

# SANCOR NEWSLETTER

## South African Network for Coastal and Oceanic Research

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## Mysterious oarfish washed ashore

By Siphokazi Nonyukela and Penny Haworth

Seldom seen, the rare, elongated oarfish, measuring between 3-8 meters from nose to tail, is a likely source of myths about sea serpents. Recently, a 4m long specimen was found washed up at Bokkomsbaai in the Western Cape by a commercial fisherman, Keith Boas. This ribbon-shaped, brilliant silver fish which has irregular blackish streaks and spots on its body and crimson dorsal and pelvic fins, is seldom seen far from the deep sea and is believed to be the longest bony fish in the ocean.

After it was found, the fish was taken to Fransmanshoek Conservancy at Vleesbaai for safe keeping where Ricco Menezies and colleagues from Cape Nature in Stilbaai maintained it in excellent condition. It was cleaned and blast frozen at Viking Fisheries and thereafter transported to the South African Institute for Aquatic Biodiversity (SAIAB) in Grahamstown for preservation. SAIAB is a Research

Facility of the National Research Foundation (NRF).

“These fishes are seldom caught and they are mostly seen when washed ashore,” said Dr Stephen Lamberth, Inshore Resources Researcher from the Department of Agriculture, Forestry and Fisheries. They are found in temperate and tropical oceans worldwide. They live in deep water and are rarely seen.



SAIAB's Senior Aquatic Biologist, Roger Bills, injects formalin into the flesh of the oarfish to speed up the preservation process



Unlike other fishes, the oarfish keeps its body straight and swims vertically in the water column. This movement makes it easier to spot prey silhouetted against the light from the surface. "They are a mystery to scientists and are commonly found to depths of 100metres and more where they feed on crustaceans and fish larvae," added Lamberth.

On its arrival, the 4metre long deep water fish provided hours of fascination for curious SAIAB and Rhodes University Department of Ichthyology and Fishery Sciences (DIFS) staff and students. SAIAB and DIFS maintain strong relations as a large number of DIFS students are supervised by SAIAB.

The fish is soaked in a bath of 10% formalin to be disinfected and 'fixed'. This retards decomposition. With large specimens such as this, formalin is also injected into the flesh to ensure that the internal tissues and organs are also fixed and do not decay. Once fully 'fixed' the specimen will be thoroughly rinsed and transferred into a storage bin containing ethyl alcohol. The SAIAB Collection has five other specimens of this species dating back to 1966. Tissue samples taken from the oarfish will be stored in SAIAB's Biomaterials Bank for DNA sequencing. The oarfish specimen will be stored in SAIAB's Collection Facility and will be used for research. This state-of-the-art storage facility is specially designed for the long-term preservation of aquatic specimens.

For more information on SAIAB and its collections, visit <http://www.saiab.ac.za/>

## Sharing benefits from the coast

By Rachel Wynberg, Maria Hauck,  
Philile Mbatha, Mayra Pereira and  
Serge Raemaekers

Coastal resources are vital for local coastal communities, many of whom live in abject poverty. These resources also hold significant value for a number of different economic sectors, many of which supply expanding global consumer markets. Although these activities provide numerous opportunities for economic development and income generation, global patterns indicate growing levels of economic inequality between custodians of these resources and those

exploiting them, as well as an increase in poverty.

Benefit sharing is a popular term to describe interventions to redress inequalities, and thus alleviate poverty. The expression was originally developed in the context of bioprospecting, but today the term is widely adopted by different sectors. In the coastal context, understanding remains poor as to what benefit sharing means in practice, and the linkages with poverty reduction have not been fully explored.

To answer these questions a three year research project was initiated by UCT in

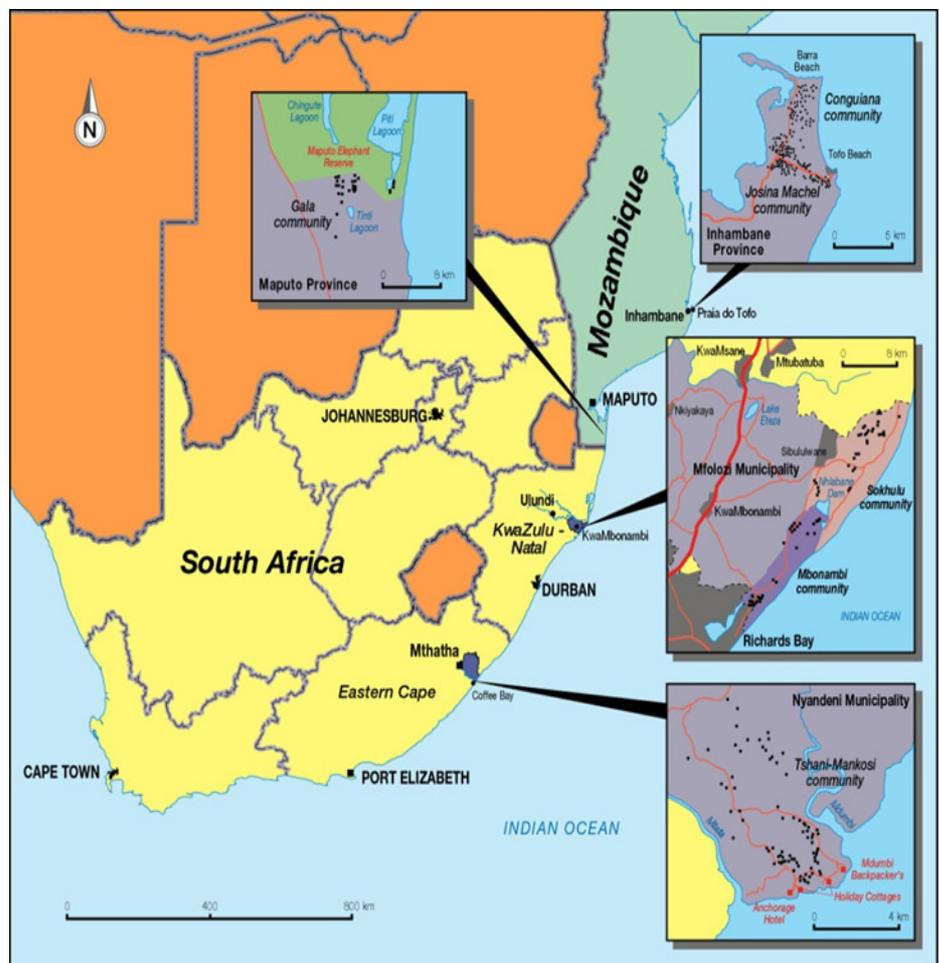


Figure 1: Case study communities in SA and Mozambique.



South Africa and Mozambique, funded by the Western Indian Ocean Marine Science Association (WIOMSA). In South Africa, research involved the communities of Sokhulu and Mbonambi in KwaZulu-Natal and Mankosi in the Eastern Cape (Figure 1). In Mozambique, communities included Gala in Maputo Province, and Conguiana and Josina Machel in Inhambane Province. These cases represented marginalised or poor communities reliant on coastal resources and also included a so-called benefit-sharing arrangement aiming to redistribute benefits to the poor (e.g. a fishing committee to determine the allocation of permits, or a shareholder scheme to distribute profits from mining or tourism).

We explored a diversity of arrangements between the state, community, non-governmental organisations (NGOs) and/or business and also investigated a range of sectors, including forestry, fisheries, tourism, agriculture, mining and conservation. We also explored interactions of benefits and losses *between* sectors. Both

quantitative and qualitative research methods were used and included 515 household surveys, 46 focus groups and 61 key informant interviews.

**Key Findings and Policy Recommendations**

**Decisions must be informed by the interlinking benefits and losses between sectors**

Our findings (which focus on South Africa) affirm the importance of coastal resources to livelihoods and the various ecological, economic, social and cultural benefits they bring through a range of economic sectors. However, many of these benefits were paralleled by equivalent or greater losses incurred by the same communities. For example, although there may be economic benefits from mining, it also leads to the loss of livelihoods through negative impacts on agriculture, indigenous forests, tourism and fisheries (Figure 2). Tourism may bring economic benefits but may also lead to ecological losses through over-



Harvesting mussels at Sokhulu (Photo by Rachel Wynberg)



Mdumbi Lodge, Eastern Cape (Photo by Serge Raemaekers)



Rock lobster harvesting in the Eastern Cape (Photo by Rachel Wynberg)



Titanium mining on the dunes at Richards Bay (Photo by Rachel Wynberg)

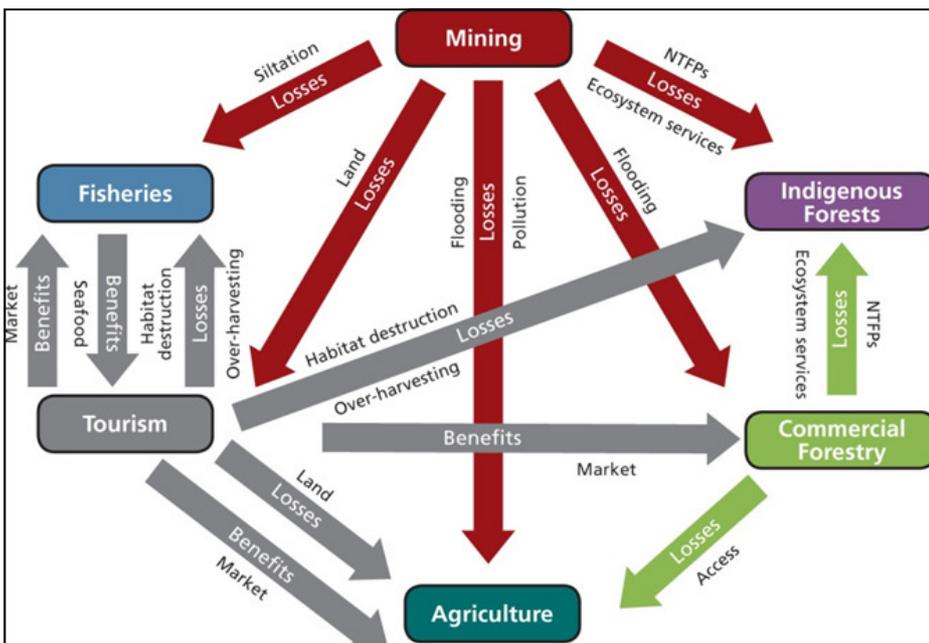


Figure 2. Benefits and losses from diverse sectors are integrally related



exploitation. Many households - some 67% of households in Mbonambi as an example - were involved in two or more economic sectors, demonstrating the linkages between sectors and their impacts on livelihoods. It is vital that these interlinkages are taken into consideration to enable coherency and effectiveness in policy implementation and economic development. This runs contrary to the current silo-like way in which government takes decisions.

