Benguela current news

THE NEWSLETTER OF THE BENGUELA CURRENT LARGE MARINE ECOSYSTEM PROGRAMME

BCLME Programme looks ahead to a second phase

by Dr Mick O'Toole

The Benguela Current Large Marine Ecosystem (BCLME) Programme is now entering its final phase, with a little over a year left before completion.

Over the past four years, we have invested over US$10 million (about R65 million) in support of 75 projects. The projects are paving the way for the three countries of the Benguela to manage the region's valuable marine and coastal resources at the ecosystem level, and to better balance human needs with conservation issues.

The centre pages of this newsletter detail the projects that have received support from the BCLME Programme over the past four years. The majority of these projects are now complete, or are nearing completion, signifying that the BCLME Programme is in the process of winding down.

With less time being dedicated to the management of projects, one of the Programme's major thrusts over the past six months has been to draft an agreement between the three countries that will lead to the establishment of a Benguela Current Commission (BCC). Thanks to the cooperation and goodwill of a number of senior officials in the three countries, this process has proceeded very smoothly and we are now at the point where we are anticipating that an Interim Agreement will be signed by Angola, Namibia and South Africa by year-end.

The Interim Agreement will open the way for a new framework for regional cooperation in marine science and policy in which BENEFIT will be transformed into the scientific arm of the Commission. In time, the implementation of the ecosystem approach will involve new and adaptive management systems, joint monitoring of shared fish stocks, use of early warning systems in response to environmental variability and climate change, use of "State of the Ecosystem" information systems and contingencies, and the monitoring of transboundary pollution.

The fact that the Global Environment Facility is considering funding a second phase of the BCLME Programme, from 2008 to 2012, bodes well for the future success of the BCC. The planned second phase will focus on two components: the development of institutional capacity and the strengthening of the BCC, and the adaptation of the BCLME to climate change, particularly in relation to fisheries.

This is an exciting and challenging time for the BCLME Programme and nowhere is this more evident than in the pages of this newsletter which is packed with information about the BCLME Programme's activities over the past year. We trust it makes for a good read.

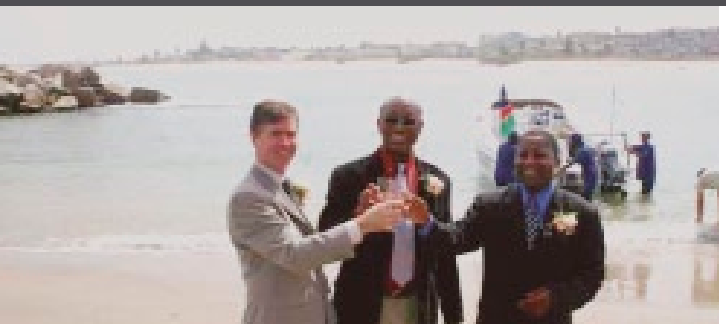
BCLME Chief Technical Advisor (Programme Coordinator)

Inside News

July 2006 Issue 4

A west coast rock lobster, **Jasus lalandi**, *takes shelter among pink anemones. This photograph, by well known underwater photographer, Geoff Spiby, is included in a new, 20 panel display on the BCLME Programme that is to be launched in Cape Town in August.* *Turn to p.33 for the full story.*

O Programa BCLME olha em frente para uma segunda fase



Dr Mick O'Toole, chief technical advisor to the BCLME Programme, toasts the launch of the ski-boat **Noctiluca** *with Simon Nhongo, UNDP Resident Representative in Namibia and Dr Abraham Iyambo, Minister of Fisheries and Marine Resources in Namibia.* *Turn to p.11 for the full story.*

por Dr. Mick O'Toole

O Programa do Grande Ecossistema Marinho da Corrente de Benguela (BCLME) está agora a entrar na sua fase final, tendo pouco mais de um ano até terminar.

Ao longo dos últimos quatro anos, investimos cerca de US$10 milhões (cerca de R65 milhões) no apoio a 75 projectos. Os projectos foram concebidos para desenvolver a informação científica e económica de base sobre o que se sabe acerca do BCLME, como está a mudar ao longo do tempo e qual o melhor modo de lidar em toda a região com os problemas de gestão transfronteiriça relacionados com a pesca, exploração mineira, exploração petrolífera, desenvolvimento costeiro, biodiversidade e poluição. Em resumo, os projectos estão a abrir caminho para os três países do BCLME gerirem os ricos recursos marinhos e costeiros ao nível do ecossistema e para melhor equilibrarem as necessidades humanas com aspectos de conservação.

As páginas centrais deste boletim descrevem os projectos que receberam apoio do Programa BCLME ao longo dos últimos quatro anos. A maioria destes projectos estão agora finalizados, ou quase a serem finalizados, o que significa que o Programa BCLME entrou num processo de desaceleração.

Com menos tempo dedicado à gestão de projectos, um dos objectivos principais do Programa ao longo dos últimos seis meses tem sido a elaboração de um acordo entre os três países que conduzirá ao estabelecimento de uma Comissão da Corrente de Benguela (BCC). Graças à cooperação e boa vontade de uma série de oficiais seniores nos três países, este processo tem corrido bem, estando agora no ponto em que se aguarda a assinatura de um Acordo Interino por Angola, Namíbia e África do Sul até ao final do ano.

O Acordo Interino abrirá caminho para um novo quadro de cooperação regional na ciência e política marinha, no qual o BENEFIT será transformado no braço científico da Comissão. Ao longo do tempo, a implementação da abordagem de ecossistema irá envolver sistemas de gestão novos e adaptáveis, a monitorização conjunta de stocks pesqueiros, o uso de sistemas de alerta antecipado para responder à variabilidade ambiental e alterações climáticas, o uso de sistemas de informação e contingência sobre o "Estado do Ecossistema" e a monitorização da poluição transfronteiriça.

O facto de que o Fundo de Ambiente Global (GEF) está a considerar financiar uma segunda fase do Programa BCLME, de 2008 a 2010, é um bom sinal para o futuro sucesso da BCC. A segunda fase que está planeada concentrar-se-á em dois componentes: o desenvolvimento de capacidade institucional e fortalecimento da BCC, por um lado, e a adaptação do BCLME às alterações climáticas, particularmente no que diz respeito às pescas, por outro.

Esta é uma altura excitante e desafiante para o Programa BCLME, o que é evidente nas páginas deste boletim que está carregado de informação acerca das actividades do Programa BCLME ao longo do último ano. Acreditamos que é uma boa leitura.

BCLME experience will help Namibia

The lessons learnt from the implementation of the BCLME Programme will help Namibia to participate meaningfully in other transboundary environment projects, such as the Orange River Basin Programme.

Simon **Nhongo**

This is the opinion of Simon Nhongo, UNDP Resident Representative in Namibia, who has taken a strong interest in the implementation of the BCLME Programme since his appointment in January 2005.

"The BCLME Programme uses a regionally integrated ecosystem approach," notes Mr Nhongo. "Using the same approach, Namibia stands to benefit immensely from participating in other transboundary projects like the Orange River Basin Programme."

Currently in the early stages of implementation, the Orange River Basin programme is working towards the development of an integrated water resources management plan for the Orange River. Namibia, South Africa, Lesotho and Botswana all depend on the Orange River for their hydro-power generation, industrial production, agriculture and economic growth. Yet, declining average rainfall, pollution and land degradation all pose a threat to the quality of life in the Orange River Basin.

"I see a lot of potential for the Benguela Current Commission and, further down the line, a similar 'Orange River Commission', especially in the context of SADC," says Mr Nhongo.

"The establishment of an inter-country commission would culminate in more comprehensive agreements and conventions, supported by sustainable funding mechanisms and underpinned by contributions from the countries themselves."

Although the BCLME Programme is a multinational initiative, the location of the Programme Co-ordination Unit (PCU) in Windhoek has led to a close working relationship between the PCU and the Environment Unit of UNDP Namibia.

UNDP Namibia focuses intensely on eradicating poverty and

Mr Nhongo is satisfied that the BCLME Programme is directly addressing key targets of the World Summit on Sustainable Development and the Millenium Development Goals, especially the goals of eradicating poverty, ensuring environmental sustainability and developing a global partnership for development.

Mr Nhongo is confident that Angola, Namibia and South Africa will negotiate a fully-fledged Benguela Current Commission that will help the three countries to engage at a political level on the management of transboundary marine resources.

"Given the significance of the economic benefits to the respective countries' economies, the political commitment of the member countries is almost assured," he concludes.

High level GEF meeting for Cape Town

Ministers and high-level government delegations from 176 nations will attend the Assembly of the Global Environment Facility (GEF) which is scheduled to take place at the Cape Town International Convention Centre from 29 to 30 August.

The GEF, one of the key sponsors of the BCLME Programme, was established in 1991 with the goal of assisting developing countries to fund projects that protect the global environment. It holds an Assembly once every three to four years.

At the Assembly meeting, member countries come together to review and evaluate the GEF's general policies, operations and membership. The Assembly also provides an opportunity for prominent environmentalists, parliamentarians, business leaders, scientists, and NGO leaders to discuss global environmental challenges within the context of sustainable development and other international development goals.

The hosting of the Assembly in Cape Town, presents the BCLME Programme with a unique opportunity to showcase its work to the GEF's member countries and key figures in the environmental sphere.

As a result, the BCLME Programme will host one of the key side events of the GEF Assembly: a ministerial event during which the countries will signal their committment to the establishment of the Benguela Current Commission.

Since 1991 the GEF has provided $4.5 billion (R27 billion) in grants and generated $14.5 billion (R87 billion) in co-financing from other partners for projects in developing countries and countries with economies in transition. In 2002, 32 donor countries pledged $3 billion (R18 billion) to fund operations between 2002 and 2006.

Benguela Current Commission: Ministers prepare to sign Interim Agreement

The Benguela Current Commission (BCC) - a formal institutional structure that will facilitate the understanding, protection, conservation and sustainable use of the Benguela Current Large Marine Ecosystem - will be established by Angola, Namibia and South Africa by year-end.

An Interim Agreement is to be signed by Angola's Minister of Fisheries, Salomão José Luheto Xirimbimbi, Namibia's Minister of Fisheries and Marine Living Resources, Dr Abraham Iyambo, and South Africa's Minister of Environmental Affairs and Tourism, Marthinus van Schalkwyk.

"The signing of the Interim Agreement by the three Ministers will set in motion one of the world's first commissions based on the LME approach to ocean governance," says Dr Mick O'Toole, Chief Technical Advisor to the BCLME Programme. "It will also lead to the establishment of the various committees that make up the Benguela Current Commission."

The committees include:

- a Ministerial Conference, made up of a Minister from each of the three countries;
- a Management Board, comprising a delegation from each country;
- a Secretariat, comprising an Executive Secretary and a co-ordinator; and
- an Ecosystem Advisory Committee consisting of experts nominated by each of the three countries.

The Ministerial Conference is the ultimate decision-making body of the BCC. The role of the Management Board is to promote a regional approach to the management of the BCLME and the task of the Ecosystem Advisory Committee is to support decision making by providing the Management Board, the Ministerial Conference and each of the three countries with the best available scientific, management, legal and other information, as well as expert advice concerning the conservation and sustainable use and development of the BCLME. The Secretariat plays an administrative role.

The Interim Agreement will take effect once it has been signed by the Angolan ministers of Fisheries, Urbanisation and Environment and Petroleum; the Namibian ministers of Fisheries and Marine Resources, Environment and Tourism and Mines and Energy; and the South African ministers of Environmental Affairs and Tourism.

The first meeting of the management Board will be held within three months of the Interim Agreement entering into force. At that meeting, the Management Board will adopt rules and procedures for itself and determine the initial composition of the Ecosystem Advisory Committee.

Comissão da Corrente de Benguela: Ministros preparam-se para assinar o Acordo Interino

A Comissão da Corrente de Benguela (BCC) – uma estrutura institucional formal que facilitará o conhecimento, protecção, conservação e uso sustentável do Grande Ecossistema Marinho da Corrente de Benguela – será estabelecida por Angola, Namíbia e África do Sul até ao final do ano.

Em Agosto será assinado um Acordo Interino pelo Ministro das Pescas de Angola, Salomão José Luheto Xirimbimbi, o Ministro das Pescas e Recursos Marinhos Vivos da Namíbia, Dr Abraham Iyambo, e o Ministro do Ambiente e Turismo da África do Sul, Marthinus van Schalkwyk.

"A assinatura do Acordo Interino pelos três Ministros permitirá arrancar com uma das primeiras comissões no mundo baseada na abordagem de LME para a governação dos oceanos", diz o Dr Mick O'Toole, Assessor Técnico Principal do Programa BCLME. "Conduzirá ainda ao estabelecimento dos vários comités que fazem parte da Comissão da Corrente de Benguela."

Os comités incluem:

- *uma Conferência Ministerial, constituída por um Ministro de cada um dos três países;*
- *um Conselho de Gestão, constituído por uma delegação de cada país;*
- *um Secretariado, constituído por um Secretário Executivo e um coordenador; e*
- *um Comité Assessor do Ecossistema formado por peritos nomeados por cada um dos três países.*

A Conferência Ministerial é o orgão fundamental de decisão da BCC. O papel do Conselho de Gestão é promover uma abordagem regional para a gestão do BCLME, equanto a tarefa do Comité Assessor do Ecossistema é apoiar a tomada de decisão ao fornecer ao Conselho de Gestão, à Conferência Ministerial e a cada um dos três países a melhor informação científica, de gestão, legal ou outra disponível, bem como apoio especialista no que diz respeito à conservação e ao uso e desenvolvimento sustentável do BCLME. O Secretariado desempenha um papel administrativo.

O Acordo Interino entrará em vigor assim que for assinado pelos ministros angolanos das Pescas, Urbanismo e Ambiente e Petróleo; os ministros namibianos das Pescas e Recursos Marinhos, Ambiente e Turismo e Minas e Energia; e os ministros sul africanos do Ambiente e Turismo.

A primeira reunião do Conselho de Gestão será realizada durante os

The main thrust of the BCC will be to implement an ecosystem approach to managing the BCLME. For instance, the Commission may consider and make recommendations to the three countries concerning the optimum levels of harvesting in respect of stocks which are known, or suspected, to be shared by two or more of the three countries. Other subjects around which the Commission may provide recommendations are:

- the monitoring, control and surveillance of marine fisheries;
- the conservation of the biological diversity of the BCLME;
- the implementation of integrated coastal management and the ecosystem approach to fisheries management;
- the establishment of a system of marine protected areas;
- the rehabilitation of environmentally degraded areas;
- the coordination of regional efforts to conserve species such as sea birds which are not harvested;
- the prevention of the introduction of harmful and invasive alien species;
- responses to harmful algal blooms;
- environmental impact assessment and other procedures for the planning and approval of new projects and activities which have the potential to impact on the BCLME;
- processes and standards for minimising and remediating the environmental impacts arising from marine prospecting, mining and dredging and from the exploration and development of oil and gas fields, including their associated pipelines;
- contingency plans for dealing with extreme events and threats such as major oil spills;
- the adoption and enforcement of harmonised regulatory frameworks for the discharge of sewage, pollutants, waste and other pollution control measures;
- guidelines on water quality standards;
- maritime safety and related matters with the potential to impact on the BCLME; and
- the responsibilities, procedures and routines for the exchange of information and liaison between the three countries.

Once the Interim Agreement is signed, the countries will work together with the assistance of donor partners to build the capacity of the Management Board, Secretariat and the Ecosystem Advisory Committee. Thereafter they will work towards implementing the Strategic Action Programme and negotiating a binding legal instrument that will establish a permanent and sustainable Benguela Current Commission.

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três meses seguintes à entrada em vigor do Acordo Interino. Nessa reunião, o Conselho de Gestão irá adoptar as suas próprias regras e procedimentos e determinar a composição inicial do Comité Assessor do Ecossistema.

O objectivo principal da BCC será implementar uma abordagem de ecossistema para a gestão do BCLME. A Comissão poderá, por exemplo, analisar e apresentar recomendações aos três países sobre os níveis óptimos de exploração dos stocks que se sabe – ou que se pensa – serem partilhados por dois ou mais dos três países. Outros temas em torno dos quais a Comissão poderá apresentar recomendações são:

- *a monitorização, controlo e vigilância da pesca marinha;*
- *a conservação da diversidade biológica do BCLME;*
- *a implementação da gestão costeira integrada e da abordagem de ecossistema para a gestão da pesca;*
- *o estabelecimento de um sistema de áreas marinhas protegidas;*
- *a reabilitação de áreas ambientalmente degradadas;*
- *a coordenação dos esforços regionais para conservar espécies tais como aves marinhas que não são exploradas;*
- *a prevenção da introdução de espécies prejudiciais e invasoras;*
- *resposta aos florescimentos de algas tóxicas;*
- *avaliação de impactes ambientais e outros procedimentos para o planeamento e aprovação de novos projectos e actividades que são potenciais causadores de impactes no BCLME;*
- *processos e padrões para minimizar e remediar os impactes ambientais resultantes da prospecção, exploração mineira e dragagem marinhas e da exploração e desenvolvimento de campos de petróleo e gás, incluindo os oleodutos e gasodutos associados;*
- *planos de contingência para lidar com ameaças e eventos extremos tais como grandes derrames de petróleo;*
- *a adopção e fiscalização de quadros regulamentares harmonizados para a descarga de esgotos, poluentes, resíduos e outras medidas de controlo de poluição;*

directrizes para os padrões de qualidade de água;

- *segurança marítima e aspectos relacionados com potencial para resultar em impactes no BCLME; e*
- *as responsabilidades, procedimentos e rotinas para a troca de informação e ligação entre os três países.*

Assim que o Acordo Interino seja assinado, os países trabalharão juntos com a assistência de parceiros doadores para capacitar o Conselho de Gestão, o Secretariado e o Comité Assessor do Ecossistema. Subsequentemente trabalharão para a implementaçao do Programa Estratégico de Acção e a negociação de um instrumento legal obrigatório que estabelecerá uma Comissão da Corrente de Benguela permanente e sustentável.

