

The future agenda for EBSAs: maintaining momentum

Seascope Consultants Ltd, a relatively new specialist marine governance consultancy based in the UK, is pleased to have been asked to provide the Secretariat to GOBI for the next three years. As former Executive Secretary to the OSPAR Commission, I am aware of the importance and value of scientific opinion. I believe strongly that the scientific marine community can make a difference and hope that collectively we can continue to support and inform policies to conserve biodiversity in the deep oceans.

In addition to continuing to support the momentum generated by CBD to describe a global set of EBSAs, it seems to me that we should help consolidate these efforts by asking and addressing some searching questions. For me these include the following: Can we further the scientific knowledge and information and enhance the description of the EBSAs? What can we do to address gaps in the EBSA coverage? How can we build on the results of the Regional Workshops - is continuous work needed? How can we optimise the use of the Repository? How do we use EBSAs to inform management?

Bilateral discussions on these topics are ongoing and we intend to set out how, when and where GOBI can engage with these issues.

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Prof. David Johnson presenting at the Dräger Foundation Conference in Portugal, June 2013. Image courtesy Axel Kirchhof, Germany.

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Upcoming GOBI-related events

BBNJ, New York, 19-23 August 2013

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. Includes GOBI Advisory Board meeting (19 August) and GOBI/CBD side event (20 August). See <http://www.un.org/depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm>

SBSSTA-17, 14-18 October, Montreal, Canada

17th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice. <http://www.cbd.int>

IMPAC3, Marseille, 21-27 October 2013

3rd International Marine Protected Areas Congress. GOBI session - date to be confirmed. <http://www.impact3.org>

Convention on Biological Diversity North Pacific Regional EBSA Workshop

Moscow, Russian Republic, 23 February – 1 March 2013

Patrick N. Halpin, Duke University

The Executive Secretary of the CBD convened, with financial support from the Government of Japan (through the Japan Biodiversity Fund), the North Pacific Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas (EBSAs), in collaboration with the Food and Agriculture Organization of the United Nations (FAO), the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP), the North Pacific Marine Science Organization (PICES), the IOC Sub-Commission for the Western Pacific (WESTPAC), and the North Pacific Fisheries Commission (NPFC). This regional workshop was hosted by the Government of the Russian Federation in Moscow, from 25 February to 1 March 2013.

The workshop was attended by approximately 34 representatives from Parties, other Governments and relevant regional and international organizations spanning the Eastern and Western margins of the North Pacific region - namely, Canada, the Democratic People's Republic of Korea, Japan, Mexico, Philippines, the Republic of Korea and the Russian Federation, the National Oceanic and Atmospheric Administration of the United States of America, the Food and Agriculture Organization of the United Nations (FAO), the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP), the North Pacific Marine Science Organization (PICES), the North Pacific Fisheries Commission (NPFC), the Global Ocean Biodiversity Initiative (GOBI), the Russian Association of Indigenous Peoples of the North, Siberia and the Far East, and WWF-Russia. A member of the Bureau of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) as well as local observers also attended the workshop.

Mr. Alexander Shestakov (SBSTTA Bureau, Russia) and Mr. Jake Rice (Canada) co-chaired the workshop. The first decision of the meeting was to decide on the geographic scope of the workshop. Experts from Parties and other governments were first asked if they wished to have this workshop undertake description of EBSAs in their respective marine waters within national jurisdictions. Experts from Mexico and the Russian Federation expressed their requests for the workshop to consider

areas within the marine areas of their respective national jurisdictions. For other countries, and other areas, the workshop agreed to take note of national processes of applying EBSA criteria and/or similar national processes of identifying marine areas of particular importance.

The participants agreed to use the northern limit of the area considered in the Western South Pacific regional workshop on EBSAs (Fiji, November 2011) as the southern boundary of the area considered in this workshop. The participants were informed that the Eastern Tropical and Temperate Pacific regional workshop on EBSAs (Galapagos, August 2012) had reported that they had not completed a full evaluation of the northeast corner of their workshop area, due to unavailability of some relevant information. The participants of the present workshop were informed that the previously missing information was now available, and agreed to include that area in the scope of this workshop. The participants also agreed to use the Bering Strait as the northern boundary of the area to be considered at this workshop, including the Russian coastal area and the “Donut Hole” in the Bering Sea, but not the marine areas within the national jurisdiction of the USA.



Participants of the North Pacific EBSA Workshop

This is a summary prepared using the text of the draft workshop report, as adopted at the CBD regional workshop held in Moscow, 25 February - 1 March 2013. The workshop report is being finalised by the CBD Secretariat in consultation with the workshop Co-Chairs.

