



August 2018

Issue 221

ISSN 03700-9026

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SANCOR'S CURRENCY AND STRENGTH IS INFORMATION

# SANCOR Newsletter

## *Communication is costly in Heaviside's dolphins*

Research led by scientists at the University of Pretoria (UP) has shed light on an evolutionary arms race with a twist. This research, conducted by Morgan J. Martin, a PhD student from UP has found that the small Heaviside's dolphins (*Cephalorhynchus heavisidii*) selectively switch between cryptic,

high frequency, echolocation sounds used to search for prey, and lower frequency communication sounds which help to maintain their highly social lifestyle. However, this switch may come at the risk of being heard by their key predator - killer whales (*Orcinus orca*).



Heaviside's dolphins are found only in the Benguela Ecosystem along the west coast of southern Africa.

## About Heaviside's dolphins

Heaviside's dolphins are found only in the Benguela Ecosystem along the west coast of southern Africa and range from southern Angola to the Cape of Good Hope in South Africa. They are one of the smallest dolphins on earth, smaller than a person (less than 1.7 m long) and found in shallow waters along the coast. "Heaviside's dolphins are a poorly understood species of dolphin and we are working to collect as much baseline information as possible on their numbers and behaviour," says Dr. Simon Elwen, a marine mammal expert at UP and Director of the Namibian Dolphin Project.

## What we know about sound use in Heaviside's dolphins

All dolphins use sound to find objects in their environment, such as fish. This process, called echolocation, involves the animal producing a sound commonly termed a 'click,' which hits a target, producing an echo which the animal hears and processes, effectively 'seeing the world with sound'. Most dolphins also use other sounds, such as whistles, to communicate over long distances. Heaviside's dolphins are one of 13 species of toothed whales that have lost the ability to

produce whistles for communication.

Most dolphins echolocate with clicks which cover a range of frequencies, from around 10 kHz to 200 kHz. However, these 13 species have shifted their echolocation signals to occur only in an incredibly high and narrow frequency band around 130 kHz (almost seven times higher than the 20 kHz upper limit of human hearing and even above the hearing limit of killer whales). These acoustic adaptations are thought to reflect a type of acoustic crypsis, meaning that they decrease the risk of being heard by predatory killer whales.

## New findings

Scientists from the Namibian Dolphin Project and UP first started recording Heaviside's dolphins in 2009 in Walvis Bay, Namibia. "When we first recorded the dolphins, we noticed unusual features to the sounds, which Morgan Martin has investigated further," says Dr. Tess Gridley (now based at the University of Cape Town). In contrast to the prevailing idea that many dolphin species are effectively acoustically hiding from predators, Ms Martin's results showed that Heaviside's

dolphins are commonly producing communication signals consisting of click sounds at a much lower frequency and with a more broadband structure (i.e. the sounds cover a range of frequencies). This makes them very different from other similar dolphins and porpoises, a result which has surprised scientists worldwide. These lower frequency clicks are risky to produce because they can easily be heard by eavesdropping killer whales which potentially increases the chance that Heaviside's dolphins end up on the dinner table.

"Heaviside's dolphins seem to be hunting and navigating using typical narrowband high-frequency clicks but use riskier lower frequency clicks when they communicate with each other," explains Ms Martin.

The research team then started wondering about why these dolphins would switch to signals that were more likely to be heard by potential



**Author, Morgan J. Martin, is a PhD student at the University of Pretoria. Her research is based on wild dolphin abundance estimates and their underwater acoustic signals.**

predators when they could stick to their “safer” cryptic biosonar signal. “The lower frequency of these communication signals means that they are less directional and travel further underwater, so they are much more effective for social communication,” says Dr. Frants Jensen, a bioacoustics expert at Aarhus Institute of Advanced Studies and co-author of the study.

“So far, this seems to be the only narrowband high-frequency species that selectively increases communication range by changing the structure of their clicks,” emphasises Ms Martin. The team’s initial [paper on the research](#), “Heaviside’s dolphins relax acoustic crypsis to increase communication range”, was published on 18 July 2018 in the *Proceedings of the Royal Society of London B*.

Four months ago, Ms Martin and her team observed a pair of killer whales attacking and killing a Heaviside’s dolphin right after they had observed the dolphins socialising in a group nearby. It is possible that their lower frequency communication sounds gave the dolphins away to the lurking predators.

While research has shown how these sounds are important for communication, Ms Martin

emphasises that there’s still much more to learn, “These dolphins communicate by emitting bursts of very rapid clicks (more than 500 clicks per second) at highly varying repetition rates. We don’t yet know what information they can encode when they produce these sounds, but we are trying to find out.” She adds that the next paper will link specific sounds produced underwater with surface behaviours to understand the function of different social signals.

#### Acknowledgements

The authors gratefully acknowledge research funding by UP, a United States Fulbright Research Fellowship, Claude Leon Foundation, National Research Foundation and National Geographic Society’s Emerging Explorers Grant in conjunction with the Wait Foundation.

