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The global freshwater availability and water use model WaterGAP 2.2d

Hannes Müller Schmied^{1,2}, Denise Cáceres¹, Stephanie Eisner³, Martina Flörke⁴, Christoph Niemann¹, Thedini Asali Peiris¹, Eklavya Popat¹, Felix T. Portmann¹, Robert Reinecke⁵, Maike Schumacher⁶, Somayeh Shadkam¹, Camelia Eliza Telteu¹, Tim Trautmann¹, and Petra Döll^{1,2}

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

(hannes.mueller.schmied@em.uni-frankfurt.de)

²Senckenberg Leibniz Biodiversity and Climate Research Centre (SBIK-F), Frankfurt am Main, Germany

³Norwegian Institute of Bioeconomy Research (NIBIO), Ås, Norway

⁴Institute of Hydrological Engineering and Water Resources Management, Ruhr-Universität Bochum, 44801 Bochum, Germany

⁵International Centre for Water Resources and Global Change, Germany

⁶Institute of Physics and Meteorology, University of Hohenheim, Stuttgart, Germany

Freshwater availability is of vital importance for humans, freshwater biota and ecosystem functions. In the past decades, global hydrological models (GHMs) were developed to improve understanding of the global freshwater situation in a globalized world, by filling gaps in observational coverage and assessing scenarios of the future under consideration of different socioeconomic developments and climate change. The Water Global Assessment and Prognosis (WaterGAP) model was one of the first GHMs developed to evaluate freshwater resources and their use for both historical and future conditions. It consists of five water use models (for irrigation, domestic, cooling of thermal power plants, manufacturing, and livestock sectors) and the WaterGAP Global Hydrology Model (WGHM). Recently, the latest model version, WaterGAP 2.2d, was finalized, containing a number of enhancements and revisions such as a river storage-based flow velocity approach, improvements in modelling groundwater recharge in dry environments and integration of historical development of irrigated areas.

This presentation provides an overview about the WaterGAP 2.2d scheme and features, assesses global freshwater resources (runoff and streamflow) and water balance components, and provides insights to evaluation results against observed streamflow, GRACE total water storage and the AQUASTAT database.