South African Network for Coastal and Oceanic Research

SANCOR'S CURRENCY AND STRENGTH IS INFORMATION

SANCOR Newsletter

South Africa – home to the world's most endangered seahorse

Many divers, particularly photographers, have a bucket list of all the species they want to see before age catches up with them and diving is no longer an option. Back in 2009, I drew up my own personal bucket list of the 10 marine species that I wanted to photograph before I turned 50. The #2 species on my list is the world's most Endangered seahorse, the Knysna seahorse (*Hippocampus capensis*).

This January, I was invited to take part in a research project on the Knysna seahorse in South Africa, so I jumped at the opportunity. My destination was the small coastal town of Knysna, on the southern coast of Africa, where I spent some time with Dr Louw Claassens. Louw is one of the leading authorities on the Knysna seahorse, having spent the past 4 years studying the species as part of her PhD. She is now the Director of the Knysna Basin Project: an environmental NGO focused on continued research within the Knysna Basin - one of South Africa's most important estuaries
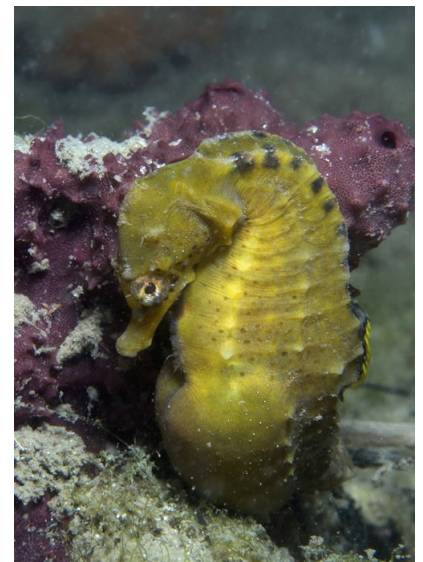
Pregnant Knysna seahorse male on purple sponge habitat. Photo by David Harasti.

(www.knysnabasinproject.co.za). Louw investigated how artificial structures, such as marinas, influence where we find seahorse species and how many we find. Information from her project is used to manage the Knysna seahorse and reduce the chance of it going extinct in the wild. I was fortunate to spend two days in Knysna where I managed a few dives to check out the Knysna seahorse and see what was contributing towards making it the most endangered seahorse in the world.

So, what makes the Knysna seahorse so endangered? It has a very limited distribution, which is the main reason it is 'Endangered' on the IUCN Redlist. We have found it in only three estuaries (in the world): Keurbooms estuary in Plettenberg Bay, the Knysna estuary, and the estuarine portion of the Swartvlei system in Sedgefield. Within these South African estuaries, the habitats that they rely on, such as seagrass and algae, are under threat from sedimentation, boating activities, expanding coastal developments, and more specifically, nutrient enrichment in the Knysna estuary causing displacement of the eel grass by nuisance algae. This is why Louw's research on the role of

artificial structures in conserving the Knysna seahorse is so important. If the natural habitats continue to decline, perhaps the seahorses can be conserved through the installation of artificial habitats? Louw's research addressed this question by assessing the effects of a new marina estate development on the Knysna seahorse.

Her research focused on the Thesen Islands residential marina estate, located in the eastern section of the Knysna estuary. Building of the estate began in 2000 and ended in 2005. What sets this marina apart from conventional developments is that the canals were made out of Gabions and Reno mattresses (wire boxes filled with rocks). Louw found significantly higher densities of seahorses on artificial Reno mattresses compared to nearby vegetation. The reason for the higher occurrence of seahorses on the artificial habitats over the natural habitats was unknown, but she speculated that perhaps there weren't enough natural habitats available, so the seahorses moved onto the artificial structures - so she set out to test this.

Mouth of the Knysna estuary. Photo by David Harasti

This is the main seahorse survey area in the marina. Photo by David Harasti.
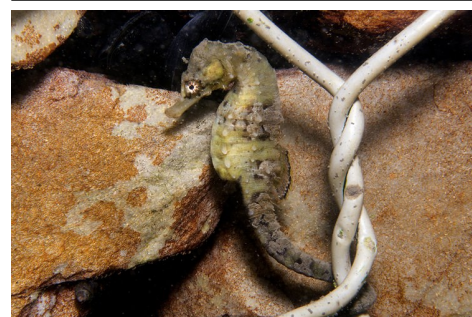
Female Knysna seahorses using reno mattress . Photo by David Harasti.

Reno mattress habitat within the marina. Photo by David Harasti.

Louw did a controlled experiment, where seahorses could choose between natural seagrass vegetation (*Zostera capensis*) and artificial Reno mattress habitat. She found that the Knysna seahorses were more likely to move away from the seagrass habitat onto the Reno mattress or remain on the Reno mattress. Reno mattress seems to provide more areas for seahorses to hold on to, as well as protection from predators, with all its nooks and crannies.

Now, Louw wants to find out how many Knysna seahorses live in the Knysna and Keurbooms estuaries. This baseline information on the actual numbers of seahorses occurring in the estuaries is important so that in the future we can see if the populations are recovering or continuing to decline. While estimating numbers of seahorses in the wild is very challenging it can be done - through a mark-recapture process. This is where I come in. I showed Louw how to mark seahorses with their own identification marks using a material known as VIFE (visible implant fluorescent elastomer). Each seahorse is injected with three little marks, approximately 1 mm in length (see photos below for example). These marks sit just under the skin of the seahorse and placed on various locations of the body - allowing each individual seahorse to be uniquely identified. (Note that seahorses are not harmed during this process).

In addition to obtaining population estimates, marking seahorses allows us to monitor each seahorse over long periods. In my study of another Endangered seahorse – White's seahorse (*Hippocampus whitei*) in Australia - I was thrilled to find seahorses marked with VIFE living in the wild up to five years after initial capture. We don't know if the Knysna seahorse likes to stay in the same place, or whether it is more of a 'roamer' that moves around the estuaries. Louw is hoping that the individual marking of Knysna seahorses will help us find out. With assistance from the Konrad Taeuber Trust and the Rufford Foundation, Louw will be doing diving surveys over the next 12 months to understand better the species' movements, home range and population abundance.

While this South African visit provided me with the opportunity to tick off the #2 species on my bucket

Marking of Knysna seahorse using elastomer.

Female Knysna seahorse with three red elastomer marks.

Knysna seahorses using *Caulerpa* algal habitat. Photos by David Harasti.

list, it became so much more than a photography excursion. Observing this species up close in the wild and seeing how incredibly fragile its habitats are made me realise how important people like Louw, and the role she plays, are in ensuring its ongoing survival. We all need champions – even seahorses. At the end of the day, we have a responsibility to make certain that the Knysna seahorse doesn't become the first seahorse to go extinct in the wild.

Dr Dave Harasti is a marine scientist in Australia who specializes in research on threatened marine species and marine protected areas, and is a member of theIUCN Seahorse, Pipefish and Stickleback Specialist Group. He is also an iSeahorse National Seahorse Expert for Australia.

