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WIOMSA Newsbrief

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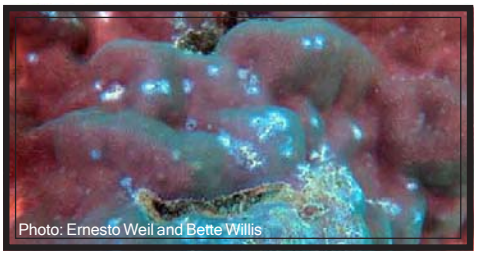
regional workshop on coral diseases

Coral reefs under stress

Few incidences of coral diseases have been reported in the Western Indian Ocean region - has the region been spared or is the evidence lacking due to limited research and monitoring?



Pigmentation response in areas with necrotic tissue or unhealthy looking tissues.

Corals subjected to bleaching. The colonies are pale or white, but tissue is still present. Intensity of degree of bleaching may vary within and across species.

Corals with tumors. Tumors include abnormal growth of tissue and skeleton in which the skeleton is enlarged, but otherwise not significantly modified.

Predation by crown of thorn starfish. Adults usually digest large areas of tissue while juveniles produce small scars. The starfish attack many different coral species.

Diseases of coral reef organisms have been escalating, particularly in the Caribbean. Similarly, recent surveys in the Great Barrier Reefs appear to disprove the tacit assumption that coral disease is rare and that it has little impact on coral communities. On the other hand, only few incidences of coral disease have been reported from the Western Indian Ocean (WIO) region. Lack of research and monitoring has probably underestimated the influence and severity of the coral disease in this region.

Regional workshop in Zanzibar

To learn more about these issues, a workshop on coral diseases was held at the Institute of Marine Sciences (IMS) of the University of Dar es Salaam in Zanzibar, Tanzania from 3rd to 7th April in 2006. It aimed at initiating a long term program to assess and monitor coral disease problems in WIO and was organized by the East Africa Centre of Excellence (CoE) and the coral Disease Working Group (DWG) under the auspices of Coral Reef Targeted Research and Capacity Building for Management (CRTR) project. The workshop was attended by coastal zone managers, marine park rangers, marine ecolo-

gists and postgraduate students from Comoros, Kenya, Madagascar, Seychelles and Tanzania. The participants were introduced to the concepts and significance of coral diseases and equipped with the necessary skills to identify, assess and monitor the occurrence and severity of coral disease incidences in the WIO region.

Diseases cause serious damage

Coral reef communities around the world have been experiencing increasingly stressful conditions from a combination of natural and anthropogenic detrimental factors. Recent information suggests that bleaching and coral reef infectious diseases are two "natural" factors that have become major players in the deteriorating dynamics of coral reefs worldwide. Workshop instructors confirmed that coral diseases can cause severe population declines, threaten biodiversity and alter the structure of reef communities by challenging the resilience of these systems. Once damaged, reefs will provide fewer resources, especially fish and other seafood. The rate of reef construction will be less and their capacity to act as shoreline protectors to keep up with sea-level rise will be reduced.

Regional coral disease collaboration

During the workshop, participants discussed and practiced agreed protocols for assessing the status of coral diseases. Participants involved in coral reef monitoring in their respective countries showed willingness to use the skills learnt to improve their work and include coral disease assessments into their regular coral reef monitoring programs, and later contribute data and information for collaborative publication on disease in the WIO. A tentative data collection schedule was proposed including sites where coral disease surveys will be conducted. The CRTR-Bleaching Group representatives expressed their plans to have a follow-up workshop in 2008 and agreed to explore the possibility of some participants continuing their training in coral disease at relevant laboratories.

Workshop Instructors from the Coral Disease Working Group were:

Dr. Bette Willis (James Cook University, Australia); Dr. Garriet Smith (University of South Carolina, USA) and Dr. Ernesto Weil (University of Puerto Rico).

Workshop coordinators were:

Dr. Drew Harvell (Coral Disease Working Group Chair), Sue Merkel, (Cornell University, USA) and Dr. Christopher Muhando, (IMS, Zanzibar).

This workshop was funded with support from the Khaled bin Sultan Living Oceans Foundation and the World Bank/GEF CRTR Program. It was a collaborative effort between the Disease Working Group, the Institute for Marine Sciences, the East Africa Coral Reef Task Force, Cornell University and the Australian Research Council CoE for Coral Reef Studies.

