



UNEP Activities on Cold-water Coral Reefs

Submitted by UNEP

Introduction

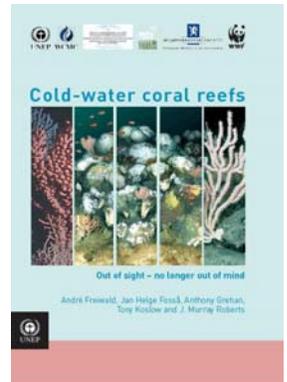
1. In addition to the Report of the ICRI Ad-Hoc Committee on Cold-water Coral Reefs (cf. 4.2/1), ICRI is invited to note the attached information on two projects initiated by UNEP on cold-water coral reefs, i.e.:

Annex 1: **Production of a Television Documentary on Cold-water Coral Reefs.**

Annex 2: **Establishment of a Global Cold-water Coral Reef Data Base and GIS.**

These activities respond to the recommendations made in the Report *Cold-water coral reefs: Out of sight – no longer out of mind* and the list of activities on cold-water coral reefs and related ecosystems that ICRI agreed to recommend as guidance for voluntary action (cf. document ICRI ???).

These Annexes were also submitted to the recent meeting of the Working Meeting of the Working Group on Marine Protected Areas Species and Habitats (MASH), which was held on 3-7 October 2005 in Bristol, UK under the auspices of the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic.



Further information about these projects can be obtained from the head of the UNEP Coral Reef Unit during the ICRI General Meeting, or by correspondence from:

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- DRAFT PROJECT OUTLINE -

Production of a Television Documentary on Cold-water Coral Reefs

- Coordination and implementation:** UNEP Coral Reef Unit (CRU), in collaboration with supporting organisations
- Producer:** Earth Report, Television Trust for the Environment (TVE)
- Project administration:** UNEP-WCMC; project code: 2028H (TVE cold-water corals)

I. OBJECTIVES

- To raise the global awareness of the distribution, threats and importance of cold-water coral reef ecosystems to marine biodiversity, particularly in developing countries and SIDS;
- To implement the recommendations set out in the 2004 UNEP Report *Cold-water Coral Reefs: Out of sight – no longer*;
- To contribute to the implementation of recommendations to protect vulnerable deep water ecosystems, incl. cold-water coral reefs, agreed by the UN General Assembly, and to facilitate the subsequent activities set out in the programmes of work under the Convention on Biological Diversity, the International Coral Reef Initiative and other international bodies.

II. BACKGROUND AND NEEDS

In 2003, the UNEP Coral Reef Unit (CRU) established a cold-water coral reef initiative with the Governments of Ireland, Norway and the UK, and WWF. This initiative commissioned a group of international cold-water coral reef experts under the lead of Prof. Freiwald (Germany) to prepare an authoritative summary of the current state of knowledge on cold-water coral reefs and the threats they are facing, including recommendations for further action to be taken for their protection and sustainable management. The resulting 84-page report was edited by CRU and launched by UNEP in June 2004. Hard copies of the report, as well as a CDrom with the report and additional materials (including a 9'30" minute Video News Release produced by TVE for UNEP) were widely distributed within and outside the UN/UNEP system. The report has become a standard reference for scientists as well as policy- and decision makers, and contributed to the international identification of cold-water coral reefs as a vulnerable key ecosystem for marine biological diversity in the deeper waters of the oceans, both within and outside national jurisdiction, *inter alia* in the Addendum to the Report of the Secretary General on Oceans and the Law of the Sea to the 59th session of the UN General Assembly.

Since the publication of the report and the call for urgent consideration included in the UNGA Resolutions 58/240, 58/14, 59/24 and 59/25, work on the protection of cold-water coral reefs has been initiated, or intensified, in various intergovernmental frameworks at the global and regional level, including the Convention on Biological Diversity, the International Coral Reef Initiative and the OSPAR Convention. However, public knowledge of cold-water coral reefs is still poor, and plans for their protection have been taken only in few countries (e.g. Canada, Norway, New Zealand and the US) and regional bodies (e.g. European Community, NEAFC). A major obstacle in initiating global action to preserve cold-water coral reefs is the widespread view that these reefs are exclusively distributed in the cold waters of high latitudes in the South and North Atlantic and Pacific, and that consequently the work on the protection of these ecosystems is a subject for those (developed) countries in which waters they have been found. This is a common misconception caused by the focus and geographical bias of deep water research to date – observations and literature¹ clearly show that cold-

¹ The UNEP Report *Cold-water Coral Reefs: Out of sight – no longer out of mind* lists 41 countries where cold-water coral reefs have been observed, many of which developing countries and SIDS.

water coral reefs are globally distributed and occur throughout the oceans where the environmental conditions are right for them to flourish. This includes the deeper shelf, seamount and offshore areas of developing countries and SIDS in tropical and sub-tropical regions, where cold-water coral reefs and similar habitats are threatened by the increasing amount of deep-water fisheries, especially with bottom trawls.

III. TVE / EARTH REPORT PRODUCTIONS

Television Trust for the Environment (TVE) is an independent, non-profit organisation, which promotes global awareness of the environment, development, human rights and health issues through the platforms of broadcast television and other audio-visual media. As an UK-registered charity, TVE fulfils an international remit in association with offices and networks of partner organisations in Africa, Asia Pacific and Latin America and the Caribbean. Above all, TVE works to promote informed debate, public awareness and practical solutions to the growing challenges of human development. TVE was set up in 1984 with the support of WWF, the United Nations Environment Programme (UNEP) and Central Television (now part of ITV). Since then, TVE has produced and co-produced close to 1,000 films. It now has headquarters based in London, a regional office in Sri Lanka, and affiliate/associate offices in Italy, Japan and the US.

TVE is not affiliated to any pressure group and all its films for broadcast are made on a strictly editorially independent basis. In addition to its charitable status in the United Kingdom, it is a registered 501 3 (c) non-profit in the United States, and is governed by an independent board of Trustees.

The TVE Earth Report series consists of half hour documentary style programmes, which cover a wide range of environmental issues – from the importance of conserving wetlands to the need for responsible tourism, from strategies for sustainable food production, to the impact of climate change. Earth Report documentaries are broadcast on BBC World service, accessible to more than 600 million homes globally.

TVE has a long and successful track record in producing television and video programmes for UNEP. With support from the UNEP GPA Coordination Office and UNEP CRU, TVE produced in 2003/2004 a very successful 2-part *Hilltops to Oceans (H2O)* Earth Report documentary on the effects of land-based activities on the marine environment, especially coral reefs.

IV. CONTENT AND MAIN MESSAGES

See attached 2-page leaflet.

V. DURATION

The duration of the project will be for one year from 1 August 2005 to 31 July 2006.

VI. ACTIVITIES, TIME SCHEDULE AND KEY EVENTS

The project activities will be carried out in three distinct phases:

Phase 1: Production of a trailer (August– November 2005)

This phase is dedicated to producing a 5-10 minute cold-water coral reef trailer for the main Earth Report documentary by utilising existing footage. This trailer will be a self-standing product, but most, if not all, of the footage contained in the trailer will be integrated into the main Earth Report documentary.

The main activities in this phase will be to review existing cold-water coral reef footage from various sources, identify those sequences which could be used in the trailer and/or in the main ER documentary, and enquiring the conditions of use of this footage (copyrights, costs etc.). An initial review by CRU and TVE has identified the a number of sources of footage, including:

- UNEP / TVE Video News Release on cold-water coral reefs
- uw-footage of Norwegian *Lophelia* reefs taken by the German submersible 'JAGO' on previous cruises (and the current cruise in July/August 2005);

- uw-footage of Norwegian *Lophelia* reefs taken by the Norwegian Institute of Marine Research (Dr. Jan Helge Fosså);
- uw-footage of *Lophelia* reefs off the coast of Ireland taken with the French Deep-Sea ROV *Victor 6000* during the Polarstern cruise ARK XIX/3 in 2003
- uw-footage from *Lophelia* reefs off the coast of Scotland (Dr. J. Murray Roberts).