Two members of GOBI provided presentations on scientific data for the North Pacific region. Mr. Pat Halpin provided a presentation on "Review of relevant scientific data compiled to facilitate the description of EBSAs in the North Pacific" and Ms. Autumn-Lynn Harrison provided a presentation on "Marine predators in space and time in the North Pacific Ocean".

The workshop considered the EBSA criteria in the following order: (i) Biological Productivity; (ii) Biological Diversity; (iii) Importance for threatened, endangered or declining species and/or habitats; (iv) Special importance for life-history stages of species; (v) Uniqueness or Rarity; (vi) Vulnerability, fragility, sensitivity, or slow recovery; and (vii) Naturalness. As successive criteria were discussed, in many cases the information relevant to a new criterion reinforced the areas described with previously discussed criteria.

From the workshop consideration, four types of areas were identified as possibly meeting one or more criterion. These types of EBSA areas were:

- **Spatially stable features, whose positions are known and individually resolved on the maps:** Examples include individual seamounts and feeding areas for shark and seabirds. Such areas do not have to be used all year round, nor does all the area have to be used every year. However, all the area within the corresponding map polygon has the feature(s) that meet the criterion being considered;
- **Spatially stable features, whose individual positions are known but a number of individual cases are being grouped:** Examples include a group of seamounts or seabird breeding sites where the location of each is known but a single polygon on the map and corresponding template encompasses all the members of the group. The grouping may be done because there may be insufficient knowledge to evaluate each separately or the information is basically the same for all members of the group, so one message can be applied to all group members;
- **Spatially stable features, whose individual positions are not known:** Examples include areas where coral or sponge concentrations are likely, but information is insufficient to specify the locations of each individual concentration. Each such area may be represented by a single map polygon and template, but the entire area inside the polygon is not to be interpreted as filled with the feature(s) meeting the criteria. Narrative about these areas should stress the importance of getting better information on the spatial distribution of these features.
- **Features that are inherently not spatially fixed:** An example is the central north Pacific frontal transition

zone. The position of this front moves seasonally and among years. The map polygon for such a feature should include the full range occupied by the front (or other feature) during a typical year. However, the template and narrative should describe seasonal movement of the key feature(s). The text for description should also make very clear that at any given time, the ecological importance usually is highest wherever the feature is located at that time and often decreases as distance from the feature increases. It may even be the case that at any given time some parts of the total area contained in the polygon are ecologically little different from areas outside the polygon.

The Workshop participants were then split into several break-out groups, including:

- Three major subgroups formed for (i) the central Pacific transition zone and coastal currents beyond EEZs; (ii) for seamounts, and (iii) for the ecological features along the Russian coastal area and the Sea of Okhotsk.
- Smaller subgroups also were formed for (iv) hydrothermal vents and corals and sponges not associated with seamounts, (v) for the Mexican coastal area and offshore islands, and (vii) for the few additional special areas not fitting into the other groups.

The Workshop participants agreed on descriptions of 20 areas meeting EBSA criteria. These areas represented both fixed features as well as ephemerally dynamic oceanographic features covering a broad representation of biogeographic areas of the North Pacific.

Further details will be provided in the final report of this workshop, available in due course at:
<http://www.cbd.int/doc/?meeting=EBSA-NP-01>



*Northern Fulmar - a common seabird in the northern Pacific.
Image courtesy R.Wynn.*

Convention on Biological Diversity's South-Eastern Atlantic Regional EBSA Workshop

Swakopmund, Namibia, 8-12 April 2013

David Johnson, Seascope Consultants Ltd

The CBD Executive Secretary convened, with financial support from the Governments of Norway, Japan (through the Japan Biodiversity Fund), and the United Kingdom of Great Britain and Northern Ireland, the South-Eastern Atlantic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas (EBSAs), in collaboration with the Abidjan Convention, the Food and Agriculture Organization of the United Nations (FAO) and the South East Atlantic Fisheries Organization (SEAFO). This workshop was hosted by the Government of Namibia and took place in Swakopmund, from 8 to 12 April 2013.

In addition to GOBI Secretariat participation, GOBI Partners represented included Birdlife International, CSIRO (Technical Support Team), IUCN CEM-FEG, OBIS-UNESCO/IOC, SANBI and UNEP. In accordance with CBD COP decision X/29 (paragraph 36), this Workshop also benefitted from the participation of representatives of the Food and Agriculture Organisation of the UN (FAO), the Abidjan Convention Secretariat, the South East Atlantic Fisheries Organisation (SEAFO), and the Benguela Current Commission (BCC). The Workshop was given additional impetus (focus and direction) as a result of a Sustainable Ocean Initiative sponsored capacity building workshop held in Dakar, Senegal from 4-8 February 2013.

