

Benguela

current news



THE NEWSLETTER OF THE BENGUELA CURRENT LARGE MARINE ECOSYSTEM PROGRAMME

BCLME Programme enters its fourth year

by Dr Mick O'Toole

Three years after the implementation phase of the BCLME Programme began, it is time for reflection. In May, the BCLME community met in Cape Town for a two-day "Highlights Symposium". The purpose of the meeting was to turn the spotlight onto some of the key achievements and results of the Programme to date, and to lay the foundation for future actions.

At the Highlights Symposium the BCLME community had a unique opportunity to learn about the wide range of projects that are being funded by the BCLME Programme, and hear from senior representatives from each of the three countries about the challenges that lie ahead.

The Highlights Symposium was seen as an essential component of the mid-term review. This process began in May, with the purpose of evaluating the achievements of the BCLME Programme against its original objectives.

The mid-term evaluation is being conducted by Dr David Vousden, a sustainable development and management advisor from the UK and Dr Magnus Ngoile, director general of the National Environment Management Council of Tanzania. Both evaluators have extensive knowledge of environmental and development issues, as well as GEF procedures.

It is expected that the evaluators will produce a document which will assess the progress of the BCLME Programme and outline the extent to which the objectives have been met and where gaps are evident. It will also provide recommendations

to strengthen the Programme in the future and formulate "lessons learned" that could be applied to other GEF funded Large Marine Ecosystem Programmes worldwide.

A favourable mid-term review will provide everyone associated with the BCLME Programme with independent affirmation of their work. While enormous progress has been made in creating a platform for regional co-operation in managing the Benguela ecosystem, it is already clear that to take root, long-term sustainable funding will be required. The participating countries have recognised that it will take more than five years to fully institutionalise the new paradigm for transboundary ecosystem management.

The Programme Steering Committee (PSC) has accordingly tasked the Programme Co-ordination Unit (PCU) with approaching the GEF and other donors to secure funding for a second phase. This would build capacity within the planned Benguela Current Commission, across the spectra of ecosystem management functions and build the capacity of countries to adapt management practices in the face of climate change. The PSC has emphasised that movement to a second phase would necessarily be conditional on the realisation of several outcomes. These include, in particular, the creation of an Interim Benguela Current Commission (IBCC) as a prelude to the formal incorporation of the Benguela Current Commission (BCC).

continued.../2

Inside News

June 2005 Issue 3

New director for Namibian Activity Centre	3
Study recommends structure for BCC	4-5
Regional co-operation makes economic sense	6
Documentary launched in Angola and Namibia	7
Specialists gather for Forecasting Workshop	8-9
A passion for development	10-11
Workshop puts EAF project on the map	12-14
Projects supported by the BCLME Programme	15-19
Nansen to sample from Cape Town to Senegal	20-21
Extensive biodiversity project for BENEFIT	22
Public Relations	23
Plankton collection could hold key to ecosystem change	24-25
Climate change could trigger degradation of upwelling systems	26-27



TUOR to boost monitoring programmes

Calanoides carinatus (pictured above) is a zooplankton species that is commonly found in the Benguela Current Large Marine Ecosystem (BCLME).

Plankton sampling in the BCLME is to receive a boost following the recent purchase by the BCLME Programme of a towed under-way oceanographic recorder (TUOR). The TUOR will be delivered to the Benguela region by the Chelsea Technologies Group. It is fitted with a MiniPack CID-F to measure conductivity, temperature, depth and fluorescence, as well as an Autonomous Plankton Sampler (APS).

The use of TUORs is seen as a key activity in monitoring long term trends within Large Marine Ecosystems. When deployed from "ships of opportunity", the instruments can provide very large datasets at reduced costs.

For more about plankton studies in the BCLME, turn to p.25.



Shake on it! Maria de Lourdes Sardinha, director of the BCLME Programme's Activity Centre for Biodiversity, Ecosystem Health and Pollution, Neville Sweijd, director of Benefit, and Mick O'Toole, chief technical advisor of the BCLME Programme are pictured at the signing of the contract between UNOPS and BENEFIT for the implementation of a major biodiversity project.

In terms of the contract, BENEFIT will manage and integrate the results from a suite of biodiversity projects and produce a conservation planning tool that may be applied by all three countries of the Benguela region. See p. 22.

1/...continued

The BCLME Programme Steering Committee has approved a recommendation from a team of environ-

mental and legal consultants that an IBCC should be established as soon as possible, within the lifetime of the BCLME Programme. A complementary study by a team of economists from the University of British Columbia has shown that it makes good financial sense to establish the BCC and move towards the co-operative management of the Benguela. (See p. 6.)

The main thrust of the BCC will be to implement an ecosystem approach to managing the BCLME. Its focus will be on regional co-operation between the three countries, specifically with regard to the harvesting of shared fisheries resources and improving the management of human impacts on the Benguela region. The proposed BCC will include scientific research, monitoring and training, as well state of the environment reporting and an early warning system for harmful algal blooms, low oxygen water and Benguela Niños. The BCC may also include advice on

potential economic opportunities that could promote the development of sustainable livelihoods within the coastal communities of the BCLME.

A key event for the BCLME Programme is the GEF Third Biennial International Waters Conference which is to be held in Salvador, Brazil in June 2005. This International gathering will bring together a broad range of experiences, viewpoints and approaches from diverse stakeholders in the GEF International Waters programmes. Its aim will be to foster knowledge sharing and collaboration between GEF International Waters projects, UN agencies, participating governments and the private, academic and non-profit sectors. The BCLME will feature prominently on the agenda and will be one of the main GEF-sponsored LME programmes to be highlighted at the conference. See p.11.

**BCLME Chief Technical Advisor
(Programme Co-ordinator)**

O Programa BCLME entra no seu quarto ano

Por Dr. Mick O'Toole

Três anos passados desde o início da fase de implementação do Programa BCLME, é altura para reflexão. Em Maio, a comunidade BCLME reuniu-se na Cidade do Cabo para um "Simpósio de Destaques" durante dois dias. O objectivo desta reunião foi chamar a atenção para alguns dos sucessos e resultados do Programa até à data, bem como lançar as bases para acções futuras.

Este Simpósio foi uma oportunidade única para a comunidade BCLME tomar conhecimento de uma vasta gama de projectos que estão a ser financiados pelo Programa BCLME e para ouvir os representantes séniores de cada país exporem os desafios que existem.

O Simpósio de Destaques foi considerado como uma componente essencial da revisão de médio prazo. Este processo começou em Maio, com o objectivo de avaliar os result-

ados do Programa BCLME em relação aos seus objectivos iniciais.

A avaliação de médio prazo está a ser conduzida pelo Dr David Vousden, um consultor sobre desenvolvimento e gestão do Reino Unido, e Dr Magnus Ngoile, director geral do Conselho Nacional de Gestão do Ambiente da Tanzania. Ambos os avaliadores possuem um vasto conhecimento sobre assuntos de ambiente e desenvolvimento, bem como sobre os procedimentos do Fundo de Ambiente Global (GEF, Global Environment Facility).

Pretende-se que os avaliadores preparem um documento que avalie o progresso do Programa BCLME e descreva em que medida os objectivos do Programa têm sido atingidos e quais as falhas evidentes. O documento apresentará recomendações para fortalecer o Programa no futuro e formulará "lições

aprendidas" que poderão ser aplicadas a outros programas de Grandes Ecossistemas Marinhos (LME, Large Marine Ecosystem) a nível mundial financiados pelo GEF.

Uma revisão de médio prazo favorável permitirá que todas as pessoas associadas com o Programa BCLME tenham uma confirmação independente do seu trabalho. Embora tenha havido grande progresso na criação de uma plataforma para a cooperação regional na gestão do ecossistema da Corrente de Benguela, torna-se evidente que será necessário financiamento sustentável para a sua sólida implantação. Os países participantes reconheceram que serão precisos mais do que cinco anos para institucionalizarem este novo paradigma de gestão transfronteiriça do ecossistema.

New director for Namibian Activity Centre

Dr Moses Maurihungirire has been appointed as the director of the BCLME Programme's Activity Centre for Marine Living Resources in Swakopmund, Namibia.

Dr Maurihungirire, who holds a doctoral degree in Marine and Estuarine Environmental Sciences from the University of Maryland in the USA, joins the BCLME Programme from the Namibian Ministry of Fisheries and Marine Living Resources where he held the position of deputy director responsible for inland fisheries and research administration.

He replaces Dr Hashali Hamukuya who has taken up the position

of executive secretary of the South East Atlantic Fisheries Organisation (SEAFO) in Walvis Bay. See p.25.

As director of the Activity Centre for Marine Living Resources, Dr Maurihungirire will be responsible for managing one of the BCLME Programme's key interventions; that is, how best to manage fish stocks that are shared by two or more countries of the BCLME region. He will also play a central

role in the establishment of an Interim Benguela Current Commission (IBCC) which will be set up by the three countries of the Benguela region within the next two years.

Dr Maurihungirire takes up his position with the BCLME Programme on 10 May 2005.



Dr Moses Maurihungirire

Assim, o Comité Director do Programa (PSC, Programme Steering Committee) incumbiu a Unidade de Coordenação do Programa (PCU, Programme Coordination Unit) de contactar o GEF e outros doadores para assegurar o financiamento de uma segunda fase. Esta segunda fase permitiria a capacitação dentro da Comissão da Corrente de Benguela para a gama de funções de gestão do ecossistema, bem como fortaleceria as capacidades dos países para adoptarem práticas de gestão face às alterações climáticas. O PSC frisou que a passagem para uma segunda fase seria necessariamente dependente do alcance dos vários objectivos. Estes objectivos incluem, em particular, a criação da Comissão Interina da Corrente de Benguela (IBCC, Interim Benguela Current Commission) como um prelúdio para a constituição formal da Comissão da Corrente de Benguela (BCC).

O Comité Director do Programa BCLME aprovou já a recomendação de uma equipa de consultores ambientais e legais para que se estabeleça uma Comissão Interina da Corrente de Benguela o mais cedo possível. Um estudo complementar realizado por uma equipa de economistas da Universidade de British Columbia mostrou que faz bom sentido financeiro estabele-

lecer a BCC e caminhar no sentido da gestão cooperativa da Corrente de Benguela. (ver página 6).

O grande impulso para o BCC será a implementação de uma abordagem de ecossistema para gerir o BCLME. O seu foco será a cooperação regional entre os três países, particularmente no que diz respeito à exploração de recursos pesqueiros partilhados e à melhoria da gestão dos impactes humanos na região da Corrente de Benguela. O BCC proposto incluirá pesquisa científica, monitorização e formação, bem como elaboração do relatório do estado do ambiente e um sistema de aviso prévio para florescimentos de algas tóxicas, água com baixo nível de oxigénio e Niños Benguela. O BCC poderá ainda incluir informação sobre potenciais oportunidades económicas que poderão promover o desenvolvimento de meios de subsistência sustentáveis nas comunidades costeiras do BCLME.

Um evento chave para o Programa BCLME será a Terceira Conferência Bienal do GEF sobre Águas Internacionais, a realizar em Salvador, no Brasil, em Junho de 2005. Esta conferência internacional reunirá uma vasta gama de experiências, pontos de vista e abordagens de diversos grupos de interesse dos programas de Águas Internacionais

do GEF. O seu objectivo será fomentar a partilha de conhecimento e a colaboração entre projectos de Águas Internacionais do GEF, agências das Nações Unidas, governos participantes e os sectores privado, académico e sem fins lucrativos. O BCLME terá lugar de realce na agenda e será um dos principais programas LME apoiados pelo GEF a ser destacado durante a conferência. Ver página 11.



Dr Magnus Ngoile and Dr David Vousden visited the Benguela region in May to conduct a mid-term evaluation of the BCLME Programme on behalf of the Global Environment Facility.

Study recommends structure for Benguela Current Commission

News

Angola and Namibia have announced the maritime boundary markers between their two countries, reports *The Namibian*.

Angolan president José Eduardo Dos Santos and his Namibian counterpart, President Sam Nujoma, received the final report of the joint commission for delimitation and demarcation of the boundary in February.

The maritime boundary is defined as the line of latitude seventeen degrees, fifteen minutes and zero seconds south of the equator, which commences at its intersection joint with the line of low water at the Kunene River mouth and runs westwards for a distance of two hundred nautical miles.

A report by Birdlife International and the Royal Society for the Protection of Birds suggests that longline fishing boats might be killing some species of albatross faster than they can reproduce. All 21 albatross species are classed as under threat of extinction.

The elegant white gliders are famed for their large wingspan and long ocean journeys. The northern royal albatross can fly up to 1 800km in 24 hours and the grey-headed albatross can circle the globe in 42 days.