Further potential sources will be identified at the start of the project by writing to cold-water coral reef experts, including the co-authors of the UNEP report.

The trailer will be produced by TVE in close consultation with CRU and the other supporting organisations. The draft script for the trailer, as well as a draft version of the footage, will be shared with all supporting organisations for comment.

Trailer screening:

[3rd International Symposium on Deep-Sea Corals](#) in Miami, USA (26 November – 2 December 2005)

The main objectives for screening the trailer at this meeting are (i) to promote the project within the cold-water coral reef community; (ii) to invite meeting participants to come forward with additional footage for inclusion into the final ER documentary, especially footage from less-well known cold-water coral reef locations off the coasts of developing countries and SIDS; (iii) to approach potential co-funders and co-sponsors present at the meeting. It is planned that a crew from TVE will participate at this conference to interview scientists and, as appropriate, to shoot additional footage at the Harbor Branch Oceanographic Institution (home to the 62-m R/V *Seward Johnson* and *Johnson-Sea-Link* Research Submersibles) during the post-conference field trip.

The costs for producing the trailer will be covered by the UNEP Coral Reef contribution (\$ 5,000) and monies from other supporting organisations which have indicated that their funds can be used wholly or in part for the production of the trailer.

Towards the end of Phase 1, all supporting organisations will review the progress achieved under the project and the availability of funds for Phases 2 and 3, and decide whether and how to proceed.

Phase 2: Production of the Earth Report documentary (December 2005 –February 2006)

In Phase 2, additional footage coming forward after the 3rd ISDPS will be reviewed and incorporated into the ER documentary. As appropriate, TVE will produce additional, new footage to capture for example traditional knowledge by interviewing fishermen in Norway to hear their views about the importance of cold-water coral reefs for local businesses and communities. All cutting and editing of materials, voice-overs, subtitles and quality assessments will be carried out in Phase 2 with a view to have a final ER documentary (in English) ready by the end of February, so that it can be broadcast on BBC World Service.

Documentary Launch:

[8th meeting of the Conference of the Parties to the Convention on Biological Diversity](#), Curitiba, Brazil (20 - 31 March 2006)

Phase 3: Post-production / broadcasting promotion of the Earth Report documentary (March –July 2006)

The experience from producing the H2O documentary has shown that there is a need to promote the final ER documentary to ensure that the product receives appropriate attention and has maximum impact. The objective of Phase 3 is to distribute the ER documentary globally and as wide-spread as possible, especially in developing countries and SIDS. Copies of the documentary on DVD will be distributed within and outside the UN and UNEP system, including all Regional Sea Conventions and Action Plans and Regional Fishery Bodies, and the Environment / Fisheries Ministers of cold-water coral reef range states. Further contacts will be identified in consultation with the supporting organisations.

Under current arrangements, the BBC produces Earth Report documentaries also in a Japanese language edition, which would become available – free of charge - after broadcasting. It is intended to make the Japanese language edition of the ER documentary available to Japan (Wildlife Research Centre; Ministry of the Environment) as current co-host country of the International Coral Reef Initiative (ICRI) for in-country promotion. In addition, and depending on the availability of funds, it is foreseen to produce the ER documentary in other language (e.g. Spanish and French) versions at a cost of approximately £1,500 per language to ensure maximum up-take in non-English or Japanese speaking countries.

VII. DRAFT BUDGET AND COSTS

The overall costs for producing the ER documentary on cold-water coral reefs are estimated to be in the region of £30,000 – £35,000.

The products/outputs of the project will make maximum use of existing footage, thereby reducing the costs and the need to produce new footage. Necessary graphics, illustrations and computer animation will, to the extent possible, be produced in-house by UNEP-WCMC or other supporting organisations. It is intended to carry over unutilised funds from one phase into the next phase.

UNEP-WCMC will carry out the financial administration of the project, including the administration of funds from supporting organisations, reporting on utilisation of funds and final expenditure report.

The costs stated above include the review and examination of existing footage (including, where necessary, the purchase of copyrights and licenses etc.) for the preparation of the trailer and the final Earth Report documentary in English. The costs of additional language editions include translation, voice-over, subtitles, editing, quality assessment test/report, level synchronisation, copying on BETA tape.

VIII. SUPPORTING ORGANISATIONS²

Each supporting organisation will be regularly informed about the project progress, and will be involved in making strategic decisions about the work to be carried out under the project (cf. Correspondence Group below).

When agreeing to contribute funds to the project, the funder should identify whether these funds can be used in part or in total for the production of the trailer.

Supporting organisations, if they so wish, will be mentioned in the credits of the trailer and the final Earth Report documentary, and can have their logo on the post-production / post-broadcasting materials prepared under the project.

At the end of each phase, all supporting organisations will review the availability of funds to start the next phase. If there are not enough funds secured at the end of phase 1, the supporting organisations might decide to stop or postpone the production of the production of the main Earth Report documentary in phase 2. In this case, each supporting organisation which has contributed funds to this phase should inform CRU for what other purposes their monies could be used, or whether these funds should be reimbursed.

A similar review at the end of phase 2 will determine whether and how much money is available for the post-production/broadcasting promotion of the Earth Report documentary, including the production of the documentary in additional languages.

IX. CORRESPONDENCE GROUP

As was the case for the UNEP cold-water coral reef report, a correspondence group will be established under the lead of CRU consisting of 1 representative of each supporting organisation, and a representative of TVE. The group will mainly communicate by e-mail, and, if and when necessary, via telephone conference. The correspondence group might decide to invite international cold-water coral reef experts into their deliberations.

² For the purpose of this document, 'supporting organisation' means any organization, agency, body or individual that provides funds or in-kind support for the project.

The main tasks of the correspondence group are: (i) to review the progress under the project, including fundraising activities; (ii) to examine and comment on the draft script, intermediary footage and the draft products and outputs of the project (e.g. the draft trailer and the draft Earth Report documentary); (iii) to decide at the end of each project phase whether and how to proceed with the next phase; and (iv) to determine the post-production/broadcasting promotion activities.

X. SECURED FUNDS AND FUND RAISING STRATEGY

As of 26 August 2005, the following funds have been secured [further funds and supporting organisations will be added]:

£ Sterling	US Dollar	Norwegian Krona	Funder
2,775	5,000		UNEP
4,300		50,000	Norwegian Government

Exchange rates to £ Sterling from www.oanda.com

Fundraising for additional monies will be carried out from the start of the project and throughout all phases, until the costs for all project activities are sufficiently covered and secured. Each supporting organisation, as well as TVE, should do its utmost to raise additional funds for the project.

At the outset of the project, the correspondence group of supporting organisations (cf. above) will establish a list of potential organisations to be contacted with a view to raising additional support and funds, and who should initiate this contact. The correspondence group will regularly review this list and the fund raising efforts by the supporting organisations and TVE.

All existing supporting organisations will be consulted prior to accepting the offer of support or funds from additional organizations.

