Expert Group on Antarctic Biodiversity Informatics: Coordinating the state-of-the-art internationally for biodiversity informatics in Antarctica

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Abstract

Biodiversity informatics have emerged as a key asset in wildlife and ecological conservation around the world. This is especially true in Antarctica, where climate change continues to threaten marine and terrestrial species. It is well documented that the polar regions experience the most drastic rate of climate change compared to the rest of the world (IPCC 2021). Research approaches within the scope of polar biodiversity informatics consist of computational architectures and systems, analysis and modelling methods, and human-computer interfaces, ranging from more traditional statistical techniques to more recent machine learning and artificial intelligence-based imaging techniques. Ongoing discussions include making datasets findable, accessible, interoperable and reusable (FAIR) (Wilkinson et al. 2016). The deployment of biodiversity informatics systems and coordination of standards around their utilization in the Antarctic are important areas of consideration.

To bring together scientists and practitioners working at the nexus of informatics and Antarctic biodiversity, the Expert Group on Antarctic Biodiversity Informatics (EG-ABI) was formed under the Scientific Committee on Antarctic Research (SCAR). EG-ABI was created during the SCAR Life Sciences Standing Scientific Group meeting at the SCAR Open Science Conference in Portland Oregon, in July 2012, to advance work at this intersection by coordinating and participating in a range of projects across the SCAR biodiversity science portfolio. SCAR, meanwhile, is a thematic organisation of the International Science Council (ISC), which is the primary entity tasked with coordinating high-quality scientific research on all aspects of Antarctic sciences and humanities, including the Southern Ocean and the interplay between Antarctica and the other six continents. The expert group is led by an international steering committee of roughly ten members, who take an active role in leading related initiatives. Currently, researchers from

Australia, Belgium, the United Kingdom, Chile, Germany, France, and the United States are represented on the committee. The current steering committee is comprised of a diverse range of scientists, including early-career researchers and scientists that have primary focuses in both the computational and ecological aspects of Antarctic biodiversity informatics.

Current projects that are being coordinated or co-coordinated by EG-ABI include the SCAR /rOpenSci initiative, which is a collaboration with the rOpenSci community to improve resources for users of the R software package in Antarctic and Southern Ocean science. Additionally, EG-ABI has contributed to the POLA3R project (Polar Omics Linkages Antarctic Arctic and Alpine Regions), which is an information system dedicated to aid in the access and discovery of molecular microbial diversity data generated by Antarctic scientists. Furthermore, EG-ABI has trained and helped collate additional species trait information such as feeding and diet information, development, mobility and their importance to society, documented through Vulnerable Marine Ecosystem (VME) indicator taxa, in The Register of Antarctic Species (http://ras.biodiversity.aq/), and the comprehensive inventory of Antarctic and Southern Ocean organisms, which is also a component of the World Register of Marine Species (https://marinespecies.org/). The efforts highlighted are only some of the projects that the expert groups have contributed to.

In our presentation, we discuss the previous accomplishments of the EG-ABI from the perspective of a currently serving steering committee member and outline its state in the status quo including collaborations and coordinated activities. We also highlight opportunities for engagement and the benefits for various stakeholders in terms of interacting with EG-ABI on multiple levels, within the SCAR ecosystem and elsewhere. Developing consistent and practical standards for data use in Antarctic ecology, in addition to fostering interdisciplinary and cross-sectoral collaborations for the successful deployment of conservation mechanisms, are key to a sustainable and biodiverse Antarctica, and EG-ABI is one of the premier organizations working towards these aims.

Keywords

coordination, polar

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