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The challenge of conducting marine scientific research under the COVID-19 pandemic

O desafio de conduzir pesquisa científica marinha sob a pandemia de COVID-19

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Abstract

This opinion paper highlights the unseen impacts that the current COVID-19 outbreak has posted to ocean sciences, particularly in developing countries. Ocean science diplomacy, i.e. the interplay between ocean science and international affairs, present useful tools to leverage from this new normal and address the need to foster balance between regions in terms of scientific capabilities to unveil the ocean as a public good. The UN Decade of Ocean Science offers a timely framework to advance such discussions.

Resumo

Este artigo de opinião destaca os impactos invisíveis que a atual pandemia de COVID-19 causou às ciências oceânicas, particularmente nos países em desenvolvimento. A diplomacia científica oceânica, ou seja, a interação entre a ciência oceânica e as relações internacionais, apresenta ferramentas úteis para o benefício deste novo normal e abordar a necessidade de promover o equilíbrio entre as regiões em termos de capacidades científicas no sentido de conhecer o oceano como um bem público. A Década de Ciência Oceânica da ONU oferece uma estrutura oportuna para o avanço dessas discussões.

Keywords: Ocean science diplomacy, COVID-19, Decade of Ocean Science.

Palavras-chave: Diplomacia científica oceânica; Pandemia de COVID-19; Década da Ciência Oceânica.

The current COVID-19 pandemic has posted many threats to the ocean activities. The immediate thinking, though, goes to the economic impacts from the travel bans, sanitary restrictions and health safety. The hundreds of participants of the recent World Economic Forum's Ocean Dialogues shared their perspective on the most impacted sectors of the ocean economy by an informal pool

held by The Economist and have ranked these as follows: tourism (70.7%), fisheries (10.4%), offshore oil and gas (7.2%), shipping (6.2%), offshore renewables (2.9%) and aquaculture (2.6%)¹.

There are, however, discussions also about the positive effects of the pandemic on the ocean environment recovery, especially in fisheries and tourism. With fishing vessels being prohibited to go to sea, we would expect a raise in fish stocks, especially in nesting sites. Some have advocated we take this time to rethink fisheries subsidies to reinvent the sector². Same applies to tourism. There should be a reshaping of the tourism industry to be more sustainable and just.

The economic impacts were understandably the most highlighted in the press, however, other major threats to the ocean are sensed during this pandemic that will certainly revert into economic impacts in one way or another. One of such impacts, still to be measured, is the raise in ocean pollution. Conservationists are already reporting growing presence of masks, gloves and other protection equipment being tossed out irresponsibly and ending up in our ocean³. A higher presence of plastics might be also seen in the upcoming months due to the massive use of disposable take away containers and cutlery.

Another silent consequence of the current pandemic is the conduct of marine research. Due to the sanitary restrictions and port closures, almost all scientific cruises had to be either cancelled or postponed. Unfortunately, this does not only mean going at sea to collect data for research projects, which people would tend to see as something not essential and therefore subject to delays, but rather also means the recovery, maintenance, and substitution of equipment at sea that remotely and continuously collect data which is essential to ocean forecast and prediction. These equipment at sea are powered by batteries that last for an entire year, and have been doing so for the last decades, so those need to be substituted. Historical data series are the only way we must understand long time scale trends (decades to centuries) which feed essential information on international processes such as the ones about climate change, for instance.

Moreover, the environmental monitoring as well as the monitoring of biodiversity with economic impacts, such as fisheries, also depend on equipment at sea and marine research cruises that many times are seasonal and need to be done in specific times of the year. Pushing most of the cruises for further in the future post science managers with a challenge on rearranging research programs that are organized in two or three years in advance. This will result in conflicting time scales and ship space, not to mention the difficult decision on prioritizing projects and teams onboard. This picture is even more challenging in developing countries where research vessels availability is extremely limited.

This pandemic has also exposed an intriguing recurrent practice in ocean science when addressing the fundamental discrepancies between developing and developed countries science capabilities. It is not uncommon that scientists from developed nations access funding and research infrastructures to conduct research abroad. They often lead the research projects and only a small portion of the

1 <https://www.undp.org/content/undp/en/home/blog/2020/the-ocean-and-covid-19.html> accessed on July 20, 2020

2 <https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2387> accessed on July 20, 2020

3 <https://www.theguardian.com/environment/2020/jun/08/more-masks-than-jellyfish-coronavirus-waste-ends-up-in-ocean> accessed on July 20, 2020

funding is locally applied, in special regarding installed equipment. This form of science colonialism has been evident in the current Covid-19 pandemic (de Vos, 2020), with developed countries' scientists regretting having lost their field work access due to travel bans, thus jeopardizing entire research projects, when the simplest solution was to have well equipped and trained personal on the ground, both providing capacity development as well as access to technology.

