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South African Network for Coastal and Oceanic Research

SANCOR'S CURRENCY AND STRENGTH IS INFORMATION

# SANCOR Newsletter

## *Tiger sharks caught in the KZN bather protection program*

By

**Matt Dicken**

*KwaZulu-Natal Sharks Board  
Maritime Centre of  
Excellence*

with the white and bull shark, tiger sharks form part of the "Big Three" in the shark attack world. Despite this fact, there has been very little research into any aspects of its biology or ecology in South Africa.

Tiger sharks (*Galeocerdo cuvier*) are one of the most iconic shark species, easily identified by their characteristic tiger like stripes (Figure 1). Growing up to 6 m in length and with a reputation for eating almost anything they are also considered to be one of the most dangerous. Along

Tiger sharks are one of the most commonly caught species in the bather protection gear of the KwaZulu-Natal Sharks Board (KZNSB). They are one of the few species to exhibit significant increases in both catch (Figure 2) and



Figure 1: Tiger shark (*Galeocerdo cuvier*) at Aliwal Shoal. Picture courtesy of Jon Cooper.

mean length over the past 37 years, suggesting a healthy local population along the KZN coastline. This is in stark contrast to declines elsewhere in the world including the Northwest Atlantic and both the Queensland and New South Wales bather protection programs in Australia.

Both small (< 180 cm) and large sharks (> 180 cm) were recorded from the entire coastline (Figure 3), but large sharks were most common at Scottburgh and Park Rynie. Both these sites are situated inshore of Aliwal Shoal, a very productive shallow water reef system located only 5 km offshore. It is likely that sharks are attracted to the area due to the abundance of food.

Between 2005 and 2014 drumlines were introduced at 17 beaches along the Hibiscus Coast. The ratio between the number of sharks caught in the nets to those on the drums equate to a drum to net replacement of 1.92. This is 50% less than the current replacement ratio of 4 and indicates that the drums are effectively catching twice as many sharks as the net they have replaced. This is a factor, which will be taken into account when deploying drumlines as an alternative to nets at other beaches in the future. Concern has been expressed from opponents to baited drumlines that they could potentially act as attractants drawing large sharks into the nearshore

environment. However, there was no significant increase in the catch rates of sharks in nets following drumline deployment.

The size of sharks caught ranged 85.0 cm to 400.0 cm (PCL). However, very few young of the year (< 100 cm) (0.8%), or mature adult (> 250 cm M, > 280 cm F) sharks (1.8%) were caught by either gear type with the majority being either juvenile, or adolescent (97.4%). In fact, of all the sharks dissected only a single shark was pregnant and only one male was considered to have recently mated (bleeding claspers). The absence of large numbers of young of the year or mature *G. cuvier*, especially pregnant females from catches in the KZN gear, or indeed, from anywhere in the Western Indian Ocean (WIO) makes it difficult to determine not only the location of pupping grounds, but also mating and gestating areas. It is likely that these areas are further to the north in the warmer waters of

Mozambique and more tropical waters within the WIO.

Interestingly, the drumlines caught significantly smaller sharks (mean size = 138 cm PCL) than the nets (mean size = 184 cm PCL). This may be due to the fact that the drumlines are baited with small pieces of fish, which larger *G. cuvier* do not view as an attractive bait. Whatever the reason, it is of concern as it is large *G. cuvier*, which feed on prey types such as turtles, elasmobranchs and marine mammals, and pose the greatest threat to humans (Figure 4). This suggests that the complete replacement of nets by drumlines would not be an effective shark control strategy against *G. cuvier* and that the use of mixed gear should be continued, or that bait of a larger, possibly elasmobranch origin is used.

Of the 486 *G. cuvier* tagged and released after capture in the KZNSB gear almost all (n = 20) were recaptured within 150 km of their original tagging location. Of

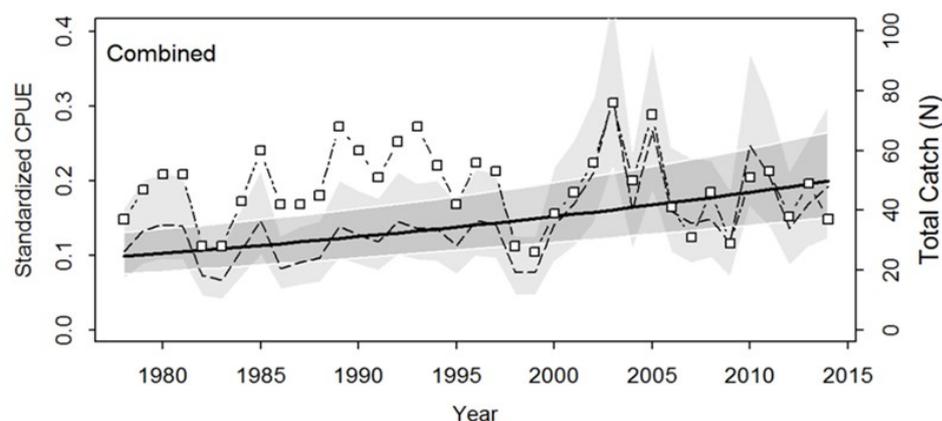


Figure 2: Overall catch and predicted values ( $\pm 95\%$  CI) for *G. cuvier* CPUE (sharks km<sup>-2</sup> net month<sup>-1</sup>), standardized for year.

the remaining 3 recaptures, a female of 180 cm was recorded after 255 days off Port Elizabeth, a distance of 799 km from its original tagging location. Another female of 180 cm was recorded after 122 days about 250 km offshore from Inharrime (south of Inhambane, Mozambique) in the Mozambique Channel, a distance of 1,200 km from its original tagging location. The third shark, a male of 175 cm was recorded after 401 days, 1,530 km away near Anakao, in southern Madagascar. Since all these sharks were immature it is likely that these movement patterns are related to the exploration of new potential foraging grounds.

Tiger sharks are commonly referred to as the garbage bins of the sea with a reputation to eat anything and everything. Stomach contents from dissected sharks revealed a diverse range of 192 different prey items ranging in size from small unidentified shrimps and bivalves to various large whale species including *Physeter macrocephalus* (sperm whale) and *Megaptera novaeangliae* (humpback whale). Interesting terrestrial species recorded in stomach contents included: *Cryptomys hottentotus* (Common mole-rat), *Philantomba monticola* (blue duiker) and *Hystrix africae australis* (South African porcupine). Human remains, comprising parts of tibia, fibula and pelvis bones were recorded from 2 sharks.

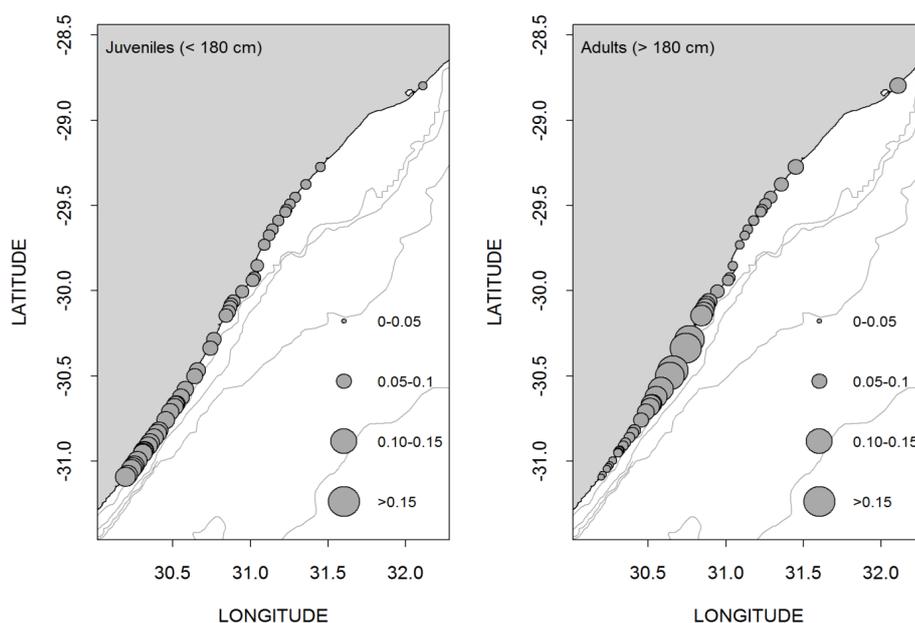


Figure 3: Spatial distribution of standardized CPUE (sharks km-net month<sup>-1</sup>) for small and large *G. cuvier* caught within the nets of the KwaZulu-Natal Sharks Board in 2014.