Training and Capacity Building

Asser **Katunahange**

Thinking out of the box

After working at sea for several years, Namibian fisheries inspector, Asser Katunahange is finally doing what he wants to do – encouraging an interest in fish and fishing among the youth of his country.

A peculiar feature of Namibian life is that, regardless of the critical role that fisheries play in the country's economy and the fact that thousands of Namibians find work in the fishing industry, there is very little awareness of the country's marine environment among Namibian youth.

This is an incongruity that Mr Katunahange, a fisheries inspector working for Namibia's Ministry of Fisheries and Marine Resources (MFMR), has set out to change.

Mr Katunahange is soon to complete a three-year diploma in Fisheries Resource Management at the Cape Town University of Technology. At the same time, he is enthusiastically setting up an education programme aimed at encouraging the youth of Namibia to better understand the ocean environment and consider a career in marine science or fisheries management.

Mr Katunahange's university education was made possible by a bursary from the BCLME Programme and he is achieving his goal of becoming a marine and coastal educator with the assistance of his employer, the MFMR.

It has taken time and effort to get this far, says Mr Katunahange, who began his career as a fisheries observer.

"I was a desperate young man searching for a job," he recalls, admitting that he never thought that the sea-going job he reluctantly accepted in 1992 would spark an abiding interest in fish, fishing and the marine environment.

Mr Katunahange spent eight years at sea, recording the catches of commercial trawlers that catch hake, monk and horse mackerel off Namibia. During this period he was selected by the MFMR to undertake a year of special training that improved his fish identification skills and enabled him to take comprehensive biological samples from the catches of the commercial fishing fleet.

After coming ashore in 1999, Mr Katunahange began to develop his ideas for transferring knowledge about the marine environment to learners at Namibian secondary schools. Eventually he put his ideas down on paper and sent them off to the Minister of Fisheries and Marine Resources, Dr Abraham Iyambo.

Within three days he was sitting in the Minister's office and explaining the concept to Dr Iyambo and the Permanent Secretary, Nangula Mbako.

Before long, Mr Katunahange had developed a pilot programme aimed at educating the learners at four secondary schools in Walvis Bay about the marine environment. At the same time he applied to, and was accepted to study at the Cape University of Technology.

Mr Katunahange's worries about financing his studies were resolved by Dr Hashali Hamukuaya, then the director of the BCLME Programme's Activity Centre for Marine Living Resources. Dr Hamukuaya arranged for the BCLME Programme to award Mr Katunahange a bursary.

Today Mr Katunahange is back in Walvis Bay, completing the practical component of his diploma and working hard to expand his education programme to other coastal schools. His final-year project is entitled Communication: specialising in marine and coastal environmental education.

Mr Katunahange is determined to generate a passion for the marine environment among secondary school learners with the purpose of helping to groom future fisheries managers and leaders.

"With the vast ocean and the resources we have in Namibia we should really try to maximise our human capacity," says Mr Katunahange.

He is grateful for the assistance of the BCLME Programme and would like to work more closely with the BCLME and BENEFIT programmes in the future.

Training and Capacity Building Summary

The following activities were funded by the BCLME Programme during the first six months of 2006:

LMR/CF/NANSEN/05/02
Sea Allowances:
NatMIRC cruise members
Transboundary pelagic survey
(Angola and Namibia)
JP Roux – US$400
B Dundee – US$400
H Mupupa – US$200
M Uumati – US$200
Total Cost: US$1 200

LMR/CF/NANSEN/05/03
Sea Allowances:
NatMirc cruise members
Transboundary hake survey
(Orange River and Lüderitz)
R Cloete – US$920
P Kainge – US$920
V Hashoongo - US$920
R Lemke – US$920
S Kashava – US$920
Total Cost: US$4 600

Phytoplankton Course:
Naples 31 March-26 April 2005
50% sponsorship
Deon Louw, NatMirc
Total Cost: US$2 548

R/V Tombua INIP, Luanda
Modification of R/V Tombua official visit to Luanda
Alan Robertson,
Arcon Management Services
Total Cost US$2 472

BCLME Post-Doctoral Scholarship Award
Barbara Patterson
Total Cost: US$14 198

MSc Degree Aquatic Fisheries Management, University of Hull United Kingdom, September 2005-September 2006 (final payment)
Hilda Khoeses, MFMR
Total Cost: US$22 792

Large Marine Ecosystem assessments in relation to climate change upwelling, fisheries and coastal communities
Trieste, Italy 20-25 March 2006
Anja Kriener, NatMIRC
Total Cost: US$3 994

Wildscreen Festival
BCLME Current of Plenty entry
Total Cost: US$341

ODINAFRICA seminar
Brussels, Belgium 24-26 April 2006
Domingos Azevedo, INIP
Total Cost: US$2 203

English Writing Skills Course
Cape Town 24-28 April 2006
Henriette Nsilulu, INIP
Filomena Vaz Velho, INIP
Domingos Neto, INIP
Kumbi Kilongo, INIP
Pedro Tchipalanga, INIP
Total Cost: US$16 678

Hake Otolith Reading and Validation Mini-Workshop
Cape Town, 15-19 May 2006
Margit Wilhelm, NatMIRC
Total Cost: US$667

Optical Mooring Demo Workshop
Lamberts Bay/Cape Town 16-17 May 2006
Isabel Rangel, INIP
Quilanda Fidel, INIP
Total Cost: US$3 824

Formação e Capacitação

Cientistas angolanos beneficiam de formação sobre escrita

Seis cientistas do Instituto de pescas angolano, INIP, receberam formação intensiva sobre escrita prática quando participaram recentemente num curso de cinco dias na Cidade do Cabo.

O tutor do grupo foi o Dr Helmke Hennig, co-autor de *Practical Writing for Practically Everybody* (Escrita Prática para Praticamente Toda a Gente) e escritor independente com muitos anos de experiência.

O Dr Hennig apresentou um curso que foi concebido para responder às necessidades específicas dos cientistas angolanos. Abordou duas áreas principais: como escrever relatórios científicos e como dar apresentações científicas.

Alguns dos tópicos incluíram: escrever claramente e com grande impacto, utilizar técnicas organizativas para melhorar a estrutura dos relatórios, e escrever com estilo.

Os seis participantes ganharam experiência prática durante o curso de cinco dias e levaram para Angola livros de texto e exercícios detalhados de modo a poderem melhorar as suas capacidades de escrita no futuro.

"Foi muito intensivo", admitiu o Dr Hennig.

Legenda: Os cientistas que participaram no programa de formação sobre escrita são (fila de trás), tutor Dr Helmke Hennig, Domingos Neto, Kumbi Kilongo, Quilanda Fidel, Pedro Tchipalanga. À frente Henriette Lutuba Nsilulu e Filomena Vaz Velho

The scientists who participated in the writer training programme are (back row), tutor Dr Helmke Hennig, Domingos Neto, Kumbi Kilongo, Quilanda Fidel, Pedro Tchipalanga. In front are Henriette Lutuba Nsilulu and Filomena Vaz Velho.

Angolan scientists benefit from writer training

Six scientists from the Angolan fisheries institute, INIP, received intensive training in practical writing when they attended a five-day course in Cape Town recently.

The group's tutor was Dr Helmke Hennig, co-author of Practical Writing for Practically Everybody, *and a freelance writer with many years of experience.*

Dr Hennig presented a course that was tailor made to meet the particular needs of the Angolan scientists. It addressed two main focus areas: how to write scientific reports and how to give scientific presentations.

Some of the topics covered included writing clearly and with high impact, using organising techniques to improve the structure of reports and writing with style.

The six participants gained practical experience during the five-day course and took detailed workbooks and textbooks back to Angola so that they can work on their writing skills in the future.

"It was very intensive," admitted Dr Hennig.

OLRAC COURSE Management Living Marine Resources
Cape Town, 24-26 May 2006
Henriette Nsilulu, INIP
Samantha Petersen, Birdlife SA
Total Cost: US$3,959

SADCO MEETING
Cape Town 31 May 2006
Domingos Azevedo, INIP
Total Cost: US$1 724

Summer Institute in Coastal Management, Rhode Island, USA 29 May – 16 June 2006
Nkosi Luyeye, INIP
Total Cost: US$10 032

Short Term Training Courses at INIAP/IPIMAR
Lisbon, Portugal May/June/July duration 2/3 Months
Bernardo Moises da Silva Fernandes
Zooplankton – 2 Months
Justino Masseu Sequesseque
Icthyoplankton – 3 Months
Enoque Canganjo
Nutrients – 2 Months
Antonio Unza
Instrumentation – 3 months
Zabaka Roberto
Chromatography – 3 months
Isabel Cativa Eunice
Chromatography – 3 months
Total Cost : US$35 424

IIFET Conference
University of Portsmouth, UK 11-14 July 2006
Hellen Amupolo, MFMR
Wilbard Nashindi, MFMR
Total Cost : US$3 317

Training in use of CPR and Aqua-shuttle, Rhode Island University, Narragannsett Lab USA, 9-19 July 2006
Hans Verheye, MCM
Total Cost: US$5 607

Clivar Workshop
Tanzania, 10-13 July 2006
Larry Hutchings, MCM
Total Cost: US$2 138

30th Virginia Law of Sea Conference
Dublin, Ireland 12-14 July 2006
Albert Hoffmann, MME (International Tribunal for the Law of the Sea)
Total Cost: US$3 331

Overtime NANSEN Cruise
Angola-Namibia Pelagic Transboundary Survey
Martha Uumati, NatMIRC
Helvi Mupupa, NatMIRC
Total Cost: US$2 336

BCLME Staff members' Training
Professional Receptionist Training
Windhoek, February-May 2006
Evelyne Museke,
PCU Front Office Assistant
Course Fees: US$587

Project Management Course
Cape Town, March-June 2006
Cristina Cicognani,
Admin Assistant EVAC
Course Fees: US$582

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Taking a closer look at the Angola Benguela Front

Dr Neville Sweijd, director of the BENEFIT Programme, outlines the objectives of the workshop.

Namibia's Deputy Minister of Fisheries and Marine Resources, Kilus Nguvauva, delivered the opening address at the Angola Benguela Front Workshop that was held in Swakopmund in April.

Speaking to the oceanographers and fisheries biologists who had gathered at the National Marine Information and Research Centre (NATMIRC) to share knowledge about the Angola Benguela Front, Mr Nguvauva noted that the transboundary region is of great importance to both Namibia and Angola.

"It has rich fisheries resources comprising pilchard, horse mackerel, anchovy, sea bream, sardinella, deep water crab, tuna and hakes, all of which are commercially exploited by local as well as foreign vessels," said Mr Nguvauva.

"Understanding the mixing processes, dynamics and impacts on fisheries in the region, as well as predicting decadal events such as Benguela *Niños* and low oxygen water anomalies is of major concern to fisheries managers in Angola and Namibia."

The Angola Benguela Front usually occurs between 14 and 16°S, where the cold, northward flowing Benguela Current meets the subtropical, southward flowing Angola Current.

It is one of the most productive regions of the Benguela Current Large Marine Ecosystem (BCLME).

The Angola Benguela Front Workshop was hosted jointly by the BCLME Programme and BENEFIT, and focused on describing the physics, chemistry and biology of the frontal zone.

Some of the oceanographic work that has been undertaken in the frontal zone has focused on Benguela *Niños*, sustained warming events that are characterised by large swathes of warm, highly saline water moving into northern and central Namibia from Angola.

These events occurred on average every ten years during the 20th century. Oceanographers have been watching closely to see whether the warm event that was documented off Namibia between January and March 2006 - which was a consequence of reduced upwelling favourable winds - develops into a fully fledged Benguela *Niño*.

One session of the Workshop was dedicated to piecing together the knowledge of physical and chemical oceanographers in the region in an effort to throw more light on the phenomenon of Benguela *Niños*. The session was chaired by Professor Vere Shannon who first coined the term "Benguela *Niño*" in the 1980s.

Oceanographers' understanding of Benguela *Niño* has grown considerably since 1995 when a massive intrusion of warm water was documented in northern Namibia.

The Benguela *Niño* of that year was preceded by an invasion of low oxygen water over much of the shelf (in 1993 and 1994). The two extreme environmental events had a dramatic impact on the northern Benguela ecosystem and serious repercussions for the fishing industry. An estimated two billion juvenile hakes were killed by low oxygen water in the inshore nursery grounds and over 300 000 seals died of starvation. The breeding cycles of marine birds such as cormorants and penguins were also severely disrupted.

One of the objectives of the Angola Benguela Front Workshop was to plan research activities that will eventually help scientists to predict the occurrence of extreme environmental events, such as Benguela *Niño*. It is hoped that an "early warning system" will alert managers and decision-makers before a major oceanographic event takes place, building on Namibia's existing excellent "state of environment" reporting system.

Key components of the early warning system are an Atlas buoy that has been deployed off Angola and several tide gauges that will be set up at a number of locations along the coast of South Africa, Namibia and Angola.

The Atlas buoy and tide gauges have been purchased by the BCLME Programme to enhance oceanographic and metereological observations with the ultimate goal of improving the predictability of unusual environmental events in the Benguela region.

The Atlas buoy is part of an extension of the PIRATA buoy system into the southeast Atlantic. (See p. 10)

The Workshop was officially opened by Kilus Nguvauva, the deputy minister of Namibia's Ministry of Fisheries and Marine Resources (centre). The deputy minister is pictured with Ms Francisca Delgado, director general of Angola's fisheries institute, INIP, Dr Neville Sweijd, Dr Moses Maurihungirire, director of Resource Management at MFMR and Dr Mick O'Toole, chief technical advisor to the BCLME Programme.

THE SPECTRE OF CLIMATE CHANGE

Climate change is a subject that is beginning to receive increased attention among scholars of the Benguela.

Environmental monitoring in Angola, Namibia and South Africa, coupled with recent outputs from the BCLME Programme, provide a growing body of evidence which shows that significant changes have taken place in the Benguela ecosystem over the past half century.

Environmental parameters such as sea surface temperature have shown a pronounced warming trend in the northern Benguela, a cooling inshore in the south, and warming offshore near the southern boundary of the BCLME since the early 1980s.

There has been an increased frequency of warm events, including Benguela Niños *in the northern Benguela and the occurrence of low oxygen water and sulphur eruptions appear to have been more frequent off Namibia, with severe implications for fisheries resources.*

Scientists are beginning to talk about a "regime shift" in the Benguela and are tentatively suggesting that the changes that have been observed in the Benguela could be associated with global climate change. They also suggest that climate change – or at least climate variability - may be behind the eastward movement of sardines and other species around the Cape peninsula.

The eastward movement of sardines has been well documented. Senior specialist scientist at Marine and Coastal Management, Carl van der Lingen confirmed in April that catches of sardines taken off Mossel Bay have leapt up from 2110 tons to 121 536 tons in five years.

Other species have also shown an eastward movement. Most notable has been the shift of west coast rock lobster from the traditional fishing grounds on the west coast to the southeast coast. Seabird biologists have also documented changes in the breeding patterns of several seabirds. For instance, populations of Cape gannet Morus capensis *appear to have followed the sardine shoals east. In 1956, only seven percent of southern Africa's gannet population occurred in the Eastern Cape. This number has jumped to 67%, while the number of gannets breeding on Namibia's offshore islands has plummeted.*

Other seabirds that have moved their breeding localities eastward are the endemic crowned cormorant Phalacrocorax coronatus, *which now breeds at Tsitsikamma National Park, 355km east of its traditional nesting sites. Similarly, the Hartlaub's gull* Larus hartlaubii *has established two breeding colonies in the vicinity of Port Elizabeth; it is breeding 550km further east than it did 10 years ago.*

If recent oceanographic and ecosystem studies are correct, an eastward and poleward shift in the Benguela ecosystem may be taking place. The shift might explain the changes that fishermen are reporting from the fishing grounds and the dramatic changes in seabird distribution. It could also signal serious consequences for the Benguela, an ecosystem that has, until recently, sustained large scale fisheries.

Most important for Angola, Namibia and South Africa are the hake, sardine, horse mackerel and rock lobster fisheries which support thousands of jobs and earn valuable foreign currency. Large scale environmental change has the potential to alter these industries, with substantial effects on national economies.

An eastward movement of sardines in the southern Benguela has been well documented.

