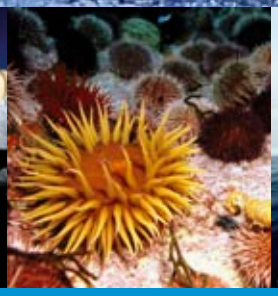
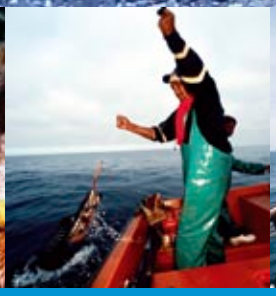
BENEFIT

BCLME
Benguela Current Large Marine Ecosystem Programme

A Decade of Collaboration




To commemorate the final symposium of the BENEFIT and BCLME programmes

SWAKOPMUND, 19 ~ 21 NOVEMBER 2007

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Preface

Coming together for the Benguela
Two programmes ~ one goal

This brochure is a collection of personal testimonies on a decade of international cooperation in the framework of two outstanding programmes. The BENEFIT (Benguela Environment Fisheries Interaction and Training) and BCLME (Benguela Current Large Marine Ecosystem) programmes were the first multi-national programmes on research and its application to resource management in southern Africa. Both were developed and carried out by the three riparian countries Angola, Namibia, and South Africa. They had their headquarters in Swakopmund and Windhoek respectively.

It is a privilege for the government of Namibia to host the final symposium celebrating the conclusion of BENEFIT and the transfer of major responsibilities of the BCLME Programme to the newly established Benguela Current Commission. BENEFIT will now transform into the Ecosystem Coordinating Committee of the Benguela Current Commission.

In June 1997, BENEFIT was launched in Walvis Bay. Neither currents nor fish respect national boundaries in the sea, therefore marine research and management has to be transboundary. It took the marine scientists less than two years to convince the administrators and politicians of their countries to join forces in research, monitoring and assessment of the Benguela Current ecosystem and its rich living resources. Rapidly a wonderful cooperation developed between the three erstwhile conflict-ridden countries.

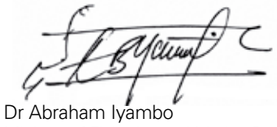
In the course of a decade the understanding of the environmental system of the Benguela Current and its variability has grown substantially. We have learned to what extent fisheries, environmental variability and perhaps global warming have affected our most economically important fish stocks. The need for restoration measures and precautionary management has become self-apparent.

For these reasons, the BCLME Programme was developed as a programme on science-based management. In preparation for its establishment, the three countries applied for major funding by the Global Environment Facility (GEF). Right from the beginning, the BCLME Programme was multi-sectoral, bringing together all stakeholders working in the sea and using its resources. The BCLME Programme was created to provide an environmentally sound basis for the sustainable development of the partly conflicting marine activities like fisheries, shipping, ocean mining, oil and gas exploration and extraction, and tourism. The ultimate objective was to ensure the health of the ocean in the interest of continuous societal welfare in the region. BENEFIT became the partner of the BCLME Programme in terms of science and training.

The multi-sectoral approach to ecosystem management is well reflected in the Benguela Current Commission which had its first meeting very recently, with ministers and representatives of all government ministries with maritime interests attending. The BCC is the first commission of its kind in the world to apply the Large Marine Ecosystem approach to sustainable management as a means of addressing transboundary issues and challenges. It engages with all sectors of marine interests in a large ocean area which incorporates the EEZs of three countries. Without BENEFIT and the BCLME Programme, there would not be a Benguela Current Commission of such broad scope and scale. Together they have become the cornerstone of a Pan-African network of Large Marine Ecosystem programmes.

Several hundred scientists, technicians and administrators in the three countries have been engaged in the marine programmes. Many junior staff members received first class specialised training. BENEFIT and the BCLME Programme were able to attract substantial and continued scientific and technical support for research and training from international partners. The *RV Dr. Fridtjof Nansen* of Norway operated in the Benguela region for years, while Germany sent various vessels for research and training cruises. Iceland and Japan strengthened the research fleet by providing smaller vessels and France helped by setting up remote sensing systems for monitoring the surface waters of the Benguela region. While greatly appreciating the financial support by GEF and other international and national funding agencies, we emphasise gratefully the personal partnership of scientists, technicians and administrators from all over the world. We also congratulate our three governments for the bold and visionary political commitment to this cooperation.

Reflecting on the past decade of marine development in the Benguela region, I proudly and gratefully share the enthusiasm reflected in the statements of this booklet



Dr Abraham Iyambo
Minister of Fisheries and Marine Resources, Namibia
November 2007

BCLME
Benguela Current Large Marine Ecosystem Programme

FINAL SYMPOSIUM OF THE BENEFIT & BCLME PROGRAMMES

Celebrating a decade of collaboration in the Benguela region,
the outcomes of the BENEFIT and BCLME programmes
and the establishment of the Benguela Current Commission

SWAKOPMUND, 19 ~ 21 NOVEMBER 2007

The BENEFIT team: Antonio da Silva, Leesa Jephthah, Neville Sweijd, Petro Rabe and Pavitray Pillay.

The BCLME team: Frikkie Botes, Lesley Staegemann, Catherine Kuske, Maria de Lourdes Sardinha, Celoreen Boy and Evelyne Museke. In front, Ayn Garises, Marcelina Rebelo and Mick O'Toole.

Introduction

The upwelling system off the west coast of southern Africa and the adjacent waters off central and northern Angola constitute the Benguela Current Large Marine Ecosystem. High biological productivity and rich fisheries make the LME very attractive to local and foreign fleets. The system, however suffers from great variations in the environmental conditions from year to year and decade to decade. The effects of overfishing are often camouflaged by natural changes in the distribution and abundance of the stocks. These phenomena are largely transboundary. Therefore region-wide cooperative research and management programmes are essential if the fisheries are to be sustainably managed.

Ten years ago, Angola, Namibia, and South Africa, with support from Norway, Germany, France, Iceland and others, and with international funding by the Global Environment Facility (GEF) launched two regional programmes - BENEFIT (Benguela Environment Fisheries Interaction and Training) and the BCLME (Benguela Current Large Marine Ecosystem) Programme. Their objectives were to establish cooperative research amongst the three states, monitor the living resources of the LME and its marine environment and develop an ecosystem-based approach to integrated management. Building and strengthening of scientific and managerial capacities, particularly in Angola and Namibia, was a primary goal of both programmes.

In 2007 the Benguela Current Commission was established with the overall aim of sustainable management of the marine resources and protection of the marine environment. The Commission is multi-sectoral with many stakeholders including fisheries, diamond mining, oil and gas extraction, shipping and tourism. On the other hand, conservation of biodiversity and other amenities are high on the agenda. The Commission will make good use of the scientific results produced by BENEFIT and the BCLME Programme and of the human capacity and technical and administrative infrastructure created by those programmes.

On the occasion of the closing of BENEFIT and the conversion of the BCLME Programme by the end of 2007, a book is being compiled on the history and achievements of ten years of international cooperation in the "Current of Plenty". The book will consist of essays on the various phases and facets of the programmes and of the state and variability of the marine environment and living resources of the Benguela system. Furthermore, key people prepared brief statements on their experiences of the past years and on the outlook for the future. Many people contributed to the success of both programmes: ministers, managers, scientists, technicians, administrators, secretaries, students and many others, mostly from the region but also from overseas. The list of authors consist of only a few of those who have been involved in BENEFIT and the BCLME Programme over the past decade. The retrospective book is due to be published in early 2008 under the title "Current of Plenty".

This brochure is a forerunner of "Current of Plenty". It is primarily intended for distribution to the participants in the final BENEFIT/BCLME Programme symposium, which is to be held in November 2007 in Swakopmund, Namibia; and thereafter for distribution to a wider public in the Benguela region and the international LME community. The statements are summarised excerpts given from a personal perspective and provide a flavour of the unique collaboration in marine research and capacity building in the region. Further information includes key publications produced by both programmes, as well as a list of the major cooperative research cruises which were undertaken between 1997 and 2007.

The Benguela LME is faced with a dramatic ecological regime shift as reflected in the changes in the geographical distribution and abundance of all major fish stocks and other populations in the region. A brief review of the present state of knowledge of some of the large scale and long-term phenomena is included as part of the take-home message of BENEFIT and the BCLME Programme. This comprises a selection of slides which were presented by scientists at workshops during the course of the programmes.

We thank all the authors for providing their statements. Gotthilf Hempel, of Kiel, Germany helped us to edit the work. We were assisted by Claire Attwood in the technical editing and illustration of the booklet. The collaboration of Günther Komnick Studios in rushing the design and printing of this publication is gratefully acknowledged.

Michael O'Toole and Neville Sweijd
November 2007

Current views

Scientists, managers and students who have worked with the BENEFIT and BCLME programmes over the past 10 years share their personal perspectives on the Current of Plenty.

An interview with "BENEFIT's mother"

Petro Rabe

By Gotthilf Hempel, February 2007

GH: Petro, people talk of you with respect and gratitude as the "mother of BENEFIT". How did it happen that you became appointed administration officer of BENEFIT?

PR:I studied Business Computers at the Cape Technikon in Cape Town for three years. Then I moved to Windhoek and worked at the Namibian Broadcasting Corporation, starting off in my first year at the personnel department of NBC. I became interested in television and worked towards the position of producer of kiddies and sport programmes, as well as a continuity producer. After 11 years, I left the NBC and started working at the University of Namibia, in the Ecumenical Department, helping with publication of books. During this period I got married and decided to move back to my home town, Swakopmund. My husband and I bought a flower shop and after a year, I saw the advert for an administration officer for BENEFIT. I applied and started working right away.

GH: You are one the first staff members of BENEFIT and look pretty young. So BENEFIT must be a healthy environment in spite of, or because of, all the stress!

PR: Yes, I was a staff member of the BENEFIT Programme from day one and what an experience it has been! There were so many fantastic days that you tend to forget the few bad ones. I helped organise and participated in many conferences, forums, symposia and meetings, which sometimes caused a lot of stress. But, looking back, it was all good stress, and I learned so much from it.

GH: Tell me about your work. What did you like best? How was your work different to ordinary administration?

PR: When I first started, I wanted to resign after three months! I had no computer and absolutely nothing to do. Charles Hocutt, the director, told me to wait and that it would get very busy. Hard to believe! Not even six months later, the first *Africana* cruise took place, with a reception held on the ship in each country. I had to organise about 60 flights to and from different countries, work out *per diems*, try and keep track of the budget, and organise each reception, all on my own. Proud, I was indeed.

GH: You have made hundreds of travel arrangements for people in the region and all over the world. Did your boss ever let you go and see for yourself BENEFIT at work in seminars or, even more exciting, at sea?

PR: I did not travel much in the beginning but after the first secretary was appointed, I was given the opportunity to visit Norway, Luanda and Cape Town. I also had the opportunity to travel on the *Dr Fridtjof Nansen* from Cape Town to Walvis Bay when I participated in the CUFES project. I had to work shifts, did not have much sleep, saw what a CTD looks like and how it works and counted a lot of fish eggs. I was shocked and very emotional to see how many fish were caught on a trawl, and that they just let them die. It was cruel, but it was indeed a trip that I will always remember.

GH: BENEFIT Secretariat was not a static unit. You "survived" more than one boss.

PR: In the office, the staff changed continually. The two directors were Prof Charles Hocutt and Dr Neville Sweijd. I worked with three different Angolan colleagues, (Fontes Pereira, Vianda Filipe and, presently, Antonio da Silva) and two different secretaries; Sylvia Kapepu and Leesa Jephthah.

GH: I don't want to ask who you liked best, but I wonder which of your various activities you liked best?

PR: With all the organising at BENEFIT, it became a passion of mine. I like working with people, and of course all the thanks you receive from everyone gives you renewed energy. I think in every job there are some things you don't like, and for me, it's changing tickets and cancelling accommodation bookings. But I can live with that. And of course, the financial part of my job - my actual job! I've learned so much about budgets and I always looked forward to having the auditors with me so that then I would know that everything is correct.

GH: It is always a comfort to know that when the job needs doing, it will be done sooner and better than you hoped. There is a sense of trust that one can place on a stalwart who knows the ropes and is intimate with the details of every situation. Your director has told me that you rescued many a situation with amazing recollection, combined with a creative solution and a positive attitude. Can you tell me a nice story to confirm his positive views?

PR: Difficult question, there are so many. I think flights that were missed or cancelled, were my biggest headache. There's just no time to think, you have to get on the phone and sort it out. Thanks to our fantastic travel agent, we could not have rescued so many situations. She was available 24 hours a day. Of course, everything is a team effort, and everybody in BENEFIT gives their everything. Thank you guys.

GH: My personal contacts with you were not as dramatic, but very pleasant, as I received the DSA I deserved and you got me a car to reach the airport in time. And you did all that with a wonderful smile. Now you have the final word. What did really matter to you?

PR: I met so many different and wonderful people from all over, especially Angola, South Africa and Namibia and a lot of new friendships were formed. Some of them have been part of the Programme from the beginning and still are. I gained a lot of experience over the years and a lot of responsibilities were entrusted to me. It opened a lot of new doors for the future and I am proud to say that I was given the opportunity to be part of the BENEFIT Programme. Thank you.

Current views




Benguela, current of plenty?

Ian **Hampton**

My first memories of the Benguela go back 35 years to the Cape Cross Research Programme which was instituted by the South African government in 1971 to investigate the collapse of the South West African pilchard stock. This programme, which was directed with great drive by two relatively junior scientists (Dave Cram and Dries Visser) can be truly said to have kick-started modern fisheries science in the region, with the introduction of night-time aerial surveys, acoustic surveys, an extraordinarily large-scale egg and larval survey programme (SWAPELS), which ran for more than 15 years, aerial radiation thermometry, state-of-the-art oceanographic equipment, mini-computers, and wonder of wonders, telex machines for communication between Cape Town and Walvis Bay. A lasting memory is the night-time flying and the sight of the bioluminescence from pilchard schools extending tens of miles along the coast in patches from south of Walvis Bay to Cape Frio. Unfortunately, equally unforgettable is a radio conversation with Dave Cram during a multi-vessel aerial/acoustic survey in January 1977, concluding from the survey evidence that the pilchard stock had collapsed. How right we were. Other memorable impressions are the smells, sounds and piratical crew of *R.V. Benguela*, living in the Pelican Point lighthouse for three months as a base for experiments on pilchard target strength, and the look of disbelief on a young Mick O'Toole's face on arriving in Walvis Bay from the green hills of Ireland. Over-riding everything, however, was the can-do spirit, dedication and enthusiasm of the scientists and technicians.

After a period working on Antarctic krill, I returned to the Benguela shortly before Namibia's Independence in 1990, and I remember well the first meeting with Norwegian scientists in Swakopmund, which was charged with suspicion on both sides. Happily all that changed rapidly and we soon found ourselves working closely with Tore Strømme and his colleagues in the Nansen Programme and the staff of the newly-formed NatMIRC laboratory in Swakopmund. This cooperation, existing contacts between Namibia and Angola, and strong donor support from Norway and Germany in particular, ultimately led to the idea of a collaborative regional research and capacity building programme, and to the birth of BENEFIT at a milestone workshop/seminar in Swakopmund in June 1995, attended by 10 countries. At more or less the same time, the idea of a UNDP/GEF–funded LME study in the Benguela took root, which introduced new players and new methods of project planning.

Remarkable throughout all this, considering the recent political history of the region, was the will for cooperation on all sides, which soon materialized in a host of committees and working groups through which the scientific staff of the region learned to know each other and their international partners and the intricacies of multi-institution, multi-national research planning. A key engine in all of this, then as now, was the BENEFIT Secretariat which was set up in 1998 under Charles Hocutt. Hoke's enthusiasm, initiatives and largeness of spirit did much to build and foster a genuine marine science community transcending national barriers, and to establish a unique identity for BENEFIT on the regional and international stage. Equally important has been the contribution made by his successor, Neville Sweijd, who has made enormous efforts to keep BENEFIT moving ahead and to find the most effective place for the Programme within the region's marine science structures, particularly the BCLME Programme. Throughout its existence, the Secretariat office, run by Petro Rabe, has been a model of efficiency and accountability, and the glue which has kept the Programme together.