The official inquiry into Namibia's most serious maritime disaster – the sinking of the *MFV Meob Bay* near Lüderitz in 2002 – was concluded recently when Namibia's Court of Marine Enquiry found that neither the boat's skipper nor its crew were responsible for the accident.

A team of experts has recommended that an Interim Benguela Current Commission (IBCC) should be established as soon as possible, during the life of the BCLME Programme, as a precursor to a permanent Benguela Current Commission.

The recommendation was made by Cormac Cullinan, Svein Munkejord and Heidi Currie of EnAct International, consultants in environmental law and policy. They completed an investigation into whether there is a need to establish an institutional structure to facilitate regional co-operation between Angola, Namibia and South Africa and ensure the sustainable management of the BCLME.

Their findings are contained in a report which was presented to the BCLME Programme Steering Committee in December 2004, revised and approved in March 2005.

The report suggests that the existing governance systems for marine resource management are not adequate to ensure the long-term protection and ecologically sustainable use of the BCLME. This is primarily as a result of a

lack of capacity to identify priorities at an ecosystem level and to ensure that priority issues are addressed throughout the ecosystem.

The authors found that Angola, Namibia and South Africa all have gaps in their legal frameworks which undermine the protection of the BCLME at national level. For instance, there are few laws dealing with environmental impact assessments (EIAs) for projects that may have transboundary impacts. Equally, legislation governing integrated coastal management or regional co-operation with regard to the conservation of marine ecosystems is inadequate or non-existent.

They conclude that in order to implement an ecosystem approach to managing the BCLME, it will be necessary to establish institutional arrangements which, at the very least, deal with those human

activities that impact negatively on the BCLME. Other reasons for establishing a BCC include:

- ▶ the need to fulfill the international obligations of the three countries;
- ▶ the need to develop a better understanding of the functioning of the BCLME;
- ▶ the need to improve the management of human impacts on the BCLME;
- ▶ the need to facilitate regional capacity building; and
- ▶ the need to increase the benefits derived from shared fish stocks.

The report suggests that a regional institution can only be established by agreement between Angola, Namibia and South Africa. It proposes that this should be a binding agreement that is recorded in writing; that is, a treaty.

When formulating a proposed

Estudo recomenda estrutura para a Comissão da Corrente de Benguela

Uma equipa de peritos recomendou o estabelecimento de uma Comissão Interina da Corrente de Benguela (IBCC) o mais cedo possível, durante o período de vida do Programa BCLME, como precursora de uma Comissão da Corrente de Benguela permanente.

Esta recomendação foi apresentada por Cormac Cullinan, Svein Munkejord e Heidi Currie de EnAct International, consultores em direito e política ambiental. Esta equipa investigou se os sistemas actuais de governação para a gestão dos recursos marinhos são adequados para assegurar o uso sustentável do BCLME; se a cooperação entre Angola, Namíbia e África do Sul é desejável; e se existe necessidade de estabelecer uma estrutura institu-

cional para facilitar a cooperação.

Os resultados da investigação encontram-se descritos num relatório que foi apresentado ao Comité Director do Programa BCLME em Dezembro de 2004, e revisto e aprovado em Março de 2005.

O relatório sugere que os sistemas de governação existentes para a gestão de recursos marinhos não são adequados para assegurar a protecção a longo prazo e o uso ecologicamente sustentável do BCLME. Tal fica a dever-se principalmente à falta de capacidade para identificar prioridades ao nível do ecossistema e para assegurar que os temas prioritários são abordados em todo o ecossistema.

Os autores verificaram que Angola,

Namíbia e África do Sul apresentam falhas nos seus enquadramentos legais, pondo em causa a protecção do BCLME ao nível nacional. Por exemplo, existem poucas leis que lidam com a avaliação de impactes ambientais (AIA) de projectos que poderão ter impactes transfronteiriços. De igual modo, a legislação acerca da gestão costeira integrada ou cooperação regional no que diz respeito à conservação de ecossistemas marinhos é inadequada ou ausente.

Os autores concluem que a implementação de uma abordagem de ecossistema para gerir o BCLME dependerá do estabelecimento de estruturas institucionais que, no mínimo, se dediquem às actividades humanas com impactes negativos

structure for the BCC, the authors drew on the experiences of Norway and the UK – which negotiated the co-operative management of shared oil and gas resources. They also looked at South Africa, Zimbabwe and Mozambique which are in the process of establishing the Great Limpopo Transfrontier Park.

The authors developed three possible scenarios for the co-operative management of the BCLME. The first is the establishment of a research-orientated Benguela Current Commission; the second option is a management-orientated structure and the third is a minimalist option which envisages regional co-operation based on a network of bilateral or trilateral agreements.

The authors favour the second option which is the establishment of a BCC made up of a Ministerial

Conference to determine policy, a Joint Management Board to co-ordinate the development and implementation of the Strategic Action Programme, three Joint Management Committees supported by task-specific working groups, and research support being provided by a restructured BENEFIT.

The authors say that if the three countries are committed to moving from a focus on joint research and information exchange towards active co-operation on management issues, then they should establish an institutional structure similar to that proposed in option two.

They suggest that the BCC is likely to be both viable and sustainable, provided that:

- ▶ it receives high-level support from each of the countries;

- ▶ each country identifies a lead Ministry and mandates specific officials to drive the co-ordination of the national activities necessary to promote the overall objectives of the BCC;

- ▶ it is implemented in a manner that reflects the critical success factors identified in the report; and
- ▶ the performance of the structure is reviewed after an initial period and adjustments are made where appropriate.

The report recommends that once an appropriate institutional option has been agreed to, it would be best to adopt a phased approach to establishing an IBCC.

The report concludes with the recommendation that the BCLME Programme's existing institutional structures should function as supporting structures to the IBCC until new structures are operational.



no BCLME. Outras razões para o estabelecimento da BCC incluem:

- ▶ necessidade de cumprir obrigações internacionais dos três países;
- ▶ necessidade de melhorar o funcionamento do BCLME;
- ▶ necessidade de melhorar a gestão dos impactos humanos no BCLME;
- ▶ necessidade de facilitar a capacitação regional; e
- ▶ necessidade de aumentar os benefícios decorrentes dos stocks pesqueiros partilhados.

O relatório defende que só se poderá estabelecer uma instituição regional através de um acordo entre Angola, Namíbia e África do Sul. É proposto um acordo obrigatório que seja regis-

tado por escrito; ou seja, um tratado.

Para formular a estrutura proposta para a BCC, os autores basearam-se nas experiências da Noruega e Reino Unido – países que negociaram a gestão cooperativa dos recursos de petróleo e gás natural. Os autores consideraram ainda o exemplo da África do Sul, Zimbabué e Moçambique, países que se encontram a estabelecer o Parque Transfronteiriço de Great Limpopo.

Os autores desenvolveram três cenários possíveis para a gestão cooperativa do BCLME. O primeiro cenário é o estabelecimento de uma Comissão da Corrente de Benguela orientada para a pesquisa, tal como é recomendado pelo Programa Estratégico de Acção (SAP) do Programa BCLME. A segunda opção

é uma estrutura orientada para a gestão e a terceira é uma opção minimalista em que a cooperação regional é baseada numa rede de acordos bilaterais e trilaterais.

Os autores preferem a segunda opção, ou seja, o estabelecimento de uma BCC constituída por uma Conferência Ministerial para determinar as políticas, uma Direcção Conjunta de Gestão para coordenar o desenvolvimento e implementação do SAP, três Comitês Conjuntos de Gestão apoiados por grupos de trabalho específicos para cada actividade, e apoio ao nível da pesquisa fornecido por um BENEFIT reestruturado.

Os autores afirmam que se os três países estiverem comprometidos a

continuação... / 6

Regional co-operation makes economic sense



Dr Rashid Sumaila

An economic study has shown that the benefits of managing the Benguela's shared fisheries resources co-operatively, far outweigh the costs of establishing and maintaining a regional management structure such as an Interim Benguela Current Commission.

The economic study was undertaken in September 2004 by Rashid Sumaila, Gordon Munro and Heather Keith of the Fisheries Economics Research Unit at the University of British Columbia.

They found that the potential for obtaining net benefits from regional co-operative management of the BCLME are "huge" and they recommend that the establishment of an Interim Benguela Current Commission (IBCC) should be pursued.

The economists suggest that there are two main benefits of regional co-operative management: it will help to minimise the wasteful use of shared stocks and it has the potential to increase catches by organising fishing in such a way that shared stocks are allowed to grow to their fullest economic potential.

Current knowledge of the BCLME indicates that the deep water hake stock (*Merluccius paradoxus*) is shared by South Africa and Namibia and the shallow water stock (*Merluccius capensis*) is also shared, if only indirectly through cannibalism of juveniles. Pilchard and horse mackerel stocks are

shared between Angola and Namibia, as are red crabs and bronze whaler sharks. Big eye, yellowfin and longfin tunas are also shared by the three countries of the BCLME, both in their respective exclusive economic zones and on the high seas.

Based on the number and value of shared stocks, and the results of economic studies that have demonstrated the benefits of managing shared stocks co-operatively, the economists believe that the regional management of the BCLME is justifiable.

They recommend that the IBCC should be implemented on a modest scale, using the experience gathered over the years from the BCLME and BENEFIT programmes. This approach, they suggest, will allow for learning and the building of confidence and mutual trust between the parties which are crucial for the success of the Commission.

A fundamental issue that must be agreed upon is how to fund the IBCC sustainably. Ultimately, the resources for running the IBCC will have to come from the region if the Commission is to be sustain-

able in the long-term. The economists recommend that current levels of funding by international donors be continued until a point in time when the national governments of Angola, Namibia and South Africa will take over the full funding of the Commission.

Other recommendations are that, when designing the structure of the IBCC, care should be taken to ensure that the sovereignty issue does not become a significant problem. Similarly, the fact that the member states are unlikely to have identical resource management goals should be taken into account.

The economists stipulate that the IBCC will require high quality, credible research and suggest that sustainable funding and strong political commitment should be at the centre of the development of the IBCC. They also recommend that the new Commission should work out a way to collaborate with international organisations such as the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Southern African Development Community (SADC) and the South East Atlantic Fisheries Organisation (SEAFO).



Dr Gordon Munroe

5/ ...continuação

passar de um foco na pesquisa conjunta e partilha de informação para uma cooperação activa em temas de gestão, então deverão estabelecer uma estrutura institucional semelhante à proposta pela opção dois.

Eles sugerem que a BCC será provavelmente viável e sustentável desde que:

- ▶ *receba apoio ao mais alto nível de cada um dos países;*
- ▶ *cada país identifique um Ministério director e atribua mandatos a oficiais específicos para conduzir a coordenação das actividades nacionais necessárias para promover os objectivos gerais da BCC;*

▶ *seja implementada de um modo que reflecta os factores críticos de sucesso identificados no relatório;*

▶ *o desempenho da estrutura seja revisto após um período inicial e sejam feitos ajustes quando necessário; e*

▶ *a estrutura seja operacionalizada de modo faseado.*

O relatório recomenda que assim que seja seleccionada e aprovada uma opção institucional apropriada, o melhor será adoptar uma abordagem faseada para estabelecer uma IBCC. A primeira prioridade será preparar, negociar e assinar o acordo necessário entre os três países do BCLME. Seguidamente, os vários grupos de trabalho e comités conjun-

tos de gestão deverão ser postos em funcionamento seguindo a ordem de prioridades determinada pelas necessidades mais prementes. Nos próximos passos, o Comité Director do Programa BCLME deverá discutir e seleccionar uma estrutura institucional aconselhável e submetê-la à aprovação ao nível Ministerial de cada país. Um acordo provisório poderá então ser preparado para negociação e assinatura numa cimeira ministerial.

O relatório termina com a recomendação segundo a qual as actuais estruturas institucionais do Programa BCLME deverão funcionar como estruturas de apoio à IBCC até que as novas estruturas se encontrem operacionais.

Lançamento de um documentário em Luanda

A Vice-Ministra das Pescas de Angola, Dra Victória de Barros Neto, lançou oficialmente a versão portuguesa de *Current of Plenty* ("Corrente de Abundância") numa cerimónia decorrida em Luanda no dia 4 de Outubro de 2004.

O documentário foi bem recebido pelos representantes de alto nível do governo, indústria, Universidade Agostinho Neto e corpos diplomáticos que estiveram presentes no lançamento.

O Representante Residente do PNUD em Angola, Mr Pierre Francois Pirlot, fez uma breve apre-

sentação do Programa BCLME e da sua posição no conjunto de projectos apoiados pelo PNUD Angola.

Durante a cerimónia foram distribuídas cópias da versão portuguesa do documentário. O documentário *Current of Plenty* será provavelmente transmitido na televisão nacional Angolana em breve.



Pierre Francois Pirlot, UNDP Resident Representative; Dr Victoria de Barros Neto, Deputy Minister of Fisheries and Mr Domingos Graciano, Deputy Minister of Urban Affairs and Environment are pictured at the launch of Current of Plenty in Angola.

