



SANCOR'S CURRENCY AND STRENGTH IS INFORMATION

SANCOR Newsletter

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A world first: predation of a humpback whale calf by dusky sharks

By Matt Dicken ¹, Alison Kock ² and Morne Hardenberg ³

¹ KwaZulu-Natal Sharks Board Maritime Centre of Excellence; ² Shark Spotters; ³ Shark Explorers

While looking for sardine activity, during the annual sardine run, off the Pondoland coast in June last year Morne Hardenberg (of Shark Explorers) documented a group of approximately 20 dusky sharks (*Carcharhinus obscurus*) attacking a humpback whale (*Megaptera novaeangliae*) calf. This is a world first and a particularly incredible observation due to the rarity of these events in both time and space. In fact, documented shark predations on whales are limited to only a handful of second hand accounts. Most evidence of predation is simply inferred

from stomach content analysis and scarring patterns on animals.

The whale calf, which was only 4 m long and presumed to be less than 2 weeks old, was found swimming alone (with no mother) about 3 km offshore from Port St. Johns. A group of about 20 dusky sharks all ranging in size from 2 to 3 m were seen following the calf, which already had multiple bite marks along its body (Figure 1). Although the calf swam quickly and often dived it wasn't able to deter the sharks from attacking it. On numerous



Figure 1. Bite marks along flank of humpback whale calf.

occasions a shark would charge along the surface of the water (from behind the whale) and bite it along its flank and head. Although dusky sharks are a large species of shark (Figure 2) growing to nearly 4 m in length they are not considered cetacean predators making this a truly once in a lifetime observation.



Figure 2. Picture of two dusky sharks following the whale calf.

The distribution of bites and rakes were noticeably concentrated on the calf's dorsal and lateral surfaces, particularly in the region between its dorsal and tail fin. This observed pattern of bites is probably due to a combination of factors. Firstly, the whale calf is likely to turn its back to the pursuing sharks in an attempt to reduce the probability of exposing its more vulnerable ventrum, and is a tactic that has been postulated for dolphins when evading a shark attack. Secondly, attacks directed to the tail region would slow, or immobilize the victim and prevent escape.

Over the course of the day the number of fresh and bleeding bites observed on the calf slowly increased and its condition deteriorated (Figure 3). By the end of the day it was spending little

time at the surface and when it dived there was a continuous stream of bubbles from its blow hole. Eventually the calf stopped surfacing all together and was presumed to have drowned through sheer exhaustion and stress.

Due to the high energetic value and the availability and volume of fluids, which would leach from the calf it's likely that its carcass would ultimately represent a valuable scavenging opportunity to other shark species commonly associated with the sardine run such as bronze whaler sharks (*Carcharhinus brachyurus*). Semmens *et al.* (2013) estimated that 30 kg of whale blubber could provide a 943 kg white shark

with sufficient energy for 11.6 days. As a result, a whale carcass of any size represents a high quality food source. Over the last 10-years the sardine run appears to have decreased in intensity in terms of both sardine presence and sardine egg abundance. This phenomenon may represent a significant change in the winter food resources for sharks associated with the sardine run. As a result, whale carcasses (and calves) could form an increasingly important component of shark diets during this time of year.

Humpback whale calves are typically born in tropical and subtropical waters off Mozambique and Madagascar. The

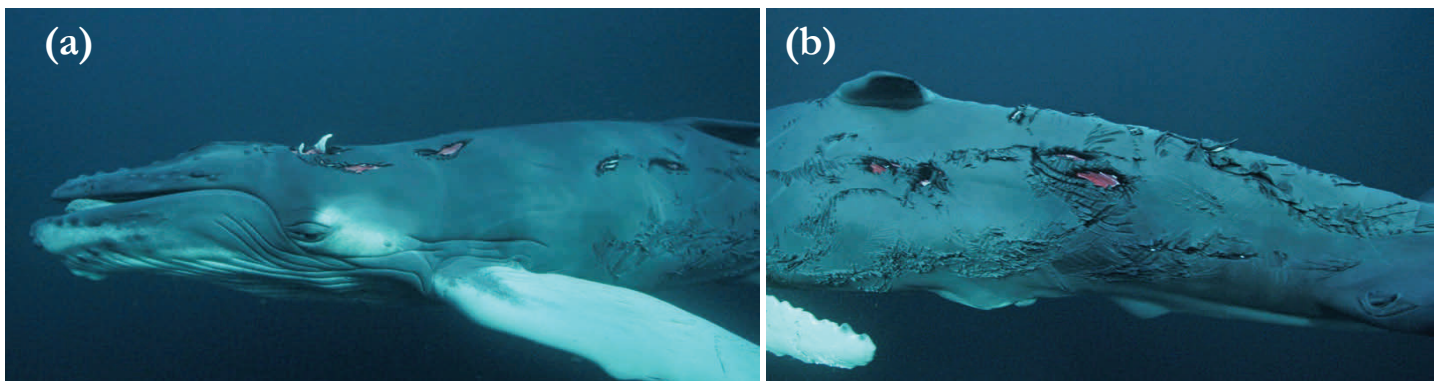


Figure 3. Close up of fresh and bleeding shark bites on head (a) and left flank behind dorsal fin (b) of the humpback whale calf.

observation of a calf less than 2-weeks old within the Pondoland MPA is unusual and may reflect an aborted pregnancy, which would explain the absence of a mother. Alternately, a more southerly calving may be the result of a recovery in the humpback whale population, which is increasing at a rate between 9 and 11.5 % along the east coast of South Africa. Increasing calving rates in this region may lead to more frequent observations of shark predation attempts. Although signs of shark attacks on humpback whales are extremely rare shark predation attempts on whales may occur more frequently than existing literature suggests. Very little is known about the frequency of shark attacks on humpback whales, or on mysticetes in general. Further work is required not only to better understand their importance to the diets of sharks, but also the predation pressures they are exposed to.

We would like to thank Dr. Stephanie Plon (Bayworld) for her comments regarding humpback whale behavior and Steve Benjamin (Animal Ocean) for sharing his eyewitness account of the event.

For the full story, please read: "Dicken, M. L, Kock, A. A., and Hardenberg, M. 2015. First observations of dusky sharks (*Carcharhinus obscurus*) attacking a humpback whale (*Megaptera novaeangliae*) calf", which will be published in the *Journal of Marine and Freshwater Research*, later this year.

All photos courtesy of M. Hardenberg.



