



Applying an Ecosystem Approach to Fisheries Management in the High Seas

A Focus on Seamounts of the southern Indian Ocean



IUCN Global Marine and Polar Programme





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Cover photographs:

Front: *Slototeuthis* sp. squid, © Sarah Gotheil / IUCN

Back: *Argyropelecus acuelatus* - Hatchetfish, © Sarah Gotheil / IUCN

The Seamounts Project

PROJECT OBJECTIVE

The overall objective of the “seamounts project” is to develop ecosystem approaches to fisheries management for biologically-globally significant and commercially-important areas beyond national jurisdiction, the high seas. By focusing on seamounts in the southern Indian Ocean, it aims to serve as an innovative demonstration for improving the conservation and management of unique biodiversity and ecological resources in the high seas.

The project will address the three main barriers to sustainable fisheries management and marine biodiversity conservation in the high seas:

1. Lack of scientific knowledge about seamount ecosystems and their relationship with fisheries resources
2. Lack of comprehensive and effective governance frameworks for marine biodiversity in the high seas
3. Difficulty of managing offshore fish stocks, including monitoring, control and surveillance

BACKGROUND

The global depletion of inshore and continental shelf fisheries, coupled with improvements in fishing technology and growing demand for seafood, has led commercial operators to fish further out and deeper into the oceans. Some of these fisheries are in oceanic waters beyond national exclusive economic zones (EEZs), where they are subject to weak or sometimes no regulation.

Seamounts and other complex, raised seabed features in the open ocean are often hotspots of biological diversity and production. Some attract concentra-

While seamounts in temperate regions around developed countries have been visited for research, those in more remote regions remain nearly unexplored.

tions of commercially-important pelagic fish, such as tuna, and concentrations of animals such as cetaceans, seabirds, sharks and pinnipeds. Seamounts also host deep-water fish species, such as orange roughy or alfonso, that are highly attractive to commercial

communities of cold water corals, sponges and other animals.

While seamounts in temperate regions around developed countries have been visited for research, those in more remote regions remain nearly unexplored. This is particularly true for the southern Indian Ocean, for which the few biological data that exist come almost exclusively from the deep-sea fishing industry or from national fisheries research programs prospecting for exploitable fish stocks. Furthermore, these data are not available to the public for reasons of commercial confidentiality.



The November-December 2009 expedition was on board the Dr Fridtjof Nansen

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operators. The limited knowledge of seamount-associated fauna to date indicates that many species grow and reproduce slowly and are therefore much more vulnerable to overexploitation.

Evidence has shown that deep-sea bottom fisheries can cause depletion of commercially-important fish stocks in just a few years and irreparable damage to slow-growing deep-seabed

The southern Indian Ocean remains the most significant gap in current knowledge of global seamount ecology and biodiversity. Thus, conservation and management of marine biodiversity based on precautionary and ecosystem approaches is hampered by a lack of fundamental scientific knowledge and understanding of seamount ecology and their relations to benthic and pelagic fish species of commercial interest.

Global Governance Framework for the High Seas

Seamounts

Seamounts, underwater mountains rising from the ocean floor, are found in all oceans of the world and are abundant features of the seafloor. They are known to be hotspots of biological diversity and production, and are important for marine biodiversity and the status of marine food webs. Migratory fish and cetaceans rely on seamounts as well for their food supply. Limited knowledge of seamount-associated fauna to date indicates that many species grow and reproduce slowly, thus are highly vulnerable to overexploitation.



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The international legal regime for the high seas is made up of a number of global and regional legal instruments. It includes the United Nations Convention on the Law of the Sea (UNCLOS), an umbrella convention covering all ocean uses; and the Convention on Biological Diversity (CBD), which places obligations on nations to conserve and sustainably use marine biodiversity in areas beyond national jurisdiction.

With regards to fisheries, the only global framework calling for sustainable management of high seas fisheries, based on the precautionary and ecosystem approaches, is the United Na-

tions Fish Stocks Agreement (UNFSA). However, the Agreement applies only to highly migratory and transboundary fish stocks and does not cover sedentary high or deep-sea fish populations.

There are some binding legal agreements at the regional level, such as those establishing Regional Fisheries Management Organizations (RFMOs). They do not, however, cover all high seas fisheries with respect to species or ocean areas.

Globally, the conservation and sustainable management of high seas biodiversity has gained momentum in recent years, and has become a priority at international fora and for specific institutions such as the UN General Assembly (UNGA), the CBD, and

the UN Food and Agriculture Organisation (FAO).

