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DEEP-SEA MARINE SCIENTIFIC RESEARCH AND GENETIC RESOURCES IN AREAS BEYOND NATIONAL JURISDICTION: SUBMISSION

The Deep Ocean Stewardship Initiative (DOSI)¹ Deep-Sea Genetic Resources Working Group welcomes this opportunity to provide input to the first Preparatory Committee meeting for the 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 in areas beyond national jurisdiction (UNGA Resolution 69/292). We wish to highlight the role of the deep-sea scientific research community in assisting in the development of solutions for accessing marine genetic resources (MGR) in areas beyond national jurisdiction (ABNJ) and the fair and equitable sharing of benefits arising from their potential use.

The contents of this submission are based on the results of a survey conducted by the Working Group to solicit the views of the deep sea research community on priorities and concerns regarding the development of a new instrument. There were 49 responses to the survey, from scientists from 18 developed and developing countries.

Marine scientific research is crucial to advance knowledge of marine biodiversity, ecology and ecosystem processes in ABNJ for the benefit of humankind. Sustained long-term deep-sea observations are critical to support measures for the conservation and sustainable use of biodiversity, including generating baseline data and monitoring the impacts of human activities in the deep sea. These applications cut across the full spectrum of priorities that the new international legal instrument will address.

Scientific knowledge, data and samples are significant benefits from MGR in ABNJ that arise from marine scientific research. In addition to these ‘non-monetary’ benefits, there could also be potential for monetary benefits to arise from research and development. Open access to knowledge, data and biological samples is necessary to ensure that benefits can be realised for all mankind (as envisaged in UNCLOS Part XI article 143). International cooperation, capacity building in marine scientific research and the transfer of marine technology are crucial to support enhanced participation and strengthened research capacity of developing States (UNCLOS articles 143(3), 242, 243 & 244 and Sustainable Development Goal 14 Target 8²). For example, international cooperation is needed to facilitate access to deep-sea research infrastructure and share the high costs of accessing the deep sea in ABNJ.

¹ 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. (<http://dosi-project.org/>).

The DOSI Deep-Sea Genetic Resources Working Group 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.

² SDG 14, Target 8 provides: “Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.”

Deep-sea scientific research, primarily from technologically more developed States, is the primary actor accessing deep-sea MGR in ABNJ and deriving and sharing benefits (data and samples) from their use. Existing best practice approaches within the scientific community for sharing data and information and cooperating internationally provide a blueprint to enhance open-access, strengthen research capabilities, train scientists and transfer marine technology. These issues are particularly important to benefit developing States and technologically less developed States. For example, data is already being shared by the scientific community through online open access data-sharing platforms and peer reviewed publications, whilst some samples can be accessed through international networks of registered collections. However, new approaches would be needed to meet the high costs of accessing, collecting, reporting, curating, and sharing deep-sea samples and subsequent data to support benefit-sharing of MGR in ABNJ. There is also a need for increasing initiatives to strengthen research capacity and training in developing States in order to widen capabilities to participate in these activities.

Deep-sea scientific researchers are key stakeholders in informing the development of the new international legal instrument as they can provide options based on their expertise, insight and experience in designing and implementing any access and benefit sharing measures for MGR in ABNJ. For example, the deep-sea scientific community can advise on effective but 'light touch' access measures for research that ensure that any new regime facilitates and does not hinder marine scientific research for the benefit of mankind as a whole. International networks, such as the International Network for Scientific Investigation of Deep-Sea Ecosystems (INDEEP) and DOSI, already play important roles in facilitating international cooperation in research involving deep-sea ABNJ.

A confluence of scientific and technological advances is opening up new avenues for research and development of marine genetic resources. For example, disciplines such as genomics are increasing human understanding of the building blocks of life, whilst synthetic biology could revolutionise the way in which this knowledge can be applied for the development of new biotechnology. It is possible that a single marine genetic resources research activity could use material from areas both within and beyond national jurisdiction. This would raise legal issues with complexity not previously foreseen and would require a multidisciplinary approach engaging different scientific disciplines in order to develop solutions that support research and innovation.

We urge the Preparatory Committee to consider the following in the 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 in areas beyond national jurisdiction:

1. Support deep-sea marine scientific research in ABNJ to advance scientific knowledge of deep-sea biodiversity, ecology, ecosystem functionality and genetic resources to benefit all mankind.
2. Enhance international cooperation in marine scientific research in ABNJ to advance knowledge of marine biodiversity and genetic resources, increase capacity building, facilitate transfer of marine technology, and share costs of research.
3. Facilitate open-access sharing of deep-sea biological data, samples and knowledge.
4. Avoid excessive bureaucratic burdens that could hamper marine scientific research.
5. Improve marine scientific research capacity building of developing States and technologically less developed States with a view to strengthening their research capabilities through improved access to research infrastructure and technology, training programmes, early career researcher exchanges, and the resources to build regional centres of research excellence.
6. Build on best-practice in deep-sea scientific research for accessing MGR in ABNJ.