Source:

Harasti, D. (2018, August 29). South Africa – home to the world's most endangered seahorse. Retrieved from http://www.projectseahorse.org/blog/2018/8/29/south-africa-home-to-the-worlds-most-endangered-seahorse ✄

The blue in blue diamonds could be from the sea

Blue diamonds get their colour from small quantities of boron, a chemical concentrated in Earth's crust, trapped within them. But we know diamonds form in Earth's mantle – well below the crust – where temperatures and pressures are high enough to forge these hardest of stones.

So how, then, does boron land up in blue diamonds?

Diamonds are composed almost entirely of carbon, but trace quantities of other elements can give them colour; without these ele-ments, diamonds are colourless. Boron imparts a blue colour, where-as nitrogen, for example, gives a yellow hue.

Blue diamonds, like the famous Hope diamond, have long been con-sidered unusual, but exactly how or where they are formed has remained unknown.

A new study involving UCT geolo-gist Professor Steve Richard-son reveals that a geological convey-or-belt transporting minerals from the bottom of the ocean into Earth's deeper mantle could explain how the

One of the blue diamonds with mineral inclusions that was examined as part of this research, which investigated the origin of these gems.

boron ended up in these diamonds. [The article](#) was published in the journal *Nature* on 1 August 2018.

For the study, an international team of researchers, including Richardson, analysed the minerals trapped in 46 blue diamonds. Their results show that the diamonds likely formed in Earth's lower mantle, as much as four times deeper than most other diamonds. Their analysis also suggests that the material from which the diamonds formed contained water and came from the tectonic plates beneath the world's oceans.

Blue diamonds, they posit, grew in the presence of rocks that were once a part of the ocean floor.

Plate tectonics describes the large-scale movement of the pieces of crust that make up Earth's outer shell and overlie the more plastic mantle. These plates move relative to each other and interact along their boundaries. At one type of site where tectonic plates collide, called a subduction zone, an oceanic plate is forced under another plate.

"A couple of years ago, we found that the world's largest and most valuable gem diamonds, like the 3 106-carat Cullinan, formed from metallic liquid deep in the Earth's

mantle transition zone," says Richardson.

These enormous and irregularly shaped diamonds that lack nitrogen contamination – and are colourless – were given the name CLIPPIR (Cullinan-like, large, inclusion-poor, relatively pure, irregular shaped and resorbed) diamonds.

"We then speculated that blue diamonds, which also tend to be large, could be part of the same story as the CLIPPIR diamonds," explains Richardson. "They have boron in them, but no nitrogen either.

"This would mean that they might also be from very deep and the boron in them might be recycled boron because it's an element

that's not very common in the mantle, whereas it's concentrated in the crust."

The findings mean that blue diamonds are some of the deepest ever found. Moreover, they reveal a geochemical pathway that extends from the Earth's crust – at the bottom of the oceans – into the lower mantle and provides a potential route for the cycling of Earth's water.

Source:

(2018, August 7). The blue in blue diamonds could be from the sea. Retrieved from https://www.news.uct.ac.za/news/research-office/-article/2018-08-07-the-blue-in-blue-diamonds-could-be-from-the-sea ⌀
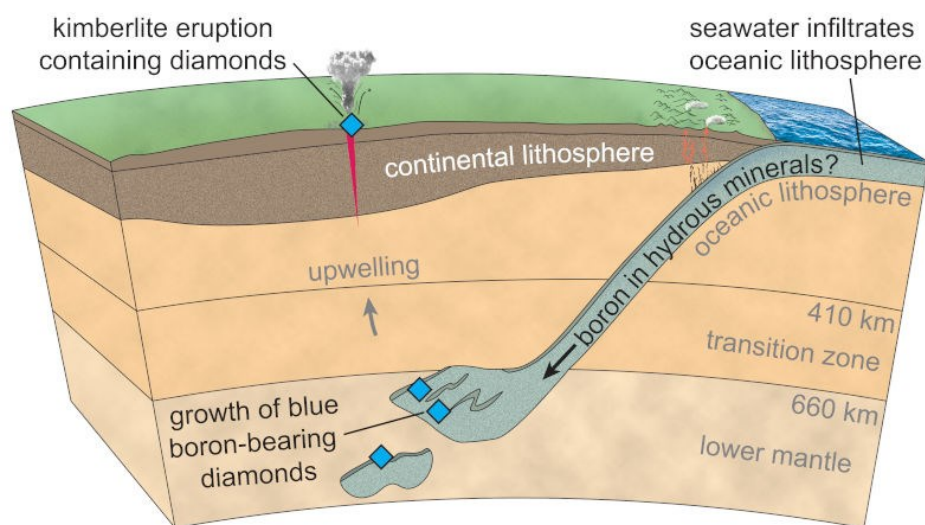
A cross section of Earth's layers showing how minerals could be transported from the crust to deeper layers where blue boron-bearing diamonds form. This study proposes that the boron might have originally been from the ocean. Illustration Evan M. Smith/© 2018 GIA.

Text mining of abstracts from more than 30 years of publication of the African Journal Marine Science

By
Dawit Yemane

Department of Agriculture Forestry & Fisheries

Background

The review of existing literature is a starting point for all scientific studies as it provides a basis from which to identify gaps in knowledge (and hence to indicate what the new study intends to achieve) and to generate new hypotheses. Over time the total number of publications, in all scientific fields, has increased substantially, to a point where conducting an exhaustive literature review is becoming difficult. Currently, although not as a replacement but rather as a complement to the traditional literature review, the use of quantitative literature reviews (or text mining) is becoming a common occurrence (especially in the social and medical sciences). Quantitative literature review is broadly the combined use of automated text extraction and a range of machine learning tools to synthesize relevant information from massive collections of abstracts or of the full content of published literature.

Most research is largely based on what is known as structured data, of which there is a range of examples in all scientific disciplines, e.g. catch data from surveys. But there is a large amount of information/knowledge locked in written documents (including both scientific and non-scientific publications) that is known as unstructured data. In the past, information from unstructured sources was synthesized manually, which was fine when dealing with limited numbers of publications but almost impossible when dealing with thousands or millions of publications. The process of synthesizing/extracting of relevant information from text data is generally referred to as text mining.

The main aim of this work was to identify major themes across all papers published in the *(South) African Journal of Marine Science*, and trends in these themes over time. Abstracts published since the first volume of the journal in 1983 were collected from an online source and analyzed. Extended version of this demo, accompanying R code and the rmarkdown files can be found in my github repository [https://github.com/DawitYemane/AJMS_abstract_textMining].