#### Source:

Martin, M. J. (2018, July 20). Communication is costly in Heaviside's Dolphins. Mammal Research Institute News. Retrieved from <https://www.up.ac.za/en/mammal-research-institute/news/>



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# ATAP Anecdotes: The tale of a “home-loving” spotted grunter

By  
**Paul Cowley, Taryn Murray & Matt Parkinson**  
*South African Institute for Aquatic Biodiversity*

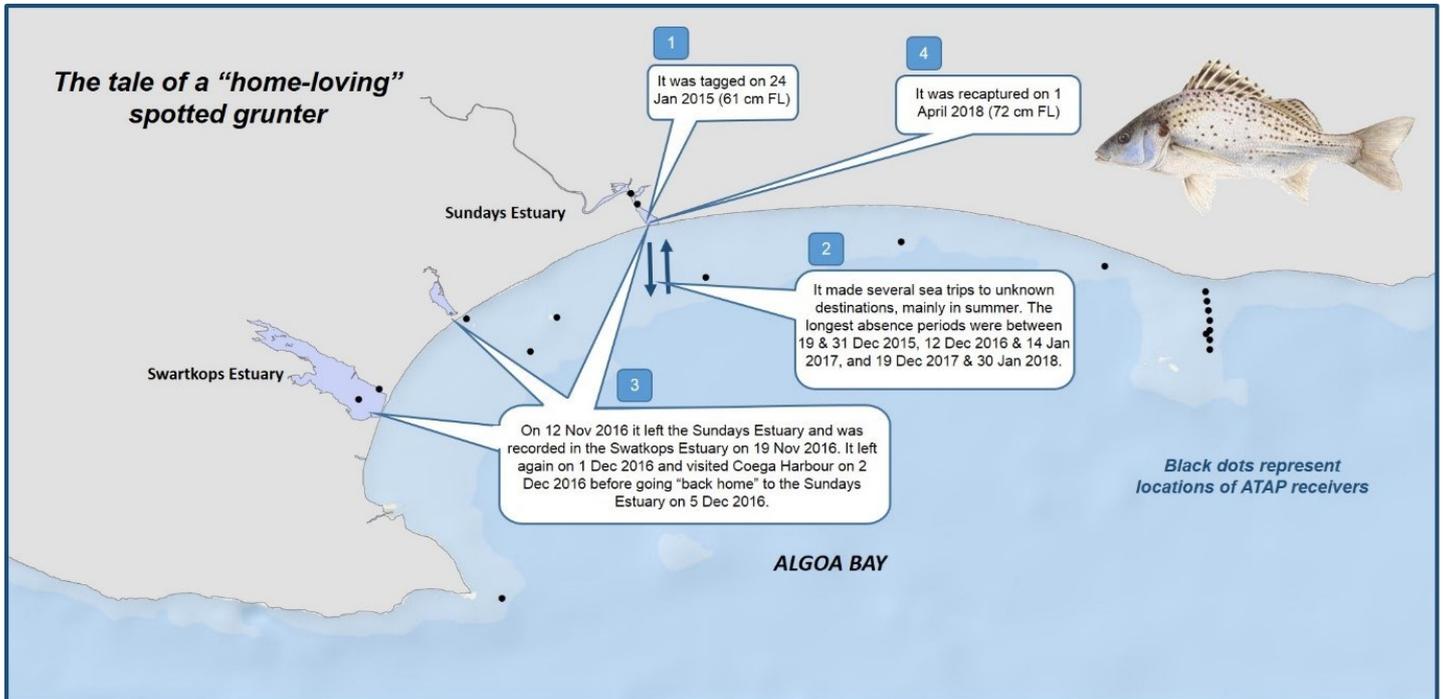
Researchers from the South African Institute for Aquatic Biodiversity (SAIAB) have been studying the movement behaviour of spotted grunter since 2004, with more than 120 individuals having been tagged with acoustic transmitters to date. The research initially focussed on juveniles in a single estuary and later the movements between

neighbouring estuaries (habitat connectivity). Currently, the focus is on longshore movements and stock segregation of adults.

Dart tagging data from the Oceanographic Research Institute’s Cooperative Fish Tagging Project revealed that 95% of all recaptures made were within 3.5 km of the release site, with only 2% moving more than 100 km (Cowley *et al.* 2012). The findings of earlier acoustic telemetry studies confirmed this residency behaviour, with juvenile individuals occupying relatively small home ranges in

**ATAP Anecdotes**  
 The Acoustic Tracking Array Platform (ATAP) is a nationwide research platform. This column will be a regular feature in the newsletter and aims to keep you updated with the exciting movements of various tagged species along the South African coastline.

both permanently open and intermittently open estuaries (Childs *et al.* 2008, Maree *et al.* 2016). With the recent tagging of many more adult spotted grunter, we are beginning to gain a much better understanding of the movement



behaviour and estuarine-dependency of this species throughout its life history.

