DEEP-SEA GENETIC RESOURCES BEYOND NATIONAL JURISDICTION: HOW TO CONSERVE MARINE LIFE & FACILITATE SCIENTIFIC RESEARCH?
DOSI Deep-Sea Genetic Resources Working Group: Discussion Paper

SUMMARY
Gaps in the international legal framework for marine areas beyond national jurisdiction (ABNJ) raise many questions for marine scientific research, including the sharing of data and biological samples, the ownership of biological material, and the implementation of new access and benefit sharing regimes. Deep-sea scientific research is a key stakeholder in the development of a new international legal instrument to conserve marine life beyond national boundaries (64% of the ocean surface) - particularly in relation to access and benefit sharing of deep-sea marine genetic resources (MGR)[1] in ABNJ. The aim of this short briefing paper is to provide a summary of the governance issues relating to deep-sea MGR in ABNJ in order to serve as a background to the DOSI Deep-Sea Genetic Resources Survey and to stimulate discussion within the scientific community on possible opportunities and challenges for deep-sea science and stewardship.

NEW LEGAL INSTRUMENT TO CONSERVE MARINE BIODIVERSITY IN ABNJ
Substantive aspects of a new international legally-binding instrument on the conservation and sustainable use of marine biological diversity of ABNJ ('new instrument') under the *1982 United Nations Convention on the Law of the Sea* (UNCLOS) will be developed over the next two years.[2] The new instrument has the potential to afford better protection to marine life in ABNJ, which accounts for more than 95% of ocean volume and 64% of the ocean surface and includes a large proportion of the deep ocean. ABNJ incorporates two distinct maritime zones established by UNCLOS: 'the high seas' (water column) and 'the Area' (sea-bed and subsoil). The development of the new instrument will consider four issues: 1) MGR, including the sharing of benefits; 2) Measures such as area-based management tools, including marine protected areas; 3) Environmental impact assessments; and 4) Capacity building and the transfer of marine technology.

RELEVANCE TO SCIENTIFIC RESEARCH
Scientific research constitutes one of the main activities currently accessing MGR in ABNJ. The range of relevant scientific activities spans the collection and retention of biological samples, for example: ecology, environmental monitoring, taxonomic research, natural products chemistry, microbiology, molecular biology, whole genome sequencing and enzyme discovery. Scientific research could thus both inform - and be impacted by - a new instrument for access and benefit sharing of MGR in ABNJ. Opportunities for scientific research could include: enhanced access to samples; open access to data; international research collaboration; capacity building and access to technology; evaluating ecosystem services; integrated studies; and support for deep-sea biodiversity and ecosystem functioning research. Challenges for scientific research could include: increased reporting, Big Data storage and management, administrative and other requirements for the collection, curation, storage and sharing of biological samples from ABNJ. There are some concerns within the research community that the adoption of a new instrument could potentially create barriers to research and discovery and strain on researcher and institutional capacity. It is thus important to engage marine scientific researchers in the discussions relating a new instrument at this early stage in order to maximise opportunities and minimise possible challenges.

[1] There is no internationally agreed definition of MGR. However, the term 'genetic resources' is defined as "*genetic material of actual or potential value*" in the *1992 Convention on Biological Diversity*. MGR could thus be considered to include biological specimens collected for scientific research and products derived from marine biodiversity including genes, proteins and natural products.

[2] The UNGA adopted Resolution 69/292 – *Development of 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*, on 19 June 2015. The two year Preparatory Committee process will provide substantive suggestions to the UN General Assembly, which may then convene for inter-governmental negotiations to adopt a new instrument.

GOVERNANCE GAPS

MGR have a number of potential applications – from scientific research to commercial products (e.g. pharmaceuticals, nutraceuticals, cosmetics, food, bioremediation, restoration) – and could provide monetary (e.g. financial) and non-monetary (e.g. access to data) benefits. In order to realise any of the possible benefits from MGR in ABNJ, it is necessary to conserve the 'living library' of genetic resources provided by deep-sea biodiversity, facilitate scientific research, and address the following governance gaps:

1) ***Legal status & definitional gaps:*** The lack of an internationally agreed definition of MGR in ABNJ (UNCLOS does not mention or define 'genetic resources') triggers: uncertainty relating to the legal status of MGR in ABNJ; questions relating to intellectual property rights; difficulties in differentiating commercial from non-commercial research; and challenges in aligning terminology across different activities that use MGR. MGR in ABNJ could be considered to encompass all marine life in ABNJ and include specimens collected for scientific research (including taxonomy) and products derived from marine biodiversity (e.g. genes, natural products, proteins).
2) ***Access & benefit sharing:*** MGR *within* national jurisdiction are subject to the regime established by the *2014 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable sharing of benefits arising from their Utilisation to the Convention on Biological Diversity*. However, there is a gap in the international legal framework for access and benefit sharing of MGR *beyond* national jurisdiction. This has raised concerns about fair and equitable benefit sharing of MGR in ABNJ, particularly given that not all countries have the knowledge of their existence, or the technological, financial and other means to access the biological diversity of ABNJ. The long time-frame, high cost and complicated pipeline of scientific, technical, regulatory and legal processes needed to develop a commercial product is also an issue. Learning from experiences in implementing the Nagoya Protocol could be useful in addressing these issues in ABNJ.

ROLE OF DEEP-SEA SCIENTIFIC RESEARCH?

Developing a new instrument for MGR will require a holistic multidisciplinary approach including science, law, economics and business. Scientific knowledge is a crucial enabler of all elements being considered for the new instrument, including to enhance knowledge of deep-sea biodiversity, ecosystems and resources. Advancing genomics research, developing new ways to culture deep-sea microorganisms are examples of possible MGR research priorities. It will therefore be important to facilitate, and not hinder, scientific research in the development of any new regime for MGR.

The deep-sea scientific research community is an important stakeholder and uniquely placed to inform the development of a new instrument for access and benefit sharing of MGR in ABNJ. However, given the definitional gaps and governance challenges, many scientists that could be impacted by a new instrument may not yet be engaging with the discussion, perhaps because research interests are not readily identified with 'genetic resources' (e.g. taxonomists, deep-sea biologists and ecologists, microbiologists, and indeed any researcher taking biological material for study). Therefore, it is important to ensure that the expertise of the broad deep-sea research community contributes to the development of a new instrument for the conservation and sustainable use of marine biodiversity in ABNJ.

ABOUT DOSI

The Deep Ocean Stewardship Initiative (DOSI) is a union of experts from across disciplines and sectors formed to develop new ideas for sustainable use and management of deep-ocean resources. DOSI seeks to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction.
The DOSI working group on Deep-Sea Genetic Resources aims to explore and identify options for conserving and sustainably utilising deep-sea genetic resources, including questions relating to access and benefit sharing of marine genetic resources beyond national jurisdiction. http://dosi-project.org/

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Useful links: e.g. UNCLOS: http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.htm
BBNJ: http://www.un.org/Depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm