

SANCOR NEWSLETTER

South African Network for Coastal and Oceanic Research

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South African researchers explore the shallow seamount of Walters Shoal

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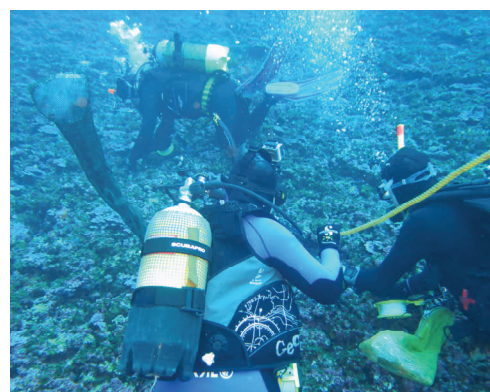
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Prominent topographic features which rise abruptly over 1000m in height from the seafloor are scattered across the world's ocean and collectively cover an area estimated to exceed that of most terrestrial biomes. The existence of seamounts, as they are more broadly defined, has been known since the nineteenth century. Developments in our understanding of these mysterious habitats, the biological communities which they support, and their contribution to marine biodiversity, have however only largely taken place over the last 20 years and thus remain poorly understood.



Divers collecting and photographing samples from 25m depth.

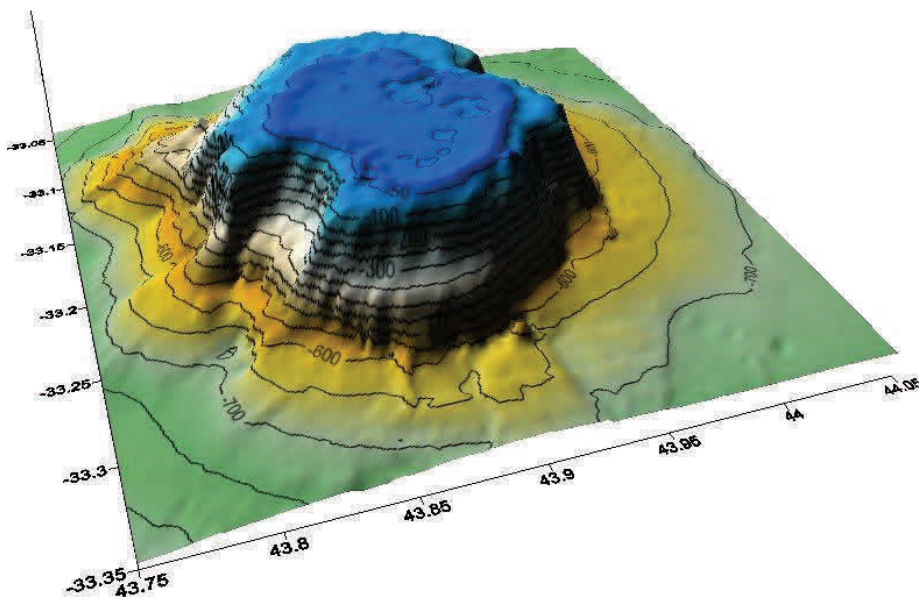
Seamounts were initially thought of as stepping stones in the deep ocean, facilitating the dispersal of marine organisms across ocean basins. The vast distances separating most seamounts from habitats of similar depth, together with reports of apparently high levels of endemism subsequently led to the view of seamounts as isolated island-like habitats favourable to the evolution of novel species. More recently, it has been proposed that seamounts may function as 'oases' capable of attracting and supporting an abundance of marine life in the open ocean. With fewer than 300 of the estimated 100,000 seamounts worldwide having been studied to date, most of the mysteries surrounding seamounts still remain largely unresolved. It is however



becoming increasingly apparent that seamounts serve as important aggregation sites for many pelagic species, making them particularly vulnerable to the effects of overexploitation by unregulated fisheries.

In May 2015, a team of researchers departed from Cape Town on a 30-day expedition aboard the *RV Algoa* to investigate the shallow-water seamount of Walters Shoal: the only known seamount in the south-west Indian Ocean which rises from the abyss to within the photic zone (< 20m). The goal of the expedition, which forms part of the third phase of the African Coelacanth Ecosystem Programme (ACEP III), was to conduct an oceanographic and biological survey of this unique environment. The research team was comprised of scientists and technical staff from the Department of Environmental Affairs (DEA), Department of Agriculture, Forestry and Fisheries (DAFF) and the South African Environmental Observation Network (SAEON). The team also included three MSc students, who were provided with a unique opportunity to develop multidisciplinary skills in ship-based marine research.

As another sunset drew closer after over a week at sea, including a layover in Richards Bay to refuel and collect the remaining team members, the *RV Algoa* finally approached the coordinates signalling the location of Walters Shoal; over 300 nautical miles from the nearest landmass. Despite the unassuming nature of this remote area of open ocean, which at first appeared identical to the waters we had been crossing since departing from Richards Bay, differences soon became apparent. Over the period of less than an hour, the echo sounder's reading of the seafloor changed drastically, climbing from over 1000m depth to within fifty metres of the ocean's surface, and at



Bathymetric map of the shallow seamount, Walters Shoal.

times registering depths as shallow as 15 metres! The first evening on Walters Shoal also saw a remarkable increase in faunal encounters, including a diversity of pelagic bird life and a pod of over 100 bottlenose dolphins (*Tursiops truncatus*) which accompanied the ship until sunset.

Twelve days were set aside to gather data on

Walters Shoal, requiring a tight schedule that encompassed a broad range of oceanographic and biological sampling methods: After an initial survey to map the bathymetry of the seamount, the oceanographic conditions associated along different slopes of the seamount were investigated. This included measuring changes in salinity, temperature and



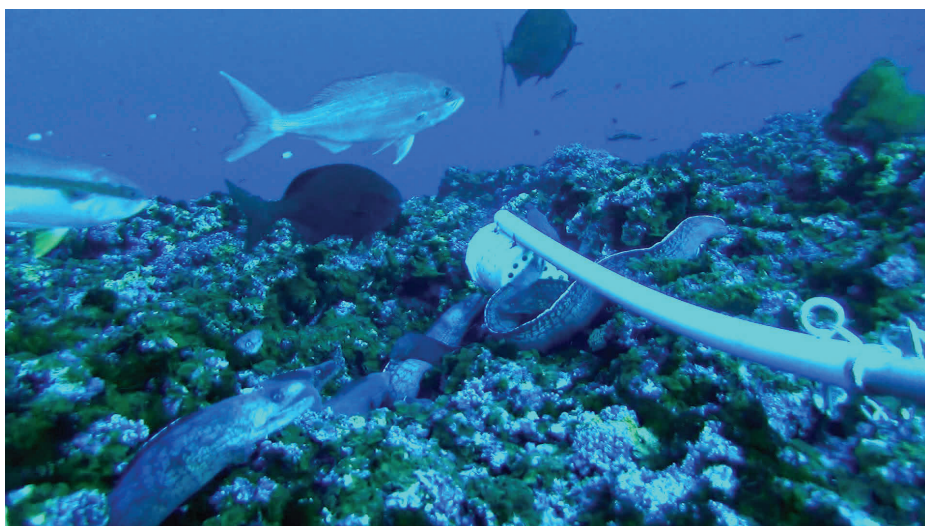
The Department of Environmental Affairs' research vessel, the *RV Algoa*, operating on one of the few calm days on Walters Shoal.

dissolved oxygen across different depths together with the collection of nutrient, phytoplankton and zooplankton samples. Many zooplankton species undergo vertical migrations in the water column between day and night. This required teams of researchers and crew to work together in shifts to sample the seamount over a period of 48 hours.



Following a fairly serene welcome to the seamount, conditions soon changed, bringing in 8m swells, gale force winds and technical problems which forced us to reconsider our sampling schedule. Once the sea and most people's nausea had settled down enough to allow us to continue, the benthic collections were made by towing large sleds up the steep slope from a depth of more than 400 m and by more selective diver collections on the shallow plateau. In addition to specimen collections, photos of the benthos were taken down to a depth of almost 150m using a novel Drop-Camera system. A reef community largely dominated by coralline algae was revealed, with few conspicuous filter feeders present. The sponge fauna in particular does not appear to be unusually diverse, and is largely comprised of small growth forms which become rarer with depth.

Unlike the benthic community which had not been previously sampled, a study published in 1991 by Collette & Parin provided some background on the fish community of Walters Shoal. Traditional sampling methods were given a modern twist with the deployment of Baited Remote Underwater Video systems (BRUVs) which provided hours of footage from which to study the fish community. Together with collections, a total of 21 fish species were recorded, confirming the presence of two previously-reported endemic fishes known only from Walters Shoal: A highly abundant species of moray eel (*Gymnothorax parini*) and a plankton-feeding Lutjanid (*Paraceasialutjanid waltervadi*). We had expected to encounter tropical species, endemics and temperate species associated with the West Wind Drift islands (Tristan da Cunha, Gough, Amsterdam and St. Paul), in similar



Footage of the fish community gathered by Baited Remote Underwater Video system (BRUV). The endemic eels appear perfectly at home within the rugged reef, emerging from holes and crevices to swarm the bait container.

proportions to what was previously recorded by Collette & Parin. Contrary to our expectations however, the video footage revealed a stronger influence of widespread tropical fishes, including less common species such as the white-blotched grouper (*Epinephelus multinotatus*) and potato bass (*Epinephelus tukula*).