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Since 2002, when the UNGA called on states to urgently consider ways of minimising risks to seamounts and other underwater features, a number of milestone events and resolutions have been achieved. They have all urged states to take measures for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction. In 2006, the UNGA adopted resolution 61/105 on sustainable fisheries which included a call for urgent action to protect deep-sea corals and other vulnerable ecosystems from the impacts of bottom fishing on the high seas. In specific, paragraph 80 of UNGA res. 61/105:

“Calls upon States to take action immediately, individually and through regional fisheries management organizations and arrangements, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect vulnerable marine ecosystems, including seamounts, hydrothermal vents and cold water corals, from destructive fishing practices, recognizing the immense importance and value of deep sea ecosystems and the biodiversity they contain.”

Paragraphs 83-85 of res. 61/105 detail the steps that States and RFMOs are to take to ensure the sustainability of deep sea fisheries and to prevent significant adverse impacts on vulnerable marine ecosystems. The FAO Guidelines for the Management of Deep Sea Fisheries on the High Seas elaborate on these elements.

Governance Framework for the High Seas of the Indian Ocean



Work onboard a deepsea trawler in the Indian Ocean. Copyright: SIODFA.

The only regional fisheries agreement currently in force in the Indian Ocean, the Indian Ocean Tuna Commission (IOTC), applies specifically to the conservation and management of tuna and tuna-like species. The Southern Indian Ocean Fisheries Agreement (SIOFA), which focuses on all fishery resources of the southern Indian Ocean, is not yet in force, and the interim measures called for by the UNGA resolution 61/105 have not yet been agreed on a regional basis for the Indian Ocean.

Thus, unlike most high seas areas elsewhere, bottom fisheries in the Indian Ocean are not subject to multilaterally agreed conservation measures taken within the frame of a Regional Fisheries Management Organisation (RFMO). They are subject to flag state regulation only, which can vary significantly from one country to the other.

The only large-scale conservation initiative for seamounts in the Indian Ocean came from within the industry which set aside 11 no-go areas

The only large-scale conservation initiative for bottom features such as seamounts in the southern Indian Ocean came from within the industry.

In 2006, the Southern Indian Ocean Deepsea Fishers Association (SIODFA) voluntarily set aside 11 Benthic Protected Areas (BPAs), thereby protecting over 300 000km² of areas of the seafloor from the impact of fishing gear.

SIODFA has also undertaken a number of complementary measures that contribute to conservation of deepwater fisheries in the region:

- Members have agreed not to expand fleet size or fishing capacity in the fishery in the absence of scientific assessments;
- Members have agreed that their operations should be free of subsidies to avoid incentives to overfish;
- SIODFA vessels are undertaking acoustic stock assessments of selected species to contribute to knowledge of the abundance of these species;
- All SIODFA vessels participate in data collection programmes with an emphasis on bycatch, especially invertebrates and deepwater sharks; and
- SIODFA monitors all relevant conservation developments for potential adoption by their vessels, e.g. bird-strike mitigation measures.

While the initiative by SIODFA represents an important step forward, it emphasizes the need for effective governance and enforcement, within the framework of a transparent and open multilateral decision-making process. It also highlights the need for conservation measures to apply to other fishing and extractive companies, and for further identification of vulnerable marine ecosystems.

The combination of the lack of understanding of important oceanic features such as seamounts and their interactions with commercial fish species and the existing gap in the high seas marine biodiversity governance and regulatory system poses major threats to marine species and their habitat.

These gaps can allow unregulated and unreported activities, overexploitation of marine resources and destruction of benthic habitats.

Objectives of the Project

1. Improve scientific understanding and capacity for monitoring, assessment and analysis of high seas biodiversity and fisheries around seamounts

The project aims to enhance the knowledge base necessary to develop effective conservation and management options for high seas biodiversity.

Two research expeditions of 40 days each will study five selected seamounts in the southern Indian Ocean. The first cruise will focus on the pelagic ecosystem, fishery resources and oceanography, and the second cruise on benthic ecosystems. They will help answer key scientific questions, including:

- o What is driving the seamount ecosystems and fisheries?
- o How diverse are seamount fishes, crustaceans and other invertebrates?
- o What are the benthic communities of the studied seamounts like?
- o Are the predictions of coral diversity based on global modelling studies accurate?
- o What are the impacts of past and current deep-sea fishing activities?
- o Do the BPAs make a significant contribution to conservation of vulnerable seabed communities and do they benefit fishing?

The scientific expeditions, planned for the end of 2009 and 2011 respectively, will comprise a multidisciplinary team of international scientists, paired with experts from the region. This will provide opportunities for capacity building, as well as expanding the global network of scientists interested in oceanography and deep-sea applied research and conservation.

The major partners on this research cruise are IOZ/ZSL, FAO and its EAF-Nansen project, the ASCLME Project,

ACEP, IMR and SIODFA. The work is funded by the Global Environment Facility, The Natural Environment Research Council, UK, and the FAO.