**Tenure security must be ensured, rights clarified, and access to the coast and its resources facilitated**

The extent to which communities benefit from coastal resources is determined by ownership and tenure security of land and resources, access to the coast and its resources, and control over how resources are used. Different sectors therefore will lead to different benefit outcomes. For example, rights and access to resources are central in the fisheries sector, but these are underpinned by the common pool nature of marine resources, and strong national and provincial government rules, applied in regulation and management. Although permits were perceived by the majority of fishers at all study sites as an important benefit, different policy approaches to the management and sale of resources play a key role in benefit distribution. In KwaZulu-Natal, for instance, co-management and subsistence fishing permits have formalised access rights, which were historically illegal. Recognition of these rights was considered a substantial benefit by

fisher communities. However, prohibitions on the sale of resources were perceived to curtail benefits, and reduce livelihood opportunities. In the Eastern Cape, there is limited government intervention, but this has led to a greater proportion of monetary benefits among fishers, at the cost however of ecological sustainability.

Despite strong laws requiring access to the coast to be facilitated, rights to do so are unclear. Although the coast is a public asset, adjacent land may be privately concessioned or owned, hindering access to the coast and its benefits. Government, in partnership with coastal stakeholders, needs to identify ways to enhance access to the coast, especially for those with historic links to the area or for those who are dependent on the coast for livelihoods.

**Support partnerships to share benefits**

External actors such as the private sector and NGOs have played a critical role in initiating and implementing benefit-sharing arrangements (Figure 3). Ongoing support and promotion of these interventions is important to unlock livelihood opportunities and promote equitable sharing of long-term benefits. Inter-

estingly, some of the key benefits that emerged from non-state initiatives were often those relating to the failure of government to deliver basic services such as health care, education, roads and drinking water. This suggests, rather worryingly, the potential abuse of benefit-sharing mechanisms to absolve government of its core responsibilities, rather than the use of these mechanisms to add to the benefits that communities are already entitled to from the state.

**Engage the relevant institutions**

Institutions play a critical role in determining beneficiaries and distributing benefits. Although institutions have been set up to enhance benefits to local communities, their effectiveness at achieving equity has been compromised by a lack of accountability, questions of representivity, elite capture of benefits, power dynamics, and a multiplicity of competing institutions at the local level. For example, more than half of interviewed households in Sokhulu and Mbonambi believed that institutions used to share benefits from coastal mining were neither representative nor effective. This is attributed to the lack of accountability, transparency and procedural justice within local institutions (i.e. traditional

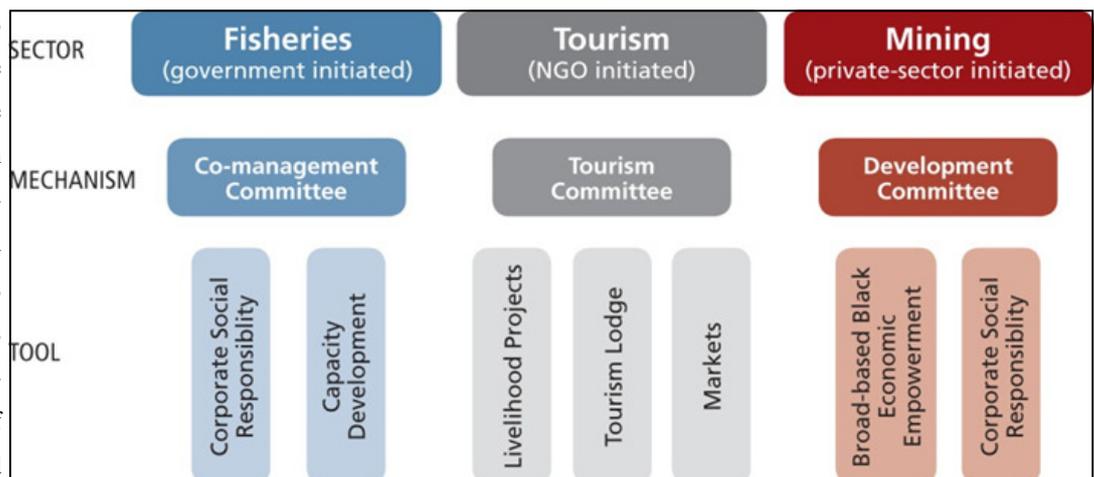


Figure 3. Examples of benefit-sharing arrangements in the different sectors



authorities and local committees set up by the mining company). Where efforts were made to provide benefits, these were either considered insignificant in relation to the losses incurred, or were absorbed by the community elite at the local level and as a result, did not reach the wider community. These dynamics are in turn influenced by the value of the resource, with higher-value resources such as minerals or prime coastal estate, attracting more political competition.

These problems are largely attributed to the conflicting jurisdiction of traditional and state authorities, the failure of national government to clearly distinguish the roles of traditional leadership institutions and democratically elected local government representatives, and the mismatch between local practices and top-down governance frameworks. These factors create major institutional blockages to benefit distribution.

Where there was devolution and representative decision-making power for benefit distribution communities perceived a greater level of tangible and intangible benefits. However, where decision-making power was not decentralised benefits were largely outweighed by losses. The more control people have over their resources the greater the chance of equitable benefits.

It is vital that substantial consideration is given to the institutions used to imple-

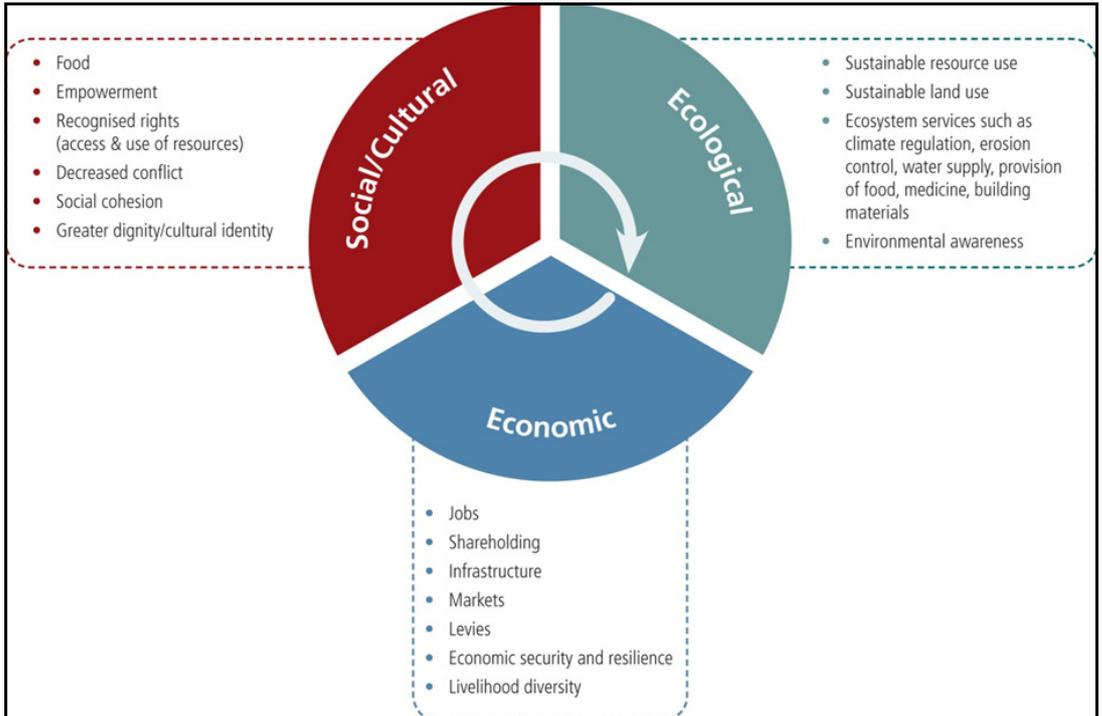


Figure 4. A range of monetary and non-monetary benefits are obtained from coastal resource use

ment benefit sharing, in order to ensure that they reflect local realities and are accountable and participatory.

**Recognise the value of both monetary and non-monetary benefits**

A key conclusion is the importance of both monetary and non-monetary benefits (Figure 4). An understanding of benefits is also not complete without an understanding of losses. For example, 18% and 33% of households in Sokhulu and Mbonambi respectively earned an income through employment by Richards Bay Minerals, which mines titanium on the coastal dunes. Despite this relatively large injection of cash, only 4% and 22% of respective households believed they benefited from mining. In contrast, 39% and 71% of these respective households believed they had suffered significant ecological, social and cultural losses due to mining. The multi-faceted nature of benefits needs to be taken into account when decisions are made about conservation and development interventions.