Not many countries can cope with the ocean technological race due to the high costs associated with research infrastructure or to the lack of domestic scientific capacities to develop technologies on their own. These global disparities can be seen in classic science indicators, such as published papers and resulted citations (Tolochko & Vadrot, 2021). UNESCO's Global Ocean Science Report shows how dominant certain countries are in producing ocean science (IOC-UNESCO, 2020). As a consequence, some areas are better sampled than others, with large gaps in knowledge for immense ocean spaces, in special the Southern parts of the Atlantic and the Pacific (for a more comprehensive assessment, please see Inniss et al., 2017).

Most developing countries depend on foreign research capacities to unveil their waters and coasts. Instead of naively perceiving developed countries as aid providers to lesser capable nations, there are interests underlying the access to the features of other coastal States' waters. There is an emerging need to understand the global ocean dynamics and seek answers on pressing issues such as the relation to climate and natural hazards (Farmer & Cook, 2013) and on the loss of biodiversity and ecosystem services (Hughes et al., 2018; Worm et al., 2006).

Considering these timely issues, we believe that an ocean science diplomacy framework can provide some insights on producing global ocean science with high standards and promote a better balance in marine research capabilities.

There is still much debate in Academia on exactly what science diplomacy means, but a common understanding is that it englobes the multitude of processes that interplay between science and international relations dealing with global, transborder and regional issues of common concern or interest (Flink & Rüffin, 2019). Thus, science diplomacy is the umbrella framework that sheds light into the influence of science in diplomatic relations and how international relations can foster research and innovation. Science diplomacy in action includes issues such as feeding evidence to international decision making; bridging nations with political tensions in other areas by establishing joint research projects; allowing technical cooperation to address humanitarian challenges and so on. Ocean science diplomacy pertains the application of such features to address the ocean as a global commons and a public good (Vogler, 2012). Some endeavors to identify this ocean science diplomacy have shown how critical the provision of scientific evidence is to ocean affairs, in particular at the UN level and in intergovernmental organizations (Harden-Davies, 2018; Polejack & Barros-Plataiu, 2020; Robinson, 2020). Countries in the Atlantic Ocean are advancing in adopting ocean science diplomacy to progress in addressing societal challenges through scientific knowledge, by establishing a research alliance, and balancing national and global interests (Polejack, Gruber, & Wisz, 2021).

Science diplomacy can help shape new frameworks and bridge communities, so there is better communication and coordination, that will hopefully foster a balance between national interests

and global concerns, as well as promote science literacy to decision makers and society, and policy literacy to scientists (Kopke, Black, & Dozier, 2019). By scientifically cooperating, countries can also overcome existing geopolitical tensions by agreeing on common goals or concerns (for a range of examples, please refer to Colglazier, 2018). In the current new post-COVID normal, in which the ocean faces pollution threats and ocean science is being affected, there is a chance to join efforts and cooperatively progress in filling the knowledge gaps with the available research opportunities.

Ocean science diplomacy can be a game-changer in finding common grounds of understanding and levelling research capacities worldwide by providing access to research infrastructure and human capacities while struggling with the new *normale*. The central matter is to understand how science diplomacy can reorganize relevant stakeholders internationally to solve wicked humanitarian puzzles in the Anthropocene, learning from lessons in the past and shaping the future (Turekian, Copeland, Davis, Patman, & Pozza, 2015). From a country's perspective, it is necessary to identify where its strengths and weakness lie so as to negotiate favorably in demanding the “fair and reasonable terms and conditions” in any agreement, as indicated by UNCLOS (Article 266, item 1).

The upcoming UN Decade of Ocean Science for Sustainable Development is an unique opportunity to develop such fair mechanisms, bringing countries to common goals in designing together research projects that will in turn produce information that can be fed back to international negotiations at the UN level. In the COVID-19 crisis there is an opportunity to acknowledge all these issues and propose true changes and science diplomacy can be a pillar to guiding this new model.

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