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Open Polar: A Comprehensive Database for Advancing Arctic and Antarctic Research

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In the realm of environmental and climate science, addressing the multifaceted challenges our planet faces necessitates a comprehensive approach. Holistic solutions are crucially dependent on the integration and interoperability of data. The polar regions, especially the Arctic, are particularly vulnerable to climate changes, experiencing a rate of temperature increase that is four times faster than the global average [1]. Accelerated polar warming is frequently marked by sea ice loss, but also includes shrinking habitats for polar biospheres that in turn drastically affect Arctic peoples. Though enhanced at the poles, the effects of warming are wide-ranging across the oceans and continents of our planet, affecting weather patterns, ecosystems and human activities. Polar research is thus invaluable for researchers and policymakers and should be widely and freely available. However, In 2019 a significant findability gap was discovered for open access polar records, indicating the need for a cross-disciplinary research service to provide efficient and seamless access to open polar research [2].

The Open Polar database [3] was launched in cooperation between the University Library at UiT The Arctic University of Norway and the Norwegian Polar Institute in 2021. Open Polar promotes Findable and Accessible polar research, such that researchers, policymakers, and society have equal and unfettered access to polar region publications and data. Open Polar harvests metadata from over 4600 open access providers, filters for polar research using over 11000 keywords, and enriches the record result by defining geolocations and applying correct DOIs, before finally building the Open Polar database that is searchable by standard text or geolocation. Currently, the database includes nearly 2.5 million open access records, consisting of approximately 75% publications and 25% datasets. Nearly 2 years after its launch, Open Polar maintains a constant robust engagement, and we aim to improve our usage by incorporating new sources, reducing redundancies and considering integration with data archiving and open education services.

[1] Rantanen, M., Karpechko, A.Y., Lipponen, A. *et al.* (2022). The Arctic has warmed nearly four times faster than the globe since 1979. *Commun Earth Environ* **3**, 168. https://doi.org/10.1038/s43247-022-00498-3

[2] Abu-Alam, T. S. (2019). Open Arctic Research Index: Final report and recommendations. *Septentrio Reports*, (3). https://doi.org/10.7557/7.4682

[3] https://openpolar.no/