



Newsbrief

The Nairobi Convention and Partners Organise Regional Meetings on Partnership on Science to Policy Forum and Area Based Planning Tools and Regional Cooperation for the Implementation of the 2030 Agenda. By Louis Celliers



Group photo of Science Policy and Area Based Planning Participants.

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Partnership on Science to Policy Forum

In October 2016, about 60 participants, from seven countries and a number of supporting institutions attended an important regional meeting on how to close the gap between the sciences and policy in the Western Indian Ocean region. This meeting was arranged to discuss the many aspects of the creation of a Partnership on Science to Policy Forum for the Western Indian Ocean region.

The meeting, organized by the Secretariat of the Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean (the Nairobi Convention) region in collaboration with the Western Indian Ocean Marine Science Association (WIOMSA) took place in Mahe, Seychelles on the 11-12 October 2016. Participants to the meeting were sponsored by the Nairobi Convention, WIOMSA, the Indian Ocean Commission (IOC), and Government of Kenya.

Arranged around six working sessions, the meeting was attended by, amongst others, the Minister of Environment, Energy & Climate Change of Seychelles, Hon. Didier Dogley, Secretary of State in charge of the Ocean, Government of Madagascar, Hon. Dr. Ylenia Randrianarisoa, Directors of Environment and Fisheries, representatives of research institutions and universities, senior experts, regional partners and non-governmental organizations from Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania.

The meeting was opened by the Chair of the Bureau of the Nairobi Convention, Seychelles, represented by the Minister of Environment, Energy & Climate Change, Hon. Didier Dogley. He noted that delegates were gathered to initiate the development of a terms of reference, mode of operation for and composition of a Science to Policy Forum.

The sessions that followed included setting the scene for such a Forum, a number of group discussions, and exploration of the role of science in supporting the implementation of SDG14. Principally, the meeting explored the future manifestation of a Science to Policy Forum. Such a Forum, as proposed by one of the groups during the various interactive sessions, could be a multi-stakeholder platform comprising representatives of formal and informal knowledge-generating institutions, practitioners, policy makers, communities and the private sector within the WIO region. It is hoped that such a Forum could serve as an intermediary body to bridge the gaps between science, policy and practice.

The hope was expressed that the Science to Policy Forum could develop a better understanding of national processes required to incorporate the objectives of the Nairobi Convention and the supporting scientific outcomes into national (economic) development plans. Interestingly, this implies a departure from the current perception that the Nairobi Convention only deals with the

“environmental sector”. Another function of the Forum, discussed at the meeting, was the possibility for it to facilitate a regional research agenda and priorities that could assist member states in validating or confirming their own agendas. It was agreed that the Forum should do this without extending its functions to overlap with those of national agencies.

With the meeting outputs as a foundation there is a very strong basis for the future development of a regional Science to Policy Forum.

Area Based Planning Tools and Regional Cooperation for the Implementation of the 2030 Agenda

The successful discussions on the future of the Science to Policy Forum were followed by a second important regional meeting. This meeting, on Area Based Planning (ABP) Tools and Regional Cooperation for the Implementation of the 2030 Agenda, was held back-to-back (13-14 October 2016) with the Science to Policy Forum meeting. The second meeting was attended by about 50 participants including the Focal Points of the Nairobi Convention, representatives of research institutions and universities, regional partners and non-governmental organisations.

The ABP meeting was arranged by the Secretariat for the Nairobi Convention in collaboration with the United Nations Environment Programme’s World Conservation Monitoring Centre (UNEP WCMC). This meeting formed



One of the Group discussions in the Area Based Planning meeting.

part of the implementation of the project on Sustainable Fisheries Management and Biodiversity Conservation of Deep-sea Living Resources and Ecosystems in the Areas Beyond National Jurisdiction (ABNJ).

The objective of the meeting was to test the applicability of ABP tools to ABNJ and to share lessons learned from regional experiences. This is critical for regional cooperation in the Western Indian Ocean and the incorporation of the relevant outcomes of the SDG14 into the Nairobi Convention work programme for 2018 – 2022. One of the sessions dealt specifically with the options to support regional and national actions in the implementation of SDGs with specific reference to SDG 14 on the marine and coastal environment.

Some of the sessions of the workshop included: ABNJ Ocean Governance frameworks in the Western Indian Ocean; Capacity assessment; Regional Engagement and Priorities in ABNJ; and Towards SDG 14 implementation–experiences in the WIO. One of the presentations and a discussion session in the implementation of SDG 14 was led by the Partnership for Regional Ocean Governance (PROG) which consists of DDRI, GIZ and IAAS 44.

PROG serves as a platform at the science, policy, society interface to facilitate dialogue processes for cross sectoral cooperation whose main areas of work are in conservation and sustainable use of the “high

seas” (ABNJ); and implementation of the Agenda 2030 (Sustainable Development Goals) for ocean and coasts. PROG is working with the WIO region on SDGs since the region is a biodiversity hotspot that is facing increasing pressure. In addition to this, there are countries of the WIO that are pioneers for overall SDG implementation and blue economy initiatives, there is a regional pioneer (Nairobi Convention) and existing sectoral governance mechanisms and established regional networks and science/policy forums).

The meeting concluded with a recognition of the importance of SDGs and how regional action will be important within this context. The workshop discussed the importance of area based tools, how they can support planning in the EEZs and how they can be scaled up to management of the ABNJ. Marine spatial planning and the tools used in support thereof was highlighted as having specific benefits to stronger and more consistent actions on implementing ABNJ. Although there are still many challenges with using marine spatial planning tools in the region, there is also the expectation that it will be beneficial to the implementation of Blue Economy frameworks.

The meeting reports of both meetings are available from the Resources page of the UNEP-Nairobi Convention website (<http://web.unep.org/nairobiconvention/>).

The partners who sponsored the Science Policy and ABP Tools meetings



MASMA Programme evaluated



Board members and PC members listening to the preliminary findings of the external evaluation.

An external evaluation of the MASMA Programme for the period from July 2012 to date was undertaken from September to December 2016. The evaluation is a requirement of the cooperation agreement between the Swedish International Development Cooperation Agency (Sida) and WIOMSA. Following a restricted competitive call, the WIOMSA Board of Trustees selected and commissioned NIRAS Indevelop, an independent firm from Sweden, to undertake the evaluation.

The objective of the external evaluation was to measure and report on the performance, to date, of the MASMA Program. The evaluators looked at the extent to which the programme met its set objectives and milestones, they analysed the challenges or deviations to the implementation of the program as well reviewed the modalities for programme implementation in order to ensure that the Programme remains both relevant and effective. The evaluation also proposed alternatives for the future of WIOMSA and the support from the Government of Sweden. In this regard, the evaluation comprised both a review of programme activities and a forward-looking component. The former was aimed at documenting and assessing the performance of the MASMA Programme to date while the latter aimed at proposing alternatives for the future of WIOMSA and the next phase of the Swedish support.

The evaluation team visited three countries in the WIO region: Kenya, Tanzania and Mozambique. The field visits enabled the two evaluation team members to conduct face-to-face interviews with key informants, visit the sites of selected MASMA-funded projects and participate in MASMA grantees meetings, meetings of the Programme Committee and the WIOMSA Board of Trustees. They also administered online questionnaires to WIOMSA members and partners.

The WIOMSA Board of Trustees, the Marine and Coastal Science for Management (MASMA) Program Committee and the WIOMSA Secretariat jointly met with the team of external evaluators on the 27th of October 2016, in Mombasa Kenya, with the purpose of providing input to the evaluation team.

Speaking at the opening of the joint meeting, the President of WIOMSA Dr. Jacqueline Uku underscored the importance of the external evaluation noting that the outcomes of the evaluation will be used by the WIOMSA Board to develop the next MASMA Programme (2017-2022) and that the evaluation would help both WIOMSA and Sida to develop a programme that was aligned to the Swedish Government Strategy for Research Cooperation and Research for Development Cooperation 2015-2021.

During the Mombasa meeting, the evaluation team presented the preliminary findings and conclusions about the performance of the MASMA Programme including an assessment of all the activities undertaken through the different implementation modalities of the MASMA Program. This included a review of all the projects supported through the competitive grants scheme for research, a review of the training courses/ workshops and the grants for supporting publications that were awarded during the phase, an analysis of the progress in strengthening existing networks and establishing new networks for marine science and management in the Western Indian Ocean (WIO) region, an overview of the communication materials produced during the programme and an analysis of the progress in strengthening the capacity of individuals and institutions in the region in the fields of marine science, policy and management. Feedback from the meeting participants was used to validate and refine the preliminary findings, and

provided an additional source of data for the evaluation.

The evaluators looked at the relevance of the MASMA Program in terms of the degree of thematic alignment between the MASMA Programme and regional and national priorities for marine science and management; the coherence of the Programme design and the utility of the results monitoring and reporting framework; and the relevance of the Programme for the Swedish Government Strategy for Research Cooperation and Research for Development Cooperation 2015-2021. The evaluators also assessed the effectiveness of the programme in terms of the extent to which it achieved the set out goals and objectives and the efficiency of the MASMA Programme in the delivery of outputs in relation to inputs including an assessment of expenditures vis-à-vis activities.

Scenario development and assessment

The members of the Board, the Programme Committee and the Secretariat, under the guidance of the evaluators, did an exercise on scenario development and assessment which involved the meeting participants working in groups to elaborate possible scenarios describing future modes of operation of WIOMSA and the related modalities of future Swedish support to the Association for each of the scenarios: WIO Research Council, a “WIO Science-Policy think tank”, a “Nairobi Convention Implementer” and a “WIOMSA plus” scenarios. The WIOMSA Board will be making decisions on the developed scenarios and the future directions of the Association.

The report of the MASMA evaluation will be finalized at the end of December 2016.