Agulhas System Climate Array (ASCA)

Siblol uLwandle – Investigating the Oceans

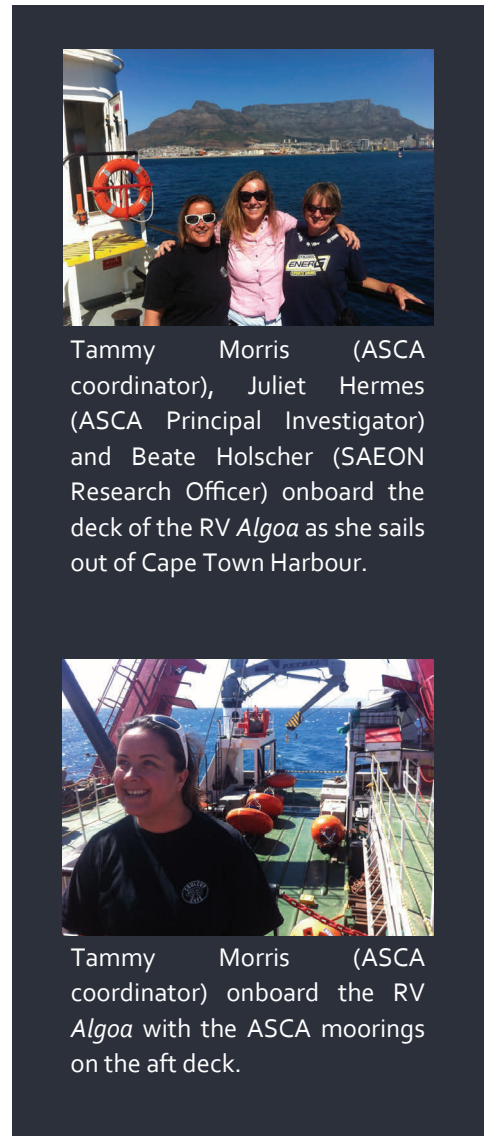
By

**Tammy Morris, Juliet Hermes and
Beate Holscher**

*South African Environmental
Observation Network*

The Agulhas System Climate Array is an international oceanographic project with partners from South Africa, the US, and the Netherlands, and funding support from the South African Departments of Science and Technology (DST) and Environmental Affairs (DEA), the US National Science Foundation (NSF) and the Royal Dutch Institute for Sea Research (NIOZ). It is designed to provide long term observations of Agulhas Current volume, heat and salt transport and its variability from mesoscale (eddies), through seasonal to interannual timescales. This will be achieved by means of two shelf and seven full-depth tall moorings, interspersed with five Current- and Pressure-recording Inverted Echo Sounders (CPIES), measuring pressure, current velocities, temperatures and salinities. The ASCA shelf and tall moorings will extend 200 km offshore along the descending TOPEX/Jason satellite ground track # 96, through the core of the Agulhas Current, with CPIES measurements extending the array to 300 km offshore.

The Agulhas Current System plays a vital role in regional weather, with mean summer rainfall along the east



Tammy Morris (ASCA coordinator), Juliet Hermes (ASCA Principal Investigator) and Beate Holscher (SAEON Research Officer) onboard the deck of the RV *Algoa* as she sails out of Cape Town Harbour.

Tammy Morris (ASCA coordinator) onboard the RV *Algoa* with the ASCA moorings on the aft deck.

coast related to the distance to the Agulhas Current core, as well as impacting the local biodiversity. It also critically contributes heat and salt to the Thermohaline Circulation and thus impacts on climate variability and climate change. The baseline study that the ASCA project provides will contribute to Operation *Phakisa* (a Sesotho word meaning "Hurry Up"), which assesses how the ocean can be used to promote the South African

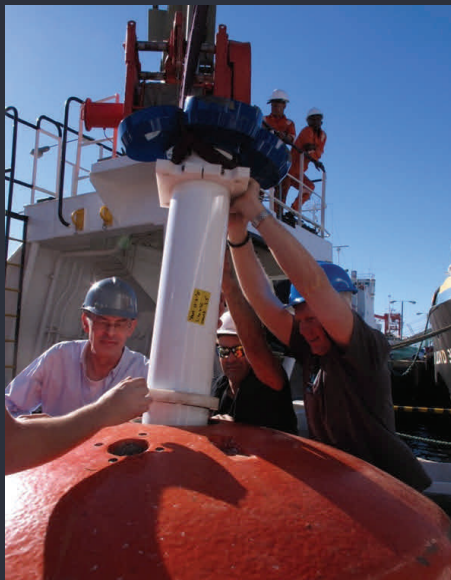
economy. ASCA will provide contribution in knowledge to how the Agulhas Current impacts marine transport, as it dominates the east coast of South Africa, and the marine protection services and governance in terms of providing data on current and temperature variability on the impacts downstream on marine protected areas and critically endangered ecosystems.

The first deployment cruise took place in April 2015 onboard the South African Research Vessel *Algoa* (the first leg just concluded at the time of writing), with the two shelf moorings and the first four tall moorings successfully deployed. This will be complemented (still underway at time of writing) by a Conductivity, Temperature and Depth (CTD) survey along the full ASCA transect, with underway chemistry and ship-borne Acoustic Doppler Current Profiler (ADCP) surveys, SVP Drifter and Slocum Glider deployments.

At the closure of this first deployment cruise, SAEON, through the Department of Science Technology, in partnership with Ocean and Coasts, Department of Environmental Affairs, will launch the ASCA project to the two departments' upper management, the Eastern Cape Government and mayors from Port Elizabeth and East London, collaborating science teams and universities, students, media and public interested in the project. The aim of the launch will be to showcase to the greater community the benefits of this very large monitoring array in terms of climate research and long-term monitoring and the value of scientific collaboration at the inter-governmental



The mooring technicians are precariously balanced on the edge as they connect the Acoustic release to the mooring cable.



Prof. Dr. Geert-Jan Brummer (NIOZ) (left) supervises as the ADCP is inserted into a flotation buoy. Bradley Lows (BCRE) and Leon Wuz (NIOZ) are the senior mooring technicians on this cruise.



There she goes!! The flotation buoy of the first mooring is being deployed.

department level, between universities and science groups and at the international marine science community level.

We thank all participants, and the officers and crew of the RV *Algoa*, and collaborators that made the first leg of this cruise a success and look forward to an informative launch session and educational outreach program involving the RV *Algoa* and fruitful collaborations going forwards with the ASCA project. More information can be found at:

- <http://asca.dirisa.org>
- www.linkedin.com/company/saeon
- Twitter: @Saeonews ☞



Some of the scientists and technicians onboard the RV *Algoa* - Xolisa Dlomo (SAEON/NMMU), Tammy Morris (SAEON), Fehmi Dilmahamod (SAEON/UCT), Jethan D'Hotman (SAEON/CPUT), Gavin Louw (DEA), Bradley Blow (BCRE) and Leo Wuiz (NIOZ).

Miniature sea snails found in acidic sea near volcanic seeps

By Colin Barras

New Scientist

It's the survival of the smallest. As ocean acidification begins to bite, some marine species might adapt by shrinking – threatening the profitability of commercial fisheries.

Carbon dioxide emissions lead to ocean acidification. When atmospheric CO₂ levels soared in Earth's distant past, life sometimes experienced mass extinctions that wiped out most species and shrunk many of the surviving ones.

Many marine shellfish, corals and fish that made it through the turmoil reduced in size by one-third or more, and remained small for tens of

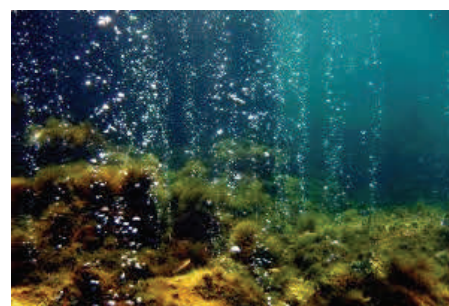
thousands of years, says Richard Twitchett at the Natural History Museum in London.