To conclude, the KZNSB provides one of the longest time series of catch records for *G. cuvier* worldwide. It provides a unique fishery independent monitoring tool, which can be used as a baseline to effectively monitor population trends,

upon which conservation management policies can be implemented. The key question remains, however, as to whether the trends observed in this study are indeed indicative of the larger WIO population. This highlights the



Figure 4: A large mature female tiger approaching a diver. It is this size class, which poses the greatest risk to bathers. Picture courtesy of Roger Horrocks.

importance of future studies to better understand the duration and long-term movement patterns of sharks to determine the level of population connectivity within the region. Of particular importance is the identification of key habitats for the ecologically important behaviors of mating, gestating and pupping.

For the full story, please refer to the following two articles:

Dicken ML, Cliff G, Winker H. (2016). Sharks caught in the KwaZulu-Natal bather protection programme, South Africa. 13. The tiger shark *Galeocerdo cuvier*. *Afr J Mar Sci*. 38(3): 1-17

Dicken ML, Hussey NE, Christiansen HM, Smale MJ, Nkabi N, Cliff G, Wintner SP. (2017). Diet and trophic ecology of the tiger shark (*Galeocerdo cuvier*) from South African waters. *PLoS ONE* 12(6): e0177897. <https://doi.org/10.1371/journal.pone.0177897> ✂

## Global Ocean Science Report

The Global Ocean Science Report (GOSR) assesses for the first time the status and trends in ocean science capacity around the world. The report offers a global record of who, how, and where ocean science is conducted: generating knowledge, helping to protect ocean health, and empowering society to support sustainable ocean management in the framework of the United Nations Agenda 2030.

The GOSR identifies and quantifies the key elements of ocean science at the national, regional and global scales, including workforce, infrastructure and publications. This is the first collective attempt to systematically highlight opportunities as well as capacity gaps to advance international collaboration in ocean science and technology. This report is a resource

for policy makers, academics and other stakeholders seeking to harness the potential of ocean science to address global challenges.

A comprehensive view of ocean science capacities at the national and global levels takes us closer to developing the global ocean science knowledge needed to ensure a healthy, sustainable ocean.

Click [here](#) to download the full report. ✂



The Current Status  
of Ocean Science  
around the World



## SANMAP to produce geological maps of SA's continental shelf

By

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University

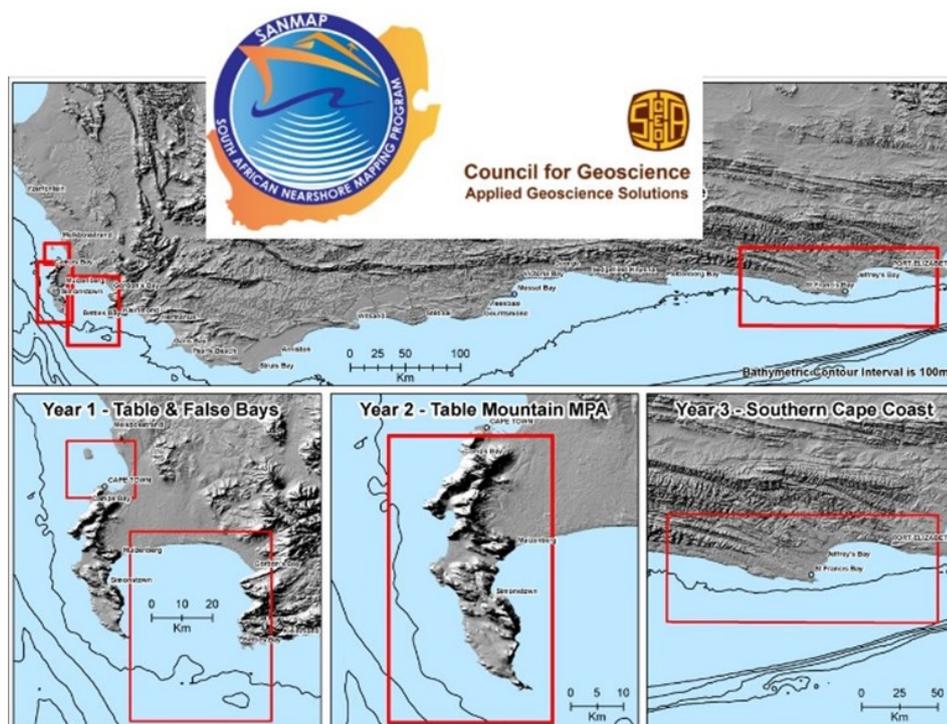


Figure 1. Planned coverage of offshore mapping blocks for the first two years of the SANMAP programme.

### OVERVIEW

The South African Nearshore Mapping Programme (SANMAP) was initiated in April 2016 and aims to conduct a mapping programme covering the entire South African continental shelf. SANMAP has a clear vision: to produce seamless onshore-offshore geological maps of the seafloor on a scale of 1:50,000. The need for the acquisition of high-resolution, high-quality marine geophysical and hydrographic data is apparent in the range of applications which can be derived - such as the delineation and designation of marine protected areas, geohazard assessments, quantifying sediment migration, infrastructural planning on coasts, and providing baselines for monitoring global change.

SANMAP aims to provide essential geophysical and geological data for both ocean and coastal research and management, to stimulate and grow

research, and raise public education and awareness of coastal and ocean issues. New mapping is being carried out, in tandem with analytical work on existing datasets and the development of a robust data management strategy.

### INTRODUCTION

The existing baseline geological information on the South African continental shelf is largely based on regional data, which was collected from 1967 through to the late 1980s. Bathymetric and geological maps on a scale of one in five million covering the

shelf and upper slope of the Southern African continental shelf were completed in 1975 (Dingle *et al.*, 1975).

Mineral resources are important to the economy and capacity building of South Africa and are being extensively exploited on land and this will likely shift into the offshore environment, where exploration is currently focused on diamonds and titanium sand. The risk in future exploration and eventual exploitation, however, lies in the current relative lack of detailed knowledge of the seafloor. Careful environmental planning

needs to be carried out in conjunction with the mapping of mineral deposits to adhere to international regulations as well as to protect our rich heritage and ongoing marine geophysical surveys are currently being conducted. The applications of geophysical datasets are vast. Exploration for mineral deposits, hydrographic mapping and charting, researching the effects and deposits of past sea-level fluctuations, benthic habitat mapping, assisting towards marine spatial planning, and interpreting submerged environments and underwater landscapes, highlight some of these possibilities.

The Council for Geoscience (CGS) (Principal Investigator: Hayley Cawthra) has initiated the SANMAP Programme.

The scientific aims are to:

- acquire new marine geophysical datasets from regions of strategic interest and importance;
- to develop a high-resolution geophysical/geomorphic/palaeoenvironmental database for key sections of South Africa's continental shelf embracing technological development and innovation; and
- to design a methodology for marine geoscientific data management.

With these data, the CGS intends to generate computer models of offshore geological and palaeoenvironmental

settings under various climatic/sea level scenarios and create habitat maps for the living marine resource to be applied in sustainable marine planning through collaboration with partners, as two examples. The maps will be produced as a series of 1:50,000 geological maps, both covering the shelf or presented as seamless onshore-offshore geological maps where they extend across the shoreline.

Our strategic aims of this programme include the development of a strong marine geoscience group at the CGS; fostering partnerships and embracing collaboration; and remaining involved and active in matters related to ocean governance.

The first geographic area being addressed is the region surrounding the City of Cape Town (Table Bay, False Bay, Table Mountain Marine Protected Area). Following the work in the Western Cape, the project will focus on the Eastern Cape in the vicinity of Cape St. Francis.