2. Enhance governance frameworks for high seas resources conservation and management

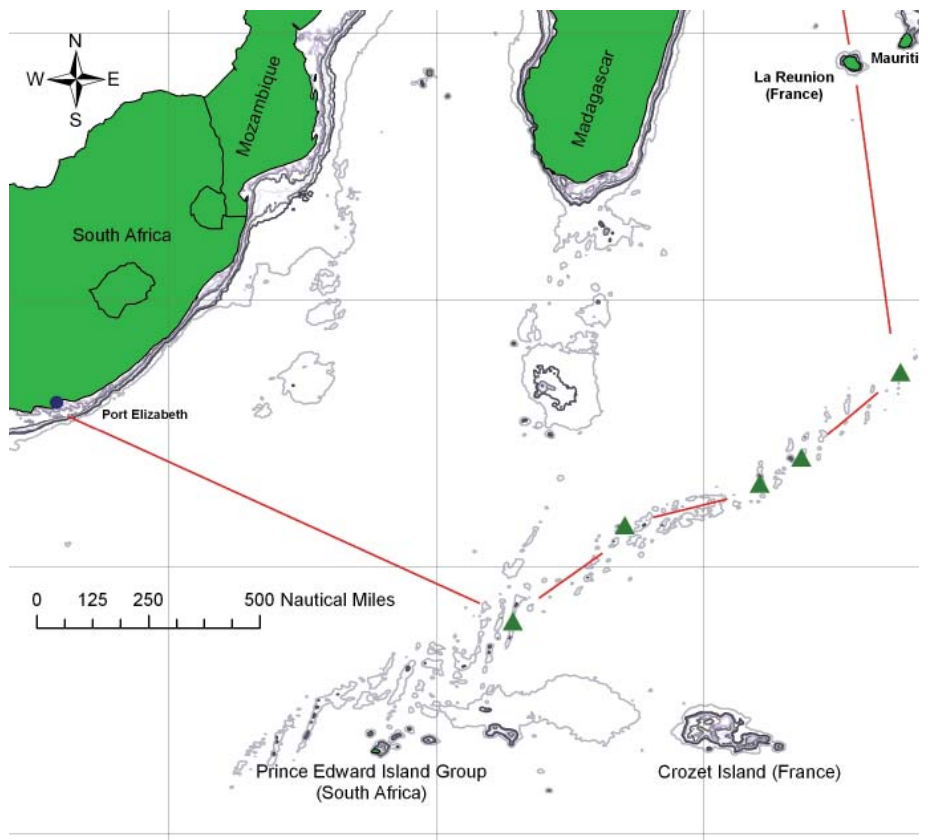
In order to support the enhancement of the governance and regulatory framework for the conservation and management of high seas marine biodiversity of the southern Indian Ocean, the project will:

- o Develop an institutional and legal gap analysis for the Indian Ocean
- o Develop a comprehensive list of

possible options for the improvement and strengthening of the legal and institutional framework to achieve sustainable fisheries and biodiversity conservation

- o Closely follow developments at international and regional fora and feed project results into them
- o Liaise with key governments and international, regional and technical entities and networks to maximize cooperation and coordination

The ASCLME Project, which also addresses high seas governance in areas that fall within the Large Marine Ecosystem boundaries but fall outside of national jurisdictions, is an important partner. Cooperation and liaison



Map of Project Area (Courtesy of TG Bornman)

The proposed project will focus on 5 seamount areas, 3 of which are inside proposed Benthic Protected Areas (BPAs) and 2 outside BPAs. All seamounts are exclusively in the high seas.

History of deep-water fishing

Deep-sea fisheries are generally considered to be fisheries conducted for bottom dwelling species below 200 meters on the continental slope, seamounts, deep-sea ridges and plateaus and associated underwater features. There has been a long history of traditional and artisanal handline fisheries for deep-water species, but industrial deep-sea trawl fisheries only developed in the 1950s and 1960s with the advent of factory trawlers. Firstly dominated by countries of eastern Europe and former USSR until their decline in the 1980s, deep-water bottom trawl fisheries were then developed by a number of other countries. Kept within countries' EEZs along the continental slope and on seamounts throughout the 1980s and 1990s, many of these fisheries have progressively expanded into deeper waters and further offshore, including beyond the limit of national jurisdiction.

Source: Matthew Gianni (2004), high seas bottom trawl fisheries and their impacts on the biodiversity of vulnerable deep-sea ecosystems: options for international action.

In just ten years, between 1992 and 2002, the percentage of fish, both pelagic and deepsea, caught in the high seas in relation to the global marine catch rose from 5% to 11%.

Source: UNEP (2006). Ecosystems and Biodiversity in Deep Waters and High Seas. UNEP Regional Seas Reports and Studies No. 178. UNEP/IUCN, Switzerland 2006.

applied to other ocean areas, be expanded to a basin-wide scale, or include industries other than fishing.

