

Life below water we're all in it together



GOBI at the UN Ocean Conference

The second UN Ocean Conference (Lisbon, 27 June to 1 July 2022) is a rare chance for scientific, political and advocacy spheres to join forces to improve the fate of the ocean and all life that depends upon it. Ocean governance is a complex and multifaceted endeavour requiring the best available knowledge and expertise from all sectors of society to ensure that an equitable and sustainable future for humanity can be delivered and maintained. The Global Ocean Biodiversity Initiative (GOBI), in its small but significant capacity, is in attendance to share collective scientific knowledge on how to recognise, describe and facilitate the protection of marine areas worthy of protection, as well as to highlight its mission to supply actionable knowledge for effective sustainable use and management of increasingly precious ocean resources.

GOBI is an international partnership of organisations committed to advancing the scientific basis for conserving biological diversity in the marine environment. GOBI's remit was established at its inception in 2008, to help countries meet the goals adopted under the Convention on Biological Diversity (CBD) and at the 2002 World Summit on Sustainable Development. These goals – since updated, reformulated and readopted to keep up with the times – still relate to reducing the rate of biodiversity loss, applying ecosystem-based approaches to managing human activities in the ocean, and establishing representative marine protected area networks. GOBI's mission is therefore closely aligned with the UN Ocean Conference's own theme of "Scaling up ocean action based on science and innovation for the implementation of [Sustainable Development] Goal 14: stocktaking, partnerships and solutions".

GOBI's alignment of purpose with the UN Ocean Conference theme is exemplified by the very nature of the collective long-term work of the entire GOBI partnership. Within the pages of this newsletter, we reflect on how our most recent activities – funded by Germany's International Climate Initiative (IKI) – and the entire partnership's collective achievements contribute towards marine biodiversity conservation and global sustainable development goals.

Stocktaking

Since its inception, a primary role for GOBI has been to help the CBD deliver its programme of describing ecologically or biologically significant marine areas (EBSAs) across the globe. To date, this has been done through providing support to a series of CBD-led regional EBSA workshops that have covered

all the world's ocean (except around Antarctica, where a similar autonomous process is in place). Providing technical support, as well as regional or taxon-focused expertise (e.g., on seabirds, marine mammals and hydrothermal vent communities), GOBI partners have made significant contributions at all 15 regional EBSA workshops, resulting in the identification and international recognition of over 300 EBSAs worldwide. GOBI continues to assist and inform the CBD in its efforts to evolve the EBSA process, considering ways to amend or update EBSA descriptions, assessing the impact of the EBSA process so far¹, and suggesting ways to find and describe new EBSAs – for example, through thematic rather than regional assessments, which will be explored through a GOBI workshop on 'EBSAs in ABNJ' planned in November 2022. Ongoing work by GOBI partner CSIRO to identify biologically defined regions in the Indian Ocean and the southwestern Pacific is now being used to assess the representation of such 'bioregions' within the current EBSA portfolio, where new EBSAs might be located, as well as which bioregions are most at risk of being degraded. The intention is to be able to prioritise areas in need of recognition or risk-averse management, and to inform the establishment of a flexible and effective network of marine protected areas across the ocean.

Partnerships

GOBI embodies working in partnership, founded on the principle that the impact of its coordinated collective output is far greater than the sum of each partner's impact working in isolation. Such cooperation has already yielded significant progress by supporting and promoting the activities of other groupings of experts dedicated to a common cause. For example, GOBI partners BirdLife International and Tethys Research Institute, with GOBI support for a subset of their activities, spearhead the global efforts to identify Important Bird and Biodiversity Areas (IBAs) and Important Marine Mammal Areas (IMMAs), respectively. Their success in drawing international attention to areas that are critical to the survival of keystone components of biodiversity has led directly to the designation of several marine protected areas, such as the North Atlantic Current and Evlanov Seamount MPA designated by the OSPAR Commission in 2021. Their efforts and track record have also stimulated the establishment of similar groupings of experts targeting other keystone taxa, such as marine turtles (under Important Marine Turtle Areas, IMTAs) and sharks, rays and chimaera

(under Important Shark and Ray Areas, ISRAs). All these taxon-defined important areas are independent from prevailing politics, and provide the raw knowledge necessary to inform the description of EBSAs, the placement of MPAs and/or Other Effective Conservation Measures, or the setting of decisions and resolutions of the CBD and the Convention on Migratory Species (CMS).

A further example of successful cooperation amongst GOBI partners is the recent launch of the SARGADOM project (supported by the Fonds Français pour l'Environnement Mondial), building on GOBI-sponsored research and advocacy performed by Fundación MarViva to devise and promote a regional governance model for the Costa Rica Thermal Dome, and on the success of the Sargasso Sea Commission to strengthen the stewardship of the Sargasso Sea. Combining perspectives from each organisation is intended to contribute towards the creation of area-specific hybrid governance models to protect and manage these two remarkable areas of the high seas.

Solutions

The quest for science-based solutions to pressing problems that require an interdisciplinary approach is a key driver for much of the work undertaken by GOBI and its partners. The proposed governance scheme for the Costa Rica Thermal Dome devised by Fundación MarViva is a good example of how results from dedicated scientific research have been combined with national societal concerns and regional governance challenges to offer a roadmap for improved management of human activities in marine areas within and beyond national jurisdiction. Another example of solution-led scientific research is Duke University's evaluation of genetic connectivity between hydrothermal vent communities at mid-ocean ridges, coupled with an assessment of risk to such communities from activities such as deep-sea mining. The results of this work are informing the International Seabed Authority's ongoing development of regional environmental management plans for deep-sea mineral exploitation, with the aim to protect and conserve the unique diversity of organisms associated with mid-ocean ridge hydrothermal vents.

Lastly, to generate the much-needed actionable knowledge on which effective conservation and management decisions can be based at an appropriate scale, Duke University together with the University of Queensland have developed an interactive web-based platform to visualise the range and movement of migratory species in the ocean – the Migratory Connectivity in the Ocean (MiCO) platform. Armed with such easily accessible knowledge, policymakers have the relevant information available to recognise and act upon the need for cross-border and transoceanic cooperation to ensure the protection and continued wellbeing of migratory animal populations.

These are just some examples of how collaborative scientific research under GOBI is being applied to present-day concerns to provide innovative solutions and advance progress towards attaining Sustainable Development Goal 14. However, it is also important to recognise that scientific expertise and technical ability are often geographically concentrated and in a constant state of attrition, which is why GOBI actively engages with capacity building initiatives. Under a long-term partnership with the CBD's Sustainable Ocean Initiative, GOBI is an active provider of capacity building activities around the world, sharing expertise and practical advice that draws upon on the extensive knowledge of its partnership base. In this capacity, GOBI Coordinator Prof. David Johnson will contribute to a special Sustainable Ocean Initiative event and reception during the UN Ocean Conference, hosted by the French Biodiversity Agency, CBD Secretariat and GOBI on the evening of 29 June 2022.

For further information on all activities under GOBI, to discuss potential collaborations, or simply to subscribe to our newsletter, visit us at the joint CBD-GOBI stand in the main UNOC conference arena, 27 June - 2 July 2022, go to www.gobi.org, follow [@GOBIsecretariat](https://twitter.com/GOBIsecretariat) on Twitter, or email secretariat@gobi.org

GOBI is an endorsed Ocean Decade action!

We are delighted to announce that GOBI has been endorsed as an official Action (No 81) under the UN Decade of Ocean Science for Sustainable Development



2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development

¹ See: CBD Secretariat (2021) *Special Places in the Ocean – A Decade of Describing Ecologically or Biologically Significant Marine Areas (EBSAs)*

Getting to grips with recent developments in global ocean governance

by David Johnson, GOBI Coordinator

Force majeure delays to negotiations caused by the ongoing pandemic have seriously impacted and continue to frustrate the global ocean governance agenda. Several inter-related processes and their combined deliberations, which are fundamental to GOBI's work and future plans, merit an update.

Firstly, the UN Division for Ocean Affairs and the Law of the Sea continues to facilitate General Assembly resolution 72/249, the Intergovernmental Conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ). Based on the recommendations of a Preparatory Committee, finalised in 2015 after lengthy deliberations that confirmed a 'package' of topics agreed in 2011, a fourth session of the Intergovernmental Conference was convened on 7-18 March 2022. This hybrid meeting captured proposals made by delegations and accredited organisations in conference room papers. The outcome is a further revised draft text of an agreement (30 May 2022) taking into account the latest proposals. Despite efforts to streamline text and merge elements, there remain many instances where definitions, conceptual approaches, interpretations and text suggestions, as expressed by different options in the revised draft text, are seemingly far from achieving consensus.

A fifth session of the Intergovernmental Conference is being convened on 15-26 August 2022, pursuant to General

Assembly decision 76/564. GOBI Secretariat representatives will participate (if protocols allow) and hope to promote the case for articulating a holistic vision for the ocean's future within the General Provisions¹. Principal interests for GOBI continue to be Part III (Measures such as Area-Based Management Tools, including Marine Protected Areas: Articles 14-21) and Part IV (Environmental Impact Assessments Article 21bis-41ter). Capacity Building and Transfer of Marine Technology, perhaps the least controversial part of the package, is relevant to dissemination of GOBI resources and engagement with the CBD Sustainable Ocean Initiative (SOI).

Whilst international lawyers wrestle with the BBNJ agreement text, three further activities with a focus on areas beyond national jurisdiction in the North Atlantic should be noted. The International Seabed Authority (ISA) has undertaken a stakeholder consultation on the draft regional environmental management plan (REMP) for the Area of the northern Mid-Atlantic Ridge with a focus on polymetallic sulphide deposits. Comments received are being considered by the ISA Legal and Technical Commission. Similarly, the OSPAR Commission continues its deliberations on the North Atlantic and Evlanov Seamount (NACES) marine protected area (MPA). A technical workshop (13 June 2022) has assessed available scientific and technical evidence informing whether or not to include the seafloor as an element of this MPA. The NACES MPA is primarily designated as a hotspot for surface-dwelling seabirds drawing on BirdLife International's tracking data collated as part of GOBI's IKI-funded work².

1 See: The need for a Global Ocean Vision within BBNJ: a key role for Strategic Environmental Assessment by Adelaide Ferreira and colleagues, in review at *Frontiers in Marine Science*

2 See article in the [Winter 2021-22 edition of the GOBI newsletter](#)



Describing the special places of the ocean in a changing world: the EBSA side event at SBSTTA24 in Geneva. Left: GOBI Coordinator David Johnson with Jihyun Lee, Director of the Science, Society and Sustainable Futures Division at CBD Secretariat. Right: sharing highlights from the recently-published EBSA impact study⁴.