#### METHODS AND RESULTS

Methods applied in new marine geophysical surveys incorporate the application of multibeam bathymetry, side-scan sonar, boomer seismic profiling, pinger seismic profiling and marine magnetics. We surveyed the

Table Bay seafloor from March - April 2017 applying all of these techniques and using the vessel 'T Craft', hired from the company Gibbs & Dold in Durban. Data curation is being undertaken through an ESRI portal which is designed to accommodate historical archives, as well as the newly acquired datasets. We are using existing marine geophysical datasets to interpret geological setting of the continental shelf, modelled palaeoenvironments through multi-disciplinary collaboration, samples are being analysed for signals of palaeoclimate and palaeo sea-level reconstructions are underway.

In addition to existing work offshore of Robben Island (MacHutchon and Salzmann, 2016), the new data acquired



Figure 2. Geophysical equipment used in this work. Top: side-scan sonar and winch. Middle: marine magnetometer. Bottom: multibeam echosounder.

in Table Bay have demonstrated that were there is a paucity of well-preserved outcrops onland, but a relative abundance of Malmesbury Group deposits on the seafloor. With the high-resolution datasets acquired through the SANMAP programme, shipwrecks have been identified and mapped, the seafloor is being considered as a submerged landscape and tied into archaeological projects, and areas which may contain mineral or commodity deposits are being delineated. This is coupled with a thorough data archiving project, and the maintenance of a comprehensive database.

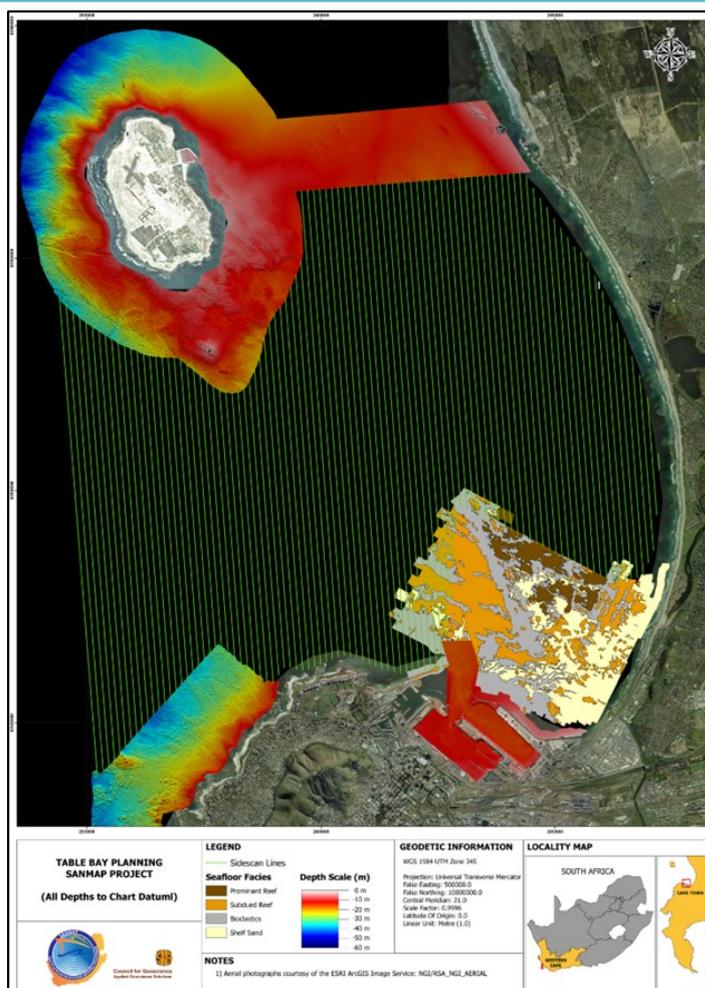
The geological maps which will be produced on a scale of 1:50,000. Ten maps per sheet will be published, which include the following: onshore-offshore (or only offshore) geology, colour shaded bathymetry, greyscale DEM, acoustic texture, benthic habitats, sediment isopach, reflection seismic profiles, magnetic anomalies, rock elevation, data visualisation & integration.

## CONCLUSIONS

A thematic offshore mapping programme (SANMAP) is under way at the Council for Geoscience, incorporating six focus areas (technology in marine geophysics, innovation in mapping, knowledge and research, capacity building and training, ocean governance, data management). Marine geophysical mapping has commenced and is ongoing in Table Bay, applying bathymetry, sonar, sub-bottom profiling, and magnetic techniques. The SANMAP programme tests new applications of marine mapping techniques, covers systematic mapping guidelines through informed thematic drivers and is being used as a platform to train young scientists and postgraduate students. For more information, please contact Dr Hayley Cawthra [hcawthra@geoscience.org.za](mailto:hcawthra@geoscience.org.za)

## REFERENCES

Dingle, R. V. and Siesser, 1975. Geology of the continental



First results from the new data collected for the SANMAP programme, showing the initially surveyed areas with multibeam bathymetry and line coverage of new geophysical datasets collected in April 2017 (data currently being processed).

margin between Walvis Bay and Ponta do Ouro. Government Printer, 1pp.

MacHutchon, M.R., Salzmann, L., 2016. Annual technical report – March 2016: Robben Island 1Nm mapping. Council for Geoscience report 2016-0057, 38 pp. ☞

## ***SANCOR celebrates excellence in marine science***

SANCOR held its triennial awards ceremony at the gala function of the Southern African Marine Science Symposium on 6 July 2017 at the Port Elizabeth Boardwalk Convention Centre. The aim of the awards is to recognise distinguished scientists, technicians, science communicators and emerging researchers in the marine and coastal sciences. We were delighted to honour and acknowledge the following recipients. [Click here](#) to read their citations.

### *About the Awards:*

The Marine & Coastal Communicator Awards are made to individuals or groups of individuals in recognition of their outstanding contributions towards communication of information about the marine and coastal environment to the public via various media at various levels. This award serves as an acknowledgement of, and a symbol of appreciation for, the dedication, enthusiasm and diligence of the persons performing such communication.

The SANCOR Young Researchers Award has been established to acknowledge a new generation of scientists and to encourage research excellence in science in the marine and coastal environment.

Derek Krige Medal is awarded in recognition of outstanding achievements in the field of technical support to marine science in South Africa. The award of this medal serves to emphasize the valuable contribution to marine science made by those who provide the technical and logistical support services that make research possible.

The Gilchrist Medal is awarded to distinguished marine scientists. The Medal serves as recognition of the recipients' contributions to marine science, to further stimulate excellence in South African marine science, and to focus attention on South Africa's marine and coastal environments.

### **MARINE AND COASTAL COMMUNICATOR AWARD**



Ms Jone Porter



Ms Claire Attwood

### **DEREK KRIGE MEDAL**



In memory of Mr Barrie Rose 1947-2017

### **SANCOR YOUNG RESEARCHERS AWARD**



Dr Sarah Fawcett



Dr Romina Henriques

### **GILCHRIST MEDAL**



Prof Peter Ryan



Prof John J. Bolton

## Embracing the blue at SAMSS 2017

The 16th Southern African Marine Science Symposium (SAMSS) was successfully hosted by SANCOR and Nelson Mandela University (NMU) during 4-7 July 2017 at the Port Elizabeth Boardwalk Convention Centre. The conference theme 'Embracing the blue – unlocking the ocean's potential whilst maintaining social and ecological resilience' was highly topical and appropriate, aligning with Operation Phakisa, which is the national approach to developing a blue economy. Under this broad theme, 6 separate specialist workshops including many contributions under three broad subthemes were presented on: biodiversity and conservation, global change, and food security. The conference was attended by 446 participants of which 253 were students. The event allowed participants to showcase their latest research results and provided an opportunity to network. As mentioned in the [Abstract Book](#), attending SAMSS is a milestone in a student's career. They are able introduce themselves to the marine community and meet and listen to established experts. Local and international keynote speakers gave participants a deeper understanding on critical issues across disciplines. Prof Mark Gibbons gave a Gilchrist Evening Lecture. His talk was entitled: "Jellyfish: a celebration through

culture and science". Dr Andrew Kaniki (National Research Foundation) outlined the framework of the upcoming Marine and Coastal Research Funding Instrument. A SANCOR Student Meeting was held to inform students about available opportunities. A new student representative was elected - Miss Sinegugu Mbense - to serve on the SANCOR Steering Committee. The symposium was concluded with a panel debate on how blue economies can be developed and sustained. Unique response cards captured the views of the audience on the discussion chaired by Prof Kevern Cochrane.