This response has been dubbed the "Lilliput effect" – a reference to the fictional island inhabited by tiny people in *Gulliver's Travels* by Jonathan Swift. Now it seems that the Lilliput effect is poised to return, as a direct result of present-day ocean acidification.

Twitchett, working with Jason Hall-Spencer at Plymouth University, UK, and his colleagues, studied marine communities living in the Mediterranean Sea around volcanic seeps, where carbon dioxide is naturally injected into the seawater. This effect causes the kind of ocean acidification locally that we might see

globally if atmospheric CO₂ levels continue to rise. The average pH around the seeps is 7.2 rather than a standard seawater pH of 8.1, meaning that the water is more acidic than normal.

The researchers found that there was a 30 per cent drop in biodiversity near the vents, and two species of sea snail



Seeping gas
(Image: Jason Hall-Spencer).

that do survive there are about 1.5 times smaller than members of the species living beyond the influence of volcanic seeps. In other words, the vent snails are Lilliputians.

The team took samples of the snail communities back to the lab. Their tests showed that the small snails had to work harder than larger ones to maintain their metabolism, with the Lilliputians consuming at least twice as much oxygen per milligram of tissue – probably because living at low pH puts them under more metabolic stress.

But because the Lilliputian snails were so small, their total oxygen consumption was actually roughly half that of the larger snails, suggesting that their diminutive size is an adaptation to lower their metabolic demands and boost their survival prospects.

"That's the nub of the analysis," says Hall-Spencer. "The smaller organisms can survive high carbon dioxide concentrations because they don't need as much oxygen."

Shrinking effect

A study last year reported a similar dwarfing response to ocean acidification, when oysters were reared in aquaria filled with seawater that was more acidic than normal.

But natural experiments provide us with a glimpse of how species would fare in the real-world scenario.

There are huge changes throughout the day in ocean pH because of photosynthesis of the plants in the water, says Hall-Spencer. "Here off the coast of Plymouth, pH goes up and

down by one whole unit daily." Mimicking such real-life complexities in aquarium experiments is tricky, he says.

"Studies at ocean seeps and other naturally acidified habitats have been extremely helpful in elucidating future impacts from ocean acidification," says Toby Tyrrell at the University of Southampton, UK.

The findings are important because they show that the Lilliputians' small size is not simply a "plastic" and reversible response to ocean acidification, but is an adaptation: if individual small snails were placed in normal seawater, they continued to metabolise as if they were growing in low pH conditions.

That's probably because the small snails have experienced such conditions for generation after generation – with the volcanic seeps locally lowering pH for at least 12,000 years – and so have become naturally hardwired to expect ocean acidification.

If marine shellfish in general begin to adapt to lower pH conditions by shrinking, there could be commercial implications, in addition to environmental concerns over changing ecosystems.

"The people who will be looking at this the hardest, I suspect, will be those who make a living from growing shellfish," says Hall-Spencer. "You're not going to make much money if everything shrinks."

Journal reference: Nature Climate Change, DOI: 10.1038/nclimate2616

This article was retrieved from the *New Scientist* [website](#). ↗



Winter School: Modelling the marine ecosystem from the ocean to the fish

29 June-10 July 2015

University of Cape Town

This course aims to provide an overview of how marine ecosystems are represented in models, from the physics and the biogeochemistry of the oceans to the fish. Emphasis will be put on how the different components of the ecosystems interact and respond to fishing and climate forcing.

Contact persons:

[Yunne Shin](#) and [Emlyn Balarin](#)

Closing date for applications:

22 May 2015

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

Research can't explain disappearance of salmon in Alaska

By Andisa Bonani

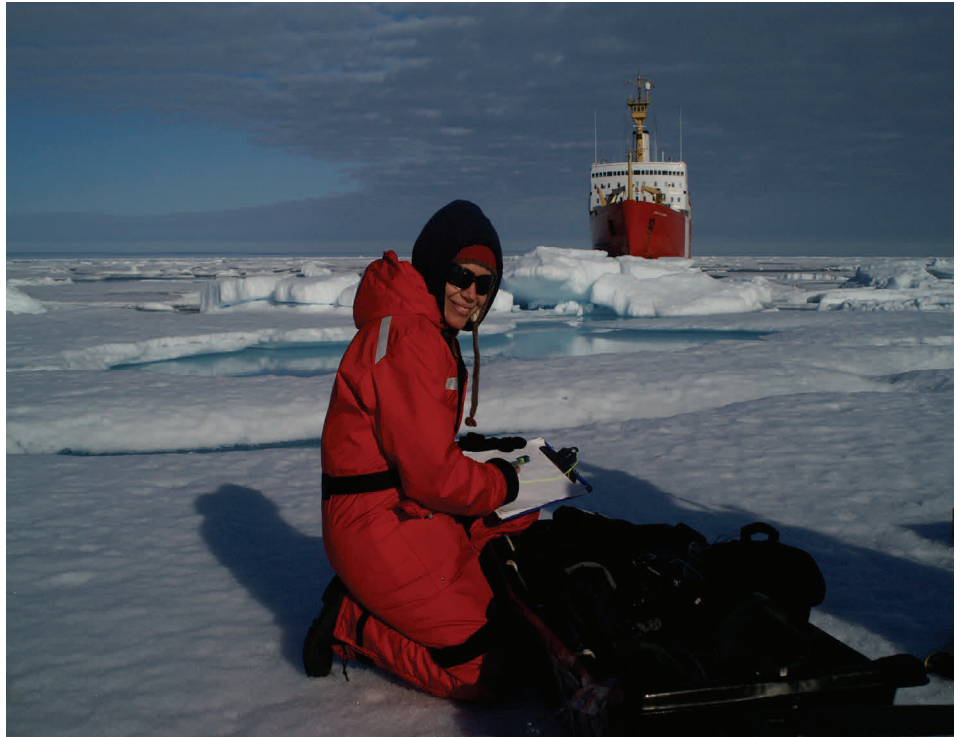
*South African Institute for
Aquatic Biodiversity*

Research Oceanographer at ASL Environmental Sciences in Canada, Dr Jennifer Jackson, visited the South African Institute for Aquatic Biodiversity (SAIAB) during February this year invited by Dr Francesca Porri to work on ongoing collaborative research on possible physical drivers of larval connectivity under the African Coelacanth Ecosystem Programme (ACEP) Open Call programme.

She also presented a seminar on a study on satellite tracking of surface chlorophyll-a off the British Columbia coast between 1997 and 2010.

Surface chlorophyll-a is used in photosynthesis. Plants use chlorophyll-a to absorb energy from the sun and convert it to oxygen and carbohydrates. By studying chlorophyll-a, we can gain an understanding of the amount of single-celled plants called phytoplankton that are in the surface water.

The collaborative study was conducted in Alaska, the mainland United States and British Columbia. The researchers developed ways to track down phytoplankton in different fishing zones. Phytoplankton are microscopic organisms that live in aquatic environments, both salty and fresh.



Dr Jackson doing field work for the research in Alaska

"The goal of this research is to get the data we gathered published so that fisheries scientists can access it and utilise this information for further research or refer to it when they need to for their own projects," said Dr. Jackson.

This study produced various findings rather than a single outcome. The research found that phytoplankton have various patterns in which they grow. Their growth is influenced by various environmental and climatic factors.

Dr. Jackson explained how the disappearance of salmon in Fraser River in 2009 inspired fisheries scientists to conduct a study in various fishing zones.

"No one knows what exactly happened that year, very few fish returned to spawn in 2009 and then returned in large numbers in 2010. There were various speculations on what happened, including changes to the environment and overfishing she said.

Experienced fisheries scientist joins the BCC Secretariat

By Claire Attwood

Media Consultant,

Benguela Current Commission

Seasoned fisheries biologist and scientific administrator, Dr Kumbi Kilongo, joined the Benguela Current Commission (BCC) Secretariat in January 2015 as Ecosystem Coordinator.

Dr Kilongo was formerly Deputy Director of Angola's fisheries research institute, Instituto Nacional de Investigação Pesqueira (INIP), and has over 25 years of practical experience as a marine biologist and administrator. Crucially for the BCC, Dr Kilongo is one of a core group of Angolan professionals who participated in the Benguela Environment Fisheries Training Interactions Programme (BENEFIT) and the Benguela Current Large Marine Ecosystem (BCLME) Programme; consequently he has valuable understanding of the philosophy behind regional cooperation and intimate knowledge of its history and characteristics in the BCLME.

"I strongly believe that the BCC has an opportunity to make a difference and to contribute to the sustainable development of the BCLME region, for the benefit of the people in the three countries," says Dr Kilongo, adding that his move to Swakopmund proceeded very smoothly.

He is accompanied by his wife, Teresa de Jesus, and the two youngest of his four children who are engaged in tertiary studies.

Dr Kilongo is a biologist by training. He holds a PhD in Marine Biology from the University of Algarve in Portugal and completed his Masters degree at the University of Bergen in Norway. His doctoral thesis focused on understanding the dynamics of fisheries resources in relation to the environment in the northern Benguela.

Throughout his career, Dr Kilongo has maintained a strong interest in demersal fishes. He participated in dozens of biological and environmental surveys of the BCLME on the research vessel *Dr Fridtjof Nansen* -- many of them in the role of cruise leader -- and between 1994 and 2002, he worked as coordinator of INIP's demersal programme. He was later appointed Head of INIP's Fisheries Research Centre in Lobito and Dr Kilongo spent a happy 11 years commuting from his home in Benguela to the Research Centre in Lobito. It was during this period that he completed his PhD.

"Benguela is a very pleasant place to live," says Dr Kilongo, "it is much more relaxed than Luanda!"

During the BENEFIT years, and over the course of the BCLME Programme, Dr Kilongo served on a number of working groups and participated in several regional projects. He was also the Chair of the Scientific Committee of the South East Atlantic Fisheries Organisation (SEAFO) for three years, providing strategic leadership to scientists representing the member states of Angola, Japan, Namibia,



Dr Kumbi Kilongo joins the BCC as Ecosystem Coordinator.

Norway, Republic of Korea and South Africa. Under his leadership, the SEAFO Scientific Committee drafted some of the most comprehensive conservation and management measures for the fisheries resources and the environment of the high seas of the southeast Atlantic Ocean.

Dr Kilongo's profound understanding of regional cooperation and his familiarity with the BCC's stakeholders and development partners, mean that he is able to make a unique contribution to the BCC Secretariat. And, his fluency in the official languages of the BCC are an added advantage.

"There is a lot of work to do," he says, "our priority is to implement the Strategic Action Programme (2015 to 2019) and make sure there are sufficient funds and capacity to implement the projects that will help to meet the BCC's objectives." ✂

Swift tern chicks rescued after perilous plunge

By Francois Louw

Southern African Foundation for the Conservation of Coastal Birds

A large number of Swift tern chicks are undergoing rehabilitation at SANCCOB (Southern African Foundation for the Conservation of Coastal Birds) after leaping from a high-rise building in the V&A Waterfront. The recent rise in temperatures in Cape Town caused most of the adult birds to temporarily leave the nests in order to escape the heat. Unfortunately, many of the chicks followed suit without being able to properly fly yet and plummeted to the bottom of the building.

Thanks to Nelson Mandela Gateway personnel, SANCCOB was alerted and together with the Two Oceans Aquarium and local SANCCOB volunteers, managed to save 80 of the heat-stressed chicks. Some of the chicks landed up in the ocean and had to be rescued by a diver from the aquarium. Upon arrival at SANCCOB, the little chicks were immediately

stabilised, examined by the veterinarian for possible injuries, treated for heat stress and provided with a unique identification number to individually monitor each

chicks' rehabilitation progress.

During the next couple of weeks, the chicks will receive a balanced nutritional diet of squid and pilchards, a daily dose of vitamins, kept hydrated with electrolyte fluids and provided with fresh water to cool down in. Handling of the birds will be kept to a minimum to make their stay at SANCCOB as stress-free and comfortable as possible. Once the birds have passed all SANCCOB's release criteria, which include waterproofing evaluations and flying tests, they will receive identification rings and will be released at Robben Island where they will be monitored in the future.

If you would like to make a contribution in aid of SANCCOB's work to care for these beautiful birds until they are old enough to be released back into the wild, please visit our website, www.sanccob.co.za, call us on 021 557 6155 or send us an e-mail at info@sanccob.co.za. ☞



SECOND AFRICAN MARINE DEBRIS SUMMIT

Plastics|SA, through its Sustainability Council and as part of the Global Plastics Industry Marine Declaration on Marine Debris, invites you to a Summit to be held in Cape Town 4th and 5th of June 2015. The Summit will be held in the Colophon Room, in the CBC Building at the SANBI Conference Centre in Kirstenbosch, Cape Town.

Further information and details can be obtained from john.kieser@plasticssa.co.za

[Click here to download the flyer.](#)

Plastics | SA



BirdLife South Africa trains international fishery observers

By Adri Meyer and
Bronwyn Maree
BirdLife South Africa

BirdLife and the ATF

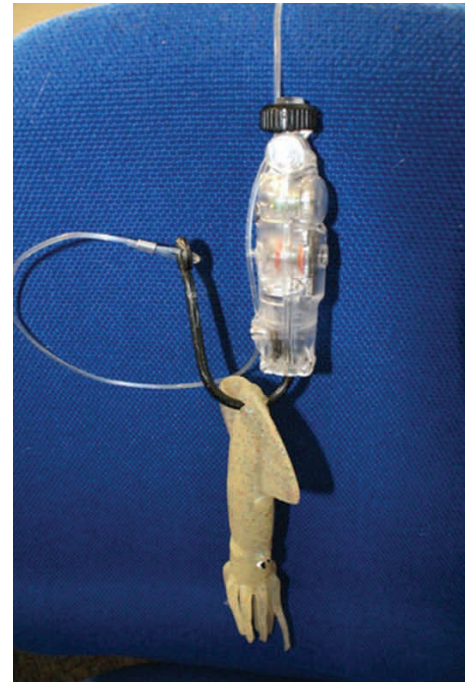
Albatrosses are amongst the most threatened birds on Earth, with 15 of the 22 species being either vulnerable, threatened or endangered. The negative impacts of longlining and trawling on these birds has become an international conservation priority, especially because many albatrosses cross international boundaries and spend much time in the high seas. BirdLife International's Marine Programme (BIMP) was initiated in 1997 to promote collaborative global action to prevent seabird decrease. BirdLife South Africa's (BLSA) Albatross Task Force (ATF) was established in 2006 to address this issue, with the aim to save albatrosses from extinction by collaborating with the fishing industry and national governments to minimise seabird bycatch. Fishing companies allow ATF observers to join fishing trips on a voluntary basis, which assists with understanding the realities of the fishing industry, as well as providing the observers with the opportunity to collect data on seabird abundance and seabird interactions with fishing gear.

