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COMISIÓN OCEANOGRÁFICA INTERGUBERNAMENTAL  
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ  
اللجنة الدولية الحكومية لعلوم المحيطات  
政府间海洋学委员会

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**Subject: SBSTA IOC contribution to the upcoming Research Dialogue**

Your Excellence Ambassador Mpanu Mpanu, Chair of the SBSTA,

In response to the invitation expressed in the FCCC/SBSTA/2021/L.5 and in my capacity as Executive Secretary of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, I am delighted to submit IOC's views on possible themes for the fourteenth meeting of the research dialogue, to be held in conjunction with SBSTA 56 (June 2022).

*IOC proposes that the upcoming session of the UNFCCC SBSTA addresses the ocean and climate nexus and coastal resilience, which are at the focus of two Challenges of the UN Decade of Ocean Science for Sustainable Development. Below is the motivation for this proposal.*

Climate-related science is critical to achieve many of the other Ocean Decade Challenges including those linked to ecosystem management and protection, food security and sustainable ocean economy. New innovative initiatives in the framework of the Ocean Decade are now addressing ocean stressors, caused by climate change and in a multiple stressor approach, responding to the urgency to understand, model and manage multiple ocean stressors and their impacts on the marine environment now.

The current ocean change is already happening and projected to amplify in the future, as illustrated in the IPCC AR6. However, the confidence in some of the projections is only medium, particularly with respect to *ocean deoxygenation*, which will be. A new topic for UNFCCC. It is expected that a data atlas featuring high quality checked oxygen datasets for the global coastal ocean using a consistent and well documented quality control and flagging procedures and available along the FAIR principles, would help to reduce this gap of confidence. An ocean oxygen data atlas approach was developed, which would support products and indicators for the global coastal zone and related policy making processes (e.g., Marine Protected Area (MPAs) definition, Marine Spatial Planning (MSP)).

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Only by using all data available ocean stakeholders, including Member States and UN agencies, will be able to promote the development of a modelling system for the global coastal seamless coupled at its interface with the other Earth system reservoirs. Other links, currently missing but of high importance, are: the connection between oxygen and species datasets at global scale to upscale the impact of hypoxia on biodiversity, as well as the interaction between the oxygen cycle, pollutants dynamics and other biogeochemical cycles of essential elements like carbon, nitrogen and phosphorus.

The confidence related to the global phenomenon of *ocean acidification* is high (IPCC AR6), while local conditions can result in high differences in rate of change, severity, variability and consequences. Understanding the variability however is going to be critical for developing effective mitigation and adaptation strategies locally. Achieving SDG 14.3 by focussing on the reduction of the impacts of ocean acidification is directly linked to the UNFCCC, nevertheless there is insufficient capacity to monitor ocean acidification and observe its impacts. There is a need to develop new approaches and technologies to make ocean acidification observations easier and cheaper, including the greater use of tools for sampling in remote places and with greater temporal resolution (e.g. autonomy, remote sensing). The co-location of biological and ocean acidification observations must be improved, to increase our knowledge about the biological impacts. There is a need for a higher degree of harmonization of legislated ocean observing/monitoring to ensure greater return on investment. For example, a large amount of biological monitoring will take place in association with MPAs, but the degree to which physical-chemical monitoring, required to relate biological to ocean acidification and other ocean changes due to climate change, will be conducted is uncertain. Currently the legislative basis for conservation does not take account the likely changes ion environmental conditions and their consequences for the effectiveness of that legislation. Future activities to reduce the impacts of ocean acidification and multiple ocean stressors at large should include the investment in *climate-smart* MPAs, fisheries, MSP, etc.

Currently researched 'solutions' to ocean acidification and climate change such as blue carbon, carbon capture and storage and ocean alkalisation need to be better understood (both benefits and impacts) and used (or not) based on evidence rather than on assumptions. This understanding needs to include knowledge of the secondary and tertiary effects that may occur. Like for oxygen data, ocean carbon data have been hidden away from those that need it, often due to limited access rights. In addition, investments to improve the IT infrastructure are required to facilitate the fast and reliable flow of open-access data between data repositories and end users. Tools are needed that allow the end user to draw relevant data from multiple sources and visualize, interpret and present the data in a way that increases understanding and knowledge in support of effective adaptation and mitigation actions.

*IOC offers to inform the UNFCCC SBSTA research dialogue via regular stocktaking of knowledge gaps in relation to the ocean-climate nexus, related adaptation and resilience.* The Ocean Decade, coordinated by IOC, regularly solicits Actions to fill critical ocean knowledge gaps through co-design of transformative research initiatives. In this way the Decade makes an essential contribution to engagement of policy makers, governments, industry and civil society in the identification of key ocean-climate knowledge gaps and activities aimed at reducing them. A growing portfolio of Decade Actions is organized into thematic and regional Communities of Practice that work to identify key knowledge gaps, identify future priorities, and catalyse synergistic research action.

I hope that we can have a discussion with you and UNFCCC Secretariat to turn this elaboration into a specific set of themes for the research dialogue.

Yours sincerely,



Vladimir Ryabinin  
Executive Secretary, IOC