The scientific criteria for describing EBSAs are now well enshrined and the CBD's regional EBSA workshops have been something of an iterative process providing opportunities to show specific examples for lessons learned as they continue to be convened in different regions. In this case SEAFO also explained relevant scientific activities associated with the protection of vulnerable marine ecosystems in the international waters of the Southeast Atlantic. As with other EBSA Workshops, the meeting decided on its geographic scope based on biogeographic classification systems, but also informed by the scope of previous workshops. The Southeast Atlantic is well defined biogeographically by three main current regimes and gyre dynamics, the GOODS biogeographic classification system, Longhurst marine province datasets and the Russian Abyssal Bioregion dataset (Zezina 1997).

The Workshop agreed on descriptions of 45 areas meeting EBSA criteria

To achieve this, the Workshop split into 3 working groups (with GOBI Partner representatives in each) based broadly on geographic proximity, including the consideration of marine areas of the South-East Atlantic beyond national jurisdiction. In general, the physical data layers provided by the technical team for open ocean areas were much more comprehensive than the biological layers. The groups also considered other sources of information from published literature, but the amount and quality of information on biodiversity and ecology for this area is sparse. The data, combined with expert knowledge, were used to identify those areas meeting EBSA criteria, and groups used prominent geomorphological and hydrographical features (e.g. frontal zones) that were likely to support biota and create significant ecological processes. Relatively shallow areas comprising seamounts and seamount chains, and near-surface hydrographic features such as major convergence zones clearly met EBSA criteria. Deep-sea habitats (i.e. pelagic and benthic habitats deeper than the photic zone) were more difficult to describe based on current information. Ecosystem linkages between shallow and deep waters are however very significant and were recognized in the description of areas meeting EBSA criteria. The workshop noted that the Mid Atlantic Ridge was a prominent feature in the South East Atlantic but felt reluctant to describe the entire ridge as an area meeting EBSA criteria without more information. The workshop noted that there are also significant additional data holdings in both countries represented at the workshop and those unable to attend, which would be useful in the future EBSA description.

Further details will be provided in the final report of this workshop available in due course at:
<http://www.cbd.int/doc/?meeting=EBSA-SEA-01>

This is a summary prepared based on the draft workshop report, as adopted at the CBD regional workshop held in Swakopmund, 8 - 12 April 2013. The workshop report is being finalised by the CBD Secretariat in consultation with the workshop Co-Chairs.

Bringing the deep pelagic zone into the light

Daniel C. Dunn, Malcolm Clark, Tracey Sutton, Patrick N. Halpin & Patricio Bernal

In 2011, the GOBI Pelagic Working Group held a workshop to develop guidelines and examples of how the Convention on Biological Diversity's (CBD) criteria for Ecologically or Biologically Significant Areas (EBSAs) might be applied in the pelagic realm. Whilst the results from that workshop (Dunn ed., 2011) represented a significant contribution to the EBSA process and informed regional efforts to describe areas potentially meeting the EBSA criteria, the workshop was largely limited to considering the epipelagic zone (the top 200 m of the water column). The lack of direct attention to deep pelagic zones (200 m – 10 000 m) at the workshop was mimicked in the EBSA process. The deep water column rarely, if ever, entered discussions in the regional EBSA description workshops. Even on a regional or national basis, deep pelagic zones have been so poorly studied that they are generally not included in monitoring and management schemes or conservation planning. Supported by the Lenfest Ocean Program through a grant to the Marine Geospatial Ecology Lab at Duke University, and in conjunction with INDEEP, the Pelagic Working Group set out to address this gap in our efforts to conserve marine biodiversity by organising a workshop to coalesce available knowledge into a product that could be used to incorporate the largest biome on Earth into our conservation planning.

Dr Tracey Sutton (Nova Southeastern University, USA) and Dr Malcolm Clark (National Institute of Water and Atmospheric Research, New Zealand) were requested to identify goals and convene the workshop. Based on the recommendation of the co-conveners and a panel of experts consulted during the Deep Sea Biology Symposium in Wellington, New Zealand in 2012, the decision was made to focus on producing biogeographic classifications of deep pelagic realms. Recent global biogeographies are the backbone of efforts to quantify our progress toward meeting objectives for representative protection of the world's biomes (e.g., Aichi Target 11), but they concentrate on the upper water column (e.g., Longhurst provinces, or the Global Open-Ocean and Deep-Sea (GOODS) report and follow on work by Mark Spalding and coauthors) or the seafloor (e.g., the GOODS report or recent depth specific biogeographic classifications by Les Watling and coauthors (see his piece in this newsletter). However, a wealth of new data is now available for deep pelagic realms from programs of the Census of Marine Life like the Census of Marine Zooplankton (CMarZ) and the Mid-Atlantic Ridge Ecosystem (MAR-ECO), as well as other national efforts. In order to summarise and consider these new data, experts were invited to participate in a 3-day workshop in Glasgow, Scotland from 11 - 14 July, 2013.