Populations of Cape Gannet (Morus capensis) *appear to have followed the sardine shoals east.*

PIRATA buoy deployed off Angola

Mathieu Rouault of the University of Cape Town, points to the approximate position off Angola where the PIRATA buoy, **Kizomba,** *was deployed in June.*

The oceanographic information that is being relayed in real time from an ATLAS buoy off the coast of northern Angola may help oceanographers to unravel some of the secrets surrounding Benguela *Niños* - large scale warming events that have severe impacts on the climate and fisheries of Namibia and Angola.

The Atlas buoy, named *Kizomba*, was deployed in June by French scientists from IRD working from the research vessel *Atalante*. It is moored at 6°S; 8°E, at a depth of 4100m.

The BCLME Programme provided funding for the construction and transport of the ATLAS buoy which effectively extends the PIRATA project into the southeast Atlantic.

PIRATA (Pilot Moored Array in the Tropical Atlantic) is a cooperative project between Brazil, France and the USA. Since 1997, PIRATA has deployed 12 ATLAS buoys with the purpose of monitoring, describing and understanding oceanographic processes in the tropical Atlantic. The extension of the PIRATA array into the southeast Atlantic is expected to improve ocean models and climate prediction and help scientists in the Benguela region to better understand ocean processes, particularly anomalous events such as Benguela *Niño*.

"This will provide the missing link between the equator - the source of Benguela *Niño* - and the area that is affected by the event," explains University of Cape Town oceanographer, Dr Mathieu Rouault.

"It will also be helpful for the Gulf of Guinea as major warm events in the tropical Atlantic often start as Benguela *Niños*."

It is hoped that by better understanding the mechanism behind Benguela *Niños*, scientists will ultimately be able to predict when they will occur.

The ATLAS buoy is capable of transmitting a wide variety of oceanographic measurements in real time. It is fitted with a current meter and several underwater temperature and conductivity sensors. These are deployed between 20 and 180 metres below sea surface. Two temperature/pressure sensors are also fitted at 300 and 500 metres. A meterological station on top of the mooring measures wind, air temperature, humidity, solar radiation and rainfall.

Dr Rouault explains that the southeast extension of the PIRATA array is regarded as a pilot project. There is concern that the buoy might be tampered with or destroyed by vandals, even though the area where it is moored is devoid of fisheries.

"This is a test," he says.

"If the buoy is not vandalised, we will try to make it permanent and perhaps consider extending PIRATA to the South.

The oceanic and meteorological observations that are gathered by the buoy's instruments are transmitted to shore via satellite and are available in near real-time on the internet. They are communicated to the Global Telecommunication System and are readily available for ocean and weather prediction models.

"The extension of PIRATA is essential to any ocean forecasting system that aims to be beneficial to society," says Dr Rouault.

"At the moment there is a big data gap off Angola and Namibia."

Prior to the deployment of the new ATLAS buoy, the closest PIRATA mooring to the Benguela region was at 0°; 0°.

Kizomba is the name of an Angolan dance. The buoy's name was suggested by Maria de Lourdes Sardinha, director of the Activity Centre for Biodiversity, Ecosystem Health and Pollution. Each of the 13 Atlas buoys in the PIRATA array is named after a traditional dance.

- Visit the Pirata South East Atlantic extension web site: **http://www.egs.uct.ac.za/~rouault/piratase.html**

Kizomba *is capable of transmitting a wide range of oceanographic measurements in real time.*

The buoy was deployed from the French research ship, **Atalante.**

Noctiluca launched in Namibia

At a fun-filled event that saw Namibia's Minister of Fisheries and Marine Resources, Dr Abraham Iyambo, and UNDP Resident Representative, Simon Nhongo, donning lifejackets and going to sea, the 5.5m environmental monitoring boat, *Noctiluca*, was launched in Namibia.

The BCLME Programme funded the construction and delivery of *Noctiluca* and a second, identical ski-boat, for the purpose of improving environmental monitoring off Namibia and Angola.

Noctiluca is named after a microscopic dinoflagellate (a type of plankton) that gives off bioluminescence at night. She was officially launched in Swakopmund in February.

Noctiluca was built by Z-Craft boat builders in Empangeni, South Africa. The boat is powered by twin Yamaha 90 hp outboard motors and was supplied with a heavy duty trailer which will allow it to be launched at slipways at Swakopmund and Walvis Bay.

The boat is equipped with fish hatches, fishing rod racks as well as brackets for storing SCUBA apparatus.

Noctiluca will largely be used for monitoring of water quality, the benthos, harmful algal blooms, pollution and near-shore fisheries. It may also be used for training purposes and to build capacity in fisheries and environmental research.

"As its name implies the boat will be used mainly for red tide sampling - to routinely sample the inshore waters and complement the shore-based monitoring we do for aquaculture," says Bronwen Currie of the National Marine Research and Information Centre (NATMIRC).

"It will be especially useful when we have a visible bloom beyond the surf zone."

NATMIRC scientists will use *Noctiluca* to carry out other water quality tests – to check for bacterial or chemical pollution and to monitor sulphide events. These are natural events that can be harmful to fish and other living organisms.

Sampling will be carried out using a Niskin bottle over the side. Plankton net samples may also be taken over the side of *Noctiluca*.

The facilities for storing diving equipment will enable researchers to conduct underwater research and to maintain scientific equipment which is moored to the ocean floor.

As part of the package, a two- to three-day training course in the operation and maintenance of the ski-boat will be presented to key staff of NatMIRC by Z-Craft.

Noctiluca ***takes to sea.***

Namibia's Minister of Fisheries and Marine Resources, Dr Abraham Iyambo prepares to go to sea with Bronwen Currie, chief biologist in NatMIRC's aquaculture directorate.

Benguela: Predicting a Large Marine Ecosystem

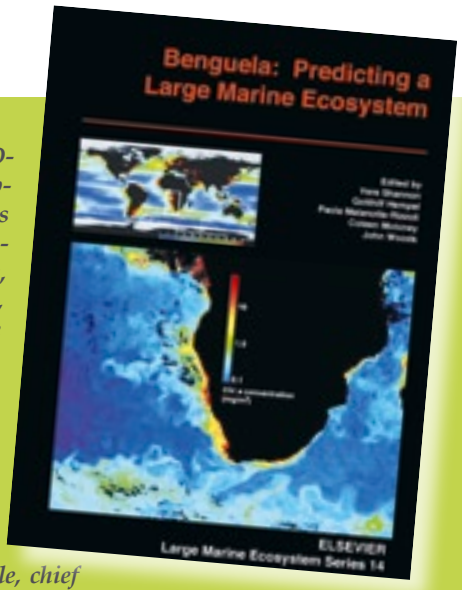
Benguela: Predicting a Large Marine Ecosystem *is soon to be published by Elsevier as Volume 14 of their Large Marine Ecosystem series.*

The book is a product of the International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems which was held in Cape Town in November 2004. The workshop was sponsored by the BCLME Programme, in partnership with nine other international and regional agencies.

It is jointly edited by Vere Shannon of the BCLME Programme, Gotthilf Hempel of the Centre for Marine Tropical Ecology in Bremen, Germany, Coleen Moloney of the University of Cape Town, Paola Rizzoli of the Massachusetts Institute of Technology and John Woods of Imperial College, London. Dr Sally Adams of the National Oceanic and Atmospheric Administration in the USA is the technical editor.

Each chapter has been subjected to an international peer review process.

The book is in four parts and captures the essence of the thinking and knowledge emanating from the workshop. It is regarded as the definitive work on the variability and predictability of the BCLME.



Uniquely, the book includes a CD-ROM containing a wealth of supplementary information such as details about the Benguela Forecast Workshop, observations, animations and model outputs, several papers presented at the Workshop and comprehensive information about the BCLME Programme, BENEFIT, SANCOR (the South African Network for Oceanic Research) and SADCO (the South African Data Centre for Oceanography).

With a foreword by Mick O'Toole, chief technical advisor to the BCLME Programme, and endorsement by the ministers responsible for fisheries and marine resources in Angola, Namibia and South Africa, the 400 page book and CD-ROM is dedicated to Kenneth Sherman who developed the concept of Large Marine Ecosystems as a practical means of implementing the ecosystem approach to ocean governance and strongly supported the establishment of the BCLME Programme.

Information about its publication date, availability and price can be found on the Elsevier website (www.elsevier.com).

CSIR entrega pacote de poluição marinha

Susan Taljaard

O Concelho Sul Africano para a Investigação Científica e Industrial (CSIR) preparou uma página de internet exaustiva e de fácil utilização que contém uma grande quantidade de informação valiosa sobre a gestão da poluição marinha na região da Corrente de Benguela.

A página www.wamsys.co.za/bclme é apenas um dos recursos que foram desenvolvidos pelo CSIR durante a implementação de dois projectos BCLME sobre poluição marinha proveniente de fontes terrestres. Ambos os projectos foram geridos pelo Centro de Actividade da Biodiversidade, Saúde do Ecossistema e Poluição em Luanda. A página de internet deverá ser um recurso extremamente valioso para profissionais envolvidos na gestão diária da poluição, bem como para cidadãos de Angola, Namíbia e África do Sul que têm interesse em assuntos relacionados com a poluição marinha.

A página contém um inventário da informação e dados disponíveis relacionados com a gestão da poluição marinha proveniente de fontes terrestres em Angola, Namíbia e África do Sul. A página permite que grupos de interesse autorizados actualizem a informação de base sobre as origens e a gestão da poluição marinha na região, garantindo-se desta forma que se mantenha em dia.

Um aspecto importante é que a maioria do conteúdo da página está disponível em inglês e português.

O líder de projecto, Susan Taljaard, uma cientista sénior da divisão de Recursos Naturais e Ambiente do CSIR, explica que a página integra os resultados de dois projectos: uma avaliação de base das fontes e gestão da poluição marinha na região do BCLME; e o desenvolvimento de um conjunto comum de directrizes de qualidade recomendadas para as áreas costeiras do BCLME.

Os projectos foram implementados simultaneamente e pretenderam atingir quatro objectivos principais: uniformizar a abordagem e metodologia utilizadas para gerir as fontes de poluição marinha na região do BCLME; recomendar protocolos para a concepção de programas de medição de base e de monitorização a longo prazo; recomendar um conjunto de directrizes de qualidade da água e sedimentos para a região; e obter protocolos de melhores práticas para a aplicação destas directrizes de qualidade.

Os objectivos foram atingidos em larga medida através da preparação de um quadro genérico para a gestão da poluição marinha na região do BCLME. Este quadro promove uma abordagem baseada no ecossistema, em vez de se focar em fontes individuais de poluição marinha. O quadro identifica os componentes chave que devem ser considerados na gestão da poluição marinha – tais como legislação, objectivos de qualidade ambiental e estudos de avaliação – e descreve as ligações entre eles.

São incluídos no quadro programas de medição de base e de monitorização a longo prazo, sendo estes aspectos de gestão da poluição descritos ao pormenor.

O quadro proposto tem ainda que ser aprovado e adoptado

CSIR hands over marine pollution package

South Africa's Council for Scientific and Industrial Research (CSIR) has put together a comprehensive and easy-to-use website that contains a host of valuable information on the management of marine pollution in the Benguela region.

The website ***www.wamsys.co.za/bclme*** *is just one of a number of resources that were developed by the CSIR during the implementation of two BCLME projects on land-based marine pollution. It should prove to be a highly valuable resource for professionals involved in the day-to-day management of pollution, as well as for citizens of Angola, Namibia and South Africa who have an interest in marine pollution issues.*

The website contains an inventory of available information and data related to the management of land-based marine pollution in Angola, Namibia and South Africa. It allows authorised stakeholders to update baseline information on sources and management of marine pollution in the region, thereby ensuring that it remains current.

Importantly, most of the contents of the website are available in English and Portuguese.

Project leader, Susan Taljaard, a senior scientist at the CSIR's Natural Resources and Environment division, explains that the website integrates the results of two projects: a baseline assessment of sources and management of land-based marine pollution in the BCLME region; and the development of a common set of recommended quality guidelines for the coastal areas of the BCLME.

Both projects are part of the portfolio managed by the Activity Centre for Biodiversity, Ecosystem Health and Pollution.

The projects were implemented concurrently and aimed to achieve four major objectives: to standardise the approach and methodology by which land-based marine pollution sources in the BCLME region are managed; recommend protocols for the design of baseline measurement and long-term monitoring programmes; recommend a set of water and sediment quality guidelines for the region; and obtain best practice protocols for the application of these quality guidelines.

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pelas autoridades governamentais responsáveis na Namíbia e Angola e, segundo a Sra Taljaard, os países poderão ter que refinar e ajustar o quadro para responder a necessidades específicas. Do mesmo modo, as directrizes de qualidade da água e sedimentos precisam de ser oficialmente aprovadas e adoptadas nos três países.

"Até à altura em que um quadro de gestão e directrizes de qualidade tenham sido incorporadas nas políticas oficiais dos governos, propõe-se que o quadro de gestão e directrizes de qualidade propostos sejam aplicados como instrumentos preliminares para melhorar a gestão da qualidade da água nas áreas costeiras da região do BCLME", sugere a Sra Taljaard.

Ela acredita que um dos principais resultados dos dois projectos foi o estabelecimento de uma rede de qualidade da água costeira na região. A rede ofereceu aos especialistas em gestão da poluição na região do BCLME uma oportunidade para partilharem as suas experiências e melhorar o seu conhecimento dos instrumentos, capacidade e apoio técnico disponíveis neste ramo.

"Conseguimos pôr as pessoas a falarem umas com as outras", diz a Sra Taljaard.

A rede foi estabelecida durante as sessões de trabalho que foram organizadas pelo CSIR e seus parceiros na Namíbia e Angola e realizadas em cada país. Nestas sessões de trabalho, foram apresentados o quadro de gestão proposto, bem como as directrizes e protocolos de qualidade propostos, tendo sido dada oportunidade aos participantes para contribuirem.

Seguiram-se seminários de trabalho em cada um dos três países, onde foi dada formação preliminar a grupos de interesse chave sobre a aplicação do quadro de gestão e directrizes de qualidade.

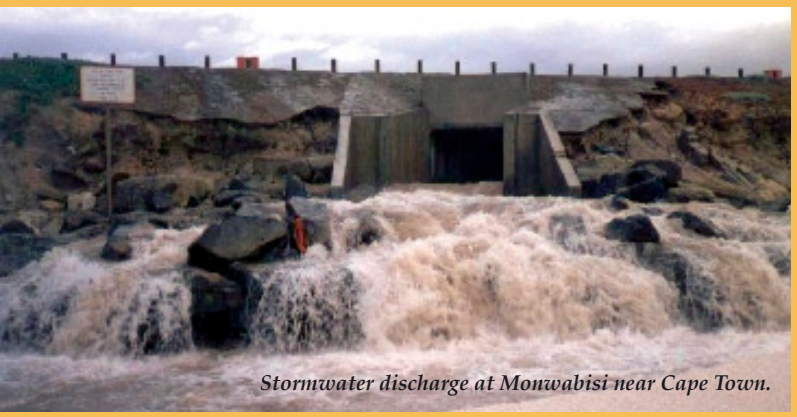
A rede costeira deverá ser mantida através da página de internet, oferecendo, assim, um instrumento de apoio à tomada de decisão e educativo muito útil para a gestão da qualidade da água marinha nas áreas costeiras do BCLME.

A Sra Taljaard está satisfeita por os dois projectos terem lançados as bases de trabalho para uma melhor gestão da poluição marinha proveniente de fontes terrestres na região, mas realça que cabe aos governos da região implementar e refinar os quadros e protocolos.

"O objectivo final da gestão dos recursos aquáticos costeiros é manter um ambiente adequado para todos os usos designados – tanto usos existentes como futuros", diz a Sra Taljaard.

Fact File:

Land-based threats to the marine environment



Stormwater discharge at Monwabisi near Cape Town.

Land-based activities pose an increasing threat to the sustainability of the ecological, social and economic functions of the marine environment. The following are major threats to the marine environment in southern Africa:

- *Disposal of untreated sewage, either through diffuse inputs from informal settlements or through effluents discharged from malfunctioning sewage treatment plants;*
- *Coastal developments and coastal mining activities which contribute to the modification and destruction of coastal habitats;*
- *Water abstraction, such as the damming of rivers. This results in a reduction in freshwater inflow to the marine environment and causes a reduction in the amount of sediment and nutrients that would naturally have reached the sea;*
- *Inappropriate agricultural practices, such as the excessive use of pesticides and fertilizers. This results in a deterioration of the quality of river water entering the marine environment and increased suspended solid loads as a result of soil erosion;*
- *Contaminated stormwater runoff from large urban areas introduces toxic substances such as trace metals and oils (hydrocarbons) to the marine environment;*
- *Industrial wastewater discharges, predominantly from fish factories and oil refineries. Industry introduces a range of pollutants to the marine environment, depending on the industry type;*
- *Fossil fuel fires from large informal settlements and traffic emissions from large urban areas my introduce pollutants to the marine environment via the atmosphere.*

Developing nations are tackling water issues head on

Al Duda

Water. How to use it. How to share it. How to manage it in the face of a changing climate. These are some of the key issues that the Global Environment Facility (GEF) has been helping developing nations to tackle since its inception in 1991. Dr Alfred Duda, Senior Advisor for the GEF's International Waters portfolio, shares some of his perspectives on transboundary water resources with Claire Attwood.