These findings affirm the growing number of studies that challenge conventional frameworks for understanding human well-being, focused on money, commodities and economic growth, and point towards the need for a more nuanced and complex approach to development in general, and benefit sharing in particular. The multi-faceted nature of benefits, the reliance of communities on a diverse range of sectors for their livelihoods, and the inter-connectedness of benefits and losses between these sectors, further underpins the importance of viewing coastal livelihoods in an integrated and holistic manner.

Further information about the project can be found at: <http://www.eeu.uct.ac.za/>





# €1.5 million support for EAF

By Claire Attwood

The purpose of the Benguela Current Commission is to coordinate a joint research project that is expected to modernise and improve the management of key marine fisheries in Angola, Namibia and South Africa.

Aptly named ECOFISH, the project aims to improve the scientific assessment of hake, horse mackerel and sardinella – three fish stocks considered most important for securing the prosperity of the fishing industries of Angola, Namibia and South Africa, and the livelihoods of fishers and fish workers.

The ultimate goal of ECOFISH is to help the three SADC countries to develop a new framework for the ecosystem approach to fisheries (EAF) in the Benguela Current Large Marine Ecosystem. Angola, Namibia and South Africa committed themselves to introducing an ecosystem approach to fisheries management at the World Summit on Sustainable Development in 2002. The ECOFISH project will help them to fulfill this pledge.

“To effectively introduce the ecosystem approach to fisheries management at the regional level, we need good quality fisheries data,” explains Dr Hashali Hamukuaya, Executive Secretary of the Benguela Current Commission.

“ECOFISH will greatly improve the capacity of the three countries to gener-

ate new data and better process existing data. For example, ECOFISH is expected to improve the collection of socio-economic data, and ensure that the knowledge of fishers and fishing communities is taken into account, thereby improving fisheries management.”

ECOFISH has won the support of the European Union, which has provided a grant of 1.5 million Euros to fund the initiative over four years (2011 to 2015). ECOFISH activities are organised into four “work packages”. The work packages are integrated with the objective of building a knowledge base for the implementation of an ecosystem approach to fisheries in the BCLME.

Work package one concentrates on stock assessments. The goal is to extend existing stock assessment methods so as to take into account current data and knowledge. New models will be tested using new information.

Work package two aims to improve inputs to the stock assessment models ap-



*Packing hake fillets for export. In South Africa and Namibia, hake stocks are important for the prosperity of fish workers and the fishing industry.*

plied in the management of hake, horse mackerel and sardinella stocks. In this work package, four distinct activities are planned:

- a genetic study to determine the trans-boundary nature of hake stocks;
- a study of the ways in which environmental variables (e.g. water temperature or algal blooms) affect catch rates of hake (the “catchability” of hake);
- a re-look at the aging of fish samples so as to improve growth rate estimates of hake, horse mackerel and sardinella;
- an analysis of the position of hake, horse mackerel and other demersal and pelagic fish stocks in the food web of the BCLME.

Work package three will bring together a wide range of information – including

## Benguela Current Convention to be signed this year

The city of Benguela in southern Angola has been selected as the location for the signing of the Benguela Current Convention, a treaty between Angola, Namibia and South Africa that will regulate the future management of the marine ecosystems of the Benguela Current.

The Convention will be signed in August or September this year. The three southern African countries are expected to ratify the Convention by December 2012, thereby bringing into force a unique multilateral agreement that has as its objective the long-term conservation, protection, rehabilitation and sustainable use of the Benguela Current Large Marine Ecosystem or BCLME.



environmental indicators and stakeholder knowledge and experience – to develop a coherent assessment approach for two case studies: the Namibian hake fisheries and the Angolan purse seine fisheries for horse mackerel and sardinella.

Work package four will strengthen regional capacity in stock assessment and the implementation of the ecosystem approach through formal courses targeting fisheries scientists and managers; stock assessment workshops; and yearly project meetings.

#### Who is involved in ECOFISH?

The ECOFISH consortium is made up of scientists and fisheries managers in Angola, Namibia and South Africa and a team of specialists from the Technical University of Denmark. Scientists from the universities of Cape Town and Stellenbosch are also participating in the initiative.

The management of shared fish stocks is just one of the areas of interest for the Benguela Current Commission which is working to promote the integrated management, sustainable development and protection of the Benguela Current Large Marine Ecosystem, or BCLME. Other areas of interest are environmental monitoring and early warning systems; biodiversity and ecosystem health; abatement of marine pollution, responsible marine mining, responsible oil and gas exploration and production, marine transport, governance of marine ecosystems, capacity building in marine sciences and the classification of marine data and information.

For more on ECOFISH visit [www.benguelacc.org](http://www.benguelacc.org)

## Students and scientists develop copepod identification skills

By Riaan Cedras

Copepods are crustaceans (like crabs and prawns) and those that swim freely in the open ocean (members of the plankton) are arguably the most multitudinous metazoans on the planet, being found in all oceans and seas, at all depths. They are diverse – there are about 1800 species each with its own operational optima, and they are small – nay minute (generally less than 1 mm in length). Because of these features and the fact that they cannot out-swim a ship they are easily sampled using nets (etc), and this makes them ideal for monitoring the state of the marine environment.

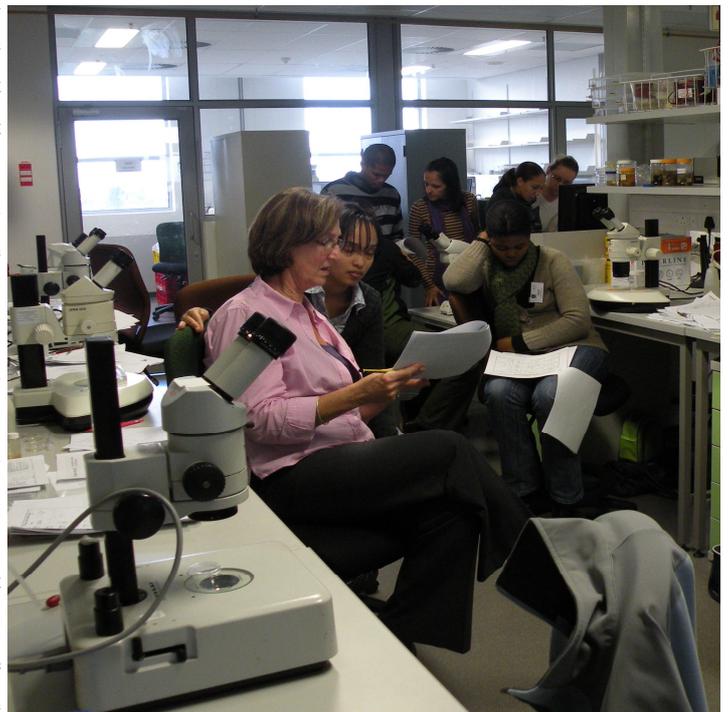
In order to be able to use copepods in any sort of monitoring (or other) work, however, you need to know what you are looking at in a net caught sample of plankton. Now that may sound simple, but given how many different species there are, given that males look different from females and that a copepod goes through almost 10 moult stages before it reaches adulthood (each stage of which looks slightly different from the one before and the one after), it is anything but easy! In South Africa, only scientists working with the Department of Environmental Affairs have any knowledge of copepod identity, and that knowledge is largely restricted to the common species that are caught from the Atlantic Ocean along the west coast, as these are the beasts that



*Pleuromamma spp. identified from Indian Ocean samples. Note: the obvious black knob feature on their right quickly identifies this particular group.*

fuel the food chains leading to hake and sardine....not to mention seabirds, whales and seals. Our knowledge of the copepods living in the South West Indian Ocean along the East and South coasts of South Africa is almost non-existent, which effectively means we cannot use copepods as barometers of environmental change (etc).

That has all changed, however, thanks to a four-day workshop hosted by the University of the Western Cape in early June 2011 in the New Life Science building. Two experts visited South Africa from Australia specifi-



*Trainees hard at identifying copepods from Australian waters.*



cally to help regional students and scientists learn how to identify copepods for themselves. The two in question were Claire Davies and Anita Slotwinski, who work for the CSIRO in Brisbane where they form core-members of the AusCPR team (see Box). There, they are responsible for identifying copepods to species level from routine samples that are collected from around the Australian coastline. They therefore have an extensive knowledge of tropical, subtropical, warm temperate and cold temperate copepods – an array of habitats far in excess of anything we find locally. Importantly, from a training point of view, they are para-taxonomists, and not strict taxonomists. The differences between these two words may seem small to most but they are key. A taxonomist is someone who will spend hours and hours looking at every feature of a specimen before deciding that it is species X, focussing especially on all the critical features. It takes a proper taxonomist several days to look through a plankton sample. A para-taxonomist, on the other hand, will take much less time to process a sample, in part because she/he uses non-critical but geographically unique features (e.g. size, shape, spots etc) to supplement the use of some (not all) of the critical features. Inevitably, there are errors in the para-taxonomic method, but it is quick and if consistently applied it is extremely



*Claire at the microscope showing trainees on the screens what to look for in this particular copepod group.*

useful in generating biodiversity information. Most para-taxonomists are self-taught, though most have extensive contact with and some training from proper taxonomists, and this do-it-yourself approach is essential when it comes to training.

