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NOTE AND COMMENT

Delivering scientific evidence for global policy and management to ensure ocean sustainability

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Abstract

Life depends on the ocean, with societal health, cultural systems and national economies reliant on ocean processes and resources. As ocean resources are used, and humans continue to drive climate change, the benefits from the ocean to society are being diminished. Science must meet the needs of policy and deliver to decision makers the information and tools for identifying pathways that support continued delivery of the benefits society derives from the ocean, whilst minimising impacts.

ocean provides food and jobs for billions of people (OECD 2020) and mediates the e ects of climate change at a scale far greater than terrestrial systems (Caldeira et al. 2018).

Inclusive participation and delivering integrated multi-disciplinary science to policymaking frameworks

The need for delivery of information, grounded in science, that can inform policy at multiple scales has seen a number of global assessments, mandated under international processes developed over recent decades. Such assessments have been highly e ective in elevating awareness of topics such as climate change (Hermansen et al. 2023) and biodiversity (Borie et al. 2020) and progressing policy dialogue under international processes such as the United Nations Framework Convention on Climate Change (Hermansen et al. 2023). Such assessments provide a mechanism via which information derived from multiple disciplines, vast numbers of research topics and numerous parallel (but rarely connected) discourses can be brought together.

In discussing a global framework for sustainable development (which would eventually result in the 2030 Agenda) at The World Summit on Sustainable Development, the governments of the world recognised that an assessment specifically focused on the marine environment was needed to support the protection and management of "the natural resource base of economic and social development".[2] Although assessments produced under established international processes such as the Global Environment Outlook[3] and the Intergovernmental Panel on Climate Change (IPCC)[4] focus on topics of relevance to the ocean, their mandates require that the assessments they produce, while multi-disciplinary in content, are delineated in their focus on the ocean considered by their assessments. This has resulted in large gaps in the consideration of social, economic and cultural aspects of the ocean and wholistic delivery of relevant information that is needed for comprehensively assessing the ocean and identifying the multiple pathways needing to be implemented for achieving sustainability. For example, the Special Report on Ocean and Cryosphere in a Changing Climate (IPCC 2019) only considers impacts on oceans and associated ocean-based communities associated with climate change. It does not consider human use and other associated impacts on the ocean, the interactions between multiple uses and the cumulative e ects of impacts, the flow-on e ects on social, economic and cultural systems and the pathways for addressing those multiple impacts and multiple mechanisms needed for

part of the initial scoping and information gathering stages of the WOA.

The WOA is relatively young compared to other assessments, currently part way through its third cycle. In the spirit of continual improvement and adaptability to policy needs, it has undertaken an active evolution across cycles. Key areas in which development and improvement have focused are (i) linking science with policy across multiple scales; (ii) inclusivity of engagement with, and delivery of products to, ocean stakeholders; (iii) integration of content across the environment, society and the ocean economy; (iv) provision of options and tools for supporting decision-making.

For global assessments to have a meaningful impact on policy formulation, it is essential that they bridge the gap between the international and the national/sub-national levels of decision-making and policy implementation. To assist this, regional workshops covering most ocean regions are held during each cycle of the WOA. These provide a pathway for the flow of regionally based and produced information, the incorporation of multi-disciplinary perspectives and facilitate interactions between experts from di erent ocean sectors including policymakers operating at the national and sub-national scales. They also facilitate contributions to each assessment cycle outside of formal participation in the writing of each assessment.

Recognising the need for input at multiple stages within each assessment cycle, the workshops have been expanded from one round of five workshops in the first cycle, to two rounds of five workshops in the second and third cycle. This expansion has specifically aimed to broaden input into the development of assessments, at first, the scoping and, second the content development stages to ensure that assessments are broadly responsive to feedback provided by those involved in the workshops and facilitate broad engagement in the development of each assessment. Further, they are purposefully regionally distributed to facilitate engagement across geographic areas and direct support is provided that facilitates the engagement of participants from underrepresented regions, including, in particular, least developed countries (LDCs) and small island developing states (SIDS). This allows those involved in guiding the development of each assessment to identify improved mechanisms for engaging those that contribute and support the development of each assessment and delivering the assessment and its content in accessible and useable ways. It is through this process that the WOA initiated during its third cycle the development of digital delivery mechanisms that will eventually result in vastly improved access to and exploration of WOA content (see also below).

The expanded opportunity for engagement in the WOA, facilitated through the regional workshops, goes some way to addressing earlier criticisms around participation in the WOA (Fawkes and Cummins 2019) and engagement in international processes more broadly (e.g. Hulme et al. 2011; Feary et al. 2014; Díaz-Reviriego et al. 2019; Singh et al. 2023), noting that there is always room for improvement. It also results in the WOA being somewhat di erent to other global assessments, where the design of individual assessments and identification of topics and thematical content is largely set internally and gathering of information is limited to the e orts of individual writing teams. These workshops are important mechanisms for connecting the WOA to the

is limited to the practical and procedural elements of each assessment cycle and provides no clear mechanism for evaluating the use and uptake of information into policy.

As part of the workshops for the third WOA, the secretariat for the Regular Process distributed a survey gauging the awareness and use of the first and second assessment. These aimed to better understand the utility of assessments and where improvements to the WOA could be introduced. The survey identified that while there was awareness of the WOA amongst many of the participants, actual use of the assessment was limited. This was identified as the result of two inter

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