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Overview of International Governance and Scientific Issues Regarding the High Seas and Deep-water Ecosystems and Biodiversity

Overview of international governance and scientific issues regarding the high seas and deep-water ecosystems and biodiversity

1. Introduction

UNEP presented at the 6th Global Meeting of the Regional Seas Conventions and Action Plans (Istanbul, Turkey 30 November – 2 December 2004) a document entitled 'Emerging Issues Related to The High Seas', which informed about the negative impacts of high seas exploitation, the potential economic benefits from the high seas and related threats, and responses require to ensure a sustainable future use of the high seas. The objectives of the current paper are:

(i) to up-date this previous document by providing an overview of the subsequent international discussions on international governance and scientific issues regarding the high seas and deep-water ecosystems and biodiversity especially regarding the impact of fisheries as well as other issues, new developments and other considerations related to deep-water and high sea biodiversity and ecosystems;

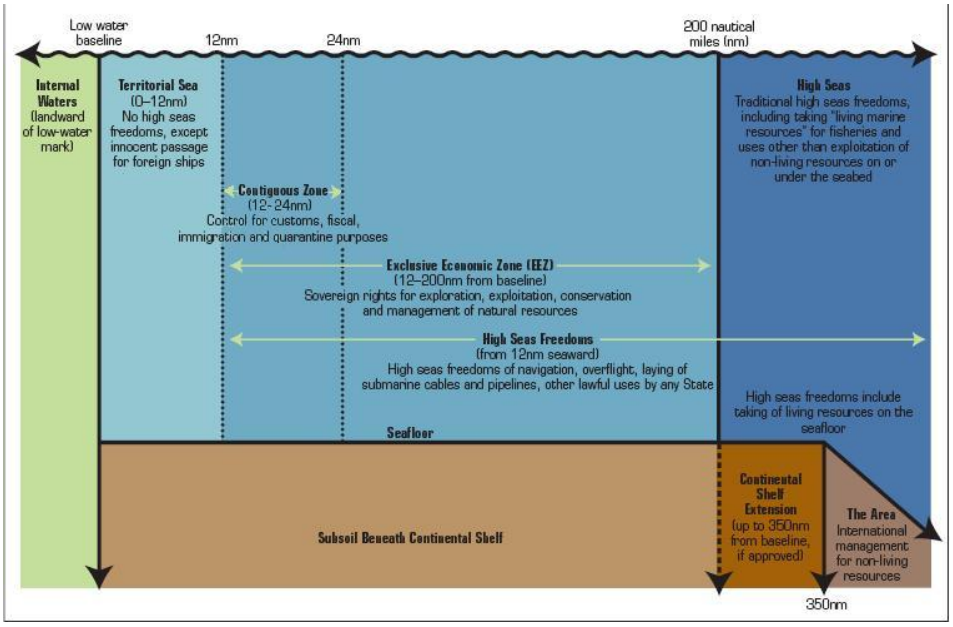
(ii) to provide the 9th Global Meeting of Regional Seas Conventions and Actions Plans with background information related to three priority issues identified by UNEP, i.e. (i) Marine and coastal biodiversity, including deep seas, (ii) Environmental aspects of high seas and seabed management and governance and (iii) Environmental aspects of fisheries;

(iii) to set out issues which Regional Seas Conventions and Action Plans may wish to consider in their future work, as appropriate, either individually or collectively, such as in the review and establishment of the strategic directions of the UNEP Regional Seas Programme in the period 2008-13.

Over the last 3 years, the international governance and scientific issues regarding the high seas and deep-water ecosystems and biodiversity has been the subject of numerous international meetings and processes (cf. selection at Annex 1), most of which UNEP has followed closely. In addition, it should be noted that UNEP (under the lead of the UNEP Coral Reef Unit) has produced in collaboration with various partners several publications and products related to the subject of this document. These are listed at the end of Annex 1.

2. Definitions of 'high seas' and 'deep-water'

For the purpose of this document, the term "**high sea**" includes all marine areas beyond national jurisdiction. In accordance with the UN Convention on the Law of the Sea (UNCLOS), these consist of the 'High Sea' - the water column beyond 200 nautical miles, and the 'Area' – the seabed and the



subsoil beyond national jurisdiction (cf. Fig 1 below). The term "**deep-water**" refers to areas below 200 metres water depth. This coincides with the average depth of continental shelves and the usual limit of light penetration, i.e. below 200 metres no photosynthetic primary production takes place.

Fig. 1: Maritime Zones under UNCLOS

2. Impact of fisheries on deep-water and high sea biodiversity and ecosystems

The increasing scientific evidence of the destruction of vulnerable deep-water and high seas biodiversity and ecosystems caused by fisheries, especially bottom trawling, triggered international organisations (e.g. OSPAR at the Ministerial Meeting in 2003) to consider the conservation, protection and sustainable management/use of areas beyond national jurisdiction. Controls and measures to regulate and mitigate the environmental impact of high seas fisheries (consistent with international law and with the principles of an integrated ecosystem-based approach to management) are still one of the most prominent and urgent issues being discussed at the global and regional level. A statement on protecting the world's deep-sea coral and sponge ecosystems, signed by over 1,450 scientists, urges the United Nations and appropriate international bodies to establish a moratorium on bottom trawling on the High Seas. Several countries and Heads of State (including Pacific Islands Forum leaders) have called for a temporary moratorium on deep sea bottom trawling. The UN General Assembly (UNGA) addressed the impact of fisheries on deep-water and high sea biodiversity and ecosystems from 2003 onwards, both in the discussions with respect to 'oceans and the law of the sea' and 'sustainable fisheries'. The latest state of affairs is reflected in the UNGA resolution 61-105 on sustainable fisheries (cf. extract at Annex 2), as well as in the advanced, unedited report of the Secretary General on sustainable fisheries for the 62nd (2007/8) session of the UNGA.