The 35th Meeting of the WIOMSA Board held in Mombasa

The WIOMSA Board of Trustees held a meeting on the back of the MASMA Grantees meeting and the joint meeting of the Board, MASMA PC, Secretariat and evaluators. The meeting took place at the Sarova Whitesands Hotel in Mombasa on the 28th October 2016. Among the matters discussed at the Board meeting were strategic decisions on the issues raised during the MASMA Program Committee meeting and the joint meeting on the external evaluation, updates on ongoing WIOMSA activities (the 10th WIOMSA scientific symposium, the Western Indian Ocean Journal of Marine Sciences, the WIOMSA Trust, the MASMA program, partnerships etc.) Discussions were held on the revival of WIOMSA National Chapters, the development of the new MASMA program for 2017-2022 and on the introduction of fee paying courses.



File photo of WIOMSA board members.

Introduction of Fee Paying Training Courses:

The Board adopted the introduction of a fee paying policy for WIOMSA training courses. The Board has considered the issue of the introduction of fee paying courses including conducting an in-depth analysis of the cost-benefits of the process, the challenges associated with the current model of fully funded WIOMSA capacity building courses, the capacity of WIOMSA to deliver short courses in a competitive environment, the regional demand for training courses and lastly the models that could be applied in charging fees. The introduction of fee paying courses could generate funding that will enable the Association to hold more training courses while at the same time enhancing the commitment of participants who will be attending the courses. The Board has therefore approved a step wise introduction of fee paying models that will be adapted for use as relevant. Some of the fee paying measures include: cost sharing of

expenses between WIOMSA and the trainees, promotion of in-country training courses, promotion of training partnerships with institutions where some costs are met by participant institutions, trainees fully covering the costs of training (open to participants from outside the region) and limiting the percentage of full scholarships for training.

Approval of the Revised WIOMSA Handbook

WIOMSA produced its first Handbook in 2000 and since then no revision or updates have been made on it. The need for revisions was prompted by the realization that since then, many decisions have been taken, new projects/activities initiated and financial regulations updated, making it necessary to incorporate these changes in the handbook. Further, following WIOMSA's intention to apply to be a Regional Implementing Entity (RIE) for Projects and Programmes supported by the Adaptation Fund, it is essential that WIOMSA meets the fiduciary standards of the Adaptation Fund.

The 14th Meeting of the Marine Science for Management (MASMA) Grantees



MASMA Grantees in a group discussion session .

The Fourteenth Meeting of the Marine Science for Management (MASMA) Grantees: Monitoring the Performance of the Approved Projects was held in Mombasa from 25-26 October 2016. Over 20 representatives of the 8 MASMA projects including Principle Investigators (PIs), 7 members of the Scientific Programme Committee (PC) and 4 Secretariat staff attended the meeting.

The MASMA Grantees Meetings is a progress evaluation exercise that offers a unique two-way communication between approved MASMA project teams and the PC. The opportunity emphasises a two-way exchange of views with the PC listening as well as giving comments to projects. This year's grantees meeting availed each project team the opportunity to make a presentation showing their work including how they were addressing comments by the PC, their scientific results, their links with other relevant research projects/management authorities, progress in implementing their project's proof of concept, project outcomes achieved, and progress in implementation of joint activities agreed between different projects.

It was apparent during this year's meeting that the 6 projects that have been implemented since 2013/14 have shown marked improvement in terms of their interactions with management and stakeholders compared to projects funded in the previous MASMA Programme. The PC noted that all current MASMA projects, including the 2 recently selected projects, have undertaken the research for impact training and are integrating the tools in their projects as evident from improved communication products and deliberate targeting of non-science stakeholders.

Summary findings and the progress by the 6 older projects and the focus of the 2 new projects are given below:

Linking marine science, traditional knowledge and cultural perceptions of the sea in the Mozambique Channel to build tomorrow's marine management using spatial simulation tools and educational game (MOZALINK)

Preliminary results from this project show that in general, Marine Spatial Planning (MSP) is not a rational process but involves power and knowledge asymmetries. At the same time, the project has shown the need to integrate transparency, equity and science as pillars of MSP negotiations in the Western Indian Ocean (in local management rules, in national law and regulation, and in regional conventions) and communicated this through country focal points during the workshop on "Area Based Planning tools and Regional Cooperation for the implementation of the 2030 Agenda in the Western Indian ocean that was held in Mahé, Seychelles in 2016. The MOZALINK project has developed a web based tool that uses maps and social media to support MSP.

Emerging Knowledge for Local Adaptation - Modifying the Symbiosis of Knowledge and Governance for the Adaptation of Western Indian Ocean Coastal Communities at Risk from Global Change (EKLA).

The project has completed an assessment of local government in Kenya and South Africa. The assessment constitutes establishing a governance baseline for local governments themselves to track their progress in the area of adaptation to climate change in the context of coastal management. It proposes a framework for the flow of scientific data, information and knowledge in public sector institutions. The project has engaged with key national stakeholders including the National Environment Management Authority (NEMA) and informally with the National Droughts Management Authority (NDMA) in Kenya as well as the National Department of Environmental Affairs (NDEA) in South Africa.

Developing a model for strategic adaptive management of MPAs in the Western Indian Ocean (SAM)

The project has worked with management agencies in Kenya (Kenya Wildlife Service), Tanzania (Marine Parks and Reserves Unit), and Seychelles (Seychelles National Parks Authority) with a view towards empowering them to transition from an ad hoc management approach to targeted management focusing on priority issues, determined through scientific assessments. Notable areas of improvement

in Kenya are in social capital (trust and team work) and the degree of innovation and management in MPAs. The project reports a transformed MPA management from reactive, conflict driven processes to consensus-driven, learning oriented management. Institutional structures and processes have shifted focus from primarily an MPA to the entire ecosystem through involvement of communities in planning and management. A similar process has been piloted in Mafia Island Marine Park (MIMP) in Tanzania with a national launch planned in 2016.

Advancing adaptive co-management of small-scale fisheries in East Africa (Co-management)

The project, in collaboration with the Kenyan State Department of Fisheries, has facilitated the completion of a draft co-management plan for Kuruwitu Beach Management Unit (BMU) while those of Kanamai and Musumarini BMUs are underway in collaboration with in Kenya. The project has also facilitated changes to the structure and functioning of the Locally Managed Marine Areas (LMMA) in Madagascar. The project has deployed gated traps at 8 experimental sites, scaling up the use of this modified traditional basket traps in partnership with the Kenya Coastal Development Project (KCDP). At the regional level, the project has facilitated linkages and collaboration through the workshops on “Designing a Regional Network for Western Indian Ocean Local Fisheries Management to Build Community Capacity and Governance” and on “Enhancing co-management of small-scale fisheries: Sharing Experiences from the Western Indian Ocean and the Tropical Western Pacific Frameworks”

Dugongs (*Dugong dugon*) of the Western Indian Ocean Region: – Identity, Distribution, Status, Threats and Management

The project has generated information on historical dugong distribution and abundance and identified seven current potential dugong hotspots across its project area (Kenya, Mozambique and Tanzania). The project results have been integrated into respective country government structures for implementation such as the setting up of a National Facilitating Committee in Mozambique by the National Director of the Environment in consultation with NGOs and GEF and producing a draft Dugong Management Plan for Bazaruto in Mozambique. At the global level, the project has fostered close links with relevant organization such as aligning to the GEF Global Seagrass and Dugong Conservation programme. The project can ultimately provide data to support a reassessment of the WIO dugong population for the IUCN Red List.

BY-Catch Assessment and Mitigation in Western Indian Ocean Fisheries (BYCAM)

This project aims to initiate assessment of target and non-target vulnerable megafauna in the Western Indian Ocean (WIO) and to develop realistic bycatch mitigation measures and recommendations for governance and management across the region. Project components

include the collection of baseline fisheries, socio-economic and governance statistics, information and bycatch data and engaging stakeholders in SWIO artisanal gillnet, line fisheries and semi- and industrial prawn trawl fisheries and initial development of mitigation devices. The project’s lead implementers are key management and policy agencies including the Ministry of Livestock and Fisheries (MLF) in Zanzibar and Fisheries Research Institute (IIP) in Mozambique among others.

Responses of Biological Productivity and Fisheries to Changes in Atmospheric and Oceanographic Conditions in the Upwelling Region Associated with the East African Coastal Current (PEACC)

This project seeks to investigate the ecosystem impacts of meteorological and oceanographic conditions in the upwelling region associated with the East African Coastal Current (EACC) system. A key aspect of the study is the socio-economic impact, which places emphasis on establishing the vulnerability and resilience of the local communities in view of proposing viable options. The main intervention by this project will be the provision of management action points to enhance coastal community resilience to vulnerabilities associated with recent changes in meteorological and oceanographic conditions associated with the EACC system. Key national agencies involved in this project include the Kenya Meteorological Department. At the regional level, the project is aligned with the Western Indian Ocean Upwelling Research Initiative (WIOURI), of the IIOE-2 theme on circulation, climate variability and change.

A socio-ecological assessment of fisheries in three estuarine systems of the SW Indian Ocean – identifying essential links for improved governance (Estuarize-WIO)

Estuarize-WIO aims to identify essential links and feedback loops in the socio-ecological systems (SES) that affect small-scale fisheries in the Tana River estuary (Kenya), Rufiji delta (Tanzania), and the Bons Sinais estuary (central Mozambique). The project will involve participatory meetings with community stakeholders and local governance to document traditional knowledge, and to map perceived linkages and feedback systems as part of the project process. It will provide a predictive tool of different scenarios or management decisions and demonstrate to both fishers and managers as a way of facilitating their understanding of the socio-ecological relationships, and to strengthen the case for collaborative management based on a broad information base.

Unlike previous meetings, the MASMA grantees also participated in the evaluation of the MASMA programme through discussing specific elements of the MASMA Programme and the anticipated results of the projects. This session will facilitate further the improvement of how the MASMA programme is implemented.

WIOMSA signs a letter of intention to collaborate with MABIK



Group Photo of MABIK and WIO Scientists.

A four-member delegation of regional scientists visited the National Marine Biodiversity Institute of Korea (MABIK) from 28 – 30 November 2016 to explore opportunities for initiating collaboration between MABIK and research and academic institutions from the Western Indian Ocean (WIO) region. Members of the delegation were Profs Yunus Mgaya (University of Dar es Salaam), Agnes Muthumbi (University of Nairobi), Salomao Bandeira (University of Eduardo Mondlane), and Dr Julius Francis (WIOMSA). The visit was very informative to the regional scientists who learned a lot from MABIK's on-going research projects and educational programmes, designed to train future leaders in marine biodiversity.