The trainees in this instance were some eight students and scientists from the region, most of whom had limited experience of working at the resolution of copepods in unfamiliar samples. “Classes” contained a minimum of theory and were of the practical, do-it-yourself types, and were initially based on material that Claire and Anita had brought

with them from Down Under. As the trainees developed their knowledge and their confidence in being able to identify species using a suite of different tools, so they had an opportunity to work with their own material from the Indian Ocean. This sometimes made the two tutors very excited, as they got to see a number of things for the first time. The training sessions were made so much easier by the fact that high and low-power microscopes were connected to a computer, which projected high resolution images on plasma screens. And, Claire and Anita had spent a lot of time putting a comprehensive set of references and keys together that the students could use to make their lives simpler.

All in all, the workshop could be considered a success. The participants learnt some new techniques to help them with their work, they made some new contacts for the future and they got to appreciate that their efforts could be made so much easier by discussing problems with their colleagues. The trainers also got a chance to make some new contacts, to see some new *goggas* and to test-drive their courseware, in addition to sampling the delights of the Cape.

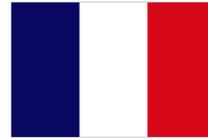


UNIVERSITY of the  
WESTERN CAPE

Back in the 1930s, Sir Alistair Hardy designed a plankton sampling devise that could be towed behind a ship and that would sample the water on a continuous basis. Water enters the devise (known as a continuous plankton recorder – CPR) through a small opening at the front, passes across a silken mesh before being sandwiched between another, and the two are then wound into a drum of preservative. The rate at which the silk is rolled into the storage drum is fixed and with a knowledge of the ship’s speed and track it is then possible to geo-reference segments of the mesh on analysis. The simple design and robust nature of the CPR means that it can be deployed behind ships of opportunity and an extensive monitoring programme based on the CPR has been in existence in the North Atlantic from 1930s (<http://www.sahfos.ac.uk>). The results of this survey have been widely published, especially in recent years, because of the empirical support they add to debates about climate change. In more recent time too, sister survey programmes have been initiated – in the North Pacific, Antarctica, Gulf of Guinea and off Australia (<http://imos.org.au/auscpr.html>). There are plans too for one along the west coast, between Cape Town and Luanda.



## The Marine Research Institute and the French Connection



By Pavs Pillay and John Field

Making a quantum step forward in our understanding of climate variability, climate change and development is a long term endeavour, but in the short to medium term a lot can be achieved, and yet more put into place, to ensure that UCT becomes a recognized centre in Africa as regards understanding the physical dynamics and social facets of climate and development from an African perspective.

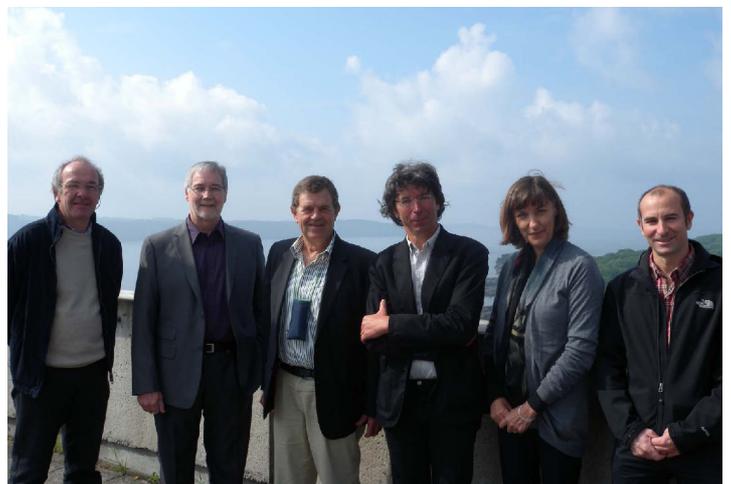
To further this broad objective and build on France-South Africa partnerships in Atmospheric and Marine Sciences as already established through the *Institut de Recherche pour le Développement* (IRD) and UCT's Marine Research (MA-RE) signature theme, Profs Danie Visser, John Field and Dr Marilet Sienaert, plus two representatives of the IRD currently based at UCT, Drs Steven Herbetette and Francis Marsac visited France from 2-6 May 2011. The short-term purpose of the visit was to discuss co-badging degrees and ultimately joint degrees in marine science with the *l'Université de Bretagne Occidentale* (UBO) in Brest on the Atlantic coast and the University of Montpellier (UM2) on the Mediterranean.

First stop was at the UBO and the *Institut Français de Recherche pour l'Exploitation de la Mer* (IFREMER) campuses (2-4 May). Brest has recently been developed as the biggest marine science centre in France and the University hosts the European University Marine Institute (IUEM), with a multi-disciplinary staff

and hundreds of post-graduate students in physical oceanography, marine biogeochemistry, marine geology, biology and molecular biology. Marine Science is UBO's highest priority and they run highly regarded masters courses and a PhD programme, with several modules taught in English. Prof. Visser and the President of UBO, Prof. Pascal Olivard, signed a Letter of Intent and time was spent working on a general Memorandum of Understanding between the two universities. The two university delegations also discussed a Specific Implementation Agreement for co-operation in marine science, with student and staff exchanges, funding for these, and mutual acceptance of one another's Masters' modules, and co-supervision of doctoral students. The UCT guests were also taken on a tour of the IRD-UBO joint Laboratory for Physical Oceanography (LPO), directed by Dr Claude Roy, with spectacular views of the Brittany coastline.

The following two days were spent in Montpellier, to meet with the Executive of the University of Montpellier for Science and Technology (UM2) and also to visit the joint IRD-UM2 marine laboratory in Sète, 40 km to the west of the city. UM2 is one of the oldest universities in France, with particular strengths

in chemistry, earth system science, integrated environmental studies and ecology including water-related research. Overall, some 50% of academic staff are full-time researchers employed by the *Centre National de la Recherche Scientifique* (CNRS), working in research groups alongside the teaching staff, under the French "mixte" policy. This "mixte" policy brings together the IRD and IFREMER marine researchers with UM2 to form a world-leading group in fisheries ecology, modelling, and an ecosystem approach to fisheries management in the Sète marine laboratory, directed by Philippe Cury. Again, a letter of intent was signed with the President of UM2, Daniele Hérin, and this time a general MoU was also signed, with a Specific Implementation Agreement for co-operation in marine science (including the French IRD) to follow. There is also potential for other specific agreements in areas of mutual interest and complementary strength between UCT and UM2 (e.g. plant ecology, H3D, climate and sustainable development).



Left to right: Claude Roy, Danie Visser, John Field, Yves-Marie Paulet, Marilet Sienaert, Steven Herbetette.



## The claim by Pichegru *et al.* that marine no-take zone benefits penguins remains premature

Doug S Butterworth, Anabela Brandao,  
Caryn L de Moor and Will Robinson



Pichegru *et al.* (*SANCOR Newsletter* Issue 190, 2010) (referenced hereafter as "PGCR"), based on the results from two years of measuring foraging behaviour of African penguins around breeding colonies at the St Croix and Bird islands, strongly contend that a marine no-take zone rapidly benefits endangered penguins. Coetzee (*SANCOR Newsletter* Issue 191, 2010) argues that this claim is premature, to which Ryan *et al.* (*SANCOR Newsletter* Issue 192, 2010) (henceforth "RPG") respond by claiming that a number of Coetzee's assertions are flawed. However, both PGCR and RPG contain serious flaws.

PGCR and RPG implicitly castigate DAFF's Pelagic Scientific Working Group (PSWG), which Coetzee chairs, for seemingly failing to apply a precautionary approach and take "urgent action to improve the conservation status of the African penguin".

The Precautionary Principle as developed in Rio by UNCED in 1992 states that: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a rea-

son for postponing cost-effective measures to prevent environmental degradation." Thus the PSWG has to consider whether on the balance of all the evidence, the possible effectiveness of fishery closures around islands outweighs large costs in terms of revenue and employment losses in the fishing industry.

In 2007, the PSWG evaluated whether the available evidence did suggest that fishing around penguin breeding colonies harmed penguin reproductive success, and found the results obtained for two major Dassen and Robben island breeding colonies unclear. GLM-estimated impacts on fledging success and breeders per adult moult suggested increases rather than declines under greater pelagic catches, but the results were not statistically significant. Power analyses indicated that an experimental closure programme might take up to two decades to yield reliable results because of the large "additional variance" (a CV of some 20%) in the relationship between the impact on reproductive success and the extent of fish catches. Accordingly a feasibility study was initiated to better determine this additional variance for two pairs of island colonies (Robben/Dassen and St Croix/Bird with pelagic fishing suspended around one of each pair) for indices related to reproductive success (including new ones based on foraging trip distance and duration). This was to inform the design of a possible future fuller scale experiment.

Given this weak power, the claim by PGCR to have a firmly determined result within only two years is a surprise. RPG also suggest that the positive correlations

between penguin reproductive success and fish catches are explained by the "simpler and more plausible inference that penguins, like fisheries, do well in years when pelagic fish are more abundant". But this effect had already been incorporated in the GLM analyses through the inclusion of an estimable year effect, and associated conclusions related to the remaining residuals. The broad methodology applied has subsequently been endorsed by a recent international review.

Ironically, though RPG implicitly criticize these earlier analyses for omitting consideration of year effects linked (in part) to pelagic fish abundance when those analyses do in fact include them, PGCR omit this same factor, and essentially assume that additional variance is zero. This flaw leads to their spuriously firm conclusion of a statistically significant positive effect on penguins of closure of the neighbourhood of a colony to pelagic fishing. This is not to say that there is no such effect, only that the analyses in PGCR certainly do not confirm it. Results in PGCR suggest additional variance CVs in the region of 20%, which are similar to those for other longer index time series available for Robben and Dassen islands, indicating that this foraging information will have low discriminatory power. Hopefully however the acquisition of further data as the feasibility study proceeds will lead to more optimistic results for this power.