Methods

The data-analysis approach adopted here is commonly used for the analysis of text in various disciplines. The process of text mining starts with: (i) accessing the text data (usually done programmatically); (ii) reading and processing text data; (iii) exploratory analysis (e.g. word clouds); and (iv) depending on the study objective, the application of different types of modelling. Usually there is an interest in extracting from the collection of text data the underlying structure – when this exists – as sets of topics/themes. There are sets of models/algorithms that are commonly utilized for this purpose and that are generally referred to as *topic models* or *concept mapping models* (Ponweiser 2012; Nunez-Mir et al. 2016). The most common topic model is Latent

Dirichlet Allocation (LDA), which is widely used across a range of disciplines (Silge and Robinson 2016; Ponweiser 2012). In principle, topic modelling is the same as the clustering methods applied to numerical data.

To use *LDA* one needs to specify the desired numbers of topics/themes into which to split the text collection. There is a range of algorithms/metrics that one can use identify optimal number of clusters. The automated method of topic selection employed here used the *CaoJuan2009* (Cao *et al.* 2009) algorithm in the ldatuning package (Nikita 2016) in R (R Core Team 2018).

Data analysis

The whole process from data collection to analysis can be summarised as follows:

1) The abstracts used in this analysis were extracted using a Mendeley desktop [http://www.mendeley.com/] as BibTex files.

2) The content of the .bib file was read and converted to a data frame in R.

3) Standard text-mining approaches were applied to first split each abstract into words, then to remove 'stop' words (these are words that are unnecessary e.g. *is, was, are, to, and, …* etc.).

4) Conduct exploratory analysis(e.g. single-word word clouds and pairs-of-words word clouds or bigram clouds)

5) Perform topic (modelling this included selection of the optimal number of topics, fitting LDA, and extracting and summarising the results).

Result and discussions

Figure 1 shows the bigram plot, frequency of pairs words, based on all the abstacts. It highlights that overall the most common words are *South Africa, West coast, Kwazulu natal, sardinops sagax, marine protected, african penguin, rock lobster.* This suggests that most of the publications are from, or focused on, the marine environment of South(ern) Africa.

Time-series of the numbers of papers on each of the topics are given in Figure 2. As can be seen

Figure 1: Word clouds of bigrams (word-pairs) based on all the papers published in *AJMS* since inception in 1983.

from Figure 2, for most of the themes/topics identified the numbers of papers were variable but largely stable.

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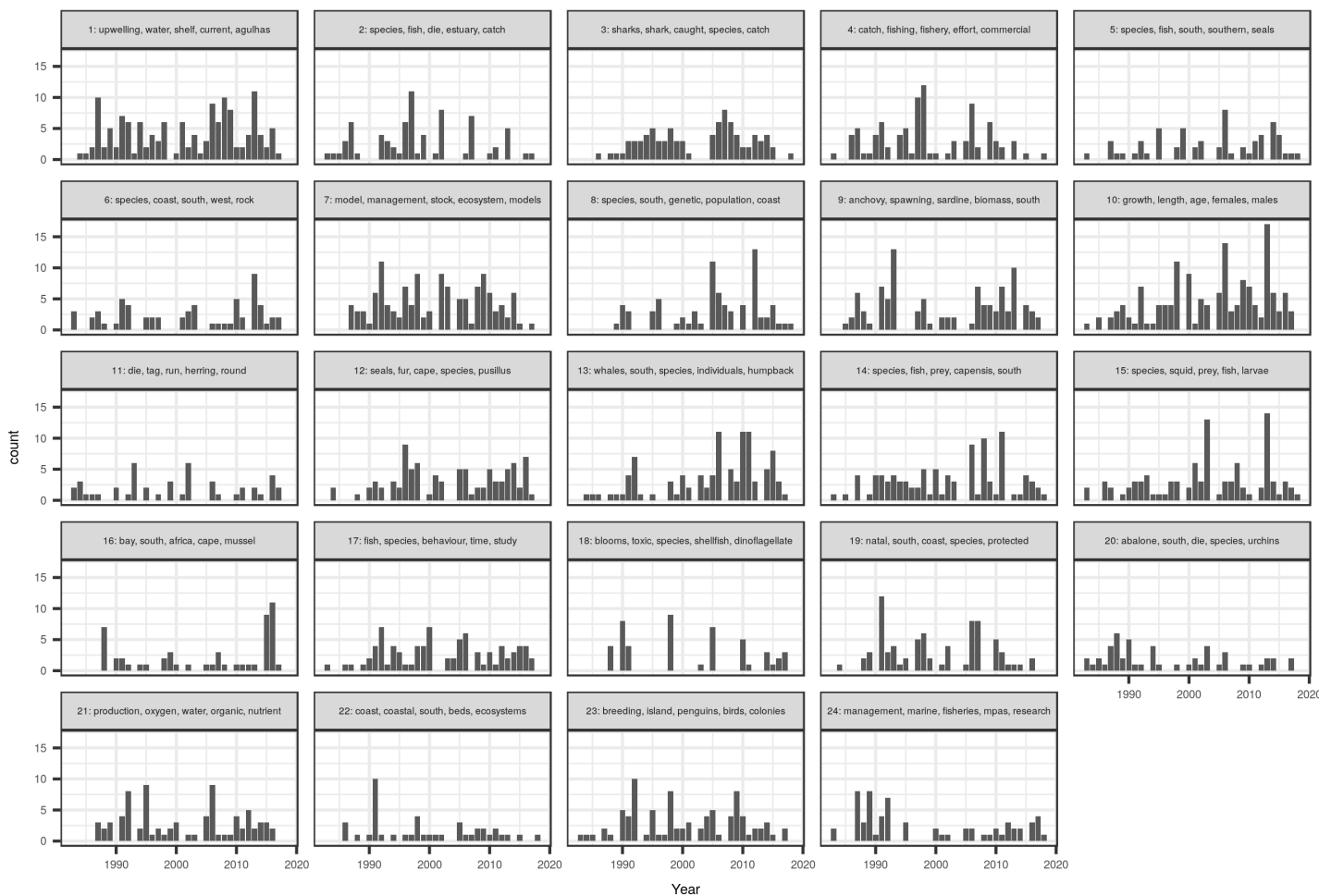