With the high standard of presentations at the symposium, the judges had the difficult task of selecting student winners for the oral, speed talk and poster presentations. Bernard Erasmus from Rhodes University won the top oral presentation for his talk on the impact of

ocean acidification on the survival, growth and skeletal development of larval dusky kob. Robert Schlegel from the University of the Western Cape delivered the top speed talk. He presented the South African atlas of sea surface temperature trends and extreme events. Jessica Escobar Porras from the University of KwaZulu-Natal produced the best poster on shark species *Carcharhinus humani*, in northern South Africa. Click [here](#) to view the full list of winners and runners up.

The SANCOR Steering Committee extends a warm thanks to the Local Organising Committee, chaired by Prof Ronel Nel at NMU. ✂



LOC Chair, Prof Ronel Nel, welcomes participants to SAMSS 2017.

## New SANCOR Steering Committee Members

The SANCOR Steering Committee welcomes new members that has been elected throughout 2017. We wish them every success in their new terms.

**Sinegugu Mbense - Student Representative**



Sinegugu is a PhD student at Nelson Mandela University. Her doctoral studies are on ecosystem services in South African Estuaries mainly blue carbon in mangrove, salt marsh and seagrass habitats and how blue carbon in these habitats will be affected by climate change in the future.

**Dr Pierre Pistorius - National Forum Representative**

Pierre is leader of the Marine Apex



Predator Research Unit and an active researcher at the Nelson Mandela University. Pierre is a senior lecturer in the Zoology Dept and member of the Institute for Coastal and Marine Research.

**Dr Lucienne Human - National Forum Representative**



Lucienne is marine and estuarine biogeochemist at SAEON Elwandle Node where he runs the water quality laboratory. His research and engagement can be very integrative and represents a scarce skill where knowledge transfer is needed across the country.

Our heartfelt thanks and appreciation goes out to the outgoing members, Dr Louis Celliers (chairperson and National Forum Representative), Ms Rita Steyn (Student Representative) and Dr Lara Atkinson (National Forum Representative) for their leadership, dedication and support of SANCOR activities. ✂



### VOLUNTEER POSITIONS

#### River pipefish conservation

We are looking for volunteer research assistants/interns to participate in a diving survey, genome screening and/or establishment of a captive breeding population of one of Africa's rarest coastal fish species, the critically endangered river pipefish, *Syngnathus watermeyerii*.

The first field survey is expected to take place in late March 2018. Full details [here](#).

## SANCOR Travel grant recipient for 2017

Daniel Lemley, a Botany PhD student at the Institute for Coastal and Marine Research at Nelson Mandela University won the SANCOR International Student Travel Award for 2017. This travel award is given annually to PhD students in recognition of their work accomplished thus far and offers up and coming young marine scientists the opportunity to attend an international conference and to showcase their research as well as gain experience in presenting a paper to an international audience. “

Daniel attended the 24<sup>th</sup> Biennial international conference of the Coastal & Estuarine Research Federation during 5-9 November 2017 in Providence, Rhode Island, USA. He delivered an oral presentation on recurrent harmful algal blooms and the causative role of catchment. Daniel's PhD research focuses on the influence of agriculture on two Eastern Cape estuaries and options for remediation. He has a passion for estuaries, and more specifically the factors responsible for determining the water quality/eutrophic condition of estuarine



ecosystems. His goal is to one day play a role in preserving the estuaries of South Africa, and internationally, by promoting effective management and protection of these ecosystems. ∞



## Vacancy

### Research Manager

We are looking for a dynamic individual that is passionate about white shark research and conservation to fulfill the role of Research Manager at Shark Spotters. The Research Manager will also assist and coordinate research on other shark species in Cape Town, including sevengill cow sharks.

Closing date: 19 January 2018

[Click here for more information.](#)

## Western Cape MCEN conference

The Marine and Coastal Educators Network (MCEN) Western Cape Regional Mini-conference was held on 14 October 2017 (during National Marine Week) at the beautiful Save our Seas Foundation (SOSF) Shark Education Centre in Kalk Bay. The meeting was attended by 27 environmental educators and included a fascinating lineup of relevant and informative topics in marine science and education.

Dr Ken Hutchings (Anchor Environmental Consulting) presented on the marine environmental impacts of desalination. He described the production process of obtaining freshwater by reverse osmosis (RO) desalination and the potential marine environmental impacts of this process. He discussed the operational phase impacts associated with both the intake of sea or brackish water and the discharge of brine and other co-discharges and described some of the studies undertaken for existing RO desalination plants along the Western Cape Coast and comment on the proposed RO plants planned to partly address the City of Cape Town water crisis. Tammy Morris (South African Environmental Observation Network) described what is being done to monitor the Agulhas Current using large mooring arrays and discussed the impacts of the

current. Lorraine McGibbon (WESSA) outlined the new WESSA Eco-Schools theme, Marine & Coasts. She covered the 7 step framework for the identification of local environmental issues and the development and implementation of an action project to address that issue. The Eco-Schools programme is an international environmental education programme which enables young people to be the change for sustainability that our world needs, by engaging them in fun, action-oriented and socially responsible learning about coastal and marine habitats, how people affect them, and what to do to protect them. Lisa

Mertens, a marine genetics PhD student from the University of Stellenbosch, presented on "Marine Education in South Africa: Challenges and Impulses". She provided results of a survey conducted on local marine educators. The survey highlighted the need for more rocky shore lessons and promoting authentic environmentally sustainable behaviour. Angela McQueen (MSC) gave an overview of the Marine Stewardship Council, its global impacts report and latest developments for educators. Catherine Phillips (Cape Leopard Trust) showed how the Trust connected children with nature through, hikes, excursions and camps. She gave



Some of the participants at the MCEN regional meeting.