PGCR's characterization of the situation which they evaluate as "treatments" (no fishing) and "controls" (fishing) is problematic. Reliable analyses need to quantify the (highly variable) extent of fishing when it occurs. Annual catches of sardine around St Croix in 2008 and 2009 were very similar (at 491 and 320



tons respectively) despite nominal closure in 2009, and about an order of magnitude less than typical over the preceding decade. Hence data from St Croix for these two years can hardly be expected to discriminate the effects on penguins of fishing or of an absence of fishing, as PGCR assumes.

RPG query Coetzee's assertion that penguin abundance remained stable at Robben island, but dropped at Dassen island, while pelagic fishing was prohibited within 20 km of the latter during 2008 and 2009, pointing to similar reductions in terms of counts of occupied nests at each colony from 2007 to 2009. However in terms of counts of moulting birds the reduction at Dassen island was much larger. Neither measure supports the hypothesis that penguins at Dassen island fared better than those at Robben island as a result of the closure around Dassen.

PGCR and RPG demonstrate misunderstandings in their comments that pelagic fish stocks "have decreased markedly during the last decade, owing to changing environmental conditions and a lack of spatial management of the competing purse-seine fishery" and that "Dassen island is farther north than Robben island, and given the generally south and eastward shift in the fish stocks, penguins there are likely to have suffered from reduced prey availability more than on the colony on Robben island".

The dominant aspect of the dynamics of anchovy and sardine during the peak penguin breeding season in autumn is the migration of recruits of the year for both species southward down the west coast and past both these island colonies. The differential impact on the two colonies suggested by RPG is unlikely, as the

impact of the fishery is low. Fishing has decreased the density of anchovy that would otherwise have been available to penguins at Robben and Dassen islands by at most about 20% in the years following 2000. This is less than before 2000, as anchovy abundance has generally been appreciably larger since 2000 contrary to PGCR's statement. This argues against poor feeding conditions for breeding birds with a consequent impact on reproductive success being a major cause of the post-2003 declines in penguins at these colonies.

Moreover, PGCR provide no evidence supporting their claim that the fish stocks are in poor condition because of a "lack of spatial management". Spatial management has potential benefit only when there are multiple overlapping stocks with catches taken being disproportionate to stock abundances. There is no compelling evidence that there are multiple anchovy stocks. The possibility of multiple sardine breeding stocks is under consideration in the review of the basis for managing this resource which is currently in progress. Nevertheless there has as yet been no analysis presented which suggests that this recent poor sardine recruitment is the result primarily of the higher catches of sardine that were permitted during the period of the early-2000s boom, rather than environmental effects which typically cause major fluctuations in the abundances of such species.

Furthermore, given the low levels of fishing mortality used to set TACs for sardine and anchovy, RPG's tacit implication that the current SA pelagic fishery situation near mimics the collapse of the Namibian sardine resource in the 1970s, with its consequent negative impact on the penguins in that region, is hardly

justified. Certainly if the abundance of penguins' major food resource is reduced by well over an order of magnitude as in Namibia at that time, their abundance is going to be adversely impacted. But for the typical range of pelagic fish abundance in South Africa at the present time, other factors such as habitat availability may also play important roles. Current analyses of penguin dynamics clearly suggest increased adult mortality rather than diminished reproductive success that is the main reason for the recent declines in penguin numbers, so that MPAs around breeding colonies are not obviously going to ameliorate these declines.

Finally, RPG make some questionable sweeping statements:

a) "Unlike the crude estimates of fish stocks, there are robust counts of penguins from all their main breeding sites for the last few decades": Though penguin coming ashore makes them easier to count than fish, the quality of time series of indices of abundance rests on their bias and precision. Considerable research has greatly reduced bias in the lengthy time series of acoustic survey estimates of anchovy and sardine abundance. In contrast, few attempts to reduce bias in penguin counts appear to have been attempted. There has been no standardization across different counters, and at Dassen island there is an unknown trend in bias of the counts as estimates of total numbers because these cover only the near-coast areas while varying numbers of penguins moult further inland in different years. Coarse computations suggest that CVs are typically about 5% for adult penguin moult counts, and nearer to 10% for juvenile counts; this compares with the average of 14% achieved for anchovy November spawning biomass surveys over recent years.



b) "As to the core argument that relatively little fishing took place in these [St Croix] waters, it might be trivial to the fishing industry, but the 250 tons 'saved' for penguins in the core area of the closure is roughly half the amount of fish required to raise a brood of chicks by the 7000 pairs of penguins breeding at St Croix in 2009": Estimates of recent annual consumption of anchovy and sardine off South Africa by natural predators range from about 2.5 to 5 million tons, with catches by the industry only some 10-15% of such amounts. Reliable conclusions can scarcely be drawn about differential utilization of a component of pelagic fish production that constitutes less than 0.01% of this overall mortality.

c) "The extension of fishing closures around key penguin breeding islands is likely to be a more palatable measure than cutting fishing quotas, although the latter measure may also have to be considered if penguin numbers continue to fall": Analyses addressing his possibility were considered by the PSWG in 2008. These indicated a linkage of the drop in survival rates for penguins at Robben and Dassen islands to the reduction in abundance of sardine in the survey stratum in which those colonies fall. However that reduction was much more the result of an eastward shift in the sardine distribution, than of catches of sardine by the industry. Consequently simulations indicated that catch reductions would offer little benefit to penguins, which primarily require a return of the sardine distribution to its earlier pattern with greater proportions to the west.

Note: The full version of this response was published as an e-letter in *Biology Letters* and contains a full set of references. It is available at: [http://rsbl.royalsocietypublishing.org/content/6/4/498.abstract/reply#roybiolett\\_el\\_82](http://rsbl.royalsocietypublishing.org/content/6/4/498.abstract/reply#roybiolett_el_82)

## Plastic ain't my bag!

*A very personal viewpoint from Hayley McLellan, Senior Bird Trainer at the Two Oceans Aquarium*



**F**or the record I would like to state, rather obviously of course, that plastic has many extraordinary and important uses in our modern-day world, so I do practically support responsible production and consumption of this material. The bag I refer to is the ubiquitous plastic shopping bag once, and even still today, rather indifferently labelled our "national flower". While acknowledging that the cause of litter and its knock-on effects in South Africa will not entirely be resolved by eliminating the availability of the plastic shopping bag alone, I strongly feel that this type of forceful legislation will go a long way in solving many critical environmental concerns. It must also be declared that the bag is really not the problem here, but rather the behaviour of us humans ...

As an individual I passionately advocate saying no to plastic bags at every opportunity, and encourage every other citizen to do the same.

In 2004 Valli Moosa, our then-Minister of Environmental Affairs, showed excellent initiative by imposing a levy on the plastic grocery bag that we see in all shopping outlets. Even if it meant the average person on the street was the one being made to pay up, at least there were healthy intentions there. Do you recall the general feeling around this new law? Most everyone was outraged! If my memory serves me accurately, we all had a 30-second conniption and then we swiftly recovered and went on with our daily lives ... Simply incorporating yet another cost into our daily budgets, but for what gain, we should all have asked.



The obvious problem for me is that human conduct did not shift one iota, and this is what would have had a valuable effect on some of the issues at hand.

I logically believe this act had three, or more, intended outcomes:

- to undertake to clean up our environment as the number of plastic bags drifting around was becoming unmanageable as well as embarrassing to South Africa as a country of otherwise magnificent natural beauty;
- to create consumer awareness as to our mindless use and abuse of this item; and, importantly,
- to create Buyisa-e-Bag whose job it was (oh, and still is!) to generate recycling and educational programmes that would support all communities (rich and poor) to take responsibility for our use and disposal of these plastic bags as well as other plastic items.

So, did we achieve any of the above? To some degree, most certainly. In other aspects, most certainly not. The following statistics were taken from a *Carte Blanche* report aired in March 2011.

- Pre-bag-levy South African consumers were using approximately 10-billion plastic shopping bags each year. This figure is now down to 4-billion per year.
- Buyisa-e-Bag has built seven of the



30 planned centres.

- 13% of all levies collected goes to Buyisa-e-Bag: R156-million since 2004.

I remain eternally optimistic each time I am in a store and see others committedly and consciously using their re-useable canvas bags! Buyisa-e-Bag made at least some effort to fulfil their duties and we can only trust that, with enough consumer pressure on them, they will effectively manage their systems and ultimately achieve all that it takes to honour the financial support they are receiving each and every day off profitable support of the bag by end-users.

It is relevant to note here that retailers make no money from the sale of these bags and that the large majority of the funds go directly to Buyisa-e-Bag for above-mentioned purposes.

Of interest, the Plastics Federation of South Africa recently concluded its fifth survey into the recycling of plastics in South Africa for the period 2009-2010 and had this to report: "According to the results of this survey, there is a growing demand for recycled plastic as it is a product that has proven itself to be versatile, economic and reliable. The challenge for the future lies in educating the South African public about the importance of the recycling of their plastic waste and developing new markets and recycling methods."

Although our culture around and attitude towards recycling in this country is improving, it is useful to note that: "In 2009/2010 [only] 19% of the recycled plastic was high density polyethylene (PE-HD), used in milk bottles, fruit juice bottles, drums, tubs, closures, crates and plastic shopping bags." (Plastic Federation Recycling Survey Results, April 2011). (author's own comment italicised.)

From this we can deduce that probably a very small percentage was made up of the bag.

#### Paper or plastic?

Neither, actually. It has been well documented that the varied resources required to manufacture paper bags are possibly equally as taxing on the environment as those needed for plastic. It is also wise to continuously remind ourselves that plastic bags are made from fast-dwindling natural resources namely petroleum, coal and natural gasses. The time for alternative thinking is long overdue.