7. Support mechanisms that facilitate the sharing of expertise and methodologies, international cooperation for access to research vessels, equipment and other resources as well as costs of undertaking research and support capacity development through increased opportunities to participate in research cruises.

In closing, the DOSI Deep-Sea Genetic Resources Group recognizes the importance of this opportunity to improve the conservation and sustainable use of marine biodiversity beyond national jurisdiction. We remain at your disposal to help channel expert advice from the deep-sea scientific community on the development of an access and benefit sharing regime that facilitates wider marine scientific research, promotes open access to data and enables international cooperation to advance knowledge of the marine environment in ABNJ and build scientific capacity in developing and less technologically advanced countries. DOSI as a whole also stands ready to contribute to your deliberations with its knowledge and expertise on the sustainable use and management of deep-ocean resources for the benefit of all mankind.

DOSI DEEP-SEA GENETIC RESOURCES SURVEY: SUMMARY OF RESULTS & OBSERVATIONS

The Deep Ocean Stewardship Initiative (DOSI) Deep-Sea Genetic Resources Working Group³ conducted a survey of DOSI members on Deep Sea Genetic Resources: Science, Access and Benefit-Sharing (07/03/2016 - 16/03/2016). The survey sought to collect opinions from deep-sea scientific researchers on the governance of deep-sea genetic resources in marine areas beyond national jurisdiction (ABNJ). Questions were asked in relation to 3 key issues: access, benefit sharing, and the facilitation of scientific research. The purpose of the survey was to gauge the views of the deep-sea research community in order to guide DOSI activities in the context of the development of a new international legally binding instrument for the conservation and sustainable use of marine biological diversity in ABNJ.

There were 49 respondents to the survey from 18 countries (80% of respondents identified as being from a developed country, 20% identified as being from a developing country). The respondents were mainly deep-sea scientific researchers (60% were deep-sea ecologists).⁴

1. Access to MGR in ABNJ

- Regulations on access to marine genetic resources in ABNJ (monitored, controlled or open) provoked mixed views, with monitoring through notification and reporting seeming to be the preferred option. There appear to be mixed views relating to how deep-sea MGR in ABNJ should be accessed.
 - i. 65% of respondents indicated that access to biological material in ABNJ should be monitored (notification and reporting). 19% selected 'controlled through permits'. 9% selected 'unsure'. 7% selected 'open and unmonitored'.
- It is not clear whether there is a need for more strict, binding measures to set rules to collect biological material in ABNJ.
 - i. 50% of respondents felt there is a need for more strict, binding measures to set rules for collecting biological material in ABNJ (22% no, 29% unsure)
 - ii. Some support this notion, suggesting there is a need to ensure sustainable management, especially in vulnerable marine ecosystems or protected areas. One suggested that scientists are independent but also need to be regulated. However, there are also concerns about restricting scientific research and questions relating to how permits would work in practice.
- There seems to be support for developing a code of conduct for collecting and curating deep-sea biological samples in order to minimise environmental impacts of sampling, standardise formats for data recording and maximise use of marine samples for different purposes.
 - i. (87% of respondents felt that a code of conduct for collecting and curating deep-sea biological samples in ABNJ should be developed (4% no, 9% unsure)
 - ii. More than 75% of respondents felt that the following aims were of high or very high importance: mitigate environmental impacts of sampling, standardise formats for data recording and maximise use of marine samples for different purposes.

³ <http://dosi-project.org/working-groups/genetic-resources>

⁴ 67% of respondents were aware of the development of a new BBNJ instrument; 67% of respondents were aware that Part XIII of UNCLOS sets out provisions for the conduct of marine scientific research; 72% of respondents were aware of voluntary measures to minimise adverse environmental impacts of sampling; 71% of respondents were aware of the Nagoya Protocol.

- iii. There appears to be support for the development of a code of conduct for collecting and curating deep-sea biological samples in ABNJ. However the importance of allowing – not blocking – research is highlighted and questions were raised about how costs can be handled without limiting science, how such a code would be reported on, and how it would be developed when so little is known about deep-sea ecosystems.