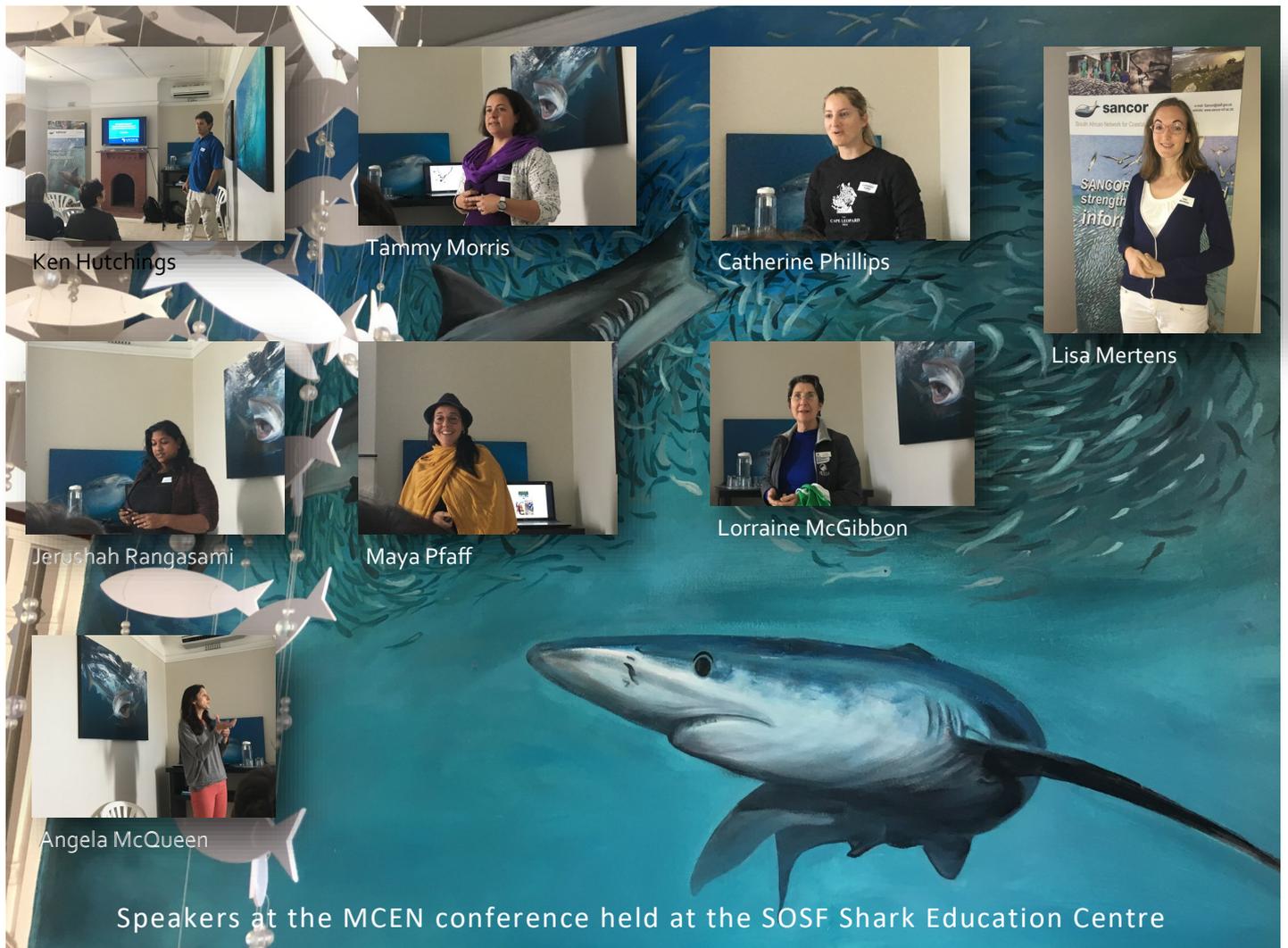
examples of how scientific research results were conveyed to children, promoting the protection of predators in their natural environments, as well as to raise awareness of broader biodiversity issues and promoting the need for committed conservation of ecosystems. Jerushah Rangasami (Impact Consulting) presented on the importance and processes of monitoring and evaluating the impact of education programme. Dr Maya Pfaff shared "The LIMPET citizen science programme: Long-term Intertidal Monitoring through Participation, Evaluation & Training, a joint project in

collaboration with Centre for Conservation Education, DEA Oceans and Coasts, Redhill Wilderness Initiative, which exposes kids to scientific processes. This programme will also offer the much needed rocky shore demonstrations for educators in 2018.

MCEN is a coordinating group of SANCOR and assists marine educators by facilitating collaboration, coordinating national initiatives and identifying future opportunities for marine education in South Africa.

Events held by MCEN aim to promote awareness and education on the marine and coastal environment and bring together formal and informal educators from schools, public aquariums, non-profit NGOs, and government agencies.

Acknowledgements: We are grateful to the SOSF Shark Education Centre for co-sponsorship of the event and to Dr Eleanor Hutchings (MCEN Western Cape Representative) and the team at the Shark Centre for coordination and support of the event. 🐟



Speakers at the MCEN conference held at the SOSF Shark Education Centre

## *MSC report highlights the role of certification in delivering Sustainable Development Goals*

In June 2017 the Marine Stewardship Council (MSC) published a new, comprehensive analysis of the impact of sustainable seafood certification in safeguarding our marine resources. The [MSC Global Impacts Report 2017](#) details more than a thousand examples of positive change made by certified fisheries to safeguard fish stocks and marine habitats.

Analysis of stock data from a sample\* of certified and non-certified fisheries shows that MSC certified fisheries target healthy or recovering fish stocks. Certified fisheries, overall, target larger populations of fish in the years following certification and, compared to non-certified fisheries, show less variability in the sustainability of target fish stocks.

The findings preceded the United Nations (UN) Oceans Conference, held in New York to support the implementation of Sustainable Development Goal (SDG) 14, which called to conserve and sustainably use the oceans. The MSC report provides governments, industry and NGOs with evidence for credible certification as a powerful tool to catalyse and secure improvements in marine fisheries.

"The MSC program provides both

recognition and incentive for responsible ocean stewardship," said Rupert Howes, MSC's Chief Executive. "20 years since the creation of the MSC, certified fisheries today account for 12% of global marine catch. MSC certified fisheries are targeting healthy and well managed stocks. They are also safeguarding marine habitats and ecosystems through ongoing commitments to improve their performance."

With certified fisheries currently comprising 12% of global marine catch, the MSC's goal is for 20% of all wild caught seafood to come from fisheries engaged in the MSC program by 2020. The report clearly demonstrates that with the correct incentives and actions fisheries can achieve the sustainable performance required to meet the SDGs.

### **A catalyst for change in habitats and ecosystems management**

The MSC report shows that 94% of fisheries entering the program have made at least one improvement to achieve or maintain certification, totalling more than 1,200 over the last 16 years. Of these, 117 actions by 39 fisheries contributed to improving habitat status, management and



information. In total, MSC certified fisheries have been involved with 46 new scientific research projects as part of efforts to better understand and minimise impacts on habitats.

As example, the report highlights the Greenland coldwater prawn fishery's considerable efforts to preserve habitats. The fishery launched a research project with the Zoological Society of London in response to a lack of information on sea floor habitats. This led to the discovery of a rich ecosystem and the trialling of innovative measures to protect sea pens, in addition to the designation of a marine protected area to safeguard important corals and sponges.

"Investing in science and research has been a key part of the MSC's journey over the past 20 years," said Dr David

Agnew, Science & Standards Director at the MSC. “Fisheries science and management is constantly evolving. That’s why we systematically review and update our Standards to reflect best practice in fisheries science. The revised edition of the MSC Fisheries Standard, released in 2014, features an increase in requirements for habitat protection.”

To date, 18 MSC certified fisheries have changed where and how they fish to minimise damage to seabed habitats, with some implementing voluntary closed areas in order to maintain certification.

#### **Assurance in the supply chain**

Ensuring that fisheries are sustainable is only one side of the equation. The MSC requires that certified seafood is traceable from the fishery to the consumer, and checks the integrity of its chain of custody certification system regularly. A 2016 study commissioned by the MSC tested the DNA of fish sold in 122 UK fish and chip shops. The study revealed mislabelling at a rate of just 1.64% in shops with an MSC certificate, compared to over 8% in non-certified shops. Overall DNA testing results since 2009 have shown near negligible (<1%) levels of mislabelling for MSC certified products, compared to a global average of 30%.

#### **Our oceans, our future - more to do**

Roughly half of fisheries which complete voluntary pre-assessment to the MSC Fisheries Standard do not progress to full assessment, suggesting that they have work to do to reach the requirements of certification.

The MSC Global Impacts Report maps the location of certified fisheries in large marine ecosystems (LMEs) around the world, showing the proportion of MSC certified fisheries in areas of international importance to biodiversity. The maps reveal a need to support small-scale fisheries, particularly those in developing countries, on the road to sustainability.

The MSC is developing new tools and investing in scientific research to support fisheries in achieving MSC certification.

In order for these initiatives to have impact at scale, the MSC encourages the international community meeting at the UN to support market-based incentive mechanisms, including certification, as an essential tool to contribute to realising the SDGs. Consumers can also play their part by choosing seafood with the blue MSC label. The MSC program is recognised in the UN Concept Paper for Partnership dialogue as a promising tool for developing partnerships and sustainable seafood supply chains. 

## MSc and PhD projects

are available from February 2018 in the Department of Oceanography, UCT to work on climate change and variability in the Southern Ocean and its impacts on South African climate. A particular focus concerns the ongoing droughts in the Western Cape and parts of the Eastern Cape.

[Full details available here.](#)

## Working together to study ocean acidification

By

**Morgana Tagliarolo and  
Carla Edworthy**

*South African Institute for  
Aquatic Biodiversity*

On World Oceans Day (8 June 2017), the OA-Africa Network organised an awareness day to focus attention on ocean acidification (OA). The event involved 23 countries ringing the African continent. Several other countries around the world also participated in the event to show solidarity with the researchers working in Africa.