The key objective was to produce a biogeographic classification of the deep pelagic zones including geospatial datasets and a peer-reviewed publication. The scale of the biogeography was to be global. In order to align with the GOODS classification and subsequent updates (Spalding et al. 2012; Watling et al. 2013), the level of division was the Province: large areas of pelagic ocean that can be defined by large-scale, spatially and temporally stable (or seasonally recurrent) oceanographic drivers. These host distinct species assemblages that share a common history of co-evolution. There was open discussion about depth zonation in the deep water column. It was very clear that conditions change with depth, and animals migrate vertically over large distances. However, the workshop agreed that a mesopelagic zone from 200 to 1000 m was reasonable for describing relatively consistent large-scale environmental characteristics (such as oceanography, light, physiological constraints), and there was sufficient information available from localised studies as well as large-scale environmental data to undertake a complete global classification. It was felt that there were too few data, and a lack of confidence in use of environmental data as biological proxies, to undertake a similar exercise for deeper bathypelagic waters. However, a start was made with workshop participants expressing views on major patterns that might be expected. It is hoped in future to undertake large-scale analyses of certain taxa which can dominate at greater depths in an effort to inform future efforts towards bathypelagic biogeography.



It was recognised early in planning the workshop, that quantitative analyses of taxonomic and environmental data were not possible for deep pelagic zones. Hence the focus was to use the knowledge of a group of experts in distributional patterns of pelagic fauna or regions, and combine this with environmental data where it was felt that they were useful biological “proxies.” The workshop blended various sources of environmental data (e.g., temperature, salinity and oxygen at different depths from the CARS model) with participants’ biological data. Oxygen Minimum Zones, distribution of extreme water temperatures (<0.5°C and >10°C), topography and epipelagic biogeographic classifications were all used to expand on known breaks in faunal community distributions.

The provisional classification from the workshop defined 32 provinces depicting the daytime distribution of large-scale

mesopelagic faunal communities. The boundaries of these provinces are not fixed. They are “works in progress,” as are the descriptive characteristics. All such boundaries need to be regarded as transitional zones, and not abrupt borders. The provinces are currently being reviewed by the workshop participants, and also by several experts who were unable to attend the workshop. There are a large number of qualifications and caveats that are associated with the data used at the workshop (data gaps, sampling biases, taxonomic issues, seasonality of environmental conditions, to name but a few), but nevertheless, it is anticipated that the general scheme will prove reasonably robust, with changes in boundary positions rather than wholesale changes to the core provinces. Hence we hope that the provisional classification will prove useful as an input to policy planning and management for conservation and sustainable use of deep pelagic marine biodiversity.

Emerging Perspectives Symposium on the Law, Science, and Policy of Dynamic Marine Conservation

Ben Lascelles, Birdlife International & Jeff Ardron, IASS

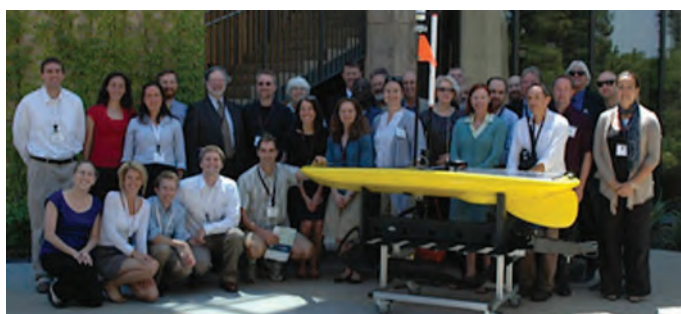
Held 10-11 May 2013, the symposium was a joint effort between several departments linked to Stanford University, namely the Stanford Law School’s Environmental and Natural Resources Law and Policy Program, the Center for Ocean Solutions, and two law school journals, the Environmental Law Journal, and the Journal for Law, Science, and Policy - all at Stanford.

Keynotes were given by Jane Lubchenco (former NOAA administrator) and Kristina Gjerde (IUCN / GOBI Steering Committee), and were accompanied by varied panels and talks given by a range of world experts on ocean law, policy, science and management. Other GOBI Steering Committee members who participated in panel discussions included Daniel Costa, Daniel Dunn, Ben Lascelles, and Jeff Ardron. The talks highlighted some of the key blockages in these different fields to advancing protection of the oceans, as well as providing a number of examples of how the dynamic nature of the oceans has already been accounted for in successful management regimes.

