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THE GLOBAL TERRESTRIAL NETWORK FOR PERMAFROST (GTN-P) DATA MANAGEMENT SYSTEM WITHIN THE FRAMEWORK OF THE ARCTIC DATA INTERFACE (ADI)

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The 21st century environmental turmoil, with rapid projected change in the conditions of the arctic, focuses the global attention and efforts toward Northern regions. Multiple initiatives are undertaken to respond the needs, from a variety of stakeholders, for accessing comprehensive and exploitable sets of information. The challenge being to adapt to the environmental, economic and social dynamics, while taking the best opportunities from the knowledge available.

The Arctic Data Interface (ADI) is an initiative developed at the Arctic Portal, Akureyri, Iceland, in collaboration with several international institutions. It intends to establish, through the development of web-based tools and interfaces, a platform of services devoted to search, to visualize, to query and to distribute geospatial information while enhancing data quality control and assurance. Arctic Portal embed its action within the framework of pilot actions with the intention of connecting technologies and demonstrating methodologies.

In that regard and within the EU 7th Framework (FP7) Changing Permafrost in the Arctic and its Global Effect on 21st Century (PAGE 21) project, Arctic Portal develops a central Data Management System (DMS) for permafrost monitoring parameters of the Global Terrestrial Network for Permafrost (GTN-P). Permafrost has been identified as an Essential Climate Variable (ECV) by the Global Observing community. The existing data, however, were far from being homogeneous and were not yet optimized for databases, without framework for data reporting or archival and the data documentation was incomplete. Each component of the DMS, including parameters, data levels and metadata formats were developed in cooperation with the GTN-P, the International Permafrost Association (IPA) and the Arctic Portal team. The researcher can now edit, visualize and download standardized datasets, metadata, charts and statistics for all relevant parameters for a specific site in all partner countries. Tools are further developed to provide data processing, analysis capability and quality control assurance. The end of the distribution chain delivers highly structured datasets in NetCDF files, format developed by UNIDATA and used by climate modelers.

The elaboration of this project highlights the absence of standardized data model for scientific DMS (especially for terrestrial data) and the opportunity that represent the generalization and the distribution of tools, such as the GTN-P DMS, within the elaboration of the Arctic Data Interface. It is vital to make accessible the extensive amount of data on different fields in the Arctic in order to integrate knowledge across disciplinary boundaries to efficiently develop innovation, sustainability and strategies within the region.