BirdLife's involvement with Regional Fisheries Management Organisations (RFMOs)

BirdLife began working with the

international fishing industry through RFMOs in 2004. RFMOs are multilateral organisations formed by countries with fishing interests in a specific area. When BirdLife first initiated work with RFMOs, most Asian distant water fleets were virtually inaccessible. These fleets are responsible for almost 90% of tuna longline fishing effort globally. In 2012 the Indian Ocean Tuna Commission (IOTC) passed a resolution that strengthened the requirements for tuna longliners to use seabird bycatch mitigation measures in areas of high seabird abundance. Since then some Asian nations have accepted BirdLife's positive role in helping fleets to become more seabird-friendly. The Republic of Korea agreed to collaborate with BirdLife in trialling new measures, specifically through adding weights to their lines. In July 2013 an ATF instructor boarded a Korean longline vessel (the first time an environmental NGO had been invited onto a high-seas longliner) and undertook experimental research. The experimental work of the

ATF, as well as lessons learnt from working with the fisheries, are presented at the RFMOs and often result in changed resolutions which fishing nations have to abide by.



A Hook Pod, showing how the hook is contained. The holder pops open at a predetermined depth, releasing the hook (source: www.hookpod.com).



Lecture presentations. From left: Dr Yuna Kim, Bronwyn Maree, Chrissie Madden, Gi Chul Choi, Jaegu Jung.

Common Oceans Project

The Areas Beyond National Jurisdiction Program (ABNJ) – often referred to as Common Oceans – is a broad-scale, innovative approach to achieve efficient and sustainable management of fisheries resources and biodiversity conservation in marine areas that do not fall under the responsibility of any one country. This project has three focus areas: supporting implementation of sustainable fisheries management and fishing practices; reducing illegal, unreported and unregulated fishing through strengthened monitoring and compliance and reducing ecosystems impacts of tuna fishing (including bycatch). This unique project draws together a large and diverse group of stakeholders – from consumers and industry to RFMOs, NGOs and international organizations – that play important roles in tuna fisheries. BirdLife South Africa has been recognised as key role player and will be the implementing partner on a five-year project which will take our Albatross Task Force approach to the high seas tuna fleets. This multi-million dollar project involves working with the fishing nations to demonstrate best practise seabird bycatch mitigation measures; training of fishermen in seabird identification and training workshops to provide fisheries observers with the skills to collect information relating to seabird-fisheries interactions and practical implementation of mitigation measures.

Training begins!

In March 2015, two South Korean fisheries observers, Mr Jaegu Jung and

Mr Gi Chul Choi, travelled to Cape Town for a 5-day observer training workshop. This workshop was developed and delivered by BirdLife's Korean liaison, Dr Yuna Kim, Dr Wanless, and the South African ATF-team. The workshop consisted of lectures as well as practical experience and excursions. The lectures covered the Ecosystem Approach to Fisheries (EAF) management, seabird identification and biological information, assistance on conducting scientific experiments, bycatch mitigation measures and best practice recommendations according to the IOTC.

The observers have returned to Korea and will board Korean fishing vessels from April to June to apply what they have learned. This projects marks an important stepping stone to ensuring seabird bycatch is reduced in tuna longline fisheries globally!

Further information:

Please contact Ross Wanless (ross.wanless@birdlife.org.za). ☎



Practical experience on board a South African fishing vessel.



The two Korean observers, Jaegu Jung and Gi Chul Choi, on a pelagic birding trip (demersal trawl vessel in the background).



Making bird-scaring lines at Ocean View Association for Persons with Disabilities.

A tribute to Prof Peter Best

By Ken Findlay

*Mammal Research Institute Whale Unit,
Department of Zoology & Entomology,
University of Pretoria*

Prof Peter Best passed away on April 22, 2015 after a long illness. Described as the world's foremost authority on the whales and dolphins of the Southern African region, Peter was born in London in 1939 and was educated at Bradfield College, Berkshire, England where he obtained his A levels in 1957. Before going to university he spent two summer seasons on the Antarctic whaling factory *Balaena* as a chemist's assistant, and a winter at the Saldanha whaling station, near Cape Town, where he collected biological specimens and in particular obtained detailed information on the little known Bryde's whale being taken there. He achieved his Bachelor of Arts Honours degree from Cambridge University in 1962, and worked as a whale research officer with the Fisheries Development Corporation of South Africa in Cape Town between 1962 and 1969. In 1971 he received his Doctor of Philosophy from Cambridge University on "Studies of South African Cetacea with special reference to the sperm whale (*Physeter catodon*)", one of the earliest Cambridge graduate degrees based on fieldwork away from the University (another was Jane Goodall's on chimpanzees). Between 1969 and 1984 he was employed as a Professional/Senior/Chief Professional

Officer at the Sea Fisheries Research Institute, in Cape Town, where he oversaw marine mammal research. In 1985 Peter joined the staff of the Mammal Research Institute of the University of Pretoria, first as an Antarctic/Senior Research Officer between 1985 and 2004, and as an Extraordinary Professor thereafter.

Peter was a leading figure in Southern African, Southern Hemisphere and global marine mammal research. Amongst his international colleagues, Peter was seen as amongst, if not the best, cetacean field biologist in the world. His field experience was extensive and included, amongst other field research, specimen collection at whaling stations in South Africa and at sea in the Antarctic; whale-marking off South Africa and in the Indian Ocean; participation in sighting surveys of large whales in the Antarctic and in the Western Indian Ocean, and at sea and aerial surveys of fur seals off the South African west coast and Namibia. However, Peter is probably best known for his extensive aerial surveys of southern right whales off South Africa where he undertook fixed-wing surveys between 1969 and 1987 and photographic surveys by helicopter between 1979 and 2004 and continued to oversee this programme until 2014. This, now 36-year-long, research programme has resulted in one of the longest time - series of large whale research information in the world, tracking the remarkable recovery of



this population. His interests in right whale biology extended to photogrammetry, genetic and satellite tracking studies. Through student supervision, Peter initiated shore based surveys of migrating humpback whales off both the east and west coasts of South Africa, an intensive photo-identification project on Heaviside's dolphins between 1999 and 2001 and more recently a study on southern right whale feeding off the South African west coast. During his tenure with the Mammal Research Institute, Peter supervised six PhD and five MSC students.