It's no surprise that the person responsible for the management of water resources in the GEF – a multi-billion US dollar fund that specialises in the global environment - is a hydrologist by profession. Over the years, however, Dr Al Duda's focus has shifted from the management of rivers and groundwater to the governance of oceans and other transboundary water resources.

Dr Duda's introduction to transboundary water management issues came in the late 1980s when he headed the bi-national secretariat of the International Joint Commission between Canada and the United States. The Commission was tasked with resolving existing disputes, and preventing future wrangles between the two nations over water. In 1992 Dr Duda joined the World Bank and in 1995 he was asked to assist with the development of the GEF.

"I was there from the start in developing the GEF's strategy," he recalls, explaining that from very early on the GEF was concerned with how to manage large transboundary water bodies- from Large Marine Ecosystems (LMEs) like the BCLME, to river basins and shared ground water resources like the Nubian aquifer in North Africa.

Dr Duda assisted the GEF Council – the GEF's governing board that represents 176 countries – to develop its Operational Strategy. He was later appointed to head the International Waters (IW) part of the GEF.

In Dr Duda's words, the primary goal of the IW portfolio is to assist countries so that they can jointly manage and sustainably use their shared water resources and thereby derive benefits from them into the future.

He cites the Orange River as an example. The Orange River forms a thick, snake-like boundary between Namibia and South Africa. In the desert landscape of southern Namibia and the Northern Cape, the Orange provides commercial farmers with a golden opportunity to farm intensively on the banks of the river. But, with vast quantities of water being extracted for irrigation purposes, there is little left in the river by the time it reaches the parched landscape of the Richtersveld.

"Projects like the Orange River Basin programme are all about helping countries to balance different water uses, be they irrigation, mining, environment protection, or even tourism and leisure," explains Dr Duda.

Large Marine Ecosystem projects, another key focal area of the IW portfolio, are no different. The BCLME Programme, for instance, helps Angola, Namibia and South Africa to better balance industrial activities like commercial fishing, diamond mining and oil extraction in the Benguela, while all the time ensuring the health of the ecosystem and sustainable benefits for coastal communities.

Dr Duda notes that the global reality of climate change is increasingly being factored into IW projects.

"Countries are realising that these large water systems are critical for their sustainable future but the fluctuating climate is increasingly becoming a constraint. So, they realise that they have to work together to minimise the impacts of climatic variations on their shared water systems," he explains.

Looking back over the past ten years, Dr Duda is encouraged by the progress that developing countries have made in this area. Today, 136 countries are working together on transboundary water projects. These countries have secured US$900 million (R5.4 billion) in GEF grants to help them do this. This GEF funding is complemented by US$3 billion (R18 billion) in additional funds, including in-kind contributions from participating nations, loans and bi-lateral assistance.

The BCLME Programme is undoubtedly one of the success stories of the IW portfolio, says Dr Duda. It is one of two GEF-funded LME projects that have taken significant strides towards instituting an ecosystem approach to ocean governance.

The other project is the GEF International Waters Project of the Pacific Small Island Developing States (SIDS) which has been highly successful in negotiating an ecosystem-based treaty under the 1995 United Nations Agreement on the Conservation and Management of Straddling and Highly Migratory Fish Stocks. The Pacific treaty provides an opportunity for the 15 island states and their distant fishing partners to manage one of the world's largest tuna fisheries through an ecosystem-based approach.

The Pacific SIDS are a step ahead of the BCLME Programme because they have already established the Western and Central Pacific Fisheries Commission (WCPFC) as a joint management institution and GEF is now funding capacity building of the SIDS and their commission to implement the convention. Dr Duda is excited to hear that the BCLME Programme is rapidly moving in a similar direction:

"If the BCLME Programme is moving towards a science-based commission for joint management of the LME and a treaty expressing their commitments to it, then it will certainly live up to GEF's expectations," he says.

Dr Duda believes the experience of the BCLME Programme is very important for the African continent as a whole, saying that the agencies involved in the establishment

of the Agulhas and Somali Large Marine Ecosystem (ASLME) Programme have been asked to follow the model of the BCLME Programme.

"The Benguela region was very fortunate," he says. "They had the BENEFIT Programme that built country capacity to better understand how the LME works and GEF was able to build on that. Now we're replicating that step-by-step approach on the other side of the African continent with the benefit of South Africa's experience in the BCLME."

Dr Duda looks forward to showcasing the BCLME Programme at two important international meetings that are scheduled to take place in Cape Town in the next 12 months. The first is the GEF Assembly which takes place in August (see p. 3). The second is the Fourth GEF Biennial International Waters Conference, which is scheduled for late July 2007 (see p. 34).

"These portfolio meetings provide an opportunity for GEF waters projects to exchange experiences with each other in a South-to-South setting" he says.

"The BCLME Programme is a critical project for the global oceans community and for the 121 countries that are now working together with GEF support to balance competing uses of 17 other LMEs."

12/ …continued

The objectives were achieved largely through the preparation of a generic framework for the management of marine pollution in the BCLME region. The framework promotes an ecosystem-based approach, rather than focusing on individual sources of marine pollution. It identifies the key components that should be addressed when managing sources of marine pollution – such as legislation, environmental quality objectives and assessment studies – and describes the links between them.

Baseline measurement and long-term monitoring programmes are included in the framework and these aspects of pollution management are outlined in full.

The proposed framework has yet to be approved and adopted by the responsible government authorities in Namibia and Angola and, says Ms Taljaard, it may well be that the countries require the framework to be refined or adjusted to meet their specific needs. Similarly, the recommended water and sediment quality guidelines need to be officially approved and adopted in all three countries.

"Until such time as a management framework and quality guidelines have been incorporated into official government policy, it is proposed that the quality guidelines and the proposed management framework be applied as preliminary tools towards improving the management of the water quality in coastal areas of the BCLME region," suggests Ms Taljaard.

She believes that one of the most important outcomes of the two projects was the establishment of a coastal water quality network in the region. The network has provided pollution management specialists in the BCLME region with an opportunity to share their experiences and improve their awareness of the tools, capabilities and technical support available in the field.

"We have got people talking to one another," says Ms Taljaard.

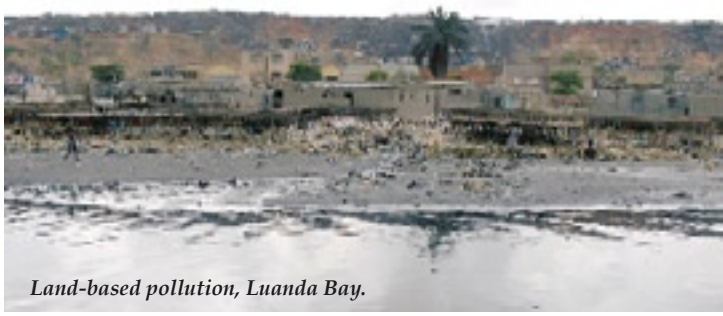
The network was established at the work sessions that were organised by the CSIR and their partners in Namibia and Angola, and hosted in each country. At the work sessions, the proposed management framework, proposed quality guidelines and protocols were introduced and participants were given the opportunity to provide their input.

This was followed by training workshops in each of the three countries, where key stakeholders were given preliminary training in the application of the management framework and quality guidelines.

The coastal network is to be maintained through the website, thereby providing a very useful decision-support and educational tool for marine water quality management in the coastal areas of the BCLME.

Ms Taljaard is satisfied that the two projects have laid the groundwork for improved management of land-based sources of marine pollution in the region, but she points out that it is up to the governments of the region to implement and refine the frameworks and protocols.

"The ultimate goal in the management of coastal water resources is to keep the environment suitable for all designated uses – both existing and future uses," says Ms Taljaard.



Land-based pollution, Luanda Bay.

Stormwater discharge at Strand near Cape Town.

Projects supported by the BCLME Programme

The BCLME Programme has allocated more than US$10 million (R65 million) in support of 75 projects. The projects are being implemented by a wide variety of clients, including government institutes, universities, private consultancy companies and the regional scientific programme, BENEFIT. Each project has been designed to address transboundary environmental problems and contribute to the integrated and sustainable management of the Benguela Current Large Marine Ecosystem.

Completed Projects

Final reports for the following projects have been submitted and approved and, in most cases, posted to the BCLME Programme's website: **www.bclme.org.za**. Where final reports are under review, this is indicated.

PCU/TCB/03/01
Training and capacity building needs assessment for the BCLME region
Project value: US$26 230
Contracted to: Anchor Environmental Consultants
Completion date: September 2003

PCU/AVM/03/01
Publicising the BCLME Programme through audio visual media
Project value: US$16 000
Contracted to: Francois Odendaal Productions
Completion date: September 2004

PCU/BCC/04/01
Institutional review and analysis for Benguela Current Commission (BCC)
Project value: US$63 425
Contracted to: EnAct International
Completion date: December 2004

PCU/BCC/04/02
Economic study and cost benefit analysis of cooperative research and management of the BCLME
Project value: US$30 100
Contracted to: Fisheries Economics Research Unit, UBC
Completion date: October 2004

PCU/TCB/06/01
Integration and review of training and capacity building in the BCLME Programme
Project value: US$8 500
Contracted to: Anchor Environmental Consultants
Completion date: March 2006

BCLME/LMR/CF/03/06
Potential shared hake stocks – research planning meeting (Namibia and South Africa)
Project value: US$53 048
Contracted to: BENEFIT
Completion date: May 2006

BEHP/BAC/WORKSHOP/04/01
Ecosystem mapping and biodiversity consultative workshop
Project value: US$47 095
Contracted to: BENEFIT
Completion date: May 2004

BEHP/IA/03/03
Harmonisation of national environmental policies and legislation for marine mining, dredging and offshore petroleum exploration and production activities in the BCLME region
Project value: US$39 697
Contracted to: SAIEA
Completion date: July 2004

BEHP/LBMP/03/01
Baseline assessment of sources and management of land-based marine pollution in the BCLME
Project value: US$85 000
Contracted to: CSIR
Completion date: January 2006

BEHP/LBMP/03/04
The development of a common set of water and sediment quality guidelines for the coastal zone in the BCLME region
Project value: US$80 000
Contracted to: CSIR
Completion date: January 2006

BEHP/CEA/03/03
Assessment of the cumulative effects of sediment discharge from on shore and near shore diamond mining activities on the BCLME
Project value: US$140 000
Contracted to: CSIR
Completion date: June 2006

EV/LS/02/04
Participation in the Climate Variability Programme (CLIVAR/OOPC) Workshop on South Atlantic Climate Observing System in Angra dos Reis, Brazil
Project value: US$3 160
Completion date: March 2003

EV/LS/02/02
Feasibility study of the south-east extension of PIRATA (Pilot Moored Array in the Tropical Atlantic)
Project value: US$29 900
Contracted to: UCT
Completion date: November 2003

EV/SADCO/03/01
SADCO holdings of Namibian data: Assessment of historical oceanographic data available from SADCO
Project value: US$2 400
Contracted to: Ms Fiona Duncan, contracted through UNDP-SA
Completion date: October 2003

EV/Provare/02/01
Feasibility assessment for the use of a towed undulating oceanographic recorder (TUOR) in the BCLME
Project value: US$5 850
Contracted to: Dr Chris Reid, Foundation for Ocean Science
Completion date: November 2003

EV/PROVARE/02/02(a)1
The Lüderitz Upwelling Cell/Orange River Cone (LUCORC) Workshop
Project value: US$31 000
Contracted to: BENEFIT
Completion date: April 2006
Synthesis report under review

EV/HUMBOLDT/04/01
Ichthyoplankton distribution, monitoring and training, northern Namibia/southern Angola; oceanographic, hydrological and benthos monitoring in Angolan waters
Project value: US$130 000
Contracted to: Baltic Sea Research Institute
Completion date: July 2004

EV/HAB/02/01
Harmonisation of regulations for microalgal toxins for application in countries bordering the BCLME
Project value: US$69 323
Contracted to: MFMR
Completion date: April 2005

EV/HAB/02/02a
Development of an operational capacity for monitoring of Harmful Algal Blooms (HABs) in countries bordering the northern part of the BCLME
Project value: US$36 260
Contracted to: MFMR
Completion date: April 2005

EV/HAB/04/Shellsan
Development of a shellfish sanitation programme model for application in consort with the microalgal toxins component
Project value: US$27 925
Contracted to: MFMR
Completion date: April 2005
Shellsan project included in EV/HAB/02/01 & EV/HB/02/02a reports available at www.bclme.org

EV/HAB/02/03
Investigation into the diversity and distribution of cysts of Harmful Algal Blooms (HABs) within the BCLME
Project value: US$25 420
Contracted to: UCT
Completion date: January 2005

EV/HAB/02/05
Development of an operational capacity for real-time observation and forecasting of Harmful Algal Blooms (HAB) in the BCLME: Detection of HABs through the deployment of bio-optical moorings. Phase 1: Demonstration project in Namibia and South Africa
Project value: US$135 035
Contracted to: UCT
Completion date: July 2005

EV/HAB/02/06
Development of an operational capacity for real-time observation and forecasting of Harmful Algal Blooms (HABs) in BCLME: utility of models in forecasting HABs events
Project value: US$30 700
Contracted to: UCT and CSIR
Completion date: April 2006

EV/HAB/05/01
Investigation into the diversity and distribution of cysts of harmful algal blooms within Luanda Bay (Angola) and Lüderitz Bay and Walvis Bay (Namibia)
Project value: US$29 994
Contracted to: UCT
Completion date: November 2005

EV/HABSCON/04/01
11th International Conference on Harmful Algal Blooms (Cape Town)
Project value: US$8 000 (sponsorship)
Donated to: Secretariat (ICHA 2004) – conference organisers

EV/LOW/02/01
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
Project value: US$46 250
Contracted to: UCT and CSIR
Completion date: April 2006

EV/FORECAST/04/01
International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems
Project value: US$80 000 (sponsorship)
Completion date: November 2004

EV/ANGOLA/03/01
Compilation of inventory and acquisition of oceanographic environmental data in the Angola sector of the BCLME. Phase one (inventory)
Project value: US$20 000
Contracted to: INIP
Completion date: July 2005.

EV/ANGOLA/03/02
Comprehensive review and reinterpretation of oceanographic information on the Angola sector of the BCLME
Project value: US$20 000
Contracted to: INIP
Completion date: July 2005

EV/ANGOLA/03/03
Assessment of the present state of oceanographic environmental monitoring in the Angolan sector of the BCLME
Project value: US$10 000
Contracted to: INIP
Completion date: July 2005

EV/ANGOLA/03/05
Build capacity for Angola
Project value: US$7 000
Contracted to: INIP
Completion date: July 2005

EV/ANGOLA/03/06
Upgrade communication systems for Angolan BCLME core partner institutions
Project value: US$8 000
Contracted to: INIP
Completion date: July 2005

EV/ANGOLA/05/01
Provision of basic English courses to Angolan institutions participating in the BCLME Programme
Project value: US$17 840
Contracted to: INIP
Completion date: April 2006

LMR/COM/02/01
Henties Bay Community project
Project value: US$ 4 051
Contracted to: Henties Bay Community
Completion date: Project terminated

LMR/COM/03/01
An assessment of means of involving coastal communities in the BCLME Programme
Project value: US$ 30 000
Contracted to: Eco-Africa
Completion date: March 2004

LMR/COM/03/02
Introducing the BCLME Programme to the wider audience within the coastal communities
Project value: US$16 000
Contracted to: Eco-Africa
Completion date: June 2004

LMR/COM/04/01
Development of a demonstration website for the Artisanal Fisheries Institute, Angola
Project value: US$ 5 000
Contracted to: Eco-Africa
Completion date: December 2005

LMR/AFSE/03/01
Review of institutional arrangements and provision of baseline information in respect of artisanal fisheries, including socio-economic surveys of coastal communities
Project value: US$194 120
Contracted to: Environmental Evaluation Unit, UCT
Completion date: The project has three components: a) January 2005 b) March 2006 c) March 2005

continued…/18




Completed Projects continued…

LMR/CF/03/07
Determination of optimal harvesting strategies for the hake trawl and longline fisheries in Namibia and South Africa
Project value: US$98 100
Contracted to: Fisheries Economics Research Unit, UBC
Completion date: October 2005

LMR/CF/03/04
Feasibility study into the application of genetic techniques for determining fish stock identity of transboundary populations in the BCLME
Project value: US$6 906
Completion date: November 2003

LMR/CF/03/01
Feasibility study into the establishment of a permanent regional fish ageing centre in one of the BCLME countries
Project value: US$11 520
Contracted to: BENEFIT
Completion date: November 2003

LMR/CF/03/02
An assessment of the state of commercial Fisheries catch data in the BCLME
Project value: US$11 240
Contracted to: BENEFIT
Completion date: May 2004

LMR/CF/03/08
Assessment of the ecological importance of pelagic fish and pelagic gobies in the functioning of the BCLME region - a desktop review
Project value: US$300 000
Contracted to: BENEFIT
Completion date: September 2005
Final report under review