Looking back one cannot but be impressed by the major advances in research effort, capability and coordination which have occurred in the Benguela over the past 30 years or so. Unfortunately, it would appear that none of this activity has been able to arrest the declines in many of the region's major commercial resources (particularly in the northern Benguela) over this period. Whether this is due to ineffective management measures leading to overfishing or to inadequate understanding of resource dynamics and ecosystem functioning, or to changes in the environmental conditions or (most likely) a combination of the three, is the over-riding question at the moment. Let us hope that by answering this question and directing future research and management effort accordingly, the Benguela will one day become more like the Current of Plenty which it once was.

Hopes for the future, as seen from Angola

Filomena **Vaz Velho**

The three main advantages of BENEFIT to Angola's Institute of Marine Research were: improved scientific capability of existing staff; more high level capacity building; and integration of Angolan scientists in the scientific community of the region and beyond. In the future, after BENEFIT, more cooperation with institutes in tropical countries would be of great interest to Angolan marine scientists.

In the framework of BENEFIT, the relations between scientists of Angola with those in Namibia and South Africa have been considerably strengthened. The knowledge about the resources of the region and its environmental variability has greatly increased. And we have better relationships between scientists and managers than before.

On the other hand, apart from the development of the Namibe lab, our institution did not receive as much technical support as expected. There is room for improvement in the coordination of the projects, including the follow up of training activities, i.e. the analysis of the data collected during the research/training cruise of *RV Africana*. Better links between the BENEFIT working groups on resources and environment and improving their effectiveness would have helped in the development of the regional programme.

The regional training programme should be well structured and focus on the collection and analysis of data and the publication of results, preferably in joint papers. There is still a need to improve the language competence of Angolan staff in terms of scientific English. BENEFIT should be measured by the number and quality of scientific publications, the increase of personnel with Ph.D. and Masters degrees in all fields of marine science and management, and by the increase in the active participation in international symposia by scientists of the Benguela region.

BENEFIT and the BCLME Programme are not duplicating each other as long as BENEFIT is considered the scientific support of the BCLME Programme which works basically in the fields of asssessments and management advice. The international advisory panel ISAP could play a major role in commenting on and improving submitted projects and providing feedback in a short time.

The financing of BENEFIT or any successor should steadily be shifted from overseas donors to raising of funds within the three governments and with industries like oil and gas, mining and fisheries, all of them extracting resources and impacting the environment of the Benguela Region.

Current views




Building two houses

Nkosi **Luyeye**

The BENEFIT and BCLME Programmes are like two houses that I have witnessed being built over the last decade. Although not the architect, I have learnt how to build such houses which have hosted many people and will leave their legacy in the future. These two houses were built in the region called "Benguela Ecosystem". From the early days when it all started in the mid 1990's, certain names come to mind. The list is too long to mention, but each name is like a brick used for the building of the two houses.

The BENEFIT and BCLME houses were like big schools where most of the young scientists from the region have been trained and learned the technological and analytical skills to bring them up to where they are today. I am also one of them. Let me tell you that I was fortunate to be involved in the building of these structures and through these activities I developed special abilities and "know how". From the builders and teachers I have learnt to be humble and work together with my colleagues from the region.

In the mid-1990s when the building of the first house BENEFIT started, people were often negatively thinking and sceptical about such an initiative. Also, during the building of the second one, people laughed, saying the BCLME Programme and a Benguela Current Commission were only an illusion.

My joy is that these two projects have become mature and have been very successful in achieving their objectives. I am so glad to be one of the participants from the early stages and both programmes have greatly contributed to my life and career and have helped me become who I am.

BENEFIT and the BCLME Programme have contributed to a lasting legacy for the advancement of marine science and cooperative management in the Benguela Region and throughout the SADC countries.

No 'big brother', no pariah, just partner

Johann **Augustyn**

My first recollection of the meetings around developing the BENEFIT programme was one of huge excitement; after so many years of being the pariahs of the world, it was refreshing and wonderful to be involved in a new international initiative in which we were a full partner. There was some trepidation, of course, because we didn't know to what extent we would be accepted as South Africans, and it hadn't been that long since we were on the other side of a regional war as a country. Some of us were afraid of being seen as arrogant, or having a "big brother" mentality. There may have been a little of that, but as we got into the planning phases, science took a front seat, and it was immensely satisfying to be part of the process of starting up the first full programme and being part of some of the first joint cruises. Over time we have become good friends with our Angolan and Namibian colleagues, communications are much better and I think there is a sense of being brothers and sisters with the same passions, desires and needs – science wise! The BCLME Programme added to the excitement and provided an opportunity to explore new horizons and we have gone a long way to placing the Benguela Current Commission on a firm platform of understanding. It was one of the proudest days of my life when the ministers signed the BCC Agreement in Cape Town on 28 August 2006 – the end of a long and visionary road that started with the first BENEFIT science plan; but also the start of a new one which holds even greater promise. Long live the BCC – and Benguela science!

My blessings as a BENEFIT novice

Beau **Tjizoo**

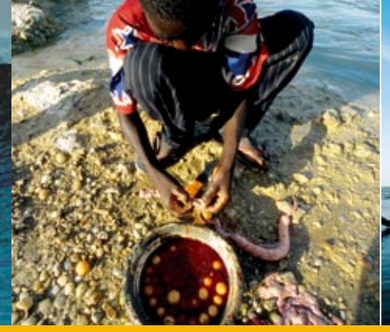
As an undergraduate armed with knowledge in biochemistry and an interest in exploring physiological interaction of organisms with their ambient environment, I entered the Benguela marine world.

At the onset, I was appointed as a technical coordinator of the ENVIFISH programme, between various European countries and the BENEFIT countries, to investigate pelagic fish recruitment through the compilation and comparison of historical fisheries and oceanographic data. Through the ENVIFISH family I learnt many of the theories that form the basis of discussions these days. At the ENVIFISH meeting in October 2000, Cape Town participants agreed that I may be granted funds for further studies. As a post-graduate student, I worked with some of the greatest scientists in the region and met many more from around the world. My first presentation at an international conference (SAMSS 2000) with an attendance of about 300 individuals was an experience that gives me a sense of pride to this day.

After completing my honours degree, I took a position of junior biologist with the Ministry of Fisheries and Marine Resources, Namibia. In about a year, the senior position was left vacant and I stood up to the greatest challenge of my life so far. I had to lead a team of young scientists with limited experience and withstand the daunting confrontations between science and industry regarding the Namibian pilchard fishery.

BENEFIT also granted me funds to further my studies. And, just as I thought my hands were full, I was awarded the national Best Emerging Scientist award. Now, you can imagine what it is like to live by this standard and prove to everybody else who may have doubted my nomination.

To newcomers like me, BENEFIT was a heaven in this intricate science, offering us opportunities to participate in discussions with some of the greatest scientists. I wonder what our part of the world will be without BENEFIT.

An exponential learning curve

Neville Sweijd

Coming into the BENEFIT family was a huge leap of faith for me. Having to take over from Charles Hocutt who had set up the operations of the programme and not really understanding how the land lay, was a daunting task. I recall making the conscious decision to be very careful to learn about the culture of the organization before trying to assert myself. So you can imagine how perplexed I was when in my first week on the job, it was the ill-fated BENEFIT Agreement that scuppered the BCLME launch event (with ministers, TV and all the hard planning coming to nought). The South Africans noted procedural errors and called it off at the eleventh hour!

It will soon be six years since I first flew into Walvis Bay and I recall being quite shocked at seeing nothing but sand. Landing in Luanda for the first time was even more shocking (they were still rebuilding the entrance road to the airport). Arriving as a white South African male into a city that conjured up all sorts of fantasies was both exciting and terrifying. I recall Dra Victoria De Barros Neto (then Director General of IIM) saying to me, "We employed you to change BENEFIT". How? From what, to what? HELP! After just three months on the job I had hosted the annual BENEFIT Forum, the SAMSS symposium, participated in the *RV Africana* cruise to southern Angola and attended a steering committee meeting in Bergen. The learning curve was exponential, and I made lots of mistakes, but the colleagues were dedicated, serious, supportive and forgiving – and I couldn't have done it without them – starting with Petro Rabe, who really does know it all!

While the history and baggage of the past that we bring with us is still extant, and while cultural barriers do still exist, I cannot say more sincerely how amazing it feels to see real and meaningful cooperation taking place under the auspices of BENEFIT and the BCLME Programme. All this despite the fact that some of us were enemy soldiers just a few years back. It's the people that I have been privileged to engage with that make BENEFIT the little miracle that it is. From the eternal debates and power struggles around the transboundary nature of the hake resource, the "remote sensing nonsense" around the establishment of a regional RS Unit, arguments over the intellectual ownership of the H_2S biogeochemical dynamics, appeasing angry *per diem* seekers, fights with editors, chasing up missing invoices, dealing with everything from bus tickets to strategic planning, fretting over missing delegates (did they get on the flight, or miss the transfer?), medical emergencies and many more hilarious, outrageous, frustrating and satisfying moments – it has truly been an incredible journey for all of us, but especially for me.

I have been truly honoured and privileged to serve as BENEFIT Director – I was the conductor, but everyone else made the music: the donors (NORAD, the GTZ and the FSP among others), the scientists from the regional and international institutes and universities and the governments themselves – we have a lot to be proud of and grateful for. It's the cooperation and friendship, the laughter and reminiscing, the formal celebrations and informal meals we shared that we have to look back on with joy and warmth among us. And it's the accomplishments – the reports, the publications, the skill and knowledge that we have engendered and generated that we can all be proud of. It has truly been an honour and a privilege. Thank you!

BENEFIT ~ The making of a success

Pedro de Barros

The BENEFIT programme was an outstanding success. This is a somewhat blunt statement, but I know that it is true. Some people will claim that better science could have been produced with a smaller investment and that more scientific projects, reports and papers could have been written by fewer people, with a higher "efficiency" of the money invested. But those who take this stand fail to understand that true development, building ownership, takes time and often tears, and that the process might generate far more benefits than just papers or reports.

In the Before BENEFIT (BB) era, scientists and managers in each of the three countries looked at their counterparts in the other two countries as strangers to be feared, at best. The "other side" was only a flush of shadows and blurred, nameless, threatening faces. In Angola and Namibia, most scientists were deeply reluctant to present their work in public and of cooperating in important research projects. In the After BENEFIT (AB) era, however, colleagues are at the other end of the line, they have a name and a face, share stories and jokes, common successes and failures. They are the ones we call to clear a doubt or share an important insight. Angolan and Namibian scientists are respected in the region and in other areas and there is an overall confidence that lies at the heart of many achievements to come.

BENEFIT made this possible, and it extended this effect to other areas, cooperation was made possible by spreading the word and the attitude.

But what made BENEFIT so unique? The answer is "people". BENEFIT grew because the directors of the national research institutes in the three countries decided that it was time to trust each other and create a true community for the benefit, not only of science, but of their people. I mean, Victoria de Barros Neto, Burger Oelofsen and Andrew Payne. Working very closely with the first, I got to also know and respect the two others, for their vision, their commitment and for the courage with which they all defended their points of view. They all believed that cooperation was better than confrontation.

I am proud of being a convert from the first day. It was sometimes pointed out to me that I am a foreigner. But even if I hold a Portuguese passport , I am not a foreigner among BENEFIT colleagues. As one says in Angola, once you drink the water from the Bengo river, your heart will never leave. And mine remains there, as my colleagues call me "Angolan at heart". And my Angola includes BENEFIT, for one's home is where one's friends are. Thank you all for sharing so much with me!




Fifteen years of excitement

Michael **O'Toole**

My involvement with the development of regional cooperation in marine science in the Benguela started when I first met Gotthilf Hempel for breakfast at the Strand Hotel in Swakopmund. It was a typically foggy Swakop morning in June 1995 and we had just finished a very successful International Symposium on the Benguela Current the day before. At the time, I was acting head of the hake research division at the newly built National Marine Information and Research Centre (NatMIRC). I had arrived in Namibia from Ireland with my wife and young family two years earlier, fired up with a desire to help the newly independent state develop its marine fisheries research capability and to assist with the training of young Namibian fisheries scientists, oceanographers and technicians. Over coffee, we talked about the recommendations of the recently completed IOC/UNESCO report on "Capacity Building in Marine Science in Namibia" which highlighted the need for regional cooperation as a way to bring this about. It was clear to me before long that Hempel was looking for someone to lead this initiative. I knew that only Namibia could broker such a deal and would have to be the lead country in building regional cooperation in marine science. This would not be an easy task, especially since South Africa, Namibia and Angola had just emerged from years of civil strife, war and the apartheid system and were only recently at peace.

During the 1970's and 80's, South Africa had built up a formidable fisheries research and applied marine science capability, spearheaded by the Sea Fisheries Research Institute and the University of Cape Town. This reached its peak during the Benguela Ecology Programme (BEP) which produced many top class graduates and marine scientists as well as volumes of scientific publications. Tapping into this expertise and transferring it northwards into Namibia and Angola was essential in order to protect the living marine resources of the Benguela Current region and manage them in a sustainable manner for future generations. Getting South Africa on board was the key, but not easy to achieve. They had many years of experience and had become very self sufficient during the apartheid years. They were used to being in control and doing things their own way. The challenge was to persuade them to become the major partner in a regional initiative which would allow transfer of their technology and expertise and the building of institutional capacity in Namibia and Angola. Through the assistance of South Africa and with key international players such as Norway and Germany, it would be possible to develop and implement a science plan that would combine fisheries and oceanographic research on a region wide basis. This would allow for the eventual transboundary management of shared stocks and the development of a sustainable and integrated management system for the Benguela Current region as a whole. Ecosystem management was in its infancy in those days.

Finally, Hempel asked me if I would take the lead and coordinate the effort. I agreed there and then and the rest is history. From then on, my life changed and I found myself with a mission, almost with a sense of destiny. I have been pursuing this vision with enthusiasm for the last fifteen years. Being fully involved in coordinating the development of regional cooperation and building capacity and partnerships among three countries of the Benguela region has been a great privilege for me. It has been a very demanding time but it has all been well worth the effort.

Shortly after the official launch of the BENEFIT Programme, Burger Oelofsen, Director of Resource Management at the Ministry of Fisheries and Marine Resources, asked if I was interested in heading up the BENEFIT Programme. The post offered an attractive salary with good job security. The alternative was to leave the Ministry for an uncertain future with the UNDP and GEF to coordinate the development phase of the BCLME Programme. There was also no guarantee that the outcome would be successful. However, it was clear that if the development phase of the Programme was approved by the GEF, it would secure significant funding which would have a major impact on regional cooperation in marine science, fisheries, ecosystem based management and training and capacity building in Angola, Namibia and South Africa. For me, the BCLME Programme was key to making things happen. Besides addressing regional management issues, it would strengthen BENEFIT and pave the way for the ultimate goal of establishing the Benguela Current Commission. The decision was a difficult one but the challenge offered by the BCLME Programme won out in the end.

Despite some local difficulties and a few setbacks, the development phase of the BCLME Programme was eventually completed. The Norwegians, although cautious at first, became more accepting of the initiative and we submitted the Project Brief to the GEF Council for consideration in March 2000. I left Namibia and returned to Ireland shortly after that when my contract was complete. The following year, I took up a position working with FAO as Chief Technical Advisor of the Bay of Bengal LME Programme, based in Chennai, India. Little did I know that I was to hear the call of the Benguela and return once again to the "Current of Plenty".