The symposium was highly informative, and all in

attendance agreed that the combination of presentations facilitated novel, and needed, discussions on how greater interdisciplinary interactions could help drive the dynamic marine conservation agenda.

The two Stanford law journals plan to capture much of this discussion by publishing papers that build on themes from the symposium in a special issue scheduled for spring 2014. Presentations given at the conference can be viewed at: <http://blogs.law.stanford.edu/dynamic-ocean/presentations>. Videos of presentations have been made available on the Stanford Law School youtube site.



CCAMLR fails to make progress in establishing Antarctic MPAs

Jeff Ardron, IASS

Russia assures meeting that despite its critical stance it supports MPAs

Two special back-to-back CCAMLR Scientific Committee and Commission meetings were held 11-16 July in Bremerhaven, Germany, to discuss MPA network proposals for the Antarctic. However, after intensive negotiations, no meaningful progress was achieved.

The proposals call for networks of MPAs in the Ross Sea, proposed by New Zealand and the USA; and the Eastern Antarctic, proposed by Australia, France, and the European Union. The MPA networks are proposed with varying levels of protections in each site, ranging from scientific research to limited commercial fishing.

Most of the distant water fishing nations present expressed varying levels of concern regarding the numbers and sizes of the proposed MPAs. Those opposed to the proposals surprised the Commission by arguing that CCAMLR did not have the legal mandate to declare MPAs, and that the establishment of MPAs in the high seas was contrary to the United Nations Law of the Sea. One view was that CCAMLR had no right to limit 'rational use'. MPAs have been under discussion in CCAMLR for

almost 10 years, and this is the first time its legal competence has been questioned on this matter. Indeed, in 2009 CCAMLR established its first MPA, near the South Orkney Islands. In 2010 the Commission endorsed Scientific Committee's plans to develop a system of MPAs as a matter of priority. In 2011 CCAMLR adopted through consensus Conservation Measure 91-04, General framework for the establishment of CCAMLR Marine Protected Areas.

Some delegations suggested that the MPAs should be of fixed duration, the so-called 'sunset clause', and one State party went further, suggesting that consensus might only be achieved if CCAMLR agreed to MPAs of short duration. IUCN and others pointed out that that long-term protection is intrinsic to the goals of MPAs as is reflected in international practices.

This was the first-ever special meeting of the Science Committee, and the second-ever meeting of the Commission since its establishment in 1982. The meetings were called because the two proposals failed to get consensus at the regular 2012 Commission meeting. They will be discussed again at the next regular CCAMLR meeting at the end of October this year.



Sunset in Antarctica. Image courtesy P. Tyler.

DOSI: The Deep Ocean Stewardship Initiative

Lisa Levin, Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography

Deep-sea biodiversity faces change... via climate and intensifying human extraction activities. The Deep Ocean Stewardship Initiative (DOSI) has emerged to address the research, management and decision-making needs required to maintain the integrity, functions and services of deep ocean ecosystems for future generations. Launched during an April 2013 planning workshop in Mexico City, DOSI seeks to engage experts in biology, law, policy, economics, business, regulation and conservation in issues relevant to the stewardship of the deep ocean within and beyond national jurisdictions. DOSI is envisioned as gathering expertise across disciplines, jurisdictions and sectors to foster discussion, provide guidance, and facilitate communication. Activities will be developed to advance the following priority goals:

- (1) Develop comprehensive, ecosystem-based management practices for deep-ocean environments subject to human extraction, harvest, disposal and contamination.
- (2) Define and address knowledge gaps relevant to effective deep-sea stewardship, including those associated with changing climate, cumulative human impacts, and external costs of resource use.
- (3) Promote technology development and innovation to enable deep-ocean observations, impact assessment, and enforcement of regulations.
- (4) Ensure appropriate representation of the deep sea in global ocean assessments and environmental governance and management.
- (5) Develop criteria for deep-sea institutional and corporate social responsibility (e.g., transparency, data collection, data sharing and compliance) by working with industry, states, civil society, and scientists.
- (6) Strengthen capacity, provide training, and raise public awareness globally of current opportunities and impacts associated with human activities in the deep sea.
- (7) Offer guidance on use and benefit sharing of deep-sea genetic resources in the context of multiple human activities.
- (8) Provide a centralized location for information about ongoing deep-sea stewardship activities across multiple sectors, jurisdictions and disciplines.

DOSI Actions are critical because:

- The remoteness, expense of access and evolutionary

novelty require special considerations

- The deep sea holds mineral, energy and genetic resources of tremendous value
- The deep sea is a frontier poised for exploitation
- The deep ocean plays key roles in maintaining the health of the planet
- Multi-disciplinary guidance can make a difference – it is not too late!