Midwater fish in the Mozambique Channel listed and identified

Fiftyfour species of mesopelagic fish (fish living in the so called "twilight zone", a middle layer of the ocean) have been identified by Madagascan researcher in cooperation with reseachers from the University in La Reunion.

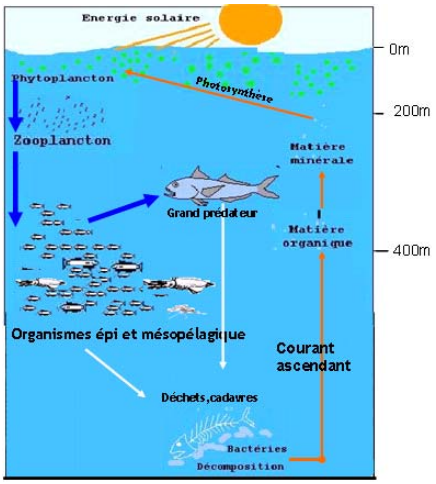
The most common fish family was the Myctophidae (lantern fish) with 23 species. The researchers also identified eight species of small shrimps (Euphausidae), six species of deep sea shrimps and twelve families of cephalopods (octopuses, squids, cuttle fish and nautilus). The species were collected in September 2002 and were identified throughout a three months training course from March to June in 2006.

During a workshop in September 2006, the species place in the deep-sea food chain will be determined by measuring isotopic signatures of the stable isotopes 13C and 15N in the fish's muscle tissue. Due to stepwise enrichment of the isotopes with increasing trophic level, the content can be used to establish the position and function of the identified species in the food chain. In top predators the isotop concentration is at maximum level.

It is essential to understand the structure and dynamics of mesopelagic organisms since they are preyed on by commercially important top predators like tuna, swordfish and sharks.

The study was partially funded by a WIOMSA MARG-II grant and the report can be downloaded from the WIOMSA website.

Doris, B.H., 2006. Study of trophic structure of mesopelagic fishes in the Mozambique Channel - the position and role in the food chain. Using the methods of stable isotopes of 13^{C} and 15^{N}. WIOMSA/MARG-II/2006-I.



The classical food web in the pelagic zone.

Coral reef conservation and pro-poor tourism

A Social Science Research Programme in the Southwest Indian Ocean.

As a result of the popularisation of diving as a tourism leisure activity since the early 1990s, coral reefs have become an increasingly important resource for the international tourism sector, especially in countries of the South. At the same time, the depletion of the world's coral reefs during the 1990s as a result of global warming, an increased human pressure on coastal areas and the overexploitation of fishing resources, not only represent a serious threat to the marine environment and ecosystems, but also to the tourism industry on which the livelihood of coastal communities frequently depend.

Immense tourism growth

International tourism through its rapid expansion during the late 20th century has become one of the most thriving manifestations of a globally interconnected world. While positively contributing to macroeconomic growth in destination countries, tourism has often been criticized for creating its own economic networks frequently disconnected from the social and economic spaces that it uses as its resource base. Development cooperation policy during the 1980s was therefore marked with severe criticism towards tourism's potential as a poverty reduction tool and focused on concerns about the sustainable use of natural and social resources. However, the 1990s saw the emergence of a focus on su-stainable livelihoods in which tourism could play a marked role in particular to countries with limited alternatives. Most international conservation organisations have consequently widened their approach not only to include the preservation of cultural and natural resources, but also to the mobilisation of these resources for national, regional and local development strategies. A major outcome of this process was the development of pro-poor tourism strategies implemented by international cooperation and donor organisations since the late 1990s. For a large number of developing countries, in particular LDCs, pro-poor tourism has since then become a strategic tool contributing to the implementation of sustainable development and poverty reduction plans.

