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heatflow.world: A FAIR, Quality-Controlled Global Platform for Heat-Flow Data and Geothermal Applications

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Heat-flow data are a critical input for geothermal exploration, lithospheric studies, and assessments of the global heat budget. Despite decades of measurements, their reuse has been hampered by heterogeneous or incomplete metadata, inconsistent quality assessment and documentation, and limited interoperability between regional and global compilations. To address these limitations, we present the new European heat-flow compilation as part of the World Heat Flow Database, now served through the www.heatflow.world platform as its new digital home. The European dataset comprises more than 14,000 heat-flow determinations from approximately 8,000 locations, including complementary data (e.g., underlying rock properties, measured temperature gradients, site-specific effects), and covering measurements acquired between 1939 and 2025. The dataset strictly follows a unified metadata schema and quality evaluation framework developed by the International Heat Flow Commission. This framework evaluates heat-flow determinations along three independent dimensions: methodological robustness, numerical uncertainty, and environmental or site-specific perturbations. These dimensions are combined into a transparent, reproducible quality score that supports objective comparison, automated filtering, and informed reusable data structure. Our analysis demonstrates that high-quality heat-flow data are available across most European regions, although the spatial density of data remains uneven. Importantly, data quality shows no systematic dependence on the year of measurement, underlining the long-term value of well-documented legacy data when embedded in a modern, quality-controlled framework. By integrating the European compilation into the World Heat Flow Database and publishing it via heatflow.world, regional datasets become interoperable components of a continuously expanding, standardised global resource. The heatflow.world platform is designed to follow the FAIR data principles, providing findable, accessible, interoperable, and reusable heat-flow data, grids, and maps for both academic and applied users. The online interface of the World Heat Flow Portal supports transparent data citation, community-driven updates, and long-term sustainability, thereby establishing a robust foundation for future geothermal exploration and global thermal studies.