It is of absolutely no significance whatsoever if I am prepared to so boldly state my position on this topic, fraught with scandalous debate, without some sort of a wrapping up of what can be done about it ... What would I like to see happen? Ultimately? Why, ban the bag, of course! "Wow, what is she thinking?" It's really not so bizarre a suggestion ... Other nations that have achieved precisely this:

Bangladesh (March 2002)

Taiwan (January 2003)

Bhutan (June 2005)

Tanzania (2006)

San Francisco (March 2007)

China (January 2008)

Delhi (January 2009)

Mumbai (January 2010)

Maldives-Baa Atoll (2009)

Philippines (January 2011)

Italy (January 2011)

United Arab Emirates (January 2012/13)

There are alternatives

- Re-useable bags: If treated well, they can be used literally hundreds of times. Be sure to care for them as regular items of laundry and keep them clean in your health's best interest.
- Baskets: A wonderful way to return to the ways of old.
- Make yourself aware of the impact of the plastic bag on the environment: This will probably be quite enough to convince you of the need to re-think.
- Spread the word: Be passionate!
- Look for campaigns to support, like [rethinkthebag.org](http://rethinkthebag.org). Stand up for what

is important to you.

Two Oceans Aquarium makes a stand I am so proud to say that I work for an environmental organisation that has shown its commitment to rethinking the bag. Two Oceans Aquarium Managing Director Dr Patrick Garratt made an appeal to staff and all Two Oceans Aquarium staff members have pledged to no longer bring any plastic bags into the building. We have created collection points for spare re-useable bags and all staff may help themselves to these bags for work or personal use at any time. With this simple project, we aim to both reduce the presence of plastic bags in the building as well as create awareness of the many issues surrounding this item. As a marine institute it is our duty, and in our best interests, to promote this way of thinking. I utter the obvious in saying that we have only one planet and that there is no "away" when we throw...

I can honestly say that I have not taken a plastic bag from a retail store for about the past five years and, wow, I'm doing just fine! If that is one per week, then I have only saved about 240 bags in all that time, but multiply that by a conservative 29 400 000 (estimated number of South African adult shoppers – Wikipedia, 2003 census) and see what you get! (You get 7 056 000 000.)

There are many worthy causes to support and it can be overwhelming as to which one to pick. A small change in your behaviour has the power to make a massive difference to your world. After all, when do you give up on something you care about? Never ...

Consider it a challenge!

The Two Oceans Aquarium would like to extend a challenge to all companies out there: Ban the plastic bag at your place of work and see how awareness spreads! We'd even go as far as to extend the challenge to government: The world's developing nations are leading the way in banning the plastic bag – shouldn't South Africa be pioneers, too?



# Navigating datasets in SA's marine and coastal environment

By Fiona Cuff



The Nairobi Convention is a UNEP (United Nations Environment Programme) initiative developed to enable regional cooperation and includes ten continental and island states in the western Indian Ocean. Through this initiative countries can coordinate and collaborate their actions and together solve coastal and marine environment issues that are not only within their own countries, but also those that extend across national boundaries. South Africa is a signatory to the Nairobi Convention, and thus partakes in these activities.

Many datasets exist that are relevant to the western Indian Ocean region. The

Nairobi Convention Clearinghouse (NCCH) provides an interface through which to search, browse and connect to any of these datasets. Each Member State is responsible to maintain their own such portals, all of which are accessible through the regional portal.

The aim of the portal is to provide a single point of entry from where you can find any marine or coastal dataset which you know exists, as well as a list of other similar datasets. The metadata supplied will help you decide if the data meets your criteria by providing detailed information about the dataset. Where possible, the metadata records will provide online links to where the data can be downloaded, or any other data products relevant to that dataset, such as maps or map services. A search performed using the regional portal will incorporate regional and cross-border datasets in the

results.

Participating organizations maintain the metadata records that form the core portal content. These metadata records describe the data sets, and the more they are exposed, the higher the possibility that the data they are associated with will be discovered and used. The data sets continue to be hosted by their custodians and the NCCH simply provides a search interface, descriptions and links to these data sets. Care is taken to ensure no duplication of data occurs within the NCCH. If a participating organization is unable to host their own datasets, an arrangement can be reached with SAEON for assistance.

Users of the NCCH include policy makers, academic researchers, NGOs, government departments and the public. Benefits for participating States and or



rganisations include:

- Reduced duplication of data collection and observation activities
- Proper documentation and cataloguing of data sets that represent major investments
- Enhanced chances of discovery and accessibility to data holdings
- Enhanced transparency of marine and coastal conditions

South African organisations are obliged to contribute to the NCCH, as South Africa is a signatory to the Nairobi Convention, and doing so will also assist in adherence to South Africa’s national legislation, policies and guidelines. The Department of Environmental Affairs nominated SAEON to be the NCCH country agency for South Africa, and the country co-ordinator is Wayne Goschen from SAEON’s Egagasini Node.

A Working Group was established to oversee the South African portal implementation and ensure its success and sustainability. Organisations represented in the Working Group are:

- SAEON
- SADC (South African Data Centre for Oceanography)

- CSIR (Council for Scientific and Industrial Research)
- ASCLME (Agulhas Somali Current Large Marine Ecosystem)
- UCT (University of Cape Town)
- DEA: O&C (Department of Environmental Affairs: Oceans and Coasts)
- ORI (Oceanographic Research Institute)
- SWIOFP (South West Indian Ocean Fisheries Project)
- ACEP (African Coelacanth Ecosystem Programme)
- IMT (Institute for Maritime Technology)
- ACCESS (Africa Centre for Climate and Earth Systems Science)
- IOI (International Ocean Institute)

The Working Group identified organisations that have data holdings, and individuals within the organisations were given access to the portal to load and maintain metadata records. SAEON and participating organisations continue to maintain the portal and its metadata content.

The South African portal can be accessed at <http://www.saeonocean.co.za/geonetwork>.

## SADC adopts new communication channels

The Southern African Data Centre for Oceanography (SADC) has been maintaining its own quarterly Newsletter since 1990. The Newsletter conveyed issues of interest about system development, data loaded, new products, feedback from Steering Committee meetings, etc.

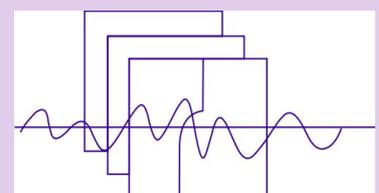
Escalating costs in the production of each Newsletter caused the SADC Steering Committee in November 2010 to agree to bring the paper-based version to an end. The last paper edition occurred in February 2011. At its meeting in May 2011 the Steering Committee decided that the edition of the Newsletter can be halted altogether. It was indicated that this is not an irreversible decision and, should conditions change, the production of newsletters can be revisited.

To maintain communication with interested parties SADC will henceforth proceed in two ways:

- It is planned to make regular submissions to the SANCOR Newsletter. These submissions may be brief and are intended to highlight issues of SADC’s marine data management, data loading, etc.
- The SADC web site (<http://sadc.csir.co.za>) will also portray newsworthy items, or it may be the URL to which SANCOR articles point (which are graphic-intensive).

This way forward will be new to SADC, but the hope is expressed that this new avenue will be as successful as the previous. At this junction, readers are invited to send comments and suggestions to [mgrundli@csir.co.za](mailto:mgrundli@csir.co.za).

Marten Gründling  
SADC, Stellenbosch



**SOUTH AFRICA: COELACANTH - SURFACE TRACKING POSITIONS AND DEPTHS**

Abstract: ACEP cruise ALG 119  
Keywords: ACEP, South Africa - Sodwana Bay

**Identification info**

Title	South Africa: Coelacanth - surface tracking positions and depths
Date	2003-0-1- (publication)
Individual name	African Coelacanth Ecosystem Programme
Organisation name	African Coelacanth Ecosystem Programme
City	Grahamstown
Role	Publisher
Role	Originator
Organisation name	African Coelacanth Ecosystem Programme
Role	Owner
Presentation form	Document Digital
Abstract	ACEP cruise ALG 119
Supplemental Information	Coelacanth
Purpose	To explore and describe the ecosystem of the African coelacanth and Marine ecology
Topic category	Biota
Descriptive keywords	ACEP (theme).
Descriptive keywords	South Africa - Sodwana Bay (place).
Spatial representation type	Vector

**Geographic box**

North bound latitude: -27.0  
West bound longitude: 32.0  
East bound longitude: 34.0  
South bound latitude: -25.0

**Access constraints**  
Use constraints: Copyright  
Other constraints: Patent  
Maintenance and update frequency: Open access for non-profit  
As Needed

**Distribution info**  
Distributor: Tommy Bormman, Karen Hissmann

Example of a metadata record



## Marine Science Community bids Prof Johann Lutjeharms a final farewell

Professor Johan Lutjeharms, one of Southern Africa's leading marine scientists and foremost authority on the Agulhas Current, died on Wednesday, 8 June 2011, after a 10-year battle with cancer. He died during the last hour of World Oceans Day at the age of 67, surrounded by loved ones.

Tributes to this remarkable researcher poured in from all over the world. He is remembered and honoured for his extraordinary academic passion, his prodigious contributions to peer-reviewed scientific literature, the scores of international awards and other honours he received, as well as for the support he provided to young researchers and students. He served as a visiting academic in many universities around the world, thus building the international reputation of African marine science and the oceans around this continent. Since 1998 he was an "A" rated researcher of the South African National Research Foundation, identifying him as an internationally recognised leader in his field.