The RV *Algoa* departed Walters Shoal following 12 days of intensive sampling, which yielded thousands of specimens to be analysed over the coming years. Two ADCP units moored on Walters Shoal as well as six autonomous ARGO floats operating within the area continue to record oceanographic data. This will aid in piecing together a better picture of the physical process operating within the area, and how they may contribute to supporting marine life in such an isolated shallow-water habitat. Walters Shoal will again be sampled in 2015, this time by an IUCN-funded team of researchers from France. At this stage, few conclusions can be drawn about the nature of Walters Shoal. There are however exciting prospects for marine research in the south-west Indian

Ocean, including potential collaborations and developments in our understanding of seamount ecosystems.

Acknowledgements

Resources were jointly provided by the South African Institute for Aquatic Biodiversity (SAIAB), the South African Environmental Observation Network (SAEON), the Department of Environmental Affairs (DEA) and the Department of Agriculture, Forestry and Fisheries (DAFF), with student funding being provided by the NRF. The authors are grateful to the ship's captain (Geordie MacKenzie), officers and crew, and all the staff members whose contributions made this project a reality.

Further reading

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Unmanned ocean gliders to answer fundamental questions on climate change

*By Marcel du Plessis and
Seb Swart*

Southern Ocean Carbon and Climate Observatory (SOCCO), CSIR and Marine Research (MA-RE) Institute, University of Cape Town

The Southern Ocean is a vast and expansive region, forming the barrier between the frozen Antarctic and the rest of the world. Besides being a mediator for Earth's climate, it is becoming increasingly important as more anthropogenic CO₂ is being released into the atmosphere. The Southern Ocean alone absorbs half of the ocean's portion of atmospheric CO₂ uptake, which is the same rate as the entire terrestrial biosphere. This underscores the significant global importance in CO₂ mitigation by the Southern Ocean. However, the Southern Ocean is one of the most under researched regions of the world, and with no surprise given its remoteness and harsh working conditions. Situated in the heart of the Roaring Forties and Fifties, extreme weather

and ocean state conditions make it difficult for continued research access, which in addition have high costs and manpower when undertaken from a research ship. Compounding this situation is that physical oceanic processes occurring at sub-seasonal and sub-mesoscales are playing important roles in understanding the sensitivity of the primary productivity (which enhances atmospheric CO₂ mitigation) to climate change. It's unfeasible due to time and cost that research ships sample these time and space scales.

Researchers from the CSIR-led Southern Ocean Carbon and Climate Observatory (SOCCO) have begun to contribute to this knowledge gap by using autonomous ocean gliders. Primarily there are two types of these robots being used: the first are deep profiling gliders, which are around the size and weight of a person. They sample from the surface to depths of 1000m and are able to spend up to 6 months at sea uninterrupted. The second are surface gliders, which look like boogie boards with

sensors on top and a sub-structure with fins that use wave energy to propel them forward. These are known as Wave Gliders. Deep profiling gliders sample at length and time scales around 2 km within 5 hours, while the surface gliders obtain a consistent stream of measurements. Both devices can be controlled from land and endure in the roughest of ocean environments, including the Southern Ocean.

The gliders are collecting important information on variables such as seawater temperature, salinity, CO₂, acidity, oxygen, bio-optics and PAR (a measure of light into the ocean), all key indicators in monitoring the affects of climate change on the oceanic state. The first deployment of the gliders in late 2012 under the framework of the Southern Ocean Seasonal Cycle Experiment (SOSCEX) was considered a success, with 5 deep profiling gliders being used to attain measurements continuously over 6 months at very high-resolution. Both the SOCCO team as well as Honours, Masters and Doctoral students from the University of



Wave Glider (front) and Seaglider (back) before deployment into the Southern Ocean. The experiment lasted 4.5 months where both gliders collected a suite of high resolution variables.



Wave Glider being hoisted onto the polar ship S.A. Agulhas II at the V&A Waterfront in preparation for its voyage into the Subantarctic region.



Cape Town are currently analysing this data. SOCCO team member Dr Nicolette Chang is coupling the glider output to a three-dimensional physical-biogeochemical model while Doctoral candidate Sarah Nicholson is undergoing a collaborative study with LOCEAN-IPSL in Paris using state of the art models with information attained from the gliders to answer questions around mixing regimes and nutrient supply enhancing ocean productivity.

Dr Seb Swart, the principle coordinator of the glider project, has recently published in the *Journal of Marine Systems* and found that high spatial and temporal variability in upper ocean mixing is key in predicting the timing and strength of ocean primary productivity. Marcel du Plessis, supervised by Dr Swart, has been looking at how atmospheric variability couples with the processes that define the state of the upper ocean. In the meantime, Dr Thomalla of SOCCO has been analyzing bio-optics data from the gliders to model the seasonal evolution of phytoplankton production and Dr Monteiro, who heads SOCCO, is assessing the robustness of carbon flux estimates made from ships and models in comparison to the high-resolution measurements of CO₂ flux made by Wave Gliders in the Southern Ocean.

Despite the strides being made in answering these questions around linking climate change to uptake of carbon by the ocean, there needs to be continual observations to understand how the processes that are being observed respond to a changing climate. These experiments and scientific monitoring requires highly skilled technical and engineering personnel capable of operating and maintaining gliders and ship-based sensors. The South African Marine

Engineering & Robotics Centre (SAMERC), a CSIR-led new national facility, provides this capability. SAMERC's Chief Engineers, Mr Derek Needham and Mr Andre Hoek help run the state of the art facility that (1) provides a glider-port for maintaining and piloting gliders, (2) services and calibrates ship-based equipment and sensors for ocean profiling (e.g., CTD, UCTD, XBT), and (3) serves as a platform to grow advanced technological R&D and marine engineering innovation in South Africa. The Centre is host to a number of early career engineers, such as Mr Sinekhaya Bilana, as well as students completing their in-service training and BTech projects, thereby growing human capacity in this specialised sector.

SAMERC houses and maintains all of SOCCO's gliders, which currently includes 4 deep- profiling Seaglidors, 1 Slocum Glider, 2 SV2 Liquid Robotics Wave Gliders with pCO₂ systems and weather stations, and 2 new generation SV3 Liquid Robotics Wave Gliders. This fleet is considered to be the future of marine research and environmental monitoring, with global interest in SOCCO and SAMERC's capabilities expanding rapidly. The re-usability of the autonomous platforms means that a cost effective method of attaining high-resolution information from the tempestuous Southern Ocean now exists, with the cost of one glider equating to around one week of ships time at sea. The future of Southern Ocean marine science looks promising with autonomous gliders offering a novel dimension to ocean sampling. ✂

Call for 2015 SANCOR Postdoctoral Fellowships



SANCOR promotes the development of emerging scientists by offering postdoctoral fellowships in research in the marine and coastal environment.

Recent recipients of a doctoral degree are invited to apply for postdoctoral scholarships over a 24 months' duration. The total award per annum is R120 000 stipend plus R30 000 running expenses.

The programme aims to encourage and promote the development of young researchers, produce highly skilled scientists in science in the marine and coastal environment and enable the Fellow to undertake significant and publishable research.

Click [here](#) for more information on this opportunity.

Closing date: 22 October 2014



Indo-Pacific marine species biogeography

Sharing population genetic data – Monica Mwale visits NESCent in North Carolina

By Penny Haworth

South African Institute
for Aquatic Biodiversity

Dr Monica Mwale from the South African Institute for Aquatic Biodiversity (SAIAB) travelled to Durham, North Carolina, United States of America from 14-18 July, 2014 for a research meeting of the [Indo-Pacific working group](#) held at the US National Evolutionary Synthesis Center (NESCent) at Duke University. This was at the invitation of the group team leaders Drs Eric Crandall (Southwest Fisheries Science Center, NOAA Fisheries Service, USA) and Cynthia Riginos (University of Queensland, Australia).

The international Indo-Pacific Network plans to examine the recent evolution of Indo-Pacific taxa by drawing upon all available population genetic data. The meeting, which aimed to foster collaboration and data sharing of genetic resources on Indo-Pacific marine taxa including fishes, provided a unique opportunity for networking and collaboration with top-rated researchers in phylogenetics and marine biogeography as well as for learning and growth in advanced genetic analyses such as next-generation sequencing.

The goals of the meeting were to finalise a Research Coordination Network (RCN) proposal to send to the National Science Foundation (NSF), as well as to continue development of two papers describing the patterns of diversity and genetic structure of available data resources.

When asked what is significant about the invitation for her, Monica said, "This collaboration provides an opportunity for me to network and collaborate with top-rated

researchers in phylogenetics and marine biogeography. It also affords access to data and opportunities for learning and growth in advanced genetic analyses, for example next-generation sequencing. The meeting was therefore a very valuable experience for me and highly relevant for SAIAB. This should

encourage international partnerships for future collaboration in the region."

The important knock-on advantage of such collaborative opportunities for marine science in South Africa is the chance to develop a better understanding of the evolution of our unique marine fauna and



Map highlighting the Indo-Pacific bioregion.
Source: Wikipedia

diversification patterns in the Indian Ocean. Envisaged outputs from the collaboration are papers on the biogeography of Indo-Pacific species and the development electronic and community infrastructure that will facilitate collaboration and cooperation for a greater level of scientific inquiry.



Monica Mwale with MSc student, Murray Duncan, collecting fish in rock pools near Kogelberg in the Western Cape.