3. Issues, new developments and other considerations related to deep-water and high sea biodiversity and ecosystems

A number of main emerging issues can be extracted from the various international discussions, processes and meetings on international governance and scientific issues regarding the high seas and deep-water ecosystems and biodiversity. The text below has been compiled using literature resources (including those referenced in Annex 1), information from HERMES[1] partners and research carried out by experts from the UNEP-WCMC Spatial Planning Unit. It should be noted that the list of other human activities and issues is not exhaustive, and that there are close linkages between these issues. The order does not reflect importance.

(i) Implementation of international commitments in relation to the high seas

The international community agreed on a number of goals and targets related to the marine environment. The actions needed to achieve and implement these targets and goals also with respect to the areas beyond national jurisdiction are being discussed in a number of global and regional fora.

[1] Hotspot Ecosystem Research on the Margins of European Seas, a large multidisciplinary research project funded by the EC under FP6, in which UNEP became a partner in October 2006.

Application by 2010 of the ecosystem approach for the sustainable development of the oceans

Discussions are still ongoing in various international fora about the concept of an 'ecosystem-based approach', and how it could/should be implemented in marine environmental management and governance policies at the global, regional, national and local level. Until these discussions are resolved, there is a trend to address concerns and threats to marine biodiversity and ecosystem on a 'case-by-case' or 'sector-by-sector' basis. Examples are the recent international discussions on the impact of fisheries on vulnerable marine biodiversity and ecosystems beyond areas of national jurisdiction (UNGA 2005/6), and the discussions on marine genetic resources (UNICPOLOS, 2007).

Significant reduction in the current rate of loss of biological diversity by 2010

Of the 33 phyla of animals, 32 are found in the oceans, and 15 are exclusively marine. Although only around 15 per cent of the 1.5-1.8 million named species are found in the sea, experts suggest that there are between 0.5 (macrofauna) – 10 million undescribed species in the deep sea alone. Fig. 2 shows that the highest biodiversity values are expected to occur at about 2 000 m depths.

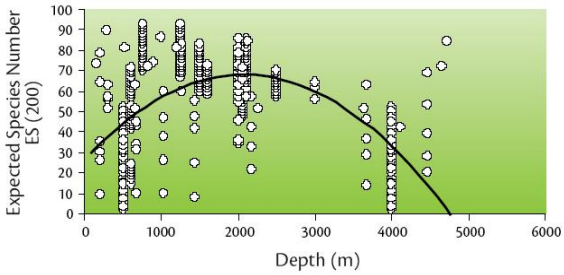


Fig.2: Biodiversity patterns in the deep sea

This illustration shows the depth-related pattern of benthic biodiversity, obtained by summarizing all the information available in literature. Open slopes are expected to host most of the undiscovered biodiversity of the globe.

(WEAVER, P et al. (2004): Hotspot Ecosystem Research on Europe's Deep-Ocean Margins. Oceanography Vol.17, No.4, Dec. 2004)

Establishment of a representative network/system of marine protected areas by 2012

The World Database on Protected Areas (WDPA) records around 117 000 designated protected areas. Only around 4 200 of these are marine protected areas (MPAs), which cover around 2.2 million square kilometres (approx. 0.6 per cent of the ocean area). Most MPAs (62 per cent) are within the Territorial Sea (i.e. within 12 nm from the baseline) of coastal states. An analysis of the MPA Global database revealed that less than 100 marine protected areas cover waters deeper than 200 metres. The number of protected areas in the high seas (HSMPAs), i.e. beyond national jurisdiction, is less than 10 (spatial/temporal fisheries closures excluded)[2]. Proposals for the amount of marine areas beyond national jurisdiction that would need to be protected in order to conserve high sea marine biodiversity and ecosystems range from 5-40 per cent. Most of the existing marine ecoregional classifications, e.g. the Large Marine Ecosystem (LME) or the Marine Ecoregions of the World (MEOW) approach, are not sufficiently detailed to guide the establishment of representative HSMPAs. Therefore, a number of international initiatives were set up to identify criteria for ecologically or biologically significant areas beyond national jurisdiction (workshop held in Canada, December 2005) and biogeographical classification systems (workshop held in Mexico, January 2007). On a regional scale, habitat classification of marine habitats, including deep-water and high seas, are being pursued, *inter alia*, within the

Proposed closure size (%)	Global catch loss %	Global catch loss 10^6 (t)	Global revenue loss (Billion US$)	Global profit loss[a]
10	0.9	0.75	1.35	0.14
20	1.8	1.50	2.70	0.27
50	4.5	3.75	6.75	0.68
100	8.9	7.50	13.50	1.35

[a]Based on a net return from fishing of 10% of landed value (Statistics Iceland 2005, Statistics Norway 2005)

:ion of marine mammals, e.g. the whale sanctuaries
ctuary in the Mediterranean.

context of OSPAR. Potential costs and benefits of marine reserves in the high seas has recently been determined by analysing the global costs/losses which would occur if a percentage or all of the high seas where closed to fisheries (cf. Fig. 3) as an insurance against extinction and loss of marine biodiversity and the goods, services and benefits they provide for current and future generations.

Fig. 3 Likely global loss of catches, revenue and profit under suggested proportions of marine reserve closures of the high seas

(Sumaila, U.R. et al (2007): Potential costs and benefits of marine reserves in the high seas. Mar Ecol Prog Ser, Vol. 345: 305–310, September 2007)

(ii) The 'high seas governance gap'

From the outcome of the international discussions, there appears to be general consensus that: firstly, UNCLOS provides the overarching (legal) framework for all marine activities, including those taking place in areas beyond national jurisdiction and, secondly, the provisions of UNCLOS are not sufficient for an effective governance of these areas, especially in the light of the increasing activities and pressures on the high seas. There are numerous international, intergovernmental organisations and treaties, which address various high seas issues, including global bodies such as FAO, ISA, IMO, UNESCO-IOC, CBD, CMS, CITES and regional Conventions such as the certain RFMOs and Regional Sea Conventions and Action Plans. However, the competence of these organisations on marine biodiversity and ecosystems beyond national jurisdiction is not always clear, or limited by their specific and geographical scope (e.g. bodies only certain fish stocks or with only a regional mandate). In addition, interagency mechanisms (e.g. UN Oceans), international stakeholder fora/partnerships (e.g. Global Forum Oceans, Coasts and Islands) and several NGOs, individually (e.g. IUCN, WWF) and/or collectively (e.g. Deep Sea Conservation Coalition), have established working groups or programmes related to the conservation of the high seas. In the light of the increasing human activities and (synergistic) impacts on the high seas, the main question is whether the existing framework of international bodies is able and sufficient to establish and implement an integrated and comprehensive (ecosystem-based) approach to close the gap in the management and governance of the high seas. The two main options/approaches are being considered in this context:

(i) to call on the responsibilities of flag states and existing, regional and global bodies with a high seas mandate to manage and govern activities under their remit, and to strengthen existing (or establish new) regional bodies, where necessary. The UNGA has followed this approach in resolution 61-105 on sustainable fisheries with respect to the management and governance of commercial fishing activities, especially bottom trawling, in deep waters and high seas (cf. extract at Annex 2). It should be noted that this resolution also includes provisions for reviews of the effectiveness of the international actions by end of 2007 and 2008, respectively (cf. highlights in Annex 2);

(ii) to negotiate a dedicated Implementation Agreement under UNCLOS for the high seas (similar to the UN Fish Stocks Agreement). This option would provide a kind of 'umbrella' for the various global and regional bodies working on the management and governance of areas beyond national jurisdiction. Several countries, including the EU, supported this option in the high seas discussions held under the UNGA.

(iii) The lack of scientific information on deep-water and high seas biodiversity and ecosystems (the high seas science gap')

The Secretary General report on oceans and the law of the sea to the 59th session of the UN General Assembly states that despite the recent increase in research efforts, the deep-sea environment remains rather poorly studied and understood, in fact, only some 0.0001 per cent of the deep-sea floor has been subject to biological investigations. Issues, which urgently would need further study where identified, *inter alia*, at the first meeting of the UN Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (cf. Annex 1). It should also be noted that most of the existing scientific data on deep-water and high seas biodiversity / ecosystems is being stored and maintained by individual experts, i.e. there are only very few freely accessible, central sources of information on these issues (e.g. seamounts online, global cold-water coral database and GIS). This, and the fact that new discoveries are being made on a regular basis, means that there has to be a direct link/input of the scientific community to the policy and decision-making processes related to deep-water and high seas biodiversity and ecosystems, which UNEP established by becoming a partner in HERMES. Marine scientific research (MSR) itself, if not conducted with due care, has the potential to adversely affect marine biodiversity and ecosystems. A number of international activities are underway to establish voluntary 'Code of Conducts' for MSR for individual ecosystems with high vulnerability (e.g. hydrothermal vents, cf. InterRidge) and/or for MSR in general (cf. activities under OSPAR).

The lack of scientific information also impedes the economic valuation of the goods and services provided by deep-water and high sea ecosystems. UNEP, in collaboration with HERMES partners, is preparing an overview report, which will identify some of the values (in terms of use and non-use), using, *inter alia,* the MA framework.

(iv) New developments with potential impact on deep-water and high seas biodiversity and ecosystems

The increased depletion and regulation of natural resources on land and in coastal waters makes the exploration and exploitation of deep-water areas and the high seas increasingly interesting (and commercially viable) for industry. Emerging industrial activities in the deep waters and the high seas include:

deep-sea mining – Companies such as Nautilus Minerals are looking to the ocean floor as the next frontier for mining. Substantial amounts of resources and monies are currently being invested (including the building of a specialised deep-sea mining ship) in the exploration of polymetallic crusts and sulphite deposits rich in gold, copper, silver and zinc often found on and around seamounts –with potential exploitation starting in 2010.

oil & gas exploration – The depletion of shallow-water offshore hydrocarbon reserves, rising oil prices, and the development of new drilling and sub-sea technologies, has made the exploration and exploitation of oil and gas reserves in deep (500 metres and deeper) and ultra deep (1500 metres and deeper) waters increasingly interesting and commercially viable. In September 2006, a test well was drilled in the Gulf of Mexico in 2,100 metres water depth, which discovered the largest US oil field in four decades (3 – 15 billion barrels) around 6,100 metres below the seafloor.

ocean fertilisation – Planktos, a US-based company, has started large-scale tests for 'seeding' ocean areas with iron to increase phytoplankton growth with a view to remove atmospheric CO_2.

Commercial carbon credit eligible operations are planned. Several scientific organisations have expressed concern about the benefits and the potentially far-reaching environmental implications of this practise for deep-water and high sea ecosystems.

carbon sequestration – IPCC distinguishes three main practices for carbon sequestration in the marine environment, i.e. (i) at various depths in the water column, (ii) on the seafloor and (iii) in geological formations below the seabed. The OSPAR Commission recently adopted measures (legally binding for OSPAR Contracting Parties including the EC) which ban carbon sequestration in the water column and of the seafloor, and allow injection / storage in sub-sea geological formations.

bioprospecting – deep-water and high seas organisms, especially those associated with extreme environmental conditions (e.g. hydrothermal vents, cold seeps) or with biodiversity hotspots (e.g. deep-sea sponge fields, cold-water coral reefs), are an important source of new substances and compounds for pharmaceutical and technical applications. The issue of marine genetic resources (MGR) was discussed at the 2007 UNICPOLOS meeting (cf. reference in Annex 1), which highlighted, *inter alia*, the services MGR provide, the marine scientific research on MGR (including the lack of definitions to distinguish between pure and applied marine scientific research), commercialisation of MGR (including intellectual property rights), the law and policies related to MGR activities within and beyond areas of national jurisdiction, and the vulnerabilities, threats and anthropogenic impacts associated with MGR activities.