Early in 2002, the GEF approved funding to implement the BCLME Programme and the region was awarded a substantial grant of US$ 15 million (R105 M) aimed at achieving the goals outlined in the Strategic Action Programme. The position of Chief Technical Advisor was subsequently advertised. I applied, was successful and in March 2002, I took up my new job at duty station Windhoek, Namibia.

The last fifteen years have been most challenging and there were many times when I thought of throwing in the towel! Yet, it has been a very rewarding journey and a great honour to be of service to the region and to have met and worked with so many wonderful and dedicated people.

The Benguela Current off Namibia is a very special place for me. I worked there in the early 1970's and witnessed the system brimming over with millions of tonnes of pilchard, anchovy, hake and horse-mackerel. When I returned again in the late 1980's, the fish stocks were greatly depleted from two decades of over-exploitation by local and distant water fishing fleets. More recently, in the mid 1990's, I see the northern Benguela as a shadow of it's former self, an altered ecosystem with little or no pilchard or anchovy left in the system and a greatly reduced biomass of hake and horse-mackerel.

However, history has shown the greater Benguela is resilient and full of surprises. Given half a chance, the fisheries could recover but we need to help the process and create the necessary conditions to enable them to do so. We now have a Benguela Current Commission in place which will facilitate the necessary institutional and legal arrangements for the countries to jointly manage the shared fish stocks, improve environmental monitoring and early warning and address issues such as ecosystem health, socio-economics and governance. In the coming years, recovery of fish stocks, implementing an ecosystem approach to management and training and capacity building will be at the forefront of the Commission's agenda.

Today we also have a network of marine scientists, technicians and managers in Angola, Namibia and South Africa who cooperate and work together for the sustainable utilisation of the region's marine resources and protection of the Benguela Current ecosystem as a whole. Many new scientists and technicians have been trained and substantial institutional capacity has been built over the last decade by the two regional initiatives.

All this would not have been possible without the successful partnership between BENEFIT and the BCLME Programme, the generous assistance of the GEF and donor countries such as Norway and Germany who provided the necessary assistance and sustained funding during those critical early years.

We are indebted to Abraham Iyambo, Minister of Fisheries and Marine Resources in Namibia for his leadership over the last decade, and to the late Axel "Zeppy" Ishitile (former Permanent Secretary) and Burger Oelofsen (former Director of Resource Management) both of whom were staunch supporters of the BCLME initiative in those crucial early days. Angola's former Minister of Fisheries and Environment, Fatima Jardim and the former Director of the Fisheries Research Institute (INIP), Victoria de Barros Neto were key to the successful partnership because they ensured a strong commitment from Angola, despite the many difficulties that their country faced at that time.

Finally, we owe much gratitude to Ken Sherman, Director of the National Marine Fisheries Service Laboratory (NOAA), Naragannsett, Rhode Island, USA and to Gotthilf Hempel, University of Bremen, Germany for their unfailing support for the BCLME and the BENEFIT programmes in the arena of international marine science and bio-politics.

Current views




A blueprint for Africa

Vere **Shannon**

The impossible has happened! We have a Benguela Current Commission in place and we are now celebrating ten years of truly collaborative scientific collaboration between Angola, Namibia and South Africa. It all started in May/June 1995 at the Workshop on Fisheries Resource Dynamics in the Benguela Current Ecosystem in Swakopmund – a watershed event which was opened by the young and visionary Namibian Deputy Minister of Fisheries and Marine Resources (now Minister) Iyambo. It was there that I met Brad Brown, Hashali Hamukuaya, Justin Ahahanzo, Gotthilf Hempel and many others who were to play a pivotal role in advancing regional science and integrated management of the Benguela. Out of this flowed the BENEFIT Science Plan in 1996, the launch of BENEFIT the following year, and an embryonic plan for the BCLME Programme – the latter compiled by Ken Sherman, Les Clarke, Mick O'Toole and myself sitting in my old office at the Sea Fisheries Research Institute (now MCM) towards the end of 1995.

So, what do I feel are the highlights and lowlights (yes, there were a few!) of the past ten years? Perhaps the overarching thing is the energy the optimism and enthusiasm of all the players to make BENEFIT and the BCLME Programme success stories – the willingness to reach consensus without compromising excellence or on fundamental principles. To me this was most apparent at the various stakeholder workshops which preceded the establishment of the BCLME Programme. In fact, it was stakeholder consultation and involvement at all times and at all levels that has enabled the Programme to deliver on all its promises. The BCLME Programme has been truly a regionally-driven programme, which unlike so many well-intended but failed initiatives elsewhere in the continent, was not dictated to by foreign "experts" and "consultants". It is in the BCLME that we have really experienced the benefits of finding African solutions to African problems. In saying this I do not wish to underplay the valuable guidance and help provided by overseas scientists, managers and institutions, but rather to stress that these have provided us with an enabling and mentoring environment in which we could excel. The Transboundary Diagnostic Analysis (TDA) exercise was a prime example of this. At first sight the GEF/International Waters TDA process appeared to us to be ridiculous – tedious and bureaucratic, but our experience with it was exactly the opposite. Without the TDA, and also the trust between individuals in the three countries that BENEFIT fostered, there could never have been a successful BCLME Programme. Yes, there were times when we were frustrated and de-motivated by the requirements and constraints articulated by some of the experts sent by GEF and UNDP to help us during the Programme development phase, but at the end of the day without their advice we would have achieved nothing. Out of the TDA emerged a roadmap Strategic Action Programme (SAP) for the BCLME, and later, the Project Document. My only regret – it took much too long between Programme concept and GEF approval. The real work then started in April 2002 with the launch of the Programme and the appointment of Mick O'Toole as its chief officer (CTA), followed by the appointment of the Activity Centre Directors and support staff. So, we had "lift-off".

The core projects of the BCLME Programme were workshopped in 2002 and 2003 and comprehensive specifications, deliverables and timelines for these were formulated. Most projects were put out to open tender. Herein lay a fundamental difference in approach between the science components of the BCLME and BENEFIT initiatives, the latter preferring to go the route of calling for project proposals rather than tendering with very specific requirements. Both approaches have merits and demerits, but I personally prefer the deliverable-specification-tender route. Inevitably, there was some overlap between BCLME and BENEFIT which did lead to healthy competition and some conflicts, all of which were resolved as the two programmes matured and complemented one another meaningfully.

To me the highlight of the BCLME Programme was the International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems which was held in Cape Town in November 2004 with co-sponsorship from 10 regional and international institutions and which resulted in the publication of the book *Benguela: Predicting a Large Marine Ecosystem* in 2006.

My frank opinion is that the BCLME Programme has been an outstanding success, regionally and internationally. It really is a blueprint which integrated marine ecosystem management in other parts of the world could learn from. So, the vision expounded by Minister Iyambo on 30th May 2005 has been realised. It has been a pleasure and privilege to have been able help implement the vision and to work with the CTA, the three Directors, the Programme Administrator, support staff, and all those involved in the suites of projects. Well done folk!

BENEFIT came just in time

Graça **D'Almeida**

The BENEFIT Programme could not have come at a better time in my professional life. When the Programme was officially launched in 1997, I had only been with the Namibian Ministry of Fisheries and Marine Resources for three years. I was also doing a Master of Science in Fisheries (in Maryland in the USA), but was not yet convinced it was the right thing for me. At that time, our national institute, NatMIRC, being in its infancy and manned by relatively young and inexperienced biologists, did not seem to incite a quest for research.

Secondly, before joining the Ministry I was oblivious of the existence of our coastal waters and the plethora and importance of its resources. As previously disadvantaged Namibians from inland, I hadn't been exposed to these facts. I thus simply stumbled into the Ministry of Fisheries from a mere need to earn a salary and it was the only offer available to me at the time.

The formation of BENEFIT has opened doors and availed the much needed access to expertise, both from South Africa and the partner countries, which I believe instilled my love for fisheries science and dedication to the research of our resources. I have been involved with the Programme at various levels, from its conception to organization and participation. I still remember when I was asked to accompany the BENEFIT founding delegation to Luanda in 1996, to assist with some Portuguese translation and minute taking. I was thrilled, as this not only provided me with an opportunity to travel to the country of my birth for the first time since leaving in 1975, but also gave me a chance to work closely with some of the people I revered, such as Prof. John Field.

Perhaps my biggest reward came when I joined the Resources Working Group in 2003 as a Namibian representative. I ended as its chair from 2004 to 2006. This was an exciting time for me as I had an insight into all the projects and thus a huge bank of knowledge. Through this activity, I have also acquired valuable experience in project evaluation and management, which later enabled me to operate at a much higher level within the Ministry.

BENEFIT Forums were not only a time to get to business but to hook up both professionally and casually with the many colleagues and friends met and made through the Programme. BENEFIT in my mind was the best thing that could happen to the region: it transcended politics, language and cultures. It sutured things at difficult times when the region had experienced a drain in expertise. Bridges were leading in some instances to bilateral cooperation. I thus sincerely hope the momentum gained through this programme is not left to whither to just a memory.




Two sides of the coin

Antonio **da Silva**

Today is Tuesday, February, 13, 2007, the birthday of my wife Arminda. She is in Swakopmund, while I am sitting on the famous Norwegian research vessel *Dr Fridtjof Nansen* operating off the coast of my homeland, Angola, on a survey of the effects of the oxygen minimum on the distribution of groundfish and young fish. It is a typical BENEFIT *Nansen* cruise. The chief scientist is a Norwegian, three co-PIs, Hans Verheye from South Africa, Anja Kreiner from Namibia and myself, representing Angola, are accompanied by six junior scientists as helpers and trainees. Research and training are the two sides of the big coin called BENEFIT, which started off with a Science Plan and a Training Plan. This time we have on board a group of six German marine biologists and chemists with a container full of equipment. The group is headed by my friend Werner Ekau who was with us on earlier cruises. Of course, we have faced the normal headaches of late arrival of equipment and missing documentation. The BENEFIT Secretariat is used to those problems and very creative in solving them. English is the working language on board, but it is not the mother tongue of almost any of us. In earlier years I had to struggle more than others, being an Angolan who received his academic training in German. Now everything is working routinely, the weather is fine and the food is good. So I am just in the mood to reflect on my life with BENEFIT and with the international cooperation in the region, from which I have benefited so much.

I was privileged to do my academic studies in biology at the Alexander von Humboldt University in Berlin, Germany. My master thesis was on physiology of freshwater fish. In 1999 I returned to Angola and went to the then *Instituto de Investigação Marinha* (IIM) in Luanda. Dra Victoria de Barros Neto (then Director General of IIM) gave me the opportunity to carry on my studies with samples collected in Angolan marine waters on a variety of vessels. In 2000, I went back to Germany as the first overseas PhD student financed from the BENEFIT programme. On invitation by the *Institut fuer Ostseeforschung Warnemuende* I became a Ph.D student of Rostock University. The theme of my thesis was the feeding conditions of horse mackerel in Angolan waters. Emphasis was on zooplankton but I had to keep in mind the complex system of physical and chemical features in the region of the Angolan Benguela Front. During my studies I, participated in some research cruises such as the *Meteor* 2000, *Africana* 2002 and *Humboldt* 2004. Through the BENEFIT Programme, I also had the opportunity to present the preliminary results of my PhD work at the SAMSS 2002 and at the BENEFIT Forum 2003, which contributed a lot to the successful finalization of my studies and provided me with an opportunity to familiarise myself with international and regional scientists. I returned to Angola in 2004 with my concluded PhD and started to work at IIM. Early in 2005, I had the privilege to become part of the BENEFIT Secretariat as research officer – a post I still hold.

My job is to facilitate communication and capacity development among Angolan participants and the BENEFIT programme, to assist with the management and operation of the BENEFIT Research Programme, to participate in some of them and to administer the scientific sub-programmes. I knew that it was a new challenge for me, but I had no idea what awaited me. As with all beginnings, I had my difficulties, which I overcame with time. It was only possible with help from the BENEFIT family in general and especially from its director Neville Sweijd, who is an excellent leader and always willing to help. The working atmosphere in the BENEFIT Secretariat is great and we are a good team and a happy family. Thanks BENEFIT.

Towards an expanded ecosystem approach

Frikkie **Botes**

To me the BCLME Programme is an impressive programme addressing important regional issues and working towards establishing sustainable ecosystem management in the Benguela Current region. It is heartening to see that so many of the projects that were conducted by the BCLME Programme were directed at collecting and analyzing relevant data and information to enable the scientists, users and managers in the region to eventually implement the Ecosystem Approach to Fisheries (EAF) management. However, it is clear from the results from these projects that we have a lack of understanding of the exact dynamics of the ecosystem and that we have to recognize that there are many interactions in the ecosystem, on various levels throughout the food web, which are being disturbed and negatively impacted by human activities.

All the stakeholders should realise that ecosystem science should be applied in the design of a system of management focused on bridging the gap between what people collectively want from the ecosystem and what is ecologically possible. We should realise that we can actually not "manage" the ecosystem in itself, but we can manage the human activities that influence the ecosystem. I am of the opinion that in our approach, the ecosystem should be "expanded" beyond biology and ecology and we need to include and consider socio-economics in all management issues and decisions. Furthermore, the stakeholders (managers and users) must keep in mind that EAF is an approach to management, and not to science. But it has implications for science and scientists.

The challenge is now for the newly established Benguela Current Commission to ensure that all the different sectors and stakeholders in the Benguela Current System are involved in and buy into this management approach. The proof of the ecosystem approach to fisheries management in the BCLME region will be in the implementation thereof.

Current views




Publicity for the BCLME Programme

Claire **Attwood**

Almost every organisation is concerned about the way that it is represented in the public arena. As a result, public relations (PR) is increasingly recognised as an important management function. The PR practitioner has the task to foster communication, create goodwill for the organisation and bolster its image in the public domain.

Mick O'Toole and the Programme Steering Committee were quick to recognise that a PR practitioner could play an important role in the the BCLME Programme. Mick asked me to help him draft a communications strategy for the BCLME Programme and we identified three key objectives:

- to communicate the activities and successes of the BCLME Programme to a clearly defined audience;
- to improve communication between people participating in the Programme; and
- to record the progress of the BCLME Programme over four years.

We defined our audience as scientists, managers and politicians in the three countries, as well as global funders and supporters of the Programme. We also wanted to communicate key issues to stakeholders in the fishing and mining industries and, wherever possible, to raise awareness of the Programme among the general public.

Our strategy was to use the website to circulate information to stakeholders and the newsletter to record the achievements and successes of the programme. We also agreed that I would use my skills and contacts as a journalist to write articles about the Programme and liaise with the media. We recognised that, wherever possible, we should communicate in English and Portuguese; almost all of the PR material we produced was in those two languages.

One of the things we did right, from the beginning, was to work with a good graphic designer who was able to produce a corporate image for the BCLME Programme. All our public relations material, including newsletters, website, CDs, brochures, displays and even press releases, made use of the teal blue that came to be associated with the BCLME Programme. We also repeatedly used a map showing the extent of the Large Marine Ecosystem and other elements, like a stylised wave and a school of swimming fish. Good use of colour and images enhanced the quality of our publications and ensured that our PR material looked professional. This was important for a Programme that involved world class scientists, high level politicians and international donors.

Of the wide range of public relations material we produced over four years, the map of the world's large marine ecosystems stands out in my mind. We included the map – which highlights the BCLME and includes a brief description about the BCLME Programme - with the first edition of the newsletter. I have seen that map on office walls from Swakopmund to Maputo. Four years later, I'm still seeing it.

We published three brochures, a large and comprehensive display, a number of CD roms and a mini documentary. But my favourite project was the newsletter. It gave me an opportunity to find out about some of the BCLME projects. For instance, Kevern Cochrane opened my eyes to the possibilities of the ecosystems approach to fisheries.