4. Learning, awareness raising and knowledge sharing

The project will contribute greatly to global knowledge of seamount ecosystems and provide a concrete example of how remote oceanic ecosystems could be sustainably managed, in coordination with the fishing industry. To this end, the project will:

- o Regularly exchange project findings and information of mutual interest with other projects and entities concerned with the southern Indian Ocean and high seas resources, to ensure results and learning are shared as widely as possible and benefit from the experience of others
- o Widely publicise project findings and results to raise awareness of the importance of deep-sea biodiversity and highlight new discoveries for the attention of decision-makers, the private sector, scientific institutions and the wider public
- o Disseminate project results at international, regional and technical fora and feed outcomes and developments of policy-making processes into the project implementation

The project has already established cooperation and collaboration mechanisms with several entities and projects, including the ASCLME Project, ACEP and the Western Indian Ocean Marine Science Association (WIOMSA).

with relevant entities, such as FAO, the South West Indian Ocean Fisheries Commission (SWIOFC), the Indian Ocean Commission, IOTC, etc. will be actively sought as well as SIOFA if and when it comes into existence.

3. Identify options for conservation and management measures applicable to high seas areas in the southern Indian Ocean

The proposed project will facilitate the identification and assessment of various options for conserving and sustainably managing deep-sea fishery resources and marine biodiversity. In particular, the project seeks to:

- o Identify conservation and management options based on a precautionary and ecosystem approaches applicable to areas in the high seas of the southern Indian Ocean
- o Identify options for managing deep-sea fisheries to prevent significant adverse impacts to vulnerable marine ecosystems and ecologically and biological significant areas
- o Identify appropriate monitoring, control and surveillance systems to ensure effective enforcement of, and compliance with, conservation

- and management plans
- o Develop a model management framework for high seas biodiversity and important high seas areas in the southern Indian Ocean
- o Identify threats from activities other than fisheries - such as maritime traffic or mining - that may negatively impact marine resources, and cumulate stress factors

The project will work in close collaboration with the fishing industry, to ensure feasibility and cost-effectiveness of measures, and encourage maximum buy-in and future compliance. It also seeks to provide a model that can be



Work onboard the Dr Fridtjof Nansen

Two scientific expeditions

The scientific component of the Indian Ocean Seamounts project aims to describe the marine communities of this region in order to understand and quantify their diversity, biogeography, and ultimately what is driving the energy supply and pathways within the seamount system. This information will inform an understanding of the impacts of the past and current deep-sea fishing activities in the region.

2009 RESEARCH CRUISE

The first of the two cruises was undertaken in November-December 2009 on board the Norwegian research ship Dr Fridtjof Nansen.

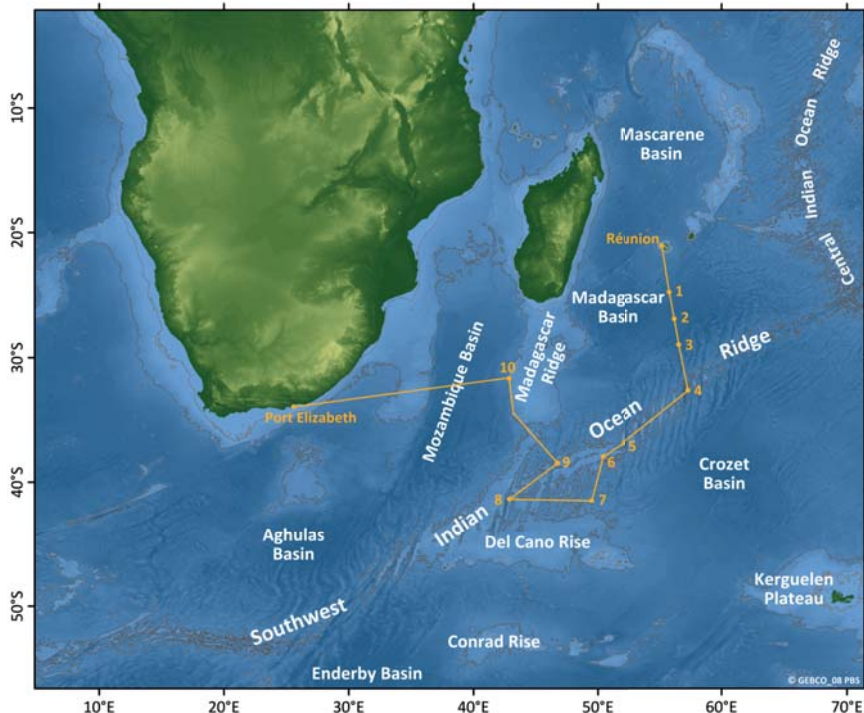
It represents the first comprehensive biological survey ever conducted on the pelagic ecosystems associated with these underwater mountains.