So what does this association hold for the future? According to Monica, the RCN proposal to the National Science Foundation (NSF) in the USA should foster collaboration if successful. The aim is to get support for an international coordinating network of researchers (Diversity of the Indo-Pacific Network; DIPnet) using genetic

methodologies to study the ecology and evolution of marine organisms in the Indo-Pacific. The project also aims to build a state-of-the-art population genetic database for genotypic data as well as data from current and future generations of sequencing technology. ✂

Next-Generation Sequencing (NGS) refers to new technologies (incorporating novel chemistries and physics) and platforms that "parallelize" the DNA-sequencing process, producing hundreds of thousands to several million different sequences simultaneously in single reactions. This is far beyond what was capable with standard or traditional Sanger (dye-terminator) sequencing approaches. The latest platforms can produce upwards of 50 million sequences (each up to 200 nucleotides in length) in each "run". These high-throughput systems enable low-cost sequencing and, conversely, the need for low-cost sequencing has driven much of the investment in developing this technology.

In marine science (particularly in the fields of marine molecular biology and biotechnology), NGS platforms are generating sequence data on unprecedented scales to examine the genomes of particular organisms, metagenomes (the genomes of all the organisms in a particular environment or system) or their transcriptomes (expressed genes in the form of mRNA transcripts).

The use of these technologies was initially driven by bio-prospecting. However, NGS is now much more widely applied in marine science. It is being used to describe and map organismal diversity, from multicellular organisms through to bacterial and viral communities, in complex marine systems. These range from characterising plankton or symbiotic bacterial communities (mitogenomics) to the detection of rare or invasive species, without physically sampling the whole organisms in question, by sequencing environmental DNA (eDNA).

NGS approaches are being used to generate large data sets which enable the study of genetic variation in more detail and on much finer-spatial scales than was previously possible. Researchers can examine diversity that is the result of adaptation (adaptive variation) and consider how this correlates with the physiology, ecology, biochemistry and behaviour of the organisms in question.

Through these approaches, researchers can screen and access large parts of the genome and can identify, through experimental manipulation, the candidate genes responsible for certain processes or the expression of certain traits.

By Dr Gavin Gouws (SAIAB)

In memory of Dr Sven Kaehler

The South African Institute for Aquatic Biodiversity (SAIAB) and Rhodes University are very sad to announce the



untimely passing of Dr Sven Kaehler on Monday 15th September.

Sven was a much loved and respected individual at Rhodes and SAIAB and indeed throughout the marine and freshwater research community. Sven completed his PhD at the University of Hong Kong and arrived in Grahamstown in 1997 to join Professor McQuaid's research group as a post-doctoral fellow. He soon found his research passion in developing isotope analytical techniques and established his own company Iso-Environmental, providing service to both local and international researchers. Sven's passing will be sorely felt by the broader research community and by his colleagues, friends and family in Grahamstown. We are grateful to the staff, students and medical personnel who provided assistance on that Monday afternoon.

Our deepest sympathies go out to his family and friends.

*By Dr Angus Paterson and Prof Ric Bernard
(SAIAB)*



All not well under the sea

By Judi Davis

South Coast Herald

Paul Cowley is a passionate angler who fishes for a living – and what he has been catching lately is causing him grave concern.

You see, Paul is no ordinary angler. He is the principal scientist for the South African Institute of Aquatic Biodiversity. While he is pulling in the fish (and tagging and releasing them), often in the most pristine regions of the world, he is actually catching – and collating – data. Sadly, what he is seeing is proving that fish stocks around the world are in trouble.

A passionate and entertaining speaker, Paul gave a fascinating if worrying presentation about his 'fishing for data' projects at the August Tuesday Rostrum lunch. It wasn't just the anglers in the audience who found his talk extremely interesting. It appears there is an amazing world out there beyond the breakers. It is just that it is invisible to most people – and governments – so we don't really know much about it. Or how much impact we humans are having on it.

A selection of old photographs of busy fishing spots and incredible catches of huge fish highlighted the fact that generations of fishermen have fished with little thought about the future of our oceans. With new information and a better understanding of environmental matters one would think that attitudes have changed, Sadly, this isn't always the case according to in-depth surveys Paul has done at various popular fishing spots. Lack of compliance regarding bag and size limits and poor policing of these regulations were still major concerns, he said. What was also of concern was that many anglers were unable to catch their full daily bag of popular fish species. This

indicated a drop in numbers of these species, he pointed out.

Something else that was surprising was that Paul had discovered about 80 percent of fish that were hooked around our coastline were taken home for the pot. This showed that relatively few fishermen practised catch and release techniques. Research had also brought to light the fact that not enough efforts were being made to return the fish safely to the sea, using 'best practice' methods, he said.

Research was throwing up some other surprising results, particularly as modern technology was brought into play. New ways of aging fish showed that their ages had long been underestimated, according to Paul. Just think – that big fish you have hooked could be more than 100 years old. Tagged and recaptured fish were also showing just how very slowly fish grew, he said.

While tagging and recapturing of tagged fish still offered valuable data, scientists were now using acoustic telemetry to obtain high-tech information about fish. This involved fitting fish with radio transmitters then setting up receivers in the study areas.

Paul spoke about major research projects using both tagging and acoustic telemetry that he had been involved in, studying both reef species and species associated with estuaries. Results were most interesting and showed that the fish studied were far more resident than had previously been thought.

The results were also disconcerting, showing that many species were heading for trouble. Most important, the research pointed to two important aspects of fish conservation. Paul said the protection of our estuaries, the nurseries of the fish world, were proving vital. He also said research highlighted the



Paul Cowley, principal scientist for the South African Institute of Aquatic Biodiversity.

absolute necessity of closed fishing areas – known as Marine Protected Areas in South Africa.

While many anglers complained when new closed areas were announced, they should in fact support their formation. Marine Protected Areas were proving vital to preserve fish stocks for future generations. Also, because fish tended to hang around their places of birth much more than was previously thought, there would be a spillover effect and fishing would be excellent alongside the Marine Protected Areas where fish would be allowed to grow and multiply.

It was not only anglers who could help preserve our fish. Paul pointed out that everyone should learn to be responsible consumers and to eat only fish listed as 'green' on the Southern African Sustainable Seafood Initiative's data base.

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Identifying sensitive areas in the southern Benguela ecosystem

By Steve Kirkman¹,
Dawit Yemane² and
Toufiek Samaai¹

¹Department of Environmental Affairs
and ²Department of Agriculture,
Forestry and Fisheries

The marine environment is heterogeneous and resources tend to be patchily distributed in terms of abundance and/or biodiversity. Biological “hotspots” in the marine environment generally refer to localized areas of biological importance either because they are associated with key processes such as spawning, nursery or feeding areas, or because they have significantly elevated levels of productivity or biodiversity relative to the surrounding seascape. Given their potential in terms of supporting human livelihoods or the conservation of biodiversity and/or natural processes, identifying biological hotspots and determining which factors govern and maintain them is a growing area of research. In a recent study, species richness patterns, including the locations of biodiversity hotspots of demersal fauna, were modeled from distribution and abundance data of demersal fish and cephalopod species that were caught during routine demersal surveys conducted over the past 30 years throughout the Benguela Current Large Marine Ecosystem. Physical (depth, latitude, and longitude) and environmental (seabed temperature) relationships of species richness patterns including hotspot locations, were also assessed. The study was part of the NansClim project involving South Africa, Namibia, Angola and Norway, that was funded by the Norwegian Agency for

Development Cooperation. Here, findings for the southern Benguela ecosystem, in particular the west coast of South Africa, are mainly focused on.

The observed pattern of species richness for the study area in South Africa was bimodal, with an initial increase in species richness up to ca. 250 m followed by a decline at intermediate depths before it increased at greater depths peaking at around 1000 m (Figure 1). Hotspots were therefore generally associated with greater depths, particularly in the vicinity of the shelf break and upper slope areas, and, based on analysis of environmental data obtained during the trawl surveys, with relatively cool bottom temperatures (Figure 2). On the other hand, areas of low diversity were generally associated with warmer bottom temperatures and shallower, inshore areas. An exception was a hotspot located at intermediate to greater depths within an area that transcends the boundaries between South Africa and Namibia (Figure 3). While establishing the causative processes of the observed species richness gradients was outside the scope of the study, the high biodiversity in the latter area may be related to the heterogeneous habitat of the area, which includes a seamount and a self-indenting canyon. More generally, the observed depth-dependent richness patterns are expected to be influenced by various factors including productivity, environmental conditions, evolutionary history of the system, and disturbance (both natural and anthropogenic).

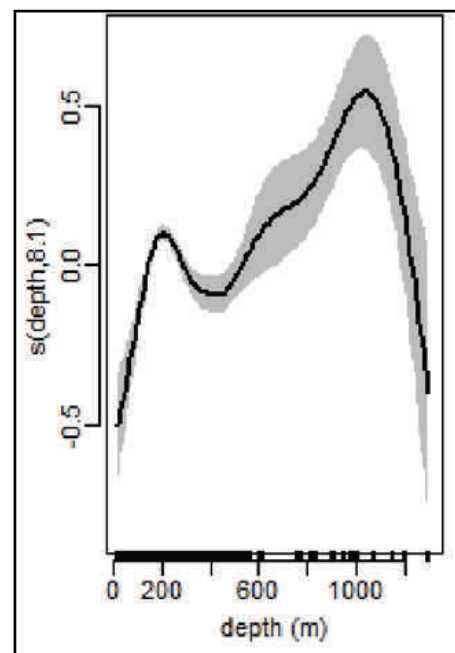


Figure 1. Result of a generalised additive model used to predict species richness for the whole time-series of South Africa (1984–2010), showing the bimodal species richness (s) vs. depth response curve.