The newsletters also gave us an opportunity to print some of the many photographs I took at all sorts of gatherings, in all three countries. In many ways, the newsletters provide us with a record of what has happened over the past four years, the people who have been involved in the Programme and the progress that has been made.

Media liaison worked well. Especially in Namibia we built up good contacts in the print media. In South Africa we achieved good coverage if we had a newsworthy topic, e.g. when we raised the issue of climate change and linked it to the Benguela. My professional relationship with two fisheries publications helped to ensure that the specialist press regularly ran stories about the BCLME Programme. I wrote about projects and political milestones in both *Maritime Southern Africa* and *Fishing News International*. A coup was an eight page story in the premier South African environment and travel journal, *Africa Geographic*.

The website grew on me. This was my first experience of website management and I have come to appreciate the value of maintaining a site and loading it with information. A website requires constant vigilance and a keen eye for detail; this is a lesson I will move ahead with in my career.

From Okahandja to the ocean

Jeremia **Titus**

I started working as Technical Assistant (TA) for the Ministry of Fisheries and Marine Resources at NatMIRC in June 1994. Hailing from Okahandja, about 300km inland from the coast, arriving at NatMIRC in Swakopmund was only the second time I'd been to the sea! I made various attempts to study further but this was initially problematic. That did not discourage me and I continued to work as a TA for four years. I had gained much experience in that time and it was during this period that my mentor, Geoff Bailey, from Marine and Coastal Management in South Africa and I were sent by BENEFIT to Namibe in Angola to assist in the training of our Angolan counterparts on how to execute their monitoring line, survey preparation, sampling, making up of chemical reagents, and to conduct physical and chemical analyses. It was amusing to find myself in a position of trainer – not being able to speak a word of Portuguese and my trainees, who could hardly speak English! But with great effort we managed, using all sorts of communication including sign language.

In 2003, BENEFIT granted me a bursary for the completion of my diploma course at Cape Peninsula University of Technology and I graduated in 2004. Immediately afterwards I was appointed Fisheries Research Technician in the environmental subdivision at NatMIRC. As a consequence of my training, I am now actually working directly with the researchers in the Physical/Chemical Oceanography section and I enjoy a wide range of responsibilities.

Since working in this section and in addition to my regular work at sea and in the laboratories, through BENEFIT I have been able to participate in several exciting research surveys, including deep-sea work on the American research vessel *Melville*, environmental surveys on the South African *RV Africana* and various Angolan vessels for oceanographic monitoring on the Namibe line. I have also set-up the first automatic weather station in Namibe. I am now involved in training students from the Fisheries Resources course at the University of Namibia. Thus, the knowledge and experience which I have gained at work at NatMIRC and through BENEFIT activities is being passed on to our future scientists and technicians.

Much of my personal achievements could not have been possible without BENEFIT. At times it must have been quite a challenge for the BENEFIT Secretariat to work with us, organising everything from bus trips to accommodation in Cape Town, but they did a great job and we are all very grateful!

Current views




Mining Namibia's sea floor

Gabi Schneider

My first encounter with what was to become the BCLME Programme was at a conference in Cape Town in 1997, where we were trying to develop a project proposal to apply for funding to GEF. It was there and then that I had to get up for the first time in front of a large number of scientists dealing mostly with living marine resources, and tell them why and how we mine the sea floor in Namibia. Quite a hostile environment indeed – how naïve had I been in assuming that the whole world knows that we geologists are true environmentalists at heart! However, being as passionate as I am about both mining and the environment, I took up the challenge, and have since spoken many times about the synergies and benefits that can be derived from careful development of all the resources – living and non-living – of this Current of Plenty that we are blessed with.

As the project unfolded, the colleagues got used to me and my passion for marine diamond mining and even gave me a nickname: "the polluter"! Knowing that this nickname does not imply real bad feelings, I have actually come to cherish it! Working with the BCLME family - and by now it is a family indeed - has given me the opportunity to get to know a fair number of colleagues from the region, representing a variety of disciplines. Despite our varied backgrounds, it has turned out that we all share a common goal: the sustainable management of the Benguela Current for the benefit of present and future generations. The cultural diversity within our group has given us the chance to learn from each other about different ways to do things.

For five years, we have been able to commission studies dealing with a variety of issues and generate valuable data and knowledge not available before. This has given the three countries useful tools for the management of an important national asset, and even more important for the trans-boundary management of the Benguela Current by the three countries. Working with colleagues from Angola, South Africa and my own country, Namibia, has been most rewarding and lobbying the politicians to create the Benguela Current Commission has been a success. The Benguela Current still remains a new frontier and it is certainly a highlight of my professional career to be part of the team that works to achieve proper management of this precious asset with all its resources – a true Current of Plenty!

BENEFIT was a happy surprise

Geoff Bailey

The design of BENEFIT between 1995 and 1997 was both confusing and exciting. At the former Sea Fisheries Research Institute, we were accustomed to Dr Shannon's organisational abilities and he became involved in designing BENEFIT with the same meticulous procedure. We were used to the operational side of big programmes - long periods at sea - but nothing could have prepared us for the BENEFIT Programme. Suddenly we were in on the planning side, meeting with colleagues from neighbouring countries and from overseas, some of whom were to become friends for life. In a helter-skelter of meetings in partner countries, it was emphasized that BENEFIT was to be inclusive. Ideas were to be blended into a regional research and training programme that national research institutes would buy into. The funding mentioned was an order of magnitude more than we were accustomed to and it seemed the sky was the limit to our aspirations, provided our Norwegian and German donors approved. We were excited to be working with colleagues in Namibia and Angola in the wider Benguela system and told to forget about research driven by selfish interests. We were to become involved in the new concept of capacity building.

I'd performed oceanographic research in the former South West Africa, where being at sea was harsh, but phenomena such as the Lüderitz upwelling plume and the low oxygen zone were adequate compensation for an oceanographer. The people and the landscape were warm and welcoming too. After independence in 1990, Namibia took its rightful place, carrying out its own research. It seemed until the launch of BENEFIT, that our work in these waters was over. BENEFIT brought us back to sharing ideas with Namibians, new in the field but eager to learn. Initially, projects and the working groups were led mostly by South Africans. After putting the Environmental Working Group (EWG) on its feet, Larry Hutchings handed the chair over to me. Namibians quickly gained confidence and within three years, Ekkehard Klingelhoeffer took over chair of the EWG from me and Namibians began to lead projects in collaboration with South Africans, Angolans and Germans.

Charles Hocutt, first Director of BENEFIT, I remember for his booming laugh, easy going attitude and help given to establish projects, training cruises and workshops. Personally I found the annual BENEFIT Forums, at which each project leader had to present their achievements, invaluable. Reviewing research and training achievements of fellow scientists, many were left wishing for something similar at our home institutes. Angola, after a protracted war, had to make up ground as I discovered during two multi-ship training cruises, workshops and visits to Namibe. The new BENEFIT director, Dr. Neville Sweijd, was a fair leader and friend, indefatigable in his drive for financial support for work in that country. Angolans such as Quilanda Fidel were of great help; Fidel drove 400 km just to get distilled water from Lubango for my nutrient analysis training course in Namibe! The determination of the Namibe lab in southern Angola, despite power and water problems is a lesson to others who take these assets for granted.

The commitment and friendship of BENEFIT colleagues has made a life-long impression on me and my wish is that they can continue to serve the region despite the obstacles.

Benefits from BENEFIT for Angola

Victoria de Barros Neto

My passion for the sea started when I was a child. My parents went to live in a house in front of the sea and during the high tides the sea entered the kitchen-garden. When the tide lowered, I always became enchanted by the organisms lower down in the kitchen-garden: sea stars, multicoloured sea snakes, sea cucumbers, etc. Therefore it was not a big surprise for my family when I gave up studying medicine, as my father wanted, decided to study biology and became a marine biologist. Since 1983 I have been engaged in the development of marine and fisheries research in Angola.

One of the most critical decisions to take was related to the start of regional cooperation after a long period of hostilities in southern Africa. When Tore Strømme wanted to talk about regional cooperation in fisheries science, I was very reluctant. The differences between the three countries in political, cultural and language terms were too big. I was aware that it would be very difficult for Angola to follow the other two countries at a time when issues like environment, sustainable development and marine research were not high on the political agenda of the country facing a very destructive war that consumed almost all the financial and human resources.

In spite of that, supported by the senior scientists and by the Minister, Fatima Jardim, we decided to face the challenge and join BENEFIT. I personally was very much supported by Gabriella Bianchi. Apart from all the efforts she made for the Angolan insertion into the Nansen Programme, she was a key person for the final decision of Angola to be part of BENEFIT. We did know some colleagues from Namibia, because we had a bilateral agreement for the research of shared stocks with the Namibian Institute but the South African marine research community was unknown. It was difficult for us at the beginning when the language and the imbalance of scientific capacity from south to north in the Benguela region made communication almost impossible. Thus, capacity building was a priority for Angola, both in BENEFIT and later, in the BCLME Programme.

Today I think it was a good decision to join both BENEFIT and the BCLME Programme. Both programmes provided a new vision on marine science using the Large Marine Ecosystem approach as a tool for the sustainable management of living resources and protection of the marine environment. Angola, Namibia and South Africa are working together, developing several projects in different fields (living marine resources, environmental variability, biodiversity, ecosystem health, pollution) and good results are being achieved. All these activities contributed to create a small but committed group of Angolan scientists. They are able to carry out their work for the development of marine science not just in Angola but also in the region. I believe that the establishment of the Benguela Current Commission will be a very important step to ensure the sustainability of the Programme through the engagement of the three partner countries.

On copepods and other benefits

Hans Verheye

I became actively involved in BENEFIT's research and training affairs shortly after its formal inauguration in April 1997 when, on the 20th of that month, I boarded the Germany-chartered Russian *RV Petr Kottsov* in Walvis Bay to take part in the first Angola-Benguela Front Expedition (ANBEFEX). This cruise was led by one of Germany's leading physical oceanographers, Hans Uli Lass from the IOW in Warnemuende. Alas, Hans Lass could not resist leaving his signature – or was it his foot print? – on the Angolan shelf, so in the afternoon of 28 April, he expertedly 'parked' IOW's only Scanfish on the bottom at 15° 30.6'S, 011° 46.2'E, for it to remain there ever after...

As I am writing this article, it suddenly occurs to me that it is almost to the day ten years later, and I have braved many more BENEFIT-facilitated cruises on quite a variety of Angolan, German, Namibian and South African research and not-so-research vessels along various parts of the west coast of southern Africa.

During the past decade of BENEFIT, many a trainee from the three riparian countries of the 'Current of Plenty' has been able to witness under a microscope, usually with much glee how, for instance, copepods go about their sex life, right from the initial foreplay involving stroking and groping with their P5 to the actual copulation, with the male grabbing the female with his modified, prehensile appendages, followed by the subsequent placement by the male of a spermatophore. Some persevering folk even observed the subsequent broadcasting by the female of a batch of eggs.

I am soon to visit the Angola-Benguela Front area for the fifth time, in a continued effort to unravel the effects of hypoxic conditions on plankton organisms. This time, it will be onboard *RV Dr Fridtjof Nansen*, and in collaboration with some of the finest German scientists from Bremen, a Hansastadt I have come to fall in love with over the years – thanks to BENEFIT – during my frequent visits to concoct research proposals, plan cruises and discuss amazing findings.

Besides the good science that I have been priveleged to practice during the BENEFIT decade, in collaboration with scientists from various research institutions both locally and abroad, I think I can say that, through dedicated training and capacity building efforts, I have been able to make a contribution, however small, toward the seeding of a new generation of marine scientists and technicians in the region. I must add here immediately though, that the success of my contribution, as well as that of many of the others who all believed in making a difference in one way or another, could not have been made possible without the reliance on a small team of unselfish people at the BENEFIT Secretariat in Swakopmund. I salute them all!

Current views

Haunted by ghosts and apostrophes

Catherine Kuske

I started working with the BCLME Programme on 7 July 2002 as programme administrative officer. The beginnings were rather humble, with a huge desk with only one drawer and an old chair. The furniture had inventory numbers of the South West African Administration (SWAA) which reminded me of my school days in the colonial past.

Our first office was in the GIPF building next door to the Ministry of Fisheries and Marine Resources. However, with more staff and more space requirements, we were moved into Aaron Kasingo House on Uhland Street which also housed the SADC Fisheries Coordination Unit and the SADC / European Union Monitoring, Control and Surveillance (MCS) Project. These offices were very spacious and we soon got started with the establishment of the Programme Coordination Unit (PCU).

We were located at the end of the building which was only accessed through a long, narrow and rather dark corridor. On several occasions we had to work after hours and late at night to get workshop documents ready. At times, we heard some strange noises but did not take too much notice. As time went on and the unusual noises persisted, we began to feel uneasy, as if we were being watched by an invisible presence. I used to get goose pimples and soon we began to realize that maybe the offices were "haunted". Sometimes the electricity would trip off and we would find ourselves standing in the dark. At other times, the photocopiers would come on or a toilet would flush. On various occasions we would hear what appeared to be the crying of babies and noises of chains coming from below the floor. We decided to do an enquiry about the past status of the premises and found out that they were used as an interrogation and detention centre during the colonial times in Namibia. We eventually decided to move out to our present offices in the Hidas Centre, Klein Windhoek. Needless to say, we have been very happy here at this location ever since.

I remember another incident when setting up the accounting system for the PCU and all Activity Centers where we were experiencing a computer glich. We had two visiting UNDP experts from Nairobi to assist with the setting up of the Imprest Accounting System. All went well with downloading and installation of the accounting data and by 17h00 that afternoon all the vouchers were processed and logged onto the system. We had one problem with the accounts which we could not balance. Despite persistent efforts, it always gave a systems error report. Later that evening, we again carried out a new downloading of all the data and vouchers. We finally solved the problem at 23h00, when we realized that the bug on the accounting system was Dr O'Toole's name. The reason for this was the UNDP accounting system did not accept or acknowledge the apostrophe (') in the name O'Toole!

Organising some of our large meetings and workshops were the most difficult tasks, especially getting scientists from all over the world to the region on time. For example, scientists from 10 different countries participated in the Forecasting Workshop held in Cape Town in 2006. At the Pan African LME Forum meeting, a Minister from the Gambia was selected to give the keynote speech. Due to the large number of presentations, the speeches were limited to 10 minutes. After exceeding his time, the chairperson reminded the Minister of his over-run, to which he responded: "I will take my time" and quoted Fidel Castro, saying that once you have the microphone, one should make the best use of it!

At this meeting, we also had a pre-arranged dialogue between Professor Gotthilf Hempel from Germany and Dr George Wiafe from Ghana. We were assured by the conference centre that this would be properly recorded. Alas, when the time came, the electronic engineer forgot to press the record button! Another incident that caused some problems was the detention of a delegate from South Africa who was attending one of our meetings in Angola. Upon our arrival at Luanda airport he was refused entry because of incomplete paperwork and we were informed about this incident. He was subsequently held in a very dark corner of Luanda airport by the immigration authorities for a number of hours before we managed to get him released with the assistance of the South African Embassy.

Then there was the saga of the ski-boat "*Ambiente*" which was built in KwaZulu-Natal for the Angolan Ministry of Fisheries. The boat was scheduled to depart from Rundu, Namibia in November 2006 as cargo on a Russian Antonov plane. Due to the delayed and mysterious landing times of this aircraft at Rundu airport, the CTA decided that the boat should be returned to Swakopmund until secure arrangements were in place. The director of the Living Marine Resources Activity Center had a difficult task of driving 1 500km to tow the ski-boat with the project Toyota Prado 4x4 back to Swakopmund. In March 2006, the ski-boat was finally loaded on the cargo plane for delivery to Angola. However in the follow up, the pilot could not be traced and the clearing agent in Luanda was not aware of any ski-boat delivery at Luanda airport. Our biggest fear was that the ski-boat was stolen. Finally, the owners of the cargo plane were able to provide the correct documents for clearing the ski-boat. It took us one year to solve this matter and the ski-boat was eventually located in a warehouse in a military part of Luanda airport, cleared through customs and finally handed over to INIP in January 2007.