Under the Convention on Biological Diversity, the 24th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA24) took place in Geneva on 14-29 March 2022. Prof. David Johnson, GOBI Coordinator, moderated a well-attended side event on EBSAs, titled "Describing the special places of the ocean in a changing world". GOBI Secretariat also participated in the launch of the SOI impact study "The Sustainable Ocean Initiative: 10 years of building capacity and catalyzing partnerships to achieve global ocean goals"³.

However, SBSTTA24 deliberations on the marine and coastal agenda – in particular the future modality of describing new EBSAs or adjusting/updating existing EBSAs – were less satisfactory. Time available did not allow a proper exchange of views, and a follow-up online forum convened on 8-15 June 2022 invited written comments (posts) on CBD/SBSTTA/REC/24/9 on the conservation and sustainable use of marine and coastal biodiversity. This was not a negotiation but rather a chance for participants to reflect on key elements based on 'threads' representing groups of paragraphs in the Annex to the draft Recommendation. A total of 160 posts on all five threads were received from 55 participants. Views exchanged stressed potential implementation elements at all levels, particularly alignments, synergies and inclusivity (e.g. a review of the Programme of Work in the context of the post-2020 Global Biodiversity Framework and the opportunity to link to the new treaty (UNEP Res. UNEP/EA.5/Res14) on plastic pollution including abandoned, lost or otherwise discarded fishing gear). Another online forum will be convened in late July to discuss CBD/SBSTTA/REC/24/10

on EBSAs. Another online forum will be convened in late July to discuss CBD/SBSTTA/REC/24/10 on EBSAs. A fourth session of the Open-Ended Working Group on the post-2020 Global Biodiversity Framework are taking place in Nairobi during week commencing 20 June 2022. These exercises are due to feed into CBD COP15, delayed from 2020 and dates for which are still unclear.

This summer, NOAA and partners are conducting a series of three telepresence-enabled ocean exploration scientific cruises on the *Okeanos Explorer*, in the period 11 May to 18 August 2022. The expedition is set to cover a west-east transect through the Charlie-Gibbs Fracture Zone, southwards along the Mid-Atlantic Ridge and across the Azores Plateau. The ship will pass through areas described in the North East Atlantic Regional EBSA Workshop, MPAs designated by the OSPAR Commission, and Vulnerable Marine Ecosystems recognised by the North East Atlantic Fisheries Commission. It is likely that data gathered will also provide baseline information of value to the ISA's REMF for the northern Mid-Atlantic Ridge, including potential new insights into marine life supported by both active and inactive hydrothermal vents, of interest to GOBI's current IKI-funded work. Initiatives such as these – continuing to explore the ocean, generating new science including water column surveys and high-resolution information about seafloor features – are essential to support decision-making and an ecosystem-based approach.

3 [CBD Secretariat \(2022\) The Sustainable Ocean Initiative: 10 years of building capacity and catalyzing partnerships to achieve global ocean goals](#)

4 [CBD Secretariat \(2021\) Special Places in the Ocean – A Decade of Describing Ecologically or Biologically Significant Marine Areas \(EBSAs\)](#)

Putting Important Marine Mammal Areas to work

by Erich Hoyt

Co-chair, IUCN SSC-WCPA Marine Mammal Protected Areas Task Force
Research Fellow, Whale and Dolphin Conservation

At the World Marine Mammal Conference in Barcelona in December 2019, Task Force co-chair Giuseppe Notarbartolo di Sciarra and I were just walking into a symposium we'd organised on solutions for identifying marine mammals on the high seas when we heard the news: the US Navy had published in the Congressional Record an 80-page assessment of each of our Important Marine Mammal Areas, or IMMAs, in relation to the Navy's use of low frequency sonar. According to US legislation, these known marine mammal habitats for susceptible species would have to be subject to special precautionary measures. Announcing the news after the symposium, we were pleased to see yet another demonstration that the IMMA tool was taking on a life of its own.

Since 2017, when the first IMMAs were announced in the Mediterranean Sea, IMMAs have steadily gained traction among stakeholders ranging from scientists, conservation NGOs, government ministries, business, even whale

watching companies. In most cases IMMAs are being used to identify areas where measures ought to be taken to avoid harming marine mammals. But they also highlight areas where other measures such as monitoring and further research are needed. The measures to be taken depend on the conservation status, existing use and accessibility of the area as well as the particular species found in the IMMA. Bycatch, including entanglement in fishing gear, can affect almost all of the 132 species of whales, dolphins and other marine mammals. Large whales, however, may need specific protection from shipstrike. Beaked whales, in particular, are susceptible to stranding from sonar and seismic noise. Seals, sea lions and sea otters may have their coastal haulouts destroyed by coastal developments or ship traffic. River dolphins and manatees are susceptible to river pollution; dugong rely on the health of inshore seagrass, each dugong consuming up to 40 kg of seagrass a day. For the polar bear, the loss of sea ice habitat has made them the marine mammal most affected by climate change.



Crabeater seals and orca in the Southern Ocean IMMA.
Image courtesy Robert L. Pitman.

The nine members of the 'IMMA Secretariat' – our core Task Force team working on the global identification and promotion of the IMMA tool – have answered a steadily increasing number of requests for IMMA mapping files, with more than 300 requests to date. These IMMA files are assisting national coastal zoning and spatial planning processes in a number of countries mainly in the Indian and South Pacific oceans. In Indonesia, the Balikpapan Bay IMMA for endangered Irrawaddy dolphins is contributing to coastal zonation plans. In Malaysia, IMMAs are part of the National Policy on Biological Diversity including the Mersing Special Area Plan and the Perlis Integrated Shoreline Management Plan. As IMMAs are based on scientific agreement and peer review, they are adding solid arguments for marine protected area (MPA) proposals as well as contributing to the review, revised design and zonation, and potential expansion of existing MPAs.

In the last few years numerous companies have started consulting IMMA data layers to ensure that developments they undertake meet internationally recognised standards. These ensure that environmental impacts do not threaten the survival and recovery of vulnerable species and habitats.

One such standard is the World Bank's International Finance Corporation Performance Standard 6. This standard recognises that conservation and management of living natural resources are fundamental to the maintenance of ecosystem services and sustainable development. IMMA layers are also being distributed to many companies through the Proteus Partnership, as well as via the Critical Habitat screening layer accessible through the Integrated Biodiversity Assessment Tool. Such layers enable users to make policy and practical decisions utilising information from the IUCN and the UN Environment Programme's World Conservation Monitoring Centre.

IMMAs are compatible with, and often supply supporting information to, other spatial conservation initiatives, such as ecologically or biologically significant marine areas (EBSAs) identified through the CBD and biologically important areas (BIAs) identified in the US and Australia. IMMAs have also been used to help assess nearly 30 potential IUCN key biodiversity areas (KBAs) to date, so far mainly in Australian waters and the Mediterranean.

As of June 2022, our IMMA Secretariat – assisted by more than 200 scientists and independent reviewers – has completed examination of 35% of the ocean's surface. With an intensive scientific workshops just completed in Costa Rica covering the South East Tropical and Temperate Pacific, and further workshops planned soon for the southwestern Atlantic, coverage will be close to 50% complete. Intensive work over the next five years, subject to further funding, will, it is hoped, complete the global ocean picture. At the same



Above: Blue whale, Baja California. Image courtesy Lucy Molleson.

time, separate initiatives stimulated by the IMMA process are examining important marine turtle areas (IMTAs), and important shark and ray areas (ISRAs). These layers along with BirdLife International's Important Bird and Biodiversity Areas (IBAs) will provide a powerful set of tools for protecting biodiversity.

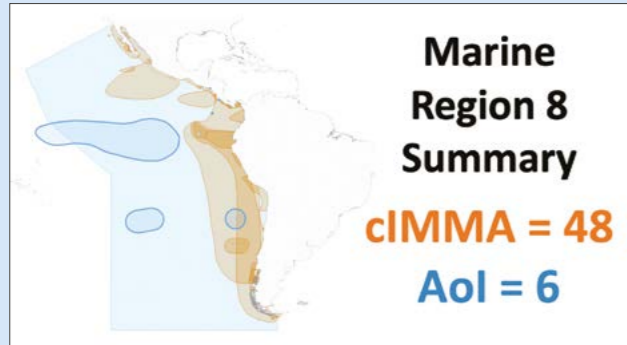
IMMAs aim to make the job of protecting marine mammals much easier. They are a hands-on knowledge tool. Anyone can request the mapping files at no cost. Please try it yourself by going to <https://marinemammalhabitat.org> and clicking on any areas that interest you. You will find maps, photos, background information on the species and why it's important. From there you can request more information including the mapping file. The final step is up to you: to use that information wisely to help protect the ocean and its inhabitants.

For more information: The Important Marine Mammal Area network: a tool for systematic spatial planning in response to the marine mammal habitat conservation crisis, by M.J. Tetley and colleagues, in *Frontiers in Marine Science* (2022). DOI: [10.3389/fmars.2022.841789](https://doi.org/10.3389/fmars.2022.841789)

This paper and other articles, reports and maps are available for free download at <https://marinemammalhabitat.org>

Outcomes from the latest IMMA workshop

Fifty-six marine mammal scientists contributed in person and virtually in the latest IMMA workshop held in San José, Costa Rica, 6-10 June 2022. Starting off with 118 preliminary Areas of Interest (pAol) to consider, the scientists divided themselves into six subgroups covering the long coast from northern Mexico to the southern tip of Chile and out into the high seas.



Nearly half of the world's whale, dolphin, porpoise, pinniped and mustelid species live or visit the productive waters of the South East Tropical and Temperate Pacific Ocean. This IMMA region comprises 24% of the Pacific Ocean.

The IMMA Secretariat of the Marine Mammal Protected Areas Task Force tallied the preliminary results on the workshop's last day: a total of 48 new candidate IMMAs will go forward to the reviewers, along with 6 Aol. Following the review process over the next few months, approved IMMAs will be placed on the e-Atlas at www.marinemammalhabitat.org/imma-eatlas

Additional support for this workshop was provided by GOBI partners Tethys Research Institute, Whale and Dolphin Conservation and MarViva Foundation.