One such example includes a truly "home-loving" spotted grunter that was acoustically tagged in the Sundays Estuary on 24 January 2015 (61 cm fork length (FL); approximately 4.3 kg) and was recaptured in the same estuary 38 months later on 01 April 2018 (72 cm FL; approximately 6.7 kg). Throughout those 38 months, the fish rarely left the estuary, making the occasional trip to sea. Of all those sea trips, only two were longer than 30 days. Even though it was never detected by one of the sea receivers in Algoa Bay, this grunter was recorded visiting the neighbouring Swartkops Estuary and Coega Harbour during one excursion. It left the Sundays Estuary on 12 November 2016 (18h15) and was recorded in the Swartkops Estuary on 19 November 2016 (14h00). It remained in the estuary for a number of days before leaving on 01 December 2016 (15h00). It was briefly recorded in the Coega Harbour on 02 December 2016 (around 14h00) and on 05 December 2016 it ventured back "home" to the Sundays Estuary.

Interestingly, over each Christmas period since tagging, this spotted grunter was recorded leaving the estuary (i.e. went to sea). It was absent from 19 to 31 December 2015, 12 December 2016 to 14 January 2017 and again from 19 December to 30 January 2018. Boat noise has been found to disturb fish (Jacobsen *et al.* 2014) so perhaps increased boating activity during the holiday season could account for the sea trips made by this spotted grunter. Another possibility is that it went to sea to spawn. Similar observations of philopatry (home-loving) with marine excursions predominantly taking place during summer months have also been recorded for adult spotted grunter tagged in other estuaries.

Spotted grunter is an important recreational and subsistence fishery species, with no allowable commercial exploitation. Given the high levels of estuarine dependency, along with extensive fishing pressure within these habitats, this species is now considered to be over-exploited. Spotted grunter are managed by catch restrictions in the form of minimum size (40 cm total length)

and daily bag (5 fish per person per day) limits. A detailed fishery survey conducted on the Sundays Estuary (Cowley *et al.* 2013) revealed that 30% of the retained catch of spotted grunter was below the legal size limit and that the daily bag limit of 5 fish was only attained on 0.1% of the recorded outings. This suggests that improved management is required to reverse the over-exploited status of this species. Improved law enforcement and a reduction of the daily bag limit are recommended. Furthermore, long-term fidelity to single estuaries by spotted grunter suggests that Estuarine Protected Areas and local (per estuary) management arrangements could be beneficial.

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Maree BA, Cowley PD, Næsje TF, Childs A-R, Terörde AI, Thorstad EB. 2016. Influence of prey abundance and abiotic factors on the long-term home-range and movement dynamics of spotted grunter *Pomadasys commersonnii* in an intermittently open estuary. *African Journal of Marine Science* 37(4): 1-10.

Whitfield AK. 1998. Biology and Ecology of Fishes in Southern African Estuaries. *Ichthyological Monographs of the J. L. B. Smith Institute of Ichthyology* 2: 1–223. ☞

## ***Building research capacity for sustainable ecosystem-based management***

The South African Association for Marine Biological Research (SAAMBR) Oceanographic Research Institute (ORI) recently played host to a three-day British Council Researcher Links Workshop funded by the UK Department of Business, Energy and Industrial Strategy and National Research Foundation and managed by the British Council.

The workshop aimed to build research capacity for sustainable ecosystem-based management (EBM) of estuaries and coasts.

The workshop was co-ordinated by Professor Trevor Hill of UKZN, Ms Bronwyn Goble of the ORI, Dr Luciana Esteves of Bournemouth University, and Dr Katie Smyth of the University of Hull's Institute for Estuarine and Coastal Studies (IECS).

The purpose of Researcher Links workshops is to bring Early Career Researchers (ECRs) together with seasoned researchers to provide mentorship opportunities and create long-term collaborations. The programme included an opportunity for participants to

introduce themselves, with ECRs presenting a poster summarising their current research. Workshop co-ordinators emphasised efforts to bridge the gap between science and governance.

More than 40 ECRs and established researchers took part in the workshop, with postgraduate students and lecturers coming from six South African universities and 12 British universities.

Representatives attended from the South African Institute for Aquatic Biodiversity (SAIAB); Sharks Board, the Department of Environmental Affairs; KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs; Council for Scientific and Industrial Research, eThekweni Municipality; Western Cape Government; WILDOCEANS and the UK's Marine Management Organisation.

Professor Mike Elliott, IECS Director, addressed participants about research needed to support EBM of estuaries and coasts, Professor Alan Whitfield of SAIAB spoke about challenges and opportunities for the

implementation of EBM in these systems, and Professor Andrew Cooper of Ulster University laid the foundations for developing research collaborations. UKZN's Professor Ursula Scharler gave a presentation covering the South African Network for Coastal and Oceanic Research (SANCOR) and the importance of international networks for promoting long-term links and collaboration as well as tools for the implementation of EBM.

Presentations fed into panel discussions and participants formed working groups to aid ECRs in their career development and long-term research and cross-sectoral collaborations which included development of an action plan. Participants also had the opportunity to visit the uShaka Marine World aquarium.