My overall experience with the BCLME Programme has been very challenging and exciting. I have gained invaluable experience in the marine scientific world and it has been a privilege for me to be part of this most successful programme.

Enthusiastic researchers and an enraged ostrich

Lesley Staegemann

As I write this piece on my personal impressions of the BCLME Programme, many thoughts flash through my mind.

Firstly, what the BCLME "skeleton" team has achieved over the past five and a half years is certainly impressive. Over 100 projects have being contracted and completed. Also, numerous workshops and logistical planning thereof, meetings and expert scientific conferences, both regional and international, were all successfully executed from the planning phase to completion by the team. Of utmost significance has been the challenge of establishing the Benguela Current Commission.

These achievements were not possible without support from regional scientists, researchers, management in the government institutions and at the political level.

I have been part of the Programme since 2002 as director of the Environmental Variability Activity Centre, based in Cape Town, South Africa. The experience and exposure gained has enriched me with unprecedented personal and professional growth and knowledge.

Being part of the team has given me exposure and the opportunity to network with people at various events and meetings, where I either presented the BCLME Programme in its full entirety or under the environmental banner, shared challenges that the Programme faced, good and bad practices, and lessons learnt. The enthusiasm shown by researchers involved in various projects has been inspiring. In fact, certain project leaders surpassed the requirements of their environmental variability projects, giving added value to the Programme. On completion of some of the projects, the governments and other institutions have taken up the challenge of continuing pilot projects and started implementing them into their National Plans of Action.

Fun memories that I have experienced are many, like cancelled or rerouted flights, lost baggage, hotel curtain rails collapsing, shuttles grinding to a halt, sharing evening meals with others when on missions..... our team being chased by an enraged male ostrich. No footage, but it did happen!

The BCLME Programme will soon be coming to an end and the challenge now remains for the newly established Benguela Current Commission to utilise the successes and achievements of the BCLME programme to achieve its objectives.




Views of a young training officer

Pavitray Pillay

In their conception stages, both BENEFIT and the BCLME Programme recognised that training and capacity building would play an important role in ensuring long-term success. The programmes subsequently accomplished many of their training objectives, at various levels and through several mechanisms. Firstly, within the specified projects by training students and early-stage researchers, secondly, through stand-alone student bursaries and finally, by conducting independent training courses - from English language courses to on-board ships training. While the training efforts had been successful to some degree, it was recognised that a dedicated training programme, managed by a full time training officer, would be a better option. That's where I came into the picture as the BCLME Programme/BENEFIT training officer.

My passion for training and capacity building began as a student at the University of Cape Town, where I completed my Masters in marine science. I soon realized that being one of only a handful of black women involved in marine science in South Africa, I had a unique perspective and thought I would contribute to the emerging field of training. I was fortunate enough to then be employed by the National Research Foundation as the South African Network for Coastal and Oceanic Research (SANCOR) secretariat, where I gained formative knowledge on the inner workings of research funding and management. After four years at SANCOR, I joined BENEFIT.

I soon learnt that trying to implement a training plan within and between three countries was no easy feat. In the year that I have held this portfolio I have encountered many limitations but just as many successes and surprises. Besides the superficial problems of late flights, lost baggage, no visas and missing trainees, some of the more serious challenges were the development of equitable training courses that synchronised the needs of people at different levels in the various countries, found harmony between the schedules of people at three different institutions and avoided duplication of national training efforts. We managed, however, to develop a training programme that encompassed workshops and hands-on training courses in hydroacoustics, research survey design, stock assessment, fisheries management and GIS; the list goes on and on…

In terms of training cruises, we secured one dedicated BENEFIT cruise per annum on the *RV Africana* which trained about 20 people from the region. Furthermore, we put people of the region on national cruises in an effort to gain experience and skills for remittance.

A major "thorn in the side" of the training programmes, has been the high staff turn-over at the partner countries' national institutions. This has meant the loss of trained personal, expertise and - if viewed in a broader context - a loss of investment. Moreover, this has often meant that inappropriate people receive training in fields that are not their areas of expertise or interest. This has been frustrating for the trainee, the trainer and myself as the training officer. If I have learnt one thing from managing this training programme it has been that feasibility and flexibility are keys to success.

Having identified these main issues, I must highlight that in the short time I have been here, the sense of trust and acceptability has been instrumental in the many successes of the training initiatives. Successes include people that have gone through the training programme being employed in senior management positions; and trained and capable technical staff and a host of students (including in-service people) having successfully completed all kinds of diplomas and degrees.

A host of new possibilities and opportunities have materialised. These range from the need for more advanced training courses - sometimes just in an effort to keep up with the pace of technology - to a greater demand than ever for funds for bursaries. The training programme has meant that international experts have intermingled and networked with people of the region and provided many opportunities for regional technicians and researchers to go abroad to receive specific training at other institutions and to join international cruises. Creating a forum for the regional researchers and technicians to sound out their research internationally and to cooperate has been invaluable.

I can lay testament to the fact that training and capacity building is indeed the pivotal cog in the wheel of success and is a process that cannot cease but will ameliorate as capabilities and expertise are developed and fine tuned in the Benguela region. I do feel strongly that when international support leaves this region, enough would have been done in terms of strengthening capabilities, developing new ones and building capacity (people and institutions), that the region will continue to successfully manage, sustainably utilize and conserve the Benguela system and its natural resources. On a personal note, I have learnt that when it comes to training and capacity development, *"enthusiasm is no substitute for perseverance"*.

Teamwork and training

Maria de Lourdes Sardinha

I am not a writer, so when I was asked to share my personal views on the BCLME Programme, I nearly declined! However, when I considered how the Programme has enhanced my abilities and helped me to build friendships within the region, I changed my mind and put together these notes.

When I first joined a BCLME/BENEFIT meeting, I was replacing a colleague who had attended several meetings and was quite familiar with the regional cooperation that was taking place between Angola, Namibia and South Africa. Looking back, I barely remember what I said at that meeting; for the first time I came face to face with well known South African scientists, some of whom I had cited in my Masters degree thesis. I was about to tear up my thesis, afraid that I had misinterpreted the concepts! I also considered hiding it or myself under the table! But, I survived the experience and I remember very clearly watching scientists from Angola, Namibia and South Africa dancing together to a song by Miriam Makeba - breaking the post-war ice between the countries.

Many reports have been written about the major social, scientific and management achievements of the BCLME Programme, according to the several areas set forth in the SAP. What I can say is that the results were much better, both qualitatively and quantitatively than I expected. Although there has been some criticism about the way the Programme approached the imbalance between the three countries, I can testify that a lot of experiences were shared and capacity building objectives were always present, both in terms of "in service" training and formal education. Perhaps the Programme's time frame was a little short if one takes into account the ambitious (in a positive way) objectives set for the Programme.

My best personal memories of the Programme come from a team building trip to Oropoko Reserve in Namibia where we were attacked by an ostrich. Lesley jumped on to my lap and Mick was screaming! Another memory is Nkosi and I being arrested at *Point Noir* Airport when we were coming back home from a meeting. Neville asked me to write about that adventure and I will. Next time!

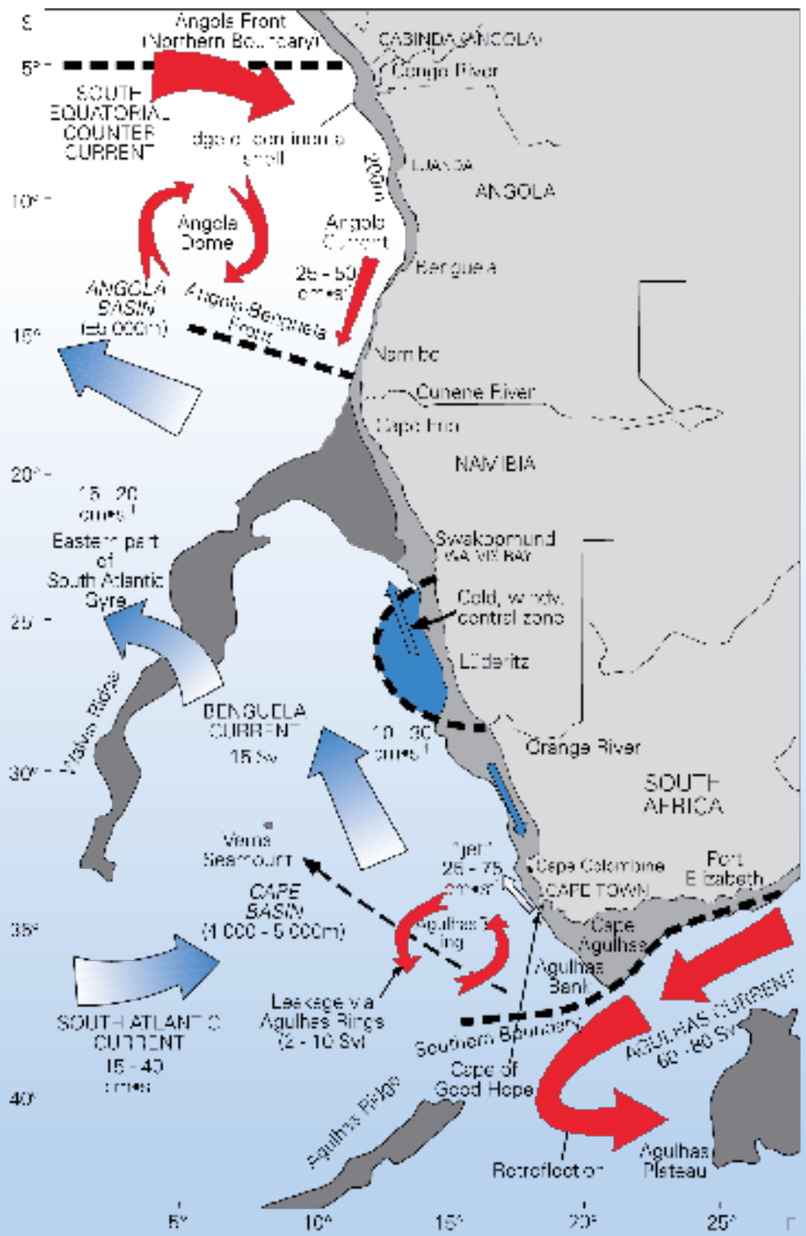
Well, I can say that I enjoyed being part of the BCLME Programme team. All my colleagues (the ones remaining in the Programme and the ones who have left) were very supportive and I will never stop telling everyone that the key factor in the success of the BCLME Programme is the excellent team who worked on this project.

A changing Benguela

The Benguela Current Large Marine Ecosystem is highly variable. Over the past ten years, this variability has been evident in the changes in geographic distribution and abundance of major fish stocks, as well as top predators such as seabirds. The following graphs and images were presented by scientists at workshops hosted by BENEFIT and the BCLME Programme. Together they represent our current understanding of the changes that are taking place in the Benguela.

Physical features of the BCLME

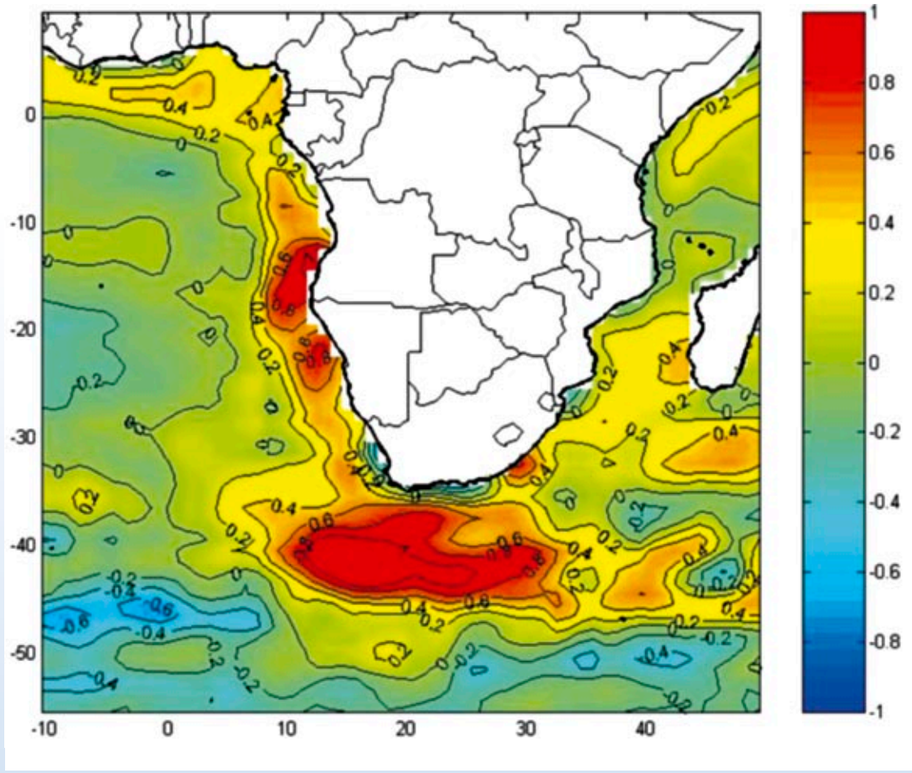
Conceptual image showing the main physical features and surface currents in the Benguela Current Large Marine Ecosystem, including the warm Angola Current, the cool Benguela Current and the warm Agulhas Current.



Key:

- Warm current
- Cold current

Sea surface temperature 1982–2005



Sea surface temperature rise in the greater BCLME region over the past 25 years.

Image courtesy of Dr Pierre Florenchie, University of Cape Town, South Africa.

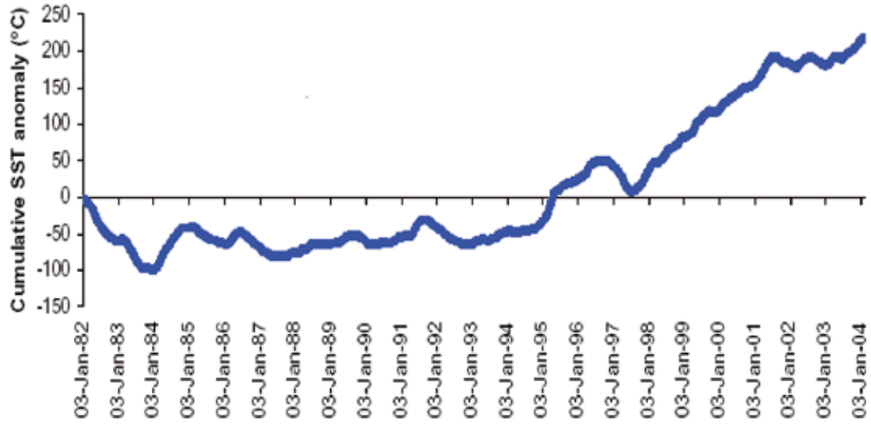
A changing Benguela




Sea surface temperature anomaly

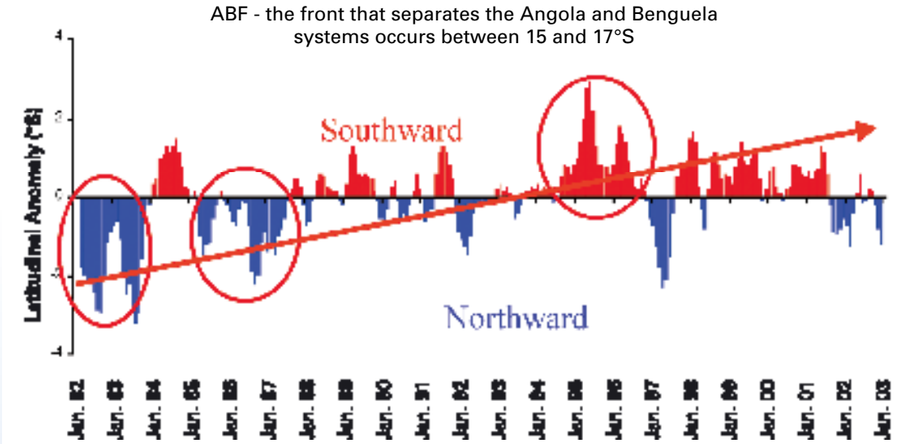
The graph illustrates the cumulative sea surface temperature (SST) anomalies over the entire Namibian shelf since 1982. The first two years, when the graph slopes downward, indicate a period of consistent negative SST anomalies (a colder than average period). From 1984 to 1994, the positive and negative anomalies cancelled each other out, therefore there is no upward trend in the graph, but alternating warm and cool periods. However, since 1995, the graph shows a strong upward trend which indicates a period of consistently positive (SST) anomalies, pointing towards an extended warmer than average period.