DOSI intends to expand and form linkages with many other groups engaged in deep-sea stewardship. DOSI activities and future fundraising will be guided by a steering committee and theme-based working groups. Early actions have involved preparation of a brief for the Global Ocean Commission and preparation of a marine policy manuscript that highlight the unique features of the deep sea and how they affect environmental management. A brief proposing an ISA-sponsored workshop on ecosystem-based management of seabed mining has also been prepared. Interdisciplinary DOSI meeting sessions and a SCOR working group have been proposed. Additional activities we seek to conduct are workshops, student projects, industry-science collaborations, a GIS inventory of mining proposals, gap analyses of deep-ocean assessments, legal analyses, a survey to enhance industry engagement, joint industry-policy seminar series, online courses, video library, book, and app to raise awareness, a deep-ocean stewardship bibliography and a centralised communication hub.

For more details or to actively participate please see:

<http://www.indeep-project.org/deep-ocean-stewardship-initiative>



*Participants at the inaugural DOSI workshop
Mexico City, 15-17 April, 2013*

Biogeographic Provinces of the Deep-Sea Floor

Les Watling, University of Hawaii at Manoa

Biogeographic provinces have been well known for the continental shelves of the world for a long time. But the fauna of the deep sea bottom has largely been considered either mostly homogeneous over very large areas, or divided according to the major ocean basins. Beginning with the Global Open Ocean and Deep Sea (GOODS) conference in Mexico City in 2007, and culminating in a large GIS project published recently (Watling et al. 2013) we now have a proposed biogeography of the deep ocean benthos that covers all of the high seas.

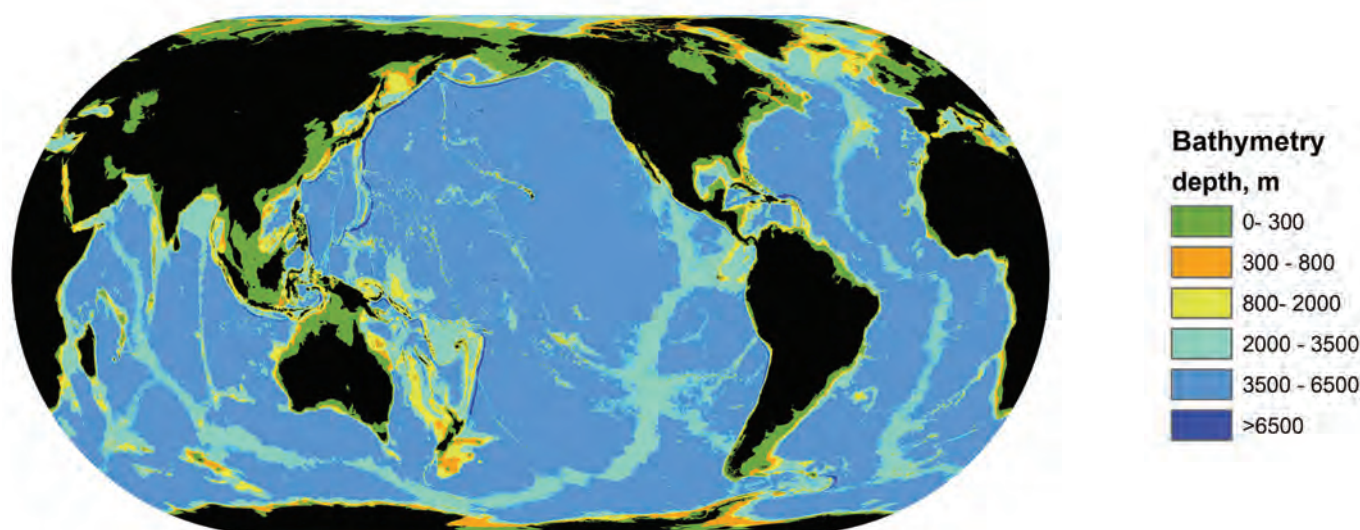
There has been considerable sampling in selected areas of the deep sea, for example, in the North Atlantic and parts of the Pacific, but many areas still have little or no biological information. This is partly due to the fact that no sampling has occurred in those areas, but also if samples were taken, the species found have not been identified or named and described if new. Thus, it seemed necessary to find proxies that could help to delineate likely provinces.

The approach was first to consider biogeographic provinces as evolutionary entities: that is, the species within them would all be responding to the same set of biotic and abiotic variables over evolutionary time. Variables that seemed to offer high predictive value then included water depth, temperature, salinity, oxygen, and organic matter flux to the seafloor. Temperature and salinity, in particular, are used to characterize water

masses in the ocean. In addition, we plotted these variables in relation to the bathymetry so that we would know what the temperature, for example, was at any depth on a mid-ocean ridge or a seamount as well as along the slopes and rises of the continents.