MABIK is a public institution, whose main purpose is to preserve and conserve marine biological resources as well as their sustainable utilization. The Institute was only established in mid-2015 to conduct research that maximizes efficient conservation of marine bio-resources, and provide the public with high-quality exhibitions and educational programmes for nurturing ocean literacy. This new Institute aims to be a global leader in the conservation and sustainable utilization of marine biological resources.

While at the Institute, the delegation visited the institute's four exhibition halls. Hall 1 has a collection of marine algae and plankton, marine invertebrate, fish and mammals, and interactive media hall. Hall 2 focuses on the future value and importance of biodiversity, with special emphasis on benefits to humans and the importance of further research and development. Hall 3 contains multimedia which

describes a story of a baby humpback whale separated from its mother in a killer whale attack, and Hall 4 is for special exhibitions on new subjects.

On 29 November 2016, a meeting involving MABIK's senior management team and the WIO regional scientists was held. The meeting was attended by representatives from the Korea Maritime Institute and Korea Institute of Ocean Science and Technology (KIOST). In the meeting, on-going research and education programmes on marine biodiversity in Tanzania, Kenya and Mozambique were presented, experiences on different modalities of collaboration were discussed and potential areas of collaboration, including areas of research, education and exchange were identified.

The meeting culminated with the signing of the letter of Intention to collaborate between MABIK and WIOMSA. In this agreement, the two organizations have agreed to consult each other on matters of common interest and to exchange information on planned activities. The agreement was signed by Dr Sang-jin Kim, MABIK's President, and Julius Francis, WIOMSA's Executive Secretary.

In the coming few months, the regional scientists will be working with MABIK staff to develop a proposal that will be submitted to the Government of Korea for its consideration. It is the expectation of both sides that the trip has opened a new chapter of collaboration between the WIO and MABIK scientists.



Signing of the agreement.

The publication of new book on the Nansen Programme coincides with the launch of the new research vessel



Nansen Book participants take a group photo.

Following the successful production of a comprehensive Regional State of the Coast Report for the Western Indian Ocean region, another multi-authored book is in the advanced stages of preparation and is scheduled to be published early in 2017. This new book will document the contribution of the research vessel, Dr Fridtjof Nansen, to research capacity development, management, and conservation of marine resources and ecosystems in the Western Indian Ocean region. Five of the sixteen authors are from outside the region (1 from FAO and 4 from Norway's Institute of Marine Research (IMR)) and the rest are from the region.

Between 1977, when the vessel undertook its first cruise in the WIO, and the present, over 30 cruises have been carried out in the region, leading to the production of a number of scientific publications. However, there is no publication that has assessed this data in its totality, to determine the distribution and abundance of the main fisheries resource groups of the region and their relationship with biological and physical processes. Also, an assessment of how the data and information from the vessel surveys has been used by the countries for improving their management and conservation efforts is lacking. These are some of the reasons behind the decision to produce this book.

The book has ten chapters that cover a historical overview of the Programme; study area, vessels and surveys; physical oceanography; ocean productivity; pelagic resources; demersal resources and biodiversity; and contribution of the programme to science, capacity development, policy

and management. The last two chapters will summarize the results from the core chapters and give recommendations on future areas of focus for Nansen Programme activities, and in particular the research surveys.

While the FAO's EAF-Nansen Programme is providing technical and financial support towards the production of the book, Johan Groeneveld of the Oceanographic Research Institute (ORI) with assistance from Julius Francis of WIOMSA, is responsible for the coordination of the production of the book. As part of the production of this book, three authors workshops have been held. The first one was held in Durban, South Africa in February 2016, the second in Zanzibar, Tanzania in May 2016 while the third meeting was held in Mombasa, Kenya from 6-8 December 2016. At the Mombasa workshop, discussions were held on the external reviewers' comments on all the chapters, the harmonization of chapters to minimize repetition, and revisions of chapters. Other important details such as the title of the book, final layout and publisher were also discussed.

With the new vessel, also to be called *Dr Fridtjof Nansen*, scheduled to be launched in March 2017 in Oslo, Norway, the publication of the book is very timely as it will help to define priority research topics requiring the use of the vessel in the short and long-term. The plans are for the vessel to undertake surveys in the region from 2018 and arrangements have been initiated to ensure active participation of scientists from the region.

MARG Grantee Articles:

Every year WIOMSA disperses Marine Grants (MARG Grants I, II and III) to researchers in the Western Indian Ocean region. The MARG Programme covers all subject areas of marine science and technology. The WIOMSA Newsbrief provides a platform for MARG grantees to present main highlights of their projects. In this edition, two completed MARG I projects from Kerry Reid, and Majambo Jarumani, are featured.

The Role of Cyclones in Long Distance Dispersal in the Marine Environment: The Case of Dusky Groupers in Coastal Waters of Réunion Island.

By Kerry Reid, *Molecular Ecology and Evolution Programme, University Of Pretoria, South Africa*

Dispersal in the marine environment can often be complex to understand and many species often have a benthopelagic life style, meaning that the adults are relatively sedentary and dispersal and gene flow is facilitated by the movement of pelagic larvae in the water column, at the mercy of directional currents and oceanographic features such as eddies. Although this is relatively well understood, there are other features besides oceanographic ones that can influence sporadic long distance dispersal in the marine environment and these include ENSO events and cyclones.



Port of Saint Philippe (Reunion island). Location where the specimen of dusky grouper have been caught.

In June 2012, two individuals of an unknown grouper species were observed by artisanal fishermen in Saint Philippe on the south coast of Réunion Island (Figure 1). These fishermen were able to capture one of them, took photographs and kept a tissue sample. They then contacted our lab (Molecular Ecology and Evolution Programme, University of Pretoria, South Africa) to find out if we could identify it. From photographs, the specimen appeared to be a dusky grouper *Epinephelus marginatus*, a temperate species which occurs in the Mediterranean Sea, the Atlantic and around South Africa, but has never been recorded in Réunion. To further investigate the origin of

the specimen, we used several genetic markers to identify the likely population of origin. From the genetic data it was clear that the most likely origin for the specimen was from South Africa.

Additionally, we used hydrodynamic modeling to verify the pattern of connectivity between South Africa and Réunion (>2000 km). We first retro-calculated the likely spawning months from the age and size of the fish, which coincided with the South African spawning period of dusky groupers (Austral summer). The results from the hydrodynamic modeling showed that a direct connection between Réunion and South Africa was not possible. However, the model also showed the possible presence of a resident population around Madagascar with a significant level of connection with South Africa. Finally, the only possible connection allowing for the colonization of Réunion over this period was during February 2011, which also coincides with the cyclone Bingiza that had a particular trajectory between the two islands.

This study appears to be one of the first to identify contemporary long distance dispersal likely due to a cyclone within the marine environment. This study shows that the combination of genetics and hydrodynamic modeling is providing valuable insight to the understanding of demography of marine organisms in the WIO region, and should be used for large projects focusing on connectivity patterns in the region. The results of this study are available at *Molecular Phylogenetics and Evolution* (2016) 103:98-103.

Estimating larval connectivity among Western Indian Ocean reefs. By Majambo Gamoyo, Department of Oceanography, University of Cape Town Cape Town, South Africa

Reef building corals are the key ecosystem of tropical coral reefs; the most diverse marine ecosystem on earth. Increasing disturbance frequency is causing declines in abundance and shifts in the composition of coral assemblages (Loya et al., 2001; Hughes et al., 2003; Obura et al., 2005). Altered coral assemblages can affect many other taxa dependent on structurally complex reef (e.g. reef associated fishes), leading to altered ecosystem processes and impacting the provision of ecosystem services (Hughes et al., 2010; Graham and Nash, 2013). Consequently, the ability of reefs to recover from disturbance and maintain a coral dominated state is a key objective of coral reef management. Most broadcast spawning corals rely on dispersal of a larval stage by ocean currents for population replenishments, and this influences coral biogeography, genetic structure and

population dynamics (Veron, 1995). Due the difficulty in empirically measuring dispersal of larvae in the open ocean, numerical modelling allows dispersal paths and connectivity to be explored and informs reef management.

In this current work, the potential connectivity between reefs of the Western Indian Ocean (WIO) is determined by tracking simulated larval releases from reef locations performed using a biophysical model (Ichthyop; Lett et al., 2008). Modelled ocean currents, temperature and salinity were obtained from Regional Ocean Modelling System (ROMS) and used to drive the Lagrangian model. Reef habitat for release and settlement were downloaded from the UNEP-WCMC 2010 dataset (<http://data.unep-wcmc.org/datasets/1>). The reef distribution data was re-gridded onto 1/10 cells creating ~400 habitat cells that define the release and settlement locations in the model.

One hundred model larvae were released from each grid cell per month over seven years of ROMS model output, totaling 84 spawning events and a total of >2.5 million particles. The capability of larvae settling (competency) was set from day 1 to 7, allowing for retention of larvae within natal reefs as well as for longer distance dispersal approximating the curve of Connolly and Baird (2010).

Larval transport and dispersal

Larval transport is defined as the horizontal dispersal of larvae between points x_1, y_1 and x_2, y_2 , where x and y are the horizontal axes. Lagrangian trajectories of particles released off different parent reefs over the WIO illustrate the quasi-chaotic nature of turbulent transport in the ocean, driven primarily by eddy-driven transport and variability in the winds (Figure 1 and 2). Mean dispersal patterns from 364 habitat locations show strong dependencies on particle-release location and season, reflecting annual circulation patterns in the study domain. The results show that reef population connectivity operates at a broader scale than the individual natal reefs and that the populations may not be replenished exclusively by self-recruitment. From the results, connectivity depends on the pelagic larval duration (PLD) parameter. Where the PLD threshold is high (above 15 days), connectivity between reefs is strong. On the contrary, when the threshold is low, results show low connectivity. Analysis of larval trajectories indicates that the pool of larvae coming into the east African coast tends to follow the flow of the EACC/SC, while within the Comoros Basin, reef larvae tend to follow the Comoros eddy, and some make it to Tanzania and Mozambique. Connection of larvae from Seychelles to the Comoros basin occurs only during the inter-monsoon periods and when the PLD is approximately 35 days or longer. Although this study considered the reef larvae as passive, it provided evidence of the existence of inter-jurisdictional connections between reefs in the region.