XI. CONTACTS

UNEP Coral Reef Unit

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Earth Report / Television Trust for the Environment (TVE)

Contact persons: Mr. Robert Lamb (robert.lamb@earthreport.info);
 Mr. Gus Lamb (gus.lamb@earthreport.info)
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 Web: www.tve.org/index.cfm; www.tve.org/earthreport/

XII. SELECTED LINKS

Cold-water coral reef initiative (Governments of Ireland, Norway, the UK, WWF and UNEP)

- Report *Cold-water Coral Reefs: Out of sight – no longer out of mind*
www.unep-wcmc.org/index.html?http://www.unep-wcmc.org/press/cold_water_coral_reefs/index.htm-main
- Cold-water coral reef Video News Release: www.unep-wcmc.org/press/cold_water_coral_reefs/video/Small_cold_water_coral.wmv

Earth Report / TVE documentaries

- "Little Geek" www.tve.org/earthreport/archive/doc.cfm?aid=1707
- Hilltops-2-Oceans, Part 1 www.tve.org/earthreport/archive/doc.cfm?aid=1514
- Hilltops-2-Oceans, Part 2 www.tve.org/earthreport/archive/doc.cfm?aid=1515

Selection of potential contributors and sources of footage

- Prof. Freiwald & team www.cool-corals.de
- Dr. Jan Helge Fosså & team www.imr.no/coral/
- Dr. J. Murray Roberts www.sams.ac.uk/research/deep%20sea%20benthos/coldcoralsintro.htm
- JAGO Team: www.orn.mpg.de/~hissmann/jago.html
- HERMES: www.eu-hermes.net

Selection of key events and important meetings

- 3rd Int. Symp. on Deep-Sea Corals <http://conference.ifas.ufl.edu/coral/>
- 8th CBD COP meeting www.biodiv.org/convention/cops.asp

United Nations General Assembly reports and resolutions

58th session

Resolution 58/240 on Oceans and the Law of the Sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/58/240&Lang=E>

Resolution 58/14 on Sustainable Fisheries <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/58/240&Lang=E>

59th session

SG Report on Oceans and the Law of the Sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/59/62&Lang=E>

SG Report on Oceans and the Law of the Sea, Add 1 <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/59/62/Add.1&Lang=E>

SG Report on Sustainable Fisheries <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/59/298&Lang=E>

Resolution 59/24 on Oceans and the Law of the Sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/59/24&Lang=E>

Resolution 59/25 on Sustainable Fisheries <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/59/25&Lang=E>

60th session

SG Report on Oceans and the law of the sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/60/63&Lang=E>

Promotional Flyer for a Television Documentary on Cold-water Coral Reefs

DEEP TROUBLE

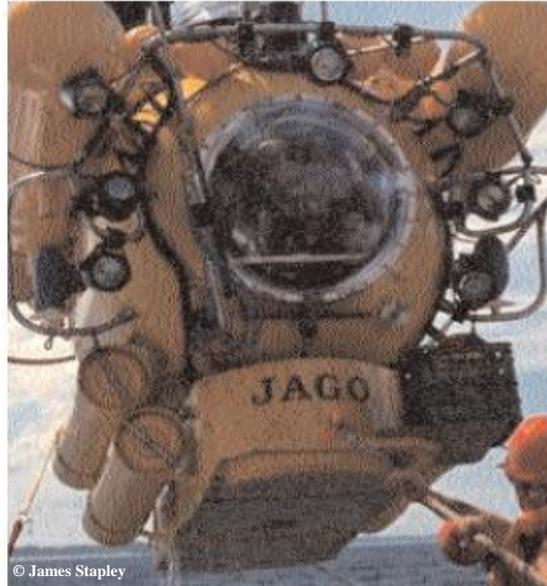
Everybody knows that the biggest coral reef on earth is the Australian Great Barrier Reef. Everybody could be wrong. Stunning coral reefs are also found in cold, lightless conditions deep below the oceans' surface. Thousands of reefs formed by the deep-water coral *Lophelia pertusa* have been discovered along the eastern Atlantic continental margin from the Barents Sea all the way down to West Africa. A similar belt of corals extends on the other side of the Atlantic between Nova Scotia and the Gulf of Mexico.

It's a good indicator of just how little we know about the deep oceans that such numerous, and sometimes very large structures have escaped our notice until only a few years ago. While individual cold-water coral species have long been known, nobody suspected that they could grow into such large reefs and seafloor forests, just like their warm-water relatives.

Most of the cold-water coral reefs discovered so far are in Northern waters. But that's probably only because most of the research has been carried out in these seas. In fact, cold-water corals occur throughout the oceans in places with suitably low temperatures, high currents and hard seafloors. In Norway, cold-water corals



Far beneath the waves, cold-water corals are very delicate and fragile



© James Stapley

Studying cold-water corals: not your average biology field-trip!

exist even at depths as shallow as 40 metres - well within the range of SCUBA divers. Usually, however, they are found at much greater depths. Because the right environmental conditions exist throughout the oceans in layers at various depths, cold-water coral reefs occur in large areas stretching for several thousands of kilometres.

Our patchy knowledge of the whereabouts of cold-water coral reefs, especially in the Indian and Pacific Oceans, is representative of the state of our knowledge on the subject as a whole. For it is only in the last decade that a systematic approach has been made to study these inaccessible ecosystems. Our understanding has benefited greatly from advances in marine technology, in particular that of Remotely Operated Vehicles, or ROVs, equipped with high-definition video cameras. The use of these submersible robots has shed new light on cold-water coral reefs and their associated species. But we have much still to learn, especially about the ecological function of the reefs and their role within the wider oceanic environment.

Hundreds of metres below the ocean surface, beyond the impact of light and waves, life is at a slower pace. Growing at only a tenth of the rate of warm-water reefs, cold-water coral reefs can be over 8,000 years old. Even the fish they harbour can live for more than 100 years. One might expect that cold-water corals would be relatively safe from man and his destructive activities in this remote environment. Not so: they are rapidly being depleted, mainly as a result of bottom trawling – a method of fishing by which heavy equipment with high-strength nets are dragged along the seabed, clear-cutting the corals in their path and destroying sensitive life for the sake of one or two commercial species. The use of this technique in deeper waters is a fairly recent development – made possible by 'rock-hopper' gear, stronger vessels and advances in sonar. Spurred on by the increasing demand for fish and the depletion of traditional fishing grounds, a single trawl can reduce a millennia-old reef to rubble within minutes. Bottom-trawling in reef areas may well be undermining the long-term viability of the deep-water fisheries themselves, since the reefs are thought to play a role as nurseries and feeding grounds for several commercial species. Bottom trawling in deeper waters is characterised by 'boom-and-bust' cycles as habitats and stocks are rapidly exploited for a quick profit before moving on to the next pristine area. This is like cutting the tree in order to harvest the apples. However, the pattern looks set to continue until the last



© Dr R. Grant Gilmore
Cold-water coral reef photographed before...



© Lance Horn
...and after bottom trawling.

cold-water coral reefs have disappeared – and it will be thousands of years until they grow back again, if at all. Meanwhile, other potentially harmful human activities – such as oil and gas exploration and the laying of pipes and cables on the seabed – are on the increase. All of which poses the question: will we learn the value of cold-water corals before we've destroyed them all? Or will 'out of sight' continue to mean 'out of mind' for these unique and ancient ecosystems?

In this programme we meet leading cold-water coral experts who bring news from the cutting edge of science. We hitch a ride with the 'Jago' submarine crew as they visit a newly discovered reef off the coast of Norway. We see rare footage of bottom trawling in action and ask fisheries ministers if they can justify this destructive practice. We hear about the life-long experiences of local fishermen. And we examine the measures taken and options being considered by policymakers and governments for the protection of cold-water corals. The programme will be adorned throughout with stunning underwater footage.



© Erling Svensen

Pink Lophelia pertusa – a major reef-building species

- DRAFT PROJECT OUTLINE -

Establishment of a Global Cold-water Coral Reef Data Base and GIS

Coordination: UNEP Coral Reef Unit (CRU), in collaboration with supporting organisations

Implementation: UNEP-World Conservation Monitoring Centre (WCMC)

Project administration: UNEP-WCMC; project code: 2028G (cold-water coral GIS)

I. BACKGROUND

In 2003, the UNEP Coral Reef Unit (CRU) established a cold-water coral reef initiative with the Governments of Ireland, Norway and the UK, and WWF. This initiative commissioned a group of international cold-water coral reef experts under the lead of Prof. Freiwald (Germany) to prepare an authoritative summary of the current state of knowledge on cold-water coral reefs and the threats they are facing, including recommendations for further action to be taken for their protection and sustainable management. The resulting 84-page report was edited by CRU and launched by UNEP in June 2004 and has since become a standard reference for scientists as well as policy and decision makers. The report contributed to the international identification of cold-water coral reefs as a vulnerable key ecosystem for marine biological diversity in the deeper waters of the oceans, both within and outside national jurisdiction, *inter alia* in the Addendum to the Report of the Secretary General on Oceans and the Law of the Sea to the 59th session of the UN General Assembly. It thereby supported the calls for urgent consideration of cold-water coral reefs given in the UNGA Resolutions 58/240, 58/14, 59/24 and 59/25.