Peter was a respected and valued member of a number of research committees and fora, amongst others the Scientific Committee of the International Whaling Commission, 1971-1982 and an invited participant thereafter (including as Vice-chairman of the Scientific Committee in 1982 and 1983); the International Union for Conservation of Nature (IUCN) / Species Survival Commission (SSC) Group of Specialists on Whales between 1971 and 1975, the IUCN/SSC Group of Specialists on Seals between 1983

and 1986 and the IUCN/SSC Group of Specialists on Cetaceans from 1985 onwards. He was a charter member and later honorary member of the Society of Marine Mammalogy, an Associate Editor of *Marine Mammal Science* between 1985 and 1995, and a member of the Society for Marine Mammalogy's Committee of Scientific Advisors from 2003 onwards. He published over 160 papers in peer-reviewed journals. Peter's 338-page seminal "*Whales and Dolphins of the Southern African Subregion*" was published by Cambridge University Press in 2007, the same year that he was the Conference Chair of the 17th Biennial Conference on the Biology of Marine Mammals, held in Cape Town.

Amongst the numerous awards Peter received were the Cape Times Centenary Medal in 1993, the Gold Medal of the Zoological Society of Southern Africa in 1998, the Gilchrist Memorial Medal in 2005 and the University of Pretoria's Commemorative Research Medal in 2008. In 2004 Peter was elected a Fellow of the Royal Society of South Africa.

Peter married Margaret Ann Ralph (Maggi) in June 1974 and is survived by her, their son Robert and daughter Alison. ☞

Short Course

Introduction to Statistical Modelling – a data-based approach

14-17 July 2015

Mathematical Sciences Building, Wits University, Johannesburg

Past participants: "Even if I only take home a fraction of what I've learned I've definitely benefited" "I finally understood many concepts I hadn't before. I enjoyed the real-life examples too as they put statistics into context"

Following on from several successful previous workshops over the last six years and due to popular demand, a workshop team from the University of St Andrews ([CREEM](#)), in conjunction with the [ACCESS](#) programme and the [CoE-MaSS](#) at Wits University, and the [GCSRI](#), also at Wits, will host a 4 day workshop to introduce participants (open to all) to basic statistical modelling techniques. The course will be heavily practical based (using real data examples), working directly with statistical software.

This 4 day course is taught using methods that can be widely applied but is illustrated using an Environmental Impact Assessment case study (using a large scale offshore windfarm). This course starts at a very basic level and covers the following:

- Exploratory data analysis: graphical illustrations (e.g. histograms, boxplots etc)
- Summary statistics, the basics of parameter estimation and inference (e.g. means, medians, variances)
- Confidence Intervals, Hypothesis Testing (including *t*-tests and ANOVAs)
- Models for continuous response data: Multiple linear models - including model specification, fitting, selection, assessment and interpretation (with a particular focus on interpretation)

- Models for count data and models for binary responses (e.g. presence/absence data): Generalized Linear Models (GLMs) - including model specification, selection, fitting, diagnostics and interpretation. Accounting for overdispersion will also be covered.
- Models for correlated data: Generalized Estimating Equations (GEEs) - including model specification, selection, fitting, diagnostics and interpretation.

The **R** software package will be used for workshop-based practicals but all code will be provided and no prior experience with the **R** package is assumed.

Those with laptops are advised to download both the [free R package](#) and [R-Studio](#) before arrival, but all files required will be provided.

There will be no tuition fee charged for the course (it's free) however a registration fee of R500 to cover catering and printing costs will be required. Accommodation and travel costs will also be the responsibility of participants (assistance with booking may be provided). Prospective participants are invited to apply to attend the course by following the link below (**Deadline 1st June 2015**):

[Click on this link to apply.](#)

Successful applicants will be informed by email where after proof of payment to secure your place will be required. ☞



Do ARGO floats observe the oceans uniformly?

By Senam Tsei ¹, Dr. Seb Swart ^{1,2}
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Autonomous profiling floats have become transformative tools and equipment for oceanographers. They have enabled continuous and real-time subsurface observations of the global ocean. In addition, autonomous profiling floats provide the means to collect vast amounts of hydrographic data from remote regions. These platforms are complementary to

remotely sensed satellite observations of the surface ocean and provide detailed subsurface information on the state of the ocean. The Argo float, a vertical profiling instrument, has become an integral component of the marine observing system. They are

becoming a useful source of real-time data to assimilate into numerical ocean models used for research and forecasting the ocean on a variety of time scales.

Over the last 15 years, about 6000 Argo platforms have been deployed. Approximately 3500 floats are currently active, continuously collecting temperature, salinity and pressure data from the upper 2000 m in the ocean every 10 days. However, there are few Argo floats in the Southern Ocean where data collection is complicated by logistical reasons and the harsh ocean environment. In addition, a thorough investigation into the spatial distribution of Argo profiling floats in the Southern Ocean has not yet been

done. More specifically, the sampling bias introduced by the entrainment of the floats into frontal jets that are topographically steered has not been examined. This study therefore aims to investigate the sampling bias introduced by the entrainment of the floats into frontal jets that are steered by the bathymetry.

The trajectories of some Argo profiling floats deployed on the GoodHope Line were assessed in accordance to the underlying bathymetry. These profiling platforms (Figures 1 and 2), were observed to be steered by sea floor bathymetry such as the sea mounts and ridges. Generally, it is understood that the underlying topography steers and creates perturbations in the flow of

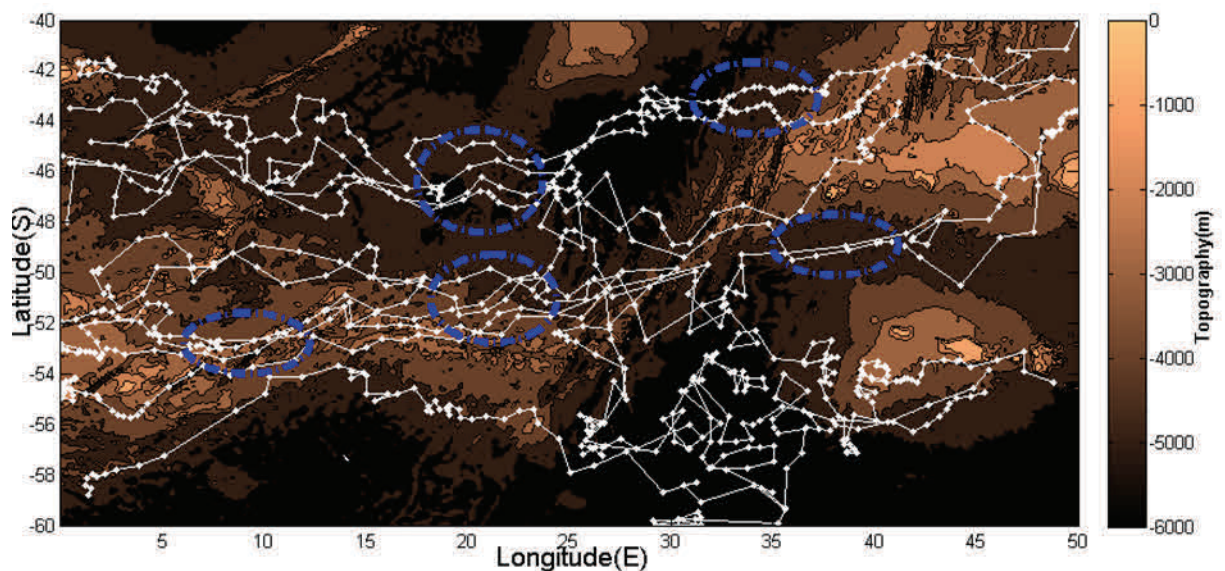


Figure 1: Schematic representation of trajectories a portion of Argo profiling floats deployed at the GoodHope Line overlaid on the bathymetry. The floats can be seen to be steered by bathymetry – i.e. mostly avoiding shallower regions. The dash circles (mostly the red dash circles) represent examples of regions of convergence of floats that may be induced by front convergence due to topographical steering.