Dr Esteves, who visited KwaZulu-Natal in 2016 to speak about coastal management and conservation, gave a one-day workshop preceding the Researcher Links workshop for 45 members of local provincial government; addressing the importance of EBM. The interactive workshop included discussion of understanding risk and vulnerability



The workshop held during 19-21 June 2018 in KZN brought together SA and UK researchers from the social and natural sciences to co-construct, advance and share knowledge to support estuarine and coastal EBM. *Photo by Bronwyn Goble.*

in coastal systems, explored perceptions of coastal management and introduced principles of EMB from a broad, integrated outlook.

This workshop emphasised the importance of dedicating attention to coastal management at local government and municipal level and provided an international perspective on the challenges and issues encountered in coastal management. Goble indicated that to aid this, plans are in motion to embed an introduction to coastal management into Geography courses at universities, covering topics including EBM, policy

development and legislation, in order to prepare future environmental managers for the task.

**Source:**

Cuénod, C. (2018, July 23). Building research capacity for sustainable ecosystem-based management. UKZN News. Retrieved from <https://www.ukzn.ac.za/news/building-research-capacity-for-sustainable-ecosystem-based-management/> 

## What ocean and atmosphere modelling can tell us about climate and weather

According to recently appointed SARChI chair and oceanographer, Professor Mathieu Rouault, studying patterns of how the ocean and the atmosphere interact not only improves weather forecasting but can help us to better predict and ameliorate the social impact of climate events.

“Modelling is an excellent tool to understand the mechanisms linking the interaction between our oceans and the atmosphere to our weather and climate,” says Rouault. “Take the phenomenon of El Niño in the Pacific Ocean, which is playing a part in the current droughts in southern Africa.”

According to Rouault, modelling, when applied strategically, can be used to predict climate impact and therefore help to mitigate the effects of natural climate variability or climate change on human societies.

As examples of the kind of social and economic impacts he is talking about, Rouault points out that in the 2015 to 2016 drought, inflation of food prices rose 20%, 100 000 cattle died, maize production fell by 50% and it was triggered by El Niño and properly forecasted.

Rouault is now looking forward to using his appointment to the renewed SARChI chair in ocean-atmosphere modelling to test and develop models specific to our oceans. “This includes gaining a better understanding of the effect of the Agulhas Current on extreme weather conditions and the creation of an aquaplanet model – where only the oceans are modelled, without including the continents – to better understand the role of the current in regional weather patterns, and an in-depth exploration of how El Niño affects local climate conditions.”

Rouault’s second aim for the chair is to develop the modelling capacity of African students.



*Prof Mathieu Rouault, SARChI in Ocean & Atmospheric Modelling.*

“I already have a cohort of six doctoral students from four African countries; the research chair also helps to create two positions for postdoctoral fellows. This will enable students to continue their studies while finding another postdoctoral fellowship in the best institutions around the world.” Mathieu Rouault is also co-director of the Nansen Tutu Centre for Marine Environmental Research, a joint initiative between Norway and South Africa that is based in UCT’s Department of Oceanography. Together with UCT and the Nansen Tutu Centre, Rouault is looking forward to collaborating with ocean and climate modellers from Japan, Norway, France and Germany.

Modelling can tell us about climate events that have happened in the

The Department of Science and Technology's South African Research Chairs Initiative (SARChI) is managed by the National Research Foundation. The chairs are held by individuals. Their purpose is to strengthen the ability of our universities to produce high-quality research and nurture students.

past as well as events in the future. Rouault is looking forward to continuing work on his hypothesis that our local Agulhas Current had a part to play in the survival of *Homo sapiens* through the penultimate ice age.

“It is technically difficult to model, but feasible, and it will take some time to implement,” Rouault says. “But it is a very exciting idea and one that could show that the effects of ocean and atmosphere have always had a big impact on humankind.”

**Source:**

Nicholson, A. (2018, July 1). What ocean and atmosphere modelling can tell us about climate and weather. UCT News. Retrieved from <https://www.news.uct.ac.za/article/-2018-07-01-what-ocean-and-atmosphere-modelling-can-tell-us-about-climate-and-weather> ☒

## Measuring our impact at the Shark Education Centre

One of the real challenges for education centres, like the non-governmental organization, Save Our Seas Foundation (SOSF) Shark Education Centre, is how exactly we assess the impact that we are having with our programmes. This goes beyond just a case of keeping a detailed listing of schools, numbers of educators and kids, visitor numbers, etc. and it also needs to be an ongoing process of monitoring, evaluating and learning.

In order to do this, we have been working with a specialist company to develop an evaluation system to assess the impact of the SOSF Shark Education Centre. This is a very important process and needs to be specifically targeted to our audience and facilities, and can take a lot of time and effort to set up properly. The first step was to go through a

rapid evaluation and thereafter to develop the Centre’s Theory of Change. This theory is then used as a framework around which to construct exactly what we need to measure, and how we go about it!