Conservation policies and tourism

Dr David Picard, a senior research fellow working at the Centre for Tourism and Cultural Change, Sheffield Hallam University, United Kingdom, is currently leading a university funded international research programme aiming to critically assess the pro-poor tourism approach in coastal and marine environment contexts in countries of the Southwest of the Indian Ocean. Through a multisided ethnographic approach in La Reunion, France (Parc Marin de La Reunion), Madagascar (Andavadoaka Octopus Reserve), and Tanzania/Zanzibar (Misali Island Marine Conservation Area), this programme is interested more specifically in the global-local interface of international natural conservation policy. It addresses issues of transculturation within the contact zones of international coral reef conservation, in particular the meeting, interaction and clash of different cultures of the natural environment.

These include:

- Competing understandings and values of nature and natural beauty among coastal communities, tourists, tourism operators, donors, public sector, and international development agencies
- Contested forms of coastal land ownership and natural resource management at local, regional and national scales
- Problems and processes of economic and social integration of tourism to coastal community economies and the creation of alternative livelihoods.
- Capacity transfer programmes, the academic training of "locals" and the creation of national curricula at the tourism-conservation nexus.

Spear-gun fisherman with scuba gear in the waters of Pemba Island, 2006.

This programme runs from 2005 to 2006. It includes governmental, academic, private sector and non-governmental partners in each case study country and international academic and policy partners of the Centre for Tourism and Cultural Change. For further information, please contact Dr David Picard:

Address: Centre for Tourism and Cultural Change, Sheffield Hallam University, Owen Building, Howard Street, Sheffield S1 1WB, United Kingdom

Email: d.picard@shu.ac.uk, dpicard72@yahoo.co.uk

Web site: www.tourism-culture.com

Inauguration of NaGISA activities in the Western Indian Ocean

WIOMSA supports the first Natural Geography In Shore Areas (NaGISA) meeting and launching of sampling protocol in the Indian Ocean region.

Dr. Melckzedeck Osore, Research Coordinator at WIOMSA, Prof. Shaukat A. Abdulrazak, Chairman of KMFRI Board of Management, Dr. Margareth Kyewalyanga (IMS), Dr. Renison Ruwa, Deputy Director KMFRI and Dr. Edward Kimani, Coordinator IO-NaGISA after the formal opening of the NaGisa meeting.

NaGISA is a collaborative effort whose overall objective is to involve local researchers in discovering, describing and monitoring the biodiversity of their own coastal zones using simple, cost-efficient and low-tech sampling protocols. As a component of the Census of Marine Life (CoML), NaGISA's ultimate goal is to incorporate the data collected into the global database of the Ocean Biogeographical Information System (OBIS) for global inshore biodiversity comparisons and monitoring.

First meeting in Kenya

The first NaGISA meeting and protocol workshop for the Indian Ocean were held in Mombasa, Kenya from 26 to 30 June, 2006. The two events were hosted by the Kenya Marine and Fisheries Research Institute (KMFRI) and brought together 28 experts and representatives of research and academic institutions working in biodiversity research, conservation and education. The countries represented were Comoros, Egypt, India, Kenya, Mauritius, Mozambique, Seychelles, South Africa, Tanzania and Venezuela.

Current taxonomic capacity

Prior to the official opening, the Coordinator of NaGISA activities in the Caribbean and South America, Dr Patricia Miloslavich, made a presentation highlighting the goals and the global activities of CoML and NaGISA. Dr Miloslavich, who is based at the University of Simon Bolivar in Venezuela, expressed hope that through this meeting, a detailed description of the current status of the taxonomic capacity in the Indian Ocean would emerge. She reiterated that the target of CoML by 2010 is to ensure that more knowledge about the five major taxonomic groups pre-selected for the global biogeographical comparisons, macroalgae, polychaetes, decapods/crustaceans, mollusks and echinoderms, will be gained, and that the capacity by the regional experts to identify and place them in the databases will be greatly enhanced in the Indian Ocean region.

Regular updates important

The meeting was officially opened by the Chairman of the Board of Management of KMFRI, Prof Shaukat A. Abdulrazak. In his speech, Prof Abdulrazak emphasized the importance of maintaining and regularly updating records of known fauna and flora in the in-shore areas of the WIO region. He commended the development of the NaGISA protocol that employs a simplified approach to ensure the full participation of both the local and international scientists, while encouraging the members of the local coastal communities to be involved.