II. OBJECTIVES, NEEDS AND BENEFITS

The objective of the project is to establish a global cold-water coral reef database and internet-based GIS system, providing a central entry point and easy access to geo-referenced data and information on cold-water coral reefs with a view to:

- implementing the recommendations set out in the 2004 UNEP Report *Cold-water Coral Reefs: Out of sight – no longer*;
- contributing to the implementation of recommendations to protect vulnerable deep water ecosystems (including cold-water coral reefs) agreed by the UN General Assembly, and to facilitate the subsequent activities set out in the programmes of work under the Convention on Biological Diversity (CBD), the International Coral Reef Initiative (ICRI) and other international bodies;
- supporting the work of national and international bodies and agencies to implement the commitments made at the World Summit of Sustainable Development on (i) achieving a significant reduction in the current rate of loss of biological diversity by 2010, and (ii) the establishment of representative networks of marine protected areas by 2012.

The project is part of a portfolio of activities carried out or facilitated by the UNEP Coral Reef Unit in support of the conservation and sustainable use of warm and cold-water coral reefs.

Currently, most data and information on cold-water coral ecosystems are kept/stored by individual scientists, national authorities and industry sectors operating on or near the seafloor (e.g. fisheries, oil & gas, pipeline laying, cable placement). The fragmented and disjointed nature of cold-water coral reef records makes access and use difficult, if not impossible, and risks that vital data might be lost over time.

For tropical warm-water coral reefs, a number of comprehensive databases and GIS facilities are in place, such as Reefbase (<http://www.reefbase.org/>) and UNEP-WCMCs IMapS (cf. below). However, there is no such centralised database and GIS facility to compile, store and display the distribution and geo-referenced

information for cold-water coral reefs world-wide. The lack of a single entry and access point to global cold-water coral reef data and information is a serious impediment for:

- (i) ***national policy and decision makers***, especially from developing countries and SIDS, to access and evaluate information on the distribution, state and threats of cold-water coral reefs in their national waters, and to take action accordingly;
- (ii) ***the work of intergovernmental frameworks***, including the Convention on Biological Diversity (CBD) and the International Coral Reef Initiative (ICRI), to take concerted action for the protection and sustainable management of cold-water coral reefs in national waters and areas beyond national jurisdiction;
- (iii) ***the planning and execution of further research*** to close the gaps in understanding of the distribution and biology of cold-water coral reefs.

There are a multitude of benefits of creating an interactive global GIS to visualise the location of cold-water coral reefs and make relevant data and information available, including:

- ***governments***: in the efforts to implement the relevant goals and objectives agreed at WSSD and the associated targets and programmes of work under CBD, e.g. relating to the reduction of the loss of biological diversity by 2010 and the establishment of a representative network of marine protected areas by 2012;
- ***national agencies***: in the licensing of seabed operations or activities in the national waters and EEZ which have the potential to affect cold-water coral reefs;
- ***industry***: in the planning of commercial seabed operations or activities in the marine environment which have the potential to affect cold-water coral reefs;
- ***academia***: in the planning and execution of research cruises and seabed exploration;
- ***international bodies and organisations***: in the further discussions (e.g. under DOALOS and CBD) regarding the protection and sustainable management of marine biodiversity and vulnerable marine ecosystems in national waters and areas beyond national jurisdiction.

III. EXISTING RESOURCES, LINKS TO ONGOING ACTIVITIES AND POTENTIAL PROJECT PARTNERS / SUPPORTERS

UNEP-WCMC Interactive Map Service (IMapS)

UNEP-WCMC provides data and support to over 20 international agreements (including CBD, CITES, CMS, Ramsar), and hosts a number of international data bases for the conservation and sustainable management of biodiversity, species and habitats, including the *CITES Trade Database*, the *World Database of Protected Areas* and the *United Nations List of Protected Areas*.

UNEP-WCMC offers independent, objective services to UNEP and the UN system, and to numerous other partners, including private sector companies. The UNEP-WCMC IMapS tool (http://imaps.unep-wcmc.org/imaps_index.htm) was established and is further developed to provide 24 hour access to the Centre's comprehensive, geo-referenced environmental information and conservation data bases, ranging from biodiversity, World Heritage sites, distribution of coral reefs, seagrasses and mangroves at the global level, to environmental information services for particular regions such as the Caribbean, Mediterranean, Black Sea or Caspian Sea (cf. examples at Annex 1). IMapS enables users to create their own, customised maps over the internet to meet their individual requirements, incorporating information and background data on environmental sensitivities such as protected areas, breeding areas and vulnerable species.



International Conventions and bodies

The first meeting of the CBD Ad Hoc Open-Ended Working Group on Protected Areas (Italy, 2005) discussed options for cooperation for the establishment of marine protected areas in areas beyond the limits of national jurisdiction, utilizing, *inter alia*, cold-water coral reef distribution data supplied by the UNEP Coral Reef Unit. Our understanding of the location, biology, state and threats of cold-water coral reefs, although scarce, is still far more advanced than that of most other vulnerable high sea ecosystems and habitats. In the light of the role which cold-water coral reefs have for deep-water marine biodiversity, and their linkage to high sea features such as seamounts, the distribution of these reefs supports the identification of marine biodiversity hotspots in the high seas³ and would make cold-water coral reefs an ideal 'test' ecosystem for biodiversity conservation in marine areas beyond national jurisdiction, especially if this knowledge of cold-water coral reefs is easily accessible.

Several intergovernmental and non-governmental bodies and organisations, including IUCN, WWF and Oceana, have established, or are developing, programmes in support of the international efforts to conserve the biological diversity in marine areas beyond national jurisdiction.

OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic

Under the auspices of OSPAR, the Joint Nature Conservation Committee (JNCC) of the United Kingdom is in the process of compiling and mapping data on the distribution of threatened and/or declining species and habitats in the OSPAR maritime area, including *Lophelia* reefs (cf. <http://212.219.37.107/hosted/ospar/ospar.html>). UNEP provided JNCC with the data set used to produce the distribution maps in the UNEP report, and since then OSPAR Contracting Parties (including Iceland and Norway) have contributed additional cold-water coral reef data and observations. At the 2005 meeting of the OSPAR Commission, all OSPAR Contracting Parties agreed that the data they reported (or will report) to OSPAR on cold-water coral reefs can be made available to UNEP.

Hotspot Ecosystems Research on the Margins of European Seas (HERMES)

HERMES is an international, interdisciplinary research consortium which comprises 45 partners from 15 European countries. Work under HERMES started in April 2005 and is funded by the EU under the 6th Framework Research Programme. Cold-water coral reef ecosystems are one of five thematic HERMES work packages. Most of the European cold-water coral reef scientific community is involved or a partner in HERMES, including four of the five co-authors of the UNEP report. Prof. A. Freiwald, the lead author of this report, is also the coordinator of the HERMES cold-water coral reef WP. The UNEP Coral Reef Unit participated and gave a presentation at the HERMES kick-off meeting in Rhodes (3-9 April 2005) on the urgent need for new data and information on cold-water coral reefs gained under HERMES to be shared with the wider community.

Other Cold-water Coral Reef Research Teams and Experts

Over the last two years, the UNEP Coral Reef Unit established an extensive network of contacts within the global scientific cold-water coral reef community by promoting UNEP's work on this ecosystem at various international events, including the 2nd International Deep Sea Coral Symposium (Germany, 2003), the 10th International Coral Reef Symposium (Japan, 2004) and the conference "Europe's Hidden Coral Worlds" (UK, 2005).

The UNEP Coral Reef Unit will present and promote the project at the 3rd International Symposium on Deep-Sea Corals (28 November – 2 December 2005, Miami, US) with a view to reaching out to global cold-water coral reef community and identifying potential contributors of cold-water coral reef data and information as well as additional funders of the project.