Over 40 days, a team of the world's leading marine experts, paired with scientists from the South Western Indian Ocean Ridge (SWIOR) and one seamount further north at Waters Shoal. The scientists, covering a range of expertise, including acoustics, physical oceanography, and biology of phytoplankton, zooplankton, fish and seabirds, returned with a wealth of unique data and specimens. Nearly 7,000 lots of samples were gathered and labeled including fish, shrimps and squid. Samples of zooplankton and phytoplankton were also collected. The two seabird and marine mammal observers recorded thousands of seabirds from as many as 36 species and 26 marine mammals over the course of the expedition.

2011 RESEARCH CRUISE

Whereas the first cruise focused on the pelagic ecosystems, the second one will investigate benthic assemblages on seamounts of the same area.

The study sites lie along the central part of the SWIOR and include seamount



South West Indian Ocean Seamounts Cruise 2009; cruise route and stations:

1. CTD station. 2. Off Ridge Station. 3. CTD Station. 4. Atlantis Bank. 5. Sapmer Bank. 6. Middle of What Seamount. 7. Off-Ridge cold-water station. 8. Coral Seamount. 9. Melville Bank. 10. Un-named Seamount Walters Shoal. [Cruise Report Dr. Fridtjof Nansen – Southern Indian Ocean Seamounts. 12th November-19th December, 2009]

features in the 'Coral', 'Bridle' and 'Atlantis Bank' Benthic Protected Areas (BPAs). Two other seamounts will be sampled along the intervening ridge sections, the heavily fished Melville Bank in the south and the Sapmer seamount in the north, resulting in a total of 5 sampled seamounts which were sampled during the 2009 cruise.



© LEO REYNOLDS

The second expedition is scheduled with RRS James Cook to conduct benthic sampling; 7 November 2011 - 21 December 2011.

Following surveys, benthic sampling will be undertaken by means of 3 techniques: Remotely operated vehicle

(ROV) video transects, ROV sampling and corers. The ROV KIEL 6000 from IFM-GEOMAR will be used on board the RRS James Cook.



© IFM-GEOMAR

ROV KIEL 6000 (IFM-GEOMAR) has been designed for scientific purposes with an operational depth rating of 6000 m

BLOGS

<http://seamounts2009.blogspot.com>

<http://seamountsexpedition.blogspot.com>

Results of the taxonomic analysis

TAXONOMIC WORKSHOP

As part of the scientific component of the seamounts project, a taxonomic workshop was held on 8-15 November 2010 in Grahamstown, South Africa.

21 scientists and students representing seven countries gathered at the South African Institute for Aquatic Biodiversity (SAIAB) to identify some 7000 samples collected during the seamounts cruise in 2009. The results of this taxonomic

analysis will improve scientific knowledge of this corner of the Indian Ocean, of seamounts more generally and will inform decisions on how we can better manage and protect these remarkably rich features.

Participants worked incredibly hard, spending on average 12 hours per day at the world-class facilities generously provided by SAIAB (South African Institute for Aquatic Biodiversity).



©RAINER VON BRANDIS

Hatchetfish (Argyropelecus aculeatus). These small (5cm), unusually shaped deep sea fish use bioluminescence (lights on their bodies) to escape predators. By matching the light intensity of their bodies with the light penetrating the water from above, the fish does not appear darker if seen from below and can therefore not be seen by predators.

History of deep-water fisheries in the Indian Ocean

Deep-sea trawl fishing has taken place over the past several decades in the high seas of the South West Indian Ocean region, with exploratory surveys by vessels from the former USSR beginning in the 1970s. Former USSR vessels conducted periodic deep-sea trawl research cruises on a commercial scale throughout the 1980s and 1990s, and deep-sea trawlers from both New Zealand and Australia were reportedly also fishing in the region during the 1990s. In the period 1999 – 2001 there was a major increase in deep-sea trawling on the high seas with the discovery of orange roughy (*Hoplostethus atlanticus*) stocks by vessels from New Zealand. The combined catch of all deep-sea species in 2000 was estimated at approximately 40,000 tonnes, involving up to 50 vessels from over a dozen countries, although accurate catch data are unavailable, given the unreported and unregulated nature of the fishery. In 2001, only eight vessels reportedly participated in the fishery and, in 2002, fishing activity declined even further. Very little information is available on the South East Indian Ocean.

Detailed information on the former USSR deep-sea trawl fisheries be-

tween 1970s and 1990s indicated that well over 100 species were taken as by-catch, which suggests that the impact on associated and dependent deep-sea species could be significant.