ocean currents, in particular the Antarctic Circumpolar Current (ACC). As a result, the ACC diverges or converges downstream leading to the entrainment or dispersion of water masses containing Argo profiling floats. Hence, the floats become entrained into the frontal regions of the ACC.

The geographical positions of the Argo profiling floats were co-located with the underlying bathymetry, in order to study the relationship between the float trajectories and the underlying bathymetry. It was found that a bias exists in the distribution of the positions of the floats in relation to the bathymetry. Floats are more likely to be found in the ocean where the underlying depth of the ocean is greater than 2000m, compared with shallower regions where the distribution of the floats is sparse. Interestingly, two particular ocean depth ranges were found to contain a higher concentration of floats – these depths ranged from 4000m to 5000 m and from 2000 m to 3000 m. There was a 30% greater chance of the floats sampling in ocean depths ranging from 4000m to 5000m and a 10% higher likelihood of the floats sampling in the depth range of 2000 to 3000 m.

Figure 2 highlights the above findings, showing three Argo profiling float trajectories being influenced by topographic features of the Southern Ocean. The three trajectories tend to remain in waters deeper than 4000m, suggesting that they are entrained into circulation features of the ACC that are topographically steered.

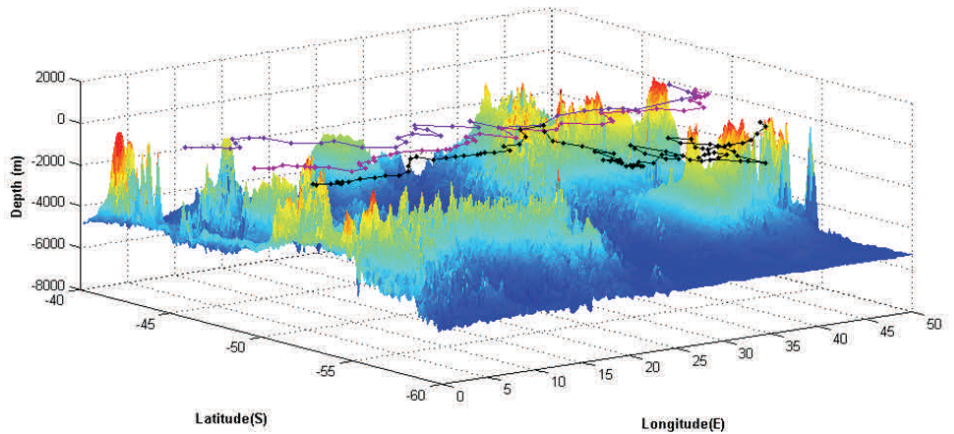


Figure 2: 3D illustration of the steering of three Argo floats by the underlying bathymetry. The trajectories of the floats are represented by blue, magenta and black curves.

To study the link between topographically steered currents in the ACC and the trajectories of the Argo floats, their positions were co-located with the altimetry-derived mean surface geostrophic current velocities to assess if there was a particular bias between the Argo profiling floats and regions of enhanced surface ocean velocities. Similarly to the bathymetry, the floats were found to be located in regions of higher velocities, in

particular for areas that had surface velocities of between 0.1 to 0.22m/s and 0.34 to 0.36m/s with a 30% higher likelihood of floats being found where the velocities were approximately 0.16m/s.

To highlight these findings, the Argo floats identified to have high velocity biases were overlaid with the altimetry-derived mean surface geostrophic current velocities in Figure 3. The

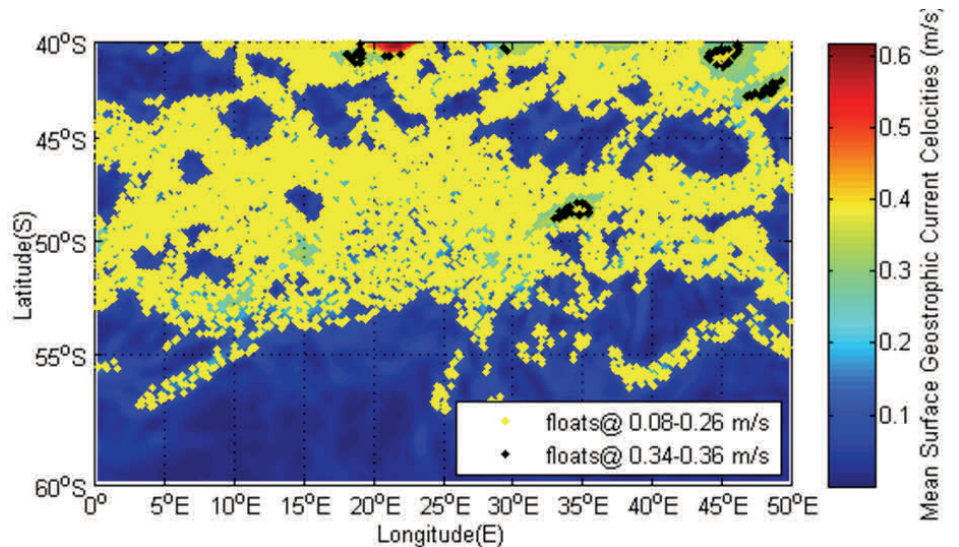


Figure 3: Locations of floats that have positive bias in the velocity bins between 0.08 to 0.26m/s (yellow dots) and between 0.34 to 0.36m/s. The floats are overlaid onto the mean surface velocities (colour shading).

aforementioned floats can be seen to aggregate and entrain into the higher velocity regions associated with the ACC fronts as well as other oceanic features such as mesoscale eddies.

In conclusion, the Argo floats trajectories analyzed in this study show that the floats are entrained into frontal jets of the ACC that are steered by the underlying bathymetry. It was found that there is 20 to 30% likelihood that Argo floats in Southern Ocean south of Africa will predominantly sample in depths ranging from 4000 to 5000m. In addition, the investigation reveals that there is up to a 60% increased chance of finding more floats in higher surface geostrophic current velocities.

This study indicates that indeed Argo floats are not sampling the ocean uniformly, in particular the Southern Ocean. This poses problems for ocean-climate research using Argo floats and also numerical models which assimilate profile data from the Argo program. These biases in sampling likely add a yet unknown error to model output and the interpretation of the ocean dynamics.