NaGISA protocol and field training

The presentation and demonstration of the NaGISA sampling protocol was conducted in the field under the supervision of Dr Miloslavich assisted by Dr Mohideen Wafar of the National Institute of Oceanography in Dona Paula, India. The 2-days field demonstration was conducted at Gazi Bay on the south coast of Kenya. Participants received hands-on field experience in using the standardized NaGISA protocol including: i) passive sampling by photography and other observational techniques, ii) active sampling with corers and the removal of organisms from small quadrants and iii) assessment and measurement of environmental variables such as temperature, salinity and light.

WIOMSA support

The Indian Ocean Coordinator of the NaGISA start-up activities, Dr Edward Kimani from KMFRI, was pleased to note that WIOMSA embraces and fully supports the Indian Ocean NaGISA.

Through its marine research travel grant (MARG III Programme), WIOMSA

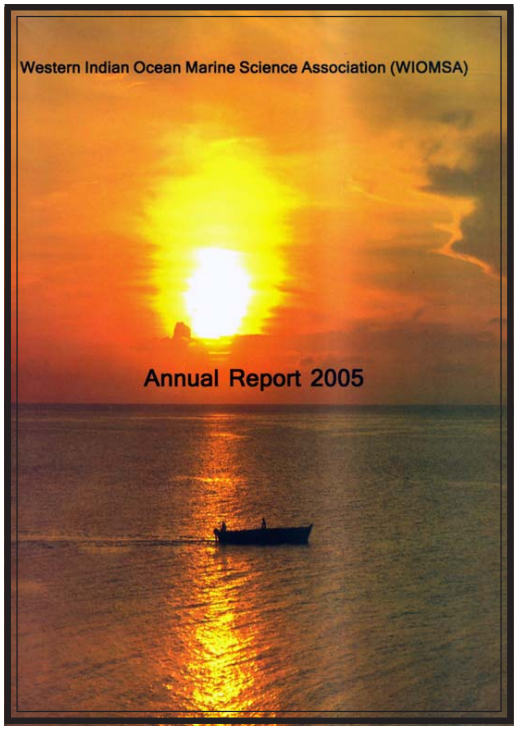
Participants of the NaGISA meeting collecting samples and testing methodologies during the fieldwork session in Gazi Bay, south coast of Kenya.

provided support to enable the participation in this meeting of several scientists from the WIO region. WIOMSA also sent its Research Coordinator, Dr Melckzedeck Osore, who made a presentation highlighting the support that WIOMSA has been providing the regional scientists with since 1995 - either travel grants to attend relevant meetings, or funds to conduct research on marine and coastal biodiversity related issues. Also, the majority of Letters of Intent and proposals submitted to WIOMSA's Marine Science for Management (MASMA) Programme concern marine resource sustainability and management and ecosystem functioning. These themes rely on data and information collected through biodiversity research.

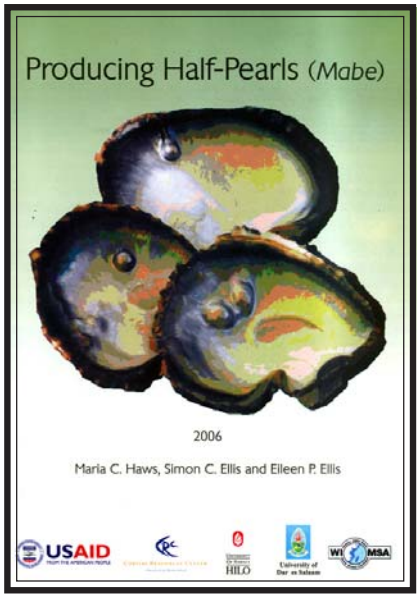
Way forward

WIOMSA was requested to avail its network and lists of taxonomists, para-taxonomists and other experts from its more than 1000 strong membership base to assist in the initial phase of establishing appropriate linkages useful to the Indian Ocean NaGISA. Participants to the workshop were urged to submit lists of experts, or to update the list of marine taxonomists in the workshop proceedings "Marine Biodiversity in Sub-Saharan Africa: The known and the unknown", South Africa 2003. It was unanimously decided that Dr Kimani should proceed to the next course of action and coordinate the immediate future activities of the Indian Ocean NaGISA.