Ocean acidification is poorly understood despite the considerable impact it is having on our local marine resources. The aim of this event was to promote ocean acidification research in Africa and to communicate with and educate the general public about ocean acidification.

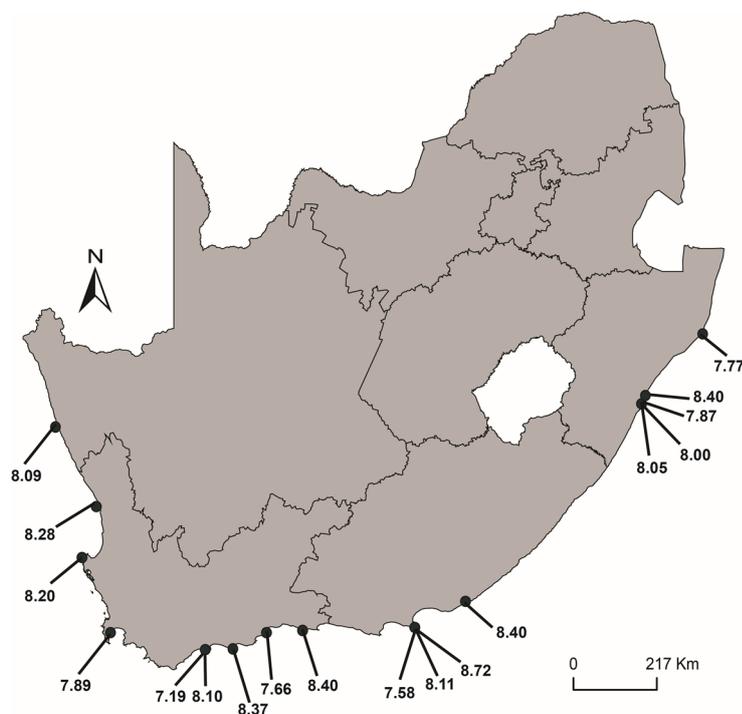
OA is a result of the continuous release of carbon dioxide (CO<sub>2</sub>) into the atmosphere by human (anthropogenic) activity. As CO<sub>2</sub> increases, pH decreases due to the accumulation of hydrogen ions, meaning that the ocean is becoming more acidic. The average pH of surface seawater ranges between 7.9 and 8.3 in the open ocean. Since the industrial revolution, which began in Britain in the late 18th century, the

burning of fossil fuels, deforestation, economic and population growth have constantly increased and have led to unprecedented release of CO<sub>2</sub> into the atmosphere. Over the last few decades, the ocean has absorbed about 30% of all anthropogenic carbon dioxide from the atmosphere, causing ocean acidification. Since the beginning of the industrial era, the pH of ocean surface water has decreased by 0.1 pH units, corresponding to a 26% increase in acidity.

OA was reported as far back as the 1970s but only recently emerged as an important issue for the scientific community. Since then, many scientists around the world have started investigating this problem and its impacts on marine ecosystems. The study of OA is a growing field but very little research has been done in Africa. In 2012, the United Nations Conference on

Sustainable Development - or Rio+20 - specifically called for supporting initiatives that would address OA by enhancing international cooperation. In response to this, the OA-Africa network was established to promote a coordinated effort for monitoring and understanding OA in Africa and its surrounding oceans. OA-Africa created a fundamental platform for sharing ideas, designing collaborative research programmes, troubleshooting challenges, facilitating international collaboration and supporting all scientists interested in OA research in Africa.

On World Oceans Day 13 South African institutions participated by measuring



Spatial variability of the coastal pH measured in South Africa on Ocean Acidification Awareness Day 2017.

the pH of coastal seawater at 18 different sites along the South African coastline. The pH ranged between 7.19 and 8.72 with a mean value of 8.06. Higher pH values were recorded next to rocky shores where a higher abundance of macroalgae was likely present. Conversely, lower values were generally found in harbours.

The high variability and complex mechanisms controlling pH in coastal waters imply that the ocean acidification concept cannot be investigated in coastal ecosystems using global pH averages for the open ocean, as it has been previously done. Coastal waters are subjected to complex biogeochemical dynamics, for example, the presence of upwelling, the influence of estuaries and freshwater inflow as well as the effect of benthic organisms play an important role in influencing the physical and chemical conditions (Duarte et al. 2005). Due to this dynamic variability, the study of OA in coastal waters needs to focus on regional dynamics. To compute the effect of anthropogenic pressures on the coastal environment, continuous monitoring programmes and the study of the effects of OA on local communities needs to be implemented.

The OA Awareness Day and the OA-Africa network would like to involve more scientists and institutions in the monitoring of seawater pH and in the study of the effects of OA on South

African marine resources and associated coastal communities. Support for the training and the development of new infrastructure is now in process. Recently the Aquatic Eco-physiology Research Platform (AERP) was opened by the South African Institute for Aquatic Biodiversity (NRF-SAIAB) in partnership with the Department of Ichthyology and Fisheries Science (DIFS) at Rhodes University in Grahamstown in the Eastern Cape. This platform is now fully operational and equipped for scientists to study of the effects of OA in aquatic ecosystems. Current research includes students at various academic levels assessing the effect of OA on larval and juvenile fishes, which has paved the way for future research on the impact of OA at an organism level. The facility

and the research groups working in this field aim to continuously expand the research approach to ocean acidification and climate change in order to understand the impact of multiple drivers of change at an ecosystem level.

For more information about OA-Africa and ocean acidification:

[Follow us on Facebook](#)

[View the YouTube clip.](#)

References:

IPCC 2007. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

Duarte CM, Middelburg JJ, Caraco N (2005) Major role of marine vegetation on the oceanic carbon cycle.

Participating institutions and pictures of some of the researchers, students and interns involved in the activity in South Africa.



## Developing South African capacity aboard the Cape Canyon Cruise

By  
Zingisa Gono<sup>1</sup> and  
Omega Ndongeni<sup>2</sup>

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Mthatha

With a couple of weeks before leaving the Eastern Cape for Cape Town, we quickly learnt reading through the sailing orders, that multi-disciplinary canyon research was an emerging and exciting field in South Africa. This document further highlighted that submarine canyons are internationally recognized to host unique benthic assemblages and act as funnels that connect the coastline to deeper environments. The Chief Scientist of the cruise, Ms Zoleka Filander (DEA)

further explained the importance of understanding the functionality of such deep-water ecosystems, as the ocean regulates the climate and serves as a carbon dioxide reservoir. She also highlighted the significance of offshore research and its relevance to South Africa's current conservation and management initiatives.

The main objective of the cruise was to characterize the Cape Canyon that lies geographically off the West coast of South Africa, and in the heart of the commercial fishing industry. Several operations were proposed, ranging from CTD's (an instrument used to collect different oceanographic variables) to dredges and grabs used to collect benthic biodiversity data. The data collected will improve our understanding of the ecological role by submarine canyons in deep-sea processes.

We were extremely excited when we

Two postgraduate students from historically disadvantaged backgrounds, participated in a scientific research cruise aboard the *RV Alga* as part of an initiative led by DEA and UCT to expose young, black, female scientists to ocean-based research. Joining the second phase of the Cape Canyon Exploration cruise, led by Chief Scientist Zoleka Filander in March this year, Zingisa Gono (Nelson Mandela University) and Omega Ndongeni (Walter Sisulu University) soon discovered that canyon research is an interesting emerging field in South Africa. Here, they share their experience.



Dr Lamont during training.



Grab operations



Zingisa and Omega uploading station



Canyon cruise participants

learnt that our applications to participate in the cruise were successful, as it was going to be our first time at sea and being on a plane! On our arrival, we faced several tasks to ensure that we were physically capable to work at sea and fulfil our responsibilities highlighted in the sailing orders. This included medicals and a training course in survival techniques, which involved jumping off a 3m wall into a pool (another first!). Although very challenging, we successfully received our certificates with the support of an encouraging team. We also helped with the loading of materials and equipment that was needed on the expedition. Training sessions on isotope, chlorophyll and oxygen sampling were conducted by Dr Tarron Lamont (DEA),

Mr Gavin Tutt (DEA), Dr Eleonora Puccinelli (UCT), and Mr Baxolele Mdokwana (DEA).