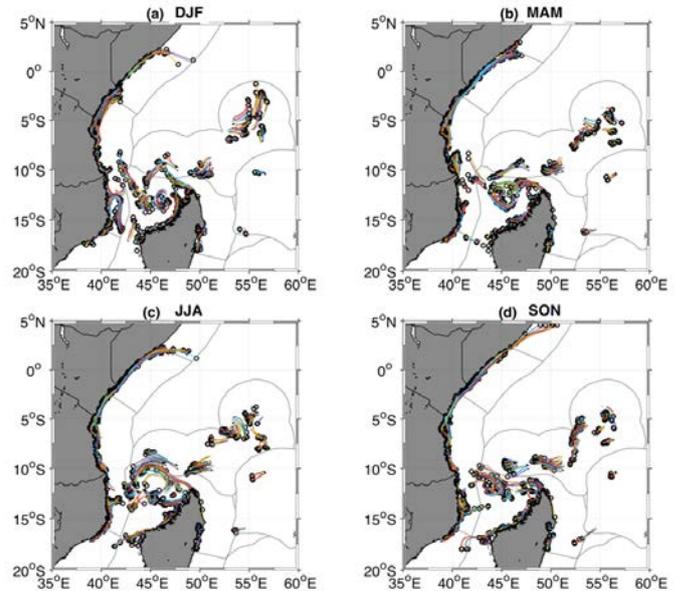


Figure 1: Modeled larval dispersion over the western Indian Ocean during a) DJF [north-east monsoon], b) MAM [inter-monsoon], c) JJA [southwest monsoon] and d) SON [inter-monsoon] with pelagic larval duration (PLD) at 15 days. Overlaid on the map are the marine ecoregions over the study area.

When a more comprehensive understanding of regional connectivity patterns becomes available, managers should adjust their plans accordingly. For example, once managers have determined which sites are usually sources and which are usually sinks i.e., which provide larvae to others, and which rely on larvae provided by others, they can prioritize sites for protection or other management measures.

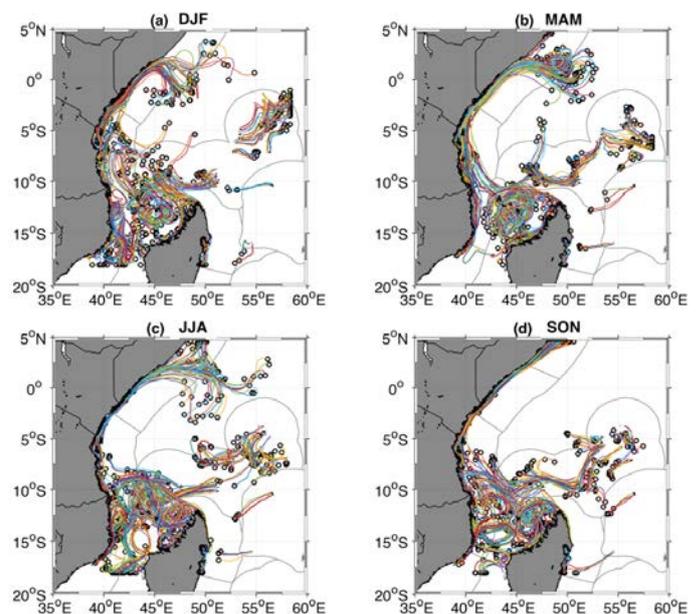


Figure 2: Same as Figure 1 but pelagic larval duration set to 35 days

Events: Workshops/courses

3° CLE - Latin-America Echinoderm Congress , San José, Costa Rica July 2016. By Chantal Conand¹

The Latin-America Echinoderm Congress is a regional congress that takes place every three years. The third Latin-American Echinoderm Congress was organised in Costa Rica (San Jose) from the 18th to 22nd July 2016, at the Costa Rica University, CIMAR Centro de Investigacion en Ciencias del Mar y Limnologia, by Juan José Alvarado, with the help of a local team and a scientific committee comprising members from several countries. A very good introduction on the Latin American region was given by J. J. Alvarado and F. A. Solís-Marín (eds.), in their book *Echinoderm Research and Diversity in Latin America*, DOI: 10.1007/978-3-642-20051-9-2, Springer-Verlag 2013 available at <https://www.researchgate.net/publication/278702616>.



Group Photo of CLE Congress participants.

Seventy four participants from 13 countries (Spain, USA, Mexico, El Salvador, Costa Rica, Colombia, Ecuador, Chile, Venezuela, Brazil, Uruguay, Argentina and France) attended the congress and presented oral communications and posters (53 oral and 40 posters) in the following sessions: Ecology, Taxonomy, Paleontology, Reproduction, Physiology, Molecular phylogeny and Ecotoxicology.

Key note presentations were given in the plenary sessions each morning by the following:

- C. Conand “Recent trends in world sea cucumber fisheries: captures, markets, management and the problem of the illegal”
- J.C. Hernandez “Influencia humana en las fluctuaciones poblacionales de erizo de mar: implicaciones para el manejo de los ecosistemas marinos”
- T. Rubilar “Reflexiones éticas sobre el uso de equinodermos en estudios científicos”
- R. Perez-Portela “Molecular studies of echinoderms across the Atlantic Mediterranean area: from population genetics to gene expression”

A number of pre-congress courses were organized around the following topics :

- *Echinoderms Physiology* by Dr. Tamara Rubilar.
- *Application of molecular markers to ecological and evolutionary studies*, by Dr Rocio Perez-Portela.
- *Marine Ecology Experimental design*, by Dr. Jose Carlos Hernandez”

A mid-symposium excursion went to Volcán Poás and for the Doka Coffee Tour.

The national Newspaper ‘La Nacion’ published a long article on the sea cucumber exploitation following the plenary ‘Expertos alertan sobre explotación de pepino de mar’ and several interviews were conducted for the University journal.

The *Proceedings* from this congress are going to be published in a special issue of the *Journal of Tropical Biology* in 2017.

The next CLE will be organised at the Instituto Politecnico National, La Paz, BCS, Mexico in 2019.

My participation to the congress was financed by the Institut Français Amérique Centrale, for which I am sincerely grateful.

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Training and Capacity Building in MPA Law in the Western Indian Ocean



Group Photo of MPA Law Training Participants.

Legal and institutional frameworks for MPAs have always been a part and parcel of the training courses in MPA management in the WIO region. A five-day course held in Seychelles in September 2016 was the first course in the region whose objective is to build the capacity of MPA staff in MPA law.

The EU/IOC Biodiversity Project contracted WIOMSA to provide training and capacity building in environmental laws applied to marine protected areas (MPAs) in the Western Indian Ocean (WIO). The purpose of this assignment was to build the capacity of nationals from the English-speaking project targeted countries (Kenya, Tanzania, Seychelles, Mauritius) for an improved understanding of the importance of MPA related laws and their implementation including enforcement and governance arrangements, to be achieved by training a batch of professionals from the MPA/environmental sector, the line Ministries, relevant departments in Universities and from the legal profession - in environmental laws relating to marine protected areas. Once empowered, the intention is for the beneficiaries of the training to be able to train a wider range of stakeholders. WIOMSA put together a multi-disciplinary team comprising Dr Tim Andrew (WIOMSA), Ms Sarah Lucas (environmental law expert), Mr Lawrence Sisitka (MPA training expert) who worked together with the host institution, the Blue Economy Research Institute (BERI) of the University of Seychelles (UniSey), to prepare and deliver the course. The course was run over a 5-day period from 26th to 30 September 2016 at a venue on the University of Seychelles campus at Ans Royale, Mahe.

Course materials were adapted from existing modules produced by IUCN in environment law related to Protected Areas (<http://www.protectedareaslaw.org/>) to ensure a WIO regional context was included and to provide a focus on Marine Protected Areas (MPAs). While the original materials include eleven modules, these mostly cover Protected Area Law in general and are not directly relevant to MPAs. They also contain much repetition and were designed to be presented over several weeks. Due to the time constraint of

5-days for the current course, and the need to focus on MPAs, four modules were identified from the IUCN materials that were of particular relevance to MPAs, and were adapted and included in the course. These were:

1. Basic Legal and Protected Area Concepts
2. Governance Principles and Approaches
3. Law and MPAs
4. Special Legal Considerations for National Frameworks

A total of 66 applications were received for the course. These included 7 from Mauritius, 10 from Seychelles, 27 from Kenya, 14 from mainland Tanzania, and 8 from Zanzibar. Initially only 25 participants could be accepted for the course, so a process of assessment of the letters of motivation and profiles was undertaken by the project training team. This initial selection was shared with The BIODIVERSITY Project for their approval. Selection involved ensuring that the different countries were equitably represented, that participants included a range of institutions and disciplines from both the public and private sector, that gender balance was considered, that participation in previous trainings related to MPAs was taken into account, and that key individuals were included who could also act as resource persons. In addition, cognisance was taken of the potential that candidates had to act as trainers of trainers once they returned to their work stations. This was balanced according to the quality of applications received. Overall, it was possible to include participants from all categories indicated in the Call. A further 5 participants were later accepted at the request of the University of Seychelles, to make up a total of 30 trainees.

The course comprised a mixture of Powerpoint presentations, case studies, and exercises, with a focus on ensuring participation from attendees. All case studies were presented by participants, while a guest presentation was included on Thursday by the Coordinator of the Marine Spatial Planning Process in Seychelles, Ms Helena Sims of the Nature Conservancy.

A half-day field trip to St Anne's National Park was included in the middle of the week.

Although all participants received a Letter of Attendance at the end of the course, a course assignment was set for those that wished to complete it after the course for the purpose of earning a course certificate. Participants were given a week after the course to complete this and were required to submit it by email to the course facilitators for assessment. Twenty two participants submitted the assignment, all of whom passed, except three. On evaluation, the general feeling of participants was that the course was useful and would assist them to carry out their work better. There were several observations regarding the timeframes and content that will be taken into account in the preparation for the next course to be held in French in Madagascar in early 2017.