We also chose to divide the ocean vertically into a small number of units making the data more manageable. These units were proposed primarily by Russian investigators in the 1970s, and are as named as follows: 0-300 m, continental shelf, 300-800 m, upper bathyal, 800-3500 m, lower bathyal, 3500-6500 m, abyssal, and >6500 m, hadal. None of these boundaries are sharp and some of them vary considerably in certain areas of the ocean. The continental shelf, upper bathyal, and areas at hadal depths are almost exclusively within some country's EEZ, while the lower bathyal and abyssal are largely in the high seas. The continental shelf and upper bathyal were not considered further while the hadal classification followed that of Belyaev.

In all, the lower bathyal and abyssal was divided into 14 provinces each, reflecting the distribution of major water masses of the deep seas as well as the influence of organic matter deposition from surface layers to the deep-sea floor. A good example of the latter is in the central Pacific abyssal. All of the abyssal seafloor of the Pacific is under the influence of Antarctic Bottom Water that flows northward from its origin around Antarctica.

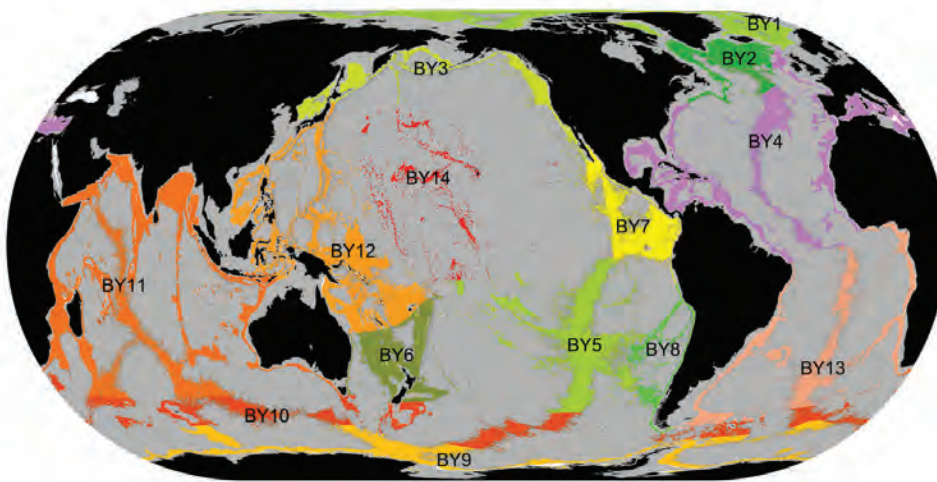


Bathymetric map showing the depth intervals used in the study.

However, on the eastern side of the Pacific there is intense upwelling which promotes high levels of production of phytoplankton. The phytoplankton is swept out into the central Pacific on the equatorial current, thus ensuring a heavier supply of food to the bottom in that area relative to areas to the north and south. We knew from limited sampling that the benthic species diversity under the high productivity zone was higher than in areas with low surface water productivity so we tried to delimit central Pacific provinces that would reflect the differing levels of food input.

There has been some limited testing of these proposed provinces using data sets for specific groups of animals.

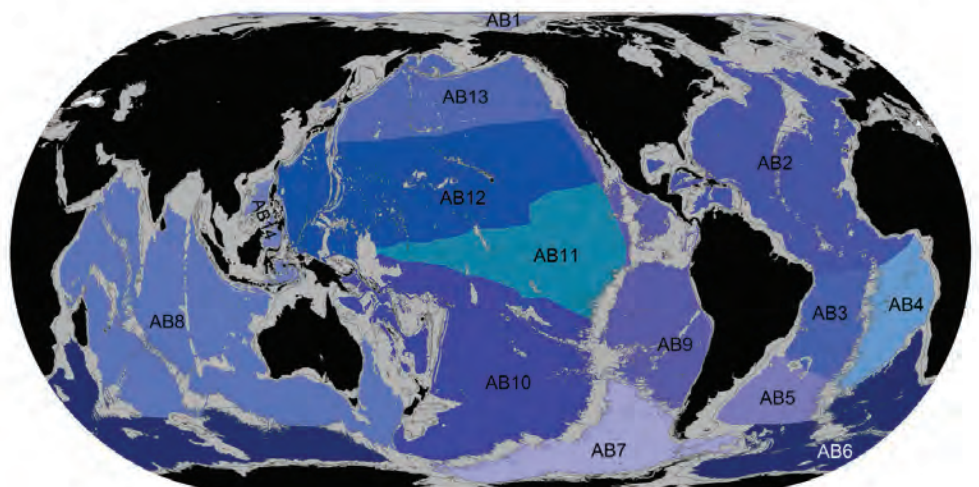
For example, cumaceans reflected the abyssal provinces quite well in the Atlantic, but there was a possibility that the North Atlantic should have been divided into eastern and western North Atlantic provinces. However, at bathyal depths, the North Atlantic provinces seem to correspond moderately well to the distribution of cumaceans. Other issues regarding boundaries have also been suggested, and it is likely that sharp boundaries as drawn on the maps will not exist, rather there will be zones of transition from one province to another. Such zones will reflect both the fact that water masses move slightly over long time periods and that larvae of animals can settle and grow, but not reproduce, in areas that marginal to their normal distribution.