Graph courtesy of Chris Bartholomae, Ministry of Fisheries and Marine Resources, Namibia.



Cumulative SST anomaly over the Namibian shelf (satellite derived)

Angola Benguela front shifts



The graph illustrates the anomaly of the 22°C isotherm's latitudinal position which indicates the Angola/Benguela frontal area, off the northern Namibian and southern Angolan coast. The blue areas of the graph indicate periods when the isotherm's latitudinal position was further north (reflecting cooler years or periods), while the red areas of the graph highlight warmer periods, when the 22°C isotherm moved further south.

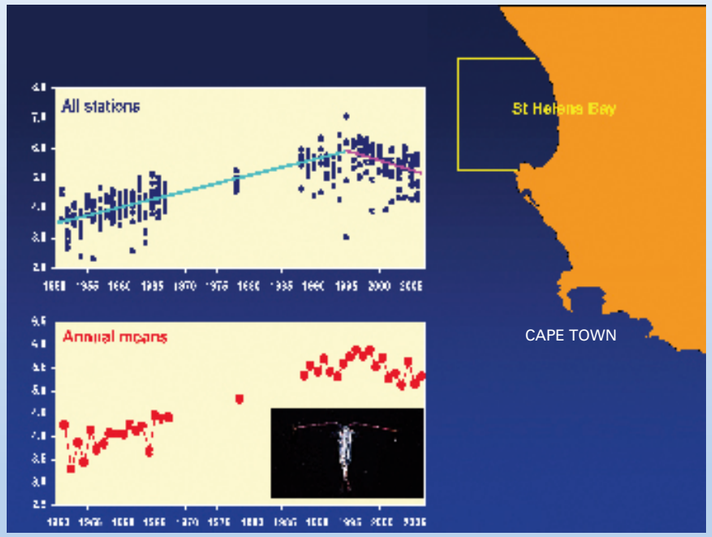
Graph courtesy of Chris Bartholomae, Ministry of Fisheries and Marine Resources, Namibia.

Upwelling favourable wind anomalies at Diaz Point (Lüderitz)

An illustration of the annual upwelling favourable wind anomalies (winds blowing from a southerly direction) at Diaz Point near Lüderitz. This is the centre of upwelling in the Benguela Current. Wherever the bars rise above the baseline, southerly winds were stronger than the long-term average and induced above normal upwelling. Where the bars are below the baseline, southerly winds were below average and upwelling relaxed.

Graph courtesy of Chris Bartholomae, Ministry of Fisheries and Marine Resources, Namibia.

Autumn zooplankton (copepods) time-series in St Helena Bay, 1951–2006



A retrospective analysis of historic zooplankton collections from a one by one degree square in St Helena Bay in the southern Benguela. The analysis reveals a turning point in the long-term abundance of copepods, reversing from a 100-fold increase from the 1950s until the mid-1990s, to a steady decline to the present.

Graphs courtesy of Hans Verheye, Marine and Coastal Management, South Africa.

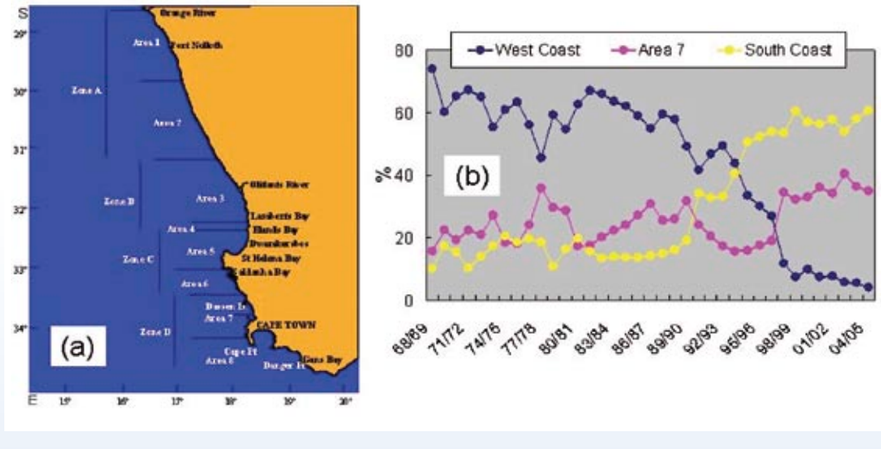
A changing Benguela




Documented change: South Coast increasingly important to West Coast rock lobster from early 1990s

The graph illustrates how catches of west coast rock lobster declined on the west coast of South Africa and rose sharply on the south coast in the 1990s. Catches at Dassen Island (Area 7) remained comparatively steady.

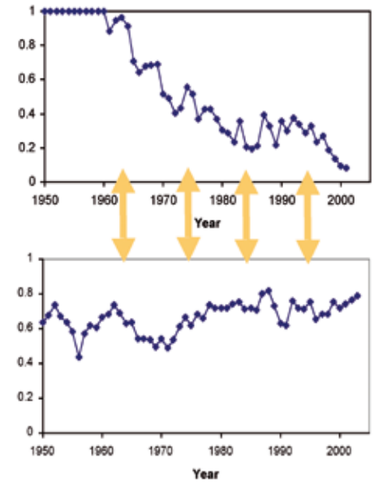
Image courtesy of Andy Cockcroft, Marine and Coastal Management, South Africa



Documented change: Relative importance of pelagic landings

Northern Benguela

Southern Benguela



Benguela Niños

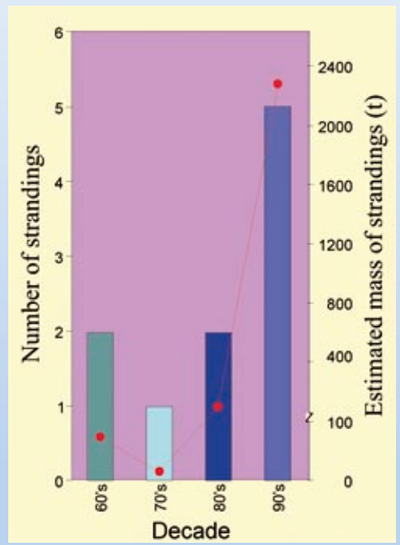
Catches of small pelagic fish, i.e. sardine and anchovy, expressed as a percentage of catches in the Southern versus Northern Benguela.

Graph courtesy of Lynne Shannon, Marine and Coastal Management, South Africa and Jean Paul Roux, Ministry of Fisheries and Marine Resources, Namibia.

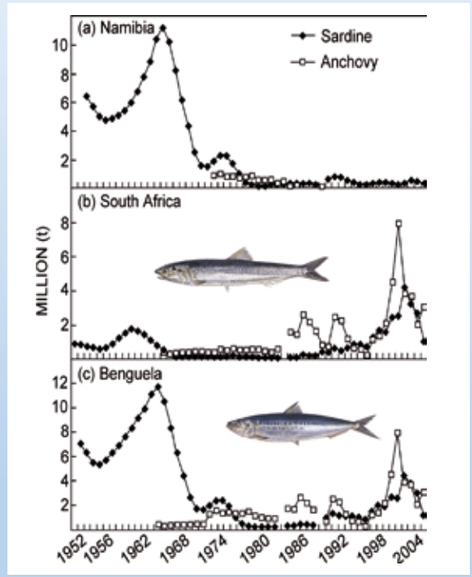
Rock lobster strandings in Elands Bay

The number of lobster mass mortality events on the South African west coast and the amount of lobster stranded (tonnes) on a decadal scale.

From: Cockcroft A (2001) *Jasus lalandi* 'walkouts' or mass strandings in South Africa during the 1990s: an overview. Marine Freshwater Research Vol 52, 1085 – 1093.



Fluctuations in biomass of sardine and anchovy in the Benguela 1952–2004



Fluctuations in biomass of small pelagic fish, i.e. sardine and anchovy, in Namibia, South Africa and the Benguela as a whole.

Graphs courtesy of Marine and Coastal Management, South Africa and Ministry of Fisheries and Marine Resources, Namibia (unpublished data).

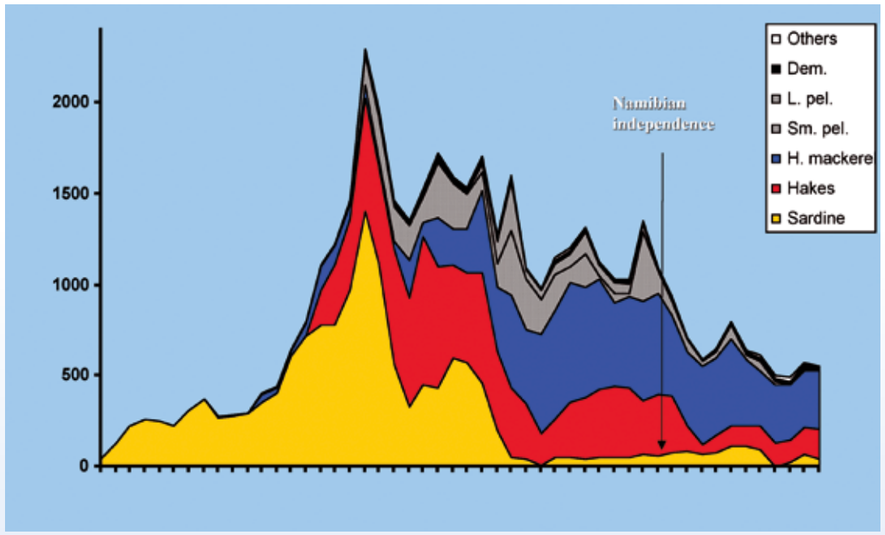
A changing Benguela




Trends in Namibian fish catches 1950–1999

The graph shows trends in Namibian fish catches, including demersal fish, large pelagic and small pelagic fish, horse mackerel, hakes and sardine.

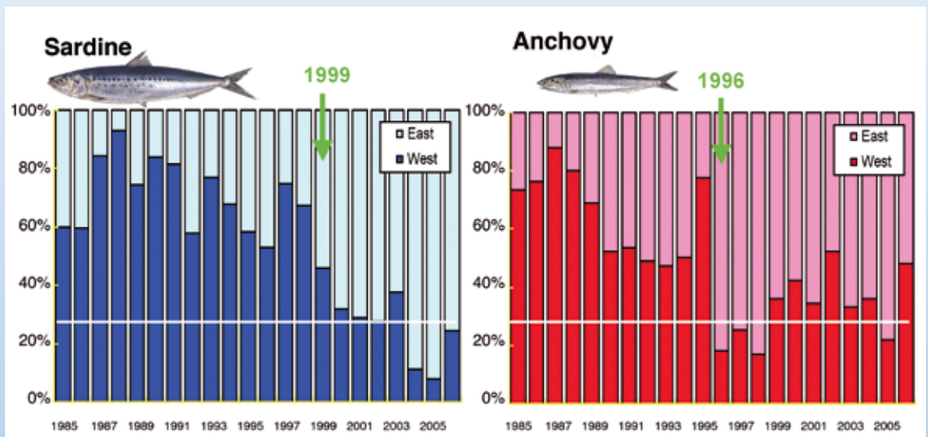
Graph courtesy of Jean Paul Roux, Ministry of Fisheries and Marine Resources, Namibia.



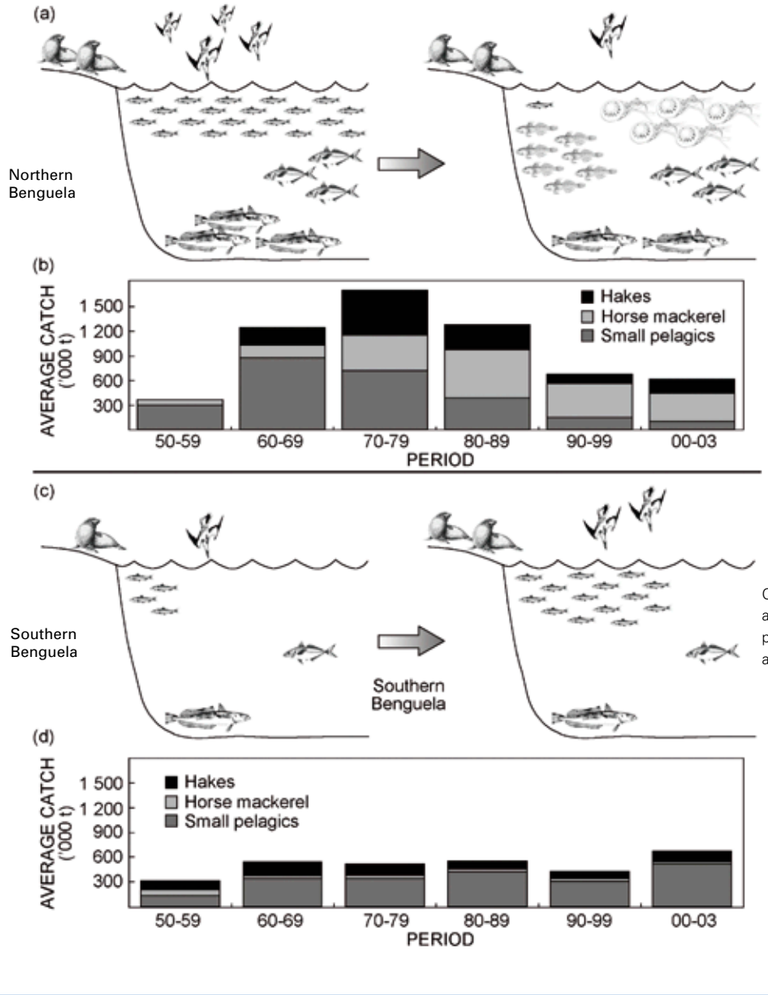
Variability in distribution of spawning sardine and anchovy

The graphs illustrate decadal-scale changes in the relative distribution of sardine and anchovy, with both species showing an eastward shift in spawner distribution. Sardine showed a steady change in distribution after 1999, while anchovy showed an abrupt shift in distribution in 1996.

Image courtesy of Carl van der Lingen, Marine and Coastal Management, South Africa.



Ecosystem-level change has been documented in the BCLME



Change from anchovy-sardines to goby-jelly dominance; much reduced seabirds and reduced fishery catches

Change to abundant small pelagics, seals and seabirds

Changes in ecosystem structure and relative abundance of dominant living marine resources are shown for the northern (upper figure) and southern Benguela (lower figure). Small pelagic fish, horse mackerel, hakes, goby, jellyfish, Cape gannets and Cape fur seals are shown. The number of individuals approximately reflects relative abundance. The two ecosystem states approximate periods around 1970 (left hand side) and the current situation (right hand side).

Image courtesy of Carl van der Lingen, Marine and Coastal Management, South Africa. First published in Shannon *et al.* (2006) Benguela: Predicting a Large Marine Ecosystem.