Documentary launched in Luanda

Angola's Deputy Minister of Fisheries, Dr Victoria de Barros Neto, officially launched the Portuguese version of Current of Plenty at a ceremony in Luanda on 4 October 2004.

The documentary was well received by the high ranking representatives of government,

industry, Agostinho Neto University and the diplomatic corps who attended the launch.

The UNDP Resident Representative in Angola, Mr Pierre Francois Pirlot, gave a short presentation on the BCLME Programme and its location in the suite of projects

that are supported by UNDP in Angola.

Copies of the Portuguese version of the documentary were distributed at the ceremony and it is likely that Current of Plenty will shortly be screened on Angolan national television.

Minister launches documentary

Namibia's Minister of Fisheries and Marine Resources, Dr Abraham Iyambo, was the keynote speaker at a function in Windhoek that marked the launch of *Current of Plenty*, a 25 minute documentary on the Benguela current.

Current of Plenty was produced for the BCLME Programme by Francois Odendaal Productions. Copies of the documentary have been widely circulated to environmental educators in the region.

Speaking at the launch of *Current of Plenty*, Dr Iyambo confirmed that a Benguela Current Commission would be set up by Namibia, Angola and South Africa in a few years time.



Namibia's Minister of Fisheries and Marine Resources, Dr Abraham Iyambo, hands over copies of the documentary Current of Plenty to John Mutorwa, Minister of Basic Education, Sport and Culture.



Dr Neville Sweijd, director of the BENEFIT Programme, Timo Mufeti of NACOMA and Paul Nichols, ministerial advisor in Namibia's Ministry of Fisheries and Marine Resources.



Professor Josephine Msangi of the University of Namibia, Ms Anna Kaduma and Dr Jacqui Badcock, the former United Nations' resident representative in Namibia.



Specialists gather for Forecasting Workshop

In November 2004 the International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems was held in Cape Town. Sponsored by the BCLME Programme in partnership with nine other international, regional and national organisations, the workshop addressed a key policy action of the BCLME, namely the assessment of environmental variability, ecosystem impacts and improvement of predictability.

Two cornerstones of this policy action are the development of an early warning system and the improvement of predictability of extreme events and their impacts in the BCLME.

Participation in the four-day meeting was by invitation, and over 100 leading international and regional experts took part.

Objectives

An overarching objective of the workshop was to contribute to the management of the BCLME by improving assessment of variability and developing an effective and affordable forecasting capability for the region. To achieve this, the workshop had to assess

what was known about variability in the BCLME and ascertain which aspects are amenable to forecasting of value. In order to make optimal use of time and the available knowledge and expertise, a programme was devised whereby definitive overviews of the state of knowledge and understanding of the BCLME variability were presented in plenary on the first day, followed by eight parallel specialist discussion, review and planning sessions on the remaining three days. Regular report-backs were made in plenary to inform and promote integration.

The Overviews

Dr Kenneth Sherman gave the keynote address entitled "Assessment and management of Large Marine Ecosystems – Indicators of changing states of LMEs". Then came the six invited overview papers. The overviews provided a sound foundation for the specialist sessions on days two to four. The topics of the papers were:

- ▶ Resource and ecosystem variability, including regime shifts in the BCLME;
- ▶ Large scale variability in the physical environment of the Benguela;
- ▶ Forecasting low oxygen water variability in the Benguela system;
- ▶ Variability of plankton in the BCLME;
- ▶ The variability and potential for prediction of harmful algal blooms in the southern Benguela ecosystem; and
- ▶ Variability and change in comparable systems – lessons learned.

Specialist Sessions

Eight themes were identified for the specialist and integrating sessions. A brief description of the content of the sessions follows:

Aspects of BCLME variability amenable to forecasting of value

The focus was on operational management and economic aspects of forecasting and applications for planning.

Oceanic transboundary influences on the Benguela

This session considered those modes of ocean-atmosphere variability which impact on the Benguela, examined various models which show promise for predicting extreme events such as Benguela Niños, addressed problems associated with downscaling from basin to shelf, and proposed what should be done regionally in terms of modelling and data assimilation.

Detecting and forecasting long-term ecosystem changes

This session focused on ecosystem indicators that can detect and monitor ecosystem changes. The data requirements for an ecosystem observing system were discussed and likely products identified. A schedule for implementation was proposed.

The requirements for forecasting harmful algal blooms (HABs) in the Benguela

This was addressed in two parts. Part 1: Identification of the physical processes important to the development of HABs and identification of physical-biological couplings underlying HABs. Part 2: Real-time observation, modelling and prediction of HABs.



Piers Chapman, Louisiana State University, USA; Andy Cockcroft, Marine and Coastal Management, South Africa; and Paola Rizzoli, MIT, USA.



Hans Verheye, Marine and Coastal Management South Africa; Neville Sweijd, BENEFIT; Juergen Alheit, IOW, Germany.

Forecasting shelf processes in respect of low oxygen water (LOW) – hypoxia/anoxia, etc

A pre-requirement for forecasting LOW variability and its impact on services and living marine resources is the ability to deal with the extreme range of scales involved.

Forecasting shelf processes of relevance to living marine resources (LMR)

The focus was on environmental changes and events that can affect the abundance and/or distribution of LMR on the shelf, or result in localised fish mortalities.

Maritime operations in the Benguela coastal ocean

The offshore industries demand better forecasting capabilities. How their expectations, as well as those of the responsible management agencies, can best be satisfied was the focus of this session.

Towards a future integrated forecasting system

This theme brought all the other sessions in the Workshop together to design an early warning system for the BCLME.

Conclusions

Professor John Woods of Imperial College, London, presented a stimulating paper at the end of the Workshop in which he summarised the proceedings from his perspective. He made the point that the BCLME is important economically, is highly complex and under-sampled, but it may be the historic watershed which enables us to progress from the diagnostic to the prognostic. Monitoring is essential to provide the data

required by models and to enable forecasting, said Professor Woods. He concluded by expressing the opinion that we ARE now ready to design an operational system for forecasting in the BCLME.

The Workshop was closed by the "Grandfather" of both BENEFIT and the BCLME Programmes, Professor Gotthilf Hempel - an incisive, witty and charming conclusion to what was by consensus a very successful meeting.

Outputs of the Workshop

The information, knowledge, wisdom and advice emanating from the Workshop is being captured in a definitive peer-reviewed book entitled "The Benguela: Predicting a Large Marine Ecosystem". This book is being edited by Gotthilf Hempel, Paola Malanotte-Rizzoli, John Woods, Coleen Moloney and Vere Shannon and will be published internationally in 2005 by Elsevier. The book will not only be a significant contribution to the BCLME Programme and its sustainable management



Workshop organisers, Lesley Staegemann, director of the BCLME Programme's Activity Centre for Environmental Variability and Vere Shannon, University of Cape Town (UCT).



Geoff Bundrit, UCT; Ed Urban, Scientific Committee on Oceanic Research, USA; Pierre Freon, IRD, France; and John Field, UCT, South Africa.

objectives, but also a blueprint for application in other LMEs around the world.

by Vere Shannon

Fact File:

Why Forecast?

Permanent, continuously operating real-time regional ocean prediction systems are increasingly required to support a variety of critical activities in the ocean and coastal environments, including:

- fisheries management
- navigation and marine operations
- response to oil and hazardous material spills
- search and rescue
- prediction of harmful algal blooms and other ecosystem or water quality phenomena

Implementation of such systems requires advanced technologies in sensors and observing systems, and numerical models and data assimilation, as well as the infrastructures necessary to use them. Hydrodynamic and ecological models for regional systems are beginning to show considerable skills.

A passion for development



In the 1950s, German biologist, Gotthilf Hempel, changed the focus of his research from grasshoppers to fish. The scientist's early decision proved to be a fortuitous one for the Benguela region, which today honours Professor Hempel as the "grandfather" of the BENEFIT and BCLME programmes.

Professor Hempel first visited Namibia soon after the south-west African nation celebrated its independence in 1990. He had been working as a biologist for the Inter-governmental Oceanographic Commission (IOC) in the 1960s and his role was to help developing countries to establish expertise in marine science.

Meanwhile he had become one of the leading biological oceanographers in Germany.

On his visit to Namibia, Professor Hempel formed part of a four-man commission which was sent by UNESCO - the Educational, Scientific and Cultural Organisation of the United Nations - to offer advice on the building of institutional and educational infrastructure and human capacity in marine science and fisheries management in the newly independent country. One of the UNESCO commission's strongest recommendations was that marine science in Namibia should be strengthened through close co-operation with South Africa and Angola.

"This was an ecologically correct approach, but it was not politically correct," recalls Professor Hempel.

At the time, South Africa was isolated from the international community because of its policy of apartheid, and Angola was embroiled in a long and bloody civil war. However, the recommendations sowed the seed for future discussions around regional co-operation in marine science.

By 1995, many of the political problems that had prevented Angolan, Namibian and South African scientists from working together had been overcome and scientific collaboration began to seem more feasible. A first meeting was arranged in Swakopmund, by the Namibian Ministry of Fisheries and Marine Resources, to talk about scientific co-operation:

"It was really surprising to see how much good will there was, both within governments and the (scientific) institutes," he remembers.

At the Swakopmund meeting, the three countries laid the groundwork for a co-operative programme. Professor Hempel worked hard to ensure that it contained a prominent training and capacity building component because it was obvious to him that there were real discrepancies in the capacity of the three

countries to carry out marine research.

Professor Hempel recalls that BENEFIT was established fairly soon after the initial meeting in Swakopmund. Two research ships, the Russian ship, *Petr Kottsov* from Germany, and the Norwegian ship, *Dr Fridtjof Nansen*, provided a platform for the first ever BENEFIT cruise. Young scientists from Angola, Namibia and South Africa participated in the cruise, which had a strong focus on environmental variability off the coast of Namibia and Angola. The cruise was followed by an extended workshop for the analysis of data and samples. Afterwards, young scientists from Angola and Namibia received advanced training in Germany and Norway.

A second research cruise, this time on board South Africa's flagship research vessel, *Africana* and the German ship, *Poseidon*, followed.

Although Professor Hempel didn't participate in the research cruises, he made sure that he was present at the official launch of BENEFIT in April 1997:

"I was very keen on the overall concept, especially the focus on training," he says.

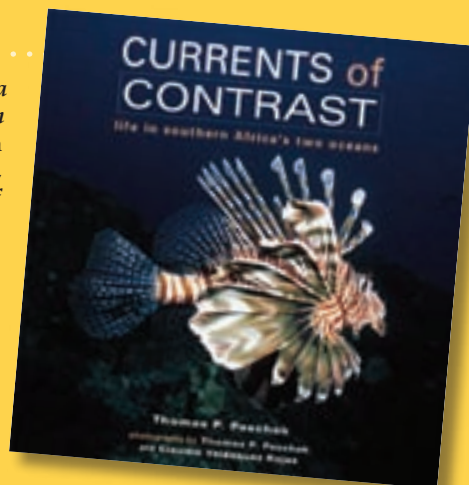
During this period, a number of German specialists worked on research cruises on board the research ship *Meteor* in the Benguela region. In this way, scientists from the region were exposed to some of the finest German expertise, while the German scientists got to work in one of the most dynamic ecosystems in the world.

The Swakopmund meeting proved to be propitious for another reason – it encouraged Ken Sherman, whose pioneering work on large marine ecosystems helped to define the LME concept, to develop a keen interest in establishing a LME project in the Benguela.

Currents of Contrast

A new book on the marine ecosystems of the Benguela and Agulhas Currents has been published in South Africa. *Currents of Contrast - Life in Southern Africa's Two Oceans* is written by marine biologist, Thomas Peschak. The BCLME Programme is one of the book's seven corporate sponsors.

The stunning photographs in *Currents of Contrast* were taken by the author and Claudio Velasquez Rojas, the film director who produced the documentary, *Current of Plenty* for the BCLME Programme in 2004.



The Benguela was, of course, particularly well suited to the development of a LME project: the ecosystem is shared by only three countries, the marine environment has been relatively well studied and the Benguela is characterised by very interesting transboundary fisheries which are affected by overfishing, Benguela Niño and regime shifts. So the Benguela was well positioned to become a showcase for the LME philosophy.

Although there was some trepidation about running a LME project concurrently with the BENEFIT Programme, it was hoped that the two programmes would complement each other.

"We put some effort into it and it was amazing to see how Mick (O'Toole) picked it up and got it moving," tells Professor Hempel.

The BCLME Programme is now in its third year of implementation and the BENEFIT Programme is poised

to become the scientific arm of the proposed Benguela Current Commission (BCC). Professor Hempel believes that the establishment of a strong environmental and fisheries commission with a dedicated scientific arm bodes well for the future of the Benguela.