Figure 2: Time-series of the numbers of publications that fall in each of the topics identified.
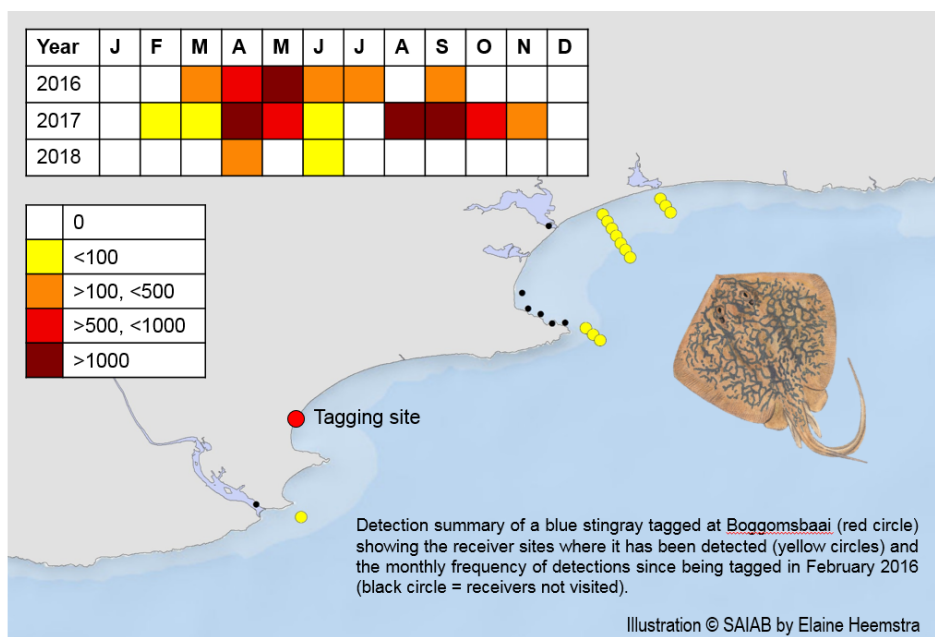
ATAP Anecdotes: The stingray tales

By

Taryn Murray, Matt Parkinson & Paul Cowley

South African Institute for Aquatic Biodiversity

Year	J	F	M	A	M	J	J	A	S	O	N	D
2016												
2017												
2018												

	0
	<100
	>100, <500
	>500, <1000
	>1000

● Tagging site

Detection summary of a blue stingray tagged at Boggomsbaai (red circle) showing the receiver sites where it has been detected (yellow circles) and the monthly frequency of detections since being tagged in February 2016 (black circle = receivers not visited).

Illustration © SAIAB by Elaine Heemstra

Chondrichthyans, including rays, evolved at least 420 million years ago. Despite them being one of the most speciose lineages of predators on the planet, overfishing and habitat degradation have profoundly altered populations of many species. The relative extinction risk of this group was assessed using the Red List Categories and Criteria of the International Union for the Conservation of Nature (IUCN). Overall, it was estimated that 25% of chondrichthyans are threatened worldwide, and more concerning is that almost half (46.8%) are considered to be Data Deficient, meaning that information on these species is insufficient to assess their status (Dulvy *et al.* 2014).

A group of ATAP researchers initiated a stingray-tagging project aimed at improving our understanding of the movement behaviour of these animals, particularly blue stingrays, diamond rays, duckbill rays and eagle rays. According to the IUCN Red List, all are considered to be data deficient, while blue stingrays are considered to be least concern. Conventional dart tagging appears to be an inappropriate method with which to assess the movement behaviour of these animals, mostly because less than 1% of all rays tagged by anglers in the Oceanographic Research Institute's Cooperative Fish Tagging Project (ORI-CFTP) have been recaptured. This is more than likely due to tag shedding. Enter acoustic telemetry! Internally-equipping stingrays with transmitters not only prevents tag shedding, but also enables animals to be tracked for multiple years by using long-life transmitters.

To date, 55 stingrays have been acoustically tagged – 22 blue stingrays, 14 diamond rays, 13 duckbill rays and 6 eagle rays. Some individuals are already moving further than has ever been recorded! For example, the maximum distance travelled according to the ORI-CFTP for a duckbill ray is 123 km. However, a duckbill ray acoustically tagged on 18 October 2016 at Cape Infanta near the mouth of the Breede Estuary (Western Cape), was recorded moving all the way to Kei Mouth (Eastern Cape) approximately

850 km away – seven times further than previously recorded! This particular animal, being detected 1373 times, initially spent approximately three months in the Cape Infanta area, before disappearing from the array and reappearing in Mossel Bay (± 140 km eastwards) on 02 May 2017. Four days later, it was detected in Plettenberg Bay (a further ± 130 km eastwards), moving at an average speed of 1.35 km/h. It continued moving eastwards, passing Port Alfred on 31 May 2017 before reaching Kei Mouth on 09 June 2017. It then turned around and headed westwards, being detected in Algoa Bay on 25 July 2017, in Plettenberg Bay where it spent most of August 2017, in Mossel Bay on 05 September 2017, and finally back to Cape Infanta where it appeared to spend most of the summer 2017/18 (between 13 September 2017 and 24 February 2018). It was last detected on 05 May 2018 in Mossel Bay. A-ray-zing or what?

In contrast to this highly mobile animal, a blue stingray tagged in Boggomsbaai, Vleesbaai (Western Cape) on 26 February 2016 has revealed extreme resident behaviour. To date, it has been

	Blue stingray *Dasyatis chrysonata*	Diamond ray *Gymnura natalensis*	Duckbill ray *Aetomylaeus bovinus*	Eagle ray *Myliobatis aquila*
RED LIST	Least concern	Data deficient	Data deficient	Data deficient
SAAMBR / ORI	3176 tagged, 10 recaptured, 0.31% recap. rate — Max. distance 234 km	3418 tagged, 25 recaptured, 0.73% recap. rate — Max. distance 1756 km	1097 tagged, 10 recaptured, 0.91% recap. rate — Max. distance 123 km	613 tagged, 4 recaptured, 0.65% recap. rate — Max. distance 49 km
Acoustic Tracking Array Platform	22 tagged, 2558 detections — Max. distance ±50 km	14 tagged, 687 detections — Max. distance 570 km	13 tagged, 16690 detections — Max. distance 850 km	6 tagged, 518 detections — Max. distance ±50 km

Illustrations © SAIAB by Elaine Heemstra

detected 2491 times, mostly on receivers in Mossel Bay. It was first detected in Mossel Bay on 19 March 2016, and was detected here periodically for six months before going undetected from 19 September 2016 until 21 February 2017. It was once again detected in Mossel Bay for almost nine months, before disappearing from the array on 07 November 2017. It reappeared off the Gouritz Estuary mouth on 01 April 2018 and moved back into Mossel Bay, where it was last detected on 22 June 2018.

This exciting project has already revealed new insights into the movement behaviour of data-deficient stingray species. The research team aim to tag more stingrays over the upcoming summer season.

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Exposure to SEAmester III – SA's class afloat

By

Zingisa N. Gono

Department of Biological and Environmental Science,

Walter Sisulu University

SEAmester is South Africa's first floating university aimed at introducing postgraduate students and interns from over 20 institutions to marine science. Combining deck work with theoretical class room learning, SEAmester began in 2016 and is now in its 3rd year. Here participants from different backgrounds, races and cultures get a chance to be hands-on on ship-based deck. The research platform used is the South African polar research vessel the *SA Agulhas II*. It is well equipped for all the marine research operations such as CTD (an oceanography instrument used to measure the conductivity, temperature and pressure of seawater), bongo nets and a benthic dredge – instruments used to collect biodiversity data, and other operations.

