emerging marine and coastal issues and to start the process of public mindset change from environmentally demanding to environmentally friendly.

The implementation of the project involved governmental, academic and private structures and NGOs. Among them was IOI-Ukraine, the organization "Ecological initiative", the Oceanological Centre of the National Academy of Science of Ukraine (NASU), the Institute of Biology of the Southern Seas of the NASU, the Ecological Centre of Sevastopol, the municipal department for education, the municipal department for family, youth and sport matters, the Ministry for Family and Youth matters, the Sevastopol Chamber of Commerce, etc.

All activities conducted during the project's implementation could be divided into: conferences, ecological trips, workshops ("Children and the Sea" (2005), "From rivers to the Seas. Youth vision of ecological problems" (2006), and "Role of women-leaders in the sustainable development of the recreational areas and ecotourism (2007)), publications (Proceedings of the Youth Conference "Pont Evxinskij" (2005), proceedings of "Ecology: problems and solutions. Youth vision" (2005-2006), and the book for children "Marine ecology for kids" (2007)); research ("Safe marine environment for women and children in Ukraine. Clean seas and health of women and children in coastal communities of Ukraine" (2007)); and active campaigns involving a wide range of public clean ups of beaches (2005-2007) and reforestation campaigns (2006-2007).

Harbor Expansion versus Nature Protection – Is there a compromise?

Anna Schopp & Dominik Rudolf

Ökumenisches Gymnasium zu Bremen,

As container transport is increasing world-wide, new and bigger harbor facilities are planned along the coasts. The project investigates the conflicts between harbor development and nature protection by using the example of the new container terminal four (CT4) in Bremerhaven, Germany (North Sea).

The container terminal in Bremerhaven consists of four quays. In 2004, Bremerhaven started with the construction of the fourth quay which will be finished in the year 2008. By then, the container terminal in Bremerhaven, with its 5 km length, will be the largest in the world. It will be able to load and unload 15 container ships at the same time. However, there are a lot of adverse impacts of this port. With the construction of CT4 another part of the unique coastal environment in this area will be lost, the noise of the port will affect the neighboring residential areas and water pollution from ships will increase.

The project discusses some ideas to solve such problems. For instance, working hours could be reduced from 24 to 18 or 20 hours. By means of better safety regulations, the risk of ship accidents could be minimized and pollution of the sea could be reduced. While container-shipping is very important for the world economy, the need for nature protection for our future lives is still insufficiently taken into account and needs more awareness.

Aquaculture and the resulting problems in Ecuador

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Our project deals with industrial shrimp breeding in Ecuador and its subsequent environmental and social problems during the last forty years.

The main ecological problems are the destruction of mangroves and the eutrophication and pollution of the water. In addition there are social problems, e.g. the Ecuadorian population has hardly benefited from the huge production in their country.

We investigated the problems and discussed possible solutions which would combine the different interests of industry, local population and environmental protection. Though it seems to be very difficult to find solutions which are acceptable for all parties, we conclude that ecofarms are a more sustainable form of shrimp production.

Marine Ecosystem Rehabilitation Program in Impacted Area

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Phuket marine biological Center

The Indian Ocean Tsunami of 26 December, 2004 destroyed the marine ecosystem along the Andaman coast of Thailand covering 6 provinces, namely, Ranong, Phang-nga, Phuket, Krabi, Trang and Satul. Important damaged marine ecosystems were coral reefs, seagrass beds and mangrove forests. 10% of coral reefs and 5% of seagrass beds in the Andaman Sea were destroyed and the mangrove forest in Phang-nga province had 3.2km^2 of its expanse damaged .

The Department of Marine and Coastal Resources, the Ministry of Natural Resources and Environment with the support of other partners from universities, government agencies, non-governmental and private sectors, have conducted rehabilitation programs, including: an assessment of the marine ecosystem status within 15 days of the disaster, including that of coral reefs, seagrass beds, mangrove forests, endangered species and water quality; cleaning up of the reefs within 3 months of the disaster, including the collection of 103 tonnes of underwater debris by 1,960 volunteer divers and 200 officers; coral reef transplantation during 2005 to present; artificial reef installation in 6 sites in the Phuket and Krabi provinces; artificial diving sites installation, namely 1 site per impacted province area; and a long-term management and monitoring survey of the marine ecosystem in impacted areas.