LMR/CF/03/11 b
Retrospective analysis of sardinella fisheries in Angola
Project value: US$23 780
Contracted to: INIP
Completion date: February 2005

LMR/CF/03/12
A review of the impacts of seismic surveying and toxicity of oil products on the early life history stages of pelagic fish, the benthos and the pelagic ecosystem with potential application to the sardinella fishery
Project value: US$22 666
Contracted to: INIP
Completion date: May 2005

LMR/MC/03/02
Classification of coastline for aquaculture development
Project value: US$50 000
Contracted to: BENEFIT
Completion date: Project incorporated into BEHP/BAC/03/01

LMR/NANSEN/04/01
Survey of transboundary demersal fish stocks in southern Namibia with special reference to hake
Project value: US$110 500
Contracted to: IMR
Completion date: May 2004

LMR/NANSEN/04/02
Assessment of variability of transboundary pelagic fish stocks particularly sardinella from Gabon to central Angola
Project value: US$115 000
Contracted to: IMR
Completion date: October 2004

LMR//NANSEN/04/04
Transboundary study with emphasis on deep water hake in the Lüderitz–Orange River cone area
Project value: US$105 000
Contracted to: IMR
Completion date: November 2004

LMR/NANSEN/05/01
Transboundary survey between Namibia and South Africa with focus on shared stocks of hake
Project value: US$174 000
Contracted to: IMR
Completion date: November 2004

LMR/NANSEN/05/02
Transboundary survey of pelagic fish particularly horse mackerel and pilchard in southern Angola and northern Namibia
Project value: US$76 500
Contracted to: IMR
Completion date: October 2005

LMR/NANSEN/05/03
Transboundary survey of hake and hake ichthyoplankton in the transboundary area between the Orange River and Lüderitz
Project value: US$59 500
Contracted to: IMR
Completion date: January 2006

LMR/SKI/04/01
Supportive services for inshore water quality monitoring program in Namibia
Project value: US$43 700
Contracted to: Z-Craft, South Africa
Completion date: September 2005

LMR/SKI/04/02
Supportive services for inshore water quality monitoring program in Angola
Project value: US$43 700
Contracted to: Z-Craft, South Africa
Completion date: September 2005

Projects Administered by the Programme Coordination Unit

PCU/TOMBUA/06/01
Supervision and overall management of modifications work to Angolan fisheries research vessel *Tombua* in Cape Town
Project value: US$10 000
Contracted to: Arcon Management Services
Completion date: March 2007

PCU/Polytech/05/01
Assessing potential for producing final ocean colour maps for Namibia's marine environment
Project value: US$2 625
Contracted to: Polytechnic of Namibia
Completion date: September 2006

Biodiversity, Ecosystem Health & Pollution Projects

BEHP/CEA/03/01
Data gathering and gap analysis for modeling the cumulative effects of offshore petroleum exploration and production activities on the marine environment of the BCLME region
Project value: US$95 000
Contracted to: CSIR
Completion date: May 2006

BEHP/OSCP/03/01
Regional oil spill contingency planning in the BCLME
Project value: US$142 000
Contracted to: CSIR
Completion date: May 2006

BEHP/CEA/03/02
Data gathering and gap analysis for assessment of the cumulative effects of marine diamond mining activities on the BCLME
Project value: US$76 000
Contracted to: PISCES Environmental Consultants
Completion date: September 2006

BEHP/CEA/03/04
Assessment of the cumulative impacts of scouring of sub-tidal areas and kelp cutting by diamond divers in near-shore areas of the BCLME
Project value: US$66 400
Contracted to: PISCES Environmental Consultants
Completion date: January 2007

BEHP/EEF/03/01 – 02
By-catch of threatened seabirds, sharks and turtles in long-line fisheries in the BCLME: an integrated approach
Project value: US$113 299
Contracted to: WWF-South Africa
Completion date: August 2006

BEHP/BAC/03/01
Marine biodiversity status assessment and conservation planning for the BCLME
Project value: US$134 905
Contracted to: BENEFIT
Completion date: April 2007

BEHP/BAC/03/02
Mapping of the shoreline, shallow water, estuarine and offshore habitats of the BCLME
Project value: US$95 185
Contracted to: BENEFIT
Completion date: October 2006

BEHP/BAC/03/03
Identification of communities, biotopes and species along the BCLME shoreline and shallow sub-tidal zone, and assessment of offshore biodiversity
Project value: US$216 761
Contracted to: BENEFIT
Completion date: April 2007

BEHP/BAC/03/04
Baseline surveying of species and biodiversity in estuarine habitats
Project value: US$99 929
Contracted to: BENEFIT
Completion date: December 2006

BEHP/LBE/04/01
Luanda Bay Ecosystem Project
Project value: US$80 000
Contracted to: INIP
Completion date: February 2007

BEHP/MC/03/02
Classification of coastline for aquaculture development
Project value: US$50 000
Contracted to: BENEFIT (incorporated into BEHP/BAC/03/01)
Completion date: April 2007

BEHP/CD/03/01
Development of institutional capacity for biodiversity research in the countries of the BCLME
Project value: US$ 100 000
Contracted to: BENEFIT
Completion date: April 2007

BEHP/ML/03/01
Marine litter
Project value: US$50 000
Contracted to: Eco-Africa
Completion date: November 2006

BEHP/BW/03/01
Ballast water programme
Project value: US$35 000
Contracted to: GISP
Completion date: December 2006

BEHP/WRF/04/01
Assessment of the need for waste reception facilities in ports across the BCLME region
Project value: US$10 000
Contracted to: To be identified
Completion date: April 2007

BEHP/BTA/04/01
Analysis of threats and challenges to marine biodiversity and marine habitats in Namibia and Angola
Project value: US$36 308
Contracted to: BENEFIT
Completion date: November 2006

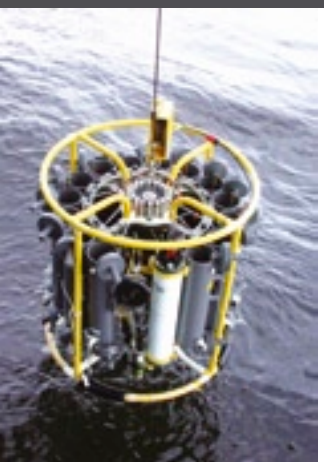
BEHP/Survey/06/01
Transboundary pollution monitoring
Project value: US$100 000
Contracted to: IMR
Completion date: January 2007

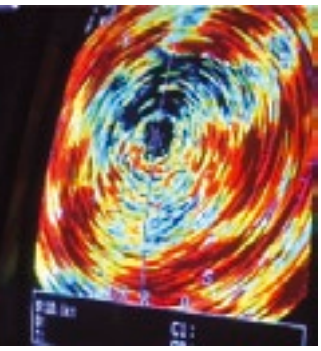





Abbreviations

CSIR: The Council for Scientific and Industrial Research (South Africa)
FAO: Food and Agriculture Organisation of the United Nations
GISP: Global Invasive Species Programme
IMR: Institute of Marine Research (Norway)
INIP: *Instituo Nacional de Investigação Pesqueira* (Angola)
IRD: *Institut de reserche pour le développement* (France)
UCT: University of Cape Town
MCM: Marine and Coastal Management (South Africa)
MFMR: Ministry of Fisheries and Marine Resources (Namibia)
NOAA: National Oceanic and Atmospheric Administration (USA)
SAIEA: Southern African Institute for Environmental Assessment
UBC: University of British Columbia (Canada)
WWF: Worldwide Fund for Nature





Environmental Variability Projects

EV/LS/02/03
Analysis of Benguela dynamical variability and assessment of predictability of warm and cold events in the BCLME
Project value: US$150 000
Contracted to: UCT
Completion date: February 2006
Final report under review

EV/LOW/02/03
Assessment of key transboundary processes and measurement scales in respect of low oxygen water (LOW) variability: preliminary implementation and examination of the role of large scale and transboundary hydrodynamic control of LOW variability
Project value: US$62 750
Contracted to: UCT and CSIR
Completion date:
Extended to April 2006
Final report under review

EV/LOW/02/04
Assessment of key transboundary processes and measurement scales in respect of low oxygen water variability: implementation of the LOW generation areas simulation that provide inputs to transboundary models in LOW project EV/LOW/02/03
Project value: US$122 500
Contracted to: UCT and CSIR
Completion date:
Extended to April 2006
Final report under review

EV/LS/02/06
Diagnosis of large scale South Atlantic modes that impact on the transboundary BCLME: investigating the potential for improved predictability and sustainable management
Project value: US$87 959
Contracted to: UCT
Completion date: January 2007

EV/PROVARE/02/05
Retrospective analysis of plankton community structure in the BCLME to provide an index of long-term change in the ecosystem
Project value: US$105 849
Contracted to: BENEFIT
Completion date:
Extended to March 2007

EV/PROVARE/04/01
Characterising the spawning habitat (temporal, spatial and in terms of physical and biological attributes) of harvested pelagic species *(Sardinops sagax, Trachurus sp., Engraulis capensis)* using Continuous Underwater Fish Egg Sampler (CUFES) and net sampling
Project value: US$93 003
Contracted to: BENEFIT
Completion date: February 2007

EWS/TG/02/02
Purchase and installing tide gauges in the BCLME
Project value: US$100 000
Contracted to: To be identified

EV/MODEL/03/01
A cross-cutting simulation-modelling capability for the BCLME
Project value: this project - US$126 935 plus additional US$36 000 (2004); US$35 000 (2005) – hardware expenditure
Contracted to: UCT
Completion date: March 2007

EV/HAB/05/02
Development of an operational capacity for monitoring of Harmful Algal Blooms in countries bordering the northern part of the BCLME: Phase 1 – Design: component pilot monitoring in the Lüderitz area
Project value: US$4 015
Contracted to: MFMR
Completion date: March 2006
Final report under review

EV/LS/02/02b
PIRATA SE Extension – purchase, deployment and retrieval of a moored buoy off the coast of Angola
Project value: US$100 000
Contracted to: NOAA, IRD and Dr Mathieu Rouault
Completion date: July 2007

EV/HAB/06/01
Development of an operational capacity for a shellfish sanitation monitoring program in countries bordering the northern part of the BCLME: phase II - implementation
Project value: US$90 743
Contracted to: MFMR
Completion date: March 2007

EV/PROVARE/06/01
Development of satellite remote sensing products for operational application.
Project value: US$112 152
Contracted to: BENEFIT
Completion date: September 2007

BCLME/EEWS/05/01
Development of and making operational a viable and integrative Environmental Early Warning System (EEWS) for the BCLME
Project value: US$116 770
Contracted to: UCT
Completion date: November 2007

BCLME/SEIS/05/01
Development of and making operational a viable and integrative State of the Ecosystem Information System (SEIS) for the BCLME
Project value: US$87 242
Contracted to: BENEFIT and Feike
Completion date: August 2006

BCLME/Boundary/05/01a
Angola/Benguela Front Workshop – part A: assessment of the structuring and functioning of the Angola-Benguela Frontal System and its implications for the sustainable resource management in the BCLME: phase I – initial study
Project value: US$45 000
Contracted to: BENEFIT
Completion date: July 2006

BCLME/Boundary/06/01
Southern Boundary Workshop
Project value: US$30 000
Not contracted out as the EVAC is involved directly
Completion date: Workshop: 3 to 5 May 2006. Completion of SBWS product expected 4 months later

Living Marine Resources Projects

LMR/CF/03/16
Development of a management plan for bronze whaler shark resources in the BCLME region
Project value: US$77 869
Contracted to: BENEFIT
Completion date: January 2007

LMR/SE/03/02
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
Project value: US$133 260
Contracted to: Enviro-Fish Africa
Completion date: December 2006

LMR/SE/03/03
An analysis of right-based micro-economic systems and governance of the important commercial fisheries in the BCLME countries
Project value: US$229 914
Contracted to: Enviro-Fish Africa
Completion date: December 2006

LMR/SE/03/04
Harmonisation of socio-economic policies and legal provisions for effective implementation of the BCLME Programme
Project value: US$135 000
Contracted to: Enviro-Fish Africa
Completion date: March 2007

LMR/SE/03/05
An analysis of revenue raising instruments of the important commercial fisheries in the BCLME countries
Project value: US$91 228
Contracted to: Enviro-Fish Africa
Completion date: December 2005 (Delayed – deliverables outstanding)

LMR/EAF/03/01
Ecosystem approaches for fisheries (EAF) management in the BCLME
Project value: US$257 270
Contracted to: MCM and FAO
Completion date: December 2006

LMR/EAF/03/02
A regional ecosystem monitoring programme: top predators as biological indicators of ecosystem change in the BCLME
Project value: US$217 994
Contracted to: MCM
Completion date: December 2006

LMR/MC/03/01
Development of a responsible aquaculture policy for the BCLME
Project value: US$92 734
Contracted to: Enviro-Fish Africa
Completion date: May 2005 (Delayed – final report to be delivered)

LMR/CF/03/10
Development and harmonization of research and management on transboundary pilchard stocks between Angola and Namibia
Project value: US$50 000
Contracted to: To be identified
Completion date: A workshop is planned for late 2006 or early 2007

Feike and BENEFIT collaborate on SEIS project

Feike, a consultancy with expertise in fisheries and environmental management, has teamed up with BENEFIT to design a set of four ecosystem information systems for the BCLME.

Through the State of the Ecosystem Information System or "SEIS" project, the following four web-based information systems will be designed and populated with the latest data available for the three countries of the Benguela:

- a State of the Environment information system which will provide data trends for oceanographic measurements such as sea surface temperature, salinity and wind speed and direction;
- State of the Marine Living Resources information system, which will provide data on a species basis for each country, recording trends in catches, catch values, spawner biomass and jobs sustained by the fishery;
- State of Negative and Adverse Impacts information system which will identify threats to the BCLME such as ballast water discharges, sewage out falls and marine mining;
- State of the Ecosystem information system which will provide access to all of this data through a website.

It is anticipated that the population of these databases will ultimately provide the users of the BCLME – for example, fisheries managers and members of the fishing industries of the three countries – with a single location on the internet where a host of relevant data may be sourced and interpreted, in order to identify possible ecosystem threats.

Dr Neville Sweijd, director of BENEFIT, Dr Mick O'Toole, chief technical advisor to the BCLME Programme and Horst Kleinschmidt and Shaheen Moolla of Feike, signing the SEIS project contract.

Namibia earmarks funds for shellfish sanitation

Namibian oysters are said to be the best in the world!

Namibia's oyster farming industry is looking to new markets in the Far East and gearing up for substantial growth. The introduction of a structured shellfish sanitation programme will help the industry to achieve its ambitions.

Oyster farming is the most established aquaculture activity in Namibia with six farms currently in operation at Walvis Bay, Swakopmund and Lüderitz. Both Pacific oysters *(Crassostrea gigas)* and European oysters *(Ostrea edulis)* are grown. The estimated production of the Namibian oyster industry in 2004 was 6 million oysters, worth approximately N$12 million (R12M). Some farmers are experimenting with alternative species such as scallops *(Argopecten purpuratus)* and one operation in Walvis Bay is harvesting wild clams, *(Venerupis corrugatus)* and fattening them for the export market.

There are a number of factors that make Namibia an ideal location for oyster farms. For a start, the nutrient-rich waters of the Benguela Current encourage rapid growth. Oysters grow to market size in eight or nine months in Namibia, in contrast with Europe where they are typically cultivated for 24 months. Namibia also has the added benefit of clean water; no rivers empty into the sea along the desert coast, dramatically reducing the potential for contamination from land-based marine pollution.

Oysters are cultivated in bags or plastic baskets like these.

The importantance of clean water shouldn't be under-estimated. As molluscan bivalves filter and ingest particulate matter in the seawater around them, they concentrate bacteria, viruses and other potentially dangerous biological contaminants that can make consumers sick. Another risk to shellfish consumers is from blooms of toxic algae (harmful algal blooms or HABs); as they filter seawater, oysters can accumulate potent biotoxins in their tissues.

Because of the dual threat to consumers from algal toxins and microbial and other contaminants, international regulations and procedures have been developed to ensure that shellfish are harvested, handled, processed and shipped under conditions to guarantee consumer safety. HAB monitoring programs are typically embedded within comprehensive shellfish safety programs which are often termed "shellfish sanitation programs".

Namibia and Angola have begun to develop basic capacity for the implementation of shellfish sanitation programs. The two countries have been working together through the BCLME Programme to develop a shellfish sanitation programme for the Benguela region. The next step for Namibia is to build and equip the industrial laboratories it needs to carry out mandatory tests that certify its cultured shellfish products are uncontaminated and safe for human consumption.

"We've been trying for five years to get a laboratory in place," says James West, chairman of the Namibian Mariculture Association, "we're still relying on Cape Town and it's not satisfactory. We need a one day turnaround time."

Test results can take up to three weeks to be returned from Cape Town and the lack of local laboratories inhibits Namibia's ability to meet the food safety requirements of potential trading partners, such as the European Union (EU).

"I definitely feel that this relatively small issue is preventing some massive development," says Mr West.