2. Sharing benefits from MGR in ABNJ

- **Open access and sharing of data** is universally agreed as of very high importance.
 - i. Increased sharing of deep-sea biological data would be beneficial: 84% of respondents indicated that they would benefit from increased sharing of deep-sea biological data (7% no, 9% unsure)
 - ii. More than 75% of respondents felt that the following were of high or very high importance: stricter requirements to lodge data in international databases; adopting a common format for data standards; creating a deep-sea biodiversity data sharing platform in the Ocean Biogeographic Information System (OBIS); open access data portals; open access peer reviewed publications.
 - iii. Data sharing is especially important for scientists from developing countries to benefit. However questions were raised about funding and resourcing, especially so as not to disadvantage developing States. Existing approaches are effective and should be encouraged.
- Increased **sharing of deep-sea biological samples** would be beneficial to respondents (73% of respondents indicated that they would benefit from increased sharing of deep-sea biological data (9% no, 18% unsure)
 - i. More than 75% of respondents felt that the following were of high or very high importance: include funds in research grants for curation and long-term care; samples retained in registered national collections open for use on a loan basis; international network of registered collections.
 - ii. The need for proper taxonomic identification of new samples was highlighted. The problem with conducting molecular analysis on formalin fixed samples was also raised.
- **International cooperation** is important to: Share expertise and methodologies (97% of respondents selected); Share research resources (e.g. vessels, equipment) (95% of respondents selected); Share costs of research (76% of respondents selected) and to support capacity development (68% of respondents selected) and target research effort (65% of respondents selected). International cooperation is already central to deep-sea research and important to share outcomes, especially with developing countries.
- Self-organising networks, such as INDEEP and DOSI, play a crucial role in facilitating and enhancing cooperation. Cooperation at all levels is needed (from intergovernmental to national levels).
 - i. 95% of respondents selected ‘Self organising networks (e.g. INDEEP&DOSI)’; 78% of respondents selected national research organisations and institutions, 66% of respondents selected intergovernmental organisations (e.g. Intergovernmental Oceanographic Commission).
- Increasing **marine scientific research capacity** is a critical priority, especially for developing countries, and can be achieved through: international cooperation (e.g. as was done for the Census of Marine Life (CoML www.coml.org)); improved access to research infrastructure, technology, training programmes, early career researcher exchanges, participation in research cruises and centres of excellence in developing countries and regions. However, the risk of ‘brain drain’ and need to retain expertise in country was identified. The importance of mentoring opportunities was

highlighted. Again, the issue of funding for research and for PhD training in developing countries was identified.

- 86% of respondents had not encountered any problems relating to intellectual property rights involving MGR (9% yes, 5% unsure).

3. Marine scientific research

- Funding; access to research vessels and infrastructure and cost of maintaining research infrastructure are all **barriers to research** (identified by more than 75% of respondents). The challenge of securing funding for deep-sea research was reiterated by many respondents, deep-sea is 'out of sight - out of mind'. Lack of access to vessels capable of deep-sea research is a key issue in developing countries. On the other hand, one respondent highlighted that there is a large amount of data and samples already collected awaiting analysis. There was one suggestion for a collaboration pool where researchers could link with other researchers looking to collaborate. One suggested the need for ISA to play a stronger role in making data centralised and public.
- An access and benefit sharing regime for MGR in ABNJ that provided increased open access to deep-sea biological samples and data would be broadly considered to be beneficial to scientific research, however there are cautions about cost and how open access will be enabled between developed and developing countries.
 - i. 74% of participants agreed or strongly agreed that "*An access and benefit sharing regime for marine genetic resources in areas beyond national jurisdiction that provided increased open access to deep-sea biological samples and data would be beneficial for scientific research.*" (15% neither, 2.5% disagree, 7.5% strongly disagree).
- Some felt that a regime could create administrative burdens and risk hindering research, others suggested that some control was needed and it was important to find a balance between freedom and oversight. Some suggested that clear rules and simple procedures – perhaps based on well prepared and globally shared code of conduct - could negate burdens, and highlighted the importance of allowing for administration and data management in project budgets.
 - i. 42% of participants agreed or strongly agreed that "*An access and benefit sharing regime for marine genetic resources in areas beyond national jurisdiction could create administrative burdens on researchers and runs a risk of hindering scientific research and discovery.*" (35% neither agree or disagree), 15% disagree, 6% strongly disagree.
- More than 75% of participants felt the following were high or very high **priorities** to facilitate MSR under a new international legal instrument for marine genetic resources in ABNJ:
 - Support enhanced data sharing (93%);
 - Advance knowledge of deep-sea biodiversity;
 - Improve international cooperation (84%);
 - Facilitate sample sharing;
 - Incentivise/fund research in new areas or understudied locations (78%).
- But there are questions about who pays, and how to work with non-marine scientists too.
 - More than 75% of participants felt the following were high or very high importance in achieving the optimum role of science in a new international legal instrument for the conservation and sustainable use of marine biodiversity in ABNJ:
 - Advance human knowledge of deep-sea biodiversity;
 - Help create a baseline;
 - Inform environmental impact assessments;
 - Improve decision making;

- Advice on tools for area-based conservation;
- Enhance understanding of cumulative Impacts.