On 27 April 2010 President Jacob Zuma presented Professor Lutjeharms with South Africa's highest honour, the Order of Mapungubwe (Silver), for his "excellent contribution to and achievements in oceanographic science". This award is made to South Africans who have "accomplished excellence and exceptional achievement to the benefit of South Africa and beyond" – an excellent summary of Professor Lutjeharms' career.

In 2008 by the National Science and Technology Forum honoured Professor Lutjeharms with its Individual Over a Lifetime award. He also received multiple honours from UCT. In 1996, he was awarded the Gilchrist Memorial Medal by SANCOR in

recognition of his contribution to marine science. In 1992 UCT awarded him the DSc degree, its most prestigious degree. He also received the Faculty of Science Research Award. This university has three main forms of recognition for its academic staff: Fellowship, the Distinguished Teachers Award and its Book Prize/Meritorious Publication Award. Professor Lutjeharms was one of only three academics who received all three.

Internationally he served on working groups of the Scientific Committee for Oceanic Research (SCOR) the International Union of Conservation of Nature and Natural Resources, and the International Association for the Physical Sciences of the Ocean. He was one of South Africa's designated representatives to SCOR. He was a member of the South African National Committee for Oceanographic Research and various other national working groups on environmental sciences. He was also the Expert Consultant in oceanography for the *Woordeboek van die Afrikaanse Taal*.

Professor Lutjeharms completed his undergraduate studies in physics. In 1971 received his MSc (cum laude) in oceanography at the University of Cape Town. He was awarded the Harry Crossley Bursary, the Fisheries Development Corporation postgraduate overseas bursary and the CSIR overseas bursary to study for a PhD at the University of Washington, where he graduated in 1977. He then joined the National Research Institute for Oceanology of the South African CSIR, where he held the position of Chief Specialist Researcher. He was appointed to the Chair of Ocean Climatology at UCT in 1990. In 1993 he became the founding Director of UCT's Centre for Marine Studies.



Professor Lutjeharms' main field of investigation was in establishing, quantifying and understanding the large-scale

circulation patterns of the oceans adjacent to southern Africa and their influence on weather and climate. To this end he maintained an active research team and supervised numerous postgraduate research projects. He participated personally in 17 research cruises and was responsible for a further 48 projects undertaken on such cruises.

Professor Lutjeharms was the most published author in the *South African Journal of Science* during its 104-year history. He produced eight books, 32 contributions to books, 177 papers in peer-reviewed international journals, 117 reviews and popular articles, 46 research and technical reports and 14 contract reports. His articles in prestigious journals included two in *Science* and five in *Nature*. He was the author of the authoritative and much acclaimed book *The Agulhas Current*, published by Springer in 2006. According to the Institute of Scientific Information, his papers have been cited more than 5 400 times in the scientific literature to date.

He was a Council member and Vice-President of the Royal Society of South Africa, a member of the Faculty Council for Science in the *Suid-Afrikaanse Akademie vir Wetenskap en Kuns*, and a member of the Academy of Science of South Africa. He was on the Council of the South African Society for Atmospheric Sciences since its inception and in 2006 was made an Honorary Member.

Professor Lutjeharms is survived by his wife, Ronel, and their children Maria and Wilhelm.

*Edited version of the official UCT obituary*



## Relinking the Mfolozi and St Lucia systems – new report lays the foundation

By Alan Whitfield



During the past decade Lake St Lucia entered the most critical part of its recent history when more than 90% of the total water area evaporated and the aquatic biota was pushed to the limit (indeed, some small species may have disappeared altogether without us even knowing!). However the primary reason for the loss of surface water in most parts of lake can be traced back to the separation of the Mfolozi River from the St Lucia Estuary in the early 1950s. This original decision was taken because of excessive silt loads entering the St Lucia system from the Mfolozi River – a situation that arose directly from floodplain sugar cane cultivation and canalization of the river through the Mfolozi Swamps. As expected, the loss of St Lucia's major source of fresh water has resulted in major changes in the way that the system has functioned over the past six decades.

The current drought crisis at St Lucia prompted a request by Ezemvelo KZN Wildlife to the Consortium of Estuarine Research & Management to convene a workshop to investigate the availability of information from the estuarine portion of the lower Mfolozi and Msunduzi rivers, thus providing management with the sort of data and ideas that could assist with forward planning, ultimately leading to the re-linkage of the Mfolozi and St Lucia systems. Sponsorship for the Mfolozi/Msunduzi Indaba was obtained from the Water Research Commission (WRC) and in May 2010 more than 20 scientists and conservationists gathered

at St Lucia Village to present their research findings and debate future options.

Soon after the indaba, work started on collating the available information into a single report which has just been published by the WRC (Bate *et al.* 2011). This report, which is structured around 14 major contributions from various disciplines, emphasizes that Mfolozi connectivity is of critical importance to the future of St Lucia. The contributions also highlight the value of the St Lucia system on a national basis and the need for administrators and politicians to support bold management actions going forward.

There is now little doubt that St Lucia will be unable to survive as a Ramsar and World Heritage Site unless it obtains Mfolozi River water, especially during droughts. It is therefore hoped that this WRC report will assist in the development of a framework to guide future research and management actions, such that we can achieve the long-term conservation of this valuable ecosystem.



Aerial view of the closed St Lucia Estuary mouth (foreground) and open Mfolozi mouth (background) during the recent drought (Picture: Ricky Taylor).



Ground view of a portion of South Lake during the recent drought. At one stage the water surface area of St Lucia had declined by more than 90%, primarily due to the absence of Mfolozi River water in the system (Picture: Rick Taylor).

### Reference

Bate, G.C., Whitfield, A.K. & Forbes, A.T. 2011. A review of studies on the Mfolozi Estuary and associated flood plain, with emphasis on information required by management for future reconnection of the river to the St Lucia system. WRC Report No. KV 255/10, 264 pp.+ Appendix.

(The above report can be freely downloaded from the WRC website <http://www.wrc.org.za/>)



## SIBER - a new basin-wide, international programme in the Indian Ocean

By Raleigh Hood, Jerry Wiggert and Wajih Naqvi



The Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER) programme is an emerging basin-wide research initiative sponsored jointly by the Intergrated Marine Biogeochemistry and Ecosystem Research (IMBER) programme and Indian Ocean GOOS (IOGOOS) with close ties to CLIVAR's Indian Ocean Panel (IOP). The long-term goal of SIBER is to understand the role of the Indian Ocean in global biogeochemical cycles and the interaction between these cycles and marine ecosystem dynamics. This understanding will be required in order to predict the impacts of climate change, eutrophication and harvesting on the global oceans and the Earth System and it is fundamental to



policy makers in the development of management strategies for the Indian Ocean. To address this goal, emphasis will be given to the analysis required to predict and evaluate the impacts of physical and anthropogenic forcing on biogeochemical cycles and ecosystem dynamics in the Indian Ocean.

SIBER has been motivated by the deployment of new coastal and open-ocean observing systems in the Indian Ocean that have created new opportunities for carrying out biogeochemical and ecological research. The IOP is coordinating the deployment of a basin-wide observing system in the Indian Ocean (the Indian Ocean Observing System, IndOOS, which includes the Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction, RAMA (International CLIVAR Project Office 2006, McPhaden *et al.* 2009). Although there are significant challenges,

deployment of an array of more 30 buoys is planned in the open ocean between 20°N and 20°S spanning the entire basin. These deployments, which are already well underway, are accompanied by Argo floats and a variety of physical oceanographic survey and mooring support cruises. In addition, several nations in the Indian Ocean are deploying coastal observing systems and programmes, including South Africa. All these programmes provide a unique opportunity for staging international, interdisciplinary research. SIBER will seek to leverage these sampling and monitoring activities and it will provide the basin-wide scientific coordination and communication required to predict Indian Ocean biogeochemical cycles and ecosystem dynamics in the context of climate change and other anthropogenic influences.

The SIBER Programme reflects the importance placed on these issues by the International Geosphere-Biosphere Programme (IGBP), the Scientific Committee on Oceanic Research (SCOR) and the Global Earth Observing System of Systems (GEOSS). SIBER, which has been developed with the guidance and endorsement of the IMBER and IO-

GOOS Programmes, is ambitious and very broad. It is basin-wide, encompasses biogeochemical research from the continental margins to the deep sea and tropic levels ranging from phytoplankton to top predators including fish and humans. SIBER is intended to provide scientific guidance and potential research foci to accommodate the

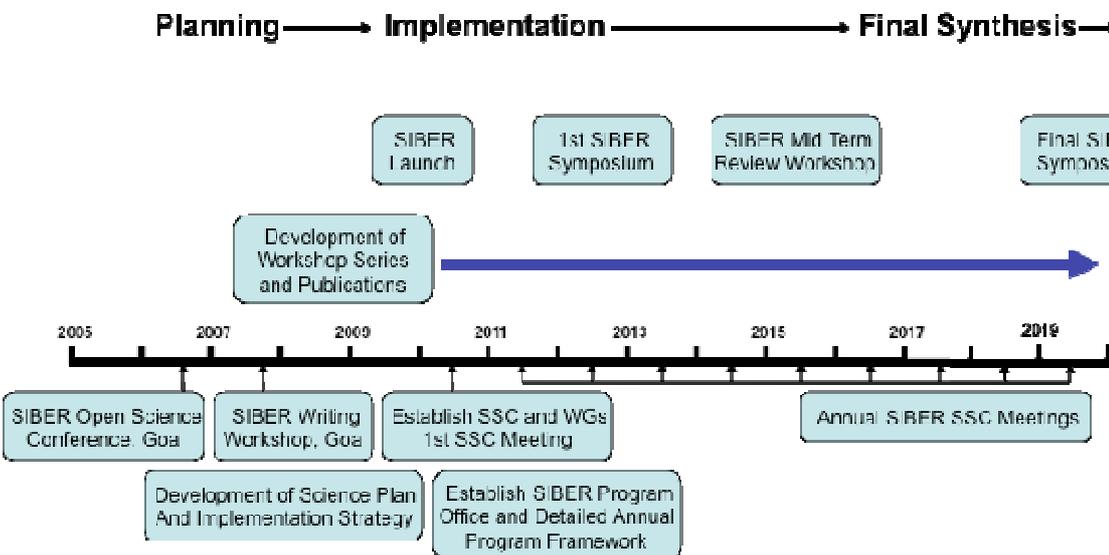


Figure 1: SIBER Programme timeline from Hood et al. (2011).



broad (and often regional) interests of many countries that are interested in pursuing research in the Indian Ocean. For more information on SIBER see <http://www.imber.info/siber.html>.