Current fisheries

The dominant bottom fishery in the high seas of the South West Indian Ocean over the past several years has been the mid-water and bottom trawl fishery on and around seamounts for alfonso (Beryx splendens) and orange roughy. In addition to the trawl fishery, a deep-sea longline fishery on the high seas developed over the past several years targeting primarily deepwater longtail red snapper (*Etelis coruscans*). Anecdotal information also suggests that several vessels may be fishing with deep-sea gillnets on the high seas of the south Indian Ocean, primarily for deep-sea sharks.

SIODFA indicated that four deep-sea trawl vessels have regularly fished the high seas of the southern Indian Ocean for orange roughy and alfonso since 2003, and not all of the vessels fish all year round.

Source: Bensch, A.; Gianni, M.; Gréboval, D.; Sanders, J.S.; Hjort, A. *Worldwide review of bottom fisheries in the high seas*. FAO Fisheries and Aquaculture Technical Paper. No. 522. Rome, FAO. 2008

More than 200 species of fish and 74 species of squid were identified. Additionally, the fish larvae expert Peter Konstantinidis has identified the larval stages of approximately 30 fish species. Although there were far too many samples to work through during this workshop, many of the participants will continue working on them during the ensuing months. Phillip Boersch-Supan and Kirsty Kemp have extracted several hundred biological samples from fishes including stomach contents, otoliths, scales, muscle tissue and brain tissue. These will be used for various studies related to deep-sea fish ecology physiology. Although the taxonomic data still need to be analysed, the principal scientist, Alex Rogers, expects to find interesting latitudinal differences in the composition of seamount-associated species. Given that this is the first time that these specific seamounts have been studied, this information and the anticipated publications arising from it, should greatly assist in the management of deep-sea ecosystems and allow us to gain a better understanding of how they function ecologically.

A NEW SPECIES DISCOVERED

A new species of squid has been discovered.

The new species, which was identified by Dr. Vladimir Laptikhovsky, Fishery Scientist from the Falkland Islands Fisheries Department, is 70cm long and is a large member of the chiroteuthid family. Members of this squid group are generally long and slender and are capable of remarkable bioluminescent displays. Some also have club-like photophores along their arms which are believed to act as lures to attract prey (similar to the anglerfish). More than 70 species of squid have been identified from the seamounts cruise samples

thus far, representing more than 20 percent of the global squid biodiversity.



Dr. Vladimir Laptikhovsky holding the new squid

BLOG

The latest news from the taxonomic workshop looking at the cruise samples was broadcast through the blog.

<http://seamounts2009.blogspot.com>

WORKSHOP PARTICIPANTS

Workshop participants included: Alex Rogers (UK, Oxford University); James McLaine (UK, Natural History Museum); Jane Read (UK, National Oceanography Centre); Julian Badcock (UK, Natural History Museum); Kirsty Kemp (UK, Zoological Society of London); Monica Mwale (SA, South African Institute for Aquatic Biodiversity); Nicole Du Plessis (SA, University of Cape Town); Nkosinathi Masangula (SA, South African Institute for Aquatic Biodiversity); Oddgeir Alvheim (Norway, Institute of Marine Research); Peter Konstantinidis (UK, Natural History Museum); Philipp Boersch-Supan (UK, Oxford University); Stela Fernando (Mozambique, National Institute of Fisheries Research); Rainer von Brandis (SA, International Union for Conservation of Nature); Riaan Cedras (SA, University of the Western Cape); Eric Anderson (SA, South African Institute for Aquatic Biodiversity), Tinus Sonnekus (SA, Nelson Mandela Metropolitan University); Tom Bornman (SA, South African Institute for Aquatic Biodiversity); Vijay Mangar (Mauritius, Albion Institute); Vladimir Laptikhovsky (Falklands, Fisheries Department); Amy Taylor (UK, Royal Holloway University of London) and Gildas Todi-nanahary (Madagascar, University of Toliara).



The new squid is 70cm long



The workshop was made possible due to the generous support of the Total Foundation and CenSeam (Global Census of Marine Life on Seamounts).

Governance Workshop

A South Western Indian Ocean regional governance workshop was held on 23-24 June 2011 at Rhodes University in Grahamstown (South Africa), looking at issues such as anthropogenic threats, legal gaps and monitoring and surveillance needs.

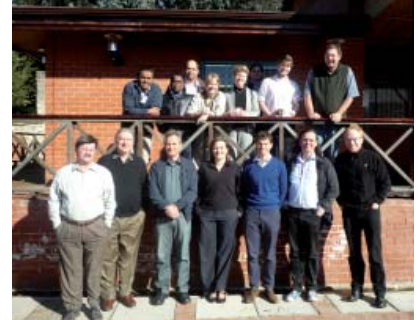
Maintaining a focus on governance and management of high seas resources in the Indian Ocean, the workshop developed a clear set of options and recommendations aiming to improve the governance framework in the region, and for seamount ecosystems in the high seas in particular.