"When I talk to my students or to administrators and politicians, I often use the Benguela as a shining example of how science can be an instrument for overcoming problems between countries," he enthuses.

"BENEFIT has been a very important political instrument because it has demonstrated how a region can adopt common scientific, fisheries and environmental policies."

After a lifetime of scientific endeavour, and having travelled to the four corners of the world in an effort to help developing nations build capacity in marine science, Professor Hempel says that it is very gratify-

ing to see what has been achieved in the Benguela.

Through his work with UNESCO and, more recently, through the establishment of the Centre for Marine Tropical Ecology in Bremen, Professor Hempel has developed an abiding passion for building strong partnerships with developing nations. He visits the Benguela region almost every year, mostly accompanied by his wife Irma who shares his interest in southern Africa's people and in the beautiful landscapes and wildlife of the region.

Good scientific co-operation is important, he maintains, yet he cautions that developing nations should always participate fully and equally in scientific partnerships:

"You don't want to fall back into scientific colonialism," he remarks, "there must be real benefits for the region."

BCLME Programme showcased at Brazil conference

The Global Environment Facility (GEF) will host its third biennial International Waters Conference from 20 to 25 June in Salvador, Bahia, Brazil.

The conference will review the GEF's global International Waters portfolio, share successes and experiences and encourage collaboration across the International Waters portfolio.

The conference will feature presentations by senior representatives from the GEF Secretariat, implementing agencies (UNDP, UNEP, World Bank), executing agencies, funding partners and GEF International Waters project managers. Also in attendance will be ministerial level participants from many of the over 130 countries that participate in GEF's International Waters portfolio.

In a plenary session on the second day of the conference, Dr Mick O'Toole, chief techni-

cal advisor to the BCLME Programme, will describe the process of devising a transboundary diagnostic analysis (TDA) and strategic action programme (SAP) for the BCLME Programme. He will also detail the implementation of key projects in the BCLME region. Later on that day, in a break away session on Large Marine Ecosystems, Dr Johann Augustyn, chief director of Research, Antarctica and Islands at Marine and Coastal Management in South Africa will share knowledge, experience and advice with other LME and coastal programmes.

Dr O'Toole will be accompanied by Ms Lesley Staegemann, director of the Activity Centre for Environmental Variability, Ms Francisca Delgado, director of the Angolan Institute of Marine Research (IIM), Mr Nkosi Luyeye, deputy director of IIM and Dr Johann Augustyn, chief director of Research, Antarctica and Islands at Marine and Coastal Management.



Günther Kohnick

The Third Biennial International Waters Conference is hosted by Brazil. Pictured here is Rio de Janeiro.

Workshop puts EAF project on the map

As signatories to the World Summit on Sustainable Development, Angola, Namibia and South Africa have committed themselves to introducing an ecosystem approach to fisheries management (EAF) by 2010. The launch of a BCLME-funded project to test the feasibility of introducing EAF to the Benguela region represents a first step towards meeting this target.



Gabriella Bianchi of the FAO and Angolan participants, Adriana Paes Costa, Filomena Vas Velho and Armenio Alexander Lopes consider the implications of applying an ecosystem approach to Angola's demersal fishery.

In September 2004, a first regional workshop was held in Windhoek to review the progress that the three countries have made with the EAF project. The workshop was held after the countries had each had an opportunity to convene scientific and management committees to drive the EAF project forward.

International co-ordinator of the EAF project, Kevern Cochrane of the FAO's Marine Resources Service, explains that separate scientific and management committees are necessary to ensure that stakeholders participate in the project.

"We wanted to make sure that the

project isn't driven only by science but that stakeholders are involved," says Dr Cochrane.

The purpose of the regional workshop was to ensure that there is good communication between the participants in the three countries, to share knowledge about trans-boundary fish stocks and exchange ideas on EAF.

According to Dr Cochrane, workshop participants ascertained that Namibia and Angola are slightly behind schedule, but in South Africa the project is moving ahead very nicely.

"Namibia and Angola will need to catch up in 2005," says Dr Cochrane.

One of the most constructive outcomes of the workshop was the completion of a simple risk assessment exercise for one of the major fisheries in each of the three countries, as a way of introducing the method to the participants. The exercise allowed the workshop participants to analyse high level policy goals and identify what implications these goals have on an ecosystem and operational level.

For instance, one of South Africa's policies is to conduct the demersal trawl fishery at levels that maintain the target populations and associated ecological community relative to its potential productivity. Workshop participants identified a number of important ecological objectives related to this policy in addition to objectives for the target species alone.

For example, the importance of maintaining adequate abundance of forage species for hake and the need to consider the impact of fisheries on the benthic biota were identified as important issues.

The process enabled groups of specialists from each country to identify the ecosystem issues that are most important in each fishery.

"The process was very constructive," reports Dr Cochrane. "In the eyes of most participants, the EAF project was transformed into something practical and sensible, rather than just a vague idea."

One goal of the workshop was to teach participants how to conduct the risk analysis exercise so that they could return to their countries



Minister opens EAF workshop

Dr Abraham Iyambo, Namibia's Minister of Fisheries and Marine Resources, opened the first regional workshop on Ecosystem Approaches for Fisheries Management in the BCLME.

He noted that BENEFIT and the BCLME Programme have supported the research and management of the living marine resources of the Benguela in an integrated and sustainable fashion.

"Adoption of EAF is a logical next step in the work of these organisations," said Dr Iyambo.

The Minister stipulated that the EAF project will not be making management recommendations on EAF to the three countries of the Benguela region, but would provide information and tools to national fisheries scientists and managers which will enable them to apply an ecosystem approach.

"In time, we should be able to better manage the impacts of, and achieve sustained yields from, a range of interacting fisheries. Even from a single fisheries perspective, EAF can assist in making better informed decisions, for example in regard to fisheries impacts on relations between predators and prey species," noted Dr Iyambo.

The Minister is aware that EAF depends on the availability of expertise and data on individual fisheries and ecosystems:

"EAF is clearly a 'data-hungry' approach to fisheries management! The availability of expertise and data varies in the three countries...I believe we have the knowledge and expertise as well as the political will to make real progress in applying EAF, ultimately to the benefit of all three countries," he concluded.

and repeat it with a wider spectrum of stakeholders. By doing so, each of the countries will be able to identify the priority ecosystem issues for each fishery.

"We want to get to the point where we've identified key issues in each fishery and are able to put forward some options for addressing them," explains Dr Cochrane.

The question of by-catch is pertinent to most fisheries in the Benguela region and it is likely to become a high priority issue for the EAF project. In many commercial fisheries, by-catch is unrecorded and so it is very difficult to evaluate the impact that a fishery has on non-target species. One of the goals of the EAF project is to improve scientific information on subjects such as by-catch and identify practical ways to address these problems.

Dr Cochrane emphasises the fact that the EAF project is a feasibility study. The project's goal is to plan for the implementation of EAF, rather than to implement EAF in

the commercial fisheries of the Benguela region.

"We don't want to alarm the fishing industry and this project will definitely not be introducing any changes in fisheries management, simply providing information on the feasibility of implementing EAF and the potential costs and benefits of the approach," he says.

In fact, the ecosystem approach that is described by the FAO is neither inconsistent with, nor a replacement for, current fisheries management approaches. Instead, it is likely to be adopted as an incremental extension of current fisheries management approaches.

Dr Cochrane says that the EAF project will use the best available information to highlight areas where improvements in the management of fisheries in the Benguela are needed. The aim of the project is to identify a range of alternative management options and detail the socio-economic and ecological implications of each.



Workshop participants from the FAO and South Africa (above) and Namibia (below) in intense discussion.



He believes that 2005 will be a critical year for the project. The focus will be on scientific analysis and gathering the best available information on each fishery.

"We've got to do the bulk of the work this year," he says.

Workshop regional dá o primeiro passo para o projecto EAF

Como signatários da Cimeira Mundial sobre o Desenvolvimento Sustentável, Angola, Namíbia e África do Sul comprometeram-se a introduzir uma abordagem de ecossistema para a gestão de pescas (Ecosystem Approach to Fisheries Management, EAF) até 2010. O lançamento de um projecto financiado pelo Programa BCLME para testar a viabilidade da adopção da EAF na região da Corrente de Benguela representa o primeiro passo nessa direcção.

Em Setembro de 2004 realizou-se em Windhoek o primeiro workshop regional para avaliar o progresso dos três países no projecto EAF. O workshop realizou-se

após cada um dos países ter tido a oportunidade de convocar comités científicos e de gestão para dar um impulso ao projecto EAF.

O coordenador internacional do projecto EAF, Kevern Cochrane do Serviço de Recursos Marinhos da FAO, explica que os comités científicos e de gestão são necessários em separado para assegurar a participação dos grupos de interesse no projecto.

"Nós queríamos ter a certeza de que o projecto não é apenas guiado pela ciência mas conta com a participação dos grupos de interesse", afirmou o Dr Cochrane.

O workshop regional teve como

objectivos garantir que existe boa comunicação entre os participantes dos três países, partilhar conhecimentos acerca dos stocks pesqueiros transfronteiriços e trocar ideias sobre EAF.

Segundo o Dr Cochrane, os participantes do workshop concluíram que tanto a Namíbia como Angola se encontram ligeiramente atrasados, enquanto na África do Sul o projecto avança a bom ritmo.

"A Namíbia e Angola precisam apanhar o comboio até 2005", afirmou o Dr Cochrane.

Um dos resultados mais construtivos do workshop foi a realização
continuação... / 14

New head for Angolan institute



Francisca Delgado

Francisca Delgado has been appointed director of the Angolan Institute of Marine Research, *Instituto de Investigação Marinha* (IIM).

Ms Delgado was appointed following the promotion of Dr Victoria de Barros Neto - the former head of IIM - to the position of Deputy Minister of Fisheries in Angola.

Ms Delgado holds a post graduate degree in marine biology from the University of Agostinho Neto in Angola and has worked as a scientist at IIM since 1986. In 1990 she was appointed as a senior scientist and between 1991 and 2004 she headed the Aquaculture Department at IIM.

Ms Delgado believes that some of the important short-term challenges facing IIM are to continue assessing the major commercial marine and freshwater fisheries in Angola, to strengthen the national sampling programme, improve the quality of fishery products that are exported from Angola and improve regional and international co-operation.

In the medium-term and long-term she would like to see an improvement in environmental monitoring in Angola, the implementation of

an ecosystem approach to fisheries, greater investments in academic education and the implementation of an Interim Benguela Current Commission.

Ms Delgado believes that the BCLME Programme can help Angola to meet these challenges by helping IIM to build capacity, creating opportunities for involving Angolan scientists in the international scientific community and by assisting with the management of shared fish stocks.

News

South Africa's Department of Environmental Affairs and Tourism has released the second in a series of booklets on Transformation in the South African Fishing Industry.

The booklet focuses on the effort-controlled fisheries, namely the squid and line fisheries. The first booklet in the series focused on the quota-controlled fisheries, including the hake, pelagic, rock lobster and abalone fisheries.

Both booklets were published under the banner of the 10 Years of Freedom campaign and are available free of charge from the Department.

13/ ...continuação

de um simples exercício de avaliação de risco para uma das maiores pescarias em cada um dos três países, o que constituiu um modo de apresentar o método aos participantes. Através deste exercício, os participantes tiveram a oportunidade de analisar os objectivos de políticas a elevado nível e identificar as suas implicações ao nível do ecossistema e ao nível operacional. Por exemplo, uma das políticas sul africanas determina que a pesca de arrasto demersal deve ser conduzida a um nível que mantenha as populações alvo e comunidade ecológica associada relativamente à sua produtividade potencial. Os participantes do workshop identificaram uma série de objectivos ecológicos importantes relacionados com esta política, para além dos objectivos definidos para as espécies alvo em si. Por exemplo, a importância de manter uma abundância adequada de espécies de que a pesca se alimenta e a necessidade de considerar o impacte da pesca na biota benthica foram considerados temas importantes.

Este processo permitiu aos grupos de especialistas de cada país identificar os temas relacionados com o ecossistema que são mais importantes em cada pescaria.

"O processo foi muito construtivo", relatou o Dr Cochrane. "Para a

maioria dos participantes, o projecto EAF transformou-se em algo prático e racional, e não apenas uma ideia vaga."

Um dos objectivos do workshop foi ensinar os participantes a conduzir exercícios de análise de risco de modo a que possam repetir os exercícios nos seus países com uma gama mais alargada de grupos de interesse. Deste modo, cada um dos países será capaz de identificar os temas relacionados com o ecossistema que são prioritários para cada pescaria.

"Queremos atingir uma situação em que tenham sido identificados os temas chave em cada pescaria e em que sejamos capazes de apresentar algumas soluções", explica o Dr Cochrane.