We have recently begun trialling some of our data collection tools for measuring our impact. It adds a fair bit of time and effort in preparation to our programmes, but should hopefully be worth it!

The first data collection tool consists of a “pre and post” question session, where the learners are asked a set of 8 questions at the beginning of their day with us (basic questions to which they answer “yes”, “no” or “don’t know”), and are asked the same set of questions at the end of the day. The answers are

anonymous and the learners can’t see what their classmates answer. The 2 sets of answers are then scored and compared, so that we can assess whether we are teaching them any of the knowledge associated with our identified key messages.

We have also been implementing the “Ocean Pledge”, where at the end of the day we ask each learner to write an ocean pledge of their own. This is a personal promise on their part, either to do something or to stop doing something, in order to help save our seas. This is aimed more at assessing whether we are effecting any attitude changes, or giving them the tools with which they feel that they can take action. Each learner writes their own pledge, and then we take a photo of the whole class’s pledges. They take their pledge

home with them as a reminder. We will follow up with their teacher later in the year so that they can ask who has been keeping their promises – as an active reminder to the learners that they themselves do have the power to take environmentally responsible actions that have positive consequences.

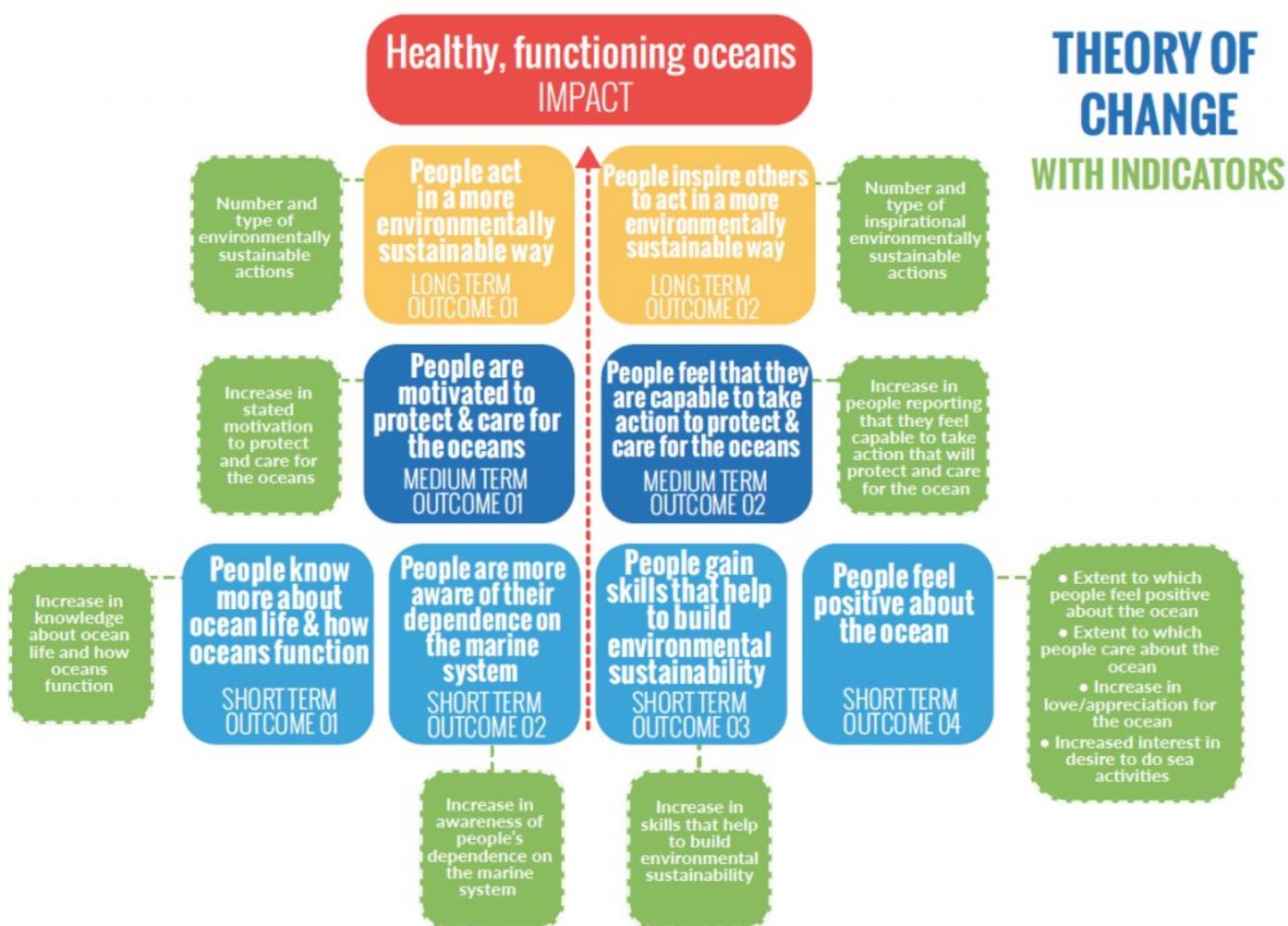
In addition, we are working with a researcher doing her M.Phil, on “Conservation benefits of

Interpretation at a wildlife tourism site: Using sharks as ambassador animals to encourage pro-conservation behaviour”. In conjunction with her, we are doing teacher surveys with all teachers who bring their groups to the Shark Education Centre. This research will aim to measure the impact that interpretation (educational signage, exhibits, interactive experiences and presentations) in a free-choice

learning centre has on the visiting public. And will thus be a valuable resource for us to use as well!