However, this cruise was not just about deep-sea science, it was also about capacity development and aimed to expose us to different offshore sampling techniques and life at sea in general. Throughout the 20 days at sea, we interacted with various technicians, engineers and scientists who we learnt from immensely. Ms Filander emphasized the importance of such experiences and how they will assist us in making informed career decisions. Moreover, she was always willing to share her own experiences as an emerging scientist within the sector.

This initiative was a productive platform that allowed us to gain first-hand experience on the science that informs policy on deep-sea conservation. We would like to thank Ms Zoleka Filander for believing in us and for all her efforts to ensure our participation. Our sincere gratitude also goes to Prof. Sarah Fawcett and UCT who sponsored the associated participation costs, and the Department of Environmental Affairs (Oceans and Coasts) for such an opportunity. Based on this experience, we would like to see more student participation in such ocean-based initiatives, as we strongly believe that it is a great opportunity to learn and interact with scientific and technical personnel in this field. ✍

### *Dr Christopher Michael Duncombe-Rae (1957-2017)*

Dr Christopher Michael Duncombe-Rae, passed away on a flight to the United States in October 2017. Christopher was a Specialist Scientist in physical oceanography and data management in the Oceans and Coast branch of the Department of Environmental Affairs (DEA), in Cape Town. He was a key member of the Departmental team that compiled the 2014 State of the Oceans Around South Africa report. Christopher was en route to Washington to spend a few weeks with the National Oceanic and Atmospheric Administration colleagues, to interact with them on how to improve the DEA's data and

information systems in support of research and the Government's Oceans Economy Strategy, Operation Phakisa: Oceans Economy. He was instrumental in initiating the process and building the system from the ground up.

Christopher was a talented and technically rigorous seagoing physical oceanographer with over 1000 days at sea. He conducted research in the ocean and shelf environment of subantarctic islands, Benguela and Agulhas ecosystems, and participated in research cruises in the North Atlantic and North Pacific Oceans. Near the end



of his career, he turned his attention to data stewardship and marine information systems, leading South Africa in the development of its Marine Information Management System. Christopher is survived by his wife, Deidre Byrne, also an ocean scientist in the Department and an 11 year-old son.

Sources: DEA and LinkedIn ✍

## Exploring the sub-Antarctic: An expedition of a lifetime

By  
Heather Forrer

*University of Cape Town*

It's April 15th 2016 and I'm sitting in Dr Sarah Fawcett's office completely confused about a new isotope concept when she pops the question, "would you like to be part of the Antarctic Circumnavigation Expedition (ACE)?" Slightly perplexed as to how that was even a question, I blurted out "yes, definitely, thank you, oh wow." Fast forward a couple of months and there I was, standing with my bag, in front of a very large, very orange Russian Ship, the *Akademik Treshnikov*. Still confused and very nervous, I stared at this beast of a ship with what felt like very misplaced trust that Sarah had bestowed upon my juvenile shoulders. After waving goodbye to Cape Town and my mother, who was at that stage on her fifth box of tissues, we set sail for the southern horizon and so began one of the best experiences of my life.

As the inaugural project of the newly founded Swiss Polar Institute by *École polytechnique fédérale de Lausanne* (EPFL), ACE aimed to strengthen international collaborations between the polar institutes of various countries as

well as "spark the interest of a new generation of young scientists and explorers in polar research". Consisting of 22 projects, this unprecedented research cruise was very optimistic indeed. Circumnavigating Antarctica over three 'legs', we aimed to study physical, chemical, and biological dynamics of the numerous Southern Ocean ecosystems, with the goal of improving predictions of future change in this vulnerable region. Combining open-ocean research with island and glacial work is generally unheard of for single expeditions of this nature. Needless to say, our Chief Scientist, David Walton from the British Antarctic Survey, had his work cut out for him trying to please all interested parties while working against a very tight time schedule and temperamental weather.

The South African ACE project, Project XII, is focusing on profiling the Southern Ocean's microbial community. Using a multi-disciplinary, multi-resolution approach, the idea is to shed some light on the interactions between nutrient cycling and microbial diversity in changing Subantarctic ecosystems. Our main questions include: Who is there? What are they doing? Why are they doing it? What are the implications for Subantarctic nutrient cycling,



Masters student, Heather Forrer describes her experience on board, the Russian research vessel *Akademik Treshnikov*.

ecosystem function, and CO<sub>2</sub> removal, today and in a warming world?

Our project is focused on leg 1 (Indian Ocean sector; Cape Town to Hobart) and leg 3 (Atlantic Ocean sector; Punta Arenas to Cape Town) of the ACE cruise, augmented by a handful of samples collected by our colleagues on leg 2 (Pacific Ocean sector; Hobart to Punta Arenas). Participants for leg 1 included Prof. Tommy Bornman (SAEON and Nelson Mandela Metropolitan University), Samantha Waterworth (Rhodes University) and myself, Heather Forrer (UCT). When leg 3 came around, Sam and I were back on board and were joined by Raquel Flynn (UCT).

Although on paper it consisted of 22 projects, ACE was essentially one massive

project. Not only because of the highly dynamic and interlinked environment in which we were working, but also because of the nature of the cruise and what each project required. It was a communal effort where everyone had to work together if anyone was to get data.

Through the trials and tribulations of pump watch, winch failures, many a late night filtering, surprise CTD stations and 4am trawls, we inevitably became much stronger scientific community and very good friends.

The Russian crew were amazing. Although working with them was certainly interesting and we all often stumbled across the language barrier rather ungracefully, they were truly wonderful. Whether it be the doctor attending to a treadmill-related injury exclaiming “No no no no no no. Haematoma”, the 11:28 tannoy announcement stating the ship’s position

to be in the “Southern Indian Atlantic Ocean” or the CTD operator proudly proclaiming there will be no CTD because “this is not a lake, this is the ocean”, they added a memorable dynamic to the cruise.

Everyone got something different from this expedition. For Sam, “it was an unexpected, marvellous journey. The highlight of Leg 1 was seeing the Aurora Australis - I count myself extremely privileged to have witnessed this gorgeous natural phenomenon!”

Although we went into the cruise with a ‘plan of action’, as we all know, things never go according to plan out at sea. Jury-rigging new ideas and collaborations along the way is part of the experience. Sam was fortunate to find someone with a similar passion for sponges and was able to set up a collaboration investigating the connectivity of Sub-Antarctic sponges

and how their environment

shifts with climate change.

Raquel’s two most memorable moments include South Georgia and Bouvetoya Islands. “Upon

arriving at King Edward Point,

South Georgia, we were all allowed to go onto the island. From fur seals asserting their dominance by chasing me, hearing the calls of the king penguins and swimming in an icy lake, it was quite the experience! Bouvetoya was equally amazing. On our second day there, we got the opportunity to bucket sample from a zodiac 100 m from the most remote landmass in the world. Seeing the harsh landscape of the island close up was truly incredible.”

This trip was spectacular, the raw beauty striking, and it really placed our work and what we were doing on the edge of the Earth into perspective. We were fortunate to visit and sample remote places and have been able to acquire the most incredible data set. We were able to do all this with the most amazing group of people who very quickly turned into family, and hilarity ensued as we bobbed around the Southern Ocean in our beloved “Treshy”.

Boarding the ship, I was an inexperienced, fresh-faced oceanography student. Disembarking the ship, I am still an oceanography student but with a Masters degree in pump maintenance, plumbing, troubleshooting and a renewed appreciation for duct tape and cable-ties. ☞



Research Vessel *Akademik Treshnikov*

# Marine spectra unite at CMR Symposium

By  
**Liza Rishworth &  
Janine Adams**

*Institute for Coastal and  
Marine Research*

The Institute for Coastal and Marine Research (CMR) hosted a hugely successful Symposium on 20 April 2017. The CMR is a research institute of the Nelson Mandela Metropolitan University that conducts cutting edge research, builds capacity and advances our understanding of the coastal and marine environment to serve the needs of South Africa, the continent and beyond, in a sustainable manner. The CMR strives for excellence in interdisciplinary research and training related to coastal and marine environments. The objective of the Symposium was to showcase the impact of research across disciplines and faculties, and to identify opportunities for collaboration within the CMR's three research themes: Living Resources and Food Security, Biodiversity and Conservation, and Global Change.