Advancing protection of rare ecosystems in the deep sea

by Cindy Van Dover, Pat Halpin & Elisabetta Menini, Duke University

Since 2016, Duke University's deep-sea experts, working together with their colleagues in the international community of deep-sea scientists, have offered scientific data and insight to inform management of seabed mining in areas beyond national jurisdiction.

All too often, resource use in the oceans is tied to habitat degradation and biodiversity loss, with sustainability solutions implemented only long after resource extraction has begun. The emergent deep-sea mining industry has an exceptional opportunity to embed ecosystem protection as an action towards sustainability within the core of its regulations before industrial-scale mining activities begin.

One target for the industry is polymetallic sulphide minerals that precipitate out of solution and are deposited on the sea floor at deep-sea hydrothermal vents. Where hydrothermal activity is ongoing, the sulphide mineral deposits host densely populated communities of organisms exquisitely adapted to thrive in a food web based on chemical energy rather than energy from sunlight. Collectively, these globally rare ecosystems occupy an area comparable to the island of Manhattan. They are valued for their ecosystem services,

their potential as a source of novel genetic and biochemical discoveries, and are vulnerable to habitat degradation and loss. Hydrothermal vent ecosystems meet the criteria for qualifying as ecologically or biologically significant marine areas (EBSAs), and are protected within the jurisdictions of numerous coastal States and Regional Fisheries Management Organisations.

The International Seabed Authority (ISA) governs the sustainable use of mineral resources on the seabed in areas beyond national jurisdiction, where many hydrothermal vent systems are found. A key outcome of recent ISA stakeholder workshops, based in part on data and expertise offered by GOBI partners, is the recommendation that hydrothermal vent systems should be recognised as "Sites in Need of Protection" from mining activities. If approved by the ISA and implemented, this would deliver an international commitment to the protection and preservation of a unique ecosystem in the marine environment. This step would also contribute to the conservation action for a sustainable use of seabed resources, in accordance with Sustainable Development Goal 14.



A new paper describes how there are few sources of publicly available scientific knowledge comprehensive enough to enable evidence-based decision-making regarding environmental management, including whether to proceed with mining in regions where exploration contracts have been granted by the International Seabed Authority. The authors propose a potential high-level roadmap of activities that could stimulate a much-needed discussion on the steps that should be taken to close key scientific gaps before any exploitation is considered.

Read the full article: Assessment of scientific gaps related to the effective environmental management of deep-seabed mining, by Diva Amon and colleagues, in *Marine Policy*. DOI: [10.1016/j.marpol.2022.105006](https://doi.org/10.1016/j.marpol.2022.105006)

Image: Extensive beds of siboglinid polychaetes (tube worms) at the Lost City hydrothermal vent site on the Mid-Atlantic Ridge. Image courtesy IFE, URI-IAO, UW, Lost City Science Party; NOAA/OAR/OER; Lost City 2005 Expedition (CC BY 2.0)

Analyses of marine turtle movements provide more evidence of global connections

by Connie Kot, Marine Geospatial Ecology Lab, Nicholas School of the Environment, Duke University

Marine turtles of conservation concern are highly migratory species, known for their extensive movements across ocean basins. The increase of satellite tracking data collected by scientists that have tagged marine turtles at various locations have allowed researchers to identify important areas that turtles use for specific activities, such as for feeding, egg laying or simply resting while avoiding predators. Data that have tracked turtle movements have furthered our knowledge on all life-stages of marine turtles, from where they develop as hatchlings or juveniles, where they forage with the changing seasons, and where they go to reproduce. Although marine turtles may spend relatively little time transiting from one such specific area to another throughout their life, they are highly dependent on the connectivity between several habitats in different regions that can be thousands of kilometers apart. More information is needed to describe the critical corridors used during transit between those habitats and the particular connections that marine turtle populations depend upon. These connections are essential to identify and consider within a more comprehensive strategy for marine conservation and management.

A recent review of available turtle tracking datasets has been published that combines the global movements from over 1,200 individually tracked marine turtles, contributed by over 70 scientists and research projects. Network analyses and graphs, developed using the tracking data, display the complex arrangement of areas and connections within oceanic regions (the Atlantic Ocean, Indian Ocean, Mediterranean Sea, and Pacific Ocean) and for six marine turtle species (loggerhead *Caretta caretta*, leatherback *Dermochelys coriacea*, green *Chelonia mydas*, hawksbill *Eretmochelys imbricata*, Kemp's ridley *Lepidochelys kempii*, and olive ridley *Lepidochelys olivacea*). Such graphs highlight the relative importance of each area habitually used by turtle species, and whether any connection between areas is more or less critical for certain species.

Those same analyses also provide details on the potential for any action in one area affecting any other areas throughout the network. For example, if access or use of a critical egg-laying beach is to be compromised because of a proposed human development, how might that affect the viability of the species as a whole, or what level of priority should turtle conservation be given in the conditions for any turtle-compromising development to go ahead? Demonstrable effects on turtle populations of possible changes to their habitat throughout the network of habitats they use are a



Hawksbill turtle, Roatan, Honduras.
Image courtesy Erin Simmons.

useful knowledge resource, enabling comparisons among areas and connections within a network to help guide conservation prioritisation.

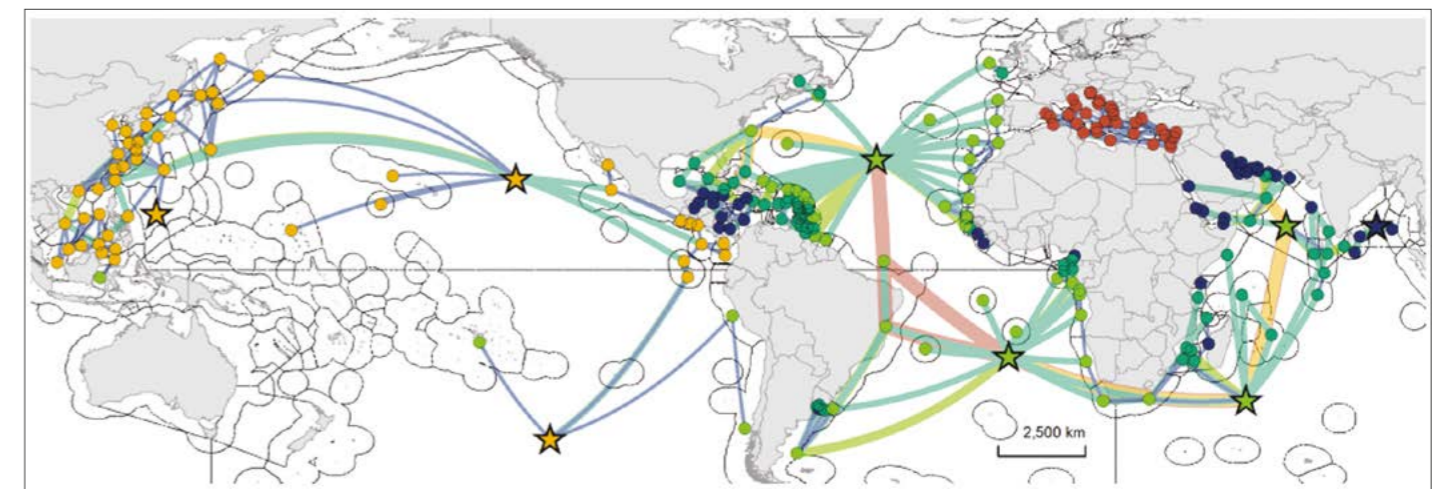
This study contributes to a better understanding of the structural and functional connectivity of areas used by marine turtles on various scales, including areas outside of national waters, where there is relatively little knowledge. The study has shown that turtle habitats and connections to areas in the high seas beyond national waters play an important role in maintaining existing spatial networks.

Finally, the highly connected spatial networks spanning entire oceans and national jurisdictions emphasise the benefits of international collaboration for marine conservation measures, especially regarding marine turtle populations and other migratory species with large geographic distributions.

Read the full article: Network analysis of sea turtle movements and connectivity: A tool for conservation prioritization, by Connie Kot and colleagues, in *Diversity and Distributions* (2022). DOI: [10.1111/ddi.13485](https://doi.org/10.1111/ddi.13485)



Hawksbill turtle hatchlings, Mexico.
Image courtesy Josue Soto.



Network graph and analysis of tracked movements collected from six sea turtle species (n = 1,235). Points and lines with warmer colours represent areas and links with higher centrality while cooler colours represent lower centrality, respectively. Stars represent areas outside of national waters. Centrality is one way to measure the role of an area or connection within a network. Image from Kot et al. (2022).



The **Important Marine Turtle Area (IMTA) Working Group**, supported by the IUCN-SSC Marine Turtle Specialist Group, has recently published its Guidelines for the definition of IMTAs. These were developed following a series of consultations amongst experts to solicit and incorporate feedback into an evolving guidance document. The resulting document describes: (1) the background and need for IMTAs, as well as the approach used to develop these guidelines; (2) standardised criteria and process for determining IMTAs; (3) a plan for initial testing of IMTA criteria at a regional scale, and (4) a Draft Strategy for Global IMTA Delineation. Further information at www.iucn-mtsg.org/imtas

EBSAs rebooted: South Africa's efforts to maximise conservation benefits

by Steve Kirkman, Department of Forestry, Fisheries and the Environment, Cape Town, South Africa

Areas meeting the criteria for ecologically or biologically significant marine areas (EBSAs) in South African waters were initially described through CBD workshops for the South East Atlantic and West Indian Ocean regions in 2012 and 2013. Following these workshops, 19 South African EBSAs were identified and adopted at the 12th CBD Conference of the Parties in 2014. These included a mix of EBSA types, with Type I and II EBSAs describing discrete features or groups of features within the Exclusive Economic Zone of South Africa or shared with neighbouring countries, and much larger Type III EBSAs that mainly extended into Areas Beyond National Jurisdiction (ABNJ).

At around the same time as these EBSAs were recognised, a regional project was initiated in the Benguela Current Large Marine Ecosystem (BCLME) region, with the goal of supporting national processes to achieve ecosystem-based management, especially Marine Spatial Planning (MSP), in the countries of the region. The MARISMA project, as it is known (standing for Marine Spatial Management and Governance project), is implemented through the Benguela Current Commission (BCC), a multisectoral, inter-governmental initiative of the three countries of the region (South Africa, Namibia and Angola), and is funded by the

German Corporation for International Cooperation (GIZ) on behalf of the German government. Under MARISMA, EBSAs were afforded their own workstream, because the value of their scientific and technical descriptions and spatial delineations for representing biodiversity priorities in the MSP process (and other spatial management measures in the region) was recognised.