(v) Other considerations related to deep-water and high seas biodiversity and ecosystems

Intrinsic linkages between coastal marine areas and the deep waters and high seas

Taking into account the legal maritime zones and boundaries defined by UNCLOS, most of the international discussions over the last 3-4 years have focussed on marine biodiversity and ecosystems in areas beyond national jurisdiction. However, it should be noted that shallow and deep waters within and beyond national jurisdiction are closely connected both in geophysical/oceanographic and biological terms. Ocean currents exchange large water masses both vertically (e.g. up-welling, eddies around seamounts) and horizontally (e.g. the 'Global Ocean Conveyer Belt'). Several species regularly migrate between deep-waters / high seas and coastal areas. Plankton and associated fish species undergo daily vertical migrations. Even certain sessile species found in coastal areas depend on offshore waters for the distribution of eggs and larvae. New deep-sea research, such as that under HERMES and the Census of Marine Life programme, continues to provide more examples of this close biological and geophysical linkage between shallow coastal waters, the continental shelf and the deep sea, even in well-known areas, such as the Gulf of Lyon in the Mediterranean.

Extent and importance of deep waters under national jurisdiction

Most Regional Seas Conventions and Action Plans[3] apply currently only to the national waters of Contracting Parties, i.e. do not have a mandate or competence on the high seas in their regions.

[3] exceptions are OSPAR, MAP, the Antarctic Treaty and SPREP. The latter cover high sea areas enclosed from all sides by the 200 nautical mile zones of the member countries.

An analysis of the bathymetry of the oceans carried out by experts from the UNEP-WCMC Spatial Analyses Unit[4] revealed around 336 million square kilometres world-wide are deeper than 200 metres[5]. The total area of national waters deeper than 200 metres is around 124 million square kilometres, i.e. about five times larger than the total of national waters shallower than 200 metres (approximately 25 million square kilometres). On average, around 70 per cent of the national waters of coastal/island states are deeper than 200 metres, rising to over 95 per cent for certain islands and SIDS (cf. Annex 3). It should be noted that a number of countries are currently in the process to define and delineate their continental shelves in accordance with Article 76 of UNCLOS, which means that the areas of continental shelf under national jurisdiction, including the natural resources of the seabed and subsoil in these areas, may increase considerably in future (cf. separate presentation on the UNEP Shelf Programme).

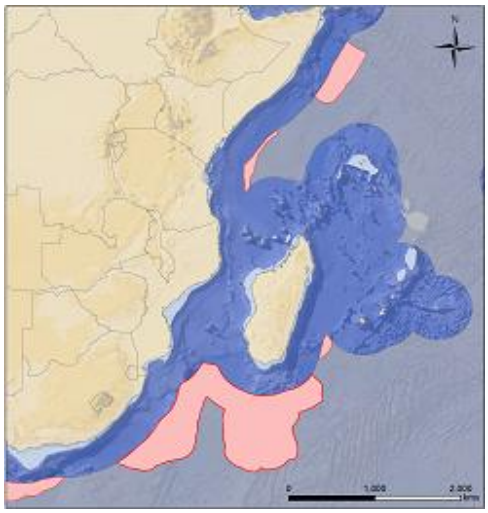


Fig. 3: Deep waters within and beyond areas of national jurisdiction in East Africa.[6]
The figure demonstrates that the overwhelming majority of marine areas under national jurisdiction in East Africa are deeper than 200 metres (dark blue), for individual country data see Annex 2. Areas in red indicate where the geomorphology might justify (subject to further research and interpretation) a submission/claim to be made by coastal states individually or jointly to increase their national seabed and subsoil areas.

4 using the following sources: Data on the distribution of Maritime Boundaries provided by the VLIZ Maritime Boundaries Geodatabase from the Flanders Marine Institute, © Flanders Marine Institute, 2007. Bathymetry from General Bathymetric Chart of the Oceans (GEBCO), Centenary Edition.

5 disputed areas were discounted in this analysis.

6 Sources for determining waters within and beyond national jurisdiction, as well as depth, as in footnote 4 above. Potential areas for extension provided by the UNEP Shelf Programme, GRID-Arendal, based on the interpretation of the 2 Minute Gridded Earth Topography Data (ETOPO2) set and the map of Total Sediment Thickness of the World's Oceans & Marginal Seas. Figure prepared by the UNEP-WCMC Spatial Analysis Unit.

Annex 1

Selected information sources, further reading and upcoming events related to deep-water and high sea ecosystems and biodiversity

Note: Reports of meetings can be accessed via the links provided. For further information, please refer to the literature references in these reports (e.g. in the SG reports and the UNEP publications).

58th – 62nd (2003-2007) sessions of the UN General Assembly

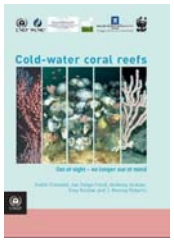
- Reports of the Secretary General (SG) on 'Oceans and the Law of the Sea' and 'Sustainable Fisheries'. Part 2 of the addendums to the SG report on Oceans and the Law of the Sea in 2004 (A/59/62/Add.1) and the addendum to the SG report on Oceans and the Law of the Sea in 2005 (A/60/63/Add.1) are especially relevant for the conservation and sustainable use of vulnerable marine biodiversity and ecosystems beyond areas of national jurisdiction.
- UNGA resolutions on 'Oceans and the Law of the Sea' and 'Sustainable Fisheries'
- UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea
- UN Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction. The first meeting of this group was held in February 2006, a second meeting is scheduled for beginning of 2008.

cf. http://www.un.org/Depts/los/index.htm

Convention on Biological Diversity (CBD)

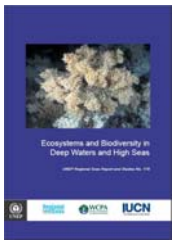
- Ad Hoc Open-Ended Working Group on Protected Areas (cf. http://www.cbd.int/convention/wgpa.shtml). A first meeting of this group was held in June 2005, a second meeting is scheduled for February 2008.
- Decision VIII/24 (2006) on Protected Areas (cf. http://www.cbd.int/decisions/cop-08.shtml?m=COP-08&id=11038&lg=0) and Protected Areas Programme of Work (cf. http://www.cbd.int/programmes/cross-cutting/protected/wopo.asp?prog=p1)
- Decision VIII/21 on marine and coastal biological diversity: conservation and sustainable use of deep seabed genetic resources beyond the limits of national jurisdiction (http://www.cbd.int/decisions/cop-08.shtml?m=COP-08&id=11035&lg=0)