**Source:**

Yeld Hutchings, E. (2018, April 18). Measuring our impact at the Shark Education Centre. Retrieved from <https://saveourseas.com/sosf-shark-education-centre/measuring-our-impact-at-the-shark-education-centre/>



## Drifting kelp raises warning for warming Antarctica

Chilean researcher Dr Erasmo Macaya's chance discovery of bull kelps on a beach on the west coast of the Antarctic Peninsula has raised alarm over biological invasions as the ice continent warms. The finding has also upended theories on Antarctica's ecological isolation.

[New research](#) reported this week (July 16, 2018) in *Nature Climate Change* by an international, multidisciplinary team of scientists led by Dr Ceridwen (Crid) Fraser of the Australian National University (ANU) reveals just how significant that beaching is.

The two southern bull kelp (*Durvillaea antarctica*) specimens had travelled at least 20 000 km – more than halfway around the globe – making these the longest-known biological rafting events recorded. Their genetic fingerprints were traced to the Kerguelen Islands in the southern Indian Ocean and South Georgia in the southwest Atlantic Ocean.

Oceanographic models show that strong circumpolar currents and westerly polar winds create an almost impenetrable barrier around Antarctica, pushing most drifting particles and organisms north.

So how did the kelp reach shore? The answer was surprising.



Southern bull kelp (*Durvillaea antarctica*) at Marion Island. Southern bull kelp drifted 25 000 km from South Georgia and the Kerguelen Islands to reach the Antarctic Peninsula, posing questions about the ice continent's continued ecological isolation in an era of global warming. *Photo by Peter Ryan.*

Using cutting-edge oceanographic modelling techniques, ANU co-author Dr Adele Morrison found that when the wave-driven surface motion of Antarctic storms was factored in, the pattern changed. Her analyses showed that large storm waves could help kelp rafts reach Antarctica.

The upshot is that the great ice continent, which supports a scant floral offering of lichens, moss, liverworts and terrestrial and aquatic algae, is not as isolated as scientists believe. Pushed south by this wave-driven motion, known as Stokes drift, and coupled with global warming, biological dispersal

could significantly change Antarctic coastal marine ecosystems, said Fraser.

"We always thought Antarctic plants and animals were distinct because they were isolated, but this research suggests these differences are almost entirely due to environmental extremes, not isolation."

### Kelp drift tracking

Additional data on kelp transfer across the Antarctic Polar Front came from co-author Professor Peter Ryan, director of UCT's Percy FitzPatrick Institute of African Ornithology, a Department of Science and Technology / National

Research Foundation Centre of Excellence.

Ryan has made a point of collecting data on drifting kelp while counting seabirds in the Southern Ocean. In 2016/17 he was part of the three-month Antarctic Circumnavigation Expedition (ACE) and mapped kelps all around the ACE track.

“We found a lot of kelp south of the Antarctic Polar Front in waters it’s not supposed to get to.”

Bull kelp grows in the intertidal zones and has a limited distribution in New Zealand, southern South America and the subantarctic islands.

“It has massive holdfasts because it’s designed to ‘stick’ to the rocky intertidal zones in these very high-energy environments; the Southern Ocean is the windiest and waviest environment in the world. It’s got to be tough to survive on the west coast of Marion Island with waves crashing in endlessly. However, it can’t grow in the Antarctic because it can’t withstand scouring by sea ice.

“Small marine animals such as crustaceans and molluscs live inside the kelp’s holdfasts, so when a kelp breaks off, it’s like a tiny ark going to sea.

“We’ve known for some time that these can drift considerable distances. But it’s only now that we



Bull kelp with goose barnacles weighing it down, adrift in the Southern Ocean. *Photo by Peter Ryan.*

can show how far. Even from our ACE observations from Marion Island you could see there was a lot of kelp downstream from Marion, and the Crozet and Kerguelen islands.

It was surprising how much kelp they were seeing – and how far from land.

His concern is that foreign species can displace local floral and faunal populations. The accidental introduction of rats and mice to subantarctic islands such as Marion and Gough, which support huge populations of seabirds, showed how vulnerable these isolated island ecologies are.

### **Intruder populations**

“Most organisms on oceanic islands

have no evolutionary response to intruder populations, which is the reason we see so many extinctions on these islands.

“Antarctica, in a sense, is like a big island because it’s been cut off from the mainstream of the rest of the world for so long. But human visits to Antarctica have increased dramatically over the past century and tourism is now a big business, especially in the Peninsula area. It hasn’t had the same impact in terms of invasive species because the climate is so prohibitively cold and miserable.”

