



## **The Global Energy Balance Archive (GEBA) version 2017**

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The Global Energy Balance Archive (GEBA) is a database for the central storage of the worldwide measured energy fluxes at the Earth's surface, maintained at ETH Zurich (Switzerland). This paper documents the status of the GEBA version 2017 dataset, presents the new web interface and user access, and reviews the scientific impact that GEBA data had in various applications. GEBA has continuously been expanded and updated and contains in its 2017 version around 500 000 monthly mean entries of various surface energy balance components measured at 2500 locations. The database contains observations from 15 surface energy flux components, with the most widely measured quantity available in GEBA being the shortwave radiation incident at the Earth's surface (global radiation). Many of the historic records extend over several decades. GEBA contains monthly data from a variety of sources, namely from the World Radiation Data Centre (WRDC) in St. Petersburg, from national weather services, from different research networks (BSRN, ARM, SURFRAD), from peer-reviewed publications, project and data reports, and from personal communications. Quality checks are applied to test for gross errors in the dataset. GEBA has played a key role in various research applications, such as in the quantification of the global energy balance, in the discussion of the anomalous atmospheric shortwave absorption, and in the detection of multi-decadal variations in global radiation, known as "global dimming" and "brightening". GEBA is further extensively used for the evaluation of climate models and satellite-derived surface flux products. On a more applied level, GEBA provides the basis for engineering applications in the context of solar power generation, water management, agricultural production and tourism. GEBA is publicly accessible through the internet via <http://www.geba.ethz.ch>.

### Reference:

Wild, M., Ohmura, A., Schär, C., Müller, G., Folini, D., Schwarz, M., Hakuba, M. Z., and Sanchez-Lorenzo, A., 2017: The Global Energy Balance Archive (GEBA) version 2017: a database for worldwide measured surface energy fluxes, *Earth Syst. Sci. Data*, 9, 601-613, doi:10.5194/essd-9-601-2017, 2017