SEAmester III was successfully funded by Department of Science and Technology (DST), National Research Foundation (NRF), South African Environmental Observatory Network (SAEON) and Department of Environmental Affairs (DEA). Like the previous classes, SEAmester III was hosted aboard *SA Agulhas II*, this third class afloat took place between 16 – 26 July 2018. Students had to choose from the two module streams (oceans in a changing world and tools of the trade) prior to the cruise. Lectures and deck work was structured according to each module stream, and both streams were given enough time for deck work and lectures. Each stream was crewed with some of South Africa's best
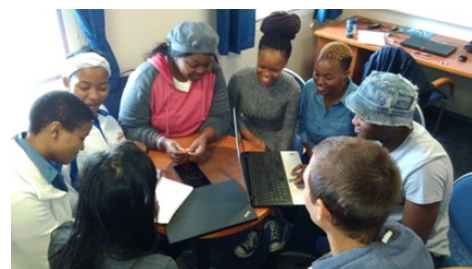
A small group of participants working on their mini project.

specialist researchers. This years' class afloat was attended by 43 students from 20 universities (local and international). All participants had an equal opportunity to meet and learn from the reputable experts.

Local and international experts gave the participants a deeper

Participants -students and experts (picture by Alexander Oelofse).

understanding of ocean, not only through lectures but through evening talks too, furthermore the participants were also given mini projects to work on during the first week with supervision from their mentors and presented their findings – this helped the students to be able to work in teams.

Mandela Day was celebrated in style and that created unity among participants because they worked together using their creative skills to create a beautiful picture of tata Madiba. Participants had an opportunity to portray their understanding of ocean through art (they created two beautiful mosaic pieces of art) based on their different streams – this formed part of the creative activities. The participants did not only learn the scientific stuff, they also had time to relax – playing many games, which made them build new friendships and got to know each other better. The two module streams' participants captured their memorable moments and presented them in form of a movie at the end of the cruise. Participants also enjoyed setting up and taking sample pictures using foldscopes during their spare time.

Attending SEAmester helped me with a lot of information and training

Zingisa is a masters student at WSU. Her research focuses on the effects of land use on water quality in the Mthatha River.

such as how to take water samples for different aspects to be tested and how to measure oxygen in water samples, which will also help me on my own masters research which focus on water quality. Attending SEAmester III (SA's Class Afloat) has given the participants a memorable experience. A sincere gratitude goes to Prof Isabelle Ansorge (the founder/ visionary of SEAmester), her team (Captain, scientists, lecturers, technicians, ship crew etc) for making this opportunity exceptional and a success, participants extends thanks to all the lecturers for tirelessly sharing knowledge and experience with them, and Alex Oelofse for the beautiful photographs. ⌀

MCEN REGIONAL CONFERENCE

The Western Cape Marine & Coastal Educators Network (MCEN), a group of SANCOR, invites educators passionate about marine science, education and conservation to join them for its regional conference in Kalk Bay. There will be engaging practical sessions and an opportunity to connect and share ideas with professionals in the field of marine science education.

Event information

Saturday, 27 October 2018

Starts 8h30 for 8h50; Ends at 2pm

SOSF Shark Education Centre,

28 Main Rd, Kalk Bay

RSVP here

MCEN Western Cape Representative:

Dr Eleanor Yeld Hutchings

Penguin Promises – What were the results?

By

Judy Mann[1,2], Gabby Harris[1], Roy Ballantyne[2] & Jan Packer[2]

[1]*South African Association for Marine Biological Research, South Africa*

[2]*University of Queensland, Australia*

Our Challenge

To design a behaviour change campaign for an aquarium that would encourage visitors to increase their environmentally responsible behaviour at home.

Our Solution - Penguin Promises

Visitors were encouraged to 'Make a Promise to the Penguins' during their visit to uShaka Sea World, Durban, South Africa. A promise was a commitment by visitors to make one change in their daily lives to become more environmentally responsible. Visitors were then asked to hand write their behaviour change promise on a post card and post it on site. The campaign focused on love not loss with the tag line 'We don't want your money honey, we want your love'.

Encouraging long-term environmental behaviour change

Penguin Promises Case Study

From: MANN, J.B., BALLANTYNE, R. & PACKER, J. 2018. Penguin promises: encouraging aquarium visitors to take conservation action. Environmental Education Research, 24(6): 859-874

How can we encourage people to change their environmental behaviour at home?

Step 1: Visitors to the aquarium made an environmental promise.

4490 postcards were collected.

5974 promises were made.

We Don't want your Money Honey, we want your LOVE™

ENDANGERED SPECIES

Step 2: Follow - up survey.

4336 follow up emails 12 - 18 months later.

316 responses.

49% could explain something that they had done for the environment that they attributed to their visit.

21% shared environmental behaviour messages with others.

Why did they keep their promise?

"I was shocked how careless some people are so I would like to make a difference"

"Having kids and wanting to make the earth a better place for them"

"The African Penguin being placed on the red list"

"My love for animals and the ocean"

ENDANGERED

What made them keep their promise?

20% Emotional connection with the animals.

20% Feeling a responsibility towards future generations.

15% Appreciation for the animals.

9% Learning from interpretive signage.

I promise to separate house-hold garbage for easy recycling

What is your Promise to the Penguins? I Promise to: throw rubbish in the bin and not in water!

What seems to be working?

Building connections between promises and daily life is important.

Giving visitors an opportunity to reflect as they select a promise personal to them.

Writing a promise down formalises a commitment.

Emotions motivate behaviour.

Using an iconic animal gives the cause a "face".

Specific promises are easier to keep.

Post visit follow up communication reinforces the commitment.

A respondent said, "Thanks for interacting with me, just reminded me that I actually have a part to play in respecting our world."

SAAMBR — INCORPORATING — ORI OCEANOGRAPHIC RESEARCH INSTITUTE — uShaka SEA WORLD

Helping people to care for our ocean

Why African penguins?

The African penguin is endangered in the wild. uShaka Sea World has a thriving African Penguin breeding colony. Visitors love penguins.

Was the campaign successful?

Visitors who completed a card were contacted a year or more after their visit and asked about the outcomes of their promise. The results (N=316) showed that 49.4% of respondents could give an example of something positive they had done for the environment, that they attributed to the campaign.

What did we learn?

By working out what encouraged visitors to make and keep their promises, this study provided us with a number of important principles that should be considered in the design of future environmental behaviour change campaigns at nature based tourism facilities.

Journal Reference:

Judy Brenda Mann, Roy Ballantyne & Jan Packer (2018) Penguin Promises: encouraging aquarium visitors to take conservation action, *Environmental Education Research*, 24:6, 859-874, DOI: 10.1080/13504622.2017. 1365355   ∅

What do recreational fishermen in KwaZulu-Natal, South Africa really think?