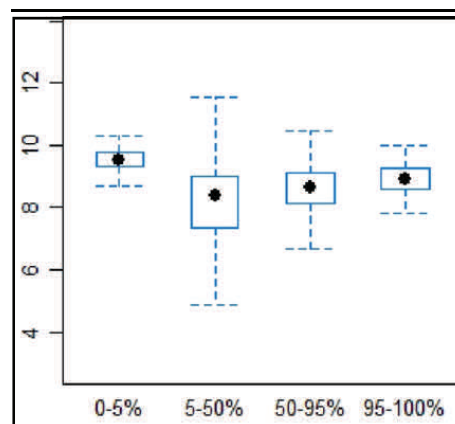



Figure 2. Box-whisker plot of bottom temperatures ($^{\circ}\text{C}$) associated with different quantiles of species richness for South Africa according to generalised additive model predictions, indicating that areas of low (<5%) and high (>95%) species richness are associated with relatively high and low sea bottom temperatures, respectively (closed symbols represent the median values, the upper and lower hinges represent the upper and lower quartiles, respectively, and the whiskers represent $1.5 \times$ the interquartile range).



Hotspots of biodiversity, along with other criteria, are relevant for identifying priority areas such as ecologically or biologically significant areas (EBSAs) in need of protection in open-ocean waters and deep-sea habitats. Because of its high biodiversity and other criteria that it fulfilled, the aforementioned transboundary area has been put forward as a potential EBSA, along with seven other areas in the southern Benguela system, for consideration by the secretariat of the Convention for Biological Diversity. While EBSAs are not necessarily precursors to marine protected areas (MPAs), the identification of EBSAs is applicable to designing representative networks of MPAs. In this regard, a key requirement of a biodiversity hotspot, in terms of its capacity for sustaining representative levels of biodiversity, is that it should be persistent over time. In this study, the presence and the location of hotspots were coherent with this requirement, at least at the spatial-temporal scales of the study (Figure 3). This was despite considerable changes that have been documented for the southern Benguela, including environmental changes (upwelling intensity and sea surface temperature), distributional shifts of species

including demersal species and changes in community structure in both the inshore and the offshore demersal systems of the southern Benguela. Theoretically, further geographical shifts in biodiversity mediated, for example, via the response of component species to climate-related environmental shifts in their ecological niches, could have implications in the longer term for species richness patterns and therefore affect the persistence of hotspots in space and time. Looking at such possible effects of climate change is particularly important when considering management options for EBSAs, and in this regard modeling studies can provide a means of predicting distributional shifts and therefore future changes in hotspot locations.

Further reading

Kirkman SP, Yemane D, Kathena J, Mafwila S, Nsiangango S, Samaai T, Axelsen B, Singh L (2013) Identifying and characterizing of demersal biodiversity hotspots in the BCLME: Relevance in the light of global changes. Proceedings of 2nd ICES/PICES/IOC Symposium on Effects of Climate Change on the World's Oceans, Yeosu, South Korea, May 2012. *ICES Journal of Marine Science* 70: 943–954. 

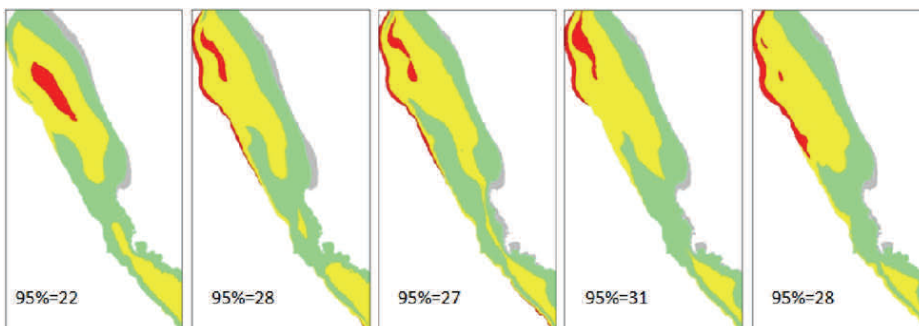


Figure 3. Horizontal map of the study areas in South Africa, showing quantiles of species richness according to predictions of a generalised additive model for shorter periods within the study period (1984–1990, 1991–1995, 1996–2000, 2001–2005, 2006–2010). Hotspots are the red areas, i.e. with species richness $\geq 95\%$ quantile, and the number of species represented by the 95% quantile is shown for each period. The boundary between the Exclusive Economic Zones of Namibia and South Africa is shown in the first panel.

The Nansen Tutu Summer School on Ocean, Climate and Marine Ecosystem



1-8 December 2014

University of Cape Town

A focus on the Agulhas Current, the Benguela upwelling system and the Tropical Atlantic

30 students from Europe, Africa and Indian Ocean Islands will attend lectures given by African and European scientists. Social activities will be plentiful to promote and strengthen interaction between students and scientists.

Please visit the [website](#) to find about the lecturers, the programme, the logistics and how to apply.

Closing date: 3 October 2014



A new and exciting chapter of marine research along the KZN coastline

By Matt Dicken

KwaZulu-Natal Sharks Board
Maritime Centre of Excellence

One of the key research objectives of the KwaZulu-Natal Sharks Board Maritime Centre of Excellence (KZNSB) is to gain a better understanding of the movement and residency patterns of potentially dangerous sharks along the KwaZulu-Natal coastline. Of particular interest is how the movement patterns of sharks, such as bull (Zambezi) and tiger sharks, are related to environmental parameters such as water temperature. This information is crucial not only in minimizing the risk of shark attack at both netted and non-netted beaches, but also in enabling the KZNSB to make informed decisions on the deployment and location of shark nets to reduce the catch of non-target species.

To achieve this goal the KZNSB is in the process of deploying a network of acoustic listening stations and temperature loggers at strategic locations along its area of operations between Richards Bay and Port Edward and fitting sharks with acoustic transmitters. The tags emit a unique coded signal, which can be detected by the listening stations up to 1 km away. Data downloaded from the stations can then be used to build a picture of when and where sharks are present.

To help ensure that this project realises its full potential and links to other national research initiatives a Memorandum of Understanding (MOU) was signed between the KZNSB and the South African Institute for Aquatic Biodiversity (SAIAB) and the South African Environmental Observation Network (SAEON) on the 25th July 2014. The

significance of the MoU was highlighted by the attendance of the KwaZulu-Natal MEC for Economic Development, Tourism and Environmental Affairs, Mr Michael Mabuyakhulu (Figure 1).

One of the projects currently funded and conducted by SAIAB is the Acoustic Tracking Array Platform (ATAP). This is a collaborative marine science program, which comprises an expanded network of acoustic listening stations around the South African coastline. Since the launch of the ATAP project in South Africa in August 2011, acoustic receivers have been deployed at monitoring sites from Hout Bay on the west coast to Ponta do Ouro in Mozambique. As part of the MoU, the KZNSB will be an official partner to the project and facilitate the deployment of 3 ATAP lines along the KZN coastline (Figure 2). These lines will supplement the array of stations already being deployed by the KZNSB. Temperature loggers will be attached to selected listening stations to contribute to SAEONs ongoing long-term environmental monitoring program to assess the impacts of climate change along the South African coast.



Figure 1: Signatories to the MoU, from left to right are: Dr. Tommy Bornman (Manager of the SAEON Elwandle Node), Mr Michael Mabuyakhulu (MEC of Economic Development, Tourism and Environmental Affairs), Mr Mthokozisi Radebe (CEO of the KZN Sharks Board Maritime Centre of Excellence) and Dr Angus Paterson (Managing Director of SAIAB).

The signing of the MoU formalizes the collaborative research partnership, which already exists between the KZNSB, SAEON and SAIAB. It provides an ideal platform for the sharing of resources including equipment, funding, data, laboratory space, and students. The MoU signals a new and exciting chapter of marine research along the KZN coastline, which will contribute to the better management and conservation of this precious natural resource. ✂



Figure 2: Matt Dicken and Geremy Cliff of the KZNSB deploying a listening station at Protea Banks



International honours for South African marine conservationist



The Future for Nature Award 2014, an international, competitive award for young conservationists, has been won by South African Bronwyn Maree. Bronwyn leads the acclaimed Albatross Task Force of BirdLife South Africa, undertaking work to prevent unnecessary deaths of seabirds during fishing operations. She is one of three winners, chosen from a total of 126 applications from 58 countries. In addition to international recognition, this award carries a purse of €50 000 for each winner.

Over half of all the seabird species in the family that includes albatrosses are decreasing and threatened with extinction. The overriding threat to these graceful ocean wanderers is the accidental, yet deadly, interaction with longline and trawl fisheries. To address this global threat, in 2005 the Royal Society for the Protection of Birds (RSPB) and BirdLife International established the Albatross Task Force (ATF) as the world's first international team of mitigation instructors working directly with fishermen to demonstrate best practice measures to reduce seabird bycatch. The ATF is active in nine countries, filling a critical gap in translating knowledge and regulations to prevent seabird bycatch into direct action onboard vessels.

Bronwyn joined the ATF team in 2008, her first job after graduating with a Masters in Ichthyology and Fisheries Science from Rhodes University. She is one of the longest-serving ATF team members, and until recently was the only female instructor in a heavily male-dominated industry. She has

been instrumental in leading her team to achieve significant results in albatross conservation onboard local trawl and longline fishing vessels, which are of global significance.

Since implementing ATF-recommended measures, seabird mortalities have decreased by 75-95% in these fleets, resulting in tens of thousands of threatened seabirds being saved each year. "Critically, the solutions that we

advocate to fishing companies and crews are cheap, simple and don't affect fish catches – the perfect win-win outcome" said Bronwyn.