³ see also the documentation presented at the 1st meeting of the CBD Ad Hoc Open-Ended Working Group on Protected Areas, UNEP/CBD/WG-PA/1/2 and UNEP/CBD/WG-PA/1/INF/1

IV. DURATION

The duration of the project will be for 17 months from 1 August 2005 to 31 December 2006.

V. KEY REQUIREMENTS AND SPECIFICATIONS

The following list provides some key requirements and specifications to be taken into account in the development of the global cold-water coral reef database and GIS. This list is preliminary and not exhaustive, and will be further developed with expert input in the course of the project. Implementation of some of the requirements and specifications is subject to the availability of funds.

System requirements and specifications

- Internet-based global GIS, allowing constant access to digital maps showing the geographical location of cold-water coral reef entry/data points. The start map is global, with possibility to zoom into any area of interest.
- Possibility to combine/overlay cold-water coral reef maps with existing IMapS features and GIS layers (cf. Annex 1), such as distribution of warm-water coral reefs, marine protected areas etc;
- Possibility to include other commercially available GIS products (cf. Annex 2), e.g.:
 - geomorphological information⁴, e.g. bathymetry and uw sea features, as the background layer for the cold-water coral reef GIS;
 - information on global maritime boundaries⁵, to identify and flag cold-water coral reefs beyond national jurisdiction;and to expand the system to include data base and GIS layers developed in other fora, e.g. location of deep and high sea features (e.g. seamounts), human activities in (potential) cold-water coral reef areas, location of other vulnerable marine habitats associated with cold-water coral reefs etc.
- Possibility to attach information to each cold-water coral reef entry/data point in a variety of formats (e.g. text files, pictures, video clips, internet links etc.).
- Possibility to flag the status of a location entry/data point (e.g. confirmed / not confirmed, observation of individual corals or coral reef associations, within or outside the area of national jurisdiction);
- Possibility to indicate actions/measures taken (e.g. protected areas, fishing regulations) to protect cold-water coral reefs at the national or regional level;
- Possibility to indicate and map potential, but not yet proven, areas of cold-water coral reefs resulting from desk top studies and predictive modelling.

Data entry and validation

Following the creation of a cold-water coral reef IMapS, the database and GIS will be 'populated' with the following data sets available at present to CRU on the global and regional distribution of cold-water corals:

- Prof. Freiwald, i.e. the data used to create the maps in the UNEP report, consisting of 1269 records of *Lophelia pertusa*, 189 records for *Madrepora oculata*, 49 records for *M. carolina*, 3 records for *M. kauaiensis*, 99 records for *Solenosmilia variabilis*;
- the additional *Lophelia* data submitted by OSPAR Contracting Parties to JNCC (cf. OSPAR above), consisting of 764 records from Norway, 76 records from Iceland and 2 records from the UK;
- the data sets on deep-water corals collected by Dr. Alex Rogers (British Antarctic Survey) and Dr. Jason Hall-Spencer (University of Plymouth), consisting of approximately 3,500 records for Scleractinia,

⁴ It is proposed to purchase and use for this purpose the Centenary Edition of the GEBCO Digital Atlas (cf. http://www.bodc.ac.uk/data/online_delivery/gebco/), which provides bathymetry data on a global grid with a one arc-minute spacing.

⁵ It is proposed to purchase a single user license for the commercial Global Maritime Boundaries data base and GIS (cf. <http://www.veridian.com/offerings/suboffering.asp?offeringID=526&historyIDs=0,536,538&leftNavID=14>) for this purpose.

Gorgonaria, Antipatharia, Stylasterina, Zoanthidea from literature, expedition reports, museum collections, etc.

In a second step, data (e.g. boundary information) and information (e.g. type of measure, internet link to further information) on national or regional actions/measures taken to protect cold-water coral reefs, such as designated protected areas, fishing regulations, will be entered, starting with those contained in the 2004 UNEP Report.

In the light of the experience gained in developing the system and entering these data, a format and guidance for data submission from other experts and sources will be established and made available for downloading on the UNEP-WCMC web site. During the development of the system, it is foreseen that data and information received other parties in digital form via e-mail, CDrom etc. will be entered by the UNEP-WCMC system administrator. At a later stage, it is foreseen to develop facilities to enable remote data entry via the internet.

The validation of data and information will be carried out in two steps: (i) 'junk' entries will be deleted by the system administrator, (ii) other entries will be examined by a small group of international experts. The composition, terms of reference and working procedures of this group will be developed during the project.

VI. ACTIVITIES, PRODUCTS/OUTPUTS, TIME SCHEDULE AND KEY EVENTS

The project will be carried out in two distinct phases:

Phase 1: Development (August – November 2005)

The following activities will be carried out in Phase 1:

Activity	Product/Output	Timing
1. Establishment of cold-water coral reef IMapS at UNEP-WCMC, incl. development of:	• global IMapS layer	Aug-Sept 05
	• links to other relevant IMapS layers and UNEP-WCMC databases (e.g. warm-water coral reef distribution, marine protected areas)	Sept 05
	• 'front-end' for easy data entry into the cold-water coral reef data base and GIS layer	Sept-Oct 05
2. International maritime boundaries data base and GIS	• maritime boundaries database purchased and integrated into IMapS	Sept-Oct 05
3. Data entry	• global distribution of cold-water coral data sets available to CRU displayed in printable map form	Oct-Nov 05
	• areas in which national or regional action/measures were taken to protect cold-water coral reefs displayed in printable map form	Oct-Nov 05
	• system to 'flag' individual cold water coral reef records (e.g. reefs within or beyond national jurisdiction)	Oct-Nov 05
4. Information entry	• a selection of cold-water coral reef location entries linked to a variety of additional information, e.g. uw video or still photos, texts, survey info and maps, links to further information	Nov 05
5. Data entry formats and guidance	• templates, formats and guidance notes for the submission and entry of cold-water coral distribution data from other sources	Nov 05

- templates, formats and guidance notes for the submission and entry of data on further national or regional action/measures were taken to protect cold-water coral reefs Nov 05
- 6. Promotional material
 - promotional brochure/flyer and poster on the global cold-water coral reef data base and GIS Nov 05

Phase 1 will end with the launch of the global cold-water coral reef data base and GIS at the

[3rd International Symposium on Deep-Sea Corals](#) in Miami, USA (26 November – 2 December 2005)

Phase 2: Implementation and expansion (December 2005-December 2006)

Following the launch and promotion of the global cold-water coral reef data base and GIS and going 'on-line', the following activities will be carried out or are expected:

Activity	Product/Output	Timing
7. Entry of further data and information provided by, <i>inter alia</i> , participants at 3 rd IDSCS	<ul style="list-style-type: none"> • increased global coverage of cold-water coral reef locations 	Dec 05-Dec 06
8. Information entry	<ul style="list-style-type: none"> • additional information (e.g. uw video or still photos, texts, survey info and maps, links to further information) available for cold-water coral reef locations 	Dec 05-Dec 06
9. Review of data entry formats and guidance	<ul style="list-style-type: none"> • revision of templates, formats and guidance notes for the submission of data and information 	Dec 05-Dec 06 (if and when necessary)
	<ul style="list-style-type: none"> • options for remote entry via internet evaluated in consultation with experts 	July 06
	<ul style="list-style-type: none"> • as appropriate, revision of 'front-end' of data base and GIS to allow remote entry 	July–Dec 06 (as appropriate)
10. Review of the global cold-water coral reef data base and GIS set up in the light of experience gained	<ul style="list-style-type: none"> • improved and more user-friendly data base and GIS 	Dec 05-Dec 06 (if and when necessary)
11. Promotion	<ul style="list-style-type: none"> • promotional material (up-dated as necessary) presented at relevant international meetings 	Dec 05-Dec 06
12. Validation of data and information	<ul style="list-style-type: none"> • Terms of Reference, modus operandi and composition of expert group 	July 06
13. Long-term operation and maintenance of the global cold-water coral reef data base and GIS	<ul style="list-style-type: none"> • needs and requirements identified 	July–Dec 06