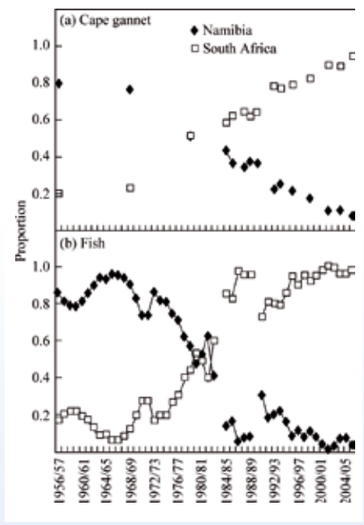
A changing Benguela



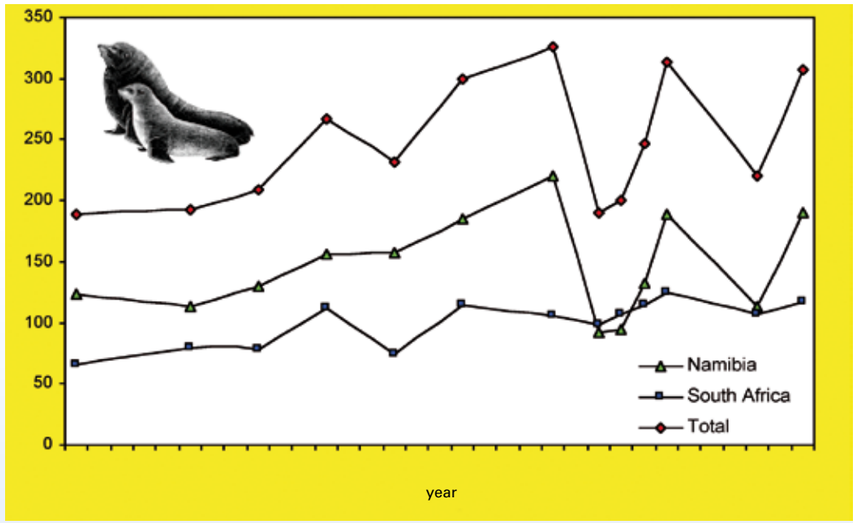

Trends in Cape gannet breeding populations

The proportions of Cape gannets *Morus capensis* breeding in Namibia and South Africa have shown marked similarity to the proportional contribution of these two countries to the overall biomass of sardine and anchovy in the southern African region.

From Crawford *et al.* Trends in numbers of Cape gannets (*Morus capensis*), 1956/1957 – 2005/2006, with a consideration of the influence of food and other factors. ICES Journal of Marine Science Vol 64 (1) pp.169-174. Figure reprinted with the kind permission of Oxford University Press, publishers of the ICES Journal of Marine Science.



Trends in seal pup numbers in the BCLME region



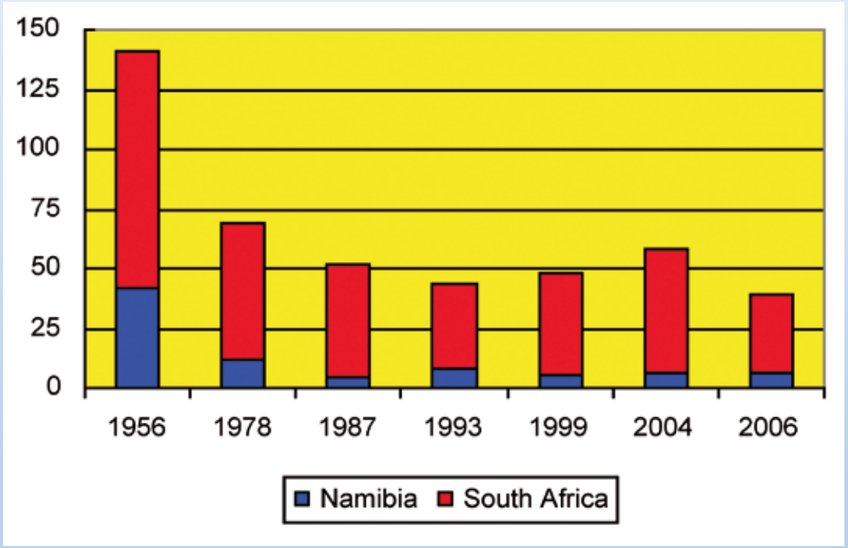
Graph showing how the overall production of Cape fur seal pups in the Benguela ecosystem increased in the 1970s but then showed considerable fluctuation on account of periodic, wide-scale prey shortages that reduced birth rates, especially off Namibia.

From Kirkman *et al.* (2007) African Journal of Marine Science 29: 161-176.

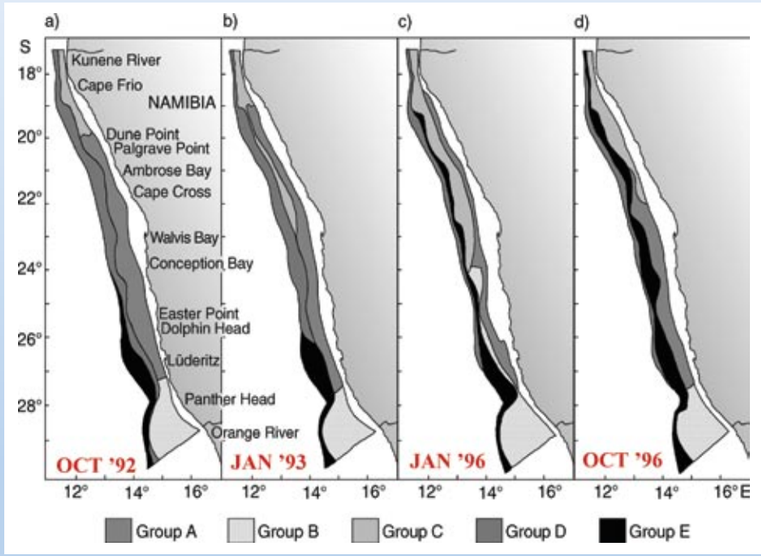
The breeding African Penguin population

The breeding population of African Penguins decreased by about 100 000 pairs in the 50 year period 1956 to 2006. There were large decreases in both Namibia and South Africa.

From Crawford (in press) Journal of Ornithology.



Distribution of deep-water hake

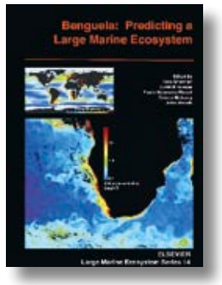


The changing distribution of deep-water hake (*Merluccius paradoxus*) over the Namibian shelf from October 1992 to October 1995. There is an apparent northward movement of hake into Namibian waters from South Africa (dark shading).

Graph courtesy of cruise reports of the RV *Dr Fridtjof Nansen*, compiled by IMR, Norway and MFMR, Namibia.

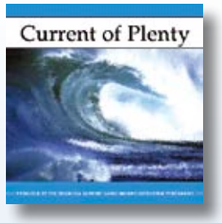
Products of BENEFIT and the BCLME Programme

Together, BENEFIT and the BCLME Programme have funded and supported a wide range of activities, including workshops, research projects, exhibitions and even the production of a documentary film. Listed below are selected products of BENEFIT and the BCLME Programme.



Books

Shannon V, Hempel G, Malanotte-Rizoli P, Moloney C, Woods J (eds) (2006) Benguela: Predicting a Large Marine Ecosystem. Elsevier Large Marine Ecosystem Series 14. Oxford, UK.



Compact discs

Attwood CS (compiler) (2005) Highlights Symposium 9-10 May 2005. A compilation of PowerPoint presentations

Staegemann L (compiler) (2007) Climate Change Workshop 15-18 May 2007. A compilation of PowerPoint presentations

Velasquez Rojas C (filmmaker) (2004) Current of Plenty. A documentary on the Benguela Current (also produced in Portuguese as *Corrente de Abundância*)

Whittle, C (compiler) (2004) Benguela: Predicting a Large Marine Ecosystem, CD supplement

Newsletters

Attwood CS (ed) Benguela Current News. The newsletter of the Benguela Current Large Marine Ecosystem Programme, issue 1, October 2003

Attwood CS (ed) Benguela Current News. The newsletter of the Benguela Current Large Marine Ecosystem Programme, issue 2, July 2004

Attwood CS (ed) Benguela Current News. The newsletter of the Benguela Current Large Marine Ecosystem Programme, issue 3, June 2005

Attwood CS (ed) Benguela Current News. The newsletter of the Benguela Current Large Marine Ecosystem Programme, issue 4, July 2006

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Booklets and brochures

Anon (2002) The Benguela Current Large Marine Ecosystem – A Transboundary Diagnostic Analysis. A 51 page booklet on the results of a Transboundary Diagnostic Analysis (TDA) workshop held in November 1999

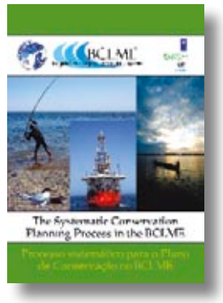
Anon (2002) The Benguela Current Large Marine Ecosystem – A Strategic Action Programme. A 23 page booklet outlining the Strategic Action Programme (SAP) adopted by seven ministers from Angola, Namibia and South Africa (also produced in Portuguese as *Programa Estratégico de Açcão*)

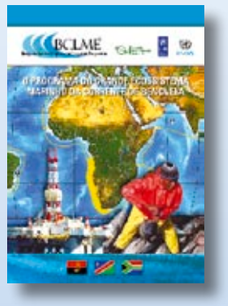
Attwood CS, O'Toole M (compilers) (2005) An African Partnership in Marine and Coastal Management. Six page fold out brochure on the BCLME Programme (also produced in Portuguese as *Uma Parceria Africanan na Gestão Marinha e Costeira*)

Attwood CS, O'Toole M (compilers) (2006) The Benguela Current Large Marine Ecosystem Programme. 12 page profile on the BCLME Programme (also produced in Portuguese as *Programa do Grande Ecossistema Marinho da Corrente de Benguela*)

Matthews S (compiler) (2002) The Benguela Current Large Marine Ecosystem. Eight panel fold-out brochure on the BCLME Programme (also produced in Portuguese as *Programa do Grande Ecossistema Marinho da Corrente de Benguela*)

Sweijd, N (compiler) (2006) The systematic conservation planning process in the BCLME. A six-page fold-out brochure in English and Portuguese.





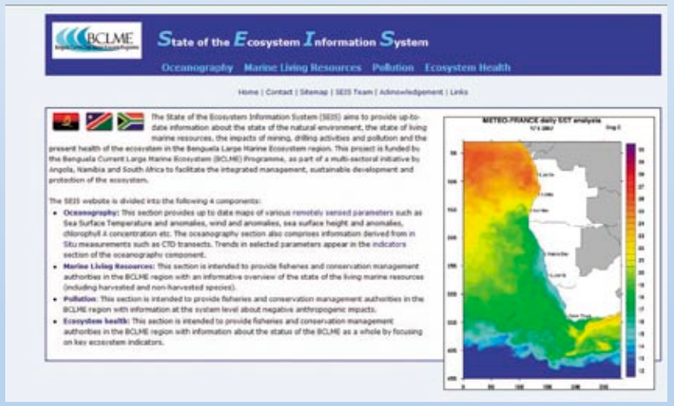
Websites

Atkinson L, Clark B, Currie H, Kerwath S, Kleinschmidt H, Moolla S, Rouault M, Sangolay B, Sweijd N, Willemse N (2006) http://seis.bclme.org: State of the Ecosystem Information System (SEIS)

Sweijd N (2002–2007) www.benefit.org.na: Official website of the BENEFIT Programme

Attwood CS, Cocks M, Collins J, Maneveldt G (2003–2007) www.bclme.org: official website of the BCLME Programme

Taljaard S, Buys S (2004) www.wamsys.co.za/bclme: web-based information system for the assessment and managment of land-based marine pollution in the BCLME.



Selected reports




Together, the BENEFIT and BCLME programmes have produced a substantial body of scientific and technical reports. The reports were compiled by a wide variety of collaborators and stakeholders, including government institutes, universities and private consultancies. The following is a selected list of reports, which are considered to have contributed to our knowledge and understanding of the Benguela Current Large Marine Ecosystem.

Agostinho D, Fielding P, Sowman M, Bergh M (2005) Overview and analysis of social, economic and fisheries information to promote artisanal fisheries management in the BCLME countries: Angola. Review of Institutional Arrangements and Provision of Baseline Information in Respect of Artisanal Fisheries, Including Socio-Economic Surveys of Coastal Communities. BCLME Project Report **LMR/AFSE/03/01/B** (Contracted to Environmental Evaluation Unit, University of Cape Town, South Africa)

Anderson P, Currie B, Louw DC, Anderson DM, Fernández-Tejedor M, McMahon T, Rangel I, Ellitson P, Torres O (2004) Feasibility study for cost-effective monitoring for shellfish in Namibia and Angola with an analysis of the various options for implementation of shellfish safety programmes. Development of an Operational Capacity for Monitoring of Harmful Algal Blooms (HABs) in Countries Bordering the Northern part of the BCLME. BCLME Project Report **EV/HAB/02/02a** (Contracted to NatMIRC, Swakopmund, Namibia)

Attwood, CS and O'Toole MJ (2006) A Cold Water Lifeline. Africa Geographic, August 2006, p.47-55

Bartholomae CH and van der Plas AK (2007) Towards the development of environmental indices for the Namibian shelf with particular reference to fisheries management. African Journal of Marine Science Vol 29, issue 1. pp. 25-36

Bartholomae CH and Hagen E (2007) Short-term variability in alongshore winds and temperature off Swakopmund, Namibia, during a non-upwelling event 1998-1999. African Journal of Marine Science Vol 29, issue 1. pp.141-146

Barlow R, Louw D, Balarin M, Alheit J (2006) Pigment signatures of phytoplankton in the northern Benguela ecosystem during spring. African Journal of Marine Science Vol 28, issue 3&4. pp. 479 -492

Batty M, Tjipute M, Shapi M (2005) Overview and analysis of social, economic and fisheries information to promote artisanal fisheries management in the BCLME region – Namibia. Review of Institutional Arrangements and Provision of Baseline Information in Respect of Artisanal Fisheries, Including Socio-Economic Surveys of Coastal Communities. BCLME Project Report **LMR/AFSE/03/01/B** (Contracted to Environmental Evaluation Unit, University of Cape Town, South Arica)

Britz PJ, Delgado F, Klingelhoeffer E (2006) A review of aquaculture policy and institutional capacity in the BCLME region, with recommended regional policy options. Development of a Responsible Aquaculture Policy for the BCLME. BCLME Project Report **LMR/MC/03/01** (Contracted to Enviro-Fish Africa, Grahamstown, South Africa)

Clark BM, Duffel-Canham (2006) Training and capacity needs assessment for the BCLME. Integration and review of training and capacity building in the BCLME Programme. BCLME Project Report **PCU/TCB/06/01** (Contracted to Anchor Environmental Consultants and Sustainability Matters, Cape Town, South Africa)

Cochrane KL, Augustyn CJ, Bianchi G, de Barros P, Fairweather T, Iitembu J, Japp D, Kanandjembo A, Kilongo K, Moroff N, Nel D, Roux JP, Shannon LJ, van Zyl B, Vaz Vehlo F. (2007) Results and conclusions of the project "Ecosystem approaches for fisheries management in the Benguela Current Large Marine Ecosystem" FAO Fisheries Circular, No. 1026, 167p. Rome, Italy.

Cochrane K, Augustyn J and O'Toole M (2006) The Implementation of the Ecosystem Approach to Fisheries Management in the Benguela Region – Experiences, Advances and Problems. 7th Meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, New York, 12-16 June, 2006.