UNEP products and publications related to international governance and scientific issues regarding the high seas and deep-water ecosystems and biodiversity



Cold-water coral reefs

a report prepared by a team of international experts under the lead of Prof. A. Freiwald (Germany). The report was published in June 2004 as a UNEP-WCMC publication with support from the Governments of Norway, Ireland the UK, and WWF.
http://www.unep-wcmc.org/resources/publications/UNEP_WCMC_bio_series/22.htm



Ecosystems and Biodiversity in Deep Waters and High Seas

a report prepared by Kristina Gjerde (IUCN high seas advisor) in close collaboration with the UNEP Coral Reef Unit. The report was published in June 2006 as a joint UNEP / IUCN publication.
http://www.unep.org/pdf/EcosystemBiodiversity_DeepWaters_20060616.pdf

Seamounts, deep-sea corals and fisheries

a report prepared by a team of authors from the Census of Marine Life on Seamounts project. The report was published in October / November 2006 as a UNEP / UNEP-WCMC publication with support from UNESCO-IOC and the Department of Nature, Ministry of Agriculture, Nature ands Food Quality, Netherlands.
http://www.unep.org/regionalseas/Publications/seamounts_deep_seas_fisheries_LR.pdf

Global cold-water coral data base and GIS

an interactive map developed by UNEP-WCMC Spatial Planning experts, showing the distribution of cold-water corals and the locations of the reefs they build. This tool was established with support from NOAA and the UK Government and displays information and data provided by various international experts.
http://bure.unep-wcmc.org/marine/coldcoral/viewer.htm

Cold Coral Deep

a television documentary on cold-water coral reefs and the impact/threats they face from bottom trawling, which was produced by TVE (Television for the Environment) with support from the Norwegian Government and broadcast on BBC World in October 2006.
http://news.bbc.co.uk/1/hi/sci/tech/6067806.stm

In addition, it should be noted that:

- **since October 2006, UNEP (represented by the UNEP Coral Reef Unit) is an official partner in the multidisciplinary EU FP6 research project HERMES (Hotspot Ecosystem Research on the Margins of European Seas). Information about HERMES, including posters and other educational materials about latest results of the deep-sea research carried out by partners are available at http://www.eu-hermes.net/;**
- **the UNEP-WCMC Protected Areas programme has produced for the CBD Secretariat a draft report and a draft global database / GIS on marine areas beyond the limits of national jurisdiction.**

Annex 2

Extract of UN General Assembly resolution 61/105 on Sustainable Fisheries [7]

Responsible fisheries in the marine ecosystem

76. Encourages States to apply by 2010 the ecosystem approach, notes the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem[8] and decision VII/11[9] and other relevant decisions of the Conference of the Parties to the Convention on Biological Diversity, notes the work of the Food and Agriculture Organization of the United Nations related to guidelines for the implementation of the ecosystem approach to fisheries management, and also notes the importance to this approach of relevant provisions of the Agreement and the Code;

77. Also encourages States, individually or through regional fisheries management organizations and arrangements and other relevant international organizations, to work to ensure that fisheries and other ecosystem data collection is performed in a coordinated and integrated manner, facilitating incorporation into global observation initiatives, where appropriate;

78. Further encourages States to increase scientific research in accordance with international law on the marine ecosystem;

79. Calls upon States, the Food and Agriculture Organization of the United Nations and other specialized agencies of the United Nations, subregional and regional fisheries management organizations and arrangements, where appropriate, and other appropriate intergovernmental bodies, to cooperate in achieving sustainable aquaculture, including through information exchange, developing equivalent standards on such issues as aquatic animal health and human health and safety concerns, assessing the potential positive and negative impacts of aquaculture, including socio-economics, on the marine and coastal environment, including biodiversity, and adopting relevant methods and techniques to minimize and mitigate adverse effects;

80. 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;

81. Reaffirms the importance it attaches to paragraphs 66 to 69 of its resolution 59/25 concerning the impacts of fishing on vulnerable marine ecosystems;

82. Welcomes the important progress made by States and regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to give effect to paragraphs 66 to 69 of its resolution 59/25 to address the impacts of fishing on vulnerable marine ecosystems, including through initiating negotiations to establish new regional fisheries management organizations or arrangements, but on the basis of the review called for in paragraph 71 of that resolution, recognizes that additional actions are urgently needed;

83. Calls upon regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to adopt and implement measures, in accordance with the precautionary approach, ecosystem approaches and international law, for their respective regulatory areas as a matter of priority, but not later than 31 December 2008:

(a) To assess, on the basis of the best available scientific information, whether individual bottom fishing activities would have significant adverse impacts on vulnerable marine ecosystems, and to ensure that if it is assessed that

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[7] source: http://www.un.org/Depts/los/general_assembly/general_assembly_resolutions.htm. Highlights added.

[8] E/CN.17/2002/PC.2/3, annex

[9] See UNEP/CBD/COP/7/21, annex

these activities would have significant adverse impacts, they are managed to prevent such impacts, or not authorized to proceed;

(b) To identify vulnerable marine ecosystems and determine whether bottom fishing activities would cause significant adverse impacts to such ecosystems and the long-term sustainability of deep sea fish stocks, inter alia, by improving scientific research and data collection and sharing, and through new and exploratory fisheries;

(c) In respect of areas where vulnerable marine ecosystems, including seamounts, hydrothermal vents and cold water corals, are known to occur or are likely to occur based on the best available scientific information, to close such areas to bottom fishing and ensure that such activities do not proceed unless conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems;

(d) To require members of the regional fisheries management organizations or arrangements to require vessels flying their flag to cease bottom fishing activities in areas where, in the course of fishing operations, vulnerable marine ecosystems are encountered, and to report the encounter so that appropriate measures can be adopted in respect of the relevant site;

84. Also calls upon regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to make the measures adopted pursuant to paragraph 83 of the present resolution publicly available;