VII. DRAFT BUDGET AND COSTS

The overall costs for establishing a global cold-water coral reef data base and GIS as part of the IMapS at UNEP-WCMC are estimated to be in the region of £26,000 (approx. \$50,000). The breakdown of costs is as follows:

	Phase	Activities	Time allocation	Costs	
				£	US \$ **

Personnel					
UNEP-WCMC GIS developer	Phase 1	1, 2, 4, 5	4 weeks	5,775	10,869
	Phase 2	9, 10, 13	4 weeks	5,775	10,869
Data entry personnel (UNEP-WCMC project assistant or consultant)	Phase 1	3, 4	approx. 2 weeks	2,000	3,764
	Phase 2	7, 8	approx. 4 weeks	4,000	7,528
UNEP CRU Head *	Phase 1	supervision and coordination of all activities	approx. 2 weeks	[4,125]	[7,763]
	Phase 2		approx. 4 weeks	[8,250]	[15,526]
UNEP CRU Assistant *	Phase 1	supervision and coordination of all activities, data entry	approx. 3 weeks	[4,725]	[8,892]
	Phase 2		approx. 6 weeks	[9,450]	[17,784]
Expert Group (nominal compensation of £500 per expert)	Phase 2		-	2,000	3,764
Software and Services					
Maritime boundary data base and GIS (single user license)	Phase 1			1,594	3,000
Centenary Edition of the GEBCO Digital Atlas	Phase 1			270	508
IMapS services	Phase 1			417	785
	Phase 2			896	1,686
Miscellaneous					
Promotional material	Phase 1			500	941
	Phase 2			500	941
Sub-Total				23,727	44,655
UNEP-WCMC project administration (10% of sub-total)				2,372	4,465
TOTAL				26,099	49,120

* The costs for the work carried out by CRU personnel represent a 'in kind' contribution and are not charged to the project.

Data and information for inclusion in the global cold-water coral reef data base and GIS will be provided for free, and remain the property of the originator. Any graphics and illustrations for inclusion in the cold-water coral reef IMapS will, to the extent possible, be produced in-house by UNEP-WCMC or other supporting organisations.

Unutilised funds from Phase 1 will be carried over into Phase 2.

UNEP-WCMC will carry out the financial administration of the project, including the administration of funds from supporting organisations, reporting on utilisation of funds and final expenditure report.

VIII. SUPPORTING ORGANISATIONS⁶

Each supporting organisation will be regularly informed about the project progress, and will be involved in making strategic decisions about the work to be carried out under the project (cf. Correspondence Group below).

Supporting organisations, if they so wish, will be acknowledged on the cold-water coral reef IMapS and any maps or reports produced with the database and GIS, and can have their logo on the promotional materials prepared under the project.

At the end of Phase 1, all supporting organisations will review the availability of funds to start Phase 2. If there are not enough funds secured at the end of Phase 1, the supporting organisations will decide on whether and how further work should be carried out. If a decision is reached to terminate the project after Phase 1 or in Phase 2

⁶ For the purpose of this document, 'supporting organisation' means any organization, agency, body or individual that provides funds or in-kind support for the project.

prior to December 2006, the supporting organisations should inform CRU for what other purposes any remaining monies could be used, or whether these funds should be reimbursed.

IX. CORRESPONDENCE GROUP

As was the case for the UNEP cold-water coral reef report, a correspondence group will be established under the lead of CRU consisting of 1 representative of each supporting organisation and the UNEP-WCMC GIS developer. The group will mainly communicate by e-mail, and, if and when necessary, via telephone conference. The correspondence group might decide to invite international cold-water coral reef experts into their deliberations.

The main tasks of the correspondence group are: (i) to review the progress under the project, including fundraising activities; (ii) to examine and comment on any draft products and outputs of the project; (iii) to decide at the end of Phase 1 whether and how to proceed with the next phase; (iv) to identify opportunities to promote the project.

X. SECURED FUNDS AND FUND RASING STRATEGY

As of 1 August 2005, the following funds have been secured [further funds and supporting organisations will be added]:

- \$10,000 from UNEP

Fundraising for additional monies will be carried out from the start of the project and throughout all phases, until the costs for all project activities are sufficiently covered and secured. Each supporting organisation, as well as UNEP-WCMC, should do its utmost to raise additional funds for the project.

At the outset of the project, the correspondence group of supporting organisations (cf. above) will establish a list of potential organisations to be contacted with a view to raising additional support and funds, and who should initiate this contact. The correspondence group will regularly review this list and the fund raising efforts carried out.

All existing supporting organisations will be consulted prior to accepting the offer of support or funds from additional organizations.

XI. CONTACTS

UNEP Coral Reef Unit

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UNEP-WCMC

Contact persons: Mr. Phil Fox (phil.fox@unep-wcmc.org)
Mr. Ian May (ian.may@unep-wcmc.org)
Tel./FAX: as above
Web: www.unep-wcmc.org

XII. SELECTED LINKS

Cold-water coral reef initiative (Governments of Ireland, Norway, the UK, WWF and UNEP)

Report *Cold-water Coral Reefs: Out of sight – no longer out of mind*

www.unep-wcmc.org/index.html?http://www.unep-wcmc.org/press/cold_water_coral_reefs/index.htm~main

Cold-water coral reef Video News Release: www.unep-wcmc.org/press/cold_water_coral_reefs/video/Small_cold_water_coral.wmv

Selection of data bases hosted / maintained at UNEP-WCMC

Species

UNEP-WCMC's Species Database: <http://sea.unep-wcmc.org/isdb/Taxonomy/>

Species Database Subsets: <http://sea.unep-wcmc.org/species/dbases/about.cfm>

CITES Trade Database: <http://sea.unep-wcmc.org/citestrade/index.cfm>

Protected Areas

World Database of Protected Areas: <http://sea.unep-wcmc.org/wdbpa>

United Nations List of Protected Areas: http://www.unep-wcmc.org/protected_areas/UN_list/index.htm

World Heritage Sites: http://www.unep-wcmc.org/protected_areas/world_heritage/index.htm

Protected Areas Worldwide: http://www.unep-wcmc.org/protected_areas/protected_areas.htm

Selection of key events and important meetings

- 3rd Int. Symp. on Deep-Sea Corals <http://conference.ifas.ufl.edu/coral/>
- 8th CBD COP meeting www.biodiv.org/convention/cops.asp

United Nations General Assembly reports and resolutions

58th session

Resolution 58/240 on Oceans and the Law of the Sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/58/240&Lang=E>

Resolution 58/14 on Sustainable Fisheries <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/58/240&Lang=E>

59th session

SG Report on Oceans and the Law of the Sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/59/62&Lang=E>

SG Report on Oceans and the Law of the Sea, Add 1 <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/59/62/Add.1&Lang=E>

SG Report on Sustainable Fisheries <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/59/298&Lang=E>

Resolution 59/24 on Oceans and the Law of the Sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/59/24&Lang=E>