In this regard, it was also recognised that the EBSA network in the region would need to be strengthened, building on the initial descriptions. This referred to potential gaps in the EBSA network, boundary delineations that were not well matched with features and thus considered to be not spatially explicit enough to usefully inform spatial management, and related issues. Therefore, the MARISMA-EBSA project in each country concentrated firstly on describing new potential EBSAs, reviewing existing EBSAs and, where applicable, modifying them. Existing EBSAs overlapping with non-BCLME countries or extending into ABNJ were not considered in the project, because reviewing and modifying them would have required processes that were outside of the scope of the BCC. Moreover, given the vastness of these EBSAs, which describe flexible processes such as fronts and upwelling regions, and uncertainty about their exact extent, they were

not considered useful for informing MSP. Instead, the focus was on the more discrete EBSAs that were wholly within national jurisdiction of BCLME countries (or overlapping between them), hereon referred to as "MARISMA EBSAs"

Focusing on South Africa, data that were collected during surveys conducted subsequently to the original regional EBSA description workshops were collated and interrogated. These new data were considered with existing data in a gap analysis to identify potential "missing EBSAs" to be assessed in terms of the CBD's seven EBSA criteria, and in the revision of EBSA descriptions and boundary delineations, providing greater precision about the location and extent of some of the areas of interest. Sophisticated spatial analytical methods were employed in the delineation or revision of EBSA boundaries, complemented by input from experts and stakeholders who were engaged in national workshops and through an online interactive system, ensuring a systematic, participatory and transparent national process.

Outcomes of this initial phase of the MARISMA-EBSA project in South Africa included description of three new candidate EBSAs (Figure 1), describing a seamount complex to the south of South Africa (Protea Seamount Cluster), an area off the south west coast of South Africa where oceans and current meet, containing key habitat features (islands and bays) that provide breeding and foraging habit for numerous threatened species (Seas of Good Hope EBSA), and an area off the southeast coast containing important estuaries and abundant inshore reefs that support many fragile, sensitive, slow-growing and threatened species (Tsitsikamma-Robberg EBSA). In addition, two large 'multi-concept' EBSAs were each split in two following revision, such that South Africa's MARISMA EBSAs increased by five, from 12 to 17. Other modifications included refinement of the boundaries of most of the original EBSAs, changes to the content of EBSA descriptions and in some cases to criteria scoring, and name changes (Figure 1). Following approval through national processes, the report on this work was submitted to the CBD Secretariat in 2020. There it awaits finalisation of the CBD's processes for the approval of new EBSA descriptions and for modifications to existing EBSA descriptions, before it can be considered further.

However, we did not stop there. In trying to mainstream our EBSAs into marine planning and decision making, we took them to the next level in the second phase of the MARISMA project, which we affectionately call our 'Maps to Action' approach. Specifically, we went about zoning the entire extent of the MARISMA EBSAs that lie outside of existing Marine Protected Areas (MPAs). Only two types of zones are distinguished, namely 'Conservation zones', containing the parts of EBSAs with higher biodiversity value, and 'Impact Management zones', containing the remaining parts of EBSAs, outside of MPAs (Figure 2). This zoning exercise was also

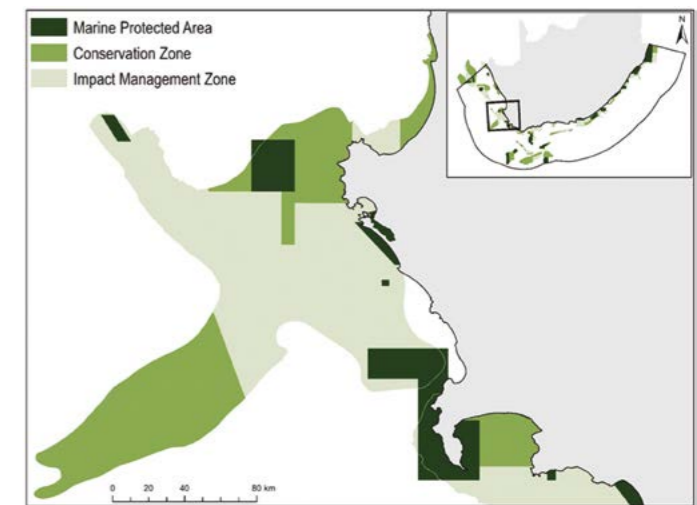
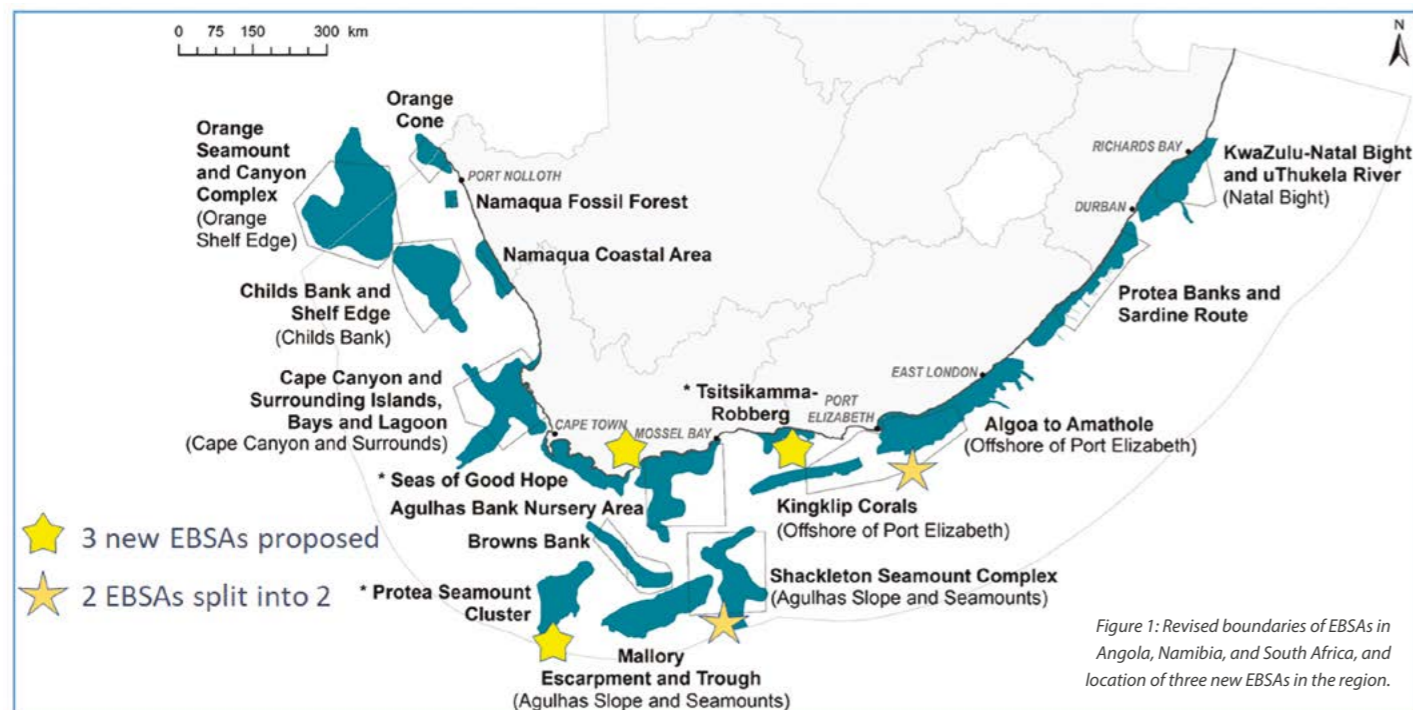


Figure 2: Example of zoning the area within EBSAs to maximise their conservation and sustainable use potential.

carried out using a systematic approach, combining spatial analytical methods with expert input, and took into account available mapped information on the ecological condition of areas, utilisation patterns of threatened or protected species, and several other input layers. Management recommendations were developed for the zones, specifically as to which types of sea uses should be seen as compatible or incompatible with the management objectives of each zone type. Broadly, in the case of the Conservation zone, the objective is to maintain the area in a natural or near-natural condition, while for the Impact Management zone, it is to prevent further degradation and maintain ecosystem function. So, for example, a recommendation may prohibit an activity such as bottom trawling in a Conservation zone as it would be incompatible with the objective, and to allow it in the Impact Management zone, subject to strict conditions.

The zoning and associated management recommendations by no means provide for legally enforced management, they constitute advice from the biodiversity sector for the management of these special features. As such, the vast body of work described above, including descriptions of new EBSAs, modifications to enhance original EBSA descriptions, and zoning of EBSAs with management recommendations, provide a solid basis for trying to secure adequate conservation and management measures for EBSAs under MSP. This is how South Africa and the other countries of the region have responded to the encouragement of the CBD for countries to take measures to enhance the conservation and management of EBSAs, and use EBSAs as a tool to progress towards implementation of ecosystem-based management.

Read the full article: Practical Marine Spatial Management of Ecologically or Biologically Significant Marine Areas: Emerging Lessons From Evidence-Based Planning and Implementation in a Developing-World Context, by Linda R. Harris and colleagues, in *Frontiers in Marine Science* (2022). DOI: [10.3389/fmars.2022.831678](https://doi.org/10.3389/fmars.2022.831678)



International recognition for the Falklands as a global seabird hotspot following Key Biodiversity Area delineations

by Jonathan Handley (BirdLife International), and Emma Hart & Sorrel Pompert Robertson (Falklands Conservation)

The Falkland Islands' inshore waters have been recognised internationally for their globally important seabird populations. Sites for nine seabird species breeding on the Falklands were formally confirmed as Key Biodiversity Areas (KBAs) in April 2022; sites that contribute significantly to the global persistence of biodiversity, following a two-year project. Recognition of sites as KBAs further reaffirms the international importance of these waters for biodiversity, and the data provide a critical resource for stakeholders involved in marine spatial planning. The project was led by Falklands Conservation (BirdLife Partner), supported by the BirdLife International Marine Programme, RSPB, and the Falkland Islands Government (FIG).