85. Calls upon those States participating in negotiations to establish a regional fisheries management organization or arrangement competent to regulate bottom fisheries to expedite such negotiations and, by no later than 31 December 2007, to adopt and implement interim measures consistent with paragraph 83 of the present resolution and make these measures publicly available;

86. Calls upon flag States to either adopt and implement measures in accordance with paragraph 83 of the present resolution, mutatis mutandis, or cease to authorize fishing vessels flying their flag to conduct bottom fisheries in areas beyond national jurisdiction where there is no regional fisheries management organization or arrangement with the competence to regulate such fisheries or interim measures in accordance with paragraph 85 of the present resolution, until measures are taken in accordance with paragraph 83 or 85 of the present resolution;

87. Further calls upon States to make publicly available through the Food and Agriculture Organization of the United Nations a list of those vessels flying their flag authorized to conduct bottom fisheries in areas beyond national jurisdiction, and the measures they have adopted pursuant to paragraph 86 of the present resolution;

88. Emphasizes the critical role played by the Food and Agriculture Organization of the United Nations in providing expert technical advice, in assisting with international fisheries policy development and management standards, and in collection and dissemination of information on fisheries-related issues, including the protection of vulnerable marine ecosystems from the impacts of fishing;

89. Commends the Food and Agriculture Organization of the United Nations for its work on the management of deep sea fisheries in the high seas, including the expert consultation held from 21 to 23 November 2006 in Bangkok, and further invites the Food and Agriculture Organization of the United Nations to establish at its next Committee on Fisheries meeting a time frame of relevant work with respect to the management of deep sea fisheries in the high seas, including enhancing data collection and dissemination, promoting information exchange and increased knowledge on deep sea fishing activities, such as through convening a meeting of States engaged in such fisheries, developing standards and criteria for use by States and regional fisheries management organizations or arrangements in identifying vulnerable marine ecosystems and the impacts of fishing on such ecosystems, and establishing standards for the management of deep sea fisheries, such as through the development of an international plan of action;

90. Invites the Food and Agriculture Organization of the United Nations to consider creating a global database of information on vulnerable marine ecosystems in areas beyond national jurisdiction to assist States in assessing any impacts of bottom fisheries on vulnerable marine ecosystems, and invites States and regional fisheries management organizations or arrangements to submit information to any such database on all vulnerable marine ecosystems identified in accordance with paragraph 83 of the present resolution;

91. Requests the Secretary-General, in cooperation with the Food and Agriculture Organization of the United Nations, to include in his report concerning fisheries to the General Assembly at its sixty-fourth session a section on the actions taken by States and regional fisheries management organizations and arrangements in response to paragraphs 83 to 90 of the present resolution, and decides to conduct a further review of such actions at that session in 2009, with a view to further recommendations, where necessary;

92. Encourages accelerated progress to establish criteria on the objectives and management of marine protected areas for fisheries purposes, and in this regard welcomes the proposed work of the Food and Agriculture Organization of the United Nations to develop technical guidelines in accordance with the Convention on the design, implementation and testing of marine protected areas for such purposes, and urges coordination and cooperation among all relevant international
organizations and bodies;

Annex 3

Depth distribution of marine waters under national jurisdiction

Sovereign	Deeper than 200m (1,000km2)	Shallower than 200m (1,000km2)	Total (1,000km2)	Deeper than 200m (%)	Shallower than 200m (%)
Albania	4.9	5.9	10.8	46	54
Algeria	119.1	9.0	128.2	93	7
Angola	449.3	52.9	502.2	89	11
Antarctica	8,336.5	479.2	8,815.7	95	5
Antigua and Barbuda	104.8	3.6	108.4	97	3
Argentina	284.2	786.4	1,070.6	27	73
Australia	4,820.6	2,036.2	6,856.8	70	30
	329.6	0.1	329.7	100	0
Cocos Islands	469.3	0.1	469.5	100	0
Heard and McDonald Islands	411.3	3.8	415.1	99	1
Macquarie Island	474.5	0.7	475.2	100	0
Norfolk Island	429.0	2.9	431.9	99	1
Australia Total	6,934.4	2,043.9	8,978.3	77	23
Bahamas	517.9	108.5	626.4	83	17
Bahrain	0.0	6.4	6.4	0	100
Bangladesh	13.6	61.6	75.2	18	82
Barbados	186.4	0.4	186.8	100	0
Belgium	0.0	3.4	3.4	0	100
Belize	26.5	9.4	35.9	74	26
Benin	27.4	2.8	30.2	91	9
Brazil	2,459.0	711.6	3,170.6	78	22
	470.3	0.0	470.3	100	0
Brazil Total	2,929.3	711.6	3,640.9	80	20
Bulgaria	23.1	11.8	34.9	66	34
Cambodia	0.0	47.3	47.3	0	100
Cameroon	2.7	10.2	12.9	21	79
Canada	3,064.5	2,480.6	5,545.1	55	45
Cape Verde	796.5	3.7	800.2	100	0
Chile	2,726.6	160.3	2,886.9	94	6
	722.4	0.1	722.4	100	0
Chile Total	3,449.0	160.3	3,609.4	96	4
China	42.6	804.6	847.2	5	95
Colombia	752.0	44.9	797.0	94	6
Comoro Islands	163.7	1.5	165.2	99	1
Costa Rica	554.9	18.7	573.6	97	3
Croatia	11.1	41.5	52.6	21	79
Cuba	303.7	55.2	358.9	85	15
Cyprus	96.0	2.5	98.6	97	3
Dem. Rep. of the Congo	0.0	0.7	0.8	6	94
Denmark	0.8	89.5	90.3	1	99
	0.0	9.1	9.1	0	100
	244.5	21.6	266.1	92	8
Greenland	1,873.4	319.1	2,192.5	85	15
Denmark Total	2,118.7	439.3	2,558.0	83	17
Disputed					
	23.6	49.7	73.4	32	68
Japan - South Korea Conflict Zone	66.4	0.1	66.5	100	0
Paracel Islands	283.6	11.0	294.6	96	4
Southern Kuriles	194.9	18.4	213.4	91	9
Spratly Islands	424.2	17.5	441.7	96	4
Disputed Total	992.8	96.8	1,089.6	91	9
Djibouti	4.6	2.2	6.8	67	33
Dominica	28.5	0.2	28.7	99	1
Dominican Republic	259.3	10.5	269.8	96	4
Ecuador	210.0	24.7	234.8	89	11
	833.1	7.3	840.4	99	1
Ecuador Total	1,043.1	32.1	1,075.2	97	3
Egypt	208.7	47.2	255.9	82	18
El Salvador	75.3	18.2	93.5	81	19
Equatorial Guinea	298.7	10.4	309.1	97	3
Eritrea	19.3	57.4	76.7	25	75
Estonia	0.0	35.0	35.0	0	100
Fiji	1,258.8	30.1	1,289.0	98	2
Finland	0.3	76.6	77.0	0	100
France	169.3	159.6	328.8	51	49
Amsterdam Island and Saint Paul Island	508.4	0.2	508.5	100	0
Bassas da India	122.0	0.2	122.2	100	0
Clipperton Island	433.4	0.0	433.4	100	0
Crozet Islands	568.8	4.5	573.4	99	1
French Guiana	89.5	44.8	134.3	67	33
French Polynesia	4,780.9	7.4	4,788.3	100	0
Glorioso Islands	42.6	1.0	43.7	98	2
Guadeloupe and Martinique	135.6	2.8	138.4	98	2