Although the oyster culture industry is understandably frustrated by the lack of laboratory services, a great deal of progress has been made in the last two years. With funding from the BCLME Programme and assistance from a team of international scientists, the National Marine Information and Research Centre (NatMIRC) has succeeded in introducing a shellfish sanitation programme modeled on the food safety regimes of other shellfish producing nations such as the EU, New Zealand and the United States. Water quality in Walvis Bay's Aquapark – 1 250 hectares of sea space in Walvis Bay harbour which is reserved for aquaculture activities - is tested once every two weeks and similar tests are conducted in Lüderitz. Oysters are tested for bacterial contamination and heavy metals, but NatMIRC still lacks the equipment to carry out routine tests for biotoxins.

Bronwen Currie, chief biologist at NatMIRC's aquaculture directorate, is well aware of the oyster producers' frustrations, but she is encouraged by the fact that Namibia's Ministry of Trade and Industry and the Ministry of Fisheries and Marine Resources have jointly earmarked funds for the construction of the required laboratories. Presently, microbiology and phytoplankton laboratories dedicated to aquaculture are being set up at NatMIRC, while biotoxin

laboratories will jointly be funded by the Ministry of Trade and Industry and The Ministry of Fisheries and Marine Resources:

"This is a huge step forward because the Ministry of Trade and Industry, as the competent authority, has realised how serious the situation is and has prioritised these laboratories," she says.

Ms Currie has no doubt that the industry will get the laboratories it needs, but she concedes that constructing and equipping of the labs will take time.

In the meantime, the oyster producers are investigating a number of stop-gap measures which would allow the industry to meet the food safety requirements of its trading partners.

Ironically, after two years of monitoring, NatMIRC scientists have found no evidence of biotoxins in Namibian oysters. Even though the waters of Namibia are extremely rich in phytoplankton, regular tests have so far proved negative for biotoxins that could cause poisoning syndromes in consumers. A species such as *Alexandrium catenella*, could cause paralytic shellfish poisoning (PSP), whilst some species of *Dinophysis* and *Pseudo-nitzschia* can cause diarrhetic shellfish poisoning (DSP) and amnesic shellfish poisoning (ASP) respectively.

"We don't think that biotoxins are a problem here, even though we've got the species," says Ms Currie.

The scientist's tests have verified the fact that the water off Namibia is exceptionally well suited to the cultivation of oysters. Regular testing of water quality in the Aquapark, coupled with tests on cultivated oysters, have all proved negative for dangerous bacteria, heavy metals and phytoplankton toxins.

"This is very good news for the industry," says Ms Currie.

A worker at an oyster farm outside Swakopmund prepares oysters for market.

A traditional Spanish raft is used to cultivate oysters, scallops and clams in Walvis Bay's Aquapark.

Oyster farmers plan for substantial growth

Spurred on by the advantage of clean, phytoplankton-rich water and strong demand from emerging markets, Namibia's oyster farmers are preparing for substantial growth.

The Aquapark at Walvis Bay, which is reserved by Namibia's port authority, Namport, for aquaculture activities, was recently expanded from 500 to 1 250 hectares of sea space. The park is situated between three and four nautical miles from the quays of the fishing companies that dominate the northern fringe of the harbour. It is protected from the prevailing south westerly swell by the sand spit of Pelican Point.

Three farms are currently utilising the Aquapark for the cultivation of oysters. Two farms use the longline system for cultivating oysters, while a third farm uses the traditional Spanish raft method.

The longline system is a very simple method of culture. Horizontal lines are strung across the water and kept afloat by large plastic drums. Racks of oysters are then suspended from the horizontal lines. Each rack holds about 1 000 medium-sized oysters. With the raft system, bags and racks of oysters are suspended from the wooden beams of a sturdy raft. The floating raft is anchored to the seabed.

Both of the farms that utilise the longline system of culture are preparing to dramatically increase the number of lines available for oyster culture.

James West of Namibia Aquaculture (Namaqua) is planning to increase the production of Namaqua's farm to a million oysters per month.

"We have a well established production system," says Mr West, so expanding our production will simply mean doing more of the same."

Henning du Plessis of Joe's Oysters is establishing 300 longlines in the Aquapark with the same goal of producing a million oysters per month.

Gregory Swartz who produces oysters at the extensive Walvis Bay Salt Refiners is also gearing up to produce larger quantities of oysters:

"We produce a million oysters per year and we're looking at expanding and producing a million-and-a-half," he says.

The industry's collective plans to expand oyster production are being driven by strong demand from markets in the Far East. Namaqua already sells oysters into Beijing, and Mr West is encouraged by avid demand for Namibian oysters from the Chinese market.

"In China you have a huge developing economy, a huge population and people moving into an income bracket where they can afford to eat oysters," explains Mr West, "the market is there."

Hake tops the shared stocks agenda

Genetic analysis is just one of a range of tools that scientists from Namibia and South Africa will employ over the next two years in a bid to ascertain with reasonable certainty whether the two countries share a single stock of deep-water hake *(Merluccius paradoxus)*.

Paul Nichols and Nangula Mbako represented the Namibian ministry of Fisheries and Marine Resources at the workshop. They are pictured with their South African counterparts, Johann Augustyn and Theresa Akkers of the Department of Environmental Affairs and Tourism.

Larry Hutchings, chief specialist scientist at Marine and Coastal Management, Tim Reddell, chair of the South African Deep-Sea Trawling Industry Association (SADSTIA) and Roy Bross, secretary of SADSTIA.

The decision to intensify genetic studies of deep water hake stocks was taken at a three-day stock assessment workshop that brought South African and Namibian scientists together in Cape Town in May.

The scientists were meeting for the first time to discuss the possibility of working more closely on the management of valuable fisheries resources such as hake.

The workshop concluded that, while there is evidence to suggest that South Africa and Namibia do not share stocks of shallow water hake *(M. capensis)*, the situation with deep water hake *(M. paradoxus)* is less certain.

Further research is warranted because, if the stock is shared by the two countries, over fishing in one country could affect catches in the other.

"The possibility that the stocks are shared should be taken seriously by both countries," concluded Dr Tony Smith, one of three international experts in fisheries stock assessment who were invited to the workshop to provide advice and to steer the discussions.

Although scientists have studied hake for more than 50 years, their research has tended to focus on the assessment of biomass (stock size), rather than the movement of hake in the Benguela ecosystem. The new interest in hake movement has been initiated by the BCLME Programme which is looking at ways of managing fish stocks that straddle the national borders of Angola, Namibia and South Africa.

Hake and horse mackerel are believed to be shared by South Africa and Namibia and Namibia and Angola respectively. But fisheries managers cannot begin to talk about future sharing arrangements before scientists can say with a degree of certainty that the stocks are in fact shared by two or more countries.

"Scientists in the Benguela region need to look to new scientific techniques, such as genetics and in-situ fish tagging to help them to determine whether deep water hake stocks are, in fact, shared by South Africa and Namibia," explains Dr Mick O'Toole, chief technical advisor to the BCLME Programme.

"This is one of the most important research questions in the region."

Tony Smith of the Australian Commonwealth Scientific and Research Organisation (CSIRO) chaired the hake workshop. He is pictured with Nangula Mbako, permanent secretary of the Ministry of Fisheries and Marine Resources (MFMR) and Moses Maurihungirire, director of Resource Management at the MFMR.

Namibian participants in the Workshop included Paul Kainge and Johnny Kathena of the MFMR's demersal section, Heinrich Lesch of Hangana Fisheries and Titus Iilende, deputy director at MFMR.

A new beginning for BENEFIT – Structures to be integrated with the BCC

In the eight years of its existence, the BENEFIT Programme has matured and is now a well- established and internationally recognised research programme, attracting several collaborative efforts from a number of countries.

by Neville Sweijd

BENEFIT has served as a vital stepping-stone for the establishment of the BCLME Programme and over the past three years, has executed projects worth US$750 000 (R4.8 million) on behalf of the BCLME Programme. Formally, the BENEFIT programme is scheduled to terminate at the end of 2007 and plans are well underway to develop the programme so that regional scientific co-operation can continue under the auspices of the Benguela Current Commission (BCC). The plan for BENEFIT is that it be absorbed into the BCC and that it becomes a part of the BCC structures under a new name. This vision has been incorporated into the Interim Agreement that is to be signed by ministers from Angola, Namibia and South Africa.

BENEFIT's Management Action Committee has already recognised that the Programme will need to transform from a science-driven programme into a more management-driven one whose research activities are determined by management priorities. Therefore, I am happy to report the Norwegian government has signed a proposal to fund a two-year bridging programme that is to assist BENEFIT to transform into a scientific body that addresses both the national and the transboundary management issues, and orients the programme towards the goals the BCC.

The Norwegian government has also agreed to maintain Norwegian co-funding of the BENEFIT Secretariat in 2006 and 2007 and support a re-focused training effort via the Secretariat. The training project aims to amalgamate the residual research and training activities of the Nansen Programme's engagement with BENEFIT. The funds acquired are fairly substantial and will help to position BENEFIT as the focal point for stakeholders in the region and internationally – thus fulfilling the original aims of the Programme.

BENEFIT is rapidly moving closer to the goals and objectives of the BCLME Programme's Strategic Action Programme (SAP) and it is essential that close co-operation continues to be maintained, especially on resources and environmental matters.

Two successful workshops

In the past six months, BENEFIT has organised two important workshops on behalf of the BCLME Programme. The first of these - the Angola Benguela Front Workshop - was hosted in Swakopmund in April and backed onto the annual BENEFIT Forum. It was a highly successful meeting which focused on the northern boundary of the BCLME, where the cold, northward flowing Benguela Current meets the warm, tropical, southward flowing Angolan Current. The frontal region is highly productive and very important to both Namibia and Angola.

The Workshop provided an ideal opportunity to gain an enhanced understanding of the mixing processes and their impacts on the fisheries of the region. It also provided researchers with an opportunity to take a closer look at decadal events such as Benguela *Niños* and low oxygen water anomalies, both of which are of concern to fisheries managers in Angola and Namibia.

The Joint Hake Research Workshop took place in Cape Town in May. It was well attended by scientists and fisheries managers from both Namibia and South Africa and represented an important first step towards the proposed joint management of deep-water hake stocks. Based on the strong recommendations of the meeting, BENEFIT has proposed that eight activities (with a total cost of US$574 000) be implemented over the next 18 months with a view to determining with more certainty whether stocks of deep-water hake, *Merluccius paradoxus*, are in fact shared between Namibia and South Africa. At least 70 per cent of the research costs would be funded by BENEFIT and would be directed towards covering the costs of transboundary ship-based research surveys.

A benefit to BENEFIT

Pavs Pillay, the smiling and efficient face behind the SANCOR secretariat for four years, was recently appointed as BENEFIT's training officer.

Ms Pillay took up her position at the BENEFIT secretariat in Swakopmund in May and is already implementing the new in-service training plan for BENEFIT. The plan consists of a series of workshops on ship-board training, hydroacoustics, report writing, stock assessment, language courses and instrumentation.

Ms Pillay has also undertaken a retrospective study with the purpose of quantifying the training and capacity building activities that have been conducted by BENEFIT and the BCLME Programme since their inception. She is focusing on student training, training courses, workshops and conferences.

The position of training officer is co-funded by BENEFIT and the BCLME Programme.

Pavs Pillay is BENEFIT's new Training Officer.

Projecto EAF conta com participação valiosa

O projecto BCLME para investigar a viabilidade da implementação de uma Abordagem de Ecossistema para as Pescas (EAF) na Corrente de Benguela está a chegar ao fim, com uma data de finalização planeada para Dezembro de 2006.

por Kevern Cochrane

A maioria das pescarias principais na região foram incluídas no projecto. Estas são:

Angola: as pescas de arrasto demersal, artesanal e de pequenos pelágicos;

Namíbia: a pesca de pescada, pesca de rede de pequenos pelágicos e pesca de arrasto de carapau em águas intermédias;

África do Sul: pesca de espécies demersais, pequenos pelágicos e lagosta do Cabo.

Apesar deste grupo de pescarias ser representativo das principais pescarias comerciais na região, existem lacunas importantes que deveriam ser consideradas no futuro.

As avaliações de risco formais foram finalizadas numa série de seminários específicos que tiveram lugar nos três países durante o ano de 2005. As avaliações de risco geraram uma lista exaustiva de problemas, fraquezas e falhas verificadas nas pescarias, cuja prioridade foi estabelecida de acordo com a magnitude do risco que colocam para o uso óptimo e sustentável dos recursos do ecossistema do BCLME.

Os seminários reuniram cientistas, gestores, membros da indústria pesqueira e grupos de conservação, que contribuiram com informação e ideias essenciais.

Durante o passo seguinte do projecto – que chegou ao ponto fulcral da avaliação da viabilidade da implementação da EAF – foi necessário identificar nas longas listas os aspectos que se podem considerar um resultado da expansão de uma abordagem de espécie única para uma abordagem de ecossistema, independentemente de serem já considerados na gestão ou não.

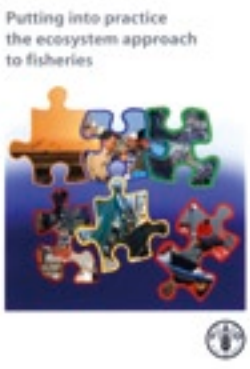
Essa foi a primeira tarefa do seminário regional acolhido pelo Instituto de Investigação Pesqueira de Angola, INIP, em Luanda em Março de 2006. O seminário prosseguiu com o início das análises de custos e benefícios das potenciais opções de gestão para a implementação da EAF.

Os custos e benefícios estimados para as opções de gestão – e para a combinação de opções de gestão que poderá ser necessária para satisfazer os objectivos de uma abordagem de ecossistema – determinarão, em última análise, quais as abordagens que serão utilizadas bem como a viabilidade geral da implementação da EAF. Darão informação, por exemplo, sobre as implicações positivas e negativas de opções como áreas fechadas, modificações nos materiais ou práticas de pesca, estações de encerramento e outras medidas para resolver aspectos da EAF identificados nos seminários de avaliação de risco.

As implicações biológicas, ecológicas, sociais, económicas e de gestão dessas opções precisam de ser avaliadas para assegurar que quaisquer decisões tomadas sobre a implementação da EAF serão baseadas na melhor e mais completa informação. Participaram dezanove pessoas no seminário e, mais uma vez, tivemos a sorte de contar com uma boa participação de gestores, cientistas, membros da indústria pesqueira e outros.

O BCLME encontra-se, sob muitos aspectos, a explorar novo terreno ao tentar realizar uma análise custo-benefício rigorosa e exaustiva da implementação da EAF e, tanto quanto sei, nunca antes se tentou uma análise de uma forma tão integrada. Como tal, esta análise está a atrair bastante atenção a nível internacional. Como exemplo, o Sr Mick O'Toole foi convidado a fazer uma apresentação sobre o projecto BCLME e a EAF no Processo Consultivo Aberto Informal sobre Oceanos e a Lei do Mar das Nações Unidas em Junho, onde o trabalho que está a ser realizado pelo projecto foi recebido com bastante interesse.

De modo a ter sucesso, têm que ser confrontados dois problemas chave. O primeiro é a complexidade da identificação e, em última análise, a integração das opções



FAO publication simplifies EAF

Although the principles of the ecosystem approach to fisheries (EAF) are not new, there is very little practical experience in their implementation. A new publication from the Food and Agriculture Organisation (FAO) of the United Nations should help to remedy that.

The booklet, Putting into practice the ecosystem approach to fisheries, *provides a concise and non-technical outline of the purpose and meaning of the ecosystem approach to fisheries. It is essentially an abridged version of the* FAO Fisheries Technical Guidelines No 4.2: Fisheries Management - The ecosystem approach to fisheries.

The booklet is written in plain language and should help people to better understand EAF and make progress with implementing an ecosystem approach to fisheries, says Dr Kevern Cochrane of the FAO's Marine Resources Service.

Putting into practice the ecosystem approach to fisheries *was put together by three South Africans: Kevern Cochrane of the FAO and writers, Karoline Hanks and Claire Attwood. It is available from the FAO in hard copy, but may also be downloaded from the FAO's website:* **www.fao.org.**

de gestão potenciais para lidar com os muitos aspectos de grande prioridade que foram identificados em todas as pescarias. O segundo problema é realizar análises de custo-benefício com significado face à informação limitada e grande incertezas. Quando este boletim for publicado, as análises custo-benefício deverão estar finalizadas para cada pescaria em estudo nos três países. Estas análises estão a ser realizadas principalmente através de seminários, mas complementadas quando necessário por consultas estruturadas. Mais uma vez, a participação de grupos de interesse múltiplos tem sido crucial. Os resultados serão preliminares e, como um todo, precisam de ser encarados como indicativos apenas e não como resultados e conclusões finais e validados. No entanto, eles serão altamente informativos e deverão oferecer uma boa indicação geral sobre as potenciais opções e as suas implicações, que terão que ser consideradas à medida que se continua a avançar para a implementação concreta da EAF na região do BCLME.

A finalização das análises custo-benefício e a extracção de resultados e conclusões é a grande tarefa restante no projecto e utilizará a maior parte do tempo disponível dos atarefados líderes e colaboradores nacionais.