A questão das capturas acidentais é relevante para a maioria das pescarias na região da Corrente de Benguela e poderá tornar-se uma prioridade para o projecto EAF. Em muitas pescarias comerciais a captura acidental não é registada, tornando-se difícil avaliar o impacte da pescaria nas espécies que não são alvo. Um dos objectivos do projecto EAF é melhorar a informação científica sobre temas como capturas acidentais e identificar modos práticos de abordar estes problemas.

O Dr Cochrane realça o facto de que o projecto EAF é um estudo de viabilidade. O objectivo do pro-

jecto é planear a implementação da EAF, e não implementar a EAF nas pescarias comerciais na região da Corrente de Benguela.

"Não queremos alarmar a indústria pesqueira; este projecto não vai introduzir alterações na gestão pesqueira, mas simplesmente fornecer informação sobre a viabilidade de implementar a EAF e sobre os potenciais custos e benefícios da abordagem", afirmou o Dr Cochrane.

De facto, a abordagem de ecossistema que é descrita pela FAO não é inconsistente com as abordagens actuais da gestão pesqueira, nem as substitui. Pelo contrário, será provavelmente adoptada como uma extensão incremental das abordagens actuais para a gestão de pescas.

O Dr Cochrane afirma que o projecto EAF utilizará a melhor informação disponível para destacar áreas onde se revela necessário melhorar a gestão de pescas na região da Corrente de Benguela. O projecto pretende identificar uma gama de opções alternativas de gestão e descrever as implicações sócio-económicas e ecológicas de cada uma dessas opções.

O Dr Cochrane acredita que 2005 será um ano crítico para o projecto. O foco será a análise científica e a recolha da melhor informação disponível sobre cada pescaria.

"Temos que fazer a maior parte do trabalho este ano", afirmou.

Projects supported by the BCLME Programme

The BCLME Programme has allocated more than \$5.5 million (R33 million) in support of 75 projects and activities. 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.



Biodiversity, Ecosystem Health & Pollution Projects

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: Nov. 2005

BEHP/LBMP/03/04

The development of a common set of water and sediment quality guidelines for the coastal zone in the BCLME

Project value: US\$80 000
Contracted to: CSIR
Completion date: Nov. 2005

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

Project value: US\$95 000
Contracted to: CSIR
Completion date: September 2005

BEHP/CEA/03/02

Data gathering and gap analysis for assessment of the cumulative effects of marine diamond mining activities on the BCLME region

Project value: US\$76 000
Contracted to: Pisces Environmental Consultants
Completion date: September 2006

BEHP/CEA/03/03

Assessment of the cumulative effects of sediment discharge from onshore and near shore diamond mining activities on the BCLME

Project value: US\$140 000
Contracted to: CSIR
Completion date: March 2006

BEHP/LBE/04/01

Luanda Bay Ecosystem Project

Project value: US\$80 000
Contracted to: IIM
(contract to be finalised)
Completion date: April 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: March 2007

BEHP/OSCP/03/01

Regional Oil Spill Contingency Planning in the BCLME

Project value: US\$142 000
Contracted to: CSIR
Completion date: (to be finalised)

BEHP/EEF/03/01 - 02

By-catch of threatened seabirds, sharks and turtles in longline fisheries of the BCLME: An integrated approach

Project value: US\$113 299
Contracted to: WWF South Africa
Completion date: April 2006

BEHP/BAC/03/01

Marine biodiversity status assessment and conservation planning for the BCLME

Project value: US\$134 905
Awarded to: BENEFIT
Completion date: December 2007

BEP/BAC/03/02

Mapping of the BCLME shoreline, shallow water and estuarine habitats

Project value: US\$140 000
Awarded to: BENEFIT
(contract to be finalised)
Completion date: September 2005

BEHP/BAC/03/03

Identification of communities, biotopes and species along the BCLME shoreline and in the shallow subtidal zone, and assessment of offshore biodiversity

Project value: US\$160 000
Awarded to: BENEFIT
(contract to be finalised)
Completion date: December 2006

BEHP/BAC/03/04

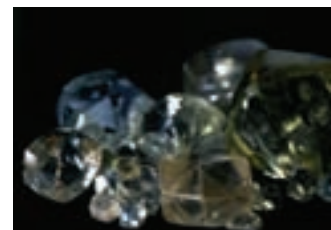
Baseline surveying of species and biodiversity in estuarine habitats

Project value: US\$100 000
Awarded to: BENEFIT
(contract to be finalised)
Completion date: December 2006

BEHP/MC/03/02

Classification of coastline for aquaculture development

Project value: US\$50 000
Contracted to: BENEFIT
(to be incorporated into project BEHP/BAC/03/01)
Completion date: September 2006





Living Marine Resources Projects

LMR/AFSE/03/01/C

Socio-economic baseline surveys of coastal communities in the BCLME

Project value: US\$93 246
Contracted to: Environmental Evaluation Unit, UCT
Completion date: February 2006

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/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, Rhodes University
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, Rhodes University
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, Rhodes University
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, Rhodes University
Completion date: December 2005

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, Rhodes University
Completion date: May 2005

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: July 2006

LMR/SKI/04/01

Construction and delivery of two catamaran type ski-boats (5.5 m) for inshore environmental and fisheries sampling in coastal waters of Namibia and Angola

Project value: US\$85 702
Contracted to: Z-Craft, South Africa
Completion date: September 2005

LMR/CF/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, Norway
Completion date: May 2005

LMR/CF/03/11B

Retrospective analysis of sardinella fisheries in Angola

Project value: US\$23 780
Contracted to: IIM
Completion date: February 2005

LMR/CF/03/16

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 in Angolan waters

Project value: US\$22 666
Contracted to: IIM
Completion date: March 2005

LMR/CF/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, Norway
Completion date: August 2005

LMR/CF/NANSEN/05/03

Investigation of the pelagic fish stock resources in the Orange River region - transboundary survey

Project value: US\$59 500
Contracted to: IMR, Norway
Completion date: October 2005

LMR/CF/03/08

Assessment of the ecological importance of mesopelagic fish and pelagic gobies in the functioning of the BCLME – desk-top reviews

Project value: US\$55 000
Contracted to: BENEFIT (contract to be finalised)
Completion date: September 2005

LMR/SOE/04/01

Development and drafting of a state of the BCLME ecosystem reporting system including both oceanographic, biological and pollution components

Project value: US\$20 000
Contracted to: Anchor Environmental Consultants (contract to be finalised)
Completion date: August 2005

LMR/CF/03/10

Development and harmonisation of pilchard assessment and management between Angola and Namibia

Project value: US\$50 000
Contracted to: OLRAC (contract to be finalised)
Completion date: September 2005

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

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\$125 916
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 the BCLME: utility of models in forecasting HABs

Project value: US\$30 700
Contracted to: UCT and CSIR
Completion date: September 2004
•Final report under review

EV/HAB/05/01

Investigation into the diversity and distribution of cysts of harmful algal blooms within Luanda Bay, Lüderitz Bay and Walvis Bay

Project Value: US\$29 994
Contracted to: Centre for Marine Studies, UCT
Completion date: November 2005

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: Oct. 2005

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: November 2005

EV/PROVARE/02/05

Retrospective analysis of plankton community structure in the BCLME to provide an index of long-term changes in the ecosystem

Project value: US\$111 985
Contracted to: BENEFIT
Completion date: December 2006

EV/PROVARE/04/01

Characterising the spawning habitat of harvested pelagic species using CUFES and net sampling

Project value: US\$93 003
Contracted to: BENEFIT
Completion date: February 2007

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/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: IIM
Completion date:
Extended to July 2005

EV/ANGOLA/03/02

Comprehensive review and re-interpretation of oceanographic information on the Angola sector of the BCLME

Project value: US\$20 000
Contracted to: IIM
Completion date:
Extended to 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: IIM
Completion date:
Extended to July 2005

EV/ANGOLA/03/05

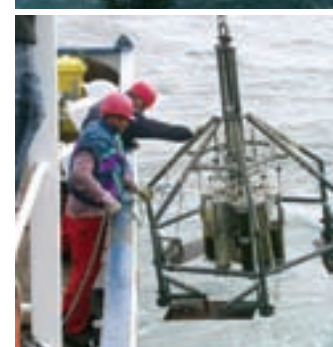
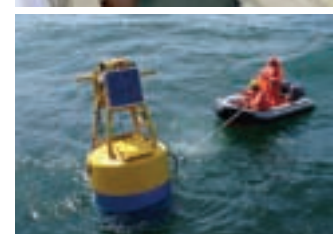
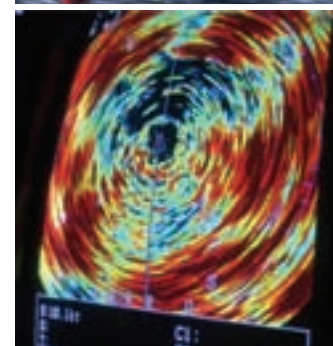
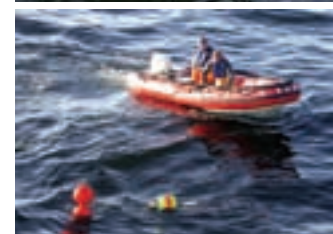
Build capacity for Angola

Project value: US\$7 000
Contracted to: IIM
Completion date:
Extended to July 2005

EV/ANGOLA/03/06

Upgrade communication systems for Angolan BCLME core partner institutions

Project value: US\$8 000
Contracted to: IIM
Completion date:
Extended to July 2005



Completed Projects

PCU/TCB/03/01

Training and capacity building needs assessment for the BCLME

Project value: US\$16 000
Contracted to: Anchor Environmental Consultants
Completed: February 2004
• Final report available at www.bclme.org

PCU/AVM/03/01

Publicising the BCLME Programme through audio visual media

Project value: US\$20 000
Contracted to: Francois Odendaal Film Productions
Completed: May 2004
• Film released in 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: November 2004
• Final report available at www.bclme.org

PCU/BCC/04/02

Economic study and cost benefit analysis of co-operative research and management for the BCLME

Project value: US\$30 100
Contracted to: Fisheries Economics Research Unit, UBC
Completion date: November 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

Project value: US\$39 697
Contracted to: SAIEA
Completed: October 2004
• Final report available at www.bclme.org

BEHP/BAC/WORKSHOP/04/01

Ecosystem mapping and biodiversity consultative workshop 26 to 27 April 2004

Project value: US\$47 095
Contracted to: BENEFIT
Completed: May 2004
• Final report available at www.bclme.org

LMR/AFSE/03/01/A

Review and audit of the institutional arrangements that impact on the artisanal fisheries sector in the BCLME

Project Value: US\$35 280
Contracted to: Environmental Evaluation Unit, UCT
Completion date: January 2005
• Final report under review

LMR/AFSE/03/01/B

Overview and analysis of social, economic and fisheries information to promote artisanal fisheries management in the BCLME

Project Value: US\$65 594
Contracted to: Environmental Evaluation Unit, UCT
Completion date: February 2005
• Final report under review

LMR/CF/Nansen/04/01

Survey of transboundary demersal fish stocks in Namibia with special reference to hake

Project value: US\$110 500
Contracted to: IMR, Norway
Completed: July 2004
• Final report available at www.bclme.org

LMR/CF/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, Norway
Completion date: October 2004
• Final report under review

LMR/CF/NANSEN/04/04

Transboundary study with emphasis on deep water hake in the Luderitz / Orange River Cone area

Project Value: US\$102 000
Contracted to: IMR, Norway
Completion date: November 2004
• Final report under review

LMR/COM/02/01

Henties Bay Community Project

Project value: US\$4 051
Contracted to: Henties Bay Community
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
Completed: March 2004
• Final report available at www.bclme.org

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
Completed: July 2004

LMR/COM/04/01

Development of a demonstration website for the Artisanal Fisheries Institute, Angola

Project Value: US\$5 000
Contracted to: EcoAfrica
Completion date: December 2005
• IPA website now in operation

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
Completed: November 2003
• Final report available at www.bclme.org

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
Completed: May 2004
• Final report available at www.bclme.org

LMR/CF/03/04

Feasibility study into the application of genetic techniques for determining fish stock identity of transboundary populations in the BCLME region

Project value: US\$6 906
Contracted to: BENEFIT
Completed: November 2003
• Final report available at www.bclme.org

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
The BCLME Programme provided co-sponsorship for Mr Quilanda Fidel of Angola and Ms Aina Iita of Namibia to attend the CLIVAR workshop in Brazil between 6 and 8 February 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
Completed: November 2003
• Final report available at www.bclme.org

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, through UNDP-SA
Completed: October 2003
• Final report available at www.bclme.org

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: Philip Reid
Completed: November 2003
• Final report available at www.bclme.org