The sites were identified following a rigorous exercise of collating distribution and abundance data for 27 species of seabirds that use Falkland waters. By focussing the analysis on the distribution of birds during their breeding period and the inshore waters of the Islands, areas for nine species met qualifying criteria, leading to the delineation of two global KBAs (Figure 1). The important areas identified represent those used by the birds for rafting, preening, bathing, foraging or as necessary transit corridors between foraging trips, depending on the species (Figure 2). The approaches used to identify these important areas at sea for seabirds, could be used to identify sites for other seabird and pinniped species (central-place foragers) across different regions where assessment for KBAs has not yet been undertaken.

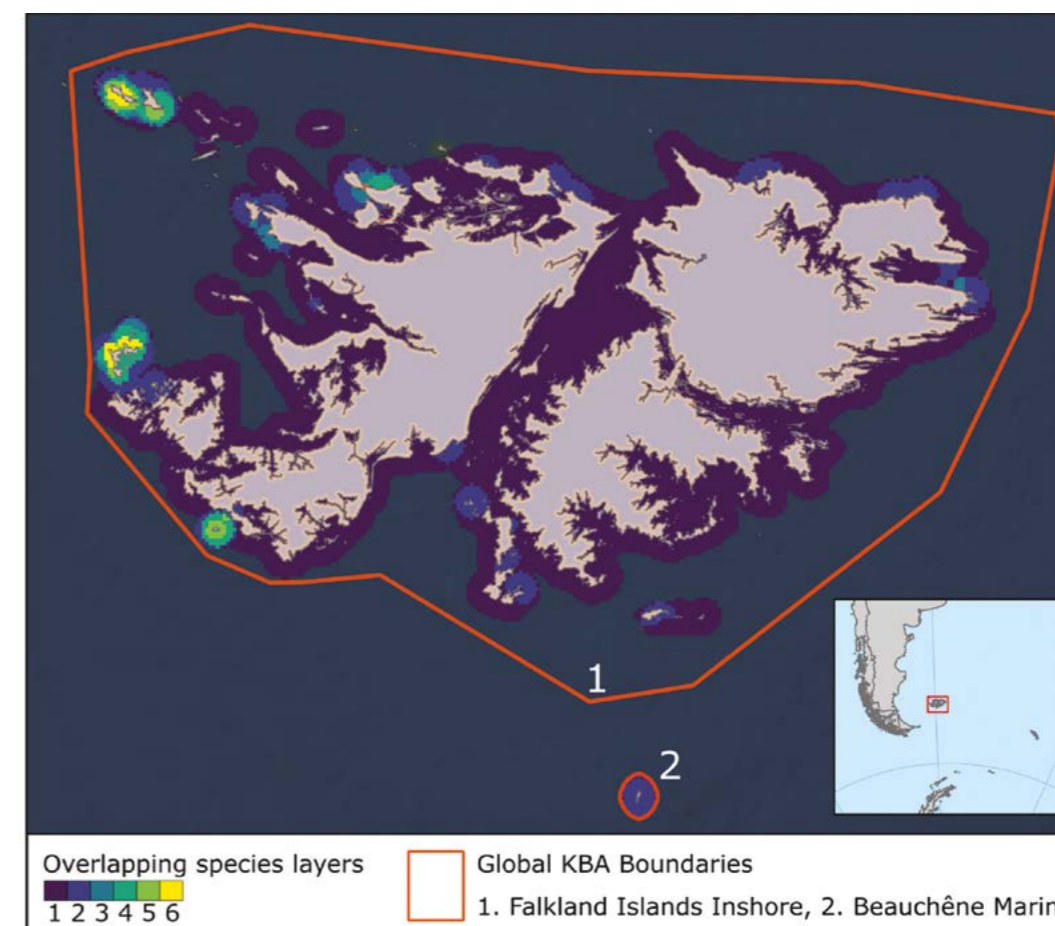


Figure 1: Overlap of globally important species layers for nine different species which met global KBA criteria, and which contributed to the identification of two global KBAs, in the inshore environment of the Falkland Islands. Species include: black-browed albatross, slender-billed prion, southern giant petrel, Gentoo penguin, southern-rockhopper penguin, brown skua, dolphin gull, Falklands steamer duck and sooty shearwater. Note: the data contributed to the update of the Falkland Islands Inshore KBA, hence the seabird data does not match with the entire KBA boundary.



KBAs are a powerful tool to support decision-making, underpinned by 13 of the world's leading nature conservation organisations, coordinated by the KBA Secretariat. All accepted and confirmed KBAs undergo consultation, expert review and are curated in a globally accessible database. These processes ensure that when KBAs are identified, there are ongoing efforts to support the infrastructure underpinning these sites and also to further promote KBAs as a leading decision-making tool for conservation action. KBAs are already recognised within the United Nation's Sustainable Development Goals, and the draft text of the post-2020 Global Biodiversity Framework calls for recognition of these sites as a key tool for identifying globally important areas for biodiversity. The Falkland Islands, and indeed almost all countries, are signatories to both Multilateral Environmental Agreements.

For the Falkland Islands, the KBA work has been critical to support decision-making on the proposed network of Marine Management Areas and proposals for industrial-

scale open-pen salmon farming, which have since been rejected by the current FIG Executive Council. Additionally, the process has highlighted where research and monitoring for certain species could be developed to improve data gaps.

To learn more about the two new global KBAs, please see: [Falkland Islands Inshore](#), [Beauchêne Marine](#).

The work was funded by Darwin Plus (DPLUS115). Falklands Conservation would like to thank all other partners, supporters and stakeholders in the project including, data holders and Paulo Catry and Sally Poncet. Further information at <https://falklandsconservation.com/seabird-kba/>

Contact: Emma Harte MCO@conservation.org.fk, Jonathan Handley jonathan.handley@birdlife.org

Figure 2 (left): Kidney Island, in the north-east of the Falkland Islands, hosts a globally significant population of breeding sooty shearwaters. Given shearwaters are known to rely on marine areas surrounding colonies for rafting, a 5 km buffer was delineated around Kidney Island in accordance with species of similar known ecology, in order to delineate the marine KBA for this species. The site is estimated to host approximately 3.2% of the global population of this globally 'Near Threatened' species and triggers KBA Criteria D1a (Demographic aggregations). Image courtesy Caroline Weir.

Seabird Sentinels

by Ana Carneiro (BirdLife International) and Richard Phillips (British Antarctic Survey)



Wandering Albatross.
Image courtesy Oli Prince.

Seabirds are one of the most threatened groups of vertebrates in the world, with 43% of species listed as globally threatened or near threatened by the International Union for the Conservation of Nature (IUCN), and 56% of the species with a known population trend are in decline. Incidental mortality (bycatch) in fisheries is one of the greatest threats, affecting 90% of all albatross species. Bycatch occurs when birds scavenge fishing bait or discards and become hooked or entangled in fishing gear, or collide with trawler cables, often resulting in drowning. Bycatch has been identified as the primary threat for the wandering albatross population breeding at South Georgia, with an estimated 40-60% decrease in the last 35 years.

The Seabird Sentinels project involves researchers integrating data from loggers that record GPS positions of tagged birds and from radar transmissions of nearby fishing vessels, to identify areas, gear types and flag states (fishing nations) representing most bycatch risk for wandering albatrosses of different life-history stages and sexes. The project has so far revealed that wandering albatrosses are at the highest risk of interacting with fishing vessels during their incubation and chick-rearing periods, when birds travel to the Patagonian Shelf break. Out of 251 birds tracked, 55% of birds encountered and 43% of birds attended fishing vessels (i.e., were within 30 km and 5 km, respectively). The greatest

overlap was with demersal longline vessels, particularly from South Korea but also including the Falkland Islands, United Kingdom and Chile, and to lower extents, trawlers flagged to Argentina and Uruguay, and pelagic longline vessels flagged to Brazil, Portugal and Taiwan. These results highlight that to minimise the bycatch risk associated with fisheries in the region, there is an urgent need for engagement with multiple stakeholders, including fisheries managers, operators and crew, to ensure mandatory implementation of best-practice seabird-bycatch mitigation, monitoring of compliance and of seabird bycatch rates. Over the past two decades, reductions in fishing effort and the adoption of mitigation regulations by all five tuna Regional Fisheries Management Organisations and adoption of seabird-safe legislation in several countries have led to substantial reductions in bycatch. However, continued population declines of many vulnerable seabird species suggest that high bycatch rates persist, threatening many populations.

The Seabird Sentinels project is a collaboration between the British Antarctic Survey and BirdLife International. Funding was provided by Darwin Plus 092 (DPLUS092).



Charlie-Gibbs Fracture Zone, North Atlantic Hope Spot Champion: David Johnson, Seascope Consultants

The Charlie-Gibbs Fracture Zone (CGFZ) is a unique and prominent geological feature of the North Atlantic, running for more than 2,000 km across the Atlantic and offsetting the zipper-like Mid-Atlantic Ridge by some 350 km. Its complex geological structure comprises two parallel transform faults that form deep and seismically active rift valleys, and – together with nearby seamounts – creates a rugged seafloor topography in water depths ranging between 700-4,500 m. The surrounding waters are a zone of strong currents and intense mixing, with nutrient-poor warm water from the south of the fracture zone mixing with cooler, nutrient-rich water from the north, creating an extraordinarily rich environment for deep-sea life. The CGFZ provides the only route for deep water and faunal exchange between the north-east and north-west Atlantic, a vast high seas MPA, a climate change refugia and somewhere to safeguard for future generations.



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Raising hope for the high seas

The Hope Spot initiative – run by marine conservation nonprofit Mission Blue – highlights places that are critical to the health of the ocean. There are currently 143 Hope Spots across the ocean, each championed by local conservationists. This month, two familiar faces from the GOBI family step up as new champions for Hope Spots in the Atlantic and Pacific oceans



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Costa Rica Thermal Dome, Eastern Pacific Hope Spot Champion: Jorge Jiménez, MarViva Foundation

The Costa Rica Thermal Dome is a unique feature in the Eastern Tropical Pacific, expanding throughout the EEZs of Central American countries and the high seas. Trade winds and ocean currents result in the upwelling of cold, nutrient-rich waters from the deep. This stimulates the growth of millions of microalgae that form the basis of a rich ecosystem, which ranges from miniscule phytoplankton to the blue whale – the largest living animal on earth. The Dome is home to a number of endangered species, and provides a breeding, feeding and transit site for multiple species of ecological and commercial value, such as whales, turtles, sharks and rays, as well as billfish, yellowfin tuna and mahi-mahi. Recently, Jorge has led efforts to develop and promote a transboundary marine management plan for the Dome region, recognising both its ecological value and economic importance to Central American countries.

