



The POLARIN Data Hub: Connecting Data and Science in the Polar Regions

The POLARIN Data Hub is a unified platform enabling easy discovery and access to interoperable polar research data.

Antonio Novellino , 3-5 minutes read

POLARIN HORIZON Europe project

The HORIZON Europe POLARIN project brings together a large international consortium of polar research infrastructures. These include Arctic and Antarctic stations, research vessels and icebreakers, observatories, and specialized data repositories. Together, they address some of the most pressing scientific and societal challenges of our time.

Accessing Polar Data Through the POLARIN Data Hub

Historically, polar data management has been highly fragmented and a core objective of POLARIN is to improve data discovery, access, interoperability, and usability of its projects. These goals are directly addressed by the Data Hub, which transforms how polar data are accessed and integrated.

The POLARIN Data Hub functions as a single-entry, user-friendly digital platform where researchers, policymakers, and other stakeholders can find, explore, and retrieve scientific data and metadata from a diverse set of polar research infrastructures.

The Hub enables virtual access (VA) to data services from multiple sources, including seven major data infrastructures, observational networks, and dozens of stations, all through one unified portal.

This centralization is a significant advancement compared to the previous fragmented landscape, in which researchers had to consult disparate archives, formats, and catalogues to assemble datasets relevant to their questions. By facilitating discovery across systems that once operated largely independently, the Data Hub significantly reduces barriers to data use

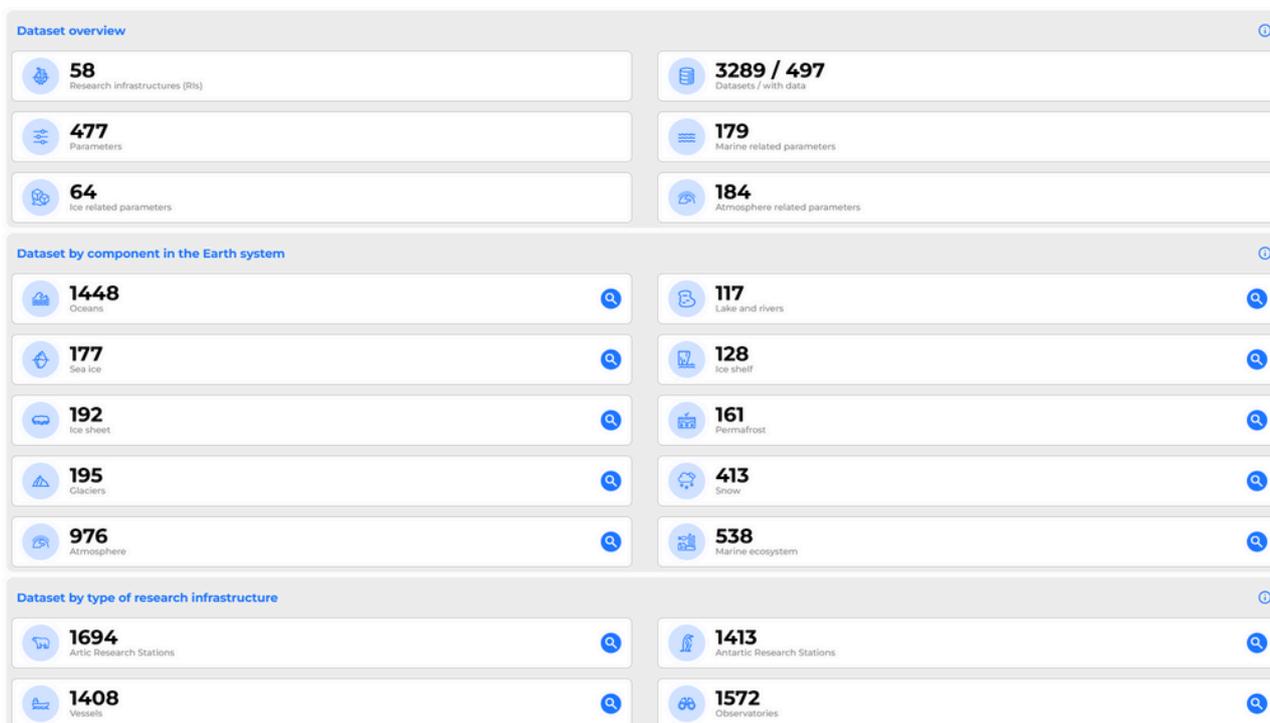
Why Understanding Polar Regions Matters

The importance of the POLARIN Data Hub is closely tied to the scientific urgency of understanding polar regions.

The Arctic and Antarctic play pivotal roles in the global climate system. They are among the most sensitive and rapidly changing parts of the Earth, acting as early warning systems for climate change. They also influence sea-level rise, ocean circulation, and global weather patterns.

Access to high-quality, interoperable data from these regions is therefore essential, not only for academic research but also for evidence-based policymaking and international climate assessments.

Polar data collection is inherently expensive, technically challenging, and scattered across many institutions and platforms. The Data Hub helps overcome these challenges by providing easy and harmonized access to data collected from multiple platforms and disciplines.



Landing page: <https://s4polarin.eu/#/>

Scalability and Interoperability

What makes the Data Hub particularly innovative is its scalability, interoperability, and advanced data services. It does not simply aggregate datasets.

The POLARIN Data Hub supports semantic consistency, allowing data from different sources to be understood and queried coherently, without requiring users to navigate incompatible formats.

In addition, the Hub's architecture supports direct data streaming from authoritative sources. This ensures access to the most up-to-date information while maintaining full traceability of data provenance. The distributed infrastructure supports both interactive, web-based discovery and machine-readable interfaces. This greatly enhances opportunities for automated workflows, computational analysis, and integration with third-party research tools.

Access for All Polar Researchers

The POLARIN Data Hub is designed for multidisciplinary users, ranging from climate scientists and glaciologists to ecological modelers and social scientists. It is accessible to both expert and non-expert users.

By offering free access to data and services, the Hub opens polar datasets to a broader scientific community. This includes early-career researchers and institutions in countries with limited polar infrastructure.

In this way, the POLARIN Data Hub democratizes access to key scientific information and supports international collaboration on critical polar science topics.



Antonio Novellino has a PhD in Biotechnology and Bioengineering, and a MSc in Biomedical Engineering, Certified Data Scientist. He works at POLARIN WP4 and he is a SmartCity Market Line Manager at ETT SpA - DedaGroup. He is an expert in data and information system management, WebGIS, decision support systems, data interoperability standards and tools (Open Data, FAIR, etc.), and EOSC-FAIR Champion. He serves on international expert teams and steering committees on environmental and marine data management, data standards, and in situ/ex situ operational data flow (EMODnet SC and TWG, SOOS DMSC, DOOS DMSC, GO-SHIP DMSC, OceanPrediction DCC, etc.). Proactively involved in EMODnet and Copernicus Marine Service (EMODnet and CMEMS are key European Commission environmental monitoring programs). He is a co-author of scientific publications and an active reviewer and editor for scientific journals.

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