Sovereign	Deeper than 200m (1,000km2)	Shallower than 200m (1,000km2)	Total (1,000km2)	Deeper than 200m (%)	Shallower than 200m (%)
Ile Europa	125.5	0.1	125.6	100	0
Ile Tromelin	272.0	0.0	272.0	100	0
Juan de Nova Island	61.3	1.3	62.5	98	2
Kerguelen Islands	504.7	60.5	565.3	89	11
Mayotte	61.4	1.8	63.2	97	3
New Caledonia	1,380.2	41.1	1,421.4	97	3
Northern Saint-Martin	3.1	2.2	5.4	58	42
RÚunion	315.9	0.2	316.0	100	0
Saint Pierre and Miquelon	4.5	7.7	12.2	37	63
Wallis and Futuna	259.2	0.4	259.7	100	0
France Total	9,838.4	335.8	10,174.2	97	3
Gabon	153.9	36.9	190.8	81	19
Gambia	17.2	5.1	22.4	77	23
Georgia	20.1	2.5	22.5	89	11
Germany	0.0	54.6	54.6	0	100
Ghana	203.6	22.5	226.1	90	10
Greece	423.0	66.8	489.8	86	14
Grenada	23.9	2.3	26.2	91	9
Guatemala	102.0	15.8	117.8	87	13
Guinea	60.5	48.3	108.8	56	44
Guinea Bissau	68.8	35.9	104.7	66	34
Guyana	83.9	52.3	136.2	62	38
Haiti	117.7	5.0	122.8	96	4
Honduras	172.8	67.0	239.7	72	28
Iceland	641.5	106.8	748.3	86	14
India	1,248.1	378.2	1,626.4	77	23
	632.3	29.7	662.0	96	4
India Total	1,880.5	407.9	2,288.4	82	18
Indonesia	4,158.9	1,838.2	5,997.2	69	31
Iran	48.2	108.7	156.9	31	69
Iraq	0.0	0.4	0.4	0	100
Ireland	241.3	133.7	375.0	64	36
Israel	23.4	3.8	27.2	86	14
Italy	424.7	109.9	534.6	79	21
Ivory Coast	162.3	11.9	174.2	93	7
Jamaica	234.0	12.0	246.0	95	5
Japan	3,722.1	301.9	4,024.0	92	8
Joint Regime					
Colombia - Jamaica	16.9	1.4	18.4	92	8
Japan - Korea	31.6	52.2	83.8	38	62
Nigeria - Sao Tome and Principe	34.8	0.0	34.8	100	0
Joint Regime Total	83.3	53.6	136.9	61	39
Jordan	0.0	0.0	0.1	56	44
Kenya	103.5	8.6	112.0	92	8
Kiribati	1,051.1	3.9	1,055.0	100	0
Line Group	1,653.6	0.3	1,654.0	100	0
Phoenix Group	747.4	0.1	747.5	100	0
Kiribati Total	3,452.1	4.3	3,456.5	100	0
Kuwait	0.0	10.7	10.7	0	100
Latvia	0.7	27.8	28.5	3	97
Lebanon	18.0	1.0	19.0	95	5
Liberia	229.2	18.0	247.2	93	7
Libya	291.2	64.4	355.6	82	18
Lithuania	0.0	5.8	5.8	0	100
Madagascar	1,072.8	124.1	1,197.0	90	10
Grand Total (km2)	123,698.2	25,034.1	148,732.4	83	17
Malaysia	81.6	391.3	472.8	17	83
Maldives	897.6	19.7	917.2	98	2
Malta	48.1	7.5	55.6	87	13
Marshall Islands	1,990.5	13.3	2,003.8	99	1
Mauritania	126.4	28.3	154.7	82	18
Mauritius	1,238.0	39.8	1,277.8	97	3
Mexico	2,866.6	401.6	3,268.2	88	12
Micronesia	2,994.6	16.4	3,011.0	99	1
Monaco	0.3	0.0	0.3	97	3
Morocco	218.6	51.8	270.4	81	19
	238.9	61.7	300.5	79	21
Morocco Total	457.5	113.5	571.0	80	20
Mozambique	491.7	79.2	570.8	86	14
Myanmar	300.7	209.6	510.3	59	41
Namibia	467.4	93.2	560.7	83	17
Nauru	310.4	0.0	310.4	100	0
Netherlands	0.0	62.1	62.1	0	100
Netherlands Antilles	67.5	1.7	69.2	97	3
Southern Saint-Martin	9.9	2.4	12.3	81	19
Netherlands Total	77.4	66.2	143.5	54	46
New Zealand	3,772.4	254.4	4,026.8	94	6
	1,971.3	0.4	1,971.7	100	0