By
Bruce Mann &
Judy Mann-Lang
South African Association for Marine Biological Research

The Challenge

Recreational fishing is a popular pastime in South Africa and it is estimated that over 1.3 million South Africans go fishing for fun. While each fisherman may only return home with a modest catch, collectively their impact on fish populations can be considerable. While a great deal of research has, in the past, been focussed on the biology and stock assessment of the fish populations, it is clear that without a better understanding of the fishermen themselves, effective management of this fishery is not possible. Appropriate social aspects including knowledge, attitudes and behaviour of recreational fishermen is needed.

Our Solution

Scientists in the Oceanographic Research Institute (ORI) in Durban,

South Africa initiated a project to complement existing recreational fisheries research, through the analysis of demographic and psychographic angler attributes collected from two independent, shore-based snap-shot monitoring surveys conducted on the KwaZulu-Natal (KZN) coastline between 1994-1996 and 2009-2010 respectively.

The Results

Results showed that there were significant changes in the demographics of anglers (including ethnic composition, age distribution, years of fishing experience and employment status) participating in the KZN shore-based linefishery between the two surveys. Traditional management regulations (minimum size limits, daily bag limits and closed seasons), whilst appearing to have support, have had limited effectiveness, based on the increased levels of admitted non-compliance and poor knowledge of regulations for target species. Anglers in both surveys believed that catches had declined over the years, with overfishing being the most common reason given.

What Next?

As management of the recreational fishery in KZN has changed dramatically over the past few years, the results of this study provide an important baseline from which to assess the impact of these changes. The paper discusses the very serious implications of these changes for both fish populations and the people who rely on them and makes suggestions on how to improve management going forward.
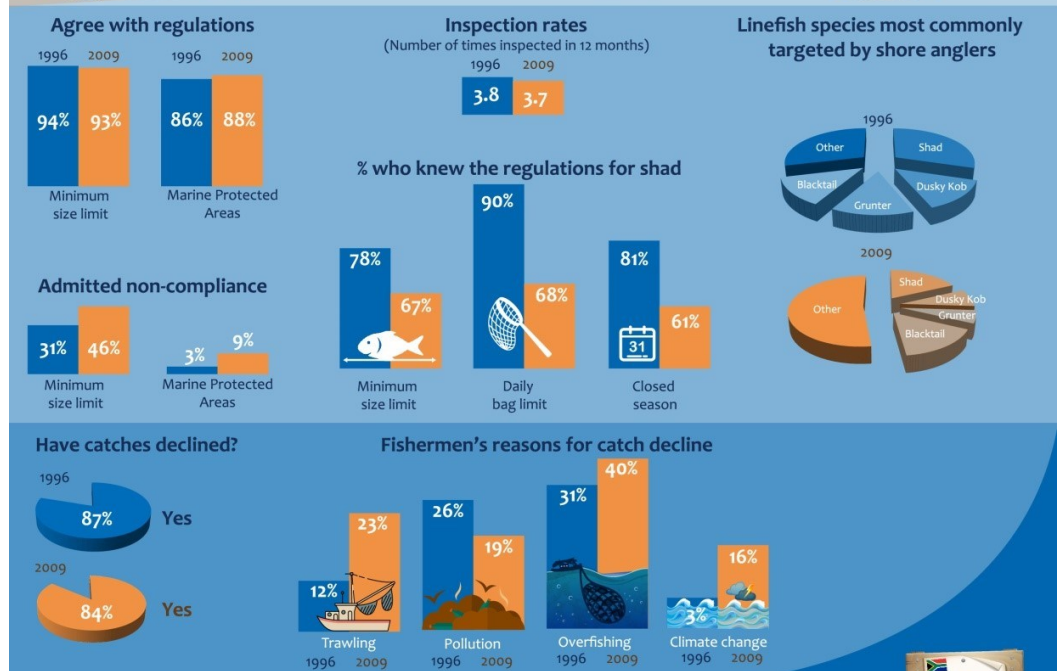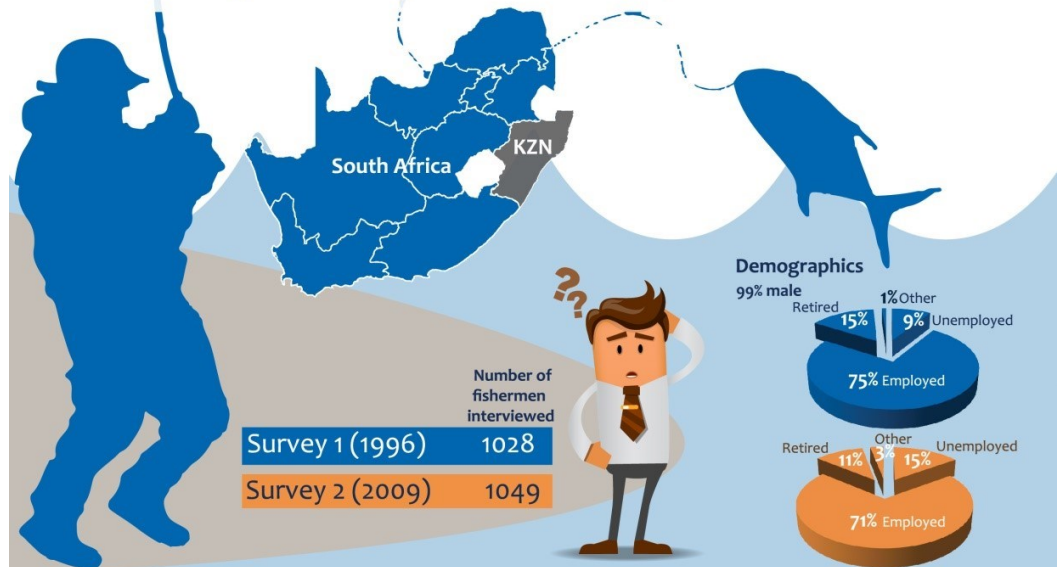
Journal Reference:

RW Kramer, BQ Mann, SW Dunlop, JB Mann-Lang & D Robertson-Andersson (2017) Changes in recreational shore anglers' attitudes towards, and awareness of, linefish management along the KwaZulu-Natal coast, South Africa, *African Journal of Marine Science*, 39:3, 327-337, DOI: 10.2989/1814232X.2017.1373704

What do recreational fishermen in KwaZulu-Natal, South Africa really think?

From: RW Kramer, BQ Mann, SW Dunlop, JB Mann-Lang & D Robertson-Andersson (2017) Changes in recreational shore anglers' attitudes towards, and awareness of, linefish management along the KwaZulu-Natal coast, South Africa, African Journal of Marine Science, 39;3, 327-337

To manage fisheries we need to understand fishermen. Analysis of data collected during two independent, shore-based snapshot surveys revealed changes over time in fishermen demographics and attitudes.