EV/PROVARE/02/02(a)1

The Luderitz Upwelling Cell/ Orange River Cone (LUCORC) Workshop

Project Value: US\$31 000
Contracted to: BENEFIT
Completion date: 30 Sept. 2004

EV/HUMBOLDT/04/01

Ichthyoplankton distribution, monitoring and training, northern Namibia/southern Angola; oceanographic, hydrological and benthic monitoring in Angolan waters (AHAB leg 9)

Project value: US\$130 000
Completed: July 2004
• Cruise report under review

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
• Final report under review

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, Namibia
Completion date: April 2005
• Final report under review

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
• Final report under review

EV/HAB/02/03

Investigation into the diversity and distribution of cysts of Harmful Algal Blooms (HABs) within the BCLME region

Project value: US\$25 420
Contracted to: UCT
Completion date: January 2005
• Final report available at www.bclme.org

EV/LOW/02/01

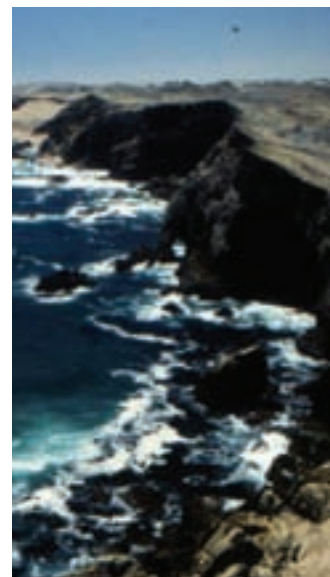
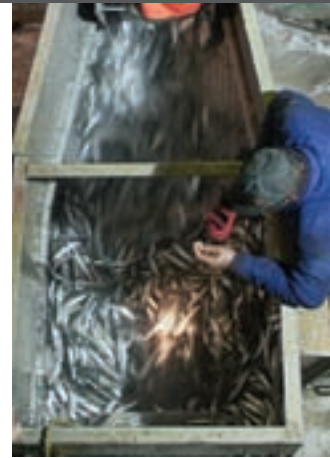
Critical review of the biophysical processes and variability that characterise the low oxygen water (LOW) variability and an improved monthly State of the Environment (SOE) reporting on low oxygen water in the BCLME.

Project value: US\$46 250
Contracted to: UCT and CSIR
Completion date: July 2004
• Final report under review

EV/FORECAST/04/01

International workshop on Forecasting and Data Assimilation in the Benguela and comparable systems.

Project value: US\$80 000
Administered by: PCU
Completion date: November 2004



Abbreviations

- CSIR *The Council for Scientific and Industrial Research (South Africa)*
- IIM *Instituto de Investigação Marinha (Angola)*
- IMR *Institute of Marine Research (Norway)*
- UCT *University of Cape Town*
- MCM *Marine and Coastal Management (South Africa)*
- MFMR *Ministry of Fisheries and Marine Resources (Namibia)*
- SAIEA *Southern African Institute for Environmental Assessment*
- UBC *University of British Columbia (Canada)*
- WWF *World Wildlife Fund*

Dr Fridtjof Nansen to sample from Cape Town to Senegal



Dr Tore Strømme

For the first time, the Norwegian research ship, *Dr Fridtjof Nansen*, is to conduct a sweep of scientific surveys down the west coast of Africa.

The *Dr Fridtjof Nansen* will spend an estimated 301 days in 2005 surveying the fisheries resources of countries as diverse as Mauritania, Cote de Ivoire and South Africa. She will provide a research platform for a wide range of studies, including stock assessment studies of fisheries resources in the Gulf of Guinea countries, investigations into the early life biology of deep-water hake off Namibia and South Africa, and surveys of ecosystem health and pollution off Angola.

In the first quarter of the year, the *Dr Fridtjof Nansen* focused her research efforts on the resources of the BCLME region, but she was scheduled to steam north in May and begin a month-long survey of the fish resources of Cote de Ivoire and Togo. A second month-long survey of the fish resources of the Gulf of Guinea is scheduled for June.

Dr Tore Strømme, head of the Nansen Programme, spoke to *Benguela Current News* when

the ship docked briefly in Cape Town ahead of a 12-day survey of transboundary hake stocks (including major prey species such as pelagic gobies). He explained that the Nansen Programme is currently in a "transitional phase"; the Norwegian government is assessing the existing role of the ship and planning its future use.

It is possible that the Food and Agriculture Organisation (FAO) of the United Nations will take over responsibility for the *Dr Fridtjof Nansen* and the ship will become an important platform for conducting research into the growing number of Large Marine Ecosystem (LME) programmes that are being supported by the Global Environment Facility and the FAO.

The *Dr Fridtjof Nansen* has conducted annual surveys in the BCLME since the early 1990s and the forthcoming cruise off Cote de Ivoire and Togo may herald an increasing involvement by the research ship in the Gulf of Guinea

LME. Furthermore, the Canary Current LME, which involves Cape Verde, Gambia, Guinea, Guinea-Bissau, Mauritania, Morocco and Senegal, recently entered the preparation (PDF Block B) phase and the *Dr Fridtjof Nansen* will undertake a 52-day survey of pelagic resources in that LME in November and December.

Dr Strømme explains that for all research cruises, the ship operates with a core staff of two to three Norwegian scientists, plus the electronic engineers who operate the acoustic survey equipment. However, the ship has accommodation for 19 scientists and it is customary for the countries whose marine resources are being surveyed to deploy their own scientists on the *Nansen*. A local and a Norwegian chief scientist are appointed for each voyage.

"The Nansen Programme places a lot of emphasis on training," says Dr Strømme.

International delegates meet to discuss illegal fishing

Approximately 100 regional and international delegates attended a two-day symposium on the monitoring, control and surveillance of fishing activities which was held in Cape Town early in February.

Over 30 speakers highlighted global strategies to combat illegal, unregulated and unreported (IUU) fishing, as well as regional achievements in the fight against IUU fishing.

The symposium was hosted by the Monitoring, Control and Surveillance (MCS) Programme, a regional initiative which is working to implement cost-effective and sustainable MCS activities in

the Southern African Development Community (SADC) region. It is funded by the European Union and the participating SADC nations.

The symposium was attended by senior MCS managers from Angola, Namibia, South Africa, Mozambique and Tanzania, with the purpose of sharing information about the state of MCS activities in the global sphere, on the regional stage, as well as in individual countries. It also provided an excellent forum for MCS manager to meet and exchange ideas and information.



Januario Marcos of Cefopescas, Angola; Professor Denzil Miller, executive secretary of CCAMLR; and Carlos Palin, programme manager of the SADC-EU Monitoring, Control and Surveillance Programme are pictured at the MCS symposium.

The *Dr Fridtjof Nansen* is designed for fisheries and oceanographic research. Built in 1993 at the Norwegian shipyard, Flekkefjord Slipp & Maskinfabrikk, the ship carries the latest acoustic instrumentation, gear for bottom trawling and pelagic trawling, plankton samplers and probes, as well as samplers for the analysis of hydrographic conditions.

The 1 450GRT ship is powered by a two stroke Wärtsilä Wickman engine that delivers 2 700 HP. She steams at 13 knots, slowing down to 10 or 11 knots to conduct acoustic surveys. Her trawl winches can pull 40 tons and carry 2 500m of 28mm wire. The ship can trawl to a depth of about 1 200m. A SCANMAR system is used to monitor trawl gear.

The *Dr Fridtjof Nansen's* scientific instrumentation includes three SIMRAD EK500 echosounders (18,38 and 120 kHz), two Bergen Echo Integrators and a SIMRAD SA950 multibeam sonar. The

ship carries standard sampling equipment such as a CTD (seabird with rosette sampler), ADCP, current meters and a fluorometer. There is a 12m² wet laboratory, an 11m² biological lab, a 22m² environmental lab, and a 20m² hydrographic lab on board. Sorting and measurement of samples is usually done on deck.

Dr Strømme is hopeful that the *Dr Fridtjof Nansen's* new programme will be initiated in 2006 and that the ship will be available to provide a research service to African LMEs until at least 2010. Although the individual LMEs will be required to pay for the ship's service, costs will be kept at an affordable level.

The BCLME Programme has chartered the *Dr Fridtjof Nansen* to carry out three transboundary surveys in 2005. The surveys will be conducted on hake and horse mackerel, stocks that are shared



between Namibia and South Africa, and Namibia and Angola respectively.

The Norwegian research vessel, Dr Fridtjof Nansen was photographed in Cape Town in March after completing a transboundary hake survey off Namibia and South Africa.

• In 2004, the BCLME Programme funded two transboundary hake surveys and a survey of sardinella stocks which are shared by Angola, Congo and Gabon.

To date the BCLME Programme has spent in excess of US\$500 000 on transboundary research cruises that have been conducted from the deck of the *Dr Fridtjof Nansen*.

New chief for MCM

Dr Monde Mayekiso, a familiar face in the marine science community, has been appointed as Deputy Director General in the South African Department of Environmental Affairs and Tourism. Dr Mayekiso will head the Marine and Coastal Management (MCM) branch.

Dr Mayekiso, who holds a PhD in Marine and Estuarine Environmental Science from the University of Maryland in the USA, returns to MCM after a year-long stint as Programme Manager of CSIR/Environmentek's Oceans and Coasts division.

Prior to his appointment at CSIR/Environmentek, Dr Mayekiso was Chief Director of Research, Antarctica and Islands within the MCM branch.

One of Dr Mayekiso's first tasks at MCM will be to guide the allocation of long-term rights to the R3 billion-a-year fishing industry. The process is already underway and it is anticipated that fishing rights in most of the commercial fisheries will be allocated by January 2006.

Over-and-above the important task of seeing that this process is administered fairly and according to tight deadlines, Dr Mayekiso believes that some of the biggest challenges facing MCM are the establishment of an effective marine research and fisheries compliance component within MCM.

"Right across the board there is a need to do extraordinary things to increase capacity," he says.

Dr Mayekiso's career in marine science has been marked by a commitment to ensure that young scientists from historically disadvantaged universities, such as Fort Hare, Transkei and the Western Cape, are afforded opportunities to further their careers in marine science. He was instrumental in establishing a scholarship programme with the Norwegian government which resulted in a number of young South Africans completing their masters degrees in fisheries science at the University of Bergen. The scholarship system is still producing top calibre fisheries scientists and has recently been complemented by the establishment of a bursary fund by the South African fishing industry.



Dr Monde Mayekiso

Extensive Biodiversity Project to be implemented by BENEFIT



Dr Neville Sweijd

BENEFIT has signed its first major biodiversity contract with the BCLME Programme.

Over the coming two years, BENEFIT will be steering the Management and Orchestration Meta project which provides an exciting opportunity to integrate the results from a suite of biodiversity projects, and produce a conservation planning tool that may be applied by all three countries of the Benguela region.

The title of the Management and Orchestration Meta project has been aptly shortened to "MOM". Like any good mother, the project will be tasked with co-ordinating the activities of its offspring – in this case, four biodiversity assessment and mapping projects that have been commissioned by the BCLME Programme's Biodiversity, Ecosystem Health and Pollution Activity Centre in Luanda.

The four projects will be concerned with assessing and mapping the biodiversity of the estuarine, coastal, nearshore and offshore environments of the BCLME, and identifying suitable sites for aquaculture.

Figure 1, below, provides a graphic representation of the ways in which the five biodiversity and conservation planning projects will be integrated.

The ultimate goal of the MOM project is to produce a strategic planning tool that is capable of providing advice on the protection of sensitive areas and vulnerable species and possible sites for marine protected areas and aquaculture installations. One of the most critical aspects of this project is that information is packaged in such a way that it is accessible to planners and conservation officials in the appropriate ministries of Angola, Namibia and South Africa.

To this end, a process of interaction and consultation with the end-users, plus a training component, have been factored into the MOM project.

T&CB Co-ordinator

BENEFIT has very recently advertised the position of Training and Capacity Building Co-ordinator. Once appointed, the training co-ordinator will be responsible for managing BENEFIT's day-to-day training activities, assisting the Director with raising funds for training and tracking and assessing the impact of training activities on the region. BENEFIT has high hopes that training and capacity building initiatives will go from strength to strength once a

suitable candidate is appointed to this position.

Still on the subject of human resources, BENEFIT was sad to bid farewell earlier this year to Filipe Vianda, a key member of the team over the past three years. Filipe has moved to Cape Town where he has registered for a Masters degree in oceanography. We wish him well with his studies.

Rather than filling Filipe's position of administrative officer, we have chosen instead to appoint Dr Antonio Da Silva to the position of research officer. Antonio is BENEFIT's first PhD graduate; he achieved his doctoral degree through the Institute of Baltic Sea Research at the University of Rostock last year. He will play a key role in BENEFIT by taking responsibility for the management and co-ordination of several research projects.