Since 2016, the CMR has been a University-wide Institute outside of the Science Faculty. This Symposium was the first large, public event arranged by the CMR since its re-establishment and it was attended by not only NMMU staff

and students, but also by external stakeholders from the Nelson Mandela Bay Metro, the Department of Agriculture, Forestry and Fisheries, DEDEAT, SANCOR,

SANParks, Rhodes University, SAEON, SAIAB, consulting companies and others. Of the six NMMU Faculties that fall under the CMR, four were represented at the Symposium. These were: Arts, Business and Economic Science, Law and Science.

The Symposium programme was packed with 23 presentations of 10 minutes each that were related to the coastal environment and marine issues. The presenters were top CMR academics and post-graduate students from the Departments of Botany, CEO Management, Development Studies, Law, Political and Conflict Studies, Sociology and Anthropology and Zoology. Four SARCHI Chairs fall within the CMR, and each was represented at



Deputy Vice-Chancellor: Research and Engagement Prof Andrew Leitch giving the welcoming speech. Photo by Leonette Bower.

the Symposium. In addition, presentations from the Centre for Coastal Paleoscience (CCP), the Sustainability Research Unit (SRU, based in George), the Marine Apex Predator Research Unit (MAPRU) and SAEON were also delivered. Prof Andrew Leitch (DVC: Research & Engagement) opened the day with a welcoming speech, and he elaborated on the importance of the cross-Faculty, and multi-disciplinary research done by CMR members, especially in light of the move to the new Ocean Sciences Campus later in 2017.

Highlights from the day were learning about the living stromatolites on NMMU's doorstep and finding out about the Eastern Cape Abalone Ranching Project and how this can influence

industry. Prof Mike Roberts, SARChI Chair: Oceanography and Food Security, had a 30 minute session to discuss his exciting new programme, called SOLSTICE (Sustainable Oceans, Livelihoods and Food Security through Increased Capacity in Ecosystem Research in the Western Indian Ocean). Furthermore, the Law Faculty was well represented by Prof Patrick Vrancken (SARChI: Law of the Sea) and two LLM post-graduate students that brought the very interesting and different perspectives of ocean governance to the Symposium. Ms Barbara Kritzinger's background video on coral reefs and her essay on examining the symbolic representations of rivers and seas appealed to the creative side of all in attendance. The CMR is fortunate to count Prof Nadine Strydom, recipient of the NMMU Researcher of the Year award for 2016, as one of its active members. Prof Strydom presented on the current advances in early stage fish research at NMMU.

The NMMU VC, Prof Derrick Swartz, was able to join the Symposium for a brief period and he was astounded that the 90-seater NMMU Council Chamber was filled to capacity, with people sitting on additional seating along the side of the venue during all three sessions. Many compliments and comments of appreciation were received:

- "Thank you for a most interesting meeting. Very well run and definitely something that should be held annually.";
- "Symposium showcased 'the depth of the intellectual enquiry and the drive towards a multidisciplinary approach' that is taking place in the Institute.";
- "I really enjoyed the day, seeing the large variety of work CMR/NMMU is doing in the marine environment.t";
- "Just wanted to congratulate you and the team on an outstanding success with the symposium yesterday - it was truly impressive and a feather in the cap for marine science at NMU.";
- "The symposium was well organised and a great experience. It combined an emphasis on empirical rigour within an informal yet respectful atmosphere. Good for emerging Researchers to get their feet wet."

After the success of this Symposium, the CMR plans to make this an annual event.

Operation Phakisa opens up many opportunities for the CMR, as is evident when a range of experts from such a wide field of expertise come together to see how collaborations on marine



Interested audience. Photo by Leonette Bower.

and coastal projects can be forged. The CMR is continually identifying gaps in knowledge and research, and this is why much effort is put into investigating and planning aquaculture ventures through the Living Resources and Food Security research theme in an attempt to contribute to the goals set by Operation Phakisa. The SARChI Chair in Marine Spatial Planning (under the leadership of Prof Amanda Lombard), alongside the development of the Marine Spatial Planning Masters programme, could also play a part in meeting Operation Phakisa targets. Furthermore, many CMR members act as consultants in their various fields, and collaborations with specialists in many disciplines need to be established in order to develop South Africa's Blue Economy in a sustainable manner. ✎

## *Nelson Mandela University launches dedicated Ocean Sciences Centre of Excellence*

With five of its seven campuses located a few hundred metres from the sea and within 25km of two major ports, Nelson Mandela University's involvement in the blue economy is inescapable.

In 2014, the South African government launched the bold Operation Phakisa growth strategy, under the guidance of the National Development Plan, to harness the largely untapped potential of the blue or oceans economy.

The blue economy was identified as the next major injector to the country's gross domestic product (GDP), with the potential to create up to a million jobs and contribute R177-billion to the economy by 2033. These ambitious targets, however, cannot be met without increasing and improving the skills pool available to the marine and maritime industry.

As one of only six comprehensive universities in South Africa, Nelson Mandela University has the capacity to provide a broad menu of programmes in a wide range of fields from certificate to doctoral level.

Mandela University is recognised for its leadership in generating cutting-edge knowledge and innovation that will make a positive contribution to realising the

economic potential of our oceans whilst protecting South Africa's rich marine biodiversity.

This, through the long-awaited new Ocean Sciences Campus, situated at the old CSIR building in Port Elizabeth, was launched on 22 September 2017.

The campus is essentially a dedicated ocean sciences centre of excellence that will foster transdisciplinary research and innovation, with a postgraduate focus, necessary to address the ecological, economic and social sustainability challenges of the oceans.

The new campus, like the recently launched Nelson Mandela University name, is part of the trajectory that has its roots in the institution's 2020 vision and strategy, birthed in 2010. The vision and strategy whose formulation and execution, led from the outset by now outgoing Vice-Chancellor Prof Derrick Swartz, aims to reposition the University in South Africa, Africa and the world.

Prof Swartz has been the driving force behind the University's bold new Ocean Sciences Strategy, which arises from his passionate belief that Mandela



University enjoys a number of competitive advantages enabling it to become the leading Ocean Sciences university on the African continent.

These include its geographical location on the Eastern seaboard, in a major port City (Port Elizabeth) with two major harbours, over forty years of ocean sciences expertise, the establishment of a dedicated new Ocean Sciences Campus, and roll-out of an exciting new generation of ocean sciences academic programmes.

The campus is part of a broader repositioning that is anchored in reimagining the academic project, which entails, among others, and as articulated by Prof Swartz, the following:

- reinvigorating curriculum renewal to equip graduates to contribute to issues of social justice, democracy, equality, sustainability, ecological justice, globalisation, technological change and the changing nature of work;
- establishing faculty transformation

committees, involving students and staff facilitating co-creation of curricula, teaching and learning methods, and innovative research and engagement practices; and

- orientation workshops for all academics to embrace the new knowledge and curriculum paradigm.

“To this end, the University has adopted a bold new Ocean Sciences strategy to drive a new research, training and innovation agenda to help find better tools for managing the twin challenges of human development and ecological sustainability,” says Prof Swartz.

“In this context, we have begun to expand academic offerings in fields such as oceanography, marine engineering, maritime economics and logistics, marine tourism, port development and management, marine spatial planning and the law of the sea, including fisheries law enforcement.

“In the next few years, we hope to recruit a new generation of smart students, academic staff and researchers to get top-class training in critical fields.”

The University has extensive linkages with both industry and the public sector

and is the proud host of the headquarters of the South African International Maritime Institute (SAIMI), which has been established through funding support from national government to coordinate the development and implementation of a national maritime skills development plan.

Mandela University looks forward to taking critical steps in a collective effort to help the country and continent take its rightful place in the blue economy through its new Ocean Science Campus.

[Press release available here.](#) 

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