The 3rd Negotiation Meeting of the ICZM Protocol of the Nairobi Convention

The Third Negotiation Meeting of the ICZM Protocol of the Nairobi Convention was a successful one as it managed to not only discuss and negotiate articles that were not discussed in the second negotiation meeting but also resolved some outstanding articles from the first negotiation meeting. With this achievement, the ICZM Protocol is now only one meeting away from its finalization and adoption by the Plenipotentiary of the Nairobi Convention.

The Contracting Parties of the Nairobi Convention held the third negotiation meeting of the Integrated Coastal Zone Management (ICZM) Protocol of the Nairobi Convention on the 21-24 November 2016, at the Double Tree by Hilton Hotel in Zanzibar, Tanzania. The meeting was organized by the Nairobi Convention Secretariat with partial financial support from the WWF Madagascar Country Office and technical support from WIOMSA. The participants of the meeting included delegations from the Contracting Parties (Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somali, South Africa and Tanzania), technical and legal experts, regional ICZM experts and the Nairobi Convention Secretariat. The Deputy Head of Mission of the Kenya High Commission in Tanzania, Ambassador Boniface Muhia, attended the meeting as part of the Kenyan delegation.

The objective of the meeting was to discuss and possibly reach agreement on some of the articles that were not negotiated in the Second Meeting and the outstanding ones from the first meeting and to agree on the form and structure of the annexes of the Protocol. The negotiations were chaired by the Chairperson, Legal and Technical Working Group, Ms. Irene Kamunge of Kenya who guided the Contracting Parties through the formal negotiation of the draft articles 20-27 of the ICZM Protocol, followed by Articles 1, 2, 3 and the preamble of the Protocol. During the negotiations, delegates proposed draft clauses in addition to, in amendment of, or deletion of some of the existing draft articles. The Zanzibar meeting also included a technical session to elaborate the annex of the ICZM Protocol. The purpose of the annex was to provide more details on some of the articles and to de-congest some articles that were too text heavy. The Contracting Parties agreed on the rudimentary structure and possible content of the Annex which will be developed by the Nairobi Convention Secretariat for the final negotiation meeting that is planned for 2017.

The output of the 4th negotiations meeting will be a working draft of the ICZM Protocol that will be presented to the Plenipotentiary of the Nairobi Convention for adoption.

Road Map to an ICZM Protocol

- **1993 Arusha Resolution on Integrated Coastal Zone Management in Eastern Africa including Island States:** Environment and Natural Resources Management ministers met in Arusha, Tanzania, endorsing a resolution containing various recommendations dealing with coastal zones in their countries. Integrated Coastal Zone Management (ICZM) recognised as the best tool for addressing the multiplicity of issues involving the coastal zones.
- **1993 Launch of EAF/5 Programme by UNEP and FAO:** “The Programme objectives include strengthening the capacity of national and local institutions and experts to implement the Integrated Coastal Area Management (ICAM) process by helping them prepare the country specific ICAM strategies; and to develop management tools, which will help the major stakeholders in the region to implement all the tasks envisaged within the framework of ICAM strategies.
- **1996 Seychelles Statement on ICZM:** Policy makers from the WIO region assess the successes and failures in ICZM since Arusha. A Secretariat is created to assist them to accelerate the implementation of ICZM in the region. 9 countries (Comoros, Eritrea, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania) and one Overseas Department of France, Reunion, formally establish the Secretariat for Coastal Area Management (SEACAM) in Maputo, Mozambique in October 1997 to work with a variety of coastal stakeholders.
- **2009-2010: Feasibility Assessment on ICZM Protocol by ReCoMaP of the Indian Ocean Commission:** The assessment made recommendations to elaborate, discuss and obtain support of countries for the possible development of an ICZM Protocol to the Nairobi Convention; and to develop respective recommendations for the 6th Conference of the Parties (COP6) of the Nairobi Convention.
- **Decision CP 6/3: Strengthening Integrated Coastal Zone Management in the Western Indian Ocean Region:** the Contracting parties decided to endorse and support the use of the integrated coastal zone management approach for the long-term sustainable development of the coastal and marine areas of the Western Indian Ocean Region; to request the Secretariat to promote and strengthen the application of ICZM tools, and in this regard work in collaboration with Indian Ocean Commission (IOC) and other partners; and to develop an ICZM protocol and request the Nairobi Convention Secretariat to support the development of such an ICZM Protocol, through a consultative process and in partnership with relevant regional and international organizations and programmes/projects, for consideration at the next COP.
- **2010-2012 Legal and Technical Working Group Drafting Meetings:** the Indian Ocean Commission organised seven intergovernmental meetings of the *Ad hoc* Legal and Technical Working Group on ICZM to develop the ICZM Protocol. At the Seventh meeting (LTWG7) held in Maputo, Mozambique in August 2012, the Legal and Technical Group on ICZM concluded the drafting of the Protocol and prepared the *Seventh Draft ICZM Protocol to the Amended Nairobi Convention*.
- **Decision CP7/3 on ‘Development of a Protocol on Integrated Coastal Zone Management’:** the Contracting Parties to the Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean region (Nairobi Convention) agreed to negotiate a protocol on integrated coastal zone management and present an agreed text for consideration for possible adoption at the next Conference of Parties serving as the Conference of Plenipotentiaries. The Contracting Parties also requested the Secretariat to facilitate meetings on negotiations on the protocol and its Conference of Plenipotentiaries.
- **September 2013:** The First Negotiations meeting on ICZM Protocol held in Cape Town, South Africa.
- **Decision CP8/3 on reviewing the status of the Draft Protocol on Integrated Coastal Zone Management** in collaboration with partners, and to facilitate discussions including possible options for the effective management of marine and coastal environment.
- **March 2016:** The Second Negotiations meeting on the ICZM Protocol held in Mauritius.

Zanzibar hosts Inter-governmental meeting on the Northern Mozambique Channel



Inter-governmental meeting in session.

An intergovernmental meeting on the Northern Mozambique Channel (NMC) was jointly organised by the WWF Madagascar Country Office (WWF MDCO) and the Nairobi Convention on the 25th of November 2016, in Zanzibar, Tanzania. The meeting was attended by the Contracting Parties of the Nairobi Convention Contracting Parties (represented by the Nairobi Convention Focal Points) and key partners of the Northern Mozambique Channel Initiative.

The overall aim of the meeting was to take stock and plan for next strategic actions in the collective efforts around the integrated ocean management in the NMC area. The specific objectives of the meeting were to discuss the progress or status around the NMC and collectively define a way forward for the initiative; and to discuss ways of collectively moving forward in the implementation of SDG14 targets, especially in the lead up to the UN Oceans Conference in New York in June 2017.

During the meeting, the NMC Coordination team presented the overall progress in the development of the NMC initiative proposal, including its strategic framework. The meeting participants discussed fund raising options for the NMC and gave country recommendations on the NMC initiative proposal development process. Some of the key recommendations made by the Contracting Parties included the need to establish coherence and complementarity of the NMC project with existing regional projects such as WIOSAP and SAPPHERE and

a need for clarity in the institutional set up of the initiative; especially the role of governments in the project.

The meeting discussed the oil and gas component of the NMC initiative, notably the discussion processes between non-governmental organizations and the civil society organisations. The Contracting Parties of the Nairobi Convention stressed the importance of aligning the proposed NMC approach in oil

and gas to the national priorities of the countries of the region, the need for capacity building for the stakeholders in the oil and gas sector and the importance of sharing experiences on oil and gas development and best practice across the region.

On the SDG 14 implementation discussions, the NMC Coordination team outlined the efforts of the initiative to engage the Government of Sweden (Sida) in catalyzing and supporting the implementation of SDG 14 through the adoption of an Integrated Ocean Management Framework as a key pathway towards fulfilling SDG 14 in the NMC area. The link with other partners' approaches in the implementation of SDG 14 targets (such as the PROG - Partnership for a Regional Ocean Governance in WIO, led by IASS, IDDRI, UNEP and GIZ) was highlighted. The meeting talked about the UN SDG 14 Summit in June 2017 and how the Nairobi Convention Secretariat and partners can support governments of the region to present a number of key elements on fulfilling SDG 14 in the NMC Area.

The intergovernmental meeting discussed the Western Indian Ocean Economy report, its aims, the context of its development, as well as the upcoming launches of the report, and its relevance to the SDG 14 process.

The meeting was attended by representatives of the Fonds Français pour l'Environnement Mondiale (FFEM) and the Government of Sweden; both of whom iterated their commitment to supporting the NMC. Follow up meetings are planned for early 2017.

Management Effectiveness Assessment Workshop held in Mombasa. By Maxwell Azali Kodia, Nyawira Muthiga and Jennifer O’leary



MEA Participants in a group photo.

The 5 day workshop on “Assessment of Management Effectiveness of marine protected areas (MPAs): A workshop to identify appropriate regional approaches and methodologies, and to integrate this tool with ongoing initiatives to build management capacity in the Western Indian Ocean” was held from 5th to 9th December 2016 at Sai Rock Hotel, Mombasa, Kenya. It brought together 25 participants comprising MPA managers, technical officers and practitioners from 8 Western Indian Ocean countries (Kenya, Tanzania, Comoros, Madagascar, Mozambique, Mauritius, Seychelles & South Africa). The workshop was co-hosted by the Wildlife Conservation Society (WCS) Kenya Marine Program and the Kenya Wildlife Service (KWS) with funding support from the Western Indian Ocean Marine Science Association (WIOMSA).

The aim of the workshop was to help build capacity for understanding and using Management Effectiveness Assessments (MEAs) as a means to improve MPA management, building on earlier and current initiatives. The workshop also sought to identify appropriate approaches and methodologies that could be disseminated through the region and to provide a calibration of progress in MEA in the WIO as well as an opportunity for participants to share challenges and lessons learned. The

workshop was facilitated by Ms Sue Wells (independent consultant, UK), Dr. Jennifer O’Leary (SAM Program) and Mr. Arthur Tuda (KWS).