BENEFIT is still working closely with the BCLME Programme and we are encouraged by the fact that there has been good progress with the discussions around the proposed Benguela Current Commission. BENEFIT's role, either as BENEFIT or as a new entity, is integral to these discussions and I believe that some exciting prospects lie ahead.

by Neville Sweijd

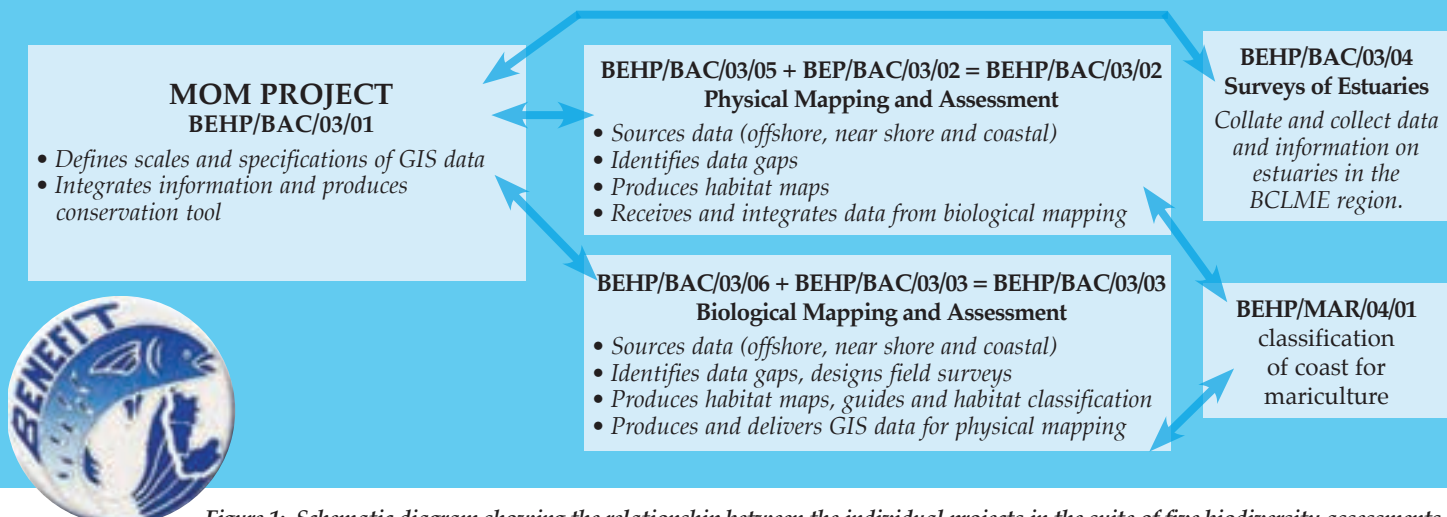
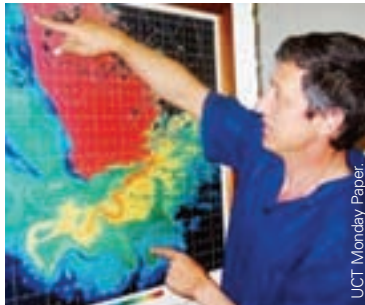


Figure 1: Schematic diagram showing the relationship between the individual projects in the suite of five biodiversity assessments.

Public Relations



The work of Oceanographer, Dr Mathieu Rouault of the University of Cape Town, pictured left, was featured in a recent edition of the university's Monday Paper.

The article focused on the role that the oceans play in determining weather patterns in southern Africa. Dr Rouault and his co-workers at UCT have demonstrated that the

impact of El Niño on Southern Hemisphere rainfall has increased during the last 25 years.

As a result, the spatial extension and intensity of droughts have increased considerably in southern Africa.

This article and 40 other articles about the BCLME Programme are available at www.bclme.org/news

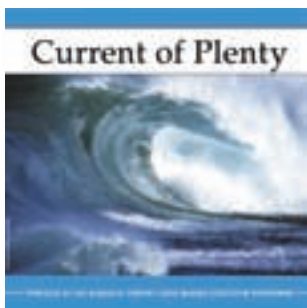
A new brochure on the BCLME Programme was printed and distributed in March. The six-page, full colour brochure describes the three main industries in the Benguela region – the fishing, diamond mining and oil and gas industries - and shows how the BCLME Programme is forging links with resource users in these industries.

The brochure also includes information about the proposed Benguela Current Commission

which will enable Angola, Namibia and South Africa to engage constructively in resolving the trans-boundary issues that threaten the integrity of the BCLME.

It will be widely disseminated at the forthcoming GEF International Waters Conference which takes place in Brazil in June.

Copies of the brochure are available from the PCU (cathy@bclme.un.na) or from the BCLME Programme website.



In June 2004, the BCLME Programme produced 1 000 copies of the documentary *Current of*

Plenty. Only a few months later, an additional 1 000 copies of the documentary were produced on CD ROM, to cater for the demand from environmental educators and the general public.

The production of the additional CD ROMs was partly funded by Marine and Coastal Management, the South African fisheries authority. MCM found the documentary to be a particularly useful resource for environmental educators and ensured that educators in coastal

areas all received a copy of the film.

Current of Plenty describes the abundance of life that occurs in the coastal regions of the Benguela and shows how humans are utilising the marine and coastal resources of the Benguela. It was produced for the BCLME Programme by Francois Odendaal Productions in both English and Portuguese.

Limited copies of *Current of Plenty* are available. To order yours, please contact the PCU at cathy@bclme.un.na

A special website that was developed for the International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems provided a user-friendly registration facility for the delegates who were invited to attend the Workshop.

The website was accessible via a link from the BCLME Programme home page, but it was also possible to access the site via www.bclme.org/forecast.

The website allowed participants to register for the workshop online

and also provided them with all the information that they needed to prepare for the workshop. Five keynote papers were posted to the website and these outlined the major topics that were covered at the workshop.

After the workshop, delegates were able to download print quality photographs that were taken at the two social events – a welcome party at the V&A Waterfront and a dinner at the Kirstenbosch National Botanical Garden.



Plankton collection could hold key to ecosystem change

Tucked away in a dusty warehouse in Cape Town are thousands of tiny glass jars containing plankton samples that date back to as early as the 1950s. The samples were collected monthly for almost two decades off the coast of Namibia and they form part of one of the most comprehensive plankton collections in the world.



Back row: Master's student, Tebello Mainoane and curator, Philip de Vos. Front row: Master's student Sakhile Tsotsobe, Dr Hans Verheye and Master's student Ignatius Kauvee. (Not present: sample analyst, Ferdi Kotze).

Preserving and cataloguing these samples is the job of curator, Philip de Vos. Philip is slowly but steadily working his way through each and every sample in the collection, some of which have never been analysed or properly catalogued. As Philip works through the jars, he tops them up with formalin, renews their labels and stores them according to a logical system. So far Philip has processed 5 500 sample jars; eventually, he will make sure that the entire stock is properly classified and recorded on a digital database.

Philip is one of the key members of a scientific team which is undertaking a comprehensive analysis of the plankton collection which is commonly referred to as the SWAPELS or South West African Pelagic Eggs and Larvae Survey collection. The project is funded by the BCLME Programme and has a strong training and capacity building component.

Two years ago, Master's student, Sakhile Tsotsobe, started to analyse a portion of the SWAPELS collection in a systematic way as part of a BENEFIT-funded pilot study.

Since then, the project has grown in scope and received the support of the BCLME Programme. A second student, Tebello Mainoane, has also completed an analysis of a few hundred SWAPELS samples and like Sakhile will soon complete his Master's thesis on plankton variability in the northern Benguela. Recently, Ignatius Kauvee of Namibia, who is registered for a Master's degree, joined the project team after completing a B.Sc. Honours degree at the University of the Western Cape, which was based on the analysis of a small portion of SWAPELS samples. A fourth student, Fabienne Cazassus of France, is soon to analyse quite a sizeable portion of this collection for her PhD degree. This team of scientists and students is backed up by sample analyst, Ferdi Kotze, who diligently assists them with the microscopic analysis of the enormous collection.

So what exactly is it that makes this dusty collection of diminutive glass jars so fascinating?

According to Dr Hans Verheye, who is steering the BCLME project entitled "Retrospective Analysis of Plankton Community Structure in the BCLME", the SWAPELS collection has the potential to provide important clues about the functioning of the BCLME and how this is changing over time.

As a plankton specialist, Dr Verheye is understandably enthusiastic about the SWAPELS collection, but his arguments for the importance of studying it become very convincing when he points out that almost every fish in the sea relies on plankton as a food source at some stage of its life-cycle; study the plankton, and you are likely to find out something important about the fish.

But the main reason why the SWAPELS collection is so important is because the samples span

the period 1972 to 1989, almost the exact years in which South Africa halted the routine plankton monitoring programme that was initiated in 1951 when its pelagic fishing industry developed. Simply put, the SWAPELS collection straddles the gap in South Africa's otherwise very comprehensive plankton time-series.

"We know that the northern and southern Benguela are different in a number of respects, but using the data from Sakhile and Tebello's analyses, as well as published data from the 1950s and data from the past few years, we have managed to do a very rough reconstruction of zooplankton abundance in the northern Benguela," explains Dr Verheye.

"We have learned that, at a crude decadal scale, there has been a long-term increase in zooplankton abundance there. This seems to match the increasing trend that I documented for the southern Benguela a few years ago."

In addition to the long-term increase in abundance, there has also been a change in the community structure of zooplankton. Interestingly, this coincides with a change in the dominance of pelagic fish species in the BCLME; in the 1950s and 1960s, sardines were more abundant than anchovy, but this was reversed in the 1970s and '80s. And, over the past ten years, zooplankton abundance in the southern Benguela has decreased markedly, a reversal in the long-term trend which happens to coincide with a massive growth in the anchovy stock and a substantial growth in the sardine stock.

Ultimately, improved understanding of plankton dynamics in the Benguela should help scientists to make predictions about future catches of pelagic fish, but Dr Verheye is careful to point out that the Benguela is a complex system and predicting catches

News

South Africa launched two new fishery protection vessels in 2004: the inshore protection vessel, *Lilian Ngoyi* and the offshore protection vessel, *Sarah Baartman*. Two more inshore protection vessels, *Ruth First* and *Victoria Mxenge*, will be delivered by mid-year. The ships are named after South African heroines.

Hamukuaya to head SEAFO

Dr Hashali Hamukuaya has been appointed as the first executive secretary of the South East Atlantic Fisheries Organisation, SEAFO. He took up his position in March, after two-and-a-half years with the BCLME Programme.

Dr Hamukuaya formerly headed the Activity Centre for Marine Living Resources in Swakopmund and was a key member of the BCLME Programme's executive.

"We are going to miss Hashali very much and we wish him the best with his new and challenging position," said Dr Mick O'Toole, chief technical advisor to the BCLME Programme.

"No doubt his appointment will serve to strengthen ties between the BCLME Programme and SEAFO, as well as other regional programmes such as BENEFIT and the SADC/EU Monitoring, Control and Surveillance programme."

The SEAFO Convention focuses on the management of deep-sea species such as orange roughy, armourhead, alfonsino, wreckfish and red crab. It was signed in Windhoek in 2001 by Angola, the European Community, Iceland, Namibia, Norway, South Africa, United Kingdom and the United States of America.

Dr Hamukuaya has considerable experience in fisheries management and international relations. He obtained his Master of Science degree in Marine Environment at the State University of New York and a doctorate in zoology at the University of Port Elizabeth.

Between 1991 and 1998 he worked as a fishery biologist at the National Marine Information and Research Centre in Swakopmund, Namibia. He was later promoted to deputy director and stationed in Windhoek. As the director of the Activity Centre for Marine Living Resources, Dr Hamukuaya was responsible for co-ordinating dozens of regional projects.

During his career, he served as a Commissioner to ICCAT and CCAMLR and has been intricately involved in the BENEFIT and Nansen programmes. He was a member of the team that negotiated the SEAFO Convention and the SADC Fisheries Protocol.



Dr Hashali Hamukuaya

from year to year is no easy task:

"There is no one parameter that can determine anything about trophic levels," he cautions.

The classification and analysis of the SWAPELS collection is only one aspect of the Retrospective Analysis project. There are other pieces that must fit into the zooplankton puzzle, such as retrieving and validating plankton data that were collected by Russian, Spanish and Portuguese scientists off Namibia in the past 50 years. Any hydrographic and fisheries data that was collected at the same time should also be classified and catalogued. And the South African plankton collection of the 1950s and 1960s that is stored at the Iziko South African Museum in Cape Town needs to be revisited and further analysed.