Sovereign	Deeper than 200m (1,000km2)	Shallower than 200m (1,000km2)	Total (1,000km2)	Deeper than 200m (%)	Shallower than 200m (%)
Niue	317.9	0.1	318.0	100	0
Tokelau	320.9	0.1	321.0	100	0
New Zealand Total	6,382.5	255.0	6,637.5	96	4
Nicaragua	53.0	73.8	126.8	42	58
Nigeria	139.9	39.9	179.8	78	22
North Korea	79.9	33.6	113.5	70	30
Norway	1,305.3	434.6	1,739.9	75	25
	439.2	0.1	439.3	100	0
Jan Mayen	289.1	1.4	290.5	100	0
Norway Total	2,033.6	436.1	2,469.7	82	18
Oman	481.5	54.1	535.6	90	10
Pakistan	172.8	47.6	220.4	78	22
Palau	606.1	2.0	608.1	100	0
Panama	278.3	49.3	327.6	85	15
Papua New Guinea	2,223.1	178.8	2,402.0	93	7
Peru	725.1	79.5	804.5	90	10
Philippines	1,589.0	233.8	1,822.9	87	13
Poland	0.0	31.2	31.2	0	100
Portugal	297.6	23.2	320.8	93	7
	1,054.0	1.9	1,056.0	100	0
Madeira	455.1	0.4	455.5	100	0
Portugal Total	1,806.8	25.5	1,832.3	99	1
Qatar	0.0	30.3	30.3	0	100
Rep. of Congo	32.2	7.9	40.1	80	20
Romania	3.1	16.9	20.0	15	85
Russia	3,436.9	4,001.8	7,438.7	46	54
Saint Kitts and Nevis	9.5	0.8	10.3	92	8
Saint Lucia	14.7	0.8	15.5	95	5
Saint Vincent / Grenadines	34.4	2.1	36.5	94	6
Samoa	131.3	0.7	131.9	99	1
Sao Tome and Principe	130.1	1.4	131.4	99	1
Saudi Arabia	116.7	89.7	206.4	57	43
Senegal	135.3	21.9	157.2	86	14
Serbia-Montenegro	3.6	3.7	7.3	50	50
Seychelles	1,289.8	49.2	1,339.1	96	4
Sierra Leone	132.4	27.0	159.4	83	17
Singapore	0.0	0.5	0.5	0	100
Slovenia	0.0	0.2	0.2	0	100
Solomon Islands	1,571.7	32.8	1,604.5	98	2
Somalia	783.8	47.3	831.1	94	6
South Africa	908.1	157.5	1,065.6	85	15
	471.6	0.6	472.1	100	0
South Africa Total	1,379.7	158.1	1,537.8	90	10
South Korea	82.7	238.9	321.6	26	74
Spain	482.0	67.5	549.5	88	12
	451.9	4.8	456.7	99	1
Spain Total	933.9	72.3	1,006.2	93	7
Sri Lanka	502.1	28.9	531.1	95	5
Sudan	52.1	11.2	63.3	82	18
Suriname	72.4	56.0	128.4	56	44
Sweden	3.1	150.2	153.3	2	98
Syria	9.1	0.9	10.1	91	9
Taiwan, Prov. of China	263.7	78.7	342.4	77	23
Tanzania	224.3	16.4	240.8	93	7
Thailand	69.8	233.5	303.2	23	77
Togo	14.4	1.1	15.4	93	7
Tonga	661.3	3.5	664.8	99	1
Trinidad and Tobago	55.8	21.1	76.9	73	27
Tunisia	35.9	65.4	101.4	35	65
Turkey	205.8	46.1	251.9	82	18
Tuvalu	735.7	1.3	737.0	100	0
Ukraine	61.4	78.3	139.7	44	56
United Kingdom	414.0	522.8	936.7	44	56
	90.5	2.1	92.6	98	2
Ascension	444.0	0.0	444.1	100	0
Bermuda	451.0	0.3	451.3	100	0
British Indian Ocean Territory	623.9	17.4	641.3	97	3
British Virgin Islands	77.4	3.1	80.5	96	4
Cayman Islands	119.4	0.3	119.7	100	0
Falkland Islands	366.9	177.7	544.6	67	33
Guernsey	0.0	8.6	8.6	0	100
Jersey	0.0	2.9	2.9	0	100
Montserrat	7.5	0.1	7.6	98	2
Pitcairn	838.7	0.1	838.8	100	0
Saint Helena	446.9	0.2	447.0	100	0
South Georgia and the South Sandwich Islands	1,420.2	22.5	1,442.6	98	2
Tristan da Cunha	754.5	0.3	754.9	100	0

Sovereign	Deeper than 200m (1,000km2)	Shallower than 200m (1,000km2)	Total (1,000km2)	Deeper than 200m (%)	Shallower than 200m (%)
Turks and Caicos Islands	146.6	7.6	154.2	95	5
United Kingdom Total	6,201.5	766.0	6,967.4	89	11
United Arab Emirates	0.8	48.6	49.4	2	98
United States	1,658.5	724.1	2,382.6	70	30
	2,340.2	1,299.9	3,640.0	64	36
American Samoa	406.6	0.2	406.7	100	0
Hawaii	2,468.1	10.9	2,479.0	100	0
Howland Island and Baker Island	437.4	0.0	437.4	100	0
Jarvis Island	318.5	0.0	318.5	100	0
Johnston Atoll	444.5	0.0	444.6	100	0
Northern Mariana Islands and Guam	973.4	1.9	975.3	100	0
Palmyra Atoll	348.1	0.2	348.3	100	0
Puerto Rico and Virgin Islands of the United States	204.7	6.9	211.6	97	3
Wake Island	409.0	0.0	409.0	100	0
United States Total	10,009.0	2,044.0	12,053.1	83	17
Uruguay	62.9	64.0	126.9	50	50
Vanuatu	634.2	7.3	641.5	99	1
Venezuela	363.0	100.5	463.5	78	22
Viet Nam	257.0	399.2	656.2	39	61
Yemen	484.6	59.0	543.6	89	11