Para além disso, é preciso completar outros estudos específicos, incluindo estudos sobre indicadores adequados para a EAF no BCLME, necessidades de investigação futura, meios de melhorar a tomada de decisão e potenciais incentivos para a implementação da EAF. Um terceiro seminário regional agendado para Novembro de 2006 na Cidade do Cabo ajudará a coordenar e sintetizar toda esta informação. O programa é apertado, mas espera-se um relatório final informativo e estimulante que deverá dar informação valiosa e abrangente aos decisores políticos, gestores e outros grupos de interesse sobre o que é necessário para a implementação da EAF e o que tal poderá significar.

Como conclusão, este é um projecto ambicioso e, apesar de se ter já atingido bastante, existe ainda trabalho fundamental considerável a realizar até ao final do ano.

EAF project enjoys valuable participation

by Kevern Cochrane

The BCLME project investigating the feasibility of implementing an Ecosystem Approach to Fisheries (EAF) in the Benguela is now drawing to a close, with a scheduled completion date of December 2006.

Most of the major fisheries in the region have been included in the project. These are:

- *Angola: the demersal trawl, artisanal and small pelagic fisheries;*
- *Namibia: the hake fishery, purse-seine fishery for small pelagics and the midwater trawl fishery for horse mackerel;*
- *South Africa: the demersal, small pelagic and rock lobster fisheries.*

Although this group of fisheries is representative of the major commercial fisheries in the region, there are clearly some important gaps that should be followed-up in the future.

The formal risk assessments were completed at a series of dedicated workshops held in the three countries during the course of 2005. The risk assessments generated a comprehensive list of the problems, weaknesses and oversights experienced in the fisheries, and prioritised them on the basis of the magnitude of risk they pose to the optimal and sustainable use of the BCLME's ecosystem resources.

The workshops brought together scientists, managers, members of the fishing industry and conservation groups, all of whom provided essential information and ideas.

During the next step in the project - which gets to the heart of evaluating the feasibility of implementing EAF - it was necessary pull out of those long lists those issues that can be considered as arising from the expansion from a single-species approach to an ecosystem approach, whether or not they are already being addressed in management.

That was the first task of the regional workshop hosted by the Angolan Institute of Fisheries Research, INIP, in Luanda in March 2006. The workshop went on to begin the analyses of the costs and benefits of potential management options for the implementation of EAF.

The estimated costs and benefits of management options, and of the combination of management options that may be required in order to satisfy the goals of an ecosystem approach, will ultimately determine which approaches should be used, and the overall feasibility of implementing EAF. They will provide information, for example, on the positive and negative implications of options such as closed areas, modifications to gear or fishing practice, closed seasons

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and other measures to resolve EAF issues identified in the risk assessment workshops.

The biological, ecological, social, economic and management implications of such options need to be evaluated to ensure that any decisions made about the implementation of EAF will be based on the best, comprehensive information. Nineteen people participated in the workshop and we were again fortunate to enjoy good participation from managers, scientists, members of the fishing industry and others.

BCLME is, in many respects, treading new ground in attempting a rigorous and comprehensive cost-benefit analysis of the implementation of EAF and, to the best of my knowledge, it has not been attempted in such an integrated manner before. As such, it is attracting considerable attention internationally. For example, Dr Mick O'Toole was invited to make a presentation on the BCLME project and EAF at the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea in June, where the work being undertaken in the project was greeted with considerable interest.

In order to be successful, two key problems have to be confronted. The first is the complexity of identifying, and ultimately integrating, the potential management options for addressing the many high priority issues that have been identified across all fisheries. The second problem is to undertake meaningful cost – benefit analyses in the face of limited information and high uncertainties. By the time this newsletter is published, cost-benefit analyses should have been completed for each fishery being studied in all three countries. They are being completed mainly through workshops but supplemented where necessary through structured consultations. Again, multi-stakeholder participation has been crucial. The results will be preliminary and, as a whole, need to be seen as being indicative only, rather than as final and validated results and conclusions. Nevertheless, they will be highly informative and should provide a good, broad indication of potential options, and their implications, that will warrant consideration as the move towards actual implementation of EAF in the BCLME region continues.

Completion of the cost-benefit analyses and extracting results and conclusions is the single biggest task remaining for the project and will absorb much of the available time of the long-suffering and very busy national leaders and contributors to the project.

In addition, some other specific studies also need to be completed, including studies on suitable indicators for EAF in the BCLME, future research needs, means to improve decision-making and potential incentives for implementation of EAF. A third regional workshop scheduled to be held in Cape Town in November 2006 will help to coordinate and synthesise all this information. The programme is tight but an informative, thought-provoking final report is anticipated that should provide valuable and broad information to the policy-makers, managers and all other interested groups on what is required for the implementation of EAF and what it could entail.

In conclusion, this is an ambitious project and although much has been achieved, there remains a lot of critical work to do before the end of the year.

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Training and Capacity Building (2005)

The BCLME Programme recently sponsored the following training fellowships, attendance at short courses and international meetings:

Bronwen Currie, NatMIRC (Namibia); IOC training course on qualitative and quantitative determination of algal toxins, Germany, 22 February – 3 March 2005;

Chris Reason (UCT-South Africa): International Geophysical Union AGM, Vienna, May 2005

Tim Eiman, Namport, Walvis Bay (Namibia); Train-Sea Coast Managing Marine Pollution Course, Cape Town, 23rd May-3rd June

Grilo Antonia, (MoUAE -Angola), Train-Sea Coast Managing Marine Pollution Course, Cape Town, 23rd May-3rd June

Silvana Manuel Faria (INIP-Angola), Train-Sea Coast Managing Marine Pollution Course, Cape Town, 23rd May – 3rd June

Paulo Alexandre da Conceicao Alfonso (MinPet- Angola), Train-Sea Coast Managing Marine Pollution Course, Cape Town, 23rd – 3rd June

Natalino Mateus, (Port Authority -Angola), Train-Sea Coast Managing Marine Pollution Course, Cape Town, 23rd May – 3rd June

Aina Iita , NatMIRC (Namibia), Train-Sea Coast Managing Marine Pollution Course, Cape Town, 23rd May – 3rd June

Wilma Gaweses, MWTC (Namibia), Train-Sea Coast Managing Marine Pollution Course, Cape Town 23rd May -3rd June

Pedro Tchipalanga, (IIM-Namibe) and **Tima Lutumba** (IIM), Argo Meeting, Cape Town, 12-14 May 2005

David Uushona (Municipality of Walvis Bay). International Course in Environmental Management, Israel, 19th May – 6th June (ticket only)

Approximately **US$25,600.00** was committed to covering the costs of the above activities.

The Training and Capacity Building Advisory Group approved the bursary amount of US$12,000.00 to **Stephen Ambambi**, Deputy Director of Operations, Ministry of Fisheries and Marine Resources, Namibia to attend a training course at the World Maritime University, Sweden in 2005 to 2006. Mr Ambambi's course is co-financed by the Ministry of Fisheries, BENEFIT and the EU-MCS Programme.

Taking a closer look at the southern boundary

The meeting and mixing of the Benguela and Agulhas currents off the southern tip of Africa came under the spotlight in May when oceanographers and fisheries scientists met for a three-day workshop in Cape Town.

Participants in the Southern Boundary Workshop reviewed recent advances in understanding the influence that environmental processes have on the southern boundary of the BCLME.

The boundary area is generally accepted as being in the vicinity of the Agulhas retroflection area which lies south of Africa.

It is here that several important fish species, such as hake, sardines and south coast rock lobster are fished commercially.

Over the past five or six years, significant shifts in the distribution of marine resources have caused scientists to look more closely at this region. For instance, a dramatic eastward shift in the sardine resource has been well documented. Whereas sardines were traditionally fished off the west coast of South Africa, catches taken off Mossel Bay have leapt up from 2110 tons to 121 536 tons in five years.

Other species have also shown an eastward movement. Most notable has been the shift of west coast rock lobster from the traditional fishing grounds on the west coast to the southeast coast. Seabird biologists have also documented changes in the breeding patterns of several seabirds, including the African penguin, Cape gannet, crowned cormorant and hartlaub's gull.

The Southern Boundary Workshop provided the BCLME community with an opportunity to examine the changes that have taken place in the southern part of the BCLME over the past five or six years.

"It is essential that the state of knowledge and understanding of this part of the ecosystem should be re-examined within the context of the greater Benguela ecosystem and its management," said Dr Mick O'Toole, chief technical advisor to the BCLME Programme.

The Workshop also provided the BCLME community with an opportunity to build links with the Agulhas and Somali Large Marine Ecosystems (ASCLMEs), an initiative that will pull together the efforts of several east African nations in addressing the most pressing environmental challenges facing the east coast of southern Africa.

Catherine Kuske and Cristina Cicognani of the BCLME Programme helped to organise the Southern Boundary workshop. They were assisted by Noni Kulati, a student at Tygerberg College.

Mathieu Rouault of the University of Cape Town, John Pope of Marpro Fishing and Lesley Staegemann, director of the BCLME Programme's activity centre in Cape Town.

Coleen Moloney of UCT and Mark Gibbons of UWC.

Laurent Drapeau of IRD and John Field of UCT.

Melhorar a previsibilidade e prognóstico no BCLME

O BCLME é caracterizado por um nível elevado de variabilidade natural. A esta variabilidade juntam-se as alterações causadas por actividades humanas tais como a pesca, exploração mineira, poluição e, talvez mais recentemente, as alterações climáticas. O resultado é um ecossistema que sofreu alterações substanciais durante os últimos 50 anos e que se está a tornar cada vez mais complexo e difícil de gerir de modo sustentável. Face a estas realidades houve necessidade de acelerar o trabalho na previsibilidade do ecossistema e seus componentes.

por Vere Shannon

A avaliação da variabilidade ambiental, impactes no ecossistema e melhoria da previsibilidade constituem acções políticas chave do Programa de Acção Estratégico (SAP). Dois componentes importantes do SAP são o desenvolvimento de um sistema de alerta ambiental antecipado (EEWS) e a melhoria da previsibilidade de eventos extremos.

Desde 2003, oPrograma BCLME tem vindo a encomendar um conjunto de projectos que pretendem fornecer as bases essenciais para o desenvolvimento e implementação do EEWS planeado para a região do BCLME.

Em Novembro de 2004 foi dado um passo significativo com a realização na Cidade do Cabo do Seminário Internacional sobre Previsão e Assimilação de Dados no Sistema da Corrente de Benguela e Sistemas Comparáveis. (O livro Benguela: Predicting a Large Marine Ecosystem – Benguela: Previsão num Grande Ecossistema Marinho – é o produto deste Seminário. Ver pág. 11.)

Os peritos que participaram neste seminário sugeriram que existem áreas em que pode ser desenvolvida a capacidade de previsão. Estas incluem o controlo ambiental de stocks de peixe pelágico, alerta antecipado de Niños Benguela, pré-condicionamento de baixos níveis de oxigénio, previsão de florescimentos de algas tóxicas e "nowcasting" operacional de estados do mar costeiros.

Com base nestes dados e conhecimento, estamos agora a passar para a próxima etapa no desenvolvimento e implementação de um EEWS custo-eficaz para a região, para complementar o sistema regional de informação do estado do ecossistema (SEIS) em desenvolvimento.

O EEWS consistirá numa gama de indicadores físicos simples e robustos que permitirão à Comissão Interina da Corrente de Benguela (IBCC) tomar decisões informadas.

O projecto EEWS foi lançado em concurso durante a última parte de 2005, tendo sido adjudicado ao concorrente vencedor: Centro de Estudos Marinhos na Universidade da Cidade do Cabo. O Dr Pierre Florenchie é o líder do projecto.

Improving predictability and forecasting in the BCLME

by Vere Shannon

The BCLME is characterised by a high degree of natural variability. Superimposed on this are the changes caused by human activities such as fishing, mining, pollution and, more recently perhaps, climate change. The result is an ecosystem which has undergone substantial changes over the past 50 years and which is becoming increasingly complex and difficult to manage sustainably. These realities have necessitated the fast-tracking of work on the predictability of the ecosystem and its components.

The assessment of environmental variability, ecosystem impacts and improvement of predictability are key policy actions of the BCLME Strategic Action Programme (SAP). Two important components of the SAP are the development of an environmental early warning system (EEWS) and the improvement of predictability of extreme events.

Since 2003 the BCLME Programme has commissioned a suite of projects that are intended to provide the essential building blocks for the development and implementation of the envisaged EEWS for the BCLME region.

A significant step forward was taken in November 2004 when the International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems, was held in Cape Town. (The book Benguela: Predicting a Large Marine Ecosystem *is the product of this Workshop. See p. 11.)*

Experts who participated in the workshop suggested that there are areas in which predictive capability might be developed. These include environment controls of pelagic fish stocks, advanced warning of Benguela Niños, *low oxygen water pre-conditioning, prediction of harmful algal blooms and operational "nowcasting" of coastal sea states.*

Drawing on this knowledge and understanding, we are now embarking on the next step in the development and implementation of a cost-effective EEWS for the region to complement the emerging regional state of the ecosystem information system (SEIS).

The objective of the present project is to develop a sustainable and user-friendly EEWS for the BCLME region. The idea is to provide the management agencies in the three BCLME countries with targeted information and early warning of extreme or anomalous events and their evolution at various time and space scales.

Foi estabelecido um pequeno comité director sob a direcção de Lesley Staegemann, directora do Centro de Actividade do BCLME para a Variabilidade Ambiental, para orientar e rever o progresso do projecto.

As previsões de grande prioridade, ou as tecnologias necessárias para as previsões que o projecto EEWS deverá produzir até Novembro de 2007 são:

Alerta antecipado de Niños Benguela;

Variabilidade da frente Angola/Benguela;

Variabilidade na área do cone Luderitz-Rio Orange;

Pré-condicionamento de água com baixo nível de oxigénio (LOW) (como antecedente para o futuro desenvolvimento de um sistema de previsão de LOW);

Monitorização de redemoinhos e filamentos – variabilidade da fronteira a Sul do BCLME;

Florescimentos de algas tóxicas;

Previsão do estado do mar.

Todo este trabalho será integrado de perto com o trabalho do projecto parceiro SEIS. De facto, ambos os projectos dependerão um do outro – o EEWS dependerá do SEIS para a informação e dados de observações, e o SEIS dependerá do EEWS para modelação e previsões.

O conjunto PIRATA de bóias ancoradas no mar alto no Atlântico equatorial/tropical e a sua extensão para sul, a rede de medidores de maré planeada ao longo da costa do BCLME, e o sistema de detecção remota por satélite são componentes vitais de ambos os projectos de monitorização (SEIS) e previsão (EEWS) do Programa BCLME, tendo estes três componentes sido bastante apoiados pelo Programa.

Numa fase mais avançada, pretende-se que o EEWS seja alargado para um sistema de alerta antecipado do ecossistema integral e em conjunto com um SEIS operacional. Este é o passo lógico a tomar de seguida no processo, esperando-se que aconteça durante a próxima fase que se espera do Programa BCLME, sob os auspícios da IBCC.

The EEWS will consist of a range of simple and robust physical indicators which will enable the envisaged Benguela Current Commission (BCC) to make informed decisions.

The EEWS project was put out to tender during the latter part of 2005 and the tender was subsequently awarded to the successful bidder: the Centre for Marine Studies at the University of Cape Town. Dr Pierre Florenchie is project leader.

A small steering committee under the chairmanship of Lesley Staegemann, director of the BCLME's Activity Centre for Environmental Variability, has been established to guide and review the project's progress.

The high priority forecasts, or forecast enabling technologies which the EEWS project is required to deliver by November 2007 are as follows:

- *Advance warning of Benguela* Niños*;*
- *Variability of the Angola/Benguela front;*
- *Variability in the Lüderitz-Orange River cone area;*
- *Low oxygen water (LOW) preconditioning (as a prelude to the future development of a forecast system for LOW);*
- *Tracking Agulhas eddies and filaments - variability of the BCLME's southern boundary;*
- *Harmful algal blooms;*
- *Forecasting of sea state.*

All of this work will be closely meshed with that of the companion SEIS project. Indeed, both projects will rely on one another – EEWS on SEIS for observational information and data, SEIS on EEWS for modelling and predictions.

The PIRATA deep-sea moored buoy array in the equatorial/tropical Atlantic and its southwards extension, the planned tide gauge network along the BCLME coast, and satellite remote sensing are vital components of both the monitoring (SEIS) and predicting (EEWS) projects of the BCLME Programme and all three components have accordingly been strongly supported by the Programme.

At a later stage it is envisaged that the EEWS will be expanded into a fully fledged ecosystem early warning system and dovetailed with an operational SEIS. This is the logical next step in the process, and hopefully it will happen during the anticipated next phase of the BCLME Programme, under the auspices of the BCC.

Public Relations

Cooperation with DLIST-Benguela

Links between the BCLME Programme and DLIST Benguela – the Distance Learning and Information Sharing Tool website – have been strengthened with the compilation of a set of concise and easy-to-read summaries of BCLME project reports.

The two-page summaries were compiled by Claire Attwood, media consultant to the BCLME Programme, and translated into Portuguese by Raquel Garcia of Eco-Africa. To date, 28 project reports have been summarised and 20 are available in both English and Portuguese on the DLIST website.