The Future for Nature (FFN) Foundation has recognised the role Bronwyn has played over the last 6 years in conserving these ocean wanderers. Through this annual award, FFN supports young, talented and ambitious conservationists working to protect endangered species. The Future for Nature Award encourages individuals to become conservation leaders and opens doors to an international network of dedicated conservationists who are able to provide learning support, mentoring and financial assistance. This prestigious international award highlights individuals who can be seen as role models who can pass on their passion and love of nature conservation to other young people, while stimulating the individual to continue their outstanding efforts in protecting endangered species. The prize money will be used to test new devices for eliminating seabird bycatch in tuna longline fishing. One of the devices, called a Hook Pod, has already been trialled successfully by the ATF team in South Africa.



The South African ATF successfully lobbied to havetori lines (bird-scaring lines) declared mandatory in the South African hake trawl fishery. Photo by Birdlife South Africa.



Albatross Task Force team leader, Bronwyn Maree, won a prestigious international award from the Future for Nature Foundation. Photo by Roy Borghouts Photography.

"A new round of trials is being planned for this year, with government and industries approval and support. This award comes at the perfect time," continued Bronwyn.

Mark Anderson, CEO of BirdLife South Africa, said "It was a great privilege for Bronwyn to accept this award earlier this year in the Netherlands. She has lead her team with passion, enthusiasm and professionalism, and their successes, and Bronwyn's leadership, have been recognised in this way". This award will go a long way towards ensuring that the world will never be without albatrosses! ✂



Linking social and ecological systems: monitoring small-scale fisheries

*By Denise Mager¹,
Mzamo Maqeba¹ and
Abongile Ngqongwa²*

¹JAYMAT Enviro Solutions, Cape Town and ²Department of Agriculture, Forestry & Fisheries, Small Scale Fisheries Management

Human dependence on marine and coastal resources is increasing. Small-scale fisheries are a crucial component of the rural economy, supporting food security and livelihoods. Thus, a national incentive for the management of small-scale fisheries is increasingly recognized as an essential tool for maintaining the nutritional status of low-income households. Elucidating trends in catch rate and composition is also important to evaluate the impact of fishing on fish stocks, and thereby guide fisheries management action. Since major changes in fish community structure can take place even at the initial stages in the development of fisheries, the onset of fisheries provides a good opportunity to assess fish communities.

The Department of Agriculture, Forestry & Fisheries (DAFF) manages the Small-Scale commercial fisheries of South Africa under the authority of the Marine Living Resources Act. The Department started a process of collecting fisheries data so that management is informed and able to take appropriate actions (e.g. number of fishing permits issued within a community). In order to create a fisheries management information system, DAFF joined forces with the national Expanded Public Works Programme (EPWP) providing work opportunities to women, youth and the disabled. Together, DAFF and EPWP set up a national, provincial and local government initiative to elucidate daily catch and composition of small-scale fisheries

whilst creating sustainable jobs to transform economic resources.

In 2011, DAFF appointed JAYMAT Enviro Solutions, an environmental management, and consulting firm based in Cape Town, as the project implementer for the Eastern Cape catch data monitoring programme. In 2013, JAYMAT was also given the implementation of the project in the Western and Northern Cape. Currently, JAYMAT employs a total of 196 people corresponding to 116 women, 121 youth and 2 people with disabilities across approximately 85 sites from Port Edward to Port Nolloth.

Key objectives of the programme includes: job creation, skills transfer and to collect critical fisheries catch-data across the Eastern, Western and Northern Cape. Data monitors have been employed to observe and record total oyster, line fish, mussels and East Coast and West Coast Rock Lobster during season. Among others, data monitors also record the bait and fishing gear used and total fishing effort (number of boats or fisherman on the coast). In order to collect

accurate information, catch data monitors receive regular training in the correct collection of catch data, key permit conditions, identification of fish organisms and measurement tools. The incumbents responsibilities of the catch data monitors includes undertaking routine patrols by

means of foot to determine total fishing effort, assisting compliance with the issue of invoice slips (line fish and west coast rock lobster) and gather information directly from the fishermen.

Once the data is collected in the field, the data is then captured in electronic format and submitted to the Department for Fishery Resource Analysis. In the Eastern Cape alone, the fishing effort across 54 sites produces between 2000 to 4000 monthly data entries, showing the importance of monitoring fisheries on a daily basis.

This programme is evidence that national incentives can provide appropriate management tools and policies for the sustainable use of common natural resources on which rural people depend on. Monitoring catch and composition not only elucidates resource fluctuations as those with few livelihoods options often feel forced to exhaust even the few resources to which they do have access, but ultimately, species monitored will allow the responsible management and conservation of resources.

✂



East Coast catch data monitors



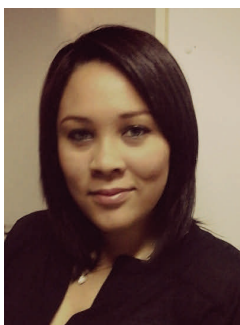
Young and crazy about science: stories of aspiring fisheries scientists

*By Jordan van Stavel,
Ishmail Letsheleha and
Zonke Gumede*

Fisheries Branch, Department of
Agriculture, Forestry & Fisheries and
Cape Peninsula University of
Technology

Transformation from school to the workplace is one of the challenging phases encountered by most young graduates in South Africa. Adaptation to the workplace demands determination, commitment, discipline and passion. But with vision, passion and persistence, this transformation can be smooth and easy as every day at work becomes a day of exploring, learning and enjoying. Three young fisheries science interns describe their love and passion for science. Hailing from different parts of the country—the coastal cities of Cape Town and Durban to the landlocked city of Johannesburg—these future fisheries investigators share their stories:

Jordan's story: I was fortunate enough to be awarded a bursary from the Department of Agriculture, Forestry and Fisheries (DAFF), to study for a



National Diploma in Oceanography at Cape Peninsula University of Technology. Numerous opportunities came my way during my Work Integrated Learning year (2014) at DAFF; I have learned new methods and techniques of conducting scientific research.

At the beginning of this year, I spent a week in Saldanha Bay where I was involved in the

land-based sampling of several demersal fish species. During May/June, my fellow interns and I joined DAFF's research team aboard the *MFV Compass Challenger* to conduct the pelagic recruitment survey along the coast of South Africa (Orange River to Port St. Francis), where I gained a great deal of practical experience in the field of offshore research. During the cruise we focused on four key components: acoustics, midwater trawling (fish sampling), fish egg sampling and plankton/environmental sampling. My main role on the cruise was assisting in the fish team. Our responsibilities included the collection of biological data and samples of various fish species caught by the midwater trawl.

I was also privileged enough to partake in the South African Marine Science Symposium (SAMSS) in Stellenbosch, where I presented a poster on my research project entitled: 'Spatial patterns in infection of South African anchovy *Engraulis encrasicolus* by a digenean "tetracotyle" type metacercarian parasite.' I aimed to elucidate whether an infection of the parasite "tetracotyle" type metacercaria (Figure 1) occurs in the eyes of the anchovy and if so, what sort of pattern that infection follows. The infection of this parasite in sardine *Sardinops sagax* has provided strong support for the hypothesis of multiple sardine stocks off South Africa (Reed *et al.* 2012). Anchovy samples were collected during the May/June 2013 pelagic recruitment survey from midwater trawls made along the coast of South Africa between the Orange River and Port St. Francis. This study required a dedicated amount of time in the laboratory, where 1193 anchovy were measured for caudal

lengths and their eyes removed and examined for the "tetracotyle" type metacercarian parasite under a microscope. For each sample, the prevalence of infection (% of sample infected), mean infection intensity (number of parasites per infected fish) and mean parasite abundance (number of parasites per fish) were calculated.

The results show that anchovy < 8 cm and > 13 cm were not infected by the parasite; however, more samples of fish are required to validate this finding. Infection intensities ranged from 1-6 parasites per fish with most infections found off the south coast between Cape Point and Mossel Bay. Mossel Bay showed the highest prevalence of infection (44%), and this pattern could most likely be related to the size-specific pattern of anchovy distribution and size-dependency of infection. The mean infection intensity was highest on the western Agulhas Bank and decreased eastwards from Cape Agulhas. The mean parasite abundance also decreased eastwards off the south coast, except for a single sample collected off Mossel Bay showing the highest infection prevalence value.

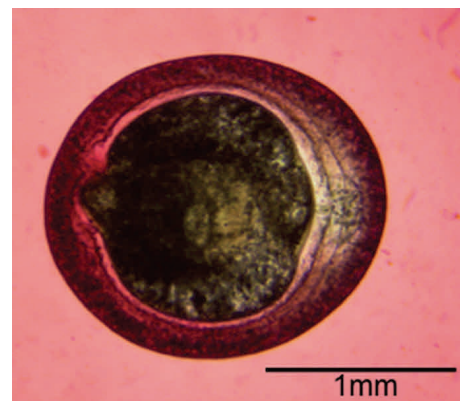


Figure 1. An illustration of a fresh "tetracotyle" type metacercarian cyst stained with Mexican Red textile stain (from Reed *et al.* 2012).



A similar size-effect has been observed for sardine (Weston, 2013); however, spatial patterns in infection of this parasite differed between the two species with infection being highest in anchovy off the south coast compared to the highest in sardine off the west coast. The dissimilarities in infection patterns may indicate differences in the population structure of anchovy and sardine, with anchovy comprising a single stock whereas multiple stocks have been hypothesized for sardine.