Number of fishermen interviewed
Survey 1 (1996)   1028
Survey 2 (2009)   1049

Demographics
99% male
1996: Retired 15%, Other 1%, Unemployed 9%, Employed 75%
2009: Retired 11%, Other 3%, Unemployed 15%, Employed 71%

Agree with regulations
1996 / 2009
Minimum size limit: 94% / 93%
Marine Protected Areas: 86% / 88%

Admitted non-compliance
Minimum size limit: 31% / 46%
Marine Protected Areas: 3% / 9%

Inspection rates
(Number of times inspected in 12 months)
1996: 3.8   2009: 3.7

% who knew the regulations for shad
Minimum size limit: 78% / 67%
Daily bag limit: 90% / 68%
Closed season: 81% / 61%

Linefish species most commonly targeted by shore anglers
1996: Other, Shad, Blacktail, Grunter, Dusky Kob
2009: Other, Shad, Dusky Kob, Grunter, Blacktail

Have catches declined?
1996: 87% Yes
2009: 84% Yes

Fishermen's reasons for catch decline
Trawling 1996 12% / 2009 23%
Pollution 1996 26% / 2009 19%
Overfishing 1996 31% / 2009 40%
Climate change 1996 3% / 2009 16%

So what?
- Most fishermen say that they support the regulations.
- Many admit to catching over the daily bag limits and keeping undersized fish.
- Knowledge of the regulations is decreasing.
- Marine Protected Areas are supported and respected by fishermen.
- Most fishermen think that catches have declined and blame this on overfishing.
- More effective communication of the fishing regulations and the reasons for the regulations is needed.

Fishing Regulations

Helping people to care for our ocean

National Science Week
2018 theme: "Deepening our democracy through science"

By
Lucky Dlamini
South African Institute for Aquatic Biodiversity

The South African Institute for Aquatic Biodiversity (SAIAB) has once again participated in the countrywide celebration of science. National Science Week (NSW), an initiative of the Department of Science and Technology (DST), kicked off on 29 July and ended on 4 August. Invited to participate by the South African Environmental Observation Networks (SAEON) Elwandle Node in its NSW activities during this week, SAIAB popularised aquatic science to grade 9, 10 and 11 learners from high schools in Port Elizabeth and the small town of Paterson.

As a participant in the four-year Horizon 2020 project, NUCLEUS, (http://www.nucleus-project.eu/), SAIAB aims to make Responsible Research and Innovation a reality. Part of this responsibility is to engage with different publics (in this case, school learners) to develop their understanding of our research and develop their appreciation of our

natural heritage. To this end, four SAIAB staff members, Ferdy Jacobs (Freshwater Research Assistant), Zipho Canda (ACEP Administration Officer), and NRF-DST Interns, Tholoana Ntokoane and Lucky Dlamini, lead an exhibition at Algoa College in Straundale (Department of Education) for learners from Masiphathisane Secondary School, Khwezi Lomso Comprehensive School and Kwazakhele High School. Approximately 200 learners arrived to learn and engage in science-based activities.

Ending the countrywide celebration of NSW, on Friday 3 August, SAIAB served as a vehicle for showcasing aquatic sciences to learners in Paterson, a small settlement in Sarah Baartman District Municipality in the Eastern Cape Province. Here, the SAIAB team made science appealing to learners, so that they might consider Science Technology Engineering Mathematics and Innovation as offering preferable career options. Approximately, 109 learners from Hendrik Kanise Combined School and Sandisulwazi High School engaged with the SAIAB exhibition. ✄

Ferdy Jacobs welcoming learners to the SAIAB exhibition.

Lucky Dlamini holds up a preserved tiger fish and explains the importance of preserving biodiversity and how fish specimens are stored in the SAIAB Wet Collection.

Tholoana Ntokoane gives learners a chance to get up close and personal with an eel.

Zipho Canda tells learners about SAIAB's dry collection.

Student / Training Opportunities

	Organisation	Closing Date
Free six week online course on Large Marine Ecosystems: Assessment and Management. No closing date indicated. Starts 3 Sep 2018.	UCT, GEF and partners	9/2/2018
The Department of Agriculture, Forestry and Fisheries (DAFF) intends to award comprehensive bursaries to qualifying applicants pursuing and/or intending to further their studies in critical scarce skills in the agricultural, forestry and fisheries sectors for the 2019 academic year. The bursary will cover tuition, accommodation, books, meals and monthly allowance. Detailed information available on these links: • Bursary Advert 2019 Academic Year • 2019 Undergraduate Application Form • 2019 Postgraduate Application Form	DAFF	9/30/2018
Honours degree in Ichthyology and Fisheries Science The honours course is designed to combine theory with practice, and is comprised of three modules; ichthyology, aquaculture and fisheries management. No closing date indicated.	Rhodes University	9/30/2018
MSc/PhD penguin research opportunity Project title: Influence of ecosystem variability on demography and reproductive performance of two species of *Eudyptes* penguins at sub-Antarctic Marion Island.	UCT FitzPatrick Institute of African Ornithology	10/1/2018
Postgraduate scholarships at MSc or PhD level for researchers from South Africa and from the fisheries research institutions partner to the EAF-Nansen Programme. Research areas: multifrequency hydroacoustics; jellyfish genetics, taxonomy and biology; the trophic ecology of mesopelagic organisms; and nekton community ecology and population genetics. No closing date indicated.	UWC, EAF-Nansen, NRF & partners	10/6/2018
Workshop: Current status and key requirements for numerical models of the Agulhas Current 22nd and 23rd October 2018, University of Cape Town Open to all researchers and students with an interest in the Agulhas System or ocean modelling around Southern Africa. No closing date indicated, but space is limited.	ESASTAP	10/21/2018
Masters Project in Mangrove Ecology	ZMT, Liebniz Centre	10/30/2018
UCT Applied Ocean Sciences Masters Degree This course will provide academic and technical skills to deal with the most applied aspects of oceanography and marine biology Deadlines for 2019: International students: 30 September 2018 South Africans: 31 October 2018	UCT MA-RE	10/31/2018