The welcome address for the workshop was given by Dr. Samuel Kasiki, the Deputy Director for Biodiversity Research and Monitoring, KWS, and National Focal Point for the Convention of Biological Diversity. In his opening remarks he noted that the workshop was of relevance due to its potential contribution to the sustainable development goal 14 (SDG) and the Convention of Biological Diversity (CBD) Aichi targets 6, 11, 17 and 19 as well as relevance at the local level in fulfilling national policy requirements on reporting on the status of biodiversity.

Dr. Julius Francis (WIOMSA) also addressed the participants during the opening of the workshop, noting that one of the aims was to highlight the relationship between the concepts of Strategic Adaptive Management (SAM) and MEA. He pointed out that the workshop should help to equip participants with tools to improve MPA management. He urged participants to join regional initiatives such as the Western Indian Ocean Certification of Marine Protected Area Professionals (WIO-COMPAS) and SAM, both of which provide skills for MPA management.

The first day was used to set the scene and introduce the topic, with presentations on the history of MEA in the WIO, and on the global text with particular reference to the emerging global urgency for protected areas to use MEA as a tool to help them meet Aichi Target 11 which calls for “effective and equitable management” of protected area systems by 2020. The second day focused on developing an understanding of the progress made in the WIO to date, with presentations from each country on progress made, challenges and lessons learned in relation to MEA.

On the third day the participants conducted an MEA for a hypothetical MPA in multi-country breakout groups, which allowed them to learn the basic steps in the process, and also to consider the range of MEA methodologies and approaches that are available. On the fourth day, the participants worked in national teams to identify priorities for their countries, and an action plan to take forward on their return. The fifth day was spent developing the conclusions of the workshop discussions and recommendations.

Since the pilot work by IUCN in 2003/2004, MEAs have been carried out in a growing number of MPAs in the WIO (the final report will include a table of MPAs at which MEAs have been undertaken). The METT – Management Effectiveness Tracking Tool – developed by WWF and the World Bank has been the most common tool used, in large part because of the GEF funded projects in the region. Despite this, the concept of MEA and the tools available are nevertheless difficult for many people to understand. Where MEAs have been carried out, stakeholders have often not been fully involved in the process and there has often been inadequate feedback of the results to MPA staff and stakeholders and so the results have not been acted upon. For most LMMAs and community MPAs, MEA is still a new concept and these sites particularly need further help. The SAM system is proving an effective mechanism in several countries for providing the “engine” to drive adaptive management – which means that in these countries it may be relatively straightforward to implement the results of an MEA. Notably, there was broad agreement that MEA helps to build management capacity and is a neutral way of dealing with management problems related to staff not performing well.

The recommendations from the workshop discussions can be summarized as follows (further details will be given in the final report):

1. More training is needed in every country, but the specific needs may vary and there may need to be two levels of training – one for those who have not undertaken any MEAs and one for those who have the capacity to move on to the more detailed methods.
2. A centralized regional platform is needed for storing information on MEAs; various suggestions were made and these will be explored.
3. Where MEAs are carried out by external consultants (e.g. for GEF projects), the consultants should be fully briefed to ensure that all relevant data and information are used and that all stakeholders are consulted (requirements for this should be made clear in their TOR).
4. Exchange programmes of various types could be very useful, with MPA practitioners from one country in the WIO assisting with MEAs in other countries and providing an independent view.
5. Materials must be provided in local languages; in particular French and Portuguese documentation must be made available for MPA staff in francophone countries and Mozambique respectively.
6. Government supported MPAs, which generally have more experience of MEA, should find a mechanism for sharing information and lessons learned with LMMAs.
7. MEA should be embedded in the management cycle of MPAs.
8. MEA demonstration sites may be useful.
9. Consideration should be given to holding a session on MEA at the 2017 WIOMSA Symposium.

Mr. George Osuri, the KWS Assistant Director Coast Conservation Area, officially closed the workshop he thanked the organizers and participants for a successful workshop that would contribute to efforts to improve MPA management. The detailed proceeding of the workshop will be circulated in a report at a later date.

Using information and communication technologies (ICTs) to promote equitable and sustainable small-scale fisheries (SSF).

By ICSF Members, Dr Serge Raemaekers (founder of Abalobi) and Dr Jackie Sunde - University of Cape Town, South Africa



Group Photo of delegates to the ICT4FISHERIES workshop.

With the current worldwide trends towards the increasing affordability of mobile devices, rapid development of internet connectivities, and ease of use of web and mobile applications (apps), information and communication technologies (ICTs) are increasingly being used to develop sophisticated systems to address some of the world's more pressing social and ecological challenges. Examples abound globally of development projects that are making use of cellular technology to empower local communities to monitor issues as diverse as natural resource use, climate change and disaster risks, community health and water quality, and to empower these same communities with marketing and management tools.

Implementation of the United Nations Food & Agricultural Organization's (UN-FAO) *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (VGSSF)* – with a focus on fisher empowerment and transformation of unequal power dynamics – provides a critical opportunity to ensure that marginalised small-scale fisher (SSF) communities are able to gain access to, and harness the power of, affordable and easy-to-use ICTs. The Guidelines specifically cite the need for *'digital inclusion and other skills of a technical nature*

that generate added value', encouraging States to ensure that fishers have access to these services (Section 6), and promoting the development of technologies that are able to support women's work (Section 8.4) and that are *'culturally appropriate'* (Section 9.9). Multiple entry points for the use of ICTs are evident in the call for the empowerment of SSF and their access to a range of resources, infrastructures, market opportunities and equitable participation in research, monitoring and governance of fisheries.

Towards this end, Dr Serge Raemaekers, International Collective in Support of Fishworkers (ICSF) member and founder of the Abalobi initiative in South Africa, co-ordinated the hosting of an international workshop on ICT for Fisheries (ICT4FISHERIES) in November 2016 in Cape Town, South Africa. Entitled *'ICTs for equitable and sustainable small-scale fisheries: promoting international cross-learning'*, the workshop was co-hosted by Abalobi, the University of Cape Town's Centre for ICT4D and Blue Ventures, and made possible with funding from the Western Indian Ocean Marine Science Association (WIOMSA).

Invited delegates were requested to list five key ICT4FISHERIES challenges prior to commencement of the workshop for discussion points – common themes identified are represented in the word cloud below:



Abalobi is a free mobile app and programme aimed at social justice and poverty alleviation in the SSF chain, transformation in the way we produce knowledge and access information, stewardship of our marine resources, and resilience-building in the face of Climate Change. The Abalobi initiative (WWW.ABALOBI.INFO) is an open source, transdisciplinary and social learning endeavour, bringing together various rights- and stakeholders in South Africa, with traditional fishers taking centre stage. It is a participatory action project with a strong community development interface. The project was borne out of a research collaboration between Serge Raemaekers, Nico Waldeck and Abongile Ngqonqwa in an attempt to meet the need to develop an SSF information-management system in South Africa that would facilitate implementation of the country's new SSF policy and empower fishers to participate fully in the management process. The Abalobi app suite comprises five inter-connected apps and an information management system—conceptualised in a co-design process and currently in various stages of development and testing – covering the full spectrum of stakeholders in the SSF sector *from hook to cook*, governance and beyond. These apps include:

- **Abalobi Fisher** – The foundation of the app suite where fishers' co-produce knowledge by collating their own catch data in a personal logbook with sharing options. The app includes planned safety-at-sea integrations and the opportunity to capture a range of climate-related data. Fishers download this for free, and are supported daily by Abalobi's field team, local fisher assistants and the Fisheries Authority's fishery development workers. Fishers use the dashboard summaries in daily fishing operations and towards co-management of their community fisheries.
- **Abalobi Monitor** – Digitised community catch monitoring at the landing site and along the shoreline, with the ability to feed into a centralised information-management system for enhanced evidence-based decision-making and policy development. The Fisheries Authority is rolling this app out along South Africa's coastline. The system detects fishers who openly use the Abalobi Fisher logbook, thereby allowing data validation and the use of real-time data for decision-making.
- **Abalobi Manager** – Real-time fishery data, access to relevant oceanographic data and information and communications for co-management. This is the interface for Government fisheries managers and co-management committee members.
- **Abalobi Co-op** – Co-operative member and fleet management. This includes a tool for collective accounting, enabling all members of the co-operative to be accountable and transparent, thereby promoting equitable practice, and facilitating catch value-adding and the creation of opportunities for women and youth who may not be involved directly in harvesting activities. Abalobi Co-op is intended to equip fisher co-operatives with the tools that can drive the development of community-based, sustainable small business entities. The technology also allows co-operatives to connect with FINTECH (online banking, micro-credit) and Insuretech (tailored life and fleet insurance).
- **Abalobi Marketplace** - Fish with an ecological and social 'story'. A virtual market where fisher co-operatives can share their story and post their daily catches for sale to consumers, restaurants and larger retailers. This component stimulates the idea of community-supported fisheries (CSF), empowers fishers in the value chain, and at the same time allows for the development of fisher-community-based labelling and marketing mechanisms. Abalobi Marketplace is currently in proof-of-concept phase with further co-design and development planned for 2017.

Networking with other partners around the world who are at various stages of working with ICTs in SSF – Ecotrust Canada who have developed Thisfish; the Caribbean Ict Research Programme (CIRP) who have developed MFISHERIES; key persons working with Open Data Kit (ODK) in organisations such as Blue Ventures based in Madagascar, the World Bank and UN-FAO; as well as organisations such as the Technical Centre for Agricultural and Rural Co-operation ACP EU (CTA) – gave birth to the dream of hosting an international workshop that would enable the sharing of experiences and lessons in developing and using ICTs specifically for SSF. This workshop was the first ever international workshop of this nature. The workshop was planned and co-facilitated by Serge Raemaekers and Jackie Sunde from the University of Cape Town, together with Steve Roccliffe and Tori Jeffers from Blue Ventures.

From the outset it was apparent that various open-source platforms, already in existence or in development, can enable fisher communities to be incorporated into information and resource networks: from fishery monitoring and maritime safety, to local development and market opportunities. Critical questions in this approach pertain to data ownership, protection of local knowledge and power imbalances related to the use of new technologies and data. Further questions lie in the scale and uptake of such technologies in regional fisheries management efforts. The workshop enabled a process of interrogating some of these key challenges and deepening the understanding of factors and processes that can enable ICTs to contribute towards the implementation of the human-rights-based approach that underpins the VGSSF.