Ishmail's story:

During the course of this year as a student intern at DAFF, I have had the pleasure of experiencing a variety of exciting



projects conducted at the offshore resources research section. These experiences contribute immensely towards my journey as an emerging fisheries investigator; and my involvement in DAFF's diverse projects such as the small boat acoustic work exposed me to the innovative methods used to study fish

and squid in shallow waters. Going to sea for the first time during this past May pelagic recruitment survey, I had to overcome seasickness and long hours of hard work to get the first-hand experience of being a successful researcher. During this survey I was part of the fish team primarily responsible for collecting biological data (i.e. fish lengths, weights, sex etc) of the important South African pelagic fish. Working on my acoustics research project and presenting a poster at SAMSS is the biggest highlight of my emerging career so far. The objective of my project is to quantify the potential bias arising from the inability to acoustically distinguish between fish-like and non fish-like sound scatterers encountered during acoustic surveys for fish density estimation using the traditional threshold method.

A recently developed bi-frequency method was applied to the May and November 2011 acoustic data collected from the 38 and 120 kHz Simrad EK60 split beam scientific echosounders, enabled me to adequately separate fish-like and non fish-like scatterers (Figure 2). I conducted exploratory analyses

to evaluate the effects of the following factors: season (May vs November), region (west vs south coast), species (sardine vs anchovy) and time of day (day vs night), to calculate the ratio of fish densities obtained from two independent methods (threshold vs bi-frequency). Overall, the results suggest that the current method of thresholding is producing realistic discrimination between fish and other scatterers. The threshold method produces slightly higher densities at night and on the west coast. Possible explanations include the fact that fish and plankton disperse in the upper water column at night, rendering discrimination between fish and plankton difficult, and increased upwelling and higher levels of productivity on the west coast in summer.

Zonke's story:

The past couple of months as an intern at DAFF have offered me some of the most amazing experiences. I



have learned so much from everyone that I have worked with. I am proud to say that I have participated in many events and exciting projects that have contributed towards my knowledge as a young investigator; as a result my passion for marine science has grown exceedingly. One of the most amazing experiences for me was to go to sea for the first time during the pelagic recruitment survey. The trip was incredible and I learnt so much; from trawl sampling to identifying different pelagic fish. I was also granted an opportunity to participate in the SAMSS 2014. I designed and presented a poster based on my current research project titled, "The efficiency of trawl sampling for apportioning acoustic

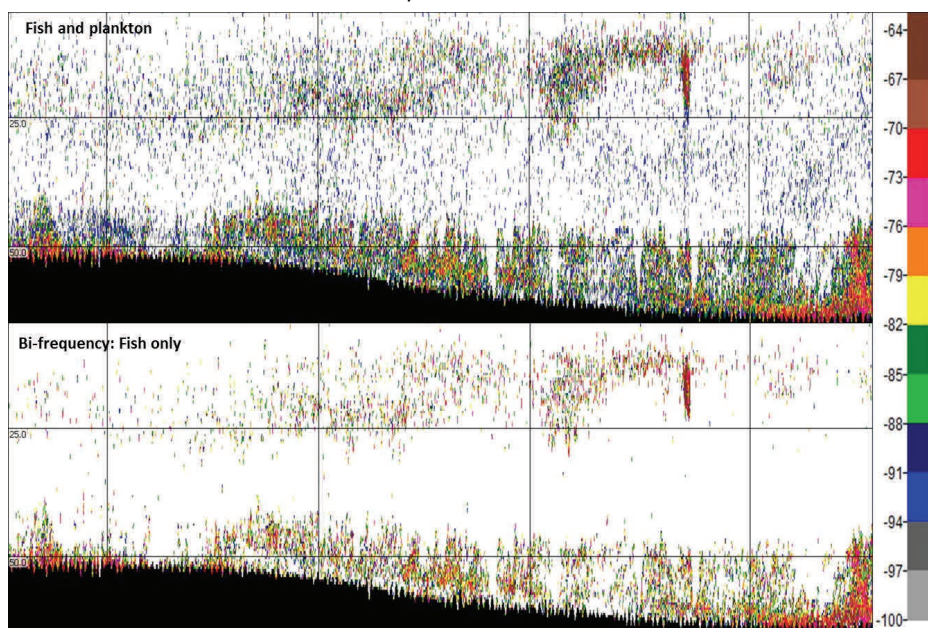


Figure 2: Discrimination of fish from plankton using the bi-frequency method



density between South African pelagic species." The opportunity to attend SAMSS 2014 also allowed me to interact with many professionals in different fields of marine science. There was much to learn from different scientists who were sharing their research. All the opportunities that I have been presented with have contributed immensely towards my knowledge in marine science, and I am hoping to stay in this field and learn more.

The intention of my project is to improve on this initial fish behavior concept and eventually derive a defensible index of efficiency that can be incorporated into the existing survey error model. To achieve the above objective, the effectiveness of trawl sampling for identifying pelagic species during acoustic surveys was evaluated at different times of the day and seasons. Biases associated with trawl sampling were investigated through comparisons of the Simrad FS20/25 netsounder data (Figure 3) and Simrad EK60 38 kHz echosounder data from the routine bi-annual acoustic surveys. Echosounder data before, during and after

trawling was analyzed to determine the response behaviour of pelagic fish to the midwater trawling gear. An index of trawl efficiency was formulated and assigned to each trawl. This is a first attempt at investigating the efficiency of trawl sampling during acoustic surveys. Results suggest that 14% of all trawls result in no catch which have both time and cost implications and increases the uncertainty of species identification. The average unweighted efficiency of trawls has been variable over the 10 years investigated, but consistently higher since 2007. This difference is thought to be partly due to the change in design of the trawl net used. No clear, consistent differences in trawl efficiency were evident between day and night for both winter and summer surveys. The efficiency of trawls used to allocate acoustic intensity to sardine, tended to be more variable than that of anchovy and round herring.

The internship programme has been very effective and instrumental at equipping us as fourth year students with the necessary baseline experience and skills required to

conduct great quality scientific research. The contacts and relationships established through this programme will help us in the future with our research aspirations and hopes. The results obtained from the above projects contribute significantly towards marine science research in South Africa, and more projects of this kind in the future will improve our research capacity and efficiency.


Acknowledgements

We are grateful to Janet Coetzee, Carl van den Lingen, Fannie Shabangu and Ainhoa Lezama-Ochoa for welcoming us onboard the fisheries research team. Other researchers, technicians and marine research assistants at DAFF are thanked for sharing their knowledge and expertise. Special thanks to Fannie Shabangu for suggesting and guiding the preparation of this article.

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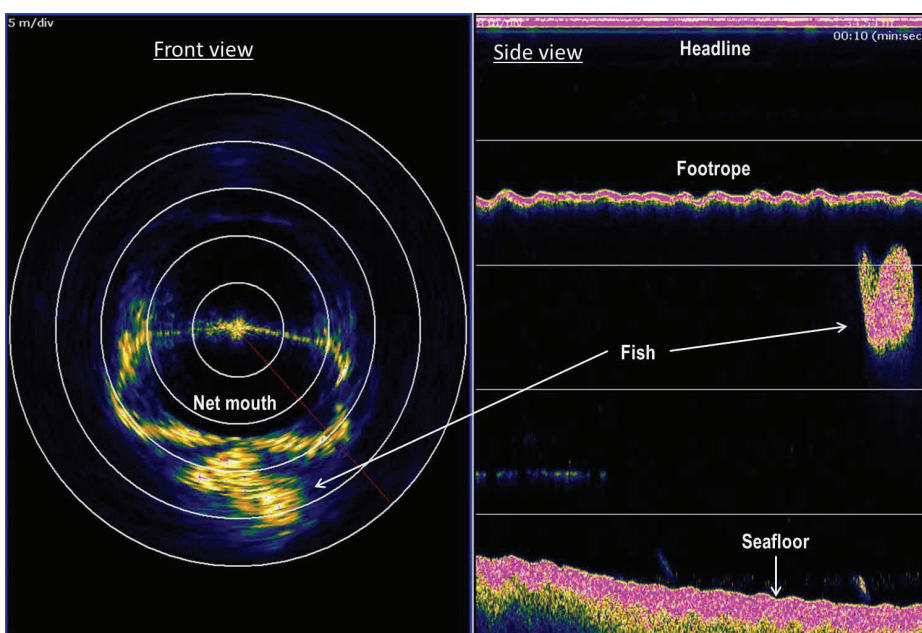


Figure 3. Echograms from a scanning netsounder attached to a scientific midwater trawl showing fish shoal avoiding the net.



Never too old to get excited - SAAMBR trains 500th course participant

By Jone Porter

South African Association for
Marine Biological Research

In August 2014, the South African Association for Marine Biological Research (SAAMBR) welcomed the 500th participant to their series of evening courses – “Introduction to Marine Biology”. These 2.5 hour courses are run over a period of 5 weeks covering a range of topics. During the first evening participants are introduced to the daily journey taken by 8.4 million litres of water from the sea to the exhibits. The mimicking of ocean processes in the life support systems are highlighted followed by an introduction to some basic oceanographic principles including currents, upwelling, oceanic plates and movement of the seashore both over the long term and short term.

This sets the foundation for the next few evenings, covering topics like biodiversity and the agents of change, threats to the environment and how individuals can make a positive difference. Classification of invertebrates and vertebrates, and a slightly deeper look at fish families is then explored over the next two weeks. The course is rounded off with general marine ecology, using the aquarium to highlight different marine ecosystems.



In this experiment, Jone Porter, Education Director at SAAMBR, demonstrates the role of salinity and density in deep ocean currents.