Upcoming conferences and workshops	Starts	Ends	Location
ECSA 57: Changing estuaries, coasts and shelf systems - Diverse threats and opportunities	3 Sep 2018	6 Sep 2018	Perth, Australia
15th International Circumpolar Remote Sensing Symposium (ICRSS)	10Sep 2018	14 Sep 2018	Potsdam, Germany
High Level Scientific Conference for UN Decade of Ocean Science for Sustainable Development	10 Sep 2018	11 Sep 2018	Paris, France
34th Annual Conference of the South African Society for Atmospheric Science	20 Sep 2018	21 Sep 2018	Balito, KZN
SAEON Graduate Student Network Indibano	16 Sep 2018	20 Sep 2018	Limpopo
4th CLIOTOP Symposium - CLimate Impacts on Oceanic TOp Predators	15 Oct 2018	19 Oct 2018	Keelung, Taiwan
IV International Conference on El Niño Southern Oscillation: ENSO in a Warmer Climate	16 Oct 2018	18 Oct 2018	Guayaquil, Ecuador
6th Argo Science Workshop	22 Oct 2018	24 Oct 2018	Tokyo, Japan
ESASTAP workshop: Current status and key requirements for numerical models of the Agulhas	22 Oct 2018	23 Oct 2018	Cape Town
2018 Ocean Salinity Science Conference	5 Nov 2018	9 Nov 2018	Paris, France
SciCOM 100 Conference 2018: Science communication and democratic South Africa: prospects and challenges	6 Nov 2018	7 Nov 2018	Stellenbosch
4th National Global Change Conference	3 Dec 2018	6 Dec 2018	Limpopo
African Bioacoustics Community Conference	3 Dec 2018	7 Dec 2018	Cape Town
AGU Fall Meeting	10 Dec 2018	14 Dec 2018	Washington D.C.
Science Forum South Africa	12 Dec 2018	14 Dec 2018	Pretoria
Fourth Xiamen Symposium on Marine Environmental	6 Jan 2019	9 Jan 2019	Xiamen, China
ICFA 2019: 21st International Conference on Fisheries and Aquaculture	17 Jan 2019	18 Jan 2019	Rome, Italy
SOLAS Open Science Conference	21 Apr 2019	25 Apr 2019	Sapporo, Japan
5th World Congress on Risk: Development and Resilience	6 May 2019	8 May 2019	Cape Town, South Africa
2019 IMBER Open Science Conference	17 Jun 2019	21 Jun 2019	Brest, France
ICTP-CLIVAR Summer School on Eastern Boundary Upwelling Systems: Assessing and understanding their	15 July 2019	21 July 2019	Trieste, Italy
13th International Conference on Paleoceanography	1 Sep 2019	6 Sep 2019	Sydney, Australia
OceanObs'19	16 Sep 2019	20 Sep 2019	Hawaii, USA
International Society for Ecological Modelling Global Conference	17 Sep 2019	20 Sep 2019	Salzburg, Austria

Vacancies	Organisation	Location	Closing date
Fisheries Consulting - Mainstreaming fisheries vulnerability assessments and climate risk information into national and regional planning and management frameworks.	BCC	-	9/5/2018
Fisheries Consulting - Undertake a study of the suitability and adequacy of existing institutional arrangements to address climate change vulnerability and adaptation.	BCC	-	9/5/2018
Consultant on West African Fisheries Project	MSC	Senegal (tbc)	9/8/2018
Assistant Professors/ Marine Scientists	LUMCON DeFelice Marine Center	Louisiana, USA	9/15/2018
Three tenure-track faculty positions in Marine Geology/Geochemistry. Review of applications will begin on 15 September 2018, and will continue until the positions have been filled.	University of Hawaií	Hawaií, USA	9/15/2018
PhD position (m/f) in the research area of ocean colour remote sensing and phytoplankton in coastal waters	Institute of Coastal Research of the Helmholtz-Zentrum Geesthacht	Geesthacht, Germany	9/16/2018
Senior Science Lead - (Climate Change and Health)	Wellcome Trust Our Planet, Our Health	London, UK	9/23/2018
Director of the Inter-University Tyndall Centre for Climate Change Research, and Chair in Climate Change Science and Policy	University of East Anglia	Norwich, UK	9/28/2018
Postdoctoral research fellowship: Humpback Whales in a Changing Climate. Applications will stay open until the position is filled. To start before end 2018.	MA-RE, UCT	Cape Town	9/30/2018
Deputy Director	Future Earth Secretariat	Paris, France	9/30/2018
Professional Officer	ICES Secretariat	Copenhagen, Denmark	10/5/2018
5-year Research Fellowships for researchers from all fields	University of Konstanz	Germany	10/15/2018
Postdoctoral Fellowships for researchers from all fields	University of Konstanz	Germany	10/15/2018
Postdoctoral researcher: Amelioration of Environmental Effects of Fish Net-pens by Sea Cucumber Polyculture as Estimated by Meiofauna Metabarcoding. No closing date specified.	NOAA	Seattle, Washington, USA	10/21/2018
Postdoctoral position: Using Genomics and Genetics to Promote Shellfish Aquaculture. No closing date specified.	NOAA & University of Washington	Washington, USA	10/21/2018
Marine Science or Fisheries Professor. No closing date indicated.	University of Namibia	Henties Bay, Namibia	10/31/2018
Fishery and aquaculture information management specialist	FAO	Rome, Italy	1/1/2019

Research Funding	Closing date
[South Africa / Japan Joint Science and Technology Research Collaboration 2019](#) Joint research proposals may be submitted in the following designated thematic areas prioritised by both countries: • Humanities • Social Sciences • Natural Sciences	9/5/2018
[Call for SA-Swedish joint research project proposals](#) To supports joint research projects, human capital development, and student and staff exchanges between South	9/12/2018
[Knowledge, Interchange & Collaboration (KIC) 2018 – 2nd Call](#) The KIC grant provides support for travel and participation in scientific events focused on four categories: • Travel Grants for Individual Researchers • Host Visiting Foreign Researchers • Africa Interaction	9/20/2018
[South Africa - Mozambique - Zambia Trilateral 2019](#) Funding supports joint research projects in the following thematic areas: • Marine Sciences/ Inland Fisheries • Agriculture (Biosciences and Food Security)	9/26/2018
[South Africa/China Joint Science and Technology Research Collaboration 2019](#) Areas of cooperation • Biotechnology in health and agriculture • Traditional medicines • Renewable energy • Water resources	9/28/2018
[NRF/DFG Partnership on International Research Training Groups (IRTGs)](#) The NRF has entered into a new partnership agreement with the DFG of Germany to jointly fund International Research Training Groups (IRTGs) between the two countries. IRTGs are structured Doctoral Programmes aimed at training scientists and academics at different stages of their careers, with a particular emphasis on doctoral researchers. IRTGs promote systematic research cooperation through joint research and qualification programmes as well as through cooperative cross-border supervision of doctoral researchers. A central feature of IRTGs is the coordinated and reciprocal research visits by doctoral researchers at the respective partner	12/31/2018

Diving deeper:
How to build a career in marine science

SANCOR PRESENTS

2018 KwaZulu-Natal Student Workshop

October 9, 2018

Sea World Education Centre, uShaka Marine World

SANCOR invites students based in KZN to its Student Workshop on 9 October (8am-4pm at uShaka Marine World, Durban). This meeting aims to provide students with the opportunity to meet and interact with each other, showcase their research and learn more about building a career in marine science at the exciting afternoon session on careers. Postgraduate students in any discipline that involves marine science are invited to submit abstracts to SANCOR Student Representative Sinegugu Mbense s210235438@mandela.ac.za before the closing date of 15 September 2018. We encourage all levels of postgraduate students to apply. Interested?

1. Fill out the RSVP form to confirm your attendance: https://goo.gl/forms/ojQ4Ktsw1R22O5dC2

2. Email your abstract to s210235438@mandela.ac.za

Full details here.

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Our Focus:
Science in the
Marine and Coastal Environments

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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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