

histMDH: introduction to a global multi-sectoral drought hazard reference dataset for 1981-2020 [Abstract]

Neda Abbasi, Tina Trautmann, Jan Weber, Petra Döll, Harald Kunstmann, Christof Lorenz, Tinh Vu, Stephan Dietrich, Malte Weller, Stefan Siebert

Angaben zur Veröffentlichung / Publication details:

Abbasi, Neda, Tina Trautmann, Jan Weber, Petra Döll, Harald Kunstmann, Christof Lorenz, Tinh Vu, Stephan Dietrich, Malte Weller, and Stefan Siebert. 2026. "histMDH: introduction to a global multi-sectoral drought hazard reference dataset for 1981-2020 [Abstract]." In *EGU General Assembly 2026, Vienna, Austria, 3–8 May 2026*, EGU26–1924. Göttingen: Copernicus. <https://doi.org/10.5194/egusphere-egu26-1924>.



histMDH: Introduction to a Global Multi-sectoral Drought Hazard Reference Dataset for 1981-2020

Neda Abbasi¹, Tina Trautmann², Jan Weber^{3,4}, Petra Döll^{2,5}, Harald Kunstmann^{3,4,6}, Christof Lorenz³, Tinh Vu⁷, Stephan Dietrich⁷, Malte Weller¹, and Stefan Siebert¹

¹Department of Crop Sciences, Division of Agronomy, University of Göttingen, Germany (neda.abbasi@agr.uni-goettingen.de)

²Institute of Physical Geography, Goethe University Frankfurt, Altenhöferallee 1, 60438 Frankfurt am Main, Germany

³Institute of Meteorology and Climate Research (IMK-IFU), Karlsruhe Institute of Technology (KIT), Kreuzteckbahnstr. 19, 82467, Garmisch-Partenkirchen, Germany

⁴Institute of Geography, University of Augsburg, 86159 Augsburg, Germany

⁵Senckenberg Biodiversity and Climate Research Centre Frankfurt (SBIK-F), Senckenberganlage 25, 60325 Frankfurt am Main, Germany

⁶Center for Climate Resilience, University of Augsburg, 86159 Augsburg, Germany

⁷International Centre for Water Resources and Global Change, Federal Institute of Hydrology, Koblenz, Germany

Drought occurrences have become more frequent across all continents in recent years, leading to greater emphasis on understanding their impacts on water resources and socioeconomic conditions. Despite the existence of several global drought monitoring systems, a comprehensive multisectoral approach, that integrates the impact on water, agriculture, ecosystems and society, is still lacking. We therefore present a multi-sectoral global drought hazard monitoring dataset (**histMDH**) for the period of 1981-2020 covering five key sectors: water supply, riverine and non-agricultural land ecosystems, and both rainfed and irrigated agriculture. With a period of 40 years coverage, histMDH is suitable to be used as the baseline/reference period for a near real-time monitoring and forecasting system, part of which will be used in an operational system in future. The dataset is derived from a modelling chain using the ERA5 reanalysis data (produced by the European Centre for Medium-Range Weather Forecasts) as climate forcing for two global models: Global Crop Water Model (GCWM) and Global Hydrological Model (WaterGAP) to generate a suite of multi-sectoral drought hazard indicators (DHI). The resulting gridded monthly dataset comprises eleven DHIs (**two meteorological, seven hydrological, and two agricultural**), spanning **1981–2020**. The DHIs defined can be used to identify droughts across different sectors and consequently define their characteristics and intersectoral impacts. The suitability of the DHIs for drought monitoring was assessed using multiple independent data sources at global and regional scales. As an open-access dataset, histMDH provides a critical baseline for near real-time drought hazard monitoring and forecasting within operational systems. It offers valuable support for decision-making in water management, agriculture, and food and water security monitoring. Furthermore, the spatio-temporal variability of DHIs at global and regional scales enables the identification of drought-prone regions, allowing to mitigate drought impacts and transition to more resilient agricultural, ecological and water supply systems.