Copies of the summaries have also been made available on the BCLME website.

The idea is that anyone who is interested in the outcome of BCLME-funded projects can log onto the DLIST or BCLME websites and very quickly learn what individual projects have achieved. If they are interested, they simply download a copy of the full project report.

DLIST is a website where anyone who is interested in the BCLME region - and coastal development in particular - can exchange information. It targets some of the most remote areas of the Benguela region, the Richtersveldt and southern Angola with the aim of helping people in these far-flung places to stay informed about key environmental issues.

By linking up with DLIST Benguela, the BCLME Programme has an opportunity to disseminate project findings and recommendations to people and communities outside of its immediate constituency of scientists and environmentalists. And by showcasing the results of the BCLME projects, DLIST Benguela achieves its mandate of sharing information.

Both DLIST Benguela and the BCLME Programme are funded by the Global Environment Facility (GEF) and focus exclusively on the Benguela region. Therefore, there are real advantages to sharing information and resources between the two projects.

Fish Africa 2005

Cristina Cicognani, administrative assistant to the Activity Centre for Environmental Variability and Maria de Lourdes Sardinha are pictured at the Fish Africa exhibition which took place in Cape Town in October 2005.

The BCLME Programme erected a display at Fish Africa and showcased the Programme to the international fishing industry. In total, 3 784 visitors from 40 countries visited the Fish Africa Expo. Many showed a keen interest in the BCLME Programme.

The directors of the three Activity Centres, Maria de Lourdes Sardinha, Moses Maurihungirire and Lesley Staegemann, all helped to manage the BCLME stand at different stages of the expo. Cristina Cicognani and Claire Attwood manned the stand for the duration of the show and Antonio Barradas of the *Instituto Nacional Investigação Pesqueira* (INIP) also lent a hand. A number of newsletters, maps, brochures and stickers were given away.

BCLME profile printed

A 12-page profile of the BCLME Programme, which describes the objectives, structure and achievements of the Programme, was included on the CD-Rom that will be circulated with the book *Benguela: Predicting a Large Marine Ecosystem*.

The BCLME profile was later updated and printed in English and Portuguese. It was circulated to the PCU and the three Activity Centres and is being used as a high quality brochure to present to international and regional partners.

Portuguese material

Early in 2006, a special effort was made to enhance the quantity of public relations material on the BCLME Programme that is available in Portuguese.

A Portuguese version of the documentary, *Current of Plenty*, was produced on CD and circulated in Angola.

Additional Portuguese copies of the Strategic Action Programme were printed, as were copies of the latest BCLME Programme brochure and profile.

The translations of these publications was handled by Raquel Garcia of Eco-Africa.

All of the publications and video material were circulated in Angola via the Activity Centre for Biodiversity, Ecosystem Health and Pollution in Luanda.

Striking photographs are a hallmark of a new BCLME display

The head of Marine and Coastal Management's busy reprographics section, Tony van Dalsen, has played a key role in designing and printing a new display on the BCLME Programme.

The display is to be launched at the Two Oceans Aquarium in August at a side event of the GEF Assembly (see p. 3).

Mr van Dalsen used his own photographs, plus high quality images provided by photographers Claudio Velásquez, Geoff Spiby, Pat Morant and the Oceana Group to compile the striking display.

It describes, in 20 panels, the unique physical features and spectacular biodiversity of the BCLME. It also illustrates the most important industries in the Benguela – such as oil and gas production, diamond mining, fisheries and aquaculture – and explains how Angola, Namibia and South Africa are working together through the BCLME Programme to improve the management of the BCLME.

The planned Benguela Current Commission is outlined briefly on two panels.

Following the launch of the fixed display, a smaller, portable display will be printed. This will allow Dr Mick O'Toole and the directors of the Activity Centres to carry a display with them when they attend international meetings.

Tony van Dalsen of MCM has produced a new display for the BCLME Programme.

Photographer goes to sea

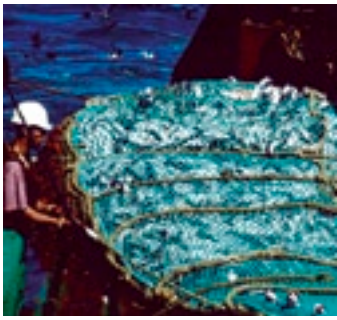
Well-known photographer, Claudio Velásquez, went to sea on the hake trawler *Sveinn Jonsson* to capture images of deep-sea fishing for a new display on the BCLME Programme.

Claudio's trip was made possible by Tim Reddell, chairman of the South African Deep-Sea Trawling Industry Association (SADSTIA), and Viking Fishing.

Claudio enjoyed his five-day voyage and produced some excellent images for the display, as well as for the BCLME website and newsletter. He complimented Captain Leon Henry and the crew of the *Sveinn Jonsson* for their cooperation and hospitality.

"The crew work incredibly long hours under really difficult conditions," said Claudio who snapped away with his digital camera as they worked. Weather conditions were bad for the duration of the voyage and Claudio had to contend with big swells and a rolling ship.

Once he had compiled a set of images for the use of the BCLME Programme, Claudio provided Viking Fishing and the crew of the *Sveinn Jonsson* with their own sets of images. He also handed over a copy of his book *Current of Plenty* to Tim Reddell and skipper Leon Henry as a token of thanks for a once-in-a-lifetime experience.



A full bag of hake is hauled on board the trawler **Sveinn Jonsson.**

UNDP film maker visits the region

The UNDP's broadcast specialist, Boaz Paldi, visited the Benguela region in May to gather material for the production of four short films on GEF-funded projects that are being implemented by UNDP in southern Africa.

The BCLME Programme was one of these projects and Mr Paldi spent several days in Namibia and South Africa filming fishing activity and the unique landscapes of the region. A tight schedule prevented him from visiting Angola.

Mr Paldi's visit to South Africa coincided with the Joint Hake Research Planning workshop which was hosted by the BCLME Programme in Cape Town in May. As a result, he got to experience first hand how the countries of the Benguela are beginning to negotiate on the subject of shared fisheries resources. He also filmed a pilchard packing plant on the Cape Peninsula and the offloading of rock lobster and linefish at Kalk Bay. In Namibia he visited Cadilu Fishing, a large hake processing plant.

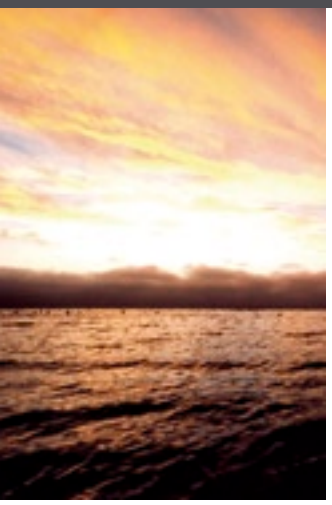
One of the highlights of Mr Paldi's trip to Namibia was visiting and filming the seal colony at Cape Cross where upwards of 300 000 Cape fur seals *Arctocephalus pusillus pusillus* haul out onto the beach.

Mr Paldi's film on the BCLME Programme focused on climate change and its impact on fisheries in the region. It was distributed to two news agencies, APTN and Reuters TV, and through them reached over 500 broadcasters worldwide; incredible international exposure for the BCLME Programme.

Boaz Paldi films Dr Larry Hutchings, Chief Specialist Scientist at MCM.

Boaz Paldi filmed fish workers offloading pilchards on the Cape Peninsula.

Forthcoming events



IW:2007 set for Cape Town

The Global Environment Facility (GEF) and its implementing agencies (UNDP, UNEP, and the World Bank) will host the Fourth Biennial International Waters Conference in Cape Town, South Africa from July 31 to August 3, 2007.

It is anticipated that approximately 350 participants from more than 100 countries will attend this invitation only event, including GEF International Waters project managers and senior staff, Implementing Agencies (UNDP, UNEP, World Bank) and Executing Agencies (UNIDO, FAO, IMO, OAS, NGOs, etc.), donor partners, and secretariats to many regional sea and river basin conventions. Also in attendance will be ministerial level representatives from over 130 countries that participate in GEF's International Waters portfolio, as well as senior officials of the South African government.

The purpose of the conference is to review GEF's global International Waters portfolio and share experiences and best practices for international waters management. At nearly US$3 billion, the GEF IW portfolio represents a significant body of practical experience.

Primary objectives of the conference are to foster knowledge sharing and collaboration between GEF International Waters projects, government partners, GEF implementing and executing agencies, and increasingly civil society and the non-profit and private sectors. Participants will engage in dialogue with peers from around the world and contribute to generating feedback to the GEF on emerging needs and priorities.

Discussion sessions will focus on practical experience in building capacity to strengthen transboundary institutional and legal frameworks. The conference will focus on common issues and challenges among projects at various stages in the TDA/SAP process, within and across regions, among similar types of projects - freshwater basins, groundwater systems, large marine ecosystems - and provide a forum for identifying opportunities for cooperation, collaboration and synergies.

Exhibit opportunities will be available for GEF projects and partners who are encouraged to visually display their work to Conference attendees. During the Third International Waters Conference, there were approximately 30 exhibits showcasing projects from all over the world. The First International Waters Conference was held in Budapest, Hungary in October 2000, the Second International Waters Conference was held in September 2002 in Dalian, China, and the Third biennial conference was held in Salvador, Bahia Brazil.

Sponsorship opportunities will be available for this event through GEF-IW:LEARN. The Global Environment Facility is providing core funding for the Fourth Biennial International Waters Conference, but private-sector leadership is essential. Past sponsors include The Coca-Cola Company, Inogen, WaterLeaders, Itaipu, and Chesf.

by Janot-Reine Mendler de Suarez

Pan-African Forum of Large Marine Ecosystems

A series of three back-to-back meetings that are to be held at the University of Cape Town in November will enhance cooperation between African Large Marine Ecosystem (LME) programmes and develop links between the LMEs and the Global Ocean Observing System (GOOS).

The meetings are scheduled as follows:

- Pan-African LMEs / GOOS-Africa Leadership Workshop on Operational Oceanography and Remote Sensing – 6 to 10 November 2006;
- The Pan-African Forum of Large Marine Ecosystems – 13 November 2006; and
- Third Forum of GOOS Regional Alliances – 14 to 17 November 2006.

The main objective of the Workshop on Operational Oceanography and Remote Sensing is to cement the cooperation between GOOS-Africa and the Pan-African LMEs, and to equip young African scientists and managers to fast-track their effective implementation. The Leadership Workshop will build on African capacity in marine sciences and technology in general and ocean remote sensing in particular.

The objective of the Pan-African Forum of Large Marine Ecosystems is to enhance cooperation between the five LME programmes that are being implemented in Africa. These are the Canary Current, Guinea Current, Benguela Current, Agulhas and Somali Currents, and the Red Sea Large Marine Ecosystem programmes.

The Third Forum of GOOS Regional Alliances is a key activity of the Global Ocean Observing System and it is anticipated that it will provide an opportunity to exchange information on lessons learned and best practices, to coordinate the development of regional coastal observing systems, identify capacity building needs and to identify funding priorities and sources of funding. The Forum will look to the lessons learnt in Africa to see the real advantages of working more closely with LME programmes to implement coastal GOOS.

It is anticipated that the three meetings will provide a unique opportunity to bring together the key stakeholders interested in promoting sustained coastal ocean observing, monitoring and forecasting systems. While each meeting has its own objectives, there is a LME thread linking all the meetings together. Through common participation and appropriate reporting from one meeting to the next, the LME thread will become clear and valuable to all.

Second Global Conference on LMEs

The port city of Qingdao in China, will provide a backdrop for the second Global Conference on Large Marine Ecosystems which is scheduled for 11 to 13 September 2007.

The Large Marine Ecosystem (LME) approach was first introduced in 1984. Since then, it has come to represent a radical shift in thinking that calls for a more holistic approach to ocean governance and managing marine ecosystems.

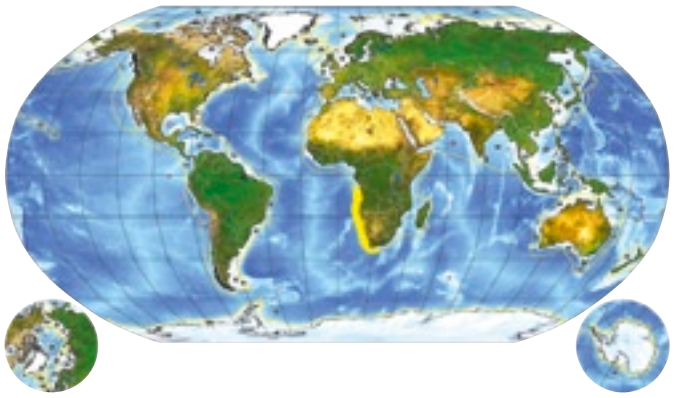
The new "ecosystem approach" aims to manage resources at the larger ecosystem level and balance human needs with conservation issues. The LME approach uses a five modular approach that addresses productivity, fish and fisheries, ecosystem health and pollution, socio-economics and governance.

Since the mid-1990's, the Global Environment Facility (GEF) in partnership with several UN agencies, has assisted many economically developing coastal states to introduce LME assessment and management methods for projects directed at the recovery and sustainability of marine resources and their environments.

The Second Global Conference on LMEs will examine scientific advances made in ecosystem assessment from LME activities around the globe; analyse the role of the LME approach in the field of marine science; introduce LME assessment and management methodologies for experts interested in ecosystem–based approaches; and look towards increased interaction between LME activities in different parts of the globe.

The Conference will provide review lectures on the results of the GEF-supported LME projects underway in Africa, Asia, Latin America and Eastern Europe. Invited speakers will deal with the theoretical background of the LME approach and its role in present day marine science. Papers and posters are invited on each of the following themes:

- The Large Marine Ecosystem (LME) approach to assessment and management of marine resources (theory and background);
- Implementation of the ecosystem approach in LMEs;
- Assessment and monitoring of LMEs;
- State of Environment and Ecosystem Information Systems in LMEs;
- Integrating socio-economics, science and governance in LMEs;
- Developing international partnerships in science and management in LMEs;
- Changing states of LMEs in regional seas: a global perspective
- LME's at risk: adaptation to climate change;
- Complementarities among LME assessments, GOOS-GEOSS and GLOBEC; and
- Towards a LME network.



To date, 64 LMEs have been described. In this map, the BCLME is highlighted in yellow.

For more information contact Dr Kenneth Sherman (Kenneth.sherman@noaa.gov) or Dr Mick O'Toole (otoole@bclmenamibia.org).

The Benguela story

In 1995, when Namibia and South Africa were both new democracies and Angola was still embroiled in a civil war, scientists from Angola, Namibia and South Africa met for the first time in Swakopmund, Namibia, to share knowledge and understanding of the Benguela Current ecosystem.

"It was really surprising to see how much good will there was, both within governments and the scientific institutes," remembers German biologist, Gotthilf Hempel, reflecting that not long before, Angola, Namibia and South Africa had been bitterly divided by the aggression by the former apartheid government.

At the Swakopmund meeting, the three countries laid the groundwork for the cooperative marine science programme, BENEFIT. Shortly afterwards they began to talk to about managing the Benguela ecosystem cooperatively through a Large Marine Ecosystem (LME) Programme.

Now, a little more than ten years later, four individuals who have been intricately involved in the establishment of BENEFIT and the BCLME Programme are putting pen to paper and writing "*The Benguela Story*", a historical record of marine cooperation in the Benguela Current system.

Through the pages of *The Benguela Story,* Drs Mick O'Toole, Neville Sweijd, Tore Strømme and Gotthilf Hempel, hope to document the development of BENEFIT and the BCLME Programme over the past decade. Each of the authors has spent decades studying the Benguela and has worked tirelessly to ensure that the ecosystem is managed cooperatively into the future.

The Benguela Story will describe the development of BENEFIT and the BCLME Programme in three time periods, each of which spanned approximately five years.

The book will also document the growth of the three national marine research programmes over the last decade and the role of international partnerships in the success of BENEFIT and the BCLME Programme. It will conclude with recommendations for the next decade of cooperation and some thoughts on the ways in which marine research can contribute to sustainable development and peace, both in the Benguela region and around the globe.

The BCLME Programme

The BCLME Programme is a joint initiative by the governments of Angola, Namibia and South Africa to manage and utilise the resources of the Benguela Current Large Marine Ecosystem in a sustainable and integrated manner.

The Programme is designed to improve the structures and capacities of Angola, Namibia and South Africa to deal with the environmental problems that occur across the national boundaries, in order that the ecosystem may be managed as a whole.

These transboundary problems include the migration of valuable fish stocks across national boundaries, the introduction of invasive alien species via the ballast water of ships moving through the region, and pollutants or harmful algal blooms that can be advected by winds and currents from the waters of one country into another.

The Programme is funded by the Global Environment Facility (GEF) which has contributed US$15.2 million through the United Nations Development Programme (UNDP) for the regional initiative. The GEF's funding complements an investment of US$16 million by the three countries, and over US$7 million from other sources such as the Benguela Environment Fisheries Training Interactions Programme, BENEFIT.

The BCLME Programme is administered by a Programme Co-ordinating Unit.

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