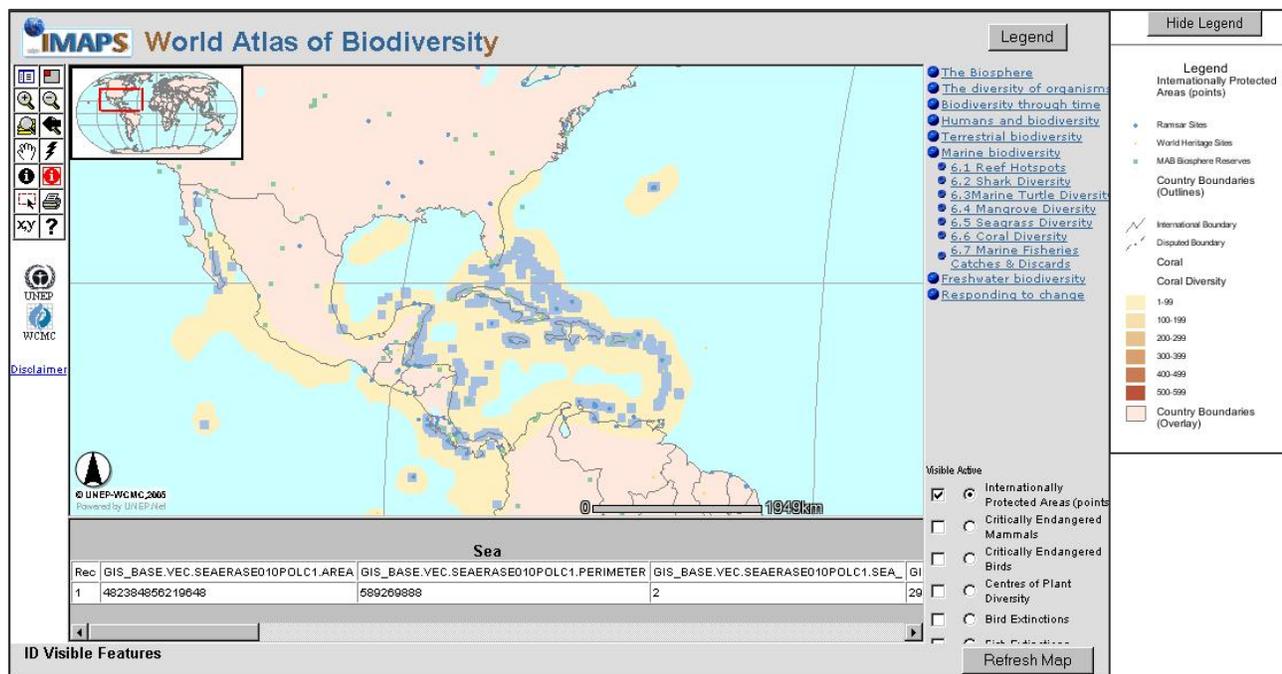
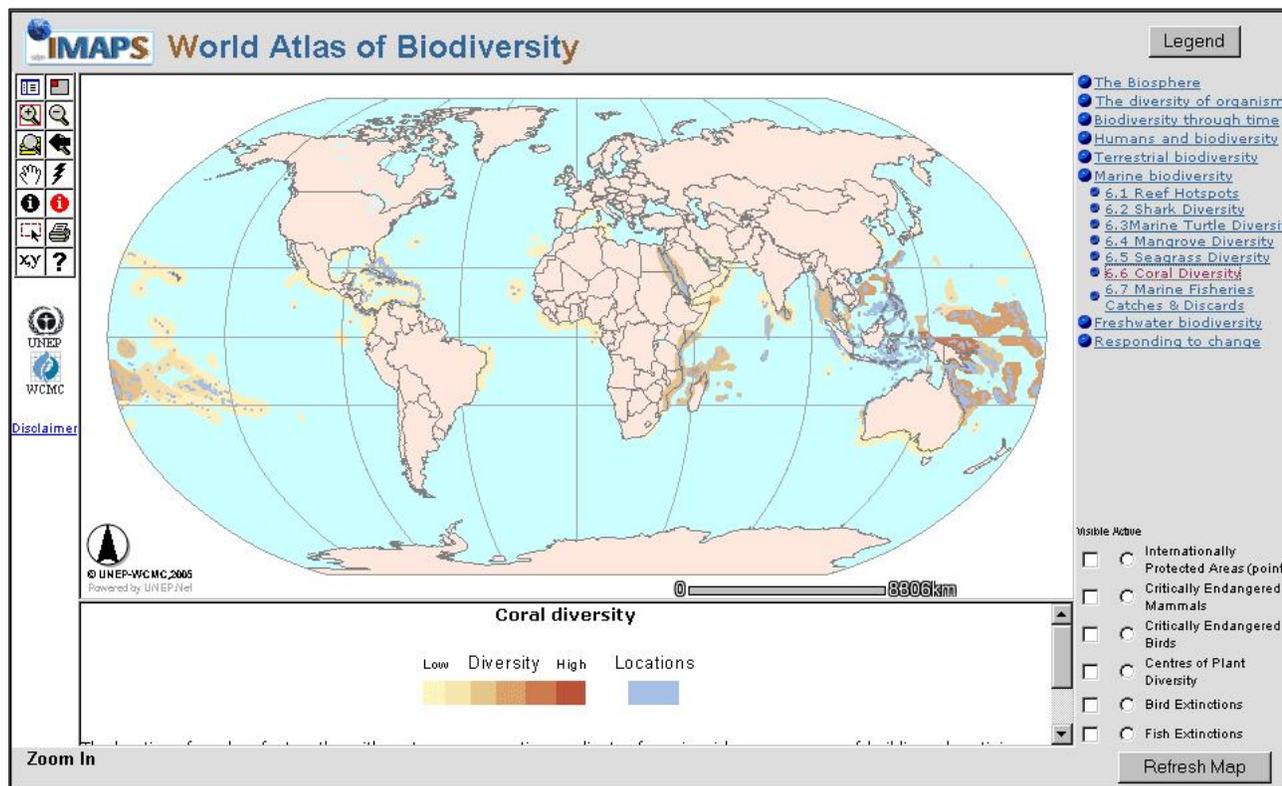
Resolution 59/25 on Sustainable Fisheries <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/RES/59/25&Lang=E>