This workshop was organised back to back with another event (ASLCME Project "Science to governance" workshop, 21-22 June 2011).

An Aide-Mémoire has been signed by the ASCLME Project and IUCN at the end of the workshop to restate the linkages within the partnership.

Participants: Philomène Verlaan, Robin Warner, François Simard, David Freestone, Magnus Ngoile, David Vousden, Rondolph Payet, Daroomalingum Mauree, Philipp Boersch-Supan, Graham Patchell, David Obura, Peter Deupmann, Rémi Ratsimbazafy, Marcel Kroese, Dixon

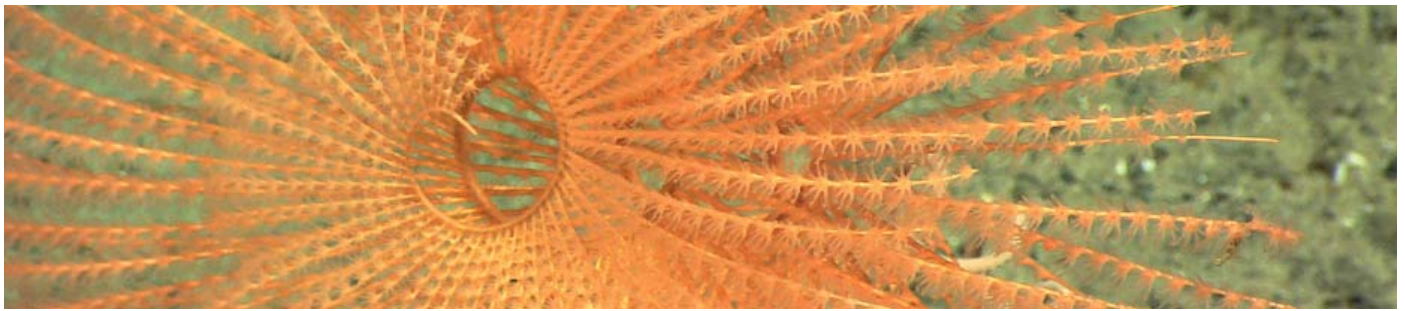
Waruinge, Andre Share, James Stapley, Lucy Scott, Warwick Sauer, James Oliver, Aurélie Spadone.



24 June 2011, Rhodes Univ., Grahamstown

RECOMMENDATIONS

- 1) Change the focus of the IUCN GEF-UNDP Seamounts project from the existing sectoral orientation to a broader ecosystem management approach for the region, noting that fisheries is an important component
- 2) A primary aim of this project should be to enhance cooperation between existing bodies and organisations rather than creating a new body
- 3) Use the ASCLME project and its existing and evolving partnerships to explore the development of an alliance as a working arrangement to demonstrate effective management and governance mechanisms for ABNJ in the Indian Ocean
- 4) This alliance concept should include the initiation of joint programs, plans of action, and MOUs to promote cooperation amongst the coastal states of the South West Indian Ocean, the signatories and parties to SIOFA, and the secretariats or administrative units of all relevant public and private bodies (such as the IOTC, SWIOFC, the Nairobi Convention, the ASCLME and SWIOF projects, Indian Ocean Commission, ISA, FAO, the Port State Control MOU and SIODFA)
- 5) The initial composition of the alliance should not exclude consideration being given to including additional States and parties who are stakeholders in the sustainable development, management and use of the resources of the ABNJ in the Indian Ocean
- 6) Within the region, it is in particular recommended to:
 - Encourage implementation of existing relevant instruments including applicable UN Resolutions
 - Encourage flag States with vessels engaged in deep sea bottom fishing in the region to adopt measures consistent with UNGA Resolutions 61/105 and 64/72 and the 2009 FAO International Guidelines for Deep Sea Fishing
 - Encourage Parties and signatories of SIOFA to bring the agreement into force and to update the 2006 interim measures bringing them into line with the 2009 FAO International Guidelines for Deep Sea Fishing
 - Collaborate with the CBD Secretariat and FAO to convene a sub-regional workshop or workshops with relevant States, authorities, experts and stakeholders to identify EBSAs and VMEs in the Indian Ocean ABNJ
 - Remove market inefficiencies such as subsidies from industrial level fishing operations in ABNJ
 - Encourage relevant regional bodies such as the Nairobi Convention and the IOTC to explore the feasibility and appropriateness of expanding their existing mandates so as to address ecosystem management in the ABNJ more effectively
 - And furthermore encourage effective management of all other activities that represent risks to biodiversity and ecosystem function in ABNJ in the Indian Ocean
- 7) Support negotiations in the UN to draft a multilateral agreement under the LOSC on conservation of biodiversity in marine ABNJ that would create a framework for all currently unregulated activities, ensure that best conservation principles are incorporated and applied in all activities and sectors in marine ABNJ, improve communications among State and non-State actors in marine ABNJ and improve compliance and enforcement mechanisms