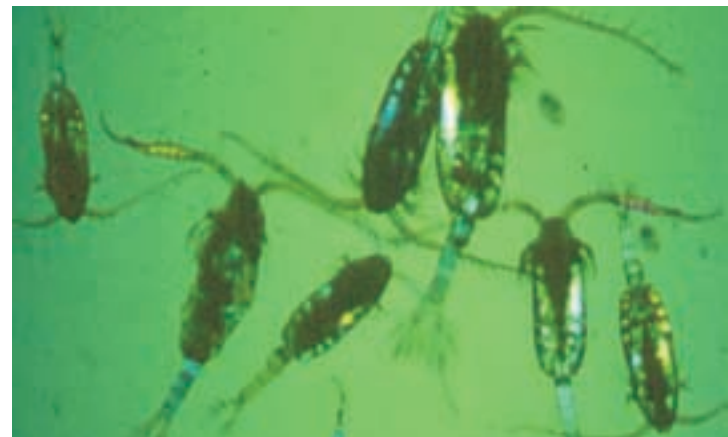
Very recently, the International Ocean Institute Southern Africa (IOI-SA) at the University of the Western Cape was appointed

to manage and consolidate the plankton data in the BCLME. IOI-SA has been tasked with not only collating the disparate databases, but also transcribing them into a format that is compatible with the Southern African Data Centre for Oceanography (SADCO) where the data will ultimately be stored.

Since it can take a full day to thoroughly analyse one plankton sample jar, this is to be a demanding and time consuming task. But, as Dr Verheye points out, the project is about more than just plankton:

"We hope to be able to say something significant about ecosystem change once this project is complete," he says.

The international scientific community has shown great interest in the Retrospective Analysis project because there is a global trend towards analysing plankton time-series to examine similarities and differences in the low-frequency



A few specimens of the Calanoid Copepod Centropages sp., showing both male and female individuals.

variability of plankton in widely separated ocean regions and to see whether these plankton trends coincide with fisheries trends.

"The world is waiting for some data to come out of the northern Benguela," says Dr Verheye, "and we are making visible progress."



A Calanoid Copepod.



A Euphausiid.

Climate change could trigger the degradation of intense upwelling systems

A recent paper by Andrew Bakun and Scarla Weeks suggests that climate change may influence the size and frequency of sulphur eruptions off the coast of Namibia and, the incessant build-up of greenhouse gases in the atmosphere may cause other intense coastal upwelling systems to switch to similar, undesirable states, especially when coupled with overfishing.

Maintaining healthy sardine stocks may be one approach to mitigating this process, say the authors of the paper which was published in *Ecology Letters* in 2004.

The paper is entitled "Greenhouse gas buildup, sardines, submarine eruptions and the possibility of abrupt degradation of intense marine upwelling ecosystems". It focuses on the Namibian coast where gas eruptions of methane carry hydrogen sulphide into the water column. The resultant sulphur in surface waters provides a clear visual marker of this phenomenon and developments in satellite observation capacity have made it possible for scientists to measure the scale and frequency of the sulphur eruptions that occur off the Namibian coast.

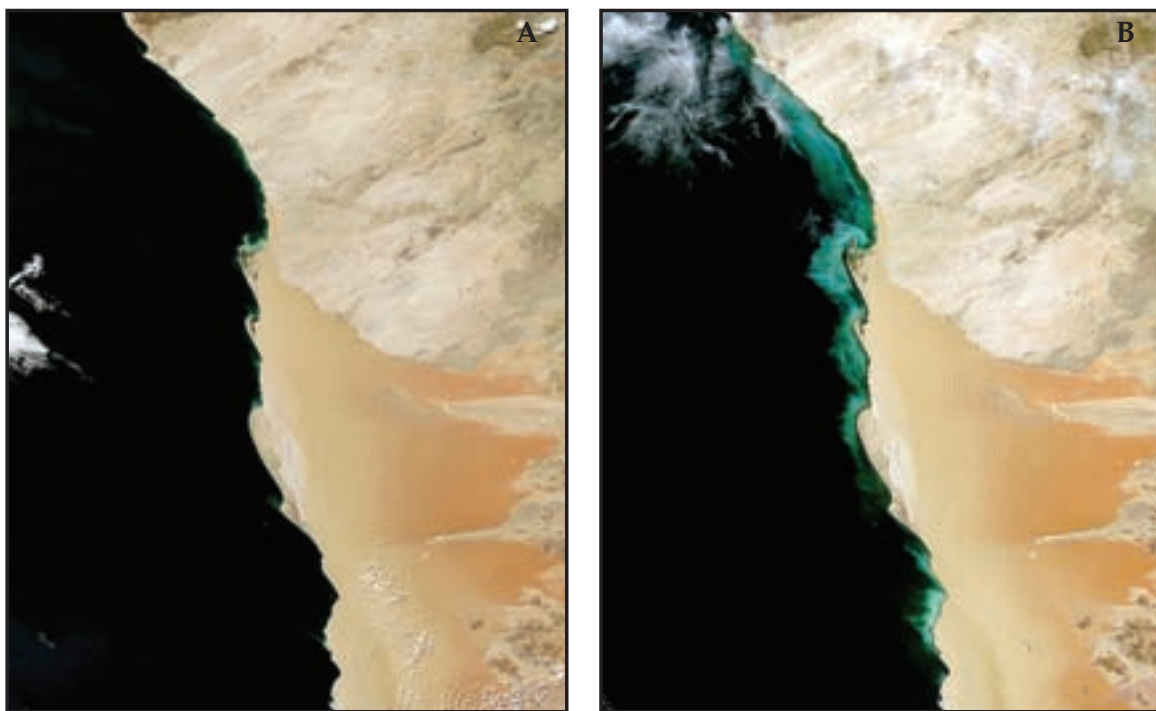
During the first year of observation, one or more major eruption signal was visible "more often than not" somewhere along the coast of Namibia, report Bakun and Weeks. Events have been observed to extend over more than 20 000km² of ocean surface - an area about two thirds of the size of Belgium!

The eruptions typically occur downstream of Lüderitz, the most intense upwelling centre in the world. Bakun and Weeks describe a process whereby upwelling favourable winds move surface water offshore and replace it with deep, nutrient rich water. This natural process of fertilisation causes vigorous phytoplankton growth. But the winds are so strong around Lüderitz that surface waters are shunted offshore and along the

coast. Planktonic grazers cannot cope with this immense build up of phytoplankton biomass which is therefore under-utilised and most of it sinks to the sea floor where it decomposes.

The accumulation of organic matter on the sea floor results in extensive areas where dissolved oxygen concentrations are very low or entirely lacking. Methane (CH₄) gas and poisonous hydrogen sulphide gas (H₂S) are produced within a metres-deep layer of anoxic diatom sludge. Under immense pressure, methane effervesces into tiny gaseous bubbles which become sufficiently buoyant to move upward. The bubbles expand rapidly as they rise, because hydrostatic pressure decreases exponentially along their

Massive sulphur eruption



MODIS quasi-true colour images showing the rapid initiation of a hydrogen sulphide eruption along the Namibian coastline in April 2005: (a) 19 April, afternoon; (b) 20 April, morning. The images were generated from MODIS Aqua and Terra satellite data, respectively. The areas

of milky turquoise colouration indicate high concentrations of suspended sulphur granules in surface waters. (Images provided by Scarla Weeks. MODIS data courtesy of the Modis Rapid Response Team, NASA/GSFC.) the region."

upward journey, causing them to rise faster. According to Bakun and Weeks, the accelerated upward movement of bubble-infused waters would induce an additional lowering of hydrostatic pressure in the surrounding water, causing a spreading of effervescence and bubble expansion. This explains the huge spatial extension of sulphur eruptions.

H₂S is highly toxic to marine organisms and also has the effect of stripping dissolved oxygen from the water column, say Bakun and Weeks. Mortalities of nearshore animals occur annually off Namibia, with varying degrees of intensity, and coastal residents have to live with noxious smells and the corrosive effects of the sulphurous gases that are released from the sea into the atmosphere.

In *Ecology Letters*, Bakun and Weeks propose that the sulphur eruptions that are degrading Namibia's marine and coastal environment might be duplicated in other parts of the world.

They suggest that the build up of greenhouse gases in the atmosphere and the consequent warming of the land, has led to a multi-decadal increase in upwelling-

favourable winds near the coast. Stronger winds create an intensification of coastal upwelling and the possibility that intense regional upwelling ecosystems might be switched to undesirable states similar to that which currently exists off Lüderitz.

In a classic positive feedback loop, the upwelling releases greenhouse gas into the atmosphere.

However, Bakun and Weeks suggest that there may be a biological buffering process available to help avoid such undesirable Lüderitz-type states. They propose that if the phytoplankton-consuming sardines are present in sufficiently large numbers, they could reduce the phytoplankton biomass and set in motion a steep decline in the local primary production.

Sardines are noteworthy among small pelagic fish because their very fine-meshed gillraker structures allow them to filter and directly consume microscopic phytoplankton. Moreover, sardines are very strong swimmers for their size and so are capable of overcoming the strong offshore-directed surface flow near the upwelling zone.

Bakun and Weeks note that the sardine biomass off Namibia is estimated to have been as much as 10 million tons. Since the collapse of the sardine resource in the 1970s, the Namibian sardine population has never exceeded a tenth of those levels and in recent years the population has almost vanished. They propose that an abundant regional sardine population may act as a particularly efficient conduit of nutrients and primary production from the upwelling zone to the higher trophic levels of the broader marine ecosystem, as well as a buffer against the development of a degraded coastal ecosystem state.

Although the authors do not claim that there were no gaseous eruptions at all in earlier years, they believe that changes in global climate could have an impact on the size and frequency of eruptions. The associated intensification of anoxia and hypoxia has important consequences for marine fauna. They conclude that, given the potential global importance of nutrient cycling in coastal upwelling systems, it would be worthwhile supporting further studies into the sulphur eruptions off Namibia.

Fact File:

Journal offers insight into ecosystem management

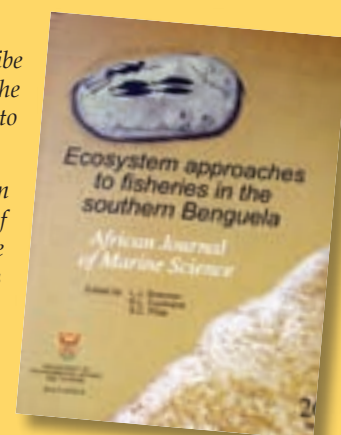
The idea that commercially exploited fish stocks form part of a complex marine ecosystem and that fisheries management should take a broader, more holistic view of the oceans' resources, is rapidly gaining momentum.

It is very useful, therefore, to have an extremely informative and highly topical volume on the subject of the ecosystem approach to fisheries management (EAF) published by the South African Department of Environmental Affairs and Tourism.

The Department has dedicated a volume of the African Journal of Marine Science to the subject of "Ecosystem approaches to fisheries in the southern Benguela".

The journal comprises 18 contributions which describe a number of ecosystem studies and highlight the importance of incorporating ecosystem models into fisheries management advice.

The Department of Environmental Affairs and Tourism has circulated limited copies of the African Journal of Marine Science in the region, but additional copies are available. Interested readers may contact the Journal's editor, Stan Pillar, at: scpillar@deat.gov.za or log onto the website of the National Inquiry Service at www.nisc.co.za.



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 Namibia, Angola 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 issues include the migration or straddling of valuable fish stocks across national boundaries, 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-ordination Unit, which is based in Windhoek, Namibia.

BCLME PROGRAMME CO-ORDINATING UNIT
WINDHOEK, NAMIBIA
Tel: +264 (0)61 246 806
Fax: +264 (0)61 246 803
Chief Technical Advisor: Dr Mick O'Toole
Email: otoole@bclme.un.na



ACTIVITY CENTRE:
BIODIVERSITY, ECOSYSTEM HEALTH AND POLLUTION
LUANDA, ANGOLA
Tel: +244 (0)2 30 9330
Fax: +244 (0)2 30 9330
Director: Ms Maria Sardinha
Email: milu_sardinha@yahoo.com



ACTIVITY CENTRE:
LIVING MARINE RESOURCES
Swakopmund, NAMIBIA
Tel: +264 (0)64 410 1106
Fax: +264 (0)64 410 1188
Director: Dr Moses Maurihungirire
Email: mmaurihungirire@benguela.org



ACTIVITY CENTRE:
ENVIRONMENTAL VARIABILITY
Cape Town, SOUTH AFRICA
Tel: +27 (0)21 402 3418
Fax: +27 (0)21 402 3351
Director: Ms Lesley Staegemann
Email: bclmeevg@deat.gov.za



Feedback:

Please send your comments, suggestions and stories to:
Claire Attwood
Tel/Fax: +27 (0)21 788 3500
Email: cattwood@mweb.co.za

Design & DTP:
Günther Kornick Studio
Tel: +27 (0)21 531 7798

Portuguese Translation: Raquel Garcia

Photography:
Claudio Velásquez, Claire Attwood, Kevern Cochrane, Hans Verhey, Helen Theron, Gabriella Nascimento, Catherine Kuske

www.bclme.org