For further information, contact:
Dr Edward Kimani
Email: **ekimani@kmfri.co.ke**
or visit the NaGISA website:
www.nagisa.coml.org



The 2005 Annual Report summarises WIOMSA's research, capacity building and communication and extension activities and confirms that WIOMSA is in an excellent position to contribute to the development of sustainable marine and coastal use options for the western Indian Ocean region. The report is available electronically on WIOMSA's website at: www.wiomsa.org



The program "Sustainable Coastall Communities and Ecosystems (SUCCESS)" has published a manual on low-cost and environmental-friendly half-pearl production for coastal communities. The manual provides practical guidance on how to select suitable farm sites, obtain adequate pearl oysters, implant nucelus into the pearl oyster, process the half-pearl and make jewelry. The manual is available electronically on WIOMSA's website at:
www.wiomsa.org

Satellite data for marine applications available

The Luigi Broglio Space Centre in Malindi in Kenya wants to establish contact with institutions interested in remote sensing data.

The Space Center is owned by the Italian Space Agency and is named after its founder, Luigi Broglio. It was founded in 1962 and is a complete space centre conducting research, launching rockets and monitoring satellites. The satellites provide information on the environment (e.g. the ozone layers), weather, desertification and marine resources (e.g. fish movement). The Centre also has the potential to provide data useful for mapping and topography.

The Space Centre is currently in the process of acquiring new equipment and devices to expand it activities and would like to get input from potential partners on what kind of satellite and other geophysical data that would be valuable for marine application and research.

For more information, contact
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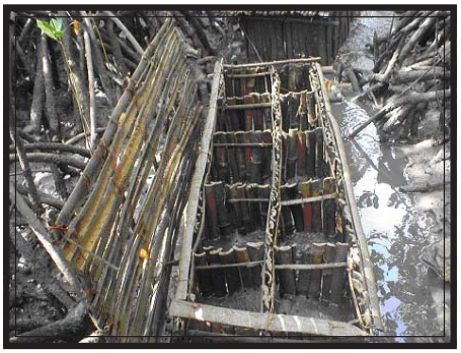
tel +254(0)42-30942/30959,
e-mail: mmwangudza@yahoo.com.

Silvofisheries gain momentum in the mangroves of Kenya

The silvofisheries project at Kwetu Training Centre for Sustainable Development in Kenya aims at helping mangrove communities to improve both their quality of life, such as income, health and education, and their physical environment, through mangrove planting and management.



Drive-in-cage for mud crab farming . The cage has ten compartments with room for one crab each.

Crab harvest from drive-in-cages in mangroves in Makongeni and Majaoni in Kenya.

Fish harvested from a silvofisheries pond situated in the sandy flats behind mangroves.

Drive-in cages and small ponds in mangroves improve crab and fish harvest. By using silvofisheries technology provided by Kwetu Training Centre in Kenya and Coral Reef Degradation in the Indian Ocean (CORDIO), the coastal fisher communities can earn a livelihood from the mangrove forests at the same time as they are involved in its conservation and management.

Women farming mud crabs

In Makongeni on the South coast of Kenya (Gazi Bay), women collect and grow mud crabs in drive-in cage impoundments. While most of this production is used for local consumption, some is sold to the local tourist hotels.

At this site, Kwetu assists the group with marketing their product and reshaping the production system. Intensive research on mud crab culture at Kwetu has led to recommendations to culture the mud crabs for three months in cages constructed by locally available material. Since the project started, there has also been drastic reduction in mangrove cutting while mangrove re-planting has been initiated.

Milkfish and mullet farming

At Majaoni on the North coast of Kenya (Mtwapa Creek) and also in Makongeni, the silvofisheries project has involved fisher communities on milkfish and mullet fish pond culture. The small earthen ponds are set on the sand flats behind the mangrove forest.

Studies showed that Majaoni milkfish grew to a mean weight of 250 g and mullets to a mean weight of 150 g in a period of six months. Makongeni fish culture yielded a mean of 300 g for milkfish and 100 g for mullets in a period of seven months. The results of the research trials in Kwetu indicate that ponds fertilized with organic manure are able to raise milkfish to a mean weight of 350 g and mullets to a mean weight of 200 g over a period of four months.

Mangrove planting

In Majaoni, the youth have successfully planted mangroves (*Rhizophora mucronata*) in their pond dykes. Mangrove deforestation is now under control and several seedlings of *Avicennia marina*, which could not previously be seen at the site, are now abundant.