Cullinan C, Munkejord S, Curry H (2005) Institutional study regarding the establishment of a regional organisation to promote integrated management and sustainable use of the BCLME. Institutional Review and Analysis for Benguela Current Commission (BCC). BCLME Project Report PCU/BCC/04/01 (Contracted to EnAct International, Cape Town, South Africa)

Fidel Q (2004) Report on the benthic workshops held in Angola and Namibia – November 2005: *Alexander von Humboldt* post-cruise analysis and training. Ichthyoplankton Distribution, Monitoring and Training, Northern Namibia/Southern Angola; Oceanographic, Hydrological and Benthos Monitoring in Angolan Waters. BCLME Project Report **EV/HUMBOLDT/04/01** (Contracted to National Institute of Fisheries Research, Luanda, Angola)

Flynn BA and Gibbons MJ (2007) A note on the diet and feeding of *Chrysaora hydroscella* in Walvis Bay lagoon, Namibia, during September 2003. African Journal of Marine Science Vol 29, issue 2. p. 303

Hutchings L (2004) The synthesis of the scientific input into the Lüderitz Upwelling cell. Orange River Cone workshop – April 2004. The Lüderitz Upwelling Cell/Orange River Cone (LUCORC) Workshop. BCLME Project Report **EV/PROVARE/02/02/A** (Contracted to BENEFIT, Swakopmund, Namibia)

Jørgensen T, Engås A, Johnsen E, Iilende T, Kainge P and Schneider P (2007) Escapement of Cape hakes under the fishing line of the Namibian demersal sampling trawl. African Journal of Marine Science Vol 29, issue 2. pp. 209-222

Kilongo K, Barros P and Diehdiou M (2007) Diet of large-eye sentex Dentex macrophthalmmus (Pisces: Sparidae) off Angola and Namibia. African Journal of Marine Science Vol 29, issue 1. pp.49-54

Leiman A, Hasson R (2006) Recommendations on beneficiation and commercialization of fishing activities in the BCLME countries. An Economic and Legal Study to Assess the Policy Prospects for Formulating a Balanced Development of Trade in Fish and Fish Products from the BCLME. BCLME Project Report **LMR/SE/03/02** (Contracted to Enviro-Fish Africa, Rhodes University, Grahamstown, South Africa)

Monteiro PMS, van der Plas AK, Bailey GW, Fidel Q (compilers) (2004) Low oxygen variability in the Benguela ecosystem: a review and new understanding. Critical Review of the Biophysical Processes and Variability that Characterise the Low Oxygen Water (LOW) Variability and an Improved Monthly State of the Environment (SOE) Reporting on Low Oxygen Water in the BCLME. BCLME Project Report **EV/LOW/02/01** (Contracted to CSIR, Stellenbosch, South Africa)

Moolla S, Currie H, Kleinschmidt H (2006) Report on the biological, social and economic impact of rights allocations in the BCLME region. An Analysis of Right-Based Micro-Economic Systems and Governance of the Important Commercial Fisheries in the BCLME Countries. BCLME Project Report **LMR/SE/03/03** (Contracted to Enviro-Fish Africa, Grahamstown, South Africa)

Nel D, Cochrane, K, Petersen L, Shannon L, van Zyl B, and Honig M (2007) Ecological Risk Assessment: A tool for implementing an ecosystem approach for southern African fisheries. WWF South Africa Report Series – 2007/Marine/002.

Odendaal F, Phillips T, Garcia R (2005) An assessment of how coastal communities can become involved and benefit from the BCLME programme. An Assessment of Means of Involving Coastal Communities in the BCLME Programme. BCLME Project Report **LMR/COM/03/01** (Contracted to EcoAfrica Environmental Consultants, Cape Town, South Africa)

Petersen S, Nel D, and Omardien, A (2007) Towards an Ecosystem Approach to Longline Fisheries in the Benguela: An assessment of impacts on seabirds, sea turtles and sharks. BCLME Project Report **BEHP/EEF/03/01/02** (Contracted to WWF SA and BirdLife SA, Stellenbosch, South Africa)

Prochazka K, Davies B, Griffiths C (plus 9 co-authors) (2005) Global International Waters Assessment (GIWA) Sub-region 44: The Benguela Current Final Report (Contracted to United Nations Environment Programme, Nairobi, Kenya)

Pulfrich A (2007) Assessment of Cumulative Impacts of Scouring of Sub-Tidal Areas and Kelp Cutting by Diamond Divers in Near-Shore Areas of the BCLME Region. BCLME Project Report **BEHP/CEA/03/04** (Contracted to PISCES Environmental Services, Tokai, South Africa)

Russo V, Campos L, Tarr P, Kegge G, Winstanley T, Cullinan C (2004) Harmonisation of National Environmental Policies and Legislation for Marine Mining, Dredging and Offshore Petroleum Exploration and Production Activities in the BCLME Region. BCLME Project Report **BEHP/IA/03/03** (Contracted to Southern African Institute for Environmental Assessment, Windhoek, Namibia)

Simmons RE, Sakko A, Paterson J and Nzuzi A (2007) Birds and conservation significance of the Namib Desert's least known coastal wetlands: Baia and Ihla dos Tigres, Angola. African Journal of Marine Science Vol 29, issue 1. pp. 713-718

Stenevik EK, Sundby S, and Cloete R (2007) Diel vertical migration of anchovy *Engraulis encrasicolus* larvae in the northern Benguela. African Journal of Marine Science Vol 29, issue 1. pp.127-136

Sumaila UR, Munro G, Keith H (2004) Benguela Current Commission (BCC) economic study. Economic Study and Cost Benefit Analysis of Cooperative Research and Management of the BCLME. BCLME Project Report **PCU/BCC/04/02** (Contracted to Fisheries Economics Research Unit, University of British Columbia, Vancouver, Canada)

Taljaard S (compiler) (2006) Baseline Assessment of Sources and Management of Land-Based Marine Pollution in the BCLME Region. BCLME Project Report **BEHP/LBMP/03/01** (Contracted to CSIR, Stellenbosch, South Africa)

Taljaard S (compiler) (2006) The Development of a Common Set of Water and Sediment Quality Guidelines for the Coastal Zone of the BCLME. BCLME Project Report **BEHP/LBMP/03/04** (Contracted to CSIR, Stellenbosch, South Africa)

Van der Plas AK, Monteiro PMS, Pascall A (2007) Cross-shelf biogeochemical characteristics of sediments in the central Benguela and their relationship to overlying water column hypoxia. African Journal of Marine Science Vol 29, issue 1. pp. 28-37

Vaz Velho F, Axelsen BE, Barros P and Bauleth D'Almeida G (2006) Identification of acoustic targets off Angola using General Discriminant Analysis. African Journal of Marine Science Vol 28, issue 3&4. pp. 525-534

Veith J (2007) The changing state of the Benguela Current Large Marine Ecosystem: expert workshop on climate change and variability and impacts thereof in the BCLME region. Kirstenbosch Research Centre, Cape Town, 15–16 May 2007. (Contracted to Oceanography Department, University of Cape Town, South Africa)

Weeks S, Barlow R, Roy C, Shillington FA (2006) Remotely sense variability of temperature and chlorophyll in the southern Benguela: upwelling frequency and phytoplankton response. African Journal of Marine Science Vol 28, issue 3&4. pp. 494-510

Training and capacity building

Between 1998 and 2007, over 50 students from Angola, Namibia and South Africa received financial support from BENEFIT and the BCLME Programme. Details of the two programmes' academic sponsorships are listed here.




STUDENTS FUNDED THROUGH BENEFIT AND THE BCLME PROGRAMMES (1998-2007)

Name	Year	Bursary	Nationality	University	Affiliation	Sponsor
Justice Matshili	1998	MSc	RSA	University of Cape Town	MCM	BENEFIT
Deon Durholtz	1998	MSc	RSA	University of Cape Town	MCM	BENEFIT
Feroza Albertus	2000	MSc	RSA	University of Cape Town	MCM	BENEFIT
Quilanda Fidel	2000	MSc	ANG	University of Cape Town	INIP	BENEFIT
Nkosi Luyeye	2000	MSc	ANG	University of Cape Town	INIP	BENEFIT
Agostino Duarte	2000	MSc	ANG	University of Cape Town	INIP	BENEFIT
Antonio da Silva	2000	Ph.d	ANG	Rostock University	INIP	BENEFIT
Margit Wilhelm	2000	MSc	NAM	University of Cape Town	NATMIRC	BENEFIT
Johnnes Kathena	2000	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BENEFIT
Erich Koch	2002	Btech	RSA	Cape Peninsula University of Technology	MCM	BENEFIT
Pedro Tchipalanga	2002	MSC	ANG	University of Cape Town	INIP	BENEFIT
Vianda Filipe	2002	MSC	ANG	University of Cape Town	INIP	BENEFIT
Jeremia Titus	2003	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BENEFIT
Ferdie Hamukuaya	2003	Btech	NAM	Polytechnic of Namibia	NATMIRC	BENEFIT
David Iiyambo	2003	Hons	NAM	University of Cape Town	NATMIRC	BENEFIT
Kathy Peard	2003	M.Sc	NAM	University of Cape Town	NATMIRC	BENEFIT
Tania Mandinga	2003	Honours	ANG	Stellenbosch University	INIP	BENEFIT
Tabello Mainoane	2003	MS	RSA	University of Cape Town	MCM	BENEFIT
Ali Gumbo	2004	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BENEFIT
Asser Katunahange	2004	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BCLME
Ignatius Kauvee	2004	BSC	NAM	University of the Western Cape	NATMIRC	BCLME
Helvi Mupupa	2004	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BCLME
Phillip de Vos	2004	MSc	RSA	University of Cape Town	MCM	BCLME
Ferdinand Kotze	2004	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BCLME
Fancisco De Almeida	2005	Btech	ANG	Cape Peninsula University of Technology	INIP	BENEFIT
Mekondjo Shantengange	2005	Honours	NAM	Rhodes University	NATMIRC	BENEFIT
Fabienne Cazassuz	2005	PHd	RSA	University of Cape Town	MCM	BCLME
Suama Kashava	2006	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BENEFIT
Ismail Imtiyaz	2006	Honours	RSA	Rhodes University		BENEFIT
Shishani Nakanwe	2006	Honours	NAM	University of Cape Town		BENEFIT
Xolela Wellem	2006	Honours	RSA	Fort Hare		BENEFIT
David Less	2006	Btech	RSA	Cape Peninsula University of Technology		BENEFIT
Selma Nuuyoma	2006	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BCLME
David Kaanandunge	2006	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BCLME
Jackson Karupa	2006	BSC	NAM	University of Zululand	NATMIRC	BCLME
Domingas RDSM Paim	2006	MSc	ANG	University Agostino Neto	INIP	BCLME
Maria DFDRD Sebastiao	2006	MSc	ANG	University Agostino Neto	INIP	BCLME
Maria Pedro Nicolau	2006	MSc	ANG	University Agostino Neto	INIP	BCLME
Tania CDAMDS Ramos	2006	MSc	ANG	University Agostino Neto	INIP	BCLME
Hoffman Vera	2007	Honours	RSA	University of Cape Town		BENEFIT
Osterle Steffen	2007	Btech	NAM	Cape Peninsula University of Technology	NATMIRC	BENEFIT
Roux Maryanne	2007	Honours	RSA	Nelson Mandela Metropolitan University		BENEFIT
Botha Marie	2007	Honours	RSA	Nelson Mandela Metropolitan University		BENEFIT
Filmalter John	2007	Honours	RSA	Rhodes University		BENEFIT
Richardson Timothy	2007	Honours	RSA	Rhodes University		BENEFIT
Sutherland Kate	2007	Honours	RSA	Nelson Mandela Metropolitan University		BENEFIT
Barbara Patterson	2007	Postdoc	NAM	University of Cape Town		BLCME
Ferdinand Mwapopi	2007	Honours	NAM	University of the Western Cape		BCLME
Inekela Iiyambo	2007	Honours	NAM	Rhodes University		BCLME
Selma Nasheya	2007	Honours	NAM	University of Cape Town		BCLME
Hanna Neshuku	2007	Honours	NAM	University of Pretoria		BCLME
Enoque Canganjo Vasco	2007	MSc	ANG	University Agostino Neto		BCLME

Scientific cruises

Between 1997 and 2007, BENEFIT and the BCLME Programme sponsored several scientific cruises on a number of research vessels. Some of the key transboundary fisheries, oceanographic, environmental research and monitoring cruises are listed here.

Vessel	Dates	Cruise Type	Region	Institutions
R.V. Kottsov BENEFIT	20/4/97 – 30/5/97	Oceanography & plankton	Central Namibian shelf	IOW (Germany) NatMIRC (Namibia) INIP (Angola)
R.V. Africana BENEFIT	1/7/99 – 14/7/99	Oceanography & plankton	Namibian and Angolan shelf	MCM (South Africa) NatMIRC (Namibia) INIP (Angola)
R.V. Meteor Leg M48/3 GERMANY	26/8/00 – 16/9/00	Oceanography, plankton and microbiology	Namibian shelf	Max-Planck Institute IOW (Germany) and ZMT (Germany)
R.V. Dr Fridtjof Nansen	4/2/04 – 10/3/04	Surveys of hake stocks	Namibia and South African shelf	NatMIRC (Namibia) IMR (Norway) MCM (South Africa)
R.V. Dr Fridtjof Nansen BCLME LMR/Nansen/04/01	19/4/04 – 2/5/04	Trawl survey – mainly deep water hake / oceanography	Lüderitz to Oranjemund	IMR (Norway) MCM (South Africa) NatMIRC (Namibia)
R.V. Dr Fridtjof Nansen BCLME LMR/Nansen/04/02	15/7/04 – 28/7/04	Trawl survey of pelagic fish (horse mackerel and sardinella)	Cabinda-Congo-Gabon	IMR (Norway) INIP (Angola) NIOMR (Nigeria)
R.V. Dr Fritdjof Nansen BCLME LMR/Nansen/04/04	26/8/04 – 9/9/04	Trawl survey – mainly deep water hake / oceanography	Lüderitz to Oranjemund	IMR (Norway) MCM (South Africa) NatMIRC (Namibia)
R.V. Alexander von Humboldt BCLME EV/Humboldt/04/01 Leg Ahab 8&9	1/10/04-30/10-04	Plankton benthic surveys Phys-Chem Oceanography	Namibia – Angola	IOW (Germany) NatMIRC (Namibia) INIP (Angola)
R.V. Dr Fritdjof Nansen BENEFIT	26/1/05 – 26/2/05	Survey of shared stocks of hake including inter- calibration studies	Namibia and South African shelf	NatMIRC (Namibia) MCM (South Africa) IMR (Norway)
R.V. Dr Fritdjof Nansen BENEFIT	28/2/05 – 31/3/07	Survey of demersal resources off Angola	Angolan shelf	INIP (Angola) IMR (Norway)
R.V. Dr Fridtjof Nansen BCLME LMR/Nansen/02/05	13/8/05 – 23/8/05	Trawl survey of pelagic fish stocks (horse mackerel and pilchard) / oceanography	Namibe to Mowe Bay	IMR (Norway) INIP (Angola) NatMIRC (Namibia)
R.V. Dr Fridtjof Nansen BCLME LMR/Nansen/05/03	26/9/05 – 17/10/05	Spawning and early life history of hakes	Oranjemund to Cape Aghulas	IMR (Norway) MCM (South Africa) NatMIRC (Namibia)
R.V. Dr Fridtjof Nansen BCLME BEHP/Nansen/06/01	14/1/07 - 30/1/07	Pollution survey (benthos, grabs, mapping, acoustics and hydrography	Northern Angola – Congo	IMR (Norway) INIP (Angola)

IOW = Institute for Baltic Sea Research Warnemünde
ZMT = Centre for Marine Tropical Ecology
MCM = Marine and Coastal Management
NatMIRC = National Marine Information and Research Centre
INIP= Instituto Nacional de Investigação Pessqueira
IMR = Institute of Marine Research (Norway)

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