The participants come from a variety of backgrounds: from divers, ski-boaters and sailors to business people and lecturers (not in the life sciences). All of them share a common passionate interest in the coast and sea! It is extremely rewarding to see the knowledge they gain on the course awakens their natural curiosity and they often write to tell us of the new and exciting things they've seen, identified and shared with their friends long after completion of the course.

A number of the past 500 participants have become volunteers at uShaka Sea World or other environmental organisations, others have taken on new jobs in the environmental field or championed an interest in environmental sustainability in the organisations they work for.

To find out more about this evening course, contact [Eltina Stenhouse](#). ✂

MARINE AND COASTAL EDUCATORS NETWORK (MCEN)

- A Group of SANCOR -
presents the

15th National MCEN Conference

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National Zoological Gardens, Pretoria



Interdependence:
**The relationship between inland
and coastal environments**

This annual conference brings together formal and informal educators from schools, public aquariums, non-profit NGOs, government agencies and research institutions for 5 days of learning, sharing, and networking. The MCEN conference is a great opportunity for all marine science communicators and educators to share their passion for marine science education and to be energized and inspired with new ideas.

The 2015 conference will be held in MCEN's newly established chapter in Gauteng and will be co-hosted by the National Zoological Gardens in Pretoria.

► Register now by filling in this [easy online registration form](#).

► Click [here](#) for more information on the conference. ✂





A project with co-existence at heart

Less than 2% of the African penguin population remain in the wild. From an estimated 1 million breeding pairs in the 1930s to less than 18 000 in 2014, the African penguin population has been reclassified as endangered in 2010. Apart from commercial over-fishing, pollution and predation – habitat destruction remains one of the leading threats to the endangered African penguin species. Together, SANParks (South African National Parks), SANCCOB (the Southern African Foundation for the Conservation of Coastal Birds) and the City of Cape Town have established a project where penguins and people can successfully co-exist.

Every year approximately 650 000 tourists from around the world are charmed by the wild African penguins which breed within the borders of the Boulders Beach colony in Simon's Town. Approximately 3069 penguins are found in the Simon's Town/Boulders area (2014 count) of which 52% live inside the park. Under the protection of SANParks, the penguin colony is about 2.5 hectares in size and situated in a popular residential area.

Right next door a group of penguins are breeding on unprotected public land managed by the City of Cape Town. Until recently, the area was open to large groups of tourists who had unrestricted access to the area. The marked increase in visitor numbers resulted in penguin nests being trampled, penguins being disturbed year-round and an increase in soil erosion. Penguins were also at risk of being attacked by domestic animals and possibly being run over by speeding vehicles along the road above the site.

Initiated by SANParks, the City of Cape Town and SANCCOB in 2011, the Burgher's Walk Project is a place where penguins and people successfully co-exist. Since the project's inception, a low-impact, environmentally friendly boardwalk as well as rehabilitation fencing has been constructed and the natural vegetation of the area has been restored with four penguin monitors employed every year. Penguin monitors, most of which are from previously disadvantaged areas, undergo a 2-week Seabird Handling and Feeding course at SANCCOB in addition to the regular ranger training offered by SANParks. These penguin protectors perform key conservation-specific tasks within the 1.63 hectare penguin colony which includes rescuing penguins at risk and transporting them to SANCCOB for rehabilitation, maintaining penguin proof barriers, collecting penguin data and cultivating the natural vegetation. Given the large number of visitors to the area, they also perform a valuable environmental awareness function by providing visitors with relevant penguin information, explaining the sensitive nature of the area and redirecting tour groups to the visitor-friendly Boulders Beach recreational area.

Margaret Roestorf, SANCCOB's Executive Director, said that the Burghers Walk Project has proven to be a valuable project for African penguin conservation. The penguin monitors perform a vital conservation role in managing one of South Africa's main African penguin colonies and are instrumental in admitting ill, injured, abandoned and oiled penguins to SANCCOB for rehabilitation. This vision has been rolled out across other colonies with SANCCOB's partners, where similar issues exist, to the benefit of seabirds and communities. ✂



Penguin monitor, Eunice Manzana, plays an important role in protecting penguins and providing valuable environmental awareness information to visitors at Boulders Beach.

Photo credit: SANCCOB





An ocean of opportunity at National Science Week

*By Nangamso Myoli and
Penny Haworth*

South African Institute for
Aquatic Biodiversity

It was a fun-filled week of awareness and education about marine biodiversity for people in Port Elizabeth and surrounding areas during National Science Week last month. The South African Institute for Aquatic Biodiversity (SAIAB) hosted several events in Grahamstown, Port Elizabeth, Addo, Paterson and Kirkwood from 4-8 August in an effort to promote marine science.

The events kicked off in Grahamstown with a public presentation on gender and science by SAIAB's own Wouter Holleman and Basil Mills of the National English Literary Museum captured imaginations with his talk on maritime stories of the Eastern Cape. Groups of school children attended workshops investigating fish and frog skeletons with Roger Bills, Collection Manager at SAIAB, and the public had the opportunity to tour the SAIAB Collection Facility.

For SAIAB Research Support Officer, Vanessa Rouhani, a highlight of National Science Week in Grahamstown was watching learners do a traditional Zambian dance used by Mills to incorporate African myths and legends into his programme. The purpose of the lesson is to enable learners to understand different points of view regarding the myths and legends of Africa. According to Rouhani, learners also really enjoyed making jelly-fish from recycled materials during a lesson on the marine environment. "One of our main goals for National Science Week is to involve learners



Basil Mills teaches learners from DD Siwisa Primary School how to do the Makishi dance.

and educators from local schools, to expose them to marine science".

In Port Elizabeth, SAIAB hosted a morning of public presentations at the Newton Park Library auditorium to celebrate women in marine science. As a major part of the focus for the week was on the work being done by the South African Marine Rehabilitation and Education

Centre (SAMREC) in saving and rehabilitating marine birds, especially penguins, Libby Sharwood who has been a driving force behind the centre since its inception in 2000 opened with an invitation to the public to get involved, support SAMREC and to help secure its future.

The morning included talks by: Bayworld's



SAIAB Collections Manager, Roger Bills studies fish and frog skeletons with learners from T.E.M Mrwetyana High School.

Michelle Bradshaw who discussed 'Pinging penguins', using acoustic transmitters to track penguins movements; Dr Shirley Parker - Nance from ProDrive who showed the incredible beauty and diversity of non-vertebrate life under the surface of the sea and spoke about Algoa Bay as a biodiversity hot spot and future Mission Blue Hope Spot.



Other speakers included: Dr Lorien Pichegru from the University of Cape Town, who spoke about the links between penguins and fisheries; Dr Nadine Strydom from Nelson Mandela Metropolitan University, who looked at estuaries in crisis; Dr Ané Oosthuizen from South African National Parks, who discussed the work done by SANParks in marine conservation and the extension of the Addo National Park to include a large section of Algoa Bay; PhD student, Taryn Murray from SAIAB homed-in on fish movements, past and present in Algoa Bay. Dr Angus Paterson, Managing Director of SAIAB then led a panel discussion during which members of the audience could pose questions to the speakers.

Co-ordinator for the SAIAB National Science Week programme, Karen Binning, said that learners and the public need to know the importance of Algoa Bay and its biodiversity. "National Science Week is about educating people on the various types of research taking place in the Bay and more specifically for this week's programme to show learners the value of estuaries and the importance of monitoring penguins to find out how far they

have to swim to find their food. This in turn tells us a lot about the state of fish stocks in Algoa Bay and helps with managing fishing effort in the Bay".

Several learners from various Port Elizabeth schools had the opportunity to visit the Swartkops Conservancy to learn about estuaries. As part of the programme, Nozi Hambaze of South African Environmental Observation Network's Coastal Node and Eddy Molekoa from SAMREC, conducted an outreach extravaganza for schools in the Sunday's River Valley, Paterson, Bornfree Foundation, Shamwari Game Reserve and Addo Community Hall where learners were treated to science shows, educational theatre and presentations by young scientists.

National Science Week is an initiative of the Department of Science and Technology (DST) facilitated by the South African Agency for Science and Technology Advancement (SAASTA) to reach out to the South African public to raise awareness of science and technology. ✂

Tribute to Wilna Wilkinson

It is with great sadness that the SANCCOB team and the conservation community bids farewell to Wilna Wilkinson, SANCCOB's Eastern Cape Rehabilitation



Manager. Wilna tragically passed away in a car accident on Tuesday, 29 July 2014. She was a beloved member of the SANCCOB team, a brilliant advocate for penguins and the ocean, and a special friend to many people she met during her travels.

Wilna was appointed as Rehabilitation Manager of SANCCOB's centre in Cape St. Francis in May 2013 after the facility (previously known as Penguins Eastern Cape) was amalgamated under SANCCOB's management. She played an instrumental role in setting up and running the new facility in Cape St. Francis and working together with the various colony managers and conservation partners in the region. In addition, her involvement was pivotal during the *Kiani Satu* oil spill in August 2013 when the centre admitted 277 oiled seabirds including African penguins, Cape gannets and Cape Cormorants. Under Wilna's management, the team successfully released 95% of the seabirds back into the wild.

In honour of Wilna, the SANCCOB team hosted a public beach release of rehabilitated Cape gannets. She has been posthumously given an award of excellence to SANCCOB and to seabird conservation. SANCCOB extends its gratitude to all its partners and friends in conservation around the world for their messages of condolences.

✂



In the penguin pool at SAMREC, Eddy Molekoa uses a globe to teach learners about African Penguins.