Moreover, capacity building in natural resources and environment conservation for students was conducted through an educational program at Phuket Marine Biological Center (PMBC) during 2005-2007. 5,288 students entered this program. Lecturers imparted their knowledge and experiences on marine ecosystems and real experiments were observed at Phuket Aquarium and PMBC.

Celebration of 2007 World Ocean Day in Thailand

Cherdsak Virapat, Sunthari Phornsuntharanan, And Bundit Wongchumpa

International Ocean Institute-Thailand, National Disaster Warning Center

The United Nations has officially designated the date of June 8 to be "World Ocean Day". As is customary, this date is a world-wide celebration of the sea to increase public awareness on the important role of oceans and seas to human life, to recognize their natural beauty, the impacts of humans, and the sustainable uses of ocean resources for future generations, and to promote coastal communities' participation in marine and coastal conservation.

On the occasion of the 2007 World Ocean Day, the National Disaster Warning Center (Thailand) cooperated with the International Ocean Institute (Thailand) and 24 schools, which fall under the Office of the Basic Education Commission of the Ministry of Education, located in the tsunami prone areas along the Andaman Sea Coast, organized the 2007 World Ocean Day activities from 5-14 June 2007. The activities included children's drawings, essay writings and motto compositions on subjects related to marine resources conservation such as fish, coral reefs and mangrove forests. The activities aimed at building awareness of youths on marine resources and coastal conservation, promoting public participation in coastal resources conservation, and building up marine natural resources conservation through artworks and children initiations. This provided an opportunity for children aged 16 and under who love to create artworks and write essays that reflect their imagination and awareness of the seas.

The activities were organized in the 24 pilot schools located in the Tsunami risk areas of 6 Andaman coastal provinces of Thailand, namely, Ranong, Phang-Nga, Phuket, Krabi, Trang and Satun. About 200 pieces of Artwork were submitted and 28 pieces were given awards in the form of cash awards and certificates.

Adaptive Learning in Disaster Management for Community Awareness and Resilience

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The Adaptive Learning in Disaster Management for Community Awareness and Resilience Project (LDCP) was initiated to focus on enhancing people's learning and participation in the planning and coordination of disaster warnings, preparedness, response, mitigation, and recovery and to build up awareness and resilience at the community level. The project provides strategic integrated approaches for all related stakeholders for implementation at the community levels. One of the approaches used in this project is to promote learning processes for local disaster risk management targeting school children, their teachers, Local Administrative Organizations (LAOs), village leaders and Government officers from different departments that are potentially exposed to hazards. Ultimately, the participation of the communities to which these target groups belong also participate in the decision making process regarding the more effective disaster management processes. The school is taken as a sustainable Government institution located at the grass-root level, which has the mandate for education.

Some baseline information for monitoring purposes is also expected to be generated through these activities. This has won the strong interest of the National Disaster Warning Center (NDWC) and the Department of Disaster Prevention and Mitigation (DDPM), which typically have limited ability to access information on socioeconomic conditions within communities. This is due

to the fact that vulnerability and impacts on local communities depend mainly upon their types of occupation such as fisheries, coastal aquaculture and agriculture, etc. This data will be partly achieved through a simple village survey and also through interviewing villagers and key informants. Through deriving the population profile, historical accounts, geographic and topographic characteristics, water resource availability and safety, food security and safety, demography and administration, public and community organizations, pride and past achievements, recent development, impacts of the tsunami, current needs, assistance, an overall picture of the community can be made.

A final participatory evaluation of the learning experience and impact of the activities will also be made in order to evaluate the extent to which local management and community participation have been affected. Adaptive local tsunami early warning system and evacuation exercise for each school/community were obtained. The project activities target 24 village locations located in six coastal provinces affected by the 26 December 2004 tsunami in Thailand. The project spreads over two years, from January 2007 to December 2008.

Caspian seal studying in the in modern conditions of the Caspian sea ecosystem

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Years ago Caspian seals were abundant, for instance, in 1960 the whole population number of Caspian seals was 500-600,000. Now the total population number is around 111,000 individuals.
This decline of the population number may be considered as a back reaction of the Caspian seals population to the longstanding impact of many factors, both of natural and anthropogenic character, existing in the Caspian Sea.