**Recent developments**

The final, peer-reviewed SIBER Science Plan and Implementation Strategy (SPIS) was submitted to IMBER and IOGOOS in early January 2011 and is now available on the SIBER/IMBER website (<http://www.imber.info/SIBER.html>). With the assistance of the IMBER and SIBER International Programme Offices, the SIBER SPIS is now undergoing final editing and formatting for hardcopy printing, and is slated for distribution in summer, 2011.

The first national SIBER programme has been established in India with funding provided by India’s Ministry of Earth Sciences (MoES). Funded proposals include 6 open ocean and 8 coastal/estuarine projects in the northern Indian Ocean.

The timeline for SIBER meetings and symposia that have been convened to date and that are planned for the future are detailed in Figure 1. SIBER convened its first official Scientific Steering

Committee (SSC\*) meeting (SIBER-1) during July 12-15, 2010 in Perth, Australia in a joint meeting with IOGOOS, IOP, and the newly formed Indian Ocean Resources Forum (IRF). The report from this meeting is available at <http://www.imber.info/SIBER.html>. This joint meeting brought together leaders in the Indian Ocean research community from many Indian Ocean rim nations and from all over the world. The goal of this meeting was to coordinate and facilitate international research efforts in the Indian Ocean.

For SIBER, the major accomplishments and action items from this meeting include:

- Election of officers and establishment of a time frame for SSC member rotations.
- Addition of four new SSC\*\* members recommended by the IMBER and IOGOOS steering committees.
- Review of scientific work, plans and priorities of countries doing biogeochemical and ecological research in the Indian Ocean.
- Development of a strategy for tying SIBER into global carbon cycle research programmes.
- Establishment of working groups dedicated to promoting SIBER in

the EU, USA, Australia, Africa, Oman/Kuwait/Pakistan, Indonesia/Thailand and Japan/China.

- Establishment of working groups dedicated to updating the SIBER Science Plan scientific themes and questions to ensure that SIBER will continue to focus on the most important scientific questions in the Indian Ocean in the coming years.
- Development of plans to convene a joint SIBER/IOP workshop on biogeochemical sensor requirements for deployment on moorings and Argo floats.

Perhaps the most significant achievement of this meeting was the identification of resources for establishing a SIBER International Project office (IPO) in INCOIS (Indian National Centre for Ocean Information Services) in Hyderabad, India. The SIBER SSC submitted a proposal INCOIS to establish this office in September, 2010, which provided specifications and resource needs for the IPO. This proposal was accepted and an Executive Director is now in place to lead the new SIBER IPO (Dr. Satya Prakash). A schematic diagram illustrating the relationships between the proposed SIBER IPO and the IMBER and IOGOOS IPOs along with oversight and responsibilities is shown in Figure 2.

Activities of the new SIBER IPO have been focused on developing a dedicated website for SIBER, publishing a quarterly newsletter and developing the agenda for the SIBER-2 (in series with IOP-8 and IRF-2) SSC meeting. This joint meeting will be held in Chennai, India, July 25-29, 2011.

Plans for SIBER-3 are already under development targeting South Africa as a potential host nation in fall of 2012. Convening SIBER-3 in South Africa would provide an excellent oppor-

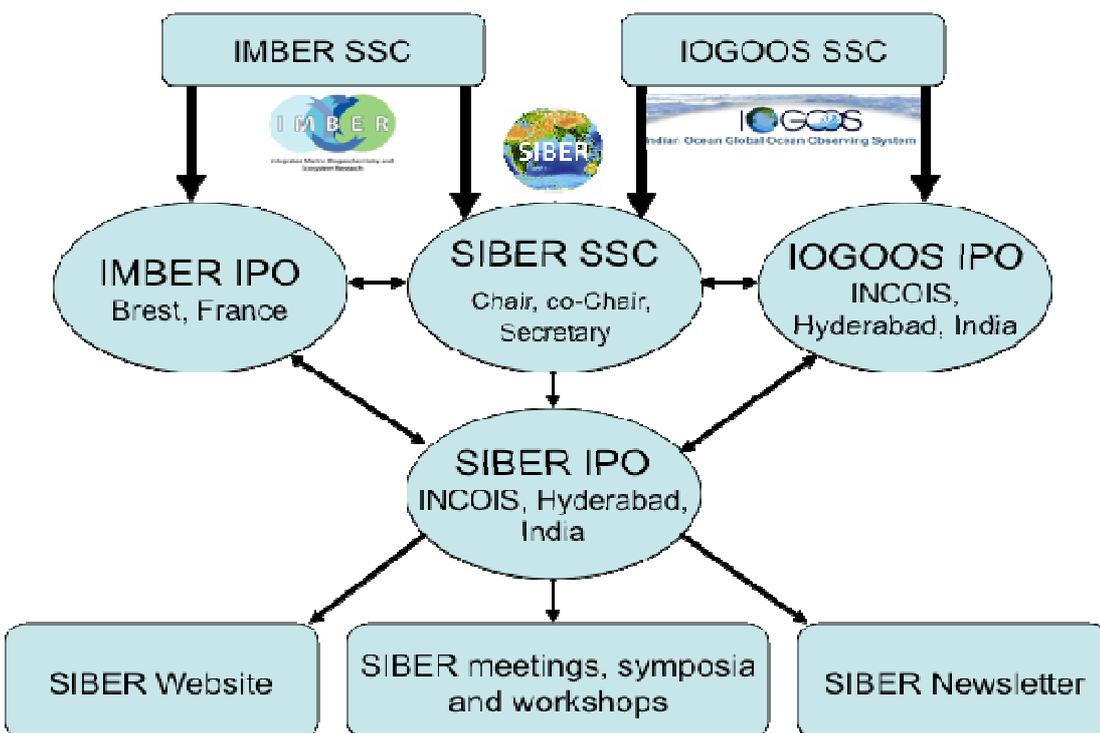


Figure 2: A schematic diagram illustrating the relationships between the proposed SIBER IPO and the IMBER and IOGOOS IPOs along with oversight and responsibilities.



tunity to develop stronger ties with scientists from this region and find ways to leverage ongoing programmes there.

\*This meeting was attended by Interim SSC members: Raleigh Hood (USA), Wajih Naqvi (India), Jerry Wiggert (USA), Catherine Goyet (France), Richard Matear (for Lynnath Beckley, Australia), Greg Cowie (UK), Dwi Susanto (USA/Indonesia), Adnan Al-Azri (Oman), Hiroshi Kitazato (Japan), and Tim Rixen (Germany). Interim SSC members Mike Landry (USA) and David Vousden (South Africa) were unable to attend.

\*\*New SSC members: M. Ravichandran (India), Mitrasen Bhikajee (Mauritius), Shiham Adam (Maldives) and Somkiat Khokiattiwong (Thailand).

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## SA Research Chairs Initiative - Call for Proposals

The Minister of Science and Technology, Mrs Naledi Pandor has approved funding in the Departmental 2011/12 Medium Term Expenditure Framework for the awarding of 62 additional Research Chairs to expand the South African Research Chairs Initiative (SARChI). The Research Chairs Initiative was established in 2006 as a strategic intervention of the South African government to reverse brain drain in the public academic and research sector. In particular, the programme is aimed at increasing scientific research capacity through the development of human capacity and stimulating the generation of new knowledge. It is designed to significantly expand the scientific research base of South Africa in a way that supports implementation of the national Research and Development policies.

Since 2006, the programme has awarded 92 Research Chairs. Investment in research, and in particular the Research Chairs, is intended to improve South Africa's international research and innovation competitiveness while responding to social and economic challenges of the country. As such Research Chairs are to be awarded in all knowledge domains including science, engineering and technology and the social sciences and humanities. It is in this context that the 62 new Research Chairs will be awarded in directed and thematic areas with at least 25% of the Chairs to be awarded in the social sciences. Eight (8) directed, special category Research Chairs will be awarded in the areas of global change, health innovation and biotechnology and the remaining 54 Chairs will be awarded within the following themes:

- Technology Missions including ICT, Biotechnology, Advanced Manufacturing and Emerging Research Areas;
- Science Missions through areas of Geographic Advantage for scientific research;
- Science and Technology for poverty alleviation and local/regional innovation including sustainable rural development;
- Open Category with a focus on Fundamental Disciplines, Scarce and Critical Knowledge Fields;
- Innovation, Engineering and Technology Development and Commercialisation; and
- Priority research areas namely the Grand Challenges.

Details on the directed and thematic research areas are posted on the NRF website:  
[http://hicd.nrf.ac.za/sarchi/sarc\\_rif\\_overview.html](http://hicd.nrf.ac.za/sarchi/sarc_rif_overview.html)

Closing date for applications:

**1 September 2011**

**Issued by the South African Network for Coastal and Oceanic Research (SANCOR), Private Bag X2, Roggebaai, 8012**

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*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).*