But now, scientists report that parts of Antarctica are among the fastest warming places on Earth.

“As the climate warms we’re starting to see invasions linked to human activity. This research suggests

there's an indirect way things can invade; there's a mechanism now where things can start to get in."

Ryan said that while the kelp will struggle to settle in the ice-scoured Antarctic intertidal zone, some of the passengers rafting with it might just find suitable homes.

"It's a mechanism by which the isolation of Antarctica might start to

break down."

He adds, "What's exciting about this paper is that the modellers were able to come up with a plausible model to explain how drifting kelp managed to cross the Antarctic Polar Front."

The findings are also significant for the science of ocean drift used to track plastics, aeroplane crash

debris and other floating material across our seas.

**Source:**

Swingler, H. (2018, July 18). Drifting kelp raises warning for warming Antarctica. Retrieved from <https://www.news.uct.ac.za/article/-2018-07-18-drifting-kelp-raises-warning-for-warming-antarctica> ↗

## Student / Training Opportunities

	Organisation	Closing Date
<a href="#">China-South Africa Young Scientist Exchange Programme 2019</a>	NRF	8/15/2018
<a href="#">Online Training Course for Supervisors of Doctoral Candidates at African Universities</a>	DIES/CREST	8/19/2018
<a href="#">Coastal Engineering Short Course   27-31 August 2018   Somerset-West</a> The course is presented every 2 years and is suited to anyone interested in receiving an introduction to some of the technical aspects involved in coastal engineering or a refresher and update in latest findings and techniques. Topics are mostly focused on nearshore/marine hydrodynamics, geophysical coastal processes, coastal structures and coastal planning/management (related to engineering). Interact with experts, practicing professionals, lecturers, peers and students in this exciting field!	Stellenbosch University	8/20/2018
<a href="#">Scholarships available to academically deserving and economically disadvantaged students from Sub-Saharan Africa. Successful candidates may pursue undergraduate or postgraduate studies at UCT and will receive mentoring, leadership development, academic and life skills support.</a>	UCT and the Mastercard Foundation	8/31/2018
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:	DAFF	9/30/2018
<ul style="list-style-type: none"> <li>• <a href="#">Bursary Advert 2019 Academic Year</a></li> <li>• <a href="#">2019 Undergraduate Application Form</a></li> <li>• <a href="#">2019 Postgraduate Application Form</a></li> </ul>		
<a href="#">Honours degree in Ichthyology and Fisheries Science</a> : 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
<a href="#">UCT Applied Ocean Sciences Masters Degree</a> : 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	Date	Location
<u>5th NRF SANAP Symposium</u>	13 - 16 Aug 2018	Hermanus
<u>5th African Marine Mammal Colloquium</u>	20 - 23 Aug 2018	Port Elizabeth
<u>AQUA 2018</u>	25 - 29 Aug 2018	Montellier, France
<u>International Summer School on Atmospheric and Oceanic Sciences</u>	27 - 31 Aug 2018	L'Aquila, Italy
<u>ECSA 57: Changing estuaries, coasts and shelf systems - Diverse threats and opportunities</u>	3 -6 Sep 2018	Perth, Australia
<u>15th International Circumpolar Remote Sensing Symposium (ICRSS)</u>	10 – 14 Sep 2018	Potsdam, Germany
<u>High Level Scientific Conference for UN Decade of Ocean Science for Sustainable Development</u>	10 - 11 Sep 2018	Paris, France
<u>34th Annual Conference of the South African Society for Atmospheric Science</u>	20 - 21 Sep 2018	Balito, KZN
<u>SAEON Graduate Student Network Indibano</u>	16 – 20 Sep 2018	Limpopo
<u>4th CLIOTOP Symposium - CLimate Impacts on Oceanic TOp Predators</u>	15 – 19 Oct 2018	Keelung, Taiwan
<u>IV International Conference on El Niño Southern Oscillation: ENSO in a Warmer Climate</u>	16 – 18 Oct 2018	Guayaquil, Ecuador
<u>6th Argo Science Workshop</u>	22 – 24 Oct 2018	Tokyo, Japan
<u>2018 Ocean Salinity Science Conference</u>	5 – 9 Nov 2018	Paris, France
<u>SciCOM 100 Conference 2018: Science communication and democratic South Africa: prospects and challenges</u>	6 – 7 Nov 2018	Stellenbosch
<u>4th National Global Change Conference</u>	3 – 6 Dec 2018	Limpopo
<u>African Bioacoustics Community Conference</u>	3 – 7 Dec 2018	Cape Town
<u>AGU Fall Meeting</u>	10 – 14 Dec 2018	Washington D.C.
<u>Science Forum South Africa</u>	12 – 14 Dec 2018	Pretoria
<u>Fourth Xiamen Symposium on Marine Environmental Sciences (XMAS-IV)</u>	6 – 9 Jan 2019	Xiamen, China
<u>ICFA 2019: 21st International Conference on Fisheries and Aquaculture</u>	17 – 18 Jan 2019	Rome, Italy
<u>SOLAS Open Science Conference</u>	21 – 25 Apr 2019	Sapporo, Japan
<u>5th World Congress on Risk: Development and Resilience</u>	6 – 8 May 2019	Cape Town, South Africa
<u>2019 IMBER Open Science Conference</u>	17 – 21 Jun 2019	Brest, France
<u>13th International Conference on Paleoceanography</u>	1 – 6 Sep 2019	Sydney, Australia
<u>OceanObs'19</u>	16 – 20 Sep 2019	Hawaii, USA
<u>International Society for Ecological Modelling Global Conference</u>	17 – 20 Sep 2019	Salzburg, Austria