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|-------------------------------|---------------------------|----------------------|
| BY1: Arctic | BY6: New Zealand-Kermadec | BY11: Indian |
| BY2: Northern Atlantic Boreal | BY7: Cocos Plate | BY12: West Pacific |
| BY3: Northern Pacific Boreal | BY8: Nazca Plate | BY13: South Atlantic |
| BY4: North Atlantic | BY9: Antarctic | BY14: North Pacific |
| BY5: Southeast Pacific Ridges | BY10: Subantarctic | |

Biogeographical maps showing all bathyal (left) and abyssal (below) provinces.

Watling et al. (2013) A proposed biogeography of the deep ocean floor. Progress in Oceanography 111, 91-112.
10.1016/j.pocean.2012.11.003



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|------------------------------------------|------------------------------------|-----------------------------|
| AB1: Arctic Basin | AB6: Antarctica East | AB11: Equatorial Pacific |
| AB2: North Atlantic | AB7: Antarctica West | AB12: North Central Pacific |
| AB3: Brazil Basin | AB8: Indian | AB13: North Pacific |
| AB4: Angola, Guinea, Sierra Leone Basins | AB9: Chile, Peru, Guatemala Basins | AB14: West Pacific Basins |
| AB5: Argentine Basin | AB10: South Pacific | |

Marine Board report highlights key scientific priorities for MPA management

Political drivers to halt the loss of marine biodiversity have led to an increase in Marine Protected Areas with global coverage estimated to be 8.3 million km² in 2012 and rising. However, the establishment of MPAs in Europe has lagged behind terrestrial equivalents and has taken place in an ad hoc and largely uncoordinated way. In a new position paper, the European Marine Board presents ten scientific priorities for MPA management, calling for urgent action to inform, engage and empower stakeholders in planning connected networks of MPAs. The paper highlights connectivity between MPA reserves as an essential biodiversity management tool, promoting genetic diversity that improves the health and overall resilience of an ecosystem. MPA management in a changing world will also require adaptive approaches moving away from 'static' nature conservation to a new era of MPA design and implementation that can respond to ecosystem shifts or protect emerging biodiversity assets. The full publication is available to download from <http://www.esf.org/publications/marine-sciences.html>.

Issues raised by this publication will be further discussed at the IMPAC3 meeting.



GOBI: key meetings 2013

Two meetings are important for GOBI in the second half of 2013. 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 (BBNJ) meets in New York 19-23 August 2013. Following BBNJ workshops earlier in the year GOBI is combining with CBD Secretariat to present a lunchtime side event entitled 'CBD's work on ocean biodiversity: EBSAs and beyond' on Tuesday 20 August. The intention is to discuss current scientific understanding, assessment, and application of EBSA-related scientific information supported by the views of key Agencies.

Secondly, the 3rd International Marine Protected Areas Congress (IMPAC3) will take place in Marseilles and

Corsica 21-27 October 2013. A GOBI session will be included on Tuesday 22 October during the 'Science and Knowledge at the Service of Effective Management' day. Presentations and moderated discussions will take place under the title 'Stewardship of the deep-sea: Thinking both inside and outside the box'. GOBI Partners will draw upon and share experiences from all the Regional CBD EBSA Workshops and protection and management of the Central American Dome will be highlighted. Pre-Congress publicity promises attention for Aichi Target 11, climate change, High Seas, MPA networks, new MPA commitments and the use of images and social media.

Summaries of GOBI activity at these meetings will be posted on the GOBI website: www.gobi.org

About GOBI



The Global Ocean Biodiversity Initiative is an international partnership advancing the scientific basis for conserving biological diversity in the deep seas and open oceans. It aims to help countries, as well as regional and global organisations, to use and develop data, tools, and methodologies to identify ecologically significant areas in the oceans, with an initial focus on areas beyond national jurisdiction. The GOBI Secretariat is provided by Seascope Consultants Ltd, supported and funded by the German Federal Agency for Nature Conservation (BfN; www.bfn.de).

For more information, please visit www.gobi.org