More information: www.mission-blue.org/hope-spots

Climate-smart 3D MPAs: the future of high seas conservation?

by Anthony J Richardson^{1,2}, Isaac Brito Morales^{1,3} & Daniel Dunn¹

¹University of Queensland; ²CSIRO Oceans and Atmosphere; ³Conservation International

As we steadily deplete our resources on land, we are increasingly exploiting the ocean for food, materials and space, a process known as the “blue acceleration”. While these human uses have historically been focused in coastal areas, they are increasingly expanding offshore and into deeper waters. This is against a backdrop of rapid ocean warming, declining water pH (increased acidity) and diminished dissolved oxygen levels. In the mesopelagic zone (200-1,000 m deep), there is a push to exploit myctophids, or lanternfish, the most abundant fish in the ocean. On the seafloor, more mining licenses are being allocated, and plastics are being ingested by animals even in the deepest trenches. In response to accelerating human impacts, there is a push to protect more areas of the high seas in marine protected areas (MPAs).

While 17% of national waters in exclusive economic zones (EEZs) are in partially protected MPAs, only 1.2% of the high seas (beyond EEZs) is similarly protected, and 0.7% is fully protected. This shortfall in the protection of the high seas means that currently only about 7.5% of the ocean is within MPAs, well short of the goal of protecting 10% of the ocean that was target for 2020 (Aichi Target 11 by the Convention on Biological Diversity). If we are to increase protection targets to 30% of the ocean by 2030, as is suggested under the Post-2020 Global Biodiversity Framework, we will need to increase protection of the high seas.

MPAs have mostly been designated in coastal ecosystems, where it is sufficiently shallow that water column and seafloor biodiversity can be considered as one ecosystem, but the high seas are different. They constitute 64% of the ocean surface, are up to 8 km deep, and biodiversity and threats vary by depth. As the climate warms and species shift towards cooler regions, the retention of species in MPAs is complicated by the three-dimensional nature of the ocean. Because rates of ocean warming and spatial temperature gradients change with depth, the speed and direction of species’ movement are also likely to vary across the water column, a phenomenon that will be more pronounced in the future. This begs the question: how do we best design MPAs that protect and retain biodiversity in the 3D environment of the high seas?

Our solution was to identify areas of the high seas that are climate-smart (i.e., resilient to climate change) across depth layers. We created separate spatial plans for three water column depth layers and the seafloor, and identified common locations for MPAs across these layers. We used data on the distributions of 12,932 species from the Aquamaps database, 12 geomorphic features on the seafloor, and three modelled climate futures from Earth System Models. To ensure that MPA networks were climate-smart, we prioritised the protection of climate refugia in each depth layer, which are areas of low levels of exposure to warming and high retention (i.e., slow velocity of climate change). However, closing off areas for conservation incurs costs, whether to industries shut out or through management and enforcement requirements. We therefore used the cost to the fishing industry, which is the dominant industry operating across large areas of the high seas, to assess the cost of possible MPAs across the board. We used the R package *prioritizr* to position MPAs so they protected biodiversity and were climate-smart, whilst minimising overlap with lucrative fishing areas.

We found many climate-smart areas that were vertically coherent through the water column, and were selected regardless of the climate scenario (Figure 1). We called these ‘low-regret areas’ because they are likely to offer protection for biodiversity regardless of our climate future. An initial priority for MPA placement could be the protection of these low-regret areas across depth domains that we identified (6% of the high seas) because they are vertically coherent, robust to different climate futures and protect key threatened species. These are priority areas that can serve as a nucleus for further expansion of the global MPA network. Such protection would increase the coverage of the global MPA network from around 7.5% to 11.3%. A benefit of targeting ocean protection in areas where responses to climate change and scenarios are coherent throughout the water column is that it decreases the risk of decoupling trophic relationships across depth domains.

However, in constructing an expanded global marine network of MPAs, society might need to consider separate reserve networks for different depth domains if they are to be robust to different climate futures. This is because climate-smart low-regret areas for different depth layers are most similar

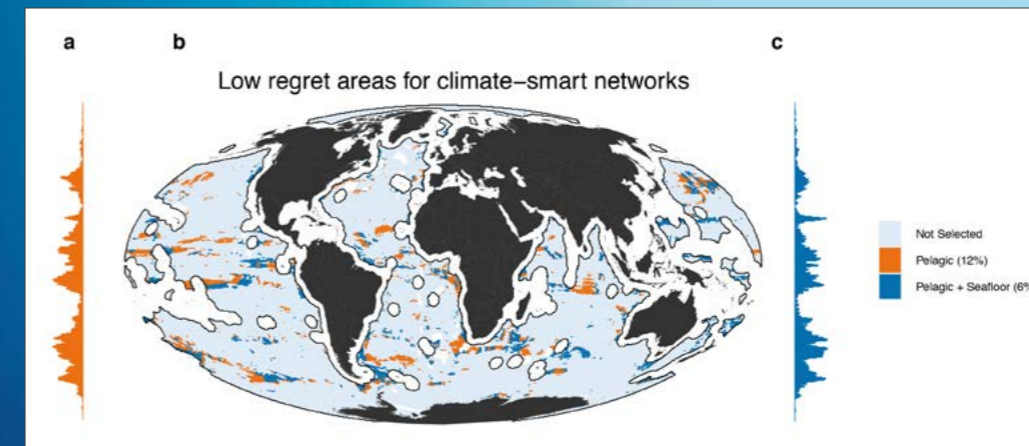


Figure 1. Low regret climate-smart networks in the high seas. Climate-smart prioritisation networks throughout the water column of the ocean for the pelagic domains (epipelagic, mesopelagic, bathyabysopelagic) and for the pelagic plus the seafloor domains (b). Lateral panels show the latitudinal distribution of the prioritised climate-smart network as a proportion of ocean area for the Pelagic (a) and the Pelagic plus the Seafloor domain (c).

between the epipelagic layer (the top 200 m of the water column) and the mesopelagic layer (200-1,000 m deep), but are quite different spatially for the bathyabysopelagic layer (below 1,000 m) and the seafloor. Thus, a second priority could be to focus on the development of sectoral spatial management measures in the upper 1,000 m of the ocean; this could add another 10% of the high seas to the area conserved, mainly representing ‘other effective area-based conservation measures’. A greater focus on a separate planning process for the bathyabysopelagic layer (below 1,000 m) and the seafloor could consider potential costs beyond deep-sea fishing, including mining and underwater cabling.

There are several limitations associated with our analysis that should be considered, many of which we are currently working to address. For example, we created our climate-smart network by protecting climate refugia, but there are alternate approaches, including protecting areas based

on a range of climate exposures and protecting stepping-stone MPAs. We also focused on climate warming and did not consider other climate impacts such as changes in pH and oxygen concentration, other current threats such as shipping, or emerging threats of mesopelagic fishing and deep-sea mining.

This work shows it is possible to identify and create a 3D climate-smart MPA network. This network not only would protect areas with important biodiversity and geomorphic features, but also areas of high biodiversity retention and low exposure to climate warming. We hope that the current work highlights the need for a paradigm shift in the approaches needed to support marine conservation.

Read the full article: Towards climate-smart, three-dimensional protected areas for biodiversity conservation in the high seas, by Isaac Brito-Morales and colleagues, in *Nature Climate Change* (2022). DOI: [10.1038/s41558-022-01323-7](https://doi.org/10.1038/s41558-022-01323-7)



Reflections from the STRONG High Seas Project

by Ben Boteler & Carole Durussel, Co-Leads, STRONG High Seas project (IASS)

The STRONG High Seas project ('Strengthening Regional Ocean Governance for the High Seas') concluded on 31 May 2022 after five successful years. It was funded through the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), coordinated by the Institute for Advanced Sustainability Studies (IASS), and implemented together with partners based in Africa, Europe, and South America, including the Secretariat of the Comisión Permanente del Pacífico Sur (CPPS) and the Abidjan Convention Secretariat. Both GOBI and the STRONG High Seas project share the same funding source and geographical scope, and are complementary to each other. GOBI partners have also contributed to scientific assessments done under the framework of the STRONG High Seas project.

The STRONG High Seas project aimed to strengthen regional ocean governance for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (ABNJ), focusing on the Southeast Atlantic and Southeast Pacific regions, which are characterised by important oceanic currents contributing to high marine productivity. Working through regional organisations, States in these regions have recognised the need to strengthen ocean governance for the conservation and sustainable use of biodiversity, including in ABNJ.

ABNJ are those areas of the ocean for which all nations share responsibility for conservation and management. They make up about 50% of the surface of the planet and comprise around 64% of the surface of the ocean. Marine biodiversity in ABNJ is threatened by intensifying human activities, such as fishing and other types of marine harvesting, shipping,

and pollution, as well as by climate change, with impacts on human wellbeing worldwide. The connectivity between ABNJ and coastal waters means that impacts on marine ecosystems in ABNJ will also have impacts on marine ecosystems closer to shore and *vice versa*, and, in turn, on socio-economic systems of States and coastal communities.

The existing ocean governance framework applicable to ABNJ is fragmented, having legal and institutional gaps, and lacking full implementation and enforcement of current regulations, making it inadequate to address comprehensive marine environmental protection. Since 2018 however, States have been negotiating a legally binding international agreement, with the objective of conservation and sustainable use of marine biodiversity in ABNJ (known as the 'BBNJ Agreement').

Over five years, the STRONG High Seas project used a participative multi-stakeholder approach to develop and implement all project activities with a view to ensure stakeholder engagement and buy-in, raise awareness about the need to conserve and sustainably use marine biodiversity in ABNJ, and create a network of, and dialogue between, relevant stakeholders within the two focal regions and beyond.

Project partners carried out transdisciplinary scientific assessments to provide decision-makers, both in the target regions and globally, with improved knowledge and understanding on marine biodiversity in ABNJ. Based on these assessments, the project engaged with stakeholders from government, the private sector, science, and civil society to co-develop ecosystem-based, cross-sectoral approaches to the conservation and sustainable use of



STRONG High Seas project participants at the BBNJ IGC3 negotiations in New York (2019). Image courtesy IISD ENB / Francis Dejon.

marine biodiversity in ABNJ in the target regions. The approaches were disseminated throughout regional and global policy processes to feed these ideas into future policy approaches. To foster interregional exchange and collaboration, the project facilitated dialogue with other marine regions. Finally, possible options for regional ocean governance in the future BBNJ Agreement were developed.