The workshop included a presentation on the VGSSF and, linked to this, a presentation by Florence Poulain of the UN-FAO on how ICTs can contribute towards achieving the principles of the Guidelines with specific attention to the thematic area of Disaster Risk and Climate Change. These presentations highlighted the fact that ICTs are central to all 13 themes of the VGSSF.

This was followed by a 'tech sharing' session using Knowledge Café Methodology. In small groups, select ICT tools were demonstrated and participants were given the opportunity to test the tools and explore how each attempts to address key challenges faced by SSF and associated stakeholders. The tools included: THISFISH (demonstrated by Eric Tamm from Ecotrust Canada);

The aims of this international workshop were to:

- bring together fisher groups, fisher leaders, non-governmental organisations (NGOs), academics and other stakeholders with experience in the use of fisher-driven ICTs, to promote networking at international, national and regional level
- build an understanding of the contribution that ICTs can make towards empowering SSF communities, enabling them to secure their human rights, share local ecological knowledge and ensure the co-production of new knowledge towards enhanced sustainability of marine resources
- identify the right processes whereby fisher-driven mobile apps can contribute towards transparency, equity, sustainability and accountability
- facilitate the sharing of knowledge on best practices in supporting the development of free or low-cost apps that can assist with the implementation of the VGSSF
- develop best practice guidelines for supporting the development of apps for fisher knowledge and data capture, data use, safety-at-sea, communication and market-related needs
- find practical ways to pool strengths and experiences and thereby foster collaboration, with specific focus on the need for integration of various apps, their ease of use, sustainability and accessibility across the globe.

Over 50 participants attended the workshop, including representatives of fisher organisations, the UN-FAO, State parties, NGOs and CBOs, as well as research institutions and organisations providing technological support. Participants represented regions from across the globe: Tanzania; Seychelles; Mauritius; Mozambique; Madagascar; South Africa; Uganda; Trinidad representing the Caribbean countries; Canada; the USA; UK; the Netherlands, France; Belgium and Italy. Key participating organisations with extensive presence in a number of countries included: the World Forum of Fisher People (WFFP); WIOMSA, working throughout the western Indian Ocean region; as well as organisations such as the CTA which works in more than 79 countries.

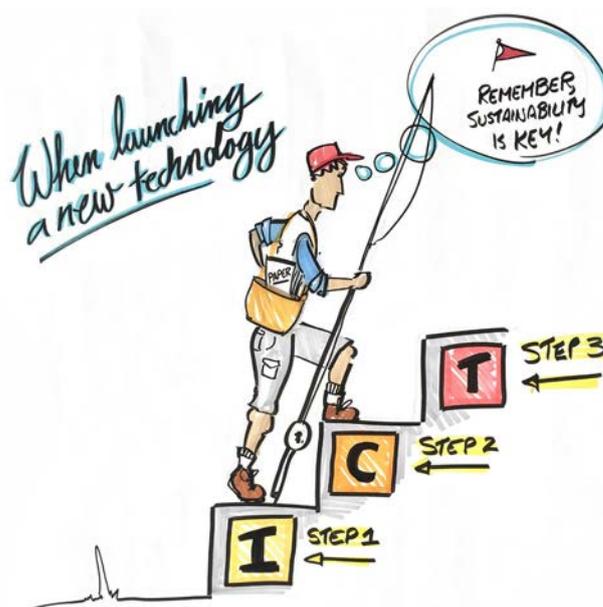
VMSTRACK (Petrus van der Linde of COASTAL Livelihoods Foundation); Open Data Kit (ODK) (Thierry Nohasiriviolo, Steve Roccliffe and Tori Jeffers of Blue Ventures, and Gertjan de Graaf of the UN-FAO/World Bank Artisanal Fisheries Data Programme); MFISHERIES (Kevon Andrews of CIRP); and Abalobi (Serge Raemaekers, Abongile Ngqongwa, Andrew Cawood and Nico Waldeck).

Groups explored the way in which each tool contributes towards the empowerment of fishers and which of the main VGSSF principles or thematic issues are addressed. The report back to plenary highlighted a very rich harvest of lessons and emerging issues. It was apparent that each of these tools is contributing to a wide range of issues from fisher empowerment in data capture and management processes, to how traceability can empower SSF and help them build leverage in the value chain.

The use of ODK in African artisanal fisheries has provided an efficient, time- and cost-saving mechanism for capturing data in the vast and very widely spread contest of many African SSF communities. Key questions remaining include issues such as how to validate data quality and how to empower fishers to be able to use the data to engage in Climate Change research from a position of strength and hold governments to account. The ODK used by Blue Ventures has enabled women fishers to be empowered and to take their skills back to their households and share them with their male partners and youth.

Participants were struck by the way that Abalobi has empowered fishers through the co-production of the platform from the onset. The MFISHERIES app demonstrated that use of simple technology can be

extended to capture fishers' stories as well as provide an accessible platform for multimedia training and capacity-building on issues such as safety at sea. It also provides access to real-time information from the cloud on a range of oceanographic data for fishers. A key insight emerging from VMSTRACK has been the manner in which an ICT tool can serve as an entry point into community-focused issues such as promoting safety at sea, but then also serve as a catalyst for further social development. In particular, VMSTRACK has contributed towards building community cohesion and solidarity, which in turn provides a springboard for alternative livelihoods and community-development projects.





Workshop insights and lessons

The particularly innovative and powerful process of ‘graphic harvesting’ (see graphics below) was used for capturing the issues emerging from the discussions and outcomes of the workshop – illustrations by Grant Johnson ([WWW.GRAPHICHARVEST.CO.ZA](http://www.graphicharvest.co.za)).

Initial insights drawn from the VGSSF and ICT tool demonstrations identified the contribution that ICTs are making to safety at sea, climate change adaptation and disaster-risk management, data capturing, research and monitoring, building accountability and transparency. This was followed by a vibrant exchange between the ‘techies’: Taylor Downs (OPENFN), Andrew Cawood (Abalobi) and Kevon Andrews (MFISHERIES) provided insight into the process of developing a simple tool using ODK, but left the participants with the strong message that while ‘technology is not *the* answer to sustainable fisheries, it should also not be the problem’. They emphasised a three-step process, with: (1) knowing what information you need, and (2) communicating this as the most important steps, and (3) developing the technology to follow this, as the last step ...

The workshop discussions indicated that process and methodology for developing ICTs are as important, if not *more* important, than the tool itself. This includes ensuring that development is a participatory, bottom-up process that identifies champions in the local community and builds trust. It must not be a case of parachuting in and out of the community, but rather of ensuring a sustainable, co-development of knowledge. In the words of one participant: ‘... *human connectivity is important in addition to internet connectivity ... relationships matter!*’

Abongile Ngqongwa emphasised that the *approach* to assisting communities to access technology is very important. Once you have introduced the idea of using the technology, then make sure that you develop the technology with the communities – once the tech is developed collaboratively, it takes away the burden of training, as fishers *own* the system that they are developing, so the skills are developed along the way. This theme of



EMPOWERING WOMEN in FISHERIES MANAGEMENT

empowerment and the need to ensure that fishers retain control over their own data was a consistent thread running throughout the discussions. The local South African fishers who have pioneered the development of Abalobi shared their journey with other fisher representatives from Mozambique, Mauritius and the Seychelles and a rich exchange of ideas and experiences led to a commitment to continue this exchange and attempt to extend the reach of Abalobi across the Indian Ocean. In return, the Abalobi fishers appreciated the ideas on how to promote gender equality that the Blue Ventures experience with their ODK tool highlighted. These male fishers expressed their eagerness to return home and ensure that they extended their work to include women and all activities along the value chain when developing their Abalobiplatform further.

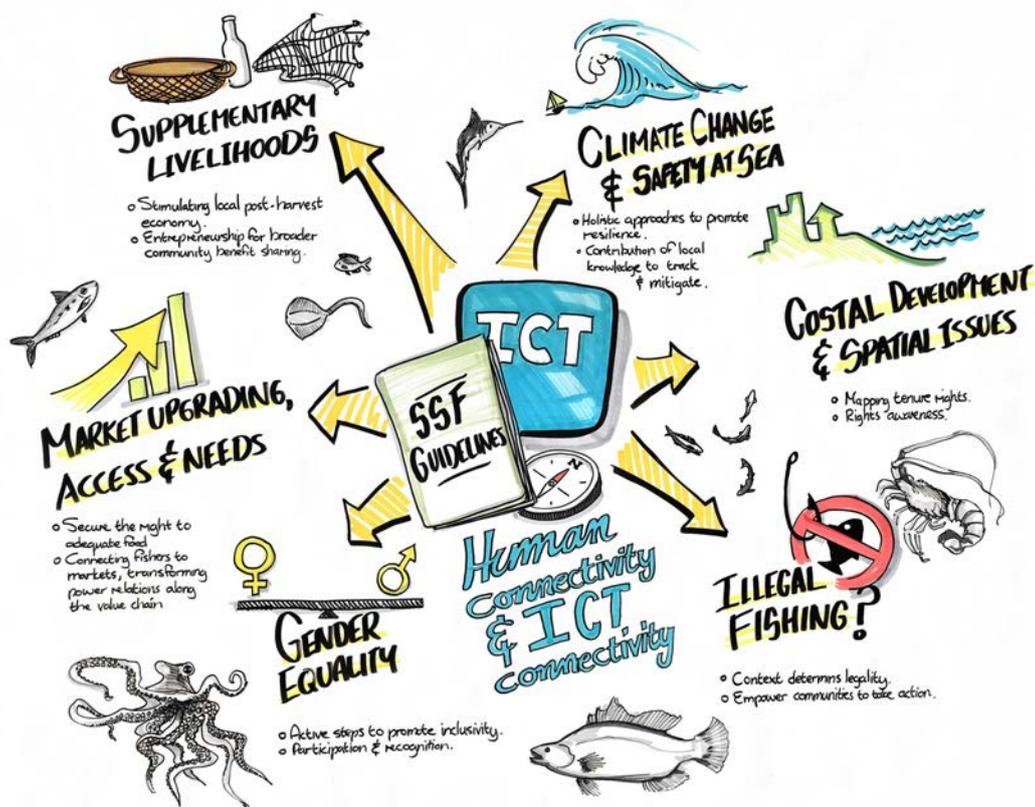
The way forward

A key outcome of the workshop has been the establishment of a website and platform for networking on ICT4FISHERIES (WWW.ICT4FISHERIES.ORG).