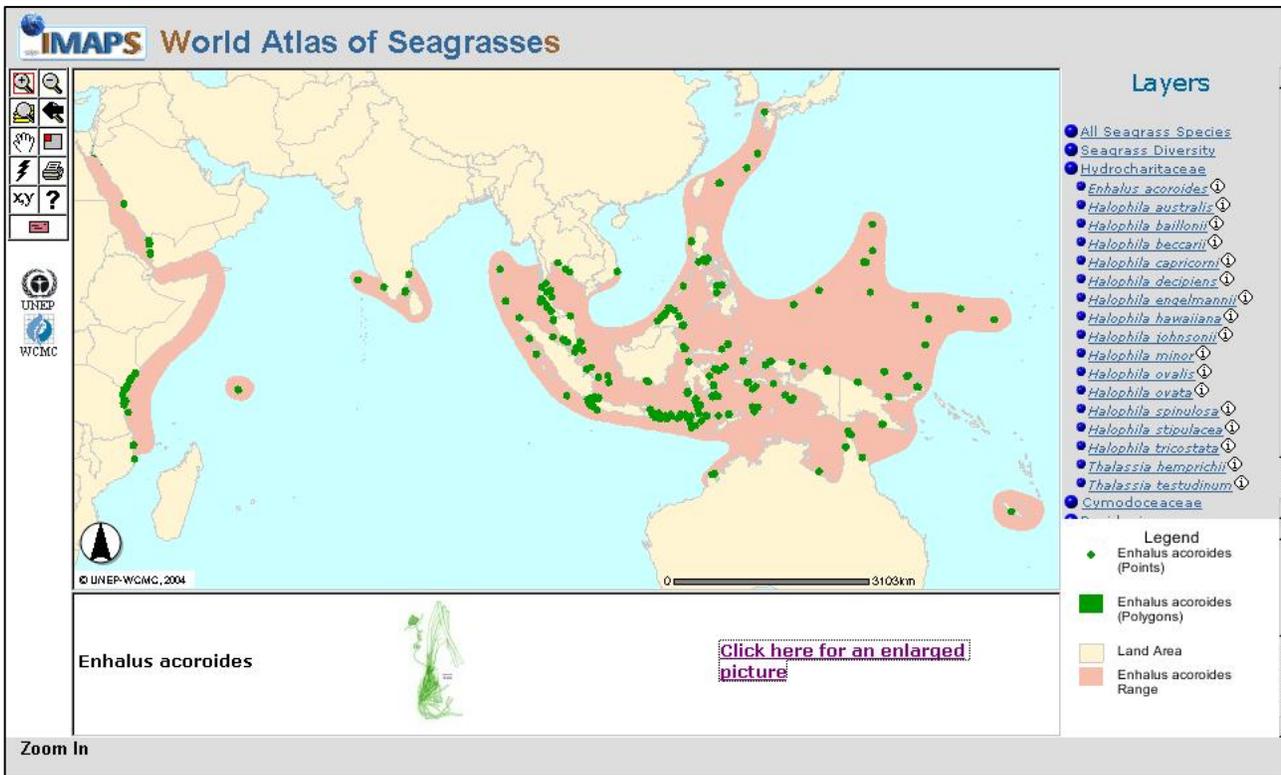
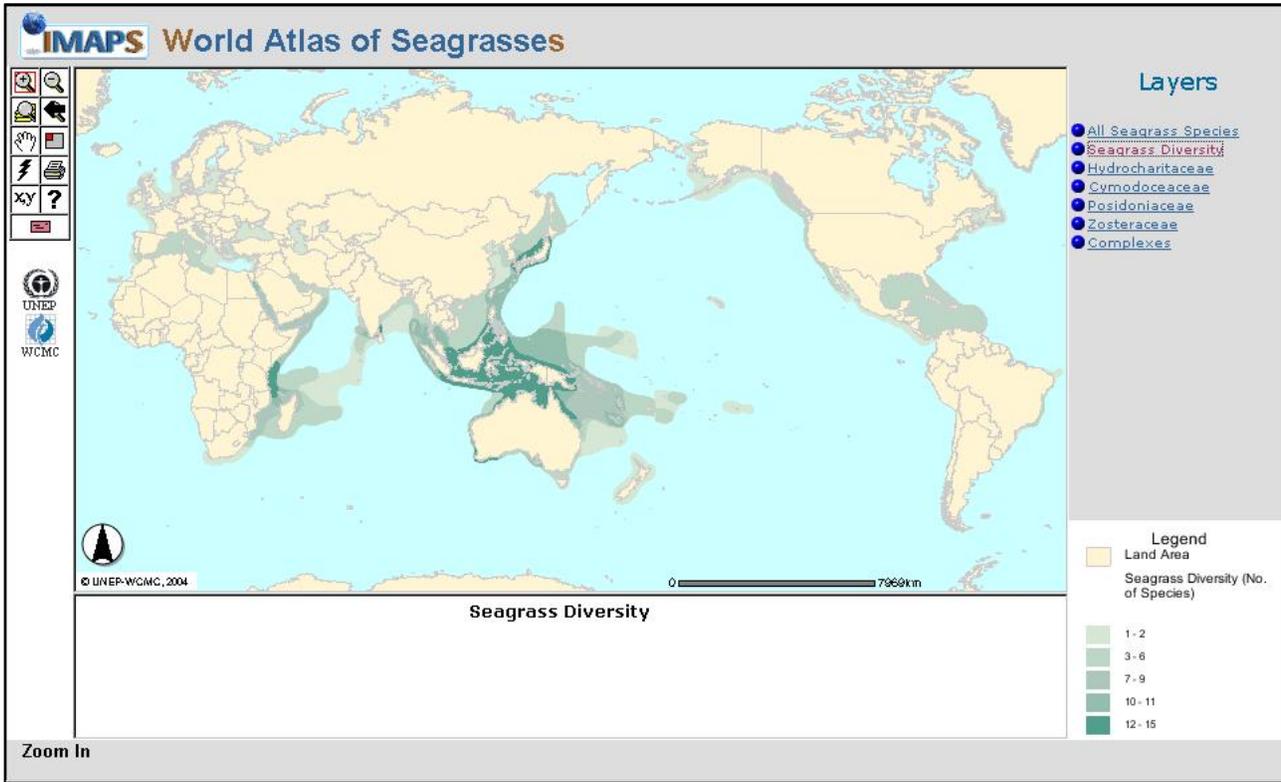
60th session

SG Report on Oceans and the law of the sea <http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/60/63&Lang=E>

IMAPS Examples

(for further information and maps please visit http://imaps.unep-wcmc.org/imaps_index.htm)





Additional GIS products to be purchased

Annex 2

General Dynamics
Advanced Information Systems
Attn: Maritime Boundaries, Suite 112
14700 Lee Road
Chantilly, Virginia 20151 USA

Phone Inquiries: 703-251-7507
Purchase Order Fax: 703-378-5404
MaritimeBoundaries@Veridian.com
www.MaritimeBoundaries.com

Maritime Boundaries of the World

Content

- Baselines
- Median Lines
- Military Zones
- Disputed Claims
- Fisheries Zones
- Economic Zones
- Territorial Seas
- Unilateral Claims
- Contiguous Zones
- World Vector Shoreline
- Joint Development Zones
- Multilateral Agreements
- Overlapping Maritime Claims
- Extensive Feature Attribution
- Hotlinked Country-By-Country Narratives
- More . . .

End Users

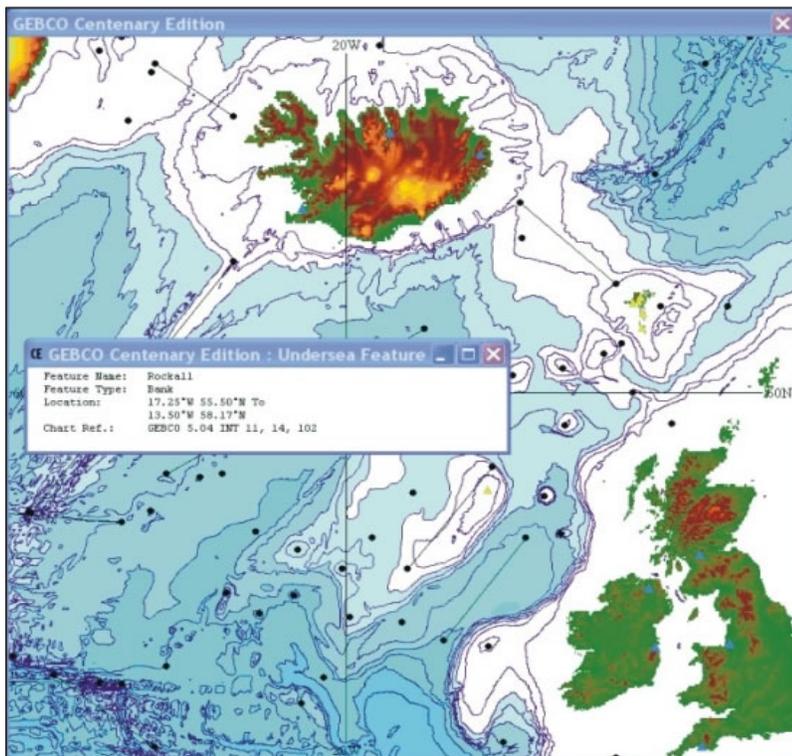
- Salvage
- Defense
- Shipping
- Fisheries
- Pollution
- Education
- Construction
- Legal (Juridical)
- Marine Archaeology
- Telecommunications
- Offshore Oil and Gas
- Hydrographic Surveys
- Marine Minerals and Mining

Price: **US\$3000 per individual license**
 Includes one update
 (see webpage for document and updates schedule)

Maritime boundaries are critical elements to the planning of any activity on the ocean surface, in the water column or on the seabed. General Dynamics Advanced Information Systems (USA) maintains the Global Maritime Boundaries Database (GMBD) to support ongoing research for various customers. The GMBD is now available to the public.
 The GMBD CD-ROM is constructed using ESRI's GIS software. The CD-ROM includes basic GIS display and query software. The GMBD contains detailed attribution on boundary lines and regions (which can be overlapping polygons) for each coastal state and maritime area. The database is continuously updated and will be published periodically.

GLOBAL MARITIME BOUNDARY DATA BASE AND GIS

- to be used for identifying/flagging of cold-water coral reefs beyond national jurisdiction
http://www.veridian.com/offerings/images/maritime_large.jpg



Sample image from the Centenary Edition of the GEBCO Digital Atlas

- to be used as a background layer for the cold-water coral reef IMapS