Here are some reflections on our experiences coordinating the STRONG High Seas project:

- Participative multi-stakeholder processes are essential to ensure experience and information exchange between stakeholder groups, thereby fostering mutual learning and collaboration across actors and organisations to underpin decision-making and support progress towards policy targets. Transdisciplinary research projects can offer a needed platform to bring together diverse stakeholder groups and champion collaborative process for sharing of lessons learnt and best practices, building new networks, and offering a space for stakeholders to engage and discuss outside of formal policy processes.
- Transdisciplinary research projects should consider the timing of relevant policy processes and tailor their efforts and interventions towards contributing to policy discussions. The STRONG High Seas focussed primarily on facilitating an understanding of scientific, legal, and governance content. Towards the project end, topics more specific to management or implementation of the BBNJ Agreement were considered.
- Transdisciplinary research projects provide an important networking and relationship building opportunity for stakeholders from diverse groups, different regions and countries. Implementing a participative multi-stakeholder approach will help to build a community of practice that will continue to expand and grow beyond

the close of the research project, continuing long-term support of project goals.

- Co-creative processes to support decision-making and achieve policy impact through incorporating ideas, scientific knowledge, and perspectives from stakeholders for the development of project outputs, require flexibility to adapt to shifts in political priorities, changing mindsets, and institutional and individual learning. It will be necessary to re-evaluate project objectives throughout the project's implementation and identify new engagement opportunities or shift to new activities to ensure a successful strategy is maintained.

The [project website](#) remains available and a [repository of all publications and resources](#) is accessible online (in English, Spanish, and French), offering a wealth of information. Some recent highlights include:

- [Glossary of Ocean Governance Terms](#);
- [Guidance to achieve biodiversity conservation measures](#) in high seas fisheries;
- Lessons Learned and Options for an [Implementation and Compliance Committee](#);
- An overview of existing and recommended [conservation and management measures](#) for the Southeast Atlantic and Southeast Pacific regions;
- Reflections and recommendations for [capacity development](#) for the conservation of marine biodiversity in ABNJ in the Southeast Atlantic and Southeast Pacific regions;
- Considerations for [integrated ocean management](#) for the conservation and sustainable use of ABNJ in the Southeast Atlantic and Southeast Pacific regions;
- [Reflections from the STRONG High Seas Project](#) on applying a participative multi-stakeholder approach in transdisciplinary ocean governance research.



Dialogue Workshop 3 in Cape Town, South Africa (2019). Image courtesy STRONG High Seas project.

A critical biodiversity resource may be in your own freezer: a call to action for genomic biodiversity conservation

by Rosie Poulin, Hannah Appiah-Madson & Dan Distel, Ocean Genome Legacy Center

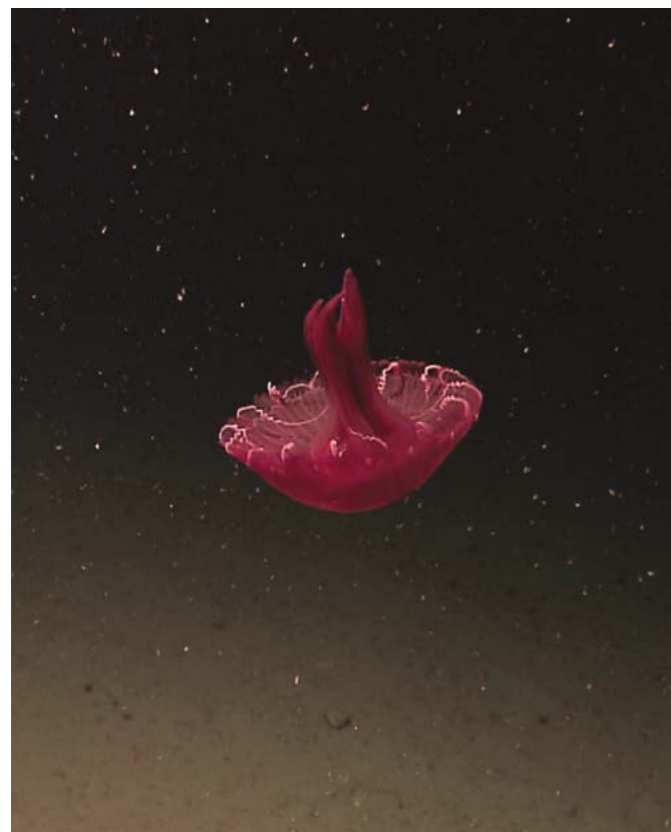
Around the world, every day, researchers collect and document biological specimens. Eventually, most samples not consumed in research will be relegated to a freezer or simply discarded. But those same samples may contain DNA with great value beyond the purpose for which they were collected. DNA is information-rich. It can reveal an organism's evolutionary origins and history, physical and biochemical capabilities and characteristics, reproductive strategies, and lifestyle. It can also be used to reveal complex relationships between species, evaluate needs for protection, regulate fisheries sustainably, identify seafood mislabeling and illegal, unreported, and unregulated fishing, monitor spread of invasive and genetically modified species, and contribute to the discovery of potential compounds and processes that can benefit health, agriculture and biotechnological research.

But how can these underutilised resources best be put to use? One way is for researchers to contribute samples and data to a publicly accessible biological repository like the Ocean Genome Legacy Center (OGL). OGL is a public, nonprofit, open-access biological collection located at Northeastern University's Marine Science Center. OGL is comprised of well-documented, vouchered and validated samples of genomic DNA and DNA-containing tissues representing a broad cross-section of the diversity of life in the ocean. OGL works by collaborating with researchers, institutions, and individual collectors to acquire the DNA and DNA-containing tissue of marine species and making them available to researchers around the world.

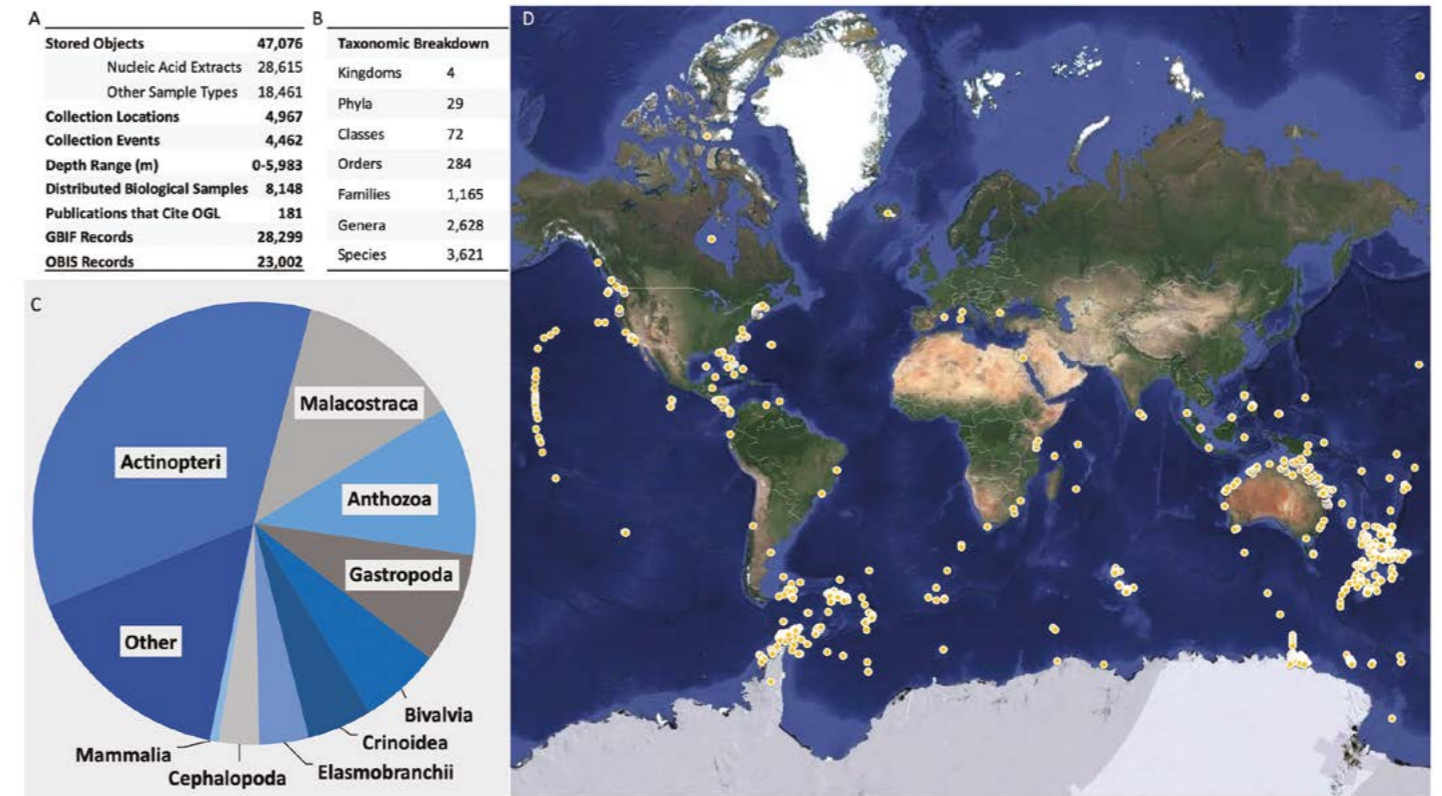
The OGL collection is large, diverse and growing. Since its inception in 2012, OGL's collection has grown to encompass over 28,000 DNA extracts and 18,000 tissue samples from over 3,600 species. These samples and DNA extracts were collected from approximately 5,000 locations across 91 countries and all ocean basins. OGL has distributed over 8,000 biological samples to the research community.

In addition to more traditional methods of sample collection, OGL has recently begun reaching out to retiring researchers, aiming to incorporate their years of research, collection and expertise into OGL's collection. This has allowed OGL to acquire large, focused collections from research spanning decades. Retirement collections at OGL currently include samples from deep-sea hydrothermal vent communities, Antarctic fishes and marine flatworms. While these collections are specialised and represent the specific scientific interests of their original collectors, the samples and data can now be used by other researchers to ask new questions.