The objective is to create an easily accessible portal where fisher groups, organisations and other stakeholders can gain a glimpse of the types of ICT4FISHERIES projects that are in existence and share lessons learnt. It aims to promote the use of the VGSSF and ICT development as a key tool for implementation of the Guidelines in the coming years.

Already there are resources emerging as Blue Ventures has written a handy manual on ODK to share and ECOTRUST CANADA has explored the issue of traceability in the value chain. The intention is that the portal will create a starting point where the group and others can connect with each other, network and extend the ripples outwards as ICTs become a key means of communicating, monitoring and documenting the implementation of the VGSSF.

The minutes, graphics and reports from this workshop and further information about the ICT tools that were demonstrated at the workshop are all available on the website. See WWW.ICT4FISHERIES.ORG.



Further reading

- See the Storify summary from the three days of the workshop at: <http://www.ict4fisheries.org/#blog>
- See the Blue Ventures report from the workshop, 'Catalysing the use of mobile technology in small-scale fisheries', at: <https://blueventures.org/catalysing-use-mobile-technology-small-scale-fisheries/>

New Publications

Climate Change Strategy for the Nairobi Convention



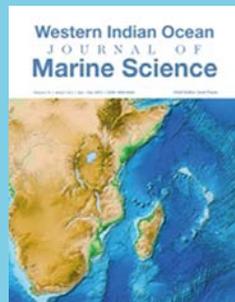
The Climate Change Strategy for the Western Indian Ocean region, developed by WIOMSA and the Secretariat of the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean (Nairobi Convention), is an operational framework to foster regional

cooperation in addressing the impacts of climate change by assessing the degree of preparedness and the vulnerability and adaptive options of communities within the Nairobi Convention area.

The French version of the Strategy will be produced in December 2016.

Volume 14 (1&2) of WIO Journal of Marine Science is out!

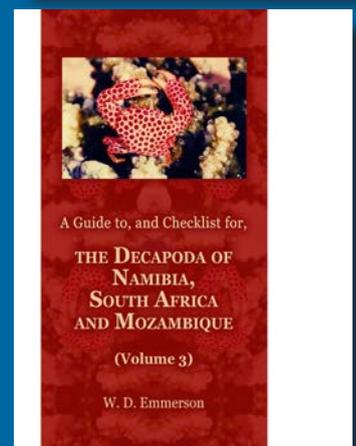
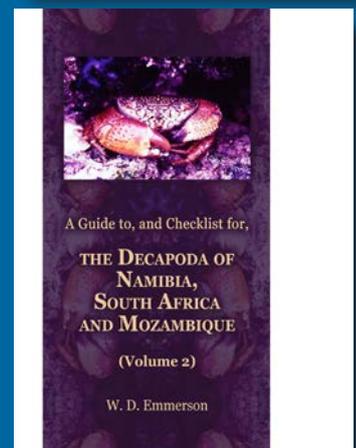
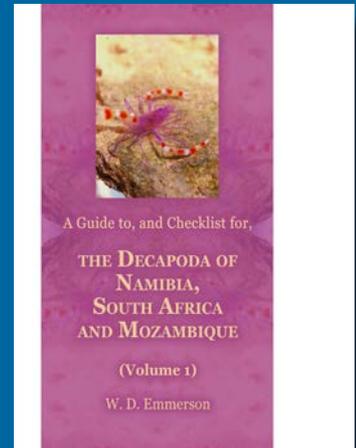
Volume 14, No. 1&2 of the Western Indian Ocean Journal of Marine Science was published in October 2016. This is the first online edition of the Journal. The Issue consists of these papers:



- i) **Seasonal fluctuations in photochemical efficiency of *Symbiodinium* harbored by three reef-building corals that differ in bleaching susceptibility** - Leonard J. Chauka, Nsajigwa E. Mbije, Simon J. Kangwe
- ii) **Mangrove transformation in the Incomati Estuary, Maputo Bay, Mozambique** - Célia C. F. Macamo, Henriques Balidy, Salomão O. Bandeira, James G. Kairo
- iii) **Feasibility of extensive, small-scale mud crab (*Scylla serrata*) farming in East Africa** - Per-Olav Moksnes, David Mirera, Razack Lokina, Jacob Ochiewo, Humphrey Mahudi, Narriman Jiddawi, Muumin Hamad, Max Troell
- iv) **Gear-based species selectivity and potential interactions between artisanal and aquarium fisheries in coastal Kenya: implications for reef fisheries management** - Gladys M. Okemwa, Boaz Kaunda-Arara, Edward N. Kimani, Benrick Ogutu, Harrison Ong'anda, Clay Obota, Mary Ontomwa
- v) **Micro-tidal dependent micro-phytoplankton C-biomass dynamics of two shallow tropical coral reefs** - Shamimta B. Sadally, Nawsheen Taleb-Hossenkhan, Beatriz Casareto, Yoshimi Suzuki, Ranjeet Bhagooli
- vi) **Demersal trawl surveys show ecological gradients in Southwest Indian Ocean slope fauna** - Bernadine Everett, Johan C. Groeneveld, Sean Fennessy, Sean Porter, Cosmas N. Munga, Nilza Dias, Osvaldo Filipe, Lourenço Zacarias, Mathias Igulu, Baraka Kuguru, Edward Kimani, Guy Rabarison, Herimamy Razafindrakoto
- vii) **Mechanisms of trophic partitioning within two fish communities associated with a tropical oceanic island** - Clément Trystram, David Roos, David Guyomard, Sébastien Jaquemart
- viii) **A preliminary assessment of the status and habitat preference of the grouper (Serranidae) population of Chumbe Island Coral Park, Zanzibar, Tanzania** - Kimberly D. Nesbitt, Matthew D. Richmond

A Guide to, and Checklist for, the Decapoda of Namibia, South Africa and Mozambique' – by W. D. Emmerson

This 3-volume edition fills a gap in the current literature on southern African decapods, updating taxonomy and including ecological and fisheries information following the publication of Barnard's Descriptive Catalogue of South African Decapod Crustacea in 1950. This publication updates the taxonomy, and includes ecological and fisheries information. In addition, Kensley's (1981) distributional checklist for the region has been updated and includes large numbers of new species and records for the region, bringing the total number of decapods to over 1000 species. Although not exhaustive, 262 species are featured, some of which are beautiful, some have commercial or artisanal value, both for consumption and the aquarium, and some have important ecological functions, while others are rare or interesting. For each species there is a photograph, synonymies, common names, a description, ecological information and name derivation (etymology).



10th **WIOMSA** SCIENTIFIC SYMPOSIUM

Western Indian Ocean
Marine Science Association

30 October — 4 November 2017
Dar es Salaam, Tanzania



FIRST ANNOUNCEMENT AND CALL FOR ABSTRACTS

The Western Indian Ocean Marine Science Association (WIOMSA), the Institute of Marine Science (IMS) and the Department of Aquatic Sciences and Fisheries (DASF) [both of the University of Dar es Salaam] and the Tanzania Fisheries Institute (TAFIRI) are pleased to announce the Tenth WIOMSA Scientific Symposium which will be held in Dar es Salaam on the 30 October – 4 November 2017.

WIOMSA is a regional professional, non-profit, membership organization, established in 1993. It is dedicated to promoting the educational, scientific and technological development of all aspects of marine sciences throughout the Western Indian Ocean (WIO) region. WIOMSA has a particular interest in linking the knowledge that emerges from research to the management and governance issues that affect marine and coastal ecosystems.

The Institute of Marine Sciences (IMS) of the University of Dar es Salaam (UDSM) was established in 1978 and is one of the oldest and most famed marine sciences institutions in the Western Indian Ocean. IMS has reputable infrastructure/facilities and marine scientists with specialities in a wide range of marine science disciplines. The two aspects have enabled IMS to excel in teaching, research and public services/consultancy. They have also strengthened IMS collaborations with other marine scientists and institutions nationally, regionally and globally. IMS is one of the key stakeholders of WIOMSA, which played a significant role in the establishment and early years of its growth (in the 1990s), including housing the Association in IMS premises.

Department of Aquatic Science and Fisheries Technology (DASFT) is one of seven teaching departments in the College of Agricultural Sciences and Fisheries Technology (CoAF) in the University of Dar es Salaam (UDSM). The Department comprises 21 academic staff who are Ph.D. holders, 10 technical staff and 3 administrative staff. The breadth and scope of DASFT encompasses programmes for undergraduate and postgraduate teaching, non-degree programmes, research and public services in basic and applied aquatic sciences with emphasis on fisheries and aquaculture.

Tanzania Fisheries Research Institute (TAFIRI) is a national parastatal organization which was established in 1980. The institute is mandated to promote, conduct and coordinate fisheries research as well as dissemination of fisheries information to government agencies, public institutions and private firms engaged in the fishing industry. TAFIRI also provides expert scientific and technical advice to the government and other stakeholders on marine and freshwater fisheries, aquaculture and the protection of the aquatic environment.

SYMPOSIUM DATES: Monday, 30th October – Saturday, 4th November 2017.

The week is divided into the following components:

- The Tenth WIOMSA Scientific Symposium – 30th October to 1st November 2017. This component will include: keynote presentations, oral and poster presentations.
- Specially convened sessions and roundtable discussions - 2nd November 2017
- WIOMSA General Assembly – 3rd November 2017
- Excursions and tours to different places of interest – 4th November 2017.

SYMPOSIUM VENUE: Dar es Salaam, Tanzania.

*Merry Christmas and
best wishes for 2017*



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Children hold the world globe aloft, Mombasa Marine Park. © Jennifer O'leary

Get your article published:

We are accepting articles for the next issue of the WIOMSA Newsbrief. Articles should be a maximum of two pages. Send your articles to secretary@wiomsa.org by the 28th of February 2017.



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