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Project Partners

UNDP



UNDP is the UN's global development network, an organization advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. UNDP is on the ground in 166 countries, working with them on their own solutions to global and national development challenges. www.undp.org

UNDP's GEF International Waters portfolio focuses on strengthening the joint management of rivers, lakes, aquifers and oceans by helping government and other stakeholders set priorities, building consensus on governance reforms and investments, nurturing and strengthening institutions, and supporting the implementation of action programs. <http://www.undp.org/gef/portfolio/iw.html>



The International Union for Conservation of Nature (IUCN) is the world's oldest and largest global environmental network - a democratic membership union with more than 1,000 government and NGO member organizations, and almost 11,000 volunteer scientists in more than 160 countries. IUCN supports scientific research, manages field projects all over the world and brings governments, non-government organizations, United Nations agencies, companies and local communities together to develop and implement policy, laws and best practice. www.iucn.org



GEF

The Global Environment Facility (GEF) is a global partnership among 178 countries, international institutions, non-governmental organizations (NGOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. It provides grants for projects related to six focal areas: biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Today the GEF is the largest funder of projects to improve the global environment. Since 1991, GEF has achieved a strong track record with developing countries and countries with economies in transition, providing \$8.6 billion in grants and leveraging \$36.1 billion in co-financing for over 2,400 projects in more than 165 countries.



ACEP

The African Coelacanth Ecosystem Programme is nested within the South African Institute for Aquatic Biodiversity (SAIAB). Its main goals are to generate new ecological knowledge about the marine environment of southern Africa, provide recommendations for conservation and management strategies, build capacity and promote public awareness. www.saiab.ac.za



ASCLME Project

The goal of the five-year Agulhas and Somali Current Large Marine Ecosystems (ASCLME) Project is to ensure the long-term sustainability of the living resources of the ASCLME region by introducing an ecosystem-based approach to management. The Project is funded by the Global Environment Facility (GEF) and implemented by the United Nations Development Programme (UNDP). www.asclme.org



ECOMAR

The University of Reunion Marine Ecology Lab researches focus on the study of the structure and the functioning of marine ecosystems in order to sustainably manage marine biodiversity and better understand anthropogenic and climate change impacts on the marine environment.



FAO Fisheries and Aquaculture Department & EAF-Nansen project

The mission of the Fisheries and Aquaculture Department of FAO is to facilitate and secure the long-term sustainable development and utilisation of the world's fisheries and aquaculture. www.fao.org/fishery FAO also executes the EAF-Nansen project, in close collaboration with IMR, and funded by the Norwegian Agency for Development Cooperation (Norad). The principal aim of the EAF-Nansen project is to strengthen the knowledge base for and implementing an ecosystem-approach to marine fisheries in developing countries, with a current emphasis on sub-Saharan Africa. www.eaf-nansen.org



IMR

The Institute of Marine Research (IMR) is Norway's largest centre of marine science. Its main task is to provide advice to Norwegian authorities on aquaculture and the ecosystems of Norway's adjacent seas and coast. IMR is also heavily engaged in development activities through the Centre for Development Cooperation in Fisheries. www.imr.no



IOZ/ZSL

The Institute of Zoology (IOZ) is the research division of the Zoological Society of London (ZSL). It is a government-funded higher education and research establishment specialising in scientific issues relevant to the conservation of animal species and their habitats. IOZ research focuses on five thematic areas: evolutionary biology, genetics, ecology, reproductive biology and wildlife epidemiology. www.zsl.org/science



NERC

The Natural Environment Research Council is the UK's main agency for funding and managing research, training and knowledge exchange in the environmental sciences. Its vision is to advance knowledge and understanding of the Earth and its environment to help secure a sustainable future for the planet and its people.



SIODFA

The Southern Indian Ocean Deepsea Fishers Association is an Association of fishing companies established in 2006, whose primary goals are to maintain unsubsidized, profitable and environmentally sustainable fisheries and to set international best practice for responsible deep-sea fishery management. It is open to companies that have deepwater fishing operations in the high seas of the Indian Ocean and share the objectives of the Association.



University of Oxford

The mission of the University of Oxford is to achieve and sustain excellence in every area of its teaching and research, maintaining and developing its historical position as a world-class university, and enriching the international, national and regional communities through the fruits of its research, the skills of its alumni and the publishing of academic and educational materials.



Norwegian Agency for Development Cooperation

The Norwegian Agency for Development Cooperation (Norad) is a directorate under the Norwegian Ministry of Foreign Affairs (MFA).



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