But sample collection and acquisition are just the first step in OGL's mission. Once samples and their associated metadata have been added into OGL's collection, they are shared with the scientific community. Taxonomic and biogeographic location data are shared via international data aggregators such as the Ocean Biodiversity Information System (OBIS) and the Global Biodiversity Information Facility (GBIF). Specimen availability is shared via the Global Genome Biodiversity Network (GGBN) and the OGL online catalog.



Jellyfish offshore Santa Cruz, California. Image courtesy NOAA Ocean Explorer Program.



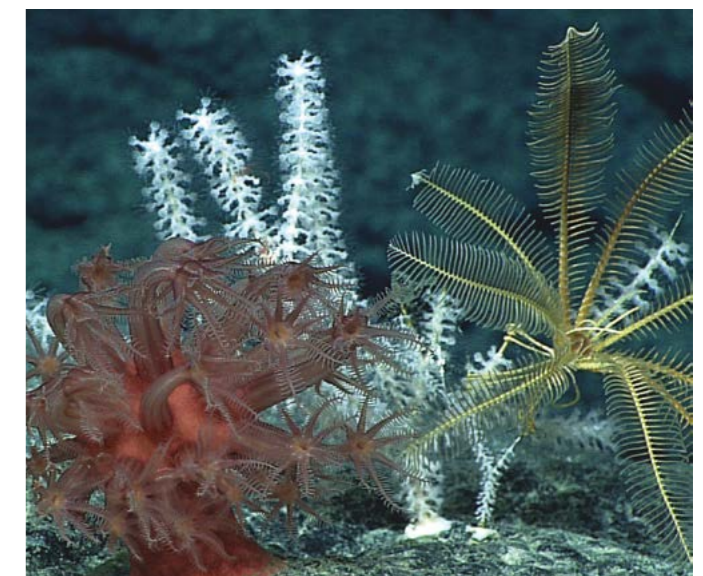
The Ocean Genome Legacy (OGL) Genomic Resource Collection. (A) Description of OGL holdings and products, including distributed biological materials and data. (B) Taxonomic ranks represented by stored objects held in the OGL collection. (C) Proportion of stored objects in the OGL collection by class. (D) Map displaying collection locations associated with stored objects held in the OGL collection. All data reflects the collection as of 22 October 2021.

OGL distributes and accepts biological materials under material transfer agreements that authorise non-commercial research in compliance with all applicable permits and regulations and with the principles of the Nagoya Protocol on Access and Benefits Sharing of the Convention on Biological Diversity. In this way, the OGL collection allows researchers to gain access to well-documented, legally collected and properly permitted biological materials as well as specimen-, sample-, population- and species-level data without need for field sampling that may be costly, time consuming and dangerous, while minimising the potential environmental impacts of sampling for new specimens.

To find out more about OGL and to explore our catalogue of available specimens please [visit our website](#). Also, please feel free to download OGL's latest publication "[The Ocean Genome Legacy: A Genomic Resource Repository for Marine Life](#)" to learn more about OGL's mission, collection, policies, and some of the ways we serve our constituents.

Collaborating with OGL is easy; simply reach out via email at OGLinfo@northeastern.edu. Researchers at OGL will work with you to give you access to samples in OGL's collection or to assist you in contributing your samples and data to OGL. OGL can even provide you with customised sampling kits providing everything you need to deposit your samples and data into the OGL collection.

If you are a new, midcareer, or retiring researcher with samples or plans to collect samples that may be valuable to the research community, and who wishes to amplify the impact of your research, please consider collaborating with OGL to share your samples and data with the world!



Octocorals and crinoids offshore Hawaii. Image courtesy NOAA Office of Ocean Exploration and Research.

Hot off the press



The Deep Ocean Observing Strategy: addressing global challenges in the deep sea through collaboration, by Leslie Smith and colleagues, in *Marine Technology Society Journal*.

The Deep Ocean Observing Strategy (DOOS) is an international, community-driven initiative that facilitates collaboration across disciplines and fields. This article lists all the many valuable and essential contributions made by the DOOS community and how it transfers knowledge to policy makers and deep-ocean stakeholders to align with the vision of the UN Ocean Decade. [DOI: 10.4031/MTSJ.56.3.11](https://doi.org/10.4031/MTSJ.56.3.11)

Evaluation of MPA designs that protect highly mobile megafauna now and under climate change scenarios, by Morgan Gilmour and colleagues, in *Global Ecology and Conservation*

This study seeks to understand how well large-scale MPAs could benefit highly mobile marine species in the tropics now and into the future by: (1) evaluating current range overlap within a large MPA; (2) evaluating range overlap under climate change projections; and (3) evaluating how well theoretical MPA designs benefit such species. Results demonstrate the potential benefits of MPA networks and protected corridors, especially with respect to dynamic ocean processes and a changing climate. [DOI: 10.1016/j.gecco.2022.e02070](https://doi.org/10.1016/j.gecco.2022.e02070)



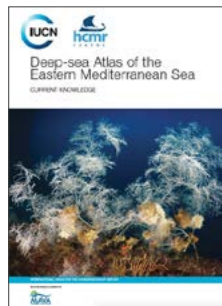
Active hydrothermal vents in the Woodlark Basin may act as dispersing centres for hydrothermal fauna, by Cédric Boulart and colleagues, in *Communications Earth & Environment*

This article reports the discovery of a high-temperature hydrothermal vent field on the Woodlark Ridge in the tropical western Pacific Ocean. Comparing its faunal composition with other nearby vents, it concludes that the newly discovered field may act as a dispersing centre for hydrothermal fauna towards the nearby North Fiji, Lau and Manus basins. [DOI: 10.1038/s43247-022-00387-9](https://doi.org/10.1038/s43247-022-00387-9)



BBNJ Economics and Finance, a Global Ocean Trust Policy Brief

This policy brief suggests practicable finance options to deliver key aspects of the required ambitious implementation of the proposed BBNJ Agreement such as a dedicated finance institution. It argues that appropriate finance mechanisms are not only required to deliver conservation outcomes based on the precautionary principle but they can also offer effective tools to support stakeholder engagement and public-private partnerships, thereby facilitating investment in a range of key ocean solutions. Available at www.iucn.org/sites/dev/files/content/documents/bbnj_economics_policy_brief.pdf



Deep-sea atlas of the eastern Mediterranean Sea, by Maria del Mar Otero and Chryssi Mytilineou (eds), an IUCN-HCMR DeepEastMed Project report

This atlas has been compiled to assess existing knowledge on Eastern Mediterranean deep-sea biodiversity and understand the full array of drivers that affect species and ecosystems in these environments, whilst recognising opportunities to improve and advance data holdings. Its purpose is to advance the understanding of the biodiversity and ecosystem functions in the deeper reaches of the Mediterranean basin, as well as to assess the impacts that will help decision-makers build effective biodiversity conservation and management actions. Available from www.iucn.org/mediterranean

How can a new UN ocean treaty change the course of capacity building? by Harriet Harden-Davies and colleagues, in *Aquatic Conservation: Marine and Freshwater Ecosystems*

Capacity building is a key part of the development of a new BBNJ Agreement, yet gaps in capacity cast doubt on the adequacy of past and current approaches to implement long-standing international commitments. This paper argues for a need to build equitable partnerships for long-term outcomes, and proposes that the soon-to-be-finalised BBNJ Agreement is a critical opportunity to change the course of capacity building by strengthening the international legal framework, including funding, information-sharing, monitoring and decision-making. [DOI: 10.1002/aqc.3796](https://doi.org/10.1002/aqc.3796)



A global map of human pressures on tropical coral reefs, by Marco Andreello and colleagues, in *Conservation Letters*

This study maps six human pressures on coral reefs using the latest quantitative data on fishing, water pollution, coastal population, industrial development and tourism, before identifying the top ranked local pressure on coral reefs across the globe. The findings provide the best available information that can ensure local pressures are effectively managed across the world's coral reefs. [DOI: 10.1111/conl.12858](https://doi.org/10.1111/conl.12858)



Emergent research and priorities for shark and ray conservation, by Salvador Jorgensen and colleagues, in *Endangered Species Research*

This review draws attention to the growing concerns about the challenges to effective conservation and management of sharks and rays. A lack of data on population status for many species, human-wildlife interactions, threats to population viability, and the efficacy of conservation approaches are addressed. A synthesis of responses to a questionnaire aggregates an array of perspectives on emergent research and priority directions for elasmobranch conservation. [DOI: 10.3354/esr01169](https://doi.org/10.3354/esr01169)



Lessons from bright-spots for advancing knowledge exchange at the interface of marine science and policy, by Denis Karcher and colleagues, in the *Journal of Environmental Management*

This research highlights 25 instances of effective knowledge exchange among marine scientists and decision-makers within a wide range of marine fields, contexts and locations. A synthesis of a diversity of approaches provides insights into what has worked well and not so well, and suggests proven ways on how to improve knowledge exchange at the interface of marine science and policy. [DOI: 10.1016/j.jenvman.2022.114994](https://doi.org/10.1016/j.jenvman.2022.114994)

State of the world's birds, by Alexander Lees and colleagues, in *Annual Review of Environment and Resources*

This review presents an overview of the global spatiotemporal distribution of avian biodiversity, changes in knowledge of bird biodiversity, and the extent to which it is imperilled. It summarises the threats driving changes in bird species richness and abundance, highlighting the increasingly synergistic interactions between threats such as habitat loss, climate change, and overexploitation. It concludes by identifying key measures to counter this loss of avian biodiversity and associated ecosystem services. [DOI: 10.1146/annurev-environ-112420-014642](https://doi.org/10.1146/annurev-environ-112420-014642)





Global Ocean Biodiversity Initiative


Global Ocean Biodiversity Initiative


Providing the scientific basis for conserving
biological diversity in the global ocean


The Global Ocean Biodiversity Initiative is an international partnership of organisations committed to advancing the scientific basis for conserving biological diversity in the marine environment. In particular, GOBI contributes expertise, knowledge and data to support the Convention on Biological Diversity's efforts to identify ecologically and biologically significant marine areas (EBSAs) by assisting a range of intergovernmental, regional and national organisations to use and develop data, tools and methodologies.

GOBI also undertakes research to generate new science that will enhance the value of EBSAs and their utility for promoting environmental protection and management for specific areas of the world's oceans. The intention is ultimately to reduce the rate of biodiversity loss through the application of ecosystem approaches to the management of human activities, and to support the establishment of networks of representative marine protected areas in national and international waters.

The GOBI partnership and activities are coordinated by a Secretariat team, provided by Seascope Consultants Ltd. GOBI is funded by the International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

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