<b>Vacancies</b>	<b>Organisation</b>	<b>Location</b>	<b>Closing date</b>
<u>2 posts: Marine Ecologists</u>	NIWA	Nelson, New Zealand	8/5/2018
<u>Fisheries Analyst / Modeller</u>	NIWA	Nelson, New Zealand	8/5/2018
<u>Data &amp; information consultant on GEF LME Projects</u>	IOC-UNESCO	-	8/6/2018
<u>Data Quality Specialist: Natural Science Collections Facility</u>	SANBI	Pretoria	8/7/2018
<u>Project Manager: Circular Plastics Economy</u>	WWF-SA Policy and Futures Unit	Newlands, Cape Town	8/14/2018
<u>PhD student (m/f) with knowledge and experience in modelling and data analyses</u>	Helmholtz-Zentrum Geesthacht	Geesthacht, Germany	8/15/2018
<u>Data Curation Specialist</u>	SAEON	Cape Town	8/15/2018
<u>Periphyton Ecologist</u>	NIWA	Christchurch, New Zealand	8/19/2018
<u>Postdoctoral Research Fellow: Climate change and resilient small-scale fisheries</u>	James Cook University	Townsville, Australia	8/26/2018
<u>Internships: Joan Wrench Scholarship Fund</u>	SANBI	Kirstenbosch, Cape Town	8/31/2018
<u>Scientific Officer &amp; Project Manager</u>	European Marine Biological Resource Centre	Paris, France	8/31/2018
<u>Posts at the new Kiel Ocean Assessment and Solution Centre</u>	Kiel Marine Science	Kiel, Germany	8/31/2018
<ul style="list-style-type: none"> <li>• Professor Position (W2) in Political Economy of Marine and Coastal Resource Management</li> <li>• Senior Scientist in Marine Food Security</li> <li>• Senior Scientist in Marine Resources and Hazard Risk Assessment</li> </ul>			
<u>Assistant Professors/ Marine Scientists</u>	LUMCON DeFelice Marine Center	Louisiana, USA	9/15/2018
<u>PhD position (m/f) in the research area of ocean colour remote sensing and phytoplankton in coastal waters</u>	Institute of Coastal Research of the Helmholtz-Zentrum Geesthacht	Geesthacht, Germany	9/16/2018
<u>Postdoctoral research fellowship: Humpback Whales in a Changing Climate. Applications will stay open until the position is filled. To start before end 2018.</u>	MA-RE, UCT	Cape Town	9/30/2018

Research Funding	Closing date
<u>PEGASuS 2: Ocean Sustainability</u> is an open call for research projects that focus on synthesis research for ocean sustainability.	8/6/2018
<u>Equipment-Related Travel and Training Grants 2018/19</u> The rationale of this funding instrument is to make funds available to support the broader science community to access state-of-the-art research equipment that is not available at the home institution, regionally or nationally. The grants are divided into two categories, namely: Equipment-related Travel Grants and Equipment-related Training Grants.	8/7/2018
<u>Thuthuka Budget Motivations 2019</u> The request for continued funding in 2019, must be submitted by all grantholders receiving Thuthuka funding in 2018 and who are eligible for continued funding for their existing NRF funded project.	8/16/2018
<u>South Africa / Japan Joint Science and Technology Research Collaboration 2019</u> Joint research proposals may be submitted in the Humanities, Social Sciences and Natural Sciences.	9/5/2018
<u>Call for SA-Swedish joint research project proposals</u> : In support of joint research projects, human capital development, and student and staff exchanges between South African and Swedish universities and research institutions.	9/12/2018
<u>South Africa/China Joint Science and Technology Research Collaboration 2019</u> Areas of cooperation: Biotechnology in health and agriculture• Traditional medicines• Renewable energy• Water resources• Palaeoanthropology / archaeology	9/28/2018
<u>NRF/DFG Partnership on International Research Training Groups (IRTGs)</u> : 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 institutions.	12/31/2018

Issued by the  
South African Network for Coastal and Oceanic Research



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### Our Focus: Science in the Marine and Coastal Environments

SANCOR's activities are made possible through financial contributions from the Department of Agriculture, Forestry and Fisheries (DAFF), the Department of Environmental Affairs (DEA) and the National Research Foundation (NRF).

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