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FOREWORD

Oil Spill on the Brazilian Coast

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It is a pleasure to introduce the Special Issue (NE) of research articles focusing on the scientific and technological aspects related to the oil spill that hit the coast of northeastern Brazil in 2019. This event has been considered the worst marine environmental disaster in the history of Brazil due to its geographic extension, with more than 4,000 km of the North-Northeast-Southeast coast; because it was not from Brazilian oil fields; and because its duration and volume of oil that reached the coastline of the country. Many Brazilian scientists acted voluntarily in the emergency phase of the disaster, together with agents from the agencies involved, aiming to determine the origin of the spill and the recovery of the various coastal ecosystems affected. In addition, several of these scientists were linked to Working Groups (WG) of the Assessment and Monitoring Group (GAA) made up of the National Petroleum Agency (ANP), the Brazilian Navy and the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) or in projects supported by municipal, state and federal funding agencies. Thus, they have been generating quality scientific knowledge, from the beginning of the disaster to the present day. Some of this knowledge has been published in scientific journals, but another significant part of this knowledge is presented here. Articles containing original research results related to the event in question, with scientific quality based on a robust dataset and that rose scientific interest for a wide audience. Thus, the main objective of the Special Number (NE) of the Annals of the ABC (AABC) is to give visibility to the "best science" available on the oil spill that reached the Brazilian coast.

The Special Number consists of seventeen original articles addressing several different topics related to the oil spill event. The articles included studies about remote sensing/numerical modeling of oil slicks (Nobre et al. 2022), mapping using Remote Sensing data of the impacted areas and its correlation with socioeconomic typology of the municipalities directly affected (Freire et al. 2022), and a technical evaluation of image attributes to support the identification of ocean targets, including oil spills, rain cells, biofilms, and low wind conditions (Lentini et al. 2022). Other articles address chemical analysis of the oil in different compartments and environmental ecosystems to determine polycyclic aromatic hydrocarbons (PAHs) concentrations in local biota to assess seafood quality (Hamacher et al. 2022), bioaccumulatiuon, bioaccessibility and risk analysis (Melo et al. 2022) and also describe the extension of affected coastline and possible origin, indicating that discharges of oil in the open sea occurred more regularly than initially expected (Lobão et al. 2022). On the other hand, the environmental and socioeconomic impacts on different ecosystems (beaches, mangroves,

reefs), were assessed by the analysis of the disaster's damage using a sample of interviewers who were impacted - fishers, tourism and beach hawkers (Ferreira et al. 2022). Besides, the environmental conflict and its impacts on the environment and on the healthy of the affected population using the method proposed by the Global Atlas of Environmental Justice (EJAtlas) were assessed (Santos et al. 2022), as well as the proposition of monitoring programs that allowed the evaluation of potential impacts on communities and ecosystems and their recovery through time (Viana et al. 2022). The big data approach were considered to assess in a fast and automated way to assess Cultural Ecosystem Service (CES) at large spatial scales to monitor the social impacts of environmental disasters (Azevedo et al. 2022), as also the evaluation of the effects of this disaster on coral vitality and benthic assemblage structure on the largest coastal marine protected area (MPA Costa dos Corais) in Brazil (Miranda et al. 2022).

Other articles addressed the use of a International Commission on Radiological Protection (ICRP) reference organisms (flatfish, crab, and brown seaweed) to assess marine biota exposure due to uranium and thorium series radiation (Protásio et al. 2022), as also the temporal monitoring of contamination on the occurrence of remaining contaminants in sandy beaches (Bontempo Filho et al. 2022) and methods to manage contaminated coastal areas, with the aim to contribute to the management of the environmental crisis caused by disasters through the use of online collaborative mapping by volunteer collaborators (Citizen science) (Souto & Batalhão 2022). The description of the incident scenario from the perspective of Brazilian Federal Government (Barbeiro & Inojosa 2022) was also considered, and the use of social media data to understand how the 2019 Brazilian oil spill influenced social initiatives (Almeida et al. 2022). Lessons learned from the incident based on the analyze of the response actions, to evaluate policies and procedures in place are presented to improve the governance in future incident (Inojosa et al. 2022).

Oil spills continue to occur on Brazil's coast but not in the intensity of the 2019 events. There are, however, assumptions that the new spills may be originated from the 2019 oil spill, or even these are new spills. However, one of the legacies of the 2019 spill is the fact that Brazilian institutions and the scientists are better prepared for this kind of challenges. This special issue aims to contribute to a better understanding of the different environmental and socio-environmental aspects related to the oil spill on the Brazilian coast

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