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Khione - Pairing science and tourist biodiversity assessments: grassroots for an Antarctic monitoring scheme

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ABSTRACT

Antarctica is among the world's most vulnerable regions to climate change. Changes in climate have already triggered changes in the cryosphere and terrestrial and marine ecosystems. Antarctica is also one of the most pristine areas in the world, and the only continent without a resident human population where the environment and ecosystems are comprehensively protected and devoted to peace and science. Ensuring effective protective measures to predict and prevent irreversible changes in these ecosystems relies on our knowledge of their functioning, its links to biodiversity, and on how biodiversity is linked to changes in climate and the cryosphere. To achieve this, it is fundamental that we increase the spatial and temporal impact of scientific research, especially in remote and inaccessible regions like Antarctica. Multidisciplinary approaches to scientific questions are evermore welcomed when solving scientific questions, as they enable a more comprehensive view of the feedback between environmental compartments (e.g., terrestrial & marine ecosystems and the cryosphere). Furthermore, increasing environmental awareness and diplomacy is crucial to foster societal action in the current climate crisis. Antarctic tourist cruises with scientific teams onboard may work as a lab to test the efficiency of how this contact of tourists with scientists and their work can increase their environmental awareness and diplomacy, simultaneously strengthening the quality and range of observational data. Khione proposes to use the Access to the Southern Ocean on board the Polar Expedition Ship ""Le Commandant Charcot"" (PONANT, France) to develop a multidisciplinary research pairing science and tourist biodiversity assessments to create the grassroots for an Antarctic monitoring scheme, with a potential for future cooperation with Ponant. Khione aims at: i) assessing terrestrial vegetation and marine phytoplankton diversity links with climate and the cryosphere; ii) understanding their contribution to ecosystem multifunctionality (i.e., the capacity ecosystems have to perform multiple functions); iii) promoting a citizen science platform to collect relevant scientific data during the expedition aiming to improve passengers' environmental awareness and diplomacy. The citizen science component will be based on an app that onboard tourists and crew will be encouraged to use during the expedition. Questionnaires will be used to evaluate users' perception and relation with the environment during the expedition, and their environmental diplomacy. Khione will tackle crucial scientific problems contributing for scaling up the derived ecological concepts through time and space. Antarctic research is crucial to understand future

planet trajectories, and polar research is a key topic under the EU climate action. Khione outputs will support evidence-informed policymaking and the much needed national building capacity to tackle climate change, in terms of policy programs and mitigation, ecosystem protection and conservation, with relevant socio-economic impacts, nationally and internationally. Khione, the name selected for the project, is the Greek Godness of snow that developed and intimate relationship with Poseidon. This reflects the links between climate, cryosphere and the oceans, that we aim to address, also bridging into a strong citizen-science and environmental diplomacy. Environmental Impact Assessment will be conducted through the Portuguese Polar Program.