Further Reading:

"An investigation into the sampling bias of Argo profiling floats in the Southern Ocean". Master degree thesis in Applied Marine Science by TSEI SENAM (2014/15). ☞

SANCOR Travel Award Winner for 2015

The SANCOR International Travel Student Award has been instituted to promote and develop capacity building in science in the marine and coastal environment. This year's winner is Taryn Murray from the Department of Ichthyology and Fisheries Science at Rhodes University.

Taryn is currently pursuing a PhD entitled "Ecology and movement behaviour of a piscivorous predator, leervis *Lichia amia*". She will be presenting her research at the 3rd International Conference on Fish Telemetry which will be hosted by the Dalhousie University's Ocean Tracking Network (OTN) which will be held at the World Trade and Convention Centre in Halifax, Canada between 13 and 17 July 2015.

Taryn was also recently selected as a member on the International Data Management Committee. This committee meets once a year in Canada and this year's meeting ties up very nicely with the international conference.

This SANCOR award is presented annually to a PhD student in recognition of their work accomplished thus far. This grant 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. Furthermore, it provides the ideal platform for the student to interact and network with national and international experts in the same research field. ☞



Taryn Murray of Rhodes University—recipient of the 2015 SANCOR Student Travel Award.

A meeting of KZN-based coastal and marine research institutions

By Louis Celliers

SANCOR Steering Committee and Natural Resources and the Environment, CSIR

Coastal and marine research institutions in the province of KwaZulu-Natal (KZN) have a long and excellent history of undertaking coastal and marine research. In light of the growing complexity of the South African research landscape, coupled with the increasing demand on shrinking research budgets, SANCOR facilitated a meeting of the provincial institutions in order to build on this legacy to improve the provincial and national research capability in South Africa. The objective of the meeting was to self-organise towards greater impact and prominence within the national research landscape. The

meeting was arranged by the SANCOR KZN and National Forum representatives (Ursula Scharler and Louis Celliers respectively). The participants were welcomed by Larry Oellermann from the Oceanographic Research Institute which hosted the meeting in the conference hall of the SeaWorld Education Centre in Durban. SANCOR was also assisted by the Natal Sharks Board and Ezemvelo KwaZulu-Natal Wildlife which made valuable inputs to the agenda and meeting arrangements.

The meeting took place at the SAAMBR Seaworld Education Centre in Durban on the 8th April 2015. The meeting was well-attended by 41 scientists and managers. The agenda was set to provide an opportunity for participants

to meet; exchange information (questionnaire and other feedback); learn about existing formal (KZN) research networks (presentations); consider mechanisms for collaboration; and plan some future activities.

Ursula Scharler, the SANCOR KZN representative introduced SANCOR as an organisation while Angus Macdonald did the same for the Western Indian Ocean Marine Science Association (www.wiomsa.org). Ryan Palmer from SAIAB also took the opportunity to inform the participants of the ACEP Marine Platform expansion. The last network presentation was made by Jean Harris from EKZNW who reflected on the workings and successes of the KZN Coastal and Marine Management Research Group (KZN MRG) that was in

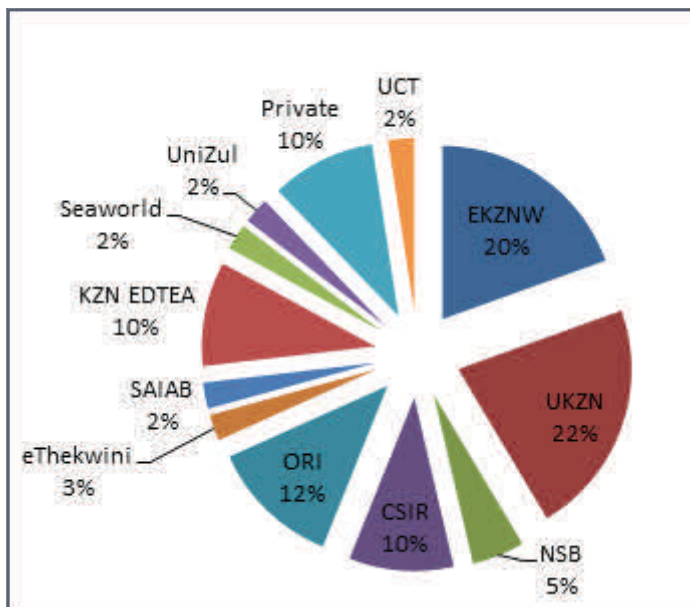


Figure 1. Proportion of individuals attending the KZN meeting of coastal and marine research institutions

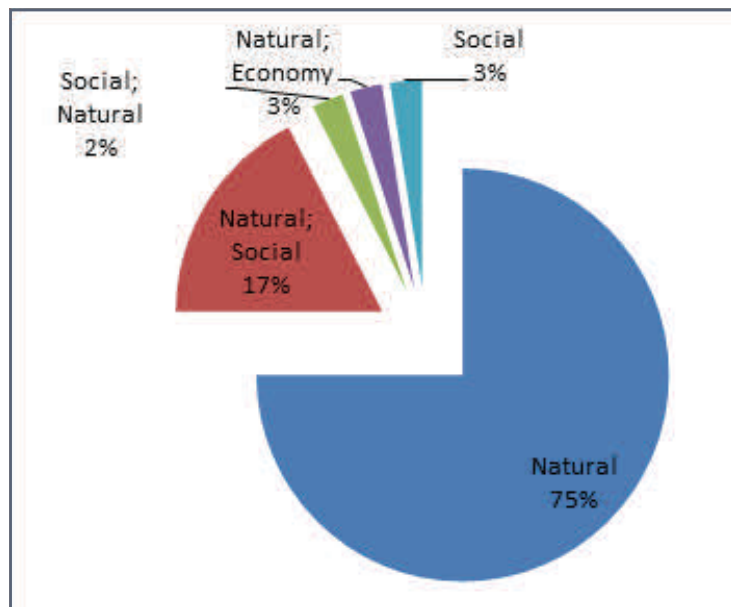


Figure 2. Self-identification by participant of their primary science alignment.

previous years considered a successful mechanisms for research collaboration on provincial conservation management research.

Participants were also requested to complete a questionnaire prior to the meeting. A snap-shot of the results were presented (Figure 1-3).

During the open discussion, the participants recognised that research cohesion in the province was negatively affected by, amongst others, fragmentation of national funding sources, the lack of provincial allocation for management-directed research (previously conducted by the KZN MRG) and the delayed initiation of the new SANCOR SEaChange Programme. The participants were of the opinion that KZN-based institutions should communicate more effectively and make use of mechanisms such as "brown-bag" presentations, thematic discussions and mini-research symposia. The use of social media was also suggested to improve the exchange of information. It was decided to



Figure 3. Funders of KZN-based coastal and marine research.

arrange another meeting of KZN institutions to consider the re-establishment and re-scoping of the defunct KZN MRG. Finally, the SANCOR representatives encouraged the KZN institutions to put forward an expression of interest to host the next SAMSS, which is due to be convened in KZN in 2017.

SANCOR acknowledges and appreciates the contribution of all participants. ☞

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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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