Also at Makongeni, *Rhizophora mucronata* seedlings planted at the pond dykes are growing well. Unplanned mangrove cutting has become history and tourists seem to enjoy watching the small ponds where mullet fish are jumping up and down.

Partly due to the involvment of Kwetu Training Centre there is a noticeable reduction in the cutting of mangroves at Makongeni.

Research and community training

All the silvofisheries components being carried out in the communities are first tried out at the centre to suit the local conditions, and frequent trainings and demonstrations are carried out at Kwetu on demand driven basis. The initiative is a partnership between Kwetu Training Centre and Coral Reef Degradation in the Indian Ocean (CORDIO) East Africa in association with four government departments, local communities and development organizations.

This project was introduced to the readers in WIOMSA's Newsletter Vol. 10 No. 4, December 2005.

One World, One Conservation, One Partnership

21st Annual Meeting of the Society for Conservation Biology, 1-5 July 2007, Port Elizabeth, South Africa

The Governing Board of the Marine Section, Society for Conservation Biology (SCB) invites your participation in the 21st Annual Meeting of the Society for Conservation Biology. The Meeting will be Hosted by: The Centre for African Conservation Ecology (ACE) of the Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, and co-hosted by the Africa Section of the SCB. The meeting will feature a diverse array of plenary sessions, symposia, workshops, organized discussions, contributed oral presentations, and poster sessions.

SCB is dedicated to effective communications regarding conservation science, policy, and practice in all habitats on earth, with emphasis on both conceptual and habitat-specific issues. The Marine Section Governing Board is striving to ensure that communications about conservation science at SCB reflect an increased consideration of marine ecosystems, both in conceptual and habitat-oriented contexts.

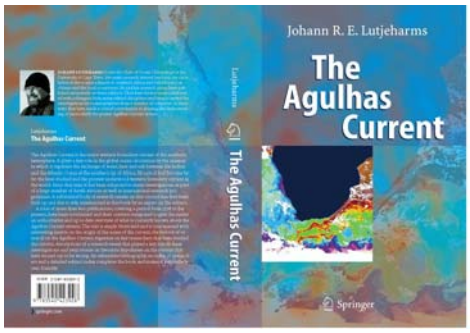
Calls for proposals for Symposia, Workshops, and Organised Discussions are being accepted now! **All proposals must be submitted by 16 October 2006 to 2007@conbio.org**

Short Course proposals must be submitted by **13 November**.

Call for abstracts for papers and poster will be from **16 October 2006 - 8 January 2007**

Early registration for the meeting begins **15 January 2007**.

Complete and current information regarding the meeting can be found on the following website:
www.conbio.org/2007 (the main website for the conference).



New book on ocean currents

The Agulhas Current by Johann R. E. Lutjeharms that has recently been published by Springer.

The book has 330 pages, 185 illustrations (a number in colour) and is based on 826 publications on the subject since 1778. It is available from various book shops or from www.amazon.com where it costs US$169.

This book covers in detail the circulation of the South Indian Ocean, the sources of the Agulhas Current, the Current proper, its retroflection, Agulhas rings, the Agulhas Return Current and the influence of all these on the adjacent shelves and the coastline. It deals in depth with the influence of this current system on local weather, climate and climate variability. It also identifies those areas and regions where very little is know and for which better information is crucial for operational oceanography and prediction for the region.

Meso-scale Effects of Coral Bleaching

Institute of Marine Sciences, University of Dar es Salaam in Zanzibar from Nov 28th to 30th, 2006.

The workshop is arranged by the Wildife Conservation Socitey and coral reef bleaching froup of the Coral reef TArgeted Research And Capacity Building Program and will examine existing theory and data concerning the effects of coral bleaching on corals, fish, and other species assemblages where data are available for greater than five years after bleaching events. The purpose is to develop a review of these meso-scale effects based on existing field studies. The organizers are inviting and covering the costs of participants who have data at this scale of study to present their findings at this workshop and contribute to subsequent meta-analyses and review publications.

Interested investigators should contact the workshop leaders below and describe their proposed contribution to the workshop and briefly describe the data and study they plan to present.

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