Book release from ORI: *Ugu Lwethu – Our Coast (A Profile of coastal KwaZulu-Natal)*

By Bronwyn Goble

Oceanographic Research Institute

The KwaZulu-Natal (KZN) coastal zone is considered to be one of the most densely populated in Africa. Coupled with increased seasonal demands for access to and use of coastal resources, this makes the need for effective coastal management critical. One of the biggest constraints to coastal management in the province is access to information about the coast. This need has been answered in the form of a 202 page book, which serves a dual function as an information resource for coastal managers on the ground, and as a precursor to the Coastal Management Programme (CMP) for KZN. The book, titled *Ugu Lwethu – Our Coast*, is aimed at providing coastal managers with some background information on the KZN coastal environment and its social and economic value, so that they can make informed management decisions.

The book is divided into a number of themes, the first of which focuses on the natural coastal environment, highlighting key coastal ecosystems and species. The second theme focusses on coastal resources and their immense value, both economically and socially. The diverse social, recreational and subsistence uses of coastal resources are described, as well as the range of commercial activities at the coast. In the next theme, the pressures and threats to KZN's coastal ecosystems, species and people are discussed. The management of the coast is summarised in the last theme, highlighting national and international legislative requirements and best practice.

The book was developed in conjunction with



Editors: Bronwyn Goble, Rudy van der Elst & Larry Oellermann.

Publishers: KZN Department of Agriculture and Environmental Affairs and the Oceanographic Research Institute.

ISBN: 978-620-58192-9

Recommended retail price: This is a free publication, a handling fee of R50 is charged and copies are limited to one per person.

the Environmental Affairs unit of the then KZN Department of Agriculture and Environmental Affairs (DAEA), now moved to the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA). The book has taken a number of years to develop and involved some 40 specialists, both within KZN and further afield, who donated their expertise, time and photographs to the project. Extensive editing ensured that the end product was easy to read and understand, and the more than 100 pictures and graphics that showcase the KZN coast and support the text give this book an accessible, coffee table feel.

The book was officially launched on 20 August 2014 in the uShaka Sea World Aquarium; the function was well attended by authors, DEDTEA staff and members of the KZN coastal and marine community. The book is currently being rolled out to its primary target audience: KZN government officials who are involved in coastal management, in terms of the Integrated Coastal Management Act (Act No. 24 of



Larry Oellermann, Bronwyn Goble and Rudy van Der Elst (The editors of *Ugu Lwethu – Our Coast* from ORI) at the launch held in August.

2008). In order to facilitate a better understanding of the content of the book, a series of training workshops are being carried out by ORI for the government officials, to highlight the value of the coast and its resources.

If you would like an electronic copy of the book, visit the ORI website www.ori.org.za. A limited number of hardcopies are still available, and an electronic version of the book is available on CD. For details of how to order a hardcopy or CD, please contact Ramini Naidoo (ramini@ori.org.za). ☒



Book review on

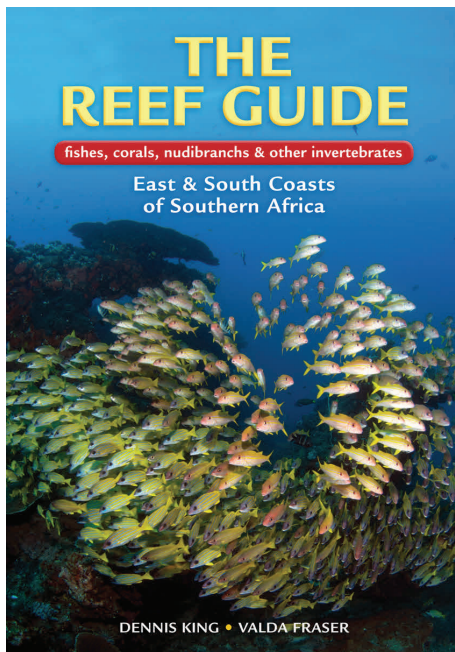
"The Reef Guide – East & South Coasts of Southern Africa"

By George Branch

University of Cape Town

Christmas has come early with the release of 'The Reef Guide', which will be a delight to all sea-lovers. Covering reef-associated animal life on the east and southeast coasts of southern Africa, but also relevant for more tropical climes in the Western Indian Ocean, this book is a joy to behold and an essential reference guide. It merges and greatly expands two earlier books by these authors, but is much more comprehensive and authoritative. There is a brief introductory section on 'How to use this book' and a very handy guide to the fish families, but the bulk of the book comprises matching pages of photographs coupled with concise descriptions about the species' characteristic features and biology.

The book does not pretend to be comprehensive, but the groups upon which it concentrates – the fish, sea anemones and corals, flatworms, larger crustaceans, molluscs and echinoderms – are covered exquisitely. The authors deliberately focus on the large and obvious species that that divers and beachcombers are most likely to see. As such, this guide will become an essential source for 'Citizen Science' programmes that are involving divers and the general public in documenting the species that exist on our reefs. It is a special joy to see attention given to lesser lights like the flatworms that are neglected in most other books, and the outstanding coverage given to those most beautiful of creatures, the nudibranchs. I was especially captivated by the wonderful pairs of photographs showing mimicry between pairs of flatworm and nudibranch species. With respect to the fish, this is the best assemblage of photographs I have ever seen for the region. Insets showing juvenile phases of many species are a particularly welcome inclusion.



The Reef Guide – East & South Coasts of Southern Africa

Authors: Dennis King and Valda Fraser

Publishers: Struik Nature, Cape Town

ISBN: 978 1 77584 018 3

Recommended retail price: R270

The book is bang up-to-date with the plethora of scientific name changes that is flowing from genetic research.

The calibre of the photographs in the book is testament to both the photographic genius and perseverance of the authors. Only people with a passion for their subject could have spent the necessary uncounted underwater hours (cumulatively, perhaps years) to capture the multitude of images in this book. Both Valda and Dennis have had new species named after them, which is fitting tribute to their contributions to marine science. The most sincere complement I can pass about 'The Reef Guide' is to say that I have owned it for only 6 weeks, but it is already getting dog-eared and the pages are decorated with notes and underlined vital information: the true mark of a book I cherish and use. ✂

Postgraduate opportunities in cetacean research



The Coastal and Marine Research (CMR) Institute at Nelson Mandela Metropolitan University presents a diverse group of marine researchers. Cetacean (whale and dolphin) research is fast expanding, with a number of postgraduate projects investigating the natural history, population dynamics and health of local populations in Eastern Cape waters.

A number of postgraduate opportunities currently exist at the CMR:

- MSc project opportunity in Biological Oceanography-distribution and site fidelity of baleen whales in Algoa Bay
- MSc project opportunity in Biological Oceanography-dolphin parasitology
- BSc Honours project in Zoology-Biochemical and morphological stratification of blubber in dolphins

Click [here](#) for more information

Closing date: 10 October 2014



SANCOR Steering Committee Membership Update

The SANCOR Steering Committee is pleased to announce the appointments of Drs Louis Celliers and Serge Raemakers as Steering Committee Members.

Dr Louis Celliers continues as National Forum Representative and Vice-Chair of the Steering Committee. Louis is a Principal Scientist



at the CSIR and heads up the Coastal Systems research group within the Natural Resources and the Environment unit. He is trained as a natural scientist but considers himself to be a new "breed" of scientist that spans the divide between science, management and policy. He is also a project manager and primary investigator of a number of national and regional trans-disciplinary projects and he serves on the Board of Trustees for the Western Indian Ocean Marine Science Association.

Dr Serge Raemakers is the new National Forum Social Science Representative. Dr Serge Raemaekers has been employed in the Department of Environmental and

Geographical Sciences at the University of Cape Town as a research fellow since April 2009, after having completed his PhD at Rhodes



University, South Africa. The focus of his PhD was on examining governance approaches to the high-value abalone and lobster fisheries in the Eastern Cape Province. Serge is a natural scientist by training with an MSc degree in bioscience engineering from the University of Ghent (Belgium, 2003), but in the past 10 years has gained expertise in inter-disciplinary research though his work on small-scale fisheries in rural coastal fishing communities. Since 2007, Serge has played an active role in the small-scale fisheries policy development process, contributing his research findings to the policy formulation process, and thinking though implementation requirements. His research work draws on systems thinking and fisheries governance theory with the aim to recommend governance models and management approaches that are more

applicable to small-scale fishers 'realities'. Dr Raemaekers also has considerable consulting and training expertise in the field of small-scale fisheries. For example, in 2010, he led a study commissioned by the Marine Stewardship Council (MSC) that aimed to identify obstacles and opportunities for small-scale fisheries to obtain MSC certification. Given the complex social dynamics that exist within small-scale fisheries in South Africa, the MSC methodology was adapted to assess additional social indicators and criteria as per the Fairtrade programme in order to measure and achieve social equity across the value chain. This new framework is currently informing the development of a Fisheries Improvement Programme led by WWF. Over the past two years Serge has been involved in various projects concerned with gathering socio-economic data on small-scale fisheries in South Africa, in particular a project funded by the UN FAO and the Benguela Current Commission on "Human dimensions of small-scale fisheries in South Africa".

We thank Prof Moenieba Isaacs, the outgoing National Forum Social Science Representative, for her valued participation and input towards SANCOR's activities in the past two years. ✂

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Disclaimer: SANCOR's main function is to disseminate information. SANCOR encourages robust, indeed provocative debate about any matters relevant to the marine science community. The views and opinions expressed in all communication from SANCOR are not a reflection of the views of SANCOR or the SANCOR Secretariat.

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