The natural factors that influence negatively the dynamics of the Caspian seals population are:

The weather conditions in winter time which form the ice field at the North Caspian Sea. The Caspian seal belongs to the ice-requiring group of seals, because the ice surface is essential for successful breeding, weaning and moulting in the life cycle of Caspian seals.

The epizootological situation by means of invasive and infectious (Canine Distemper virus) diseases that often lead to high mortality in Caspian Seals.

The main anthropogenic factors are the following:

The pollution of the Caspian Sea by stable organocloride compounds, such as DDT (dichlorodiphenyltrichloroethane) and its metabolite, and HCCH (hexachlorocyclohexane) and its isomerids.

The most negative impact on the Caspian ecosystem was caused by intensive development of oil production, oil transportation by sea, etc. For instance, during the last 10 years hydrocarbons have been the main pollutants in the northern Caspian Sea. The Caspian seal, as the major consumer in the trophic level, accumulates hydrocarbons to a considerable extent as well as other pollutants.

The development of the Women/Youth & the Sea Programme in the Caspian Sea region

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Widening of economic activities at sea created sufficient social demand for highly qualified marine specialists, especially specialists in the use and protection of the marine environment. The experience in teaching marine disciplines in higher education institutions of the CIS continuously confirms that marine education is a specific one and needs earlier professional orientation. That is why IOI Caspian Sea, since the beginning of its establishment, saw the necessity of implementing the IOI Programme for children based on the methodology of active education. The project was named “Children and the Sea” and later become Women/Youth and the Sea (W/Y&S).

On a wide scale, the IOI programme is intended to enhance the capacity and participation of women and youth in poor developing countries in ocean and coastal affairs and helps ensure environmental sustainability. In the Caspian Sea region the programme focused mostly on developing youth activities, the main goals of which are: ecological education and training of people in view of tasks related to the international cooperation of littoral states; and introduction of the principles of the IOI scientific-educational program “Children and sea” into the fields of marine sciences for formation of international solidarity and responsibility for the future of the Caspian Sea.

The programme was implemented in coastal community regions in three of five Caspian surrounding countries, e.g. Aktau, Astrakhan region, Makhachkala – Daghestan, and Turkmenbashi. However, most of these events were attended by participants from Azerbaijan, Kazakhstan, Russia, Ukraine and Turkmenistan. The strength of the implemented programme in the Caspian Sea Region was its multidisciplinarity, in that different approaches and types of activities were realized, namely: ecological camps, the International Festival of Underwater Swimming, and workshops and training through research cruises for mid-career specialists, post graduate students, students and school children. For women, different seminars were held to help improve their knowledge on ocean governance, especially with regards to the management of biological resources. In total, over a span of 5 years, more than 1, 000 participants attended the events organized within the framework of W/Y&S.

Application of imitating modeling method to study some copepods dynamics in the Caspian Sea

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The Caspian Sea is a unique water body that exhibits specific hydrodynamic processes and water conditions. The structure of the zooplankton community in the Caspian Sea has changed many times over the past few decades. Thus, the factors affecting the zooplankton community should be thoroughly analyzed to forecast its state under changing environmental conditions.

Copepods (Copepoda) are valuable food organisms of fish. Within this order, the most abundant species in the Caspian Sea are *Acartia tonsa Dana* (1849), *Calanipeda aquaedulcis Kritschagin* (1873), and *Heterocope caspia G. O. Sars* (1897) (Copepoda, Calanoida), of which the former two are invaders while the latter belongs to autochthonous species. Abundant practical material has been gathered concerning the state of populations in the Caspian Sea, but the data obtained have not been analyzed.

The authors of this study analysed literature concerning the impact of environmental factors on *A. tonsa*, *C. aquaedulcis* and *H. caspia* populations in the Caspian Sea and developed simulation models that could show interconnections among abiotic components of the Caspian Sea ecosystem and populations of the species under study. The models developed present principal flow charts that describe the dynamics of populations of the species under study on the qualitative level.

Construction of models gave a clear idea of mechanisms of interaction between populations and biotic and abiotic components of the sea ecosystem. The check of the models showed the adequacy of the state of populations of the species under study to that predicted by these models.